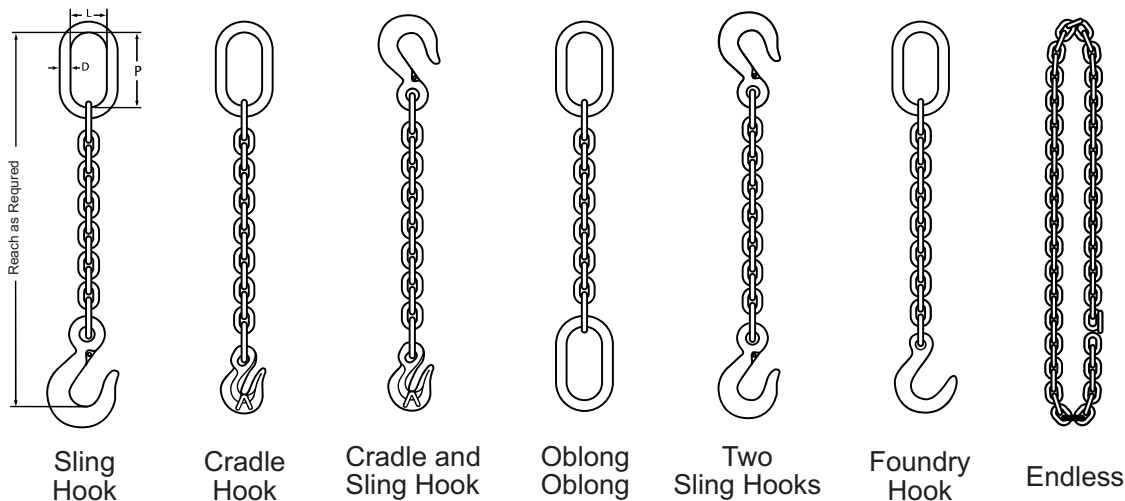


**WARNING**  
 DO NOT EXCEED WORKING LOAD LIMIT.  
 USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



## SL-20 TYPE SINGLE LEG SLING CHAINS (GRADE 80)



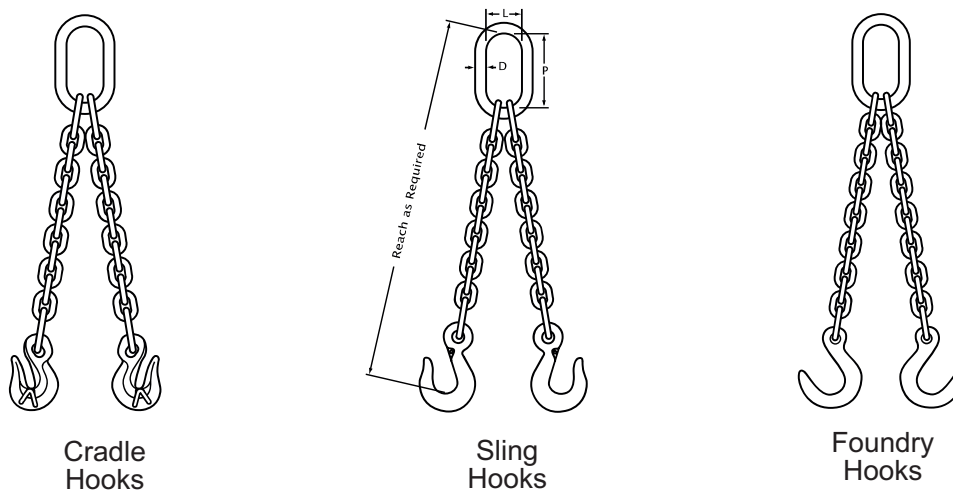
Sling Hook    Cradle Hook    Cradle and Sling Hook    Oblong Oblong    Two Sling Hooks    Foundry Hook    Endless

### SIZES AND WORKING LOAD LIMITS\* - (GRADE 80)



Chain Trade Size	6 MM	8 MM	10 MM	12 MM	16 MM	18 MM	20 MM	22MM	25 MM	28 MM	32 MM
Working Load Limit (Ton.)*	1.12	2.0	3.2	4.8	8.0	10.0	12.5	16.0	25.0	28.0	32.0

