

LOAD CHART PRACTICE EXERCISES

FOLDING BOOM CRANE

Hiab XS 288 Boom Truck Crane



CraneSafe Certification

Folding Boom Crane PRACTICE EXERCISES
LC.FB22.HBXS288.PEX3 (101109)

27 May 2010



CraneSafe Certification + Fulford Harbour Group
Tel: 604.952.6033 | www.fulford.ca

Introduction

These 6 questions are for you to use to help get ready for the load chart and rigging part of the CraneSafe Certification assessment for Folding Boom Truck Crane.

The questions on your assessment will be different from these but will be presented in the same format as these questions.

With the questions are the answers with the relevant load charts. The answers explain how we arrived at the correct answer and you can use this to help work through any questions you may have gotten incorrect. We have not included all of the charts for this crane - but everything you need to answer the questions is included. You do not need the crane manual or full load chart package to answer the questions.

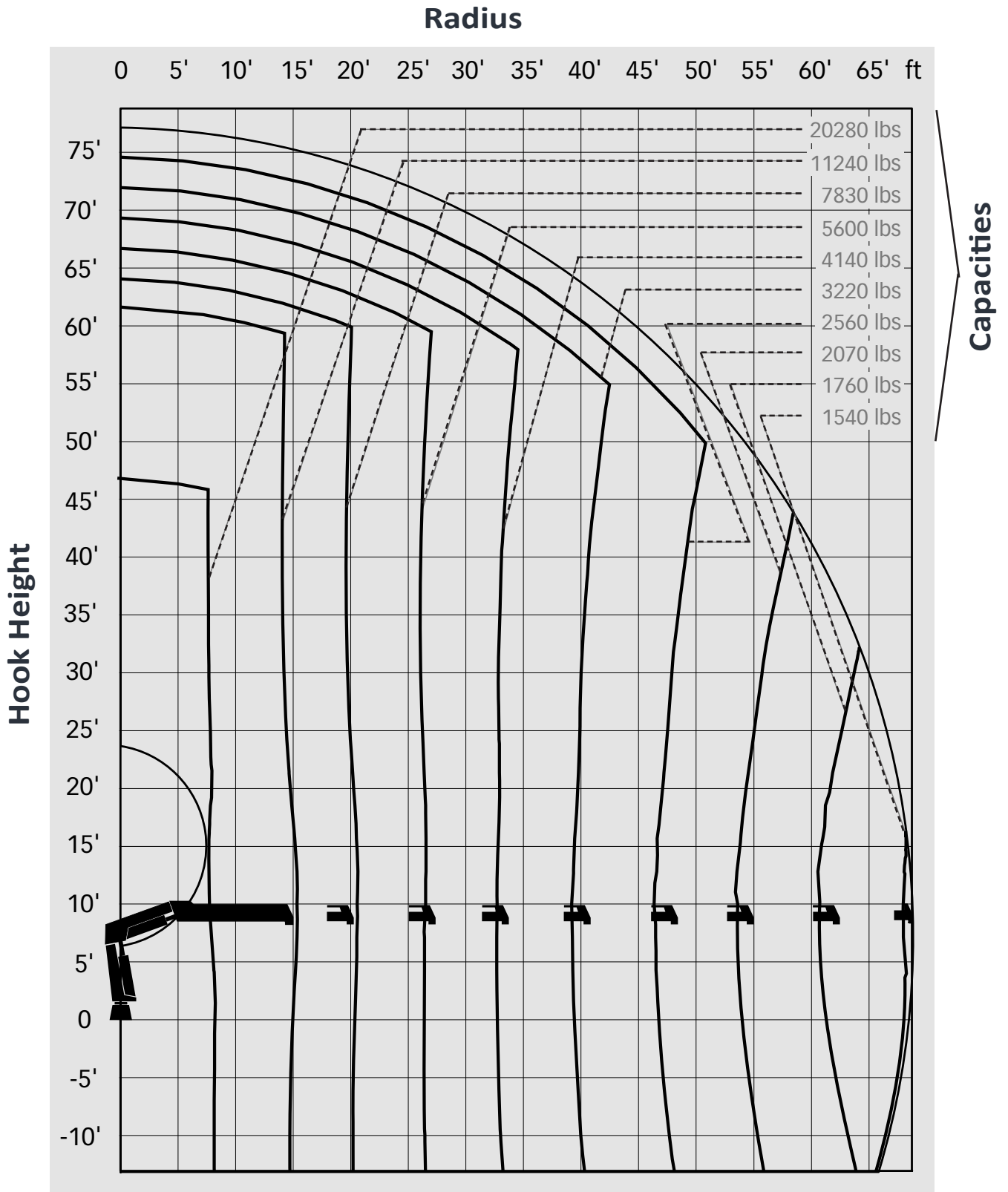
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Fulford CraneSafe Certification
#202 - 7950 Huston Road, Delta, BC, V4G 1C2, Canada
Toll free: 1.888.952.6033
Lower Mainland: 604.952.6033
Fax: 604.952.6088
info@fulford.ca

