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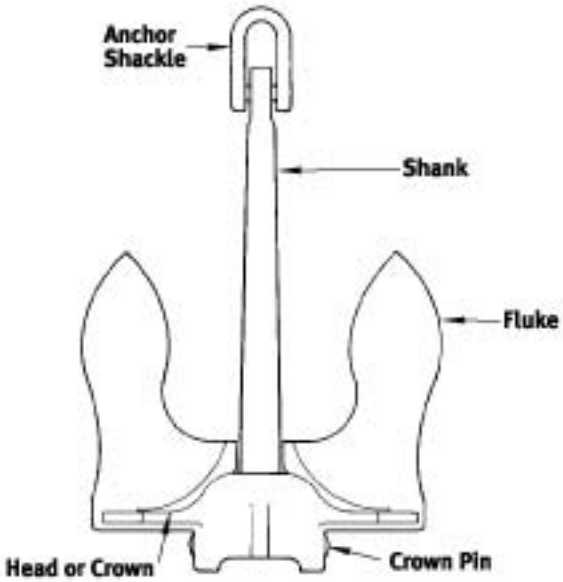
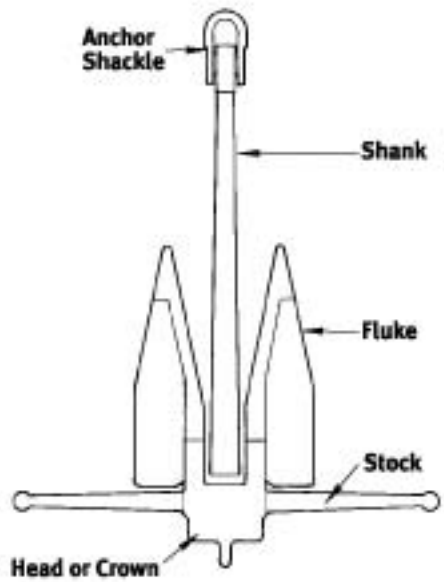
We maintain one of the largest inventories of new and used, imported and domestic anchors in the United States.

Anchor Selection





Optimum design of an anchor is influenced by the specific composition of the ocean floor. Basically, we categorize the ocean bottoms into three groups:

1. Mud, or silt, which varies the most in consistency and offers little resistance to forces.
2. Sand, ideally the most consistent, and where anchors specifically designed reach excellent holding efficiency.
3. Rock, or Marl, poor holding ground where an anchor's dead weight is it's only asset.

The efficiency of an anchor in a given test is expressed in terms of "Holding Power" per pound of its own weight, not in "Proof test" which indicates physical properties of the material.

The fluke angle of an anchor has a definite effect upon the "Holding Power". The flukes should enter the bottom at an angle that will allow the crown, or head, to penetrate to a depth which can produce maximum efficiency. Additionally, we have determined the following:

1. The angle of fluke penetration in mud bottoms should approximate 50°.
2. In sand the penetration angle should be in the area of 30°.
3. For anchoring in various bottoms a compromise approximating 43 ° is desirable.

Other considerations in selecting an anchor should include:

1. Convenience for handling and stowing.
2. Aptitude for taking hold.
3. Physical strength.
4. Freedom from fouling, which all anchors do, but some in lesser degrees.
5. Influence developed by the chain's catenary which absorbs shock loads and lowers the angle of pull at the anchor by its weight.

The anchor is the key to effective anchoring or mooring. It is essential to know what to expect from various anchors. The resistance of an anchor to being dragged through a soil has been considered as occurring in two stages: first, biting into the bottom due to the ploughing effect of the flukes, and secondly, maintaining a continuous resistance to drag after it is planted into the bottom.

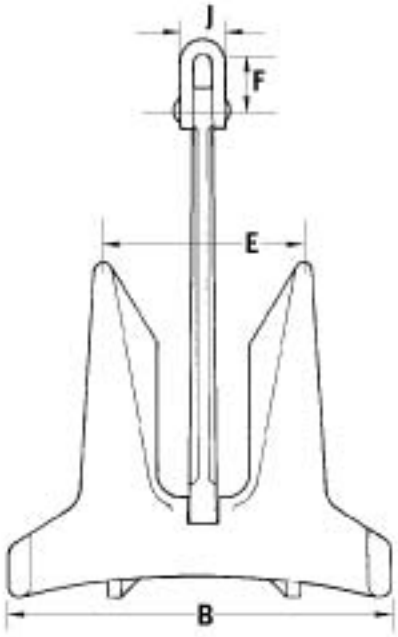
Holding power is directly proportional to projected fluke area, and shear strength of the bottom material, and inversely proportional to penetration-area resistance. In many cases a smaller anchor with favorable fluke area to weight ratio is more dependable than a heavier anchor.

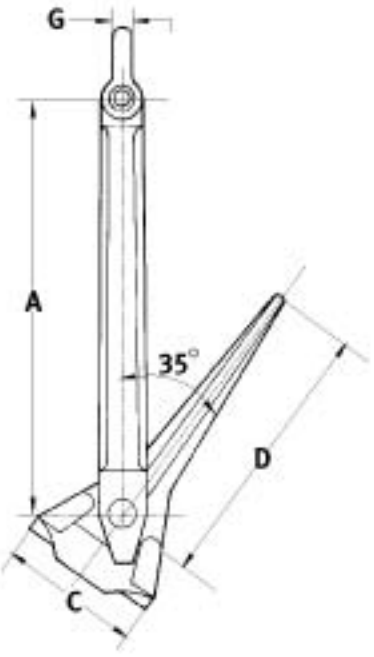
Holding Power for the two most widely used anchors are as follows:

1. Stockless Type anchors, in sand, develop a holding power to weight ratio of seven to one. In mud they develop three to one. The angle of penetration in both cases is 45°.
2. Lightweight Type anchors, in sand, develop a holding power to weight ratio of twenty to one, with the angle of penetration being 30°. In mud they develop nine to one with the angle of penetration being 50°.

The depth of penetration in all preceding cases is compiled from three to seven feet in sand, and from seventeen to twenty feet in mud. All calculations incorporate a 0° scope angle.

AC-14 Type



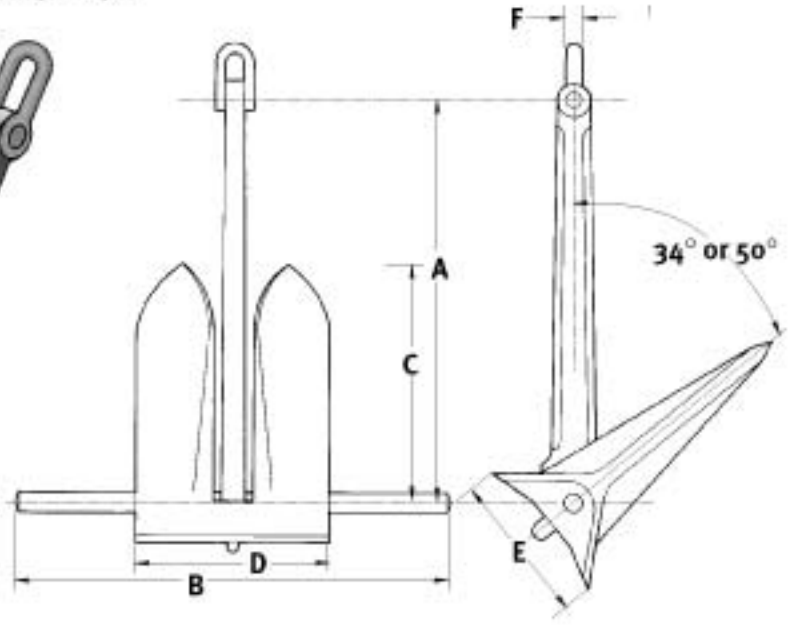


This is a high holding power anchor. The flukes are shaped to insure an immediate grip into the seabed. The small flukes on either side will right the anchor to its proper position. Its increased efficiency over conventional anchors is maintained on most bottoms including clay and pebbly sand.

Anchor Weight (lb)	A	B	C	D	E	F	G	J
2,840	63-3/4	61-1/4	18-1/2	42	32-13/16	11-7/16	2-15/16	10-3/16
3,170	63-9/16	63-7/8	19-3/16	43-9/16	34-1/16	11-7/8	3-1/16	10-9/16
3,500	65-11/16	66-1/16	19-15/16	45-1/16	35-3/16	12-1/4	3-1/8	10-7/8
4,230	69-15/16	70-1/2	21-1/8	47-15/16	37-1/2	13-1/6	3-3/8	11-5/8
4,630	72-1/6	72-1/2	21-3/4	49-7/16	38-5/8	13-7/16	3-7/16	11-15/16
5,030	74-1/16	74-1/2	22-3/8	50-13/16	39-11/16	13-3/4	3-9/16	12-5/16
5,420	75-15/16	76-7/16	22-15/16	52-1/16	40-11/16	14-1/8	3-11/16	12-5/8
6,280	79-3/4	80-1/4	24-1/8	54-3/4	42-3/4	14-7/8	3-7/8	13-1/4
7,280	83-3/4	84-1/4	25-5/16	57-7/16	44-15/16	15-9/16	4-1/16	13-15/16
8,330	87-5/8	88-1/8	26-1/2	60-1/8	46-5/16	16-5/16	4-3/16	14-9/16
8,930	89-11/16	90-3/16	27-1/16	61-1/2	48-1/16	17-1/16	4-5/16	14-15/16
10,120	93-1/2	94-1/16	28-1/4	64-1/8	50-1/8	17-7/16	4-1/2	15-9/16
11,530	97-5/8	98-1/4	29-1/2	66-15/16	52-3/8	18-3/16	4-3/4	16-1/4
12,370	99-15/16	100-9/16	30-3/16	68-9/16	53-9/16	18-5/8	4-13/16	16-5/8
13,230	103-1/8	102-13/16	30-7/8	70-1/8	54-13/16	19-1/16	4-15/16	17
14,220	104-3/4	105-3/8	31-5/8	71-13/16	56-1/8	19-1/2	5-1/16	17-3/8
15,210	107-1/16	107-3/4	32-3/8	73-7/16	57-3/8	19-15/16	5-3/16	17-13/16
20,500	118-5/16	119-3/16	35-3/4	81-1/8	63-7/16	22-1/16	5-11/16	19-11/16
25,790	127-11/16	128-7/16	38	87-5/8	68-7/16	23-13/16	6-3/16	21-1/4
29,760	133-15/16	134-3/4	40-1/2	91-7/8	71-13/16	24-15/16	6-7/16	22-5/16
35,490	142-1/16	142-15/16	42-15/16	97-7/16	76-1/8	26-7/16	6-7/8	23-5/8
39,240	146-7/8	147-3/4	44-3/8	100-3/4	78-3/4	27-3/8	7-1/16	24-7/16

Dimensions are approximate and may differ between manufacturers.
Dimensions above are in inches, weights are in pounds.

Moorfast™ Type Anchor



The Moorfast Type Anchor is designed with enlarged flukes and tripping palms for quick and stable penetration in sand or mud bottoms.

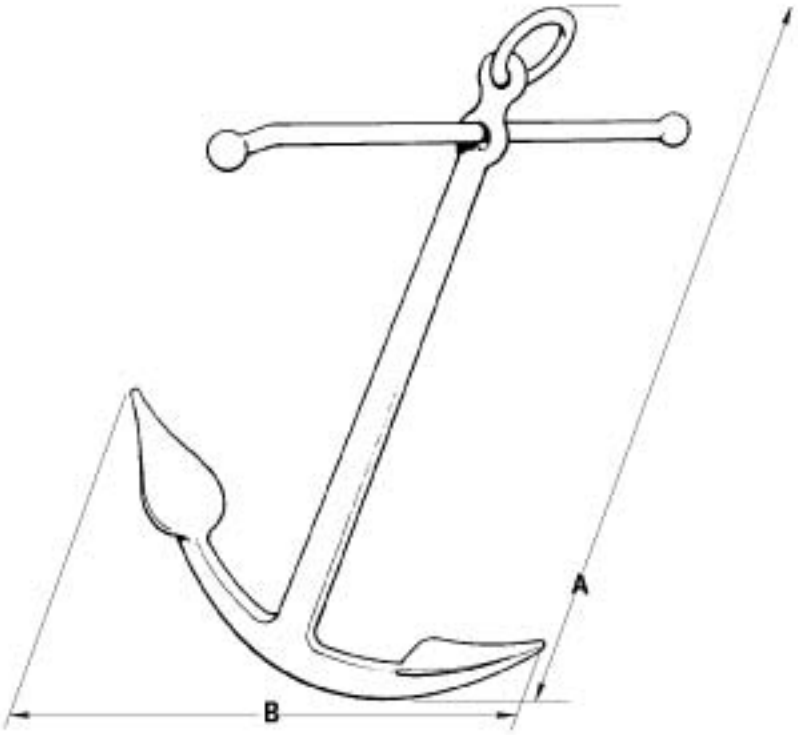
Anchor Weight (lb)	A	B	C	D	E	F
1,000	61	75	37	25	19	2
3,000	88	109	54	37	27	3
6,000	101	143	61	42	31	3-1/2
8,000	122	153	75	51	38	3-1/2
10,000	131	157	80	55	41	4
12,000	139	167	85	58	43	4
14,000	147	177	90	61	45	4
16,000	153	187	94	64	48	4-1/2
20,000	164	196	102	69	51	4-1/2
30,000	189	217	118	79	59	5
40,000	214	248	127	86	63	5-1/2
50,000	222	257	132	89	66	6
60,000	232	271	140	95	70	6
70,000	244	274	147	100	73	6
80,000	255	298	154	105	77	6-1/2
90,000	266	310	160	109	80	6-1/2
100,000	275	320	166	113	83	7

INTERMEDIATE SIZES AVAILABLE UPON REQUEST

Dimensions above are in inches, anchor weight in pounds. Certified drawings of anchors listed above, and of intermediate and larger sizes, may be furnished on request.

Kedge Anchor

The sharp flukes of the Kedge anchor clutch readily in many types of bottoms.

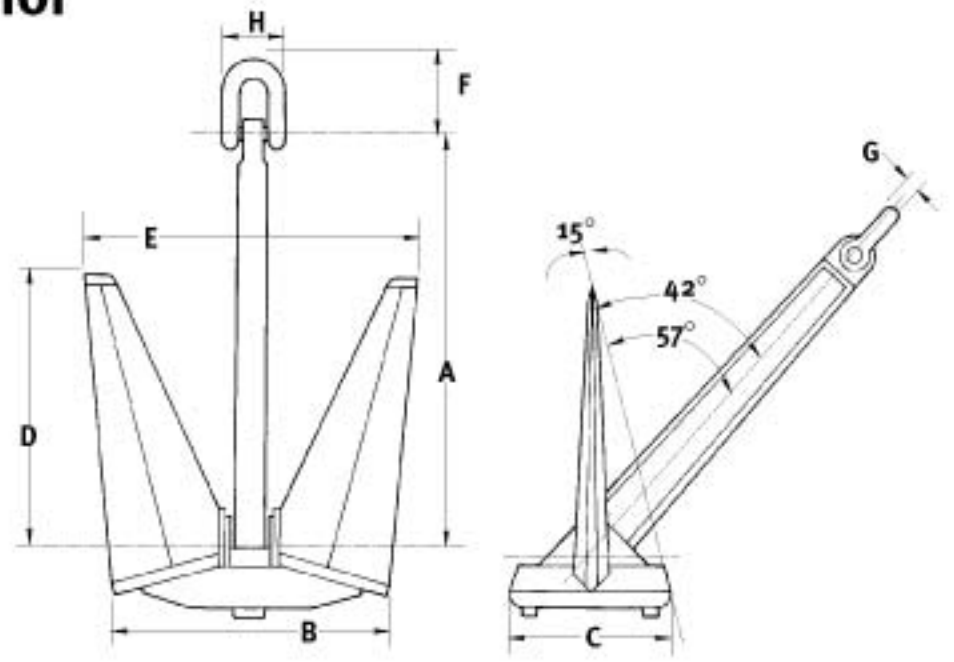


Weight (lb)	A	B	Rings
15	26	20	1/2 x 2-3/4
20	30	21	5/8 x 3
25	34	22-1/2	5/8 x 3
30	38	23	5/8 x 3
35	40	23	5/8 x 3
40	42	27	5/8 x 3
45	44-1/2	31	3/4 x 3-1/2
50	46	34	7/8 x 3-3/4
75	50	36	1 x 4-1/2
100	56	40	1-1/4 x 5
150	60	43	1-1/4 x 5

INTERMEDIATE AND LARGER SIZES AVAILABLE UPON REQUEST

Dimensions above are in inches, weights are in pounds.

Pool Anchor



Anchor Weight (kg)	A (MM)	B (MM)	C (MM)	D (MM)	E (MM)	F (MM)	G (MM)	H (MM)
90	747	537	299	491	632	120	22	90
105	788	565	315	516	665	142	28	105
125	833	597	333	546	703	142	28	105
135	857	615	343	562	723	142	28	105
180	942	676	377	618	796	157	32	116
225	1016	728	406	666	858	174	36	125
270	1079	774	432	708	911	174	36	125
315	1136	815	455	745	960	201	40	140
360	1188	852	475	780	1002	201	40	140
430	1258	902	503	825	1062	201	40	140
495	1320	948	528	866	1115	201	40	140
585	1396	1002	558	916	1180	236	50	175
675	1465	1050	586	960	1236	236	50	175
765	1528	1096	610	1002	1290	236	50	175
855	1585	1138	634	1040	1338	306	60	225
970	1652	1185	660	1083	1395	306	60	225
1,080	1714	1230	685	1124	1446	306	60	225
1,195	1771	1270	708	1161	1495	306	60	225
1,305	1825	1309	730	1180	1541	306	60	225
1,440	1886	1352	764	1236	1592	306	60	225
1,565	1942	1386	777	1274	1640	361	75	255
1,710	1997	1433	799	1309	1685	361	75	255
1,845	2048	1469	819	1342	1729	261	75	255
1,980	2098	1504	838	1375	1770	361	75	255
2,140	2151	1543	860	1411	1816	361	75	255
2,295	2202	1580	880	1444	1860	361	75	255
2,475	2260	1620	904	1480	1910	400	80	290

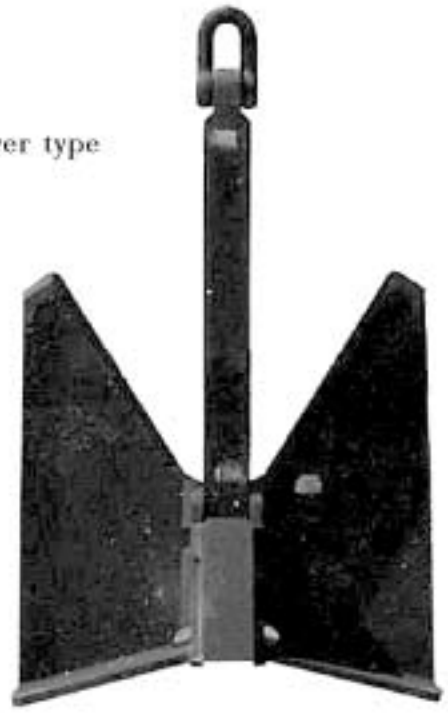
Dimensions above are in mm, weights are in kg.

Continued on next page

Certified drawings of anchors listed above, and intermediate and larger sizes, may be furnished on request.

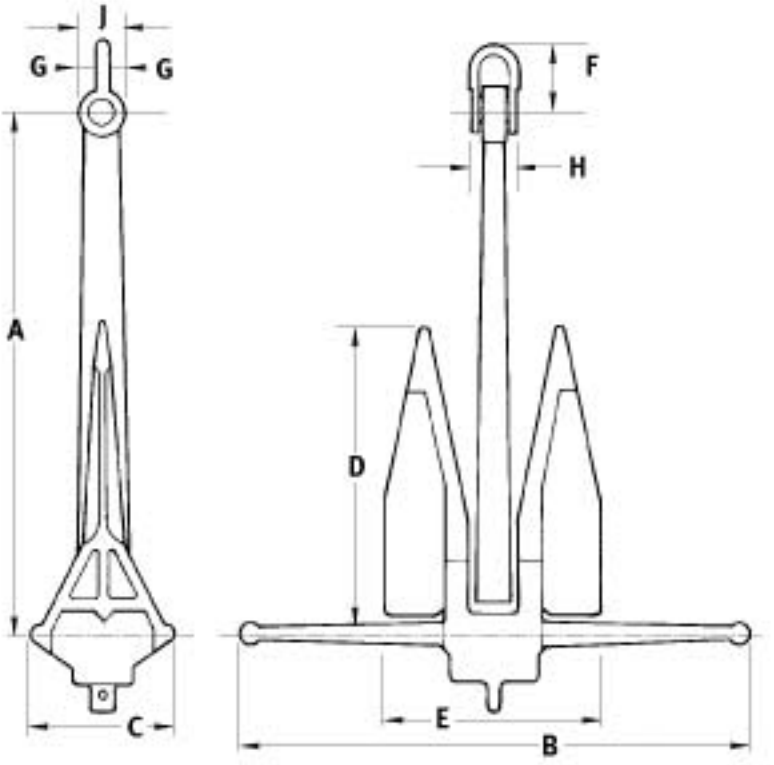
Pool Anchor

The Pool anchor is a high-holding power type anchor for sand or mud bottoms.



Anchor Weight (kg)	A (MM)	B (MM)	C (MM)	D (MM)	E (MM)	F (MM)	G (MM)	H (MM)
2,655	2312	1664	925	1513	1954	400	80	290
2,835	2364	1700	945	1550	1996	400	80	290
3,040	2418	1735	968	1585	2042	400	80	290
3,240	2471	1773	988	1620	2086	400	80	290
3,445	2522	1809	1009	1653	2129	400	80	290
3,670	2575	1847	1030	1690	2174	500	90	360
3,940	2637	1892	1055	1730	2226	500	90	360
4,210	2696	1934	1078	1763	2276	500	90	360
4,500	2757	1978	1103	1803	2328	500	90	360
4,840	2824	2026	1130	1852	2385	500	90	360
5,175	2889	2072	1155	1894	2439	550	100	400
5,515	2950	2116	1180	1934	2491	550	100	400
5,850	3009	2159	1204	1973	2541	550	100	400
6,225	3072	2204	1229	2014	2594	550	100	400
6,525	3121	2239	1248	2043	2635	550	100	400
6,975	3190	2290	1276	2092	2695	550	100	400
7,425	3258	2337	1303	2133	2751	660	130	470
7,875	3323	2384	1329	2173	2805	660	130	470
8,325	3385	2428	1354	2219	2858	660	130	470
8,775	3445	2471	1378	2253	2908	660	130	470
9,225	3502	2512	1401	2293	2958	660	130	470
9,675	3558	2553	1423	2333	3004	700	140	500
10,125	3613	2592	1445	2369	3050	700	140	500
10,573	3666	2630	1466	2404	3095	700	140	500
12,075	3881	2748	1488	2513	3235	750	150	540
13,350	3962	2842	1585	2593	3345	800	160	570
16,490	4251	3049	1700	2787	3589	870	175	625

Workboat Anchor



Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
8	20	19	5-1/16	11-1/2	7-1/4	1-11/16	3/8	1-1/2	1
16	25	23-3/4	7	14-1/2	9	2-1/8	1/2	1-7/8	1-1/4
30	30-3/4	28-3/4	8-3/4	17-1/2	11-3/8	2-1/8	1/2	1-7/8	1-3/8
50	34-3/4	33	9-15/16	20	12-7/8	2-7/8	5/8	2-3/8	1-5/8
75	38	36	11	22	14-3/8	3-1/2	3/4	2-1/2	2
100	41-1/2	39-1/2	12-3/16	24	15-5/8	3-3/4	7/8	3-3/8	2-1/4
150	46-3/4	44-1/2	13-11/16	27	17-3/8	5-1/2	1	4	2-3/8
200	47-1/2	45	14-3/16	29	18-7/8	5-1/2	1	4	3-1/8
250	47-1/2	45	14-9/16	29	18-7/8	5-1/2	1	4	3-1/8
300	53	50	16-1/8	32-1/2	21-1/4	7	1-1/4	5	3-1/4
350	53	50	16-11/16	32-1/2	21-1/4	7	1-1/4	5	3-1/4
400	57-1/2	54-1/4	17-3/4	35-1/4	23	7	1-1/4	5	3-1/2
450	60	56-1/2	18-3/8	36-3/4	24	7	1-1/4	5	3-3/4
500	61-1/2	58-1/2	19	37-1/2	24	7-1/2	1-1/2	6	4-1/4
750	69	64-1/2	21-1/8	42	28-7/16	7-1/2	1-1/2	6	4-7/8
1,000	75	71	24-1/2	46	29-1/4	9-3/4	2	8	5-1/4
2,000	92-1/2	85	30	56-1/2	37-1/4	12	2	9-1/2	7
3,000	108-1/2	104	34-3/4	66	40-3/8	15	3	11	7-3/4
4,000	116	110	37-1/2	71	44	15	3	11	9

Dimensions are approximate and may differ between manufacturers.
Dimensions above are in inches, weights are in pounds.

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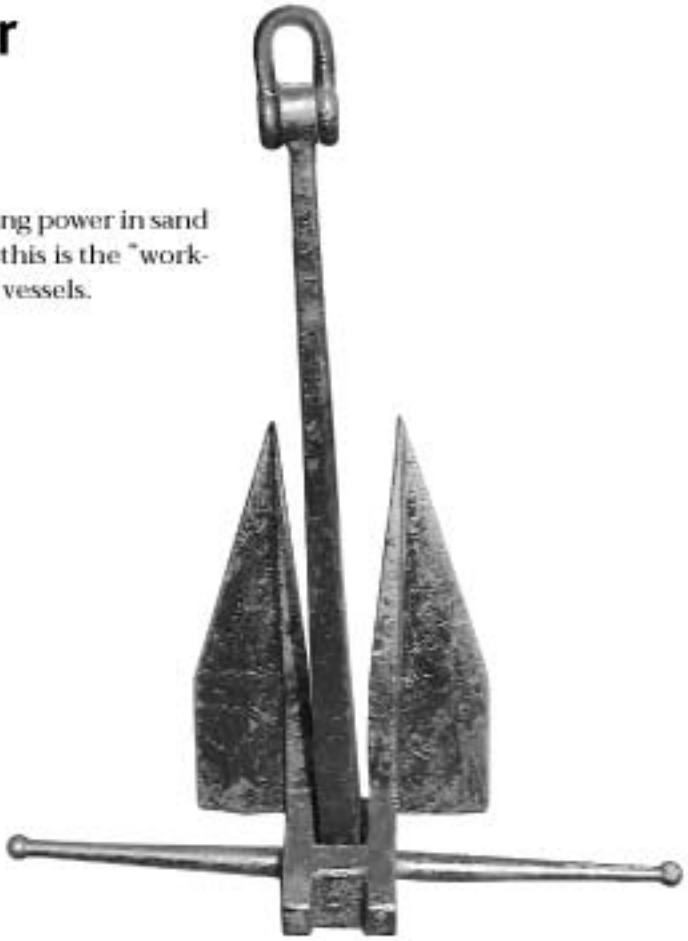
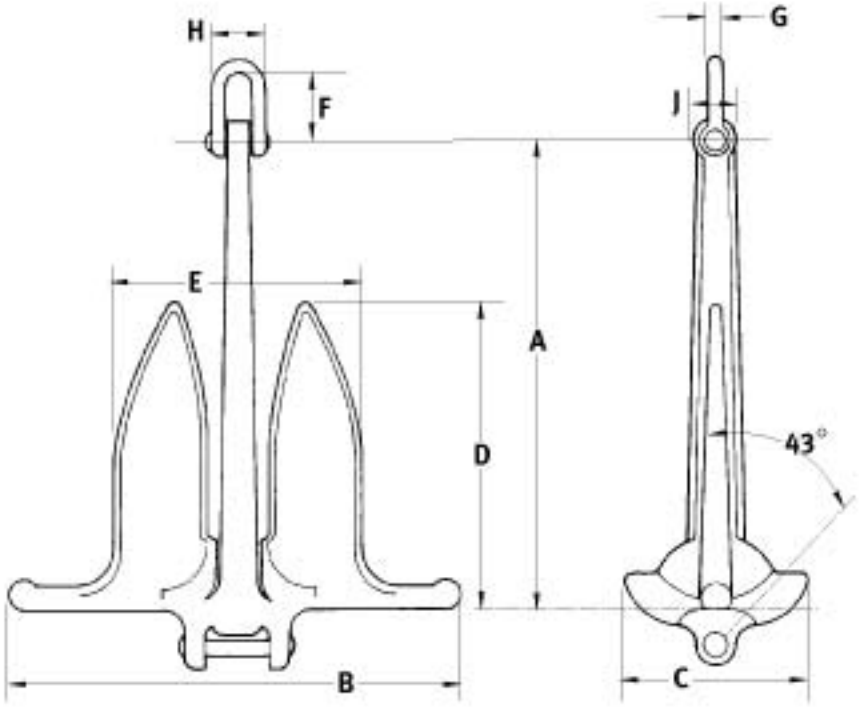
Workboat Anchor

These anchors afford excellent holding power in sand or mud bottoms. As its name states, this is the "working" anchor for numerous offshore vessels.



Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
5,000	118	112	38-3/4	72	44-3/4	17	3-1/2	12-1/2	9-1/2
6,000	124	118	41	76	47-3/4	19	4	14	10-1/4
7,000	124	118	41	76	47-3/4	19	4	14	10-1/4
8,000	128	121	43-1/2	78	50-1/4	19	4	14	12
9,000	133	126	45-1/4	81-1/8	52-1/4	19	4	14	12-1/2
10,000	144	137	49	88	55-1/4	22	4-1/2	16	13
11,000	144	137	49	88	55-1/4	22	4-1/2	16	13
12,000	146	138-1/2	49-3/4	89-1/8	57-3/8	22	4-1/2	16	13-3/4
13,000	154	146	52-1/2	94	60-1/2	24	5	17-1/2	14-1/2
14,000	154	146	52-1/2	94	60-1/2	24	5	17-1/2	14-1/2
15,000	157	149-1/4	53-5/8	96	61-7/8	24	5	17-1/2	14-7/8
16,000	161	152-1/2	54-7/8	98-1/4	63-1/4	24	5	17-1/2	15-1/8
17,000	164	155-1/2	56	100	64-1/2	24	5	17-1/2	15-1/2
18,000	167	158-1/2	57	102	65-5/8	24	5	17-1/2	15-3/4
19,000	170-1/8	161-3/8	58	104	66-3/4	25	5-1/2	20	16
20,000	173	164	59	106	68	25	5-1/2	20	16-3/8
25,000	195	186	67	119	75	30	6	22	18
30,000	208	198	71	127	80	32	6	23	19

Snug Stowing® Type Anchor



Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
200	30-7/8	29-11/16	12-1/16	20-1/8	16-3/16	5-1/2	1	4	2-3/4
250	33-5/16	32	13	21-11/16	17-7/16	5-1/2	1	4	3
300	35-5/16	34	13-3/4	23	18-1/2	5-1/2	1	4	3-1/8
350	37-3/16	35-3/4	14-1/2	24-1/4	19-1/2	5-1/2	1	4	3-3/8
400	38-7/8	37-3/8	15-1/4	25-3/8	20-3/8	5-1/2	1	4	3-1/2
450	40-3/8	38-7/8	15-3/4	26-3/8	21-1/8	5-1/2	1	4	3-3/8
500	41-3/4	40-1/4	16-3/8	27-1/4	21-7/8	7	1-1/4	4-7/8	3-3/4
750	48	46	18-3/4	31-1/4	25-1/8	7-1/2	1-1/4	4-7/8	4-3/8
1,000	52-3/4	50-3/4	20-5/8	34-3/8	27-5/8	7-1/2	1-1/2	5-3/8	4-3/4
2,000	66-1/2	64	26	43-1/4	34-7/8	9-3/4	2	7-3/4	6
3,000	76	73	29-5/8	49-1/2	39-3/4	12	2-1/2	9-1/4	6-7/8
4,000	83-3/4	80-1/2	32-3/4	54-1/2	43-7/8	12	2-1/2	9-1/4	7-1/2
5,000	90-3/8	86-3/4	35-1/4	58-3/4	47-1/4	15	3	10-1/4	8-1/8
6,000	96	92-1/8	37-1/2	62-1/2	50-1/4	15	3	10-3/4	8-3/8
7,000	101	97	39-1/2	65-3/4	52-7/8	15	3	10-3/4	9-1/8
8,000	105-3/4	101-1/2	41-1/4	68	55-3/8	15	3	10-3/4	9-1/2
9,000	110	105-1/2	43	71-1/2	57-1/2	17	3-1/2	12	10
10,000	113-3/4	109-1/4	44-1/2	74	59-1/2	17	3-1/2	12	10-1/4
11,000	117-1/2	112-7/8	45-3/4	76-1/2	61-1/2	19	4	13-3/8	10-1/2

Dimensions above are in inches, weights are in pounds.
*Snug Stowing is a registered trademark of Baldt, Inc.

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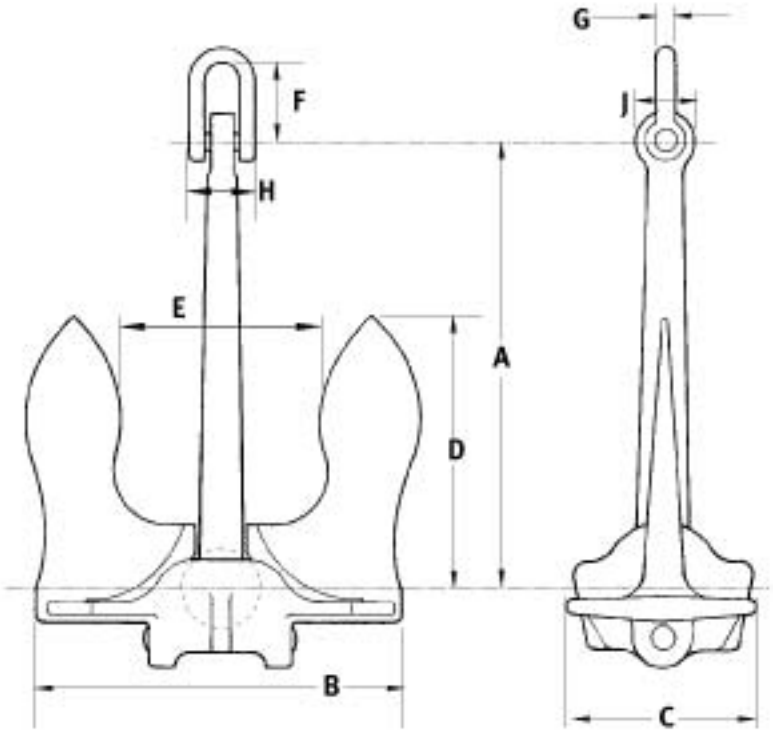
Snug Stowing® Type Anchor

This anchor simplifies ship bow design, and eliminates the need for cumbersome hawse pipe bolsters. It effectively stoppers the hawse pipe, houses freely with minimum protrudence and provides maximum bearing on the ship's shell. The anchor provides great holding power for most uses.

Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
12,000	120-3/4	116	47-1/8	78-5/8	63-1/4	19	4	13-3/8	10-1/8
13,000	124	119-1/8	48-3/8	80-3/4	64-7/8	19	4	13-3/8	11-1/8
14,000	127-1/4	122-1/4	49-5/8	82-3/4	66-5/8	19	4	13-3/8	11-1/2
15,000	130	125	50-3/4	84-5/8	68	19	4	13-3/8	11-3/4
16,000	133-1/4	128	52	86-3/4	69-3/4	19	4	13-3/8	12
17,000	136	130-1/2	53-1/8	88-1/2	71-1/8	19	4	13-3/8	12-1/4
18,000	138-3/4	133-1/8	54-1/8	90-1/4	72-1/2	22	4-1/2	15-3/4	12-1/2
19,000	141	135-1/2	55	91-7/8	73-7/8	22	4-1/2	15-3/4	12-3/4
20,000	143-1/4	137-5/8	56	93-1/4	75	22	4-1/2	15-3/4	12-7/8
25,000	154	148	60-1/4	100-1/2	80-3/4	22	4-1/2	15-3/4	13-7/8
30,000	164	157-1/2	64-1/8	106-3/4	86	24	5	17-3/4	14-3/4
40,000	180	173	70	117	94	26	5-1/2	19	16
50,000	195	187	76	126	102	28	6	20	18
60,000	206	197	80	134	108	30	6	22	19
70,000	218	208	85	140	113	32	6-1/2	23	20
80,000	227	218	89	146	120	33	6-1/2	24	21
90,000	236	226	92	153	126	35	7	26	22
100,000	244	234	95	158	130	36	7	27	23

Certified drawings of anchors listed above, and intermediate and larger sizes, may be furnished on request.

Stockless Type Anchor



Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
100	29-1/2	13-3/4	7-3/8	12-3/4	8	4	3/4	1-1/2	2-1/2
150	29-1/2	16	8-1/2	14-1/2	9	5	7/8	2-1/2	3
200	30	17-1/8	9-1/4	15-3/4	10-1/4	5	1	2-1/2	3-3/4
250	30-1/2	21	10-1/2	17	12	5	1	3-7/8	4
300	31-1/2	23-1/4	11-3/8	18	13-1/4	5-1/4	1-1/16	3-7/8	4
350	32-1/2	24-3/4	12-1/2	18-3/4	13-5/8	6	1-1/8	4-1/4	4-1/4
400	33-1/2	24-3/4	12-3/4	20-1/2	14	6	1-1/8	4-1/4	4-1/2
500	35	26-1/2	13-1/4	20-1/2	14	7	1-1/2	5-3/4	5
750	38	32	16	24	17	7	1-1/2	5-3/4	5
1,000	44	34-1/4	18	25-1/4	19-1/4	7-1/2	1-7/8	6-1/8	5-1/2
1,200	47	36	18	28	19-1/4	9-1/2	1-7/8	6-1/2	6
1,500	54	43	20	32	21-1/2	9-1/2	2	7	7
2,000	57	43	21-1/4	33-1/2	23-3/4	9-1/2	2	7	7
2,250	61	43	25-1/4	39-3/4	24-1/4	9-3/4	2-1/8	7	7
2,500	58	44-3/4	23-1/4	35-3/8	24-1/4	9-3/4	2-1/8	8-1/2	7-1/2
2,800	58	48	25	35-7/8	25-1/2	9-3/4	2-1/8	8-1/2	7-1/2
3,000	64	47	25-1/2	36	26	12	2-1/2	10	8-3/4
3,500	64	52-3/4	27-1/2	39-1/2	28-1/2	12	2-1/2	10	8-3/4
4,000	70-5/8	53-1/4	27-1/2	39-1/4	29	12	2-1/2	10	9-1/2
4,500	70-5/8	56-3/4	29	42	30	12	2-1/2	10	9-1/2
5,000	76	57-1/2	30	42	31-1/4	15	3	12	10-1/4
6,000	76	63-1/2	33-1/4	47	34-1/2	15	3	12	10-1/4
6,300	76	63-1/2	33-1/4	47	34-1/2	15	3	12	10-1/4

Dimensions are approximate and may differ between manufacturers.
Dimensions above are in inches, weights are in pounds.

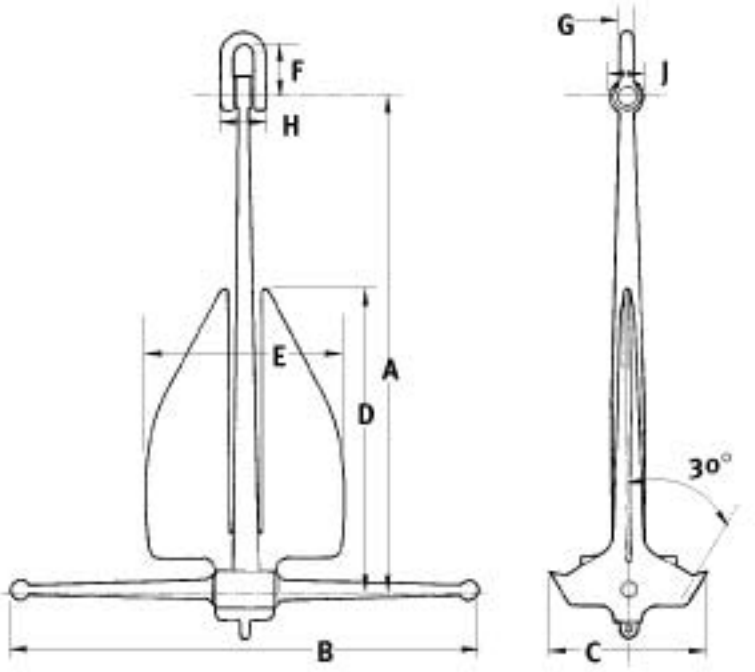
Continued on next page

Stockless Type Anchor

This is the standard anchor for ships that are likely to encounter all types of sea bottoms. It combines the advantages of dead weight for holding in very hard bottoms with the ability to bite and hold in mud and sand. Its features include rugged construction, simple design, with easy handling and stowing.

Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
6,500	82	63-1/2	33	47-5/8	17-1/4	15	3	12	10-3/4
6,750	82	65	33-3/4	48-3/4	17-5/8	15	3	12	10-3/4
7,000	82	66-5/8	34-3/4	49-3/4	18	15	3	12	10-3/4
7,600	82	67-1/2	34-3/4	49-3/4	18-3/8	15	3	12	10-3/4
8,100	93-1/2	68-1/4	34-1/4	48-7/8	18-1/4	17	3-1/2	13-1/4	11-1/2
8,600	93-1/2	68-1/2	35-3/4	50-1/2	18-1/2	17	3-1/2	13-1/4	11-1/2
9,000	96	70-1/4	36-3/8	51-3/4	19-1/8	17	3-1/2	13-1/4	11-1/2
10,000	96	75-1/2	39	58	21	19	4	14-3/4	12
11,000	96	75-1/2	39	58	21	19	4	14-3/4	12
12,000	96	76-3/4	40	58	21-3/4	19	4	14-3/4	12
13,000	98	76-3/4	40	58	21-3/4	19	4	14-3/4	12
14,000	103	80-1/2	44	60	22-1/4	19	4	14-3/4	13
15,000	103	86	46	65	24	19	4	14-3/4	13
16,000	108	86	46	65	24	19	4	14-3/4	13
18,000	112	88-1/4	48-1/4	65-5/8	24-3/4	22	4-1/2	16-3/4	13
18,900	112	88-1/4	48-1/4	65-5/8	24-3/4	22	4-1/2	16-3/4	13
20,000	112	96	50	72	26	22	4-1/2	16-3/4	14
25,000	120	103	53-3/4	77-1/2	28	22	4-1/2	16-3/4	15
30,000	128	110	57-1/4	82-1/2	29-7/8	24	5	18-3/4	16
35,000	135	116	60	87	31-1/2	25	5	19	17
40,000	140	121	63	91	32	26	5-1/2	20	17-1/2
45,000	147	126	65	94	34	27	5-1/2	21	18
50,000	152	131	68	99	35	28	6	21-1/2	19

U.S.N. LWT Anchor



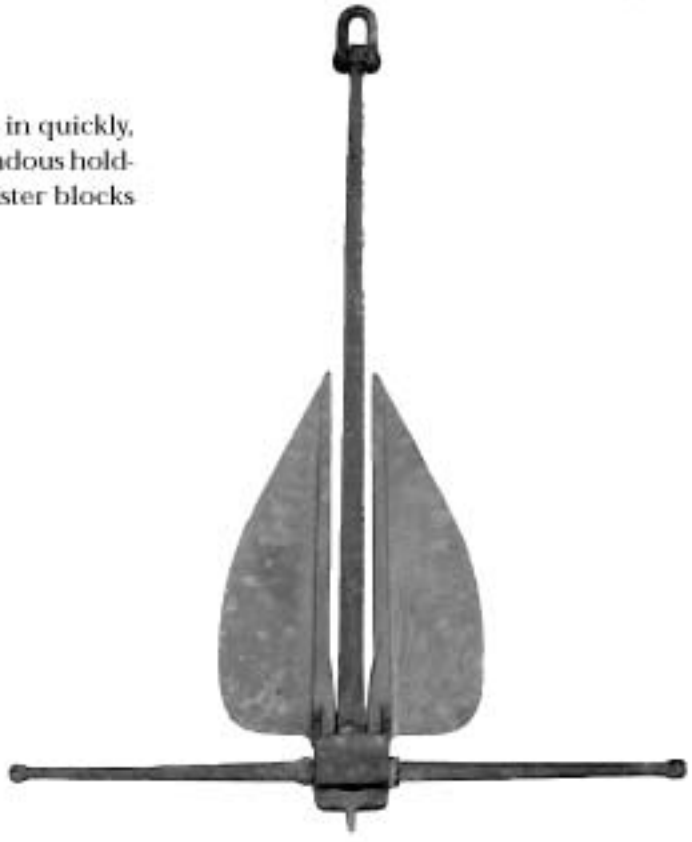
Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
100	41-1/2	39-1/2	12-3/16	24	15-5/8	3-3/4	7/8	3-3/8	2-1/4
150	46-3/4	44-1/2	13-11/16	27	17-3/8	5-1/2	1	4	2-3/8
200	47-1/2	45	14-3/16	29	18-7/8	5-1/2	1	4	3-1/8
250	47-1/2	45	14-9/16	29	18-7/8	5-1/2	1	4	3-1/8
300	53	50	16-5/16	32-1/2	21-1/4	7	1-1/4	5	3-1/4
350	53	50	16-11/16	32-1/2	21-1/2	7	1-1/4	5	3-1/4
400	57-1/2	54-1/4	17-3/4	35-1/4	23	7	1-1/4	5	3-1/2
450	60	56-1/2	18-3/8	36-3/4	24	7	1-1/4	5	3-3/4
500	61-1/2	58-1/2	19	37-1/2	24	7-1/2	1-1/2	6	4-1/4
750	69	64-1/2	21-1/8	42	28-7/16	7-1/2	1-1/2	6	4-7/8
1,000	75	71	24-1/2	46	29-1/4	9-3/4	2	8	5-1/4
2,000	92-1/2	85	30	56-1/2	37-1/4	12	2-1/2	9-1/2	7
3,000	108-1/2	104	34-3/4	66	40-3/8	15	3	11	7-3/4
4,000	116	110	37-1/2	71	44	15	3	11	9
5,000	118	112	38-3/4	72	44-3/4	17	3-1/2	12-1/2	9-1/2
6,000	124	118	41	76	47-1/4	19	4	14	10-1/4
7,000	124	118	41	76	47-1/4	19	4	14	10-1/4
8,000	128	121	43-1/2	78	50-1/4	19	4	14	12
9,000	133	126	45-1/4	81-1/8	52-1/4	19	4	14	12-1/2
10,000	144	137	49	88	55-1/4	22	4-1/2	16	13
11,000	144	137	49	88	55-1/4	22	4-1/2	16	13

Dimensions are approximate and may differ between manufacturers.
Dimensions above are in inches, weights are in pounds.

Continued on next page

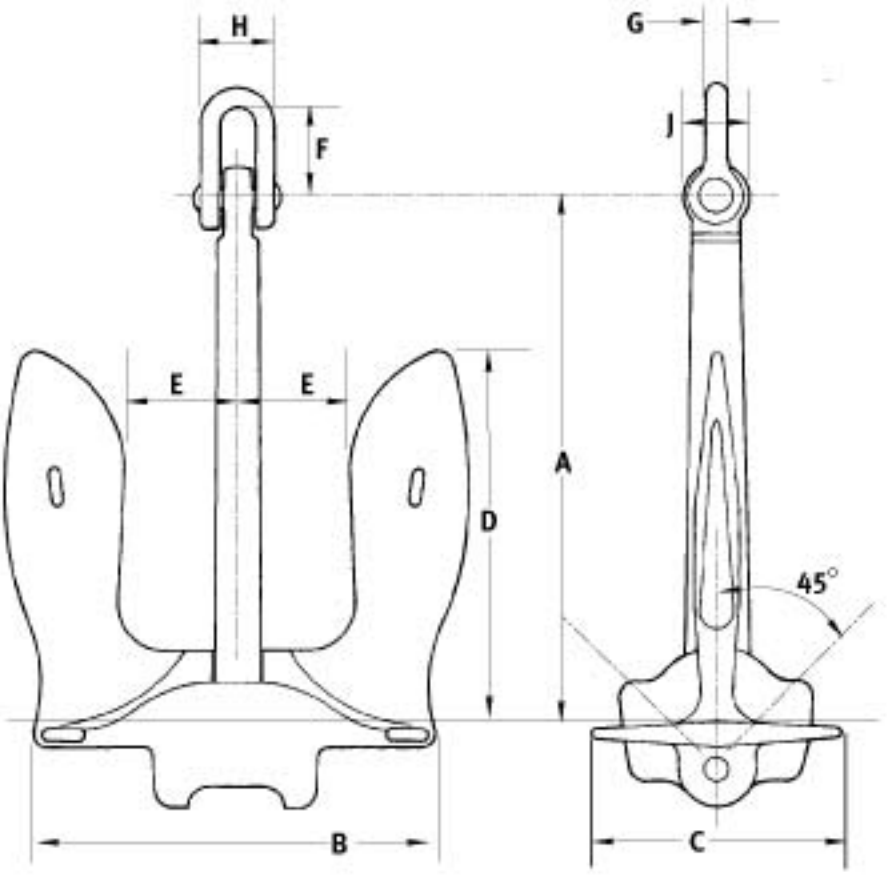
U.S.N. LWT Anchor

The "hook" head forces the flukes to dig in quickly, and the large fluke design provides tremendous holding power in sand or mud bottoms. Adjuster blocks available to alter fluke angle.



Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
12,000	146	138-1/2	49-3/4	89-1/8	57-3/8	22	4-1/2	16	13-3/4
13,000	154	146	52-1/2	94	60-1/2	24	5	17-1/2	14-1/2
14,000	154	146	52-1/2	94	60-1/2	24	5	17-1/2	14-1/2
15,000	157	149-1/4	53-5/8	96	61-7/8	24	5	17-1/2	14-7/8
16,000	161	152-1/2	54-7/8	98-1/4	63-1/4	24	5	17-1/2	15-1/8
17,000	164	155-1/2	56	100	64-1/2	24	5	17-1/2	15-1/2
18,000	167	158-1/2	57	102	65-5/8	24	5	17-1/2	15-3/4
19,000	170-1/8	161-3/8	58	104	66-3/4	25	5-1/2	20	16
20,000	173	164	59	106	68	25	5-1/2	20	16-3/8
25,000	191	178	67-1/4	116	75	26-1/2	5-1/2	20	16
30,000	198	189	67-1/2	121	78	29	5-1/2	20	17
35,000	208	199	71	127	82	30-1/2	6	21	18
40,000	218	240	75	131	86	32	6	24	20-1/2
45,000	227	250	78	136	89	33	6-1/4	26	22
50,000	235	260	81	141	92	34	6-1/2	27	23
60,000	250	278	86	150	97	36	6-1/2	29	24
70,000	264	290	91	157	103	38	7	30	26
80,000	275	304	95	165	107	40	7-1/2	31	27
90,000	287	317	99	172	112	41	8	33	28
100,000	296	328	102	178	116	43	8	34	29

U.S.N. Stockless Anchor



Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
300	28-5/8	22-1/8	13-3/4	20-5/16	6-7/16	6	1-1/8	4	3-1/2
400	31-1/2	24-3/8	15-1/8	22-3/8	6-15/16	6-13/16	1-1/4	4-3/8	3-7/8
500	34	26-1/4	16-1/4	24-3/32	7-1/2	6-5/16	1-5/16	4-11/16	4-1/8
600	36	27-29/32	17-9/32	25-5/8	7-15/16	6-5/8	1-7/16	5	4-3/8
800	39-11/16	30-11/16	19	28-3/16	8-3/4	7-5/16	1-9/16	5-9/16	4-7/8
1,000	42-3/16	33-1/8	20-1/2	30-3/8	9-13/32	7-15/16	1-11/16	6	5-1/4
1,200	45-3/8	35-1/8	21-3/4	32-1/4	10	8-3/16	1-7/8	6-3/8	5-1/2
1,300	46-5/8	36	22-3/8	33-1/8	10-9/32	8-11/16	1-3/4	6-3/8	5-11/16
1,500	49	37-7/8	23-1/2	34-3/4	10-3/4	9	2	6-7/8	6
1,800	52	40-1/4	24-15/16	36-15/16	11-7/16	9-9/16	2-1/16	7-5/16	6-3/8
2,000	54	41-11/16	25-13/16	38-1/4	11-7/8	9-5/16	2-1/8	7-9/16	6-1/2
2,200	54-5/8	43	26-5/8	39-1/2	12-1/4	10-1/4	2-3/16	7-3/4	6-3/4
2,500	58	44-7/8	27-13/16	41-1/4	12-3/4	10-3/4	2-1/4	8-3/16	7-3/16
3,000	63-1/2	50	30-1/2	44-1/2	13-7/8	11-1/4	2-3/8	8-1/2	7-1/2
3,500	64-7/8	50-1/8	31-1/16	46-3/32	14-9/32	12	2-1/2	8-15/16	7-7/8
4,000	67-7/8	52-1/2	32-9/16	48-7/32	14-15/16	12-1/2	2-11/16	9-9/16	8-13/16
5,000	73	56-9/16	35	51-15/16	16-1/16	13-1/2	2-7/8	10-1/4	9-1/8
6,000	77-3/4	60-3/16	37-5/16	55-1/4	17-1/8	14-5/16	3-1/16	10-15/16	9-5/8
7,000	82	63-1/4	39-1/4	58-1/16	18-1/32	15-1/8	3-3/16	11-1/2	9-15/16

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U.S.N. Stockless Anchor

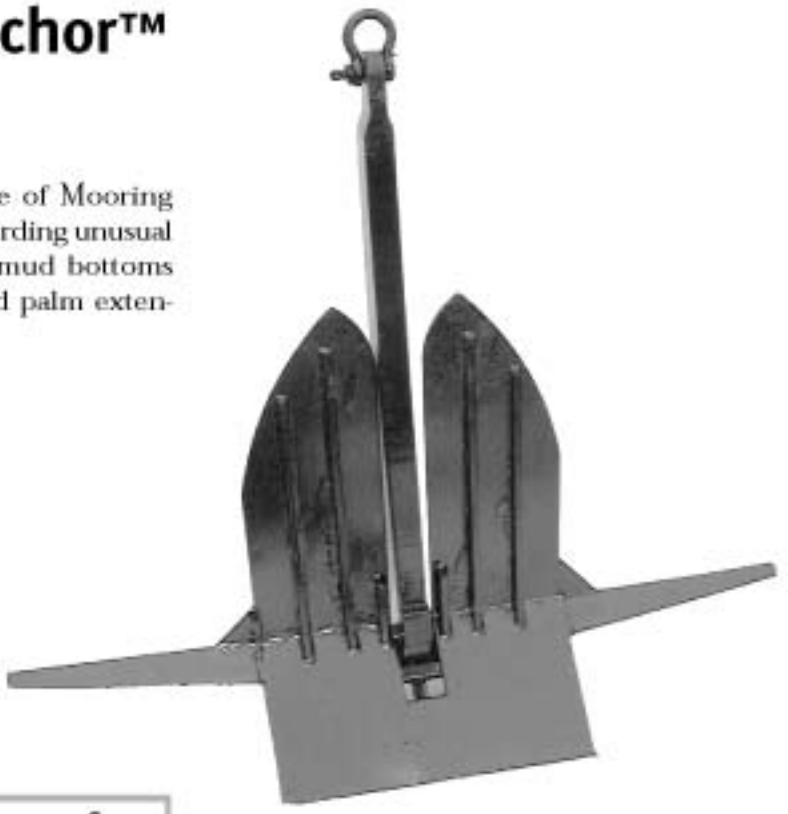
These have the same usage abilities as the stockless anchor, however the flukes are longer. Each fluke is provided with an opening for the insertion of strapping material in order to help secure the anchor to the ship's deck.

Anchor Weight (lb)	A	B	C	D	E	F	G	H	J
8,000	85-1/2	66-1/8	41	60-3/4	18-7/8	15-3/4	3-3/8	12	10-3/8
9,000	88-7/8	68-3/4	42-5/8	63-1/8	19-5/8	16-3/8	3-1/2	12-1/2	10-3/16
10,000	92	71-1/4	44-1/8	65-3/8	20-5/16	17	3-5/8	12-15/16	10-13/16
11,000	95	73-9/16	45-5/8	67-1/2	20-29/32	17-1/2	3-3/4	13-3/8	11-13/4
12,000	97-7/8	75-3/4	47	69-1/2	21-19/32	18	3-7/8	13-3/4	11-7/8
13,000	100	77-3/8	46-5/8	71-1/16	22	18-3/8	3-15/16	14-1/8	12-5/16
14,500	104	80-5/8	50	73-1/4	22-9/16	19-3/16	4-1/8	14-5/8	12-7/8
15,000	105-1/2	82-1/4	51	74	23-1/8	19-5/8	4-1/4	15	13
16,000	107-11/16	83-11/32	51-5/8	76-1/2	23-23/32	19-7/8	4-1/4	15-1/8	13-1/4
18,000	112	86-5/8	53-3/4	79-9/16	24-5/8	20-5/8	4-3/8	15-3/4	13-13/16
20,000	116	89-3/4	55-5/8	82-7/16	25-1/2	21-7/16	4-1/2	16-1/4	14-5/16
22,500	120-1/2	93-5/16	57-13/16	85-11/16	26-17/32	22-1/4	4-3/4	17	14-7/8
25,000	125	96-11/16	59-15/16	88-13/16	27-1/2	22-15/16	5	17-9/16	15-7/16
30,000	132-3/4	102-11/16	63-5/8	94-1/4	29-7/32	24-7/16	5-1/4	18-11/16	16-3/8
35,000	139-3/4	108	67-1/16	99-5/16	30-3/4	25-3/4	5-1/2	19-11/16	17-1/4
40,000	146	113-1/16	70	103-1/8	32-1/4	27-1/8	5-5/8	20-1/8	17-3/4
45,000	152	117-5/8	72-7/8	108	33-7/16	28	6	21-3/4	18-3/4
60,000	188	125-3/4	87-5/16	132-7/8	38-11/16	29	7-1/2	24-1/2	20-1/2

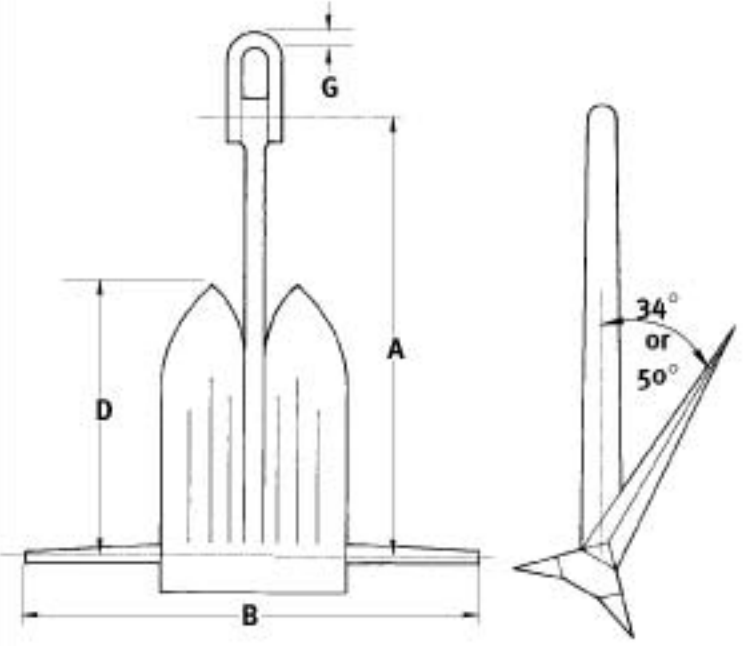
Dimensions are approximate and may differ between manufacturers.
Dimensions above are in inches, weights are in pounds.

Stato Mooring Anchor™

This is an improved permanent type of Mooring anchor developed by the U.S. Navy affording unusual holding strength in either sand or mud bottoms through the use of wedge inserts and palm extensions.



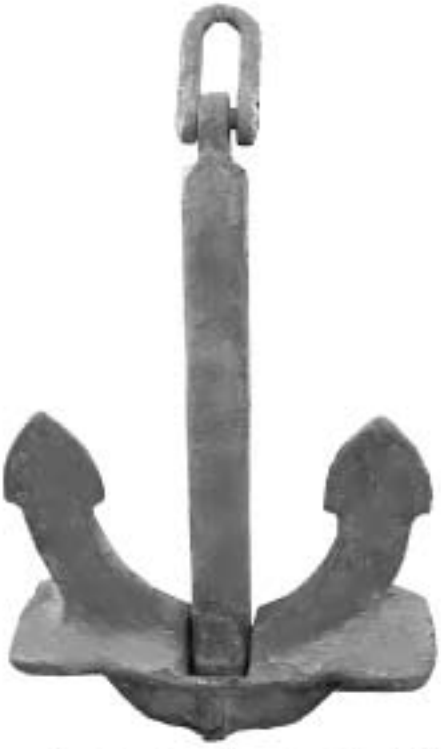
Weight (lb)	A	B	D	G
200	42	59	26	3/4
3,000	129	109	72	1-3/4
6,000	144	143	92	2-1/4
9,000	160	170	100	2-3/4
12,000	186	197	113	3
15,000	204	224	126	3-1/2
20,000	210	230	129	3-3/4
25,000	226	246	137	4
30,000	235	257	145	5
35,000	248	271	153	5-1/4
40,000	258	283	160	5-1/2
45,000	269	295	166	5-3/4
50,000	277	303	171	6
60,000	297	320	180	6
70,000	310	336	191	6-1/2
80,000	322	350	200	6-1/2
90,000	345	366	206	7
100,000	350	380	216	7-1/2

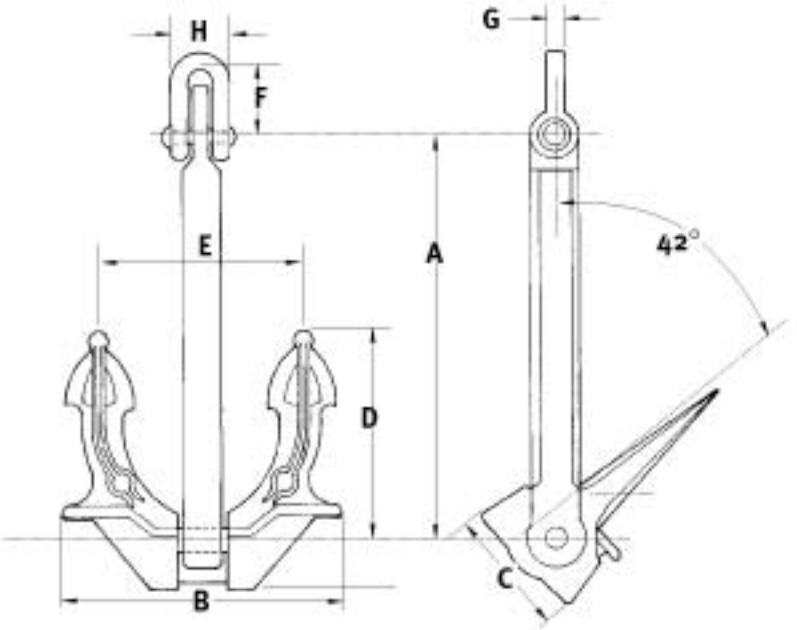


INTERMEDIATE SIZES AVAILABLE UPON REQUEST

Dimensions above are in inches, anchor weights in pounds. Certified drawings of anchors listed above, and of intermediate and larger sizes, may be furnished on request.

Hall Anchor





The Hall anchor has the characteristic of a Stockless anchor.

Anchor Weight (lb)	A	B	C	D	E	F	G	H
1,455	63-3/4	39-3/8	16-15/16	29-1/8	27-15/16	9-3/16	2-3/16	7-1/16
1,985	61-1/16	43-11/16	18-3/4	32-5/8	30-11/16	10-3/16	2-3/8	7-13/16
2,515	66-1/8	47-1/4	20-1/2	35-1/16	33-7/16	11-1/16	2-5/8	8-7/16
3,175	71-5/8	51-3/16	22-1/16	37-13/16	34	12-1/16	2-13/16	9-1/4
3,505	74	52-3/4	22-13/16	39	37-3/8	12-3/8	2-15/16	9-7/16
4,230	78-3/4	56-5/16	24-7/16	41-3/4	39-3/4	13-1/4	3-1/8	10-1/8
5,025	83-1/16	59-7/16	25-5/8	44-1/8	42-1/8	13-7/8	3-1/4	10-5/8
6,285	89-3/4	64-3/16	27-9/16	47-5/8	45-1/4	15-1/16	3-9/16	11-1/2
7,275	94-1/8	67-5/16	29-1/8	50	47-5/8	15-3/4	3-11/16	12-1/16
8,335	98-13/16	70-1/2	30-5/16	52	49-5/8	16-7/16	3-7/8	12-5/8
8,930	104-5-/16	72-1/16	31-1/8	53-1/8	50-13/16	16-7/8	3-15/16	12-15/16
10,120	105-1/8	75-3/16	32-5/16	55-1/2	53-1/8	17-9/16	4-1/8	13-7/16
15,210	120-7/8	86-1/4	37	63-3/4	61	20-1/16	4-3/4	15-3/8
20,500	133-7/16	95-1/4	40-15/16	70	64-15/16	22-7/16	5-1/4	17-1/16
25,795	103-1/8	102-3/4	44-1/8	76	72-7/16	24	5-11/16	18-7/16
29,760	151-3/16	107-7/8	46-7/16	79-1/2	76-3/8	25-3/16	5-15/16	19-5/16
34,830	159-7/16	113-3/4	48-13/16	83-7/8	80-5/16	26-3/4	6-5/8	20-3/8
40,785	167-11/16	119-11/16	51-9/16	88-9/16	84-5/8	27-15/16	6-9/16	21-7/16
44,090	172-1/16	122-13/16	52-3/4	90-9/16	78-3/4	28-3/4	6-3/4	22
50,705	180-5/16	128-3/4	55-1/2	94-7/8	90-15/16	30-5/16	7-1/16	23-1/16
54,010	184-1/4	131-1/2	56-11/16	97-1/4	92-15/16	30-11/16	7-1/4	23-9/16
60,625	191-5/16	136-5/8	58-11/16	100-13/16	96-7/16	31-7/8	7-1/2	24-7/16

Dimensions above are in inches; weight is in pounds.
Dimensions are approximate and may differ between manufacturers.

Additional Anchors

OLD STYLE

Also known as Admiralty, Kedge, Pick and Common Anchor. In great demand before the invention of the stockless anchor, now used mostly on fishing vessels and for permanent moorings, the sharp flukes clutch readily in many types of bottoms. Also available in one arm version

EELLS

This anchor is widely used in salvage operations. With an open back design, it utilizes suction to increase its holding power in soft bottoms.

MUSHROOM

Excellent for permanent moorings, channel buoys and other navigation aids. This anchor takes firm hold and remains fixed under adverse conditions. As anchor oscillates under strains, it buries itself still deeper.

TWO-FLUKED BALANCED ANCHOR

This unique anchor is characterized by having the center of gravity of the flukes below the pivot point. As a result, the flukes and shank are parallel when hoisted. This provides variations in stowage procedures—bottom-mounted stowability.

Anchor & Mooring Chain

Di-Lok Forged Steel Stud Link Anchor Chain 24

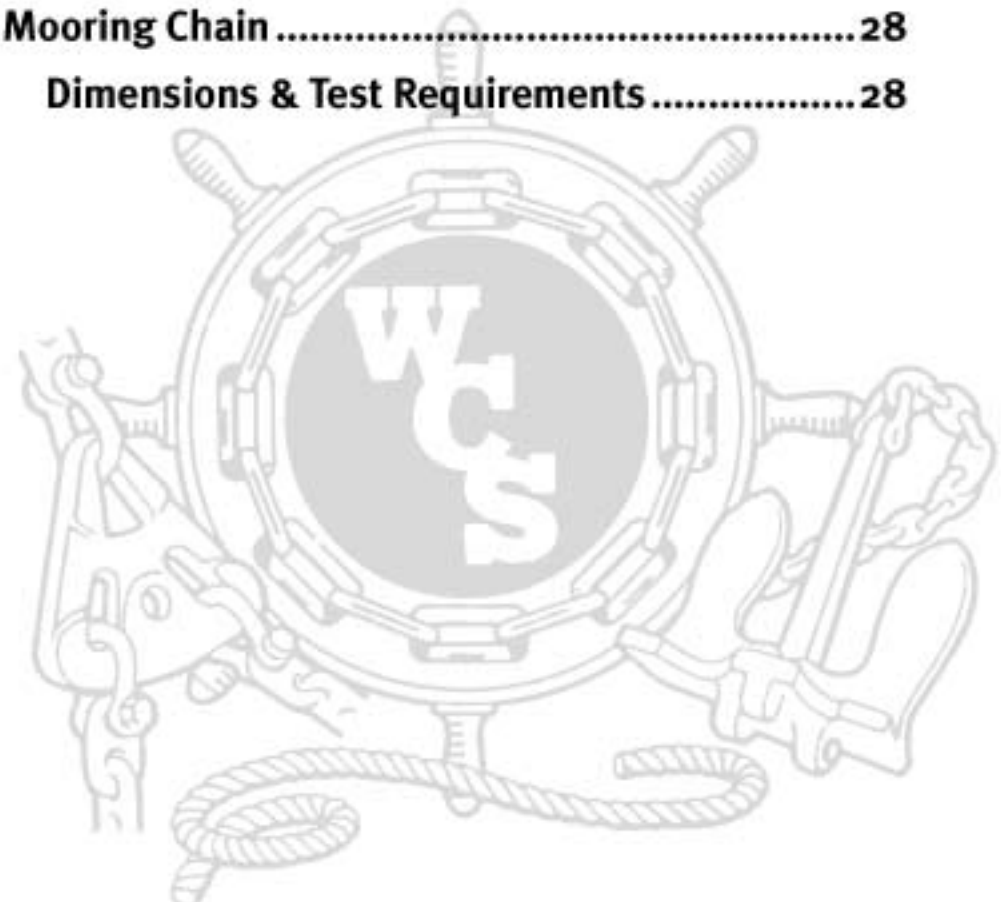
Welded Stud Link Anchor Chain 26

A.B.S. Grade Stud Link Chain 26

Oil Rig Quality 26

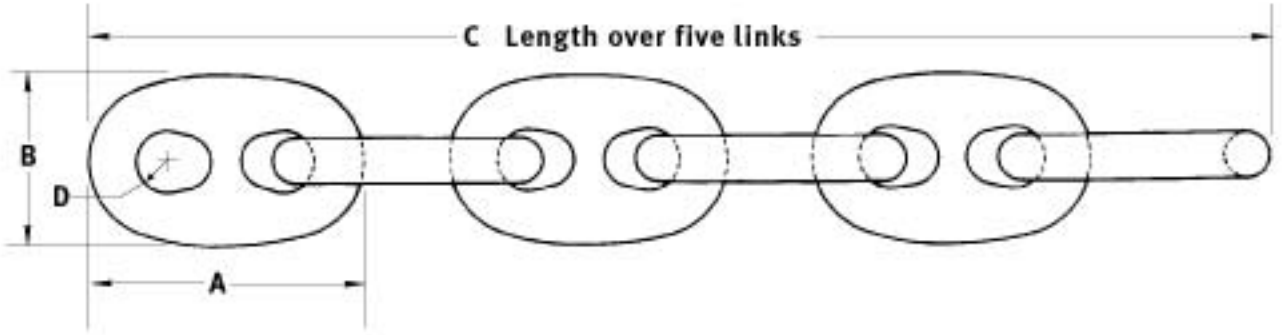
Mooring Chain 28

Dimensions & Test Requirements 28



We maintain one of the largest inventories of new and used, imported and surplus anchor chain and attachments in the United States.

Di-Lok Chain Dimensions & Test Requirements



Chain Size Inches	mm	Link Length A	Link Width B	Length Over 5 Links C	Grip Radius D	Links Per 15 Fathom Shot	Weight Per 15 Fathom Shot Approx.	Proof Test Pounds	Break Test Pounds
3/4	19	4-1/2	2-5/8	16-1/2	1/2	357	505	48,000	75,000
13/16	21	4-7/8	2-7/8	17-7/8	17/32	329	600	56,000	86,500
7/8	22	5-1/4	3-1/8	19-1/4	37/64	305	700	64,000	98,000
15/16	24	5-5/8	3-5/16	20-5/8	5/8	285	795	74,000	113,500
1	25	6	3-5/16	22	21/32	267	900	84,000	129,000
1-1/6	27	6-3/8	3-3/4	23-3/8	11/16	251	1,020	95,000	145,000
1-1/8	29	6-3/4	4	24-3/4	25/32	237	1,140	106,000	161,000
1-1/16	30	7-1/8	4-1/4	26-1/8	25/32	225	1,275	118,000	179,500
1-1/4	32	7-1/2	4-1/2	27-1/2	25/32	213	1,415	130,000	198,000
1-5/16	33	7-7/8	4-3/4	28-7/8	7/8	203	1,560	143,500	216,500
1-3/8	34	8-1/4	4-15/16	30-1/4	7/8	195	1,705	157,000	235,000
1-7/16	36	8-5/8	5-1/16	31-5/8	15/16	187	1,865	171,000	257,500
1-1/2	38	9	5-3/8	33	1	179	2,035	185,000	280,000
1-9/16	40	9-3/8	5-5/8	34-3/8	1-1/32	171	2,195	200,500	302,500
1-5/8	42	9-3/4	5-7/8	35-3/4	1-1/16	165	2,345	216,000	325,000
1-11/16	43	10-1/8	6-1/16	37-1/8	1-3/32	159	2,530	232,500	352,500
1-3/4	44	10-1/2	6-5/16	38-1/2	1-5/32	153	2,720	249,000	380,000
1-13/16	46	10-7/8	6-1/2	39-7/8	1-3/16	147	2,925	267,000	406,000
1-7/8	48	11-1/4	6-3/4	41-1/4	1-1/4	143	3,125	285,000	432,000
1-15/16	50	11-5/8	7	42-5/8	1-9/32	139	3,335	303,500	460,000
2	51	12	7-1/16	44	1-5/16	133	3,525	322,000	488,000
2-1/16	52	12-3/8	7-7/16	45-3/8	1-3/8	129	3,750	342,000	518,000
2-1/8	54	12-3/4	7-5/8	46-3/4	1-7/16	125	3,975	362,000	548,000
2-3/16	56	13-1/8	7-7/8	48-1/8	1-15/32	123	4,215	382,500	579,100

Dimensions above are in inches; weight is in pounds.

Continued on next page

Di-Lok Chain Dimensions & Test Requirements

No longer manufactured, Di-Lok chain is a forged alloy steel stud link chain with an integral stud with superior strength to weight. Each link is composed of two forged members: a serrated stem member and a socketed member. A cold heat treated serrated member is placed into the hot socketed member and assembled by forging in closed dies.

The unique design of Di-Lok stud link chain allows the use of various alloy steels and heat treatments. The integral stud is formed in the forging of the socketed member and cannot be dislodged.

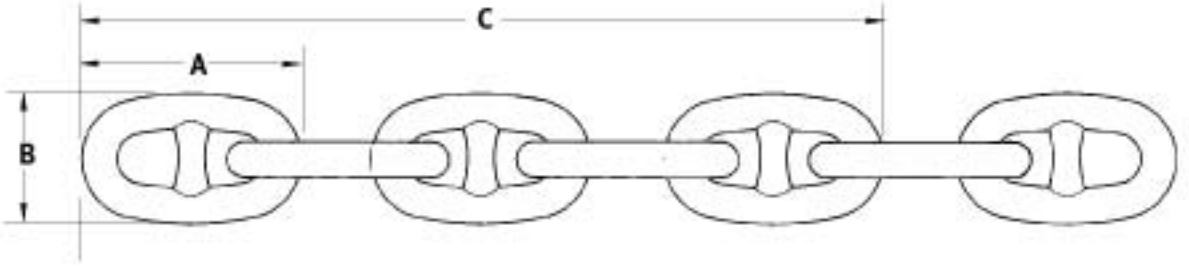
With modification in die design, high strength and super strength Di-Lok chain was manufactured to obtain superior test loads.

Chain Size		Link Length	Link Width	Length Over 5 Links	Grip Radius	Links Per 15 Fathom Shot	Weight Per 15 Fathom Shot	Proof Test	Break Test
Inches	mm	A	B	C	D		Approx.	Pounds	Pounds
2-1/4	58	13-1/2	8-1/8	49-1/2	1-1/2	119	4,460	403,000	610,000
2-5/16	59	13-7/8	8-5/16	50-7/8	1-17/32	117	4,710	425,000	642,500
2-3/8	60	14-1/4	8-9/16	52-1/4	1-9/16	113	4,960	447,000	675,000
2-7/16	62	14-5/8	8-3/4	53-5/8	1-5/8	111	5,210	469,500	709,500
2-1/2	64	15	9	55	1-5/8	107	5,528	492,000	744,000
2-9/16	66	15-3/8	9-1/4	56-3/8	1-11/16	105	5,810	516,000	778,500
2-5/8	67	15-3/4	9-7/16	57-3/4	1-11/16	103	6,105	540,000	813,000
2-11/16	68	16-1/8	9-11/16	59-1/8	1-3/4	99	6,410	565,000	849,000
2-3/4	70	16-1/2	9-7/8	60-1/2	1-13/16	97	6,725	590,000	885,000
2-13/16	71	16-7/8	10-1/8	61-7/8	1-27/32	95	7,040	615,000	925,000
2-7/8	73	17-1/4	10-3/8	63-1/4	1-7/8	93	7,365	640,000	965,000
2-15/16	75	17-5/8	10-9/16	64-5/8	1-7/8	91	7,696	666,500	1,005,000
3	76	18	10-11/16	66	2	89	8,035	693,000	1,045,000
3-1/16	78	18-3/8	11	67-3/8	2	87	8,379	720,500	1,086,500
3-1/8	79	18-3/4	11-1/4	68-3/4	2-1/16	85	8,736	748,000	1,128,000
3-1/16	81	19-1/8	11-1/2	70-1/8	2-1/16	85	9,093	776,050	1,169,000
3-1/4	83	19-1/2	11-11/16	71-1/2	2-1/8	83	9,460	804,100	1,210,000
3-5/16	84	19-7/8	11-15/16	72-7/8	2-1/8	81	9,828	833,150	1,253,000
3-3/8	86	20-1/4	12-1/8	74-1/4	2-3/16	79	10,210	862,200	1,296,000
3-7/16	87	20-5/8	12-3/8	75-5/8	2-3/16	77	10,599	892,100	1,339,550
3-1/2	90	21	12-5/8	77	2-5/16	77	10,998	922,000	1,383,100
3-5/8	92	21-3/4	12-15/16	79-3/4	2-5/16	73	11,607	1,021,000	1,566,000
3-3/4	95	22-1/2	13-3/8	82-1/2	2-15/16	71	12,626	1,120,000	1,750,000

Dimensions above are in inches; weight is in pounds.

Stud Link Chain Dimensions & Test Requirements

Welded Stud Link Chain



Chain Size		Dimensions				Test Requirements						No.of Links per 15 Fm Shot
						Grade 2		Grade 3		Oil Rig Quality		
Inches	mm	Link Length A	Link Width B	Length Over 5-Links C	Weight Per 15 Fmshot (Appx.)	Proof Load	Break Load	Proof Load	Break Load	Proof Load	Break Load	
5/8	16	3-3/4	2-1/4	13-3/4	365	23,745	33,220	33,220	47,465			432
3/4	19	4-1/2	2-5/8	16-1/2	480	34,000	47,600	47,600	68,000			357
13/16	20	4-7/8	2-7/8	17-7/8	570	39,800	55,700	55,700	79,500			329
7/8	22	5-1/4	3-1/8	19-1/4	660	46,000	64,400	64,400	91,800			305
15/16	24	5-5/8	3-5/16	20-5/8	760	52,600	73,700	73,700	105,000			285
1	25	6	3-9/16	22	860	59,700	83,600	83,600	119,500	84,000	129,000	267
1-1/16	27	6-3/8	3-3/4	23-3/8	970	67,200	94,100	94,100	135,000			251
1-1/8	29	6-3/4	4	24-3/4	1,080	75,000	105,000	105,000	150,000	106,000	161,000	237
1-3/16	30	7-1/8	4-1/4	26-1/8	1,220	83,400	116,500	116,500	167,000			225
1-1/4	32	7-1/2	4-1/2	27-1/2	1,350	92,200	129,000	129,000	184,000	130,000	198,000	213
1-5/16	33	7-7/8	4-3/4	28-7/8	1,490	101,500	142,000	142,000	203,000			203
1-3/8	34	8-1/4	4-15/16	30-1/4	1,630	111,000	155,000	155,000	222,000	157,000	235,000	195
1-7/16	36	8-5/8	5-3/16	31-5/8	1,780	120,500	169,000	169,000	241,000			187
1-1/2	38	9	5-3/8	33	1,940	131,000	183,500	183,500	262,000	185,000	280,000	179
1-9/16	40	9-3/8	5-5/8	34-3/8	2,090	142,000	198,500	198,500	284,000			171
1-5/8	42	9-3/4	5-7/8	35-3/4	2,240	153,000	214,000	214,000	306,000	216,000	325,000	165
1-11/16	43	10-1/8	6-1/16	37-1/8	2,410	166,500	229,000	229,000	327,000			159
1-3/4	44	10-1/2	6-5/16	38-1/2	2,590	176,000	247,000	247,000	352,000	249,000	380,000	153
1-13/16	46	10-7/8	6-1/2	39-7/8	2,790	188,500	264,000	264,000	377,000			147
1-7/8	48	11-1/4	6-3/4	41-1/4	2,980	201,000	281,000	281,000	402,000	285,000	432,000	143
1-15/16	50	11-5/8	7	42-5/8	3,180	214,000	299,000	299,000	427,000			139
2	51	12	7-3/16	44	3,360	227,000	318,000	318,000	454,000	322,000	488,000	133
2-1/16	52	12-3/8	7-7/16	45-3/8	3,570	241,000	337,000	337,000	482,000	342,000	518,000	129
2-1/8	54	12-3/4	7-5/8	46-3/4	3,790	255,000	357,000	357,000	510,000	362,000	548,000	125
2-3/16	56	13-1/8	7-7/8	48-1/8	4,020	269,000	377,000	377,000	538,000	382,500	579,100	123
2-1/4	58	13-1/2	8-1/8	49-1/2	4,250	284,000	396,000	396,000	570,000	403,000	610,000	119
2-5/16	59	13-7/8	8-5/16	50-7/8	4,490	299,000	418,000	418,000	598,000	425,000	642,500	117
2-3/8	60	14-1/4	8-9/16	52-1/4	4,730	314,000	440,000	440,000	628,000	447,000	675,000	113
2-7/16	62	14-5/8	8-3/4	53-5/8	4,960	330,000	462,000	462,000	660,000	469,500	709,500	111
2-1/2	64	15	9	55	5,270	346,000	484,000	484,000	692,000	492,000	744,000	107
2-9/16	66	15-3/8	9-1/4	56-3/8	5,540	363,000	507,000	507,000	726,000	516,000	778,500	105

Dimensions above are in inches; weight is in pounds.