## SL-21 DOUBLE LEG SLING CHAIN - (GRADE 80)



Cradle Hooks    Sling Hooks    Foundry Hooks

### SIZES AND WORKING LOAD LIMITS\* - (GRADE 80)

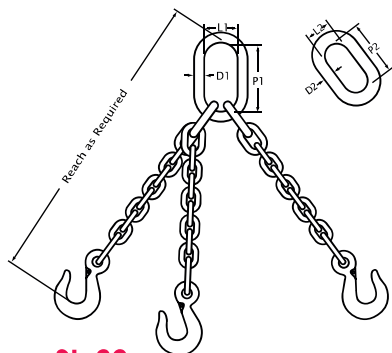


Chain Trade Size	6 MM	8 MM	10 MM	12 MM	16 MM	18 MM	20 MM	22MM	25 MM	28 MM	32 MM
Working Load Limit (Ton.)*	1.80	2.8	4.5	7.0	11.2	14.2	17.7	22.6	28.0	35.0	45.0

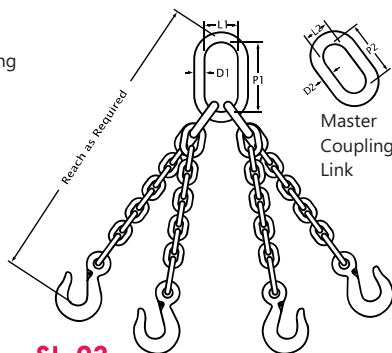
**WARNING**  
DO NOT EXCEED WORKING LOAD LIMIT.  
USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



## TRIPLE AND FOUR LEG SLING CHAIN - (GRADE 80)



**SL-22**  
Sling Hooks



**SL-23**  
Sling Hooks

**SAFETY NOTE:**

A quad branch chain sling, especially when used on a load of rigid structure, is usually not sustaining the load evenly distributed on each of its four branches.

The maximum Working Load Limits (capacity) are therefore set at the same values as for triple branch chain slings of equal quality and size and used with branches at same angle of inclination.

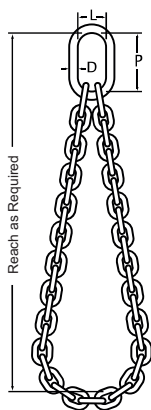
Triple and Four Sling Chains are also available with Grab hooks or Foundry Hooks.

### SIZES AND WORKING LOAD LIMITS\* - (GRADE 80)



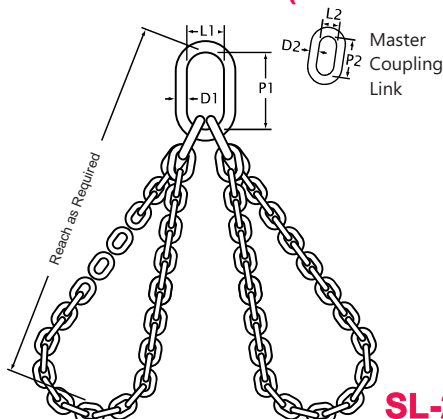
Chain Trade Size	6 MM	8 MM	10 MM	12 MM	16 MM	18 MM	20 MM	22MM	25 MM	28 MM	32 MM
Working Load Limit (Ton.)*	2.6	4.2	6.7	10.5	16.8	21.0	26.2	33.5	42.0	53.0	67.0

## SINGLE AND DOUBLE BASKET CHAIN SLINGS (GRADE 80)



**SL-24**

SINGLE BASKET



**SL-24**

DOUBLE BASKET

### SIZES AND WORKING LOAD LIMITS\* - (GRADE 80)



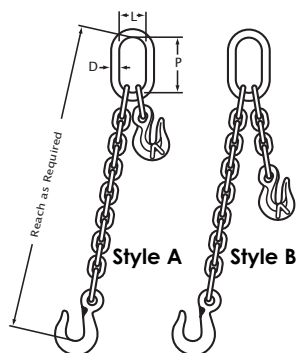
Chain Trade Size	6 MM	8 MM	10 MM	12 MM	16 MM	18 MM	20 MM	22MM	25 MM	28 MM	32 MM
Working Load Single Basket Chain Sling	1.12	2.0	3.2	4.8	8.0	10.0	12.5	16.0	25.0	28.0	32.0
Working Load Single Basket Chain Sling	2.24	4.0	6.4	9.60	16.0	20.0	25.0	32.0	50.0	56.0	64.0

**WARNING**  
 DO NOT EXCEED WORKING LOAD LIMIT.  
 USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



## ADJUSTABLE CHAIN SLINGS (GRADE 80)

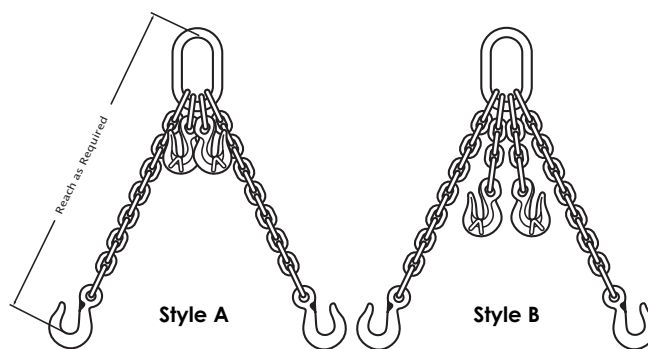
**SL-26**



**SAFETY NOTE:**

The master link on this type sling is designed for single sling use only. If used as a basket sling, do not load beyond single sling capacity.

