Ameritool

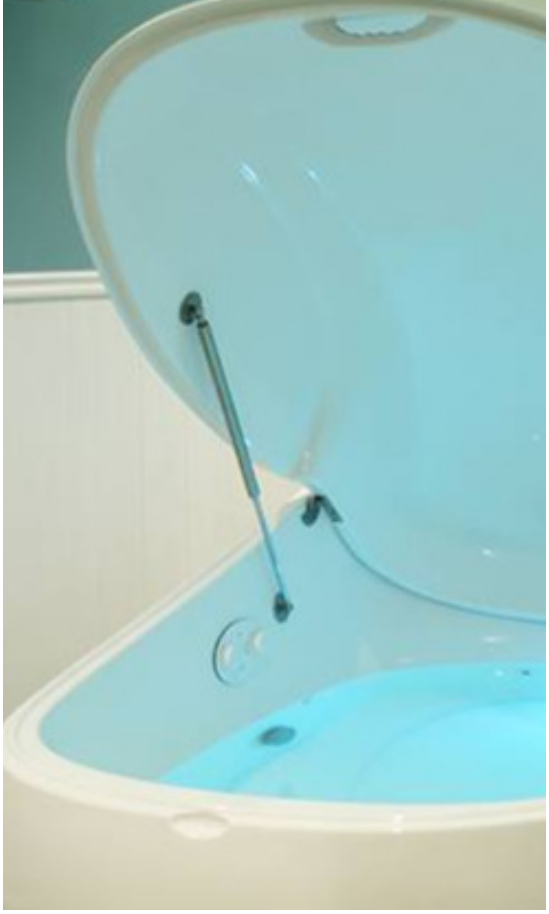
MADE IN THE U.S.

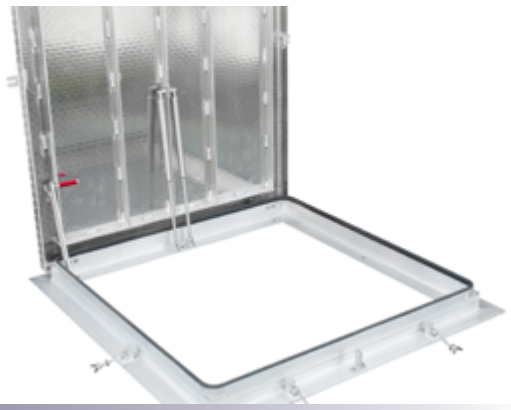
# 316 STAINLESS STEEL GAS SPRINGS & DAMPERS

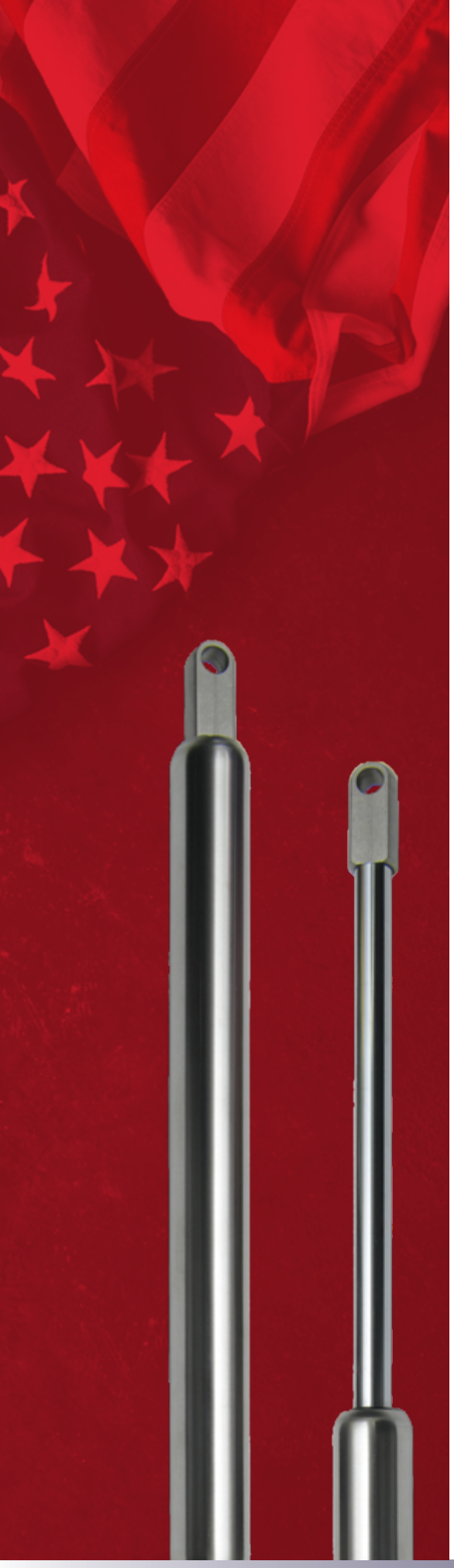
FOR THE MARINE, AEROSPACE, MEDICAL, AND INDUSTRIAL MARKETS

Visit us at ***Ameritoolmfg.com***
888.870.4884

64 Corporate Park Drive
Central Square, NY 13036







# Table of Contents

## Company Overview


With 30 years of experience manufacturing stainless steel gas springs, tension springs, and dampers, Ameritool has gained a prominent reputation through quality, revolutionary solutions, outstanding on-time delivery, and exceptional customer service. Being the first and the leading stainless steel gas spring manufacturer in North America, Ameritool is a global supplier delivering advanced technological solutions for almost every type of industry.

Here at Ameritool our business idea is to offer a wide variety of American made stainless steel gas springs, tension springs, and dampers with brilliant design at very competitive prices. Our groundbreaking customer service team is focused on a strong partnership with our customers. Our engineers strive for better designs and processes to ensure the delivery of the best possible product. Our customers' satisfaction is our success!

Ameritool continually strives to provide the widest selection of gas springs, tension springs, and damper products in the global marketplace by investing in the latest technologies and setting sights on quality improvements. Through constant evaluation and testing, we bring our customers the most cost-effective products with more features, greater performance, and improved ease of use.

Ameritool provides a unique combination of product selection, engineering excellence, and technical support to Original Equipment Manufacturers (OEMs) and aftermarket applications. Ameritool products meet the toughest energy absorption and application requirements.

Global manufacturing and sales facilities offer our customers:

- Highly trained distribution network
- State of the art engineering capabilities
- Custom solution development
- Customer service specialists
- Multiple open communication channels


**Products / Engineering / Technical Support**

If you are unsure whether one of our standard products meets your requirements, feel free to speak to one of our technical representatives toll free by calling **1-888-870-4884**, or contact us via email at **springsales@ameritoolmfg.com**.

If you require a size that is not a standard size, Ameritool will build a custom size to fit your application needs.

# Gas Spring Guidelines

1. Mount and dismount gas springs according to safety guidelines. To achieve long-life expectancy with reduced fatigue strength, employ sound mounting practices.

2. If gas springs are fitted in applications where failure means risk of health or life, we recommend using additional locking mechanisms. This is the customer's responsibility.

3. In FOOD or MEDICAL settings, request food-grade lubricating oils in place of industrial-grade hydraulic fluids, as minor quantities of fluid may leak from gas springs and should not come in contact with food or similar products or with subsoil water.

4. Allow for sufficient movement in the end fittings. If the mounts are subject to vibration, fittings must be secured. Fittings must be screwed on completely.

5. Gas springs, tension springs, and dampers are not safety parts. These units are wear parts and thus should be eplaced depending on the stress and the area of the application.

6. Avoid side loading of gas springs. Long strokes may require additional support to avoid bending and tilting. Avoid non-axial forces.

7. Minor damage, corrosion, or paint residue on the shaft may damage the unit's seal and result in rapid failure. Any product change, adjustment, or repair through any third party, without written consent from Ameritool, will void any warranty or guarantee.

8. Unless specifically designed for tension loads, gas springs must not be loaded with traction forces.

9. Do not extend or retract gas springs beyond their design specifications. Gas springs are not to be used as a dead stop.

10. Use units only within a temperature range of -40°F to 300°F (-40°C to 148°C). Contact Ameritool if intended use exceeds this range. Do not heat above 300°F (148°C).

11. Extreme temperature variances affect extension and compression forces. Compression force changes occur at a rate of approximately 3% per every 50°F (10°C) change in operating temperature.

12. Warranty is excluded for any installation suggestions/ drawings for gas springs, tension springs, and dampers. It must be considered that not all installation parameters can be included in the theoretical suggestions, therefore the installation must be carried out with the utmost care in practice since friction values or accelerations cannot be considered in the theoretical suggestion. In general, all orders must indicate if springs are used under normal conditions, -40°F to 300°F (-40°C to 148°C), or in environments that exceed these conditions (ex: water steam > 300°F (148°C), chemicals, detergents, etc.).

13. Test gas springs after installation. Ameritool cannot simulate or anticipate the complete range of situations where our products may be used.

14. Avoid high accelerations or velocities during extension or compression as it could overload the unit. Attention: High stroke speeds or stoke frequencies lead to overheating and thus damage to the seals and the failure of the product.

15. Store gas springs in a shaft-down position to ensure lubrication of the seal.

16. For horizontal use, specify Ameritool internal floated piston bearing with oil chamber.

17. Mount non-reservoir gas springs shaft down, as they remain mostly in a static position.

18. The tolerance for the compression or tension forces is +3-8 pounds for 400, 625, and 750 series, +5-10 pounds for the 875 series, and +10-20 pounds for the 1100, 1165, and 1750 series from the nominal force. The nominal force is measured statically 1 inch from the full extension.

**Warranty is excluded for any non-observance of the above instructions.**

## Specification Worksheet

Ameritool provides design assistance to ensure peak performance of our gas springs in an endless variety of applications. Complete the form below in as much detail as possible and feel free to include pictures and/or drawings for additional resources. Please be sure to include any mounting restrictions, such as hatch ledges, channels, or anything obstructing where the gas springs would be mounted. Upon completion, please email springsales@ameritoolmfg.com.

Name _____ Email _____

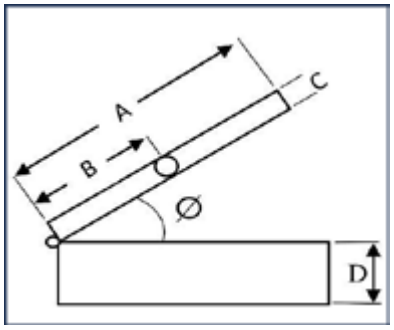
Company _____ Telephone _____ Fax _____

Address _____ City _____ State _____ Zip Code _____

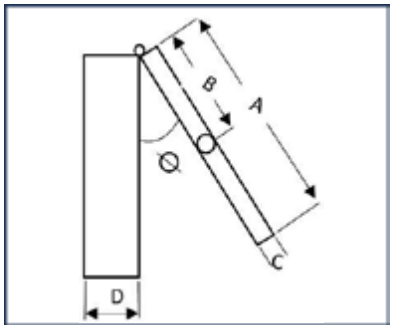
Initial Quantity Required _____ Estimated Annual Usage _____

Brief Description of Application: _____

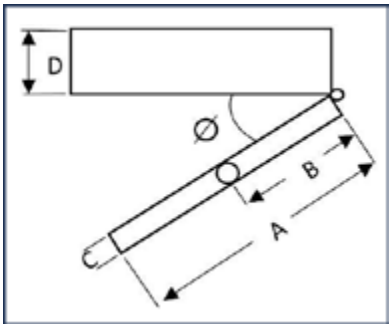
**Select the figure below that best represents your application:**




1. Starting Horizontal




2. Starting Vertical




3. Falling Lid

Application Type: ☐ 1 ☐ 2 ☐ 3 Number of Springs per Lid: ☐ 1 ☐ 2

**Technical Information:**

Weight of Lid (lbs.) _____ Opening Angle (degrees) _____ Distance from Hinge to End of Lid (Dimension A) _____

Distance from Hinge to Center of Gravity (Dimension B) _____ Thickness of Lid (Dimension C) _____ Maximum Mounting Position (Depth) (Dimension D) _____

**Lid Behavior:**

When Lid is Closed it should: ☐ Stay Closed Under its own Weight ☐ Automatically Open (Latch Required)

When Lid is Open it should: ☐ Stay Open ☐ Close Under its own Weight

On Average, how often will this application be used? (Ex. 2 Cycles per hour, once a week, etc.) _____

Operating Temperature: From _____ °F to _____ °F

Environment: ☐ Salt Water ☐ Chemical ☐ Food Processing/Medical

www.ameritoolmfg.com springsales@ameritoolmfg.com P: 315-668-2172 F: 315-668-6853

# The American Made Difference

Ameritool offers an extensive variety of 316 stainless steel adjustable and fixed force gas springs, tension springs, and dampers at competitive market prices proudly manufactured in the United States.