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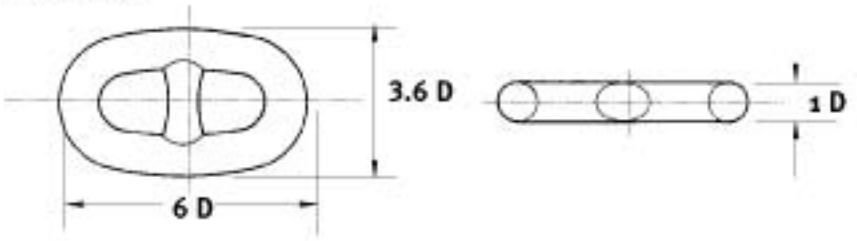
Stud Link Chain Dimensions & Test Requirements

How to Determine Chain Link Size

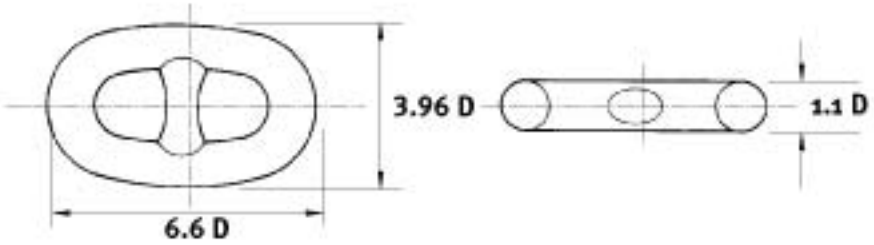
Common Link

6 x Chain Diameter = Length
(eg. 1" Chain = 6" length)



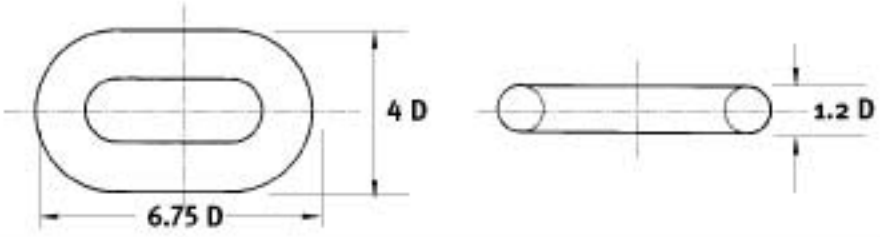
Enlarged Link

6.6 x Chain Diameter = Length



End Link

6.75 x Chain Diameter = Length



Chain Size		Dimensions				Test Requirements						No.of Links per 15 Fm Shot
						Grade 2		Grade 3		Oil Rig Quality		
Inches	mm	Link Length	Link Width	Length Over 5-Links	Weight Per 15 Fmshot (Appx.)	Proof Load	Break Load	Proof Load	Break Load	Proof Load	Break Load	
2-5/8	67	15-3/4	9-7/16	57-3/4	5,820	379,000	530,000	530,000	758,000	540,000	813,000	103
2-11/16	68	16-1/8	9-11/16	59-1/8	6,110	396,000	554,000	554,000	792,000	565,000	849,000	99
2-3/4	70	16-1/2	9-7/8	60-1/2	6,410	413,000	578,000	578,000	826,000	590,000	885,000	97
2-13/16	71	16-7/8	10-1/8	61-7/8	6,710	431,000	603,000	603,000	861,000	615,000	925,000	95
2-7/8	73	17-1/4	10-3/8	63-1/4	7,020	449,000	628,000	628,000	897,000	640,000	965,000	93
2-15/16	75	17-5/8	10-9/16	64-5/8	7,330	467,000	654,000	654,000	934,000	666,500	1,005,000	91
3	76	18	10-13/16	66	7,650	485,000	679,000	679,000	970,000	693,000	1,045,000	89
3-1/16	78	18-3/8	11	67-3/8	7,980	504,000	705,000	705,000	1,008,000	720,500	1,086,500	87
3-1/8	79	18-3/4	11-1/4	68-3/4	8,320	523,000	732,000	732,000	1,046,000	748,000	1,128,000	85
3-3/16	81	19-1/8	11-1/2	70-1/8	8,660	542,000	759,000	759,000	1,084,000	776,050	1,169,000	85
3-1/4	83	19-1/2	11-11/16	71-1/2	9,010	562,000	787,000	787,000	1,124,000	804,100	1,210,000	83
3-5/16	84	19-7/8	11-15/16	72-7/8	9,360	582,000	814,000	814,000	1,163,000	833,150	1,253,000	81
3-3/8	86	20-1/4	12-1/8	74-1/4	9,730	602,000	843,000	843,000	1,204,000	862,200	1,296,000	79
3-7/16	87	20-5/8	12-3/8	75-5/8	10,100	622,000	871,000	871,000	1,244,000	892,100	1,339,550	77
3-1/2	90	21	12-5/8	77	10,500	643,000	900,000	900,000	1,285,000	922,000	1,383,100	77
3-5/8	92	21-3/4	12-15/16	79-3/4	11,300	685,000	958,000	958,000	1,369,000	1,021,000	1,566,000	73
3-3/4	95	22-1/2	13-3/8	82-1/2	12,000	728,000	1,019,000	1,019,000	1,455,000	1,120,000	1,750,000	71
3-7/8	98	23-1/4	14	85-1/4	12,900	772,000	1,080,000	1,080,000	1,543,000	1,205,000	1,863,000	69
4	102	24	14-3/8	88	13,700	816,000	1,143,000	1,143,000	1,632,000	1,298,000	1,996,500	67

Dimensions above are in inches; weight is in pounds.

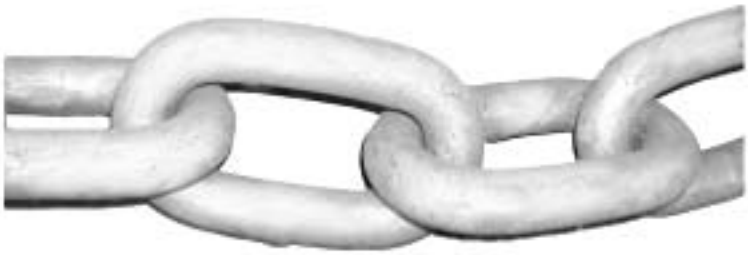
Open Link Mooring Chain
(Coast Guard-Type Buoy Chain)

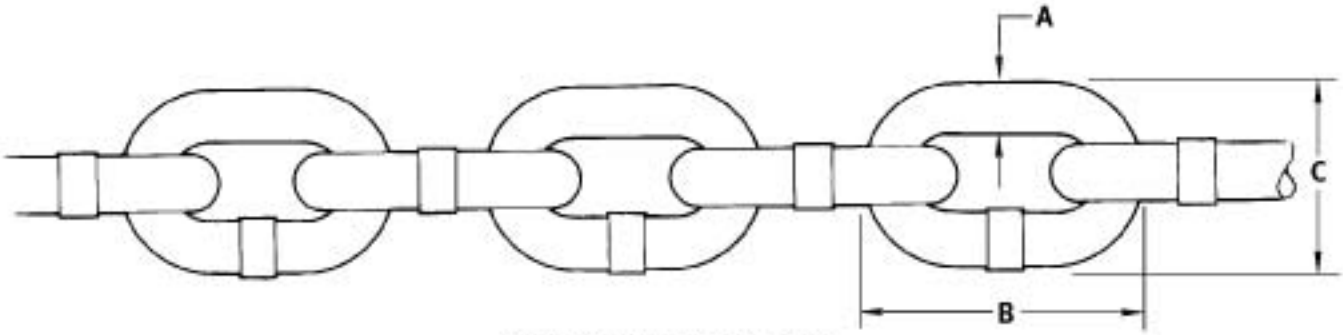
Manufactured in accordance with U.S. Coast Guard Specification Mil-C-22521C, welded buoy chain is an open-link, studless chain manufactured to a minimum quality of Grade 1.

Available with or without end links.

Ask for specifications.

Both the chain links and the end links are manufactured from carbon-steel bar stock, AISI 1030 per Mil-S-16974, with a tensile strength ranging from 71,000 to 92,500 psi.





Chain Length As Required

Dimensions			Carbon Steel		Alloy Steel		Approx. Weight
Link Diameter A	Link Length B	Link Width C	Proof Load (lbs.)	Break Test Load (lbs.)	Proof Load (lbs.)	Break Test Load (lbs.)	Per Foot (lbs.)
1/2	3	1-7/8	7,500	15,000	13,500	30,500	2.3
5/8	3-3/4	2-3/16	11,700	23,400	21,200	47,700	3.6
3/4	4-1/2	2-11/16	16,000	32,000	32,200	69,500	4.8
7/8	5-1/4	3-1/8	22,000	44,000	40,200	93,500	5.6
1	6	3-9/16	29,000	58,000	54,100	122,000	8.6
1-1/8	6-3/4	4	38,500	77,000	62,300	143,000	10.8
1-1/4	7-1/2	4-7/16	45,500	91,000	80,500	180,000	13.5
1-1/2	9	5-5/16	65,500	131,000	112,000	244,000	19.4
1-5/8	9-3/4	5-13/16	76,500	153,000	123,000	270,000	22.7
1-3/4	10-1/2	6-1/4	86,500	173,000	142,000	312,000	26.3
1-7/8	11-1/4	6-11/16	100,000	200,000	163,000	360,000	30.1
2	12	7	115,000	230,000	185,000	410,000	34.3

All specifications in pounds and inches.

Anchor Chain Attachments

Detachable Chain Connecting Links 32
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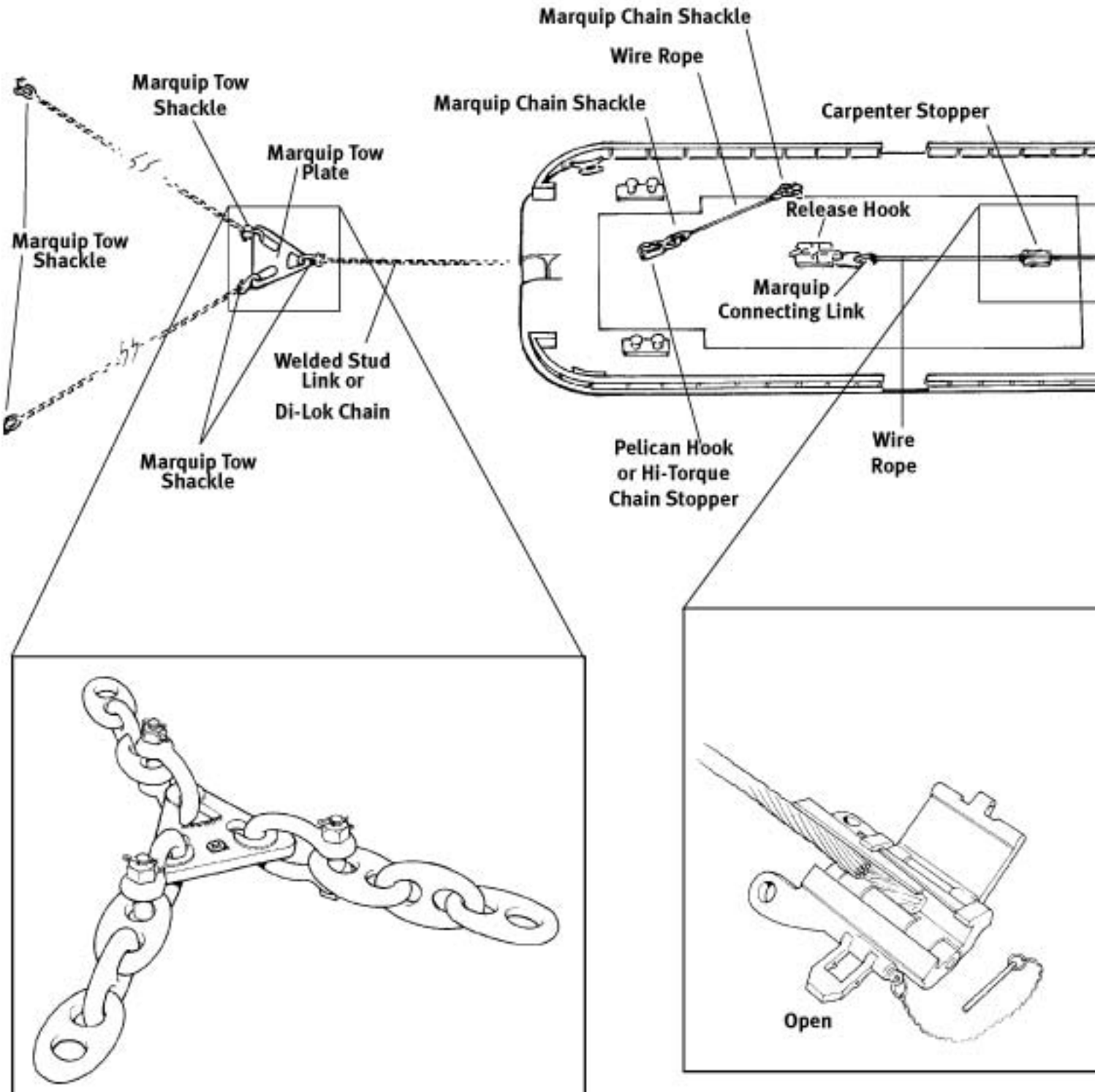
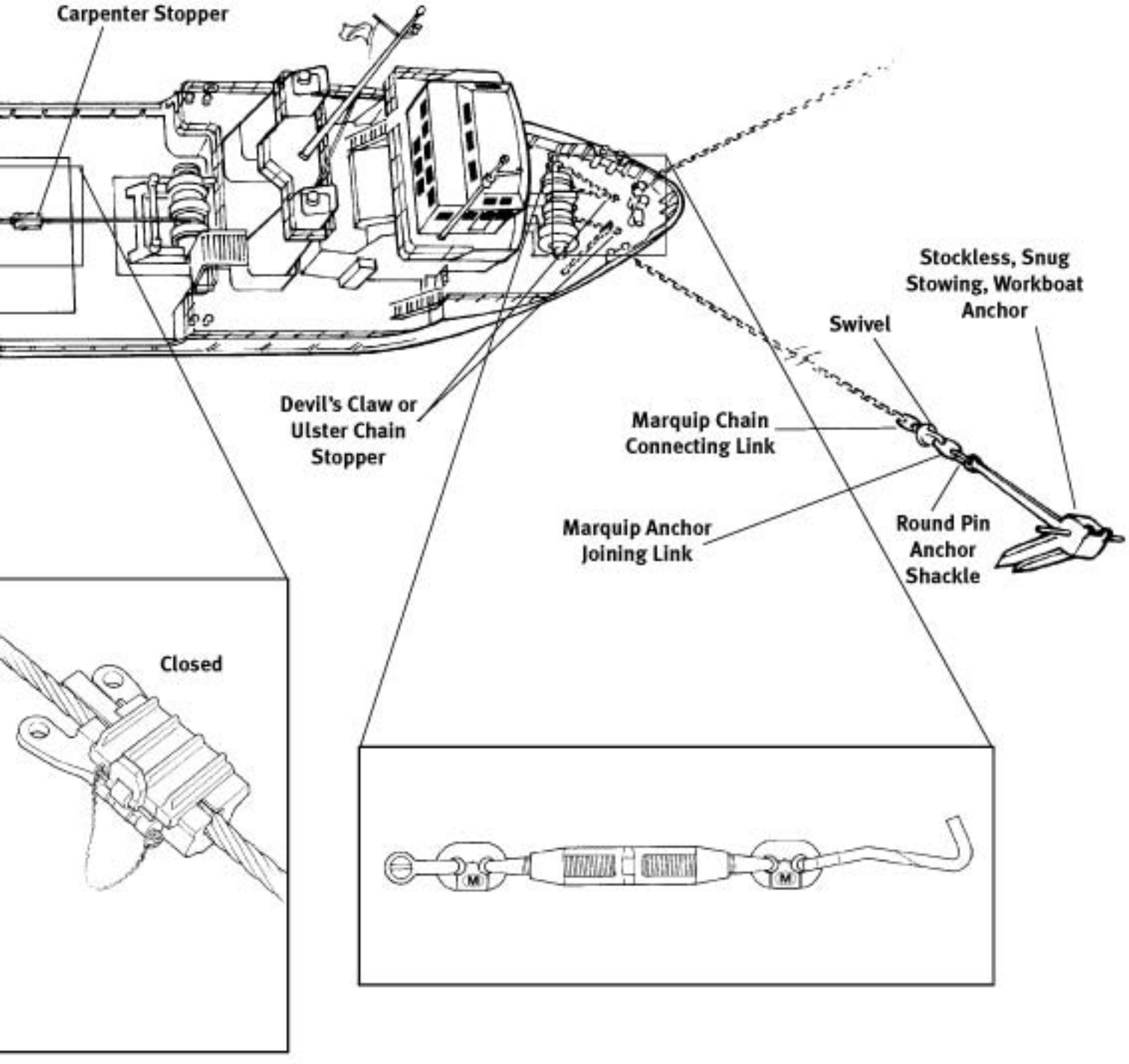
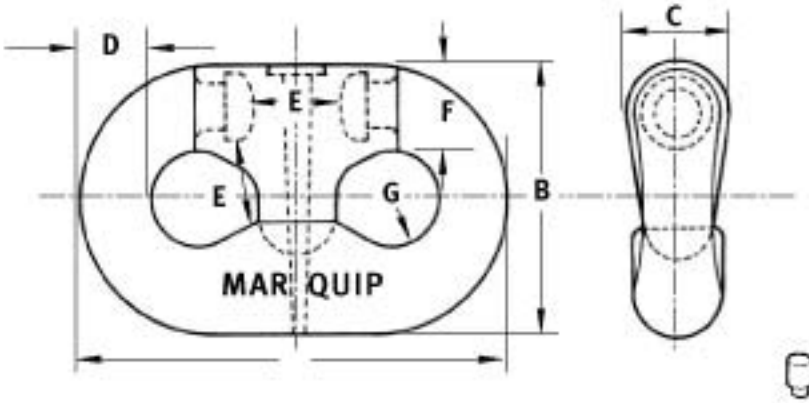
Pelican Hook Chain Stopper Assembly 48
Clear Hawse Pendant 51
Hi-Torque Chain Stopper 52
Ulster Type Chain Stopper 53

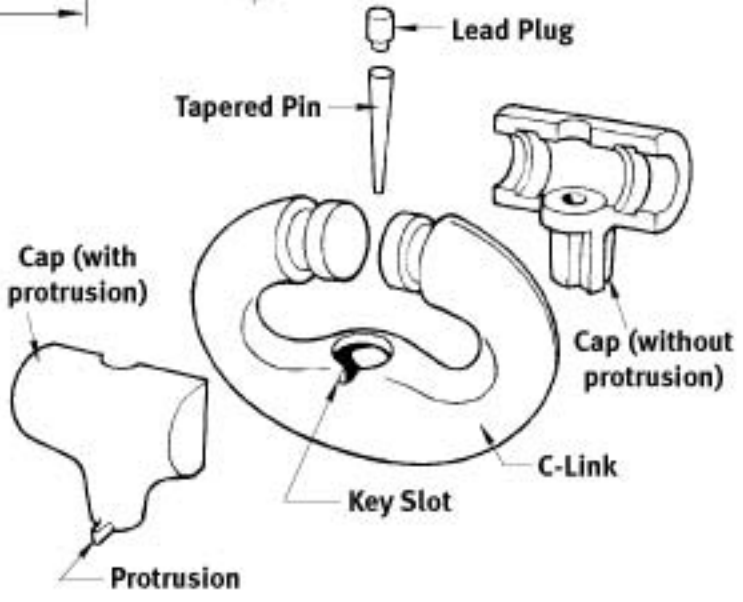
We maintain one of the largest inventories of new and used, imported and surplus anchor chain and attachments in the United States.


Marquip Chain Shackle
Wire Rope
Marquip Tow Shackle
Marquip Chain Shackle
Carpenter Stopper
Marquip Tow Plate
Release Hook
Marquip Tow Shackle
Marquip Connecting Link
Welded Stud Link or Di-Lok Chain
Pelican Hook or Hi-Torque Chain Stopper
Wire Rope
Marquip Tow Shackle
Open


Carpenter Stopper
Stockless, Snug Stowing, Workboat Anchor
Swivel
Devil's Claw or Ulster Chain Stopper
Marquip Chain Connecting Link
Marquip Anchor Joining Link
Round Pin Anchor Shackle
Closed

Detachable Chain Connecting Links





MARQUIP® forged detachable chain connecting links replace bulky shackles and end links. They make better-than-original repair or replacement links, they serve as connecting links for 90' shots of chain, and they ride through hawse pipes and over wildcats as smoothly as normal chain. Made of alloy steel, heat-treated to a tensile strength of approximately 150,000 PSI, they're as strong as or stronger than the chain. The positive-lock assembly consists of a stainless steel pin and lead plug; the pin can be removed with a sledge and drift for disassembly. Proof and break tests surpass USN and ABS requirements; additional certifications are available on request. Links are available in sizes up to 3-1/2". Cast links are also available in sizes up to 4-3/4".

Chain Size Inches	mm	A	B	C	D	E	F	G	Proof Test In Pounds	Break Test In Pounds	Wt. Lbs.
3/4	19	4-1/2	3	1-3/64	3/4	27/32	59/64	1/2	67,500	91,100	2.1
13/16 – 7/8	21 – 22	5-1/4	3-1/2	1-7/32	7/8	63/64	1-1/16	19/32	88,200	119,000	3.4
15/16 – 1	24 – 25	6	4	1-25/64	1	1-1/8	1-7/32	21/32	116,100	156,700	5.1
1-1/16 – 1-1/8	27 – 29	6-3/4	4-1/2	1-9/16	1-1/8	1-17/64	1-3/8	47/64	145,000	195,000	7.2
1-3/16 – 1-1/4	30 – 32	7-1/2	5	1-47/64	1-1/4	1-13/32	1-17/32	13/16	178,200	240,600	9.9
1-5/16 – 1-3/8	33 – 34	8-1/4	5-1/2	1-29/32	1-3/8	1-35/64	1-43/64	29/32	211,500	285,500	13.3
1-7/16 – 1-1/2	36 – 38	9	6	2-5/64	1-1/2	1-11/16	1-53/64	63/64	252,000	340,200	17.3
1-9/16 – 1-5/8	40 – 42	9-3/4	6-1/2	2-1/4	1-5/8	1-63/64	1-63/64	1-1/16	292,500	395,000	22.0
1-11/16 – 1-3/4	43 – 44	10-1/2	7-1/2	2-7/16	1-3/4	2	2-7/32	1-3/16	352,000	376,000	27.5
1-13/16 – 1-7/8	46 – 48	11-1/4	7-1/4	2-1/2	1-7/8	2-5/32	2-11/32	1-15/64	285,000	432,000	32
1-15/16 – 2	50 – 51	12	7-3/4	2-1/2	2	2-5/16	2-1/2	1-5/16	322,000	488,000	36
2-1/16 – 2-1/8	52 – 54	12-3/4	8-1/4	2-21/32	2-1/8	2-1/2	2-21/32	1-13/32	362,000	548,000	44
2-3/16 – 2-1/4	56 – 58	13-1/2	8-23/32	2-13/16	2-1/4	2-5/8	2-13/16	1-1/2	403,000	610,000	52
2-5/16 – 2-3/8	59 – 60	14-1/4	9-7/32	3-1/16	2-3/8	2-3/4	2-15/16	1-9/16	447,000	675,000	61
2-7/16 – 2-1/2	62 – 64	15	9-11/16	3-1/8	2-1/2	2-7/8	3-1/8	1-21/32	492,000	744,000	71
2-9/16 – 2-5/8	66 – 67	15-3/4	10-3/16	3-1/4	2-5/8	3-1/16	3-1/16	1-3/4	540,000	813,000	82

Dimensions above are in inches; weight is in pounds.

Continued on next page

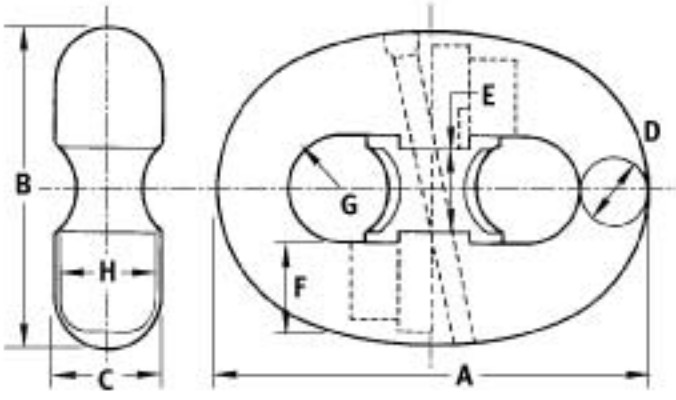
Detachable Chain Connecting Links

Marquip® forged 3-1/2" link, 3/4" link

Chain Size Inches	mm	A	B	C	D	E	F	G	Proof Test In Pounds	Break Test In Pounds	Wt. Lbs.
2-11/16 – 2-3/4	68 – 70	16-1/2	10-13/16	3-11/16	2-7/8	3-1/4	3-11/16	1-13/16	640,000	981,000	100
2-13/16 – 2-7/8	71 – 73	17-1/4	11-1/8	3-19/32	2-7/8	3-11/32	3-9/16	1-29/32	649,000	965,000	107
2-15/16 – 3	75 - 76	18	11-5/8	3-3/4	3	3-17/32	3-3/4	1-31/32	693,000	1,045,000	120
3-1/16 – 3-1/8	78 – 79	18-3/4	12-1/8	4	3-1/8	3-5/8	3-11/16	2-3/64	748,000	1,128,000	138
3-3/16 – 3-1/4	81 – 83	19-1/2	12-5/8	4-1/16	3-1/4	3-5/8	4-1/16	2-5/32	804,100	1,210,000	161
3-5/16 – 3-3/8	84 – 86	20-1/4	13-3/32	4-7/32	3-3/8	3-15/16	4-7/32	2-1/4	862,200	1,296,000	177
3-7/16 – 3-1/2	87 – 89	21-1/8	13-25/32	4-13/16	3-3/4	4-1/8	4-1/2	2-13/32	1,080,000	1,700,000	205
3-9/16 – 3-5/8	90 – 92	21-3/4	14	4-9/16	3-5/8	4-3/16	4-9/16	2-5/16	1,021,000	1,566,000	215
3-11/16 – 3-3/4	94 – 95	22-1/2	14-1/2	4-11/16	3-3/4	4-11/16	4-11/16	2-7/16	1,120,000	1,750,000	256
3-13/16 – 3-7/8	97 – 98	23-1/4	15	5	3-7/8	4-1/2	4-3/4	2-5/8	1,205,000	1,863,400	271
3-15/16 – 4	100 – 102	24	15-1/2	5-3/16	4	4-5/8	4-15/16	2-11/16	1,298,000	1,966,000	288
4-1/8	105	24-3/4	16-1/2	5-7/8	4-1/8	5	5-3/16	2-25/32	1,347,000	2,062,500	384
4-1/4	108	25-1/2	17-3/8	6-1/2	4-3/8	5-1/4	5-1/2	2-7/8	1,393,700	2,134,000	422
4-3/8	111	26-1/4	18-3/8	7-1/4	4-1/2	5-5/8	5-7/8	2-15/16	1,569,700	2,398,000	460
4-1/2	114	27	19-3/8	8	4-5/6	6	6-3/16	3	1,672,000	2,508,000	500

Dimensions above are in inches; weight is in pounds.

Kenter Joining Link



Available in grade 2 and grade 3

Chain Size Inches	mm	A	B	C	D	E	F	G	H	Wt. Lbs.
3/4	19	4-1/2	3-1/8	1-1/8	3/4	7/8	15/16	1/2	1	2.3
7/8	22	5-1/4	3-11/16	1-1/16	7/8	1	1-1/8	9/16	1-1/16	3.5
1	25	6	4-1/16	1-1/2	1	1-1/8	1-1/4	11/16	1-3/8	5.7
1-1/8	29	6-3/4	4-3/4	1-11/16	1-1/8	1-1/4	1-3/16	3/4	1-1/2	7.7
1-1/4	32	7-1/2	5-1/4	1-7/8	1-1/4	1-3/8	1-5/16	13/16	1-11/16	10.6
1-3/8	34	8-1/4	5-3/4	2-1/8	1-3/8	1-1/2	1-3/4	13/16	1-1/8	14.3
1-1/2	38	9	6-1/16	2-1/4	1-1/2	1-11/16	1-13/16	1	2	18.5
1-5/8	42	9-1/4	6-11/16	2-1/2	1-5/8	1-13/16	2-1/16	1-1/32	2-1/16	24.3
1-3/4	44	10-1/2	7-1/16	2-5/8	1-3/4	2	2-1/4	1-1/16	2-1/8	29.8
1-7/8	48	11-1/4	7-7/8	2-7/8	1-7/8	2-1/8	2-3/8	1-1/4	2-1/2	36.4
2	51	12	8-3/8	3-1/16	2	2-1/4	2-7/16	1-11/32	2-11/16	45.2
2-1/8	54	12-3/4	8-11/16	3-1/4	2-1/8	2-3/8	2-3/4	1-1/16	2-7/8	53.4
2-1/4	58	13-1/2	9-3/8	3-7/16	2-1/4	2-1/2	2-7/8	1-1/2	3	62.8
2-3/8	60	14-1/4	9-11/16	3-5/8	2-3/8	2-11/16	3-1/16	1-11/32	3-1/16	75.0
2-1/2	64	15	10-1/2	3-11/16	2-1/2	2-11/16	3-1/16	1-11/16	3-3/8	86.9
2-5/8	67	15-3/4	11-1/16	4	2-5/8	3	3-3/8	1-3/4	3-7/16	100.0
2-3/4	70	16-1/2	11-3/16	4-1/16	2-3/4	3-1/8	3-1/2	1-11/16	3-11/16	113.8
2-7/8	73	17-1/4	12-1/16	4-3/8	2-7/8	3-1/4	3-27/32	1-15/16	3-7/8	131.9
3	76	18	12-5/8	4-1/16	3	3-3/8	3-7/8	2	4	148.8
3-1/8	79	18-3/4	13-1/8	4-3/4	3-1/8	3-1/2	4	2-1/32	4-1/32	170.4
3-1/4	83	19-1/2	13-1/16	4-11/16	3-1/4	3-5/8	4-1/16	2-1/16	4-3/8	190.5
3-3/8	86	20-1/4	14-1/4	5-1/8	3-3/8	3-3/4	4-3/16	2-3/32	4-3/16	215.0
3-1/2	89	21	14-11/16	5-1/4	3-1/2	3-11/16	4-1/2	2-3/8	4-3/4	238.0
3-5/8	92	21-3/4	15-1/32	5-1/2	3-5/8	4-1/16	4-11/16	2-7/16	4-7/8	262.0
3-3/4	95	22-1/2	15-3/4	5-11/16	3-3/4	4-1/4	4-13/16	2-1/2	5-1/16	289.0

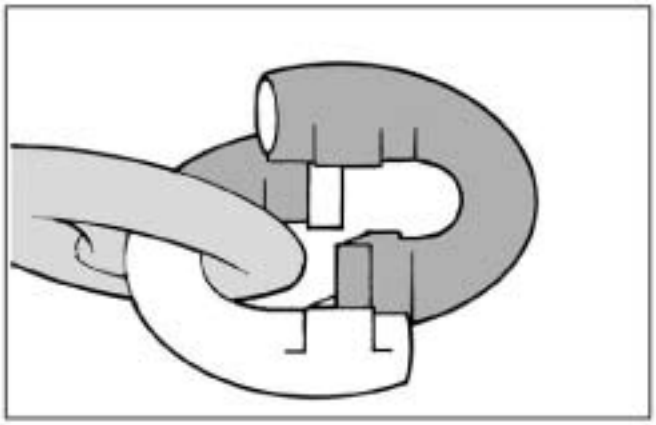
Dimensions above are in inches; weight is in pounds.

Kenter Joining Link Assembly

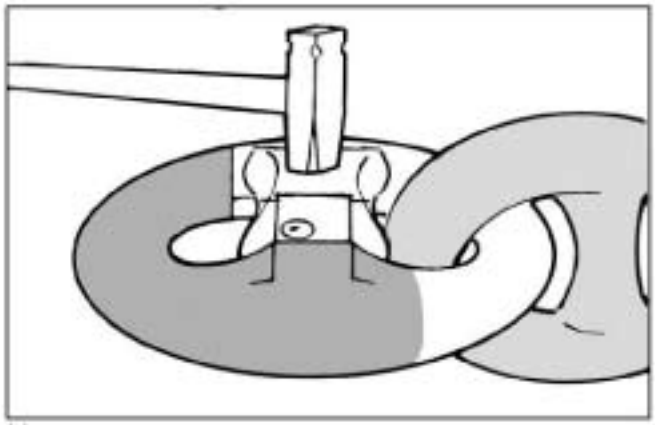
The Kenter-type joining link contains three parts plus taper pin and lead plug. The two main halves have numbers to be matched and arrows to be lined up for ease of assembly with the third piece (stud). The two main parts are attached to the ends of the chain in a vertical position and then fitted together (1), and the stud is then slid into place (2), which locks the link. The stud is secured by hammering a tapered pin into the hole drilled diagonally (3) through all three parts of the joining link. This hole is tapered, and when the pin is driven home, a small conical recess (called the "dovetail chamber") is left clear above its head. A lead pellet is hammered broad end first into this chamber (4) so as to fill it completely and thereby keep the pin in place. Precaution must be used to prevent flat, small pieces of lead from flying off the joining link into the face or eyes.

Prior to assembly, the internal mating surfaces should be coated with a molybdenum disulphide grease (MIL-G-23549) or an equivalent lithium based grease. When assembling and before inserting the new lead, any remaining lead must be reamed out.

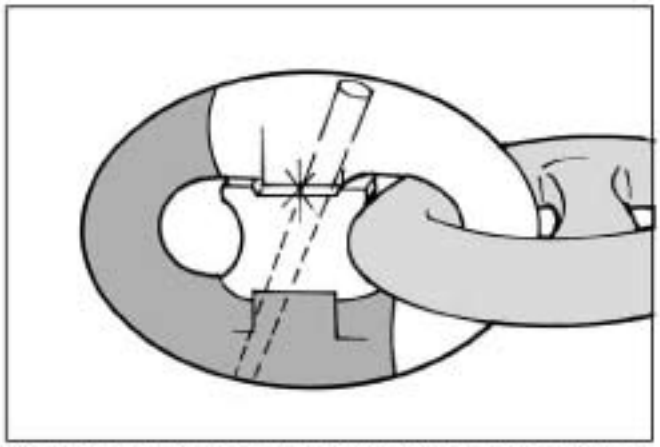
When dissembling, the locking pin is driven out with a "drift". To part the link, a top swage (shaped to the curvature of the link) must always be used between the hammer and link so as to avoid damaging the machined surfaces.



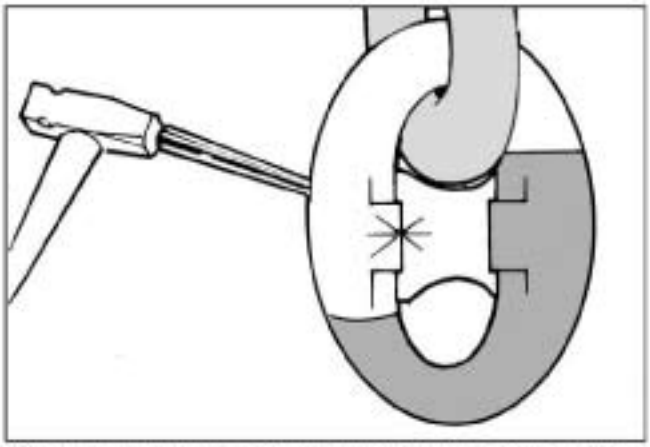
(1) After inserting the first half of link through chain, the other link is inserted in the other and driven together.



(2) The center stud is inserted.

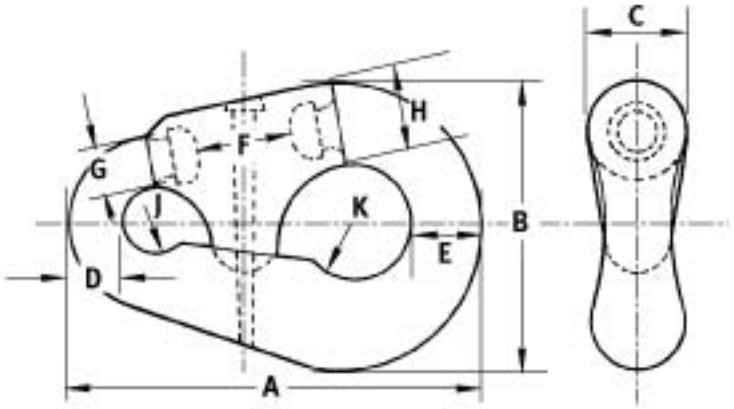


(3) When the center chock is in correct position the taper pin can without a hammer be inserted as shown on the figure which also shows the center chock in correct position.



(4) The taper pin in driven in and is secured by the lead pellet which is inserted into place with a hammer.

Detachable Anchor Connecting Links

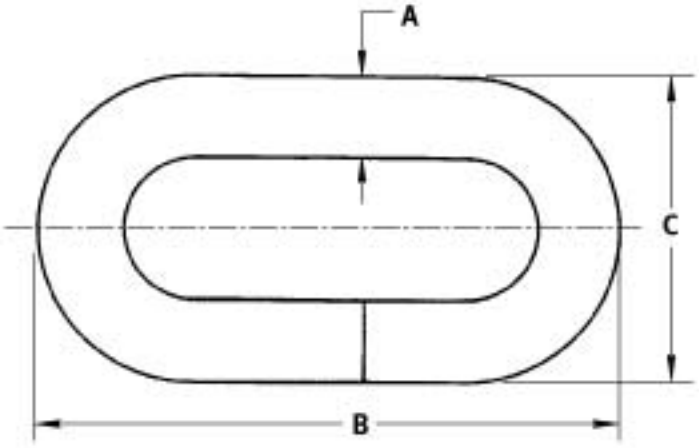


No.	Chain Size Inches	mm	A	B	C	D	E	Proof Test In Pounds	Break Test In Pounds	Wt. Lbs.
2	3/4 – 15/16	19 - 24	7-5/8	5-1/16	1-1/2	15/16	1-1/4	74,000	113,500	7
3	1 – 1-3/16	25 - 30	9-3/8	6-3/16	1-13/16	1-3/16	1-1/2	118,000	179,500	14
4	1-1/4 – 1-9/16	32 - 40	11-3/4	8-1/8	2-1/16	1-9/16	1-7/8	200,500	302,500	28
5	1-5/8 – 2	42 - 51	14-7/8	10-1/4	3	2	2-1/2	322,000	488,000	60
6	2-1/16 – 2-3/8	52 - 60	17-7/8	12-5/16	3-5/8	2-3/8	3	447,000	675,000	107
7	2-7/16 – 3-1/8	62 - 79	22-1/8	14-13/16	4-5/8	3-1/8	3-3/4	748,000	1,128,000	208
8	3-1/16 – 3-5/8	81 - 92	25-3/4	16-1/2	5-1/4	3-5/8	4-7/8	1,021,000	1,566,000	328
9	3-11/16 – 3-3/4	94 - 95	27-1/4	17-1/8	5-3/4	3-7/8	5-1/8	1,120,000	1,750,000	520
10	3-13/16 – 4	97 - 102	35	22-1/2	7-1/2	4-3/4	6-1/2	1,298,000	1,996,500	850
11	4-1/16 – 4-3/8	103 - 111	37	24	8	5	6-7/8	1,569,700	2,398,000	925
12	4-5/16 – 4-1/2	112 - 114	39	25-1/2	8-1/2	5-1/4	7-1/4	1,870,000	2,805,000	1010

No.	Chain Size Inches	mm	F	G	H	J	K	Proof Test In Pounds	Break Test In Pounds	Wt. Lbs.
2	3/4 – 15/16	19 - 24	2-1/4	15/16	1-3/8	21/32	1-3/16	74,000	113,500	7
3	1 – 1-3/16	25 - 30	2-13/32	1-1/16	1-3/4	3/4	1-3/8	118,000	179,500	14
4	1-1/4 – 1-9/16	32 - 40	3-1/4	1-9/16 x 1-3/4	2-7/32	1-1/32	1-11/16	200,500	302,500	28
5	1-5/8 – 2	42 - 51	3-15/16	2-5/16 x 2-3/8	2-29/32	1-1/4	2-1/16	322,000	488,000	60
6	2-1/16 – 2-3/8	52 - 60	4-3/4	2-7/16 x 2-7/8	3-15/32	1-15/32	2-17/32	447,000	675,000	107
7	2-7/16 – 3-1/8	62 - 79	5-7/8	3-3/8 x 3-1/8	4-3/8	1-29/32	3	748,000	1,128,000	208
8	3-1/16 – 3-5/8	81 - 92	5-7/8	4-3/8 x 4	5-1/8 x 5-1/4	2-1/8	3-1/8	1,021,000	1,566,000	328
9	3-11/16 – 3-3/4	94 - 95	6-1/4	4-7/8 x 5-3/8	5-9/16	2-1/4	3-1/4	1,120,000	1,750,000	520
10	3-13/16 – 4	97 - 102	7-1/2	5-1/8	7-1/8	2-7/8	4-1/4	1,298,000	1,996,500	850
11	4-1/16 – 4-3/8	103 - 111	8	5-3/4 x 6-1/8	7-5/8	3	4-3/8	1,569,700	2,398,000	925
12	4-5/16 – 4-1/2	112 - 114	8-1/2	6-1/2 x 6-7/8	8	4-1/8	4-1/2	1,870,000	2,805,000	1010

Dimensions above are in inches; weight is in pounds.

End Links



Welded End Link

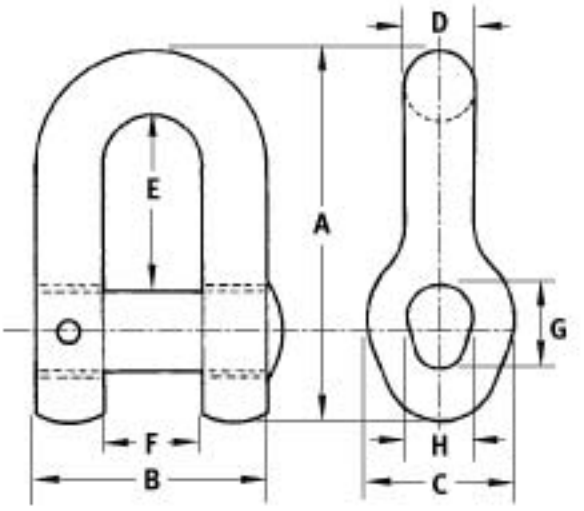
Welded end links are manufactured in conjunction with welded stud-link chain from alloy-steel bar stock. However, to compensate for the loss of strength due to the absence of the forged stud, they are of a larger wire diameter than the chain with which they are manufactured. Normalizing of the entire chain length ensures the same physical strength throughout.

Installed at one or both ends of the chain length, the studless end link enables shackles to be joined directly to the chain — a procedure normally prevented by the presence of a stud.

Chain Size Inches	mm	A	B	C	Weight Lbs.	Proof Test In Pounds
11/16 – 3/4	17 – 19	13/16	5-5/8	2-7/8	1.8	47,600
13/16 – 1	21 – 25	1-1/16	7-1/2	3-3/4	4.0	83,600
1-1/16 – 1-1/4	27 – 32	1-5/16	9-3/8	4-3/4	8.0	129,000
1-5/16 – 1-1/2	33 – 38	1-5/8	11-1/4	5-3/4	14.2	183,500
1-9/16 – 1-3/4	40 – 44	1-7/8	13	6-5/8	21.6	247,000
1-13/16 – 2	46 – 51	2-1/8	15	7-5/8	34.2	318,000
2-1/16 – 2-1/4	52 – 58	2-3/8	16-7/8	8-1/2	45.4	396,000
2-5/16 – 2-1/2	59 – 64	2-5/8	18-3/4	9-1/2	62.0	484,000
2-9/16 – 2-3/4	66 – 70	2-7/8	20-1/2	10-1/2	81.0	578,000
2-13/16 -3	71 – 76	3-1/8	22-1/2	11-3/8	105.0	679,000
3-1/16 – 3-3/8	78 – 86	3-1/2	25-1/4	12-3/4	148.0	843,000
3-7/16 – 3-3/4	87 – 95	3-7/8	28	14-1/4	202.0	1,019,000
3-13/16 – 4	97 – 102	4-1/4	30	15-1/4	258.0	1,143,000

Dimensions above are in inches; weight is in pounds.

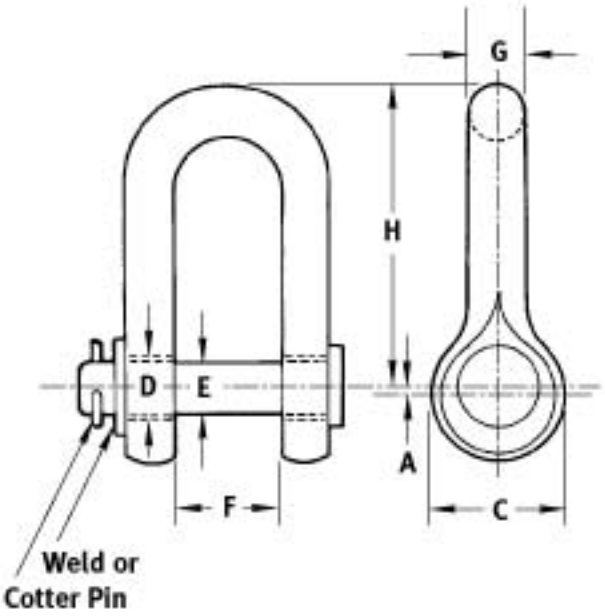
Oval Pin Joining Shackles



Chain Size Inches	mm	A	B	C	D	E	F	G	H	Wt. Lbs.
1/2 – 5/8	13 – 16	5-3/16	3-1/4	2	13/16	2-7/8	1-5/8	1-1/8	1	3
11/16 – 3/4	17 – 19	6-1/4	4	2-3/8	1	3-1/8	2	1-3/8	1-1/8	5
13/16 – 7/8	21 – 22	7-1/4	4-1/2	2-5/8	1-1/8	3-5/8	2-1/4	1-9/16	1-1/4	7.5
15/16 – 1	24 – 25	7-7/8	4-7/8	3	1-1/4	3-7/8	2-3/8	1-3/4	1-3/8	10
1-1/16 – 1-1/8	27 – 29	8-5/8	5-3/8	3-3/8	1-3/8	4-1/4	2-5/8	1-15/16	1-1/2	14
1-3/16 – 1-1/4	30 – 32	9-3/8	5-7/8	3-5/8	1-1/2	4-5/8	2-7/8	2-1/8	1-3/4	19
1-5/16 – 1-3/8	33 – 34	10-3/4	6-1/2	4-1/4	1-3/4	5-1/8	3	2-1/2	2	27
1-7/16 – 1-1/2	37 – 38	11-1/2	6-7/8	4-5/8	1-7/8	5-3/8	3-1/8	2-3/4	2-1/4	34
1-9/16 – 1-5/8	40 – 41	12-1/4	7-3/8	5	2	5-3/4	3-3/8	2-15/16	2-3/8	40
1-11/16 – 1-3/4	43 – 44	13-1/8	8-1/8	5-1/4	2-1/4	6-1/8	3-5/8	3-1/8	2-1/2	52
1-13/16 – 1-7/8	46 – 48	14-5/8	8-3/4	6	2-1/2	6-3/4	3-3/4	3-1/2	2-7/8	76
1-15/16 – 2-1/8	49 – 54	15-7/8	9-1/2	6-5/8	2-3/4	7-1/8	4	3-7/8	3-1/8	100
2-3/16 – 2-3/8	56 – 60	17-3/8	10-3/8	7-1/4	3	7-3/4	4-3/8	4-1/4	3-3/8	131
2-7/16 – 2-5/8	62 – 67	19-1/8	11-1/8	8	3-1/4	8-3/4	4-5/8	4-5/8	3-3/4	170
2-11/16 – 2-7/8	68 – 73	20-1/2	12-3/8	8-5/8	3-5/8	9-1/8	5-1/8	5	4	212
3 – 3-1/8	76 – 79	22-5/8	13-1/4	9-5/8	4	9-7/8	5-1/4	5-5/8	4-1/2	293
3-1/4 – 3-3/8	83 – 86	24	13-7/8	10-1/4	4-1/4	10-1/2	5-3/8	6	4-7/8	358
3-1/2	89	25-1/2	14-3/4	10-7/8	4-1/2	11-1/8	5-3/4	6-3/8	5-7/16	427
3-3/4	95	27-5/8	16	11-3/4	4-7/8	12	6-1/4	6-15/16	5-3/4	552

Dimensions above are in inches; weight is in pounds.

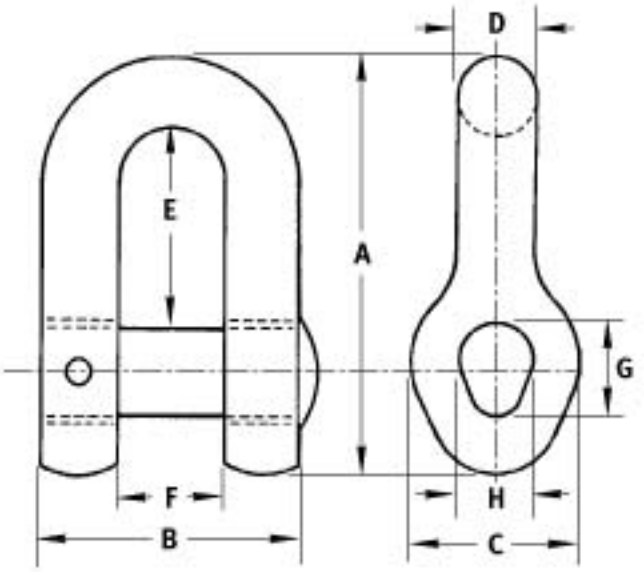
Round Pin Chain Shackles



Shackle Size Inches	mm	A	C	D	E	F	G	H	Weight Lbs.
1	25	1/8	2-1/2	1-1/8	1	2-1/4	1	6-1/2	6
1-1/4	32	1/8	3-3/8	1-5/8	1-1/2	2-3/4	1-1/4	8-1/4	11
1-1/2	38	1/8	3-5/8	1-5/8	1-1/2	2-3/4	1-1/2	9	17
1-3/4	44	3/16	4-1/2	2-1/4	2	3-1/4	1-3/4	10-1/4	29
2	51	1/4	4-7/8	2-1/4	2	3-3/4	2	11-3/4	43
2-1/4	57	5/16	5-5/8	2-3/4	2-1/2	4-1/4	2-1/4	13-1/4	59
2-1/2	64	5/16	6	2-3/4	2-1/2	4-1/4	2-1/2	14-1/2	78
3	76	3/8	7-1/4	3-1/4	3	4-3/4	3	18	136
3-1/2	89	7/16	7-13/16	3-3/4	3-1/2	5-1/4	3-1/2	20-1/2	207
4	101	7/16	9-1/2	4-1/4	4	5-3/4	4	23	339
4-1/4	114	1/2	10-3/4	4-3/4	4-1/2	6-3/4	4-1/2	26-1/2	466
5	127	1/2	11-11/16	5-1/4	5	7-1/4	5	29	625

Dimensions above are in inches; weight is in pounds.

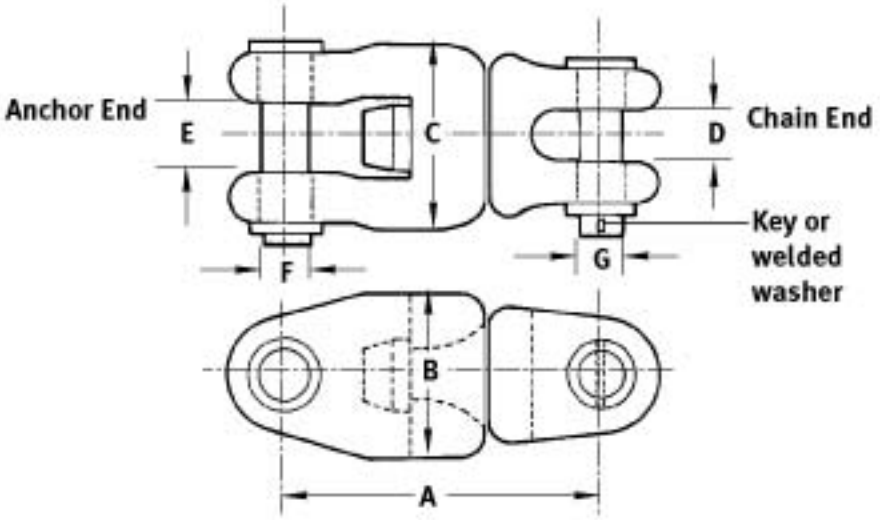
End Shackles/Bending Shackles



Chain Size Inches	mm	A	B	C	D	E	F	G	H	Wt. Lbs
1/2 – 5/8	13 – 16	5-3/16	3-1/4	2	11/16	2-1/4	1-5/8	1-1/8	1	3
11/16 – 3/4	17 – 19	6-1/4	4	2-3/8	1	3-1/8	2	1-3/8	1-1/8	5
13/16 – 7/8	21 – 22	7-1/4	4-1/2	2-5/8	1-1/8	3-5/8	2-1/4	1-9/16	1-1/4	7.5
15/16 – 1	24 – 25	7-7/8	4-7/8	3	1-1/4	3-7/8	2-3/8	1-3/4	1-3/8	10
1-1/16 – 1-1/8	27 – 29	8-5/8	5-3/8	3-3/8	1-3/8	4-1/4	2-5/8	1-15/16	1-1/2	14
1-3/16 – 1-1/4	30 – 32	9-3/8	5-7/8	3-5/8	1-1/2	4-5/8	2-7/8	2-1/8	1-3/4	19
1-5/16 – 1-3/8	33 – 34	10-3/4	6-1/2	4-1/4	1-3/4	5-1/8	3	2-1/2	2	27
1-7/16 – 1-1/2	37 – 38	11-1/2	6-7/8	4-5/8	1-7/8	5-3/8	3-1/8	2-3/4	2-1/4	34
1-9/16 – 1-5/8	40 – 41	12-1/4	7-3/8	5	2	5-3/4	3-3/8	2-15/16	2-3/8	40
1-11/16 – 1-3/4	43 – 44	13-1/8	8-1/8	5-1/4	2-1/4	6-1/8	3-5/8	3-1/8	2-1/2	52
1-13/16 – 1-7/8	46 – 48	14-5/8	8-3/4	6	2-1/2	6-3/4	3-3/4	3-1/2	2-7/8	76
1-15/16 – 2-1/8	49 – 54	15-7/8	9-1/2	6-5/8	2-3/4	7-1/8	4	3-7/8	3-1/8	100
2-1/16 – 2-3/8	56 – 60	17-3/8	10-3/8	7-1/4	3	7-3/4	4-3/8	4-1/4	3-3/8	131
2-7/16 – 2-5/8	62 – 67	19-1/8	11-1/8	8	3-1/4	8-3/4	4-5/8	4-5/8	3-3/4	170
2-11/16 – 2-7/8	68 – 73	20-1/2	12-3/8	8-5/8	3-5/8	9-1/8	5-1/8	5	4	212
3 – 3-1/8	76 – 79	22-5/8	13-1/4	9-5/8	4	9-7/8	5-1/4	5-5/8	4-1/2	293
3-1/4 – 3-3/8	83 – 86	24	13-7/8	10-1/4	4-1/4	10-1/2	5-3/8	6	4-7/8	358
3-1/2	89	25-1/2	14-3/4	10-7/8	4-1/2	11-1/8	5-3/4	6-1/8	5-7/16	427
3-3/4	95	27-5/8	16	11-3/4	4-7/8	12	6-1/4	6-15/16	5-3/4	552

Dimensions above are in inches; weight is in pounds.

Jaw & Jaw Swivel Shackles



The Jaw & Jaw swivel shackle is designed to accept the shank of an anchor and the chain end is designed to accept a closed spelter socket or mooring chain.

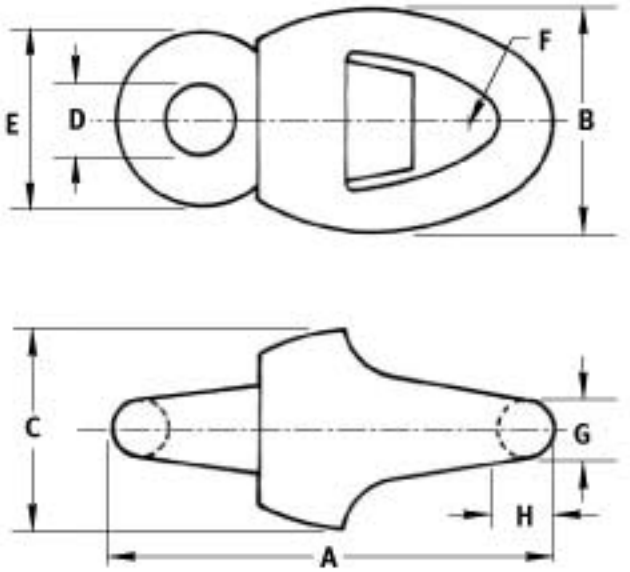
The applied proof load is dependent upon applicable design.

A	B	C	D	E	F	G
29-1/8	13-5/8	15	3-5/8	7-1/4	4-1/8	2-5/8
29-1/8	13-5/8	15	3-3/4	7-1/4	4-1/2	3
30-3/8	18	17	4-1/4	9	5-1/2	3-1/2
30-3/8	21-1/2	19	4-1/4	10	6-1/2	4
30-3/8	21-1/2	19	6	10	7-1/2	4

Dimensions above are in inches; weight is in pounds.

Other sizes available

Anchor Chain Swivels



Note: All swivels have a common link each end. Weights shown for these swivels include the weights of two common links. Pictured without common links.

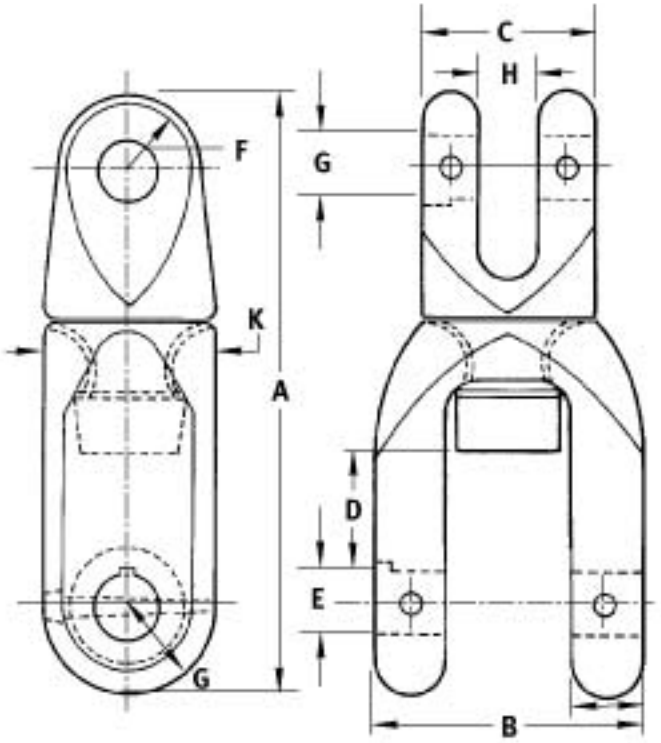
Chain Size Inches	mm	A	B	C	D	E	F	G	H	Weight Lbs.
1/2 – 5/8	13 – 16	5-3/8	2-7/16	2-7/16	13/16	2-1/16	7/16	5/8	5/8	5
11/16 – 3/4	17 – 19	6-25/32	3	3	1-1/16	2-9/16	3/4	3/4	3/4	7
13/16 – 7/8	21 – 22	7-13/16	3-1/2	3-1/2	1-3/16	2-15/16	7/8	7/8	7/8	11
15/16 – 1-1/8	24 – 29	10-3/16	4	4	1-3/4	3-11/16	1	1	1-3/16	18
1-1/16 – 1-1/2	30 – 38	14-1/4	7-3/8	6-3/4	2-1/2	5-1/2	1-1/8	1-1/2	1-1/2	63
1-9/16 – 1-7/8	40 – 48	15-15/16	7-7/8	7-7/8	2-5/8	6-3/8	1-1/4	2	2	91
1-15/16 – 2-1/16	50 – 56	19-1/8	9-7/16	9-7/16	3-1/8	7-5/8	1-3/8	2-1/4	2-1/4	144
2-1/4 – 2-3/8	58 – 60	21-11/16	10-13/32	9-1/4	4	8-3/4	1-1/2	2-3/8	2-7/16	202
2-7/16 – 2-5/8	62 – 67	23-1/8	12-5/16	8-7/16	3-5/16	9-1/16	1-3/4	3-3/16	3-1/16	527
2-11/16 – 2-7/8	68 – 73	25-5/16	13-1/2	9-3/16	3-5/8	9-15/16	1-15/16	3-7/16	3-7/16	590
2-15/16 – 3-1/8	75 – 79	27-1/2	14-11/16	10	3-15/16	10-13/16	2-1/8	3-3/4	3-3/4	656
3-1/16 – 3-3/8	81 – 86	29-3/4	15-13/16	10-3/4	4-1/4	11-11/16	2-1/4	4-1/16	4-1/16	722
3-7/16 – 3-5/8	87 – 92	31-15/16	17-1/16	11-5/8	4-9/16	12-9/16	2-7/16	4-3/8	4-3/8	798
3-11/16 – 3-7/8	94 – 98	34-1/8	18-1/4	12-7/16	4-7/8	13-3/8	2-5/8	4-11/16	4-11/16	884
3-15/16 – 4	100 – 102	35-1/4	18-13/16	12-7/8	5	13-13/16	2-3/4	4-13/16	4-13/16	938

Dimensions above are in inches; weight is in pounds.

Naval Mooring Swivel Shackle

Modified Swivel Shackle (Riser)

This modified swivel shackle has two different jaw sizes and is designed to be used in lieu of the standard swivel in a riser. The top end of the riser swivel shackle is required to fit a shackle eye plate of the tension bar while the other end will be sized to fit the upper riser link to which it will attach.



Size	A	B	C	D	E	F	G	H	K	Wt.
2	26	11-1/2	8	5-3/4	2-5/8	3-3/8	3-3/4	2-7/8	8	346
2-3/4	35	15-3/4	11	8	3-1/4	4-1/2	5	3-7/8	11	588

Dimensions above are in inches; weight is in pounds.

Retrieving Hardware

Chain Chaser and Grapnel

Used in the recovery of anchors and mooring lines, J-type chain chasers, permanent chain chasers, detachable permanent chain chasers, and grapnels are manufactured as one-piece units from special cast steel which is annealed for maximum unit strength.

The retrieving hardware is designed for use with 2-3/4 to 3-1/2 in. mooring chain and anchors in the 30,000 to 45,000-lb class. All hardware is manufactured with rated testing loads which vary from 150 to 250 tons.

All chasing equipment comes standard with welded hard-facing on contact areas to inhibit wear. Optional treatments include Rapid Solidification Plasma Deposition or R.S.P.D., for superior wear and corrosion resistance, isolated areas or entire castings can be treated.

J-Type Chain Chaser

The J-type chain chaser, complete with swivel shackle, is used to retrieve a rig's anchor when the pendant line is broken. It is a highly refined, stronger version of the conventional chain chaser originally developed for use in the North Sea. The unique design uses a sophisticated beam configuration in place of the usual T-type cross section to optimize quality and reliability.

Permanent Chain Chaser

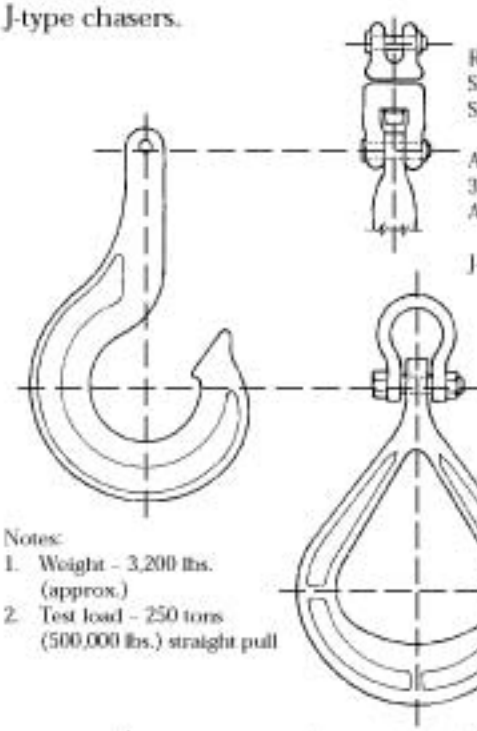
For rigs requiring a permanent-type chaser, we offer a stronger, better engineered version of the conventional chain chaser used in the North Sea. This type of anchor retrieval system eliminates the need for a pendant line buoy system. As with the J-type chaser, the permanent chaser incorporates a beam configuration that lessens the possibility of breaking with a significant decrease in eccentric bending.

Detachable Chain Chaser

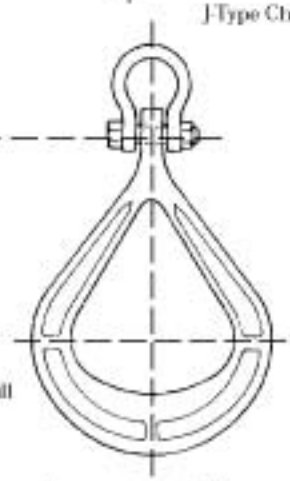
A modified conventional permanent chaser designed to make the wear area detachable and replaceable. This innovative design allows the user to hook up easily and replace individual parts that are prone to wear, rather than replace the entire chain chaser.

Grapnel

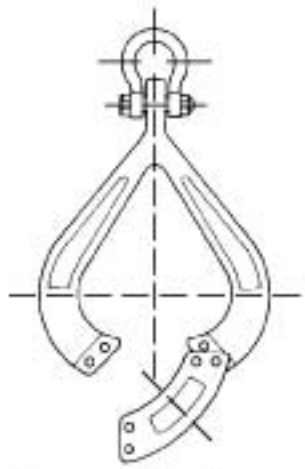
In order to offer a total coverage for a variety of retrieving applications, WCS offers a four-prong grapnel. This unit is designed to recover lost anchors and mooring lines. The four-prong reduces the outfitting costs, since it is designed to accommodate the same connecting hardware as the permanent and J-type chasers.



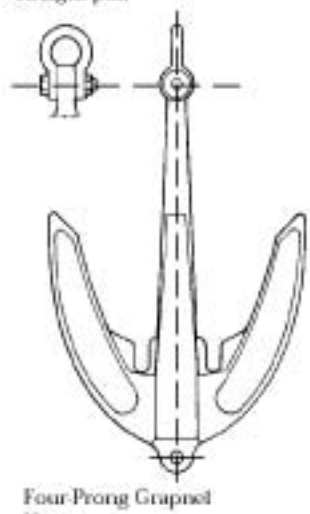
Notes:
1. Weight – 3,200 lbs. (approx.)
2. Test load – 250 tons (500,000 lbs.) straight pull



Permanent Chain Chaser
Notes:
1. Weight – 2,600 lbs. (approx.)
2. Test load – 250 tons (500,000 lbs.) straight pull

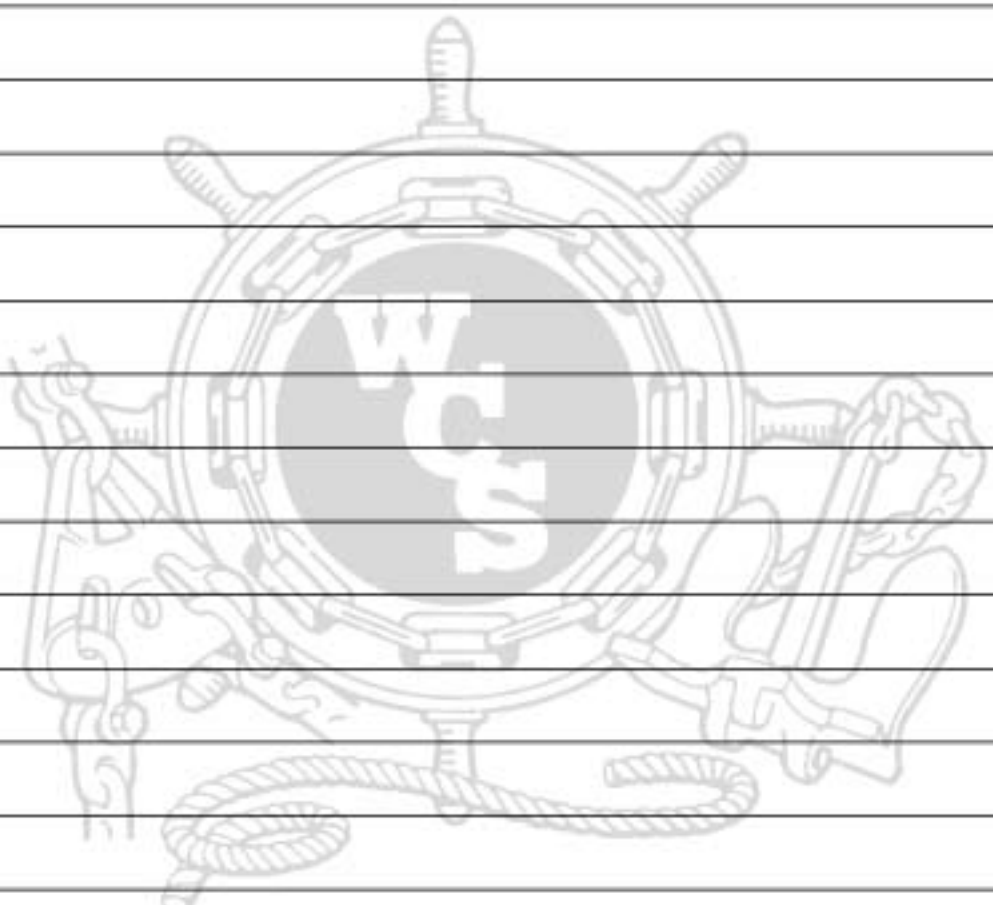


Detachable Chain Chaser
Notes:
1. Weight – 2,610 lbs.
2. Proof Test – 250 tons (500,000 lbs.) straight pull
3. Working Load Limit – 110 tons (220,000 lbs.)



Four-Prong Grapnel
Notes:
1. Weight – 4,000 lbs. (approx.)
2. Test Load – 150 tons

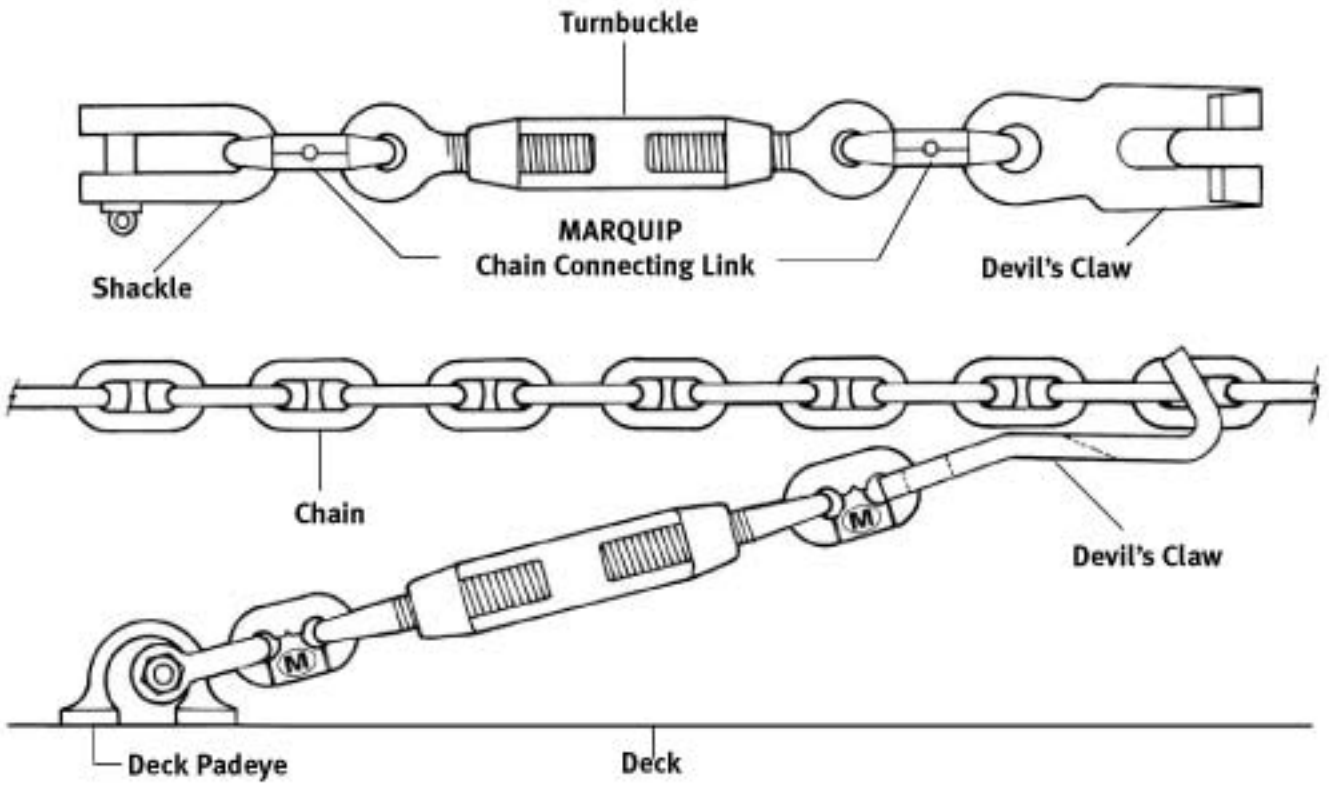
Notes



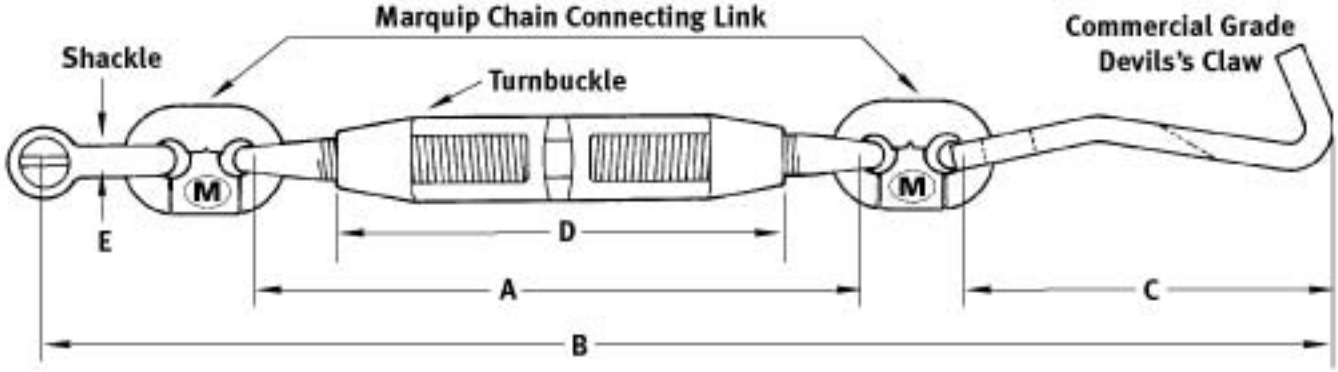
Devil's Claw Chain Stopper Assembly

The Devil's Claw Chain Stopper Assembly is designed primarily to assist in securing the anchor at the hawse pipe. Additionally, it can be utilized to help retrieve mooring components. The size of the claw and the jaw opening are directly proportional to the chain size which is to be engaged. When the stopper assembly is used to secure mooring chain, neither the stopper nor the chain is placed in a bending condition; instead, the loads are arranged in line. Each component of the assembly is forged alloy steel which is heat treated to develop a tensile strength of 150,000 psi. As an option, customers can specify additional handles to be placed at the base of the claw, which increase the ease of handling.

Higher strength devil's claws are available upon request.



Devil's Claw Type Chain Stoppers



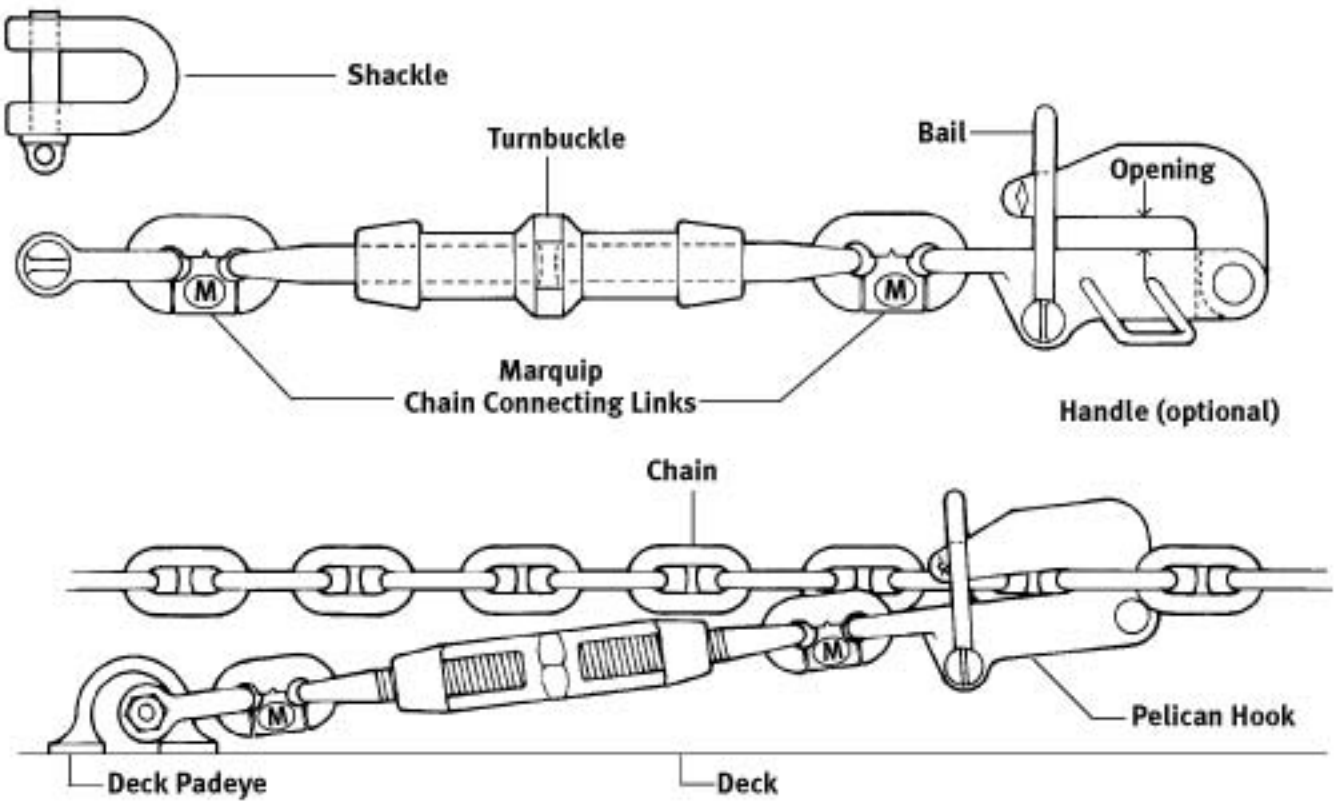
Chain Size Inches	mm	A	B Min	B Max	C	D	E	Det Link Size	Proof Load Lbs
3/4	19	16	35-1/2	42-3/4	12	11	7/8	3/4	34,000
7/8	22	17-1/4	38-1/4	45-3/8	12	11	1	7/8	46,000
1 – 1-1/8 – 1-1/4	25-32	19-1/2	43-1/16	52-13/16	12-3/4	13	1-1/4	1-1/8	92,200
1-3/8 – 1-1/2 – 1-5/8	34- 42	23-3/4	50-1/4	60-3/4	13	16	1-1/2	1-3/8	153,000
1-3/4-2	44- 51	24-1/8	53-1/8	63-5/8	16	16	1 1/2	1-1/2	160,000
2-1/8–2-3/8	54- 60	26-1/4	56-1/4	66-3/4	19	16	1 5/8	1-1/2	170,000
2-1/2-2-5/8	64- 67	29-3/4	65	78-1/8	20	20	1-7/8	1-5/8	200,000
2-3/4	70	29-3/4	67-1/4	80-1/4	24	20	1-7/8	2-1/8	220,000
3	76	36	76-1/4	92-3/8	24	24	2-3/8	2-1/8	220,000

Dimensions are approximate
Dimensions in inches

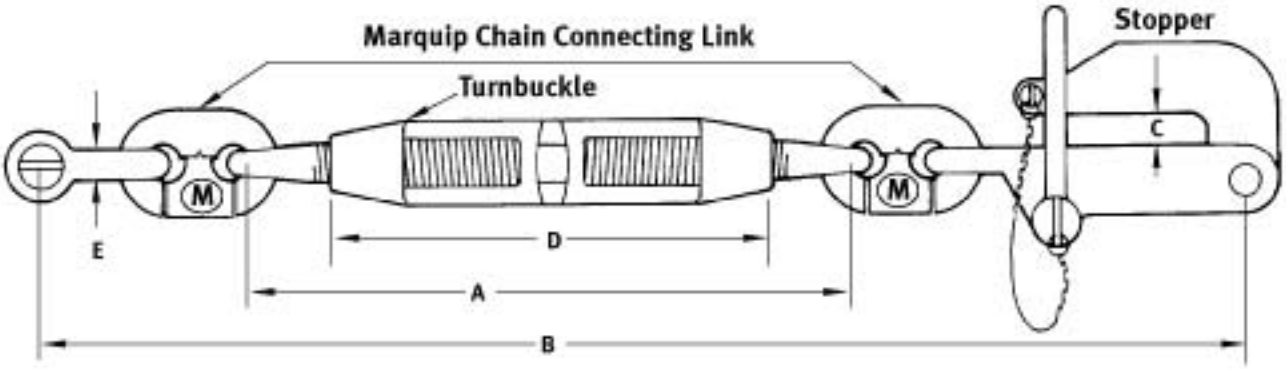
Pelican Hook Chain Stopper Assembly

The Pelican Hook Chain Stopper is engineered so that its primary function is to secure the ship's anchor at the hawse pipe. The chain can be disengaged from the stopper by manually deflecting the bail. To facilitate handling, additional handles can be added to the base of the hook should the customer desire.

The chain stopper assembly consists of a shackle, chain connecting links, turnbuckle and pelican hook. Each component is forged from fine grain heat treated alloy steel, with a minimum tensile strength of 150,000 psi.



