



## IMPORTANT WARNINGS

**READ ALL WARNINGS BEFORE USING THIS PUBLICATION**  
Failure to follow warnings and instructions may result in serious injury or death.

### Working Load Limit

This is the term used throughout the catalog. There are, however, other terms used in the industry which are interchangeable with the term Working Load Limit. These are: WLL, SWL, Safe Working Load, Rated Load Value, Resulting Safe Working Load, and Rated Capacity.

**Never** exceed the Working Load Limit.

The Working Load Limit is the maximum load which should ever be applied to a product, even when the product is new and when the load is uniformly applied - straight line pull only. **Avoid side loading.** All catalog ratings are based upon usual environmental conditions, and consideration must be given to unusual conditions such as extreme high or low temperatures, chemical solutions or vapors, prolonged immersion in salt water, etc. Such conditions or high-risk applications may necessitate reducing the Working Load Limit.

**Working Load Limit will not apply if product has been welded or otherwise modified.**

### Matching of Components

Components must match. Make certain that components such as hooks, links or shackles, etc. used with wire rope (or chain or cordage) are of suitable material size and strength to provide adequate safety protection. Attachments must be properly installed and must have a Working Load Limit at least equal to the product with which they are used. Remember: Any chain is only as strong as its weakest link.

### Raised Loads

#### Keep out from under a raised load.

Take notice of the recommendation from the Safety Council Accident Prevention Manual concerning all lifting operations:

"All employees working at cranes or hoists or assisting in hooking or arranging a load should be instructed to **keep out from under the load.** From a safety standpoint, one factor is paramount:

Conduct all lifting operations in such a manner, that if there were an equipment failure, no personnel would be injured. This means **keep out from under a raised load and keep out of the line of force of any load.**"

#### Do not operate a load over people. Do not ride on loads.

### Shock Loads

Avoid impacting, jerking or swinging of load as the Working Load Limit could be exceeded and the Working Load Limit will not apply. A shock load is generally significantly greater than the static load. **Avoid shock loads.**



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## Regular Inspections


Inspect products regularly for visible damage, cracks, wear, elongation, rust, etc. **Protect all products from corrosion.** The need for periodic inspections cannot be overemphasized. **No product can keep operating at its rated capacity indefinitely.** Periodic inspections help determine when to replace a product and reduce rigging hazards. **Keep inspection records** to help pinpoint problems and to ensure periodic inspection intervals.

Due to the diversity of the products involved and uses to which they can be put, it would be counterproductive to make blanket recommendations for inspection procedures and frequency. Best results will be achieved when qualified personnel base their decisions on information from rigging and engineering manuals and on experience from actual use in the field. **Refer to sources listed in T.O.C. > ADDITIONAL REFERENCE MATERIAL > TECHNICAL SAFETY AND INFORMATION SOURCES for technical literature.**

**Frequency of inspection** will depend on environmental conditions, application, storage of product prior to use, frequency of use, etc. **When in doubt, inspect products prior to each use.** Carefully check each item for wear, deformation, cracks or elongation - a sure sign of imminent failure. Immediately withdraw such items from service.

**Rust damage is another potential hazard.** When in doubt about the extent of corrosion or other damage, withdraw the items from service.

**Destroy, rather than discard, items that have been judged defective.** They might be used again by someone not aware of the hazard involved.

Additional warnings and information on wire rope, chain, cordage, blocks and tools can be found in the Table of Contents by clicking on the warning symbol icon (  ). These should be read and understood thoroughly before using a particular item.

## DEFINITIONS

Information contained in this catalog is subject to change; all weights and dimensions are approximate. Ratings are stated in short tons (2,000lbs.) or pounds. All dimensions are in inches; all weights are in pounds, unless stated otherwise.

### Working Load Limit (WLL)

The Working Load Limit is the maximum load which should ever be applied to the product, even when the product is new and when the load is uniformly applied - straight line pull only. **Avoid side loading.** All catalog ratings are based upon usual environmental conditions and consideration must be given to unusual conditions such as extreme high or low temperatures, chemical solutions or vapors, prolonged immersion in salt water, etc. **Never** exceed the Working Load Limit.

### Proof Test Load (Proof Load)

The term "Proof Test" designates a quality control test applied to the product for the sole purpose of detecting defects in material or manufacture. The Proof Test Load (usually twice the Working Load Limit) is the load which the product withstood without deformation when new and under laboratory test conditions. A constantly increasing force is applied in direct line to the product at a uniform rate of speed on a standard pull testing machine. The Proof Test Load does not mean the Working Load Limit should ever be exceeded.

### Breaking Strength/Ultimate Strength

Do not use breaking strength as a criterion for service or design purposes. Refer to the Working Load Limit instead.

