



# Introduction To Lifting Plan

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# Definitions

## Lifting Operation

Regulation 8(2) of LOLER defines a lifting operation as '... an operation concerned with the lifting or lowering of a load'. A 'load' is the item or items being lifted, which includes a person or people.

## Lifting Equipment

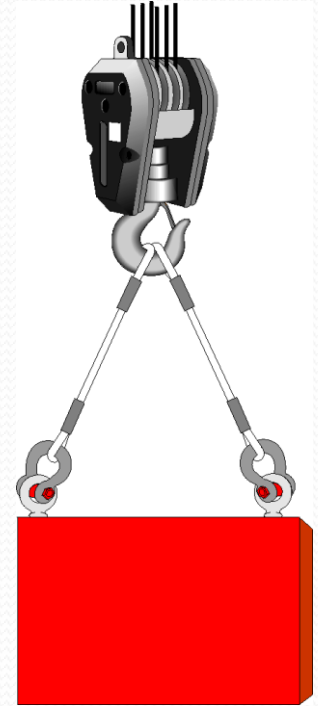
'Lifting equipment' means work equipment for lifting and lowering loads. This includes lifting accessories and attachments used for anchoring, fixing or supporting the equipment



# Definitions

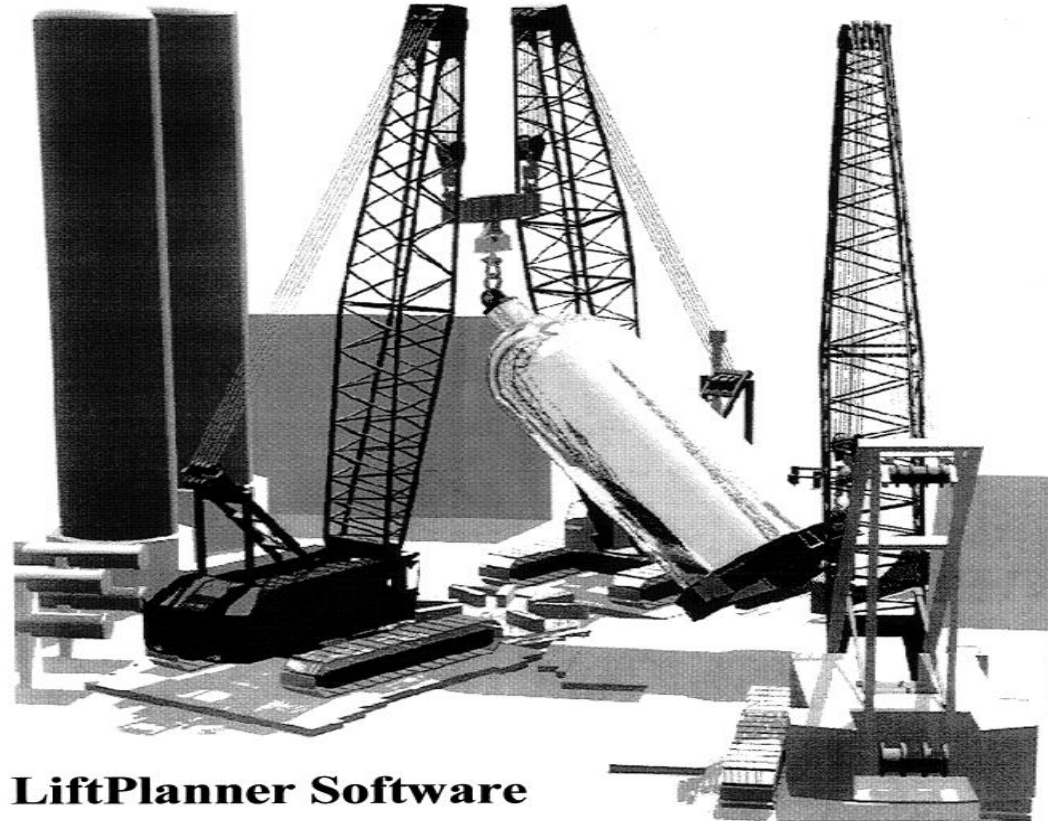
## **Lifting Accessory:**

Means any sling, shackle, swivel, ring, hook or other appliances, including lifting beams, frames and spreaders, used in connection with a lifting appliance or from the hook of a crane.



## Definitions

**Heavy Lift Crane:**  
A crane which requires an assist crane during assembly and erection on-site, any crane using a 'super-lift' or any marine crane performing a Heavy Lift as defined above.



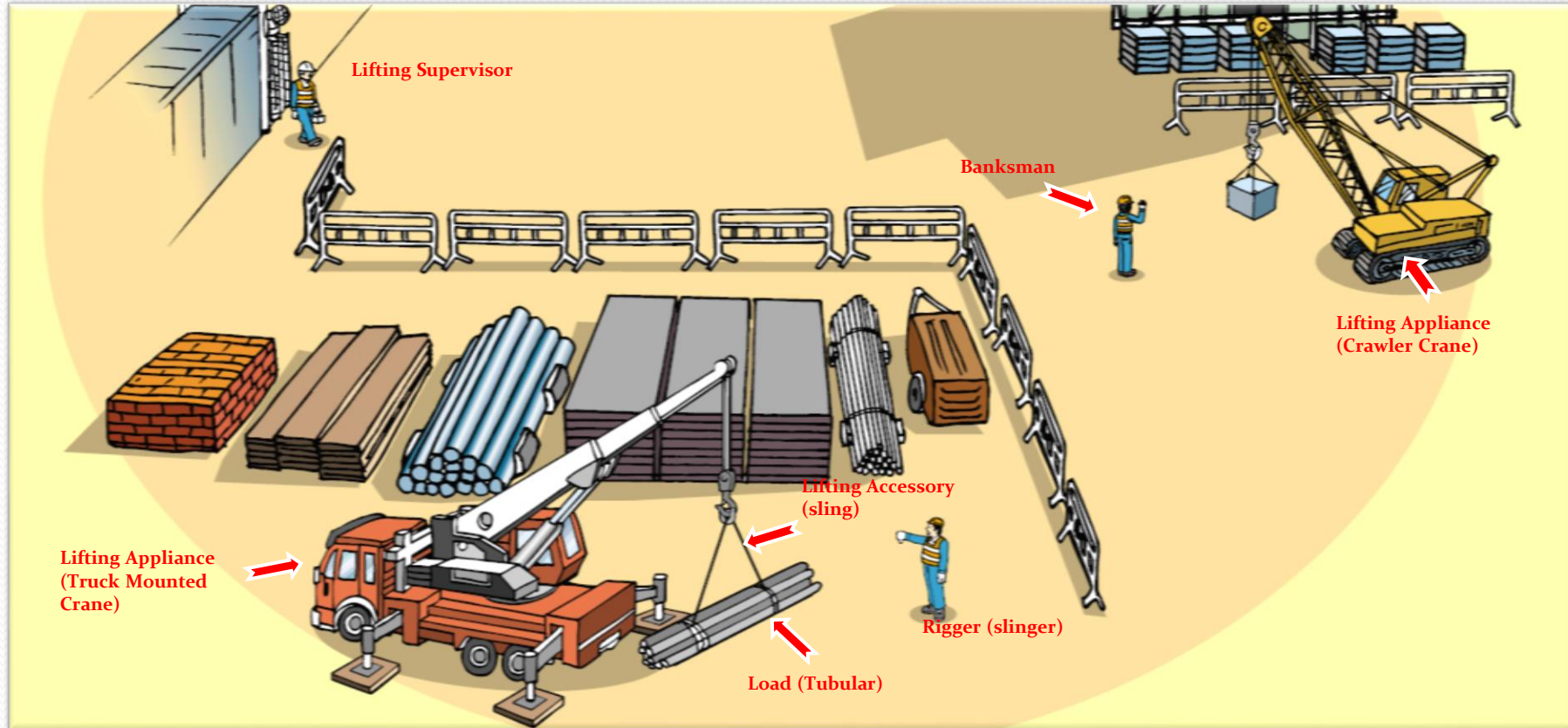
**LiftPlanner Software**

# Definitions

## Competent Person

- A Competent Person is the person concerned with the testing, examination and certification of lifting accessory.
- He should have such practical and theoretical knowledge and experience of the equipment which is to be tested, examined and certified that will enable him/her to detect defects or weaknesses which it is the purpose of the examination to discover and to assess their importance to the safety of the accessory.
- He should have the maturity to seek such specialist advice and assistance as may be required to enable him/her to make necessary judgements and be a sound judge of the extent to which he/she can accept the supporting opinions of other specialists.
- He must be able to certify with confidence whether it is free from patent defect and suitable in every way for the duty for which the accessory is required.

