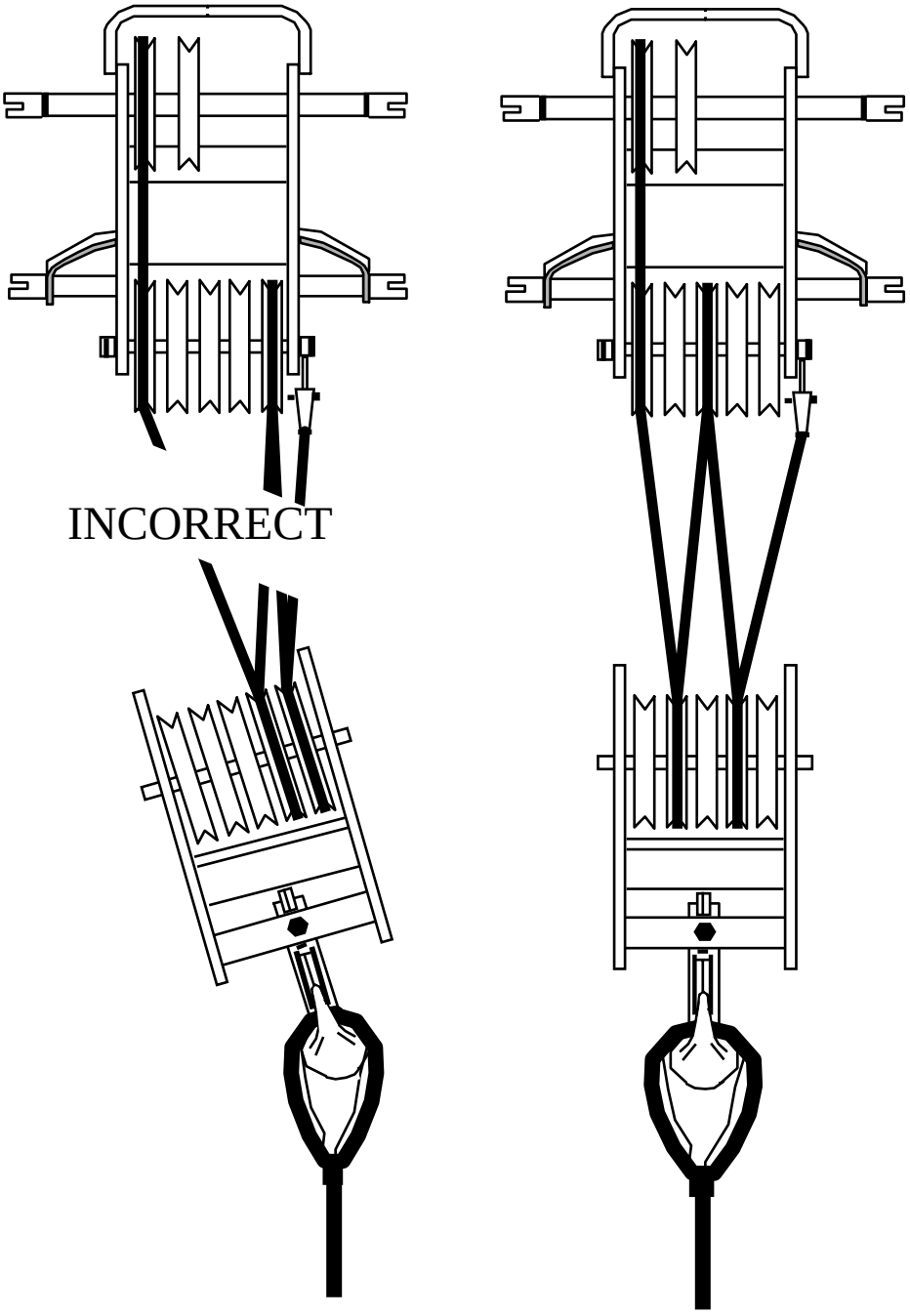
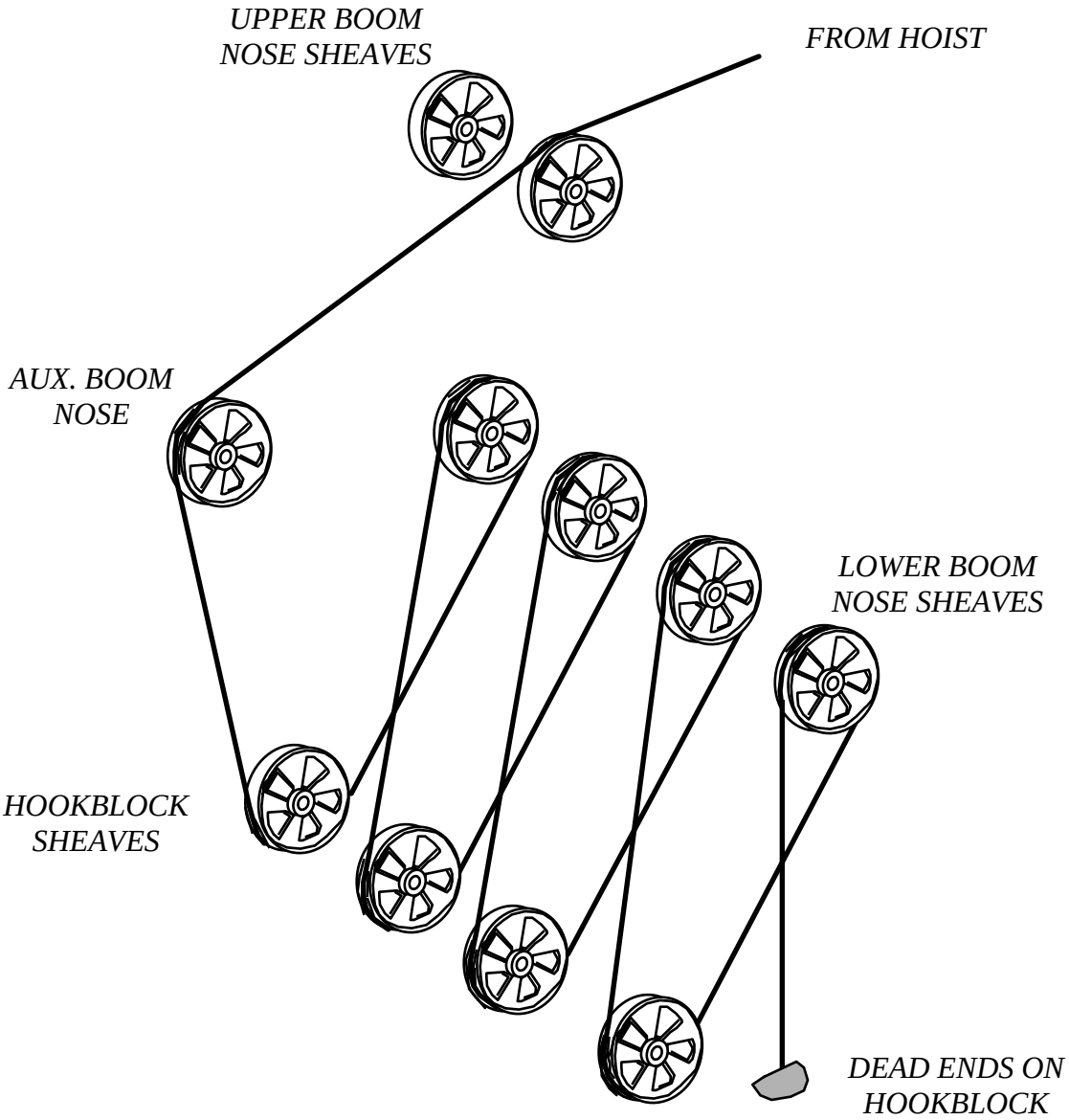
REEVING INFORMATION ON