Load Chart



*These charts are for assessment purposes only and should not be used to operate a crane.
The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.*

Load Chart Questions

1. What is the GROSS CAPACITY of the Hiab based on the following configuration?

- Hook height – 50 feet
- Radius – 30 feet

Answer: _____ pounds

2. What is the NET CAPACITY of the Hiab based on the following configuration?

- Hook Height – 55 feet
- Radius – 17 feet
- Rigging – 80 lbs

Answer: _____ pounds

3. What is the MAXIMUM RADIUS the load can be placed based on the following configuration?

- Load weight – 1,450 lbs
- Pallet forks – 350 lbs
- Hook height – 25 feet

Answer: _____ feet

4. What is the MAXIMUM RADIUS the following load can be lifted from the truck bed and placed on the ground, based on the following configuration?

- Load weight 6000 lbs
- Rigging 120 lbs

Answer: _____ feet

Load Chart Answers

Q1 – Gross Capacity

1. What is the GROSS CAPACITY of the Hiab based on the following configuration?

- Hook height – 50 feet
- Radius – 30 feet

Answer: **4,140 pounds**

Find the intersection of the hook height line at 50 feet and the radius line at 30 foot (shown by the **X** on the load chart).

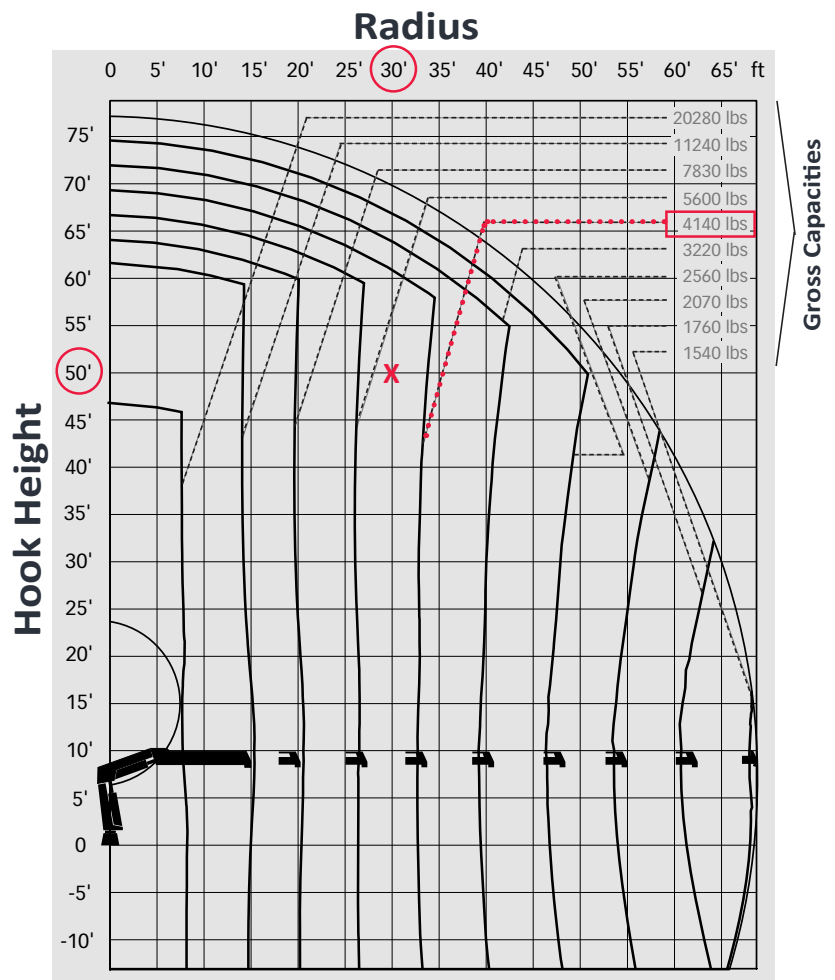
Because it's in between the listed capacities, you must go to the lower capacity (first bold line to the right of the **X**).

