

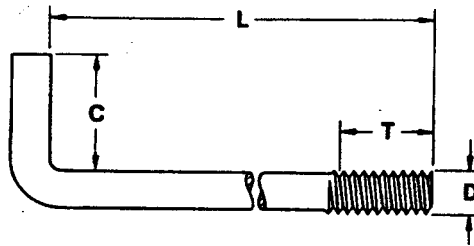


<b><u>DESCRIPTION</u></b>	<b><u>PAGE</u></b>
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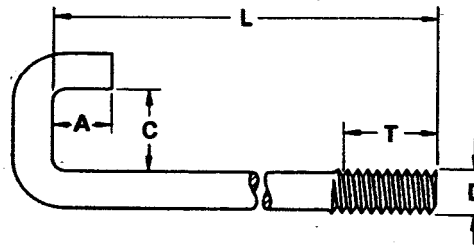
**ANCHOR BOLTS, BENT BOLTS**

**Anchor Bolt**

**Hook Bolt, Right Angle Bend  
(DxLxCxT)**

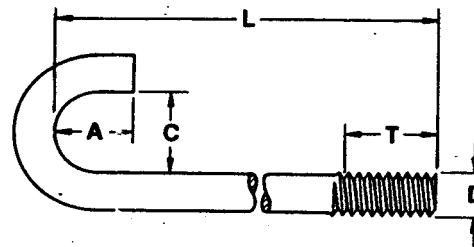


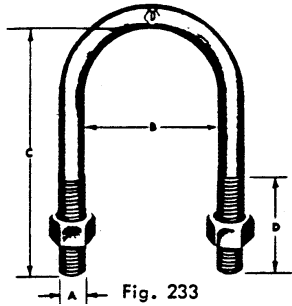
**Hook Bolt, Square Bend  
(DxLxCxAxT)**



**J-Bolt**

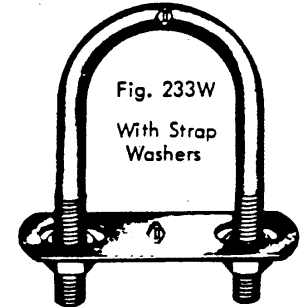
**Hook Bolt, Round Bend  
(DxLxCxAxT)**





## U BOLTS

With Hex Nuts



Inside diameters shown are those of standard pipe. Outside diameters are of standard, extra strong and double extra strong pipe. These dimensions are published from standards by E.W. Daniel, a major manufacturer of this product, and are subject to change at any time.

### Pipe and Conduit Sizes

Inside Diam in Inches	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	3-1/2	4	5	6
Outside Diam in Inches	9/16	11/16	7/8	1-1/16	1-5/16	1-11/16	1-15/16	2-3/8	2-7/8	3-1/2	4	4-1/2	5-9/16	6-5/8