GROVE CRANES



ENSURE HOIST CABLE (wire rope) IS PROPERLY REEVED.

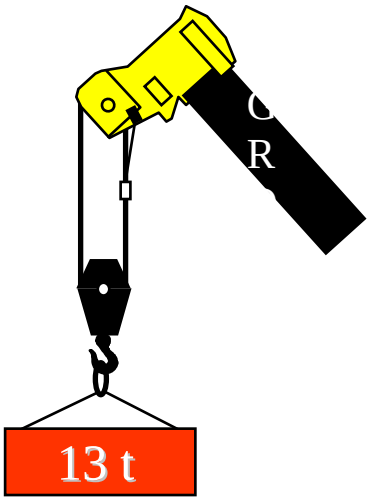
REEVING DIAGRAM UTILIZING THE AUXILIARY BOOM NOSE



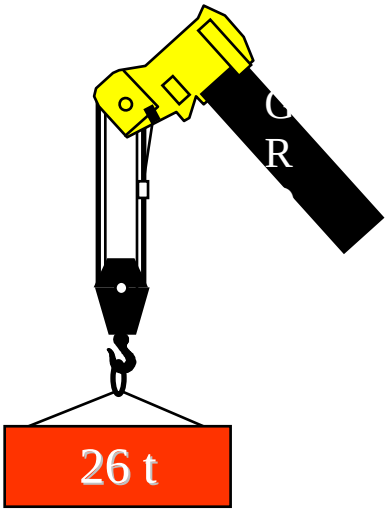
REASON FOR MULTIPLE PARTS OF LINE….

If line pull is 13,000 lb., multiply this by parts of line.

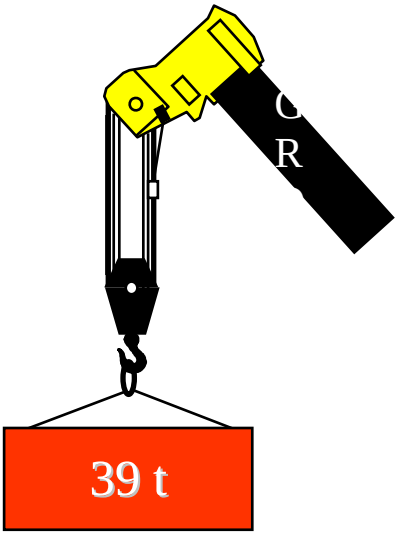
13,000 x 2 = 26,000 lb.



13,000 x 4 = 52,000 lb.



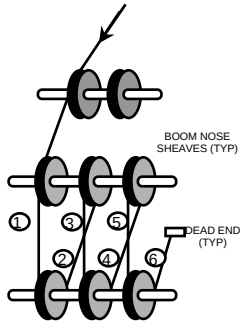
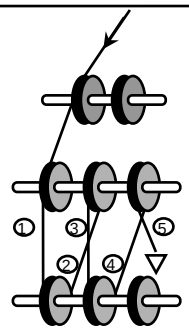
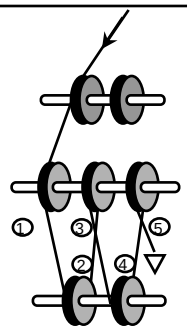
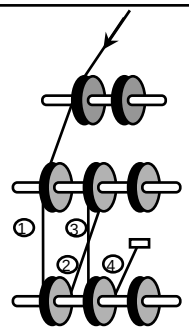
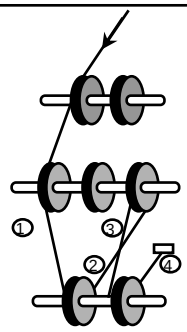
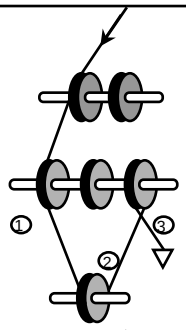
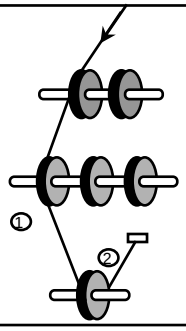
13,000 x 6 = 78,000 lb.



PICK GREATER LOADS

Remember: The load raises more slowly with multiple parts of line.

3 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES		HOOKBLOCK		
		UPPER	LOWER	3 SHEAVES	2 SHEAVES	1 SHEAVES
	6	2	3	 HOOKBLOCK SHEAVES (TYP)		
	5	2	3			
	4	2	3			
	3	2	3			
	2	2	2			