**SL-27**



**SAFETY NOTE:**

The master link on this type sling is designed for double sling use only. If used as a basket sling, do not load beyond the double sling capacity.

## SIZES AND WORKING LOAD LIMITS\* - (GRADE 80)



Chain Trade Size	6 MM	8 MM	10 MM	12 MM	16 MM	18 MM	20 MM	22MM	25 MM	28 MM	32 MM
Working Load Single Basket Chain Sling	1.12	2.0	3.2	4.8	8.0	10.0	12.5	16.0	25.0	28.0	32.0
Working Load Single Basket Chain Sling	1.80	2.8	4.5	7.0	11.2	14.2	17.7	22.6	28.0	35.0	45.0

## USE OF GRADE 80 CHAIN UNDER HEAT CONDITIONS

### Effect of Elevated Temperature on the Working Load Limit of Grade 80 Alloy Chain.

Chains should not be used outside of the -40° F to 400° F (-40°C to 204°C) temperature range without consulting the chain manufacturer. The specific working load limit reductions for Grade 80 chains used at and after exposure to elevated temperatures have been established and are shown below.

Maximum Temperature of Chain	Reduction of Working Load Limit While At Temperature	Reduction of Working Load Limit After Exposure to Temperature
Below 400°	None	None
400°	10%	None
500°	15%	None
600°	20%	5%
700°	30%	10%
800°	40%	15%
900°	50%	20%
1000°	60%	25%
Over 1000°	(see below)	(see below)

## CARE INSPECTION

**CARE** — Chain requires only minimum maintenance:

1. Store chains on an A-frame in a clean, dry place.
2. Oil chains before prolonged storage.

**INSPECTION** — It is important to inspect chain slings regularly and to keep a record of individual chain inspection. The following is a suggestion for such an inspection system.

Before inspecting: clean the chains so that marks, nicks, wear and other defects can be seen.

Each link should be inspected for the following danger signs.

1. Twists or bends.
2. Nicks or gouges.
3. Excessive wear at bearing points.
4. Stretch.
5. Distorted or damaged master links, coupling links or attachments, especially spread in throat opening of hooks.

Each link or attachment having any defect listed above should be marked with paint to plainly indicate rejection and elimination from service until properly repaired.

**WARNING**  
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 USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



## Working Load Limit for G-80 Chain Slings

### EN 818-4:1996

1-leg		2-leg		3-leg & 4-leg		Choked endless sling
Chain dim. mm		$\beta 45^\circ$ $\alpha 0-90^\circ$	$\beta 45-60^\circ$ $\alpha 90-120^\circ$	$\beta 0-45^\circ$ $\alpha 0-90^\circ$	$\beta 45-60^\circ$ $\alpha 90-120^\circ$	
6	1.1	1.6	1.1	2.36	1.7	1.8
7	1.5	2.12	1.5	3.15	2.24	2.5
8	2	2.8	2	4.25	3	3.15
10	3.15	4.25	3.15	6.7	4.75	5.0
13	5.3	7.5	5.3	11.2	8	8.5
16	8	11.2	8	17	11.8	12.5
20	12.5	18	12.5	25	18.8	20
22	15	21.2	15	31.5	22.4	23.6
26	21.2	30	21.2	45	31.5	33.5
32	31.5	45	31.5	67	47.5	50

Safety factor 4:1. Working load limits are based upon equally loaded and disposed sling legs.

#### Rules for Correct WLL

Where choke hitch is employed, the WLL of the chain sling should be reduced by 20 % (unless the Choker hook is used).

#### Asymmetrical Loading Conditions

For unequally loaded chain slings, the following approach to permissible loads is recommended:

- A two-legged system is treated as a single-legged system.
- A three- or four-legged system is treated as a two-legged system.

