The design of Jarret Industrial Shock Absorber utilizes the unique compression and shear characteristics of specially formulated silicone elastomers.

These characteristics allow the energy absorption and return spring functions to be combined into a single unit without the need for an additional gas or mechanical spring stroke return mechanism.

**Applications**
Shock protection for all types of industries including:
Defense, Automobile, Railroad, Materials Handling, Marine, Pulp/Paper, Metal Producing and Processing.

**Advantages:**
- Simple design - High reliability
- High damping coefficient
- Low sensitivity to temperature variances
Visco-elastic technology makes use of the fundamental properties of specially formulated Jarret visco-elastic fluids.

**Compressibility:**
- Preloaded spring function
- \( F = F_0 + KX \)

**Viscosity:**
- Shock absorber function
- \( F = F_0 + KX + CV^{\alpha} \) with \( \alpha \) between 0.1 and 0.4

The two functions can be used separately or in combination, in the same product:

**Preloaded Spring:**
- Spring Function Only
  - Hysteresis of between 5% and 10%
  - Reduced weight and space requirement
  - Force/stroke characteristic is independent of actuation speed

**Preloaded Spring Shock Absorbers:**
- Combine Spring and Shock Absorber Functions
  - Dissipate between 30% and 100% of energy
  - Force/stroke characteristics remain relatively unchanged between 15°F and 160°F (-10°C and +70°C)

**Shock Absorber Without Spring Return:**
- Shock Absorbing Function Only
  - Dampening devices
  - Blocking Devices
**Jarret Shock Absorbers**

**BC1N Series**

<table>
<thead>
<tr>
<th>Catalog No./ Model</th>
<th>L1 In. (mm)</th>
<th>L2 In. (mm)</th>
<th>L3 In. (mm)</th>
<th>L4 In. (mm)</th>
<th>L5 In. (mm)</th>
<th>L6 In. (mm)</th>
<th>D1 In. (mm)</th>
<th>D2 In. (mm)</th>
<th>D3 In. (mm)</th>
<th>D4 In. (mm)</th>
<th>D5 In. (mm)</th>
<th>D6 In. (mm)</th>
<th>D7 In. (mm)</th>
<th>Mass In-lbs (kN)</th>
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<td>2.1 (53)</td>
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**Technical Data**

- **Catalog No./ L1 L2 L3 L4 L5 L6 R1 D1 D2 D3 D4 D5 D6 D7 Mass**
- **Model in. in. in. in. in. in. lbs. lbs. lbs. lbs. lbs. lbs. lbs.**
- **Catalog No./ L1 L2 L3 L4 L5 L6 R1 D1 D2 D3 D4 D5 D6 D7 Mass**
- **Model in. in. in. in. in. in. lbs. lbs. lbs. lbs. lbs. lbs. lbs.**
- **Technical Data**

- **Catalog No./ L1 L2 L3 L4 L5 L6 R1 D1 D2 D3 D4 D5 D6 D7 Mass**
- **Model in. in. in. in. in. in. lbs. lbs. lbs. lbs. lbs. lbs. lbs.**

**Jarret Shock Absorbers**

**BC1N Series**

<table>
<thead>
<tr>
<th>Catalog No./ Model</th>
<th>Max Energy Capacity in-lbs (kJ)</th>
<th>Stroke in (mm)</th>
<th>Return Force</th>
<th>Compression Rdy in-lbs (kN)</th>
<th>Rdymax Shock Force Rdy in-lbs (kN)</th>
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<tr>
<td>BC1ZN</td>
<td>885 (0.1)</td>
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<td>BC1BN</td>
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<td>BC1EN</td>
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<td>(230)</td>
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</table>
Jarret Shock Absorbers
BC1N Series

1 - Selection Chart

Based On
- Impact velocity: 2 m/s
- Operating temperature: -20° to +40°C
- Surface protection: Electrolytic zinc
- Dynamic performance diagram

Symbols:
- En = Energy Capacity
- C = Maximum Stroke
- Rdy = Dynamic Reaction

2 - Energy Calculation

\[ E = \frac{1}{2} M_e V_e^2 \]