Superior marine, aerospace, industrial, food service, medical, and farm equipment manufacturers recognize our products and routinely use Ameritool gas springs as original parts in their product lines.

These traits make Ameritool the number one choice for your gas spring needs:

- 316 stainless steel shaft and body.
- Hard chrome over the 316 stainless steel shaft for longevity.
- Rod wiper keeps contaminants off the rod to prevent them from entering the system.
- Major internal components are brass, bronze, and aluminum for unrivaled strength.
- Low lead time: 2-week turnaround on regular orders with rush ordering available.
- Gas springs are built to order for maximum life expectancy.
- Ameritool offers a 1-year limited liability warranty on our gas springs.
- Capable of producing forces from 5 lbs. up to 1,200 lbs.
- Capable of producing extended lengths from 5" to 108".

## Typical Applications

- Engine room doors & hatches
- Fish boxes & anchor lockers
- Livewell compartments
- Electronic box compartments
- Storage hatches
- Davit systems
- Heavy equipment
- Awnings
- Lift equipment
- Storage chests
- Tool boxes
- Conveyors
- Gull wing doors
- Mixers

# Which Ameritool Product is Right for You

## Fixed Forced Gas Spring

- Lift assist.
- Forces from 5 lbs to 150 lbs.
- Force cannot be adjusted.
- Common 10mm ball socket.
- Industry standard sizes to replace your foreign failure.

**See these products on pages 10 - 11**

## Adjustable Force Gas Spring

- Heavy duty lift assist.
- Forces from 20 lbs to 1,200 lbs.
- Pressure can be reduced by end user.
  - Recharged by Ameritool.
- Standard lengths from 6.75" to 64.75".

**See these products on pages 20 - 21**

## Fixed Forced Tension Spring

- Non-adjustable forces from 35 lbs to 85 lbs.
- Great for keeping doors, hatches, lids, closed.
- Compressed in its natural state.

**See these products on page 13**

## Adjustable Force Tension Spring

- Force pulls applications closed.
- Optional to reduce force and recharge if needed.
- Heavy duty; min force 25 lbs, max 350 lbs.

**See these products on page 26**

## Fixed Dampers

- No lift assist; offers control of movement.
- 3 types: extension, compression, and dual direction.
- Custom speeds and fluid viscosities available.
- Available in 700 series and 850 series.

**See these products on pages 14 - 15**

## Adjustable Tank Valve Gas Spring

- Heavy duty lift assist yet offers force fine-tuning.
- Can be reduced while installed in application.
  - Force range 75 lbs to 500 lbs.
- Great for prototype scenarios.

**See these products on page 23**

## Micro Gas Springs

- Small/compact applications.
- Provides lifting pressures from 5 lbs to 30 lbs.
- Standard lengths from 2.28" to 7.28".

**See these products on page 19**

## Adjustable Dampers

- No lift assist; offers control of movement.
- Travel speed can be easily adjusted.
  - Remains constant throughout stroke.
- Heavy duty; .875" cylinder diameter.

**See these products on page 27**

## Carbon Steel Gas Springs

- Economical gas spring.
- Industry standard sizes available for quick delivery.
- Fixed force and provides lift assist.
- For use in non-corrosive environments.

**See these products on pages 28 - 29**

# CUSTOMS

When you're the manufacturer, customs are a breeze! No gas spring is too big or too small. Ameritool can build them all!

Looking for a size not listed in our catalog specs?

Looking to speed up or slow down an existing, standard Ameritool product?

Looking for a replacement in a size 'we don't carry'?

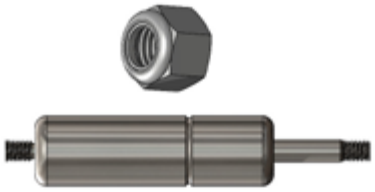
Provide us with as much detail as possible including:

- **Material Requirements**
- **Extended Length**
- **Stroke**
- **Size/Style End Fittings**
- **Drawings/Models, if available**

Upon final approval of drawing(s); customs are manufactured with the same lead time of our cataloged items!

Email us at **springsales@ameritoolmfg.com**.

Note: Custom, non-catalog sized products are non-returnable for credit.



# 316 STAINLESS STEEL GAS SPRINGS

## Features & Benefits

- **Reliable**
  Proven life of 125,000 cycles
- **Durable**
  Unique rod seal & wiper design
- **High quality**
  **316 stainless steel**
- **Low maintenance**
- **Quick delivery**

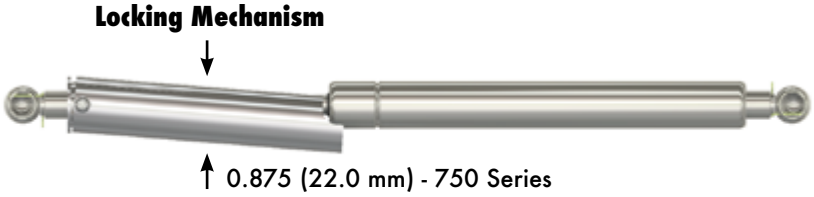
## 316 Stainless Steel Fixed Force and Locking Gas Springs

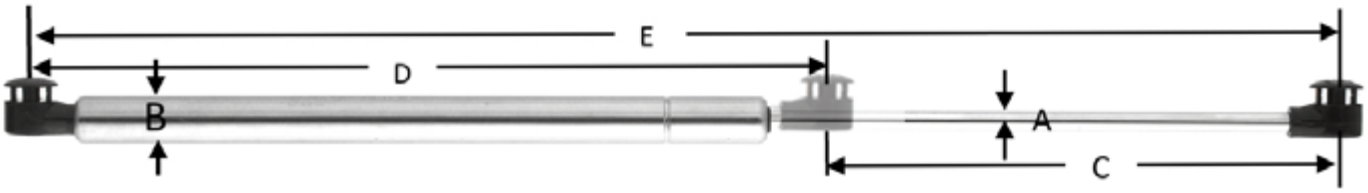
High quality 316 stainless steel fixed force gas springs are self-contained pneumatic devices capable of producing very large forces. Used in opening or closing apparatus either by a vertical or horizontal travel for lifting, counterbalancing, and motion control of doors, hatches, safety lids, hoods, cargo doors, and access panels.

- Extreme duty; tested range: -40°F to 300°F (-40°C to 148°C)

The locking mechanism accessory mechanically locks the gas spring in the fully extended position providing assurance of safety. Locking mechanisms are available on the 750 series gas springs. Adding the locking mechanism loses 0.50" stroke. To order add "09" to the part number when ordering.

Ex: 750-3-XX-09-D2D2.






## **625 Series** Forces (F1) can be factory set from 5 lbs. to 90 lbs. (22 N - 400 N)

*See page 12 for Series End Fitting / Ball Studs and Pages 16 - 18 for Brackets.*

Ordering number example: 625-6L-5-A3A3

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 625-2 | 0.250 (6.4) | 0.625 (15.9) | 2.25 (57.2) | 5.25 (133.4) | 7.5 (190.5) | M6 X 1 | 5 - 90 (22 - 400) |
| 625-3 | | | 3.0 (76.2) | 7.0 (177.8) | 10.0 (254.0) | | |
| 625-4 | | | 4.0 (101.6) | 8.0 (203.2) | 12.0 (304.8) | | |
| 625-6 | | | 6.0 (152.4) | 9.0 (228.6) | 15.0 (381.0) | | |
| 625-6L | | | 7.0 (177.8) | 10.0 (254.0) | 17.0 (431.8) | | |
| 625-7 | | | 7.5 (190.5) | 11.5 (292.1) | 18.5 (469.9) | | |
| 625-8 | | | 8.0 (203.2) | 12.0 (304.8) | 20.0 (508.0) | | |

## **750 Series** Forces (F1) can be factory set from 10 lbs to 150 lbs (44N - 667N)

*See page 12 for Series End Fitting / Ball Studs and Pages 16 - 18 for Brackets.*

Ordering number example: 750-6-20-09-D2D2

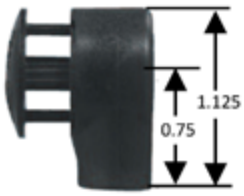
| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 750-2 | 0.312 (7.9) | 0.750 (19.1) | 2.25 (57.2) | 5.25 (133.4) | 7.5 (190.5) | | 10 - 150 (44 - 667) |
| 750-3 | | | 3.0 (76.2) | 7.0 (177.8) | 10.0 (254.0) | | |
| 750-4 | | | 4.0 (101.6) | 8.0 (203.2) | 12.0 (304.8) | | |
| 750-6 | | | 6.0 (152.4) | 9.0 (228.6) | 15.0 (381.0) | | |
| 750-6L | | | 7.0 (177.8) | 10.0 (254.0) | 17.0 (431.8) | | |
| 750-7 | | | 7.5 (190.5) | 11.5 (292.1) | 18.5 (469.9) | | |
| 750-8 | | | 8.0 (203.2) | 12.0 (304.8) | 20.0 (508.0) | | |
| 750-10S | | | 9.6 (243.8) | 13.4 (340.4) | 23.0 (584.2) | | |
| 750-10 | | | 11.2 (284.48) | 15.0 (381.0) | 26.3 (668.0) | | |

Notes:

1. Force increments of 5 pounds for 625 and 750 series.
2. Product length tolerance is ± .08 in. (2.0 mm)
3. Force tolerance is 3-8 pounds over the nominal force.
4. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
5. Gas springs are filled with oil and are under pressure. Please dispose of it properly.
6. Do not heat, open, or puncture.
7. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
8. EE denotes no end mounts on spring.

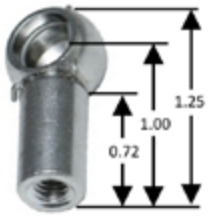
# FIXED FORCE GAS SPRINGS AND DAMPER END MOUNTS

## 400, 625, 700, and 750 Series End Mounts 10mm ball sockets

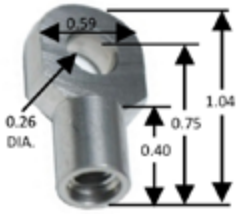



**A1**
P/N: EFC-10M

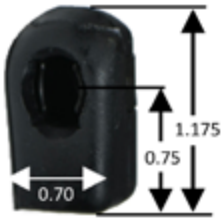

**A2**
P/N: HESS-230



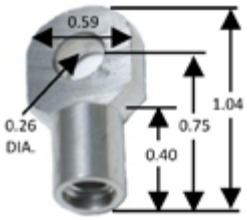

**A3**
P/N: EFSS-10M



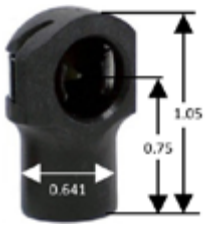

**A4**
P/N: BESS-257




**A5**
P/N: CEF-10M




**A6**
P/N: BES-257




**A7**
P/N: CNC-10M


**A8**
P/N: AEF-10M

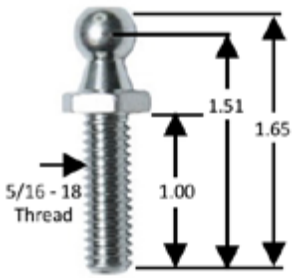

**A9**
P/N: CSL-10M


**D1**
P/N: EFS-10H

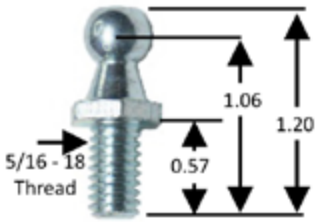

**D2**
P/N: EFSS-10H


**D3**
P/N: EFSS-10IL

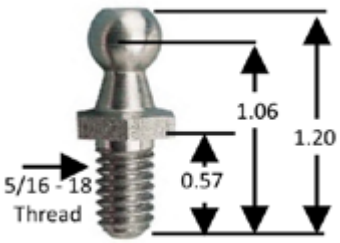
## 400, 625, 700, and 750 Series Ball Stud Mounts 10mm ball studs