NOTE:
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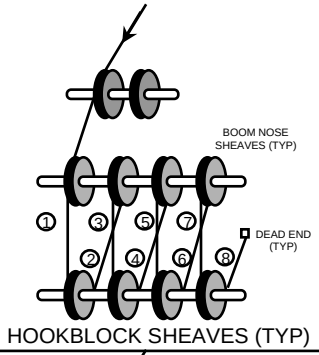
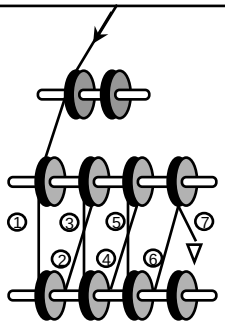
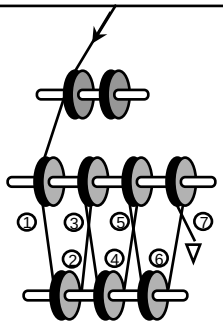
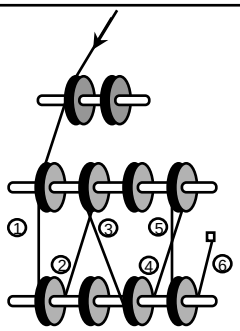
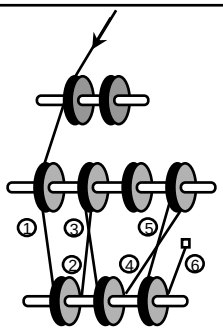
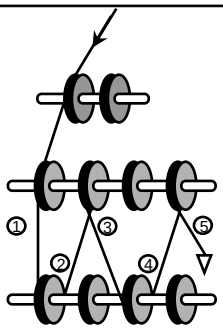
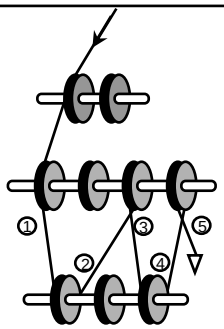
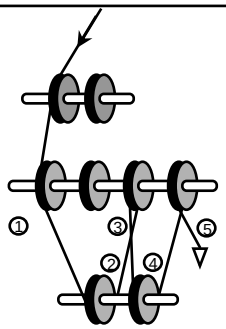
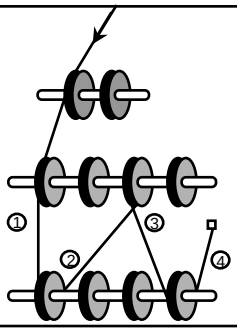
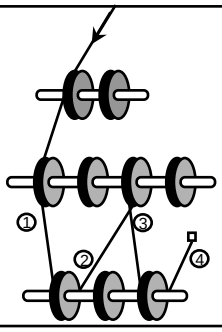
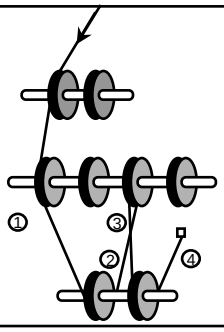
REFER TO LOAD CHART FOR LINE PULL AND REEVING.
□ DENOTES CABLE DEAD END ON BOOM NOSE.
▽ DENOTES CABLE DEAD END ON HOOKBLOCKS.
○ DENOTES CABLE DEAD END ON SWINGAWAY.

4 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES		HOOKBLOCK		
		UPPER	LOWER	4 SHEAVES	3 SHEAVES	2 SHEAVES
	8	2				
	7	2				
	6	2				
	5	2				
	4	2				

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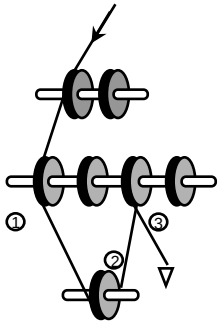
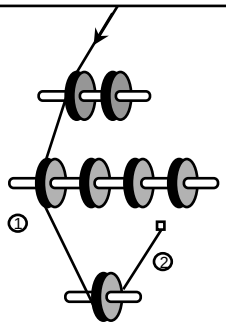
4 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES UPPER	BOOM NOSE SHEAVES LOWER	1 SHEAVE	HOOKBLOCK	
	3	2				
	2	2				

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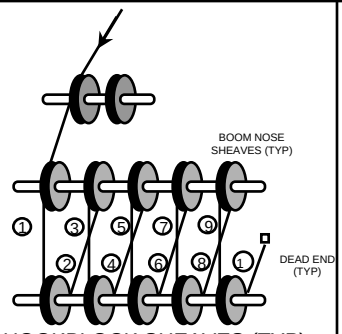
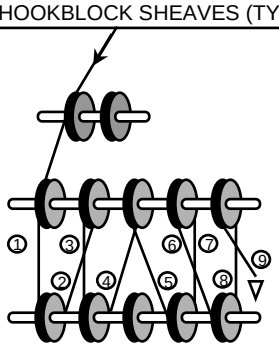
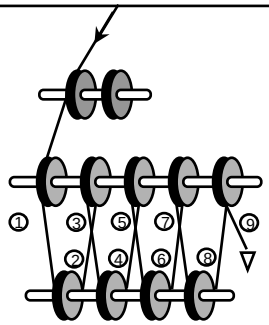
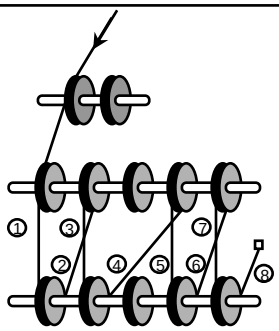
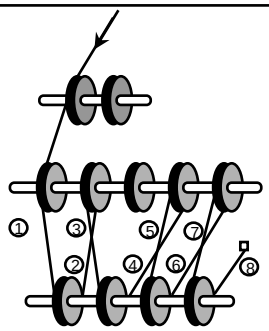
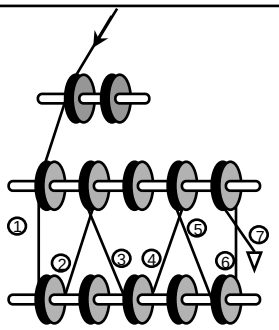
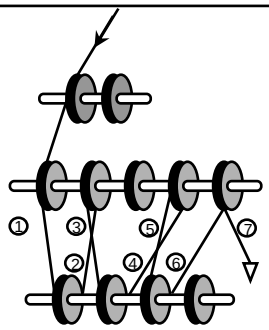
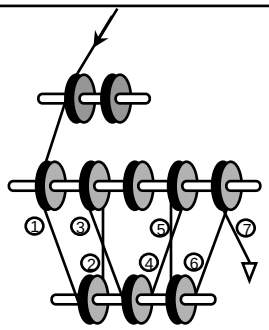
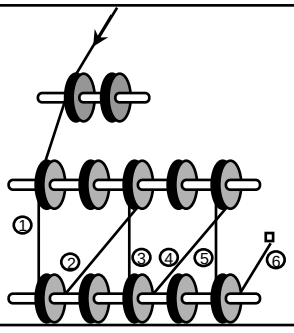
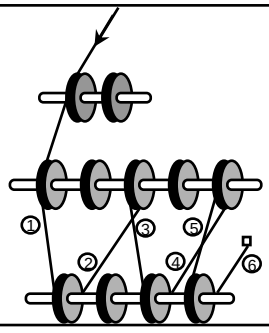
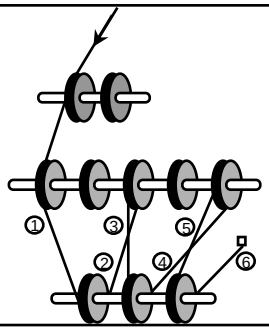
5 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES		HOOKBLOCK		
		UPPER	LOWER	5 SHEAVES	4 SHEAVES	3 SHEAVES
	10	2	5			
	9	2				
	8	2				
	7	2				
	6	2				