# Definitions and principles of lifting equipment





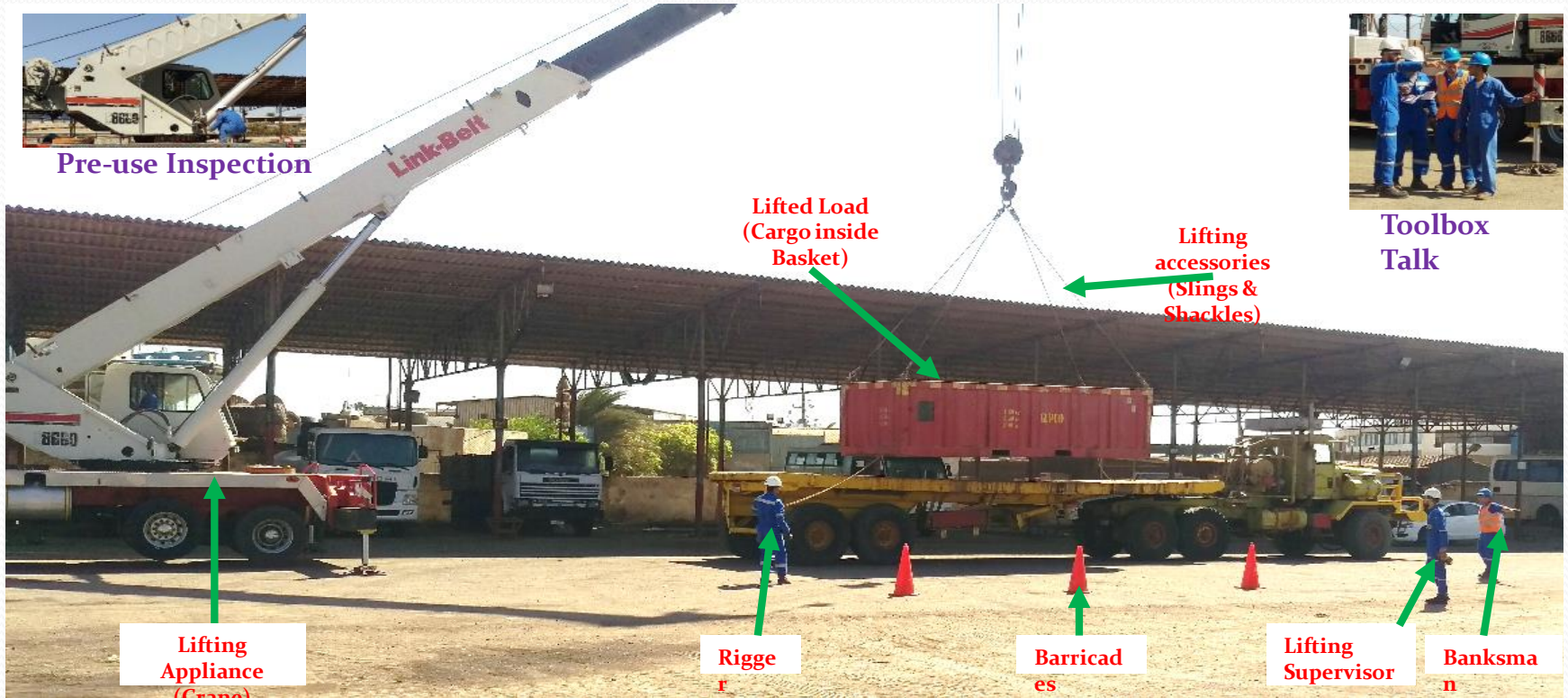
# Definitions and principles of lifting equipment



Pre-use Inspection



Toolbox Talk



Lifting Appliance (Crane)

Rigger

Barricades

Lifting Supervisor

Banksman



# Lifting Plan Categorization

Category 3: **Complex Lifting.**

Category 2: **complicated Lifting.**

Category 1: **Simple Lifting.**

# Lifting Plan Categorization

## Category 3: **Complex Lifting.**

1	Does the lift use a heavy lift crane, which is assembled on site			3
2	Is the mobile crane utilization above 85% including weight contingency factor?			
3	A Tandem /multiply Cranes Lift where the load on any of the cranes equal to or exceeding 70% of its rated capacity			
4	Does the lift involve lifting personnel?			
5	Does the lift require addition technical input or engineering Studies?			
6	Does the lift have limited boom clearance (i.e. less than 1 meter or 3.3 feet)?			
7	Could Proximity Hazards (public road, overhead power cables etc.) affect the lift?			
8	Will the load be lifted directly over or in close proximity to live plant (with a crane utilization equal to or exceeding 70%)?			
9	Does the crane (mobile, crawler, excavator) have to travel or track with a suspended load?			

# Lifting Plan Categorization

## Category 2: **complicated Lifting**

17	Is the mobile crane utilization between 75-85 % including weight contingency factor?			2
18	A Tandem /multiply Cranes Lift where the load on any of the cranes up to 70% of its rated capacity			
19	Will the load be lifted directly over or in close proximity to live plant (with a crane utilization below 70%)			
20	Is the lift blind or conducted within a confined space or trench or excavation?			
21	Does the load have an offset Centre of gravity without special slings to compensate or is it an awkward shape or have a large sail area?			
22	Is the load fragile or is its integrity uncertain or is it difficult to sling (see section 3 Definitions)?			
23	Are slings to be used at an angle of below 45 degrees from the horizontal?			
24	Can the load ground bearing pressures (GBP) exceed the site maximum allowable GBP?			
25	Is the lift in an area with restricted head room for the lifting Equipment?			
26	Load is greater than 2 ton and non-certified steel structural support members are to be used in the lifting operation			

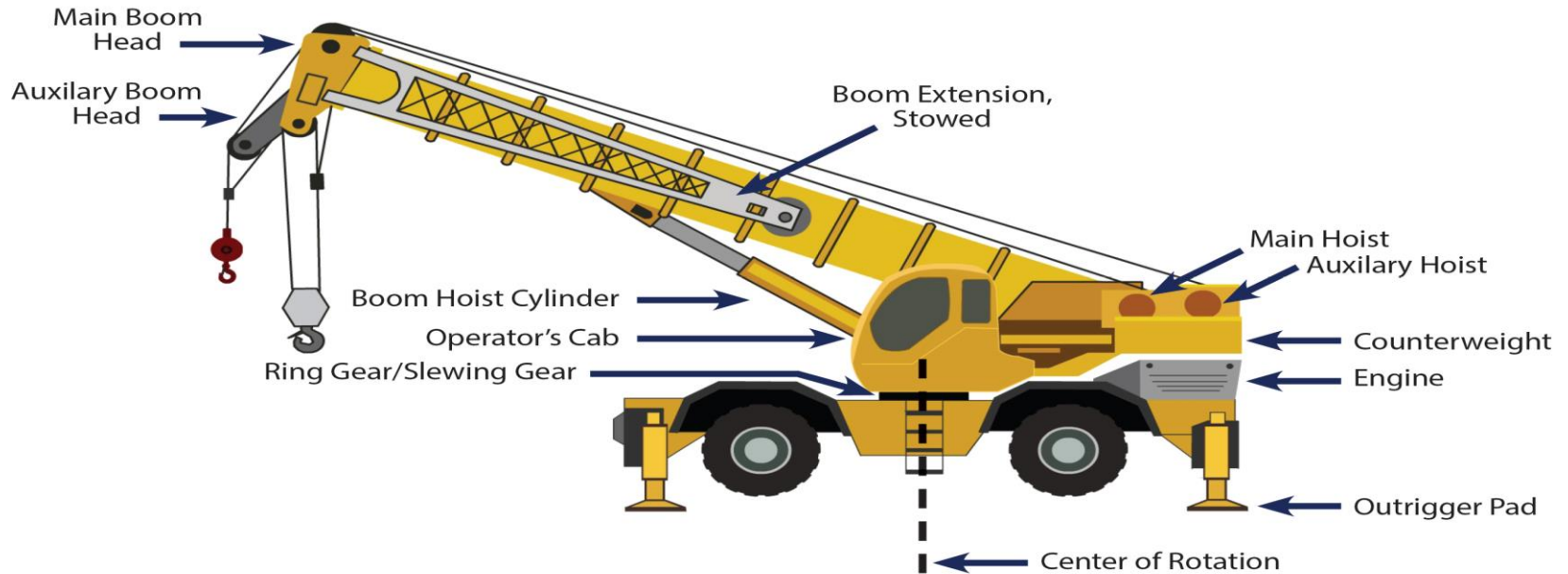
# Lifting Plan Categorization

Category 1: **Simple Lifting.**

27	None of the above applies to this lift, the load is pre slung or very easy to sling, with no external factors that complicate the operation. The team is experienced and have performed a similar lift recently			1
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# Crane Components