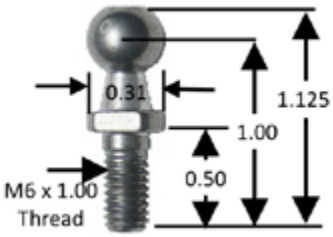

P/N: BSSS-10E 1



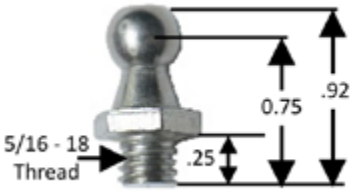

P/N: BSZ-10E




P/N: BSSS-10E




P/N: BSSS-10M

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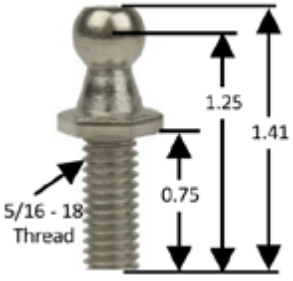


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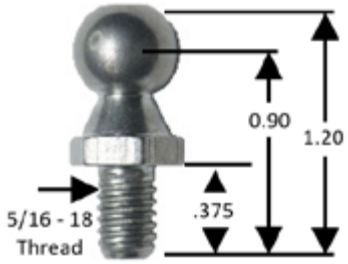


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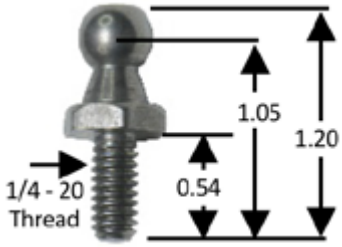



P/N: BSSS-1020

# FIXED FORCE TENSION GAS SPRINGS

Tension gas springs, also known as reverse acting gas springs, are constructed from 316 stainless steel. The force on these springs pulls the piston rod inward, operating in the opposite direction of other gas springs. Great for use on doors, lids, hatches, and hoods that need to stay closed. In its relaxed position, the spring is compressed; you must pull to extended it.

- Extreme duty; tested temperature range -40°F to 300°F(-40°C to 148°C)


**400 Series Tension Springs** Forces (F1) can be factory set from 35 lbs. to 85 lbs. (15 N - 378 N)

*See page 12 for series end fittings/ball studs & pages 16-18 for brackets.*

Ordering number example: 400-6-25-D2D2

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 400-2 | 0.312 (7.9) | 0.750 (19.1) | 2.11 (53.59) | 7.40 (187.96) | 9.40 (238.76) | M6 X 1 | 35 - 85 (156 - 378) |
| 400-3 | | | 3.11 (78.99) | 9.40 (238.76) | 12.40 (314.96) | | |
| 400-4 | | | 4.11 (104.39) | 11.40 (289.56) | 15.40 (391.16) | | |
| 400-6 | | | 6.11 (155.19) | 15.40 (391.16) | 21.40 (543.56) | | |
| 400-7 | | | 7.11 (180.59) | 17.40 (441.96) | 24.40 (619.76) | | |
| 400-8 | | | 8.11 (205.99) | 19.40 (492.76) | 27.40 (695.96) | | |
| 400-10 | | | 10.11 (295.79) | 23.40 (594.36) | 33.40 (848.36) | | |

Notes:

1. Force increments of 5 pounds for 400 series.
2. Product length tolerance is ± .08 in. (2.0 mm)
3. Force tolerance is 3-8 pounds over the nominal force.
4. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
5. Tension springs are filled with oil and are under pressure. Please dispose of it properly.
6. Do not heat, open, or puncture.
7. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
8. EE denotes no end fittings on spring.

## READY-SWITCH

As always, Ameritool is committed to providing cutting edge, innovative products that meet and exceed industry standards. It is Ameritool's mission to make the customer successful with every Ameritool product installed.

For more product information, please email us at **springsales@ameritoolmfg.com** or call us at **315-668-2172**.

## Features & Benefits

**Easily placed on installed gas spring**
No end fitting to remove

**Fits stainless and carbon gas spring tube diameters**
18mm body diameter

**Infinite positioning along rod for more accurate**
on/off locations

**Smallest, most compact design on the market**
accommodates multiple applications

**Moisture-proof switch**
Product integrity

**Accurate, reliable circuit control**
Customer satisfaction

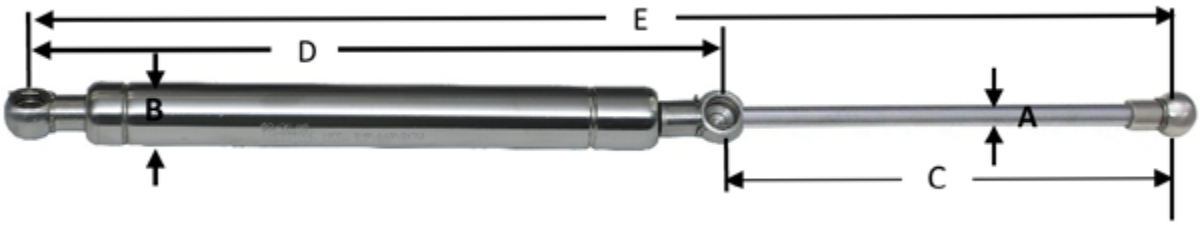
# EXTENSION, COMPRESSION, AND DUAL-DIRECTION DAMPERS

- **Extension Dampers:** controlled damping speed while rod extends out of cylinder.
- **Compression Dampers:** controlled damping speed while rod compresses into the cylinder.
- **Dual-Direction Dampers:** damping speed in both directions.

The Ameritool damper is a hydraulic damping element and is composed of a tube with a piston on a rod, and an advanced floating piston system.

Dampers can be custom designed to match specific applications. Call Ameritool for details.

EDP = Damping on extensions, free on compression.
CDP = Damping on compression, free on extension.
DDP = Dual direction damper, dampens in both directions.




## 700 Series Extension Dampers

*See page 12 for series end fittings/ball studs & pages 16 - 18 for brackets.*

Ordering number example: 700-4-EDP-D2D2

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread |
|---|---|---|---|---|---|---|
| 700-2-EDP | 0.250 (6.4) | 0.750 (19.1) | 2.25 (57.2) | 5.25 (133.4) | 7.5 (190.5) | M6 X 1 |
| 700-3-EDP | | | 3.0 (76.2) | 7.0 (177.8) | 10.0 (254.0) | |
| 700-4-EDP | | | 4.0 (101.6) | 8.0 (203.2) | 12.0 (304.8) | |
| 700-6-EDP | | | 6.0 (152.4) | 9.0 (228.6) | 15.0 (381.0) | |
| 700-6L-EDP | | | 7.0 (177.8) | 10.0 (254.0) | 17.0 (431.8) | |
| 700-7-EDP | | | 7.5 (190.5) | 11.0 (279.4) | 18.5 (469.9) | |
| 700-8-EDP | | | 8.0 (203.2) | 12.0 (304.8) | 20.0 (508.0) | |

## 700 Series Compression Dampers

*See page 12 for series end fittings/ball studs & pages 16 - 18 for brackets.*

Ordering number example: 700-4-CDP-D2D2

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread |
|---|---|---|---|---|---|---|
| 700-2-CDP | 0.250 (6.4) | 0.750 (19.1) | 2.25 (57.2) | 5.25 (133.4) | 7.5 (190.5) | M6 X 1 |
| 700-3-CDP | | | 3.0 (76.2) | 7.0 (177.8) | 10.0 (254.0) | |
| 700-4-CDP | | | 4.0 (101.6) | 8.0 (203.2) | 12.0 (304.8) | |
| 700-6-CDP | | | 6.0 (152.4) | 9.0 (228.6) | 15.0 (381.0) | |
| 700-6L-CDP | | | 7.0 (177.8) | 10.0 (254.0) | 17.0 (431.8) | |
| 700-7-CDP | | | 7.5 (190.5) | 11.0 (279.4) | 18.5 (469.9) | |
| 700-8-CDP | | | 8.0 (203.2) | 12.0 (304.8) | 20.0 (508.0) | |

## 700 Series Dual-Direction Dampers

*See page 12 for series end fittings/ball studs & pages 16 - 18 for brackets.*

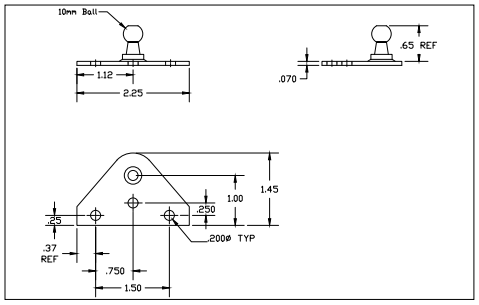
Ordering number example: 700-4-DDP-D2D2

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread |
|---|---|---|---|---|---|---|
| 700-2-DDP | 0.250 (6.4) | 0.750 (19.1) | 2.10 (53.3) | 5.73 (145.5) | 7.50 (190.5) | M6 X 1 |
| 700-3-DDP | | | 3.00 (71.1) | 7.0 (167.6) | 10.00 (254.0) | |
| 700-4-DDP | | | 4.00 (94.7) | 8.0 (193.0) | 12.00 (304.8) | |
| 700-6-DDP | | | 5.60 (142.2) | 9.45 (240.0) | 15.00 (381.0) | |
| 700-6L-DDP | | | 6.53 (165.9) | 10.45 (265.4) | 17.00 (431.8) | |
| 700-7-DDP | | | 7.00 (177.8) | 11.70 (297.2) | 18.5 (469.9) | |
| 700-8-DDP | | | 7.50 (190.5) | 12.25 (311.6) | 20.00 (508.0) | |

Notes:

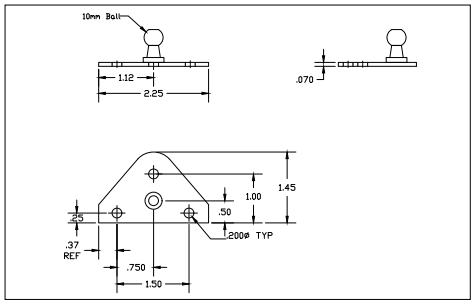
1. No force/pressure in dampers.
2. Product length tolerance is ± .08 in. (2.0 mm)
3. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
4. Dampers are filled with oil. Please dispose of properly.
5. Do not heat, open, or puncture.
6. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
7. Custom speeds available.
8. EE denotes no end mounts on spring.