From the bold line, follow the red line that to the capacity (listed on the right hand side of the chart).

Gross Capacity = 4,140 pounds

NOTE:

Whenever the hook height and radius intersect between bold lines, the capacity is determined by going to the next bold line to the right (the lower capacity).



Q2 – Net Capacity

2. What is the NET CAPACITY of the Hiab based on the following configuration?

- Hook Height – 55 feet
- Radius – 17 feet
- Rigging – 80 lbs

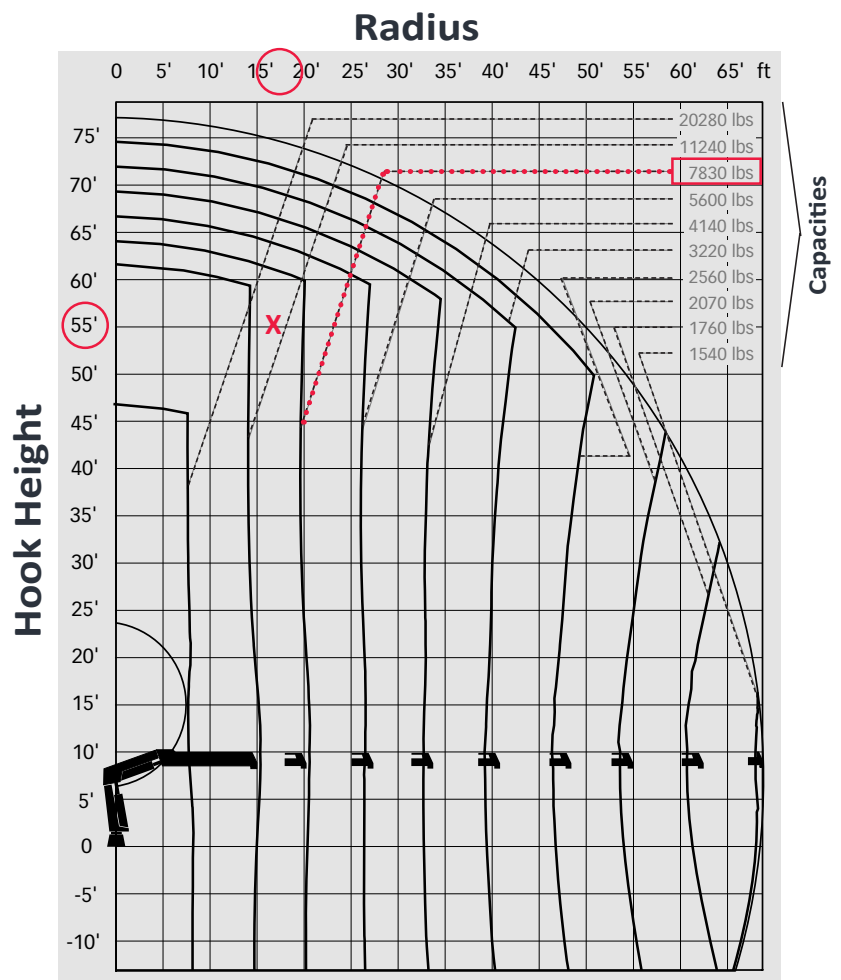
Answer: **7,750 pounds**

Net Capacity = Gross Capacity – Load Handling Devices

The Gross Capacity at a height of 55 feet and a radius of 17 feet is 7,830 lbs.