Fig. 233 Stock No.	A Thread Diam Inches	B Width Bet. Legs Inches	C Inside Length Inches	C Outside Length Inches	D Thread Length Inches	Pipe Size Inches	Wt per 100 Pcs Lbs	Figure 233W	
								Wt per 100 Pcs Lbs	Stock No.
400A	3/16	9/32	3/4	15/16	1/2		1.5		
400B	7/32	9/32	3/4	31/32	1/2		1.5		
400C	1/4	11/32	15/16	1-3/16	5/8		3/8		
401	1/4	3/4	1-1/4	1-1/2	3/4	3/8	4.4		
402	1/4	3/4	1-3/4	2	3/4	3/8	5.6		
403	1/4	3/4	2-1/4	2-1/2	1-1/2	3/8	6.9		
407	1/4	1	1-3/4	2	3/4	1/2	5.6	10	407W
408	1/4	1-1/8	2	2-1/4	3/4	3/4	6.3	10.6	408W
409	1/4	1-3/8	2-1/4	2-1/2	3/4	1	6.9	10.6	409W
410	1/4	1-3/4	2-3/4	3	1	1-1/4	8	13.8	410W
411	1/4	2	3-1/4	3-1/2	1-1/4	1-1/2	9.3	14.4	411W
412	1/4	1-1/2	3-1/2	3-3/4	2	1	9.4	15	412W
420	5/16	1-3/8	2-3/16	2-1/2	1	1	10.6	15.6	420W
420A	5/16	1-3/8	1-5/16	1-5/8	1		6.9		
421	5/16	1-3/8	3-11/16	4	1-1/2	1	15.6	20.6	421W
422	5/16	1-3/4	2-11/16	3	1	1-1/4	13	18	422W
423	5/16	1-3/4	4-3/16	4-1/2	1-1/2	1-1/4	18	22.5	423W
424	5/16	2	2-11/16	3	1	1-1/2	13	19.4	424W
425	5/16	2	3-11/16	4	1-1/2	1-1/2	16.2	20.9	425W
427	5/16	2-1/2	3-3/16	3-1/2	1-1/2	2	15	21.3	427W
428	3/8	7/16	1-1/2	1-13/16	1-1/8		11.3		
429	3/8	5/8	1-3/4	2-1/8	1-1/4		13.3		
430A	3/8	1-3/8	3-1/8	3-1/2	1-1/2	1	20.6	30	430A-W
430B	3/8	1-3/4	3-5/8	4	1-1/2	1-1/4	23		
430	3/8	2	3-1/8	3-1/2	1-1/4	1-1/2	21.2	30.6	430W
431	3/8	2-1/2	3-5/8	4	1-1/2	2	24.4		431W
432	3/8	3	4-1/8	4-1/2	1-1/2	2-1/2	27.5		432W
433	3/8	3-1/2	4-5/8	5	1-1/2	3	30.6		433W
437	7/16	11-16	2	2-7/16	1-3/8		18.8		
440	1/2	3	4-1/2	5	1-1/2	2-1/2	56.9		
440A	1/2	3/4	2-3/8	2-7/8	1-5/8		31.9		
441	1/2	3-1/2	5	5-1/2	1-1/2	3	63		
442	1/2	4	5-1/2	6	1-1/2	3-1/2	68		
443	1/2	4-1/2	6	6-1/2	1-1/2	4	73.7		
444	1/2	5-5/8	7	7-1/2	2	5	86.3		
445	1/2	6-3/4	8	8-1/2	2	6	98		
446	9/16	7/8	2-3/4	3-5/16	1-3/4		47.5		
447A	5/8	1	3-1/4	3-7/8	2-1/4		68.6		
447B	5/8	1-1/8	3-5/8	4-1/4	2-1/2		75		
448	3/4	1-1/4	4-1/8	4-7/8	3		157.5		

## LONG TANGENT U-BOLTS, GRINNELL FIGURE 137

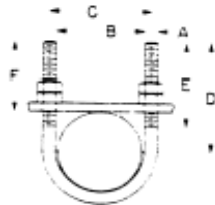
### U-bolts

standard U-bolt

fig. 137

special U-bolt (non-standard dimensions)

fig. 137S



plastic coated: fig. 137C



**SIZE RANGE:** 1/2 to 30 inch pipe.

**MATERIAL:** Carbon steel U-bolt and four finished hex nuts.

**FINISH:** Black or galvanized; furnished black unless otherwise specified.

**SERVICE:** Recommended for support, anchor or guide of heavy loads; often employed in power and process plant service.

**MAXIMUM TEMPERATURE:** 750°F.

**APPROVALS:** Complies with Federal Specification WW-H-171D (Type 24) and Manufacturers Standardization Society SP-69 (Type 24).

**ORDERING FIG. 137:** Specify rod size x pipe size (as 3/8 x 6), figure number, name. U-bolt will be furnished with longer tangents D or with longer threads E if so required and ordered. If hex nuts are not required, specify "without hex nuts."

**ORDERING FIG. 137S:** Specify figure number, name, material specification, dimensions A, B, C, D and E, and "with hex nuts" or "without hex nuts."