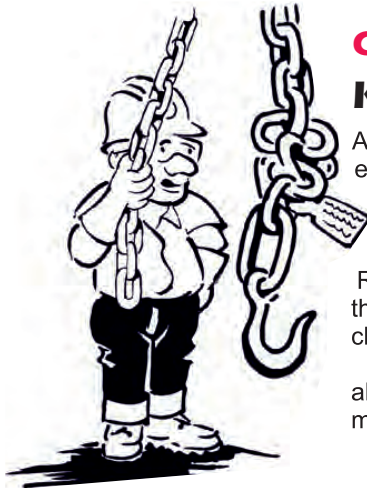
### Types of Combination of Chain Slings



**WARNING**  
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## 6 POINT INSPECTION CHECKLIST



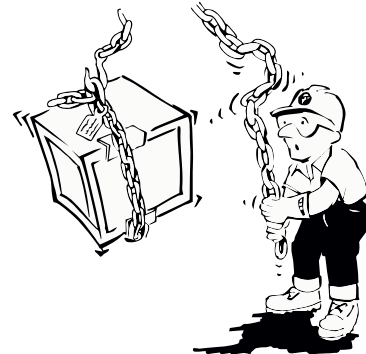
### CHECK #1: KNOTS, TWIST & KINKS.

After you have read the sling tag, and have determined it has a rating equal to or greater than the weight of the lift, check each branch of the sling to make sure the chain has absolutely no twists, knots or kinks. If you do not remove the twists, knots or kinks before lifting, the stress caused may result in the failure of the chain now or at a later use. Remember, the definition of Working Load Limit? It's "the maximum load that shall be applied in direct tension to a new and undamaged length of chain." That means straight line pull. **No twists, knots or kinks!**

Also the chain may have been abused by a previous user so always check it for nicks or damage before lifting. Safety only takes minutes, an injury can last a lifetime.

### CHECK #2: ABRUPT MOVEMENT

Added stress will be put on the sling chain if sudden jerking occurs while raising or lowering the load. Raising or lowering a load with a jerk can exceed the Working Load Limit of the sling. Take it slow and easy.



### CHECK #3: BALANCE

Unbalanced loads should always be avoided. Also make sure you center the master link on the lifting hook. Do not force sling hooks into the lifting points on the load. Tip loading of hooks will reduce the capacity of the sling and can damage the hook. Do not shorten a sling leg with a knot, bolt or other makeshift device in order to get the load in balance. Balance is particularly important when using a basket hitch where slippage of the load may occur.



**WARNING**  
DO NOT EXCEED WORKING LOAD LIMIT.  
USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.

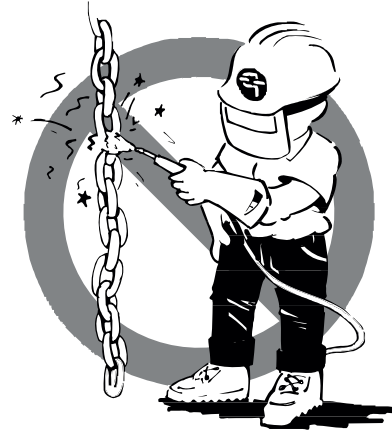


## CHECK #4: SHARP EDGES

If the chain must be wrapped around the load, pad the chain to prevent damage to the links, especially around sharp corners. When lowering loads, set them down gently to avoid crushing the chain.

## CHECK #5: HIGH TEMPERATURES

Alloy chain is heat treated in order to obtain the high strength and wear factors needed for slings. Overheating a chain sling destroys the integrity of the heat treatment. If sling chains are exposed to extreme temperatures the Working Load Limit is reduced.



## CHECK #6: INSPECTIONS



Regular sling inspections and good record keeping are keys to making a professional lift. All slings should be shipped with a test certificate indicating that the sling has been proof tested at twice the Working Load Limit of the chain. Slings that have been in service for more than three years, and that have been used on a regular basis, should be sent in for recertification. Records for each individual sling should identify the individual serial number prior to being put in service.

**WARNING**  
 DO NOT EXCEED WORKING LOAD LIMIT.  
 USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



## Chain Sling Basics

Chain slings, available in Grades 80 and Grade 100, are recommended for rugged industrial applications in harsh environments where flexibility, abrasion resistance

Note: Proof Coil Grade 30, High Test Grade 40 and Grade 70 transport tie down chain and their fittings are not recommended for lifting or hoisting.

### Features, Advantages and Benefits

#### Promotes Safety

- Permanent steel capacity tag is serialized for identification
- Welded slings offer the security of tamper proof assemblies`

#### Saves Money

- Alloy Steel construction assures long life
- Can be repaired, proof tested and recertified by Safe Lifters

#### Saves Time

- Easy to inspect for damage
- Stores easily

### Inspection Criteria For Chain Slings

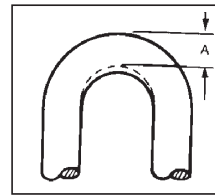
#### WARNING

Remove slings from service if any of the following are visible:

- Wear, nicks, bends, cracks, gouges or stretch
- Weld spatter on chain or attachments
- Excessive wear at bearing points - See Wear Allowance Table.
- Discoloration from excessive temperature
- End attachments, including hooks, that are cracked, deformed or obviously worn.
- Chain links should hinge freely with adjacent links.