3 - Allowable Impact Frequency

\[ F < 20 \times \frac{E}{En} \text{ Impacts/hour} \]

4 - Effective Stroke Calculation

\[ Ce = C \left( \frac{E}{En (0,03 V + 0,24)} + 1,36 \times 1,17 \right) \]

5 - Calculation of Effective Reaction \( Rdy_e \)

\[ Rdy_e = \left( \frac{Rdymax - Rdy0}{C} \right) \times E + Rdy0 \times (0,1 V + 0,8) \]

6 - Application Example

Given data: Effective mass = 15 t,
Impact speed = 0,8 m/s
Impact frequency: 25 impacts/hour

1: BC1FN Selected

2: Energy dissipated per impact is: 4,8 kJ

3: Allowable impact frequency < 20x7/4.8

4: Required stroke is 49 mm

5: With an \( Rdy_e \) = \( [(150 - 90) \times 49/60] + 90 \) x (0,1 x 0,8 + 0,8) = 122 kN

Compare with standard mechanical characteristics:

\[ En = 7 \text{ kJ, } C = 60 \text{ mm, } Rdy0 = 90 \text{ kN and } \]
\[ Rdymax = 150 \text{ kN} \]

All performance characteristics can be modified.
Please advise us of your specific requirements.
## Jarret Shock Absorbers
**BC5 Series**

### Technical Data

#### Rear Flange Mount - Fa

![Diagram of Rear Flange Mount - Fa]

#### Front Flange Mount - Fc

![Diagram of Front Flange Mount - Fc]

<table>
<thead>
<tr>
<th>Catalog No./Model</th>
<th>Max Energy Capacity (ft-lbs) (kJ)</th>
<th>Stroke Extension (in) (mm)</th>
<th>Compression (in) (mm)</th>
<th>Return Force (lbs) (kN)</th>
<th>Rdy0 (lbs) (kN)</th>
<th>Rdymax Max Shock Force (lbs) (kN)</th>
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<tr>
<td>BCSA-105</td>
<td>221,268 (255)</td>
<td>4.1 (105)</td>
<td>4,159 (18,5)</td>
<td>31,630 (140,7)</td>
<td>37,543 (167)</td>
<td>69,691 (310)</td>
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<tr>
<td>BCSB-130</td>
<td>442,537 (500)</td>
<td>4.7 (130)</td>
<td>10,039 (58,0)</td>
<td>58,416 (259,9)</td>
<td>69,691 (310)</td>
<td>121,397 (540)</td>
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<tr>
<td>BCSH-140</td>
<td>663,806 (750)</td>
<td>5.5 (140)</td>
<td>11,015 (49,0)</td>
<td>73,827 (328,4)</td>
<td>89,924 (400)</td>
<td>157,366 (700)</td>
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<tr>
<td>BCSH-160</td>
<td>885,075 (1000)</td>
<td>6.3 (160)</td>
<td>13,376 (59,5)</td>
<td>85,427 (380,0)</td>
<td>105,660 (470)</td>
<td>184,343 (820)</td>
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<td>1,127,612 (1500)</td>
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<td>26,269 (147,0)</td>
<td>122,656 (546)</td>
<td>143,878 (640)</td>
<td>247,290 (1100)</td>
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#### Impact Speed: BC5 Series shock absorbers are designed for impact velocities of up to 4 m/sec. Higher impact velocities require custom modification.