**SPECIAL NOTE:** When furnished hot-dip galvanized, oversize hex nuts must be used.

**fig. 137C coated U-bolt**

**SIZE RANGE:** 1/2 to 8 inch pipe.

**MATERIAL:** Carbon steel U-bolt and four finished hex nuts. Formed portion of the U-bolt is plastic coated.

**SERVICE:** Recommended for support, anchor or guide for glass, copper, brass and aluminum pipe.

**MAXIMUM TEMPERATURE:** 225°F.

**ORDERING:** Specify rod size x pipe size (as 3/8 x 2), figure number, name. If hex nuts are not required, specify "without hex nuts."

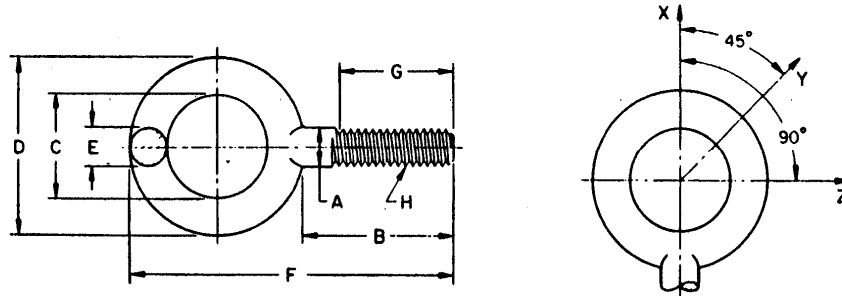
load • weights • packaging • dimensions (inches)

pipe size	rod size A	maximum recommended load, lbs		weight with nuts (approx) lb per 100	no of pieces per carton		B	C	D	E	F
		650 F	750 F		fig. 137	fig. 137C					
1/2	3/8	485	435	11	50	50	1 5/16	1 1/16	2 3/8	2 3/8	2 5/16
3/4	1/2	485	435	12	50	50	1 1/2	1 3/8	2 3/8	2 3/8	2 7/32
1	1/2	485	435	12	50	50	1 3/8	1 1/2	2 3/8	2 3/8	2 3/32
1 1/4	5/8	1220	1090	28	50	50	1 11/16	2 1/16	2 3/8	2 3/8	2 1/32
1 1/2	3/4	1220	1090	30	50	50	2	2 3/8	3	2 1/2	2 1/16
2	3/4	1220	1090	33	50	50	2 7/16	2 13/16	3 1/4	2 1/2	2 1/16
2 1/2	1/2	2260	2020	73	50	50	2 13/16	3 7/16	3 3/4	3	2 5/16
3	1/2	2260	2020	78	50	50	3 3/16	4 1/16	4	3	2 1/4
3 1/2	1/2	2260	2020	84	50	50	4 1/16	4 9/16	4 1/4	3	2 1/4
4	1/2	2260	2020	90	50	50	4 9/16	5 1/16	4 1/2	3	2 1/4
5	1/2	2260	2020	101	...	15	5 5/8	6 1/8	5	3	2 7/32
6	5/8	3620	3230	197	...	15	6 3/4	7 3/8	6 1/8	3 3/4	2 31/16
8	3/4	3620	3230	233	...	...	8 3/4	9 3/8	7 1/8	3 3/4	2 13/16
10	3/4	5420	4830	491	...	...	10 7/8	11 5/8	8 3/4	4	3 1/16
12	7/8	7540	6730	773	...	...	12 7/8	13 3/4	9 3/8	4 1/4	3 5/8
14	7/8	7540	6730	828	...	...	14 3/8	15	10 1/4	4 1/4	3 3/4
16	7/8	7540	6730	915	...	...	16 3/8	17	11 1/4	4 1/4	3 1/4
18	1	9920	8850	1348	...	...	18 3/8	19 3/8	12 3/8	4 3/4	3 3/8
20	1	9920	8850	1457	...	...	20 3/8	21 3/8	13 3/8	4 3/4	3 3/8
2 1/2	1	9920	8850	1687	...	...	24 3/8	25 3/8	15 3/8	4 3/4	3 5/8
30	1	9920	8850	1917	...	...	30 3/8	31 3/8	18 3/8	4 3/4	3 3/8

• With minimum safety factor of 5.