# FIXED FORCE GAS SPRING AND DAMPER STAINLESS STEEL BRACKETS

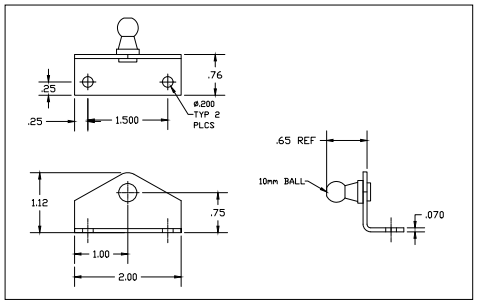



P/N: BR-202

Also available in Black: P/N BR-202B
Also available in Zinc: P/N: BR-202Z

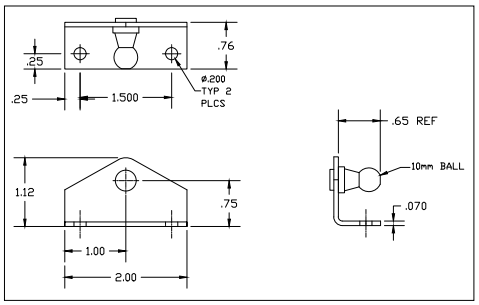



P/N: BR-203



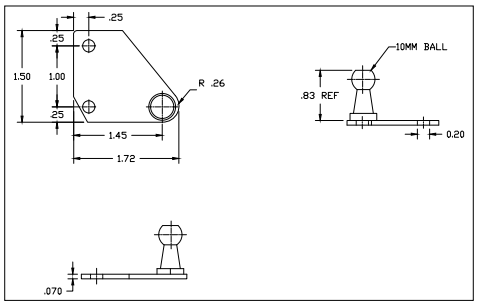

P/N: BR-204

Also available in Black: P/N BR-204B
Also available in Zinc: P/N: BR-204Z




P/N: BR-204R

Also available in Black: P/N BR-204RB
Also available in Zinc: P/N: BR-204RZ

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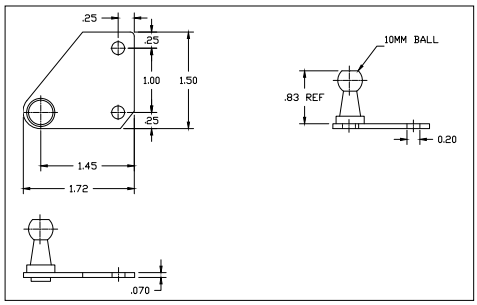
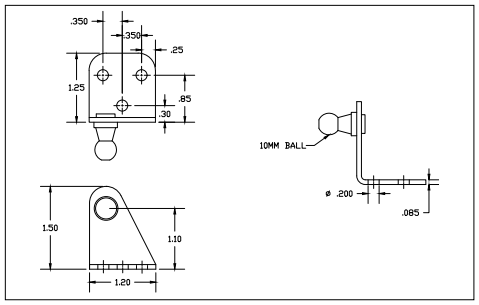
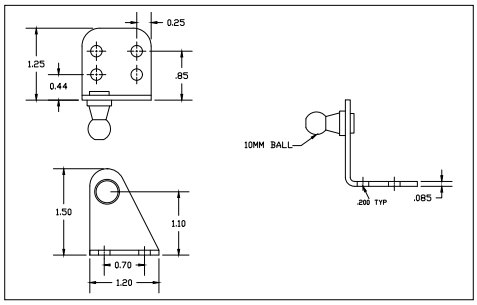


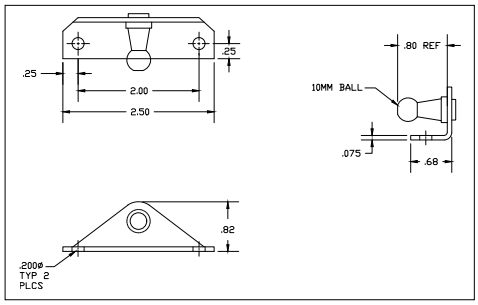

P/N: BR-205L




P/N: BR-208




P/N: BR-208M

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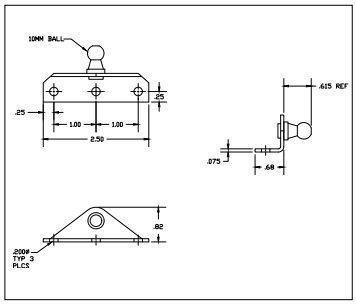
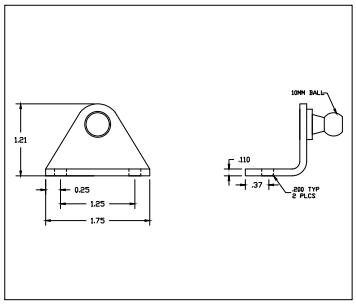
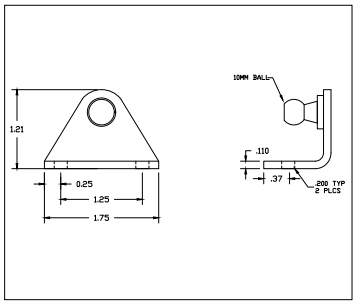


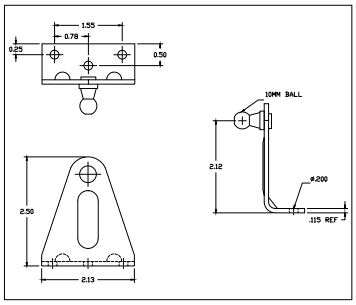

P/N: BR-209L




P/N: BR-210

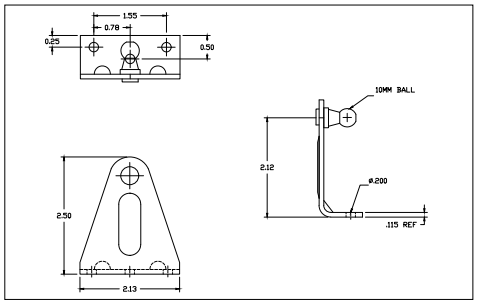



P/N: BR-210R

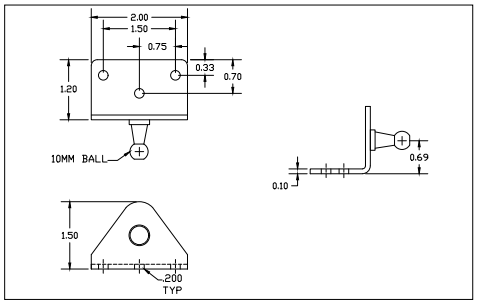



P/N: BR-211

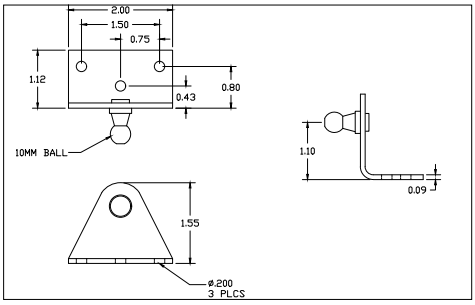
# 400, 625, 700, AND 750 BRACKETS




P/N: BR-211R

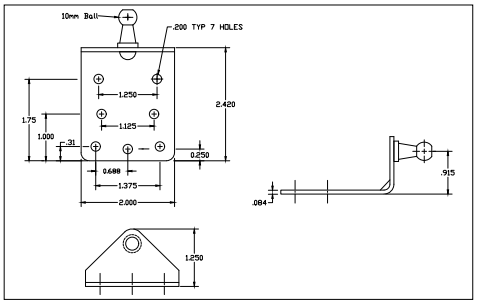



P/N: BR-212

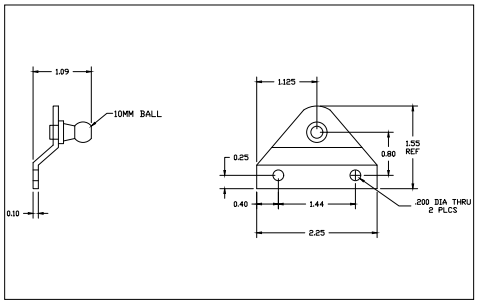



P/N: BR-213

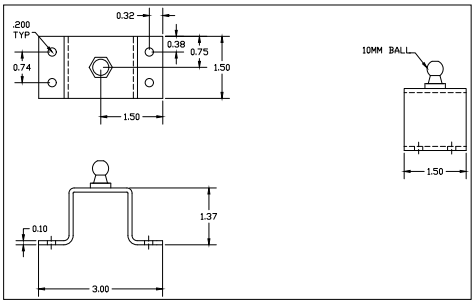
Also available in Black: P/N BR-213B
Also available in Zinc: P/N: BR-213Z



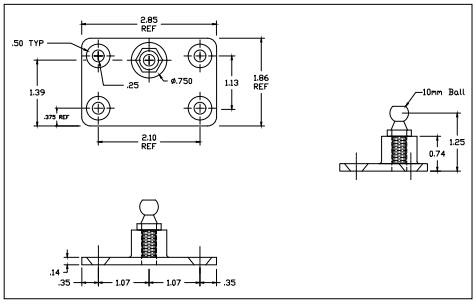

P/N: BR-214




P/N: BR-215




P/N: BR-216

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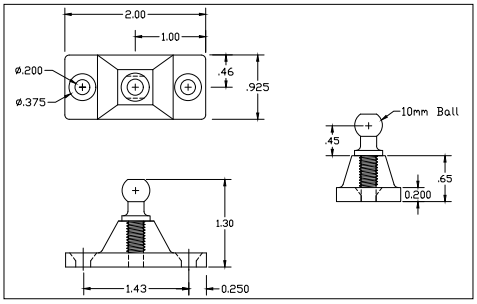
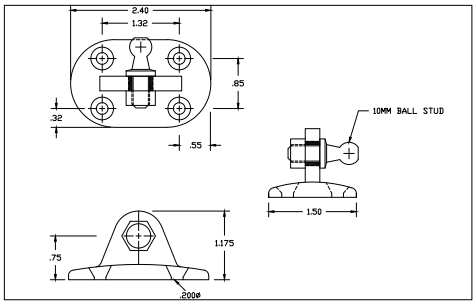
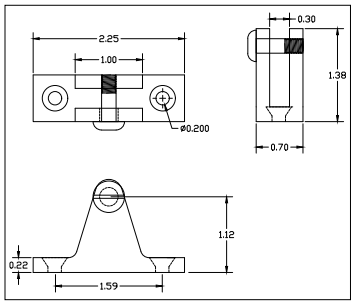


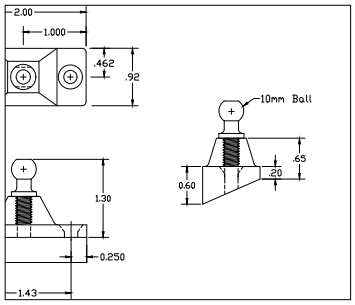

P/N: BR-219



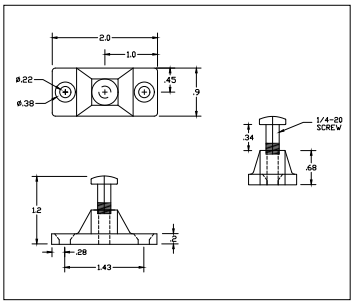

P/N: BR-220



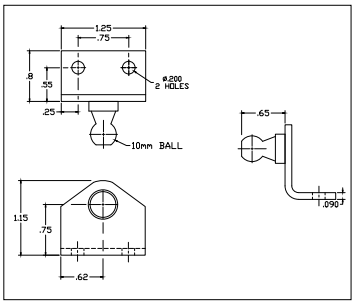

P/N: BR-222




P/N: BR-223



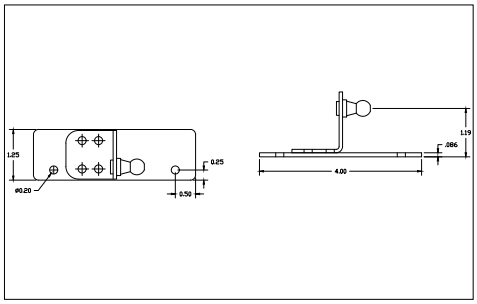

P/N: BR-226



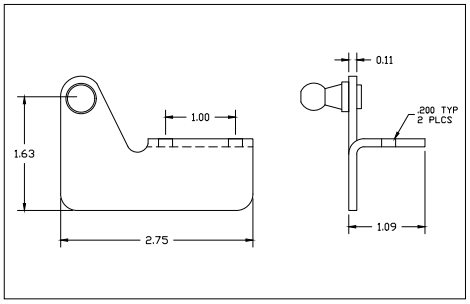

P/N: BR-230

Also available in Black: P/N BR-230B

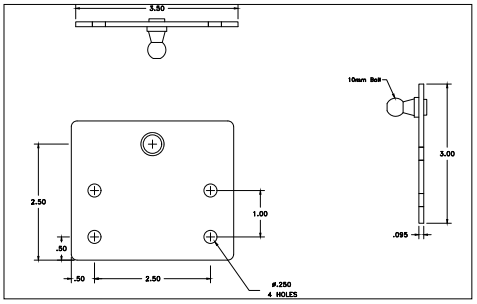
# FIXED FORCE GAS SPRING AND DAMPER STAINLESS STEEL BRACKETS



P/N: BR-231




P/N: BR-236

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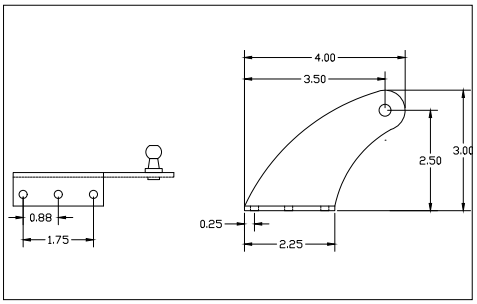
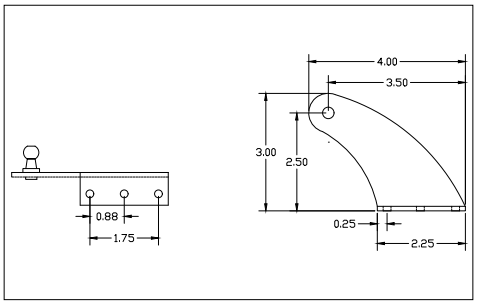
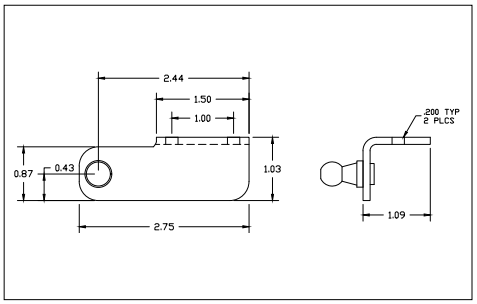