Forged Pelican Hook Type Chain Stoppers

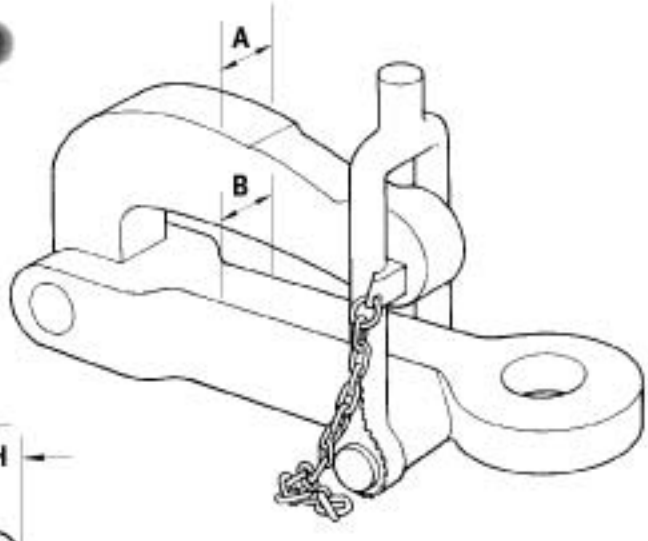


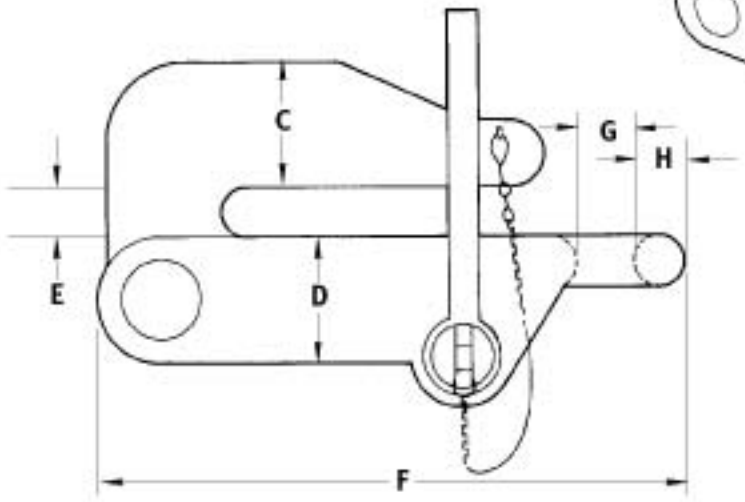
Assembly based on USN drawing 804-860000

Chain Size Inches	mm	A	B Min.	B Max.	C	D	E	Det. Link Size	Proof Load Lbs.	Break Load Lbs.
3/4	19	16	33-1/4	40-1/2	1	11	7/8	3/4	67,500	91,100
7/8	22	17-1/4	38-7/16	45-9/16	1-7/32	11	1	7/8	88,200	119,000
1 – 1-1/8	25 – 29	19-1/2	46-7/8	55-1/2	1-17/32	13	1-1/8	1-1/8	145,000	195,000
1-1/4	32	19-5/8	48	56-5/8	1-17/32	13	1-1/4	1-1/4	178,200	240,600
1-1/4HS – 1-1/2	32HS – 38	23-3/4	55-3/16	65-11/16	1-3/4	16	1-1/2	1-3/8	211,500	285,500
1-3/8HS – 1-5/8	34HS – 42	23-3/4	55-3/16	65-11/16	2	16	1-1/2	1-3/8	211,500	285,500
1-5/8HS – 2	42HS – 51	24-1/8	59-3/16	69-11/16	2-7/16	16	1-1/2	1-1/2	252,000	340,200
2-1/8 – 2-3/8	54 – 60	26-1/4	65-5/8	76-1/8	2-9/16	16	1-5/8	1-1/2	252,000	340,200
2-1/2 – 2-5/8	64 – 67	29-3/4	74-3/8	87-1/2	3-1/8	20	1-7/8	1-5/8	292,500	395,000
2-3/4 – 2-3/4HD	70 – 70HD	29-3/4	86-5/8	89-3/4	3-1/8	20	1-7/8	1-3/4	352,000	476,000
3HD – 3-1/4	76HD – 83	36	90-3/4	106-1/2	3-3/4	24	2-3/8	2-1/4	403,000	610,000
3-3/8 – 3-1/2	86 – 89	38-5/8	97-7/16	113-1/16	3-7/8	24	2-5/8	2-1/2	492,000	744,000
3-1/2HD – 3-3/4	89HD – 95	44-3/8	110	128-1/8	4-1/2	27-1/2	2-7/8	3	706,000	1,068,000
4-3/4	121	44-3/8	130-5/8	147-5/8	5-3/8	27-1/2	2-7/8	3	706,000	1,068,000

Dimensions in inches
HS High Strength Chain
HD Heavy Duty Chain

Commercial Pelican Hook Chain Stopper

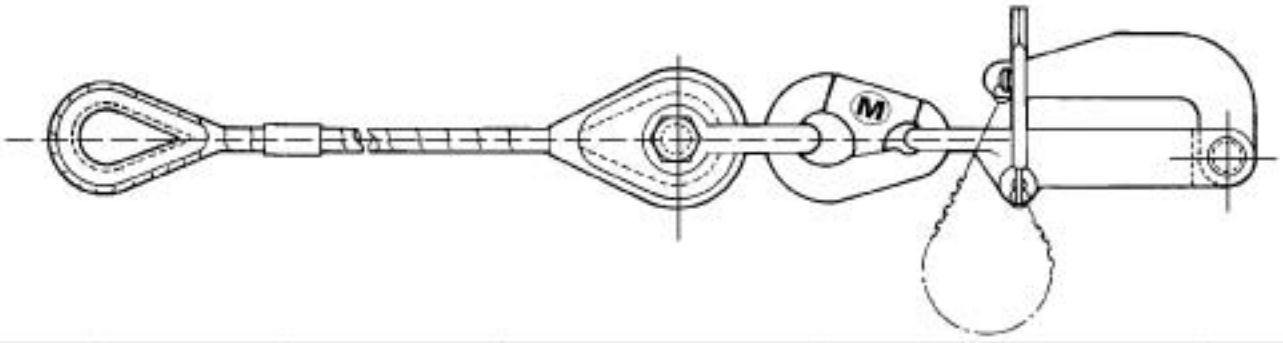




Chain Size	A	B	C	D	E	F	G	H	Proof Test Lbs.	Weight Lbs.
3/4HS* & 3/4	7/8	7/8	2	2	1	10	1-1/4	3/4	34,000	12
7/8HS & 7/8	1	1-1/8	2-1/4	2-1/4	1-7/32	12-11/16	1-3/8	7/8	46,000	16
1HS & 1, 1-1/4	1-1/4	1-1/4	2-3/4	2-1/2	1-17/32	16-11/16	1-5/8	1-1/8	92,200	32
1-1/4HS – 1-5/8	1-1/2	1-1/2	3-1/4	3	2	18-7/16	1-7/8	1-1/2	153,000	53
1-5/8HS – 2	1-3/4	1-3/4	3-1/2	3-3/8	2-7/16	21-1/4	2-1/8	1-1/2	192,000	77
2-1/8 – 2-1/4 – 2-3/8	2-1/4	2-1/4	4-1/4	4-1/8	2-9/16	25-9/16	2-1/4	1-1/2	220,000	151
2-1/2 – 2-3/4HD**	2-1/2	2-1/2	4-5/8	4-1/2	3-1/8	29-1/2	2-3/4	1-7/8	290,000	195
3HD & 3, 3-1/4	2-3/4	2-3/4	5-1/8	5	3-3/8	32-1/2	3	2	300,000	263
3-3/8 & 3-1/2	3	3	5-1/2	5-1/2	3-7/8	35-3/16	3-3/8	2-1/2	350,000	265
3-1/2HD & 3-3/4	3-1/2	3-1/2	6	6	4-1/2	37-3/4	4-1/4	2-7/8	400,000	285
4-3/4	3-1/2	3-1/2	6	6	5-3/8	46-3/8	4-1/4	2-7/8	450,000	350

Dimensions in inches, weights in pounds.
*HS = High Strength Chain
**HD = Heavy Duty Chain

Clear Hawse Pendant Assembly



Clear Hawse Pendant Assy Size	Applicable Anchor Chain Size Flash Butt Welded Chain JAW MIL-C-24633	Chain Stopper Size	Marquip Connecting Link			Anchor Shackle Size	Solid Thimble Size	Wire Rope Size		Clear Hawse Pendant Proof Load (Lbs.)
			Pear-Shaped Detachable Link Size	Detachable Link Size						
				HS Link	Std Link			Dia.	Length (FMS)	
3/4	3/4	3/4		3/4		3/4	5/8	5/8	5	34,500
3/4 HS 7/8 1	7/8 & 1	3/4 MOD		3/4		3/4	5/8	5/8	5	34,500
1 HS 1-1/8 1-1/4	1-1/8 & 1-1/4	7/8 MOD	NO. 2			1-1/8	7/8	7/8	7	71,500
1-1/8 HS 1-3/8 HS 1-3/8 1-3/4	1-3/8 to 1-3/4	1 – 1-1/8 MOD	NO. 3			1-3/8	1-1/4	1-1/4	15	103,500
1-1/2 HS 1-3/4 HS 1-7/8 2-1/4	1-7/8 to 2-1/4	1-5/8 MOD		1-3/8		1-3/8	1-1/4	1-1/4	15	103,500
2-3/8 2-3/4 HD 3 HD 3-1/8	2-3/8 to 3-1/8	2-1/8 – 2-3/8 MOD		1-5/8		1-3/4	1-5/8	1-5/8	15	162,500
3-1/2 HD 3-1/4 3-1/2	3-1/4 to 3-1/2	3 – 3-1/4 MOD			1-7/8	1-3/4	1-5/8	1-5/8	15	162,500
3-5/8 4	3-5/8 to 4	3-1/2HD – 3-3/4	#5 Inverted			1-3/4	1-5/8	1-5/8	15	162,500
4-3/4	4-3/4	4-3/4	#5 Inverted			1-3/4	1-5/8	1-5/8	15	162,500

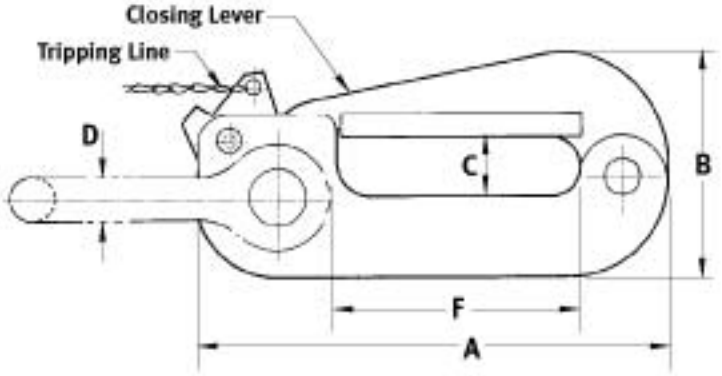
Dimensions in inches.
FMS – Fathoms

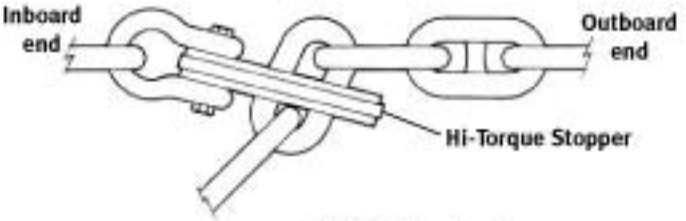
Hi-Torque Chain Stopper

The Hi-Torque Chain Stopper was designed specifically for interval or end attachment. It will accommodate a wide range of chain, end link and various wire rope rigging applications. Since its introduction the Hi-Torque Chain Stopper has been regarded by supply vessel operators as the most proficient stopping device on the market for anchor handling, buoy retrieving and other applications.

Operationally, the Hi-Torque Chain Stopper is simple and effective. The closing lever pivots between the side plates to provide additional bending support while allowing the catch plate ample space for movement even when the stopper lies on its side. The shape of the side plates enables the stopper to lie flat on the deck in a closed or open position. There is no load on the deeper pin, which means it can be removed and the stopper can be tripped open with a tripping line attached to the catch plate.

This unique stopper is fabricated from hardened, high tensile alloy steel. Each stopper is proof tested in straight tension.





End Attached
Stopper will accept end link with a 4" inside width or greater.

Middle Attached
Stopper will accept 2-1/2" to 3-1/4" chain or equivalent.

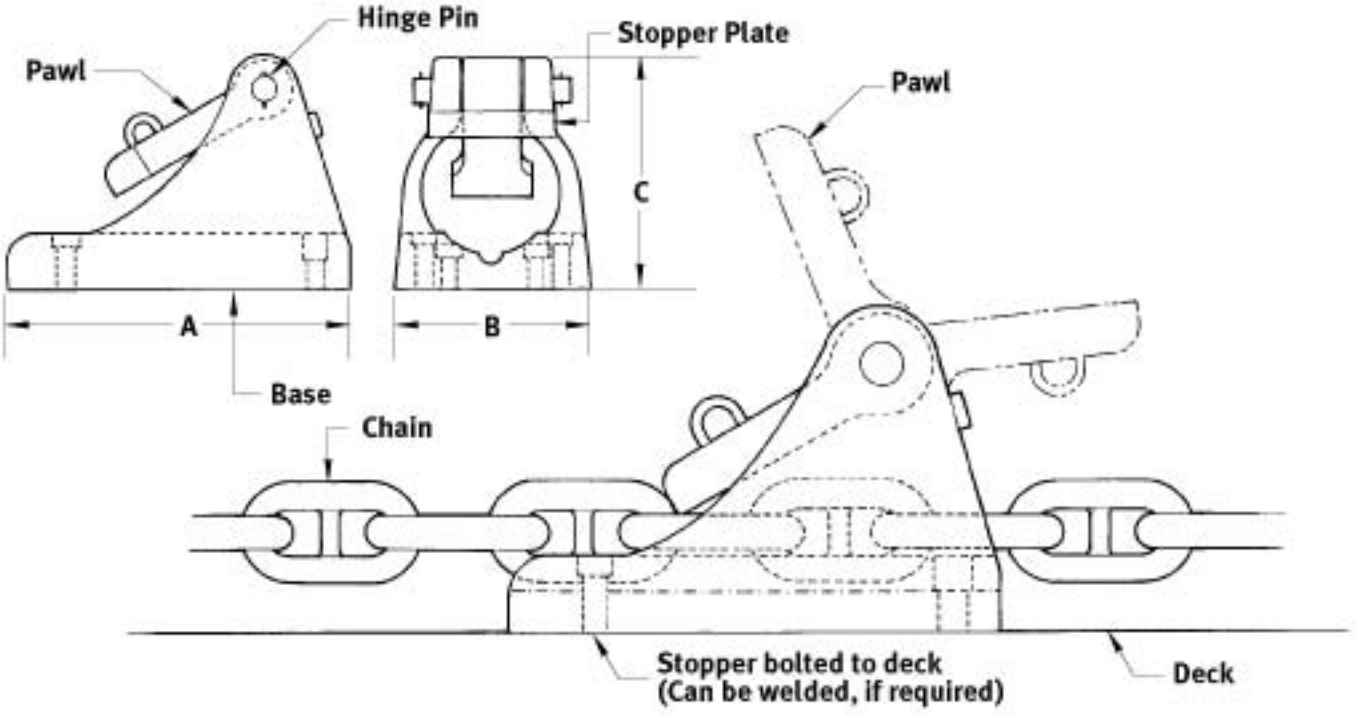
Proof Test Tension	Safe Working Load Torque	A	B	C	D	E	Weight
72T	35T	23-3/4	10	3-3/8	2	14-1/4	117
115T	50T	26-5/8	12-1/2	3-1/2	2-1/2	13-5/8	170
240T	110T	32-15/16	13-3/4	5	3	19-3/8	350

All specifications in pounds and inches, unless otherwise stated.

Ulster Type Chain Stopper

The Ulster Type Chain Stopper is a versatile tool which is designed for multiple applications such as engaging and securing anchor chain, assisting in the stowing of the ship's anchor and accepting the high loads associated with mooring commercial ships, drill ships, semi-submersibles and service vessels.

To prevent the chain from running out during anchor retrieval, the pawl of the stopper should be placed inboard. Also, the stopper should be secured to the deck with bolts or by welding. The stoppers are manufactured from high quality cast steel. The pawl is secured with an alloy heat treated hinge pin. Depending on the customer's requirements, the stopper can be equipped with a pawl counterbalance or powered cylinders.

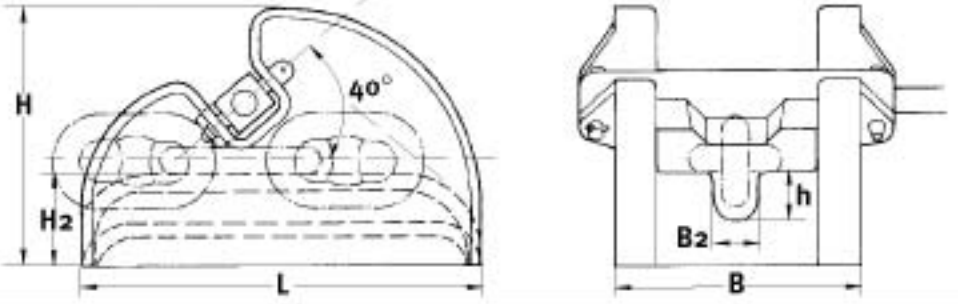


Chain Size Inches	A	B	C	Weight (approx.)
1 – 1-1/2	20	11	13-1/2	230
1-9/16 – 1-7/8	25	14-1/4	16-1/8	450
1-15/16 – 2-3/16	30	18-1/8	22	990
2-1/4 – 2-1/2	39	21-1/2	27-3/8	1,770
2-9/16 – 2-13/16	42-7/8	24-3/4	30-1/2	3,210
2-7/8 – 3-3/16	53-1/2	29-5/8	36-1/2	3,540
3-1/4 – 3-7/16	56	31	39	3,760
3-1/2 – 3-7/8	62-1/2	34-5/8	43-1/8	4,000
3-15/16 – 4-1/4	70-3/4	39-1/4	49	10,200

All specifications in pounds and inches, are approximate.

Cast Steel Bar Type Chain Cable Stopper

(Weld or Bolt Down Mounting)

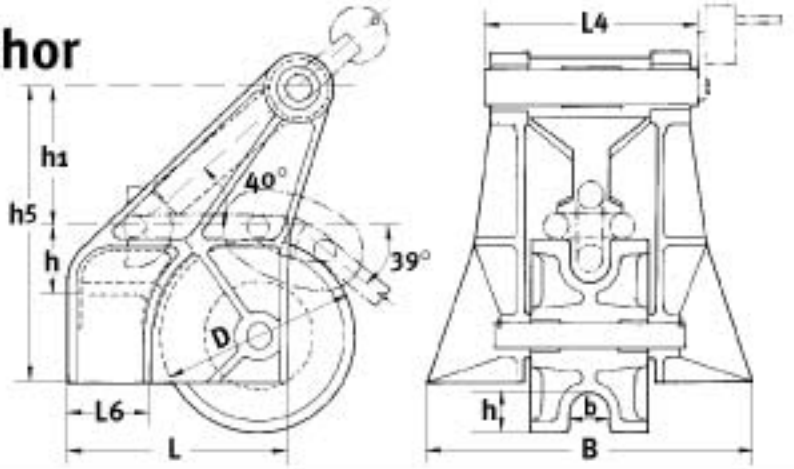


NOMINAL CABLE DIA.	B	H	H2	L	h	B2	WEIGHT KGS
38-40	336	378	130	540	68	65	110
42-44	366	412	142	590	75	72	138
46-48	397	450	155	640	82	78	177
50-52	428	491	170	695	88	85	214
54-56	457	528	182	745	95	92	261
58-60	488	565	195	795	102	98	319
62-64*	517	600	208	850	109	104	396
66-68*	547	635	220	900	116	110	482
70-73*	582	675	233	960	125	117	609
76-78*	617	715	245	1,020	133	123	740

*Sizes 62 to 78. The bar is equipped with a counter weight. The bar can be opened in right or left hand side.
Dimensions are in mm; weight is in kg.

Rollered Pawl Type Anchor Chain Cable Stopper

(For Grade 3 Chain)



NOMINAL CHAIN DIA.	h	h1	h5	L	L4	L6	B	b	D	WEIGHT KGS
70, 73	125	422	860	660	640	241	980	115	584	1,096
76, 78	133	450	918	700	680	254	1,046	123	624	1,316
81, 84	143	483	983	760	720	279	1,110	134	672	1,608
87, 90	153	515	1,055	810	770	295	1,190	143	720	1,938
92, 95	162	545	1,115	860	810	317	1,250	151	760	2,289
97, 100, 102	175	584	1,196	920	860	337	1,320	161	816	2,787
105, 107	185	617	1,265	981	900	364	1,390	170	864	3,274
111, 114	195	651	1,335	1,026	940	376	1,460	180	912	3,874
117, 122	208	695	1,427	1,100	995	408	1,550	191	976	4,600
127, 132	225	750	1,542	1,190	1,060	441	1,660	207	1,056	5,750

Dimensions are in mm; weight is in kg.

MARQUIP
& Specialty Shackles

Chain Pattern Shackles 56
Anchor Pattern Shackles 57
Tow Plates 58
Sinker Shackles 59
Dip Rope Shackle 60
Tonsberg Mooring Link..... 62
Mandal Fairlead Shackle..... 62

Washington Chain carries a wide selection of shackles, including bending, triangle, modeer and others not shown here.

Shackles–Chain Pattern

Showing double nut pin arrangement

210

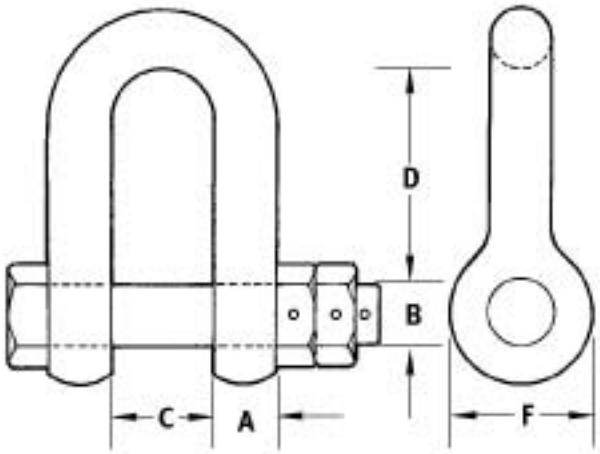
Marquip shackles offer maximum load capacity and safety for marine and construction heavy lift operations utilizing a 6:1 working load limit. Wide jaws facilitate easy installation on chains, flounder or tow plates, tow wires, bell shackles and pad eyes.

Both bails and pins are forged of 4340 extra high strength alloy steel. Each pin is then specially machined and individually precision fitted to its shackle to minimize wear from heavy or surging loads and vibrations. All shackles and pins are heat treated and magnetic particle inspected. Working load limits range from 40 tons to 185 tons, depending on shackle size and style. See specifications.

Safety type pins used on all shackles – all sizes

All through pins are available with double or single safety nuts secured by cap screws, with hex nuts and cotter keys to prevent backing off due to vibrations. Pin ends are tapered.

All certifications are available on request. With our 2,000,000 pound (1,000-ton) tensile strength testing machine, we can provide A.B.S., Lloyd's Shipping, I.L.O. or other cargo bureau certificates as required.



Custom made shackles available to meet your requirements.

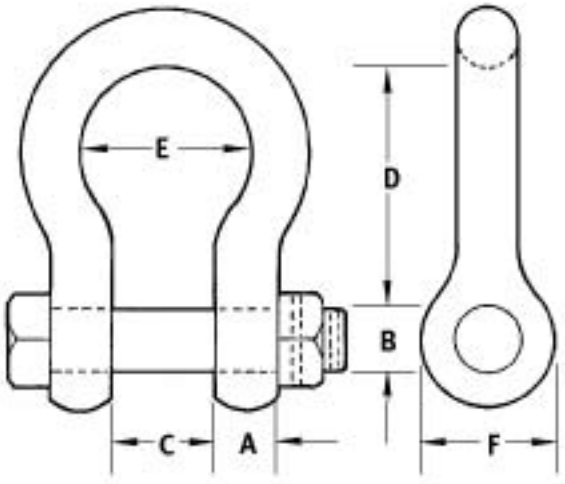
No. 210 Chain Pattern									
*Size	A	2	2-1/4	2-1/2	2-3/4	3	3	3-1/2	4
Pin Diameter	B	2	2-1/4	2-1/2	2-3/4	3	3-1/4	3-3/4	4-1/4
Jaw Width	C	3-1/4	4-1/2	4-1/2	4-1/2	4-1/2	5	5-3/4	6-1/2
Reach	D	6-3/4	7	10-1/2	11	13	13	10-1/2	12
	F	4-1/2	5	5-1/2	6	6-1/2	6-1/2	8-1/4	9
WLL Tons		44	57	71	80	94	123	132	185
Weight Lbs.		36	62	86	110	125	142	218	310
*Note: Larger or special dimension size available on special order.									

Dimensions above are in inches, weight is in pounds.

Shackles–Anchor Pattern

Showing single nut pin arrangement

211

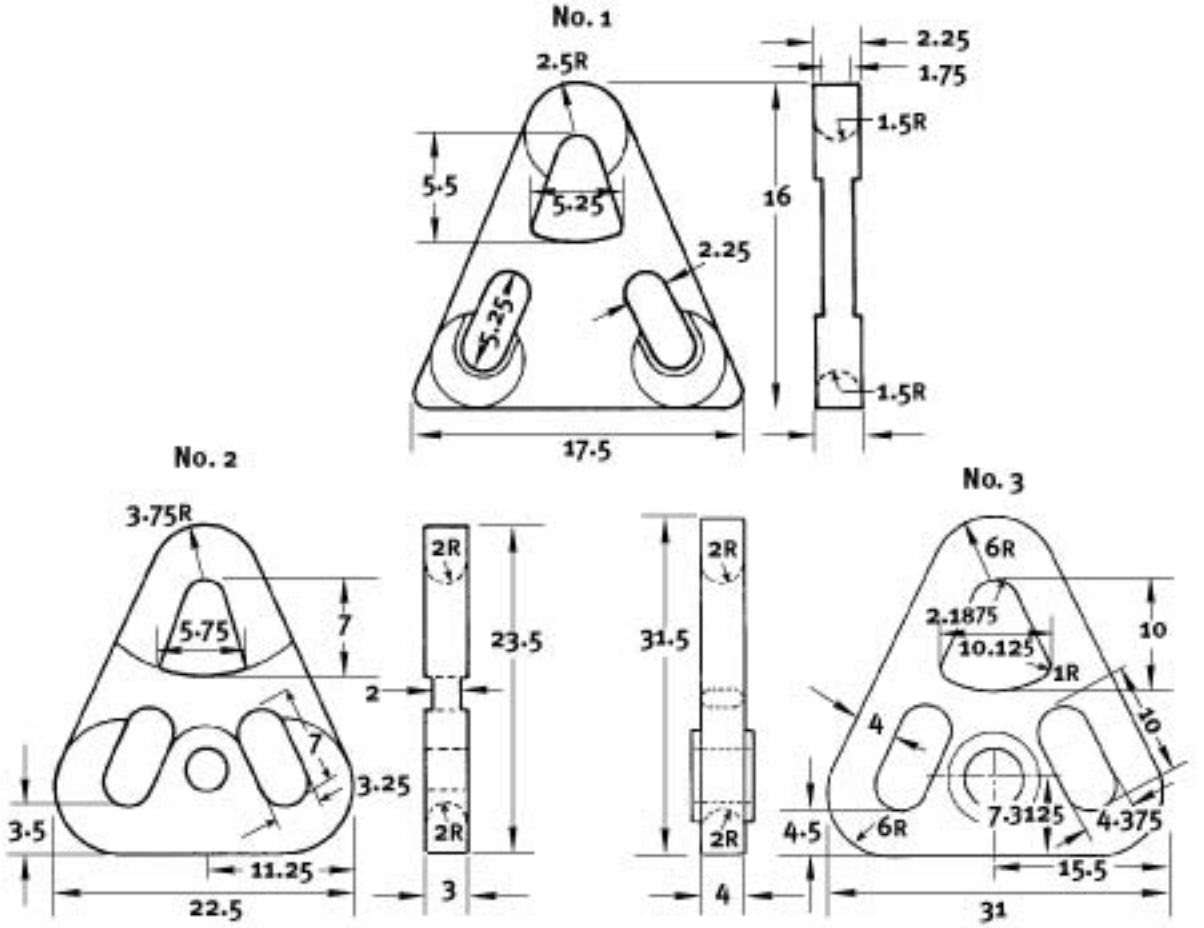


No. 211 Anchor Pattern										
*Size	A	1-3/4	2	2-1/4	2-1/2	2-3/4	3	3	3-1/2	4
Pin Diameter	B	2	2	2-1/4	2-1/2	2-3/4	3	3-1/4	3-3/4	4-1/4
Jaw Width	C	2-7/8	3-1/4	4-1/4	4-1/2	4-1/2	4-1/2	5	5-3/4	6-1/2
Reach	D	7	7-3/4	9	10	11	13	13	15	16
	E	5	5-1/4	5-1/2	7-1/4	7-3/4	8	8-1/2	9	11
	F	4-1/2	4-1/2	5	5-1/2	6	6-1/2	6-1/2	8-1/4	9
WLL Tons		40	44	57	71	80	94	123	132	185
Weight Lbs.		23	41	62	88	112	133	146	250	358

Dimensions above are in inches, weight is in pounds.

Towing Plates

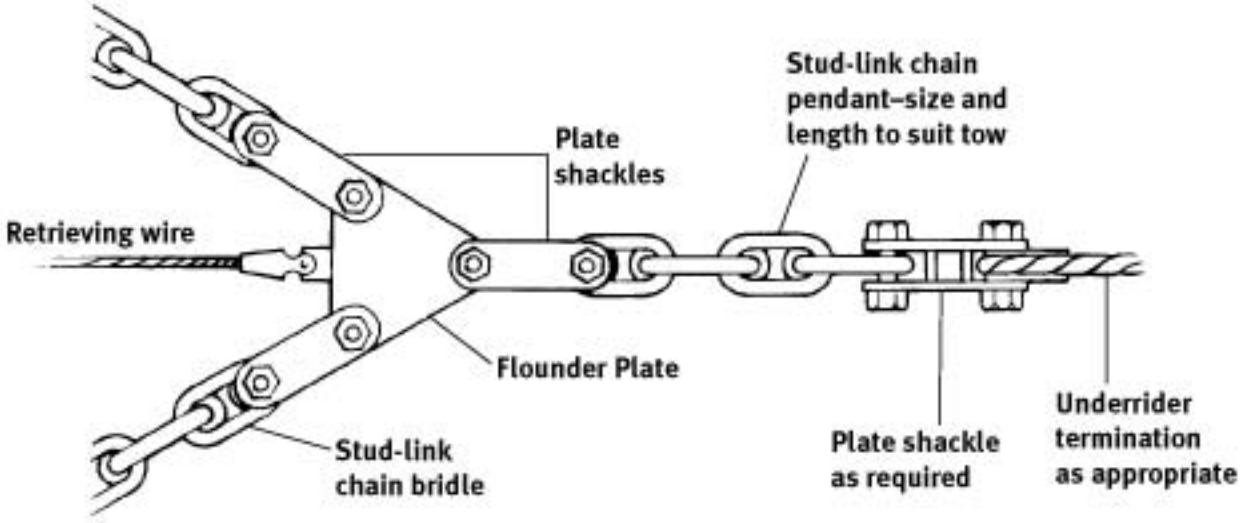
Simpler, stronger, and safer—that's the MARQUIP tow plate. Its patented design lets you rig the bridle with only three shackles, eliminating the extra weight, cost, time, and risk of older-style flounder plates. The No. 2 plate features an extra hole for a tandem shackle to tow additional barges, or to haul in the bridle. Cast from nickel-chrome steel, MARQUIP plates also provide maximum corrosion resistance. They are available in 300,000-, 485,000-, and 624,000-pound pull test capacities, and can be certified on request.

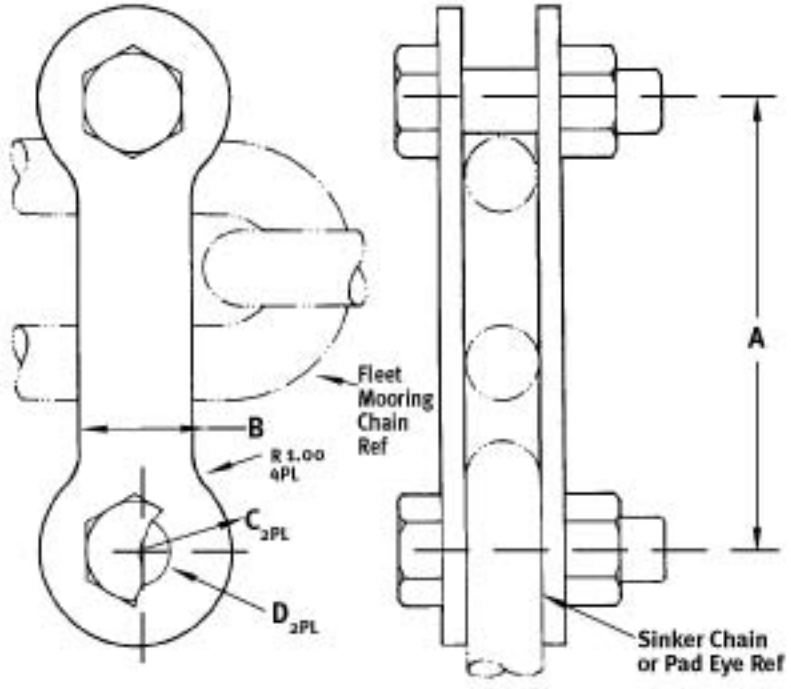


Specifications			
	No. 1	No. 2	No. 3
Shackle	1-1/2	2-1/4	3
Sizes*	1-3/4	2-1/2	4
	2	2-3/4 - 3	
Dimensions	17-1/2 x 16	22-1/2 x 23-1/2	31 x 31-1/2
Weight (lbs.)	70	170	548
Proof Test (lbs.)	300,000	485,000	624,000

***All dimensions in inches**

Sinker Shackle

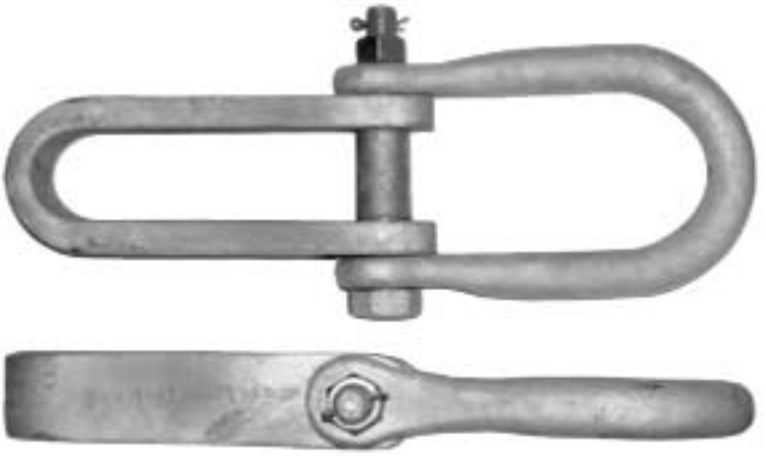


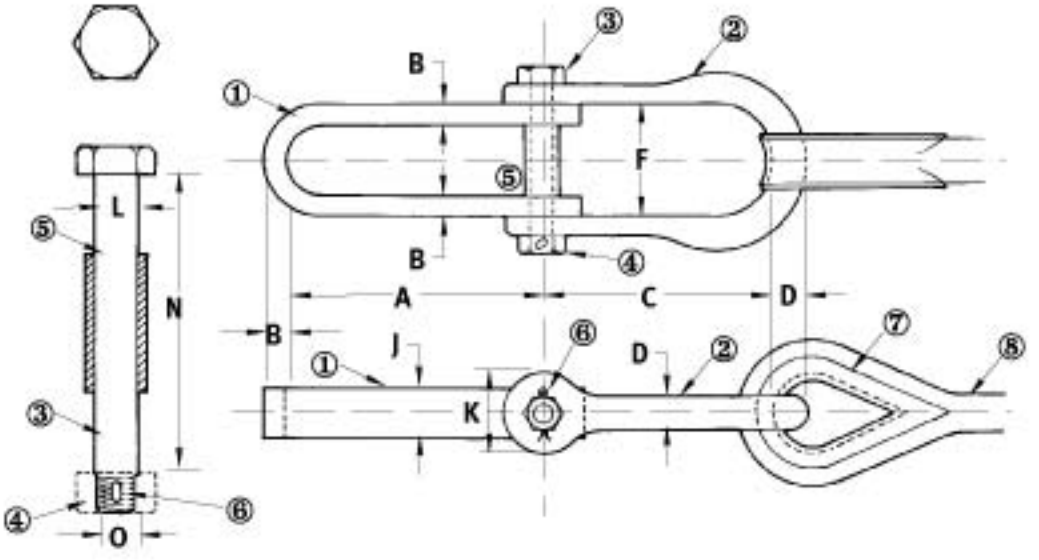


Dash No.	Sinker Chain Or Pad Eye Dia. Ref.	Dim A +/- .12	.Dim. B +/- .12	Radius C +/- .12	Dia. D +/- .06
-1	1-3/4 To 2	12.06	3.03	2.56	1.88
-2	2-1/4 To 4	22.06	4.03	3.56	2.38

Dimensions above are in inches.

Dip Shackles and Rope Assembly





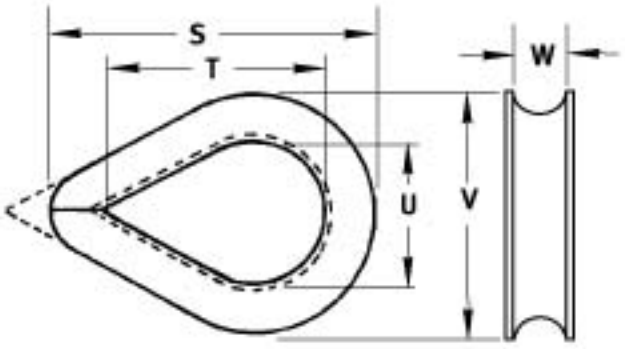
Dip Shackles and Rope – Proportional Dimensions A through K
(All figures in inches except "Length of Rope" which is in fathoms)

Chain Size				Dimensions (Ins.)							Thimble Size Nominal Rope Dia.	Nylon Rope Circ. of Rope	Nylon Rope Thimble Nominal Rope Dia.
High Strength		Standard		A	B	C	D	F	J	K			
3/4	7/8	3/4	1-1/8	4-5/8	3/8	4-1/8	1/2	2-1/16	7/8	1-3/8	7/8	2-1/4	7/8
1	1-1/8	1-1/4	1-1/2	6-1/4	7/16	5-1/2	11/16	2-9/16	1-1/8	1-7/8	1-1/8	2-1/2	1-1/16
1-1/4	1-1/2	1-5/8	1-7/8	7-3/4	9/16	6-7/8	7/8	3-3/16	1-7/16	2-5/16	1-3/8	3	1-3/16
1-5/8	1-3/4	2	2-1/4	9-1/4	11/16	8-1/4	1-1/16	3-7/8	1-3/4	2-3/4	1-5/8	3-1/2	1-7/16
1-7/8	2-1/8	2-3/8	2-3/4	11-3/8	7/8	10-1/8	1-1/4	4-3/4	2-1/8	3-3/8	2	4	1-7/16
2-1/4	2-5/8	2-7/8	3-1/4	13-1/2	1	12	1-1/2	5-9/16	2-1/2	4	2-1/4	4-1/2	1-11/16
2-3/4	3	3-3/8	3-3/4	15-1/2	1-1/8	13-7/8	1-3/4	6-3/8	2-7/8	4-5/8	2-5/8	5	1-11/16
3-1/8	3-3/4	4	4-3/4	21	1-5/16	15-5/8	1-15/16	7-7/8	3-1/4	5-1/4	3	5-1/2	2

Continued on the next page

Dip Shackles and Rope Assembly

Material For One No.	Description	Material	Remark
1	Shackle	Med. Stl.	Galv.
2	Shackle	Med. Stl.	Galv.
3	Pin	Med. Stl.	Galv.
4	Nut	Med. Stl.	Galv.
5	Distance Piece	W.I. Pipe	Galv.
6	Split Pin	Brass	Galv.
7	Thimble	Med. Stl.	Galv.
8	Dip Rope	Manila	



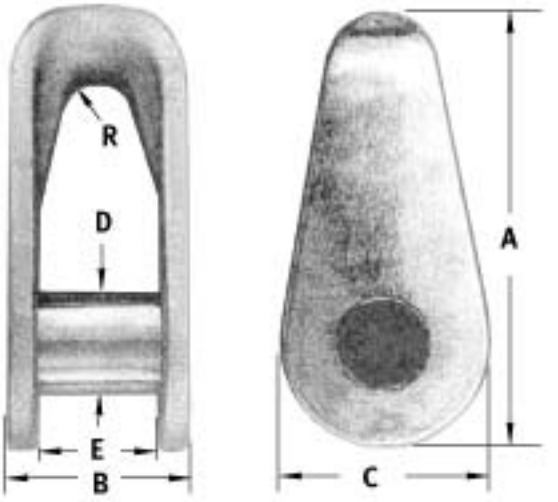
Dip Shackles and Rope – Proportional Dimensions L through W
(All figures in inches except "Length of Rope" which is in fathoms)

Chain Size High Strength		Chain Size Standard		L	N	O	Circ. of Rope	Length of Rope	S	T	U	V	W	Thimble Size Nominal Rope Dia.	Nylon Rope Circ. of Rope	Nylon Rope Thimble Nominal Rope Dia.
3/4	7/8	3/4	1-1/8	7/16	2-13/16	3/8	2-1/2	14	4-3/32	3	1-7/8	3-1/16	15/16	7/8	2-1/4	7/8
1	1-1/8	1-1/4	1-1/2	9/16	3-7/16	1/2	3-1/4	14	5-1/16	3-5/8	2-3/8	3-13/16	1-3/16	1-1/8	2-1/2	1-1/16
1-1/4	1-1/2	1-5/8	1-7/8	3/4	4-5/16	5/8	4	24	6-3/32	4-5/16	2-13/16	4-5/8	1-7/16	1-3/8	3	1-3/16
1-5/8	1-3/4	2	2-1/4	7/8	5-1/4	3/4	4-3/4	30	7-1/32	5	3-5/16	5-3/8	1-3/4	1-5/8	3-1/2	1-7/16
1-7/8	2-1/8	2-3/8	2-3/4	1	6-1/2	15/16	6	36	8-1/2	6	4	6-1/2	2-1/8	2	4	1-7/16
2-1/4	2-5/8	2-7/8	3-1/4	1-1/4	7-9/16	1-1/8	7	36	9-7/16	6-5/8	4-1/2	7-1/4	2-3/8	2-1/4	4-1/2	1-11/16
2-3/4	3	3-3/8	3-3/4	1-7/16	8-5/8	1-5/16	8	36	10-7/8	7-5/8	5-1/8	8-3/8	2-3/4	2-5/8	5	1-11/16
3-1/8	3-3/4	4	4-3/4	1-3/8	10-1/2	1-1/2	9	36	12-3/8	8-5/8	5-13/16	9-9/16	3-1/8	3	5-1/2	2

Tonsberg Mooring Link

Galvanized steel mooring link of compact design typically utilized as connection between wire rope and fiber forerunner.
Sizes: 90, 120 and 180 Metric Tons.

Model	90T	120T	180T
Forerunner			
Circ. (inches)	7 – 9	9 – 11	11 – 15
A (mm)	285	324	350
B (mm)	115	142	184
C (mm)	136	150	160
D (mm)	65	75	85
E (mm)	75	90	120
R (mm)	22	28	30
Breaking Load M/Tons	90	120	180
Proof Load M/Tons	55	70	95
Safe Working Load M/Tons	30	40	60
Weight	11.2 kg (25 lbs.)	16.9 kg (37 lbs.)	25 kg (55 lbs.)

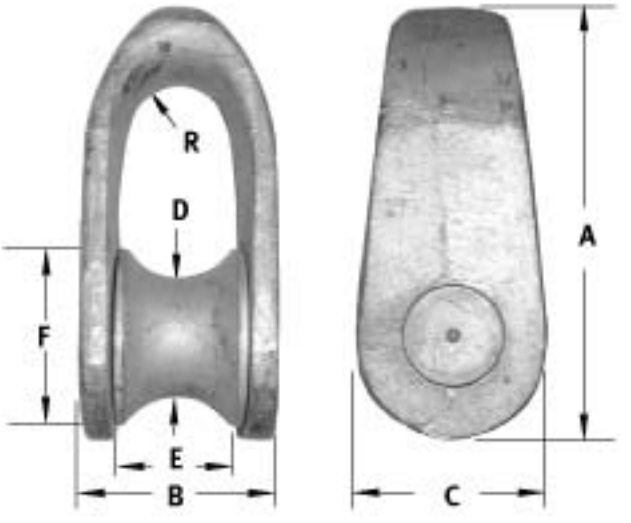


Mandal Fairlead Shackle

Stainless steel mooring shackle with sleek shape designed to pass through fairleads.
Sizes: 90 and 120 Metric Tons.

Note: Wire Rope in the sheave.
Fiber Rope around the body.

Model	90M	120M
Forerunner		
Circ. (inches)	6 – 9	9 – 11
A (mm)	255	310
B (mm)	97	121
C (mm)	120	130
D (mm)	65	82
E (mm)	67	90
F (mm)	100	128
R (mm)	34	45
Breaking Load M/Tons	90	120
Proof Load M/Tons	55	70
Safe Working Load M/Tons	30	40
Weight	7.8 kg (17.2 lbs.)	13.3 kg (29 lbs.)



Cleats, Chocks, Bitts, Bollards

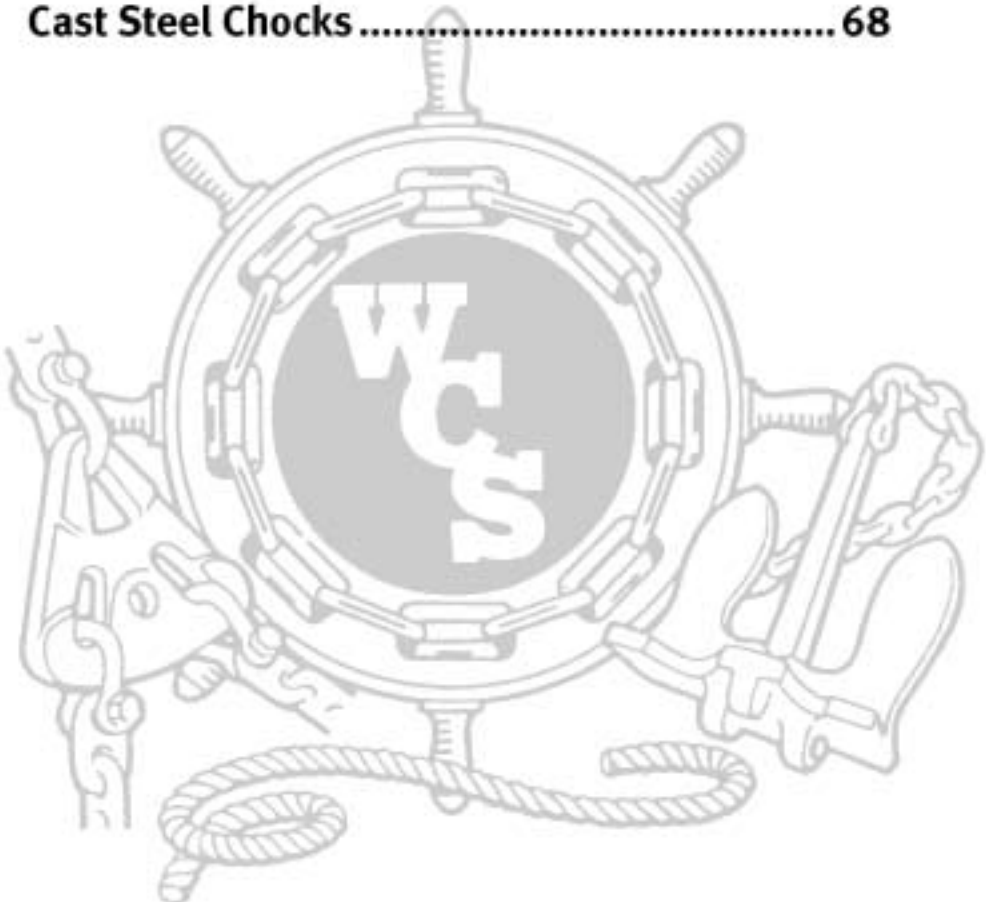
Horn Cleat (Rev A) with Base 64

Horn Cleat (BU Ship) with Base 65

Weld On Deck Cleat 66

Cast Steel Double Bitts 67

Cast Steel Chocks 68



Washington Chain is a leading supplier of horn cleats, (two-horn cleats, three-horn cleats) as well as kevel cleats.

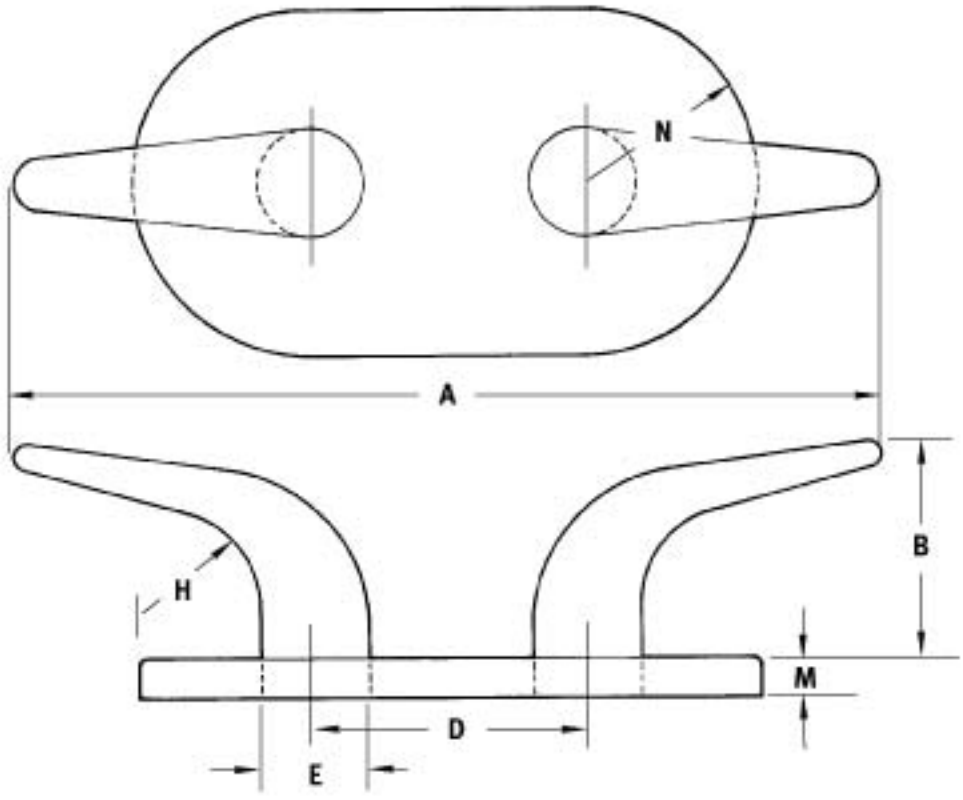
Horn Cleat with Base
Rev A

Rev A based on Dwg. No. 227 6338 A

Cleat Size	Largest Applicable Wire Rope Dia	Cleat Dimensions (Inches)							Wt. (Lbs.)	Cleat Test Load (Lbs.)
		A	B	D	E	H	M	N		
5	–	5	1-1/4	1-13/16	7/8	9/16	3/8	1-5/16	1.50	2,700
6-1/2	–	6-1/2	1-5/8	2-3/8	1-1/8	11/16	7/16	1-11/16	3.00	5,200
8	1/4	8	2	2-3/4	1-1/4	7/8	1/2	1-7/8	4.50	6,900
10	5/16	10	2-1/2	3-3/8	1-1/2	1-1/16	9/16	2-1/4	7.50	9,000
12	3/8	12	3	4	1-3/4	1-5/16	5/8	2-5/8	11.25	12,200
14	7/16	14	3-1/2	4-3/4	2-1/8	1-1/2	3/4	3-3/16	20.0	18,400
16	9/16	16	4	5-1/2	2-1/2	1-3/4	7/8	3-3/4	32.0	27,000
18	5/8	15	4-1/2	6-1/8	2-3/4	2	1	4-1/8	44.0	36,000
20	3/4	20	5	6-7/8	3-1/8	2-1/8	1-1/8	4-11/16	63.0	48,000
22	3/4	22	5-1/2	7-5/8	3-1/2	2-3/8	1-1/4	5-1/4	88.0	60,000
24	7/8	24	6	8-3/8	3-7/8	2-5/8	1-3/8	5-13/16	118.0	73,000
26	1	26	6-1/2	9-1/8	4-1/4	2-7/8	1-1/2	6-3/8	155.0	90,000
30	1-1/8	30	7-1/2	10-3/8	4-3/4	3-1/4	1-5/8	7-1/8	215.0	106,000
34	1-1/8	34	8-1/2	11-1/2	5-1/4	3-3/4	1-3/4	7-11/16	275.0	123,000

Dimensions are in inches; weight is in pounds.

Horn Cleat with Base
BU Ship

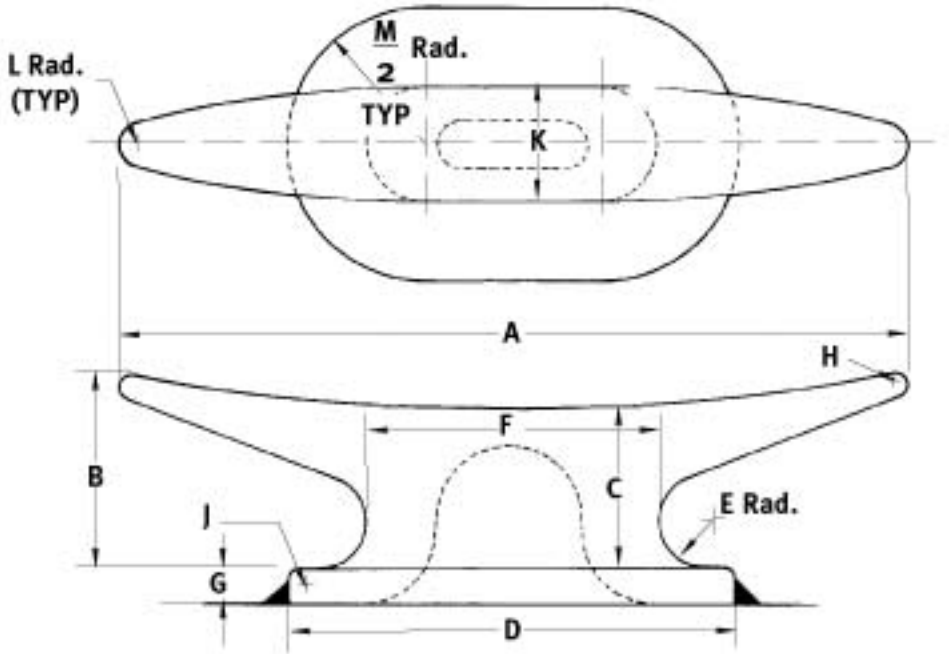


Based on Bu Ship No. 805-2276338

Cleat								Rope Circumference (Inches)				Rope Dia. (In.) 6 x 37 Fibre Core Wire Rope	Cleat Test Load (Lbs.)
Dimensions (Inches)							Calc. Wt. (Lbs.)						
A	B	D	E	H	M	N		Manila	Nylon	Dacron	Polypro-pylene		
5	1-1/4	1-9/16	5/8	9/16	1/4	1	.75	1	1/2	1/2	1	–	1,000
6-1/2	1-5/8	2-1/32	13/16	23/32	1/4	1-3/4	1.2	1-1/4	3/4	3/4	1	–	1,750
8	2	2-1/2	1	7/8	7/16	1-1/2	3.0	1-1/2	1	1	1-1/4	–	2,650
10	2-1/2	3-1/8	1-1/4	1-3/32	7/16	2	5.3	1-3/4	1	1	1-1/2	–	4,100
12	3	3-3/4	1-1/2	1-5/16	1/2	2-1/2	9.5	2	1-1/2	1-1/2	1-3/4	1/4	5,600
14	3-1/2	4-3/8	1-3/4	1-17/32	5/8	3	16.1	2-1/2	1-3/4	2	2	1/4	8,000
16	4	5	2	1-3/4	3/4	3-1/4	21.7	3	2	2	2-1/2	5/16	9,000
18	4-1/2	5-5/8	2-1/4	1-31/32	13/16	3-1/2	31.2	3-1/2	2-1/4	2-1/2	3	3/8	13,000
20	5	6-1/4	2-1/2	2-5/16	15/16	3-1/2	40	4	2-1/4	2-1/2	3	7/16	16,000
22	5-1/2	6-7/8	2-3/4	2-13/32	1-1/16	4	56	4-1/2	2-3/4	3	3-1/2	7/16	20,000
24	6	7-1/2	3	2-5/8	1-1/8	4-1/2	75	5	3	3	4	1/2	23,000
26	6-1/2	8-1/8	3-1/4	2-27/32	1-1/4	5	97	5-1/2	3	3-1/2	4-1/2	9/16	27,000
30	7-1/2	9-3/8	3-3/4	3-9/32	1-5/16	5-1/2	107	6	3-1/2	4	5	5/8	36,000

Dimensions are in inches: weight is in pounds.

Weld On Deck Cleat



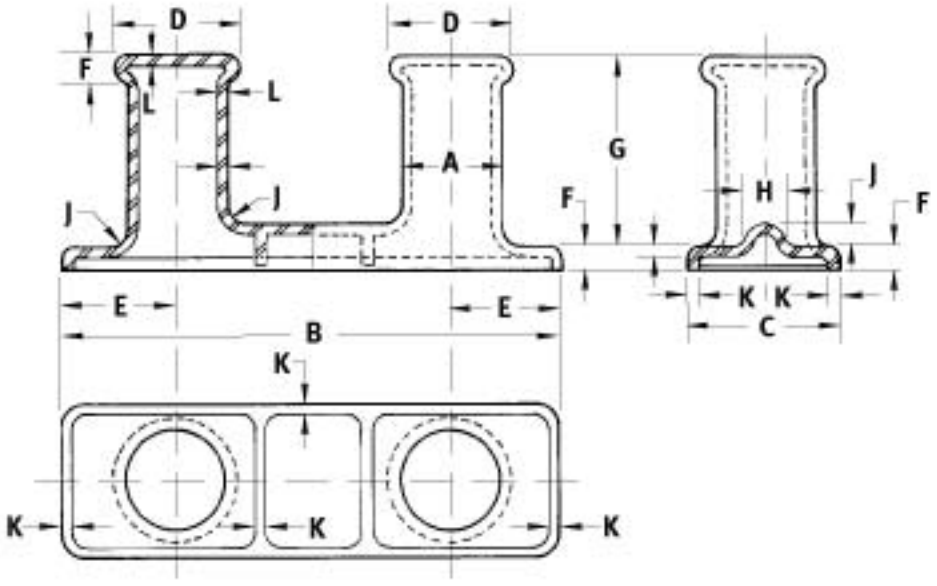
Bu Ship No. S1201-860099

Size	A	B	C	D	E	F	G	H	J	K	L	M	Wt. Lbs.	Cleat Test Load Lbs.
10	10	2-1/2	2-1/32	5-5/8	5/8	3-3/4	7/16	5/32	5/32	1-9/16	5/16	3-1/2	6.75	12,200
12	12	3	2-7/16	6-7/8	3/4	4-1/2	9/16	3/16	3/16	1-7/8	3/8	4-1/4	14.25	18,400
14	14	3-1/2	2-27/32	8	7/8	5-1/4	5/8	7/32	7/32	2-3/16	7/16	5	23.0	27,000
16	16	4	3-1/4	9-1/8	1	6	3/4	1/4	1/4	2-1/2	1/2	5-5/8	32.0	36,000
18	18	4-1/2	3-21/32	10-3/8	1-1/8	6-3/4	7/8	9/32	9/32	2-3/16	9/16	6-3/8	41.0	48,000
20	20	5	4-1/16	11-1/2	1-1/4	7-1/2	15/16	5/16	5/16	3-1/8	5/8	7-1/8	47.0	60,000
22	22	5-1/2	4-15/32	12-5/8	1-3/8	8-1/4	1	11/32	11/32	3-7/16	11/16	7-7/8	64.0	73,000
24	24	6	4-7/8	13-3/4	1-1/2	9	1-1/8	3/8	3/8	3-3/4	3/4	8-1/2	98.0	90,000
26	26	6-1/2	5-9/32	15	1-5/8	9-3/4	1-1/4	13/32	13/32	4-1/16	13/16	9-7/8	133.0	106,000
30	30	7-1/2	6-7/32	17-1/8	1-7/8	11-1/4	1-1/2	15/32	15/32	4-1/16	15/16	10-5/8	211.0	123,000

36" and 42" also in stock. Also available in Bolt-Down Style. Other sizes available.

Dimensions are in inches: weight is in pounds.

Cast Steel Double Bitts

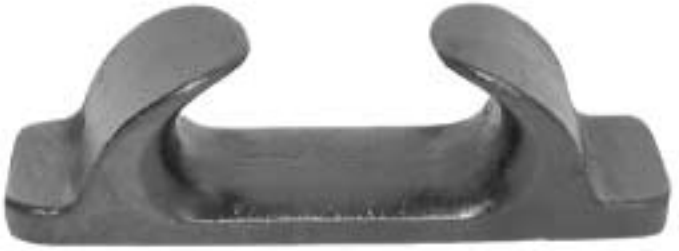


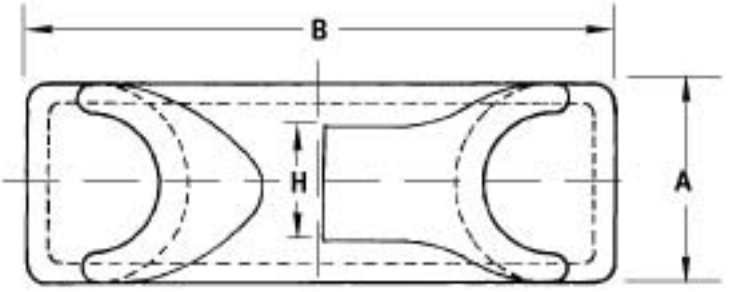
All dimensions are in inches.

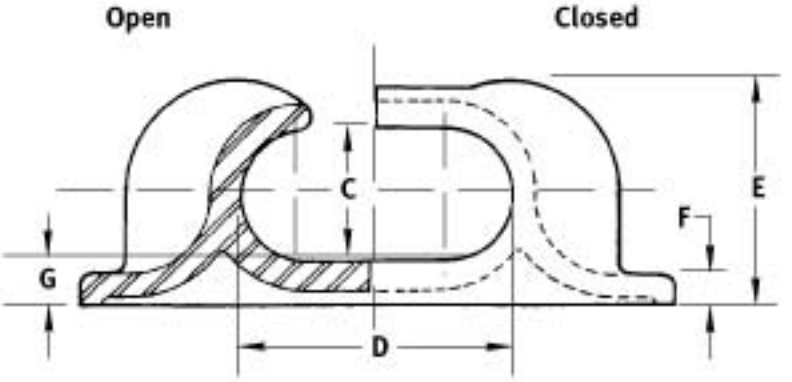
Size	A	B	C	D	E	F	G	H	J	K	L
6	6	31-1/2	9	7-1/2	6-3/4	1-1/2	11-1/4	3	1-3/16	5/8	5/8
8	8	42	12	10	9	2	15	4	1-5/8	15/16	5/8
10	10	52-1/2	15	12-1/2	11-1/4	2-1/2	18-3/4	5	2	1	3/4
10-5/16	10-5/16	52-1/2	15	12-1/2	11-1/4	2-1/2	18-3/4	5	2	1	3/4
12	12	60	18	15	13-1/2	3	22-1/2	6	2-3/8	1-1/4	1
14	14	66	21	17-1/2	13	3-1/2	26-1/4	7	2-3/16	1-1/2	1
16	16	66	24	20	12	4	30	8	3-1/4	1-1/2	1
16M	16M	76	24	20	15	4	30	8	3-3/16	1-3/4	1
18	18	94-1/2	27	22-1/8	20-1/4	4-1/2	31-1/2	9	3-1/2	2	1-1/2
22	22	109	32	26	22	4-1/2	33-3/4	10	3-5/8	2	1-3/4

Dimensions are in inches; weight is in pounds.

Cast Steel Chocks







Dimensions (Inches)

Description	A	B	C	D	E	F	G	H	Shipping Weight
Open Chock	6	19-3/4	4	8	6-3/4	1	1-3/8	3-1/2	75 Lbs.
Closed Chock									84 Lbs.
Open Chock	8	25-1/4	5-3/8	10-3/4	9	1-5/16	1-13/16	4-3/4	132 Lbs.
Closed Chock	9	27-3/4	6	12	10-1/8	1-1/2	2-1/16	5-1/4	176 Lbs.
Open Chock									160 Lbs.
Closed Chock	11-1/2	33-1/2	7	14	12-1/4	1-3/4	2-3/8	6	354 Lbs.
Open Chock	12	36	8	16	13-3/8	1-7/8	2-5/8	7	435 Lbs.
Closed Chock									455 Lbs.

Buoys & Floats

Bar Riser Buoy 70

Cylindrical Buoy 71

Peg Top Buoy 72

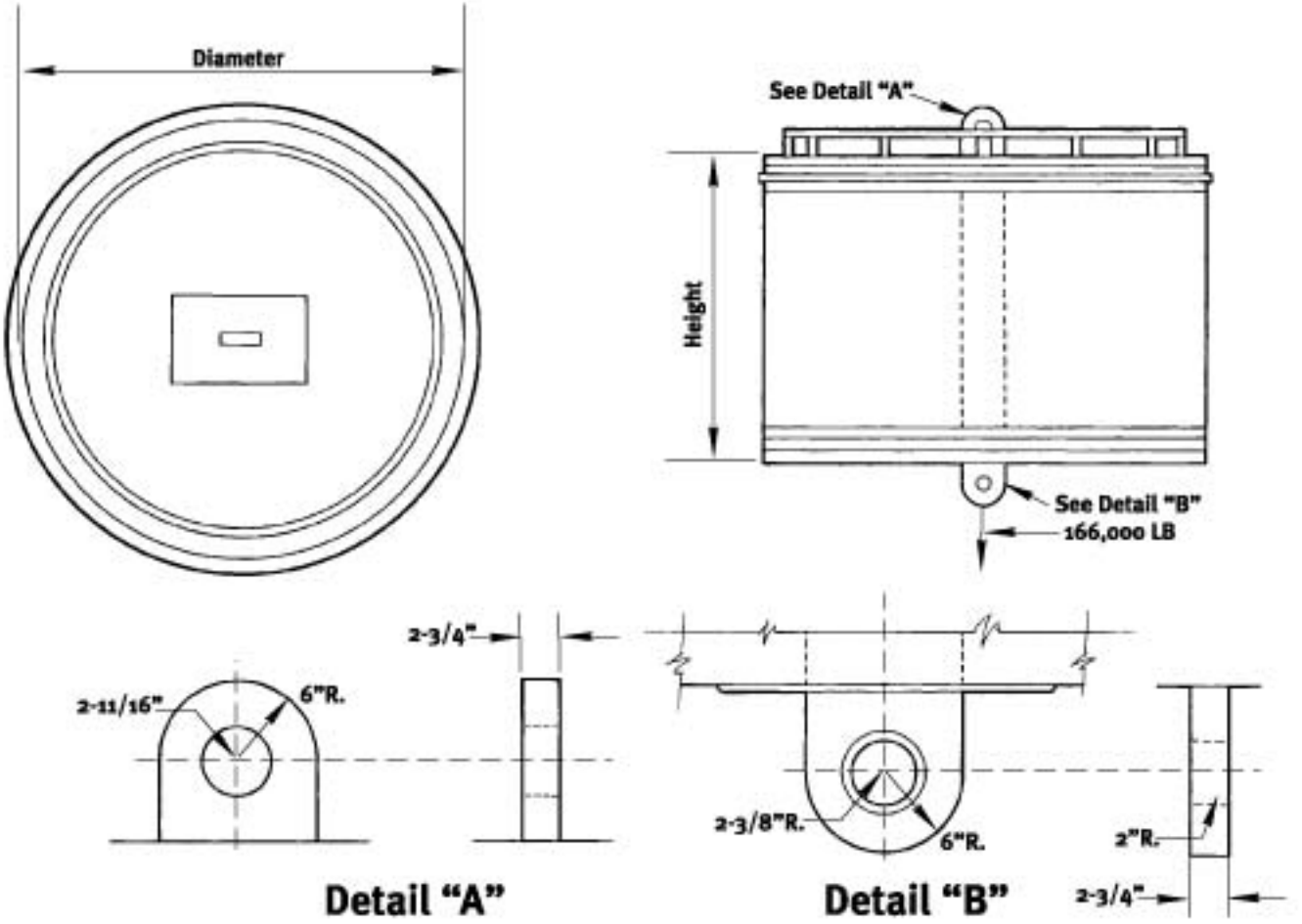
Spherical Buoy 72

Jim Buoy® 73

Inflatable Floats 74

Washington Chain has a constantly changing mix of used buoys.

Bar Riser Chain Type Mooring Buoy



Diameter	Height	Weight In Air	NAVFAC Dwg. No.
9'- 6" O.D.	5'- 0"	7,700 lbs.	620659
10'- 6" O.D.	6'- 6"	9,600 lbs	620659
10'- 6" O.D.	7'- 6"	10,100 lbs.	620659

Cylindrical Type Buoy

Type 1

Dimensions: A = 5'9" & B = 12'0"

Displacement of Seawater: 20,700 lbs.

Total Buoyancy: 15,750 lbs.

Total Liquid Capacity as container: 2,300 gallons

Weight: 4,950 lbs.

Attachments: 1-3/4" mooring eyes top and bottom
wooden rubbing strips
16" I.D. manways

Type 2

Dimensions: A = 8'0" & B = 14'0"

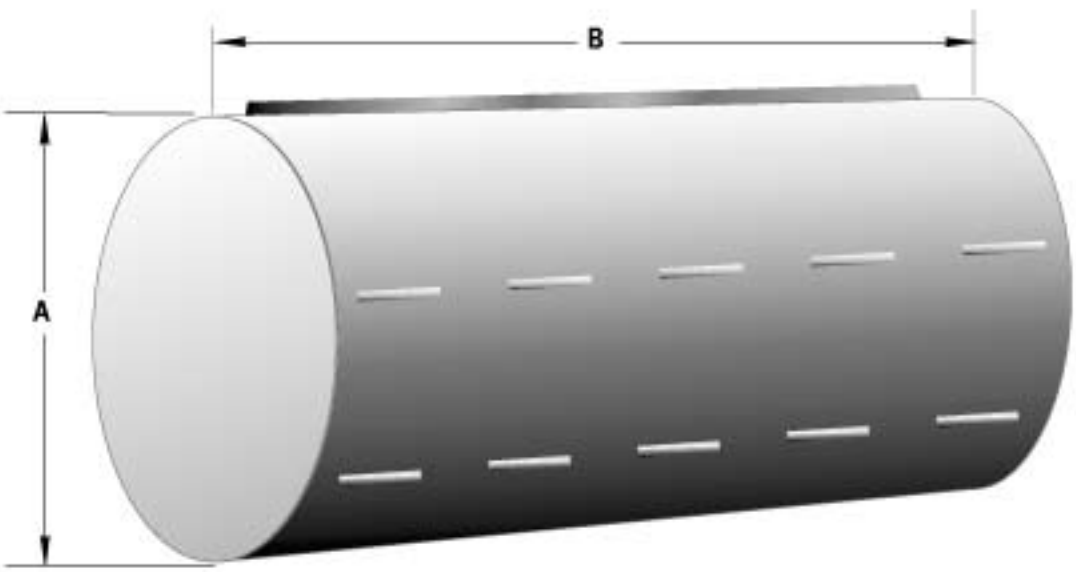
Displacement of Seawater: 45,270 lbs.

Total Buoyancy: 27,670 lbs.

Total Liquid Capacity as container: 5,264 gallons

Weight: 8,960 lbs.

Attachments: mooring eyes top and bottom
wooden rubbing strips
typical manways



Peg Top Buoy

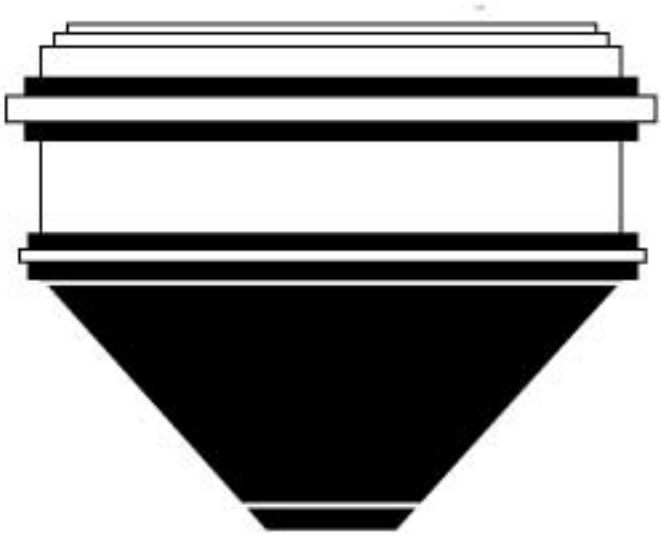
Dimensions: 13'0" dia. x 10'0" high

Displacement of Seawater: 48,100 lbs.

Total Buoyancy: 35,300 lbs.

Weight: 12,800 lbs.

Attachments: wooden rubbing strips
typical manways



Spherical Type Buoy

Dimensions: 58" dia. - 36" dia. - 28" dia. (typical)

58" is standard buoy:

Specifications

- Displacement of Seawater: 3,770 lbs.
- Total Buoyancy: 3,000 lbs.
- Total Liquid Capacity as container: 420 gallons
- Weight: 678 lbs.
- Attachments: 1/4" reinforced steel brackets top and bottom for attaching mooring lines

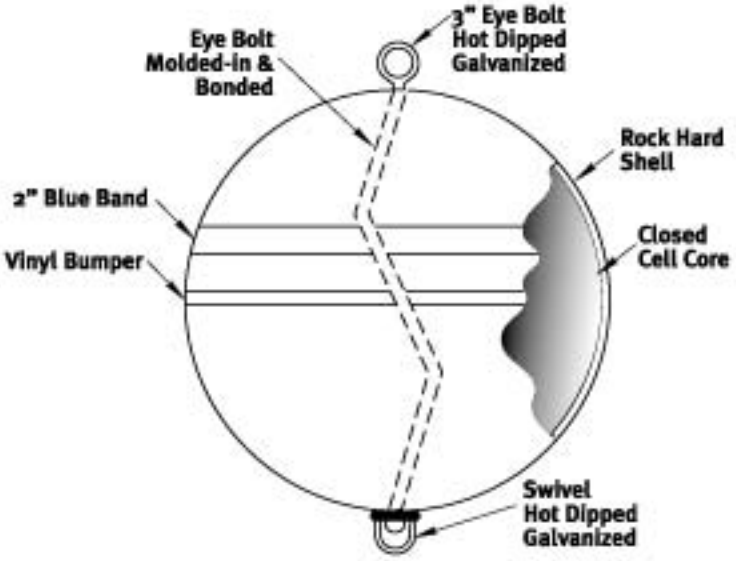
JIM-BUOY® Premium Mark V

The Jim Buoy Premium Mark V utilizes one of the toughest plastics available today. . .CJ-37. This fantastic plastic provides a ROCK HARD outer shell of a nominal 1/8" thickness that is absolutely seamless and almost indestructible!

The core is 3 lb. high density polyeurethane foam. All eye bolts are permanently bonded inside the buoy during the molding cycle, thus preventing wear and eventual loss of flotation.

JIM-BUOY's Premium Mark V Rock Hard Shell!

The CJ-37 space aged outer shell is almost indestructible–resists the hardest blows, acids and weather extremes!



Premium Mark V Selection Chart

All Mooring Buoys now available in Single Pack!

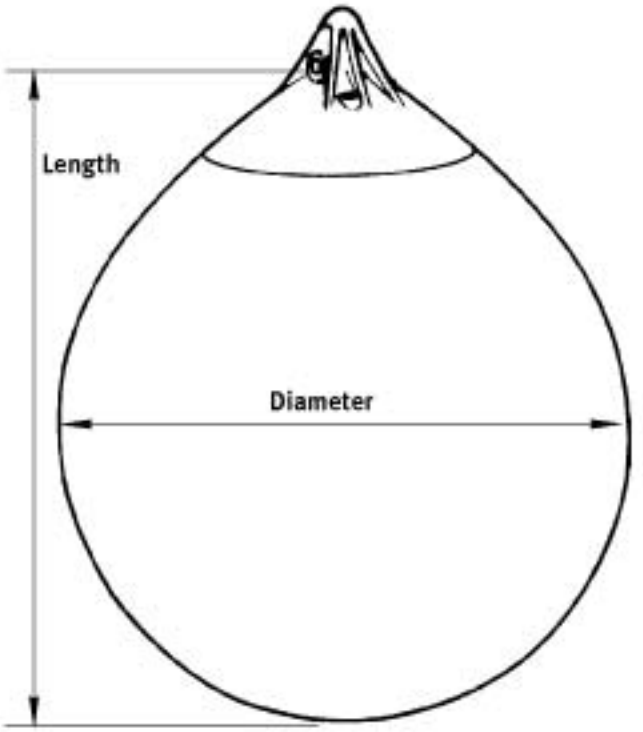
Model	Diam.	Swivel & Eye	Buoyancy (+ or - 5%)	Pack	Ship Wt.
4400	12"	1/2"	22 lbs.	4	26 lbs.
4401	15"	1/2"	46 lbs.	4	42 lbs.
4402	18"	1/2"	90 lbs.	1	20 lbs.
4402-T	18"	2" tube	87 lbs.	1	23 lbs.
4403	24"	5/8"	209 lbs.	1	27 lbs.
4403-T	24"	2" tube	196 lbs.	1	24 lbs.
4404	30"	5/8"	400 lbs.	1	47 lbs.
4404-T	30"	2" tube	396 lbs.	1	47 lbs.

®Jim-Buoy is a registered trademark of CAL-JUNE, INC.

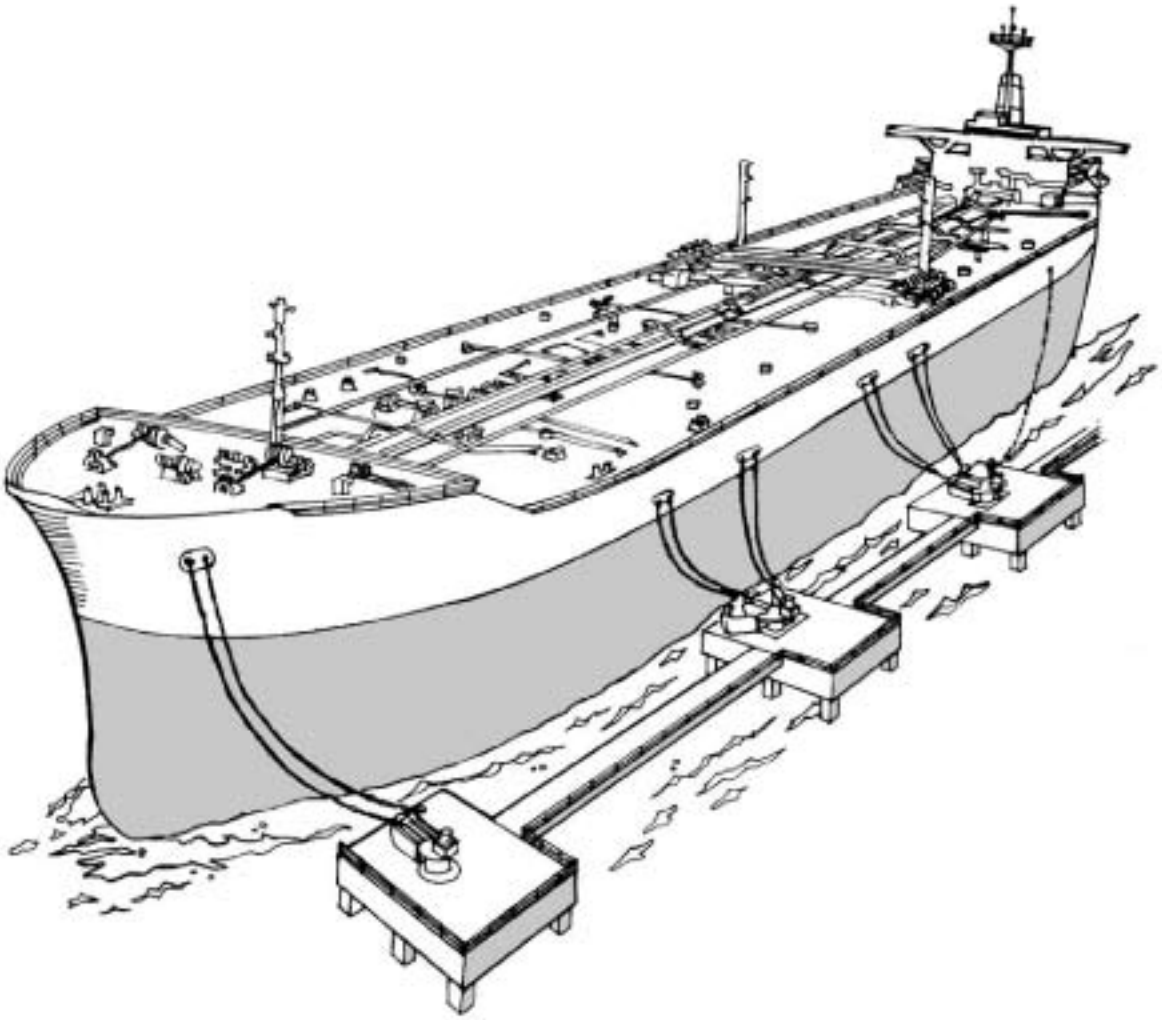
Inflatable Floats

Net Buoy/Raindrop Fender – red, white

Item No.	Buoyancy Lbs.	D x L Inches
W0/30"	14	9 x 11
W1/40"	33	12 x 15
W2/50"	70	16 x 20
W3/60"	132	19 x 24
W4/75"	247	24 x 29
W5/95"	507	30 x 37
W6/110"	950	37 x 47
W7/135"	1,488	44 x 56



Release Hooks, Buoy Hooks and Capstans



Washington Chain and Supply, Inc. Quick Release Mooring Hooks are available in nominal loads of 25, 50, 60, 80, 100, 150 and 200 tons.

All motors are explosion proof U.L. approved.

With or without integral power capstan.

Standard designs include single, double, triple & quad mounting.

Each hook of a multiple unit assembly can operate vertically, horizontally, and be released independent of the other hooks.

All hooks are suspended requiring no wearplate thereby eliminating the possibility of sparking.

Lubrication points are provided for ease of maintenance.

Each hook has a safety locking device.

Operation can be either manual or remote by hydraulic or electric control.

Load monitoring indicating and/or recording systems can be employed from a central control station.

Each release hook is tested and certified in our own test facility prior to shipment. Our test machines are capable of testing to 2,000,000 pounds. Our test machines are certified by the American Bureau of Shipping, Lloyds Register, U.S. Salvage Bureau, U.S. Dept. of Labor and OSHA

Push button switching allows one operator to release any or all hooks in the mooring system.

Our patented release hooks provide a safe, effective, and labor-saving method of ship mooring. Vessel tonnages and their relative distances from shore have increased dramatically over the years, but the Washington Chain release hook design handles virtually any situation. Whether it's a single or multiple-hook model, each is designed to swing completely free up to 180° horizontally and 45° vertically to maintain a straight pull on the lines at all times.

Safety, reliability, strength, and efficiency are the standards we set for our release hooks. Manufactured by Washington Chain since 1970, they consistently exceed every other manufacturer's specifications.

All working parts in our release hooks are heat-treated, cast alloy metals. The units are suspended, with no wearplate to maintain and no dangerous sparks. Any motors required are explosion proof and approved by Underwriters Laboratories (UL) and the Canadian Standards Association (CSA).

All models can release under full load, unlike buoy hooks, which must have slack line to release. As an additional safety feature, we've made a safety latch standard, which prevents the hooks from opening accidentally. The latch can be operated manually or from a remote station, with either a pneumatically or electrically controlled hydraulic release.

Knowing the demanding environments in which our release hooks will operate, we've made maintenance as easy as possible. All of them are hot-sprayed with zinc, then painted or galvanized. Grease fittings are recessed for both safety and ease of lubrication. Periodic maintenance is all that's required to maintain maximum efficiency.

Before leaving our plant, each hook is thoroughly tested. Every one rated 100 tons or less is individually tested to 1.6 times its rated capacity. Larger hooks are tested to American Bureau of Shipping (ABS) standards of 1.3 times rated capacity. Our test machines, which can provide up to 1,000 tons of pull, are recognized and certified by ABS, Lloyds Register of Shipping, the U.S. Department of Labor, and the Occupational Safety and Health Administration (OSHA).

Before any hooks are delivered to your location, we will have provided you with a bottom plate template, allowing you to set the anchor bolts into your structure as you're building, modifying, or repairing it. Then, when the units arrive, you merely bolt them down, and they're ready to operate. If you're replacing existing mooring equipment, we can tailor our bottom plate to fit your specifications, saving you substantial extra work.

Release hooks available in single, double, triple or quadruple configurations.

Single Release Hooks

Model show with integral capstan

Note: Hook can swing 180° horizontally and can elevate 45° vertically.

Users of our release hooks and capstans:

AMOCO Oil
ARCO
Baltimore Gas & Electric
British Petroleum
Chevron
Citgo Oil
Concrete Technology
Conoco Oil Co.
Crowley
Equilon
Express Marine
Exxon
General Tool
Magna Copper
Markey Machine
J.M. Martinac
Mitsubishi
McDermott
Mobil Oil
Murphy Oil
Neptune Terminal
N. American Shipbuilding
Penex Oil
Port of L.A.
Port of Tacoma
SeaLand Transportation
Shell Oil
Sunco Oil
Tesoro
Texaco
Transmountain
Union Carbide
Union Chemical
Union Oil
U.S. Army
U.S. Coast Guard
U.S. Navy
Westshore Terminals

Ask for our Release Hook Catalog

Triple Release Hooks

Note: Hook can swing 140° horizontally and can elevate 45° vertically.

You will find our hooks and capstans in:

Canada	Russia
Chile	Taiwan
France	Thailand
Indonesia	U. S. A.
Japan	Venezuela
Kuwait	West Indies
Mexico	

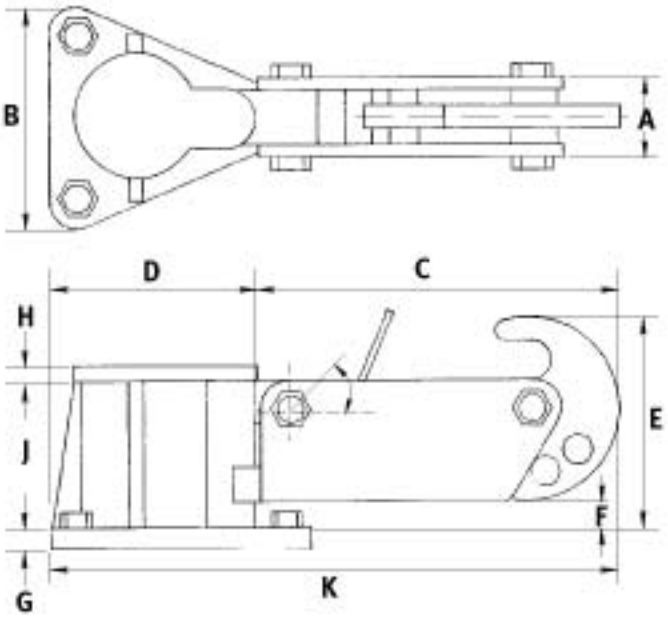
Ask for our Release Hook Catalog

Rotary Release Hooks

All of our standard air- and hydraulic-release hooks provide good dampening against the sudden shock of line release under load. These rotary-release models, though, go a step further. By spinning freely, they remove the strain from the hook itself, rather than using a bumper pad to absorb recoil. This provides for smoother release and allows the hooks to handle higher loads.