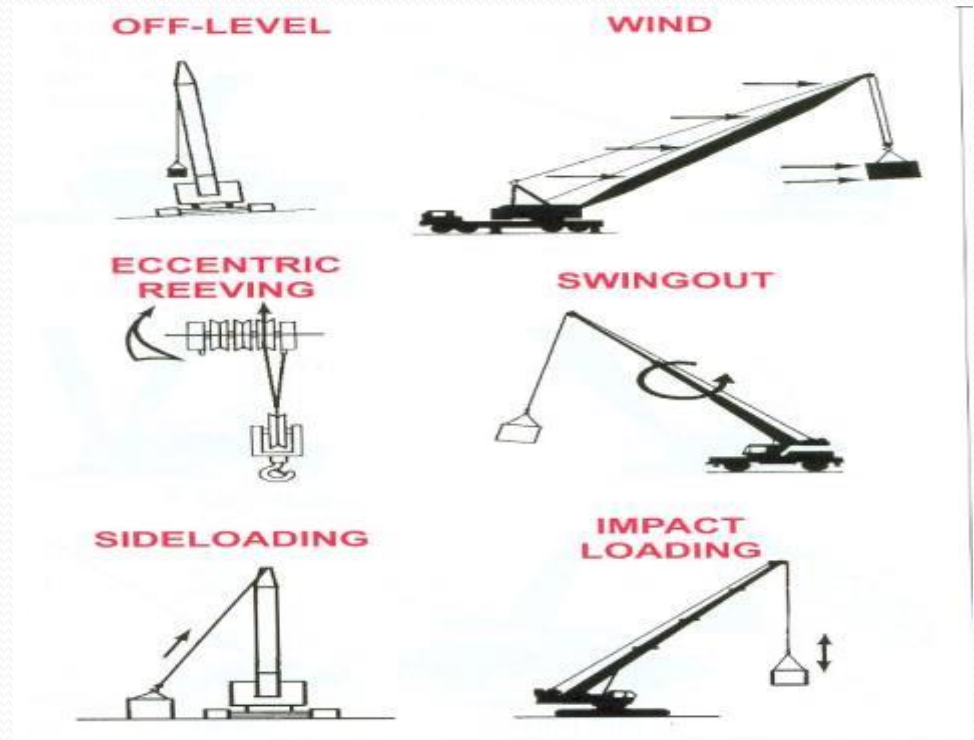
## Rough Terrain Crane Components





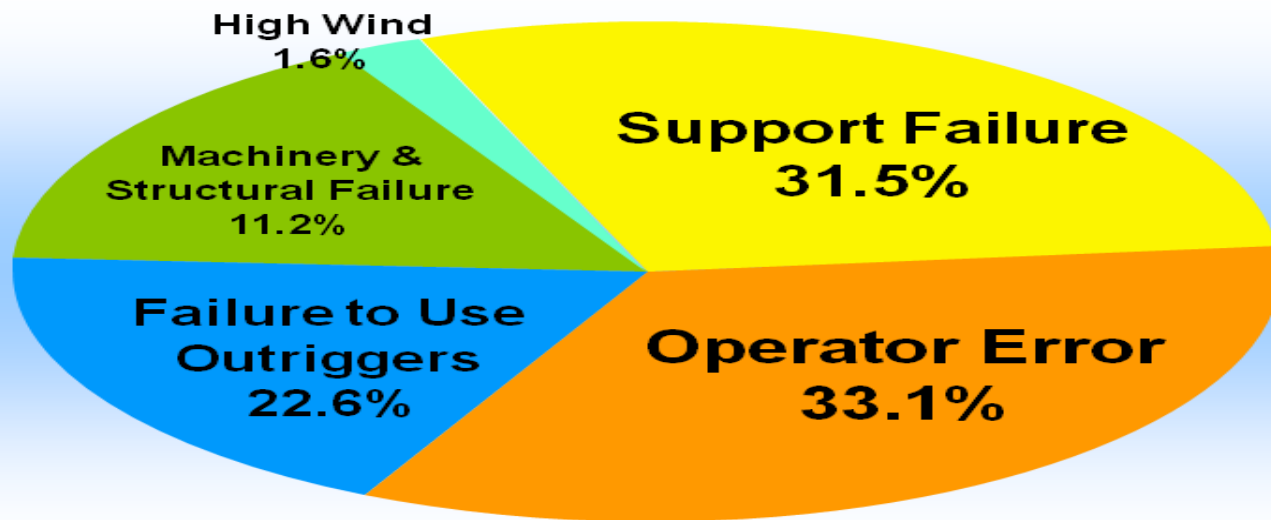
# Causes of Reduced Load Capacity

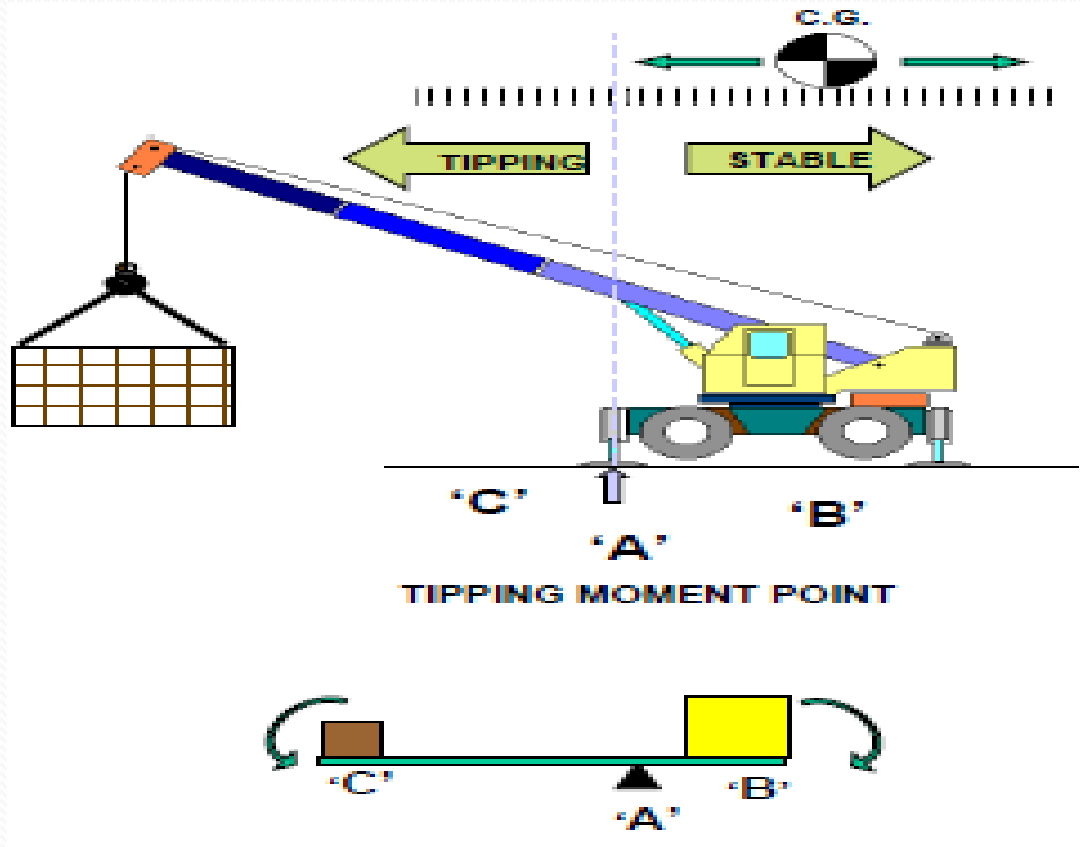
1. Off-level
2. Wind hazard
3. Eccentric reeving
4. Swing out
5. Side loading
6. Impact loading