Breaking Strength is the average force at which the product, in the condition it would leave the factory, has been found by representative testing to break, when a constantly increasing force is applied in direct line to the product at a uniform rate of speed on a standard pull testing machine. Proof testing to twice the Working Load Limit does not apply to hand-spliced slings.

**Remember:** Breaking Strengths, when published, were obtained under controlled laboratory conditions.

Listing of the Breaking Strength does not mean the Working Load Limit should ever be exceeded.

### Design Factor (sometimes referred to as safety factor)

An industry term usually computed by dividing the catalog Breaking Strength by the catalog Working Load Limit and generally expressed as a ratio. For example: 5 to 1.

### Shock Load

A load resulting from rapid change of movement, such as impacting, jerking or swinging of a static load. Sudden release of tension is another form of shock loading. Shock loads are generally significantly greater than static loads. Any shock loading must be considered when selecting the item for use in a system.

**Avoid shock loads as they may exceed the Working Load Limit.**



# WIRE ROPE CLIPS

## ! WARNING

Read and follow ALL instructions and warnings. Failure to do so could result in injury or death.

### Select the right wire rope clip for your application

- NEVER use cast malleable wire rope clips for lifting or suspending ANY load.
- Match the same size wire rope clip to the same size rope diameter. For example, use a 3/8" wire rope clip with a 3/8" wire rope.
- When working with coated cable, ALWAYS:
  - match wire rope clip size to uncoated cable diameter and
  - strip coating off cable where wire rope clips will be attached.

### Install wire rope clips correctly

- Never use fewer than the number of wire rope clips defined in the tables on the next two pages.
- Wire rope clips are made for use with wire rope only. Never use wire rope clips on pipe, rod, chain, fiber rope, etc.

### Use wire rope clips properly

- Never connect two ends of wire rope with wire rope clips.
- Never shock or impact load.

### Inspect and maintain wire rope clips regularly

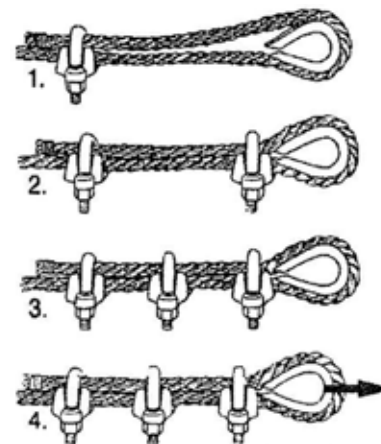
- Inspect wire rope clips before each use. Discard and replace wire rope clips that are worn, distorted, or damaged.
- Inspect wire rope clip nuts before and after each use and re-torque as needed.

## Correct Method of Installing Wire Rope Clips



**WARNING** When using wire rope clips, extreme care must be exercised to make certain they are attached correctly. Failure to do so could result in serious injury or death.

1. Turn back specified length of wire rope from thimble (see tables on next two pages). Put first clip one saddle width from seized "dead end" (Fig. 1). Seat "live end" (load carrying part) of wire rope in saddle and position U-bolt over "dead end." Remember: **"Never saddle a dead horse."** Tighten nuts evenly to proper torque (see tables on next two pages).
2. Put second clip close to the thimble without binding it (Fig. 2). Install nuts firmly but do not yet tighten to proper torque.
3. Install all remaining clips equally spaced between the first two clips (Fig. 3). Install nuts firmly but do not yet tighten to proper torque.
4. Apply light tension to wire rope assembly, and then tighten all nuts evenly to proper torque (Fig. 4).
5. Inspect wire rope clip nuts before and after each use and re-torque as needed. When loads are applied, the wire rope will stretch slightly causing the rope to slip and the termination to come loose, which may cause serious injury or death.



Add at least one more clip if a pulley (sheave) is used in place of a thimble. If uncertain, check with the wire rope manufacturer. If more clips are used than specified, proportionally increase the amount of wire rope that is turned back.

When the required minimum number of clips is installed in accordance with these written instructions, they will develop up to 80% efficiency when used on right lay wire rope of classes 6x19, 6x36, 7x19, 8x19, 19x7, and cable laid. Drop forged wire rope clips are recommended for use only with steel core wire ropes.



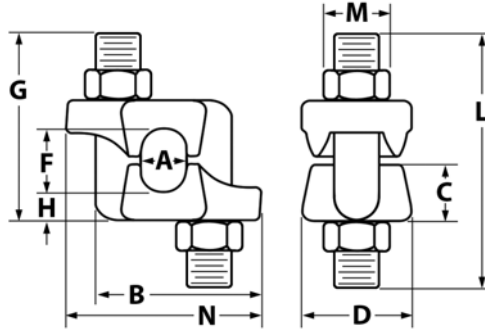
# DOUBLE GRIP WIRE ROPE CLIPS

## ! WARNING

Improper use and installation of forged wire rope clips can result in serious injury or death.