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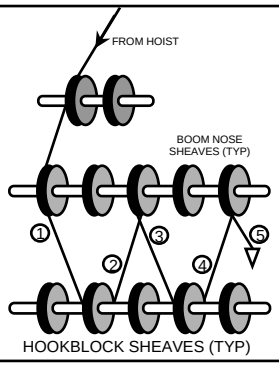
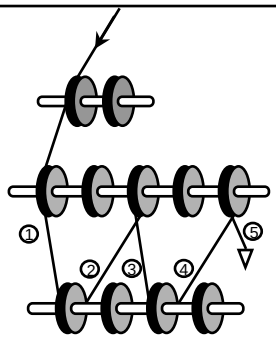
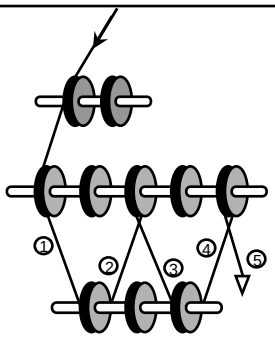
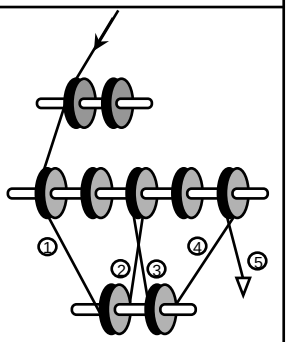
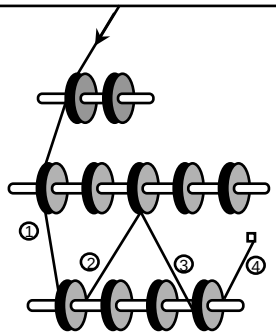
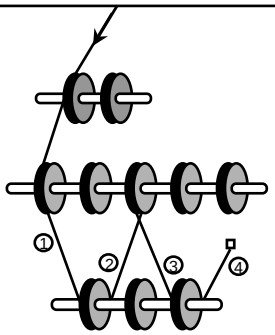
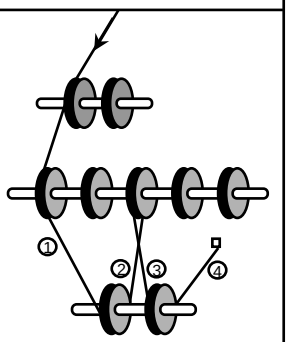
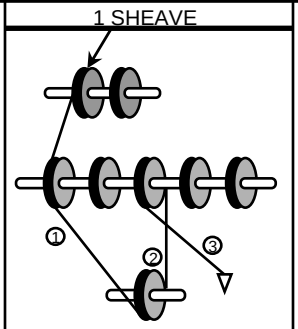
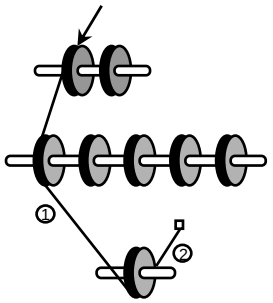
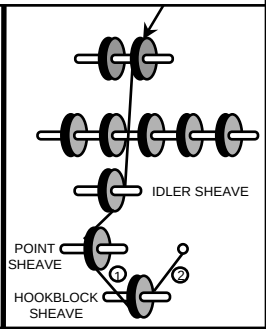
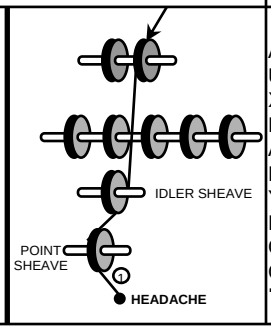
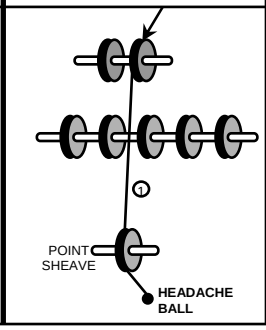
5 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES UPPER	BOOM NOSE SHEAVES LOWER	HOOKBLOCK 5 SHEAVES	HOOKBLOCK 4 SHEAVES	HOOKBLOCK 3 SHEAVES	HOOKBLOCK 2 SHEAVES
	5	2					
	4	2					
	3	2		1 SHEAVE 			
	2	2			SWINGAW 		
	1	2		SWINGAW 	AUXILIARY BOOM 		

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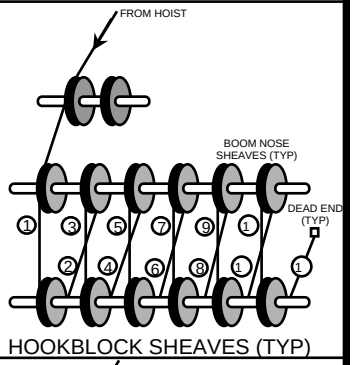
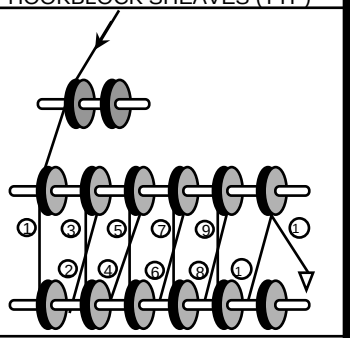
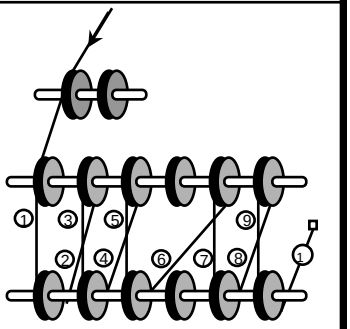
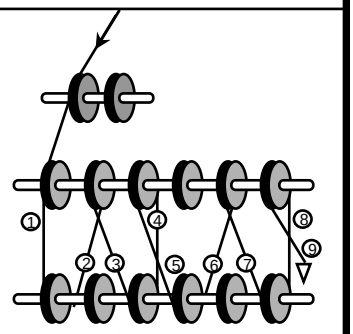
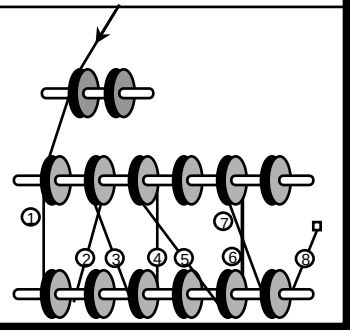
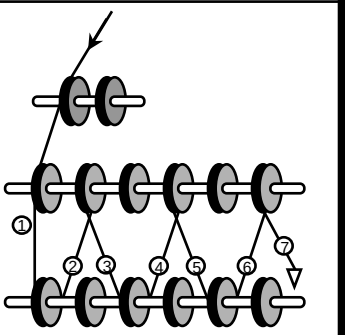
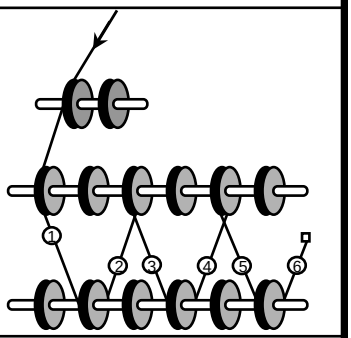
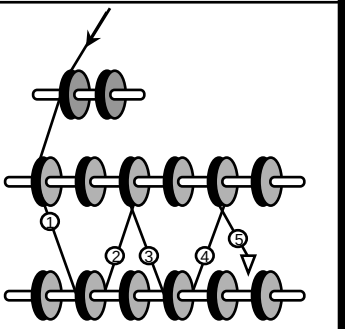
- ▽ DENOTES CABLE DEAD END ON HOOKBLOCKS.
- ○ DENOTES CABLE DEAD END ON SWINGAWAY.