The weight of the rigging is 80 lbs.

$$7,830 \text{ lbs} - 80 \text{ lbs} = 7,750 \text{ lbs}$$



Q3 – Maximum Radius

3. What is the MAXIMUM RADIUS the load can be placed based on the following configuration?

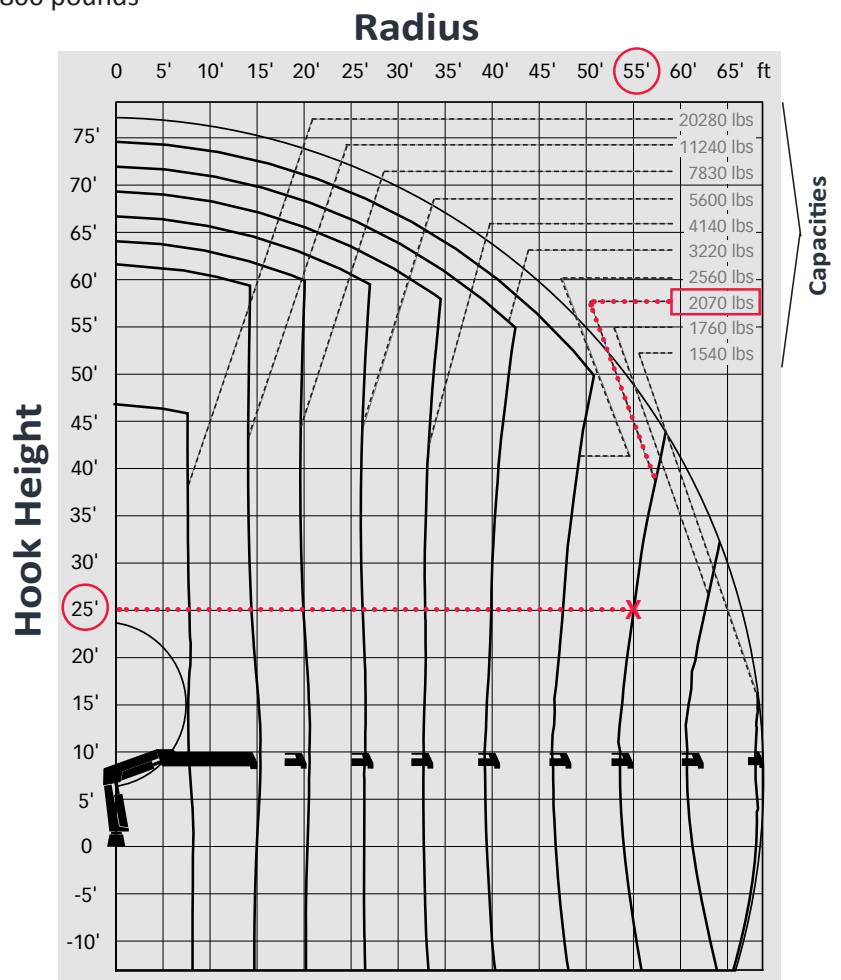
- Load weight – 1,450 lbs
- Pallet forks – 350 lbs
- Hook height – 25 feet

Answer: **55 feet**

$$\begin{aligned} \text{Gross Load} &= \text{Load Weight} + \text{Load Handling Devices} \\ &= 1,450 \text{ lbs} + 350 \text{ lbs} = 1,800 \text{ pounds} \end{aligned}$$

Follow across the 25 foot hook height line until you come to the bold line which has a capacity that is equal to or greater than the gross load of 1,800 lbs.

Maximum Radius is 55 feet at a hook height of 25 feet.



Q4 – Maximum Radius

4. What is the MAXIMUM RADIUS the following load can be lifted from the truck bed and placed on the ground, based on the following configuration?