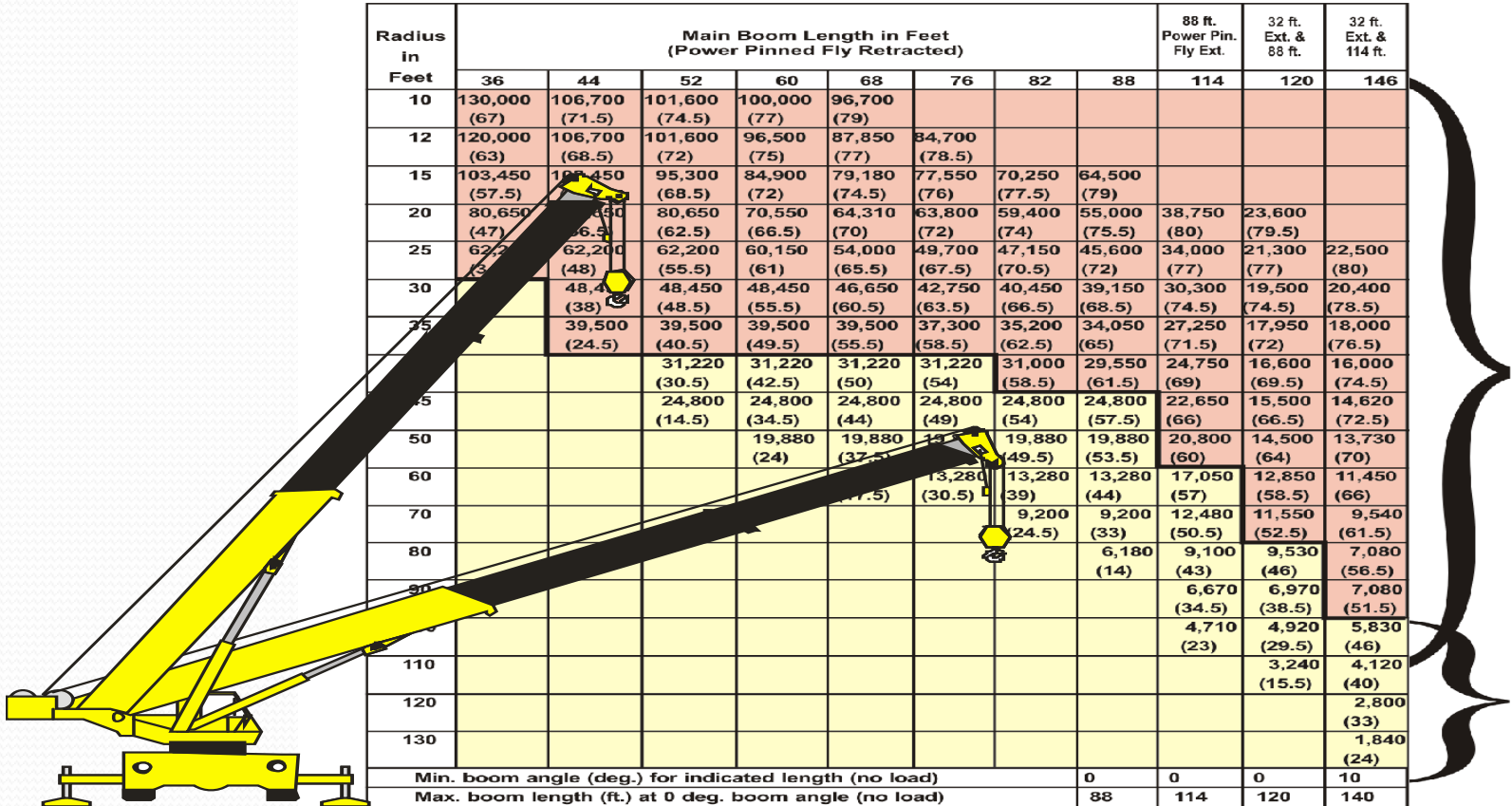
## ▲ Accident Prevention

### Main Causes of Mobile Crane Accidents





# ON OUTRIGGERS FULLY EXTENDED - 360°



Radius in Feet	Main Boom Length in Feet (Power Pinned Fly Retracted)								88 ft. Power Pin. Fly Ext.	32 ft. Ext. & 88 ft.	32 ft. Ext. & 114 ft.			
	36	44	52	60	68	76	82	88	114	120	146			
10	130,000 (67)	106,700 (71.5)	101,600 (74.5)	100,000 (77)	96,700 (79)									
12	120,000 (63)	106,700 (68.5)	101,600 (72)	96,500 (75)	87,850 (77)	84,700 (78.5)								
15	103,450 (57.5)	106,450 (68.5)	95,300 (68.5)	84,900 (72)	79,180 (74.5)	77,550 (76)	70,250 (77.5)	64,500 (79)						
20	80,650 (47)	86,500 (62.5)	80,650 (62.5)	70,550 (66.5)	64,310 (70)	63,800 (72)	59,400 (74)	55,000 (75.5)	38,750 (80)	23,600 (79.5)				
25	62,200 (39)	62,200 (48)	62,200 (55.5)	60,150 (61)	54,000 (65.5)	49,700 (67.5)	47,150 (70.5)	45,600 (72)	34,000 (77)	21,300 (80)	22,500 (80)			
30		48,400 (38)	48,450 (48.5)	48,450 (55.5)	46,650 (60.5)	42,750 (63.5)	40,450 (66.5)	39,150 (68.5)	30,300 (74.5)	19,500 (74.5)	20,400 (78.5)			
35			39,500 (24.5)	39,500 (40.5)	39,500 (49.5)	37,300 (55.5)	35,200 (58.5)	34,050 (62.5)	27,250 (71.5)	17,950 (72)	18,000 (76.5)			
40				31,220 (30.5)	31,220 (42.5)	31,220 (50)	31,220 (54)	31,000 (58.5)	29,550 (61.5)	24,750 (69)	16,600 (69.5)	16,000 (74.5)		
45					24,800 (14.5)	24,800 (34.5)	24,800 (44)	24,800 (49)	24,800 (57.5)	22,650 (66)	15,500 (66.5)	14,620 (72.5)		
50						19,880 (24)	19,880 (37.5)	19,880 (49.5)	19,880 (53.5)	20,800 (60)	14,500 (64)	13,730 (70)		
60							13,280 (30.5)	13,280 (39)	13,280 (44)	17,050 (57)	12,850 (58.5)	11,450 (66)		
70								9,200 (24.5)	9,200 (33)	12,480 (50.5)	11,550 (52.5)	9,540 (61.5)		
80									6,180 (14)	9,100 (43)	9,530 (46)	7,080 (56.5)		
90										6,670 (34.5)	6,970 (38.5)	7,080 (51.5)		
110											4,710 (23)	5,830 (46)		
120												3,240 (15.5)	4,120 (40)	
130													2,800 (33)	1,840 (24)
Min. boom angle (deg.) for indicated length (no load)									0	0	0	10		
Max. boom length (ft.) at 0 deg. boom angle (no load)									88	114	120	140		