6 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES UPPER	BOOM NOSE SHEAVES LOWER	HOOKBLOCK 6 SHEAVES
	12	2		 HOOKBLOCK SHEAVES (TYP)
	11	2		
	10	2	6	
	9	2		
	8	2		

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES UPPER	BOOM NOSE SHEAVES LOWER	HOOKBLOCK 6 SHEAVES
	7	2		
	6	2		
	5	2		

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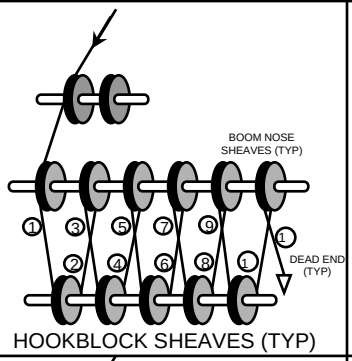
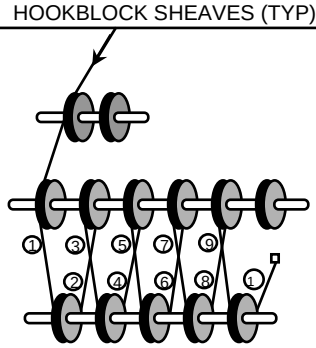
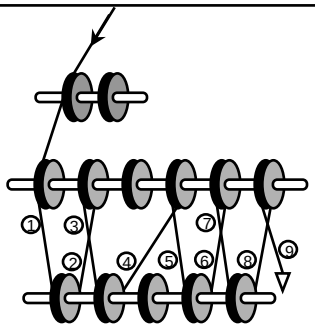
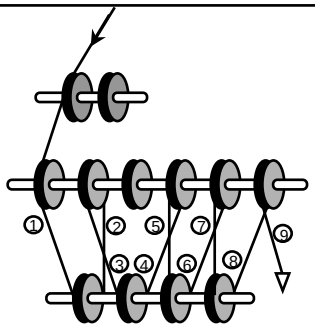
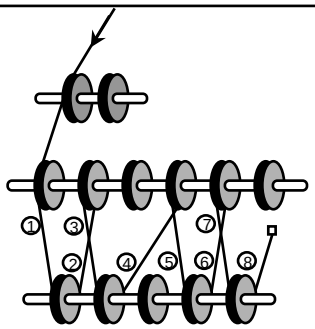
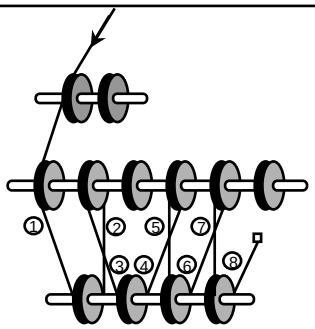
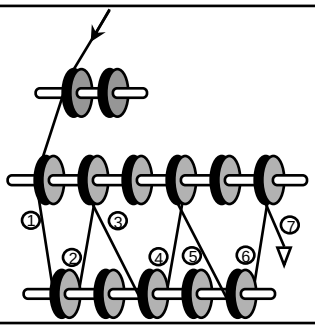
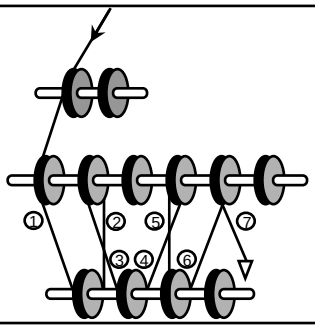
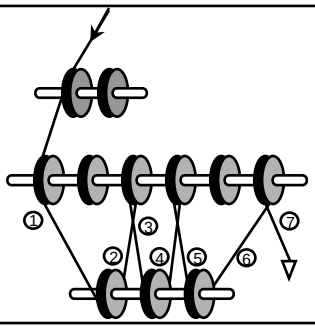
- ▽ DENOTES CABLE DEAD END ON HOOKBLOCKS.
- ⚬ DENOTES CABLE DEAD END ON SWINGAWAY.

6 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES		HOOKBLOCK		
		UPPER	LOWER	5 SHEAVES	4 SHEAVES	3 SHEAVES
	11	2	6			
	10	2	6			
	9	2				
	8	2				
	7	2				