In addition, the smoother release prolongs the life of both the hook itself and the mooring lines it handles. Of course, like our other models, rotary release hooks are made of heat-treated alloy steel, are hot-sprayed with zinc before finishing, and include the same safety features and ease of maintenance.

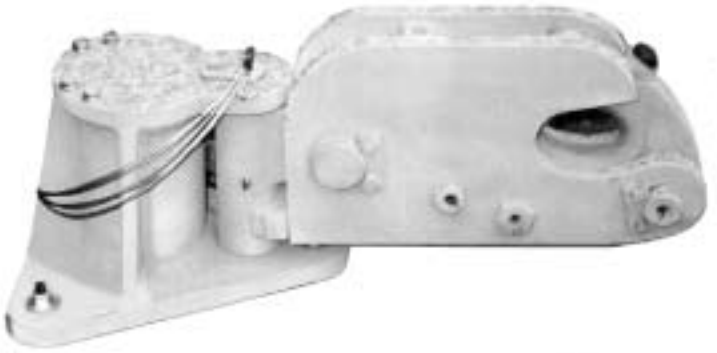
Note:
Hook in single configuration can swing 180° horizontally and can elevate 45° vertically. Each hook in a double hook configuration can swing 140° horizontally and can elevate 45° vertically.



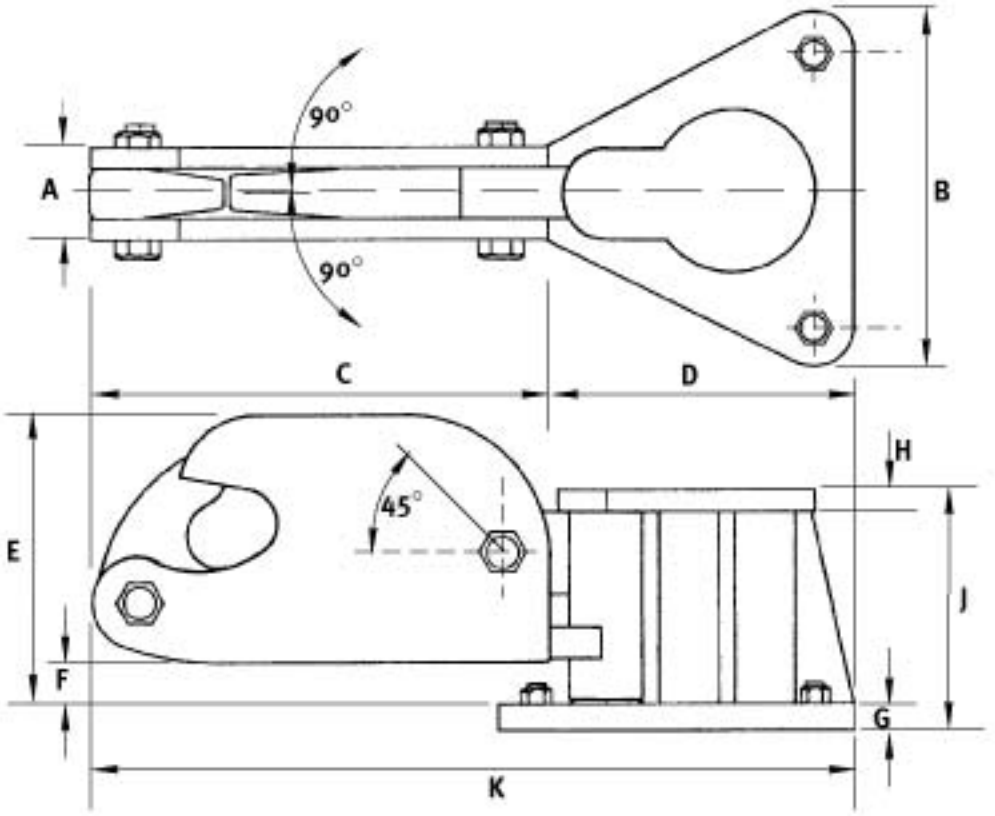
Hook Type	Line Size	Nominal Load Per Hook			Total Load Per Unit			Hook Weight			Weight Hook(s) w/Base
		60 Tons			60 Tons			579 Lbs.			889 Lbs.
RSRH 50/60	3	A	B	C	D	E	F	G	H	J	K
		7-1/2	19-1/2	30-1/2	17-1/2	16-1/2	1-1/2	2	1-3/4	13-1/2	50
		80 Tons			80 Tons			1,000 Lbs.			1,800 Lbs.
RSRH-80	3-1/2	A	B	C	D	E	F	G	H	J	K
		9-1/2	24	38-1/4	23	20-1/2	2	2-1/2	2-1/4	17-1/4	61-1/4
		100 Tons			100 Tons			1,450 Lbs.			2,200 Lbs.
RSRH-100	3-1/2	A	B	C	D	E	F	G	H	J	K
		9	24	42-1/2	23	23	2	2-1/2	2-1/4	17-1/4	69
		150 Tons			300 Tons			2,250 Lbs.			3,073 Lbs.
RSRH-150	5	A	B	C	D	E	F	G	H	J	K
		10-1/2	25	52-1/2	23	28	2	2-1/2	2-1/4	17-1/4	75-1/2
		200 Tons			200 Tons			2,350 Lbs.			3,200 Lbs.
RSRH-200	5	A	B	C	D	E	F	G	H	J	K
		10-1/2	25	52-1/2	23	28	2	2-1/2	2-1/2	17-1/4	75-1/2

Note: All dimensions in inches

Captive Release Hook
(Light Towing Hook)



Recognizing that operators' needs vary, we also offer a "captive" release hook for light towing. This hook is designed to prevent the accidental release of the tow line should it go slack, and allows for rapid hookup and release of tug-and-barge combinations.



Note: Hook can swing 180° horizontally and can elevate 45° vertically.

Ask for our Release Hook Catalog

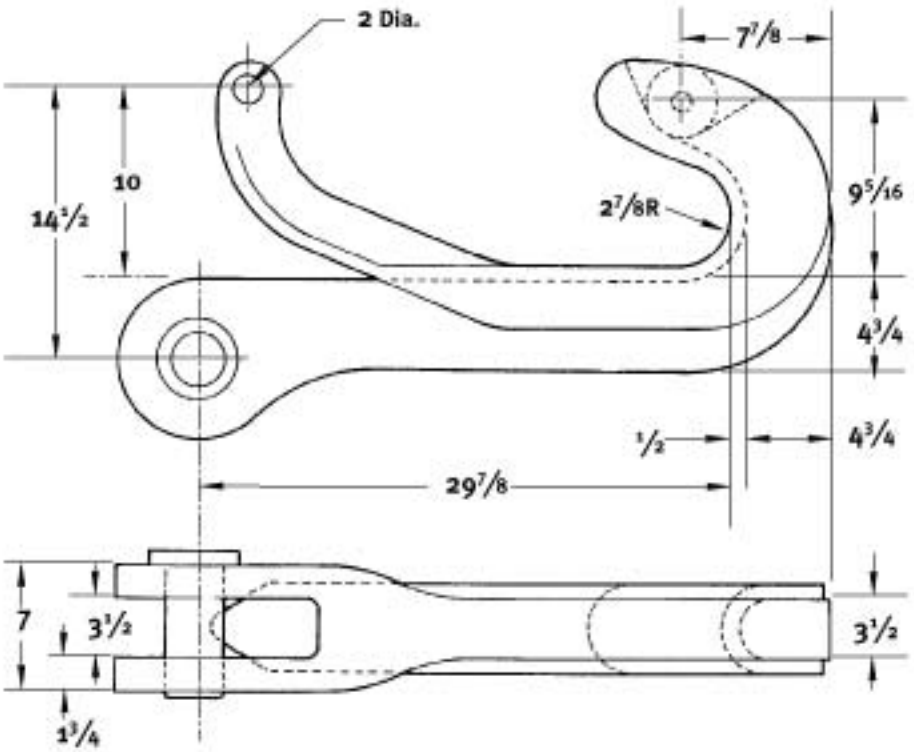
Hook Type	Line Size	Nominal Load Per Hook			Total Load Per Unit			Hook Weight			Weight Hook(s) W/Base
CSRH-50	3	50 Tons			50 Tons			166 Lbs.			304 Lbs.
		A	B	C	D	E	F	G	H	J	K
		4-1/2	17-1/2	22-1/4	15	14-1/4	2	1-1/4	1	10-1/2	37-1/4

NOTE:All dimensions in inches.

Buoy Release Hook

With world shipping moving towards larger and more sophisticated vessels especially for petroleum products, a device for fast and efficient mooring has become a necessity.

The quick release mooring hook manufactured by Washington Chain and Supply, Inc. fulfills all the requirements for a positive labor saving method of mooring ships.



Available in proof tests of 300,000 and 400,000 pounds. Total Weight: 375 pounds.

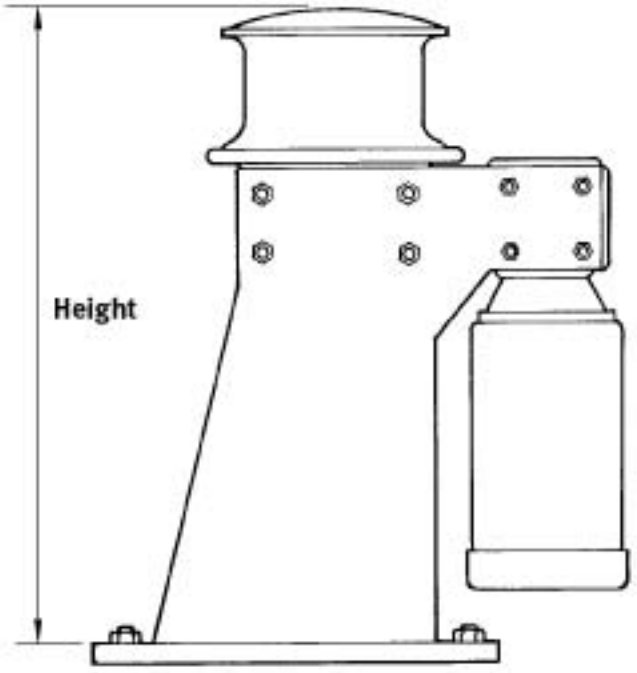
Special opening Quick Release Hook (400,000 pounds) Weight: 570 pounds.

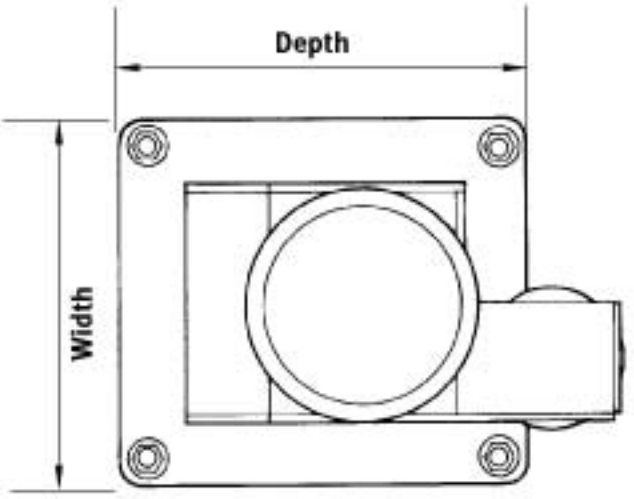
Meets MIL-H-11884A

Dimensions above are in inches: weight is in pounds.

Capstans

We manufacture a variety of capstans, both freestanding and as an integral part of another unit. Our standard models will meet the needs of almost any application, but custom fabrication is also available to accommodate specific requirements. All models are available with either one-or-two-way drive, and with a variety of capstan head sizes and styles to match your specifications.





FSC-7.5

Model	HP	Line Speed (fpm)	Line Pull (lbs.)	Weight (approx.)	Height	Width	Depth
FSC-5 (LSC)	5	75	1,700	900	44	22-1/2	30
FSC-7.5 (LSC)	7.5	75	2,600	950	44	22-1/2	32
FSC-10 (LSC)	10	75	3,000	1,050	44	22-1/2	32
FSC-15 (LSC)	15	75	5,000	2,300	44	28	38

Note: All dimensions in inches; other line speed and line pull combinations are available.

Welded Chain & Accessories

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WARNING

Low and high carbon steel welded and weldless chain and attachments are not to be used for overhead lifting purposes or where its failure is likely to cause damage to property or persons.

Washington Chain can custom fabricate and proof test to your specifications. We carry a vast inventory of domestic and import chain and fittings.

General Information

Definitions

RATED LOAD VALUE – The maximum recommended load that should be exerted on the item. The following terms are also used for the term Rated Load: "W.L.L," "Working Load Limit," and the "Resultant Safe Working Load." All rated load values, unless noted otherwise, are for in-line pull with respect to the centerline of the item.

WORKING LOAD LIMIT – The "Working Load Limit" is the maximum load in pounds which should ever be applied to chain, when the chain is new or "in as new" condition, and when the load is uniformly applied in direct tension to a straight length of chain.

PROOF LOAD – The average load to which an item may be subjected before visual deformation occurs or a load that is applied in the performance of a proof test.

PROOF TEST – The "Proof Test" is a term designating the tensile test applied to new chain for the sole purpose of detecting injurious defects in the material or manufacture. It is the load in pounds which the chain has withstood under a test in which the load has been applied in direct tension to a straight length of chain.

MINIMUM ULTIMATE LOAD – The "Minimum Ultimate Load" is the minimum load at which new chain will break when tested by applying direct tension to a straight length of chain at a uniform rate of speed in a testing machine.

SHOCK LOAD – A resulting load from the rapid change of movement, such as impacting or jerking, of a static load. A Shock Load is generally significantly greater than the static load.

SAFETY FACTOR – An industry term denoting theoretical reserve capability. Usually computed by dividing the catalog stated ultimate load by the catalog stated working load limit and generally expressed as a ratio, for example 5 to 1.

ATTACHMENTS – Any attachments, such as hooks or links, should have a rated "Working Load Limit" at least equal to the chain with which it is used.

CAUTION – Only alloy chain should be used for overhead lifting applications.

It must be recognized that certain factors in the usage of chain and attachments can be abusive and lessen the load that the chain or attachments can withstand. Some examples are twisting of the chain, disfigurement, deterioration by straining, usage, weathering and corrosion, rapid application of load or jerking applying excessive loads, and sharp corners cutting action.

Due to the crushing effect Grab Hooks have upon chain, the design factor for all assemblies must be reduced by 20% with Grab Hook applications.

All ratings given in tons refer to short tons of 2,000 lbs.

Chain Inspection

INSPECTION AND REMOVAL FROM SERVICE PER ANSI B30.9

FREQUENT INSPECTION

Normal Service - Monthly
Severe Service - Daily to Monthly

Check chain and attachments for wear, nicks, cracks, breaks, gouges, stretch, bend, weld splatter, discoloration from excessive temperature, and throat openings of hooks.

1. Chain links and attachments should hinge freely to adjacent links.
2. Latches on hooks, if present, should hinge freely and seat properly without evidence of permanent distortion.

PERIODIC INSPECTION – INSPECTION RECORDS REQUIRED

Normal Service - Yearly
Severe Service - Monthly

This inspection shall include everything in a frequent inspection plus each link and end attachment shall be examined individually, taking care to expose inner link surfaces of the chain and chain attachments.

1. Worn links should not exceed values given in table 1 or recommended by the manufacturer.
2. Sharp transverse nicks and gouges should be rounded out by grinding and the depth of the grinding should not exceed values in Table 1.
3. Hooks should be inspected in accordance with ASME B30.10.
4. If present, latches on hooks should seat properly, rotate freely, and show no permanent distortion.
5. Chains use OSHA and ASME regulations and safety information.

Table 1

MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK	
Normal Chain or Coupling Link Cross Section (in.)	**Maximum Allowable Wear Diameter (in.)**
9/32	.037
3/8	.052
1/2	.069
5/8	.084
3/4	.105
7/8	.116
1	.137
1-1/4	.169

REFER TO ANSI B30.9 FOR FULL DETAILS

Note: Exposure to temperatures in excess of 400° (F) or 200° (c) reduce the Working Load Limit.

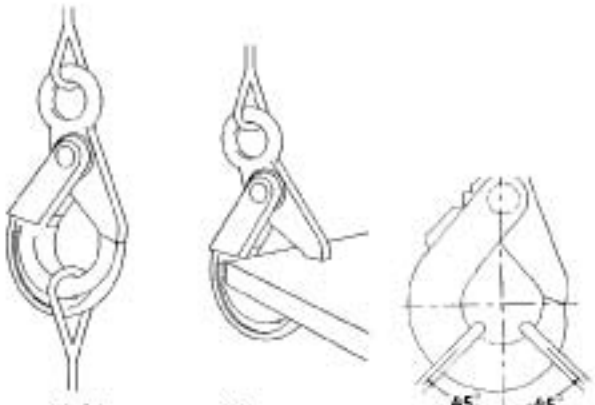
Crosby® SHUR-LOC® Hook

⚠ SEE APPLICATION AND WARNING INSTRUCTIONS

- For hooks used in frequent load cycles or pulsating load, the hook and threads should be periodically inspected by magnetic particle or Dye Penetrant. (Note: Some disassembly may be required.)
- Never use a hook whose throat opening has been increased, or whose tip has been bent or twisted.
- Never use a hook that is worn beyond designated limits.
- Remove from service any hook with a crack, nick, or gouge.
- Never repair, alter, rework, or reshape a hook by welding, heating, burning, or bending.
- Never side load, back load, or tip load a hook . (See Below.)

- Do not swivel the S-322 or S-326A swivel hook while it is supporting a load.
- The use of a latch may be mandatory by regulations or safety codes; e.g., OSHA, MSHA, ANSI/ASME B30, Insurance, etc.
- Efficiency of synthetic sling material may be reduced when used in eye or bowl of hook.

®Crosby is a registered trademark of the Crosby Group, Inc.
®Shur-Loc is a registered trademark of the Crosby Group, Inc.



Right
Figure 1

Wrong
Figure 2

Figure 3

- Always make sure the hook supports the load. (See Figure 1.)
- Do not use hook tip for lifting. (See Figure 2.)
- When placing two (2) sling legs in hook, make sure the angle from vertical to the leg nearest the hook tip is not greater than 45 degrees, and the included angle between the legs does not exceed 90 degrees.* (See Figure 3.)
- See ANSI/ASME B30.10 "Hooks" for additional information.

*For two legged slings with angles greater than 90°, use an intermediate link such as a master link or bolt type shackle to collect the legs of the slings. The intermediate link can then be placed over the hook to provide an in-line load on the hook. This approach must also be used when using slings with three or more legs.

⚠ WARNING

- **Loads may disengage from hook if proper procedures are not followed.**
- **A falling load may cause serious injury or death.**
- **Never use hook unless hook and latch are fully closed and locked.**
- **Keep body parts clear of pinch point between hook tip and hook latch when closing.**
- **Do not use hook tip for lifting.**
- **Shank threads may corrode and/or strip and drop the load.**
- **Never apply more force than the hook's assigned Working Load Limit (WLL) rating.**
- **See OSHA Rule 1926.550 (g) for personnel hoisting by cranes or derricks. A Crosby 316, 317, 318, or 326 hook may be used for lifting personnel.**
- **Use only genuine Crosby parts as replacements.**
- **Read and understand these instructions before using hook.**

Crosby® Forged Eye Bolt

⚠ SEE APPLICATION AND WARNING INSTRUCTIONS

Regular Nut Eye Bolt
G-291

Shoulder Nut Eye Bolt
G-277

Machinery Eye Bolt
S-279

Important Safety Information - Read & Follow

Inspection/Maintenance Safety:

- Always inspect eye bolt before use.
- Never use eye bolt that shows signs of wear or damage.
- Never use eye bolt if eye or shank is bent or elongated.
- Always be sure threads on shank and receiving holes are clean.
- Never machine, grind, or cut eye bolt.

Assembly Safety:

- Never exceed load limits specified in Table 1.
- Never use regular nut eye bolts for angular lifts.
- Always use shoulder nut eye bolts (or machinery eye bolts) for angular lifts.
- For angular lifts, adjust working load as follows:

Direction of Pull	Adjust Working Load
45 degrees	30% of rated working load
90 degrees	25% of rated working load

- Never undercut eye bolt to seat shoulder against the load.
- Always countersink receiving hole or use washers to seat shoulder.
- Always screw eye bolt down completely for proper seating.
- Always tighten nuts securely against the load.

⚠ WARNING

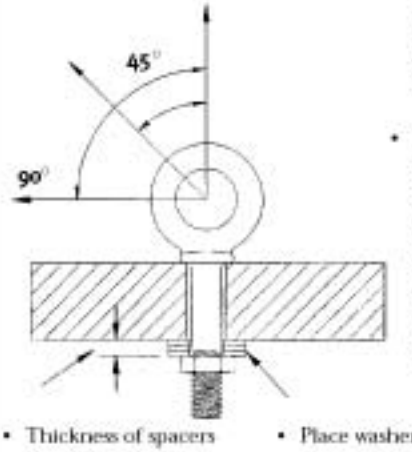
- **Loads may slip or fall if proper eye bolt assembly and lifting procedures are not used.**
- **A falling load can seriously injure or kill.**
- **Read and understand both sides of these instructions, and follow all eye bolt safety information presented here.**
- **Read, understand, and follow information in diagrams and charts below before using eye bolt assemblies.**

Table 1 (In-Line Load)

Size (in.)	Working Load Limit (lbs.)
1/4	650
5/16	1,200
3/8	1,550
1/2	2,600
5/8	5,200
3/4	7,200
7/8	10,600
1	13,300
1-1/4	21,000
1-1/2	24,000

Shoulder Nut Eye Bolt – Installation for Angular Loading

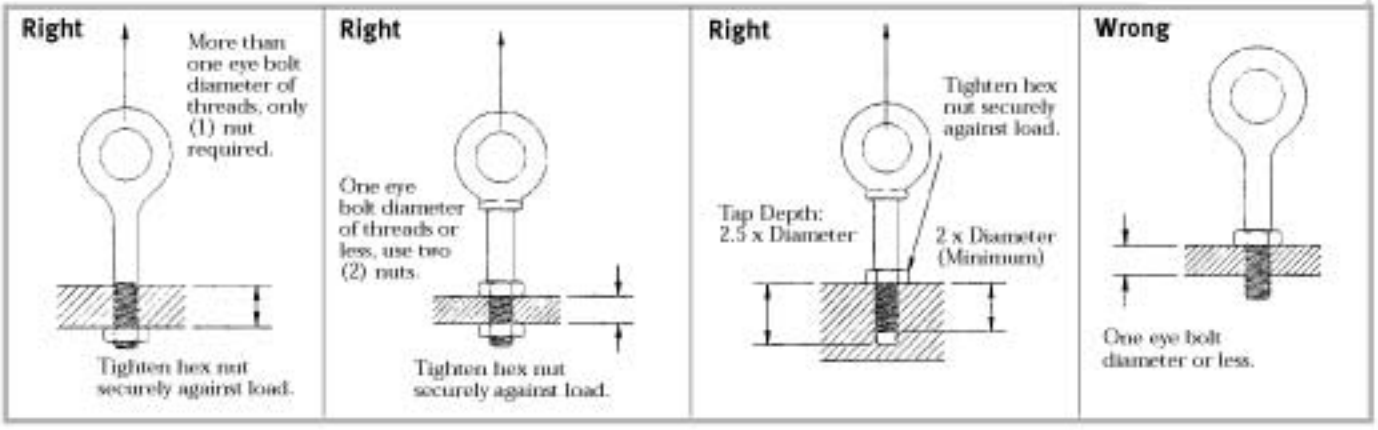
IN-LINE



- The threaded shank must protrude through the load sufficiently to allow full engagement of the nut.
- If the eye bolt protrudes so far through the load that the nut cannot be tightened securely against the load, use properly sized washers to take up the excess space BETWEEN THE NUT AND THE LOAD.
- Thickness of spacers must exceed this distance between the bottom of the load and the last thread of the eye bolt.
- Place washers or spacers between nut and load so that when the nut is tightened securely, the shoulder is secured flush against the load surface.

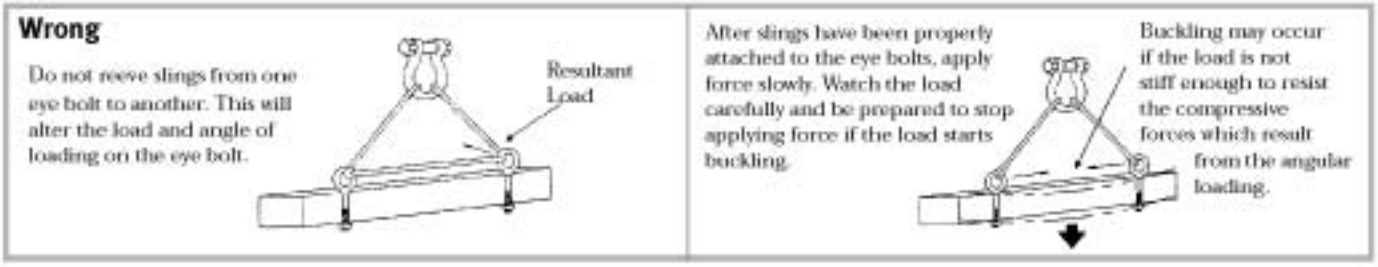
IMPORTANT – Read and understand these instructions before using eye bolts.

Regular Nut & Shoulder Nut Eye Bolt – Installation for In-Line Loading



Operating Safety

- Always stand clear of load.
- Always lift load with steady, even pull - do not jerk.
- Always apply load to eye bolt in the plane of the eye - not an angle.
- Never exceed the capacity of the eye bolt - see Table I.
- When using lifting slings or two or more legs, make sure the loads in the legs are calculated using the angle from the vertical to the leg and properly size the shoulder nut or machinery eye bolt for the angular load.



Machinery Eye Bolt – Installation for In-Line & Angular loading

These eye bolts are primarily intended to be installed into tapped holes.

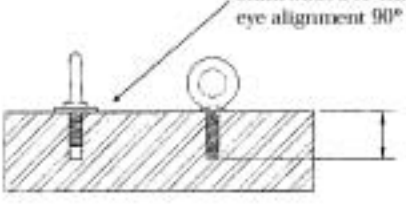
1. After the loads on the eye bolts have been calculated, selection the proper size eye bolt for the job. For angular lifts, adjust working load as follows:

Direction of Pull	Adjust Working Load
45 degrees	30% of rated working load
90 degrees	25% of rating working load

2. Drill and tap the load to the correct sizes to a minimum depth of one-half the eye bolt size beyond the shank length of the machinery eye bolt.
3. Thread the eye bolt into the load until the shoulder is flush and securely tightened against the load.
4. If the plane of the machinery eye bolt is not aligned with the sling line, estimate the amount of unthreading rotation necessary to align the plane of the eye properly.
5. Remove the machinery eye bolt from the load and add shims (washers) of proper thickness to adjust the angle of the plane of the eye to match the sling line. Use Table II to estimate the required shim thickness for the amount of unthreading rotation required.

Table II

Eye Bolt Size (in.)	Shim Thickness Required to Change Rotation 90° (in.)
1/4	.0125
5/16	.0139
3/8	.0156
1/2	.0192
5/8	.0227
3/4	.0250
7/8	.0278
1	.0312
1-1/4	.0357
1-1/2	.0417



Carbon–Welded Chain

For additional information, see page 84.

	Chain Size (In.)	Nominal Inside Ink Dimensions (In.) Length	Width	Weight Per 100 Ft. (Lbs.)	Working Load Limit (Lbs.)
Grade 30 Proof Coil Chain	3/16	.96	.41	38	800
	1/4	1.01	.48	66	1,300
	5/16	1.11	.50	98	1,900
	3/8	1.24	.62	144	2,650
	1/2	1.51	.82	278	4,500
	5/8	1.88	1.01	422	6,900
	3/4	2.13	1.13	628	10,600
	1	2.77	1.51	1,069	13,950
Grade 43 High Test Chain	1/4	1.01	.48	71	2,600
	5/16	1.11	.50	98	3,900
	3/8	1.24	.62	144	5,400
	1/2	1.51	.82	278	9,200
	5/8	1.88	1.01	422	11,500
	3/4	2.13	1.13	606	16,200
	7/8	2.52	1.38	769	22,500
	1	2.77	1.51	1,069	26,500
Grade 70 Binding Chain	1/4	.84	.48	74	3,150
	5/16	.99	.47	100	4,700
	3/8	1.15	.54	156	6,600
	7/16	1.30	.62	204	8,750
	1/2	1.45	.73	259	11,300

Dimensions and weights are approximate and subject to variations.

G-30

G-43

G-70

Welded Graded Chain

Welded graded chain is an industrial grade chain used extensively in rigging, towing and overhead lifting applications. CM® graded chains are manufactured in accordance with the NACM Specification for chain, ASTM Standard A391 and ASTM Standard A413. The standardized grade designations are 30, 43 and 70 for carbon steel chain, and 63 and 80 for alloy steel chain.

The grade number relates to the strength level of the chain, with the grade number increasing as the strength of the chain increases.

Only alloy chain is designed for overhead lifting. The other grade designated chains are not made from alloy steel and should not be used for overhead lifting.

Stainless Steel Chain

Material	Diameter		Link Dimensions Inside		Working Load Limit	Links Per	Weight Per
Nominal In.	Actual In.	MM	Length In.	Width In.	Lbs.	Ft.	100 Ft. Lbs.
1/8	.158	4	.88	.287	375	13.6	18
3/16	.209	5.3	.96	.401	1,200	12.5	37
1/4	.276	7	1.19	.480	2,000	10.1	63
5/16	.327	8.3	1.24	.510	2,850	9.7	93
3/8	.394	10	1.33	.570	3,550	9.0	142
1/2	.512	13	1.72	.748	6,500	6.9	240
5/8	.630	16	2.11	.818	9,500	5.7	358
3/4	.787	20	2.75	1.060	15,00	4.3	551

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Grade 80 Alloy Chain Slings

Working Load Limit – 4 to 1 Design Factor

Spectrum 8 Alloy Chain Size		Single Leg	Double Leg			Triple and Quad Leg		
		90°	60°	45°	30°	60°	45°	30°
(MM)	(In.)							
6	7/32	2,500	3,600	3,000	2,100	5,500	4,400	3,200
7	1/4 (9/32)	3,500	6,100	4,900	3,500	9,100	7,400	5,200
8	5/16	4,500	7,800	6,400	4,500	11,700	9,500	6,800
10	3/8	7,100	12,300	10,000	7,100	18,400	15,100	10,600
13	1/2	12,000	20,800	17,000	12,000	31,200	25,500	18,000
16	5/8	18,100	31,300	25,600	18,100	47,000	38,400	27,100
20	3/4	28,300	49,000	40,000	28,300	73,500	60,000	42,400
22	7/8	34,200	59,200	48,400	34,200	88,900	72,500	51,300
26	1	47,700	82,600	67,400	47,700	123,900	101,200	71,500
32	1-1/4	72,300	125,200	102,200	72,300	187,800	153,400	108,400

For additional information, see page 84.

The design factor of 4 to 1 on Alloy Chain agrees with the design factor used by the International Standards Organization (I.S.O.) and ANSI B30.9 is the preferred set of Working Load Limit values to be used.

To Make Your Grade 80 or Crosby® Spectrum 8® Alloy Chain Sling

Follow these simple steps in making a sling assembly:

Determine the maximum load to be lifted by the sling assembly.

Choose the type of sling assembly suited for the shape of the load and the size of the sling assembly for the load to be lifted. The decision must take into account the angle of the sling legs in multileg slings.

Determine the overall reach for bearing point of master link to bearing point on hook.

Select components, assemble chain and components. Affix sling identification tag to sling. The tag should be stamped with size chain, reach, type sling, Working Load Limit at a specific angle of lift, and some identifying number for record keeping.

If measurement comes in the link, cut the following link. For two leg type count the links and use an even number for clevis hooks and an odd number for eye hooks. This will position hooks in the same plane. In multileg slings always use the same number of links in each leg.

Caution

Derate chain in accordance with working load limit chart shown above.

A chain grab hook application will result in 20% reduction of chain capacity.

Care should be taken to observe these derated applications or chain may fracture or permanently stretch at loads less than the advertised chain ultimate strength and proof load respectively.

Grade 80 Alloy Chain Specifications

Chain Size (In.)	Nominal Inside Length Inches	Nominal Inside Width Inches	Weight Per 100-Ft. Lbs.	Working Load Limits Lbs.
9/32 (1/4)	.846	.405	67	3,500
5/16	.940	.460	114	4,500
3/8	1.209	.567	144	7,100
1/2	1.571	.736	243	12,000
5/8	1.937	.906	372	18,100
3/4	2.417	1.134	581	28,300
7/8	2.661	1.248	699	34,200
1	2.900	1.400	996	47,700
1-1/4	3.710	1.670	1,575	72,300

®Spectrum 8 is a registered trademark of the Crosby Group, Inc.

Crosby® Chain Sling Configurations

"Proof Tested" Parts Needed to Make Self Assembled Slings

KEY TO SELECTING PROPER COMPONENTS

To locate proper size Crosby chain fittings for required chain size, use following steps:

1. Locate proper table (below) for type of sling being assembled (Single, Double, Triple or Quad leg).
2. Determine size of chain required from the Working Load Limit table on page 89.
3. Locate proper chain size in the "Spectrum 8 Chain Size" column in the proper table below.
4. Follow row across until desired style of fitting is found. The size shown indicates the proper size Crosby chain fitting to be used.

Single Leg Sling **Double Leg Sling** **Triple Leg Sling** **Quadruple Leg Slings**

Single Leg Sling

Spectrum 8 Chain Size	Master Link A-342	Master Link Assembly A-345	Master Link with Flat A-344	Master Link Assembly with Flat A-347	Lok-A-Loy Link A-337	Chain Coupler S-325	Latching Clevis Chain Hook S-314	Latching Eye Hook S-315	SHUR-LOC Eye Hook S-316	SHUR-LOC Clevis Hook S-317	SHUR-LOC Swivel Hook S326	Clevis Sling Hook A-339	Clevis Grab Hook A-338	Eye Sling Hook A-327	Eye Grab Hook A-328	Eye Foundry Hook A-329
1/4	1/2	–	7/16	–	1/4	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4	1/4	1/4	1/4	1/4
5/16	5/8	–	1/2	–	5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	–	–	–	–	–
3/8	3/4	–	11/16	–	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
1/2	7/8	–	3/4	–	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
5/8	1	–	1	–	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	–	5/8
3/4	1-1/4	–	1-1/4	–	3/4	–	–	–	–	–	–	3/4	3/4	3/4	3/4	3/4
7/8	1-1/2	–	1-1/4	–	7/8	–	–	–	–	–	–	7/8	7/8	7/8	7/8	7/8

Double Leg Sling

Spectrum 8 Chain Size	Master Link A-342	Master Link Assembly A-345	Master Link with Flat A-344	Master Link Assembly with Flat A-347	Lok-A-Loy Link A-337	Chain Coupler S-325	Latching Clevis Chain Hook S-314	Latching Eye Hook S-315	SHUR-LOC Eye Hook S-316	SHUR-LOC Clevis Hook S-317	SHUR-LOC Swivel Hook S326	Clevis Sling Hook A-339	Clevis Grab Hook A-338	Eye Sling Hook A-327	Eye Grab Hook A-328	Eye Foundry Hook A-329
1/4	1/2	–	1/2	–	1/4	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4	1/4	1/4	1/4	1/4
5/16	5/8	–	11/16	–	5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	–	–	–	–	–
3/8	3/4	–	3/4	–	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
1/2	1	–	7/8	–	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
5/8	1-1/4	–	1-1/8	–	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	–	5/8
3/4	1-1/2	–	1-1/4	–	3/4	–	–	–	–	–	–	3/4	3/4	3/4	3/4	3/4
7/8	1-3/4	–	–	–	7/8	–	–	–	–	–	–	7/8	7/8	7/8	7/8	7/8

Triple and Quadruple Leg Sling

Spectrum 8 Chain Size	Master Link A-342	Master Link Assembly A-345	Master Link with Flat A-344	Master Link Assembly with Flat A-347	Lok-A-Loy Link A-337	Chain Coupler S-325	Latching Clevis Chain Hook S-314	Latching Eye Hook S-315	SHUR-LOC Eye Hook S-316	SHUR-LOC Clevis Hook S-317	SHUR-LOC Swivel Hook S326	Clevis Sling Hook A-339	Clevis Grab Hook A-338	Eye Sling Hook A-327	Eye Grab Hook A-328	Eye Foundry Hook A-329
1/4	–	3/4	–	3/4	1/4	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4	1/4	1/4	1/4	1/4
5/16	7/8	1	–	3/4	5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	1/4 - 5/16	–	–	–	–	–
3/8	–	1	–	7/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
1/2	–	1-1/4	–	1-1/8	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
5/8	–	1-1/2	–	1-1/4	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	–	5/8
3/4	–	1-3/4	–	–	3/4	–	–	–	–	–	–	3/4	3/4	3/4	3/4	3/4
7/8	–	2	–	–	7/8	–	–	–	–	–	–	7/8	7/8	7/8	7/8	7/8

Crosby® Chain Sling Configurations

The Slings shown here are standard assemblies that can be made from components and alloy chain.

Type CO | Type SOS | Type SOG | Type SOF | Type SSS | Type SGG | Type SGS | Type ASOS

Type	Description	Type	Description
CO	Single Chain Sling with Master Link each end	SSS	Single Chain Sling with Sling Hook each end
SOS	Single Chain Sling with Master Link and Sling Hook	SGG	Single Chain Sling with Grab Hook each end
SOG	Single Chain Sling with Master Link and Grab Hook	SGS	Single Chain Sling with Grab Hook and Sling Hook

Type DOS | Type DOG | Type DOF | Type ADOS

Type	Description
DOS	Double Chain Sling with Master Link and Sling Hook
DOG	Double Chain Sling with Master Link and Grab Hook
DOF	Double Chain Sling with Master Link and Foundry Hook
ADOS	Adjustable Double Chain Sling with Master Link and Sling Hook

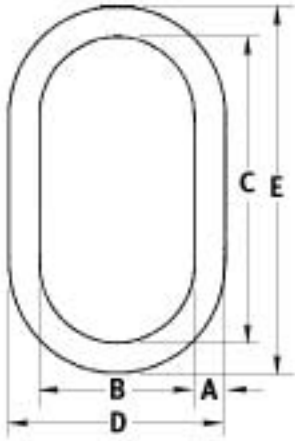
Type TOS | Type TOG | Type TOF | Type QOS | Type QOG | Type QOF

Type	Description	Type	Description
TOS	Triple Chain Sling with Master Link & Sling Hook	QOS	Quadruple Chain Sling with Master Link & Sling Hook
TOG	Triple Chain Sling with Master Link & Grab Hook	QOG	Quadruple Chain Sling with Master Link & Grab Hook
TOF	Triple Chain Sling with Master Link & Foundry Hook	QOF	Quadruple Chain Sling with Master Link & Foundry Hook

Crosby®Grade 8 Alloy Fittings

Master Link

- Alloy Steel – Quenched and Tempered.
- Individually proof tested to 2 times Working Load Limit with certification unless otherwise noted.
- Sizes from 1/2" to 2" are drop forged.



Size	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Proof Load (Lbs.)	Dimensions (In.)					
				A	B	C	D	E	Deformation Indicator
** 1/2	7,000	.82	14,000	.50	2.50	5.00	3.50	6.00	3.00
** 5/8	9,000	1.52	18,000	.63	3.00	6.00	4.25	7.25	3.50
** 3/4	12,300	2.07	24,600	.75	2.75	5.50	4.25	7.00	3.50
** 7/8	14,000	3.40	28,400	.88	3.75	6.38	5.50	8.14	4.50
** 1	24,360	4.85	48,700	1.00	3.50	7.00	5.50	9.00	4.50
** 1-1/4	36,000	9.57	72,400	1.25	4.38	8.75	6.88	11.25	5.50
** 1-1/2	54,300	16.22	113,200	1.50	5.25	10.50	8.25	13.50	6.50
** 1-3/4	84,900	25.22	169,800	1.75	6.00	12.00	9.50	15.50	7.50
** 2	102,600	37.04	205,200	2.00	7.00	14.00	11.00	18.00	9.00
†† 2-1/4	143,100	54.10	289,200	2.25	8.00	16.00	12.50	20.50	–
**†† 2-1/2	147,300	67.75	–	2.50	8.00	16.00	13.00	21.00	–
†† 2-3/4	216,900	87.70	433,800	2.75	9.50	16.00	15.00	21.50	–
†† 3	228,000	115.00	–	3.00	9.00	18.00	15.00	24.00	–
†† 3-1/4	262,200	145.00	–	3.25	10.00	20.00	16.50	26.50	–
†† 3-1/2	279,000	194.00	–	3.50	12.00	24.00	19.00	31.00	–
†† 3-3/4	336,000	198.00	–	3.75	10.00	20.00	17.50	27.50	–
†† 4	373,000	228.00	–	4.00	10.00	20.00	18.00	28.00	–
†† 4-1/4	354,000	302.00	–	4.25	12.00	24.00	20.50	32.50	–
†† 4-1/2	360,000	345.00	–	4.50	14.00	28.00	23.00	37.00	–
†† 4-3/4	389,000	436.00	–	4.75	14.00	28.00	23.50	37.50	–
†† 5	395,000	516.00	–	5.00	15.00	30.00	25.00	40.00	–

* Minimum Ultimate Load is 5 times Working Load Limit.

** Proof test load equals or exceeds the requirement of ASTM A952 (8.1) and ASME B30.9-1.4 for the chain size and number of legs shown on page 89.

† Based on single leg sling (in-line load), or resultant load on multiple legs with an included angle less than or equal to 120°. For use with chain slings, refer to page 89.

†† Welded Master Link.

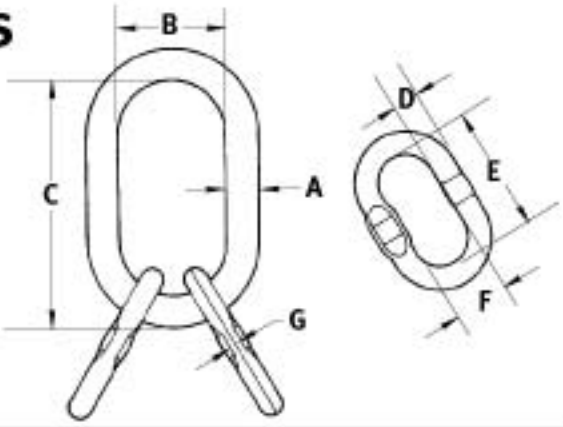
See page 84 and 89 for additional chain information.

Crosby®Grade 8 Alloy Fittings

Master Link Assembly

- Alloy Steel – Quenched and Tempered.
- Individually proof tested at 2 times Working Load Limit with certification.
- Proof test certification shipped with each link.

A-345



Size (In.)	Working Load Limit*† (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)								
			A	B	C	D	E	F	G	Deformation Indicator	Flat Size
3/4	10,500	2.60	.75	2.75	5.50	.56	3.35	1.57	.30	3.50	1/4 – 5/16", 8mm
1	24,360	6.10	1.00	3.50	7.00	.69	3.94	2.36	.33	4.50	3/8", 10mm
1-1/4	36,000	13.20	1.25	4.38	8.75	.88	3.94	2.36	.53	5.50	1/2", 13mm
1-1/2	54,300	24.20	1.50	5.25	10.50	1.13	5.91	2.76	.65	6.50	5/8", 16mm
1-3/4	84,900	35.60	1.75	6.00	12.00	1.25	6.30	3.54	.73	7.50	3/4", 20mm
2	102,600	57.30	2.00	7.00	14.00	1.50	7.09	3.94	–	9.00	No Flat

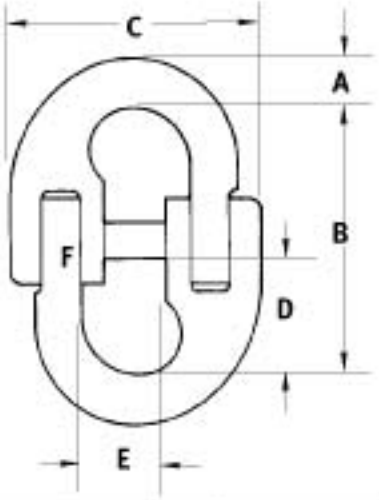
† Ultimate Load is 4 times the Working Load Limit.

* Based on 60° included angle or smaller. For included angles greater than 60°, the Working Load Limit must be de-rated. For use with chain slings, refer to page 89.

Lok-A-Loy® 8 Alloy Connecting Link

- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.
- Locking system that provides for simple assembly and disassembly – no special tools needed.
- Meets ASTM A-952-96 standards for Grade 8 chain fittings.
- Forged Alloy Steel – Quenched and Tempered.
- Fatigue rated.

A-337



Chain Size (In.)	(mm)	Weight Each (Lbs.)	Working Load Limit* (Lbs.)	Dimensions (In.)					Min. Hole Diam.
				A	B	C	D	E	F
9/32 (1/4)	7	.28	3,500	.36	1.88	1.75	.78	.66	.56
5/16	8	.33	4,500	.39	2.13	1.97	.88	.69	.63
3/8	10	.73	7,100	.52	2.50	2.50	1.03	.88	.75
1/2	13	1.67	12,000	.64	3.44	3.22	1.44	1.13	.94
5/8	16	2.86	18,100	.75	4.13	3.78	1.73	1.41	1.13
3/4	20	5.00	28,300	.97	4.94	4.66	2.06	1.63	1.28
7/8	22	7.50	34,200	1.06	5.50	5.63	2.31	2.00	1.44
1	25	11.03	47,700	1.22	6.00	6.19	2.50	2.25	1.88
1-1/4	32	20.38	72,300	1.50	7.43	7.63	3.06	2.56	2.19

*Ultimate Load 4 times Working Load Limit.

®Lok-A-Loy is a registered trademark of the Crosby Group, Inc.

Crosby®Grade 8 Alloy Fittings

Eye Grab Hook

- Alloy Steel – Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.

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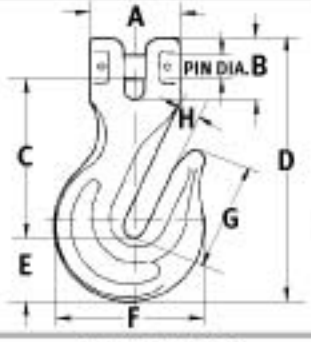
Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)							
			A	B	C	D	E	F	G	H
9/32 (1/4)	3,500	.60	1.38	.59	2.56	3.84	.91	2.16	1.44	.38
3/8	7,100	1.20	1.80	.80	3.25	4.91	1.16	3.00	2.13	.50
1/2	12,000	3.00	2.25	.98	4.19	6.50	1.69	4.00	2.86	.63
3/4	28,300	8.25	3.22	1.36	5.95	9.08	2.19	5.47	4.25	.88
7/8	34,200	11.90	3.70	1.55	6.88	10.44	2.56	6.31	4.88	1.00

* Ultimate Load is 4 times the Working Load Limit.

Clevis Grab Hook

- Alloy Steel – Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.
- Pin locking requires no special tools.



A-338

Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)								
			A	B	C	D	E	F	G	H	Pin Diameter
9/32 (1/4)	3,500	.62	1.56	1.10	2.61	4.17	.89	2.16	1.44	.38	.37
3/8	7,100	1.26	1.79	1.32	3.25	5.34	1.16	3.00	2.12	.50	.47
1/2	12,000	3.45	2.38	1.61	4.19	7.12	1.69	4.00	2.86	.62	.63
5/8	18,100	5.64	2.68	2.05	5.03	8.38	1.88	4.64	3.56	.75	.78
3/4	28,300	10.40	3.46	2.71	5.95	9.97	2.19	5.47	4.25	.88	.83
7/8	34,200	13.62	3.96	3.07	6.88	11.56	2.56	6.31	4.88	1.00	.94

* Ultimate Load is 4 times the Working Load Limit.

Chain Shortener Link

- Alloy Steel – Quenched and Tempered.
- Fatigue Rated
- Provided with spring design to retain chain.
- Individually Proof tested at 2-1/2 times the Working Load Limit with certification.

A-311A

Chain Size (In.)	Chain Size (mm)	Grade 8 Alloy Chain Working Load Limit* (Lbs.) 4:1	Weight Each (Lbs.)
–	6	2,500	.75
1/4 – 5/16	7 – 8	4,500	1.00
3/8	10	7,100	1.50
1/2	13	12,000	3.25
5/8	16	18,100	5.60

* Ultimate Load is 4 times the Working Load Limit.

Crosby®Grade 8 Alloy Fittings

Eye Sling Hook

- Alloy Steel – Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.
- S-4088 latch kit fits hook

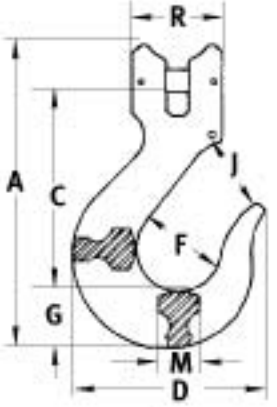
A-327

Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)								
			A	B	D	E	F	G	L	N	R
9/32 (1/4)	3,500	.81	1.34	.56	3.47	1.30	1.75	.89	5.00	2.55	3.72
3/8	7,100	2.10	1.83	.75	4.55	1.40	2.23	1.25	6.53	3.41	4.73
1/2	12,000	3.71	2.25	.94	5.50	1.75	2.50	1.55	7.88	4.09	5.66
5/8	18,100	6.40	2.77	1.12	6.50	2.00	2.88	1.88	9.28	4.78	6.59
3/4	28,300	9.80	3.27	1.28	7.36	2.15	3.27	2.16	10.75	5.53	7.61
7/8	34,200	15.40	3.72	1.44	8.48	2.50	3.62	2.47	12.17	6.23	8.56

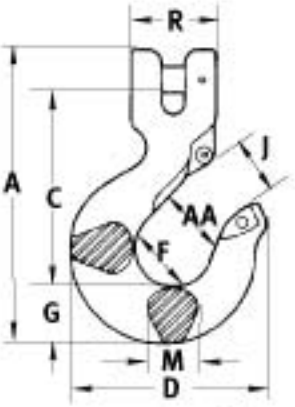
*Ultimate Load is 4 times the Working Load Limit.

Clevis Sling Hook

- Alloy Steel – Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.
- Pin locking requires no special tools.
- S-4320 latch fits 6mm - 5/8" hooks.
- S-4088 latch kit fits 3/4 & 7/8 hook.



A-339



A-339N (New Style)

Hook Size (In.)	(mm)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)										
				A	C	D	F	G	J	M	O	R	T	AA
–	6	2,500	.6	4.21	2.91	2.86	1.26	.73	.93	.63	.89	1.16	.87	1.50
9/32 (1/4)	7 – 8	3,500	1.5	5.25	3.58	3.59	1.50	1.00	1.06	.88	1.00	1.72	1.03	2.00
3/8	10	7,100	2.1	5.98	4.02	3.99	1.62	1.13	1.19	.94	1.09	1.85	1.16	2.00
1/2	13	12,000	4.2	7.46	4.95	4.84	2.00	1.44	1.50	1.31	1.36	2.39	1.53	2.50
5/8	16	18,100	8.4	9.38	6.22	6.27	2.50	1.81	1.78	1.66	1.61	2.67	1.96	3.00
3/4**	20	28,300	11.5	11.56	7.61	7.36	3.27	2.16	2.69	1.58	2.00	3.46	2.50	–
7/8**	22	34,200	17.7	13.12	8.56	8.48	3.62	2.47	3.06	1.75	2.50	3.96	2.63	–

* Ultimate Load is 4 times the Working Load Limit. **Old Style 339 Hooks.

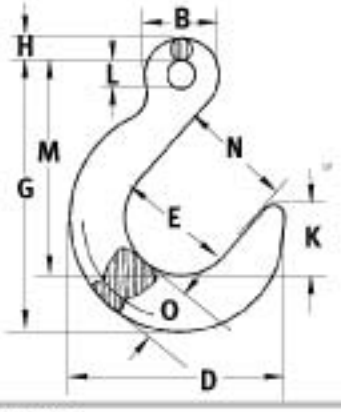
See page 84 and 89 for additional chain information.

Crosby®Grade 8 Alloy Fittings

Eye Foundry Hook

- Alloy Steel – Quenched and Tempered.
- Individually Proof Tested at 2-1/2 times Working Load Limit with certification.

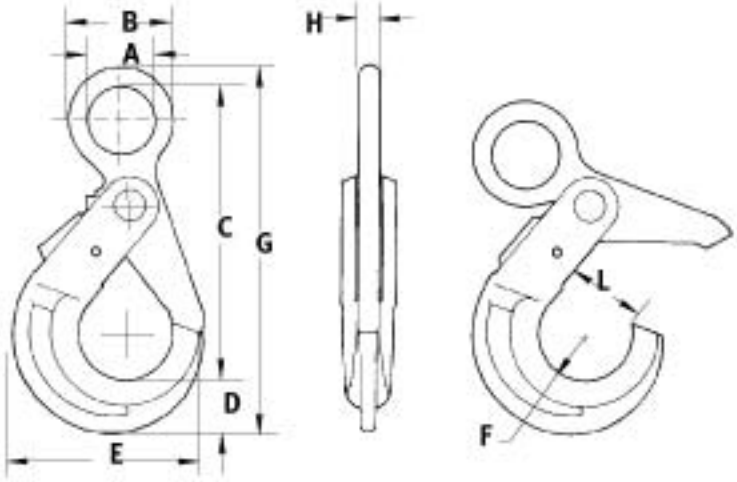
A-329



Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)									
			B	D	E	G	H	K	L	M	N	O
9/32 (1/4)	3,500	2.40	1.56	4.75	2.50	6.45	.47	1.56	.63	4.75	2.50	1.23
3/8	7,100	4.50	2.00	5.75	3.00	7.88	.63	1.88	.75	5.75	3.00	1.50
1/2	12,000	7.10	2.50	6.75	3.50	9.37	.75	2.22	1.00	6.88	3.50	1.75
5/8	18,100	12.20	3.00	7.81	4.00	10.97	.78	2.63	1.25	8.06	4.00	2.03
3/4	28,300	19.30	3.50	9.13	4.50	12.81	1.00	3.00	1.50	9.25	4.50	2.56
7/8	34,200	26.30	4.00	10.06	5.00	14.20	1.13	3.38	1.75	10.38	5.00	2.70

*Ultimate Load is 4 times the Working Load Limit.

Shur-Loc® Eye Hook with Positive Locking Latch



S-316A

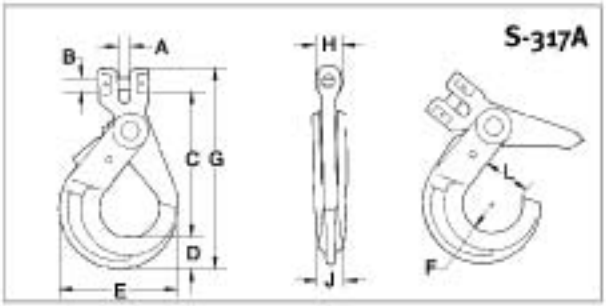
Chain Size	A	B	C	D	E	F	G	H	L	Grade 8 Alloy Chain Working Load Limit* (lbs.) 4:1	Wire Rope XIP IWRC Mechanical Splice Size (in.)	Wire Rope XIP IWRC Mechanical Splice Working Load Limit* (lbs.) 5:1	Weight Each (lbs.)
6 mm	.79	1.42	3.95	.79	2.60	.67	5.06	.31	1.14	2,500	5/16	2,000	.85
1/4 5/16	.98	1.76	5.24	1.10	3.50	.87	5.64	.39	1.46	4,500	7/16	3,800	1.81
3/8	1.30	2.44	6.63	1.15	4.35	1.10	8.30	.51	1.87	7,100	1/2	5,000	3.24
1/2	1.81	3.15	8.31	1.66	5.45	1.26	10.63	.67	2.11	12,000	5/8	7,800	5.96
5/8	2.20	3.94	10.06	2.05	6.56	1.50	12.97	.87	2.49	18,100	7/8	15,200	12.75

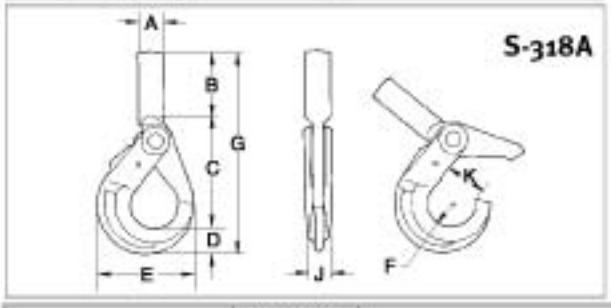
*Ultimate load is 4 times the Working Load Limit based on Grade 8 Chain. Dimension in inches (unless otherwise shown).

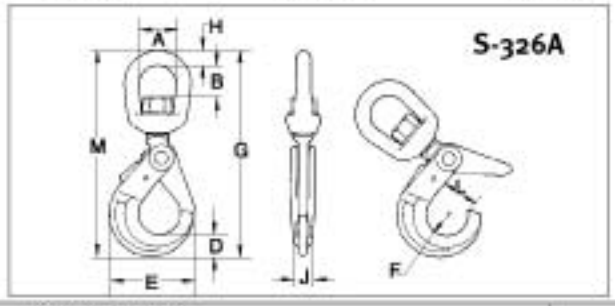
See page 84 and 89 for additional chain information. See application and warning information on page 85.

Crosby® Grade 8 Alloy Hoist Hooks

Shur-Loc® Hook Series with Positive Locking Latch







S-317A Chain Size (In.)	(mm)	Grade 8 Alloy Chain Working Load Limit* (Lbs.)	Dimensions (In.) A	B	C	D	E	F	G	H	J	L	Weight Each (Lbs.)
–	6	2,500	.28	.30	3.42	.79	2.60	.67	4.74	.67	.63	1.13	.77
1/4 – 5/16	7 – 8	4,500	.36	.39	4.42	1.10	3.50	.87	6.20	.88	.81	1.44	1.79
3/8	10	7,100	.43	.48	5.55	1.16	4.35	1.10	7.53	.98	.95	1.83	3.19
1/2	13	12,000	.57	.64	6.78	1.66	5.45	1.26	9.51	1.26	1.16	2.19	6.75
5/8	16	18,100	.71	.80	8.22	2.05	6.56	1.50	11.61	1.57	1.50	2.61	11.94

* Ultimate load is 4 times the Working Load Limit.

S-318A Chain Size (In.)	(mm)	Grade 8 Alloy Chain Working Load Limit* (Lbs.)	Dimensions (In.) A†	B	C	D	E	F	G	J	L	Weight Each (Lbs.)
–	6	2,500	.79	2.16	3.30	.79	2.60	.67	6.25	.63	1.13	1.00
1/4 – 5/16	7 – 8	4,500	1.00	2.40	4.16	1.10	3.50	.87	7.66	.81	1.44	1.99
3/8	10	7,100	1.14	2.95	5.15	1.16	4.35	1.10	9.26	.95	1.83	3.56
1/2	13	12,000	1.33	3.35	6.32	1.66	5.45	1.26	11.33	1.16	2.19	7.00
5/8	16	18,100	1.63	4.00	7.47	2.05	6.56	1.50	13.52	1.50	2.61	16.00

† Dimension before machining (as forged). * Ultimate load is 4 times the Working Load Limit.

S-326A Chain Size (In.)	(mm)	Grade 8 Alloy Chain Working Load Limit* (Lbs.)	Dimensions (In.) A	B	D	E	F	G	H	J	L	M	Weight Each (Lbs.)
–	6	2,500	1.50	1.32	.79	2.60	.67	7.45	.50	.63	1.13	6.16	1.26
1/4 – 5/16	7 – 8	4,500	1.75	1.59	1.10	3.50	.87	9.35	.63	.81	1.44	7.62	2.62
3/8	10	7,100	2.00	1.73	1.16	4.35	1.10	10.77	.75	.95	1.83	8.86	4.70
1/2	13	12,000	2.50	2.38	1.66	5.45	1.26	13.88	1.00	1.16	2.19	11.22	8.64
5/8	16	18,100	2.75	2.54	2.05	6.56	1.50	16.48	1.13	1.50	2.61	12.74	17.00

* Ultimate load is 4 times the Working Load Limit.

See application and warning information on page 85.

Crosby® Chain Hooks

Clevis Grab Hooks

A-330 hooks now rated for use with Grade 8 Chain.*

- Forged Steel – Quenched and Tempered.
- Features quick and easy assembly.
- H-330 designed for Crosby Spectrum 4® chain.
- A-330 designed for Crosby Spectrum 7® chain.
- Design factor is 4:1.

Chain Size (In.)	Working Load Limit (Lbs.) H-330 Carbon	A-330 Alloy	Weight Each (Lbs.)	Dimensions (in.) B	C	D
1/4	2,600	3,500	.36	.32	.31	1.81
5/16	3,900	4,700	.62	.39	.36	2.12
3/8	4,700	7,100	1.00	.45	.45	2.53
7/16	7,200	8,750	1.31	.66	.62	3.09
1/2	9,200	12,000	2.22	.75	.70	3.56
5/8	13,000	15,800	4.41	.91	.84	4.39
3/4	16,200	20,200	6.50	.94	.94	5.22

*Only A-330 hooks containing an "8" designating Grade 8, have new Working Load Limits.

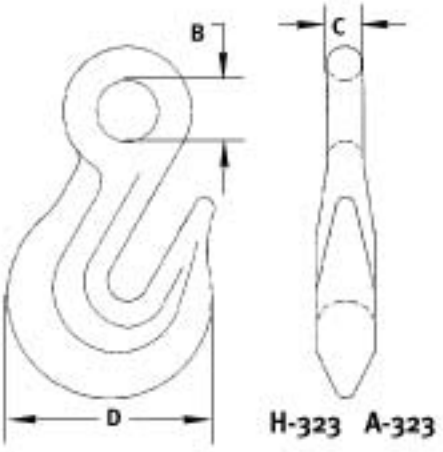
H-330 A-330

Eye Grab Hooks

- Forged Steel – Quenched and Tempered.
- Design factor is 4:1.
- H-323 designed for Crosby Spectrum 4® chain.
- A-323 designed for Crosby Spectrum 7® chain.

Chain Size (In.)	Working Load Limit (Lbs.) Carbon H-323	Alloy A-323	Weight Each (Lbs.)	Dimensions (in.) B	C	D
1/4	2,600	3,500	.28	.53	.31	1.81
5/16	3,900	5,400	.45	.62	.38	2.12
3/8	5,400	7,100	.79	.75	.44	2.53
1/2	9,200	12,000	1.75	.88	.53	3.56
5/8	11,500	15,800	3.25	1.06	.66	4.41
3/4	18,500	24,700	5.94	1.38	.75	5.22

*Only A-323 containing an "8" designating grade 8, have new working load limits.



H-323 A-323

Both hooks are suitable for use with Grade 8 chain in over head lifting applications as long as hook is Proof Tested as part of the chain sling assembly or as an individual component per ANSI D30.9-1997.

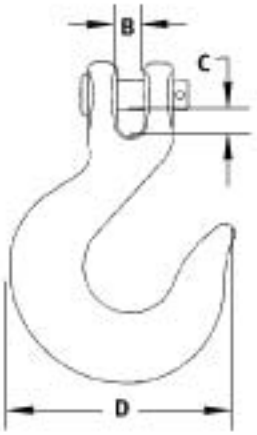
®Spectrum 4 and Spectrum 7 are registered trademarks of the Crosby Group, Inc.

Crosby® Chain Hooks

H-331
A-331

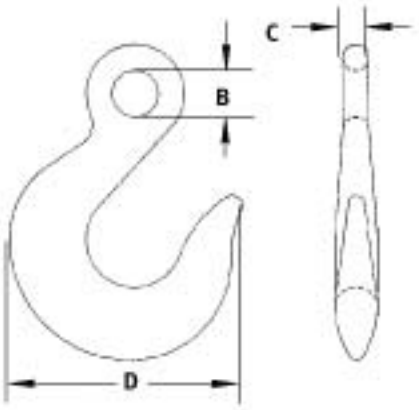
Clevis Slip Hooks

- Forged Steel or Forged Alloy Steel – Quenched and Tempered.
- All Pins Alloy Steel – Quenched and Tempered.



Chain Size (In.)	Working Load Limit* (Lbs.) H-331 Slip Hook	Working Load Limit* (Lbs.) A-331 Slip Hook	Weight Each (Lbs.)	Dimensions (in.) B	Dimensions (in.) C	Dimensions (in.) D
1/4	1,950	2,750	.55	.32	.29	2.75
5/16	2,875	4,300	.79	.43	.34	3.06
3/8	4,000	5,250	1.21	.45	.44	3.63
7/16	5,000	7,000	2.06	.59	.60	4.34
1/2	6,500	9,000	2.75	.57	.53	4.81
5/8	9,250	13,500	4.75	.71	.71	5.63
3/4	–	19,250	11.28	1.18	1.29	7.38

For sling or lifting chains, Grade 8 alloy components are recommended.
* Ultimate Load is 4 times the Working Load Limit



Eye Slip Hooks

- Forged Carbon Steel – Quenched and Tempered.

Chain Size (In.)	Weight Each (Lbs.)	Working Load Limit* (Lbs.)	Dimensions (in.) B	Dimensions (in.) C	Dimensions (in.) D
1/4	.40	1,950	.50	.28	2.75
5/16	.64	2,875	.63	.34	3.06
3/8	1.10	4,000	.72	.41	3.63
7/16	1.56	5,000	.81	.44	4.34
1/2	2.09	6,500	.94	.50	4.81
5/8	3.90	9,250	1.13	.63	5.63
3/4	6.93	12,500	1.38	.75	6.75

* Ultimate Load is 4 times the Working Load Limit

H-324

Crosby® Eye Hoist Hooks – Grade 8 Alloy

Grade 8 Alloy Chain Size (mm)	Grade 8 Alloy Chain Size (In.)	Working Load Limit* (Lbs.) 4:1	Working Load Limit For Wire Rope (Tons) 5:1	Weight Each (lbs.)
6	7/32	2,500	1	.61
7-8	1/4 (5/16)	4,500	2	1.44
10	3/8	7,100	3	2.07
13	1/2	12,000	5	4.30
16	5/8	18,100	7	8.30
20	3/4	28,300	11	15.00
22	7/8	34,200	15	21.60
26	1	47,700	22	39.50

*Minimum Ultimate Load is 4 times the Working Load Limit.

S-320AN

Shank Hooks from Crosby®

Working Load Limit* (Tons) Carbon	Alloy	Bronze	Shank** Length Type	Weight Each (Lbs.)
3/4	1	.5	Std.	.5
1	1-1/2	.6	Std.	.75
1-1/2	2	1	Std.	1.00
2	3	1.4	Std.	1.82
3	4-1/2	2	Std.	3.69
5	7	3-1/2	Std.	7.25
7-1/2	11	5	Std.	13.49
10	15	6-1/2	Std.	18.00
15	22	10	Std.	35.33
20	30	–	Std.	72.00
20	30	–	Long	85.50
25	37	–	Std.	134.00
25	37	–	Long	172.00
30	45	–	Std.	182.00
30	45	–	Long	214.00
40	60	–	Std.	268.00
40	60	–	Long	312.00
50	75	–	Std.	390.00
50	75	–	Long	426.00
–	100	–	Std.	610.00
–	100	–	Long	675.00
–	150	–	Std.	735.00
–	200	–	Std.	1,020.00
–	300	–	Std.	1,390.00

See warning information on page 85.

S-319

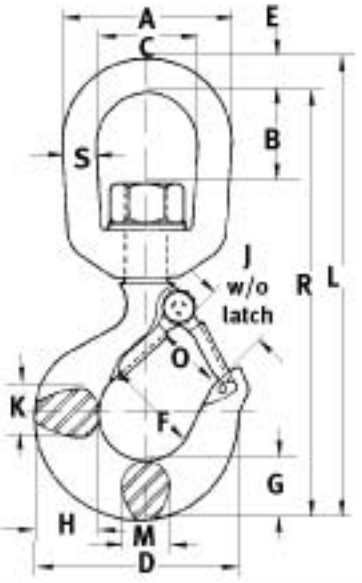
*Note: Proof load is 2 times Working Load Limit. All carbon hooks — average straightening load (ultimate load) is 5 times Working Load Limit. Alloy eye hooks 1 ton through 25 ton — average straightening load (ultimate load) is 5 times Working Load Limit. Alloy eye hooks 30 tons through 60 tons — average straightening load (ultimate load) is 4.5 times Working Load Limit. All Alloy shank hooks — average straightening load (ultimate load) is 4.5 times the Working Load Limit. All Bronze hooks — average straightening load (ultimate load) is 4 times Working Load Limit.

Crosby® Swivel Hooks

Swivel Hoist Hooks

This hook is a positioning device and is not intended to rotate under load. For swivel hooks designed to rotate under load see page 104 thru 107. Use in salt water requires shank and nut inspection in accordance with A.S.M.E., B10-1.2.1.1.-(b)-2(c) 1996.

- Forged – Quenched & Tempered
- Proper design, careful forging and precision controlled quenched and tempering gives maximum strength without excessive weight and bulk.
- Rated capacity is permanently shown on each hook – S-322 hooks have the same rating code as 319 shank hooks.
- Every Crosby-Laughlin Swivel Hook has a pre-drilled cam which can be equipped with a latch.
- Even years after purchase of the original hook, latch assemblies can be added.



S-322N

Working Load Limit* (Tons)		Weight Each	Dimensions (in.)													
322C	322A	(lbs.)	A	B	C	D	F	G	H	J	K	L	M	O	R	S
3/4	1	.75	2.00	.82	1.25	2.86	1.25	.75	.81	.93	.63	5.66	.56	.89	4.53	.38
1	1-1/2	1.25	2.50	1.25	1.50	3.15	1.38	.84	.94	.97	.71	6.71	.63	.91	5.37	.50
1-1/2	2	2.25	3.00	1.50	1.75	3.59	1.50	1.00	1.16	1.06	.88	7.75	.75	1.00	6.12	.63
2	3	2.30	3.00	1.50	1.75	3.99	1.62	1.13	1.31	1.19	.94	8.25	.85	1.09	6.50	.63
3	5	4.96	3.50	1.64	2.00	4.84	2.00	1.44	1.63	1.50	1.31	9.69	1.13	1.36	7.50	.75
5	7	10.29	4.50	2.29	2.50	6.27	2.50	1.81	2.06	1.78	1.66	12.47	1.38	1.61	9.66	1.00
7-1/2	11	16.18	5.00	2.37	2.75	7.54	3.00	2.25	2.63	2.41	1.88	14.54	1.63	2.08	11.16	1.13
10	15	23.25	5.62	2.48	3.12	8.33	3.25	2.59	2.94	2.62	2.19	16.09	1.94	2.27	12.00	1.25
15	22	47.00	7.10	3.76	4.10	10.38	4.25	3.00	3.50	3.41	2.69	21.22	2.38	3.02	16.59	1.50
–	30	70.50	7.00	3.75	4.00	13.62	–	3.66	4.62	4.00	2.86	23.22	2.86	3.25	18.06	1.50

322C – Carbon Steel 322A – Hook and Bail-Alloy Steel.

Dimensions for hooks 3/4 ton carbon through 22 ton alloy are for 4320 latch kit.
Dimensions for hooks 30 ton alloy and larger are for PL latch kit.

NOTE: Proof load is 2 times Working Load Limit. All carbon swivel hooks – average straightening load (ultimate load) is 5 times Working Load Limit. All Alloy swivel hooks – average straightening load (ultimate load) is 4.5 the Working Load Limit.

Latch Kits

S4320

S-4055

Hook Latch Kit

PL Latch Kit

See application and warning information on page 85.

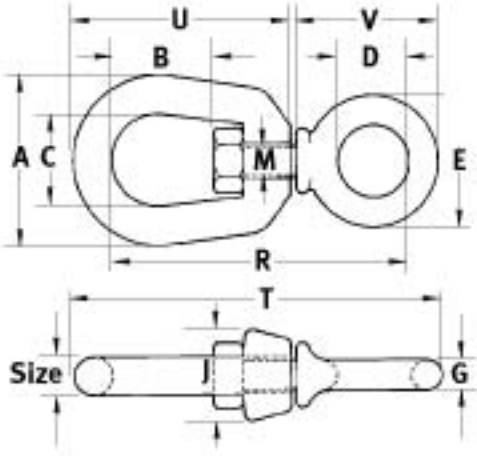
Crosby® Forged Swivels

Chain Swivels

- Hot Dip Galvanized
- Quenched & Tempered

Meets the performance requirements of Federal Specifications RR-C-271D, Type VII, Class 1, except for those provisions required of the contractor.

G-401



Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)											
			A	B	C	D	E	G	J	M	R	T	U	V
1/4	850	.13	1.25	.69	.75	.62	1.12	.25	.69	.31	2.25	2.75	1.69	1.25
5/16	1,250	.25	1.63	.81	1.00	.75	1.38	.31	.81	.38	2.72	3.34	2.06	1.47
3/8	2,500	.54	2.00	.94	1.25	1.00	1.75	.38	1.00	.50	3.44	4.19	2.50	1.88
1/2	3,600	1.12	2.50	1.31	1.50	1.25	2.25	.50	1.31	.63	4.25	5.25	3.19	2.44
5/8	5,200	2.09	3.00	1.56	1.75	1.50	2.75	.62	1.50	.75	5.13	6.31	3.88	2.94
3/4	7,200	3.09	3.50	1.75	2.00	1.75	3.25	.75	1.88	.88	5.78	7.22	4.94	3.46

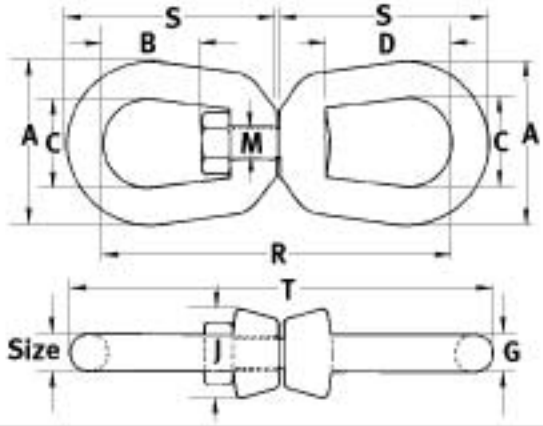
* Ultimate Load is 5 times the Working Load Limit.

Regular Swivels

- Hot Dip Galvanized
- Quenched & Tempered

Meets the performance requirements of Federal Specifications RR-C-271D, Type VII, Class 2 except for those provisions required of the contractor.

G-402



Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)									
			A	B	C	D	G	J	M	R	S	T
1/4	850	.21	1.25	.69	.75	1.06	.25	.69	.31	2.94	1.69	3.44
5/16	1,250	.39	1.63	.81	1.00	1.25	.31	.81	.38	3.56	2.06	4.19
3/8	2,250	.71	2.00	.94	1.25	1.50	.38	1.00	.50	4.31	2.50	5.06
1/2	3,600	1.32	2.50	1.31	1.50	2.00	.50	1.31	.63	5.44	3.19	6.44
5/8	5,200	2.49	3.00	1.56	1.75	2.38	.62	1.50	.75	6.56	3.88	7.81
3/4	7,200	4.02	3.50	1.75	2.00	2.63	.75	1.88	.88	7.19	4.31	8.69
7/8	10,000	6.25	4.00	2.06	2.25	3.06	.88	2.13	1.00	8.38	5.00	10.13
1	12,500	8.95	4.50	2.31	2.50	3.50	1.00	2.38	1.13	9.63	5.75	11.63
1-1/4	18,000	16.37	5.63	2.69	3.13	3.69	1.25	3.00	1.38	11.13	6.75	13.36
1-1/2	45,200	45.79	7.00	4.19	4.00	4.19	1.50	4.00	2.25	17.13	10.00	20.13

* Ultimate Load is 5 times the Working Load Limit.

Crosby® Forged Swivels

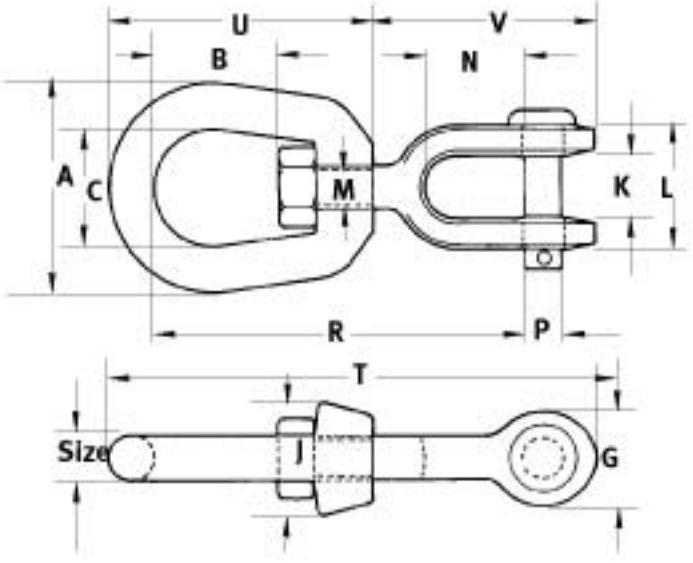
Jaw End Swivels

401, 402 and 403 swivels are positioning devices and are not intended to rotate under load. For load swivels see pages 104-107.

- Hot Dip Galvanized
- Quenched & Tempered

Meets the performance requirements of Federal Specifications RR-C-271D, Type VII, Class 3, except for those provisions required of the contractor

G-403



Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)													
			A	B	C	G	J	K	L	M	N	P	R	T	U	V
1/4	850	.21	1.25	.69	.75	.69	.69	.47	1.03	.31	.88	.25	2.63	3.38	1.69	1.69
5/16	1,250	.34	1.63	.81	1.00	.81	.81	.50	1.13	.38	.88	.31	2.94	3.88	2.06	1.81
3/8	2,250	.66	2.00	.94	1.25	1.00	1.00	.63	1.41	.50	1.06	.38	3.63	4.75	2.50	2.25
1/2	3,600	1.34	2.50	1.31	1.50	1.31	1.31	.75	1.75	.63	1.31	.50	4.50	6.06	3.19	2.88
5/8	5,200	2.48	3.00	1.56	1.75	1.63	1.50	.94	2.06	.75	1.50	.63	5.31	7.31	3.88	3.44
3/4	7,200	3.88	3.50	1.75	2.00	1.88	1.88	1.13	2.53	.88	1.75	.75	6.06	8.31	4.31	4.00
7/8	10,000	5.87	4.00	2.06	2.25	2.13	2.13	1.19	2.75	1.00	2.06	.88	7.00	9.53	5.00	4.53
1	12,500	9.84	4.50	2.31	2.50	2.63	2.38	1.75	3.72	1.13	2.81	1.13	8.56	11.69	5.75	5.94
1-1/4	18,000	15.75	5.69	2.69	3.13	3.13	3.00	2.06	4.31	1.50	2.81	1.38	9.44	13.13	6.75	6.38
1-1/2	45,200	54.75	7.00	4.19	4.00	5.63	4.00	2.88	6.00	2.25	4.44	2.25	14.74	20.84	10.00	10.84

* Ultimate Load is 5 times the Working Load Limit.

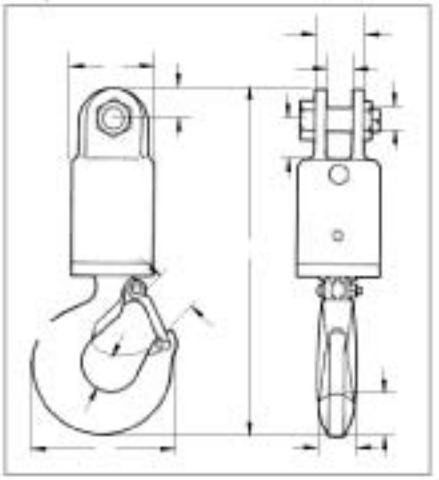
Crosby® Swivels

For swiveling under loads.

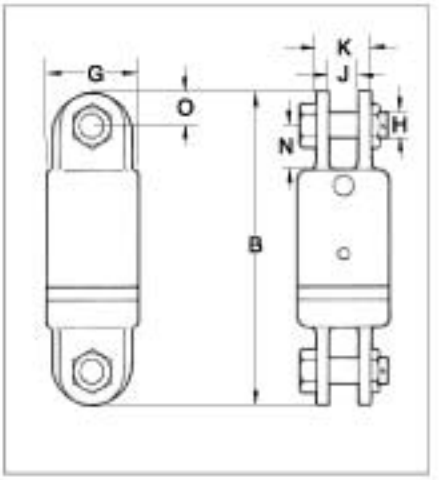
Equipped with Tapered Roller Thrust Bearing

- Designed to swivel under load.
- All swivels individually proof tested with certification.
- All hooks furnished with latches assembled.
- All jaws complete with bolts, nuts and cotter pins.
- Pressure lube fitting provided.
- NOT TO BE USED ON DEMOLITION (WRECKING) BALLS.
- Other types and capacities up to 600 tons, available to meet your requirements.

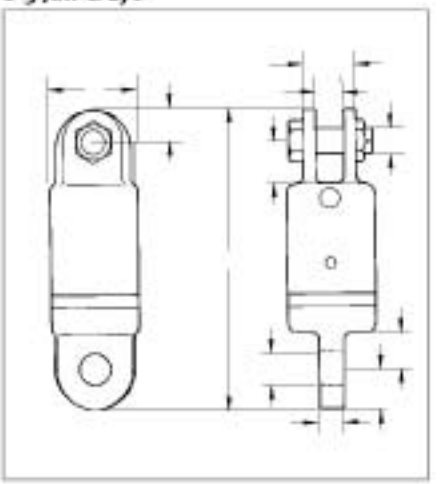
S-1 Jaw & Hook



S-2 Jaw & Jaw



S-3 Jaw & Eye



Working Load Limit* (metric tons)	Dimensions (In.)									
	A	B	C	D	E	F	G	H	J	K
3	11.44	9.28	9.34	9.41	11.50	4.84	2.75	.75	.88	1.62
5	13.34	10.31	10.06	9.81	13.09	6.28	3.00	.88	1.00	2.25
8 1/2	16.45	12.62	12.25	11.88	16.07	7.54	4.00	1.00	1.56	2.81
10	19.75	16.75	16.12	15.50	19.12	8.34	4.50	1.50	1.75	3.38
15	22.24	17.12	16.75	16.38	21.24	10.34	5.00	1.50	1.75	3.38
25	26.78	20.75	21.50	22.25	27.53	13.62	6.00	2.00	2.00	4.62
35	29.94	20.75	21.50	22.25	30.69	14.06	6.50	2.00	2.00	4.62
45	35.06	25.25	25.88	26.50	35.69	15.44	7.00	2.25	2.50	5.00

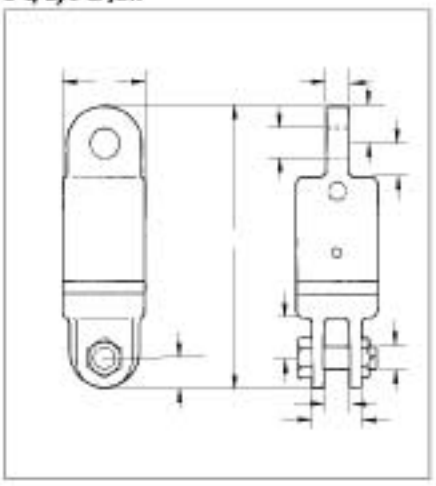
* Individually Proof tested to 2 times the Working Load Limit. Ultimate load is 5 times the Working Load Limit.

Crosby® Swivels

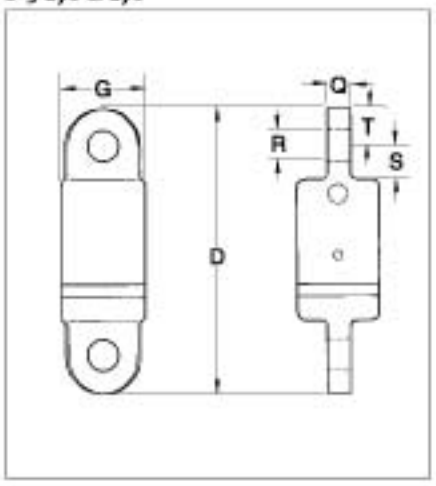
For swiveling under loads.

Important - Crosby Swivels should only be used with the recommended wire rope. Contact the wire rope manufacturer for the proper wire rope to be used with Crosby Swivels.