### Chain Wear Allowance

Determine wear by measuring cross section at link ends. If worn to less than the minimum thickness allowable, chain should be removed from service.



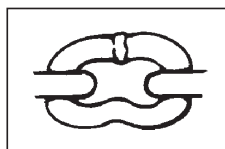
Wear Allowance Table

Trade Chain Size (in.)	Minimum Allowable thickness - A (in.)
$\frac{7}{32}$ (.218)	.189
$\frac{9}{32}$ (.281)	.239
$\frac{3}{8}$ (.375)	.342
$\frac{1}{2}$ (.500)	.443
$\frac{5}{8}$ (.625)	.546
$\frac{3}{4}$ (.750)	.687
$\frac{7}{8}$ (.875)	.750
1 (1.00)	.887
1 $\frac{1}{4}$ (1.250)	1.091

### Examples of Chain Sling Abuse

#### WARNING

All of these examples show sufficient damage to merit removal from service.



#### Bent Links

Usually caused by bending over sharp edges of a load.

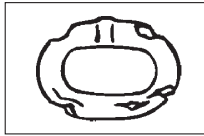


**WARNING**  
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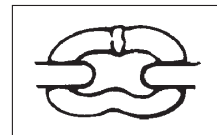
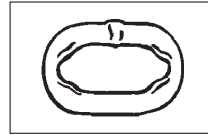
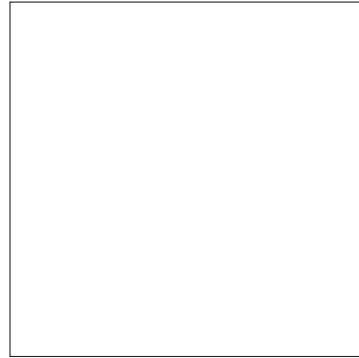
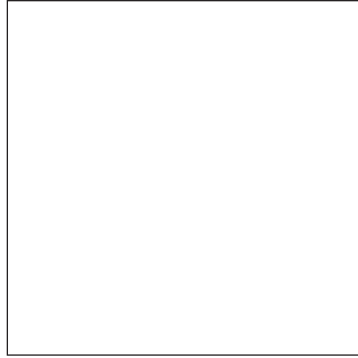
## Chain Sling Basics

### Examples of Chain Sling Abuse (Continued)



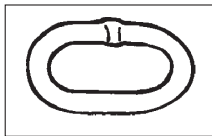
#### Gouged Links

Damaged by a heavy object being dragged over or dropped on the chain.



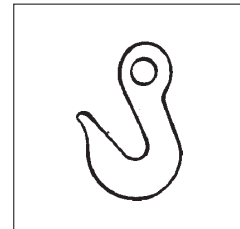
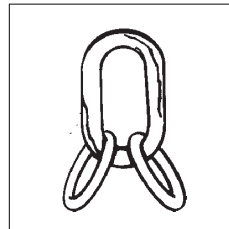
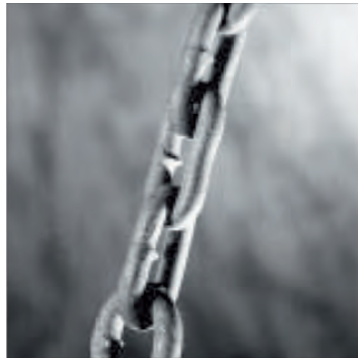
#### Multiple Types of Damage

Worn, gouged and bent links



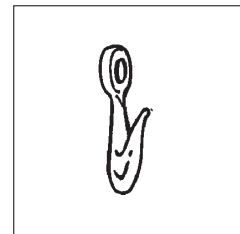
#### Stretched Links

Indicates the sling has been extremely overloaded or subjected to shock loading. These links would not hinge freely with adjacent links.



#### Worn Links

Excessive wear, especially at the bearing points, seriously weakens the chain.  
(See Wear Allowance)



#### Damaged Hooks and Attachments

This hook tip has been bent one direction and the eye another. The tip was probably point loaded and the eye bent by being rigged over the edge of a load.