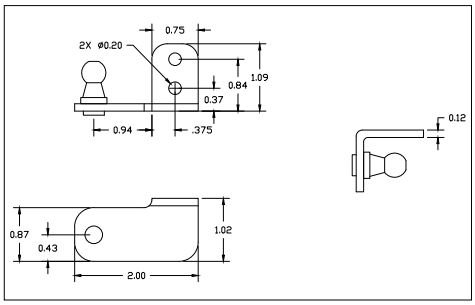

P/N: BR-240




P/N: BR-240L




P/N: BR-242

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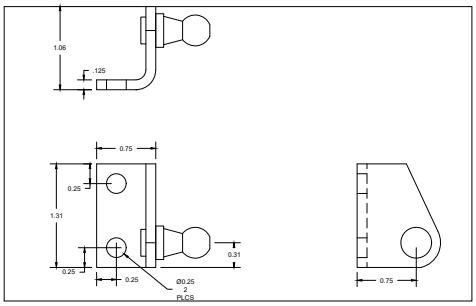
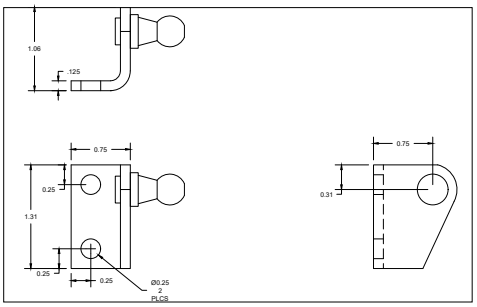
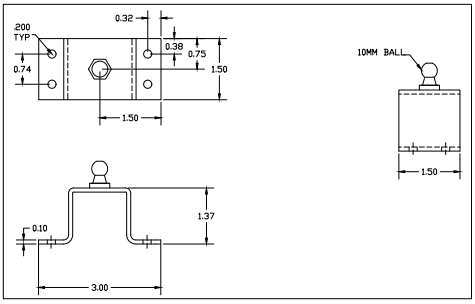


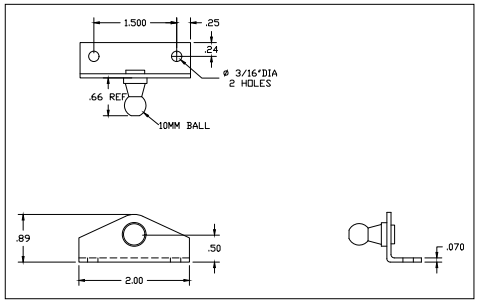

P/N: BR-244R



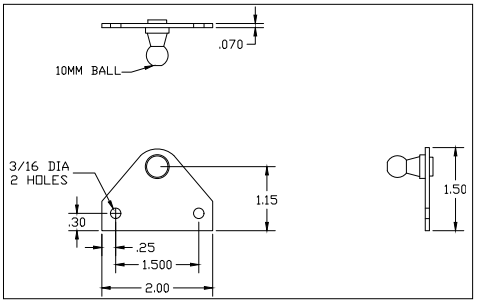

P/N: BR-244L




P/N: BR-3300



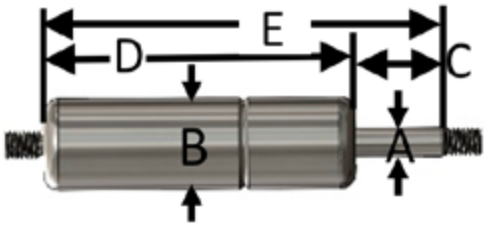

P/N: 10-292




P/N: 10-293

# 316 STAINLESS MICRO GAS SPRINGS

Ameritool Micro gas springs are a miniature and compact option with a rod diameter of just .1875" and a tube diameter of only .500". These are designed to fit in the smallest of applications. These gas springs have a force range between 5 and 30 pounds and feature stroke lengths between 1 and 3.5 inches. Micro gas springs are high quality and long-lasting gas springs. These micro gas springs are made from 316 stainless steel with a chrome plated 316 stainless steel rod for excellent corrosion resistance. These are ideal for applications where space is very limited.



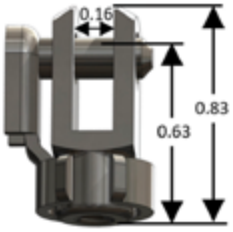

**500 Series** Forces (F1) can be factory set from 5 lbs. to 30 lbs. (22 N - 133 N)

Ordering number example: 500-.5-10-J2J2

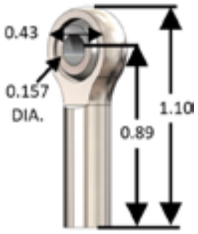
| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 500-.5 | 0.19 (4.8) | 0.500 (12.7) | .5 (12.7) | 1.78 (45.2) | 2.28 (57.9) | M4 X 0.7 | 5 - 30 (22 - 133) |
| 500-1 | | | 1.0 (25.4) | 2.28 (57.9) | 3.28 (83.3) | | |
| 500-1.5 | | | 1.5 (38.1) | 2.78 (70.6) | 4.28 (108.7) | | |
| 500-2 | | | 2.0 (50.8) | 3.28 (83.3) | 5.28 (134.1) | | |
| 500-2.5 | | | 2.5 (63.5) | 3.78 (96.0) | 6.28 (159.5) | | |
| 500-3 | | | 3.0 (76.2) | 4.28 (108.7) | 7.28 (184.9) | | |

Notes:

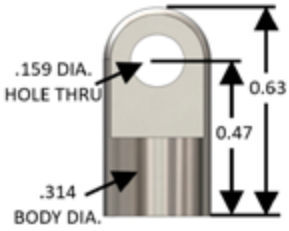
1. Force (F1) increments of 5 pounds.
2. Product length tolerance is ± .08 in. (2.0 mm)
3. Force tolerance is 2-5 pounds over the nominal force.
4. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
5. Gas springs are filled with oil and are under pressure. Please dispose of it properly.
6. Do not heat, open, or puncture.
7. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
8. EE denotes no end mounts on spring.




**J1**
P/N: CLVS-165




**J2**
P/N: HESS-150




**J3**
P/N: BESS-150

# ADJUSTABLE GAS SPRING AND DAMPER STAINLESS STEEL END MOUNTS

High quality 316 stainless steel adjustable force gas springs offer a powerhouse of lifting capacity up to 1,200 pounds – no tools required to install, trouble-free, reliable lifting support.

**Locking Mechanism**
1.25" OD -1165 Series
1" OD 875 Series

The locking mechanism accessory mechanically locks the gas spring in the fully extended position. Locking mechanisms are available on the 875 and 1165 series springs. To order add "09" to the ordering number. Adding locking mechanism adds .050" to extended length and shortens stroke by .75". EX. 875-8-XXX-09-B1B1

**Guard Tube**
1.25" OD -1165 Series
1" OD 875 Series

The guard tube accessory protects the piston rod from damage due to incidental impacts. This accessory adds 0.1" to the extended length of the gas springs. Please review the "E" dimensions. Guard tubes are available on the 875 and 1165 series gas springs. To order add "08" to the ordering number Ex. 1165-8-XXX-08-C1C1


**875 Series** Forces (F1) can be factory set from 20 lbs. to 240 lbs. (87 N - 1045 N)

*See page 22 for series end fittings/ball studs & page 24 for brackets.*

Ordering number example: 875-16-240-B2B2

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 875-2 | 0.375 (9.5) | 0.875 (22.2) | 2.0 (50.8) | 4.75 (120.6) | 6.75 (171.4) | 8 mm | 20 - 240 (87 - 1045) |
| 875-4 | | | 4.0 (101.6) | 6.75 (171.40) | 10.75 (273.0) | | |
| 875-6 | | | 6.0 (152.4) | 8.75 (222.2) | 14.75 (375.6) | | |
| 875-8 | | | 8.0 (203.2) | 10.75 (273.0) | 18.75 (476.2) | | |
| 875-10 | | | 10.0 (254.0) | 12.75 (323.8) | 22.75 (577.8) | | |
| 875-12 | | | 12.0 (304.8) | 14.75 (374.6) | 26.75 (679.4) | | |
| 875-14 | | | 14.0 (355.6) | 16.75 (425.4) | 30.75 (781.0) | | |
| 875-16 | | | 16.0 (406.4) | 18.75 (476.2) | 34.75 (882.6) | | |

## **1165 Series** Forces (F1) can be factory set from 75 lbs. to 500 lbs. (334 N - 2224 N)

*See page 22 for series end fittings/ball studs & page 24 for brackets.*

Ordering number example: 1165-10-500-C1C1

| Model Number | **A.** Rod Dia in. (mm) | **B.** Body Dia in. (mm) | **C.** Stroke in. (mm) | **D.** Compressed Length in. (mm) | **E.** Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 1165-2 | 0.562 (14.3) | 1.165 (29.6) | 2.0 (50.8) | 6.00 (152.4) | 8.00 (203.2) | 10 mm | 75 - 500 (334 - 2224) |
| 1165-4 | | | 4.0 (101.6) | 8.00 (203.2) | 12.00 (304.8) | | |
| 1165-6 | | | 6.0 (152.4) | 10.00 (254.0) | 16.00 (406.4) | | |
| 1165-8 | | | 8.0 (203.2) | 12.00 (304.8) | 20.00 (508.0) | | |
| 1165-10 | | | 10.0 (254.0) | 14.00 (355.6) | 24.00 (609.6) | | |
| 1165-12 | | | 12.0 (304.8) | 16.00 (406.4) | 28.00 (711.2) | | |
| 1165-14 | | | 14.0 (355.6) | 18.00 (457.2) | 32.00 (812.8) | | |
| 1165-16 | | | 16.0 (406.4) | 20.00 (508.0) | 36.00 (914.4) | | |
| 1165-20 | | | 20.0 (508.0) | 24.00 (609.6) | 44.00 (1117.6) | | |
| 1165-24 | | | 24.0 (609.6) | 28.00 (711.2) | 52.00 (1230.8) | | |

## **1750 Series** Forces (F1) can be factory set from 200 lbs. to 1,200 lbs. (900 N - 5338 N)

*See page 22 for series end fittings/ball studs & page 24 for brackets.*

Ordering number example: 1750-8-1200-H1H1

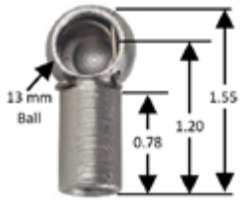
| Model Number | **A.** Rod Dia in. (mm) | **B.** Body Dia in. (mm) | **C.** Stroke in. (mm) | **D.** Compressed Length in. (mm) | **E.** Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 1750-2 | 0.875 (22.2) | 1.75 (44.5) | 2.0 (50.8) | 6.75 (171.5) | 8.75 (222.3) | 5/8 - 11 | 200 - 1200 (900 - 5338) |
| 1750-4 | | | 4.0 (101.6) | 8.75 (222.3) | 12.75 (323.9) | | |
| 1750-6 | | | 6.0 (152.4) | 10.75 (273.0) | 16.75 (425.5) | | |
| 1750-8 | | | 8.0 (203.2) | 12.75 (328.8) | 20.75 (527.1) | | |
| 1750-10 | | | 10.0 (254.0) | 14.75 (374.65) | 24.75 (628.7) | | |
| 1750-12 | | | 12.0 (304.8) | 16.75 (425.4) | 28.75 (730.3) | | |
| 1750-14 | | | 14.0 (355.6) | 18.75 (476.3) | 32.75 (831.9) | | |
| 1750-16 | | | 16.0 (406.4) | 20.75 (527.1) | 36.75 (933.5) | | |
| 1750-20 | | | 20.0 (508.0) | 24.75 (628.7) | 44.75 (1136.7) | | |
| 1750-24 | | | 24.0 (609.6) | 28.75 (730.3) | 52.75 (1339.9) | | |
| 1750-30 | | | 30.0 (762.0) | 34.75 (882.7) | 64.75 (1644.7) | | |

Notes:

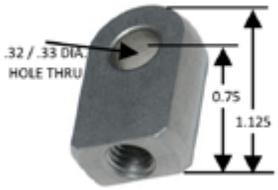
1. Required force (F1) must be within the catalog limits and in increments of 10 lbs. (45 N).
2. Product length tolerance is ± . 08 in. (2.0 mm).
3. Force tolerance is 5-10 pounds (875 series), 10-20 pounds (1165), and 20-40 pounds (1750 series) over the nominal force.
4. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
5. Gas springs are filled with oil and are under pressure. Please dispose of properly.
6. Do not heat, open, or puncture.
7. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
8. EE denotes no end fittings on spring.