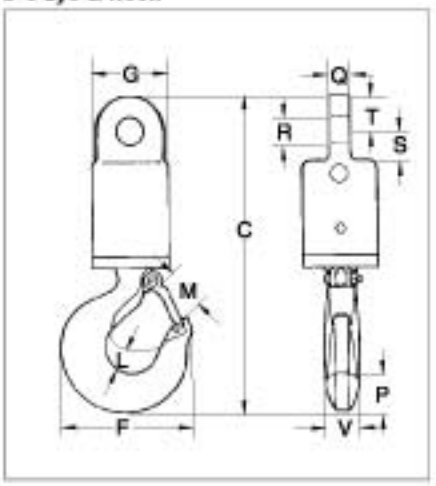
S-4 Eye & Jaw



S-5 Eye & Eye



S-6 Eye & Hook



Working Load Limit* (metric tons)	Dimensions (In.)									
	L	M	N	O	P	Q	R	S	T	V
3	1.53	1.41	1.31	1.00	1.44	.75	1.03	1.12	1.25	1.13
5	1.94	1.69	1.62	1.12	1.82	1.00	1.28	1.25	1.25	1.44
8-1/2	2.46	2.22	2.12	1.38	2.26	1.25	1.41	1.62	1.50	1.63
10	2.59	2.41	3.50	1.75	2.60	1.69	1.69	2.75	1.88	1.94
15	2.81	3.19	3.50	1.75	3.01	1.94	2.03	2.75	2.12	2.38
25	3.44	3.62	3.69	2.38	3.66	2.25	2.31	3.88	2.38	3.00
35	3.88	3.75	3.69	2.38	4.56	2.25	2.31	3.88	2.38	3.19
45	4.75	4.25	4.00	3.00	5.06	2.50	2.53	4.00	3.00	3.25

* Individually Proof tested to 2 times the Working Load Limit. Ultimate load is 5 times the Working Load Limit.

Crosby® Swivels For swiveling under loads.

Equipped with Tapered Roller Thrust Bearing

Swivel Number (Type)	Working Load Limit* (Metric Tons)	Wire Rope Size (In.)	Weight Each (Lbs.)
3-S-1	3	1/2	9.81
3-S-2	3	1/2	9.63
3-S-3	3	1/2	9.12
3-S-4	3	1/2	9.00
3-S-5	3	1/2	8.50
3-S-6	3	1/2	9.32
5-S-1	5	5/8	15.51
5-S-2	5	5/8	13.69
5-S-3	5	5/8	13.50
5-S-4	5	5/8	12.33
5-S-5	5	5/8	11.30
5-S-6	5	5/8	14.24
8-1/2-S-1	8-1/2	3/4	29.42
8-1/2-S-2	8-1/2	3/4	26.16
8-1/2-S-3	8-1/2	3/4	24.90
8-1/2-S-4	8-1/2	3/4	29.00
8-1/2-S-5	8-1/2	3/4	29.25
8-1/2-S-6	8-1/2	3/4	32.00
10-S-1	10	7/8	46.75
10-S-2	10	7/8	45.75
10-S-3	10	7/8	43.50
10-S-4	10	7/8	44.00
10-S-5	10	7/8	42.00
10-S-6	10	7/8	45.50
15-S-1	15	1	73.75
15-S-2	15	1	62.75
15-S-3	15	1	61.00
15-S-4	15	1	61.00
15-S-5	15	1	49.00
15-S-6	15	1	63.00
25-S-1	25	–	140.00
25-S-2	25	–	140.00
25-S-3	25	–	135.00
25-S-4	25	–	135.00
25-S-5	25	–	130.00
25-S-6	25	–	135.00
35-S-1	35	–	220.00
35-S-2	35	–	155.00
35-S-3	35	–	150.00
35-S-4	35	–	150.00
35-S-5	35	–	145.00
35-S-6	35	–	215.00
45-S-1	45	–	251.00
45-S-2	45	–	235.00
45-S-3	45	–	225.00
45-S-4	45	–	225.00
45-S-5	45	–	215.00
45-S-6	45	–	270.00

* Individually Proof tested to 2 times the Working Load Limit. Ultimate Load is 5 times the Working Load Limit.

S-1
Jaw & Hook

S-2
Jaw & Jaw

S-3
Jaw & Eye

S-4
Eye & Jaw

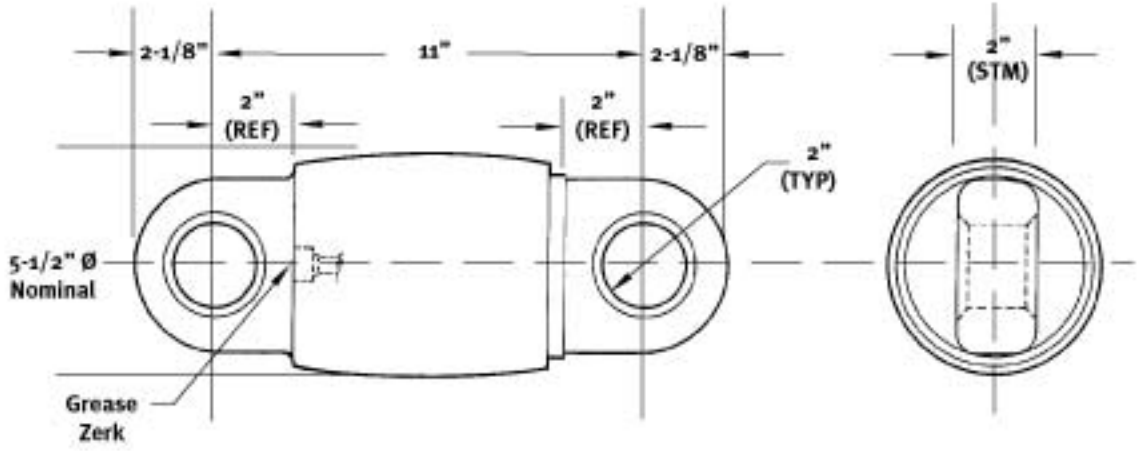
S-5
Eye & Eye

S-6
Eye & Hook

18 Ton Eye to Eye Stainless Steel Swivel

General Notes

1. Cast stainless steel, type 316
2. Timken thrust bearing
3. Grease zerk - 1/8" NPT Alemite
4. 18 ton SWL with 5 to 1 Safety Factor
5. Tapered body



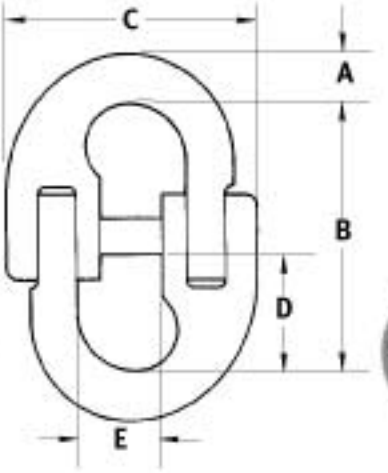
Designed for the harsh working environment of the fishing industry. Rebuildable by Washington Chain & Supply.

Links

Lok-A-Loy® 6 Connecting Link

- Individually Proof Tested.
- Forged Alloy Steel – Quenched and Tempered.
- Easy to assemble

Note: The WLL of a sling must not exceed the lowest WLL of the components in the system.



A-336

Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)					Diameter of Hole to Accept Link
			A	B	C	D	E	
1/4	3,250	.24	.31	2.06	1.69	.78	.78	.50
3/8	6,600	.58	.45	2.72	2.31	1.06	1.09	.66
1/2	11,250	1.20	.58	3.34	3.16	1.28	1.41	.88
5/8	16,500	2.42	.78	3.91	3.94	1.56	1.69	1.06
3/4	23,000	3.89	.89	4.84	4.44	1.97	2.00	1.19
7/8	28,750	6.08	1.00	5.81	5.31	2.38	2.12	1.38
1	38,750	7.03	1.08	6.48	6.07	2.84	2.55	1.47
1-1/4	57,500	13.20	1.38	8.48	7.65	3.77	3.77	1.73

* Ultimate Load is 4 times the Working Load Limit.

Note: The Working Load Limit of a sling must not exceed the lowest Working Load Limit of the components in the system.

Claw Hooks from CM®

Heat treated carbon steel

For use with chain size (in.)	Working load limit* (lbs.)	Wgt per 100 (lbs.)
3/8 Clevis	6,600	120
(8 or 10mm)		
3/8 Eye	6,600	115
(8 or 10mm)		

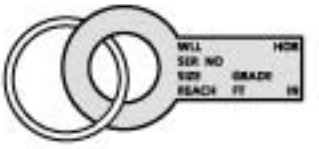
Clevis-Type

Eye-Type

Sling Identification Tags

Zinc Plated

For all sizes, with or without 2" split ring.

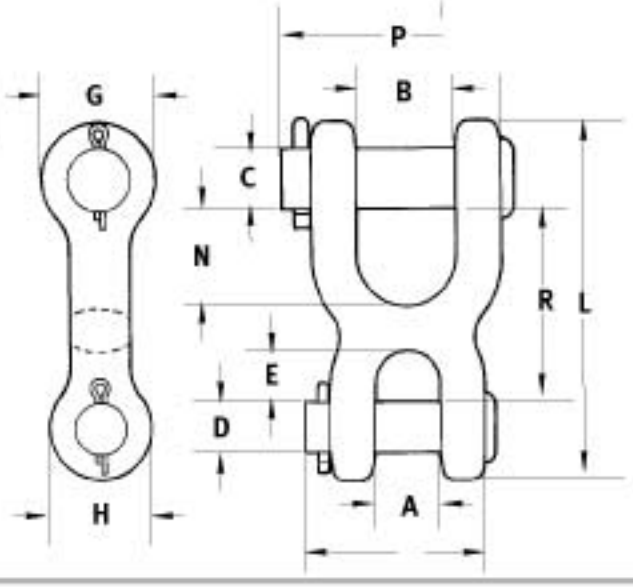


Links from Crosby®

Double Clevis Link

- Designed for linking all popular sizes of Crosby Spectrum 3® and Spectrum 4® chain to rings, end links, eye hooks, pad eyes, tractor eyebolts, etc.
- All pins Alloy Steel – Quenched and Tempered.
- Body is forged and heat treated carbon steel.
- Features quick and easy assembly.

S-247



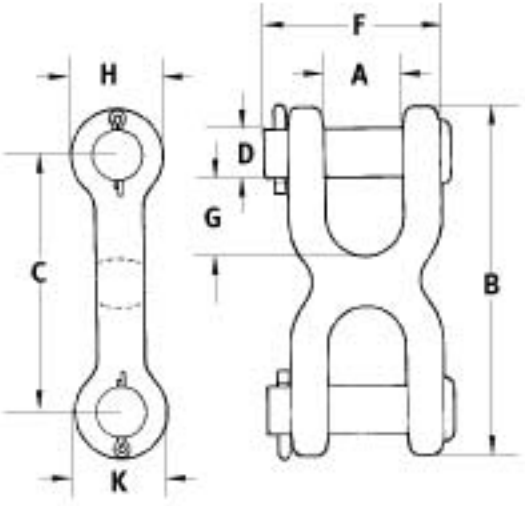
Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)											
			A	B	C	D	E	F	G	H	L	N	P	R
1/4	2,600	.38	.50	.75	.50	.31	.38	.75	1.00	.81	2.81	1.38	1.66	1.50
5/16 – 3/8	5,400	.81	.56	1.00	.63	.44	.47	1.00	1.19	1.00	3.53	1.75	2.25	1.91
7/16	7,000	1.25	.69	1.13	.69	.56	.59	1.09	1.31	1.19	4.06	2.00	2.50	2.19
1/2	9,200	1.56	.81	1.25	.75	.63	.66	1.25	1.44	1.31	4.53	2.25	2.75	2.47

* Ultimate Load is 4 times the Working Load Limit.

Twin Clevis Link

- Available in three popular sizes.
- Body is forged and heat treated carbon steel.
- All pins Alloy Steel – Quenched and Tempered.
- Features quick and easy assembly.
- Twin Clevis design provides a variety of uses and can be used with Crosby Spectrum 3®, Spectrum 4® and Spectrum 7® chain.

S-249



Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)							
			A	B	C	D	F	G	H	K
1/4 – 5/16	4,700	.31	.47	2.50	1.56	.38	1.31	.43	.94	.50
3/8	6,600	.44	.53	2.81	1.81	.44	1.53	.50	1.00	.56
7/16 – 1/2	11,250	.98	.65	3.62	2.31	.56	1.91	.63	1.31	.81

* Ultimate Load is 4 times the Working Load Limit.

Crosby® Links and Rings

Weldless End Links G-340 & S-340

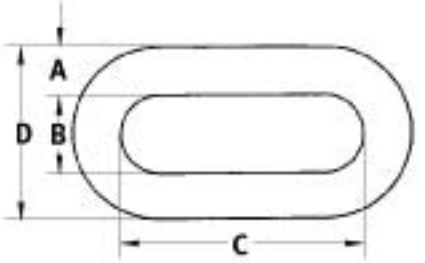
- Self Colored or Hot Dip galvanized.
- Forged carbon steel – Quenched and Tempered.

G-340 from 5/8" thru 7/8" meet the performance requirements of Federal Specification RRC-27ID, Type XV, except for those provisions required of the contractor.

Size (A) (In.)	Working Load Limit*† (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)		
			B	C	D
5/16	2,500	.15	.50	1.75	1.18
3/8	3,800	.22	.56	1.88	1.38
1/2	6,500	.49	.75	2.38	1.81
5/8	9,300	.97	1.00	3.25	2.32
3/4	14,000	1.51	1.13	3.50	2.68
7/8	12,000	2.59	2.00	5.13	3.75
1	15,200	3.95	2.25	5.75	4.25
1-1/4	26,400	7.30	2.50	7.00	5.00
1-3/8	30,000	10.38	2.75	7.75	5.50

* Ultimate Load is 5 times the Working Load Limit.

† Based on single leg sling (in-line load), or resultant load on multiple legs with an included angle less than or equal to 120°.



G-340 & S-340

Weldless Rings S-643

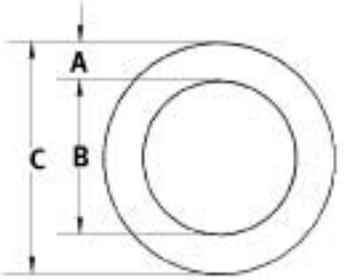
- Self Colored.
- Forged carbon steel – Quenched and Tempered.

Weldless Rings meet the performance requirements of Federal Specification RR-27ID, Type VI, except for those provisions required of the contractor.

Size (A) (In.)	Working Load Limit* Single Pull (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)	
			B	C
7/8 x 4	7,200	2.72	4.00	5.75
7/8 x 5-1/2	5,600	3.47	5.50	7.25
1 x 4	10,800	3.69	4.00	6.00
1-1/8 x 6	10,400	6.60	6.00	8.25
1-1/4 x 5	17,000	6.82	5.00	7.50
1-3/8 x 6	19,000	10.12	6.00	8.75

* Ultimate Load is 6 times the Working Load Limit.

S-643



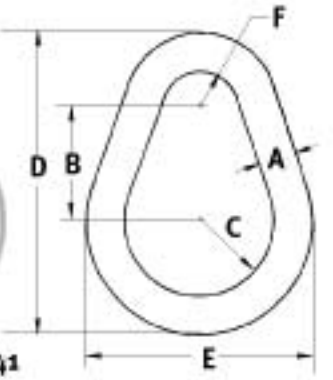
Weldless Sling Links G-341 & S-341

- Self Colored or Hot Dip galvanized.
- Forged carbon steel – Quenched and Tempered.

Size (A) (In.)	Working Load Limit*† Single Pull (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)				
			B	C	D	E	F
3/8	1,800	.23	1.13	.75	3.00	2.25	.38
1/2	2,900	.55	1.50	1.00	4.00	3.00	.50
5/8	4,200	1.06	1.87	1.25	5.00	3.75	.63
3/4	6,000	1.88	2.25	1.50	6.00	4.50	.75
7/8	8,300	2.75	2.63	1.75	7.00	5.25	.88
1	10,800	4.35	3.00	2.00	8.00	6.00	1.00
1-1/4	16,750	7.60	4.00	2.50	10.25	7.50	1.25
1-3/8	20,500	11.30	4.13	2.75	11.00	8.25	1.38

* Based on single leg sling (in-line load), or resultant load on multiple legs with an included angle less than or equal to 120°.

† Ultimate Load is 6 times the Working Load Limit.



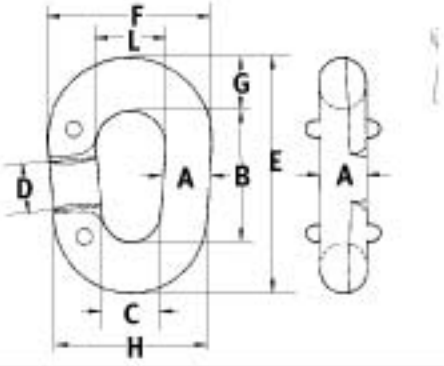
G-341 & S-341

Replacement Links

Pear Shape "Missing Link"® G-334

- Galvanized or Self-colored.
- Forged Steel – Quenched and Tempered.
- Has larger inside dimensions making it easier to attach hooks or other fittings to the chain.
- An exclusive Crosby product.
- After making connections, rivets must be peened.

Not suitable for use with Grade 8 chain or chain slings used in overhead lifting.



Chain Size (In.)	Working Load Limit* (Lbs.)	Weight Per 100 (Lbs.)	Dimensions (In.)								
			A	B	C	D	E	F	G	H	L
3/8	1,850	25.00	.41	2.00	.56	.81	2.94	1.63	.47	1.38	.81
1/2	3,300	50.00	.50	2.50	.69	1.00	3.63	2.00	.56	1.69	1.00
5/8	5,000	75.00	.63	2.75	.81	1.06	4.00	2.38	.63	2.06	1.13
3/4	7,100	125.00	.75	3.13	1.00	1.13	4.75	2.75	.81	2.50	1.25
7/8	9,600	200.00	.88	3.69	1.25	1.38	5.56	3.25	.94	3.00	1.50

* Ultimate Load is 4 times the Working Load Limit.

G-334

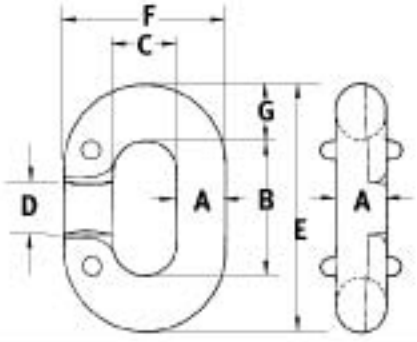
G-335

"Missing Link"® G-335

- Galvanized or Self-colored.
- Forged Steel – Quenched and Tempered.
- Integral rivets join the two halves.
- After making connections, rivets must be peened.

Meets or exceeds the performance requirements of Federal Specifications RRC-27ID, Type II, except for those provisions required of the contractor.

Not suitable for use with Grade 8 chain or chain slings used in overhead lifting.



Chain Size (In.)	Working Load Limit* (Lbs.)	Links Per Box	Weight Per 100 (Lbs.)	Dimensions (In.)						
				A	B	C	D	E	F	G
** 3/16	800	20	2.50	.25	.69	.34	.34	1.19	.78	.28
** 1/4	1,325	10	6.25	.28	.88	.44	.44	1.50	1.00	.31
** 5/16	1,950	10	12.50	.34	.94	.47	.47	1.69	1.16	.38
3/8	2,750	10	20.00	.41	1.13	.56	.56	2.06	1.38	.47
7/16	3,625	10	27.50	.47	1.28	.59	.59	2.34	1.53	.53
1/2	4,750	10	37.50	.53	1.47	.66	.66	2.66	1.72	.59
5/8	7,250	10	72.50	.66	1.81	.78	.81	3.31	2.09	.75
3/4	10,250	10	122.50	.78	2.13	.94	1.06	3.88	2.50	.88
7/8	12,000	Bulk	175.00	.91	2.50	1.13	1.13	4.50	2.94	1.00
1	15,500	Bulk	250.00	1.03	2.75	1.25	1.25	5.00	3.31	1.13

* Ultimate Load is 4 times the Working Load Limit.
** Have rivets only – no interlocking lugs.
† Has reinforced rivet holes. All Sizes have countersunk rivet holes.

®"Missing Link" is a registered trademark of the Crosby Group, Inc.

Crosby® Forged Eye Bolts

Regular Nut Eye Bolts

- Recommended for straight line pull.
- All Bolts Hot Dip galanized after threading (UNC).
- Furnished with standard Hot Dip galvanized hex nuts.
- Forged Steel – Quenched and Tempered.
- Fatigue rated at 1-1/2 times the Working Load Limit at 20,000 cycles.

⚠ SEE APPLICATION AND WARNING INFORMATION ON PAGES 86 – 87

G-291

Shank Dia. & Length (In.)	Working Load Limit* (Lbs.)	Weight Per 100 (Lbs.)	Length of Thread (In.)
1/4 x 2	650	8.20	1.50
1/4 x 4	650	11.70	2.50
5/16 x 2-1/4	1,200	13.30	1.50
5/16 x 4-1/4	1,200	25.00	2.50
3/8 x 2-1/2	1,550	23.30	1.50
3/8 x 4-1/2	1,550	29.50	2.50
3/8 x 6	1,550	35.20	2.50
1/2 x 3-1/4	2,600	50.30	1.50
1/2 x 6	2,600	66.10	3.00
1/2 x 8	2,600	82.00	3.00
1/2 x 10	2,600	88.00	3.00
1/2 x 12	2,600	114.20	3.00
5/8 x 4	5,200	103.10	2.00
5/8 x 6	5,200	118.20	6.00
5/8 x 8	5,200	135.10	3.00
5/8 x 10	5,200	153.60	3.00
5/8 x 12	5,200	167.10	4.00

Shank Dia. & Length (In.)	Working Load Limit* (Lbs.)	Weight Per 100 (Lbs.)	Length of Thread (In.)
3/4 x 4-1/2	7,200	168.60	2.00
3/4 x 6	7,200	184.50	3.00
3/4 x 8	7,200	207.90	3.00
3/4 x 10	7,200	235.00	3.00
3/4 x 12	7,200	257.50	4.00
3/4 x 15	7,200	298.00	5.00
7/8 x 5	10,600	270.00	2.50
7/8 x 8	10,600	308.00	4.00
7/8 x 12	10,600	400.00	4.00
1 x 6	13,300	421.00	3.00
1 x 9	13,300	468.50	4.00
1 x 12	13,300	540.00	4.00
1 x 18	13,300	650.00	7.00
1-1/4 x 8	21,000	750.00	4.00
1-1/4 x 12	21,000	900.00	4.00
1-1/4 x 20	21,000	1,210.00	6.00

* Ultimate Load is 5 times the Working Load Limit. Working Load Limit shown is for in-line pull.

Crosby® Forged Eye Bolts

Shoulder Nut Eye Bolts

- Forged Steel.
- All Bolts Hot Dip galvanized after threading (UNC).
- Furnished with standard Hot Dip galvanized, heavy hex nuts.
- Fatigue rated at 1-1/2 times the Working Load Limit at 20,000 cycles.

⚠ SEE APPLICATION AND WARNING INFORMATION ON PAGES 86 – 87

Shank Diameter & Length (In.)	Working Load Limit* (Lbs.)	Weight Per 100 (Lbs.)	Eye Dim. ID	Eye Dim. OD	Length of Thread (In.)
1/4 x 2	650	6.60	.50	.88	1.50
1/4 x 4	650	9.10	.50	.88	2.50
5/16 x 2-1/4	1,200	12.50	.62	1.12	1.50
5/16 x 4-1/4	1,200	18.80	.62	1.12	2.50
3/8 x 2-1/2	1,550	21.40	.75	1.38	1.50
3/8 x 4-1/2	1,550	25.30	.75	1.38	2.50
1/2 x 3-1/4'	2,600	42.60	1.00	1.75	1.50
1/2 x 6	2,600	56.80	1.00	1.75	3.00
5/8 x 4	5,200	68.60	1.25	2.25	2.00
5/8 x 6	5,200	102.40	1.25	2.25	3.00
3/4 x 4-1/2	7,200	144.50	1.50	2.75	2.00
3/4 x 6	7,200	167.50	1.50	2.75	3.00
7/8 x 5	10,600	225.00	1.75	3.25	2.50
1 x 6	13,300	366.30	2.00	3.75	3.00
1 x 9	13,300	422.50	2.00	3.75	4.00
1-1/4 x 8	21,000	650.00	2.50	4.50	4.00
1-1/4 x 12	21,000	795.00	2.50	4.50	4.00
1-1/2 x 15	24,000	1,425.00	3.00	5.50	6.00

* Ultimate Load is 5 times the Working Load Limit.
Working Load Limit shown is for in-line pull.

G-277

Screw Eye Bolts

- Forged Steel – Quenched and Tempered.
- Hot Dip galvanized.

Shank Diameter & Length (In.)	Weight Per 100 (Lbs.)	Eye Dim. ID	Eye Dim. OD	Length of Thread (In.)
1/4 x 2	4.30	.50	.88	1.50
5/16 x 2-1/4	9.90	.63	1.13	1.69
3/8 x 2-1/2	18.88	.75	1.38	1.88
1/2 x 3-1/4	37.50	1.00	1.75	2.44
5/8 x 4	85.50	1.25	2.25	3.00

G-275

Crosby® Forged Machinery Eye Bolts

Shoulder Type Machinery Eye Bolts

- Forged Steel – Quenched & Tempered.
- Working Load Limits shown are for In-line pull.
- Recommended for straight line pull.
- Fatigue rated at 1-1/2 times the Working Load Limit at 20,000 cycles.
- All Bolts threaded UNC.

SEE APPLICATION AND WARNING INFORMATION ON PAGES 86 – 87

Size	Working Load Limit* (Lbs.)	Weight Per 100 (Lbs.)	Eye Dimensions (In.)			
			A** Thread	Thread of Length	ID	OD
1/4 x 1	650	5.00	1/4 – 20	1.02	1.13	.75
5/16 x 1-1/8	1,200	9.00	5/16 – 18	1.15	1.38	.88
3/8 x 1-1/4	1,550	15.00	3/8 – 16	1.27	1.62	1.00
1/2 x 1-1/2	2,600	28.00	1/2 – 13	1.53	1.95	1.19
5/8 x 1-3/4	5,200	55.00	5/8 – 11	1.79	2.38	1.38
3/4 x 2	7,200	96.00	3/4 – 10	2.05	2.76	1.50
7/8 x 2-1/4	10,600	154.00	7/8 – 9	2.31	3.25	1.75
1 x 2-1/2	13,300	238.00	1 – 8	2.57	3.76	2.00
1-1/4 x 3	21,000	399.00	1-1/4 – 7	3.09	4.50	2.50
1-1/2 x 3-1/2	24,000	720.00	1-1/2 – 6	3.60	5.50	3.00

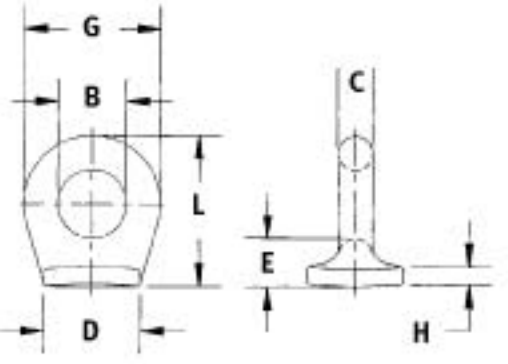
* Ultimate Load is 5 times the Working Load Limit.

** All Bolts Threaded UNC.

S-279

Crosby® Pad Eyes

- Forged Steel – Quenched and Tempered.
- Forged from 1035 Carbon Steel.
- Excellent welding qualities.
- Widely used on farm machinery, trucks, steel hulled marine vessels and material handling equipment.
- Reference American Welding Society specifications for proper welding procedures.



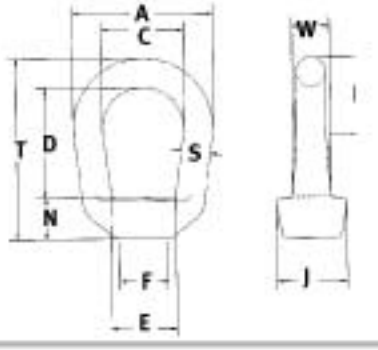
Size No.	Weight Per 100 (Lbs.)	Dimensions (In.) B	C	D	E	G	H	L
*0	2.80	.25	.19	.63	.31	.63	.09	.75
*1	6.50	.38	.25	.88	.41	.88	.13	1.03
*1-1/2	10.40	.63	.25	1.00	.44	1.13	.16	1.31
2	21.10	.75	.38	1.06	.50	1.50	.19	1.63
4	52.20	1.00	.56	1.44	.78	2.13	.22	2.34
5	82.50	1.25	.69	1.75	.81	2.63	.25	2.75

* Meets the requirement of Military Specification MS-51930A.

Crosby® Forged Eye Nuts

Eye Nuts

- Forged Steel – Quenched and Tempered.
- Hot Dip galvanized.
- Tapped with standard UNC class 2 threads after galvanizing.

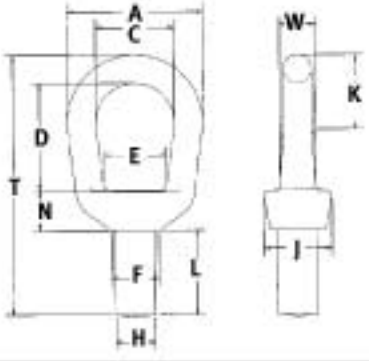


Size No.	Stock Size (In.) S	Std. Tap Size	Working Load Limit* (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)									
					A	C	D	E	F	J	K	N	T	W
1	.25	1/4	520	.09	1.25	.75	1.00	.75	.50	.69	.63	.46	1.72	.31
2	.31	3/8	1,250	.17	1.62	1.00	1.20	.83	.56	.81	.89	.58	2.09	.41
3A	.38	1/2	2,250	.28	2.00	1.25	1.44	1.08	.81	1.00	1.09	.73	2.55	.50
4	.50	5/8	3,600	.60	2.50	1.50	1.92	1.35	1.00	1.31	1.31	.83	3.25	.69
5	.63	3/4	5,200	1.00	3.00	1.75	2.28	1.59	1.12	1.50	1.57	1.05	3.96	.84
6	.75	7/8	7,200	1.65	3.50	2.00	2.50	1.96	1.38	1.88	1.77	1.14	4.40	1.00
7	.88	1	10,000	2.69	4.00	2.25	2.92	2.21	1.56	2.13	2.02	1.30	5.10	1.19
8	1.00	1-1/4	15,500	3.87	4.50	2.50	3.35	2.46	1.88	2.38	2.27	1.52	5.87	1.38
9	1.13	1-3/8	18,500	5.00	5.00	2.75	3.58	2.59	2.00	2.56	2.57	1.67	6.38	1.50
10	1.25	1-1/2	22,500	6.78	5.62	3.12	3.81	3.08	2.25	3.00	2.83	1.83	6.89	1.66
11	1.50	2	40,000	14.60	7.12	4.10	6.00	4.09	3.13	3.75	3.68	2.49	10.13	1.94

* Ultimate Load is 5 times the Working Load Limit. Rating based on standard tap size.

Crosby® Lifting Eyes

- Forged Steel – Quenched and Tempered.



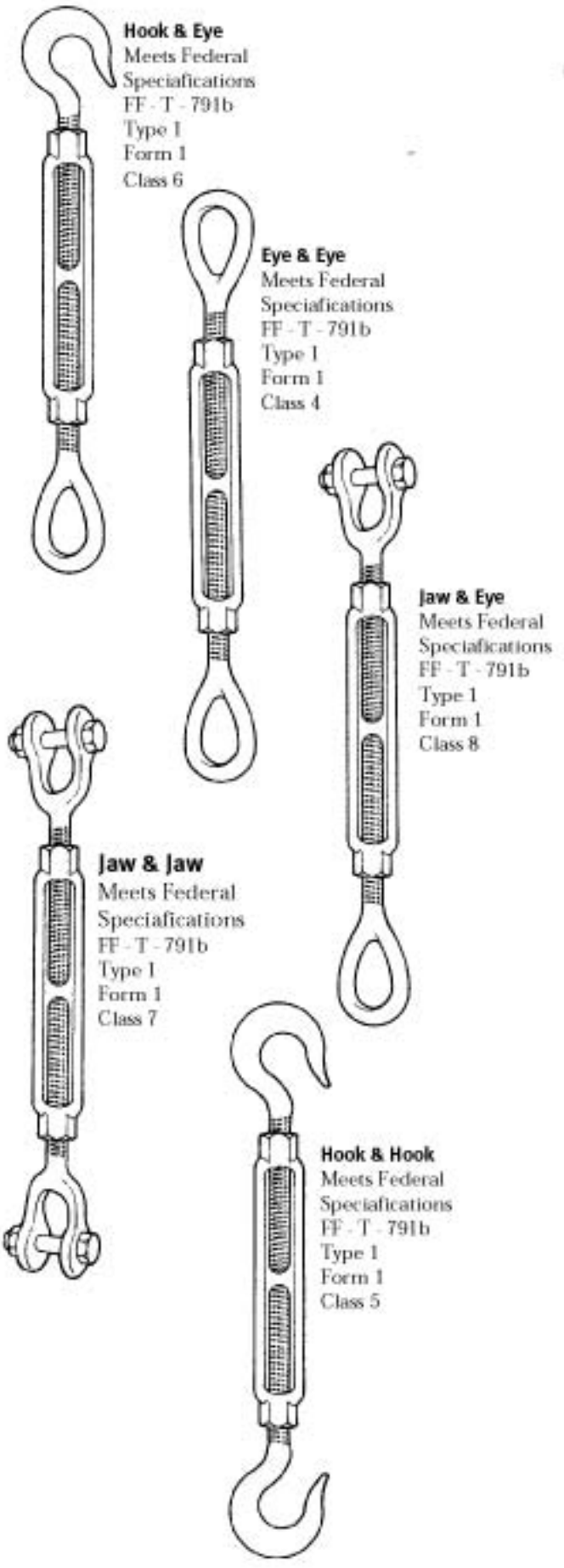
Size No.	Working Load Limit* Threaded (Lbs.)	Weight Each (Lbs.)	Dimensions (In.)											
			A	C	D	E	F	H	J	K	L	N	T	W
1	850	.10	1.25	.75	1.02	.66	.50	.34	.69	.67	.69	.42	2.46	.31
2	1,250	.20	1.62	1.00	1.20	.75	.56	.41	.81	.92	.94	.55	3.00	.41
3	2,250	.50	2.00	1.25	1.44	1.00	.81	.53	1.13	1.13	1.25	.68	3.69	.50
4	3,600	.79	2.50	1.50	1.92	1.19	1.00	.66	1.31	1.38	1.50	.80	4.59	.69
5	5,200	1.25	3.00	1.75	2.28	1.38	1.12	.78	1.50	1.66	1.75	.98	5.55	.84
6	7,200	2.25	3.50	2.00	2.50	1.63	1.38	.91	1.88	1.91	1.88	1.06	6.16	1.00
7	10,000	3.25	4.00	2.25	2.92	1.88	1.56	1.03	2.13	2.16	2.06	1.20	7.07	1.19
8	12,500	4.70	4.50	2.50	3.35	1.94	1.88	1.16	2.38	2.47	2.50	1.40	8.16	1.38
10	18,000	9.33	5.62	3.12	3.81	2.75	2.25	1.53	3.00	2.98	2.94	1.69	9.74	1.66

* Ultimate Load is 5 times the Working Load Limit. Rating based on UNC thread size shown in column H.

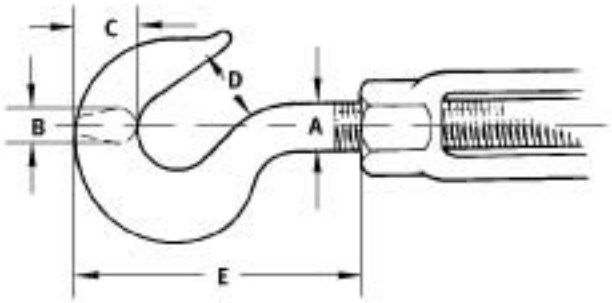
Turnbuckles

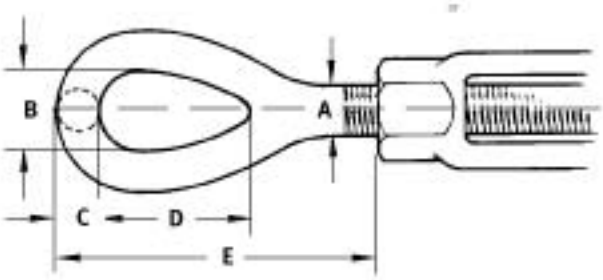
Diameter and Take Up (In.)	Average Overall with Ends in Closed Position (In.)	Weight (Pounds Each) Hook & Eye Eye & Eye Hook & Hook	Jaw & Eye	Jaw & Jaw
1/4 x 4	8-1/4	.31	.32	.36
5/16 x 4-1/2	9-9/16	.41	.47	.52
3/8 x 6	11-7/8	.71	.76	.81
1/2 x 6	13-5/16	1.45	1.53	1.61
9	16-5/16	1.68	1.71	1.74
12	19-5/16	2.00	2.06	2.11
5/8 x 6	15-1/2	2.35	2.35	3.02
9	18-1/2	2.88	3.06	2.88
12	21-1/2	3.78	3.78	3.38
3/4 x 6	17	3.64	3.87	4.11
9	20	4.31	4.30	5.10
12	23	5.08	5.36	5.65
18	29	6.29	6.57	6.86
7/8 x 12	24-5/8	7.35	7.76	8.17
18	30-5/8	9.35	9.24	9.13
1 x 6	20-5/8	8.53	8.92	9.32
12	26-5/8	11.23	11.20	11.18
18	32-5/8	13.23	13.30	14.60
24	38-5/8	16.58	16.30	17.30
1-1/4 x 12	29-7/8	17.90	19.40	20.91
18	35-7/8	22.85	24.18	25.50
24	41-7/8	26.77	28.40	28.70
1-1/2 x 12	32-3/8	27.94	28.99	30.05
18	38-3/8	33.19	32.38	31.56
24	44-3/8	37.69	39.18	40.67
1-3/4 x 18	41-3/4	50.88	49.16	55.04
24	47-3/4	58.00	60.68	63.36
2 x 24	51-3/4	89.80	94.60	100.00
2-1/2 x 24	58-1/2	140.00	150.00	161.00
2-3/4 x 24	61-1/2	194.00	200.00	216.00

- Hot dip galvanized forged steel quenched and tempered.
- Outstanding design features include elongated turnbuckle eyes. Shackles one size smaller than turnbuckles can be reeved through turnbuckle eye.
- Jaw End Fitting, sizes 1/4" through 5/8" have Bolts and Nuts. Jaw End Fittings, sizes 3/4" through 2-3/4 have pins and cotters.
- Galvanized lock nuts available for all sizes.
- Hooks not supplied on sizes larger than 1-1/2".



Turnbuckles





Hook

Dimensions and strength

Hook Dimensions in Inches					Working Load Limit (Lbs.)
A	B	C	D	E	
1/4	1/4	3/8	7/16	1-5/8	400
5/16	5/16	7/16	1/2	1-29/32	700
3/8	3/8	17/32	9/16	2-9/32	1,000
1/2	1/2	11/16	21/32	2-27/32	1,500
5/8	5/8	27/32	27/32	3-17/32	2,250
3/4	3/4	1	31/32	4-5/16	3,000
7/8	7/8	1-3/16	1-1/8	5	4,000
1	1	1-3/8	1-1/4	5-11/16	5,000
1-1/4	1-1/16	1-1/2	1-1/2	6-29/32	5,000
1-1/2	1-5/16	1-3/4	1-7/8	8-11/32	7,500

Proof Load Twice Working Load Limit.

Eye

Dimensions and strength

Eye Dimensions in Inches					Working Load Limit (Lbs.)
A	B	C	D	E	
1/4	11/32	7/32	25/32	1-25/32	500
5/16	7/16	9/32	15/16	2-3/16	800
3/8	17/32	11/32	1-1/8	2-9/16	1,200
1/2	23/32	7/16	1-7/16	3-7/32	2,200
5/8	7/8	1/2	1-3/4	3-7/8	3,500
3/4	1	5/8	2-1/8	4-11/16	5,200
7/8	1-1/4	3/4	2-3/8	5-1/4	7,200
1	1-7/16	7/8	3	6-3/8	10,000
1-1/4	1-13/16	1-1/8	3-9/16	7-3/4	15,200
1-1/2	2-1/8	1-1/4	4-1/8	8-5/8	21,400
1-3/4	2-3/8	1-1/2	4-11/16	10	28,000
2	2-11/16	1-3/4	5-3/4	12-1/8	37,000
2-1/2	3-1/8	2	6-1/2	13-9/16	60,000
2-3/4	3-1/4	2-1/4	7	15	75,000

When Ordering Turnbuckles Be Sure To Specify:

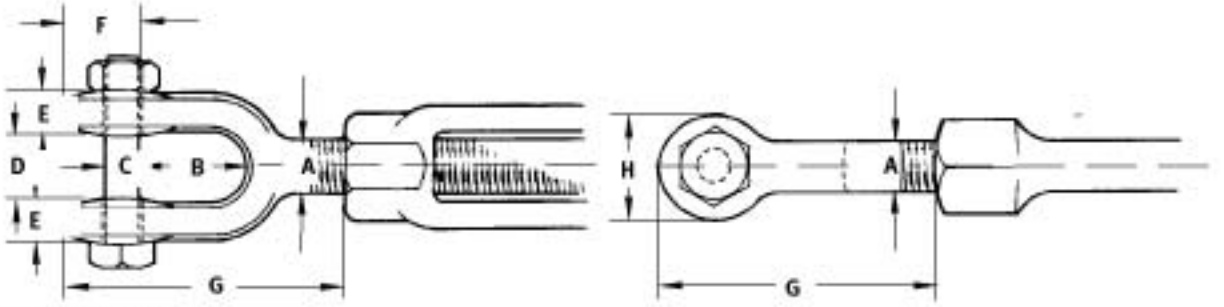
1st – Diameter of thread

2nd – Length of take-up

3rd – Types of end fitting desired.

Also available in stainless steel.

Turnbuckles



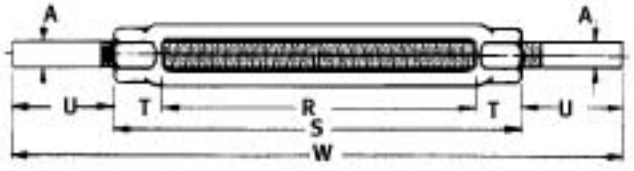
Jaw

Dimensions and strength

Jaw			Dimensions in Inches					Working Load Limit (Lbs.)
A	B	C	D	E	F	G	H	
1/4	5/8	1/4	13/32	9/32	1/2	1-5/8	5/8	500
5/16	7/8	1/4	15/32	9/32	1/2	2	11/16	800
3/8	7/8	5/16	1/2	5/16	19/32	2-3/16	13/16	1,200
1/2	1-1/16	3/8	5/8	13/32	3/4	2-3/4	1	2,200
5/8	1-5/16	1/2	3/4	1/2	1-1/32	3-1/2	1-5/16	3,500
3/4	1-1/2	5/8	15/16	9/16	1-9/32	4-1/8	1-5/8	5,200
7/8	1-3/4	3/4	1-1/8	11/16	1-15/32	4-27/32	1-7/8	7,200
1	2-1/16	7/8	1-3/16	25/32	1-21/32	5-17/32	2-1/8	10,000
1-1/4	2-13/16	1-1/8	1-3/4	1	2-3/32	7-3/16	2-5/8	15,200
1-1/2	2-13/16	1-3/8	2-1/16	1-1/16	2-15/32	7-7/8	3-1/8	21,400
1-3/4	3-3/8	1-5/8	2-3/8	1-1/4	2-29/32	9-3/8	3-1/2	28,000
2	3-11/16	2	2-1/2	1-9/16	3-17/32	10-7/8	4-3/16	37,000
2-1/2	4-7/16	2-1/4	2-7/8	1-9/16	4-5/8	13-11/32	5-5/8	60,000
2-3/4	4-3/16	2-3/4	3-1/2	1-5/8	5-3/8	15	6-1/8	75,000

Stub End Turnbuckles

Dimensions and strength



Dimension "W" figured with stubs screwed in as shown. To determine overall length of longer takeup turnbuckles add the difference in takeup.

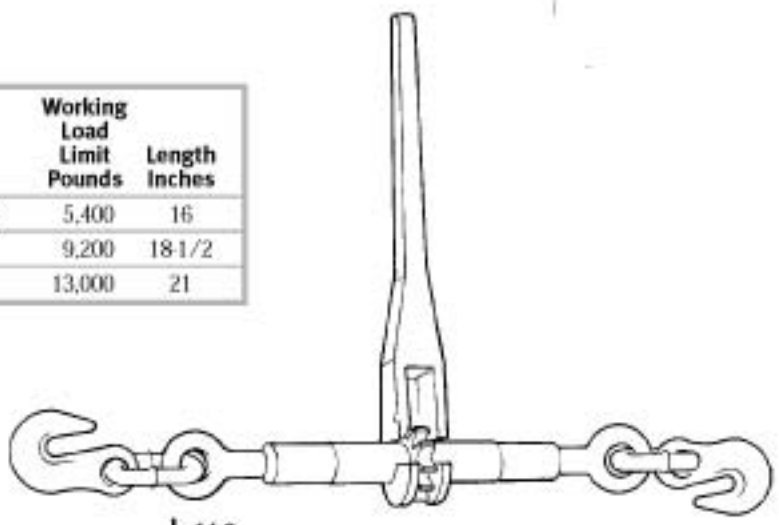
Stub End			Dimensions in Inches			Working Load Limit (Lbs.)
A	R	S	T	U	W	
1/4	4	4-3/4	3/8	2-5/8	10	500
5/16	4-1/2	5-7/16	15/32	2-21/32	10-3/4	800
3/8	6	7-1/8	9/16	4-7/16	16	1,200
1/2	6	7-1/2	3/4	4-1/4	16	2,200
5/8	6	7-7/8	15/16	4-1/16	16	3,500
3/4	6	8-1/4	1-1/8	4-3/8	17	5,200
7/8	6	8-5/8	1-5/16	4-11/16	18	7,200
1	6	9	1-1/2	5	19	10,000
1-1/8	6	9-1/8	1-9/16	4-15/16	19	12,400
1-1/4	6	9-1/8	1-9/16	5-7/16	20	15,200
1-3/8	6	9-3/4	1-7/8	5-3/8	20-1/2	18,000
1-1/2	6	9-3/4	1-7/8	5-3/8	20-1/2	21,400
1-5/8	6	10-3/8	2-3/16	5-5/16	21	25,000
1-3/4	6	10-3/8	2-3/16	5-13/16	22	28,000
2	6	11	2-1/2	6	23	37,000
2-1/2	6	13-1/2	3-3/4	6-1/4	26	60,000
2-3/4	24	31-1/2	3-3/4	6-1/2	44-1/2	75,000

Load Binders

Standard Ratchet Binder

Min-Max Chain Size Inches	Handle Length Inches	Barrel Length Inches	Take-Up Inches	Size Inches	Working Load Limit Pounds	Length Inches
5/16 – 3/8	14	10	8	5/16 – 3/8	5,400	16
3/8 – 1/2	14	10	8	3/8 – 1/2	9,200	18-1/2
1/2 – 5/8	14	10	8	1/2 – 5/8	13,000	21

Upgrade for use with Grade 7 Transport Chain

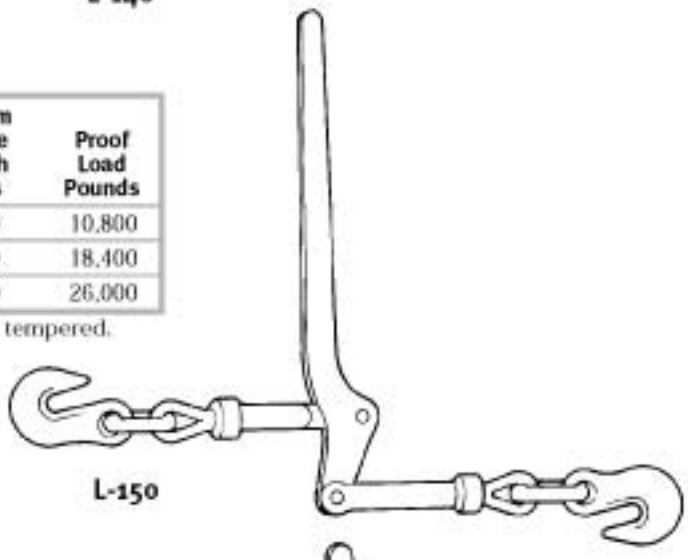


L-140

Standard Load Binders

Take-Up Inches	Min-Max Chain Size Inches	Working Load Limit Pounds	Handle Length Inches	Minimum Ultimate Strength Pounds	Proof Load Pounds
4-1/2	5/16 – 3/8	5,400	16	19,000	10,800
4-1/2	3/8 – 1/2	9,200	18-1/2	33,000	18,400
4-3/4	1/2 – 5/8	13,000	21	46,000	26,000

Forged steel, quenched and tempered. Hooks are quenched and tempered.

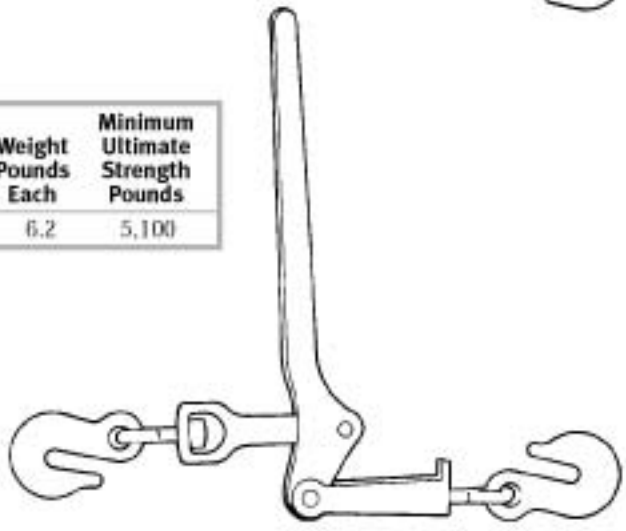


L-150

Midget Load Binder

Handle Length Inches	Working Load Limit Pounds	Take-Up Inches	Min-Max Chain Size Inches	Weight Pounds Each	Proof Load Pounds	Weight Pounds Each	Minimum Ultimate Strength Pounds
11-1/4	1,450	2-1/2	3/16 – 1/4	2.4	2,900	6.2	5,100

Forged handle, hooks and swivel link. Steel swivels and clevis.



Note: Binders shown with Proof Load Pounds have been individually proof tested to these values shown prior to shipment.

Crosby® Forged Anchor Shackles

Load Rated® QUIC-CHECK® Q® "QT"

- Working Load Limit permanently shown on every shackle.
- Forged – Quenched and Tempered, with alloy pins.
- Capacities 1/3 thru 55 metric tons.
- Look for the Red Pin® . . . the mark of genuine Crosby quality.
- Shackles can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification. Charges for proof testing and certification available when requested at the time of order.
- Hot Dip galvanized or Self Colored.
- Fatigue rated.

Screw Pin G-209 S-209

Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 2, except for those provisions required of the contractor.

Round Pin G-213 S-213

Round pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 1, except for those provisions required of the contractor.

Do Not Side Load Round Pin Shackles

Anchor Shackles

Working* Load Limit (Tons)	Nominal Shackle Size (In.)	Dimensions (In.)							Weight (Lbs.)	
		Inside Length	Inside Width at Pin	Inside Width at Bow	Diameter Pin	Diameter Outside of Eye	Tolerance Plus or Minus Length	Tolerance Plus or Minus Width	213	209
1/3†	3/16	7/8	3/8	11/16	1/4	9/16	1/16	1/16	–	.05
1/2	1/4	1-1/8	1/2	25/32	5/16	11/16	1/16	1/16	.13	.12
3/4	5/16	1-7/32	17/32	27/32	3/8	13/16	1/16	1/16	.17	.19
1	3/8	1-7/16	21/32	1-1/32	7/16	31/32	1/8	1/16	.25	.31
1-1/2	7/16	1-11/16	23/32	1-5/32	1/2	1-1/16	1/8	1/16	.38	.38
2	1/2	1-7/8	13/16	1-5/16	5/8	1-3/16	1/8	1/16	.70	.63
3-1/4	5/8	2-3/8	1-1/16	1-11/16	3/4	1-9/16	1/8	1/16	1.50	1.38
4-3/4	3/4	2-13/16	1-1/4	2	7/8	1-7/8	1/4	1/16	2.32	2.25
6-1/2	7/8	3-5/16	1-7/16	2-9/32	1	2-1/8	1/4	1/16	3.40	3.38
8-1/2	1	3-3/4	1-11/16	2-11/16	1-1/8	2-3/8	1/4	1/16	5.00	5.32
9-1/2	1-1/8	4-1/4	1-13/16	2-29/32	1-1/4	2-5/8	1/4	1/16	6.97	6.81
12	1-1/4	4-11/16	2-1/32	3-1/4	1-3/8	3	1/4	1/16	9.75	9.50
13-1/2	1-3/8	5-3/16	2-1/4	3-1/2	1-1/2	3-5/16	1/4	1/8	13.25	13.25
17	1-1/2	5-3/4	2-3/8	3-7/8	1-5/8	3-5/8	1/4	1/8	17.25	17.70
25	1-3/4	7	2-7/8	5	2	4-5/16	3/4	1/8	29.46	30.38
35	2	7-3/4	3-1/4	5-3/4	2-1/4	5	3/4	1/8	45.75	45.00
55†	2-1/2	10-1/2	4-1/8	7-1/4	2-3/4	6	3/4	1/4	–	85.75

*Working Load Limit for vertical in-line pull. † Furnished in screw pin only.

®Load Rated is a registered trademark of the Crosby Group, Inc.
®QT – Quench & Tempered is a registered trademark of the Crosby Group, Inc.

Crosby® Forged Chain Shackles

Load Rated™ QUIC-CHECK® Q® QT

- Working Load Limit permanently shown on every shackle.
- Forged – Quenched and Tempered, with alloy pins.
- Capacities 1/3 thru 55 metric tons.
- Look for the Red Pin® . . . the mark of genuine Crosby quality.
- Shackles can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification. Charges for proof testing and certification available when requested at the time of order.
- Hot Dip galvanized or Self Colored.
- Fatigue rated.

Screw Pin G-210 S-210

Screw pin chain shackles meet the performance requirements of Federal Specification RR-C-271D, Type IVB, Grade A, Class 2, except for those provisions required of the contractor.

Round Pin G-215 S-215

Round pin chain shackles meet the performance requirements of Federal Specification RR-C-271D Type IVB, Grade A, Class 1, except for those provisions required of the contractor.

Do Not Side Load Round Pin Shackles

Chain Shackles – Round Pin & Screw Pin

Working* Load Limit (Tons)	Nominal Shackle Size (In.)	Dimensions (In.)						Weight (lbs.)	
		Inside Length	Inside Width	Tolerance Plus or Minus		Diameter			
				Length	Width	Pin	Outside of Eye	210	215
1/2	1/4	7/8	15/32	1/16	1/16	5/16	11/16	.11	.10
3/4	5/16	1-1/32	17/32	1/16	1/16	3/8	13/16	.17	.18
1	3/8	1-1/4	21/32	1/8	1/16	7/16	31/32	.24	.25
1-1/2	7/16	1-7/16	23/32	1/8	1/16	1/2	1-1/16	.40	.38
2	1/2	1-5/8	13/16	1/8	1/16	5/8	1-3/16	.59	.50
3-1/4	5/8	2	1-1/16	1/8	1/16	3/4	1-9/16	1.21	1.21
4-3/4	3/4	2-3/8	1-1/4	1/4	1/16	7/8	1-7/8	2.25	2.00
6-1/2	7/8	2-13/16	1-7/16	1/4	1/16	1	2-1/8	3.16	3.28
8-1/2	1	3-3/16	1-11/16	1/4	1/16	1-1/8	2-3/8	4.75	4.75
9-1/2	1-1/8	3-9/16	1-13/16	1/4	1/16	1-1/4	2-5/8	6.75	6.30
12	1-1/4	3-15/16	2-1/32	1/4	1/8	1-3/8	3	9.06	9.00
13-1/2	1-3/8	4-3/8	2-1/4	1/4	1/8	1-1/2	3-5/16	11.63	12.00
17	1-1/2	4-13/16	2-3/8	1/4	1/8	1-5/8	3-5/8	15.95	16.15
25	1-3/4	5-3/4	2-7/8	3/4	1/8	2	4-1/8	26.75	29.96
35	2	6-3/4	3-1/4	3/4	1/8	2-1/4	5	42.31	43.25
55†	2-1/2	8	4-1/8	3/4	1/4	2-3/4	6	71.75	–

*Working Load Limit for vertical in-line pull.

† Furnished in screw pin only.

Crosby® Bolt-Type Shackles

Load Rated

QUIC-CHECK® Q

"QT"

- Working Load Limit permanently shown on every shackle. Capacities 1/3 thru 150 metric tons.
- Forged – Quenched and Tempered, with alloy pins.
- Look for the Red Pin®. . . the mark of genuine Crosby quality.
- Shackles 55 metric tons and smaller can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification.
- Certification must be requested at time of order.
- Shackles 85 metric tons and larger can be provided as follows.
  - Non Destructive Tested
  - Serialized Pin and Bow
  - Material Certification (Chemical)
  - Certification must be requested at time of order.
- Hot Dip galvanized or Self Colored.
- Fatigue rated.

Bolt Type Anchor Shackle

G-2130

S-2130

Bolt Type Anchor shackles with thin head bolt – nut with cotter pin. Meets the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 3, except for those provisions required of the contractor.

Bolt Type Chain Shackle

G-2150

S-2150

Bolt Type Chain shackles. Thin hex head bolt – nut with cotter pin. Meets the performance requirements of Federal Specification RR-C271D Type IVB, Grade A, Class 3, except for those provisions required of the contractor.

Bolt Type Anchor & Chain Shackles

Working Load Limit (Tons)	Nominal Shackle Size (In.)	Dimensions (In.)							Weight (Lbs.)	
		Inside Length		Inside Width at Pin	Diameter		Tolerances Plus or Minus			
		2130	2150		Pin	Outside of Eye	Length	Width	2130	2150
2	1/2	1-7/8	1-5/8	13/16	5/8	1-3/16	1/8	1/16	.79	.75
3-1/4	5/8	2-3/8	2	1-1/16	3/4	1-9/16	1/8	1/16	1.68	1.47
4-3/4	3/4	2-13/16	2-3/8	1-1/4	7/8	1-7/8	1/4	1/16	2.72	2.52
6-1/2	7/8	3-5/16	2-13/16	1-7/16	1	2-1/8	1/4	1/16	3.95	3.85
8-1/2	1	3-3/4	3-3/16	1-11/16	1-1/8	2-3/8	1/4	1/16	5.66	5.55
9-1/2	1-1/8	4-1/4	3-9/16	1-13/16	1-1/4	2-5/8	1/4	1/16	8.27	7.60
12	1-1/4	4-11/16	3-15/16	2-1/32	1-3/8	3	1/4	1/16	11.71	10.81
13-1/2	1-3/8	5-3/16	4-3/8	2-1/4	1-1/2	3-5/16	1/4	1/8	15.38	13.75
17	1-1/2	5-3/4	4-13/16	2-3/8	1-5/8	3-5/8	1/4	1/8	20.80	18.50
25	1-3/4	7	5-3/4	2-7/8	2	4-1/8	3/4	1/8	33.91	31.40
35	2	7-3/4	6-3/4	3-1/4	2-1/4	5	3/4	1/8	52.25	46.75
55	2-1/2	10-1/2	8	4-1/8	2-3/4	6	3/4	1/4	98.25	85.00
85†	3	13	8-1/2	5	3-1/4	6-1/2	1/4	1/4	154.00	124.25
††120†	3-1/2	14-5/8	–	5-1/4	3-3/4	8	1/4	1/4	265.00	–
††150†	4	14-1/2	–	5-1/2	4-1/4	9	1/4	1/4	338.00	–

*Working Load Limit for vertical in-line pull.
† Individually proof tested with certification and furnished with round head bolts with welded handles.
†† Furnished in anchor style only.

Note: Maximum Proof Load is 2.2 times the Working Load Limit or as designated. Minimum Ultimate Load is 6 times the Working Load Limit.

®Red Pin is a registered trademark of the Crosby Group, Inc.

Crosby® Screw Pin Anchor Shackle

Load Rated QUIC-CHECK® Q "QT"

- Working Load Limit permanently shown on every shackle.
- Forged Alloy Steel – Quenched and Tempered, with alloy pins.
- Capacities 2 thru 21 tons.
- Shackles can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification. Charges for proof testing and certification available when requested at time of order.
- Hot Dip Galvanized.

Nominal Size (In.)	Working Load Limit* (Tons)	Weight Each (Lbs.)
3/8	2.0	.31
7/16	2.6	.38
1/2	3.3	.63
5/8	5.0	1.38
3/4	7.0	2.25
7/8	9.5	3.61
1	12.5	5.32
1-1/8	15.0	7.25
1-1/4	18.0	9.88
1-3/8	21.0	13.25

G-209-A

Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade B, Class 2, except for those provisions required of the contractor.

Trawling Shackles

Available 3/8" to 2"

Same WLL as chain shackles on opposite page.

Working* Load Limit (tons)	Nominal Shackle Size (In.)	Dimensions (In.)		
		Inside Length	Inside Width at Pin	Pin
2	1/2	1-5/8	13/16	5/8
3-1/4	5/8	2	1-1/16	3/4
4-3/4	3/4	2-3/8	1-1/4	7/8
6-1/2	7/8	2-13/16	1-7/16	1

*Working Load Limit for vertical in-line pull.

NOTE: Ultimate load is 4 times the Working Load Limit.

S-2131

Trawling shackle with thin square head screw pin.

Crosby® Alloy Bolt-Type Shackles

Load Rated QUIC-CHECK® Q "QT"

- Shackles are Quenched and Tempered and can meet DNV impact requirements of 42 joules at -20°C.
- Working Load Limit is permanently shown on every shackle.
- Alloy bows, Alloy bolts.
- Quenched and Tempered.
- All sizes are individually proof tested to 2.0 times the Working Load Limit.
- Shackles 200 metric tons and larger are provided as follows.
  - Non Destructive Tested
  - Serialized Pin and Bow
  - Material Certification (Chemical)
  - Certification must be requested at time of order.
- Forged Alloy Steel 30 thru 175 metric tons. Cast Alloy Steel 200 thru 400 metric tons.
- Pins are galvanized and painted red.

Notice: All 2140 shackles 120 tons and larger are magnetic particle inspected. Certification available on special request.

G-2140 and S-2140

G-2140 meets the performance requirements of Federal Specification RR-C-271D, Type IVA, Grade B, Class 3, except for those provisions required of the contractor.

Nominal Shackle Size (In.)	Working Load Limit* t	Available		Weight Each (Lbs.)
		G-2140 Galv.	S-2140 S.C.	
1-1/2	30	x	x	20.8
1-3/4	40	x	x	33.9
2	55	x	x	52.0
2-1/2	85	x	x	96.0
3	120	x	–	178.0
3-1/2	150†	x	–	265.0
4	175†	x	–	338.0
4-3/4**	200†	x	–	450.0
5**	250†	x	–	600.0
6**	300†	x	–	775.0
7**	400†	x	–	1,102.0

* Maximum proof load is 2.0 times the working load limit. Minimum ultimate load is 4 times the working load limit on 200 - 400 metric tons. For sizes 30 through 175 metric tons, minimum ultimate load is 5.4 times the working load limit.

** Cast Alloy Steel † Furnished with Round Head Bolts with welded handle.

Wire Rope

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Have Washington Chain custom fabricate and proof test to your specifications.
We carry a large inventory of domestic and import wire rope and fittings, and an ever-changing mix of good used wire.

Standard Wire Rope Abbreviations

STRAND CONSTRUCTION

PRF ..... preformed
NP ..... non-preformed
S ..... seale
FW ..... filler wire
SFW ..... seale filler wire
FWS ..... filler wire seale

LAYS

RRL ..... right regular lay
LRL ..... left regular lay
RLL ..... right lang lay
LLL ..... left lang lay
AL1-1 ..... alternating lay of strands, 1 lang and 1 regular
AL2-1 ..... alternating lay of strands, 2 lang and 1 regular

TYPE OF CORE

FC ..... fiber rope core; natural or synthetic fiber
IWRC ..... independent wire rope core
PPC ..... polypropylene rope core
SC ..... strand cord

GRADE AND FINISH OF WIRE

MPS ..... mild plow steel
PS ..... plow steel grade of wire
IPS ..... improved plow steel
GIPS ..... galvanized improved plow steel
DR ..... drawn galvanized improved plow steel
XIP ..... extra improved plow steel
GXIP ..... galvanized extra improved plow steel
DR/GXIP ..... drawn galvanized extra improved plow steel
GAC ..... galvanized aircraft
SS ..... stainless steel wire
GI ..... galvanized iron wire
COM GI ..... galvanized common iron grade of wire, for strand
GI SZG ..... galvanized iron grade of wire for seizing strand
BRIGHT ..... wire without any coating, such as zinc or tin
BRZ ..... bronze wire

How to Order Wire Rope Products

To insure that your order is filled accurately, according to your requirements, the following information should be included for each item.

1. LENGTH ..... The length of each piece and the number of pieces required should be specified
2. DIAMETER ..... Specify the exact diameter of rope required.
3. CONSTRUCTION ..... It is necessary to state the required construction of the rope.
4. FINISH ..... When galvanized finish is required, it should be so stated. If no finish is stated, bright, or ungalvanized, finish will be furnished.
5. GRADE ..... The grade of steel should be stated, i-e. Improved Plow Steel (IPS) or Extra-improved Plow Steel (XIP).
6. PREFORMING ..... The requirement of preformed or non-preformed rope must be specified.
7. LAY ..... The direction and type of lay should be specified. If no lay is specified, Right Regular Lay will be furnished.
8. CORE ..... Specify which type core is desired.
9. PURPOSE ..... It is desirable that you state the purpose or end use of the rope.
10. SPECIAL PROCESSING ..... Any special instructions not included in the above should be stated exactly.

Wire Rope

Wire rope is a mechanical power-transmission machine-made of a number of multi-wired strands laid in a helix around a core of steel or fiber. Each member of this machine, that is the wires, has a precision tolerance to allow the rope to operate.

The wires, used to construct the strands, derive their physical properties from chosen metallurgy, cold-metal working and heat-treatment, and greatly influence the life span of the rope.

In the formation of strands, any number of variations of wires and sizes can be conceived. However, with years of experience in rope designing, certain number of wires and manner of forming them in strands have been standardized.

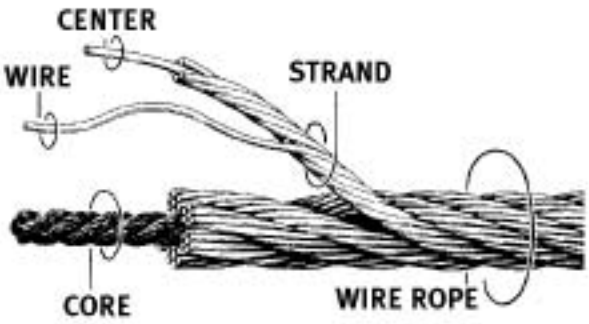
In rope formation, the strands are laid in a prefixed helix around a core -which provides the support to the strands. The strands could follow either a left- or right-hand spiral and the direction of wires in the strand could be the same as that of the strand (LANG LAY) or opposite (REGULAR LAY),

CORES

Most wire ropes are supplied either with a fiber or a steel core. The core is the foundation of a wire rope. Its primary function is to support the wire strands of the rope, maintaining them in their correct relative positions during the operating life of the rope.

Fiber cores are ropes made from fibers formed into yarns, then into strands and finally into the finished core form. There are two general types of fiber: natural vegetable material, such as sisal or cotton, and synthetic filaments, such as polypropylene.

Steel cores comprise an independent wire rope (IWRC) or, in the case of small diameter ropes, a wire strand core (WSC). These steel cores provide more substantial support than fiber cores to the outer strands during the rope's operating life. Steel cores resist crushing, are more resistant to heat, reduce the amount of stretch, and increase the strength of the rope.



WIRE ROPE LAY

The helix or spiral of the wires and strands in a rope is called the lay. Regular lay means the wires and strands spiral in opposite directions; thus the wires appear to run roughly parallel to the center line of the rope. Lang lay is the opposite; the wires and strands spiral in the same direction and seem to run at a diagonal to the center line of the rope. If the strands rotate around the rope in a clockwise direction (as the threads do in a right hand bolt), the rope is said to be right lay. When the strands rotate in a counterclockwise direction (as the threads do in a left hand bolt), the rope is left lay. Right regular lay is furnished for all rope applications unless otherwise specified.

When a lay-length is used as a unit of measure, it refers to the lengthwise distance a single strand extends in making one complete turn around the rope. Lay length is measured in a straight line parallel to the center line of the rope, not by following the path of the strand. The appropriate time to replace a wire rope in service is frequently determined by counting the number of broken wires in the length of one rope lay.

Right Lay—Regular Lay

Left Lay—Regular Lay

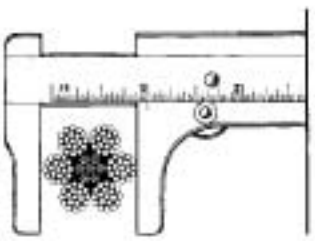
Right Lay–Lang Lay

Wire Rope

HOW TO CALIPER WIRE ROPE

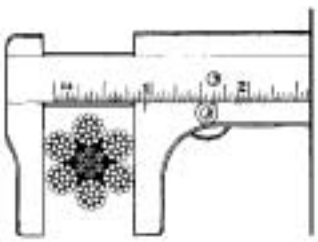
Rope diameter is specified by the user and is generally given in the equipment manufacturer's instruction manual accompanying the machine on which the rope is to be used.

Rope diameters are determined by measuring the circle that just touches the extreme outer limits of the strands–that is, the greatest dimension that can be measured with a pair of parallel-jawed calipers or machinist's caliper square. A mistake could be made by measuring the smaller dimension.



RIGHT WAY

Always measure the *larger* dimension, between the outer limits of the strands.



WRONG WAY

Do not measure the *smaller* dimension across the "flats" of the strands.

SPECIFICATIONS

Wire rope is manufactured to Federal Specification RR-W-410, and to meet the requirements of American Bureau of Shipping, Lloyd's Registry, American Petroleum Institute, and others that may be applicable.

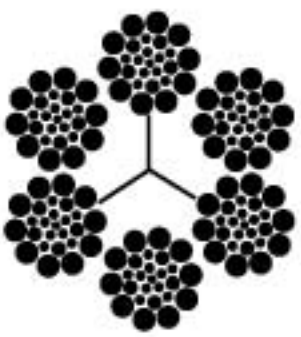
Some special-purpose ropes are covered by other specifications. Mining ropes follow the recommended specifications of the U.S. Bureau of Mines. Elevator ropes, to meet conditions peculiar to the operation of passenger and freight elevators, are generally made to other, more restrictive specifications.

Specifications serve a useful purpose in establishing manufacturing limitations. However, they do not specify how good a wire rope may be. They indicate the permissible minimum.

WIRE ROPE TOLERANCE

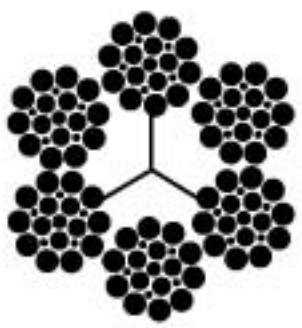
Wire rope is always made larger – never smaller – than the nominal diameter. In standard practice, the nominal diameter is the minimum diameter. All tolerances are taken on the plus side. A rope is not termed oversize until its diameter exceeds the allowable maximum.

Example: a 1-in. nominal-diameter wire rope may vary between 1 in. and 1-3/64 in. in diameter.

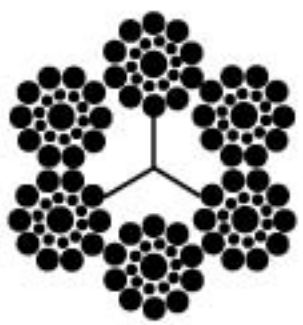


6 x 26 Type A with fiber core

6 x 25 filler wire Type W with I WRC



6 x 21 filler Type U with fiber core



6 x 21 Seale with fiber care

Wire Rope Common Terms

AIRCRAFT CABLES – Strands and wire ropes made of special strength wire originally used primarily for aircraft controls and miscellaneous uses of aircraft industry. No longer made to that specification.

CLOSED SOCKET – Wire rope and fitting consisting of basket and bail made integral

CONSTRUCTION – Design of wire rope including number of strands, number of wires per strand and arrangement of wires in each strand

CORE – Member of a wire rope about which the strands are laid. It may be fiber, a wire strand or an independent wire rope

CORRUGATED – Term used to describe the grooves of a sheave or drum when worn so as to show the impression of a wire rope

DIAMETER – Distance measured across the center of a circle circumscribing the wires of a strand or the strands of a wire rope

GALVANIZED ROPE – Rope made of galvanized wire

GRADES, ROPE – Classification of wire rope by its breaking strength. In order of increasing breaking strengths they are Iron, Traction, Mild Plow Steel, Plow Steel, Improved Plow Steel, Extra Improved Plow Steel

GRADES, STRAND – Classification of strand by its breaking strength. In order of increasing breaking strengths they are Common, Siemens Martin, High Strength and Extra-high Strength. A Utilities grade strand is also made to meet special requirement

INNER WIRES – All wires of a strand except surface or cover wires

INTERNALLY LUBRICATED – Wire rope or strand having all wires coated with lubricant

IWRC – "Independent Wire Rope Core"

LANG LAY ROPE – Wire rope in which the wires in the strands in the rope are laid in the same direction

LAY – Manner in which wires are helically laid into strands or strands into rope

LEFT LAY – (a) Strand – Strand in which the cover wires are laid in a helix having a left-hand pitch; (b) Rope – Rope in which the strands are laid in a helix having a left-hand pitch

MOORING LINES – Galvanized wire rope, usually 6 x 12, 6 x 24 or spring lay construction, for holding ships to dock

OPEN SOCKET – Wire rope fitting consisting of a "basket" and two "ears" with a pin

SUPER-FLEX SLINGS

Several wire ropes helically laid by machine form sling body of 3, 4, 5, 7 or 9 parts. Offer higher rated capacity than hand formed slings. Flemish-type splices and mechanically pressed sleeves form eyes, providing "centerline" pull. High flexibility. Every sling proof tested.

BRAIDED SLINGS

One or more wire ropes are braided to provide wide bearing surface in the body. Very flexible and capable of bending in tight radius to "snug up tight" around loads. 5, 6 and 7-part slings have flat bodies, 8 part is round.

PREFORMED WIRE ROPE – Wire rope in which the strands are permanently shaped, before fabrication into the rope to the helical form they assume in the wire rope

REEL – The flanged spool on which wire rope or strand is wound for storage or shipment

REGULAR LAY ROPE – Wire rope in which the wires in the strands and the strands in the rope are laid in opposite directions

REVERSE LAY – Synonymous with "Alternate Lay"

ROTARY LINES – The wire rope on a rotary drilling rig which raises and lowers the traveling block

SOCKET – Type of wire rope fitting. See "Closed Sockets," "Open Sockets" and "Wedge Sockets"

STAINLESS STEEL ROPE – Wire rope made of chrome-nickle steel wires having great resistance to corrosion

STRENGTH, NOMINAL – Published catalog strength which has been calculated and accepted by the wire rope industry following a set standard procedure. The wire rope manufacturer uses this strength as a minimum strength when designing the wire rope, and the user should consider this to be the strength when making his design calculations

STRENGTH, ACCEPTANCE – Strength which is 2-1/2% lower than the nominal strength. This variance is used to offset possible variables which might exist when the test is made to determine the breaking strength of a specific piece of wire rope. Its use originated with the basic government wire rope specification

STRENGTH, BREAKING – Load, applied through some type of tensile machine, that it takes to pull that piece of rope apart. This is the load at which a tensile failure occurs in the piece of wire rope being tested

STRENGTH, AGGREGATE – Sum of the breaking strength in tension of all the wires of a wire rope when the wires are tested individually

THIMBLE – Grooved metal fitting to protect the eye of a wire rope

WEDGE SOCKET – Wire rope fitting in which the rope is secured by a wedge

WIRE ROPE – A plurality of strands laid helically around an axis or a core

HAND LAID & SPLICED SLINGS

Fabricated from one or more wire ropes helically laid together continuously through both eyes and sling body. Rope ends secured by hand-tucked splices. High flexibility, conform well to irregular loads, snug load tighter in choke hitch and easier to pull from under loads than mechanically spliced eyes.

CABLE LAID SLINGS

These smooth, clean slings are made from a rope-like fabric formed by laying 6 wire ropes in a helical pattern around a core rope. Flemish splices secured by pressed sleeves provide "centerline" pull at eyes. More flexible than same capacity single-part slings.

Wire Rope

Nominal Strengths and Weights - 6 x 19 Class and 6 x 37 Class

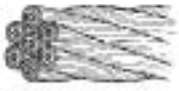
6 x 19 Seale

6 x 21 Filler Wire

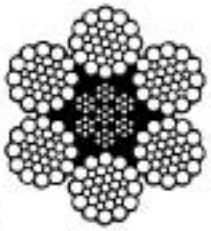
6 x 25 Filler Wire

6 x 26 Warrington Seale

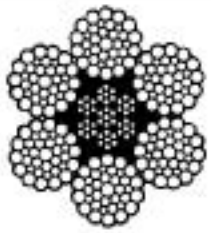
Diameter In Inches	Diameter In Millimeters	Nominal Strength In Tons of 2000 Pounds				Approximate Weight Per Foot In Pounds	
		Improved Plow Steel		Extra Improved Plow Steel	Extra-Extra Improved Plow Steel		
		Fiber Core	IWRC	IWRC	IWRC	Fiber Core	IWRC
3/16	5	1.55	1.67	-		.059	.065
1/4	6.3	2.74	2.94	3.40		.105	.116
5/16	8	4.26	4.58	5.27		.164	.18
3/8	9.5	6.10	6.56	7.55	8.3	.236	.26
7/16	11.1	8.27	8.89	10.2	11.2	.32	.35
1/2	12.7	10.7	11.5	13.3	14.6	.42	.46
9/16	14.3	13.5	14.5	16.8	18.5	.53	.59
5/8	15.9	16.7	17.9	20.6	22.7	.66	.72
3/4	19	23.8	25.6	29.4	32.4	.95	1.04
7/8	22.2	32.2	34.6	39.8	43.8	1.29	1.42
1	25.4	41.8	44.9	51.7	56.9	1.68	1.85
1-1/8	28.6	52.6	56.5	65.0	71.5	2.13	2.34
1-1/4	31.7	64.6	69.4	79.9	87.9	2.63	2.89
1-3/8	34.9	77.7	83.5	96.	106.0	3.18	3.50
1-1/2	38.1	92.0	98.9	114.	125.0	3.78	4.16
1-5/8	41.3	107.0	115.	132.	146.0	4.44	4.88
1-3/4	44.4	124.0	133.	153.	169.0	5.15	5.67
1-7/8	47.6	141.0	152.	174.	192.0	5.91	6.50
2	50.8	160.0	172.	198.	217.0	6.72	7.39
2-1/8	54	179.0	192.	221.		7.59	8.35
2-1/4	57.1	200.0	215.	247.		8.51	9.36
2-3/8	60.3	222.0	239.	274.		9.48	10.4
2-1/2	63.5	244.0	262.	302.		10.5	11.6
2-5/8	66.7	268.0	288.	331.		11.6	12.8
2-3/4	69.9	292.0	314.	361.		12.7	14.0
2-7/8	73	317.0	341.	393.		13.9	15.3
3	76.2	-	370.	425.		-	16.6
3-1/8	79.4	-	399.	458.		-	18.0
3-1/4	82.6	-	429.	492.		-	19.5
3-3/8	85.7	-	459.	529.		-	21.0
3-1/2	88.9	-	491.	564.		-	22.6



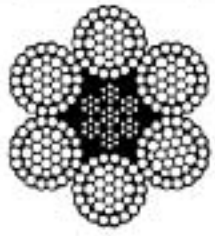
(6 x 37 Classification)



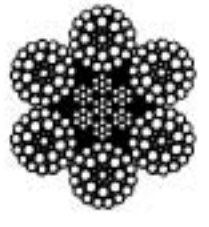
6 x 31 Warrington Seale



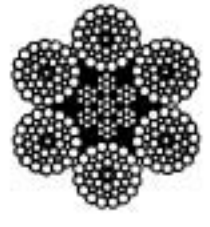
6 x 36 Warrington Seale



6 x 37 Operations



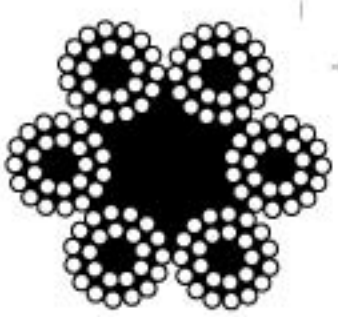
6 x 41 SFW Seale Filler Wire



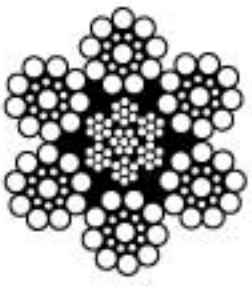
6 x 49 SWS Seale Warrington Seale

Galv. and Stainless Wire Rope

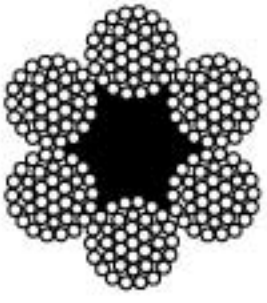
Galvanized Improved Plow Steel-Fiber Core 6 x 24			
Diameter Inches	Diameter in Millimeters	Approx. Wt/Ft in Lbs.	Nominal Strength in Tons of 2,000 Lbs.
3/8	9.5	.194	4.7
1/2	12.7	.35	8.40
9/16	14.3	.44	10.6
5/8	15.9	.54	13.0
3/4	19.0	.78	18.6
7/8	22.2	1.06	25.2
1	25.4	1.38	32.8
1-1/8	28.6	1.75	41.2
1-1/4	31.7	2.16	50.7
1-3/8	34.9	2.61	61.0
1-1/2	38.1	3.11	72.3
1-5/8	41.3	3.64	84.5
1-3/4	44.4	4.23	97.5
1-7/8	47.6	4.85	111.
2	50.8	5.52	126.



6 x 24 Galvanized Mooring Lines



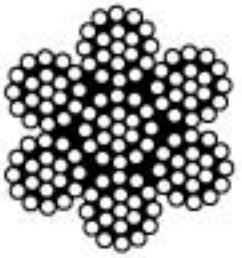
6 x 19
Galv



6 x 37
Galv

Diameter In Inches	Diameter In Millimeters	NOMINAL STRENGTH IN TONS OF 2,000 POUNDS Galv Improved Plow Steel				Approximate Weight Per Foot In Pounds	
		6 x 19		6 x 37			
		Fiber Core	IWRC	Fiber Core	IWRC	FC	IWRC
1/4	6.3	2.47	2.65	2.40	2.50	.105	.116
5/16	7.9	3.83	4.12	3.74	3.90	.164	.180
3/8	9.5	5.49	5.90	5.36	5.58	.236	.260
7/16	11.1	7.44	8.00	7.26	7.57	.32	.35
1/2	12.7	9.63	10.30	9.45	9.90	.42	.46
9/16	14.3	12.10	13.00	11.90	12.50	.53	.59
5/8	15.9	15.00	16.10	14.60	15.30	.66	.72
3/4	19.0	21.40	23.00	21.00	21.90	.95	1.04
7/8	22.2	29.00	31.10	28.40	29.60	1.29	1.42
1	25.4	37.60	40.40	36.90	38.50	1.68	1.85
1-1/8	28.6	47.30	50.90	46.50	48.50	2.13	2.34
1-1/4	31.7	58.10	62.50	57.10	59.50	2.63	2.89
1-3/8	34.9	69.90	75.10	68.80	71.70	3.18	3.50
1-1/2	38.1	82.80	89.00	81.50	85.00	3.78	4.16
1-5/8	41.3	96.30	103.00	95.30	99.90	4.44	4.88
1-3/4	44.4	112.00	120.00	110.00	115.00	5.15	5.67
2	50.8	144.00	155.00	143.00	148.00	6.72	7.39

Galv. and Stainless Wire Rope



7 x 19 Aircraft Cable

Galvanized Or Stainless Steel				
Diameter in Inches	Diameter in Millimeters	Approximate Weight Per 100 Feet In Pounds	Nominal Strength In Pounds	
			Galvanized	Stainless
1/16	1.6	.7	480	480
3/32	2.5	1.7	1,000	920
7/64	2.8	2.2	1,400	1,260
1/8	3.2	2.9	2,000	1,760
5/32	4.0	4.5	2,800	2,400
3/16	4.8	6.5	4,200	3,700
7/32	5.5	8.6	5,600	5,000
1/4	6.3	11.0	7,000	6,400
9/32	7.5	13.9	8,000	7,800
5/16	8.0	17.3	9,800	9,000
11/32	8.7	20.7	12,500	10,500
3/8	9.5	24.3	14,400	12,200
*7/16	11.1	35.6	16,000	16,300
*1/2	12.7	45.8	20,600	22,800

Note: 1/16 through 3/8 also available in 7 x 7
*6 x 19 IWRC

Used in a variety of applications, these small ropes are fabricated to uniform size and quality. For example, 1/16" 7x19 contains 133 separate wires, making the wires approximately the diameter of a human hair—but still provides strength, bendablity, and fatigue resistance.