**WARNING**  
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USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



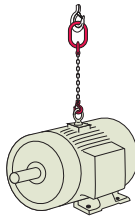
## Methods of Slings

### Single Leg Slings

#### 1 Straight lift

**WLL:** Under normal conditions the WLL will be the WLL for single leg slings.

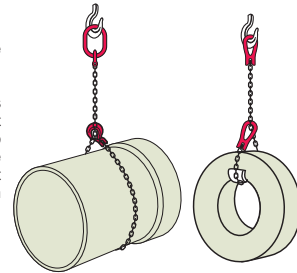
**Comment:** A suitable method of lifting an effectively balanced load from a single lifting point. :



#### 2 Choke lift

**WLL:** The WLL should be no more than 80% of the WLL for single leg slings.

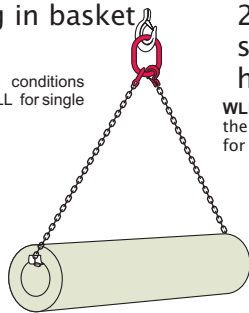
**Comment:** This method forms a loop which tightens as the load is lifted. Do NOT attempt to force the bight into closer contact with the load. Allow the chain to assume its natural angle. Single leg slings in choke hitch are not suitable for lifting long loads which might tilt or for any load which is not effectively balanced in the single loop.



### Single Leg Slings in Basket Hitch

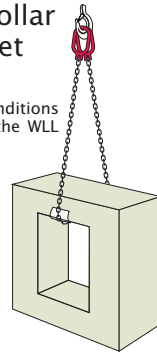
#### 1 Single leg in basket Hitch

**WLL:** Under normal conditions the WLL will be the WLL for single leg slings.



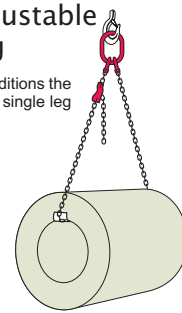
#### 2 Reeveable collar sling in basket hitch

**WLL:** Under normal conditions the WLL will be 1.4 x the WLL for single leg slings.



#### 3 Single adjustable basket sling

**WLL:** Under normal conditions the WLL will be the WLL for single leg slings.



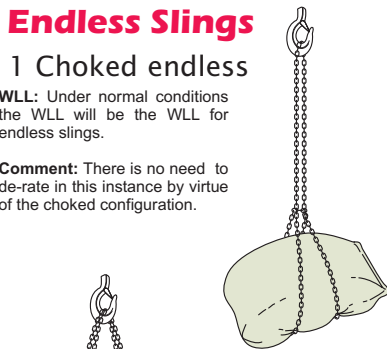
**Comment:** A single leg sling, back hooked to form a basket hitch, assumes the appearance of a two leg sling but it should never be rated as such. It should be noted that the master link is only designed for single leg loading and, therefore, the single leg WLL should never be exceeded.

### Endless Slings

#### 1 Choked endless

**WLL:** Under normal conditions the WLL will be the WLL for endless slings.

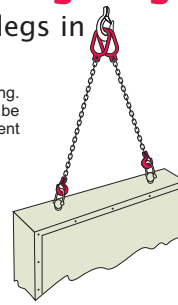
**Comment:** There is no need to de-rate in this instance by virtue of the choked configuration.