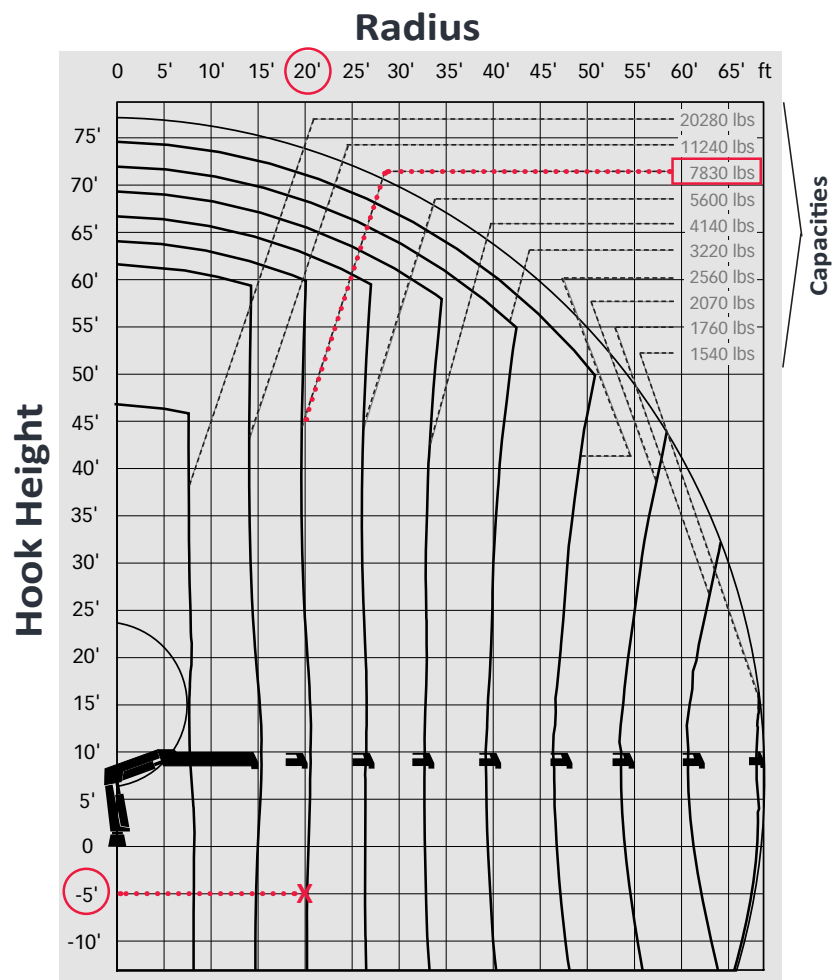
- Load weight – 6,000 lbs
- Rigging – 120 lbs

Answer: **20 feet at a hook height of -5 feet**

$$\begin{aligned} \text{Gross Load on Crane} &= \text{Load Weight} + \text{Load Handling Devices} \\ &= 6,000 \text{ lbs} + 120 \text{ lbs} = 6,120 \text{ pounds} \end{aligned}$$




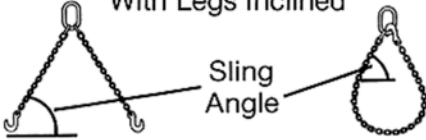
Follow across the -5 foot hook height line until you come to the bold line which has a capacity that is equal to or greater than the gross load on the crane.

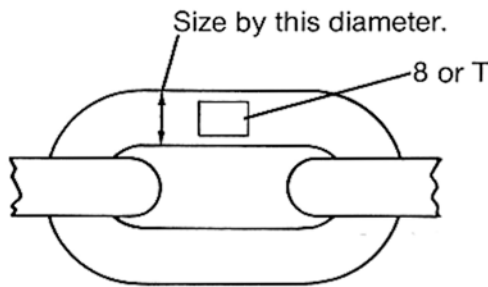
Maximum Radius is 20 feet at a hook height of -5 feet.