- Forged wire rope clips are the only type of wire rope clip approved for lifting purposes.

For complete installation instructions refer to T.O.C. > CLIPS . 



### GALVANIZED, DROP FORGED

Meets the performance requirements of Federal Specification FF-C-450D, Type 2.

Dimensions in Inches						Min. no. Clips	Rope Turnback in Inches	Torque* (ft.lbs.)	Weight per 100 (lbs.)
Size	C	D	Thd.	G	N				
3/16"-1/4"	0.40	0.94	3/8-16	1.41	1.44	2	4.00	30	21
5/16"	0.47	1.06	3/8-16	1.50	1.54	2	5.00	30	28
3/8"	0.51	1.06	7/16-14	1.84	1.78	2	5.25	45	38
7/16"-1/2"	0.59	1.25	1/2-13	2.21	2.15	3	11.00	65	63
9/16"-5/8"	0.72	1.50	5/8-11	2.72	2.57	3	13.50	130	115
3/4"	0.86	1.81	3/4-10	2.94	2.67	3	16.00	225	180
7/8"	0.97	2.12	3/4-10	3.31	2.86	4	26.00	225	230
1"	1.13	2.25	3/4-10	3.72	3.06	5	37.00	225	275



# FORGED WIRE ROPE CLIPS



Improper use and installation of forged wire rope clips can result in serious injury or death.

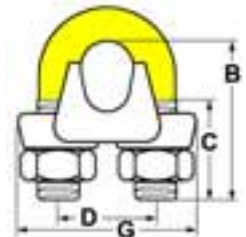
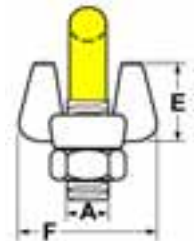
- Forged wire rope clips are the only type of wire rope clip approved for lifting purposes.

For complete installation instructions refer to T.O.C. > CLIPS

**GALVANIZED, DROP FORGED.** Meets the performance requirements of Federal Specification FF-C-450D, Type 1 Class 1.

Size	Min. Clips Req'd.	Amt. Wire Rope to turn back	Torque in ft. lbs. *	Approx. Wt. in Pounds	Dimensions in inches						
					A	B	C	D	E	F	G
1/8" **	2	3.1/4"	4.5	.05	.19	.75	.44	.44	.38	.81	.94
3/16" **	2	3.3/4"	7.5	.10	.25	.94	.56	.56	.50	.94	1.19
1/4"	2	4.3/4"	15	.18	.31	1.06	.56	.75	.63	1.19	1.50
5/16"	2	5.1/4"	30	.31	.38	1.44	.75	.88	.75	1.31	1.69
3/8"	2	6.1/2"	45	.46	.44	1.50	.75	1.00	.88	1.56	1.94
7/16"	3	7"	65	.73	.50	1.88	1.00	1.19	1.00	1.81	2.31
1/2"	3	11.1/2"	65	.73	.50	1.88	1.00	1.19	1.06	1.81	2.31
9/16"	3	12"	95	.96	.56	2.38	1.25	1.31	1.13	2.06	2.50
5/8"	3	12"	95	1.00	.56	2.38	1.25	1.31	1.25	2.06	2.50
3/4"	4	18"	130	1.50	.63	2.75	1.38	1.50	1.38	2.31	2.75
7/8"	4	19"	225	2.44	.75	3.19	1.44	1.81	1.69	2.63	3.31
1"	5	26"	225	2.7	.75	3.63	1.75	1.88	1.75	2.63	3.47
1.1/8"	6	34"	225	3.1	.75	4.00	2.00	2.00	1.88	2.81	3.56
1.1/4"	7	44"	360	4.6	.88	4.38	2.25	2.31	2.06	3.25	4.06
1.3/8"	7	44"	360	5.2	.88	4.63	2.31	2.38	2.25	3.44	4.25
1.1/2"	8	54"	360	5.9	.88	4.94	2.38	2.63	2.50	3.50	4.38
1.5/8"	8	58"	430	7.34	1.00	5.31	2.62	2.75	2.66	3.61	4.75
1.3/4"	8	61"	590	9.8	1.13	5.88	2.75	3.06	2.88	3.75	5.25
2"	8	71"	750	13.75	1.25	6.50	3.00	3.31	3.38	4.44	5.81
2.1/4"	8	73"	750	15.7	1.25	7.13	3.31	3.88	3.81	4.50	6.31
2.1/2"	9	84"	750	17.9	1.25	7.75	3.38	4.13	4.25	4.50	6.44
2.3/4"	10	100"	750	22.0	1.25	8.31	3.50	4.36	5.00	5.00	6.75
3"	10	106"	1,200	32.0	1.50	9.19	3.88	4.75	5.25	5.31	7.56

Ask for the yellow U-bolt



\* Based on clean, unlubricated threads. The table above shows the minimum torque required to reach maximum holding power of wire rope clips.

