

## Fig. 200, Fig. C-200 Fig. 201, Fig. C-201: with Extension Piece

### Hydraulic Snubber

**Size Range:** Seven standard sizes with cylinder bores of 1½" to 8" and with normal load ratings from 3,000 pounds to 128,000 pounds. All are available with 5", 10", 15", or 20" strokes except the 1½" size which is offered with 5" and 10" strokes only. Snubbers are available with integral or remote reservoirs.

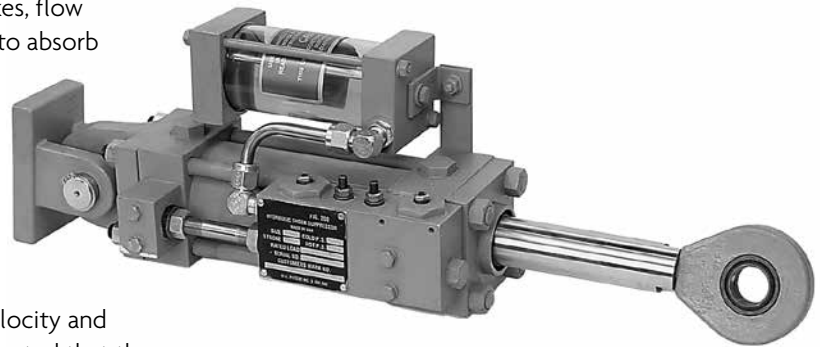
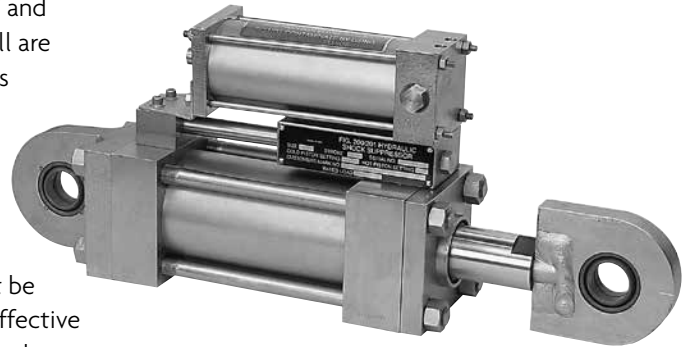
**Finish:** Fig. 200/201 painted with semi gloss primer. Fig. C-200/C-201 corrosion resistant; painted with carbo zinc.

**Service:** For use on piping systems or equipment when unrestrained thermal movement must be allowed, but which must be restrained during impulsive or cyclic disturbance. The unit is not effective against low amplitude, high frequency movement. Use with standard settings to prevent destructive response to earthquakes, flow transients or wind load. Special settings are available to absorb the continuous thrust resulting from safety valve blow-off or pipe rupture.

**Standard settings:** The standard settings are: Locking (activation) velocity 8 ±2 in./min. Bleed rate (post activation) at normal rated load 4 ±1 in./min. (Special settings are available). The valves are calibrated at the factory within the tolerances indicated at room temperature. Locking velocity and bleed rate will vary with temperature. Testing has indicated that there is little effect of these changes on dynamic operation.

**Features:**

- Choice of valve type
  - Adjustable – permits field adjustments
  - Temperature compensating – minimizes the effects of temperature on lockup and bleed
- Choice of reservoir type
  - Transparent – continuous operation at 200° F with brief transients to 250° F
  - Metal or pressurized metal – allows brief transients to 340° F
  - Pressurized – eliminates the concern of reservoir orientation relative to valve and cylinder – minimizes internal contamination
  - Remote
- Factory calibrated valves
- Rapid, positive valve closure
- Special design minimizes the “lost motion” which results from the shifting and seating of piston seals
- Unlocked resisting force is less than 1% of rated load
- Stable, non-flammable, long life hydraulic fluid made highly visible for ease of inspection
- Self-aligning bushings permit ± 5° misalignment or angular motion. Bushings are coated with a dry lubricant.
- Choice of coating (paint, primer, carbo zinc, epoxy, plating or other)



LOADS (LBS)	
Cylinder Size (in)	Max Load *
1½ (5" stroke)	3,000
1½ (10" stroke)	1,250
2½ (5", 10", 15" stroke)	12,500
2½ (20" stroke)	10,500
3¾	21,000
4	32,000
5	50,000
6	72,000
8	128,000

\* Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

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**Snubbers**

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## Fig. 200, Fig. 201 Hydraulic

Snubber (cont.)