### Two Single Leg Slings Used Together

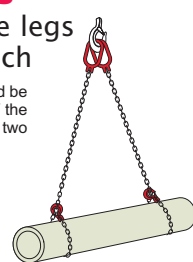
#### 1 Two single legs in straight lift

**WLL:** Rate as a two leg sling. The WLL will, therefore, be the same as an equivalent two leg sling.



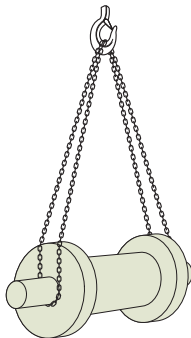
#### 2 Two single legs in choke hitch

**WLL:** The WLL should be no more than 80% of the WLL for an equivalent two leg sling.



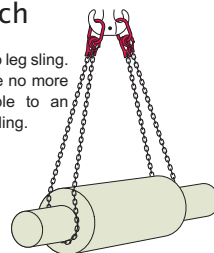
#### 2 Double endless

**WLL:** Under normal conditions the WLL will be the WLL for endless slings.



#### 3 Two single legs in basket hitch

**WLL:** Rate as a two leg sling. The WLL should be no more than that applicable to an equivalent two leg sling.



**Comment:** Two single leg slings should not be used together to form a pair unless:

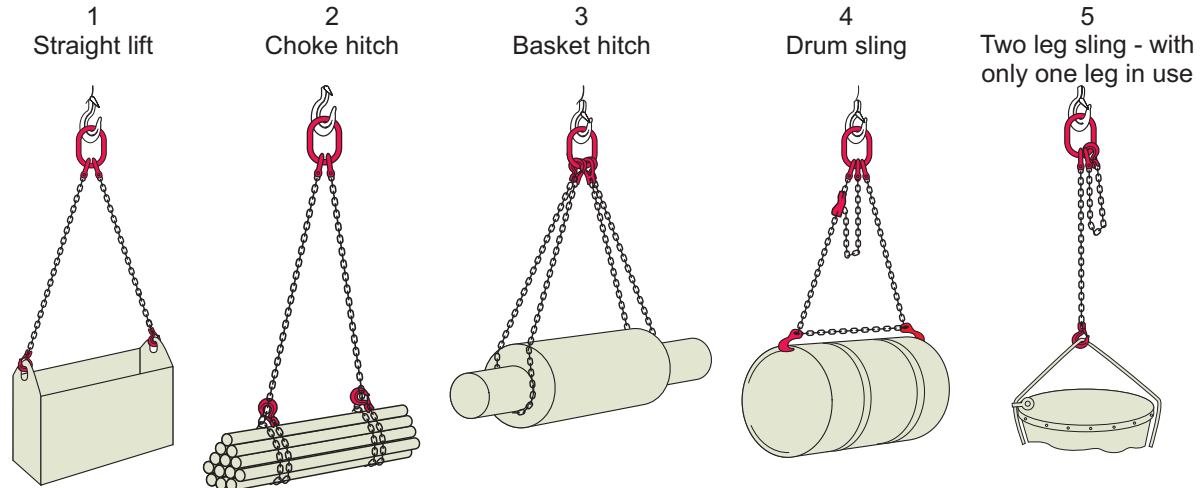
- They are of the same type, grade, size and length
- They are both marked with the same WLL
- The included angle between the two legs does not exceed 90°
- The crane hook is large enough to comfortably accept both upper terminal fittings of the slings.

**WARNING**  
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USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



## Methods of Slings

### Two Leg Slings

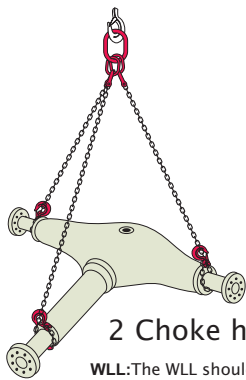


### Four Leg Slings

#### Three Leg Slings

##### 1 Straight lift

WLL: Under normal conditions the WLL will be the WLL for three leg slings.



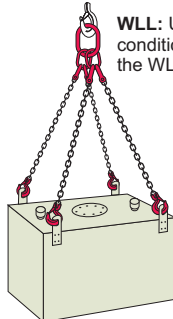
##### 2 Choke hitch

WLL: The WLL should be no more than 80% of the WLL for a three leg sling.

**Comment:** Rate as indicated only in cases where the load appears to be reasonably equally distributed between all three legs. If two are obviously supporting most of the load, rate at 2/3 of the marked working load.

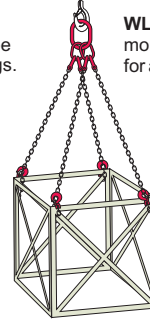
##### 1 Straight lift

WLL: Under normal conditions the WLL will be the WLL for four leg slings.

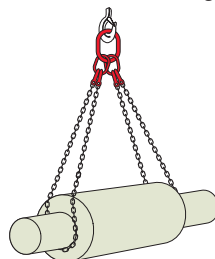


##### 2 Choke hitch

WLL: The WLL should be no more than 80% of the WLL for a four leg sling.

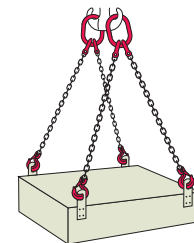


##### 3 Double basket sling



WLL: Rate as a four leg sling.  
**Comment:** This WLL applies to double baskets slings designed as such and fitted with a TUFF Master Assembly strong enough for this duty. It does not apply to a back-hooked two leg sling.

##### 4 Two, two leg slings used as four leg



WLL: The WLL should be no more than that applicable to an equivalent four leg sling.

**WARNING**  
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USE ONLY G80 & G100 COMPATIBLE COMPONENTS FOR OVERHEAD LIFTING.



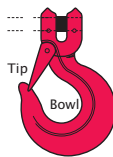
The safe and competent use of lifting gear cannot be adequately learned from a manual. A good slinger learns his trade only after practical training and lengthy experience. However, this section establishes some sound basic principles and highlights some of the major malpractice which must be avoided.

## 1 Evaluating the Load

The user should take all practicable steps to establish the weight of any load. An intelligent guess is not good enough. A drawing may be available giving the weight or it may be calculable within reasonable limits of accuracy. In the case of multi-piece loads (e.g. a bundle of steel rods) one item may be weighed in order to calculate the total weight of the load. If it is likely that the load may have to be lifted again, the weight should be clearly marked on it.