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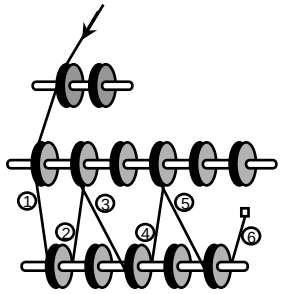
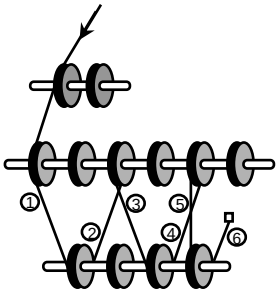
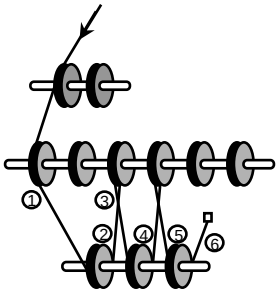
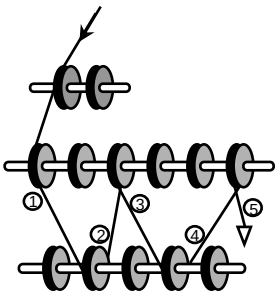
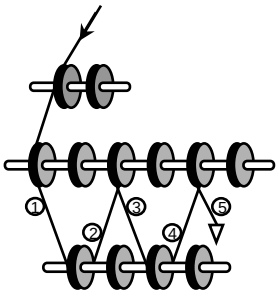
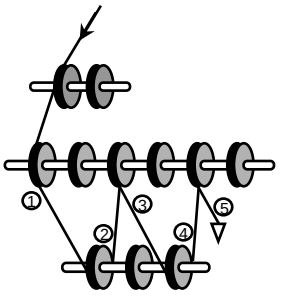
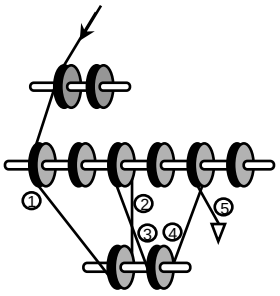
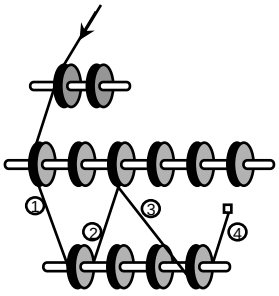
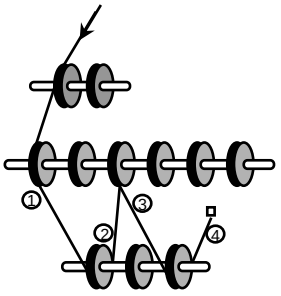
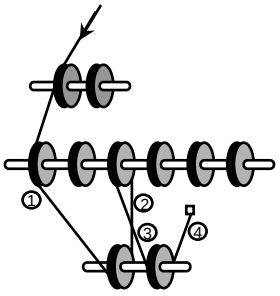
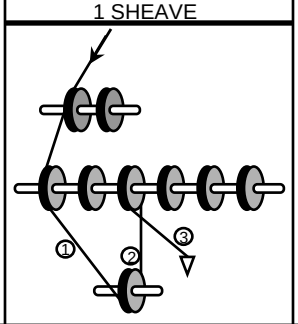
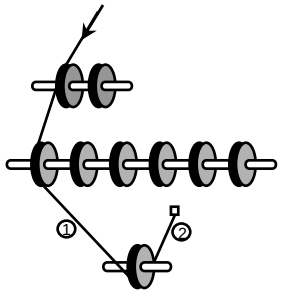
- ⚬ DENOTES CABLE DEAD END ON SWINGAWAY.

6 - SHEAVE BOOM NOSE

OPT. EQUIP.	PARTS OF	BOOM NOSE SHEAVES UPPER	BOOM NOSE SHEAVES LOWER	HOOKBLOCK 5 SHEAVES	HOOKBLOCK 4 SHEAVES	HOOKBLOCK 3 SHEAVES	HOOKBLOCK 2 SHEAVES
	6	2					
	5	2					
	4	2					
	3	2		1 SHEAVE 			
	2	2					

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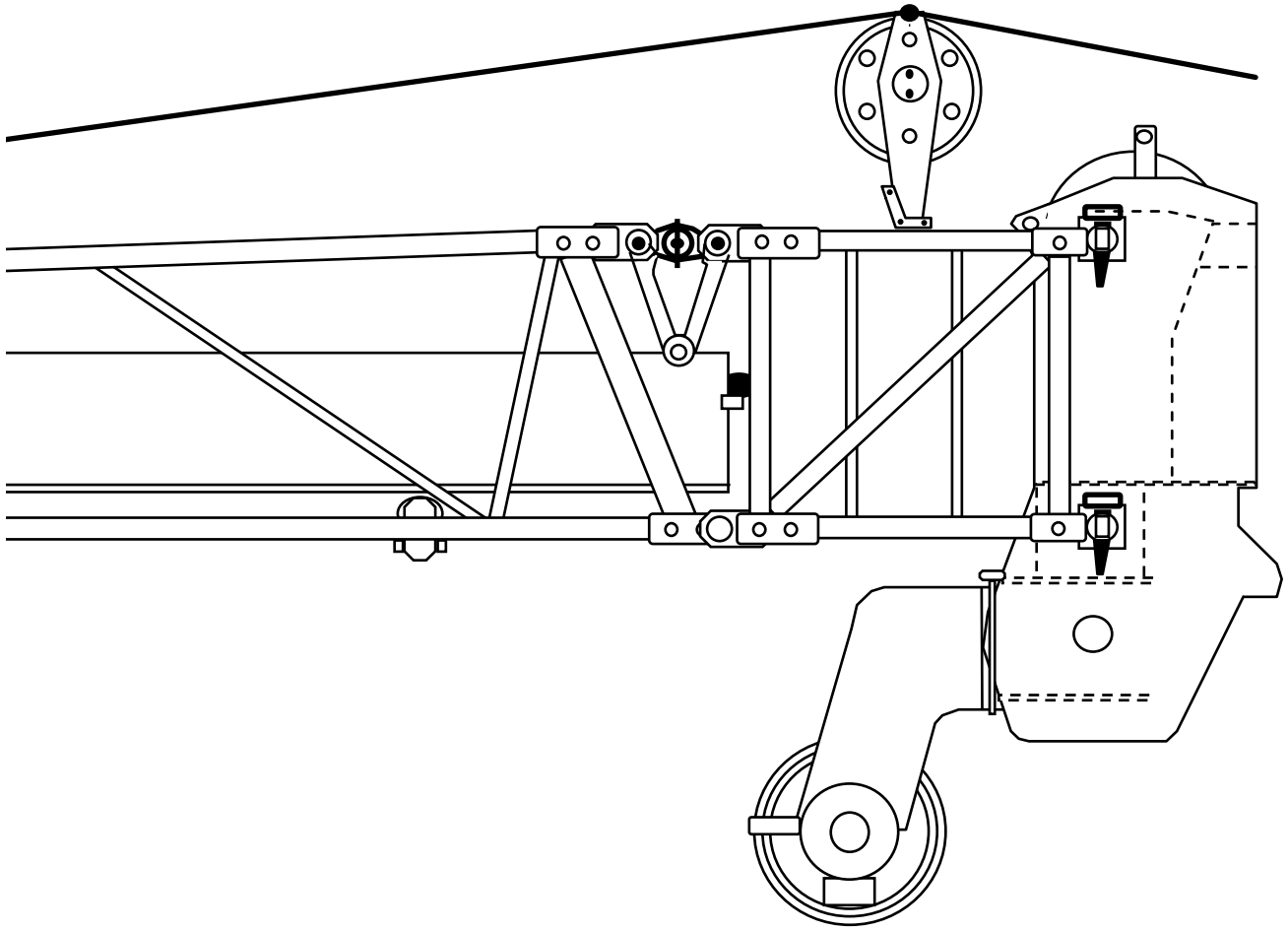
- ⚬ DENOTES CABLE DEAD END ON SWINGAWAY.