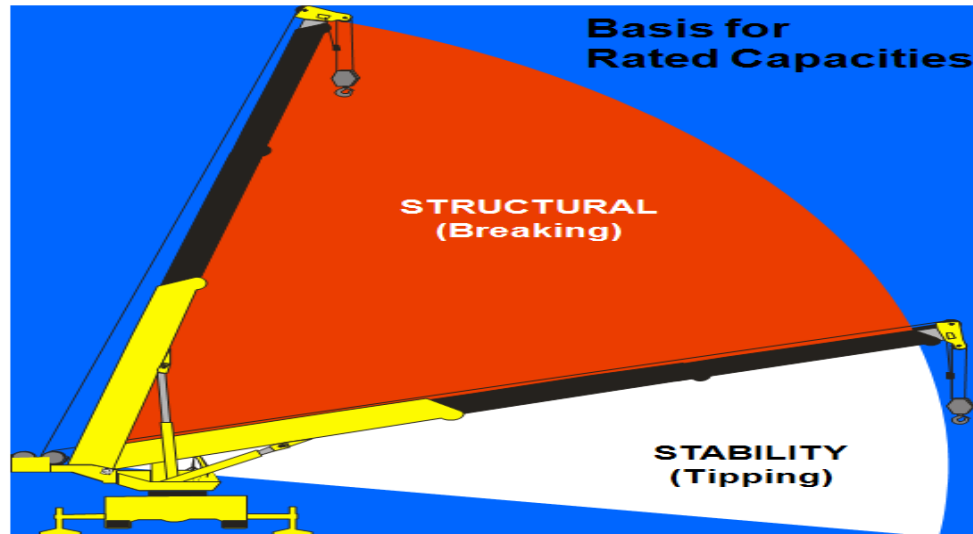
**STRUCTURAL**

**STABILITY**

## Load Rating Charts

- Exceeding rated capacities of a crane may result in one of two scenarios:
  - Loss of stability, i.e. tipping
  - Component failure, i.e. structural damage or mechanical failure

### ▲ Crane's Ratings are based more on Structural Strength

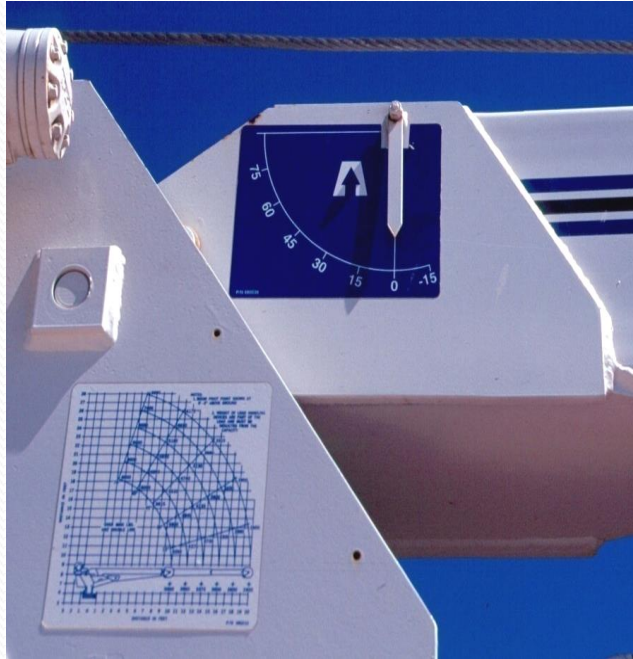




# Rated capacity indicator (RCI) and rated capacity limiter (RCL)



# Boom Angle Indicator

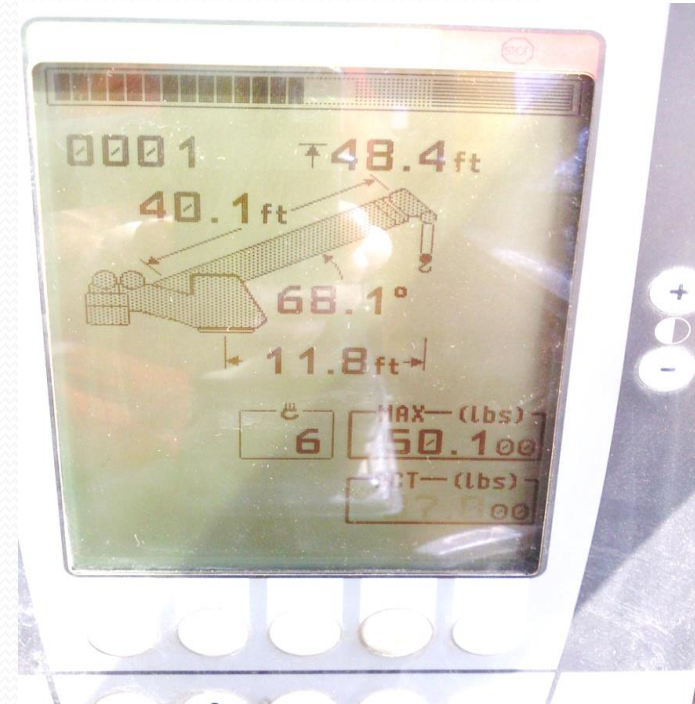


# Crane Components

## Rated Capacity Indicator (RCI) System

The LMI is showing the following information:

- The telescopic boom is extended to 40.1 ft.
- The Boom angle is shown as 68.1 deg.
- The radius from the centre of the crane slew ring to the hook is 11.8 ft.
- The rope reeving configuration is set at 6 part line (Falls).
- The height of the boom tip from the ground is 48.4 ft.
- The maximum SWL that can be picked at this radius is 50,100 lbs
- The actual load being picked is at 07,800 lbs



- ❑ If the SLI has an orange light showing during operation this signifies that you are approaching the maximum safe working load.

# Crane Selection

- The selection of the right crane for the lift, is determined by the factors listed below:
  1. Length of crane boom required.
  2. The maximum working radius of the crane.
  3. Total load weight including the weight of the crane hook block and lifting tackle.
  4. Levelness and compaction of the area where the crane is to be set up.
  5. Availability of clearance for all swinging movement of the crane and the load.
  6. Areas where the crane boom or load can be obstructed.

# Load Charts

## Components of Load Charts

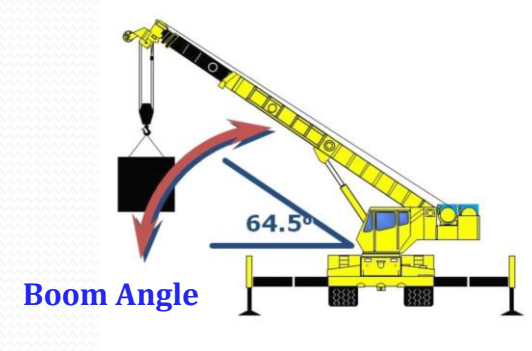
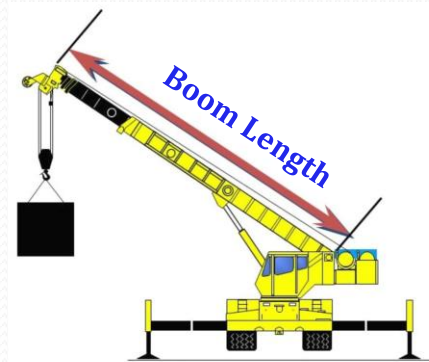
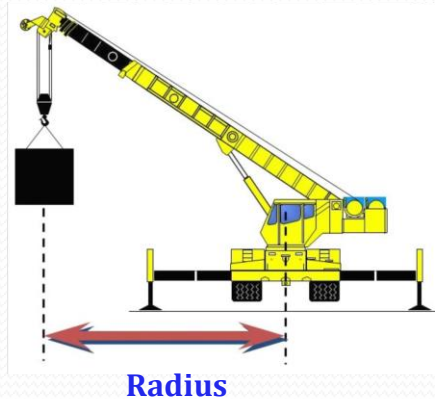
- A load chart is a tool that is supplied by the manufacturer to assist the crane operator in determining the correct rated capacity of the crane based upon the manufacturer's approved configurations.
  
- General Load Chart requirements
  1. In order for a load chart to be valid, it must have a serial number.
  2. Load charts must be durable and legible
  3. Load charts must be accessible from the operator's station



# Load Charts

## Components of Load Charts

- **Radius:** The distance from the center of rotation to the center of the load or hoist line
- **Boom Length:** The distance from the center pivot of the boom base to the top boom nose sheave
- **Boom Angle:** The angle in degrees between the boom base section and horizontal



# Load Charts

## Notes on Load Charts

## Load Rating Charts

- The values listed on the capacity table are referred to as the rated capacity or the gross capacity of the crane in a specific configuration.
- According to manufacturer requirements, Federal regulations and nationally recognized standards, these rated capacities are NOT to be exceeded.