**Upgrade Kits:** Kits are available to upgrade existing snubbers with temperature compensating valves and/or pressurized reservoir.

**How to size:**

- (1) **Cylinder size:** Use table on page 216 to select cylinder bore size large enough to restrain expected load.
- (2) **Stroke:** Define expected movement of the pivot joining the suppressor with the equipment to be protected (cold to hot plus any abnormal movements). Determine maximum and minimum distances between this curve and the fixed pivot pin of the snubber. The minimum recommended stroke is 20% greater than the difference between these lengths.  
**Note:** If erected position at the snubber's location on the equipment is outside of the range of normal cold-to-hot movement (e.g. cold pull of pipe), the snubber should not be installed until after the equipment is in its cold position. This eliminates the need of providing for the extra travel in the snubber's stroke. For 2 1/2" through 8" snubbers, standard strokes are 5", 10", 15", and 20". For the 1 1/2" snubber, 5" and 10" are the only standard strokes.
- (3) **Installed piston setting:** As indicated previously, the snubber should be installed at its cold piston position if possible. From the installed position, take extension (outward movement) of the piston rod as positive (+) and retraction as negative (-).
- (4) **Installed piston position =**

$$\left( \frac{\text{Stroke} - (\text{Algebraic Sum of Movements})}{2} \right)$$

To aid in measuring the piston position, we have shown a dimension, "Z". This dimension represents the distance between the cylinder head and the end of the rod when the rod is fully retracted. Whenever specifying the position at which the piston rod is to be set, the total dimension from the cylinder head to the end of the rod should be given. Thus, Piston Setting = Piston Position + Z.

- (5) **Assembly length:** Determine the installed "C" dimension by adding the installed piston position (not setting) to C minimum. Lay in take out dimensions E and/or B, and find required pin-to-pin snubber length. If a pin-to-pin length adjustment is desired, use Fig. 201. Calculate the required "W" dimension by subtracting (C installed + F) from the required pin-to-pin length. If this is less than W minimum, only a Fig. 200 can be used, and one of the attachments will have to be moved or shimmed to suit. If a Fig. 200 is to be used, make sure that the required pin-to-pin length is at least as great as (C installed + B). If neither a Fig. 200 nor a Fig. 201 can be accommodated, and the installation cannot be modified, consult your Anvil representative about designing a special or modified unit.

**Ordering:**

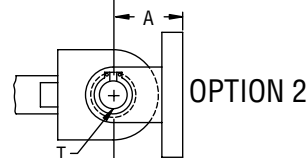
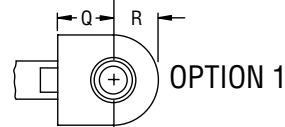
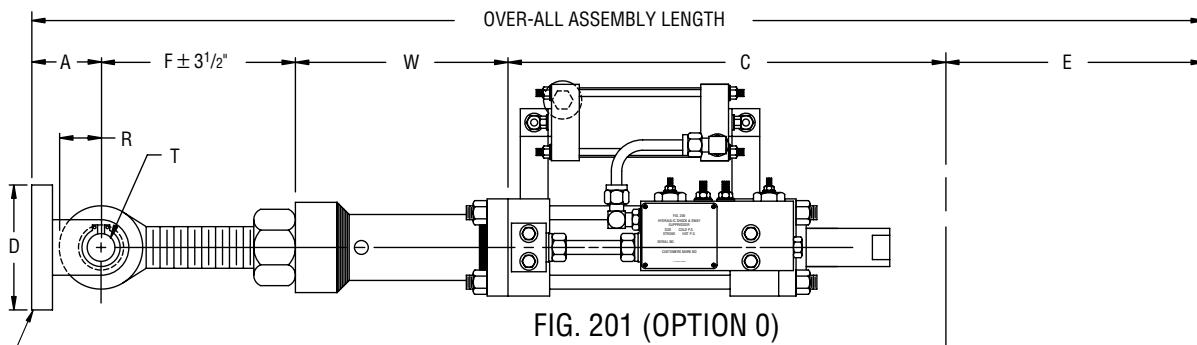
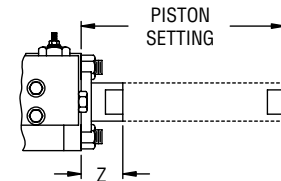
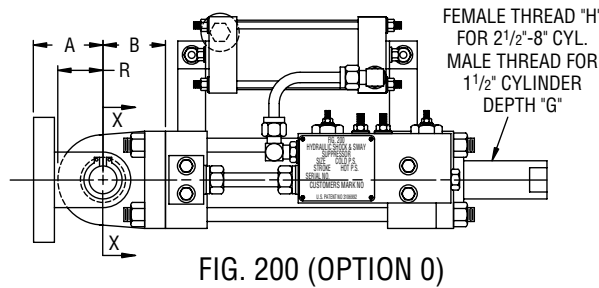
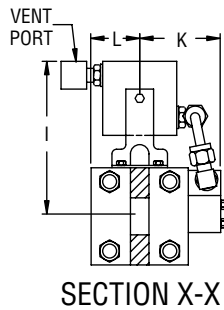
Ordering: Specify part number as follows:						
XXX	X	XX	X	X	X	X
						Reservoir Orientation 0=Does not apply for pressurized or remote U=Rod up D=Rod down or horizontal
						Reservoir Type L=Transparent (Polycarbonate) M=Metal (limited applications) P=Pressurized R=Remote
						Valve Type A=Adjustable T=Temperature Compensating
						Option (0,1,2, or 3), See Option Table Below
						Stroke (5, 10, 15, 20)
						Cylinder Size: 1 (1 1/2 Cyl.) 2 (2 1/2 Cyl.) 3 (3 1/4 Cyl.) 4 (4Cyl.) 5 (5Cyl.) 6 (6Cyl.) 8 (8 Cyl.)
						Figure No. (200 or 201), Also Specify: W Dimension when Specifying Fig 201 Pipe Clamp Size when Specifying Option 3 Surface Coating Cold and Hot Piston Settings.