## 2 Tip Lifting of Hooks

All TUFF hooks are designed to support the load in the bowl. Users should ensure that the hook of a sling engages freely in the lifting point so that the weight of the load is supported in the bowl of the hook. Wedging or forcing the hook tip into the lifting points results in the hook being stressed in a manner for which it was not designed which may easily lead to hook deformation and premature failure.



## 3 Mis-use of Shortening Clutches

TUFF Shortening Clutches can be mis-used. Ensure that the chain carrying the load always leads out of the bottom of the clutch as illustrated. If the direction is reversed so that the load-carrying chain leads out of the top of the clutch, this can result in the front portion of the clutch being pulled off and the load released.

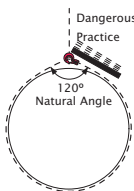


## 4 Knotting, Twisting and Transverse Bending of Chain

Chain is designed to support a load in a straight line with the line of force running through the crowns of each link. Chain which is twisted, or even worse knotted, cannot develop its full strength and will almost certainly fail prematurely. Users should remove twists from a chain leg before lifting and should NEVER knot a chain. If it is necessary to shorten a chain, a TUFF Shortening Clutch should be used. Similarly, chain which is bent under tension across a sharp corner is stressed in a manner for which it is not designed. The user should use timber (or any other suitable material) packing pieces to reduce the severity of this type of stressing.

## 5 Battening Down

It is sometimes believed that slings in choke hitch can be made more secure by striking the hook, link or adjacent chain in an attempt to force the bight into closer contact with the load. This malpractice is often known as 'battening down' and is dangerous. The bight should be allowed to assume its natural angle which will be about 120°.



## 6 Load Stability

Good slingers will develop the habit of assessing unusual loads and estimating the center of gravity and then attaching the sling in such a manner that the center of gravity is below the lifting points, or if this is impossible, well within them. If there is the slightest doubt of the stability of a load, it should be slowly lifted just clear of the ground. If the load tilts, the sling should be refixed in a more stable position.

## 7 Slingers Duty of Self Protection

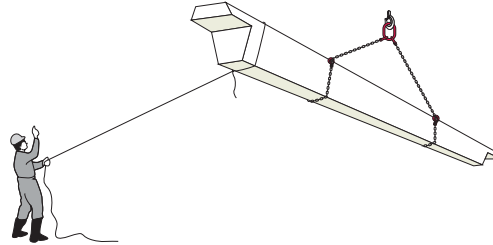
Slingers should wear suitable protective clothing. At the moment when the strain is taken on a sling, the slinger's hands and feet should be clear of the load and he should then position himself so that he does not risk injury if the load were to fail.

## 8 Shock Loading

Crane drivers, particularly, and slingers should be aware of the dangers of shock loading. Shock loads may break a chain even though the weight of the load being lifted is well below the working load limit for that chain. High acceleration forces, or shock loads, may be caused by the sudden operation of the crane, by not taking up slack before starting to lift, or by the sudden impact of falling loads. Crane drivers should always lift and lower .

## 9 Tag Lines

When lifting long loads, particularly in confined spaces, slingers should attach a rope or 'tag line' to one or both ends of the load so that rotational movement may be controlled.

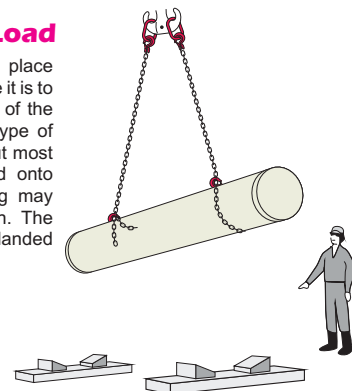


## 10 Code of Signals

Slingers and crane drivers should use an approved Code of Signals before lifting operations are commenced. There should be an agreement between the crane driver and the slingers that one slinger only is in charge of a lift, and only he will give signals. The crane driver should ignore signals from all other personnel except the EMERGENCY STOP signal which may be given by anyone present and must always be acted upon.

## 11 Landing of Load

Before a load is lifted, a place should be prepared where it is to be put down. The nature of the load will determine the type of preparation necessary but most loads should be lowered onto timber battens. The sling may then be easily withdrawn. The load should never be landed directly on to the chain.



## 12 Hooking Back Unused Legs

In the case of multi-leg slings with not all legs in use, the unused legs should be hooked back by engaging the hook in the master link or the master assembly. Similarly, after finishing a lift, if the sling is to remain on the crane hook, all hooks should be hooked back into the master link or the master assembly.

## 13 Sling Storage

When lifting operations are finished, slings should be removed from crane hooks and stored on a properly designed rack. They should not be left lying on the floor where they may suffer damage or may be lost.