		Pounds									
		34	40	50	*58	60	70	80	90	100	105
10	70,000 (60)	66,900 (70)	58,450 (74.5)	44,900 (75.5)	26,300 (77)						
12	68,050 (62)	64,100 (67)	55,000 (73)	44,900 (74.5)	29,300 (75)	29,300 (78)					
15	59,150 (55.5)	57,850 (62)	48,000 (68.5)	41,500 (71.5)	28,300 (72.5)	25,300 (75.5)					
20	45,000 (43.5)	45,450 (52.5)	38,200 (61.5)	35,000 (69)	29,300 (67.5)	29,300 (72)	29,300 (73)	29,300 (77)			
25	35,250 (28.5)	35,250 (42)	32,400 (54.5)	30,500 (60.5)	30,500 (65.5)	27,950 (67.5)	29,350 (71)	23,250 (74)	18,550 (75.5)	15,850 (78.5)	
30		27,150 (27.5)	26,500 (46.5)	25,550 (54)	25,300 (58.5)	24,000 (62.5)	22,950 (67)	20,300 (70.5)	16,500 (72.5)	15,850 (74)	
35		19,450 (37.5)	19,150 (47.5)	18,350 (50)	18,350 (53)	20,250 (57.5)	20,000 (63)	17,650 (67)	14,800 (68.5)	14,350 (71)	
40		15,000 (24.5)	14,850 (37.5)	14,850 (43)	14,850 (46.5)	16,450 (58.5)	16,450 (64)	16,000 (65)	13,400 (66.5)	12,850 (68)	
45			11,500 (30)	11,650 (34.5)	11,650 (38.5)	12,400 (46.5)	13,100 (50)	13,450 (56)	12,500 (63)	11,550 (64.5)	
50			9,180 (13.5)	9,320 (23)	10,000 (23)	10,000 (40)	10,650 (55)	10,950 (59.5)	11,300 (59.5)	10,400 (61.5)	
55						8,170 (43.5)	8,770 (49)	9,080 (51)	9,380 (52)	8,450 (61.5)	
60						6,710 (21.5)	7,250 (37.5)	7,560 (40)	7,870 (52)	8,020 (54.5)	
65							6,020 (30.5)	6,320 (41)	6,630 (48)	6,790 (51)	
70							4,960 (20.5)	5,300 (35)	5,610 (43.5)	5,700 (47)	
75								4,450 (28.5)	4,750 (33.5)	4,890 (38)	
80								3,740 (18.5)	4,020 (28.5)	4,150 (32.5)	
85									2,830 (18)	2,950 (26)	
90										2,460 (17.5)	
95											
Minimum boom angle (deg.) for indicated length											0
Maximum boom length (ft.) at 0 deg. boom angle (no load)											105
NOTE: ( ) Boom angles are in degrees. *58 ft. boom length is with inner-mid extended and outer-mid & fly retracted. @ Capacity also applicable at maximum boom angle.											
A6-829-011360A											
Boom Angle	34	40	50	*58	60	70	80	90	100	105	
0°	10,350 (27.1)	12,700 (33)	8,300 (43)	6,030 (50.8)	5,710 (53)	4,380 (63)	3,370 (73)	2,590 (63)	1,960 (53)	1,700 (68)	
NOTE: ( ) Reference radii in feet. *58 ft. boom length is with inner-mid extended and outer-mid & fly retracted.											
A6-829-011625											

Sample of Load Rating Charts

# Load Charts

## Notes on Load Charts

- Manufacturer's separate these respective rated capacities with one of three techniques:
  - **Bold line** – values above the bold line, when exceeded, could result in structural damage while values below the bold line, when exceeded, could result in loss of stability
  - **Asterisks** – values with an asterisk, when exceeded, could result in structural damage while values without an asterisk, when exceeded, could result in loss of stability
  - **Shaded areas** – values within the shaded area, when exceeded, could result in structural damage while values outside the shaded area, when exceeded, could result in loss of stability

# Load Charts

Bold line  
Case

Foot	34	40	50	50	60	70	80	90	100	105
10	70,000 (60)	66,900 (70)	58,650 (74.5)	44,600 (79.5)	26,300 (77)					
12	66,000 (62)	64,100 (67)	55,000 (73)	44,600 (74.5)	29,300 (75.5)	29,300 (78)				
15	56,150 (52.5)	57,650 (62)	46,000 (68.5)	41,500 (71.5)	29,300 (75.5)	29,300 (77)				
20	43,400 (43.5)	45,450 (52.5)	38,500 (61)	35,000 (66.5)	29,300 (69.5)	29,300 (73)	29,300 (77)	27,000 (77)		
25	33,550 (38.5)	33,550 (39)	35,400 (40.5)	30,500 (34)	26,300 (36.5)	27,650 (36.5)	26,350 (37)	23,550 (37)	16,550 (37.5)	11,850 (37.5)
30		27,150 (27.5)	26,500 (27.5)	25,550 (27.5)	25,300 (27.5)	24,000 (27.5)	22,650 (27.5)	20,300 (27.5)	15,500 (27.5)	11,500 (27.5)
35			18,350 (37.5)	18,350 (37.5)	18,350 (37.5)	18,350 (37.5)	18,350 (37.5)	17,600 (37.5)	14,600 (37.5)	11,250 (37.5)
40			15,900 (39.5)	14,850 (41)	15,850 (41)	15,450 (41)	16,000 (41)	13,400 (41)	13,400 (41)	12,850 (41)
45			11,500 (39)	11,850 (40.5)	12,400 (41)	13,100 (41)	12,450 (41)	12,500 (41)	11,250 (41)	11,250 (41)
50			9,180 (40)	9,330 (41)	10,000 (41)	10,650 (41)	10,650 (41)	11,300 (41)	10,400 (41)	10,400 (41)
55			8,179 (41.5)	8,270 (42)	8,270 (42)	8,270 (42)	9,080 (42)	9,380 (42)	9,450 (42)	8,000 (42)
60			6,710 (41.5)	7,250 (42)	7,250 (42)	7,250 (42)	7,580 (42)	7,870 (42)	8,000 (42)	8,000 (42)
65			5,020 (43.5)	5,320 (44)	5,320 (44)	5,320 (44)	6,320 (44)	6,830 (44)	6,790 (44)	6,790 (44)
70			4,990 (43.5)	5,300 (44)	5,300 (44)	5,300 (44)	5,610 (44)	5,610 (44)	3,790 (44)	3,790 (44)
75							4,430 (46.5)	4,750 (47)	4,890 (47)	4,890 (47)
80							3,740 (48.5)	4,020 (49)	4,120 (49)	4,120 (49)

Shaded  
areas

Radius (ft)	MAIN BOOM LOAD RATINGS ON OUTRIGGERS Extended and Down 360° or Retracted and Down Front/Rear									
	23 ft Boom		35 ft Boom		47 ft Boom		59 ft Boom		71 ft Boom	
	Boom Angle (deg)	Rated Load (lbs)	Boom Angle (deg)	Rated Load (lbs)	Boom Angle (deg)	Rated Load (lbs)	Boom Angle (deg)	Rated Load (lbs)	Boom Angle (deg)	Rated Load (lbs)
8.5	64.2	50,000	73.2	34,300	78.1	33,600	79.7	27,800		
10	59.8	38,793	70.6	34,500	76.2	33,017	77.8	25,900		
12	53.6	34,893	66.9	31,426	73.6	29,253	73.8	25,900		
14	46.8	31,256	63.2	28,464	71	26,357	75.8	24,100	78.7	18,200
16	38.8	26,699	59.2	25,075	68.3	24,016	73.2	22,450	77.1	16,750
18	28.7	23,186	55.1	23,496	65.6	22,096	71.7	20,792	75.4	15,500
19.5	0	21,044	51.9	21,379	63.5	20,902	70.1	19,582	74.2	14,650
22			46	19,471	59.9	19,629	67.4	17,672	72	13,400
24			40.8	16,592	56.9	16,747	65	16,300	70.3	12,500
26			36	14,600	54	14,850	63	14,200	68.5	11,750
28			30	12,750	51	13,050	60.5	13,150	66.7	11,050
30			20	11,250	47.5	11,600	58.5	11,700	65.2	9,800
31.5			0	10,300	45	10,650	56.5	10,750	63.9	9,400
34					40	9,350	53.5	9,480	61.5	8,350
36					36	8,460	51	8,590	59.6	8,400
38					31	7,680	48.5	7,830	57	7,940
40					25	7,000	45.5	7,150	55	7,270
42					17.5	6,400	42.5	6,550	53	6,680
43.5					0	6,000	40.5	6,000	51.5	6,270
46							38	5,440	48.5	5,680
48							32.5	5,040	46.5	5,250
50							28	4,680	44	4,860
52							23	4,300	41.5	4,510
54							16	4,040	38.5	4,190
55.5							0	3,820	36	3,960
58									32.5	3,620
60									29	3,370
62									25	3,130
64									20	2,920
66									13	2,720
67									0	2,620