# ADJUSTABLE GAS SPRING AND DAMPER STAINLESS STEEL END MOUNTS

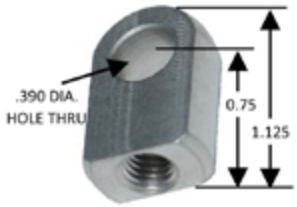
## 800, 850, and 875 Series End Mounts



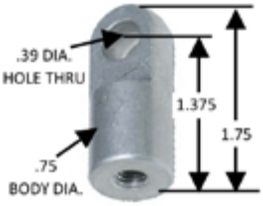

**B1**
P/N: EFSS-13M



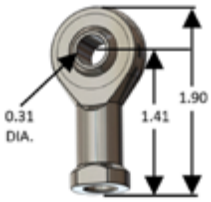

**B2**
P/N: BESS-328




**B4**
P/N: BESS-390-8

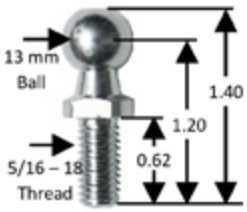



**B5**
P/N: EFAL-390-8

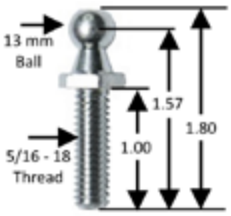



**B6**
P/N: HESS-312

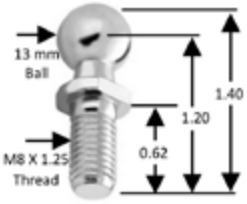
## 800, 850, and 875 Series Ball Studs




P/N: BSSS-13E

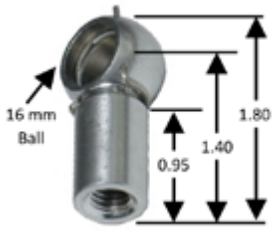



P/N: BSSS-13E 1

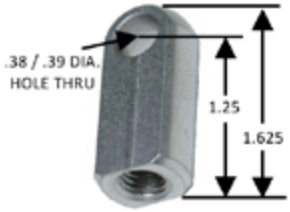



P/N: BSSS-13M

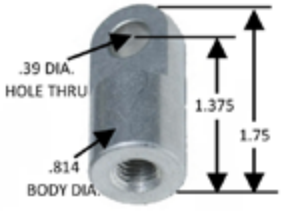
## 1100, 1150, and 1165 Series End Mounts



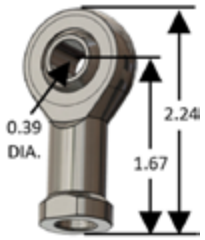

**C1**
P/N: EFSS-16M




**C2**
P/N: BESS-390-10

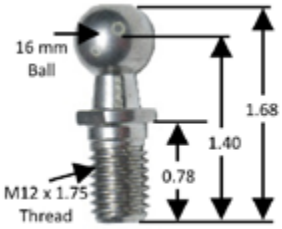



**C3**
P/N: EFAL-390-10



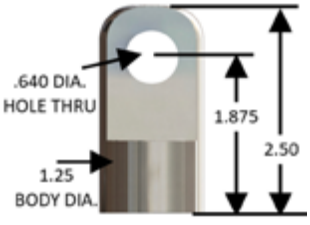

**C4**
P/N: HESS-390

## 1100, 1150, and 1165 Ball Stud




P/N: BSSS-16M

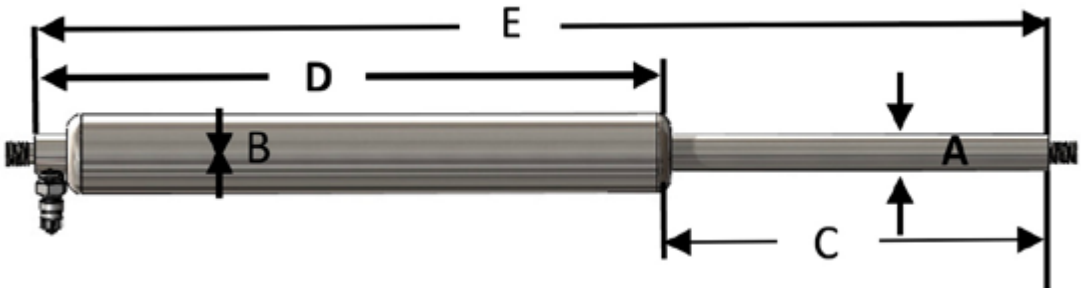
## 1750 Series End Mount




**H1**
P/N: BESS-640

# ADJUSTABLE FORCE TANK VALVE GAS SPRINGS

When you are not sure of the pressure required for your project to open or close, our adjustable tank valve gas springs are the product to consider. The 1150 series is the ideal solution to be used during product prototyping as this allows the opportunity to adjust the pressure until you attain the proper force while the gas spring is installed in your application. Another use is in scenarios where the load varies between models as these springs can be degassed to provide the correct performance when you need it. This series is equipped with a tank valve providing a more expansive range of possibilities, allowing the end user to adjust the pressure in the gas spring in real time until the force exactly matches your application.




**1150 Series** Forces (F1) can be factory set from 75 lbs. to 500 lbs. (334 N - 2224 N)

*See page 22 for series end fittings/ball studs & page 24 for brackets.*

Ordering number example: 1150-16-300-FO-C4C4

| Model Number | **A.** Rod Dia in. (mm) | **B.** Body Dia in. (mm) | **C.** Stroke in. (mm) | **D.** Compressed Length in. (mm) | **E.** Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 1150-2 | 0.562 (14.3) | 1.165 (29.6) | 2.0 (50.8) | 6.00 (152.4) | 8.00 (203.2) | 10 mm | 75 - 500 (334 - 2224) |
| 1150-4 | | | 4.0 (101.6) | 8.00 (203.2) | 12.00 (304.8) | | |
| 1150-6 | | | 6.0 (101.6) | 10.00 (254.0) | 16.00 (406.4) | | |
| 1150-8 | | | 8.0 (203.2) | 12.00 (304.8) | 20.00 (508.0) | | |
| 1150-10 | | | 10.0 (254.0) | 14.00 (355.6) | 24.00 (609.6) | | |
| 1150-12 | | | 12.0 (304.8) | 16.00 (406.4) | 28.00 (711.2) | | |
| 1150-14 | | | 14.0 (355.6) | 19.00 (482.6) | 33.00 (838.2) | | |
| 1150-16 | | | 16.0 (406.4) | 21.00 (533.4) | 37.00 (939.8) | | |
| 1150-20 | | | 20.0 (508.0) | 25.00 (635.0) | 45.00 (1143.0) | | |
| 1150-24 | | | 24.0 (609.6) | 29.00 (736.6) | 53.00 (1346.2) | | |

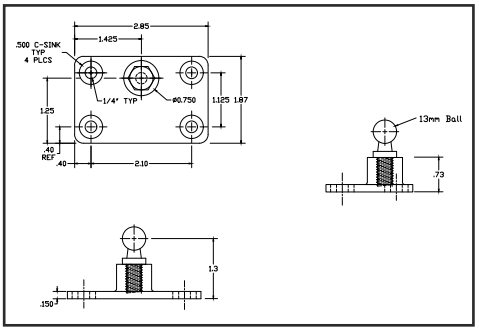
Notes:

1. Required force (F1) must be within the catalog limits and in increments of 10 lbs. (45 N).
2. Product length tolerance is ± . 08 in. (2.0 mm).
3. Force tolerance is 10-20 pounds over the nominal force.
4. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
5. Gas springs are filled with oil and are under pressure. Please dispose of properly.
6. Do not heat, open, or puncture.
7. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
8. EE denotes no end fittings on spring.

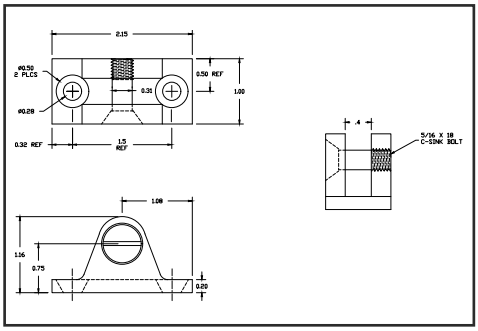
# ADJUSTABLE GAS SPRING AND DAMPER STAINLESS STEEL BRACKETS

Ameritool offers a variety of brackets for all our industry leading products. All brackets are made from high quality stainless steel unless otherwise specified.

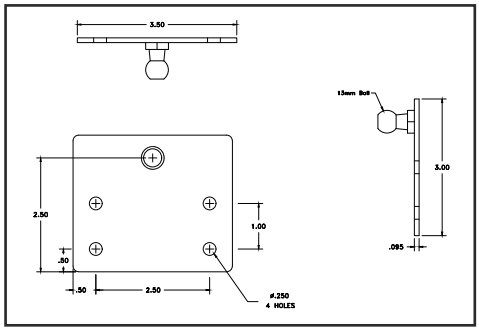
## Adjustable Gas Spring Bracket Specifications: 800, 850, and 875 Brackets