SWINGAWAY IDLER CABLE ROUTING



VIEW SHOWING CABLE IN THE OVER POSITION

SWINGAWAY IDLER CABLE ROUTING

	FIXED LENGTH NON-OFFSETTABLE	FIXED LENGTH OFFSETTABLE			TELESCOPIC OFFSETTABLE		
MODEL	**0 DEG.**	**0 DEG./2 DEG.**	**15 DEG.**	**30 DEG.**	**0 DEG./2 DEG.**	**15 DEG.**	**30 DEG.**
RT400	OVER	OVER	OVER	OVER	OVER	OVER	OVER
RT500C	OVER	OVER	OVER	OVER	OVER	OVER	OVER
RT500D	OVER	OVER	OVER	OVER	OVER	OVER	OVER
RT500DXL	OVER	OVER	OVER	OVER	OVER	OVER	OVER
RT600B	-	UNDER	UNDER	OVER	UNDER	UNDER	OVER
RT600C	-	OVER	-	OVER	OVER	-	OVER
RT700B	OVER	OVER	OVER	OVER	OVER	OVER	OVER
RT745	UNDER	OVER	OVER	OVER	OVER	OVER	OVER
RT760	UNDER	OVER	OVER	OVER	OVER	OVER	OVER
RT800B	-	OVER	-	OVER	OVER	-	OVER
RT875	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
RT880	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
RT990	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
RT9100	-	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
RT1650	-	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
RT528B	-	UNDER	UNDER	OVER	UNDER	UNDER	OVER
TMS250C	UNDER	UNDER	UNDER	OVER	UNDER	UNDER	OVER
TMS300B	UNDER	OVER	OVER	OVER	OVER	OVER	OVER
TMS475	UNDER	-	-	-	-	-	-
TMS700B	OVER	OVER	OVER	OVER	OVER	OVER	OVER
TMS760	-	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
TMS800B	OVER	OVER	OVER	OVER	OVER	OVER	OVER
TMS870	UNDER	OVER	OVER	OVER	OVER	OVER	OVER
TMS875	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
TM880	-	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
TM8100	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
TM9120	-	OVER	OVER	OVER	OVER	OVER	OVER
TM1300	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
TM9150	-	OVER	OVER	OVER	OVER	OVER	OVER
TM1500	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER	UNDER
AT400	OVER	OVER	OVER	OVER	OVER	OVER	OVER
AT635	OVER	OVER	OVER	OVER	OVER	OVER	OVER
AT700B	OVER	OVER	OVER	OVER	OVER	OVER	OVER
AT700BE	OVER	OVER	OVER	OVER	OVER	OVER	OVER
AT880	-	OVER	OVER	OVER	OVER	OVER	OVER
AT990	-	OVER	OVER	OVER	OVER	OVER	OVER
AT1100	-	OVER	OVER	OVER	OVER	OVER	OVER
AT9120	-	OVER	OVER	OVER	OVER	OVER	OVER
CM20	OVER	OVER	OVER	OVER	OVER	OVER	OVER
TTS870	OVER	OVER	OVER	OVER	OVER	OVER	OVER
TT875	-	OVER	OVER	OVER	OVER	OVER	OVER

*TM9100: Offsets for 1^{o},25^{o} & 45^{o} all are positioned over idler sheave.

	FIXED LENGTH NON-OFFSETTABLE	FIXED LENGTH OFFSETTABLE	FOLDING OFFSETTABLE	TELESCOPIC OFFSETTABLE	LUFFING BOOM OFFSETTABLE
MODEL					
RT522B	OVER	-	-	-	-
RT530E	-	OVER	-	OVER	-
RT600E	-	OVER	-	OVER	-
RT700E	-	OVER *	OVER *	-	-
RT855B	-	OVER	-	OVER	-
RT860	-	OVER	-	OVER	-
RT865B	-	OVER	-	OVER	-
RT870	-	OVER	-	OVER	-
TMS500E	-	OVER	-	OVER	-
TMS540	-	OVER	OVER	-	-
TMS640	-	OVER	-	OVER	-
TMS700E	-	OVER *	OVER *	-	-
TMS875C	-	OVER	OVER	OVER	OVER
TTS875C	-	OVER	OVER	-	OVER
ATS540	-	OVER	OVER	-	-

* RT700E and TMS700E for zero (0) degree offset, leave the mast in the stowed position.

DEAD-END RIGGING/WEDGE SOCKETS

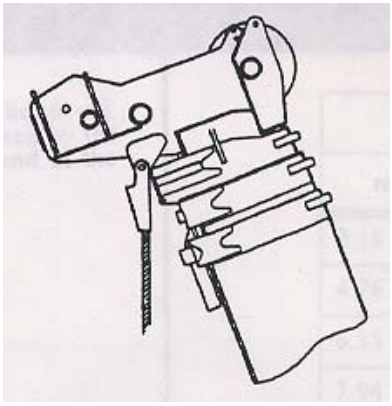
Wedge socket assemblies are popular rigging accessories and have been successfully used for decades to terminate wire ropes on mobile cranes. A wedge socket assembly is easily installed and dismantled but it must be installed and used correctly. It is essential to use only a wedge and socket of the correct size for the rope fitted. Failure to do so may result in the rope pulling through the fitting.

Since state and local laws may vary, alternate attachment methods may be necessary depending upon work conditions. If alternate methods are selected, the user is responsible and should proceed in compliance with the regulations in force. If there are any questions, contact your local Grove Distributor or Grove Product Support.

Do not mix components from different manufacturers. ***The selection, installation and use of a wedge socket assembly must be in accordance with the requirements of the wedge socket manufacturer and the wire rope manufacturer upon whose wire rope the wedge socket assembly will be used.***

Grove Crane specifies the size, type, class and line pulls for wire rope, predominantly rotation resistant wire rope, and rigging accessories such as overhaul balls and hook blocks for use with each new crane that it manufactures. Other wire ropes and rigging accessories are available from various vendors. Different wire rope manufacturers have differing requirements for the construction, handling, cutting, seizing, installation, termination, inspection and replacement of the wire ropes they produce. Their advice should be sought for each specific type of wire rope a crane user intends to install on a mobile crane.