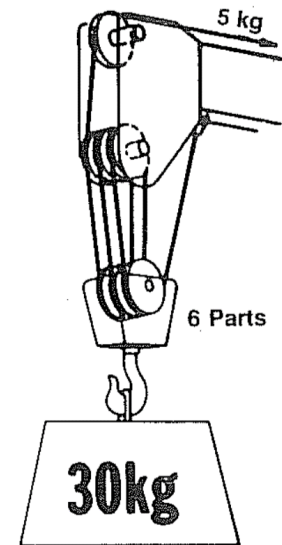
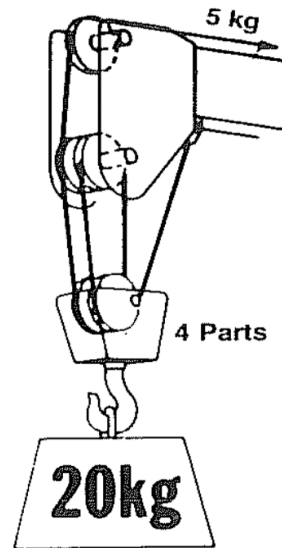
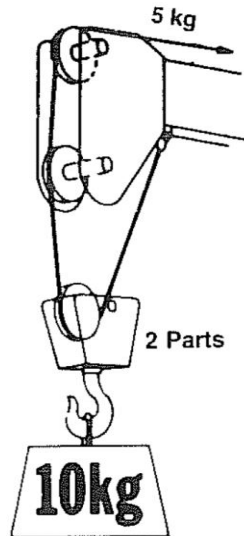
Oper. Rad. Feet	Boom Ang. Deg.	Boom Point Elev. Feet	Boom Capacity Crawlers Retracted Pounds	Boom Capacity Crawlers Extended Pounds
<b>110 Ft. Boom</b>				
22	82.3	116.8		316,900 *
24	81.2	116.4		290,900 *
26	80.2	116.1		268,600 *
28	79.1	115.7		249,300 *
30	78.0	115.2		232,400 *
32	77.0	114.7		217,500 *
34	75.9	114.2		200,300
36	74.8	113.6		183,700
38	73.7	113.0		169,600
40	72.6	112.4	132,800	157,300
42	71.5	111.7	124,000	146,500
44	70.4	110.9	116,200	137,000
46	69.3	110.2	109,200	128,500
48	68.2	109.3	103,000	121,000
50	67.0	108.5	97,300	114,200
55	64.1	106.1	85,200	99,800
60	61.2	103.4	75,500	88,300
65	58.1	100.3	67,500	78,900
70	55.0	96.8	60,800	71,000
75	51.7	93.0	55,000	64,300
80	48.2	88.6	50,100	58,600
85	44.5	83.6	45,800	53,600
90	40.6	77.9	42,000	49,300
95	36.3	71.4	38,600	45,400
100	31.5	63.6	35,600	41,900
105	25.8	54.0	32,800	38,800
110	18.6	40.9	30,300	36,000

Asterisks

# Crane principles

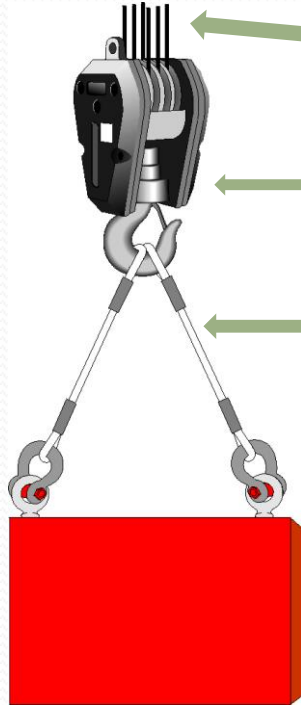
## ➤ Sheaves and Reeving:

- Parts of Line Pull





# Determining Parts of Line, Weight of Line and Sizing the Hook Block



Count the number of lines between the boom point and the block.

**ADD**

Weight of Hook Block (or Ball)

+ Weight of Rigging  
(Slings, Hardware and Lifting Devices)

+ Load Weight

= Suspended Weight

**DIVIDE**

Suspended Weight

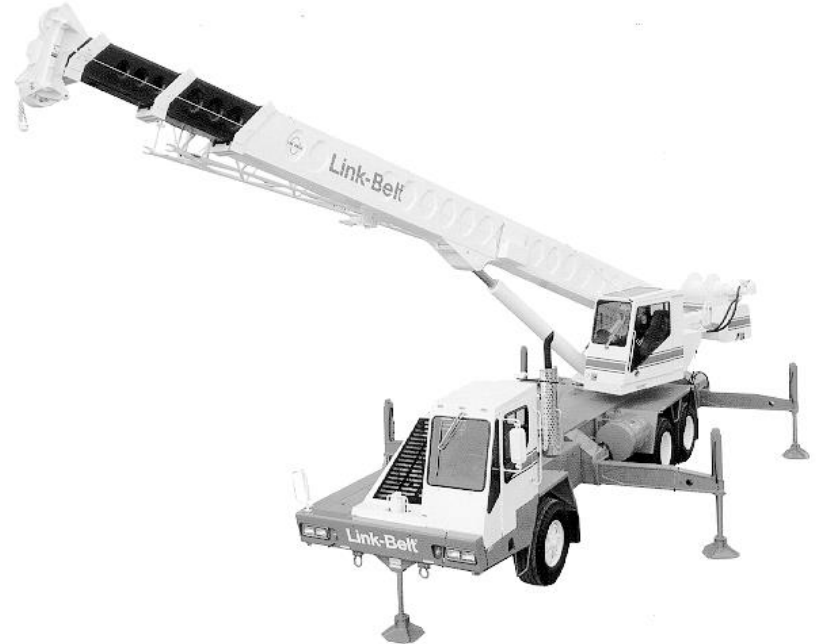
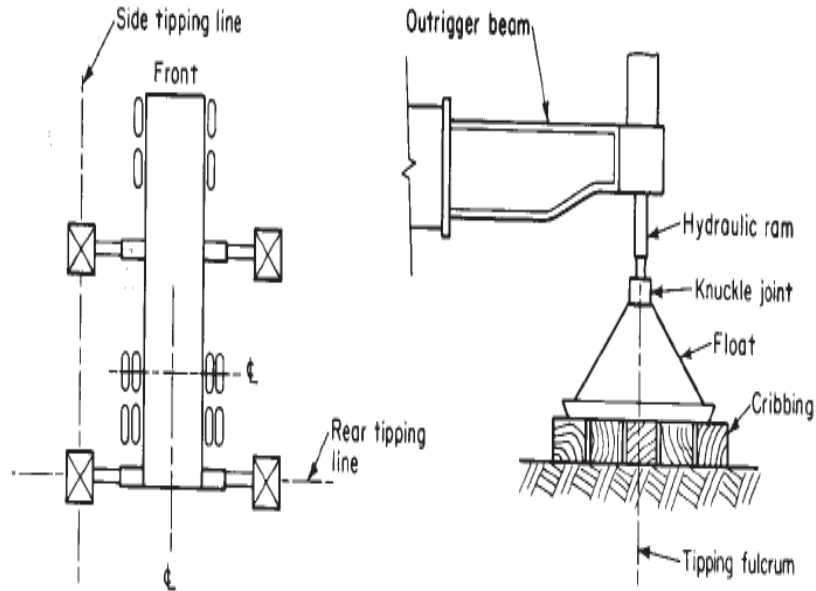
Safe Working Load of Hoist Rope