These cables have been historically called "Aircraft" cable—but since most applications do not require the special marking, lubrication and testing, a utility cable is provided.

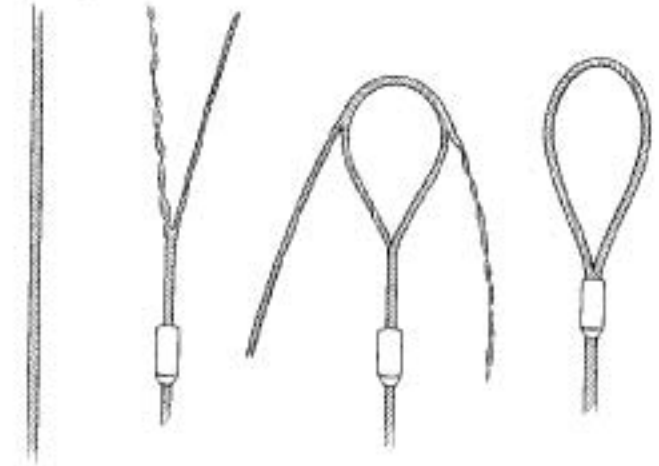
Spring-Lay

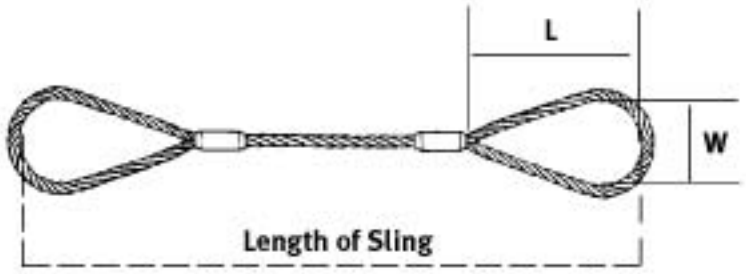
Galvanized Fiber Core		
Diameter Inches	Approx. Weight Per Foot Pounds	Minimum Breaking Strength Tons Of 2,000 Lb.
1/2	.22	4.47
9/16	.28	5.64
5/8	.34	6.95
3/4	.49	9.96
7/8	.63	13.5
1	.88	17.5
1-1/8	1.14	22.1
1-1/4	1.36	27.2
1-3/8	1.66	32.8
1-1/2	1.97	38.9
1-5/8	2.28	45.6
1-3/4	2.67	52.7
1-7/8	3.09	60.3
2	3.53	68.5
2-1/4	4.56	86.3
2-1/2	5.44	106.
2-3/4	6.65	127.

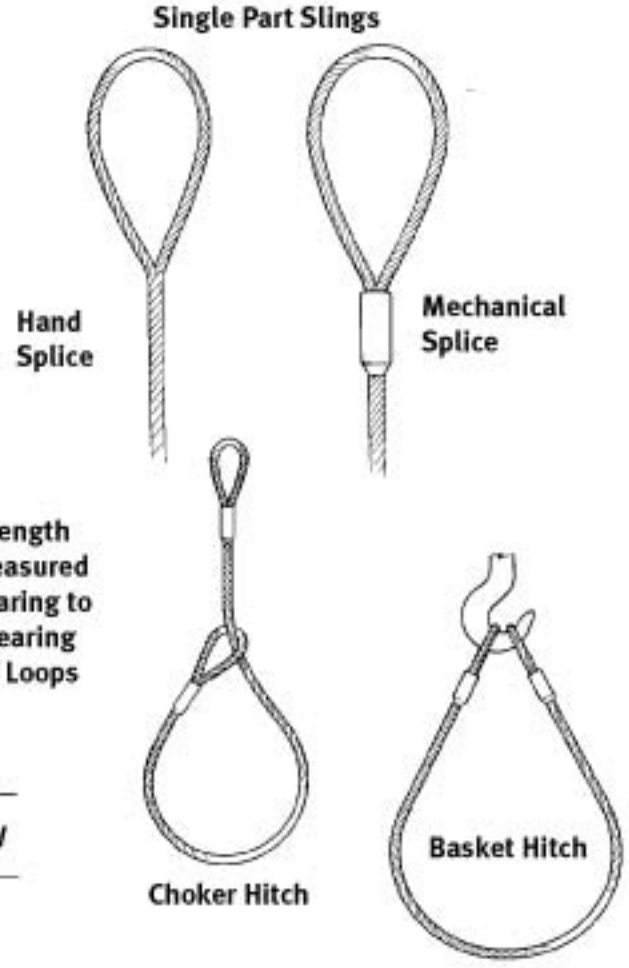
Spring-Lay is used for marine towing and mooring lines. High in strength—for strength equal to manila rope it only needs to be one-half the diameter, and its weight is less than manila rope of equal strength.

Single Leg Wire Rope Slings

In the flemish eye mechanical splice, rope is separated into two parts - 3 adjacent strands, and 3 adjacent strands and core. These are then re-laid back in opposite directions to form an eye, and secured with a pressed metal sleeve.

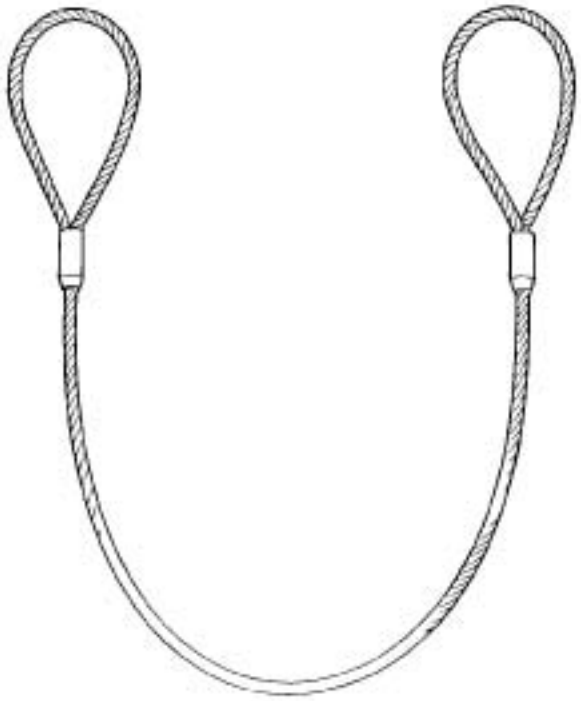






Rate Capacities in Tons of 2,000 Pounds					Rope Diameter Inches	Loop Dimensions	
Straight Pull	Choker Hitch	Basket Hitch 30°	Basket Hitch 45°	Basket Hitch 60°		W Inches	L Inches
.56	.42	.97	.79	.56	1/4	2	4
.87	.65	1.5	1.2	.87	5/16	2-1/2	5
1.2	.93	2.1	1.8	1.2	3/8	3	6
1.7	1.3	2.9	2.4	1.7	7/16	3-1/2	7
2.2	1.6	3.8	3.1	2.2	1/2	4	8
2.7	2.1	4.8	3.9	2.7	9/16	4-1/2	9
3.4	2.5	5.9	4.8	3.4	5/8	5	10
4.9	3.6	8.4	6.9	4.9	3/4	6	12
6.6	4.9	11.	9.3	6.6	7/8	7	14
8.5	6.4	15.	12.	8.5	1	8	16
10.	7.8	18.	15.	10.	1-1/8	9	18

Basket Hitch



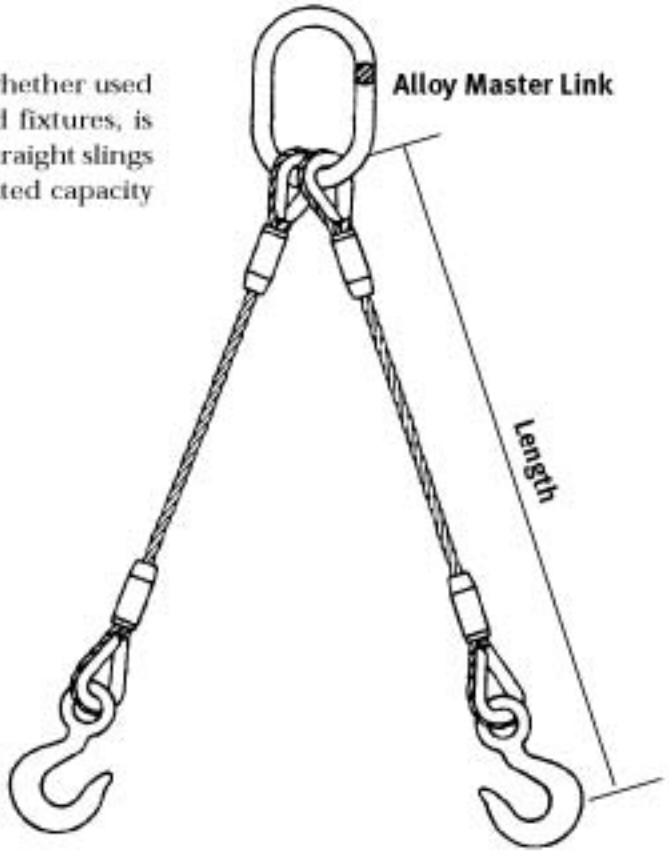
6 x 19, 6 x 37 Type, I.P., IWRC

Rope Size (In.)	Eye Size (In.) W	L	Recommended Minimum Length	Rated Capacity (Tons 2,000 Lbs.)* Straight Pull	Chocker Hitch	Basket Hitch Vertical	30°	45°	60°
1/4	3	6	1' 6"	.56	.42	1.1	.97	.79	.56
5/16	3	6	1' 10"	.87	.65	1.7	1.5	1.2	.87
3/8	3	6	1' 10"	1.2	.93	2.5	2.2	1.8	1.2
7/16	4	8	2' 4"	1.7	1.3	3.4	2.9	2.4	1.7
1/2	4	8	2' 6"	2.2	1.6	4.4	3.8	3.1	2.2
9/16	4	8	2' 8"	2.8	2.1	5.5	4.8	3.9	2.8
5/8	5	10	3' 2"	3.4	2.6	6.8	5.9	4.8	3.4
3/4	6	12	3' 8"	4.9	3.6	9.7	8.4	6.9	4.9
7/8	7	14	4' 4"	6.6	4.9	13.0	11.0	9.3	6.6
1	8	16	4' 10"	8.5	6.4	17.0	15.0	12.0	8.5
1-1/8	9	18	5' 6"	10.0	7.8	21.0	18.0	15.0	10.0
1-1/4	10	20	6' 2"	13.0	9.6	26.0	22.0	18.0	13.0
1-3/8	11	22	6' 10"	15.0	12.0	31.0	27.0	22.0	15.0
1-1/2	12	24	7' 4"	18.0	14.0	37.0	32.0	26.0	18.0
1-3/4	14	28	8' 6"	25.0	18.0	49.0	43.0	35.0	25.0
2	16	32	9' 10"	32.0	24.0	64.0	55.0	45.0	32.0

*Rated loads are based on a diameter of curvature of 20 times the individual rope diameter at points of sling contact with load.

Two Legged Bridle

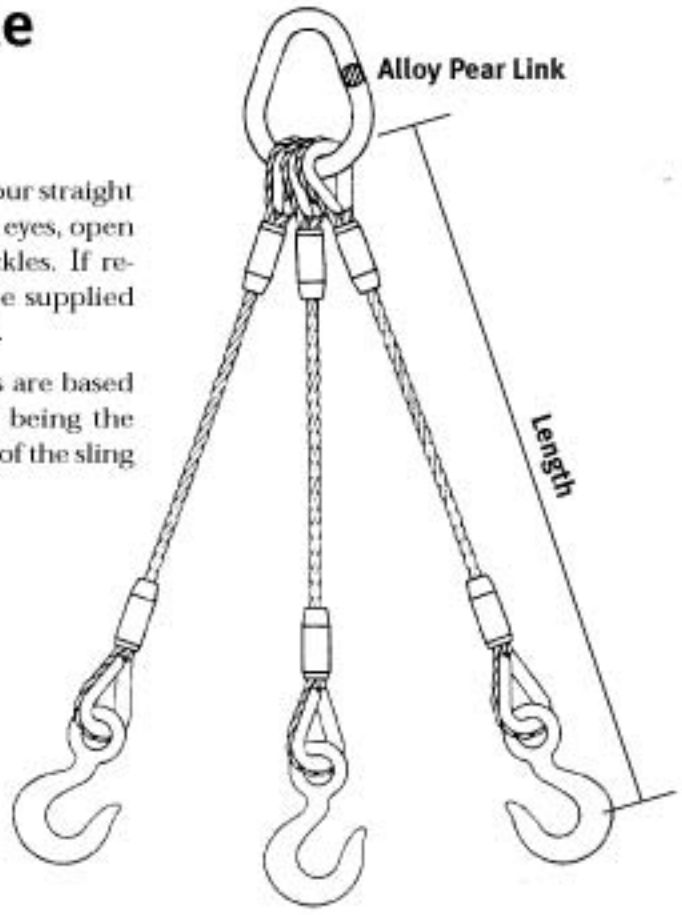
Rated Capacity for two-legged bridles whether used as chokers or with hooks or other end fixtures, is affected by rigging angles, the same as straight slings in basket hitches. Note reduction in rated capacity as legs spread to wider angles.



6 x 19, 6 x 37 Type, I.P., IWRC

Rope Size (In.)	Recommended Minimum Length	Rated Capacity (Ton 2,000 Lbs.)				Fittings	
		Straight Pull	30°	45°	60°	Hook Size In Tons	Alloy Master Links Size
1/4	1' 6"	1.1	.97	.79	.56	.75	1/2
5/16	1' 8"	1.7	1.5	1.2	.87	1.0	5/8
3/8	1' 10"	2.5	2.2	1.8	1.2	1.5	3/4
7/16	2' 4"	3.4	2.9	2.4	1.7	2.0	7/16
1/2	2' 6"	4.4	3.8	3.1	2.2	2.5	1
9/16	2' 10"	5.5	4.8	3.9	2.8	3.0	1-1/4
5/8	3' 4"	6.8	5.9	4.8	3.4	4.0	1-1/4
3/4	3' 8"	9.7	8.4	6.9	4.9	5.0	1-1/4
7/8	4' 4"	13.0	11.0	9.3	6.6	7.5	1-1/2
1	5'	17.0	15.0	12.0	8.5	10.0	1-3/4
1-1/8	5' 10"	21.0	18.0	15.0	10.0	12.0	1-3/4
1-1/4	6' 6"	26.0	22.0	18.0	13.0	15.0	1-7/8
1-3/8	7'	31.0	27.0	22.0	15.0	20.0	2-1/8
1-1/2	7' 6"	37.0	32.0	26.0	18.0	20.0	2-1/4
1-3/4	9' 2"	49.0	43.0	35.0	25.0	25.0	2-1/2

Three Legged Bridle



Single Part Body Slings

Multi-legged bridles – with two, three or four straight legs – are offered with plain eyes, thimble eyes, open or closed sockets, shackles and turnbuckles. If required, rings or alloy oblong links can be supplied rather than the pear shaped links shown.

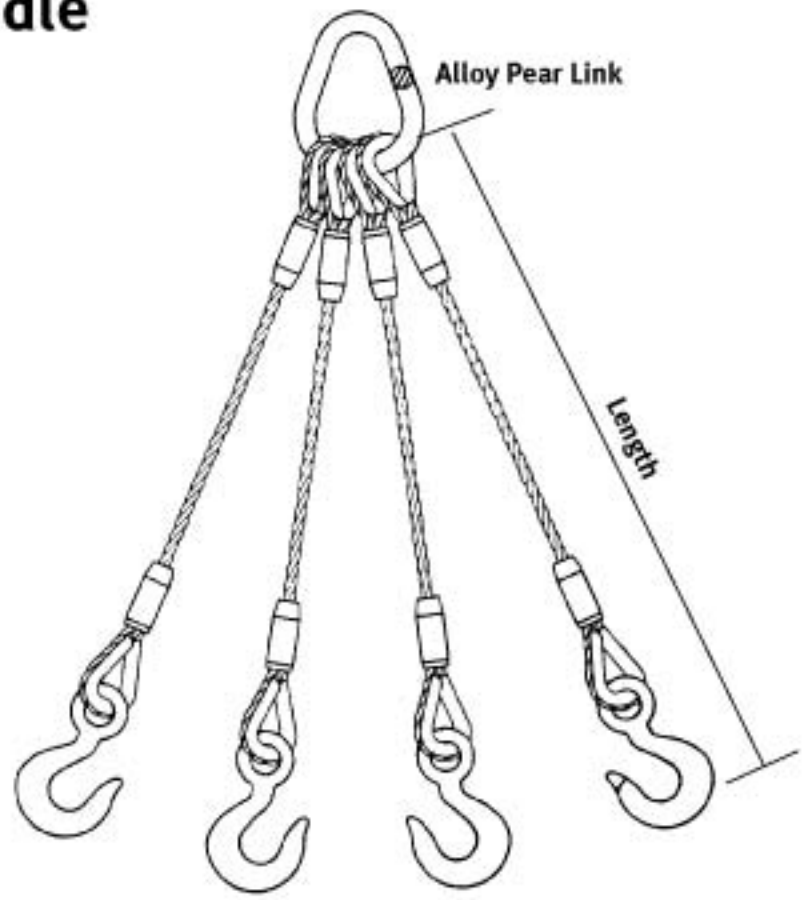
Rated capacities for 3 and 4 bridle slings are based on equal leg slings with the sling angle being the greatest angle measured between any two of the sling legs.

6 x 19, 6 x 37 Type, I.P., IWRC

Rope Size (In.)	Recommended Minimum Length	Rated Capacity (Ton 2,000 Lbs.)				Fittings	
		Straight Pull	30°	45°	60°	Hook Size In Tons	Alloy Pear Link Size
1/4	1' 6"	1.7	1.5	1.2	.84	.75	5/8
5/16	1' 8"	2.6	2.3	1.8	1.3	1.0	3/4
3/8	1' 10"	3.7	3.2	2.6	1.9	1.5	7/8
7/16	2' 4"	5.1	4.4	3.6	2.5	2.0	1
1/2	2' 6"	6.6	5.7	4.6	3.3	2.5	1-1/4
9/16	2' 10"	8.3	7.2	5.8	4.1	3.0	1-1/4
5/8	3' 4"	10.0	8.8	7.2	5.1	4.0	1-1/4
3/4	3' 8"	15.0	13.0	10.0	7.3	5.0	1-1/2
7/8	4' 4"	20.0	17.0	14.0	9.9	7.5	1-3/4
1	5'	26.0	22.0	18.0	13.0	10.0	1-3/4
1-1/8	5' 10"	31.0	27.0	22.0	16.0	12.0	2-1/8
1-1/4	6' 6"	39.0	33.0	27.0	19.0	15.0	2-1/2
1-3/8	7'	46.0	40.0	33.0	23.0	20.0	2-1/2 (2-3/4)*
1-1/2	7' 6"	55.0	48.0	39.0	27.0	20.0	2-3/4 (3)*
1-3/4	9' 2"	74.0	64.0	52.0	37.0	25.0	3 (3-1/4)*

*Links in parentheses are needed for adequate space when thimbles are used in the sling eyes at the link.

Four Legged Bridle



6 x 19, 6 x 37 Type, I.P., IWRC

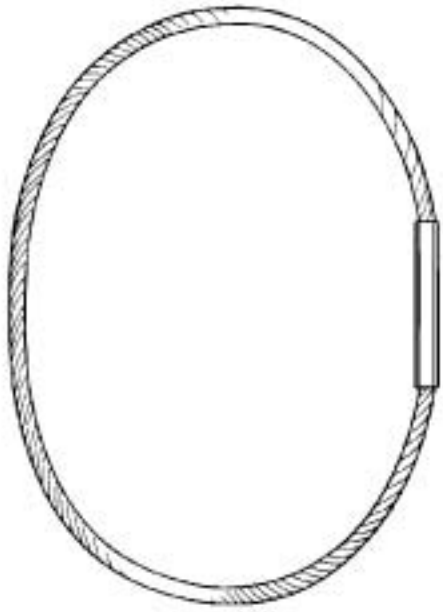
Rope Size (In.)	Recommended Minimum Length	Rated Capacity (Ton 2,000 Lbs.)				Fittings	
		Straight Pull	30°	45°	60°	Hook Size In Tons	Alloy Pear Link Size
1/4	1' 6"	2.2	1.9	1.6	1.1	.75	3/4
5/16	1' 8"	3.5	3.0	2.5	1.7	1.0	7/8
3/8	1' 10"	5.0	4.3	3.5	2.5	1.5	1
7/16	2' 4"	6.8	5.8	4.8	3.4	2.0	1-1/4**
1/2	2' 6"	8.7	7.6	6.2	4.4	2.5	1-1/4
9/16	2' 10"	11.0	9.5	7.8	5.5	3.0	1-1/4 (1-3/8)
5/8	3' 4"	14.0	12.0	9.6	6.8	4.0	1-1/2
3/4	3' 8"	19.0	17.0	14.0	9.7	5.0	1-3/4
7/8	4' 4"	26.0	23.0	19.0	13.0	7.5	1-7/16 (2)
1	5'	34.0	30.0	24.0	17.0	10.0	2-1/8 (2-1/4)
1-1/8	5' 10"	42.0	36.0	30.0	21.0	12.0	2-1/2 (2-1/2)
1-1/4	6' 6"	51.0	44.0	36.0	26.0	15.0	2-3/4 (3)***
1-3/8	7'	62.0	54.0	44.0	31.0	20.0	2-3/4 (3-1/4)
1-1/2	7' 6"	73.0	63.0	52.0	37.0	20.0	3 (3-1/4)

* Links in parentheses are needed for adequate space when thimbles are used in the sling eyes at the link.

**If thimbles are used, use 1/2" thimbles. ***If thimbles are used, use 1-3/8" thimbles.

Grommet Slings

6 x 19, 6 x 37
Classification
IPS, IWRC



Rope Grommets

Size (In.)	Rated Capacity (Ton 2,000 Lbs.)*					
	Straight Pull	Chocker Hitch	Basket Hitch			
			Vertical	30°	45°	60°
1/4	.85	.64	1.7	1.5	1.2	.80
3/8	1.9	1.4	3.8	3.3	2.7	1.9
1/2	3.3	2.5	6.7	5.8	4.7	3.4
5/8	5.2	3.9	10.0	8.6	7.1	5.0
3/4	7.4	5.6	15.0	13.0	11.0	7.5
7/8	10.0	7.5	20.0	17.0	14.0	10.0
1	13.0	9.7	26.0	23.0	18.0	13.0
1-1/8	16.0	12.0	32.0	28.0	23.0	16.0
1-1/4	19.0	15.0	39.0	34.0	27.0	19.0
1-3/8	23.0	18.0	47.0	40.0	33.0	23.0
1-1/2	28.0	21.0	55.0	48.0	39.0	28.0

Cable Laid Grommets

Size (In.)	Rated Capacity (Ton 2,000 Lbs.)*					
	Straight Pull	Chocker Hitch	Basket Hitch			
			Vertical	30°	45°	60°
3/8	1.6	1.2	3.2	2.8	2.3	1.6
9/16	3.5	2.6	6.9	6.0	4.9	3.4
5/8	4.5	3.4	9.0	7.8	6.3	4.5
3/4	5.1	3.8	10.0	8.8	7.2	5.0
15/16	7.9	5.9	16.0	14.0	11.0	8.0
1-1/8	11.0	8.4	22.0	19.0	16.0	11.0
1-5/16	15.0	11.0	30.0	26.0	21.0	15.0
1-1/2	19.0	14.0	39.0	33.0	27.0	19.0
1-11/16	24.0	18.0	49.0	42.0	34.0	24.0
1-7/8	30.0	22.0	60.0	52.0	42.0	30.0
2-1/4	42.0	31.0	84.0	73.0	59.0	42.0
2-5/8	56.0	42.0	112.0	97.0	79.0	56.0

* Rated loads are based on a diameter of curvature of 5 times the individual rope diameter at points of sling contact with load.

Fabrication Shop

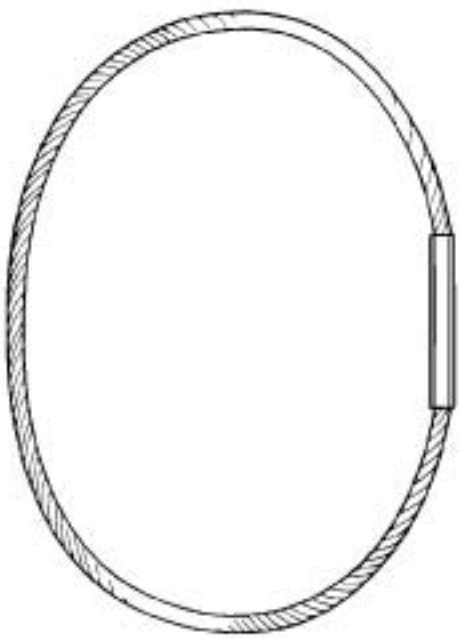
Custom Fabrication

Special Rigging

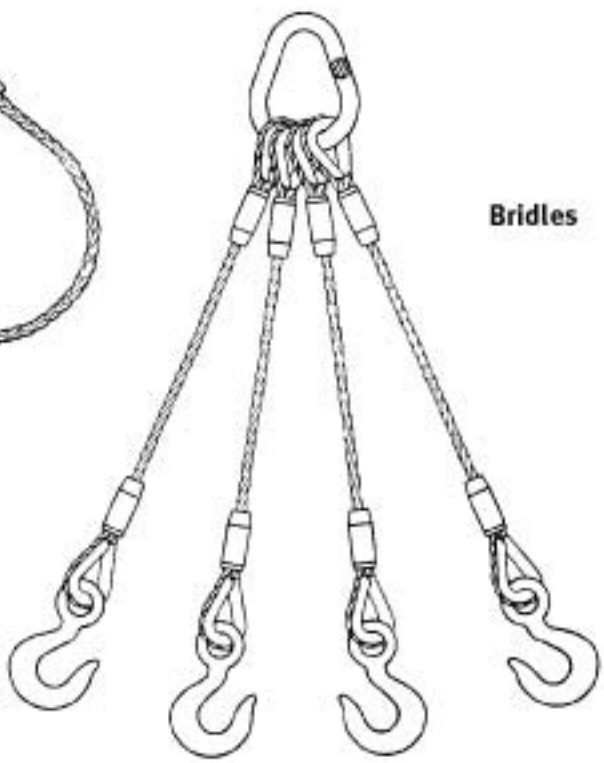
All Work Tested and Approved

Test Certificates Available on Request

Braided Slings



Grommet Slings



Bridles

Crosby® Clips

WARNINGS AND APPLICATION INSTRUCTIONS

G-450 (Red-U-Bolt)

SS-450 (316 Stainless Steel)

⚠ WARNING

- **Failure to read, understand, and follow these instructions may cause death or serious injury.**
- **Read and understand these instructions before using clips.**
- **Match the same size clip to the same size wire rope.**
- **Prepare wire rope end termination only as instructed.**
- **Do not use with plastic coated wire rope.**
- **Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque. (See Table 1, this page).**

Efficiency ratings for wire rope end terminations are based upon the catalog breaking strength of wire rope. The efficiency rating of a properly prepared loop or thimble - eye termination for clip sizes 1/8" through 7/8" is 80%, and for sizes 1 " through 3-1/2" is 90%.

The number of clips shown (see Table 1) is based upon using RRL or RLL wire rope, 6 x 19 or 6 x 37 Class, FC or IWRC; IPS or XIP. If Seale construction or similar large outer wire type construction in the 6 x 19 Class is to be used for sizes 1 inch and larger, add one additional clip. If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

The number of clips shown also applies to rotation - resistant RRL wire rope, 8 x 19 Class, IPS, XIP, sizes 1-1/2 inch and smaller; and to rotation- resistant RRL wire rope, 19 x 7 Class, IPS, XIP, sizes 1-3/4 inch and smaller.

For other classes of wire rope not mentioned above, we recommend contacting Washinton Chain or Crosby.

For elevator, personnel hoist, and scaffold applications, refer to ANSI A17.1 and ANSI A10.4. These standards do not recommend U-Bolt style wire rope clip terminations. The style wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251.

1. Refer to Table 1 in following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Apply U-Bolt over dead end of wire rope - live end rests in saddle (Never saddle a dead horse!). Tighten nuts evenly, alternate from one nut to the other until reaching the recommended torque.

2. When two clips are required, apply the second clip as near the loop or thimble as possible. Tighten nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. Proceed to Step 3.

3. When three or more clips are required, space additional clips equally between first two – take up rope slack – tighten nuts on each U-Bolt evenly, alternating from one nut to the other until reaching recommended torque.

4. **WIRE ROPE SPLICING PROCEDURES:**

The preferred method of splicing two wire ropes together is to use interlocking turnback eyes with thimbles, using the recommended number of clips on each eye (See Figure 1).

Figure 1

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 2). Spacing, installation torque, and other instructions still apply.

Figure 2

5. **IMPORTANT** Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque.

In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

Clip Size (Inches)	Rope Size (inches)	Minimum No. of Clips	Amount of Rope to Turn Back in Inches	*Torque in Ft. Lbs.
1/8	1/8	2	3-1/4	4.5
3/16	3/16	2	3-3/4	7.5
1/4	1/4	2	4-3/4	15
5/16	5/16	2	5-1/4	30
3/8	3/8	2	6-1/2	45
7/16	7/16	2	7	65
1/2	1/2	3	11-1/2	65
9/16	9/16	3	12	95
5/8	5/8	3	12	95
3/4	3/4	4	18	130
7/8	7/8	4	19	225
1	1	5	26	225
1-1/8	1-1/8	6	34	225
1-1/4	1-1/4	7	44	360
1-3/8	1-3/8	7	44	360
1-1/2	1-1/2	8	54	360
1-5/8	1-5/8	8	58	430
1-3/4	1-3/4	8	61	590
2	2	8	71	750
2-1/4	2-1/4	8	73	750
2-1/2	2-1/2	9	84	750
2-3/4	2-3/4	10	100	750
3	3	10	106	1200
3-1/2	3-1/2	12	149	1200

If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately.

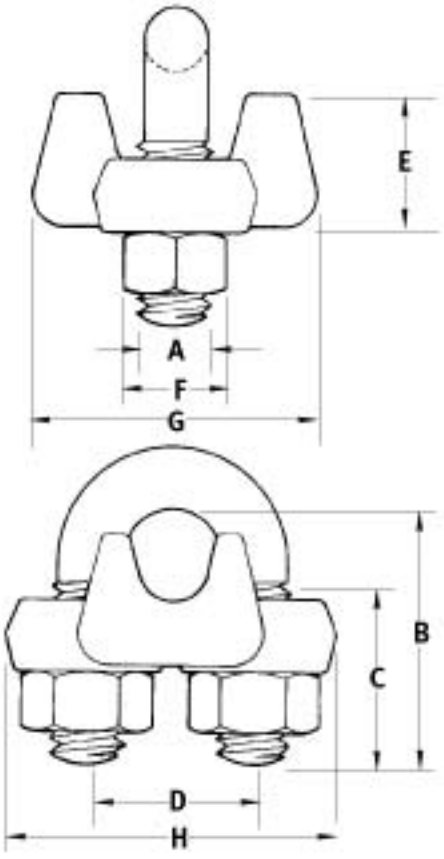
*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

Crosby® The SS-450 "316" Stainless Steel Wire Rope Clips

SEE APPLICATION AND WARNING INFORMATION On Page 140

- Each base has a Product Identification Code (PIC) for material traceability, the name CROSBY or "CG", and a size forged into it.
- Entire clip is made from 316 Stainless Steel to resist corrosive and rusting action.
- All components are Electro-Polished.
- All Clips are individually bagged or tagged with proper application instructions and warning information.

SS-450



Rope Size	Weight Per 100 (Lbs.)	Dimensions (In.)							
		A	B	C	D	E	F	G	H
1/8	6	.22	.72	.44	.47	.41	.38	.81	.94
3/16	10	.25	.97	.56	.59	.50	.44	.94	1.16
1/4	20	.31	1.03	.50	.75	.66	.56	1.19	1.44
3/8	47	.44	1.50	.75	1.00	.91	.75	1.63	1.94
1/2	77	.50	1.88	1.00	1.19	1.13	.88	1.91	2.28
5/8	106	.56	2.38	1.25	1.31	1.34	.94	2.06	2.50

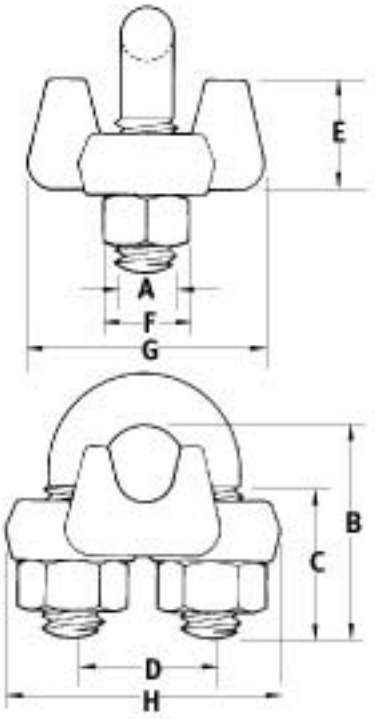
Forged Wire Rope Clips

- Each base has a Product Identification Code (PIC) for material traceability, the name CROSBY or "CG", and a size forged into it.
- Sizes 1/8" through 2-1/2" have forged bases.
- Entire Clip – Galvanized to resist corrosive and rusting action.
- Only Genuine Crosby Clips have a Red U-BOLT for instant recognition.
- All Clips are individually bagged or tagged with proper application instructions and warning information.
- Clip sizes up through 1-1/2" have rolled threads.

Crosby Clips, all sizes 1/4" and larger, meet performance requirements of Federal Specification FF-C-450 TYPE 1 CLASS 1, except for those provisions required of the contractor.

SEE APPLICATION AND WARNING INFORMATION On Page 140

Crosby® Clips



Look for the Red U-Bolt®, your assurance of Crosby Clips

G-450

Rope Size (In.)	Weight Per 100 (Lbs.)	Dimensions (In.)							
		A	B	C	D	E	F	G	H
*1/8	6	.22	.72	.44	.47	.41	.38	.81	.94
*3/16	10	.25	.97	.56	.59	.50	.44	.94	1.16
1/4	19	.31	1.03	.50	.75	.66	.56	1.19	1.44
5/16	28	.38	1.38	.75	.88	.72	.69	1.31	1.69
3/8	48	.44	1.50	.75	1.00	.91	.75	1.63	1.94
7/16	78	.50	1.88	1.00	1.19	1.03	.88	1.81	2.28
1/2	80	.50	1.88	1.00	1.19	1.13	.88	1.91	2.28
9/16	109	.56	2.25	1.25	1.31	1.22	.94	2.06	2.50
5/8	110	.56	2.38	1.25	1.31	1.34	.94	2.06	2.50
3/4	142	.62	2.75	1.44	1.50	1.41	1.06	2.25	2.84
7/8	212	.75	3.12	1.62	1.75	1.59	1.25	2.44	3.16
1	252	.75	3.50	1.81	1.88	1.78	1.25	2.63	3.47
1-1/8	283	.75	3.88	2.00	2.00	1.91	1.25	2.81	3.59
1-1/4	438	.88	4.25	2.13	2.31	2.19	1.44	3.13	4.13
1-3/8	442	.88	4.63	2.31	2.38	2.31	1.44	3.13	4.19
1-1/2	544	.88	4.94	2.38	2.59	2.44	1.44	3.41	4.44
1-5/8	704	1.00	5.31	2.62	2.75	2.66	1.63	3.63	4.75
1-3/4	934	1.13	5.75	2.75	3.06	2.94	1.81	3.81	5.28
2	1,300	1.25	6.44	3.00	3.38	3.28	2.00	4.44	5.88
2-1/4	1,600	1.25	7.13	3.19	3.88	3.19	2.00	4.50	6.38
2-1/2	1,900	1.25	7.69	3.44	4.13	3.69	2.00	4.70	6.63
†2-3/4	2,300	1.25	8.31	3.56	4.38	4.88	2.00	5.00	6.88
3	3,100	1.50	9.19	3.88	4.75	4.69	2.38	5.88	7.63
†3-1/2	4,000	1.50	10.75	4.50	5.50	6.00	2.38	6.19	8.38

*Electro-plated U-Bolt and Nuts †2-3/4" and 3-1/2" base are made of cast steel.

Notes

Crosby® Fist Grip Clips

WARNINGS AND APPLICATION INSTRUCTIONS

G-429

⚠ WARNING

- **Failure to read, understand, and follow these instructions may cause death or serious injury.**
- **Read and understand these instructions before using clips.**
- **Match the same size clip to the same size wire rope.**
- **Prepare wire rope end termination only as instructed.**
- **Do not use with plastic coated wire rope.**
- **Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque. (See Table 1, this page).**

Efficiency ratings for wire rope end terminations are based upon the catalog breaking strength of wire rope. The efficiency rating of a properly prepared loop or thimble - eye termination for clip sizes 1/8" through 7/8" is 80%, and for sizes 1 " through 3-1/2" is 90%.

The number of clips shown (see Table 1) is based upon using RRL or RLL wire rope, 6 x 19 or 6 x 37 Class, FC or IWRC; IPS or XIP. If Seale construction or similar large outer wire type construction in the 6 x 19 Class is to be used for sizes 1 inch and larger, add one additional clip. If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

The number of clips shown also applies to rotation - resistant RRL wire rope, 8 x 19 Class, IPS, XIP, sizes 1-1/2 inch and smaller; and to rotation-resistant RRL wire rope, 19 x 7 Class, IPS, XIP, sizes 1-1/2 inch and smaller.

For other classes of wire rope not mentioned above, please contact Washington Chain.

The style wire rope termination used for any application is the obligation of the user.

For OSHA (Construction) applications, see OSHA 1926.251.

Figure 1

1. Refer to Table 1 in following these instructions. Turn back specified amount of rope from thimble or loop. Apply first clip one base width from dead end of rope. Tighten nuts evenly, alternating from one nut to the other until reaching the recommended torque.

Figure 2

2. When two clips are required, apply the second clip as near the loop or thimble as possible. Tighten nuts evenly, alternating until reaching the recommended torque. When more than two clips are required, apply the second clip as near the loop or thimble as possible, turn nuts on second clip firmly, but do not tighten. Proceed to Step 3.

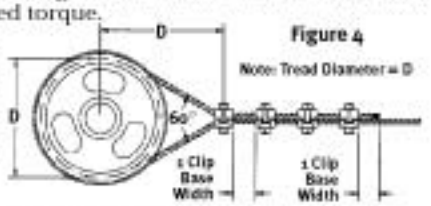
Figure 3

3. When three or more clips are required, space additional clips equally between first two – take up rope slack – tighten nuts on each clip evenly, alternating from one nut to the other until reaching recommended torque.

4. If a pulley (sheave) is used, in place of a thimble add one additional Fist Grip. Fist Grip spacing should be as shown.

Figure 4

Note: Tread Diameter = D



5. WIRE ROPE SPLICING PROCEDURES:

The preferred method of splicing two wire ropes together is to use interlocking turnback eyes with thimbles, using the recommended number of clips on each eye (See Figure 5).

An alternate method is to use twice the number of clips as used for a turnback termination. The rope ends are placed parallel to each other, overlapping by twice the turnback amount shown in the application instructions. The minimum number of clips should be installed on each dead end (See Figure 6). Spacing, installation torque, and other instructions still apply.

Figure 5

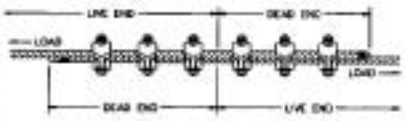


Figure 6

6. **IMPORTANT** Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque.

In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

Table 1

Clip Size (Inches)	Rope Size (inches)	Minimum No.of Clips	Amount of Rope to Turn Back in Inches	*Torque in Ft. Lbs.
3/16	3/16	2	4	30
1/4	1/4	2	4	30
5/16	5/16	2	5	30
3/8	3/8	2	5-1/4	45
7/16	7/16	2	6-1/2	65
1/2	1/2	3	11	65
9/16	9/16	3	12-3/4	130
5/8	5/8	3	13-1/2	130
3/4	3/4	3	16	225
7/8	7/8	4	26	225
1	1	5	37	225
1-1/8	1-1/8	5	41	360
1-1/4	1-1/4	6	55	360
1-3/8	1-3/8	6	62	500
1-1/2	1-1/2	7	78	500

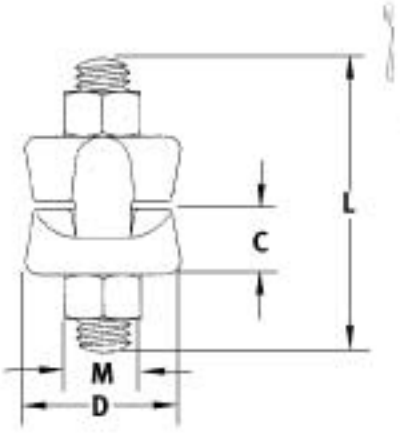
If a pulley (sheave) is used for turning back the wire rope, add one additional clip. See Figure 4.

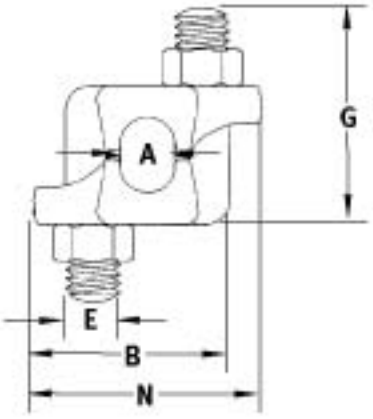
If a greater number of clips are used than shown in the table, the amount of turnback should be increased proportionately.

*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

Fist Grip® Clips

G-429





- Bolts are an integral part of the saddle. Nuts can be installed in such a way as to enable the operator to swing the wrench in a full arc for fast installation.
- All sizes have forged steel saddles.
- Entire clip is Galvanized to resist corrosive and rusting action.
- All Clips are individually bagged or tagged with proper application instructions and warning information.
- Assembled with standard heavy hex nuts.

Fist Grip wire clips meet or exceed the performance requirements of Federal Specification FF-C-450 Type III, Class 1, except for those provisions required of the contractor.

SEE APPLICATION AND WARNING INFORMATION ON PAGE 144

Rope Size (In.)	Weight Per 100 (Lbs.)	Dimensions (In.)								
		A	B	C	D	E	G	Approx. L	M	N
3/16 – 1/4	23	.25	1.25	.34	.94	.38	1.28	1.63	.69	1.47
5/16	28	.31	1.34	.44	1.06	.38	1.47	1.94	.69	1.56
3/8	40	.38	1.59	.50	1.06	.44	1.81	2.38	.75	1.88
7/16 – 1/2	62	.50	1.88	.56	1.25	.50	2.19	2.75	.88	2.19
9/16 – 5/8	103	.63	2.28	.69	1.50	.63	2.69	3.50	1.06	2.63
3/4	175	.75	2.69	.88	1.81	.75	2.94	3.75	1.25	3.06
7/8	225	.88	2.97	.97	2.13	.75	3.31	4.13	1.25	3.14
1	300	1.00	3.06	1.19	2.25	.75	3.72	4.63	1.25	3.53
1-1/8	400	1.13	3.44	1.28	2.38	.88	4.19	5.25	1.44	3.91
1-1/4	400	1.25	3.56	1.34	2.50	.88	4.25	5.25	1.44	4.03
1-3/8 – 1-1/2	700	1.50	4.13	1.56	3.00	1.00	5.56	7.00	1.63	4.66

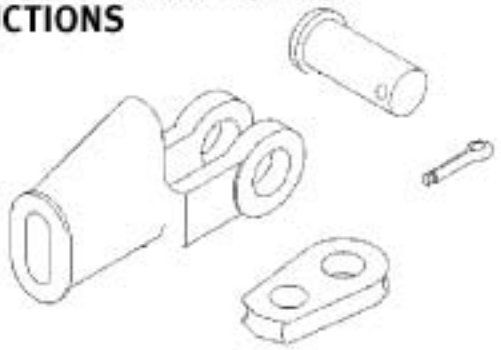
®Fist Grip is a registered trademark of the Crosby Group, Inc.

Crosby® Wedge Socket

WARNINGS AND APPLICATION INSTRUCTIONS

S-421

US-422



Important Safety Information - Read and Follow

Inspection/Maintenance Safety

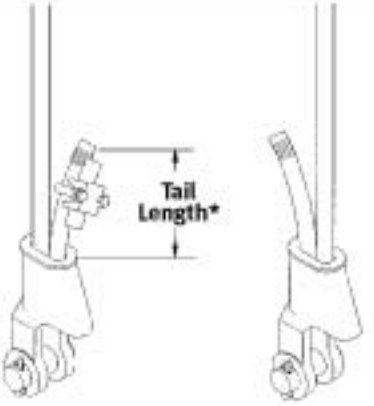
- Always inspect socket, wedge and pin before using.
- Do not use part showing cracks.
- Do not use modified or substitute parts.
- Repair minor nicks or gouges to socket or pin by lightly grinding until surfaces are smooth. Do not reduce original dimension more than 10%. Do not repair by welding.
- Inspect permanent assemblies annually, or more often in severe operating conditions.
- Do not mix and match wedges or pins between models or sizes.
- Always select the proper wedge and socket for the wire rope size – see catalog for additional information.

Assembly Safety

- Use only with standard 6 to 8 strand wire rope of designated size. For intermediate size rope, use next larger size socket. For example: When using 9/16" diameter wire rope use a 5/8" size Wedge Socket Assembly. Welding of the tail on standard wire rope is not recommended. The tail length of the dead end should be a minimum of 6 rope diameters but not less than 6".
- Align live end of rope, with center line of pin. (See Figure 1)
- Secure dead end section of rope. (See Figure 1)
- DO NOT ATTACH DEAD END TO LIVE END. (See Figure 2)
- Use a hammer to seat Wedge and Rope as deep into socket as possible before applying first load.
- To use with Rotation Resistant wire rope (special wire rope constructions with 8 or more outer strands) ensure that the dead end is welded, brazed or seized before inserting the wire rope into the wedge socket to prevent core slippage or loss of rope lay. The tail length of the dead end should be a minimum of 20 rope diameters but not less than 6" (See Figure 1).

⚠ WARNING

- **Loads may slip or fall if the Wedge Socket is not properly installed.**
- **A falling load can seriously injure or kill.**
- **Read and understand these instructions before installing the Wedge Socket.**
- **Do not interchange Crosby wedge socket, wedge or pin with non Crosby wedge socket, wedge or pin.**
- **Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.**
- **Do not interchange wedges between S-421T and US-422 or between sizes.**



RIGHT **WRONG**

*Tail Length

Standard 6 to 8 strand wire rope

A minimum of 6 rope diameters, but not less than 6".

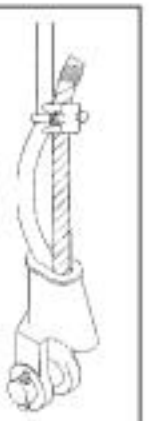
(i.e. - For 1" rope: Tail Length = 1 x 6 = 6")

Rotation Resistant Wire Rope

A minimum of 20 rope diameters, but no less than 6".

(i.e. - For 1" rope: Tail Length = 1 x 20 = 20")

Figure 1



WRONG

Figure 2

Operating Safety

- Apply first load to fully seat the Wedge and Wire Rope in the socket. This load should be of equal or greater weight than loads expected in use.
- Efficiency rating of the Wedge Socket termination is based upon the catalog breaking strength of Wire Rope. The efficiency of a properly assembled Wedge Socket is 80%.
- During use, do not strike the dead end section with any other elements of the rigging (Called two blocking).

Wedge Sockets

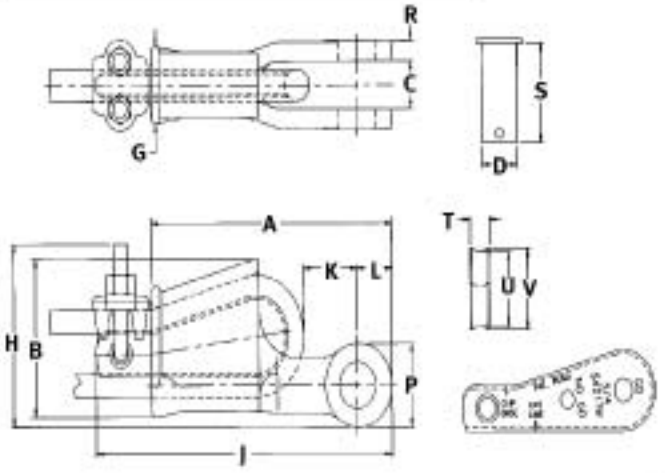
THE TERMINATOR™

Crosby®'s "New & Improved" Wedge Socket

SEE APPLICATION AND WARNING INFORMATION ON PAGE 146

QUIC-CHECK®

S-421T



Wire Rope Size (In.)	S-421T Complete Assembly Weight Each (Lbs.)††	S-421TW Wedge Only Weight Each (Lbs.)
3/8	3.18	.50
1/2	6.15	1.05
5/8	9.70	1.79
3/4	14.50	2.60
7/8	21.50	4.02
1	30.75	5.37
1-1/8	45.30	7.84
**1-1/4	57.50	6.81

*Terminator Assembly includes Socket, Wedge, Pin, and Wire Rope Clip.

**1-1/4" not available in TERMINATOR™ style.

Wedge Socket meets the performance requirements of Federal Specification RR-S-550D Type C, except those provisions required of the contractor.

U.S. patent 5,553,360 and foreign equivalents.

- Individually magnetic particle inspected.
- Pin diameter and jaw opening allows wedge and socket to be used in conjunction with open swage and spelter sockets.
- Secures the tail or "dead end" of the wire rope to the wedge, thus eliminates loss or "Punch out" of the wedge.
- Eliminates the need for an extra piece of rope, and is easily installed.
- The TERMINATOR™ wedge eliminates the potential breaking off of the tail due to fatigue.
- The tail, which is secured by the base of the clip and the wedge, is left undeformed and available for reuse.
- Incorporates Crosby's patented QUIC-CHECK® "Go" and "No-Go" feature cast into the wedge. The proper size rope is determined when the following criteria are met:
  1. The wire rope should pass thru the "Go" hole in the wedge.
  2. The wire rope should NOT pass thru the "No-Go" hole in the wedge.
- Utilizes standard Crosby Red-U-Bolt wire rope clip
- Generates a minimum efficiency of 80% based on the catalog breaking strength of the wire rope.
- Standard S-421 wedge socket can be retrofitted with the new style TERMINATOR™ wedge.
- Available with Bolt, Nut, and Cotter Pin.

Wire Rope Dia.†† (In.)	Dimensions (In.)														
	A	B	C	D	G	H	J†	K†	L	P	R	S	T	U	V
3/8	5.63	2.66	.81	.81	1.38	3.12	7.38	1.60	.88	1.56	.44	2.13	.44	1.25	1.38
1/2	6.81	3.53	1.00	1.00	1.62	3.85	8.75	1.21	1.06	1.94	.50	2.56	.53	1.75	1.88
5/8	8.16	4.25	1.25	1.19	2.12	4.58	10.34	1.64	1.22	2.25	.56	3.25	.69	2.00	2.19
3/4	9.78	4.96	1.50	1.38	2.44	5.37	12.03	2.17	1.40	2.62	.66	3.63	.78	2.34	2.56
7/8	11.16	5.66	1.75	1.63	2.69	6.28	14.00	2.22	1.66	3.12	.75	4.31	.88	2.69	2.94
1	12.75	6.31	2.00	2.00	2.94	7.02	15.86	2.71	2.00	3.75	.88	4.70	1.03	2.88	3.28
1-1/8	14.38	6.94	2.25	2.25	3.31	7.76	17.70	2.50	2.25	4.25	1.00	5.44	1.10	3.25	3.56
1-1/4	16.00	7.53	2.50	2.50	3.56	N/A	N/A	3.39	2.50	4.75	1.12	6.13	1.31	3.38	3.81

†Nominal

††For intermediate wire rope sizes use next larger size socket.

®Quic-Check is a registered trademark of the Crosby Group, Inc.

Crosby® Open Swage Sockets

S-501 Open Socket Specifications

Forged from quality carbon steel, suitable for cold forming.

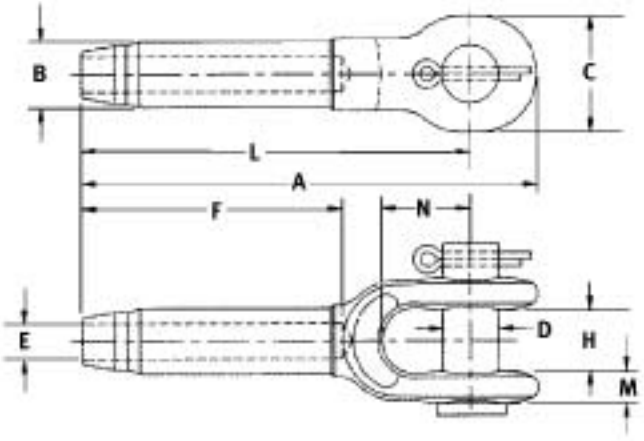
Hardness controlled by spheroidize annealing.

S-502 Swage Sockets are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL or IWRC wire rope.

Swage Socket terminations have an efficiency rating of 100% based on the catalog strength of wire rope.

QUIC-CHECK®

Swage sockets incorporate a reduced machined area of the shank which is equivalent to the proper after Swage dimension. Before swaging, this provides for an obvious visual difference in the shank diameter. After swaging, a uniform shank diameter is created allowing for a QUIC CHECK® and permanent visual inspection opportunity. This does not eliminate the need to perform standard production inspections which include gauging for the proper after swage dimensions or proof loading.



In accordance with ANSI B30.9, all slings terminated with swage sockets shall be proof loaded.*

Rope Size (In.)	Weight Each (Lbs.)	Before Swage Dimensions										Max. After Swage Dim. (In.)
		A	B	C	D	E	F	H	L	M	N	
1/4	.52	4.81	.50	1.38	.69	.27	2.13	.69	4.00	.38	1.50	.46
5/16	1.12	6.25	.77	1.62	.81	.34	3.19	.81	5.31	.47	1.75	.71
3/8	1.30	6.25	.77	1.62	.81	.41	3.19	.81	5.31	.47	1.75	.71
7/16	2.08	7.81	.98	2.00	1.00	.48	4.25	1.00	6.69	.56	2.00	.91
1/2	2.08	7.81	.98	2.00	1.00	.55	4.25	1.00	6.69	.56	2.00	.91
9/16	4.51	9.50	1.25	2.38	1.19	.61	5.31	1.25	8.13	.68	2.25	1.16
5/8	4.67	9.50	1.25	2.38	1.19	.67	5.31	1.25	8.13	.68	2.25	1.16
3/4	7.97	11.56	1.55	2.75	1.38	.80	6.38	1.50	10.00	.78	2.75	1.42
7/8	11.52	13.41	1.70	3.13	1.62	.94	7.44	1.75	11.63	.94	3.25	1.55
1	17.80	15.47	1.98	3.69	2.00	1.06	8.50	2.00	13.38	1.06	3.75	1.80
1-1/8	25.25	17.31	2.25	4.06	2.25	1.19	9.56	2.25	15.00	1.19	4.25	2.05
1-1/4	35.56	19.02	2.53	4.50	2.50	1.33	10.63	2.50	16.50	1.22	4.75	2.30
1-3/8	43.75	20.94	2.80	5.00	2.50	1.45	11.69	2.50	18.13	1.38	5.25	2.56
1-1/2	58.50	22.88	3.08	5.50	2.75	1.58	12.75	3.00	19.75	1.69	5.75	2.81
1-3/4	88.75	26.63	3.39	6.69	3.50	1.86	14.88	3.50	23.00	2.11	6.75	3.06
2	146.25	31.44	3.94	8.00	3.75	2.11	17.00	4.00	26.88	2.37	8.00	3.56

*Maximum Proof Load shall not exceed 40% of XXIP rope catalog breaking strength.

Crosby® Closed Swage Sockets

S-502 Closed Socket Specifications

QUIC-CHECK®

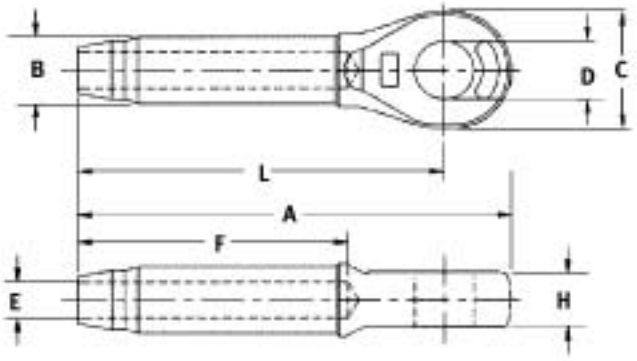
Forged from quality carbon steel, suitable for cold forming.

Hardness controlled by spheroidize annealing.

S-501 Swage Sockets are recommended for use with 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL or IWRC wire rope.

Swage Socket terminations have an efficiency rating of 100% based on the catalog strength of wire rope.

Swage sockets incorporate a reduced machined area of the shank which is equivalent to the proper after Swage dimension. Before swaging, this provides for an obvious visual difference in the shank diameter. After swaging, a uniform shank diameter is created allowing for a QUIC CHECK® and permanent visual inspection opportunity. This does not eliminate the need to perform standard production inspections which include gauging for the proper after swage dimensions or proof loading.



In accordance with ANSI B30.9, all slings terminated with swage sockets shall be proof loaded.*

Rope Size (In.)	Weight Each (Lbs.)	Before Swage Dimensions								Max. After Swage Dim. (In.)
		A	B	C	D	E	F	H	L	
1/4	.33	4.31	.50	1.38	.75	.27	2.12	.50	3.50	.46
5/16	.75	5.44	.77	1.62	.88	.34	3.19	.67	4.50	.71
3/8	.72	5.44	.77	1.62	.88	.41	3.19	.67	4.50	.71
7/16	1.42	6.91	.98	2.00	1.06	.48	4.25	.86	5.75	.91
1/2	1.42	6.91	.98	2.00	1.06	.55	4.25	.86	5.75	.91
9/16	2.92	8.66	1.25	2.38	1.25	.61	5.31	1.13	7.25	1.16
5/8	2.85	8.66	1.25	2.38	1.25	.67	5.31	1.13	7.25	1.16
3/4	5.00	10.28	1.55	2.88	1.44	.80	6.38	1.31	8.63	1.42
7/8	6.80	11.94	1.70	3.12	1.69	.94	7.44	1.50	10.13	1.55
1	10.40	13.56	1.98	3.63	2.06	1.06	8.50	1.75	11.50	1.80
1-1/8	14.82	15.03	2.25	4.00	2.31	1.19	9.56	2.00	12.75	2.05
1-1/4	21.57	16.94	2.53	4.50	2.56	1.33	10.63	2.25	14.38	2.30
1-3/8	28.54	18.63	2.80	5.00	2.56	1.45	11.69	2.25	15.75	2.56
1-1/2	38.06	20.12	3.08	5.50	2.81	1.58	12.75	2.50	17.00	2.81
1-3/4	51.00	23.56	3.39	6.25	3.56	1.86	14.88	3.00	20.00	3.06
2	89.25	27.62	3.94	7.25	3.81	2.11	17.00	3.25	23.00	3.56

*Maximum Proof Load shall not exceed 40% of XXIP rope catalog breaking strength.

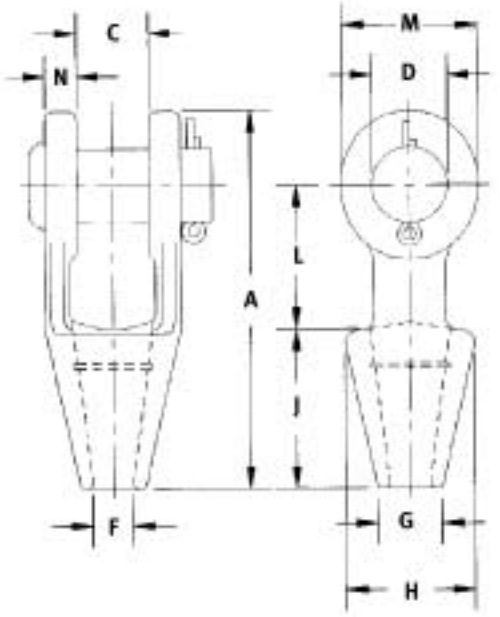
Crosby® Grooved Open Spelter Sockets

G-416

- Forged Steel Sockets thru 1-1/2", cast alloy steel 1-5/8" thru 4".
- Spelter socket terminations have an efficiency rating of 100%, based on the catalog strength of wire rope. Ratings are based on recommended use with 6 x 7, 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC, or IWRC wire rope.

Note: The drawing illustrates one groove used on sockets 1/4" thru 3/4". Sizes 7/8" thru 1-1/2" use two grooves. Sizes 1-5/8" and larger use three grooves.

Open Grooved Sockets meet the performance requirements of Federal Specification RR-S-550D, Type A, except for those provisions required of the contractor.



Notice: All cast steel sockets 1-5/8" and larger are magnetic particle inspected and ultrasonic inspected. Proof testing available on special order.

Rope Dia. (In.)	Structural Strand Dia. (In.)	Weight Each (Lbs.)	Dimensions (In.)									
			A	C	D	F	G	H	J	L	M	N
1/4	–	1.10	4.56	.91	.69	.38	.69	1.56	2.25	1.56	1.31	.36
5-16 – 3/8	–	1.30	4.84	.81	.81	.50	.81	1.69	2.25	1.75	1.50	.44
7/16 – 1/2	–	2.25	5.56	1.00	1.00	.56	.94	1.88	2.50	2.00	1.88	.50
9/16 – 5/8	1/2	3.60	6.75	1.25	1.19	.69	1.13	2.25	3.00	2.50	2.25	.56
3/4	9/16 – 5/8	5.83	7.94	1.50	1.38	.81	1.25	2.62	3.50	3.00	2.62	.62
7/8	11/16 – 3/4	9.65	9.25	1.75	1.63	.94	1.50	3.25	4.00	3.50	3.13	.80
1	13/16 – 7/8	15.50	10.58	2.00	2.00	1.13	1.75	3.75	4.50	4.00	3.75	.88
1-1/8	15/16 – 1	21.50	11.81	2.25	2.25	1.25	2.00	4.12	5.00	4.62	4.12	1.00
1-1/4 – 1-3/8	1-1/16 – 1-1/8	31.00	13.19	2.50	2.50	1.50	2.25	4.75	5.50	5.00	4.75	1.13
1-1/2	1-13/16 – 1-1/4	47.25	15.12	3.00	2.75	1.63	2.75	5.25	6.00	6.00	5.38	1.19
† 1-5/8	1-5/16 – 1-3/8	55.00	16.25	3.00	3.00	1.75	3.00	5.50	6.50	6.50	5.75	1.31
† 1-3/4 – 1-7/8	1-7/16 – 1-5/8	82.00	18.25	3.50	3.50	2.00	3.13	6.38	7.50	7.00	6.50	1.56
† 2 – 2-1/8	1-11/16 – 1-3/4	129.00	21.50	4.00	3.75	2.25	3.75	7.38	8.50	9.00	7.00	1.81
† 2-1/4 – 2-3/8	1-13/16 – 1-7/8	167.00	23.50	4.50	4.25	2.50	4.00	8.25	9.00	10.00	7.75	2.13
† 2-1/2 – 2-5/8	1-15/16 – 2-1/8	252.00	25.50	5.00	4.75	2.88	4.50	9.25	9.75	10.75	8.50	2.38
† 2-3/4 – 2-7/8	2-3/16 – 2-7/16	315.00	27.25	5.25	5.00	3.12	4.88	10.50	11.00	11.00	9.00	2.88
† 3 – 3-1/8	2-1/2 – 2-5/8	380.00	29.00	5.75	5.25	3.38	5.25	11.12	12.00	11.25	9.50	3.00
† 3-1/4 – 3-3/8	2-3/4 – 2-7/8	434.00	30.88	6.25	5.50	3.62	5.75	11.88	13.00	11.75	10.00	3.12
† 3-1/2 – 3-5/8	3 – 3-1/8	563.00	33.25	6.75	6.00	3.88	6.50	12.38	14.00	12.50	10.75	3.25
† 3-3/4 – 4	–	783.00	36.25	7.50	7.00	4.25	7.25	13.62	15.00	13.50	12.50	3.50

† Cast Alloy Steel

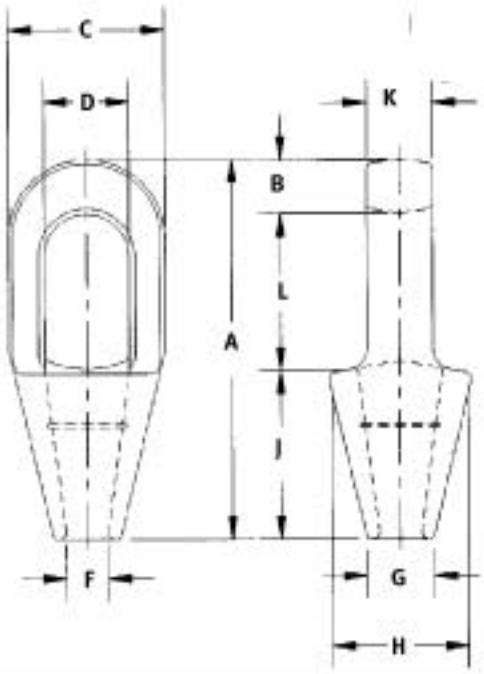
Crosby® Grooved Closed Spelter Sockets

G-417

- Forged Steel Sockets thru 1-1/2", cast alloy steel 1-5/8" thru 4".
- Spelter socket terminations have an efficiency rating of 100%, based on the catalog strength of wire rope. Ratings are based on recommended use with 6 x 7, 6 x 19 or 6 x 37, IPS or XIP (EIP), XXIP (EEIP), RRL, FC, or IWRC wire rope.

Note: The drawing illustrates one groove used on sockets 1/4" thru 3/4". Sizes 7/8" thru 1-1/2" use 2 grooves. Sizes 1-5/8" and larger use 3 grooves.

Closed Grooved Sockets meet the performance requirements of Federal Specification RR-S-550D, Type B, except for those provisions required of the contractor.



Notice: All cast steel sockets 1-5/8" and larger are magnetic particle inspected and ultrasonic inspected. Proof testing available on special order.

Rope Dia. (In.)	Structural Strand Dia. (In.)	Weight Each (Lbs.)	Dimensions (In.)									
			A	B	C	D	F	G	H	J	K	L
1/4	–	.50	4.50	.50	1.50	.88	.38	.69	1.56	2.25	.50	1.75
5/16 – 3/8	–	.75	4.88	.62	1.69	.97	.50	.81	1.69	2.25	.69	2.00
7/16 – 1/2	–	1.50	5.44	.69	2.00	1.16	.56	.94	1.88	2.50	.88	2.25
9/16 – 5/8	1/2	2.50	6.31	.81	2.63	1.41	.69	1.12	2.38	3.00	1.00	2.50
3/4	9/16 – 5/8	4.25	7.56	1.06	3.00	1.66	.81	1.25	2.75	3.56	1.25	3.00
7/8	11/16 – 3/4	7.25	8.75	1.25	3.63	1.88	.94	1.50	3.25	4.00	1.50	3.50
1	13/16 – 7/8	10.50	9.88	1.38	4.13	2.30	1.13	1.75	3.75	4.44	1.75	4.00
1-1/8	15/16 – 1	14.25	11.00	1.50	4.50	2.56	1.25	2.00	4.13	5.00	2.00	4.50
1-1/4 – 1-3/8	1-1/16 – 1-1/8	19.75	12.12	1.63	5.30	2.81	1.50	2.25	4.75	5.50	2.25	5.00
1-1/2	1-3/16 – 1-1/4	29.20	13.94	1.94	5.33	3.19	1.63	2.75	5.25	6.00	2.50	6.00
† 1-5/8	1-5/16 – 1-3/8	36.00	15.13	2.13	5.75	3.25	1.75	3.00	5.50	6.50	2.75	6.50
† 1-3/4 – 1-7/8	1-7/16 – 1-5/8	57.25	17.25	2.19	6.75	3.75	2.00	3.13	6.38	7.50	3.00	7.56
† 2 – 2-1/8	1-11/16 – 1-3/4	79.00	19.50	2.44	7.63	4.38	2.25	3.75	7.38	8.50	3.25	8.56
† 2-1/4 – 2-3/8	1-13/16 – 1-7/8	105.00	21.13	2.63	8.50	5.00	2.50	4.00	8.25	9.00	3.63	9.50
† 2-1/2 – 2-5/8	1-15/16 – 2-1/8	140.00	23.50	3.12	9.50	5.50	2.88	4.50	9.25	9.75	4.00	10.62
† 2-3/4 – 2-7/8	2-3/16 – 2-7/16	220.00	25.38	3.12	10.75	6.25	3.12	4.88	10.19	11.00	4.88	11.25
† 3 – 3-1/8	2-1/2 – 2-5/8	276.00	27.00	3.25	11.50	6.75	3.38	5.25	11.50	12.00	5.25	11.75
† 3-1/4 – 3-3/8	2-3/4 – 2-7/8	313.00	29.25	4.00	12.25	7.25	3.62	5.75	12.25	13.00	5.75	12.25
† 3-1/2 – 3-5/8	3 – 3-1/8	400.00	31.00	4.00	13.00	7.75	3.88	6.50	13.00	14.00	6.25	13.00
† 3-3/4 – 4	–	542.00	33.25	4.25	14.25	8.50	4.25	7.25	14.25	15.00	7.00	14.00

† Cast Alloy Steel

Towing Socket

MARQUIP®

(Marine Equipment)

Cast Alloy Steel Round-To-Round Special Towing Socket

- **40% more material in critical stress and wear areas.**
- **Smooth round-to-round fit; eliminates excessive wear at points of contact.**

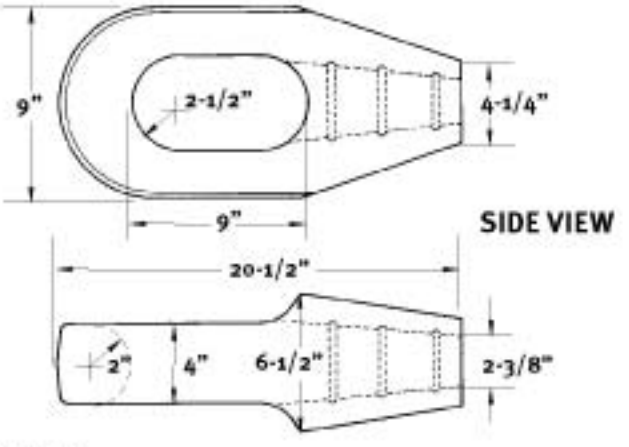
Another Sure Link in Marquip's Marine Line

MARQUIP round-to-round special towing sockets are designed to eliminate excessive wear at contact points. They provide superior safety and longer service under heavy tows using 2" to 2-1/8" cable. They can also be modified to accept 2-1/4" extra-improved plow steel wire rope, with no reduction in reliability.

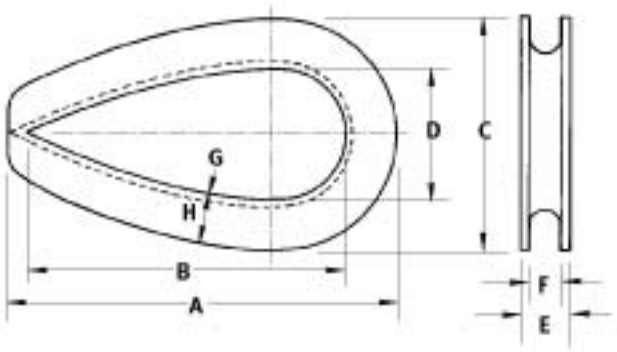
Made from 4140 extra-high-strength alloy steel, MARQUIP towing sockets are heat-treated, magnetic particle inspected, and pull-test rated to exceed the breaking strength of E.I.P. wire.

Not pictured is our Marquip Heavy Duty Tow Socket which features a radiused bale. Wt. 135 pounds.

Special Towing Socket Specifications	
Material:	Cast 4140 alloy steel, heat treated
Size:	Accepts 2", 2-1/8", and 2-1/4" wire rope
Dimensions:	20-1/2" x 9" x 6-1/2"
Weight:	113 pounds
Capacity:	Exceeds E.I.P wire capacity



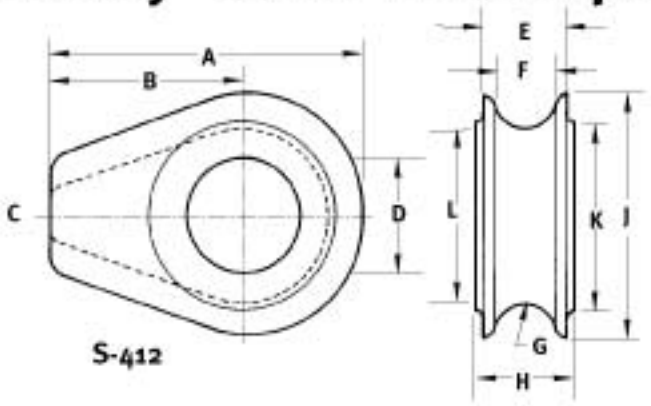
Slip Through Wire Rope Thimbles



Slip Through
For choker sling use. Welded ends to prevent distortion. Deep scored to hold rope strands firmly in place.

Rope Dia. 8 Part	Dimensions (inches) A	B	C	D	E	F	G	H	Wt. Each Lbs.
1/8	5.69	4.63	3.31	2.00	.69	.44	.13	.53	.67
3/16	7.00	5.75	4.19	2.50	.88	.63	.13	.72	.94
1/4	9.81	8.00	5.75	3.38	1.19	.81	.19	1.00	3.00
5/16	12.00	9.88	7.00	4.25	1.56	1.06	.25	1.13	5.67
3/8	13.63	11.25	7.88	4.75	1.75	1.25	.25	1.31	7.30

Crosby® Solid Wire Rope Thimbles



S-412

Solid
Fits open wire rope socket, boom pendant clevis, as well as wedge socket. Graphitic steel in smaller sizes. Larger sizes cast steel.

Sizes 1/2 through 3/4 cast ductile iron.

Sizes 7/8 and larger cast steel.

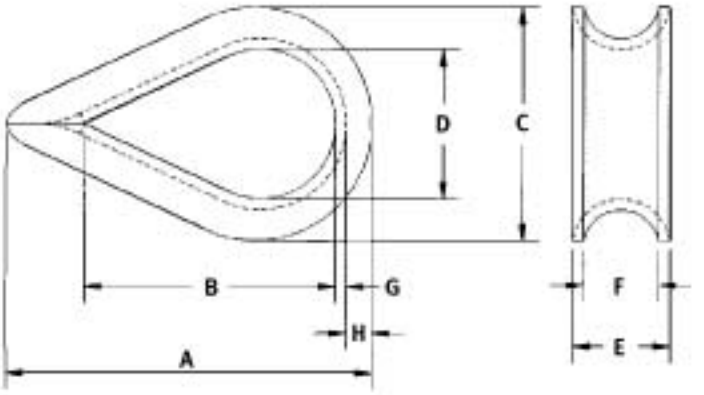
Wt. Rope Dia.	Dimensions (inches) A	B	C	D	E	F	G	H	J	K	L	Each Lbs.
1/2	2.81	1.75	.25	1.06	.75	.56	.28	.88	2.13	1.63	1.56	.61
5/8	4.69	3.00	.38	1.31	1.06	.81	.41	1.13	3.38	2.25	2.56	2.25
3/4	4.69	3.00	.38	1.50	1.06	.81	.41	1.38	3.38	2.25	2.56	2.32
7/8	6.06	3.81	.50	1.75	1.38	1.06	.53	1.63	4.50	3.25	3.44	5.45
1	6.06	3.81	.50	2.13	1.38	1.06	.53	1.81	4.50	3.25	3.44	5.25
1-1/8	7.25	4.56	.63	2.38	1.75	1.31	.66	2.06	5.38	3.88	4.06	9.29
1-1/4 - 1-3/8	7.25	4.56	.63	2.63	1.94	1.53	.78	2.31	5.38	3.88	4.13	9.81

Crosby® Standard Wire Rope Thimbles

G-411
Standard

- The standard choice for light duty applications and loading conditions.
- Hot Dip galvanized Steel.

G-411 meets the performance requirements of Federal Specification FF-T-276b Type II, except for those provisions required of the contractor.



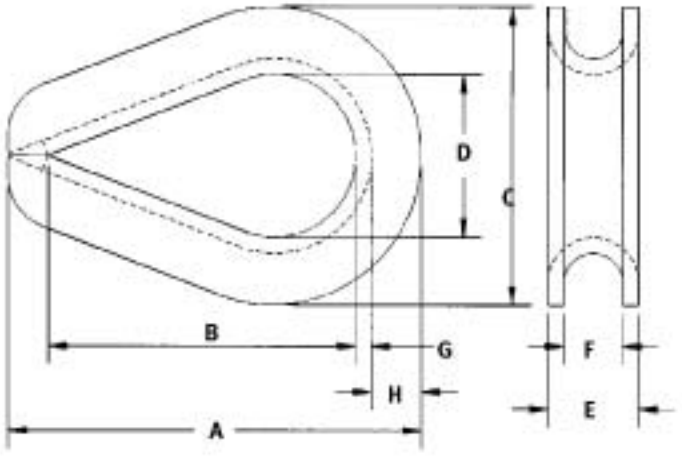
Rope Dia. (In.)	Weight Per 100 (Lbs.)	Dimensions (In.)							
		A	B	C	D	E	F	G	H
1/8	3.50	1.94	1.31	1.06	.69	.25	.16	.05	.13
3/16	3.50	1.94	1.31	1.06	.69	.31	.22	.05	.13
1/4	3.50	1.94	1.31	1.06	.69	.38	.28	.05	.13
5/16	4.00	2.13	1.50	1.25	.81	.44	.34	.05	.13
3/8	6.70	2.38	1.63	1.47	.94	.53	.41	.06	.16
1/2	12.50	2.75	1.88	1.75	1.13	.69	.53	.08	.19
5/8	34.50	3.50	2.25	2.38	1.38	.91	.66	.13	.34
3/4	47.10	3.75	2.50	2.69	1.63	1.08	.78	.14	.34
7/8	84.60	5.00	3.50	3.19	1.88	1.27	.94	.16	.44
1	97.50	5.69	4.25	3.75	2.50	1.39	1.06	.16	.41
1-1/8–1-1/4	175.00	6.25	4.50	4.31	2.75	1.75	1.31	.22	.50
1-1/2	325.00	7.50	5.00	5.38	3.25	2.06	1.56	.25	.75
1-3/4	583.25	10.75	7.25	7.25	4.25	2.38	1.88	.25	1.19
2	583.25	10.75	7.25	7.25	4.25	2.63	2.13	.25	1.19

Crosby® Extra Heavy Wire Rope Thimbles

G-414 and SS-414

- Greater protection against wear and deformation of the wire rope eye.
- Longer service life.
- Available in Hot Dip galvanized or Stainless Steel.
- Stainless steel recommended for more corrosive environments where greater protection is required.

G-414 meets the performance requirements of Federal Specification FF-T-276b Type III, except for those provisions required of the contractor.



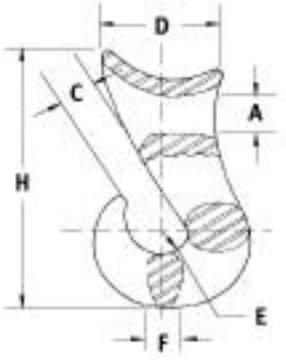
Rope Dia. (In.)	Weight Per 100 (Lbs.)	Dimensions (In.)							
		A	B	C	D	E	F	G	H
*1/4	6.50	2.19	1.63	1.50	.88	.41	.28	.06	.23
*5/16	11.80	2.50	1.88	1.81	1.06	.50	.34	.08	.28
*3/8	21.60	2.88	2.13	2.13	1.13	.63	.41	.11	.34
7/16	34.70	3.25	2.38	2.38	1.25	.72	.47	.13	.38
*1/2	51.00	3.63	2.75	2.75	1.50	.81	.53	.14	.41
9/16	51.00	3.63	2.75	2.69	1.50	.88	.59	.14	.41
*5/8	75.70	4.25	3.25	3.13	1.75	.97	.66	.16	.50
*3/4	158.10	5.00	3.75	3.81	2.00	1.22	.78	.22	.66
7/8	177.80	5.50	4.25	4.25	2.25	1.38	.94	.22	.75
1	313.90	6.13	4.50	4.94	2.50	1.56	1.06	.25	.88
1-1/8 – 1-1/4	400.00	7.00	5.13	5.88	2.88	1.81	1.31	.25	1.13
1-1/4 – 1-3/8	811.00	9.06	6.50	6.81	3.50	2.19	1.44	.38	1.13
1-3/8 – 1-1/2	1,294.80	9.00	6.25	7.13	3.50	2.56	1.56	.50	1.13
1-5/8	1,700.00	11.25	8.00	8.13	4.00	2.72	1.72	.50	1.38
1-3/4	1,775.00	12.19	9.00	8.50	4.50	2.84	1.84	.50	1.31
1-7/8 – 2	2,775.00	15.13	12.00	10.38	6.00	3.09	2.09	.50	1.50
2-1/4	3,950.00	17.13	14.00	11.88	7.00	3.63	2.38	.63	1.63

*SS-414 sizes available in stainless steel type 304.

Sliding Hooks

For Round Slings

Size (in.)	Working Load Limit Tons	Wt. Lbs.	Radius (in.) A	C	D	E	F	H
3/8	1.4	1	5/8	11/16	2	3/8	5/8	4-3/16
1/2	2.2	1-1/2	3/4	7/8	2-1/4	1/2	3/4	5-1/16
5/8	2.8	3-1/4	3/4	1-1/8	2-7/8	9/16	1-1/16	6-1/8
3/4	4.5	4-1/2	1-1/8	1-3/8	3-1/2	9/16	1-1/8	6-3/4
7/8 – 1	8.0	11-1/2	1-1/4	2	4-1/2	7/8	1-1/2	9-5/16
1-1/8 – 1-1/4	12.5	30	2-1/8	1-3/4	5-5/8	1-1/4	1-3/4	13-1/8
1-3/8 – 1-1/2	15.0	48	2-1/2	2-1/8	7	1-9/16	2	15-7/16



Manufactured from extraordinarily tough steel to afford an ample safety factor. Designed with metal distributed in relation to stress lines. Saddle is rounded to minimize wear.

Safety Latches Available

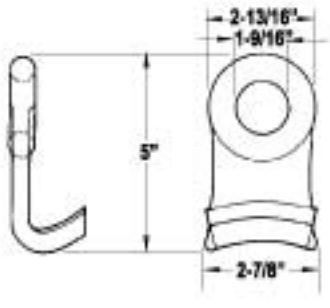
For Flat or Braided Slings

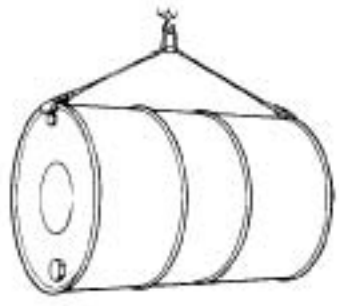
Sling-Size (in.) 8 Part	6 Part	4 Part	Size (In.)	Working Load Limit Tons	Wt. Lbs.	Radius (in.) A	C	D	E	F	H
	1/8	1/8	1	1.4	1	5/8	11/16	2	3/8	5/8	4-3/16
1/8	3/16	3/16	2	2.2	1-1/2	3/4	7/8	2-1/4	1/2	3/4	5-1/16
3/16		1/4	3	3.5	3-1/2	1	1-1/8	2-7/8	9/16	1-1/16	6-3/16
1/4	1/4	5/16	4	4.4	4	1-7/16	1-3/16	3-1/8	5/8	1-3/16	6-9/16
5/16	5/16	3/8	5	6.8	9-1/2	1-13/16	1-9/16	4	3/4	1-1/2	8-5/16
3/8	3/8	7/16	6	9.3	13	2-1/8	1-5/8	4-3/4	7/8	1-3/4	9-11/16
7/16	7/16	1/2	7	12.5	30	2-1/8	1-3/4	5-5/8	1-1/4	1-3/4	13-1/8
1/2	9/16	5/8	8	15.0	48	2-1/2	2-1/8	7	1-9/16	2	15-7/16
			10	20.0	78	3	3-3/8	7-1/2	1-7/8	2-1/4	17-15/16

Crosby® Barrel Hooks

Forged steel, heat treated and designed to take and hold a firm catch on barrell flanges.