### TYPE 1 REGULAR PATTERN EYEBOLTS, FORGED



Nominal Size	A	B	C	D	E	F	G	H	$W_x$	$W_y$	$W_z$	
	Shank Diam	Shank Lngth	Eye ID	Nominal Eye OD	Eye Sect Diam	Overall Lngth	Min Lngth Full Thrd	Thrd Size UNC-2A	Safe Working Load Lb at 0 deg <sup>1</sup>	Safe Working Load Lb at 45 deg <sup>1</sup>	Safe Working Load Lb at 90 deg <sup>1</sup>	
1/4*	0.25	0.25	1.00	0.69	1.19	0.19	2.06	0.75	1/4-20 or	400	80	60
		0.28	1.06	0.81		0.25	2.38		.250-20			
5/16	0.31	0.31	1.12	0.81	1.44	0.25	2.44	0.81	5/16-18 or	800	160	120
		0.34	1.19	0.94		0.31	2.75		.3125-18			
3/8*	0.38	.038	1.25	0.94	1.69	0.31	2.81	0.88	3/8-16 or	1400	280	210
		.041	1.38	1.06		0.38	3.19		.375-16			
7/16	0.44	0.44	1.38	1.00	1.81	0.34	3.06	1.00	7/16-14 or	2000	400	300
		0.47	1.50	1.12		0.41	3.44		.4375-14			
1/2*	0.50	0.50	1.50	1.12	2.12	0.44	3.50	1.12	1/2-13 or	2600	520	390
		0.53	1.62	1.25		0.50	3.88		.500-13			
9/16	0.56	0.56	1.62	1.19	2.25	0.47	3.75	1.25	9/16-12 or	3000	600	450
		0.59	1.75	1.31		0.53	4.12		.5625-12			
5/8*	0.62	0.62	1.75	1.31	2.56	0.56	4.19	1.38	5/8-11 or	4000	800	600
		0.66	1.88	1.44		0.62	4.56		.625-11			
3/4*	.075	0.75	2.00	1.44	2.81	0.62	4.69	1.62	3/4-10 or	6000	1200	900
		0.78	2.12	1.56		0.69	5.06		.750-10			
7/8*	0.88	0.88	2.25	1.56	3.19	0.75	5.31	1.81	7/8-9 or	6600	1300	1000
		0.91	2.38	1.69		0.81	5.69		.875-9			
1*	1.00	1.00	2.50	1.69	3.56	0.88	5.94	2.06	1-8 or	8000	1600	1200
		1.06	2.62	1.81		0.94	6.31		1.000-8			
1-1/8	1.12	1.12	2.75	1.94	4.06	1.00	6.69	2.31	1-1/8-7 or	10000	2000	1500
		1.19	2.88	2.06		1.06	7.06		1.125-7			
1-1/4*	1.25	1.25	3.00	2.12	4.44	1.09	7.31	2.50	1-1/4-7 or	15000	3000	2250
		1.34	3.12	2.25		1.16	7.69		1.250-7			
1-1/2*	1.50	1.50	3.50	2.44	5.19	1.31	8.56	3.00	1-1/2-6 or	18000	3600	2700
		1.59	3.62	2.56		1.38	8.94		1.500-6			
1-3/4*	1.75	1.75	3.75	2.75	6.00	1.50	9.50	3.19	1-3/4-5 or	22000	4400	3300
		1.84	3.88	3.00		1.62	10.12		1.750-5			
2	2.00	2.00	4.00	3.06	6.88	1.75	10.56	3.38	2-4-1/2 or	26000	5200	3900
		2.09	4.25	3.44		1.88	11.44		2.000 4.50			
2-1/2*	2.50	2.50	5.00	3.81	8.50	2.19	13.19	4.25	2-1/2-4 or	32000	6400	4800
		2.62	5.25	4.19		2.31	14.06		2.500-4			