Rigging Charts

CHAIN SLINGS

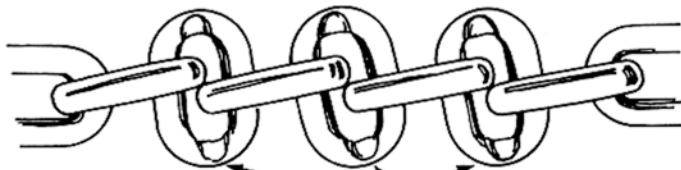
GRADE T (8) ALLOY STEEL						
Chain Size (Inches)	Working Load Limit in pounds					
	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined		
						
			60°	45°	30°	
1/4	2,800	2,100	5,600	4,850	3,959	2,800
3/8	5,680	4,260	11,360	9,838	8,032	5,680
1/2	9,600	7,200	19,200	16,627	13,574	9,600
5/8	14,480	10,860	28,960	25,079	20,475	14,480
3/4	22,640	16,980	45,280	39,212	32,013	22,640
7/8	27,360	20,520	54,720	47,388	38,687	27,360
1	38,160	28,620	76,320	66,093	53,958	38,160
1 1/4	57,840	43,380	115,680	100,179	81,786	57,840



Use only alloy steel chain. Links will be stamped with 8 or T.

When using a 2-leg bridle in a choker hitch configuration, multiply the above values by **.75**.

When using a double basket hitch configuration, multiply the above values by **2**.







Discard if more than 10% wear at bearing surfaces.

Note: For training and assessment use only.






These charts are for assessment purposes only and should not be used to operate a crane. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

NYLON WEB SLINGS

6800 lb/in Material						
Web Width (Inches)	Working Load Limit in pounds					
	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined		
					60°	45°
1	1,100	825	2,200	1,905	1,555	1,100
2	2,200	1,650	4,400	3,810	3,110	2,200
3	3,300	2,475	6,600	5,715	4,665	3,300
4	4,400	3,300	8,800	7,620	6,220	4,400
5	5,500	4,125	11,000	9,525	7,775	5,500
6	6,600	4,950	13,200	11,430	9,330	6,600
				<p>When using a 2-leg bridle in a choker hitch configuration, multiply the above values by .75.</p> <p>When using a double basket hitch configuration, multiply the above values by 2.</p>		
<p>Note: Capacities are for flat eye, twisted eye and triangle fittings. For training and assessment use only.</p>						

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WIRE ROPE SLINGS

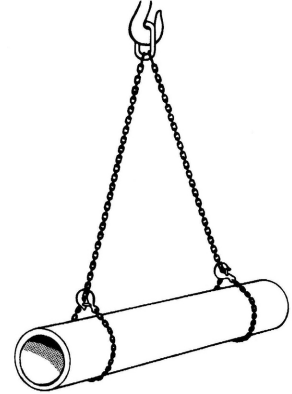
6 x 19 Classification Group, Improved Plow Steel, IWRC							
Rope Diameter (Inches)	Working Load Limit in pounds						
	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined			
						Sling Angle	
			60°	45°	30°		
3/16	650	480	1,300	1,100	900	650	
1/4	1,150	860	2,300	2,000	1,600	1,150	
5/16	1,750	1,300	3,500	3,000	2,500	1,750	
3/8	2,550	1,900	5,100	4,400	3,600	2,550	
7/16	3,450	2,600	6,900	6,000	4,900	3,450	
1/2	4,700	3,500	9,400	8,150	6,650	4,700	
9/16	5,700	4,200	11,400	9,900	8,050	5,700	
5/8	7,100	5,300	14,200	12,300	10,000	7,100	
3/4	10,200	7,650	20,400	17,700	14,400	10,200	
7/8	13,750	10,300	27,500	23,800	19,400	13,750	
1	17,950	13,450	35,900	31,100	25,400	17,950	
1 1/8	22,750	17,000	45,500	39,400	32,200	22,750	
1 1/4	28,200	21,200	56,400	48,800	39,900	28,200	
1 3/8	34,800	26,100	69,600	60,300	49,200	34,800	
1 1/2	41,300	31,000	82,600	71,500	58,400	41,300	
<p>When using a 2-leg bridle in a choker hitch configuration, multiply the above values by .75.</p> <p>When using a double basket hitch configuration, multiply the above values by 2.</p>							
<p>Note: For training and assessment use only.</p>							

These charts are for assessment purposes only and should not be used to operate a crane. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Rigging Questions

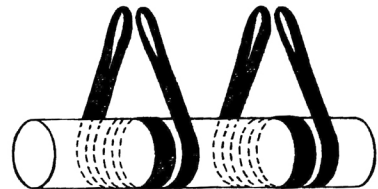
1. What is the minimum size of 2-leg chain required to lift a load of 10,000 pounds?
The bridle is choked at a 45 degree angle.