P/N: BR-218

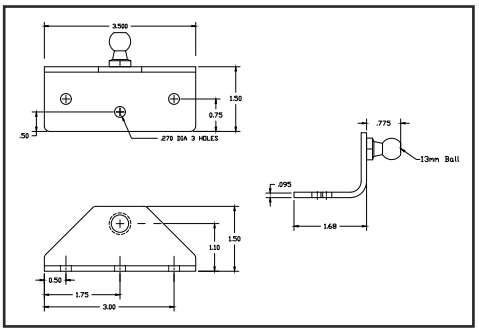



P/N: BR-221



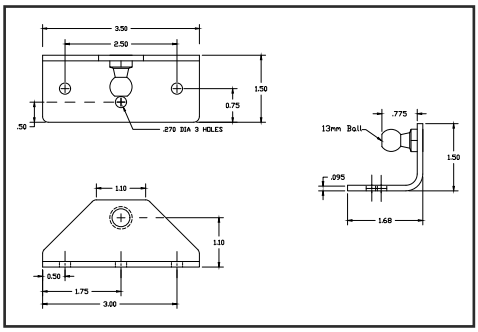

P/N: BR-228

Also available in Zinc: P/N BR-228Z

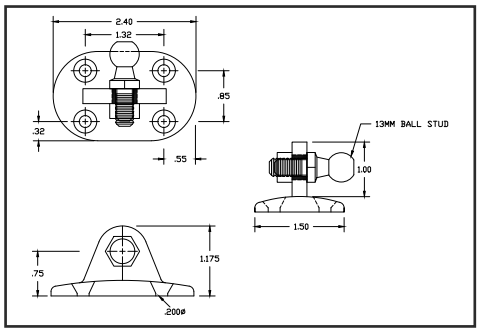



P/N: BR-229

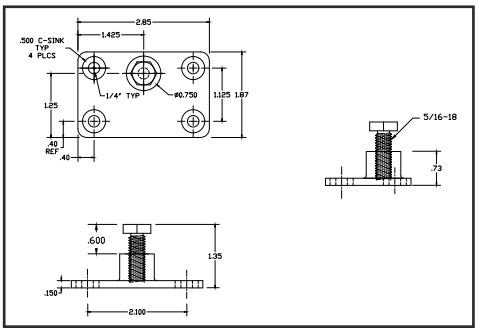
Also available in Zinc: P/N BR-229Z



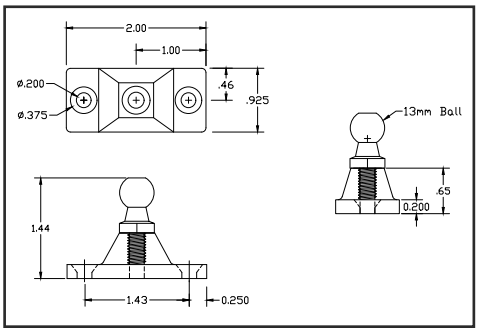

P/N: BR-229R



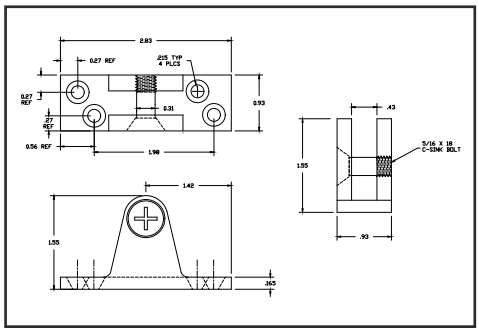

P/N: BR-232




P/N: BR-235

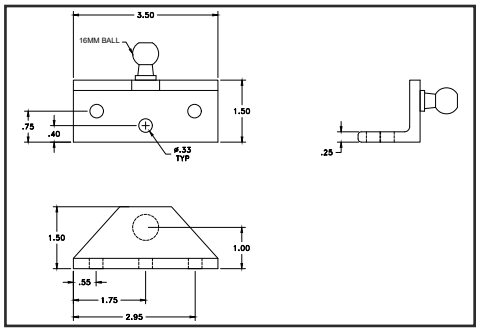



P/N: BR-237

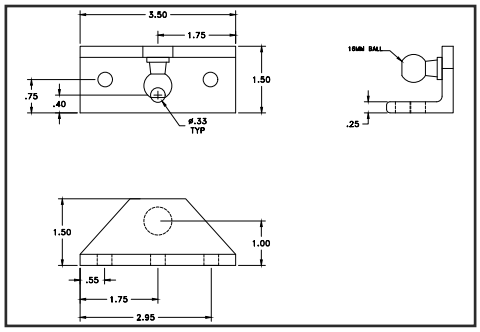



P/N: BR-239

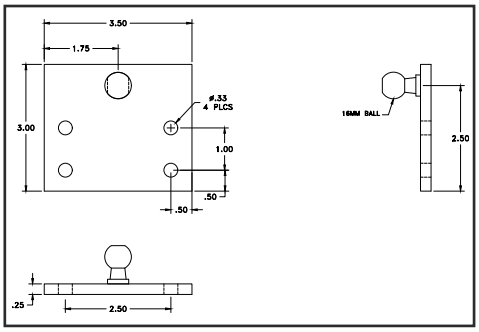
## Adjustable Gas Spring Bracket Specifications: 1100, 1150, and 1165 Brackets



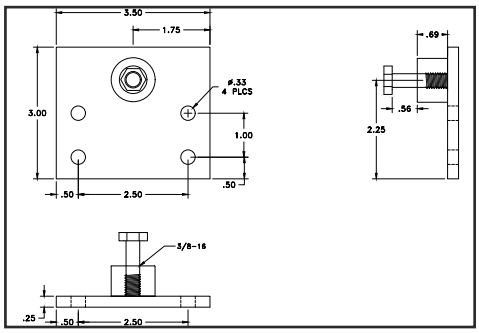

P/N: BR-225



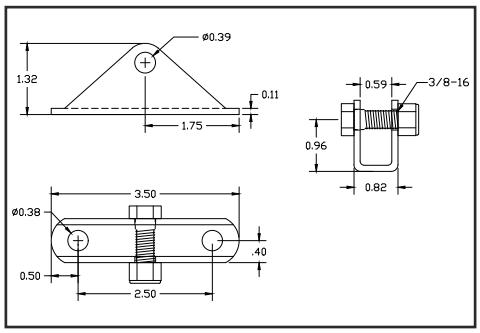

P/N: BR-225R



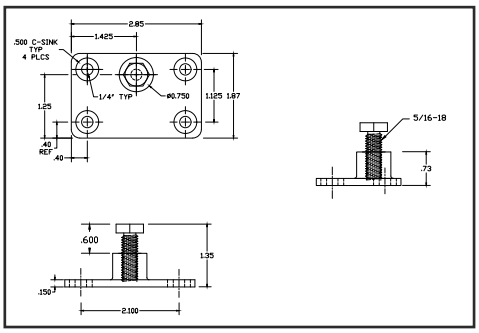

P/N: BR-227




P/N: BR-233




P/N: BR-234

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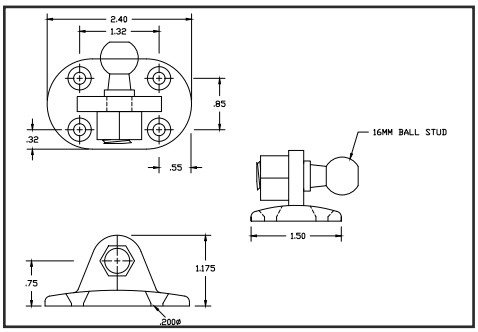



P/N: BR-245

## BLEED OFF KIT

Once you release gas from your gas spring, you can't go back! *

Attaching a kit allows you to monitor how much gas you're releasing. Each kit contains a pressure gauge, manifold, and fittings to connect to your gas spring. Instructions are included.

** Adjustable gas springs can be factory recharged by Ameritool. Please contact us to obtain an RGA#.*

**875 Series Bleed Off Kit P/N:** 875-BOK
**1100 Series Bleed Off Kit P/N:** 1100-BOK
**1150 Series Bleed Off Kit P/N:** 1150-BOK
**1165 Series Bleed Off Kit P/N:** 1165-BOK
**1750 Series Bleed Off Kit P/N:** 1750-BOK


### Bleed Off Kit Adaptors

Already own an Ameritool Bleed Off Kit but need to adjust the pressure on another series size? Then the Adaptor is just what you need; the adaptor kit allows you to swap from one series size to another using your existing bleed off kit.

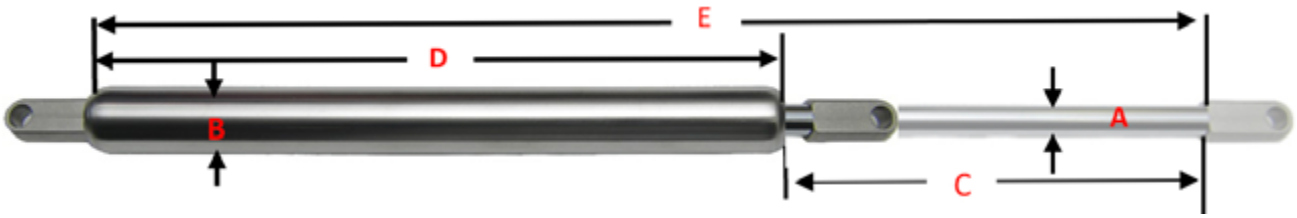
**875 Series Adaptor P/N:** 875-ADP
**1100 Series Adaptor P/N:** 1100-ADP
**1150 Series Adaptor P/N:** 1150-ADP
**1165 Series Adaptor P/N:** 1165-ADP
**1750 Series Adaptor P/N:** 1750-ADP

# ADJUSTABLE FORCE TENSION SPRINGS

Ameritool adjustable force tension springs are made from 316 stainless steel. Just like the adjustable force gas springs the pressure on these can be reduced by the user with no tools required. The force on these springs pulls the piston rod inward, operating in the opposite direction of standard gas springs. Great for use on doors, lids, hatches, and hoods that need to stay closed or would use assistance while closing. In its relaxed state the spring is compressed. You must pull to extend.

- These units can withstand a wide range of temperatures from -40°F to 300°F (-40°C to 148°C)

The guard tube accessory protects the piston rod from damage due to incidental impacts. This accessory adds 0.1 inches to the extended length of the gas spring. Please review the "E" dimension. To order add "08" to the ordering number.




## 1100 Series

*See page 22 for series end fittings/ball studs & page 24 for brackets.*

Ordering number example: 1100-8-350-C2C2

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread | F1 Force lbs (N) |
|---|---|---|---|---|---|---|---|
| 1100-2 | 0.562 (14.3) | 1.165 (29.6) | 2.25 (57.15) | 5.9 (149.86) | 8.15 (207.01) | 10 mm | 25 - 350 (111 - 1557) |
| 1100-4 | | | 4.25 (107.95) | 7.9 (200.66) | 12.15 (308.61) | | |
| 1100-6 | | | 6.25 (158.75) | 9.9 (251.46) | 16.15 (410.21) | | |
| 1100-8 | | | 8.25 (290.55) | 11.9 (302.26) | 20.15 (511.81) | | |
| 1100-10 | | | 10.25 (260.35) | 13.9 (353.06) | 24.15 (613.41) | | |
| 1100-12 | | | 12.25 (311.15) | 15.9 (403.86) | 28.15 (715.01) | | |
| 1100-14 | | | 14.25 (361.95) | 17.9 (454.66) | 32.15 (816.61) | | |
| 1100-16 | | | 16.25 (412.75) | 19.9 (505.46) | 36.15 (918.21) | | |
| 1100-20 | | | 20.25 (514.35) | 23.9 (607.06) | 44.15 (1121.41) | | |
| 1100-24 | | | 24.25 (615.95) | 27.9 (708.66) | 52.15 (1324.61) | | |

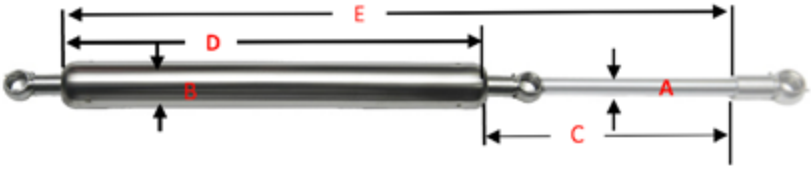
Notes:

1. Force (F1) increments of 10 pounds for 1100 series.
2. Product length tolerance is ±. 08 in. (2.0 mm).
3. Locking device shortens extended length by 1 inch.
4. Force tolerance is 10-20 pounds over the nominal force.
5. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
6. Tension springs are filled with oil and are under pressure. Please dispose of it properly.
7. Do not heat, open, or puncture.
8. Do not submerge.
9. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
10. EE denotes no end fittings on spring.

# ADJUSTABLE AND FIXED-RATE DAMPERS

Ameritool's dampers are self-contained, maintenance free units that are manufactured with heavy-duty 316 stainless steel and feature damping on compression, extension, or dual-direction. These dependable units offer long life cycle performance and are available for quick delivery.

The travel velocity on the adjustable dampers can easily be increased or decreased by fully extending the unit and turning the rod until the desired speed is achieved. Once altered the rate will remain constant throughout the stroke. The extension and compression adjustable dampers are adjustable in one direction only, with the free flow in the opposite direction.