\*\* U-Bolts and nuts zinc plated.

## STAINLESS STEEL, DROP FORGED

Size	Minimum Clips Required	Torque in ft. lbs.*	Approximate Weight in Pounds
1/8"	2	4.5	.05
3/16"	2	7.5	.106
1/4"	2	15	.19
5/16"	2	30	.30
3/8"	2	45	.46
1/2"	3	65	.68
5/8"	3	95	1.0
3/4"	4	130	1.5
7/8"	4	225	2.44
1"	5	225	2.70

Dimensions for drop forged stainless steel clips are the same as for the drop forged galvanized clips in the table above.

\* Based on clean, unlubricated threads. The table above shows the minimum torque required to reach maximum holding power of wire rope clips.



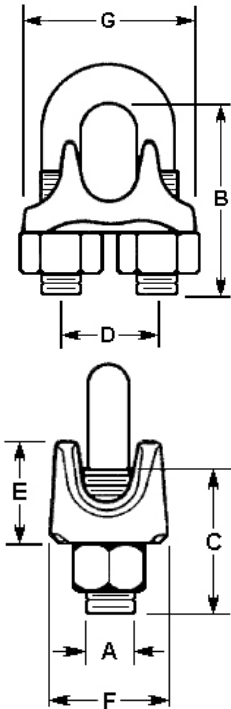
# MALLEABLE WIRE ROPE CLIPS

## ! WARNING

Improper use and installation of cast malleable wire rope clips can result in serious injury or death.

- NEVER use cast malleable wire rope clips for lifting or suspending ANY load.
- Cast malleable wire rope clips are to be used only for non-critical, light duty applications with small applied loads.

For complete installation instructions refer to T.O.C. > CLIPS ⚠.



**ZINC PLATED, MALLEABLE,** Meets the performance requirements of Federal Specification FF-C-450D, Type 1, Class 2.\*\*

Size	Min. Clips Req'd	Amt. Wire Rope to turn back	Torque in ft. lbs.*	Approx. Wt. in Pounds	Dimensions in inches						
					A	B	C	D	E	F	G
1/16" **	3	4"	2	.03	.15	.65	.45	.38	.38	.45	.69
1/8" **	3	4.3/4"	3	.04	.18	.81	.50	.50	.50	.56	.94
3/16"	3	5.1/2"	4.5	.063	.25	.94	.56	.56	.56	.63	1.06
1/4"	3	7"	15	.13	.31	1.19	.75	.75	.69	.75	1.31
5/16"	3	7.3/4"	15	.15	.31	1.31	.84	.75	.75	.75	1.44
3/8"	3	9.1/2"	30	.21	.38	1.63	1.00	.88	.84	.88	1.63
7/16"	4	10.1/4"	40	.37	.44	2.00	1.19	1.06	1.00	1.06	1.88
1/2"	4	15.1/4"	45	.37	.44	2.00	1.19	1.06	1.00	1.06	1.88
9/16"	4	16"	50	.59	.50	2.31	1.38	1.25	1.25	1.28	2.09
5/8"	4	16"	75	.59	.50	2.31	1.38	1.25	1.25	1.28	2.09
3/4"	5	22.1/4"	75	.84	.56	2.56	1.56	1.31	1.44	1.56	2.38
7/8"	5	23.1/2"	130	1.25	.63	3.06	1.81	1.63	1.75	1.81	2.88
1"	6	31"	130	1.66	.63	3.44	2.00	1.88	2.06	2.00	3.00
1.1/8"	7	39"	200	2.43	.75	4.00	2.75	2.00	2.19	2.06	3.38

\* Based on clean, unlubricated threads. The table above shows the minimum torque required to reach maximum holding power of wire rope clips.

\*\* NOTE: 1/16" and 1/8" are not covered by Federal Specification FF-C-450D.

## STAINLESS STEEL, CAST, MALLEABLE STYLE

Fits	Min. Clips Req'd.	Torque in ft. lbs. *	Approx. Wt. in Pounds	Dimensions in Inches	
				A	B
1/8"	3	3	.05		
5/32"	3	4	.06	.15	.79
3/16"	3	4.5	.19	.19	.97
1/4"	3	15	.19	.22	1.08
5/16"	3	15	.30	.30	1.34
3/8"	3	30	.46	.38	1.78
1/2"	4	45	.65	.45	2.07
5/8"	4	75	.78		
3/4"	5	75	1.09	.55	2.88
7/8"	5	130	1.63	.61	3.15
1"	6	130	2.15	.62	3.53

\* Based on clean, unlubricated threads. The table above shows the minimum torque required to reach maximum holding power of wire rope clips.