<table>
<thead>
<tr>
<th>Catalog No./Model</th>
<th>L1 in. (mm)</th>
<th>L2 in. (mm)</th>
<th>L3 in. (mm)</th>
<th>L4 in. (mm)</th>
<th>L5 in. (mm)</th>
<th>L6 in. (mm)</th>
<th>L7 in. (mm)</th>
<th>L8 in. (mm)</th>
<th>D1 in. (mm)</th>
<th>D2 in. (mm)</th>
<th>D3 in. (mm)</th>
<th>D4 in. (mm)</th>
<th>D5 in. (mm)</th>
<th>Mass lbs. (kg)</th>
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<td>1.63 (415)</td>
<td>10.8 (275)</td>
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<td>BCSB</td>
<td>1.97 (500)</td>
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<tr>
<td>BCSH</td>
<td>19.7 (500)</td>
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<td>6.9 (175)</td>
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<td>5.4 (114)</td>
<td>88</td>
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**Catalog No./L1 L2 L3 L4 L5 L6 L7 L8 D1 D2 D3 D4 D5 Mass**

- **BC5A**: 16.3 10.8 5.5 0.79 1.2 0.59 5.3 4.1 4.6 4.6 3.9 120 14
- **BC5B**: 19.7 12.8 6.9 1.0 1.3 1.2 6.1 4.9 5.6 5.6 4.5 115 14
- **BC5C**: 20.5 12.4 8.1 1.2 1.4 1.4 6.9 5.5 6.3 6.3 5.2 118
- **BC5D**: 23.0 13.8 9.3 1.4 1.6 1.6 8.5 6.7 7.1 7.1 6.0 115 18
- **BC5E**: 26.4 15.9 10.4 1.6 1.8 1.8 9.8 7.7 8.5 8.5 7.2 115 18

- **Impact Speed**: BC5 Series shock absorbers are designed for impact velocities of up to 4 m/sec. Higher impact velocities require custom modification.

[Technical Data Table]

**Contact:**

www.enidine.com  Email: industrialsales@enidine.com  Tel.: 1-800-852-8508  Fax: 1-716-662-0406
Jarret Shock Absorbers
BC5 Series

BC5A → BC5E Series

Based On
- Impact velocity: 2 m/s
- Operating temperature: -20° to +40°C
- Surface protection: Electrolytic zinc
- Dynamic performance diagram

Force kN

Rdymax

Rdy0

Symbols:

En = Energy Capacity
C = Maximum Stroke
Rdy = Dynamic Reaction

1 - Energy Calculation

\[ E = \frac{1}{2} \cdot M_v \cdot V_e^2 \]

2 - Allowable Impact Frequency

\[ F < 15 \times \frac{E_v}{E} \text{ Impacts/hour} \]

3 - Effective Stroke Calculation

\[ C_e = C \left( 1 + \frac{E}{En (0,03 \cdot V + 0,24)} + 1,36 \cdot 1,17 \right) \]

4 - Calculation of Effective Reaction Rdy_e

\[ Rdy_e = \left( \frac{\text{Rdymax} - \text{Rdy0}}{C} \right) \times C_e + \text{Rdy0} \times (0,1V + 0,8) \]

5 - Application Example

Data: Two shock absorbers in series, Effective mass m = 300 t, Impact speed v = 1,2 m/s (which is an impact of 0,6 m/s on each shock absorber), Impact frequency = 15 impacts/hour, Maximum allowable structural load 1000 kN

1: \[ E = \frac{1}{2} \left( \frac{1}{2} \cdot mV \right)^2 \] - Selection BC5-E

2: Maximum allowable impact frequency is 15 x \[ \frac{150}{108} \] impacts/hour. Therefore 15 impacts/hour is acceptable.

3: Required stroke is 167 mm

\[ C_e = 180 \times \left( 1 + \frac{108}{150 (0,03 \cdot 0,6 + 0,24)} + 1,36 \cdot 1,17 \right) = 156 \text{ mm} \]

4: \[ Rdy_e = \left( 1 - 100 \cdot 640 \right) \times \frac{156}{180} + 640 \times \left( 0,1 \times 0,6 + 0,8 \right) \]

\[ = 893 \text{ kN} < 1000 \text{ kN}, \text{ maximum allowable impact frequency} \]

Compare with standard mechanical characteristics for each shock absorber:

\[ \text{En} = 150 \text{ kJ}, \ C = 180 \text{ mm}, \ Rdy0 = 640 \text{ kN} \text{ and } \ Rdy_{\text{max}} = 1100 \text{ kN} \]

All performance characteristics can be modified. Please advise us of your specific requirements.