**FIG. 200 & FIG. 201 OPTIONS**

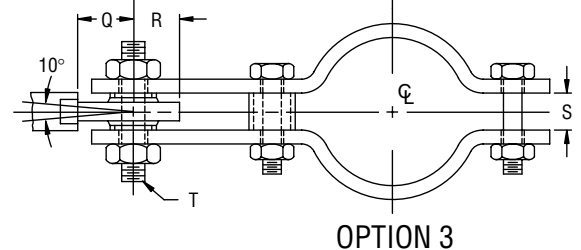
Option	Consists of...
0	Fig 200: Basic unit (snubber) with pivot mount and one rear bracket.
	Fig. 201: Basic unit with extension piece and one rear bracket.
1	Option 0 plus cylinder eye.
2	Option 0 plus cylinder eye and additional rear bracket.
3	Option 0 plus cylinder eye and pipe clamp.

## Fig. 200, Fig. 201

### Hydraulic Snubber (cont.)



NOTE:  
CYLINDER EYE  
MAY BE ROTATED  
TO ANY POSITION



## Fig. 200, Fig. 201

### Hydraulic Snubber (cont.)

#### FIG 200, 201: DIMENSIONS (IN) • WEIGHT (LBS)

Cylinder Bore	Stroke	Fig. 200 Wt.	A	B	C			D	D <sub>1</sub>	F	G	H	I			K	L	N	Q	R	S	T	W		Z
					Min	Mid	Max						Metal Res.	Trans. Res.	Press Res.								Min	Max	
1½	5	45	2½	1½	13⅞	15⅝	18⅞	2	2⅝	6	¾	⅝-18	5⅞	4⅜	4¼	2¼	2¼	⅝	2⅝	1⅞	1	¾	9½	75⅞	⅝
	10	49			18⅞	23⅞	28⅞																	65⅞	
2½	5	75	2½	2¼	13⅞	15⅞	18⅞	2	2⅞	7⅜	⅞	⅞-14	6¼	5⅞	5¾	3¼	1¾	¾	2	1⅝	1⅜	1	10⅜	94⅞	1
	10	81			18⅞	23⅞	28⅞																	84⅞	
	15	87			23⅞	30⅞	38⅞																	74⅞	
	20	93			28⅞	38⅞	48⅞																	64⅞	
3¼	5	121	3	3	14⅞	17⅞	19⅞	3	3⅜	7⅝	1⅞	1⅞-12	6⅞	5¾	6¾	3¾	2¼	¾	2½	2⅞	1⅞	1¼	10½	92	1⅞
	10	132			19⅞	24⅞	29⅞																	82	
	15	146			24⅞	32⅞	39⅞																	72	
	20	156			29⅞	39⅞	49⅞																	62	
4	5	177	4	3¾	16⅞	18⅞	21⅞	6⅞	4¼	9⅝	1½	1½-12	7⅞	6	7⅜	4	2½	1¼	3⅜	2½	2	1½	11½	89⅞	1⅞
	10	189			21⅞	26⅞	31⅞																	79⅞	
	15	206			26⅞	33⅞	41⅞																	69⅞	
	20	223			31⅞	41⅞	51⅞																	59⅞	
5	5	235	5	4½	18	20½	23	7⅞	5⅝	10⅞	1⅞	1⅞-12	8½	7	9⅞	4¼	3¼	1¾	4	3⅞	2⅝	1¾	12	86⅞	1⅞
	10	256			23	28	33																	76⅞	
	15	277			28	35½	43																	66⅞	
	20	298			33	43	53																	56⅞	
6	5	292	5¾	5½	19¾	22¼	24¾	9⅞	6¼	11⅞	2¼	2¼-12	9⅞	7⅝	10⅞	5¼	3⅞	2	4⅝	3⅞	2¾	2	13⅞	83⅞	1¾