## 800 Series Adjustable Dampers

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread |
|---|---|---|---|---|---|---|
| 800-4 | 0.375 (9.5) | 1.165 (29.6) | 4.1 (104.14) | 6.5 (165.1) | 10.6 (269.2) | 8 mm |
| 800-6 | | | 6.1 (154.94) | 8.5 (215.9) | 14.6 (370.8) | |
| 800-8 | | | 8.1 (205.74) | 10.5 (266.7) | 18.6 (472.4) | |
| 800-10 | | | 10.1 (256.54) | 12.5 (317.5) | 22.6 (574.0) | |
| 800-12 | | | 12.1 (307.34) | 14.5 (368.3) | 26.6 (675.6) | |
| 800-14 | | | 14.1 (358.14) | 16.5 (419.1) | 30.6 (777.2) | |
| 800-16 | | | 16.1 (408.94) | 18.5 (469.9) | 34.6 (878.8) | |

*Note: The compressed length (D) & extended length (E) measurements at the fully extended/fastest speed.*

## 850 Series Fixed-Rate Dampers

Ordering number example: 800-4-EDP-B4B4

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | End Mount Thread |
|---|---|---|---|---|---|---|
| 850-4 | 0.375 (9.5) | 1.165 (29.6) | 4.1 (104.14) | 6.5 (165.1) | 10.6 (269.2) | 8 mm |
| 850-6 | | | 6.1 (154.94) | 8.5 (215.9) | 14.6 (370.8) | |
| 850-8 | | | 8.1 (205.74) | 10.5 (266.7) | 18.6 (472.4) | |
| 850-10 | | | 10.1 (256.54) | 12.5 (317.5) | 22.6 (574.0) | |
| 850-12 | | | 12.1 (307.34) | 14.5 (368.3) | 26.6 (675.6) | |
| 850-14 | | | 14.1 (358.14) | 16.5 (419.1) | 30.6 (777.2) | |
| 850-16 | | | 16.1 (408.94) | 18.5 (469.9) | 34.6 (878.8) | |

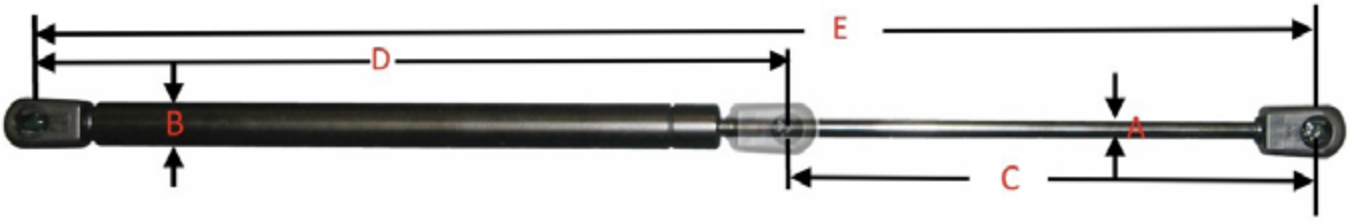
*Note: See page 22 for series end fittings/ball studs & page 24 for brackets.*

Notes:

1. No force/pressure in dampers.
2. Product length tolerance is ±. 08 in. (2.0 mm).
3. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
4. Dampers are filled with oil. Please dispose of it properly.
5. Do not heat, open, or puncture.
6. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
7. Custom speeds available for 850 series.
8. EE denotes no end fittings on spring.

# FIXED FORCE CARBON STEEL GAS SPRINGS

Ameritool carbon steel gas springs offer optimum weight compensation and force support in lifting, moving, and adjusting-type applications. Our wide range of standard product allows Ameritool to offer different strokes and force variations to meet all your application requirements.




## 6x15 Series

Forces (F1) can be factory set from 10 lbs. to 80 lbs. (44 N - 355 N)

*See pages 16-18 for brackets; select brackets available in black and zinc.*

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | F1 Force lbs (N) |
|---|---|---|---|---|---|---|
| ML11 | 0.240 (6.0) | 0.600 (15.0) | 2.25 (57.0) | 5.25 (133.4) | 7.5 (190.5) | 10 - 80 (44 - 355) |
| ML10 | | | 3.0 (76.0) | 7.0 (177.8) | 10.0 (254.0) | |
| ML15 | | | 3.5 (89.0) | 8.5 (215.9) | 12.0 (305.0) | |
| ML13 | | | 5.5 (89.0) | 9.5 (241.3) | 15.0 (381.0) | |
| ML16 | | | 7.0 (178.0) | 10.2 (259.1) | 17.0 (437.0) | |
| ML18 | | | 7.75 (197.0) | 10.75 (273.1) | 18.5 (470.0) | |
| ML14 | | | 8.0 (203.5) | 12.0 (304.8) | 20.0 (508.0) | |

## 8x18 Series

Forces (F1) can be factory set from 10 lbs. to 80 lbs. (44 N - 355 N)

*See pages 16-18 for brackets; select brackets available in black and zinc.*

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | F1 Force lbs (N) |
|---|---|---|---|---|---|---|
| ML31 | 0.310 (8.0) | 0.710 (18.0) | 2.25 (57.0) | 5.25 (133.4) | 7.5 (190.5) | 20 - 150 (100 - 670) |
| ML30 | | | 3.0 (76.0) | 7.0 (177.8) | 10.0 (254.0) | |
| ML32 | | | 3.0 (76.0) | 7.4 (188.0) | 10.4 (266.5) | |
| ML35 | | | 3.6 (91.0) | 8.4 (213.4) | 12.0 (306.0) | |
| ML33 | | | 5.5 (140.0) | 9.5 (241.3) | 15.0 (381.0) | |
| ML36 | | | 7.0 (178.0) | 10.2 (259.1) | 17.2 (437.0) | |
| ML39 | | | 7.75 (197.0) | 10.75 (273.1) | 18.5 (470.0) | |
| ML34 | | | 8.0 (203.5) | 12.0 (335.3) | 20.0 (508.0) | |
| ML38 | | | 9.8 (250.0) | 13.2 (335.3) | 23.0 (585.0) | |
| ML37 | | | 10.2 (260.0) | 16.1 (409.0) | 26.3 (699.0) | |

## 10x22 Series

Forces (F1) can be factory set from 30 lbs. to 180 lbs. (135 N - 800 N)

*See pages 16-18 & page 24 for brackets; select brackets available in black and zinc.*

| Model Number | A. Rod Dia in. (mm) | B. Body Dia in. (mm) | C. Stroke in. (mm) | D. Compressed Length in. (mm) | E. Extended Length in. (mm) | F1 Force lbs (N) |
|---|---|---|---|---|---|---|
| ML25 | 0.390 (10.0) | 0.870 (22.0) | 10.6 (269.24) | 15.7 (398.8) | 26.3 (668.0) | 30 - 180 (135 - 800) |
| ML26 | | | 11.7 (299.0) | 15.2 (386.1) | 26.9 (683.3) | |
| ML27 | | | 11.5 (292.0) | 16.49 (418.8) | 27.99 (711.0) | |
| ML28 | | | 13.75 (349.5) | 17.15 (435.6) | 30.9 (785.0) | |
| ML29 | | | 15.00 (381.0) | 21.3 (541.0) | 36.3 (922.00) | |

Notes:

1. Required F1 must be within the catalog limits and in increments of 10lbs. (50 N).
2. F1 tolerance: 6 x 15 = ± 20 N, 8 x 18 = ± 30 N, 10 x 22 = ± 40 N.
3. Not all sizes are available in 10 pounds.
4. Do not stroke more than 5 times a minute. Fast operation rates lead to excessive heat buildup resulting in internal seal damage.
5. Gas springs are filled with oil and are under pressure. Please dispose of it properly.
6. Do not heat, open, or puncture.
7. Contact Ameritool for modified standards or for engineered specials that meet your exact needs.
8. ML29 comes with 13mm steel ball sockets; all other sizes are 10 mm composite ball sockets.
9. End fittings are non-removable on the 6 x 15 and 8 x 18 springs.
10. EE denotes no end mounts on spring.

# FREQUENTLY ASKED QUESTIONS

**What is a gas spring?**
Ameritool gas springs are self-contained, pneumatic devices capable of producing very large forces (5-1,200 lbs.) from a compacted piece. A gas spring consists of a piston attached to a shaft moving within a sealed cylinder charged with nitrogen. The piston has an orifice which allows gas pressure to pass through and act equally on both sides. It is the pressure acting on the shaft cross-sectional area which provides the springs its force.

The output forces are the result of the differential between the pressure in the cylinder and the atmospheric pressure outside the cylinder acting on the cross section of the piston/shaft. As the piston/shaft is compressed into the cylinder the internal pressure increases according to the volume of gas displaced by the rod. This increase in force is called K-Factor.

Because they operate on simple pressure differentials, gas springs will perform as well in the vacuum of space as they do on land.

**How does a gas spring work?**
A gas spring consists of a piston attached to a shaft moving within a sealed cylinder charged with nitrogen. The output forces are the result of the differential between the pressure in the cylinder and the atmospheric pressure outside the cylinder acting on the cross section of the piston/shaft. As the piston/shaft is compressed into the cylinder the internal pressure increases according to the volume of gas displaced by the rod. This increase in force is called the K-Factor. Because they operate on simple pressure differentials, gas springs will perform as well in the vacuum of space as they do on land.

**What is a gas spring force?**
Gas spring force is often designated as P1 which is the force measured 1 inch from full extension. Force is a function of the charge pressure in the cylinder acting on the cross section of the rod. The smaller the diameter of the piston/rod the lower the force at the same pressure. For example, a gas spring with a 9/16 (14mm) rod charged to 1000 psi will have a P1 force of 200 pounds while a spring with a 5/16 (8mm) rod charged to the same pressure will have a P1 force of 65 pounds. Compressed force is referred to as P2. This force is measured .2" (5mm) from full compression. The P2 force will always be greater than the P1 force.

**What is a K-Factor?**
K-factor is the ratio of the compressed force (P2) and the extended force (P1). As governed by Boyle's Law, P2 force is always greater than the P1 force. During compression, the volume of the piston/shaft introduced in the cylinder displaces an equal volume of gas, increasing the pressure in the cylinder which increases the force of the spring.

**How does temperature affect gas spring force?**
Temperature affects gas springs in two ways. As the temperature of the gas spring changes, the internal pressure also changes. As internal pressure changes, so does the output force.

The force produced by a gas spring varies linearly by .19% for each degree F change from Ambient Temperature of 70°F. For example, a 30° change in temperature results in a 5.7% change in spring force (30 x .19% =5.7%).

Very high or very low temperatures can adversely affect the gas spring's ability to retain its gas charge. At very high temperatures, the permeability of the seal increases and the gas molecules may diffuse through the seal more quickly. Ameritool gas springs can support and perform reliably at temperatures ranging from -10°F to 180°F (-23°C to 82°C). High temp or low temp seal packages are also available, performing in the range of -40°F to 300°F (-40°C to 148°C).

**What is a damper?**
A damper, unlike a gas spring, provides no push or pull force, but instead controls the rate of movement throughout the stroke. Dampers look identical to gas springs, so careful consideration must be taken when specifying a gas spring versus a damper. There are three types of dampers: extension, compression, and dual direction. Extension dampers provide controlled speed while the rod is being extended out of the tube. Compression dampers provide a controlled speed while the rod is being compressed back into the tube. Dual rate dampers have equal amount of damping in both directions.

Extension dampers should be mounted shaft down to provide consistent damping for the full stroke. If mounted with the shaft pointing up, the unit may experience inconsistent damping or no damping at all.

Compression dampers should be mounted shaft up to provide consistent damping for the full stroke. If mounted with the shaft pointing down, the unit may experience inconsistent damping or no damping at all. Lubrication of the seal is not a problem due to the high volume of oil contained in a damper.

**What is a tension spring?**
Tension gas springs, also known as traction gas springs, work by keeping the piston rod in the closed position, operating in the opposite direction of other gas springs. Since a tension gas spring is compressed in its relaxed state, it always returns to it relaxed state once extension is stopped.

**What is the preferred mounting orientation of a gas spring?**
In general, gas springs should be installed with the rod facing down to ensure the seals are lubricated and to reduce the permeation of nitrogen through the seal.

**What is the expected life of a gas spring?**
When calculating the approximate life of a gas spring, one must first determine how much force the gas spring can lose before the user considers the gas spring too weak in the application. The time it takes to lose this amount of force is considered to be the life of the gas spring.

All gas springs lose output force over time. The rate at which force loss occurs varies greatly by application. Factors which affect the rate of loss include size of the gas spring, orientation, number of cycles, ambient temperature, vibration, and the geometry of the application. Considering all the variables, it is very difficult to estimate life expectancy accurately without actual testing of the application. Gas springs manufactured at Ameritool have surpassed 125,000 strokes in a test lab environment.

**How does Ameritool prevent dirt and debris from entering gas springs?**
Ameritool gas springs come with a rod wiper which prevents foreign matter from entering the gas springs by wiping away any material that has settled on the rod surface. This is a key component that gives Ameritool the leading edge on the durability and life of a gas spring.

**Are Ameritool gas springs ROHS compliant?**
Yes, Ameritool gas springs are ROHS-compliant.

**Can gas springs be used in the food industry?**
Our high-quality 316 stainless steel gas springs and dampers meet the highest requirements of the food industry. If required, food grade oil is available upon request.

**Please note Ameritool reserves the right to change products without notice.**

Ameritool

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