I.D. of Eye ..... 1-9/16"
O.D. of Eye..... 2-13/16"
Overall Length..... 5"
Width of Lip ..... 2-7/8"
Rated Working Load ..... 2,000 Lbs. Pr.
Wt./Pair ..... 3-1/4 lbs.





Wire Rope Stoppers

Pelican Hook 158
Carpenter Stopper 160

Washington Chain maintains a large stock of finished and semi-finished parts to quickly fill your requirements.

Wire Rope Pelican Hook (NASSCO)

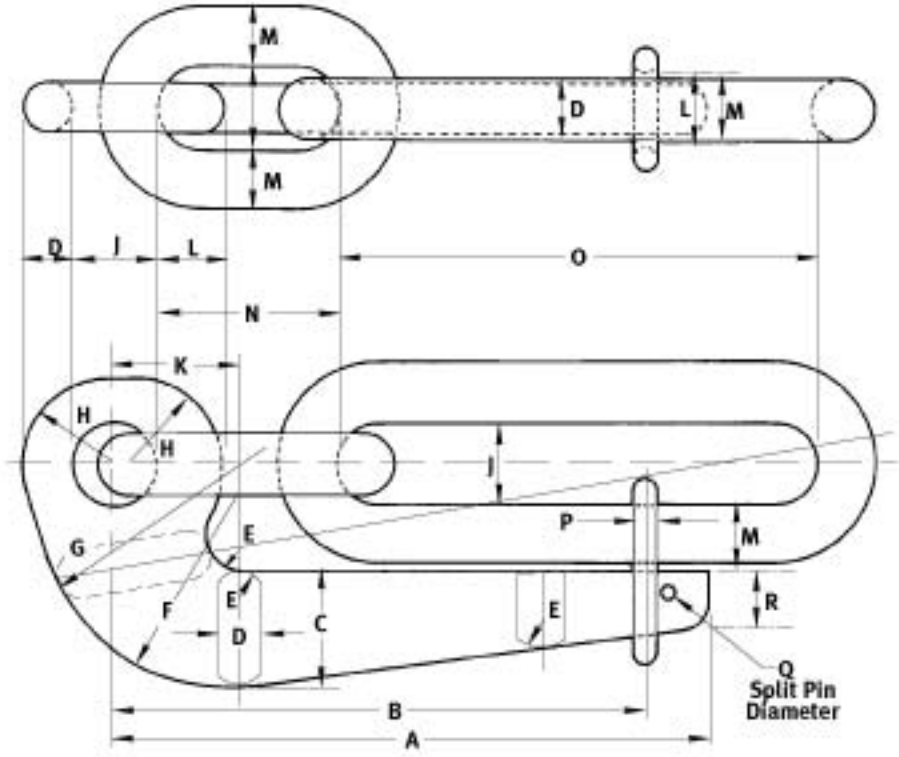


Table of Sizes and Dimensions (In Inches)

Wire Size	A	B	C	D	Rad. E	Rad. F	Rad. G	Rad. H	J	W.L.L.* (Lbs.)
1/2	5	4-1/2	1	7/16	1/4	1-1/2	2	3/4	11/16	4,000
5/8	6-1/4	5-5/8	1-1/4	1/2	3/8	1-7/8	2-1/2	15/16	7/8	9,500
3/4	7-1/2	6-3/4	1-1/2	5/8	7/16	2-1/4	3	1-1/8	1	11,600
7/8	8-3/4	7-7/8	1-3/4	11/16	1/2	2-11/16	3-1/2	1-1/4	1-1/8	17,000
1	10	9	2	13/16	9/16	3-1/16	4	1-15/32	1-5/16	19,000
1-1/8–1-1/4	11-1/4	10	2-1/4	15/16	11/16	3-1/2	4-1/2	1-11/16	1-1/2	25,000
1-3/8	13-3/4	12-1/4	2-3/4	1-1/8	13/16	4-7/16	5-1/2	2-1/16	1-7/8	32,000
1-5/8	16-1/4	14-5/8	3-1/4	1-3/8	15/16	5-1/2	6-1/2	2-7/16	2-1/8	39,600
1-7/8	18-3/4	16-3/4	3-3/4	1-9/16	1-1/16	6-3/16	7-1/2	2-13/16	2-1/2	48,000
2-1/8	21-1/4	19	4-1/4	1-15/16	1-5/16	6-11/16	8-1/2	3-3/16	2-3/4	70,000

*Working Load Limit

Continued on next page

Wire Rope Pelican Hook (NASSCO)

Table of Sizes and Dimensions (In Inches)

Wire Size	K	L	Dia. M	N	O	Dia P	Dia Q	R	W.L.L.* (Lbs.)
1/2	1-1/16	5/8	1/2	1-1/2	3-15/16	1/4	3/16	1/2	4,000
5/8	1-3/8	3/4	5/8	1-3/4	5-1/8	5/16	3/16	5/8	9,500
3/4	1-9/16	7/8	3/4	2-1/4	6	3/8	1/4	3/4	11,600
7/8	1-13/16	1	7/8	2-5/8	6-7/8	7/16	1/4	7/8	17,000
1	2-1/2	1-1/8	1	3	7-7/8	1/2	1/4	1	19,000
1-1/8-1-1/4	2-5/16	1-1/4	1-1/8	3-3/8	9	1/2	3/8	1-1/8	25,000
1-3/8	2-7/8	1-1/2	1-3/8	4-1/8	11	5/8	3/8	1-3/8	32,000
1-5/8	3-5/16	1-3/4	1-5/8	4-7/8	12-7/8	3/4	1/2	1-5/8	39,600
1-7/8	3-13/16	2	1-7/8	5-5/8	14-7/8	7/8	1/2	1-7/8	48,000
2-1/8	4-3/8	2-1/4	2-1/8	5-7/8	16-7/8	1	1/2	2-1/8	70,000

*Working Load Limit

Carpenter Stoppers

MARQUIP® (Marine Equipment)

Rugged, compact design cable grip for cable sizes from 1/2" to 3".

Hinged body has fixed smooth groove on one side; movable wedge, grooved with lay of cable, on the facing side. Movable wedge enables cable to be drawn tight.

Individually proof tested to twice the working load limit of XIP wire rope.

Cable can be released while under full tension by releasing latch on hinged lid. Lid is securely latched and locked with pin while in use.

Shackle holes are provided for rigging bridle to stopper. Bridles available with stoppers if desired.

Note: Each size wire takes a separate stopper.

Wire Size	Length	Width	Hole Size	Thickness	Weight
1/2	6-3/4	5	11/16	3-1/4	11
5/8	6-3/4	5	11/16	3-1/4	11
3/4	6-3/4	5	11/16	3-1/4	11
7/8	13-3/8	9-7/16	1-3/16	5-1/2	50
1	13-3/8	9-7/16	1-3/16	5-1/2	50
1-1/8	13-3/8	9-7/16	1-3/16	5-1/2	50
1-1/4	13-3/8	9-7/16	1-3/16	5-1/2	50
1-3/8	14-3/4	11-3/4	1-9/16	7-1/8	100
1-1/2	14-3/4	11-3/4	1-9/16	7-1/8	100
1-5/8	14-3/4	11-3/4	1-9/16	7-1/8	100
1-3/4	20-1/4	14-1/2	1-13/16	9-3/4	232
1-7/8	20-1/4	14-1/2	1-13/16	9-3/4	232
2	20-1/4	14-1/2	1-13/16	9-3/4	232
2-1/8	26-3/8	19	2-5/16	11	460
2-1/4	26-3/4	19	2-5/16	11	460
2-1/2	26-3/4	19	2-5/16	11	460
2-5/8	31-5/8	21	3-1/16	14	770
2-3/4	31-5/8	21	3-1/16	14	770
3	31-5/8	21	3-1/16	14	770

Ratings are stated in short tons (2,000 lbs.) or pounds. All dimensions are in inches and pounds unless otherwise indicated.

Blocks

Use and Maintenance 162
Reeving Manila & Wire Rope Blocks 164
Cargo Hoisting 165
Trawl and Trynet 166
Manila Rope 168
Extra Heavy Oval 169
Wide Sheave 169
Oval Pattern Construction 170
Heavy Construction 171
Snatch 172
Overhaul Ball 173
Sheave request form 174

In addition to the blocks shown, Washington Chain carries several other types as well as varying numbers of used and surplus blocks.

Tackle Block Warning, Use and Maintenance Information

⚠ WARNING

- **A potential hazard exists when lifting or dragging heavy loads with tackle block assemblies.**
- **Failure to design and use tackle block systems properly may cause a load to slip or fall - the result could be serious injury or death.**
- **A tackle block system should be rigged by a qualified person as defined by ANSI/ASME B.30.**
- **Instruct workers to keep hands and body away from block sheaves and swivels - and away from "pinch points" where rope touches block parts or loads.**
- **Do not side load tackle blocks.**
- **See OSHA Rule 1926.550 (g) for Personnel Hoisting for Cranes and Derricks. Only a Crosby or McKissick Hook with a PL Latch attached, and secured with the bolt, nut and cotter pin provided, may be used for personnel hoisting. A hook with a Crosby SS-4055 Latch attached shall not be used for personnel hoisting.**
- **Instruct workers to be alert and to wear proper safety gear in areas where loads are moved or supported with tackle block systems.**
- **Read, understand, and follow these instructions to select, use and maintain tackle block systems.**

Important

For maximum safety and efficiency, tackle block systems must be properly designed, used, and maintained. You must understand the use of tackle block components in the system. These instructions will assist you. Read them carefully and completely.

General Cautions or Warnings

Ratings shown are applicable only to new or "in as new" products.

Working Load Limit ratings indicate the greatest force or load a product can carry under usual environmental conditions. Shock loading and extraordinary conditions must be taken into account when selecting products for use in tackle block systems.

In general, the products displayed are used as parts of a system being employed to accomplish a task. Therefore, we can only recommend within the Working Load Limits, or other stated limitations, the use of products for this purpose.

The Working Load Limit or Design (Safety) Factor of each product may be affected by wear, misuse, overloading, corrosion, deformation, intentional alteration, and other use conditions. Regular inspection must be conducted to determine whether use can be continued at the catalog assigned W.L.L., a reduced W.L.L., a reduced Design (Safety) Factor, or withdrawn from service.

These products generally are intended for tension or pull. Side loading must be avoided, as it exerts additional force or loading which the product is not designed to accommodate.

Always make sure the hook supports the load. The latch must never support the load.

Welding of load supporting parts or products can be hazardous. Knowledge of materials, heat treatment, and welding procedures is necessary for proper welding. WCS should be consulted for information.

Fitting Maintenance

Fittings, including hooks, overhaul balls, shackles, links, etc., may become warn and disfigured with use, corrosion, and abuse resulting in nicks, gouges, worn threads and bearings, sharp corners which produce additional stress conditions and reduce system load capacity.

Grinding is the recommended procedure to restore smooth surfaces. The maximum allowance for reduction of a product's original dimension due to wear or repair before removal from service is:

1. Any single direction - No more than 10% of original dimension.
2. Two directions - No more than 5% of each dimension.

Any greater reduction may necessitate a reduced Working Load Limit.

Any crack or deformation in a fitting is sufficient cause to withdraw the product from service.

Tackle Block Maintenance

Tackle Blocks must be regularly inspected, lubricated, and maintained for peak efficiency and extended usefulness.

Their proper use and maintenance is equal in importance to other mechanical equipment. The frequency of inspection and lubrication is dependent upon frequency and periods of use, environmental conditions, and the user's good judgment.

Inspection: As a minimum, the following points should be considered:

1. Wear on pins or axles, rope grooves, side plates, bushing or bearings, and fittings. Excessive wear may be a cause to replace parts or remove block from service.
2. Deformation in side plates, pins and axles, fitting attachment points, trunnions, etc. Deformation can be caused by abusive service and / or overload and may be cause to remove block from service.

3. Misalignment or wobble in sheaves.
4. Security of nuts, bolts, and other locking methods, especially after reassembly following a tear down inspection. Original securing method should be used; e.g., staking, set screw, cotter pin, cap screw.
5. Pins retained by snap rings should be checked for missing or loose rings.
6. Sheave pin nuts should be checked for proper positioning. Pins for tapered roller bearings should be tightened to remove all end play during sheave rotation. Pins for bronze bushing and straight roller bearing should have a running clearance of .031 inch per sheave of end play and should be adjusted accordingly.
7. Hook or shackle to swivel case clearance is set at .031 to .062 at the factory. Increased clearance can result from component wear. Clearance exceeding .12 to .18 should necessitate disassembly and further inspection.
8. Deformation or corrosion of hook and nut threads.
9. Surface condition and deformation of hook (See Fitting maintenance and ANSI B30.10)
10. Welded side plates for weld corrosion or weld cracking.
11. Hook latch for deformation, proper fit and operation.

Lubrication: The frequency of lubrication depends upon frequency and period of product use as well as environmental conditions, which are contingent upon the user's good judgment.

Assuming normal product use, the following schedule is suggested when using lithium base grease of medium consistency.

Sheave Bearings

Tapered Roller Bearings - Every 40 hours of continuous operation or every 30 days of intermittent operation.

Roller Bearings - Every 24 hours of continuous operation or every 14 days of intermittent operation.

Bronze Bushings - (Not Self Lubricated) - Every 8 hours of continuous operation or every 14 days of intermittent operation.

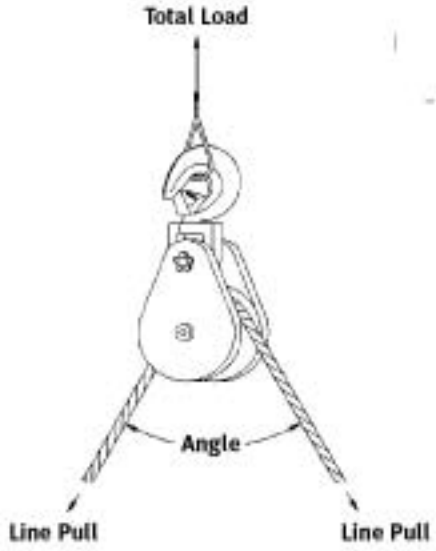
Hook Bearings

Anti Friction - Every 14 days for frequent swiveling; every 45 days for infrequent swiveling.

Bronze Thrust Bushing or No Bearing - Every 16 hours for frequent swiveling; every 21 days for infrequent swiveling.

Tackle Block Maintenance also depends upon proper block selection (see "Loads on Blocks"), proper reeving (see "The Reeving of Tackle Blocks"), consideration of shock loads, side loading, and other adverse conditions.

Loads on Blocks



The Working Load Limit (WLL) for blocks indicates the maximum load that should be exerted on the block and its connecting fitting.

This total load value may be different from the weight being lifted or pulled by a hoisting or hauling system. It is necessary to determine the total load being imposed on each block in the system to properly determine the rated capacity block to be used. A single sheave block used to change load line direction can be subjected to total loads greatly different from the weight being lifted or pulled. The total load value varies with the angle between the incoming and departing lines to the block.

The following chart indicates the factor to be multiplied by the line pull to obtain the total load on the block.

Example

Angle Factor Multipliers

Angle	Factor	Angle	Factor
0°	2.00	100°	1.29
10°	1.99	110°	1.15
20°	1.97	120°	1.00
30°	1.93	130°	.84
40°	1.87	135°	.76
45°	1.84	140°	.68
50°	1.81	150°	.52
60°	1.73	160°	.35
70°	1.64	170°	.17
80°	1.53	180°	.00
90°	1.41	–	–

Method of Reeving Manila and Wire Rope Blocks

The methods of reeving tackle blocks will vary with the applications and purpose for which they are to be employed; especially with heavy lift cargo booms, cranes and so forth, where blocks with four sheaves or more are required, in which case a number of lead blocks have to be considered. Our engineering department will be pleased to consult with you on this matter.

Method of Figuring "Parts of Line"

$$\frac{L}{P} = E$$

L = Load lifted in pounds

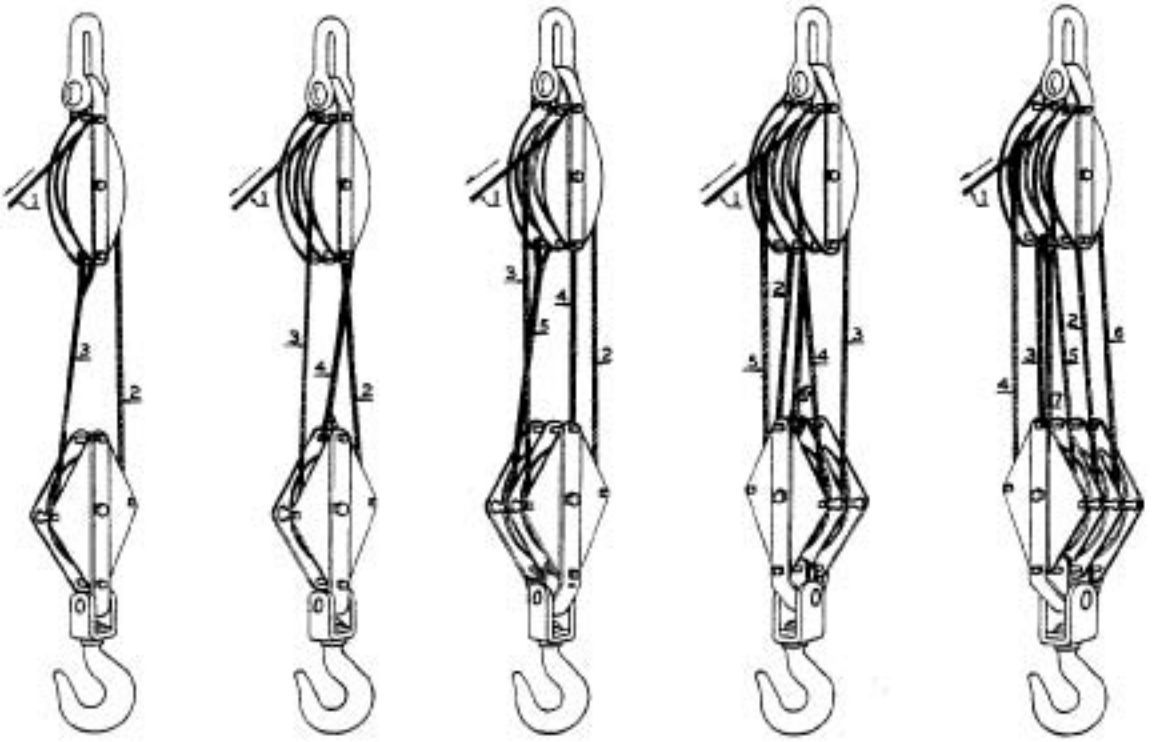
P = Line pull in pounds

E = Efficiency factor

For example: To figure "Parts of Line" required when load lifted "L" and line pull "P" are known.

$$\frac{\text{32,000 lbs. (load lifted "L")}}{\text{6,000 lbs. (line pull "P")}} = 5.3 \text{ ("E")}$$

You can see in the table below that an "E" factor of 5.3 required 6 "Parts of Line."



Parts of Line		1	2	3	4	5	6	7	8	9	10	11	12
"E" Factors	Bronze Brushed	0.96	1.85	2.8	3.6	4.4	5.2	5.9	6.6	7.3	7.9	8.5	9.1
	Roller Bearing	0.98	1.9	2.9	3.8	4.7	5.6	6.5	7.3	8.2	9.0	9.8	10.6

Western® Cargo Hoisting Blocks

E-566

With Drilled Swivel Eye

SEE APPLICATION AND WARNING INFORMATION ON PAGE 162 – 163

J-566

With Oblong Swivel Eye

- Block is galvanized.
- Block has flame-hardened roll forged sheave that assures greater wire life.
- Roll forged sheave is fitted closely into mortise of shell so wire cannot jam between sheave and shell.
- Available for 3/4" or 1" wire.
- Block is fitted with tapered roller bearings which take both load and side thrusts and hold sheave central so it cannot chafe or wear on the sides.
- Tapered Roller bearing with neoprene seals and stainless steel center pin, provide long life and trouble-free service.
- Stainless steel center pin has recessed nuts with lock washers.
- Swivel fitting has permanently sealed thrust bearing.
- Pressure lubrication fittings are standard on both center pin and swivel.
- Individually Proof Tested at 4 times Working Load or 2 times Resultant Load.
- The Working Load for Cargo hoisting blocks is the line pull.

KEY

E	Drilled Eye
J	Oblong Swivel Eye
G	Yoke and Swivel Shackle
K	Oblong Swivel Eye and Upset Shackle
QG	Swivel Bolt Type Shackle
QK	Upset Swivel Bolt Type Shackle
PG	Yoke and Upset Screw Pin Anchor Shackle
PK	Oblong Swivel Eye and Upset Screw Pin Anchor Shackle

Sheave Size & Block No.		Working Load* (Tons)	Wire Rope Size (In.)	Weight Each (Lbs.)
12"	E-566	5	3/4	95
12"	J-566	5	3/4	95
12"	G-566	5	3/4	95
12"	K-566	5	3/4	95
12"	QG-566	5	3/4	95
12"	QK-566	5	3/4	95
14"	E-566	10	3/4	100
14"	J-566	10	3/4	100
14"	QG-566	10	3/4	100
14"	QK-566	10	3/4	100
14"	PG-566	10	3/4	100
14"	PK-566	10	3/4	100
14"	E-566	10	1	100
14"	J-566	10	1	100
14"	QG-566	10	1	100
14"	QK-566	10	1	100
14"	PG-566	10	1	100
14"	PK-566	10	1	100
16"	E-566	10	3/4	130
16"	J-566	10	3/4	130
16"	QG-566	10	3/4	130
16"	QK-566	10	3/4	130
16"	PG-566	10	3/4	130
16"	PK-566	10	3/4	130
16"	E-566	10	1	130
16"	J-566	10	1	130
16"	QG-566	10	1	130
16"	QK-566	10	1	130
16"	PG-566	10	1	130
16"	PK-566	10	1	130

* Working Load equals maximum single line pull. Resultant Load equals 2 times single line pull. Ultimate Load equals 5 times Resultant Load.

®Western is a registered trademark of the Crosby Group, Inc.

McKissick® Trawl and Trynet Blocks

Double Rig Trawl Blocks

- Steel sheave with flame hardened groove, for maximum wear under abrasive conditions.
- Double row, permanently sealed tapered roller bearings.
- Pressure lubrication throughout.
- All steel construction
- Hot Dip galvanized.

Sheave Diameter & Block No. (In.)	Working Load Limit* (Tons)	Weight Each (Lbs.)	Sheave Dimensions (In.) Outside Diameter	Rim Thickness
8" J-452	10	48	8	3.75
12" J-452	10	85	12	3.75
16" F-452	20	116	16	3.75
22" F-452	30	240	22	3.75

* Ultimate load is 4 times the Working Load Limit.

J-452
Oblong Swivel Eye

SEE APPLICATION AND WARNING INFORMATION ON PAGE 162 – 163

F-453 - 6"
Round Swivel Eye

F-454 - 6"
Round Swivel Eye

J-454 - 8"
Oblong Swivel Eye

Try Net Blocks

- Forged steel swivel eyes.
- Hot Dip galvanized.
- 6" 453 - Pressed steel side plates with flared edges. Figure 8 grooved, self-lubricating bronze bushed sheaves, with pressure lube fittings. 453 has an extra wide throat opening to allow fittings to pass through.
- 6" 454 - Forged side plates designed to eliminate rope jamming. Wide throat opening and pressure lube fitting on sheave and eye fitting.
- 8" 454 - Forged steel side plates designed to eliminate possibility of rope jamming. Furnished with sealed tapered bearings. Flame hardened forged steel sheaves for wear resistance.

Sheave Diameter & Block No. (In)	Bearing Type	Working Load Limit* (Tons)	Weight Each (Lbs.)	Sheave Dimensions (In.) Weight Diameter	Rim Thickness
6" F-453	Bronze Brushed	5	35	6	2-3/4
6" F-454	Needle Bearing	5	23	6	2-3/4
8" J-454	Tapered Bearing	10	36	8	2-7/8

* Ultimate Load is 4 times the Working Load Limit.

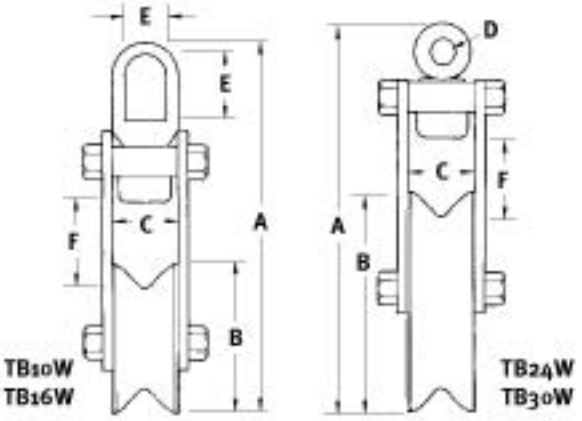
®McKissick is a registered trademark of the Crosby Group, Inc.

Skookum® Trawl Blocks

This is the ultimate quality in manufacture, engineering and design. The Skookum name is known worldwide – with 100 years experience in the block manufacturing business. The same engineering has gone into these new trawl blocks.

Check these quality/performance features:

- Timken Tapered Roller Bearings. Timken is the name synonymous with the best bearings you can buy. For strength. For long, long life. And the capacity to retain more lubricant for extended periods.
- Cast Manganese Steel Sheaves. Here again, the longest lasting material for the job. This manganese steel has work-hardening characteristics that make it extremely resistant to wire rope wear.
- Four popular sizes. Available in 10-ton (10" sheave) 25-ton (16" sheave), 50-ton (24" sheave), and 90-ton (30" sheave) for a choice to fit your fishing need.
- Made in the U.S.A. All materials are domestic. In addition to the finest quality, this means faster delivery and better availability. Skookum Trawl Blocks, service and parts are readily available through Skookum distributors.
- Skookum "Gold Standard" Alloy Shackle is an available option. This is the ultimate in metallurgical science – a special alloy steel of unmatched strength, hardness and durability.
- Hot Dip Galvanized. For a durable, corrosion resistant finish.
- Minimum Ultimate Work Load is 4 times the working load.



	Sheave	Capacity	A	B	C	D	E	F	Wt
Model TB10W Elongated Eye	10" diameter 5" wide	10-ton	25"	10"	5-3/8"	–	2-1/2" x 3-3/4"	5"	125
Model TB16W Elongated Eye	16" diameter 7" wide	25-ton	39"	16"	7-3/8"	–	3-3/4" x6	9"	370
Model TB24W Drilled Swivel Eye	24" diameter 7" wide	50-ton	43"	24"	7-3/8"	2-5/16"	–	7-3/8"	700
Model TB30W Drilled Swivel Eye	30" diameter 7" wide	90-ton	55"	30"	7-3/8"	3-3/8"	–	6"	1,250

All Models with Timken Tapered Roller Bearings and Timken Thrust Bearings. Designed to accept various wire and synthetic rope sizes.

BCM "Orange Sheaved Trawl Blocks"®

Half Side

6"	5-ton	14"	25 lbs.
8"	10-ton	19"	41 lbs.
12"	10-ton	23"	79 lbs.
16"	20-ton	28"	132 lbs.
18"	20-ton	31"	151 lbs.
20"	30-ton	37"	330 lbs.

- Made in U.S.A.
- Galvanized finish
- 5 ton to 30 ton @ 4.1 design factor
- Timken Taper Roller Bearings 10 ton - 30 ton
- Long lasting wear resistant sheaves
- Pressure lubricated sheaves and swivel eyes

Full Side

16"	20-ton	32"	158 lbs.
18"	20-ton	36"	205 lbs.
18"	25-ton	39"	315 lbs.
20"	30-ton	41"	370 lbs.

- Made in U.S.A.
- Galvanized finish
- 20 ton to 30 ton @ 4.1 design factor
- Timken Taper Roller Bearings
- Long lasting wear resistant sheaves
- Full sides helps eliminate fouling
- Pressure lubricated sheaves and swivel eyes

®Skookum is a registered trademark of Ulven Machinery Inc.
®"Orange Sheave Block" is a registered trademark of Skookum

Western® Blocks For Manila Rope

SEE APPLICATION AND WARNING INFORMATION ON PAGE 162 – 163

Key
HS = Hook
N = Swivel
S = Upset Shackle

HS-21-B Single (available in N & S)

N-22-B Double (available in HS & S)

S-23-B Triple (available in HS & N)

Western® Regular Wood Blocks

Block Size (In.)	Sheave Diameter (In.) Outside Diam.	Rim Thickness	Center Pin Diam.	Manila Rope Size (In.)	Working Load Limit* (Lbs.) 21 Single	22 Double	23 Triple	Weight Each (Lbs.) 21 Single	22 Double	23 Triple
3	1.75	.50	.38	3/8	500	800	1,200	1.00	1.75	2.50
4	2.25	.63	.38	1/2	1,000	1,400	1,800	1.75	3.00	4.00
5	3.00	.75	.38	5/8	1,200	1,800	2,400	3.25	5.60	6.50
6	3.50	1.00	.50	3/4	1,800	2,500	3,200	5.00	8.50	11.50
8	4.75	1.13	.63	7/8 – 1	2,800	3,800	4,800	9.00	14.00	21.50

* Ultimate Load is 4 times the Working Load Limit.

HS-301-B Single

N-302-B Double

P-303-B Triple

Western® Malleable Iron Shell Blocks

These blocks have Malleable Iron Shells and both outside and inside straps extend full length of shell. Ends of center pin are flush with side of shell. Malleable Iron Blocks are standard equipment with Public Utility Companies.

Block Size (In.)	Sheave Size (In.) Outside Diam.	Rim Thickness	Manila Rope Size (In.)	Working Load Limit* (Lbs.) Single	Double	Triple	Weight Each (Lbs.) Single	Double	Triple
4	2.25	.63	1/2	1,100	1,600	2,200	2.25	3.75	5.00
6	3.50	1.00	3/4	2,000	3,300	4,000	5.50	9.25	12.50
8	4.75	1.13	1	3,300	5,100	7,000	10.00	16.50	22.00

*Ultimate Load is 3.5 times the Working Load Limit.

®Western is a registered trademark of the Crosby Group, Inc.

Campbell® Extra Heavy Oval Wire Rope Blocks

- Steel blocks with steel sheaves
- Drop forged fittings
- Grooved bronze bushings with pressure greased lubrication
- Tapered roller bearings and ball bearings available on special order
- Available painted or galvanized

Bolt type
Chain shackle
Fitting "N"

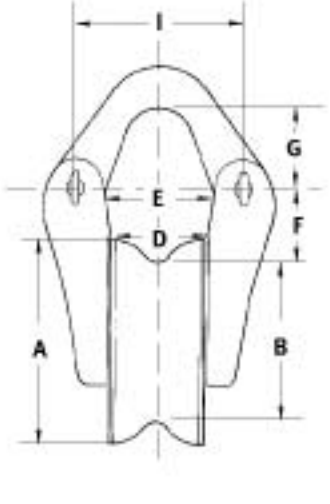
Oval triple 4033N

SEE APPLICATION AND WARNING INFORMATION ON PAGE 162 – 163

Specifications						
Diameter Rope Block Size (In)	**6**	**8**	**10**	**12**	**14**	**16**
Sheave Size	3/8 - 1/2	1/2 - 5/8	5/8	3/4	3/4 - 7/8	7/8 - 1
• O.D. (Inches)	6	8	10	12	14	16
• Rim Thickness	1	1-1/4	1-1/4	1-1/2	1-1/2	1-3/4
• Center Pin Dia.	3/4	7/8	1	1-1/8	1-1/4	1-1/2
Wt. in Pounds, Oval						
• Single	16	28	43	70	87	125
• Double	27	52	67	125	165	260
• Triple	48	75	95	170	221	335
W.L.L. (Tons)						
• Single	2-1/2	3-1/2	4	5	6-1/2	10
• Double	3	6	7	10	12	15
• Triple	4	7	8	12	14	18

Working Loads are Resultant Working Loads.

Ulven Wide Sheave Blocks



Block No.	Line Size	A Dia.	B Dia.	C	D	E	F	G	H Dia.	I	WLL Tons	Wt. Lbs.
TM-8	1 - 1-1/4	8	6	9	4	5-1/2	4-1/4	2-1/2	1-3/4	8	15	70
TM-10	1-1/8 - 1-3/8	10	7-1/2	11	4-3/4	6-1/4	5-1/4	3-3/4	2	9-1/4	25	110

®Campbell is a registered trademark of Cooper Industries

Western® Wire Rope Blocks
Oval Pattern Construction Blocks

- All blocks are galvanized.
- Sheave lubricated through pressure lube fitting in center pin.
- Assembled with self-lubricated bronze bushing.
- Combines weight of regular oval blocks with strength of extra heavy oval blocks.
- Assembled with bolt type anchor shackle.
- Side plates are rounded to provide additional stiffness and reduce wear and chaffing of the rope.
- Extra rugged to meet marine applications

SEE APPLICATION AND WARNING INFORMATION ON PAGE 162 – 163

Q-681-Z

Q-682-Z

Q-683-Z

Block Size (Inches)	Sheave Size (Inches)			Wire Rope Size (Inches)	Working Load Limit* (Tons)			Weight Each (Lbs.)		
	Outside Diam.	Rim Thickness	Diameter of Bearing		Single	Double	Triple	Single	Double	Triple
6	6	1.00	.75	3/8	2-1/2	3	4	15	25	32
6	6	1.00	.75	1/2	2-1/2	3	4	16	25	32
8	8	1.25	.88	5/8	3-1/2	6	7	29	43	62
10	10	1.25	1.00	5/8	4	7	8	38	61	80

*Ultimate load is four times the Working Load Limit.

WARNING

- Know the Working Load Limit of the block, or blocks, to be used.
  DO NOT EXCEED THE WORKING LOAD LIMIT.
- Working Loads are Resultant Working Loads.

Heavy Construction Blocks with Shackles

from Brewer_Titchener™

- Oval shell
- Available, single, double, triple and quadruple
- Grooved bronze bushings, roller bushed available on special orders
- Steel sheaves, galvanized
- Blocks with 5 or more sheaves can be made to order

SEE APPLICATION AND WARNING INFORMATION ON PAGE 162 – 163

Single
6731 Oval

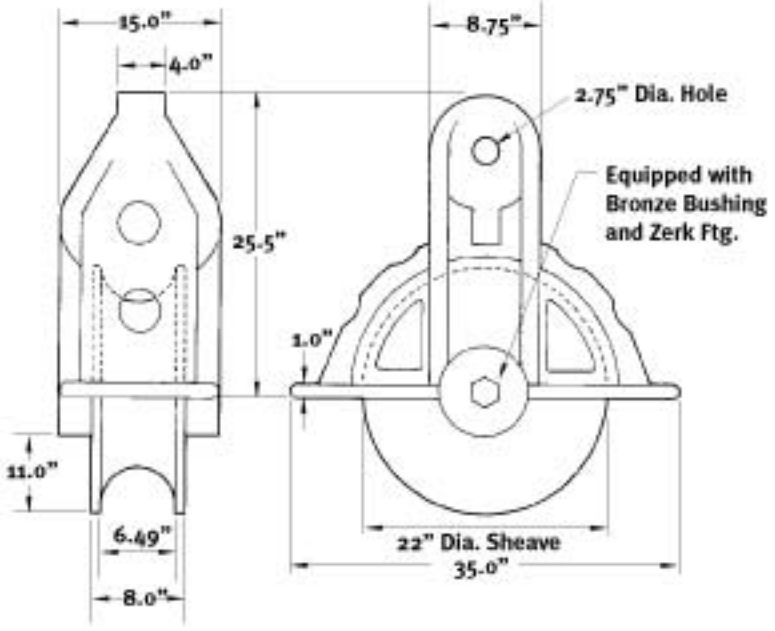
Double
6732 Oval

Specifications							
Block Size (Inches)	**10**	**12**	**14**	**16**	**18**	**20**	**24**
Diameter Rope (Inches)							
	3/4	3/4	3/4	7/8	1	1	1-1/8
Weight (Pounds)							
Single	94	118	131	195	260	420	575
Double	112	157	205	295	385	580	840
Triple	148	197	275	370	475	690	1230
Quad	191	276	355	545	660	770	1700
Working Load Limit (Tons)							
Single	10	10	10	15	18	20	25
Double	15	15	20	25	30	35	45
Triple	20	20	30	35	45	55	65
Quad	25	25	40	50	65	75	90

Working Loads are Resultant Working Loads.
Ultimate load is four times Working Load Limit.

Trawl/Mooring Block

Economical Trawl Block Alternative



McKissick® Snatch Blocks

418
With Hook

419
With Shackle

404
Tailboard

- Forged alloy heat treated hooks.
- Forged steel swivel tees, yokes and shackles.
- Hook and shackle assemblies on 4-1/2" through 14" sizes can be interchanged.
- Can be furnished with bronze bushings or roller bearings.
- Opening feature permits insertion of rope while block is suspended from gin-pole.
- 3" thru 18" 418 and 419 blocks have exclusive bolt retaining spring to assure no lost bolts.
- Can be furnished with SS-4055 hook latch.
- Pressure lube fittings.

430
With Hook

431
With Shackle

407
Tailboard

- Drop forged, heat treated swivel hook or swivel shackle.
- Hook and shackle assemblies on 8" through 14" sizes can be interchanged.
- Can be furnished with bronze bushings or roller bearings.
- Pressure lube fittings.
- 8" thru 14" 430 and 431 blocks have exclusive bolt retaining spring to assure no lost bolts.
- Can be furnished with SS-4055 hook latch.
- Fatigue rated.
- 8" and 10" models furnished with dual rated wireline sheaves.

SEE APPLICATION AND WARNING INFORMATION ON PAGE 162 – 163

Sheave Diameter (Inches)	Wire Rope Size (Inches)††	Working Load Limit* (metric tons)	Weight Each (Lbs.) 418 with Hook	419 with Shackle	404 Tail Board
** 3	5/16 - 3/8	2	4.5	4	2.7
**4-1/2	3/8 - 1/2	4	11.7	12	6.6
6	5/8 - 3/4	8	26.9	27.8	15
8	5/8 - 3/4	8	33	34	21
10	5/8 - 3/4	8	41	42	29
12	5/8	8	48	49	36
12	3/4	8	48	49	36
14	5/8	8	55	56	-
14	3/4	8	55	56	-
16	3/4	15	130	135	-
16	7/8	15	130	135	-
18	7/8	15	150	155	-
18	1	15	150	155	-

*Ultimate load is four times the Working Load Limit.

**Available in bronze bushed only.

†† May be furnished in other Wire Rope sizes.

Sheave Diameter (Inches)	Wire Rope Size (Inches)†	Working Load Limit* (metric (tons)	Weight Each (Lbs.) 430 with Hook	431 with Shackle	407 Tail Board
8	1 – 1-1/8	20	75	87	42
10	1 -1-1/8	20	89	101	55
12	1	20	103	115	70
12	1-1/8	20	103	115	70
14	1	20	123	135	90
14	1-1/8	20	123	135	90
18	1	25	240	260	165
18	1-1/8	25	240	260	165
20	1-1/8	30	375	400	215
20	1-1/4	30	375	400	215
24	1-1/8	30	450	475	290
24	1-1/4	30	450	475	290

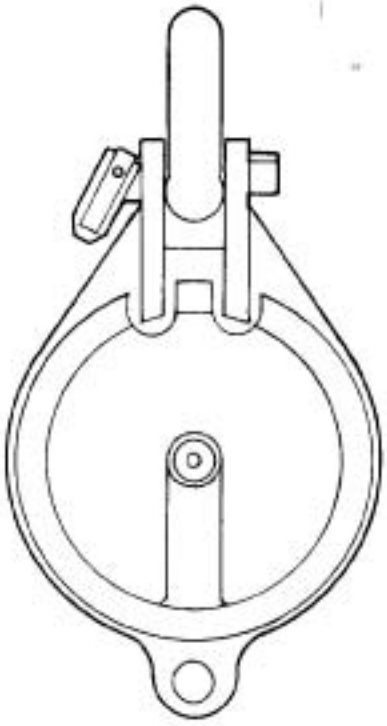
* Ultimate Load is four times the Working Load Limit.

† May be furnished in other Wire Rope sizes.

NOTE: When ordering, please specify: size, block number, hook or shackle, bronze bushed or roller bearing, and wire rope size.

Wire Rope Block with Ball Bearing

- Pressure grease fitting for easy lubrication.
- Shell contruction prevents lodging of rope between sheave and shell.
- Wire rope will not lose position in block even when slack.

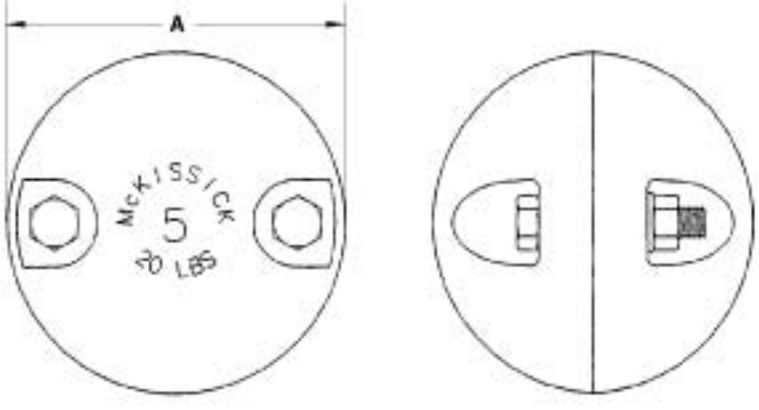


Cast Side Snatch Blocks

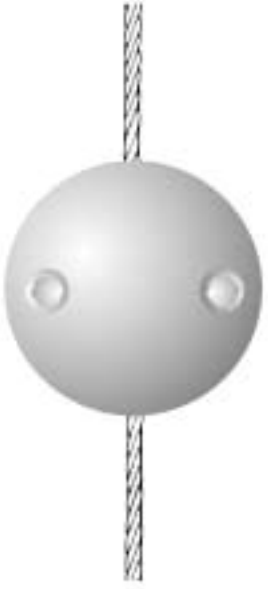
Sheave Size In Inches	Wire Diameter	Working Load in Tons	Weight in Lbs.
3	1/4 to 3/8	1-1/2	2.75
4	1/4 to 7/16	3	4.25
5	3/8 to 1/2	4-1/2	7.25
6	1/2 to 3/4	6	12.25
8	3/4 to 1	8	27.50

McKissick® Split Overhaul Ball

- Atteaches easily to Wire Rope



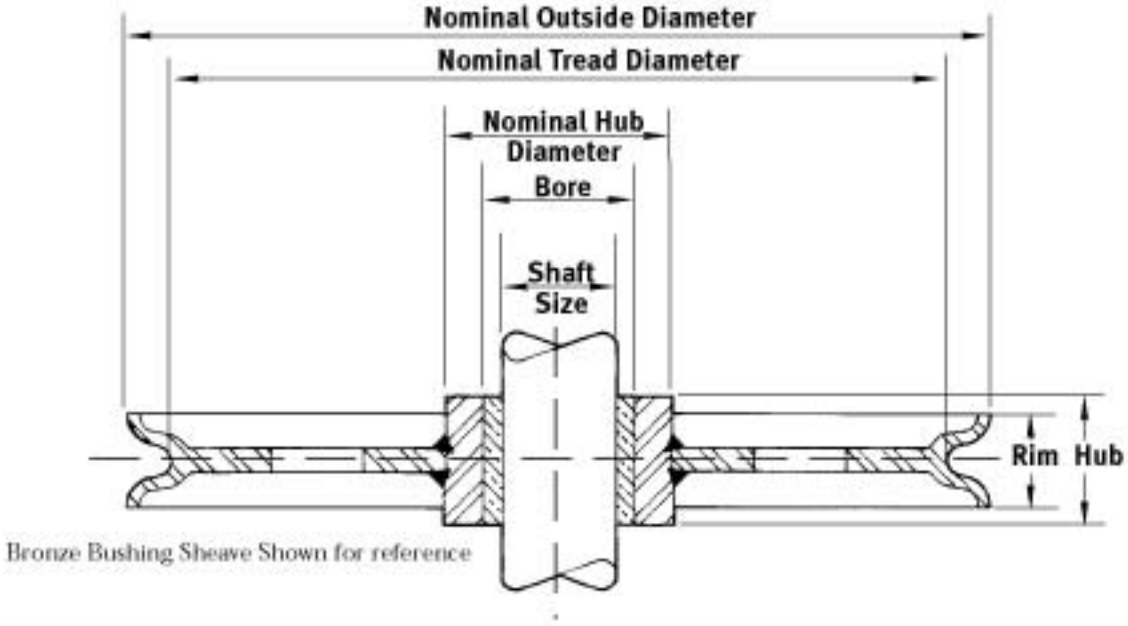
Wire Size (In.)	Weight Each (lbs.)	A Ball Diameter (in.)
3/8	20	5.38
1/2 - 5/8	50	7.12
5/8 - 3/4 - 7/8	100	9.19



SHB - 20

Split Overhaul Ball

McKissick® Custom Sheave Form



Bronze Bushing Sheave Shown for reference

Nominal Outside Diameter	Quantity
+ Shaft Size =	
* Hub Width =	
Rim Width =	
Wire Rope Size =	
Nominal Tread Diameter (optional) =	
Nominal Hub Diameter (optional) =	
+ Shaft Size is Bore Size on Plain Bore Sheaves	
* Hub width is measured over the cone on Tapered Bearing Sheaves	
BEARING TYPE	
Bronze Bushing	
† Roller Bearing	
Tapered Roller Bearings	
Finish / Plain Bore	
Other	
† Requires hardened and ground shaft	
MATERIAL TYPE	
Roll Forged (Flame hardened 14" and larger)	
Forged Steel	
Cast Steel	
Other	
Special testing, requirements or certification: UT, MPI, Paint, ABS, Lloyd's, DNV etc.	
Line Pull =	
Fleet Angle =	
Degree of Wrap =	
Line Speed =	

NOTE: Crosby manufactures sheaves in a wide array of styles and sizes.

Rope

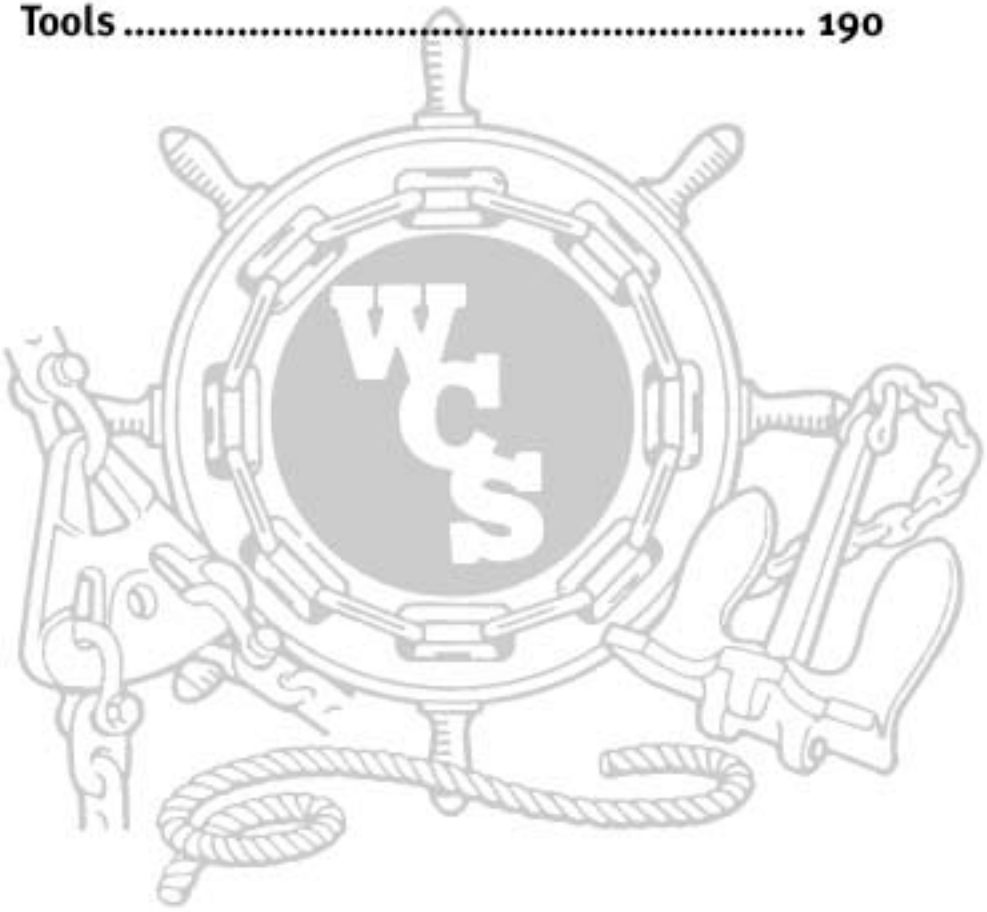
About Cordage 176

Rope Specifications 179

Synthetic Rope Types 180

Splicing Instructions 186

Tools 190



Washington Chain has a large stock of domestic and imported synthetic rope. We also, from time-to-time, have supplies of good, used ropes. Your inquiry is always welcome.

All About Cordage

CORDAGE SIZES Acceptable tolerance limits: Cords 1/8 inch diameter and smaller ±.0050. Cords larger than 1/8 inch diameter ±.1056						
Size No.*	NOMINAL DIAMETER (In.)	(Decimal)	(mm)	NOMINAL CIRCUMFERENCE (In.)	Decimal)	(mm)
2	1/16	.063	1.59	3/16	.188	4.76
2-1/2	5/64	.078	1.98	1/4	.250	6.35
3	3/32	.094	2.38	5/16	.313	7.94
3-1/2	7/64	.109	2.78	11/32	.344	8.73
4	1/8	.125	3.17	3/8	.375	9.53
4-1/2	9/64	.141	3.57	7/16	.438	11.11
5	5/32	.156	3.97	1/2	.500	12.70
5-1/2	11/64	.172	4.37	17/32	.531	13.50
6	3/16	.188	4.76	5/8	.625	15.88
7	7/32	.219	5.56	11/16	.688	17.46
8	1/4	.250	6.35	3/4	.750	19.05
9	9/32	.281	7.14	7/8	.875	22.23
10	5/16	.313	7.94	1	1.000	25.40
12	3/8	.375	9.53	1-1/8	1.125	28.58
14	7/16	.438	11.11	1-1/4	1.250	31.75
16	1/2	.500	12.70	1-1/2	1.500	38.10
18	9/16	.563	14.29	1-3/4	1.750	44.45
20	5/8	.625	15.88	2	2.000	50.80
24	3/4	.750	19.05	2-3/8	2.375	60.34
28	7/8	.875	22.23	2-3/4	2.750	69.85
32	1	1.000	25.40	3	3.000	76.20
36	1-1/8	1.125	28.58	3-1/2	3.500	88.90
40	1-1/4	1.250	31.75	3-3/4	3.750	95.25
42	1-5/16	1.313	33.34	4	4.000	101.60 (10.16 cm)
48	1-1/2	1.500	38.10	4-1/2	4.500	114.30 (11.43 cm)
52	1-5/8	1.625	41.28	5	5.000	127.00 (12.70 cm)
56	1-3/4	1.750	44.45	5-1/2	5.500	139.70 (13.97 cm)
64	2	2.000	50.80	6	6.000	152.40 (15.24 cm)
68	2-1/8	2.125	53.98	6-1/2	6.500	165.10 (16.51 cm)
72	2-1/4	2.250	57.15	7	7.000	177.80 (17.78 cm)
80	2-1/2	2.500	63.50	7-1/2	7.500	190.50 (19.05 cm)
84	2-5/8	2.625	66.68	8	8.000	203.20 (20.32 cm)
92	2-7/8	2.875	73.03	8-1/2	8.500	215.90 (21.59 cm)
96	3	3.000	76.20	9	9.000	228.60 (22.86 cm)

*Generally used only for braided cordage.

PROPER USE AND CARE OF CORDAGE

AVOID OVERLOADING . . . The lower limit of the working load range should be used where life or limb is involved or for exceptional service conditions such as shock loads, sustained loads, etc. You should never exceed the listed working load range except as indicated above. If you rope is old or worn, you should make additional allowances to assure safety.

AVOID ABRASION . . . Out and inner rope fibers contribute equally to the strength of your rope. When worn, your rope is naturally weakened. Where it is necessary for a rope to rub over an object protect with chafing gear, such as canvass wrapped and tied around the rope.

AVOID SUDDEN STRAIN . . . Rope that is strong enough under a steady strain can be broken with a sudden jerk. Care when working with rope is extremely important.

AVOID KINKS . . . When rope is repeatedly turned or twisted in one direction, it is certain that kinks will develop, unless twists are repeatedly thrown in, or out of the rope. Pulling a kink through a restricted space such as a tackle block will seriously damage the rope fibers.

AVOID SHARP ANGLES . . . Sharp bends greatly affect the strength of a rope. Any sharp angle is a weak spot. Pad is for safety, and even then, Be Careful!

Continued on the next page

All About Cordage

REVERSE ENDS . . . Prolonged use, or wear, of one part of a rope will naturally decrease its effectiveness at that point. Occasionally reverse your rope, end-for-end, to distribute the wear more evenly. A good example is an anchor line aboard a boat.

AVOID CHEMICALS . . . Virtually all synthetic fiber ropes are resistant to damage from oil, gasoline, paint and most chemicals. To be on the safe side, however, keep your rope free of any type chemical. Natural fiber ropes are, of course, severely damaged by exposure to chemicals.

KEEP ROPE CLEAN . . . Dirt on the surface and imbedded in rope acts as an abrasive on fibers. When rope becomes dirty wash it thoroughly with clean water. Be sure to dry natural fiber ropes before storing.

AVOID IMPROPER STORAGE . . . Synthetic fiber ropes require no special storing conditions other than keeping them out of direct sunlight, away from the elements and out of extremely hot rooms. The ultra-violet rays of sunlight has a weakening effect on rope that is exposed for prolonged periods of time. Natural fiber ropes must of course, be kept dry or they will rot in a very short time.

CORDAGE SPECIFICATIONS

NEW ROPE TENSILE STRENGTHS are based on tests of new and unused rope of standard construction in accordance with Cordage Institute Standard Test Methods. All figures are "Average" - The Minimum is 10% below stated amount. WORKING LOAD LIMIT is indicated by RECOMMENDED WORKING LOAD RANGES. USE OF WORKING LOADS—Because of the wide range of rope use, rope condition, exposure to the several factors affecting rope behavior, and the degree of risk to life and property involved, it is impossible to make blanket recommendations as to working loads. However, to provide guidelines, working loads are tabulated for rope in good condition with appropriate splices, in noncritical applications and under normal service conditions. WORKING LOAD RANGES should be exceeded only with expert knowledge of conditions and professional estimates of risks.

The RECOMMENDED WORKING LOAD RANGES are derived by taking 15 - 25% of NEW ROPE TENSILE STRENGTH for Braided Rope and 10 - 20% for Twisted Rope.

SYNTHETIC CORDAGE

Though initially more expensive than natural fiber ropes, synthetic ropes have proven to be more efficient and cost effective long term for most end uses. Man made fibered ropes are stronger and more durable. They are generally not affected by rot or mildew or most chemicals, and may be stored wet or dry. As a result, the service life of synthetics exceeds that of natural fiber ropes.

Each of the various types of Synthetic Fibers used in the manufacturing of rope and listed below, possesses different characteristics and properties. All of these fibers are continuous filaments of long molecular-chain polymers that extend the length of the rope. These filaments may be either extruded or spun, and are normally either termed as monofilament (larger single filaments) or multifilament (multiple smaller fibers).

NYLON: Due to its elasticity, nylon can absorb sudden shock loads that would break ropes of other fiber. It has very good resistance to abrasion and will last many times longer than natural fiber ropes. Nylon rope is resistant to rot, oils, gasoline, grease, marine growth or most chemicals.

POLYESTER: Polyester is very strong, but not quite as strong as nylon rope. The difference between the two ropes is that polyester does not have the stretch and elasticity of nylon but has better resistance to ultra-violet degradation from sunlight. Other than this, the characteristics of the two fibers are practically the same.

POLYPROPYLENE:* A lightweight, strong rope that is extensively used in many different ways. It is a floating rope and is resistant to rot, oils, gasoline or most chemicals and is waterproof. Polypropylene rope is available in monofilament fiber, which is smooth surfaced, or multifilament fiber, which has a somewhat velvety appearance and feel, and polypropylene film fiber which is produced in varying textures.

POLYETHELENE:* One of the best known synthetic fiber ropes. A floating rope somewhat like polypropylene except that is just a little heavier. Also, polyethylene's handling characteristics are a little different than polypropylene. It is not quite as strong, size for size as polypropylene.

SYNTHETIC FIBER TYPES

MULTIFILAMENT: Soft, flexible, fine diameter, continuous strands. Available in nylon, polyester and polypropylene ropes only.

MONOFILAMENT: Extruded in round fibers. Not as soft as multifilament. Available in polypropylene and polyethylene ropes only.

SLIT FILM: Polypropylene or polyethylene is extruded in sheet film form then slit to make flat fibers.

SPUN: Very fine fibers with lengths of 1/2 to 1-1/2 inches

Continued on the next page

All About Cordage

are twisted into string then into rope. Available in cotton and polyester ropes only.

TEXTURIZED: Fibers are kinked to give loft to the fiber. Available in polyester, nylon and polypropylene.

COLOR: Natural color, in synthetic cordage, means white or silvery white obtained through the use of dyes and pigments.

COTTON CORDAGE

The primary advantages of cotton twines, sash cords, shade cords and rope are its good handling characteristics and knot holding ability. Cotton cordage is especially suited to specific uses, however, it does not have the strength or durability of the synthetic fibers.

ROPE CONSTRUCTIONS

TWISTED (LAID): Size for size, and pound for pound, twisted rope is the strongest and least expensive rope manufactured today. It is normally manufactured by twisting three strands, or bundles, of fibers in a spiral direction. It is spliceable.

SOLID BRAID: constructed with 9, 12 or 18 strands of fiber lock-stitched together. Has a very smooth surface with a firm, round cross-section that holds its shape under pressure and load. Excellent for use in pulleys, on winches, or anywhere that a firm, round rope is needed. It is not spliceable.

MAYPOLE BRAID: Constructed with 8, 12 or 16 strands of fibers tightly braided around a center core of parallel fibers. It is generally not as round as solid braid, but tends to have a greater breaking strength. The strands form a herringbone patten in the rope. It is not spliceable.

DIAMOND BRAID: Constructed with 8, 12 or 16 strands of fibers braided over and under each other in a circular direction. The center of the rope is hollow, allowing for easy splicing. Generally stronger than solid braid or maypole braid constructions. Easily and quickly spliced.

BRAID-ON-BRAID: Actually two ropes in one, with a jacket braided over a braided rope core. A very strong and flexible rope that doesn't kink, hockle or rotate under load. It is spliceable.

DEFINITIONS

BONDING: A coating of liquid to increase resistance to abrasion and prevent water absorption.

NATURAL: Natural color, unbleached cotton.

WHITE: In cotton, a specified color not to be confused with natural.

POLISHED (GLAZED): Cotton cordage that has been run through a gum and pigment polish to give it a high gloss.

PHYSICAL PROPERTIES OF FIBERS

Fiber Type	Specific Gravity	Sticking Temperature °F	Sticking Temperature °C	Melting Temperature °F	Melting Temperature °C	Ultimate Elongation %
Nylon	1.34	455	235	482	250	25-35
Polyester	1.38	455	235	500	235	15-25
Polypropylene	.90	302	150	330	165	20-25
Polyethylene	.95	248	120	275	135	15-25
Cotton	1.54	–	–	Decomposes at 302	150	15-20

***SPECIAL NOTICE CONCERNING POLYPROPYLENE & POLYETHYLENE**: Polypropylene and Polyethylene are subject to deterioration when exposed to direct sunlight. These products were designed to give you many hours of use; however, the life of the product will be extended when stored away from sunlight. The product should be replaced when signs of excessive deterioration is indicated by discoloration, broken filaments, raveling, etc.

Rope Specifications

AVERAGE TENSILE STRENGTHS shown are for new (unused) rope and will decrease after use. All tests were performed in accordance with ASTM test method 4268-83.

The rope strength will be reduced after use due to heat, abrasion, ultraviolet or chemical exposure. The tensile strengths may be further reduced by up to 50% as a result of knots or kinks.

MINIMUM TENSILE STRENGTHS are defined as two standard deviations (typical about 15%) below the average and also refer only to new and unused ropes.

MAXIMUM WORKING LOADS are determined by dividing the average tensile strength by the safety factor. The safety factor is a function of the physical properties of the rope, the age and history of the rope, the type of service it will be subjected to and the risks involved if failure occurs. For a rope manufacturer to give blanket working load recommendations would be like a car manufacturer giving the "safe driving speed" of their cars.

Obviously the conditions of use far outweigh the design characteristics of the rope. Typically safety factors vary from 3:1 (for new rope used in applications with uniform loading and where failure would cause little or no risk to equipment or personnel) to 20:1 (for conditions involving moderate shock loading, possibility of snags or kinks or where failure could cause severe risk to equipment or personnel).

WORKING ELONGATION is shown from a preload tension of 200 times the diameter squared per the ASTM test specification.

ROPE WEIGHTS shown are average and may vary plus or minus 5%.

SPECIAL REQUIREMENTS

FACTORY SPLICING of various types is available for all of our ropes. Splices can be provided with various types of chafe protection or coatings.

CUSTOM LENGTHS and special constructions are available on request.

ROPE TERMINATIONS Washington Chain can provide custom terminations such as thimbles, links, rings and custom hardware. Terminations are available in plastic, bronze, stainless steel and galvanized steel. Please call or fax your requirements for a quotation.

SPECIAL COATINGS such as polyurethane, polyethylene and vinylesters may be applied to any of the synthetic ropes to improve the snag resistance, sunlight resistance or for color coding. WCS can provide ropes with a variety of finishes to meet your needs.

MILITARY SPECIFICATIONS Certificates of compliance are supplied at no charge if requested when placing the order. Certified test reports can be provided at an additional charge when requested at the time of the order.

Continental Western Specifications

3 and 8 Strand
Standard Construction

Size (Inches)		Polyrpropylene		Nylon		Polyester		Poly-Plus		Steelline		Manila		Working Loads
Dia	Cir.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	
3/16	5/8	800	.7	1,000	1.0	1,000	1.2	-	-	-	-	406	1.5	10:1
1/4	3/4	1,250	1.2	1,650	1.5	1,650	2.0	1,300	1.7	-	-	540	2.0	10:1
5/16	1	1,900	1.8	2,550	2.5	2,000	3.1	2,000	2.6	-	-	900	2.9	10:1
3/8	1-1/8	2,700	2.8	3,700	3.5	3,700	4.0	3,200	3.8	-	-	1,220	4.1	10:1
7/16	1-1/4	3,500	3.8	5,000	5.0	5,000	6.2	3,900	4.8	-	-	1,580	5.3	10:1
1/2	1-1/2	4,200	4.7	6,400	6.5	6,400	8.0	5,400	6.7	-	-	2,380	7.5	9:1
9/16	1-3/4	5,100	6.1	8,000	8.3	8,000	10.2	6,000	7.6	-	-	3,100	10.4	8:1
5/8	2	6,200	7.5	10,400	10.5	10,000	13.0	7,200	9.2	-	-	3,950	13.3	8:1
3/4	2-1/4	8,500	10.7	14,200	14.5	12,500	17.5	9,800	12.5	-	-	4,860	16.7	7:1
13/16	2-1/2	9,900	12.7	17,000	17.0	15,500	21.0	11,200	14.7	-	-	5,850	19.5	7:1
7/8	2-3/4	11,500	15.0	20,000	20.0	18,000	25.0	13,500	17.6	-	-	6,950	22.4	7:1
1	3	14,000	18.0	25,000	26.4	22,000	30.4	17,000	22.0	-	-	8,100	27.0	7:1
1-1/16	3-1/4	16,000	20.4	28,800	29.0	25,500	34.4	18,700	24.5	-	-	9,450	31.2	7:1
1-1/8	3-1/2	18,300	23.8	33,000	34.0	29,500	40.0	21,000	27.5	-	-	10,800	36.0	7:1
1-1/4	3-3/4	21,000	27.0	37,500	40.0	33,200	46.2	25,000	33.0	-	-	12,200	41.6	7:1
1-5/16	4	23,500	30.4	43,000	45.0	37,500	52.5	27,500	37.0	-	-	13,500	47.8	7:1
1-1/2	4-1/2	29,700	38.4	53,000	55.0	46,800	67.0	34,000	46.0	38,000	36.6	16,700	60.0	7:1
1-5/8	5	36,000	47.6	65,000	66.5	57,000	82.0	41,000	55.0	46,000	45.1	20,200	74.5	7:1
1-3/4	5-1/2	43,000	59.0	78,000	83.0	67,800	98.0	51,000	68.0	55,000	54.2	23,800	89.5	7:1
2	6	52,000	69.0	92,000	95.0	80,000	118.0	62,000	83.0	66,500	65.6	28,000	108.0	7:1
2-1/8	6-1/2	61,000	80.0	106,000	109.0	92,000	135.0	70,000	97.0	77,500	76.5	-	-	7:1
2-1/4	7	69,000	92.0	125,000	129.0	107,000	157.0	78,000	108.0	88,000	87.0	-	-	6:1
2-1/2	7-1/2	80,000	107.0	140,000	149.0	122,000	181.0	90,000	122.0	103,000	102.0	-	-	6:1
2-5/8	8	90,000	120.0	162,000	168.0	137,000	205.0	99,000	138.0	115,000	114.0	-	-	6:1
2-7/8	8-1/2	101,000	137.0	180,000	189.0	154,000	230.0	110,000	155.0	130,500	130.0	-	-	6:1
3	9	114,000	153.0	200,000	210.0	174,000	258.0	125,000	179.0	145,000	145.0	-	-	6:1
3-1/4	10	137,000	190.0	250,000	264.0	210,000	318.0	150,000	215.0	175,000	180.0	-	-	6:1
3-1/2	11	162,000	232.0	300,000	312.0	254,000	384.0	170,000	248.0	207,000	220.0	-	-	6:1
4	12	190,000	276.0	360,000	380.0	300,000	460.0	200,000	290.0	243,000	261.0	-	-	6:1

3-Strand Twisted

8-Strand Plaited

Continental Western Specifications

3 and 8 Strand
Standard Construction

Size Inches		Dacron® Hi Strength Polyester		LST Mooring Line		Poly-Cron		Super 800 Lock Line	
Dia.	Cir.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.
1-1/2	4-1/2	-	-	-	-	34,000	55.0	35,500	44.0
1-5/8	5	-	-	-	-	42,000	67.0	43,500	54.0
1-3/4	5-1/2	87,000	98.0	59,000	67.0	50,000	80.0	53,000	66.0
2	6	103,500	118.0	70,500	80.0	60,000	95.0	63,000	78.0
2-1/8	6-1/2	117,900	135.0	82,500	94.0	70,000	112.0	-	-
2-1/4	7	136,000	157.0	96,000	109.0	80,000	127.0	85,500	106.0
2-1/2	7-1/2	158,000	181.0	110,000	125.0	92,000	147.0	-	-
2-5/8	8	175,000	205.0	120,000	142.0	105,000	165.0	104,000	139.0
2-7/8	8-1/2	195,000	230.0	135,000	155.0	120,000	190.0	-	-
3	9	217,000	258.0	150,000	175.0	130,000	208.0	140,000	175.0
3-1/4	10	266,000	318.0	180,000	210.0	163,000	253.0	170,000	216.0
3-1/2	11	318,000	384.0	220,000	245.0	-	-	-	-
4	12	377,000	460.0	260,000	295.0	-	-	-	-

Tensile Strengths shown are average based on new ropes tested under laboratory conditions and can vary by 10%. Weights are average and may vary by 5%.

Working Loads are expressed as a ratio to tensile strength.

8 Strand Ropes are not available in Manila or sizes under 1-1/2" diameter.

8 Strand Construction Only
No Manila Available

Size (Inches)		Polypro		Nylon		Polyester		Poly-Plus		Steelline		Working Loads	Dacron® Hi-Strength Polyester	
Dia.	Cir.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.	Tensile Strength	Lbs. Per 100 Ft.		Tensile Strength	Lbs. Per 100 Ft.
4-1/4	13	220,000	320.0	440,000	430.0	350,000	540.0	270,000	385.0	280,000	309.0	6:1	435,000	540.0
4-5/8	14	252,000	365.0	510,000	500.0	410,000	626.0	313,000	447.0	316,000	356.0	6:1	505,000	626.0
5	15	290,000	420.0	575,000	570.0	467,000	720.0	360,000	513.0	359,000	409.0	6:1	575,000	720.0
5-1/4	16	330,000	475.0	650,000	645.0	535,000	820.0	410,000	585.0	402,000	466.0	6:1	655,000	820.0
5-5/8	17	366,000	530.0	720,000	715.0	600,000	920.0	460,000	662.0	445,000	527.0	6:1	725,000	920.0
6	18	410,000	594.0	800,000	796.0	675,000	1040.0	515,000	747.0	500,000	593.0	6:1	825,000	1040.0

Plasma® 12 Strand

See specifications, page 179.

Plasma™ 12 strand is the highest strength synthetic rope available. Plasma™ 12 strand is manufactured from AlliedSignal Spectra® Fiber that has been enhanced by Puget Sound Rope's patented recrystallization process. This process is especially effective in medium to large diameter ropes where strengths are over 50% higher and creep is significantly less than that of standard Spectra® 12 strand.

Plasma™ 12 strand comes standard with a polyurethane finish and is easily spliced using a simple lockstitch type splice or 4-3-2 tuck splice. Its soft, torque free braided construction provides easy handling.

Tensile Strengths are determined in accordance with ASTM test method D 4268-83.

Weights are calculated at linear density under standard preload (200 d^2) plus 4%.

- Highest strength
- Lowest stretch
- Low creep
- Soft hand
- Torque free
- Easy splicing
- Floats

Specific gravity	0.98
Melting point	284° F
Critical temp.	150° F
Coefficient of friction	0.09-0.12
Elongation at break	4% - 5%
Fiber water absorption	0%
UV resistance	excellent
Wet abrasion	superior
Dry abrasion	superior

Nominal Diameter (Inches)	Size Number (circ.)	Approximate Weight (Lbs/100ft)	Minimum Tensile Strength Pounds
7/16	1-1/4	4.2	21,000
1/2	1-1/2	6.4	31,300
9/16	1-3/4	7.9	37,900
5/8	2	10.6	51,400
3/4	2-1/4	13.3	68,500
7/8	2-3/4	19.6	92,600
1	3	23.4	110,000
1-1/8	3-1/2	31.9	147,000
1-1/4	3-3/4	36.2	165,000
1-5/16	4	41.7	196,000
1-1/2	4-1/2	51.7	221,000
1-5/8	5	65.7	291,000
1-3/4	5-1/2	78.4	314,000
2	6	91.4	355,000
2-1/8	6-1/2	109	428,000
2-1/4	7	122	481,000
2-5/8	8	167	560,000
3	9	214	780,000
3-1/4	10	261	1,000,000
3-5/8	11	324	1,250,000
4	12	394	1,520,000

Spectra® 12 Strand

Spectra® 12 strand provides very high strength, low stretch and excellent abrasion resistance in a single braid construction.

For the equivalent weight rope it is over 3 times as strong as polyester and has less than one half the elongation.

Spectra® 12 strand comes standard with a polyurethane finish and is easily spliced using a 4-3-2 tuck splice. Its soft, torque free braided constructions provides easy handling.

Tensile Strengths are determined in accordance with ASTM test method 4268-83

Weights are calculated using the linear density under standard preload (200d^2) plus 4%.

- Very Low stretch
- Very High strength
- Soft hand
- Torque free
- Easy splicing
- Floats

Specific gravity	0.98
Melting point	284° F
Critical temp.	150° F
Coefficient of friction	0.09-0.12
Elongation at break	6% - 8%
Fiber water absorption	0%
UV resistance	excellent
Wet abrasion	superior
Dry abrasion	superior

Nominal Diameter (Inches)	Size Number (circ.)	Approximate Weight (Lbs/100ft)	Minimum Tensile Strength Pounds
7/16	1-1/4	4.2	14,800
1/2	1-1/2	6.4	22,500
9/16	1-3/4	7.9	27,700
5/8	2	10.6	36,600
3/4	2-1/4	13.3	43,200
7/8	2-3/4	19.6	61,000
1	3	23.4	72,000
1-1/8	3-1/2	31.9	91,800
1-1/4	3-3/4	36.2	102,600
1-5/16	4	41.7	114,300
1-1/2	4-1/2	51.7	141,300
1-5/8	5	65.7	167,400
1-3/4	5-1/2	78.4	198,000
2	6	91.4	225,000
2-1/8	6-1/2	109	270,000
2-1/4	7	122	317,700
2-1/2	7-1/2	148	360,000
2-5/8	8	167	370,800
2-3/4	8-1/2	187	405,000
3	9	214	508,500
3-1/4	10	261	616,500
3-5/8	11	324	765,000
4	12	394	900,000

®Plasma is a trademark of Puget Sound Rope Corp.

®Spectra is a trademark of Allied Signal Corp.

Polyester 12 Plait

See specifications, page 179.

Polyester 12 Plait provides high strength, low stretch and excellent abrasion resistance in a unique single braid construction.

Polyester 12 Plait is easily spliced using a standard tuck splice and is 30% stronger than three strand or 8 plait polyester. It's torque free braided construction provides easy handling and prevents kinks and hockles.

Polyester 12 Plait comes standard with an overlay marine finish and is available on special order with a spliceable polyurethane finish in clear or any of six colors.

Tensile Strengths are determined in accordance with ASTM test method D 4268-83

Weights are calculated at linear density under standard preload (200df) plus 5%.

- Low stretch
- High strength
- Soft hand
- Torque free
- Easy splicing
- Meets MIL-R-24750

Specific gravity	1.38
Melting point	482° F
Critical temp.	350° F
Coefficient of friction	0.12-0.15
Elongation at break	15% - 20%
Fiber water absorption	0% - 1%
UV resistance	excellent
Wet abrasion	excellent
Dry abrasion	excellent

Nominal Diameter (Inches)	Size Number (circ.)	Approximate Weight (Lbs/100ft)	Minimum Tensile Strength Pounds
5/8	2	14.1	12,100
3/4	2-1/4	18.7	15,800
7/8	2-3/4	28.2	24,200
1	3	35.1	27,500
1-1/8	3-1/2	41.2	35,500
1-1/4	3-3/4	45.9	42,100
1-5/16	4	55.0	48,200
1-1/2	4-1/2	71.1	59,600
1-5/8	5	84.8	72,200
1-3/4	5-1/2	98.6	84,400
2	6	120	101,000
2-1/8	6-1/2	141	119,000
2-1/4	7	160	137,000
2-1/2	7-1/2	189	163,000
2-5/8	8	208	179,000
2-3/4	8-1/2	234	202,000
3	9	273	233,000
3-1/4	10	338	282,000
3-5/8	11	402	340,000
4	12	486	409,000

Nylon Double Braid

Nylon Double Braid is the preferred choice for applications requiring high strength with excellent shock absorbing properties. Nylon Double Braid has good resistance to abrasion, sunlight and chemicals. Due to its high elongation, nylon is almost always used in applications involving shock loading such as anchor lines and mooring lines.

Nylon Double Braid comes standard with an overlay marine finish and is available on special order with a spliceable polyurethane finish in clear or any of six colors.

- High stretch
- High strength
- Excellent shock absorption
- Soft hand
- Torque free
- Meets MIL-R-24050D

Specific gravity	1.14
Melting point	414° F
Critical temp.	300° F
Coefficient of friction	0.12-0.15
Elongation at break	30% - 35%
Fiber water absorption	3% - 5%
UV resistance	good
Wet abrasion	excellent
Dry abrasion	excellent

Size (Inches) Dia.	Circ.	Average Lbs/100ft	Strength	Standard Packaging Length	Bulk Carton Approx Wt	600ft Spool Approx Wt
5/8	2	12	14,800	4,800	576	72
3/4	2-1/4	15	19,000	3,600	540	90
7/8	2-3/4	22	28,300	2,400	528	132
1	3	26	33,500	2,400	624	156
1-1/8	3-1/2	36	44,900	1,800	648	216
1-1/4	3-3/4	41	52,300	1,200	492	246
1-5/16	4	47	58,800	1,200	564	282
1-1/2	4-1/2	60	74,000	600	360	360
1-5/8	5	74	92,400	600	444	444
1-3/4	5-1/2	89	110,900	600	534	534
2	6	106	131,500	600	636	636
2-1/8	6-1/2	124	152,800	-	-	744
2-1/4	7	144	177,000	-	-	864
2-1/2	7-1/2	165	201,000	-	-	990
2-5/8	8	188	231,000	-	-	1128
2-3/4	8-1/2	212	254,000	-	-	1272
3	9	238	283,000	-	-	1428
3-1/4	10	294	319,000	-	-	1764
3-5/8	11	356	381,000	-	-	2136
4	12	423	447,000	-	-	2538
4-1/4	13	497	522,000	-	-	2982

Polyester Double Braid

See specifications, page 179.

Polyester Double Braid provides an excellent combination of high strength, low stretch excellent weathering and easy handling.

Of all the popular fibers polyester has the best weathering charistics and the best wet abrasion resistance.

Polyester Double Braid comes standard with an overlay marine finish and is available on special order with a spliceable polyurethane finish in clear or any of six colors.

- Low stretch
- High strength
- Soft hand
- Torque free
- Excellent wet strength
- Meets MIL-R-24677A

Specific gravity	1.38
Melting point	482° F
Critical temp.	350° F
Coefficient of friction	0.12-0.15
Elongation at break	15% - 20%
Fiber water absorption	0% - 1%
UV resistance	excellent
Wet abrasion	excellent
Dry abrasion	excellent

Size (Inches) Dia.	Size (Inches) Circ.	Average Lbs/100ft	Strength	Standard Packaging Length	Standard Packaging Bulk Carton Approx Wt	Standard Packaging 600ft Spool Approx Wt
5/8	2	13.2	15,600	4,800	633	76
3/4	2-1/4	18.8	19,900	3,600	677	113
7/8	2-3/4	25.7	28,300	2,400	617	154
1	3	33.5	37,100	1,800	603	202
1-1/8	3-1/2	42.5	45,900	1,200	510	255
1-1/4	3-3/4	53.0	54,200	1,200	636	318
1-5/16	4	57.9	61,600	1,200	695	348
1-1/2	4-1/2	75.3	71,100	600	452	452
1-5/8	5	87.0	87,500	600	522	522
1-3/4	5-1/2	103	101,200	600	618	618
2	6	134	123,400	600	806	806
2-1/8	6-1/2	152	140,000	-	-	912
2-1/4	7	169	165,000	-	-	1,014
2-1/2	7-1/2	211	185,000	-	-	1,266
2-5/8	8	230	209,000	-	-	1,380
2-3/4	8-1/2	256	229,000	-	-	1,536
3	9	303	270,000	-	-	1,818
3-1/4	10	354	337,000	-	-	2,124
3-5/8	11	438	401,000	-	-	2,628
4	12	536	463,000	-	-	3,216
4-1/4	13	605	526,000	-	-	3,630

N/P Composite Double Braid

N/P Composite is a double braided rope with the inner core made of multifilament polypropylene and the outer sleeve of nylon.

N/P Composite combines the excellent sunlight and abrasion resistance of nylon with the flotation of polypropylene. It has a standard specific gravity of 1.01 and is available on special order with a specific gravity of 0.99.

N/P Composite Braid comes standard with an overlay marine finish and is available on special order with a spliceable polyurethane finish in clear or any of six colors.

- Moderate stretch
- High strength
- Soft hand
- Torque free
- Floats in sea water

Specific gravity	1.01
Melting point	284° F
Critical temp.	200° F
Coefficient of friction	0.12-0.15
Elongation at break	30% - 35%
Fiber water absorption	3% - 4%
UV resistance	good
Wet abrasion	good
Dry abrasion	good

Size (Inches) Dia.	Size (Inches) Circ.	Average Lbs/100ft	Strength	Standard Packaging Length	Standard Packaging Bulk Carton Approx Wt	Standard Packaging 600ft Spool Approx Wt
5/8	2	9.0	11,000	4,800	432	54
3/4	2-1/4	13.8	16,100	3,600	497	83
7/8	2-3/4	19.4	22,600	2,400	466	116
1	3	23.6	27,300	1,800	425	142
1-1/8	3-1/2	31.9	36,700	1,200	383	191
1-1/4	3-3/4	37.9	43,400	1,200	455	227
1-5/16	4	42.8	48,800	1,200	514	257
1-1/2	4-1/2	53.6	60,000	600	322	322
1-5/8	5	63.8	72,200	600	383	383
1-3/4	5-1/2	80.6	90,000	600	484	484
2	6	92.6	104,000	600	556	556
2-1/8	6-1/2	111	123,000	-	-	666
2-1/4	7	129	142,000	-	-	774
2-1/2	7-1/2	145	161,000	-	-	870
2-5/8	8	169	183,000	-	-	1,014
2-3/4	8-1/2	186	204,000	-	-	1,116
3	9	210	227,000	-	-	1,260
3-1/4	10	263	276,000	-	-	1,578
3-5/8	11	314	329,000	-	-	1,884
4	12	371	387,000	-	-	2,226
4-1/4	13	443	454,000	-	-	2,658

D/N Composite Double Braid

See specifications, page 179.

D/N Composite is a double braided rope with the inner core made of nylon and the outer sleeve of polyester.

D/N Composite was designed for very specific applications and should be selected with extreme caution . . . although the rope has a higher tensile strength than either nylon or polyester, the strength gain comes at the expense of rope life.

D/N Composite Braid comes standard with an overlay marine finish and is available on special order with a spliceable polyurethane finish in clear or any of six colors.

- Moderate stretch
- High strength
- Soft hand
- Torque free

Specific gravity	1.26
Melting point	482° F
Critical temp.	350° F
Coefficient of friction	0.12-0.15
Elongation at break	20% - 25%
Fiber water absorption	3% - 4%
UV resistance	excellent
Wet abrasion	poor
Dry abrasion	poor

Size (inches) Dia.	Size (inches) Circ.	Average Lbs/100ft	Strength	Standard Packaging Length	Standard Packaging Bulk Carton Approx Wt	Standard Packaging 600ft Spool Approx Wt
5/8	2	13.0	16,300	4,800	624	78
3/4	2-1/4	17.0	22,800	3,600	612	102
7/8	2-3/4	23.4	31,000	2,400	562	140
1	3	30.4	40,000	1,800	547	182
1-1/8	3-1/2	38.0	49,100	1,200	456	228
1-1/4	3-3/4	47.2	59,300	1,200	566	283
1-5/16	4	56.0	72,000	1,200	672	336
1-1/2	4-1/2	66.7	86,700	600	400	400
1-5/8	5	80.0	99,200	600	480	480
1-3/4	5-1/2	97.0	120,400	600	582	582
2	6	115	141,300	600	690	690
2-1/8	6-1/2	135	166,500	-	-	810
2-1/4	7	157	190,700	-	-	942
2-1/2	7-1/2	180	217,000	-	-	1,080
2-5/8	8	205	243,000	-	-	1,230
2-3/4	8-1/2	231	280,000	-	-	1,386
3	9	259	316,000	-	-	1,554
3-1/4	10	320	354,000	-	-	1,920
3-5/8	11	387	422,000	-	-	2,322
4	12	461	496,000	-	-	2,766

Spun Polyester Double Braid

Spun Polyester is a double braided rope with the inner core made of polyester continuous filament and the outer sleeve of DuPont type 77 Dacron® to give a soft easy-to-grip surface yet the strength of continuous filament polyester.

Spun polyester is easily spliced and has excellent weathering characteristics and abrasion resistance.

Spun Polyester Double Braid comes standard with an overlay marine finish.