	10	320			24¾	29¾	34¾																	73⅞	
	15	348			29¾	37¼	44¾																	63⅞	
	20	375			34¾	44¾	54¾																	53⅞	
8	5	515	7¼	6	23½	26	28½	14	8¾	14½	4	3-12	12½	N/A	13⅞	8⅞	4⅞	2¼	6¾	4¾	-	2½	14½	75½	2¼
	10	575			28½	33½	38½																	65½	
	15	640			33½	41	48½																	55½	
	20	705			38½	48½	58½																	45½	

#### FIG 200, 201: DIMENSIONS (IN)

OD**	E-Take Out at 650°F						E Dimension at 1005°F and 1075°F*						
	Cylinder Bore						Cylinder Bore						
	1½	2½	3¼	4	5	6	1½	2½	3¼	4	5	6	8
2	6	6⅞	-	-	-	-	8⅞	8⅞	-	-	-	-	-
2½	7	7	-	-	-	-	8⅞	8⅞	-	-	-	-	-
3	7	7	-	-	-	-	9⅞	9⅞	-	-	-	-	-
3½	7	7	-	-	-	-	9⅞	9⅞	-	-	-	-	-
4	7¼	7¼	-	-	-	-	9⅞	9⅞	-	-	-	-	-
5	7¾	7¾	9⅞	10	-	-	10¼	10¼	10¼	10⅞	-	-	-
6	8⅞	8⅞	10	10	11⅞	-	10¾	10¾	10¾	11⅞	11⅞	-	-
8	9⅞	9⅞	11¼	11¼	12⅞	-	11¾	11¾	11¾	12⅞	13¼	-	-
10	10½	10½	12¾	12¾	14¼	-	12¾	12¾	12¾	13⅞	15	-	-
12	11⅞	11⅞	13⅞	13⅞	15⅞	-	-	13¾	13¾	15	16¼	-	-
14	12⅞	12⅞	14½	14½	16	-	-	14⅞	14¾	15¾	17	-	-
16	13⅞	13⅞	15¼	15¼	17⅞	-	-	15⅞	15⅞	16⅞	18⅞	-	-
18	14⅞	14⅞	16⅞	16⅞	18¼	-	-	16⅞	16⅞	18	19¼	-	-
20	15¾	15¾	17¾	17¾	19¼	19¼	-	17⅞	18	19	21	20¾	22½
24	18⅞	18⅞	19⅞	19⅞	21¾	21¾	-	19⅞	20	21⅞	23¼	23	24¾
30	21¼	21¼	23	23	25	25	-	22⅞	23½	25	26½	26¼	28¼
36	24	24	26½	26½	28⅞	28⅞	-	25⅞	26⅞	28⅞	29⅞	-	-

\* Please specify whether a 1005°F clamp or 1075°F clamp is required when ordering.

\*\*When calculating snubber pin to pin for intermediate sizes, use the takeout "E" for the next largest pipe diameter.

Note: Carbon steel clamps can accommodate up to 4" insulation. Alloy can accommodate 6".

High temperature clamps will be made from alloy steel. Stainless steel available upon request. For other special design requirements, please contact your Anvil EPS sales representative.