Answer: _____ inch



2. What is the minimum size of nylon web slings required to lift a load of 10,500 pounds?
The two web slings are in a double basket hitch configuration at a 30 degree angle.

Answer: _____ inch



Rigging Answers

Q1 – Chain Slings / 2-Leg Bridle Choked





- What is the minimum size of 2-leg chain required to lift a load of 10,000 pounds?
The bridle is choked at a 45 degree angle.

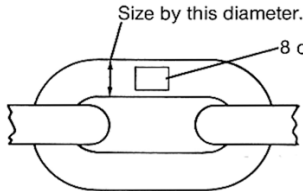
Answer: 1/2 inch

The capacity for a 1/2 inch 2-leg chain bridle at a 45 degree angle is 13,574 pounds.

The bridle is choked:
 $13,574 \text{ pounds} \times .75 =$
 10,180 pounds
 (which is greater than the load weight of 10,000 pounds)

CHAIN SLINGS

GRADE T (8) ALLOY STEEL						
Chain Size (Inches)	Working Load Limit in pounds					
	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined		
					Sling Angle	
				60°	45°	30°
1/4	2,800	2,100	5,600	4,850	3,959	2,800
3/8	5,680	4,260	11,360	9,838	8,032	5,680
1/2	9,600	7,200	19,200	16,627	13,574	9,600
5/8	14,480	10,860	28,960	25,079	20,475	14,480
3/4	22,640	16,980	45,280	39,212	32,013	22,640
7/8	27,360	20,520	54,720	47,388	38,687	27,360
1	38,160	28,620	76,320	66,093	53,958	38,160
1 1/4	57,840	43,380	115,680	100,179	81,786	57,840



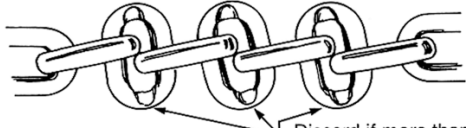
Size by this diameter.

8 or T

Use only alloy steel chain. Links will be stamped with 8 or T.

When using a 2-leg bridle in a choker hitch configuration, multiply the above values by .75.

When using a double basket hitch configuration, multiply the above values by 2.



Discard if more than 10% wear at bearing surfaces.

Note: For training and assessment use only.

Q2 – Nylon Web Slings / Double Basket Hitch

2. What is the minimum size of nylon web slings required to lift a load of 10,500 pounds?
The two web slings are in a double basket hitch configuration at a 30 degree angle.

Answer: **5 inch**

The capacity of one 5 inch web sling in a single basket hitch configuration is 5,500 pounds.




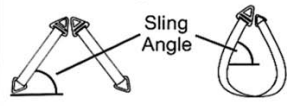
The hitch is a double basket:

$$5,500 \text{ pounds} \times 2 =$$

11,000 pounds

(which is greater than the load weight of 10,500 pounds)

NYLON WEB SLINGS

6800 lb/in Material						
Web Width (Inches)	Working Load Limit in pounds					
	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch & Single Basket Hitch With Legs Inclined		
						
				60°	45°	30°
1	1,100	825	2,200	1,905	1,555	1,100
2	2,200	1,650	4,400	3,810	3,110	2,200
3	3,300	2,475	6,600	5,715	4,665	3,300
4	4,400	3,300	8,800	7,620	6,220	4,400
5	5,500	4,125	11,000	9,525	7,775	5,500
6	6,600	4,950	13,200	11,430	9,330	6,600
<p>When using a 2-leg bridle in a choker hitch configuration, multiply the above values by .75.</p> <p>When using a double basket hitch configuration, multiply the above values by 2.</p>						
<p>Note: Capacities are for flat eye, twisted eye and triangle fittings. For training and assessment use only.</p>						