- Low stretch
- High strength
- Very soft hand
- Torque free
- Excellent wet strength
- Meets MIL-R-24536

Specific gravity	1.38
Melting point	482° F
Critical temp.	350° F
Coefficient of friction	0.12-0.15
Elongation at break	15% - 20%
Fiber water absorption	0% - 1%
UV resistance	excellent
Wet abrasion	excellent
Dry abrasion	excellent

Size (inches) Dia.	Size (inches) Circ.	Average Lbs/100ft	Strength	Standard Packaging Length	Standard Packaging Bulk Carton Approx Wt	Standard Packaging 600ft Spool Approx Wt
5/8	2	13.0	11,300	4,800	546	78
3/4	2-1/4	16.2	14,100	3,000	486	97
7/8	2-3/4	24.3	19,700	2,400	583	146
1	3	30.7	22,800	1,800	553	184
1-1/8	3-1/2	41.0	30,000	1,200	492	246
1-1/4	3-3/4	48.4	33,900	1,200	581	290
1-5/16	4	55.5	38,100	600	333	333
1-1/2	4-1/2	65.0	49,900	600	390	390
1-5/8	5	84.0	56,700	600	504	504

Splicing Instructions

Rope Terminology

BIGHT: A loop made in any part of a rope.

BITTER END: The end of a rope opposite the end in use.

BLOCK: Similar to a pulley. Used to give mechanical advantage when lifting or pulling heavy objects.

END: The end of a rope in use. (Opposite the bitter end).

FATHOM: A unit of measurement: 1 fathom is 6 feet.

FALL: The standing part of the rope coming from the fixed block on a block and tackle on which strain is applied.

LAY: The way a twisted rope is constructed. Lay is either right-hand or left-hand.

LINE: Rope used aboard boats and ships is called line.

PULLEY: A device consisting of a sheave mounted in a block or wall, which is used to achieve mechanical advantage when lifting or pulling heavy objects.

ROUND TURN: Two turns of rope around the object to which it is being fastened.

SHEAVE: Pronounced "shiv". The grooved wheel in a block or pulley upon which the rope rides when in use.

STANDING PART: The main part of the rope.

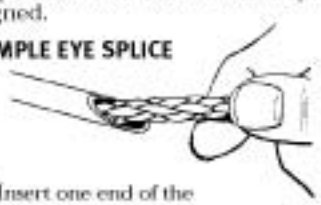
TURN: One turn of a rope around the object to which it is being fastened.

SPLICING DIAMOND BRAID ROPE

TOOLS NEEDED

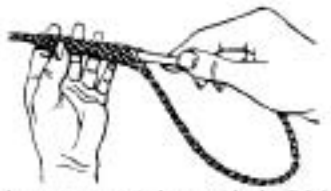
All that is needed to splice Diamond Braid rope is a hollow splicing fid of the proper size. Each diameter rope requires a fid of the same size. All fids are marked with the rope diameter for which they are designed.

SIMPLE EYE SPLICE



1. Insert one end of the rope into splicing fid.

2. Select point where splice is to begin. Insert tapered end of fid between the strands at this point.



3. As fid penetrates stritches, guide the fid down the hollow center of the rope. In this step, push fid with right hand . . . at the same time use left hand to work the rope over the fid.

4. Six to eight inches below starting point, bring the fid out between two strands.

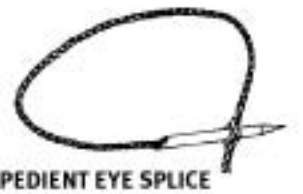
5. Remove fid from rope.

Tighten splice by pulling as indicated. (Caution: Completed splice section should measure at least six inches in length.)

6. For maximum security the splice should be stitched using a needle and heavy nylon polyethylene or polypropylene twine. If a needle is not available the fid may be used to lead the twine back and forth through the splice.

CROWN SPLICE

Make small eye splice as explained in Simple Eye Splice. Steps 1-5. Pull end protruding from the splice until loop slides down flush with end of rope. Trim off protruding end.



EXPEDIENT EYE SPLICE

1. Run end of rope through point where splice is to start.

2. Start splice two stitches above penetrating rope. Run fid through penetrating rope and continue down the hollow center for approximately six inches. Bring fid out through stitches. Remove from rope.

3. Tighten splice. Clip protruding end.

PERMANENT EYE SPLICE 1

1. Cut approximately 2 ft. from one end of rope to be spliced. Put end B into splicing fid and insert it about 8 inches from one end of rope. Push fid 4 inches through center of rope and bring it out., leaving end approximately 4 inches long.

Note direction of splice in diagram!

2. Remove fid. Pull end B until eye is correct size.

3. Splice A into B as described in End-To-End splice.

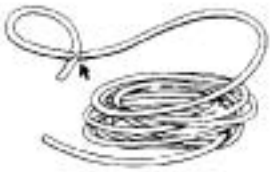
4. Splice end B into original rope with an End-to-End splice.

Continued on the next page

Splicing Instructions (continued)

PERMANENT EYE SPLICE 2

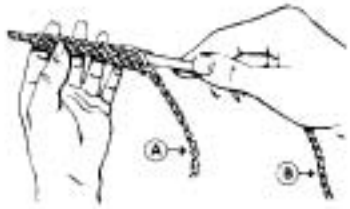
1. Place splicing fid on end of rope, opposite to end where Eye splice is wanted. Insert fid through rope, about 6 inches from end, as shown.



2. Remove fid and pull entire length of rope through to size of Eye splice desired.

3. Just below the point where rope comes through, (Arrow) insert fid into rope in direction away from loop, as illustrated. Insert short rope end into fid and guide fid down the hollow center of the rope. Push fid forward with right hand . . . at the same time use left hand to work rope over fid.

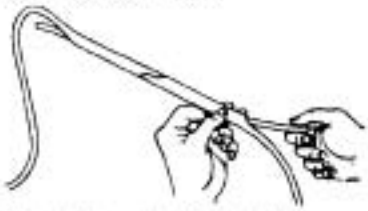
4. Five inches below starting point bring the fid out between two strands. Remove fid and pull protruding end to tighten the splice, then trim protruding end.



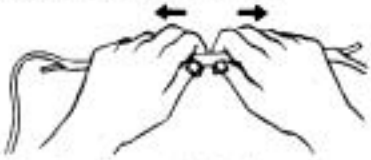
END-TO-END SPLICE

1. Splice rope B into rope A using principles described in EYE SPLICE. Steps 1-5.

2. At point where A overlaps B insert fid into rope B. Splice A into B.

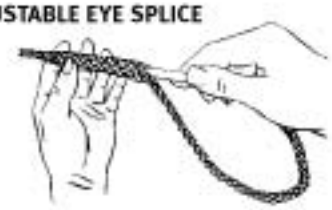


3. Adjust splice so that A abuts B.

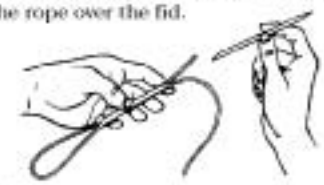


4. To tighten grasp splice firmly at center with thumb and forefinger of each hand . . . slide hands along rope as indicated by arrows. Clip any protruding ends.

ADJUSTABLE EYE SPLICE



1. Insert rope into hollow end of splicing fid, then insert fid into rope at point about 24 inches from its end. As fid penetrates strands, guide it down the hollow center of the rope. In this step, push fid forward with right hand . . . at the same time use left hand to work the rope over the fid.



2. Bring the fid and rope out between two strands six to eight inches below starting point. Remove fid from rope.

3. Cap the protruding end with a Crown splice to prevent it from slipping back through the splice.

Eye size can be changed by adjusting the length of rope protruding from the splice.

SPLICING BRAID-ON-BRAID ROPE

TOOLS NEEDED

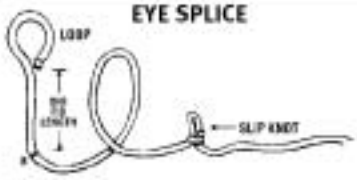
A FID . . . (B-Series) of the proper size. Braid-On-Braid splicing fids are identified with a "B" series number in addition to the rope diameter, size E, G, 3/8" (B-12), . . 1/2" (B-16) . . . etc.

A PUSHER . . . Used for pushing rope and fid into rope when making a splice.

TAPE . . . Any type of tape is satisfactory as it is only used temporarily to prevent unraveling while making a splice.

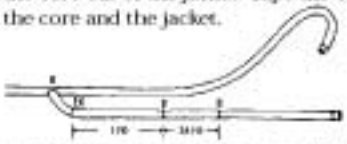
A MARKING DEVICE . . . Pencil, Dry Marker, Chalk or anything that will mark the rope being used.

EYE SPLICE

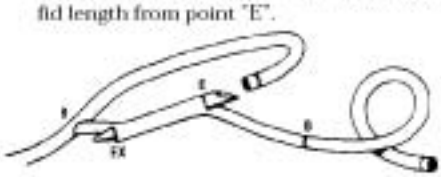


1. Form a loop the size of eye desired, then put a mark one fid length from the loop. This "B" (Base Point" is where you will extract the braided core from the braided jacket. It is important to make a slip knot approximately 5 feet from "B".

Using the pusher, part the strands of the jacket and pry out the core. Re-mark point "B" on the core where it comes out of the jacket. Now, using your fingers, pull the rest of the core out of the jacket. Tape the ends of the core and the jacket.



2. Grasp the core where it comes out of the jacket and slide jacket back until approximately 3/4 fid length is exposed. Mark this spot point "E" (Entrance). Slide jacket further back and mark point "EX" (Exit) one fid length from point "E".

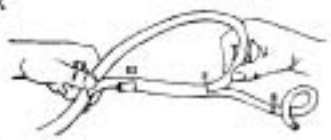


3. In this step you will pass the end of the jacket through the hollow core. Separate the strands of the core at point "E", insert fid, and slide it through . . . coming out of point "EX"

Continued on the next page

Splicing Instructions (continued)

4. Insert end of jacket into the socket of the fid. Hold the core lightly at "EX", then place the point of the pusher into the socket of the fid and push the fid and jacket through "E" to "EX" until end of jacket emerges at "EX"



5. Holding the core and end of the jacket tightly at "EX", smooth the braid of the core evenly from "EX" back to "E". Remove the tape from the end of the jacket sticking out at "EX". Pull the jacket carefully as shown, until the end disappears into the core.

6. The core must now be put back into the cover, finally emerging at point "B". Insert the fid into the jacket about 1/2 inch from "E". Place the end of the core into the fid, and use the pusher to slide fid and core through. Pull end of core until slack is taken out. You may not be able to push fid all the way to point "B" in one pass. If so bring out the point of fid between the strands of jacket and re-insert fid at the exact point where you brought it out and push it through the rest of the way, coming out at "B".

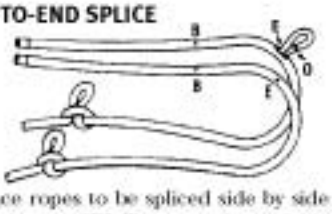
7. Grasp rope at point "E" and smooth down both sides of loop. Now, hold rope at slip knot, and with the other hand slide the jacket toward the splice. Repeat this action until exposed core is hidden inside jacket, and all slack in jacket has been removed. If bunching occurs at point "E" pull firmly on tail of core until it disappears. With this complete, smooth loop until all slack is removed and cut off tail near jacket. End will disappear by further smoothing of the loop. Untie the slip knot and your eye splice is completed.

CROWN SPLICE

A crown splice will keep a line from fraying and unraveling. This is made similar to the eye splice with the following variations:

1. In Step 1, do not measure any loop, just measure one fid length from the end of the line to get point "B". Be sure to tie a slip knot.
2. Steps 2 thru 5 are the same.
3. After cover has been inserted in core, proceed to Step 7, and bury core in the jacket. Cut off tail of core flush with end of splice.

END-TO-END SPLICE

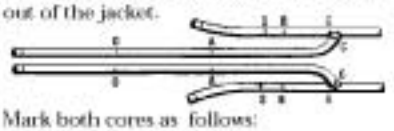


1. Place ropes to be spliced side by side and mark point "B" (Base point) one fid length from the end of each rope. Mark point "E" about 2/3 a fid length from point "B". Make certain that both ropes are marked identically.

   Tie a slip knot about 5 feet from point "E" in each rope.

   Using the pusher, part the jacket strands at point "E" and extract the core. Tape the ends of both jackets and extracted cores.

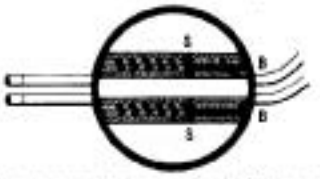
   Mark point "O" on each core where it comes out of the jacket.



2. Mark both cores as follows:

   Hold core at point "O" and slide jacket back about 2/3 a fid length. Mark point "A".

   Hold core at point "A" and slide jacket back about 1-2/3 fid lengths. Mark point "C".



3. It is necessary to taper the jacket to prevent bulge in the crossover. Do this to both ropes as follows.

   Starting at point "B" count 7 adjacent pairs of strands and mark point "S". From this point count, and mark every other intersecting pair of strands (see illustration). 7 intersecting pairs are to be marked.

   Remove the tape from the jacket end and beginning with the marked intersecting strands nearest the jacket end, cut the marked strands only and pull them from the jacket. DO NOT CUT BEYOND POINT "S". Tape end of tapered jacket.

4. Place the ropes end to end with the jacket of each beside the extracted core of the other.

   Insert the end of one jacket into the fid socket. Insert the fid at point "A" on the other rope core. With the pusher, push the fid through the center of the core and bring it out at point "C". Pull the jacket through the core till point "S" on the jacket meets point "A" on the core. Repeat this procedue with the other jacket and core.

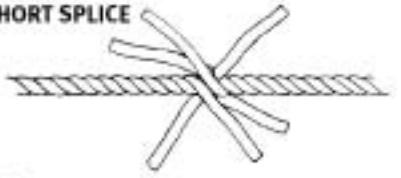
5. Insert taped end of one core into the fid socket. Insert fid at point "S" on the other rope jacket. With the pusher, push fid through the center of the jacket and bring it out at point "E". Repeat this procedure with the other core and jacket.

6. Remove tape from jacket ends and pull crossover snug by pulling jacket and core simultaneously on each side of splice. Hold the crossover firmly and smooth excess braid away from it in both directions. Cut off protruding cores at point "E".

7. Hold rope at the slip knot with one hand and with your other hand, slide the jacket toward the splice. Repeat with other rope. Do this until all slack has been removed between the slip knots and the length of the opening in the splice is about equal to the rope's diameter.

SPLICING 3-STRAND TWISTED ROPE

SHORT SPLICE



1. For end-to-end splicing of two ropes, first, unlay both ropes for a short distance and bring them together so that the main bod-

Continued on the next page

Splicing Instructions (continued)

ies of the ropes fit snugly and the unlaid strands mesh, alternating a strand of one with a strand of the other. Sealing the strand ends of synthetic fiber ropes with a a flame or hot knife will prevent their unraveling.

It is helpful to temporarily tie the strands of one rope to the body of the other rope.

2. Now, tuck one of the unlaid strands over and under a strand of the opposite rope, working against the twist.

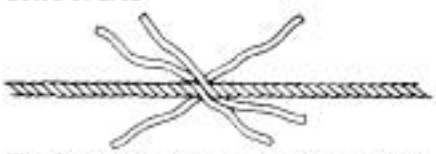
   Take the unlaid strand next to the strand just tucked, and tuck it over and under the next strand in the opposite rope. Do the same thing with the remaining unlaid strand. Now, take one more tuck with each strand.

3. Remove the temporary tie and make two tucks with the other three strands. You now have the strands of each rope tucked two times through the strands of the other rope. Now go back and make at least two more tucks with each of the six strands . . . four additional tucks are recommended for synthetic ropes.

4. Roll the splice under your foot, or a board and clip off ends of the protruding strands.

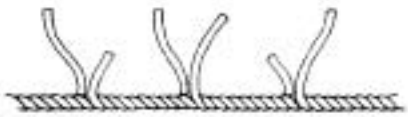
CAUTION: **Do not clip ends too close to the splice.**

LONG SPLICE

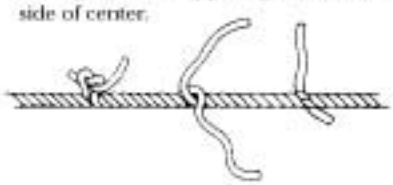


The Long splice is not quire as strong as the Short splice, but it permits a rope to run freely through a block or pulley.

1. To make a Long splice, unlay the end of each rope about 14 turns and bring them together so that the main bodies of the ropes fit snugly and the unlaid strands mesh: alternating a strand of one with a strand of the other. Sealing strand ends of synthetic fiber ropes with a flame or hot knife will prevent their unraveling.



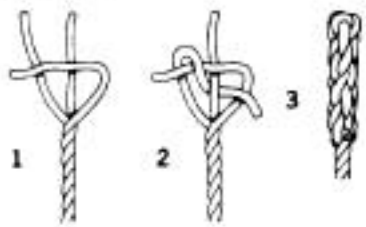
2. Starting with any opposite pair, unlay one strand and replace it with its opposite strand from the other rope. Do the same thing with another pair of strands, going in the opposite direction. You now have two long opposing strands in the center, at the original meeting point of the two ropes, and a pair of long and short opposing strands on each side of center.



3. Now tie each pair of opposing strands tightly with an overhand knot, tuck each strand twice back into the rope, going against the twist. Roll the splice under your foot or a board, clip protruding strand ends and your splice is complete.

CAUTION: **Do not clip ends too close to the splice.**

CROWN SPLICE



When you want a rope end to be a little larger in diameter than the rope, and have a finished appearance, the Crown Splice is the answer.

1. Unlay the end of your rope, (sealing the strand ends of synthetic fiber rope will prevent them from unraveling) and lay the right-hand strand across the other two as illustrated.
2. Then tuck the left-hand strand over the first strand, then back over the right-hand strand.
3. Pull all strands snug, then tuck them in sequence over and under the strands in the main body of the rope, as in a short splice. Roll the splice under your foot or with a board, and clip protruding ends, not too close to the rope.

CAUTION: **Do not clip ends too close to the splice.**

EYE SPLICE

The Eye Splice may be made as a loop of any size or it can be made tight around a metal thimble to prevent chafing of the rope fibers.

1. To begin your Eye Splice unlay the strands for a short distance and double back to form a loop of the desired size, with the unlaid strands laying across the twist of the rope.

   Sealing strand ends of synthetic fiber rope will prevent them from unraveling.

   Tuck the center unlaid strand under any one of the strands in the main body of the rope, going against the twist.

2. The next unlaid strand going over the strand under which the center unlaid strand is tucked, and is tucked under the next strand in the rope.

3. Tuck the last unlaid strand under the remaining strand in the rope, making sure the tuck is against the twist.

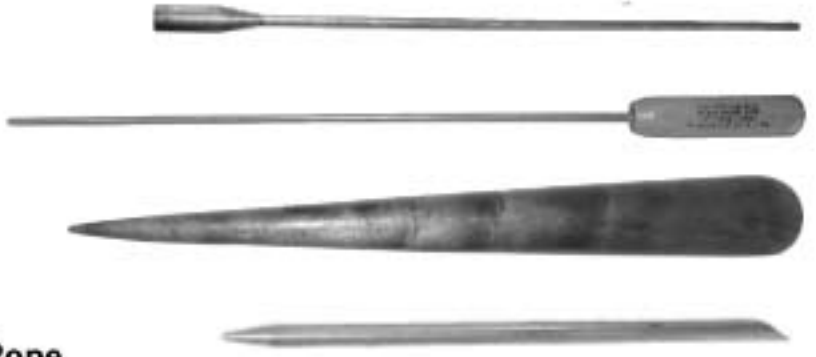
4. Pull each strand snugly up to the main body of the rope then tuck them, in sequence, over and under the strands in the rope. While it is traditional to use 4 tucks, at least 6 tucks are recommended for synthetic fiber ropes.

   Roll the splice under your foot or a board, and trim protruding strand ends, not too closely to rope. Your splice is complete.

Rope Tools

Splicing Fids and Pushers For Braid-on-Braid Rope

Fids Rope Dia. (In.)	Pushers Rope Dia. (In.)
1/4	1/4 thru 1/2
5/16	5/8 thru 3/4
3/8	
1/2	
5/8	
3/4	



Splicing Fids • For Diamond Braid Rope

All that's needed for instant, easy splicing of Diamond Braid ropes is a fid of the proper diameter for the rope.

Rope Dia. (In.)
3/16
1/4
5/16
3/8
1/2
5/8

NOTE: The 5/8 in. fid is also used for splicing 3/4 in.

Rope Measurer

Rope Measurer

Meets National Bureau of Standards H-44 Requirements. Accurately measures cordage, from 5/32 to 3/4 inch diameter, within Weights and Measures tolerances. Digital counter indicates feet and inches up to 99 feet 11 inches and continues. Also subtracts. Rates at 1,000 feet per minute.

Cutting Gun

Electronic Cutting Gun

A handy tool that cuts and seals the ends of synthetic ropes in one fast movement. 120 Volts A.C., 60 cycle, 1.1 amps., 130 watts. 5 foot cord.

Knot & Splicing Instruction Book

A comprehensive 70-page book containing a world of information about rope and its uses. 139 illustrations with easy-to-follow instructions. How to tie knots and hitches. How to splice braided and twisted ropes. How to make things with rope and much more.

Synthetic Slings

Types 1-6, 1 and 2 ply 192
Roundsling 195
Evaluating Wear 196

Washington Chain has on hand a solid inventory of synthetic slings. We will be pleased to have custom fabricated anything we do not carry.

Olympic Synthetic Products

Type 1 Slings 1 PLY

Width	Code Number	Vert. WLL	Basket WLL	Choke WLL	Adj. Ultimate	Ultimate
2	TC-1-902	3,600	7,200	2,700		18,000
3	TC-1-903	5,400	10,800	4,000		27,000
4	TC-1-904	7,200	14,400	5,400		36,000
5	TC-1-905	9,000	18,000	6,700		45,000
6	TC-1-906	10,800	21,600	8,100		54,000
8	STC-1-908	14,400	28,800	10,800		72,000
10	STC-1-910	18,000	36,000	13,500		90,000
12	STC-1-912	21,600	43,200	16,200		108,000

Type 1 Slings 2 PLY

2	STC-2-902	5,400	10,800	4,000	27,000	36,000
3	STC-2-903	8,100	16,200	6,000	40,500	54,000
4	STC-2-904	10,800	21,600	8,100	54,000	72,000
5	STC-2-905	13,500	27,000	10,100	67,500	90,000
6	STC-2-906	16,200	32,400	12,100	81,000	108,000
8	STC-2-908	21,600	43,200	16,200	108,000	144,000
10	STC-2-910	27,000	54,000	20,200	135,000	180,000
12	STC-2-912	32,400	64,800	24,300	162,000	216,000

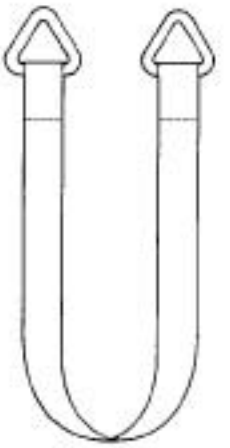
Type 2 Slings 1 PLY

Width	Code Number	Vert. WLL	Basket WLL	Choke WLL	Adj. Ultimate	Ultimate
2	TT-1-902	3,600	7,200			18,000
3	TT-1-903	5,400	10,800			27,000
4	TT-1-904	7,200	14,400			36,000
5	TT-1-905	9,000	18,000			45,000
6	TT-1-906	10,800	21,600			54,000
8	STT-1-908	14,400	28,800			72,000
10	STT-1-910	18,000	36,000			90,000
12	STT-1-912	21,600	43,200			108,000

Type 2 Slings 2 PLY

2	STT-2-902	5,400	10,800		27,000	36,000
3	STT-2-903	8,100	16,200		40,500	54,000
4	STT-2-904	10,800	21,600		54,000	72,000
5	STT-2-905	13,500	27,000		67,500	90,000
6	STT-2-906	16,200	32,400		81,000	108,000
8	STT-2-908	21,600	43,200		108,000	144,000
10	STT-2-910	27,000	54,000		135,000	180,000
12	STT-2-912	32,400	64,800		162,000	216,000

Type 1 Slings
Choker and Basket Hitch
Triangle and Choker Fittings



Type 2 Slings
Basket and vertical
Hitches Only
Two Triangle Fittings

Olympic Synthetic Products

Types 3 and 4 1 PLY

Width	Code Number	Vert. WLL	Basket WLL	Choke WLL	Adj. Ultimate	Ultimate
1	EE-1-901	1,800	3,600	1,300		9,000
2	EE-1-902	3,600	7,200	2,700		18,000
3	EE-1-903	5,400	10,800	4,000		27,000
4	EE-1-904	7,200	14,400	5,400		36,000
5	EE-1-905	9,000	18,000	6,700		45,000
6	EE-1-906	10,800	21,600	8,100		54,000
8	EE-1-908	14,400	28,800	10,800		72,000
10	EE-1-910	18,000	36,000	13,500		90,000
12	EE-1-912	21,600	43,200	16,200		108,000

Types 3 and 4 Slings 2 PLY

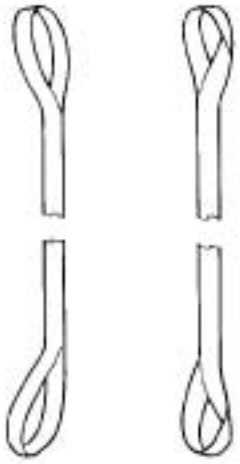
1	EE-2-901	2,700	5,400	2,000	13,500	18,000
2	EE-2-902	5,400	10,800	4,000	27,000	36,000
3	EE-2-903	8,100	16,200	6,000	40,500	54,000
4	EE-2-904	10,800	21,600	8,100	54,000	72,000
5	EE-2-905	13,500	27,000	10,100	67,500	90,000
6	EE-2-906	16,200	32,400	12,100	81,000	108,000
8	EE-2-908	21,600	43,200	16,200	108,000	144,000
10	EE-2-910	27,000	54,000	20,200	135,000	180,000
12	EE-2-912	32,400	64,800	24,300	162,000	216,000

Type 5 Slings 1 PLY

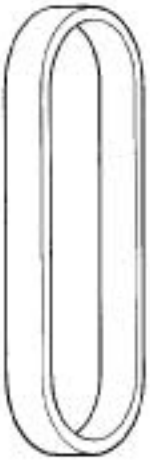
Width	Code Number	Vert. WLL	Basket WLL	Choke WLL	Adj. Ultimate	Ultimate
1	EN-1-901	2,900	5,800	2,200	14,400	18,000
2	EN-1-902	5,800	11,600	4,400	28,800	36,000
3	EN-1-903	8,700	17,400	6,500	43,200	54,000
4	EN-1-904	11,500	23,000	8,600	57,600	72,000
5	EN-1-905	14,400	28,800	10,800	72,000	90,000
6	EN-1-906	17,300	34,600	13,000	86,400	108,000
8	EN-1-908	23,000	46,000	17,300	115,200	144,000
10	EN-1-910	28,800	57,600	21,600	144,000	180,000
12	EN-1-912	34,600	69,200	26,000	172,800	216,000

Type 5 Slings 2 PLY

1	EN-2-901	5,400	10,800	4,000	27,000	36,000
2	EN-2-902	10,800	21,600	8,100	54,000	72,000
3	EN-2-903	16,200	32,400	12,100	81,000	108,000
4	EN-2-904	21,600	43,200	16,200	108,000	144,000
5	EN-2-905	27,000	54,000	20,200	135,000	180,000
6	EN-2-906	32,400	64,800	24,300	162,000	216,000
8	EN-2-908	43,200	86,400	32,400	216,000	288,000
10	EN-2-910	54,000	108,000	40,500	270,000	360,000
12	EN-2-920	64,800	129,600	48,600	324,000	432,000



Types 3 and 4 Slings
Flat or Twisted Eyes
Vertical, Choker, Basket Hitches



Type 5 Slings
Vertical, Choker, Basket Hitches

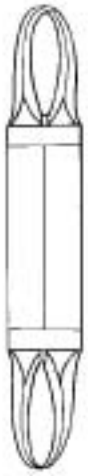
Olympic Synthetic Products

Type 6 Sling 1 PLY

Width	Code Number	Vert. WLL	Basket WLL	Choke WLL	Adj. Ultimate	Ultimate
6	WL-1-906	8,100	16,200	-	40,500	54,000
8	WL-1-908	10,800	21,600	-	54,000	72,000
10	WL-1-910	13,500	27,000	-	67,500	90,000
12	WL-1-912	16,200	32,400	-	81,000	108,000
16	WL-1-916	21,600	43,200	-	108,000	144,000
20	WL-1-920	27,000	54,000	-	135,000	180,000
24	WL-1-924	32,400	64,800	-	162,000	216,000

Type 6 Sling 2 PLY

6	WL-2-906	14,000	28,000		70,200	108,000
8	WL-2-908	18,700	37,400		93,600	144,000
10	WL-2-910	23,400	46,800		117,000	180,000
12	WL-2-912	28,000	56,000		140,400	216,000
16	WL-2-916	37,400	74,800		187,200	288,000
20	WL-2-920	46,800	93,600		234,000	360,000
24	WL-2-924	56,100	112,200		280,800	432,000



Endless or Grommet Type
Type 6 Sling
Wide Lift

SLING LOAD CHART

All Angles Measured from Vertical (1,000 lbs. Load)

EXAMPLE:

This chart illustrates how the stress on a sling increases as the angle increases (all angles measured from the vertical).

When one sling leg lifts 1,000 lbs. at 0 degrees, the sling stress is also 1,000 lbs. If the sling angle is increased to 45 degrees, the stress actually exerted on the sling would be 1,414 lbs., an increase of 41.4%.

Should the sling angle be increased to 60, the stress would be 2,000 lbs., or a 100% increase. At an 85° angle (extremely unlikely) sling stress increases 1,047%. With a load of 1,000 lbs. the sling stress would be 11,473 pounds.

Sling charts show rated capacity in lbs. with a safety factor of 5. For a higher safety factor select the next larger sling. However, it is important that you check in the column showing sling angle that most nearly corresponds with the maximum angle at which you will hoist.

SHOWING SLING STRESSES AT VARIOUS ANGLES

VERTICAL ANGLE	HORIZONTAL ANGLE	EQUIVALENT VERTICAL LOAD ON ONE LEG (LBS.)	INCREASE IN STRESS DUE TO SLING ANGLE	TOTAL SLING STRESS (LBS.)
90°	0°	1,000		
85°	5°	1,000	1047%	11,473
80°	10°	1,000	476%	5,759
75°	15°	1,000	286%	3,863
70°	20°	1,000	192%	2,924
65°	25°	1,000	136%	2,366
60°	30°	1,000	100%	2,000
55°	35°	1,000	74.3%	1,743
50°	40°	1,000	55.5%	1,555
45°	45°	1,000	41.4%	1,414
40°	50°	1,000	30.5%	1,305
35°	55°	1,000	22.0%	1,220
30°	60°	1,000	15.4%	1,154
25°	65°	1,000	10.3%	1,103
20°	70°	1,000	6.4%	1,064
15°	75°	1,000	3.5%	1,035
10°	80°	1,000	1.5%	1,015
5°	85°	1,000	0.3%	1,003
0°	90°	1,000	0%	1,000

HOW TO SELECT A SLING FOR USE AT ANY ANGLE When calculating for selection of proper sling for use at any angle, select vertical angle in chart above, read the 'increase in stress' as a percentage factor. Multiply the actual load weight by this percentage, then add answer to actual load to be hoisted. This gives Rated Capacity to look for in selecting proper size of sling.

Olympic Roundsling Features

The OLYMPIC Roundsling is a major advancement in securing almost any object to be pulled of lifted. It consists of a continuous, or endless, loop of 100% polyester fiber as shown in the cutaway at "A".

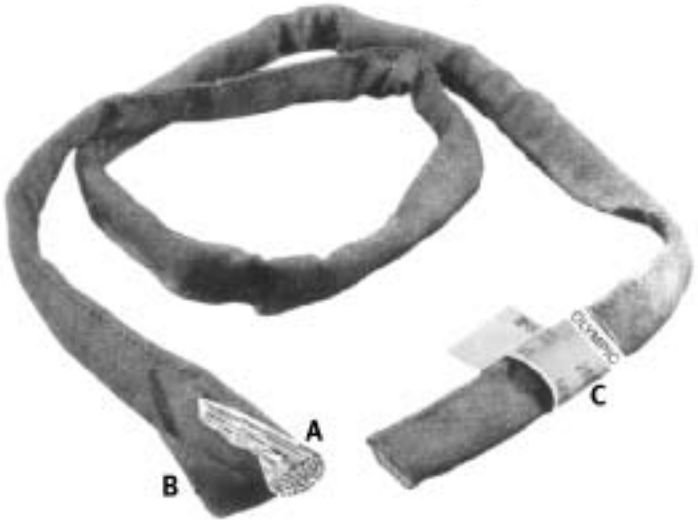
The accumulation of numerous fiber strands determines the strength factor, as the capacity chart below shows.

The multiple fiber construction makes the roundsling soft and flexible — perfect for a choked lift. The sling contours itself around the load.

The bundle of fibers is protected by a double cover of woven polyester fabric, as shown at "B" in cutaway. Because the load bearing fibers never come in contact with the load, there is no wear to them as long as the cover remains intact. In addition, the endless roundsling can be constantly rotated, further extending the wear life of the protective covering and the sling as a whole.

Load drop safety is inherent in the polyester fiber principle. Even if the sling is greatly overstressed, it will not completely break apart at once, it will stretch slowly as the individual fibers start to break, allowing time to put the load down.

Each sling has a tough, branded leather label permanently attached, with load capacities marked, as shown at "C". The ultimate breaking load is minimum of five times the rated capacity.



- Melting point 500° F (260° C)
- Max. working temp. 200° F (100° C)
- Excellent resistance to ultra violet rays, rot and mildew
- Lightweight, easy to handle, store and clean
- No loss of strength in water
- Only 3% elongation
- Protects workers' hands
- Resistant to acids
- Not resistant to heavy concentrations of alkalies
- Non-Sewn edge on cover, solid tube construction.

RATED CAPACITIES

Part No.	Approx Dia.	Color	Vertical	Choke	Vert. Basket	30° Basket	45° Basket
	Inches	Inch	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
OL1	0.60	purple	2,650	2,120	5,300	4,500	3,600
OL2	0.80	green	5,300	4,240	10,600	9,100	7,400
OL3	1.00	yellow	8,400	6,720	16,800	14,500	11,800
OL4	1.20	tan	10,600	8,500	21,200	18,300	15,000
OL5	1.30	red	13,200	10,560	26,400	22,800	18,600
OL6	1.40	orange	16,800	13,440	33,600	27,500	22,500
OL7	1.55	blue	21,200	17,000	42,400	36,700	29,900
OL8	1.75	gray	31,700	25,300	63,400	43,300	35,300
OL9	1.95	brown	52,900	42,300	105,800	53,600	43,800
OL10	2.35	olive	66,100	52,880	132,200	69,200	56,500

Testing: OLYMPIC Roundslings are quality control tested for tensile strength in straight pull and choked; also for elasticity.

Evaluating Worn Synthetic Web Slings

To the cautious sling user, many good and still operable slings have been thrown away because of the appearance of the 'red wear indicator' on the body of the sling; and in other cases, its rejection has been justified.

The first consideration should be to evaluate the nature and cause of the worn section and its severity.

Is the wear due to dragging the sling and rupturing its selvedged edge?

This is a common situation on production type small boat lifting or other similar operations where the sling is repeatedly dragged over a black top or rough concrete surface.

Selvedged edge wear is progressive and should be shown immediate attention. A piece of thin Cordura webbing can be sewn around the fraying edge bringing the sling back to 100% efficiency. If ignored, the fray will progressively travel into the body of the sling leaving only the tensile strength of the 'gut' members to carry the load. It will also create an unbalanced condition when lifting; throwing most of the load on that portion of the sling that is not frayed. If the frayed part has progressed over 1/4 of the slings width, we would consider this sling unrepairable and it should not be used.

Has the sling been physically cut or sliced by a sharp object?

The usual cause is carelessness; i.e., run over by trucks or forklifts, dropping metal plate or other heavy objects on the sling, etc...

Bear in mind that most sling type webbing carry about 80% of their ultimate tensile strength in the longitudinal gut members and about 20% in the 'pick threads or warp' (the threads that travel across the width of the webbing holding the 'gut' tensile members in a flat plane). If the cut or slice is shallow and does not involve the gut members, the sling is worth repairing. Punctures can be repaired.

Sharp corner abrasion or scrape condition.

This condition is usually created by lifting a 'sharp' corner or angular load with slings whose tensile strength is too low and/or sufficient dunnage has not been used between the sling body and sharp corner. We are referring to loads such a pallets, boxes, lumber and any load other than a round or radii configuration.

Another cause is 'jerking' or lifting a load too fast. Other than its strength, synthetic webbing's greatest attribute is its shock absorbing stretch ability. If an angular load is lifted too fast, this load under a loaded condition around a sharp corner may momentarily work up a 'friction temperature' great enough to fuse the webbing surface and partially destroy the original tensile strength of the webbing.

Usually, this type of abrasion takes place across the full width of the sling and we do not recommend repair.

Environmental deterioration

Cargo Securing

Container Securing & Handling Equipment 198

Cloverleaf Deck Sockets 199

Bulb Hooks 199

Push-Pull Ratchets 200

Acme Thread Ratchet Turnbuckle 201

Heavy Duty Forged Ratchets 202

Decklashing Material 204

Washington Chain is a leading supplier of deck-lashing materials in the Northwest United States, stocking a large supply of chain and hardware to meet your needs on short notice.

Container Securing and Handling Equipment

D-Ring & Straps
Sizes to 100,000 pounds

Container Corner Fittings
(ISO Type)

Twist-Lock Stacking Cone

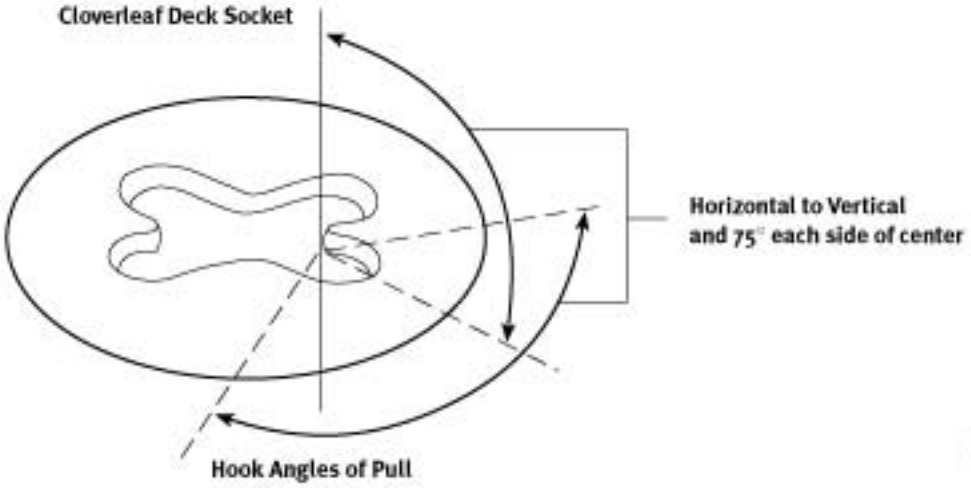
Van Lugs

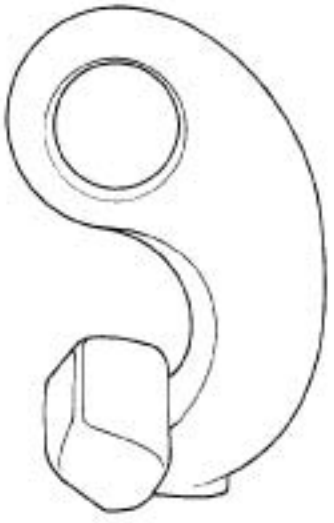
Emergency Van Lifting Lug

Flush Cloverleaf Deck Socket

Specifications	1/2 inch	3/4 inch
Weight	21 lb.	42.8 lb.
Minimum Breaking Strength	32,000 Lb.	64,000 Lb.
Dia. Of Socket	9-3/4" Dia.	12-1/2" Dia.
Top Rate Thickness	1/2 in.	3/4 in.
Finish	Galvanize or Self Colored	

Bulb Hook





Specifications	1/2 inch	3/4 inch
Minimum Breaking Strength	30,000 lb.	62,000 lb.
Weight	3.1 lb.	5.45 lb.
Finish	Cad. Plated or Galvanized	

Deck-Lashing Material

Push-Pull Ratchets

If ratchets do not meet your needs, here's how you can tailor a ratchet for your own application.

Beginning with the plain threaded barrel, choose the diameter to provide the strength you need and the length for the takeup you require.

Next, decide which of the five handles shown applies best. Then select by name the two end fittings from the eleven types shown.

Select the amount of work load in pounds or tons you anticipate and the number of ratchets needed. We will send you a quotation prompty.

Handles

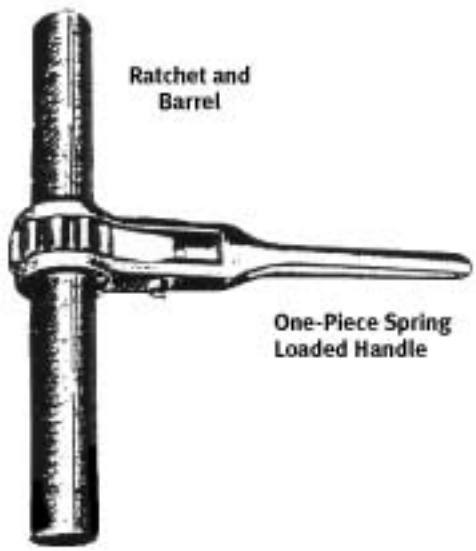
Shackle Type Pelican Hook Assembly

Angle-shank Pelican Hook Assembly

Jaw

Jaw with Locknut

Welded Link Pelican Hook Assembly



Ratchet and Barrel

One-Piece Spring Loaded Handle

Welded Link and Hook

End Fittings

Three-Piece Handle

All-Steel Handle

Hand Wheel

Vise Type

Swivel or Threaded Shank Hook

Eye and Shackle

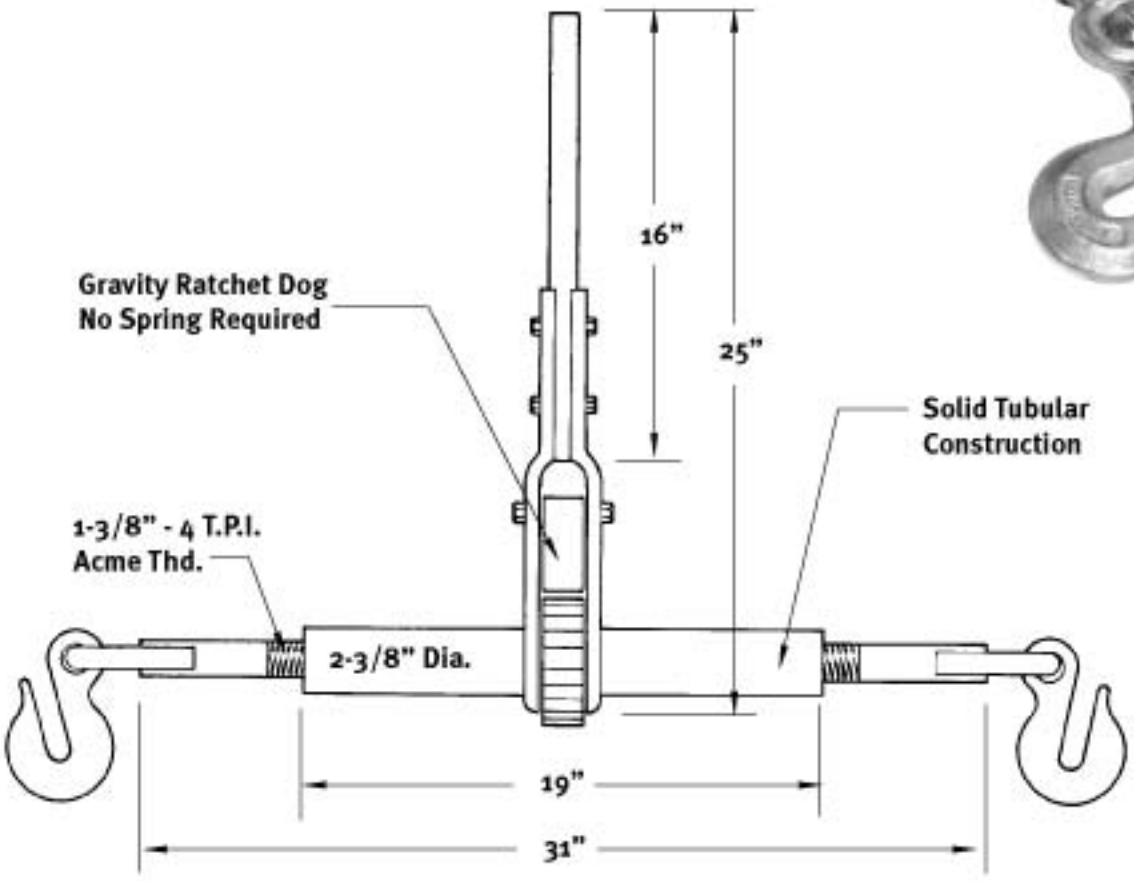
Eye and Link

Eye

Stub

Acme Thread Ratchet Turnbuckle

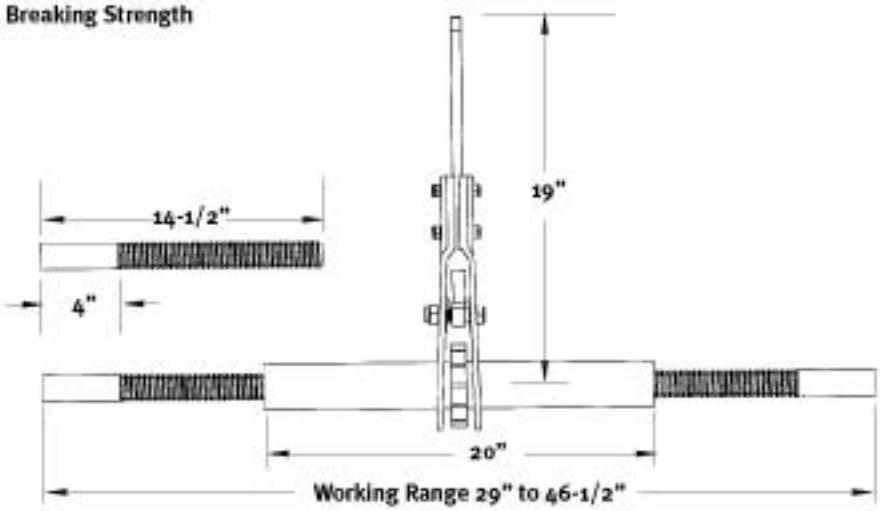
Standard Ratchet is designed for loose fit and easy operation requiring no lubricating fitting and has a minimum of moving parts.



WLL 18,000 lbs.

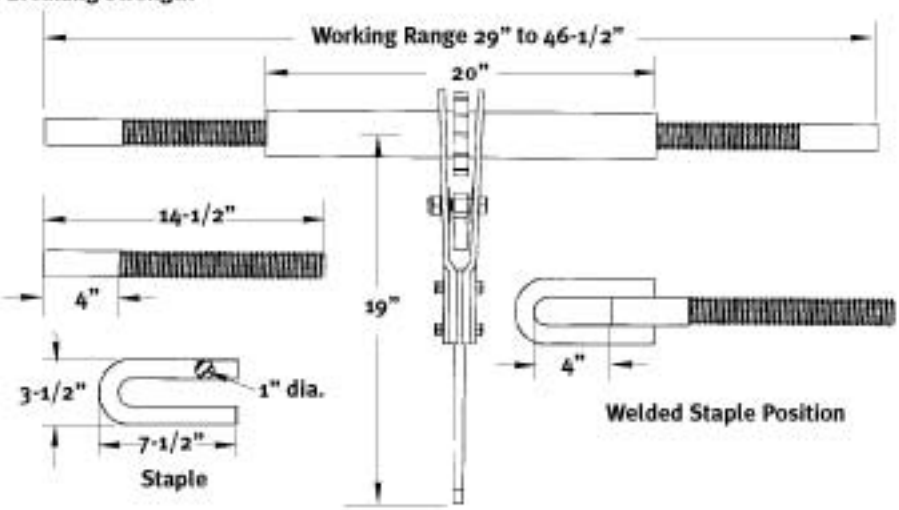
1-3/8” Forged Ratchet with Stub Ends

90,000 lb. Minimum Breaking Strength



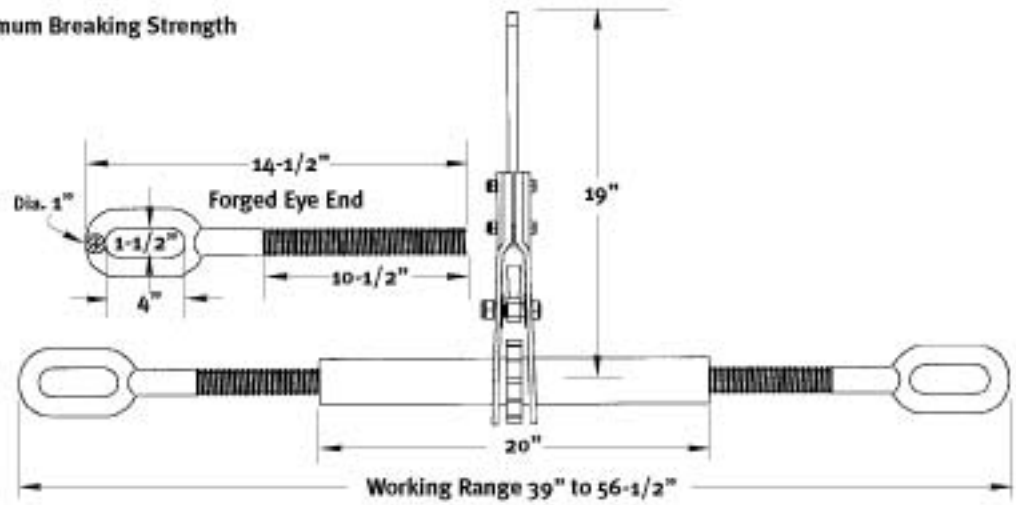
1-3/8” Forged Ratchet with Welded Staple Option

90,000 lb. Minimum Breaking Strength



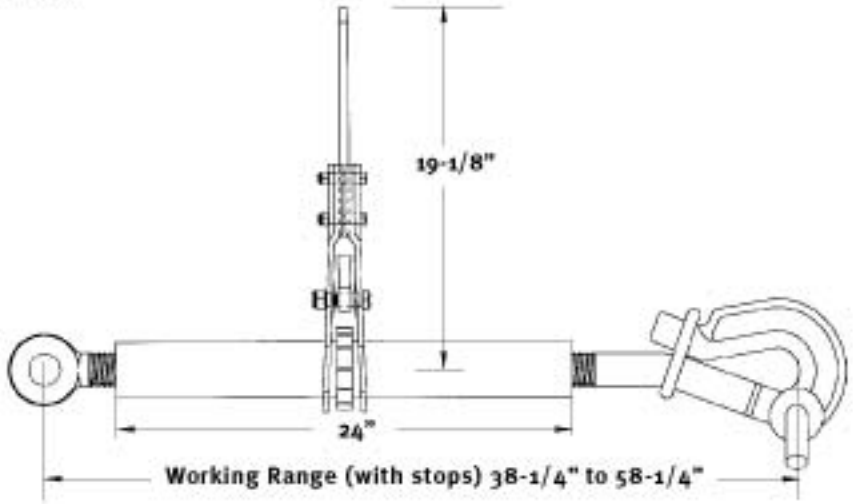
1-3/8” Forged Eye/Eye Ratchet

90,000 lb. Minimum Breaking Strength



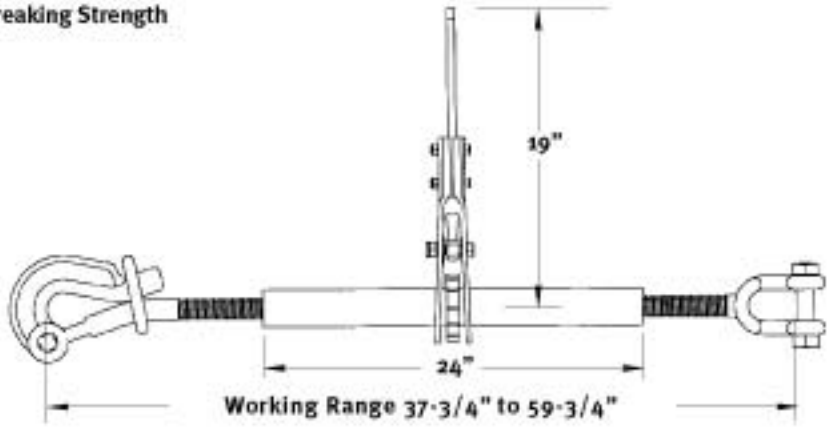
1-3/4"x 24" Forged Stationary Ratchet

126,000 lb. Minimum Breaking Strength



1-3/8"x 24" Forged Stationary Ratchet

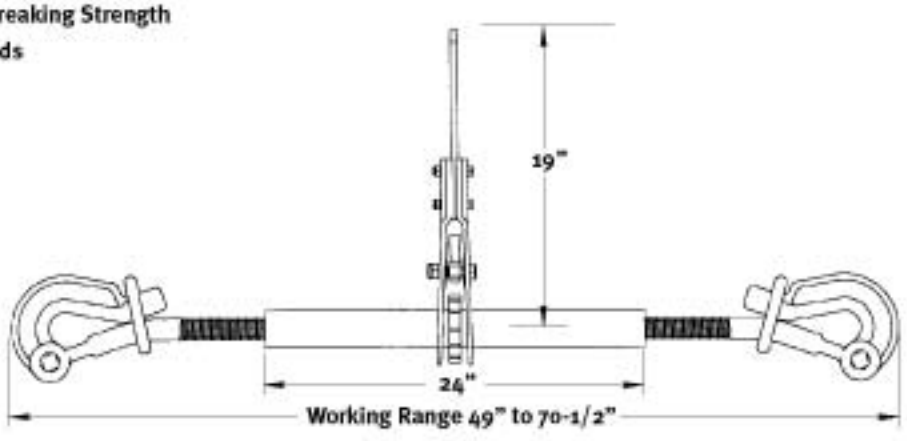
90,000 lb. Minimum Breaking Strength



1-3/8"x 24" Forged River Ratchet

90,000 lb. Minimum Breaking Strength

Pelican Hooks both ends



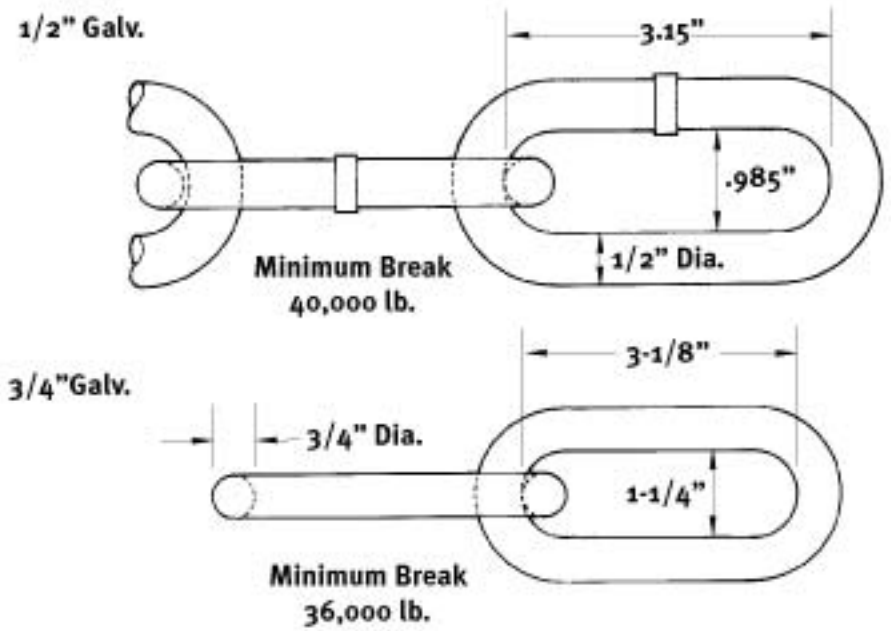
Other sizes and configurations are available.

Deck-Lashing Material

Grab Link	
Chain	**Long link, Open Link** **All Types & Sizes**
End Connections	**All Sizes**
Shackles	**All Types & Sizes (Galv. & Self-Colored)**
Turnbuckles	**All Sizes & Types**

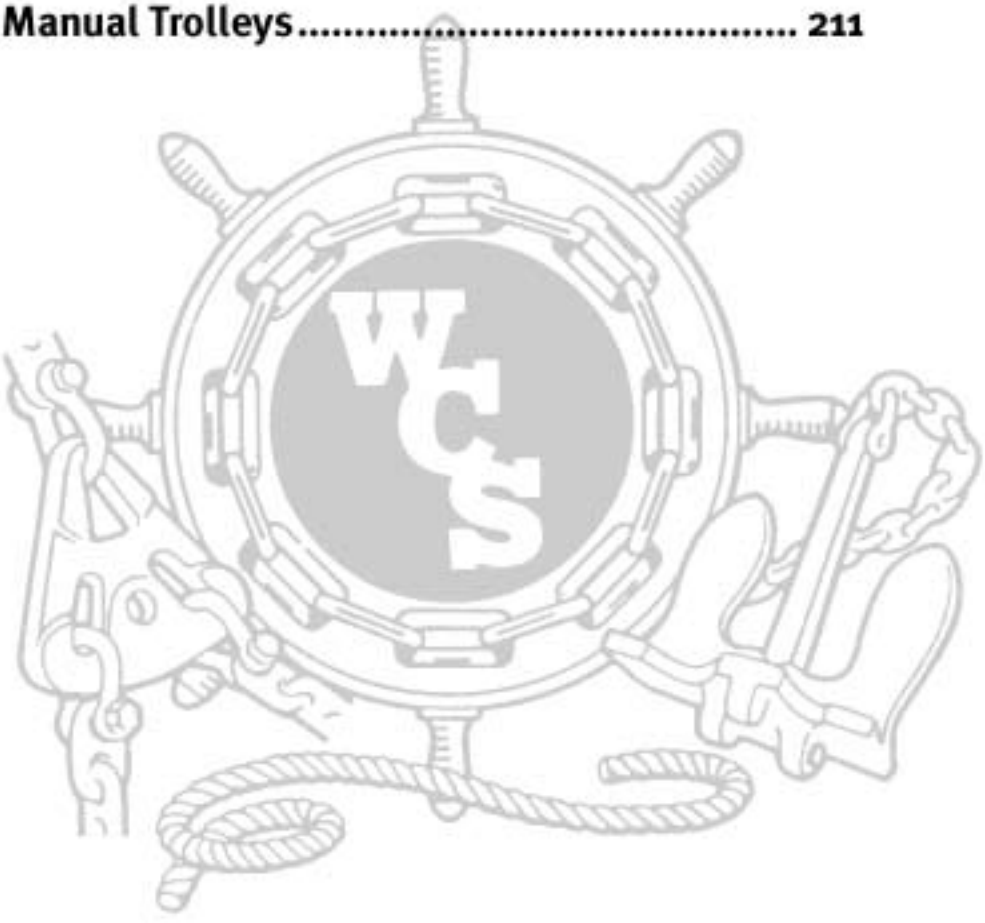
Decklashing Turnbuckle with Pelican Hook & Pear Shaped Link

Long Link Decklashing Chain



Chain Hoists

Jet L-90 206
Chain Pullers 207
Cable Pullers 210
Beam Clamps 210
Manual Trolleys 211



Chain Hoists

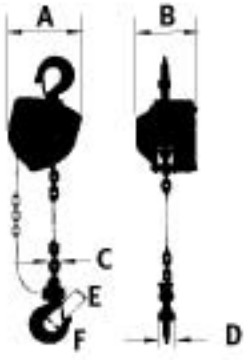
Jet L-90 Chain Hoists

- Lightweight steel construction
- Less distance between hooks makes it ideal for hoisting in close quarters and low ceiling applications
- Housing, sheaves and frame are all steel
- A rolled edge on the hand wheel cover acts as a chain guide and allows smooth operation even when pulling the hand chain at an angle
- Handwheel cover prevents dirt and dust from hampering operation
- Electrostatic powder painted before assembly to protect against rust and corrosion
- Gear case has four reinforced ribs and four knock pins
- Gears are chrome molybdenum steel
- Equipped with anchor plate to avoid over lifting/lowering
- Positive ratchet, screw and disc brake are completely enclosed to protect the brake mechanism
- Non-asbestos brake discs made of low-abrasion Aramid fiber
- Chain is heat treated, low-wear hoisting chain, surpassing ISO T-class
- Top and bottom safety hooks are standard.
- Heat treated, carbon steel, drop-forged hooks are designed to bend slowly to warn of overloads
- Meets OSHA and ANSI B30.16 standards
- Tested and certified to 125% of rated capacity

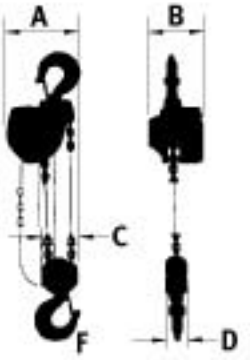
CAUTION: Be sure that supporting structures and load-attaching devices used in conjunction with this hoist provide and adequate safety factor to handle the rated load plus the weight of the equipment. If in doubt, consult a qualified structural engineer. This equipment is not to be used for lifting, supporting or transporting people, or lifting or supporting loads over people.

IMPORTANT: Before installation, see maintenance and operations manual for additional warnings and precautions. Not for use in explosive environment.

NOTE: Custom lifts are available in any length desire. However, custom lift hosts are not returnable.

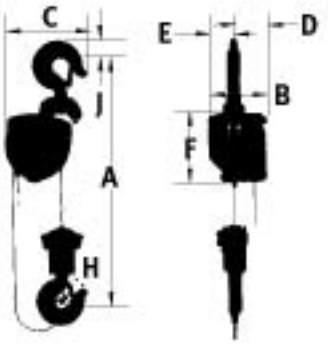


1/2T, 1T, 1-1/2T, 2T



3T, 5T

10T



15T-60T

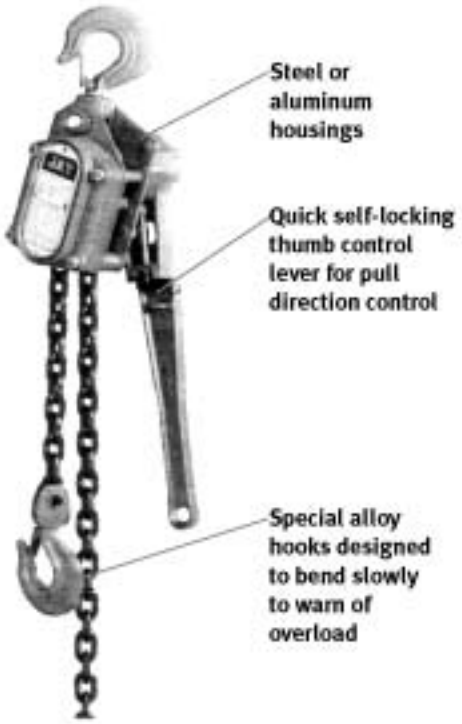
Tonnage Model	Dimensions (in inches)							
	A	B	C	D	E	F	H	J
1/2	5-1/2	6-1/8	2-9/32	1-1/4	1	1-7/16	-	-
1	6-1/4	6-1/4	2-7/16	1-3/8	1-3/16	1-11/16	-	-
1-1/2	7-1/4	6-5/8	2-9/16	1-7/16	1-3/8	1-7/8	-	-
2	8-1/2	7-3/16	2-5/8	1-5/8	1-1/2	2-3/32	-	-
3	9	6-5/8	4-3/8	2-1/2	1-3/4	2-3/8	-	-
5	11-1/8	7-1/2	6-1/2	3-3/32	2-3/32	2-3/4	-	-
10	15-1/8	7-1/2	11-13/16	3-7/8	2-3/4	3-3/8	-	-
15	41-1/2	8-1/2	21-5/8	4-3/8	4-1/8	8-11/16	3-1/8	3-1/2
20	47-1/4	15	29-1/8	7-1/2	7-1/2	8-11/16	3-3/4	4
25	53-1/8	17-3/4	31-1/2	8-7/8	8-7/8	8-11/16	3-3/4	4-1/2
30	65-3/8	20	32-1/4	10	10	8-11/16	4-5/16	5-3/8
50	80-3/4	27-1/2	35-7/16	13-3/4	13-3/4	8-11/16	5-1/8	6
60	90-1/2	29-1/2	45-1/4	14-3/4	14-3/4	8-11/16	6	7

Jet Pullers

- Size and weight of pullers allow easy handling and operation
- Choice of steel or aluminum alloy housings
- Simple design makes routine inspection or maintenance fast and easy
- Direction of pull controlled with one flip of the self locking thumb lever
- High tensile steel plate housing
- Key parts are magnafluxed and inspected before assembly
- Needle bearings provide smooth operation and long life
- Braking mechanism has increased gear ratio to reduce pressure force between 26.4% and 52.5% providing increased safety and reliability of brake
- Low-wear chain is strong and smooth finished to prevent snagging or jamming
- Gauge included to check for chain elongation and hook opening
- Drop-forged hooks are designed to bend slowly to warn of overloads
- Top and bottom safety hooks are standard
- Meets OSHA and ANSI-ASME HST-3M standards
- Each unit is tested and certified to 125% of rated capacity

CAUTION: Be sure supporting structures and load-attaching devices used in conjunction with this puller provide an adequate safety factor to handle the rated load plus the weight of the equipment. If in doubt, consult a qualified structural engineer. This equipment is not to be used for lifting, supporting or transporting people, or lifting or supporting loads over people.

IMPORTANT: Before installation, see maintenance and operations manual for additional warning and precautions. Not for use in explosive environment.



1-1/2T SLN

Model	Body Type	No. of Falls	Rated Cap'y (Tons)	Min. Dist Between Hooks (In.)	Stand. Lift (Ft.)	Lbs. Pull to Lift Lift Cap'y	Lever Length (In.)	Net Lbs.
3/4 Ton-SLN	Steel	1	3/4	12-5/16	5	51	10-1/4	17
3/4 Ton-SLN	Steel	1	3/4	12-5/16	15	51	10-1/4	20
3/4 Ton-ALN	Aluminum	1	3/4	12-5/16	5	51	10-1/4	14
1-1/2 Ton-SLN	Steel	1	1-1/2	15	5	55	16-1/8	29
1-1/2 Ton-SLN	Steel	1	1-1/2	15	15	66	16-1/8	39
1-1/2 Ton-ALN	Aluminum	1	1-1/2	15	5	55	16-1/8	25
3 Ton-SLN	Steel	1	3	18-7/8	5	83	20-5/64	51
3 Ton-SLN	Steel	1	3	18-7/8	15	83	20-5/64	62
3 Ton-ALN	Aluminum	1	3	18-7/8	5	83	20-5/64	44

NOTE: Custom lifts are available in any length desired. However, custom lift pullers are not returnable.

Jet JP Series Pullers

- Size and weight of pullers allow easy handling and operation
- Main frame made of high tensile strength steel
- Simple design makes routine inspection or maintenance fast and easy
- Direction of pull controlled with one flip of the self-locking thumb lever
- Key parts are magnafluxed and inspected before assembly
- Needle bearings provide smooth operation and long life
- Braking mechanism has increased gear ratio to reduce pressure force between 26.4% and 52.5% providing increased safety and reliability of brake
- Grade 100, high strength, low-wear chain is abrasion resistant to prevent snagging or jamming
- Non-asbestos brake discs made of low-abrasion Aramid fiber
- Gauge included to check for chain elongation and hook opening
- Drop-forged hooks are designed to bend slowly to warn of overloads
- Top and bottom safety hooks are standard
- Meets OSHA and ANSI-ASME HST-3M standards
- Each unit is tested and certified to 125% of rated capacity

CAUTION: Be sure supporting structures and load-attaching devices used in conjunction with this puller provide an adequate safety factor to handle the rated load plus the weight of the equipment. If in doubt, consult a qualified structural engineer. This equipment is not to be used for lifting, supporting or transporting people, or lifting or supporting loads over people.

IMPORTANT: Before installation, see maintenance and operations manual for additional warning and precautions. Not for use in explosive environment.

Model	Body Type	No. of Falls	Rated Cap'y (Tons)	Min. Dist Between Hooks (In.)	Stand. Lift (Ft.)	Lbs. Pull To Lift Lift Cap'y	Lever Length (In.)	Net Lbs.
JP-75-5	Steel	1	3/4	12-3/8	5	66	10-1/2	16
JP-75-15	Steel	1	3/4	12-3/8	15	66	10-1/2	16
JP-150-5	Steel	1	1-1/2	14-15/16	5	66	16-1/16	25
JP-150-15	Steel	1	1-1/2	14-15/16	15	66	16-1/16	25
JP-300-5	Steel	1	3	18-7/8	5	84	16-1/16	41
JP-300-15	Steel	1	3	18-7/8	15	84	16-1/16	41
JP-600-5	Steel	2	6	23-7/8	5	84	16-1/16	66

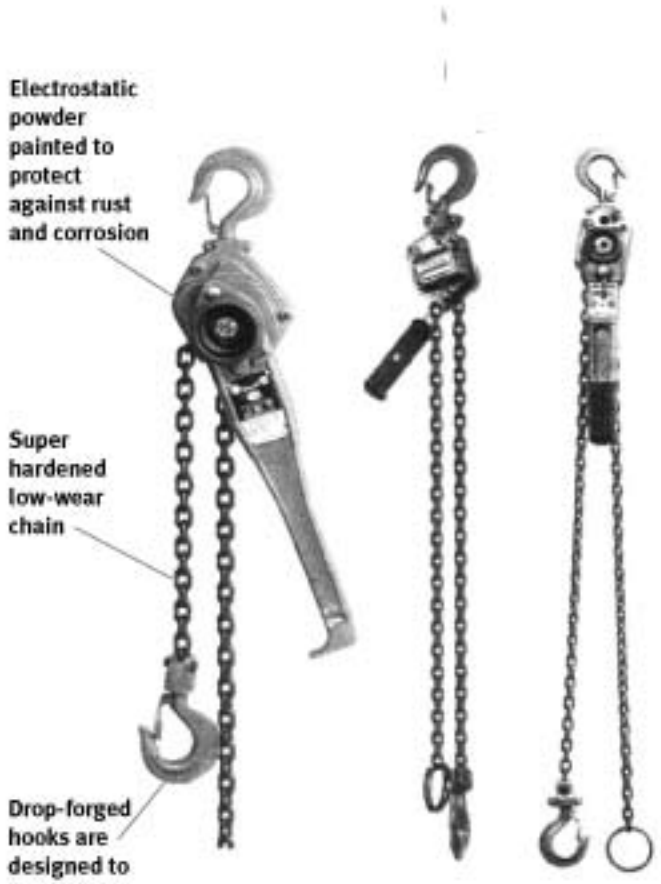
NOTE: Custom lifts are available in any length desired. However, custom lift pullers are not returnable.

Jet Mini-Mite Pullers

- Lightweight and rigid design
- Super Hardened chain
- Electrostatic powder painted before assembly to protect against rust and corrosion
- Reinforced gear cover protects pivotal gear block
- Extra strong handle
- Non-asbestos brake discs made of low-abrasion Aramid fiber
- Double action ratchet works even without a load
- Top and bottom safety hooks are drop-forged and designed to bend slowly to warn of overloads
- Meets OSHA and ANSI-ASME HST-3M standards
- Each unit is tested and certified to 125% of rated capacity

CAUTION: Be sure supporting structures and load-attaching devices used in conjunction with this puller provide an adequate safety factor to handle the rated load plus the weight of the equipment. If in doubt, consult a qualified structural engineer. This equipment is not to be used for lifting, supporting or transporting people, or lifting or supporting loads over people.

IMPORTANT: Before installation, see maintenance and operations manual for additional warning and precautions. Not for use in explosive environment.



Model	Body Type	No. of Falls	Rated Cap'y (Tons)	Min. Dist Between Hooks (In.)	Stand. Lift (Ft.-In.)	Lbs. Pull To Lift Lift Cap'y	Lever Length (In.)	Net Lbs.
MM-25	Steel	1	1/4	9-1/4	3-3	61	6-3/32	4-1/2
MM-50	Steel	1	1/2	10-1/4	5	75	11-3/16	8
MM-75	Steel	1	3/4	9-3/4	5	48-1/2	10-5/64	13-1/2
MM-751	Steel	1	3/4	9-3/4	10	48-1/2	10-5/64	17
MM-752	Steel	1	3/4	9-3/4	20	48-1/2	10-5/64	23
MM-150	Steel	1	1-1/2	13	5	51	17-5/16	23-1/2
MM-151	Steel	1	1-1/2	13	10	51	17-5/16	28
MM-155	Steel	1	1-1/2	13	15	51	17-5/16	33-1/2
MM-152	Steel	1	1-1/2	16-3/4	20	51	17-5/16	35-1/2
MM-300	Steel	1	3	16-3/4	5	75	17-5/16	46
MM-310	Steel	1	3	16-3/4	10	75	17-5/16	53
MM-355	Steel	1	3	16-3/4	15	75	17-5/16	56
MM-320	Steel	1	3	16-3/4	20	75	17-5/16	67-1/2
MM-600	Steel	2	6	24-1/2	5	79	17-5/16	82
MM-620	Steel	2	6	24-1/2	20	79	17-5/16	121

NOTE: Custom lifts are available in any length desired. However, custom lift pullers are not returnable.

Jet Pullers

Jet Cable Pullers

- All steel construction
- Two laminated ratchet wheels for added strength and security
- Concealed spring-lever control to prevent accidental release
- Lightweight with sure grip handle
- Safety latches are standard on both hooks
- Two ratchets ensure positive stops
- Snatch block included with JCP-2

Model	Max. Lift (Ft.)	Cap'y	Wire Rope Dia. (In.)	Net Lbs.
JCP-1	12	1 Ton	3/16	7
JCP-2	5	2 Ton	3/16	8

Note: Not for use in explosive environment.

Jet Grip Pullers

- May be used in any position to lift, pull, lower or stretch heavy loads
- Operated manually by engaging clutch and working the handle
- Uses standard ASA wire rope
- 66 feet of wire rope comes standard
- Longer length wire rope may be used with pulley blocks
- Shear pins in the handle will break under severe overload. Extra pins are provided and are easily installed.
- Safety latches are standard.

Model	Pulling Cap'y (Lbs.)	Lifting Cap'y (Lbs.)	Dimensions				Wire Rope Dia. (In.)	Net Lbs.
			Handle Length (In.)	Length	Height	Width		
JG-75	2,750	1,650	29-1/2	18-3/16"	7-5/8"	4-3/8"	5/16	22
JG-150	5,500	3,300	41	23-5/8"	9-3/8"	5-5/8"	7/16	48
JG-300	11,000	6,600	46-1/2	27-3/4"	9"	6"	5/8	72

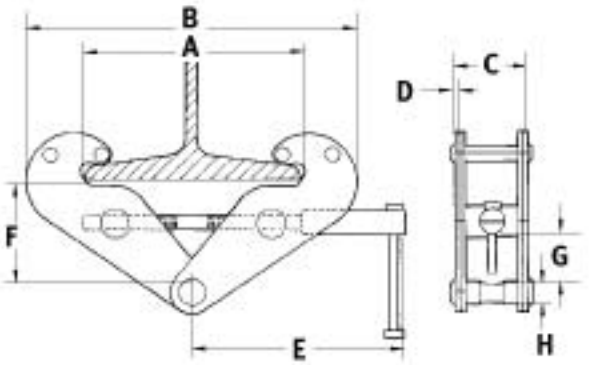
Note: Not for use in explosive environment.

Jet Beam Clamps

- Clamp jaw is designed to reduce flange stress by distributing load away from I-beam flange edge
- Can be mounted easily with threaded handle
- Fits a wide range of flange widths and beams
- Suspension bar provides lower headroom

Model	Rated Load Lbs.	Flange Width (In.)	Net Lbs.
JBC-1	2,000	2.95 – 8.66	11
JBC-2	4,000	2.95 – 8.66	12
JBC-3	6,000	3.94 – 9.84	26
JBC-5	10,000	4.92 – 10.63	34

Note: Not for use in explosive environment.

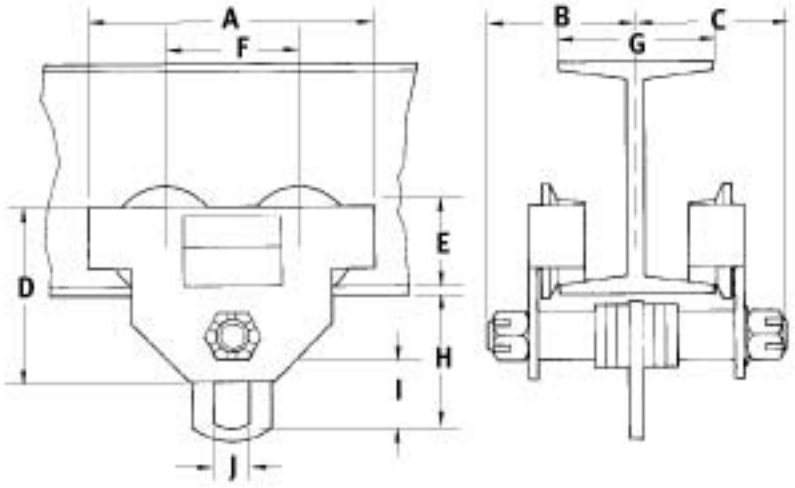


Model	Dimensions (In.)									
	Max. A	Min. B	Max. B	C	D	E	Max. F	Min. F	Min. G	H
JBC-1	9.65	7.48	14.17	2.76	0.20	8.46	5.31	3.07	1.10	.80
JBC-2	9.65	7.48	14.17	2.91	0.28	8.46	5.31	3.07	1.10	.80
JBC-3	11.22	9.84	17.52	4.65	0.31	10.24	6.30	4.33	2.17	.87
JBC-5	12.60	10.43	19.09	5.51	0.39	10.63	6.50	4.92	2.05	1.10

Jet Manual Adjustable Trolleys

Type MBT-Ball Bearing

- MBT series feature double sealed ball bearings
- Use on straight or curved track
- Can be installed on removed at any point along the track
- Adjustable to fit various size wide flange and I-Beams
- Built-in bumper guards
- Can be used with H and I-Beams



MBT Type Trolleys

Capacity (Tons)	Beam Flange Width (In.)		Min. Radius Curve (In.)	Net Lbs.
1/2	3	5-1/2	36	16
1	3-1/4	5-1/2	40	26
1-1/2	4	5-1/2	40	33
2	4	6	43	46
3	4	6	56	79
5	5	6-7/8	64	117
10	6	6-7/8	79	207

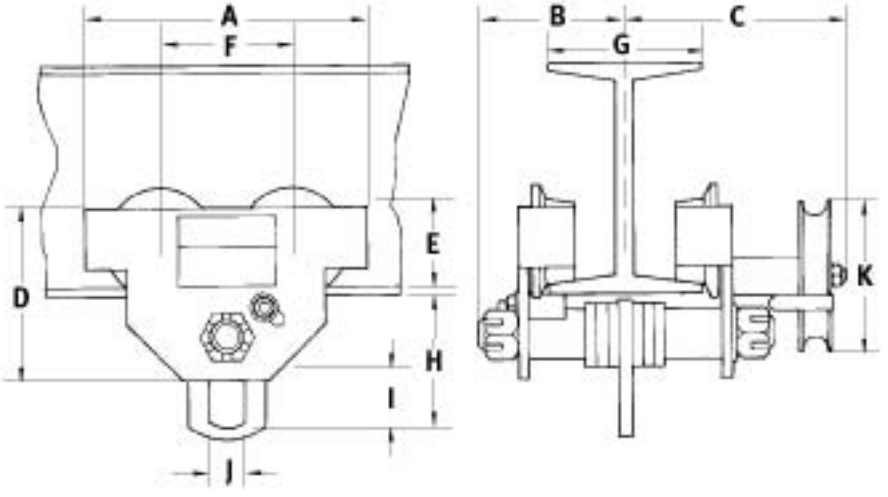
Capacity (Tons)	Dimensions (In.) A	B	C	D	E	F	G		H	I
1/2	8-3/8	4-7/8	4-7/8	5-1/8	2-1/4	4	3	5-1/2	4	1-1/2
1	9-15/16	5-1/4	5-1/4	6-1/8	3	4-5/8	3-1/4	5-1/2	4-1/2	2
1-1/2	10-15/16	5-3/8	5-3/8	6-3/8	3-3/8	4-7/8	4	5-1/2	5-1/8	2-1/8
2	11-7/8	5-7/8	5-7/8	6-11/16	3-1/2	5-3/8	4	6	5-1/4	2-3/8
3	13-5/8	6-1/4	6-1/4	8-1/2	4-1/2	6-3/16	4	6	6-1/2	3
5	15-1/16	7-1/4	7-1/4	10	4-13/16	6-3/4	5	6-7/8	7-7/8	3-3/4
10	17-15/16	7-15/16	7-15/16	11-5/8	6	7-7/8	6	6-7/8	10-1/8	4-3/4

NOTE: Not for use in explosive environment.

Jet Manual Adjustable Trolleys

Type GBT-Geared with Ball Bearings

- Geared drive wheels with ball bearings
- Use on straight or curved track
- Can be installed or removed at any point along the track
- Adjustable to fit various size wide flange and I-Beams
- Extra lifts available
- Built-in bumper guards
- Manufactured for use with wide flange and I-Beams



GBT Type Trolleys

Capacity (Tons)	Chain Length (Ft.)	Beam Flange Width (In.)	Chain Required To Move 1 Ft. (Ft.)	Min. Radius Curve (In.)	Net Lbs.
1/2	8	3-1/4 5-1/2	7	36	22
1	10	4 5-1/2	9	40	39
2	10	4 6	10	43	57
3	10	4 6	11	56	90
5	10	5 6-7/8	12	64	121
10	10	6 6-7/8	15	79	210

Capacity (Tons)	Dimensions (In.) A	B	C	D	E	F	G		H	I	J	K
1/2	8-3/8	4-7/8	8-1/8	5-1/8	2-1/4	4	3	5-1/2	4	1-1/2	15/16	5-1/4
1	9-15/16	5-1/4	8-1/4	6-1/8	3	4-5/8	3-1/4	5-1/2	4-1/2	2	1-3/16	5-1/4
2	11-7/8	5-7/8	8-1/2	6-11/16	3-1/2	5-3/8	4	6	5-1/4	2-3/8	1-7/16	5-1/4
3	13-5/8	6-1/4	9-11/16	8-1/2	4-1/2	6-3/16	4	6	6-1/2	3	1-3/4	8-1/4
5	15-1/16	7-1/4	10-11/16	10	4-13/16	6-3/4	5	6-7/8	7-7/8	3-3/4	2-3/8	8-1/4
10	17-15/16	7-15/16	11-7/8	11-5/8	6	7-7/8	6	6-7/8	10-1/8	4-3/4	3-1/4	8-1/4

NOTE: Not for use in explosive environment.

Notes

Notes

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General Cautions and Warnings

All products contained herein are sold with the express understanding that the purchaser is thoroughly familiar with the safe and proper use and application of the product.

Responsibility for use and application of the product rests with the user.

Failure of the product can occur due to misapplication, abuse, or improper maintenance. Product failure could allow the load to become out of control, resulting in possible property damage, personal injury or death.

There are numerous government and industry standards that cover these products. The catalog makes no attempt to reference all of them. We do reference the standards that are most frequently asked about.

Ratings shown are applicable to only new or "in as new" condition products.

Load Limit ratings indicate the greatest force or load a product can carry under usual environmental conditions. Shock loading and extraordinary conditions must be taken into account when selecting products for use in a system.

In general, the products displayed in WCS literature are used as parts of a system being employed to accomplish a task. Therefore, we can only recommend within the Working Load Limits, or other stated limitations, the use of products for this purpose.

The Working Load Limit, or Design Factor, or Efficiency Rating of each product may be affected by wear, misuse, overloading, corrosion, deformation, intentional alteration, and other use conditions. Regular inspection must be conducted to determine whether use can be continued at the catalog assigned WLL, a reduced WLL, or whether the product must be withdrawn from service.

Most products generally are intended for tension or pull. Side loading must be avoided, as it exerts additional force or loading which the product is not designed to accommodate.

Welding load support parts or products can be hazardous. Knowledge of materials, heat treatment, and welding procedures are necessary for proper welding.

The assigned Ultimate Load Rating for the reeving of wire, manila, or synthetic rope is based upon design; the catalog ultimate strength for the rope parts, when totaled, may exceed the assigned Ultimate Load Rating.

The Working Load Limit of a sling must not exceed the lowest Working Load Limit of the components in the system.

The recommended Proof Load on all items in this catalog is two times the Working Load Limit unless otherwise shown.

All products are to be considered as sparking unless otherwise noted.