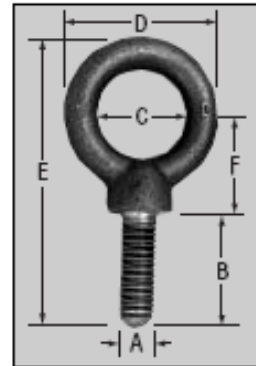
## Shoulder Pattern Eye Bolts

Stock No.	Zinc Plated Stock No.	Thread Size UHC-2A A	Shank Length B	I.D. Eye C	O.D. Eye D	Overall Length E	Center of Eye to Shoulder F	Width of Shoulder G	Approx. Wt. Per 100 Pcs.	Rated Capacity	Blanks*
14611	14611ZP	1/4-20	1	3/4	1 1/4	2 3/4	3/4	1 1/2	5.0	500	R14611
14621	14621ZP	5/16-18	1 1/2	7/8	1 7/8	2 1/2	1 1/4	1 3/4	10.0	900	R14621
14631	14631ZP	3/8-16	1 3/4	1	1 1/2	3 1/4	1 1/2	2 1/2	20.0	1,300	R14631
14638	14638ZP	7/16-14	1 3/4	1 1/8	1 3/4	3 1/4	1 1/4	2 1/2	25.0	1,900	R14638
14641	14641ZP	1/2-13	1 1/2	1 1/8	2 1/8	3 1/2	1 3/8	2 1/4	40.0	2,400	R14641
14650	14650ZP	9/16-12	1 3/4	1 3/8	2 1/4	4 1/4	1 1/2	1 1/2	70.0	3,200	R14650
14661	14661ZP	5/8-11	1 3/4	1 3/8	2 1/4	4 3/4	1 1/2	1 1/2	75.0	4,000	R14661
14672	14672ZP	3/4-10	2	1 1/2	2 1/2	5 1/4	1 5/8	1 3/8	100.0	5,000	R14672
14682	14682ZP	7/8-9	2 1/4	1 1/2	3 1/4	6	2 1/8	1 3/8	160.0	7,000	R14682
14702	14702ZP	1-8	2 1/2	1 5/8	3 1/4	6 3/8	2 1/4	1 3/8	275.0	9,000	R14702
14712	14712ZP	1-1/8-7	2 3/4	2	4 1/4	7 1/2	2 1/4	1 3/4	340.0	12,000	R14712
14723	14723ZP	1-1/4-7	3	2 1/4	4 1/4	8 1/2	2 5/8	1 5/8	465.0	15,000	R14723
14753	14753ZP	1-1/2-6	3 1/2	2 1/2	5 1/4	9 1/2	3 1/4	2 1/4	765.0	21,000	R14753
14770	14770ZP	1-3/4-5	3 3/4	2 3/4	6	10 5/8	4	2 1/2	1145.0	28,000	R14770
14780	14780ZP	2-1/2	4	3 1/4	6 3/8	11 1/4	4 3/8	2 3/4	1700.0	38,000	R14780

Part #14650 dimensions not in accordance with ANSI B18.15.  
Shoulder style lifting eye meets MS51937 specification.