When assembly is complete, the boom should be raised to a working position and a load suspended to firmly seat the wedge and rope into the socket before the crane is used operationally.



CAUTION

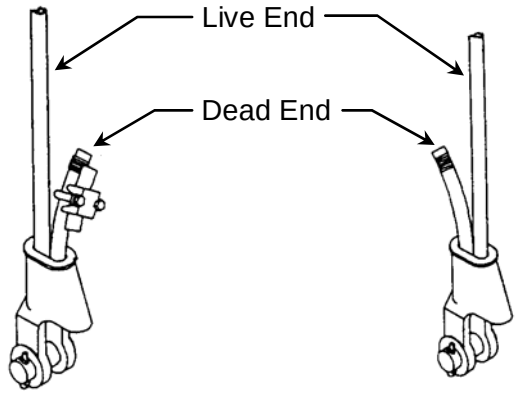
IF THE SOCKET IS NOT POSITIONED
WITH THE FLAT FACE TOWARDS
THE BOOM SECTIONS, STRUCTURAL
DAMAGE WILL OCCUR.

When anchoring the socket to the boom, ensure the flat face of the socket is in position as shown towards the boom sections.

INSTALLING THE WEDGE AND SOCKET

1. Inspect the wedge and socket; remove any rough edges and burrs.

2. The end of the wire rope should be seized using soft, or annealed wire or strand. If the end of the rope is welded, the welded end should be cut off. This will allow the distortion of the rope strands, caused by the bend around the wedge, to adjust themselves at the end of the line.



Right Wrong

3. Ensure the live-loaded-side of the rope is ***directly*** in line with the ears of the socket ***and the direction of pull to which the rope will be subjected***. If the rope is loaded into the socket incorrectly, under a load the rope will bend as it leaves the socket and the edge of the socket will wear into the rope causing damage to the rope and eventual failure.

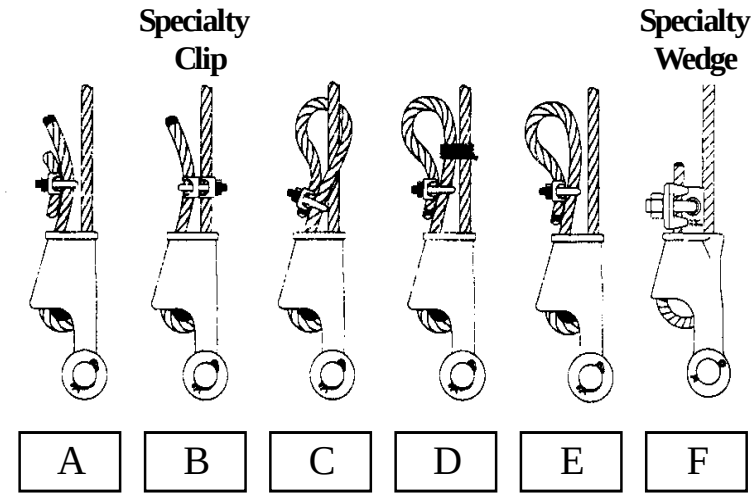
4. ***Insert the end of a wire rope into the socket, form a loop in the rope, and route the rope back through the socket allowing the "dead" end to protrude from the socket. Ensure the dead end of the rope is of sufficient length to apply end treatment to the dead end after the wedge has been seated.***

5. ***Insert the wedge into the loop and pull the live end of the rope until the wedge and rope are snug inside the socket. It is recommended that the wedge be seated inside the socket to properly secure the wire rope by using the crane's hoist to first apply a light load to the live line.***

6. After final pin connections are made, increase the loads gradually until the wedge is properly seated.

7. ***The wire rope and wedge must be properly secured inside the socket before placing the crane into lifting service. It is the wedge that secures the wire rope inside the socket where as the dead-end treatment is used to restrain the wedge from becoming dislodged from the socket should the rope suddenly become unloaded from the headache ball or hook block striking the ground, etc.***

Sketches A through F illustrate various methods for treating the dead-ends of wire ropes which egress a wedge socket assembly. While use of the loop-back method is acceptable, care must be exercised to avoid the loop becoming entangled with tree branches and other components during crane transport and with the anti two block system and other components during use of the crane. Of the methods shown below, Grove prefers that method A or B or F be used on Grove cranes, i.e., clipping a short a short piece of wire rope to the dead-end or using a commercially available specialty clip or wedge. Typically, it is recommended that the tail length of the dead-end should be a minimum of 6 rope diameters but not less than 6 inches for standard 6 to 8 strand ropes and 20 rope diameters but not less than 6 inches for rotation resistant wire ropes.



When using method A, place a wire rope clip around the dead end by clamping a short extra piece of rope to the rope dead end. DO NOT CLAMP THE LIVE END. The U-bolt should bear against the dead end. The saddle of the clip should bear against the short extra piece. Torque the U-bolts according to the figures listed in the chart titled Wire Rope Clip Torque Values.

Clip Sizes		*Torque	
mm	**Inches**	**Nm**	**Ft-Lbs**
3.18	**1/8**	**6**	**4.5**
4.76	**3/16**	**10**	**7.5**
6.35	**1/4**	**20**	**15**
7.94	**5/16**	**40**	**30**
13.28	**3/8**	**60**	**45**
11.11	**7/16**	**90**	**65**
12.70	**1/2**	**90**	**65**
14.29	**9/16**	**130**	**95**
15.88	**5/8**	**130**	**95**
19.05	**3/4**	**175**	**130**
22.23	**7/8**	**300**	**225**
25.40	**1**	**300**	**225**
28.58	**1-1/8**	**300**	**225**
31.75	**1-1/4**	**490**	**360**
38.68	**1-3/8**	**490**	**360**
38.10	**1-1/2**	**490**	**360**

Wire Rope Clip Torque Values

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

Other sources for information with which crane users should be familiar and follow is provided by the American Society of Mechanical Engineers, American National Standard, ASME B30.5, latest revised. ASME (formerly ANSI) B30.5 applies to cableways, cranes, derricks, hoists, hooks, jacks, and slings and states, in section 5-1.7.3, "(c) Swaged, compressed, or wedge socket fittings shall be applied as recommended by the rope, crane or fitting manufacture". Wire ropes are addressed in ASME B30.5, section 5-1.7.2, Ropes, which states, in pertinent part, "(a) The ropes shall be of a construction recommended by the rope or crane manufacturer, or person qualified for that service." Additional information is published by the Wire Rope Technical Board in the Wire Rope Users Manual, latest revised.