### Machinery Style Shoulder Pattern

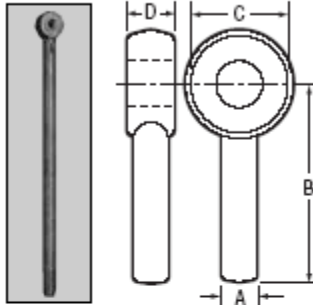
- Forged/ASTM A489
- 1030 Carbon Steel
- Self-Colored\*\*



## ROD END EYE BOLTS

### Rod Ends

- Forged
- 1030 Carbon Steel & 4140 Alloy\*
- Self-Colored



- Shank lengths can vary - 1/4 + 1/2
- Standard forging tolerances ± 1/2

**Self-colored will always be furnished unless otherwise specified.**

**INFORMATION REQUIRED:**

- (A) Shank diameter
- (B) Length center of eye to end
- (C) Head/Boss diameter
- (D) Head thickness

4140 Heat treated to B7

### Blanks

1030 Stock No.	4140 Stock No.	Shank Diameter Inches A	Center of Eye to End B	Head Diameter Inches C	Head Thickness Inches D	Approx. Wt. Per 100 Pcs.
R-18004***	—	1/4	1 1/4	3/8	3/8	3.5
R-18010***	—	1/4	2	3/8	3/8	4.5
R-18008	—	1/4	2 1/2	3/8	3/8	4.5
R-18022	—	5/16	1 1/4	3/4	3/8	14.0
R-18020	—	5/16	4	3/4	3/8	13.0
R-18024***	—	5/16	2	3/8	3/8	15.0
R-18048	—	3/8	0	1 1/8	3/8	24.0
—	RA-18048	3/8	0	1 1/8	3/8	24.0
R-18044	—	3/8	12	1 1/8	3/8	—
R-18052***	—	7/16	4 3/4	1 1/8	3/8	45.0
R-18065	—	1/2	0	1 5/8	3/8	45.0
—	RA-18065	1/2	0	1 5/8	3/8	45.0
R-18055***	—	1/2	7	1 5/8	3/8	45.0
R-18070	—	1/2	12	1 5/8	3/8	90.0
—	RA-18070	1/2	12	1 5/8	3/8	90.0
R-18059	—	1/2	18	1 5/8	3/8	98.0
—	RA-18059	1/2	18	1 5/8	3/8	130.0
R-18058***	—	1/2	2 1/4	1 1/4	3/8	40.0
R-18075	—	1/2	0	1 1/4	3/8	38.0
R-18090	—	1/2	18	1 1/4	3/8	102.0
R-18105	—	5/8	0	1 5/8	1 1/8	73.0
—	RA-18105	5/8	0	1 5/8	1 1/8	73.0
R-18110	—	5/8	12	1 5/8	1 1/8	130.0
R-18117	—	5/8	12	1 5/8	1 1/8	130.0
—	RA-18117	5/8	18	1 5/8	1 1/8	172.0
—	—	5/8	18	1 5/8	1 1/8	185.0
R-18130	—	3/4	0	1 5/8	1 1/8	110.0
—	RA-18130	3/4	0	1 5/8	1 1/8	110.0
R-18135	—	3/4	12	1 5/8	1 1/8	200.0
—	RA-18135***	3/4	12	1 5/8	1 1/8	200.0
R-18137	—	3/4	18	1 5/8	1 1/8	243.0
—	RA-18137	3/4	18	1 5/8	1 1/8	315.0
R-18150	—	7/8	0	1 11/8	1 1/8	159.0
—	RA-18150***	7/8	0	1 11/8	1 1/8	159.0
R-18155	—	7/8	12	1 11/8	1 1/8	285.0
—	RA-18155	7/8	12	1 11/8	1 1/8	285.0
R-18162	—	7/8	18	1 11/8	1 1/8	298.0
R-18170	—	1	0	2	1	213.0
—	RA-18170***	1	0	2	1	213.0
R-18175	—	1	12	2	1	350.0
—	RA-18175	1	12	2	1	350.0
R-18181	—	1	18	2	1	403.0
R-18194	—	1-1/4	12	2 1/2	1 1/4	575.0
R-18200	—	1-1/4	18	2 1/2	1 1/4	625.0
R-18210	—	1-1/2	18	3	1 1/2	650.0
R-18214	—	1-3/4	18	3 1/2	1 3/4	675.0
R-18218	—	2	18	4	2	700.0

\*Not heat treated. \*\*\*These products will be discontinued when stock is depleted.