**ANSWER**

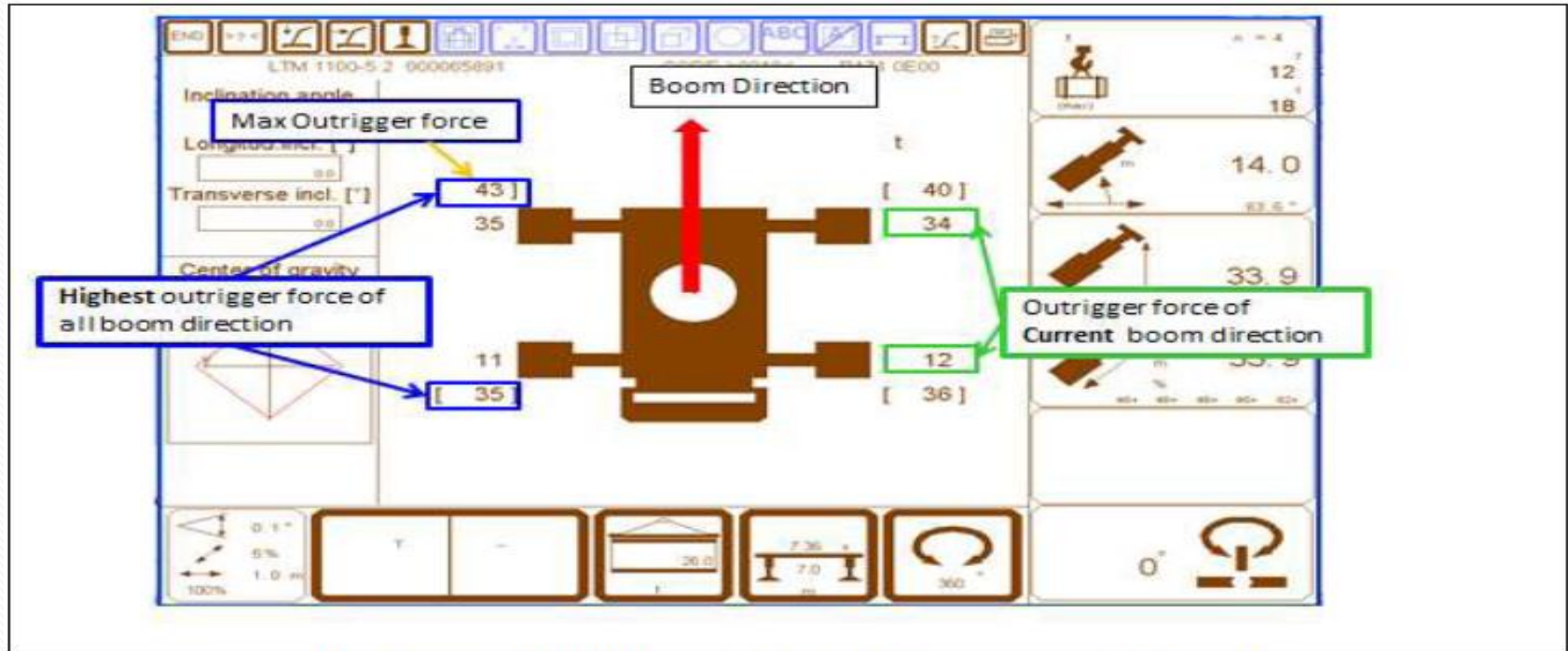
Minimum Parts of Line Required

# Position of Crane

## Rear – Front – Side



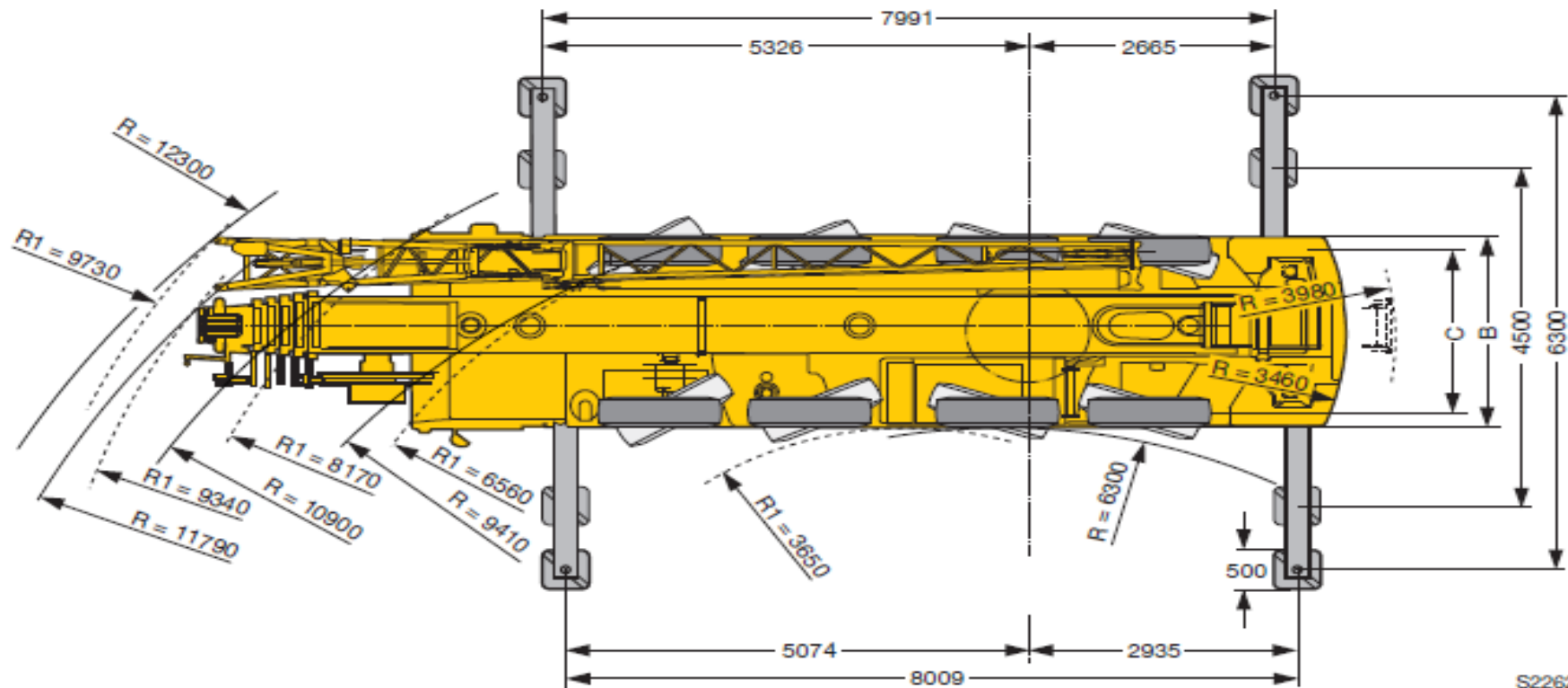
# Ground Bearing Capacity



Example of Identifying highest outrigger force with Load

# Load chart





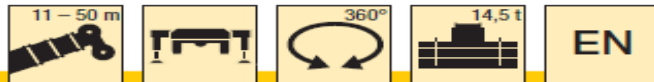


Achse · Axle Essieu · Asse Eje · Мосты	1	2	3	4	Gesamtgewicht · Total weight t Poids total · Peso totale t Peso total · Общий вес, т
t	12	12	12	12	48 <sup>1)</sup>

<sup>1)</sup> mit 10,7 t Ballast und Klappspitze · with 10.7 t counterweight and folding jib · avec contrepoids 10,7 t et fléchette pliante  
con contrappeso di 10,7 t e falcone ribaltabile · con 10,7 t de contrapeso y plumin lateral · с противовесом 10,7т и с удлинителем стрелы



Traglast · Load t Forces de levage · Portata t Capacidad de carga · Грузоподъемность, т	Rollen · No. of sheaves Poulies · Pulegge Poleas · Канатных блоков	Stränge · No. of lines Brins · Tratti portanti Reenvíos · Запасовка	Gewicht · Weight kg Poids · Peso kg Peso · Собст. вес, кг
70	7	14	500
58,4	5	11	500
38,3	3	7	450
16	1	3	275
5,7	–	1	110

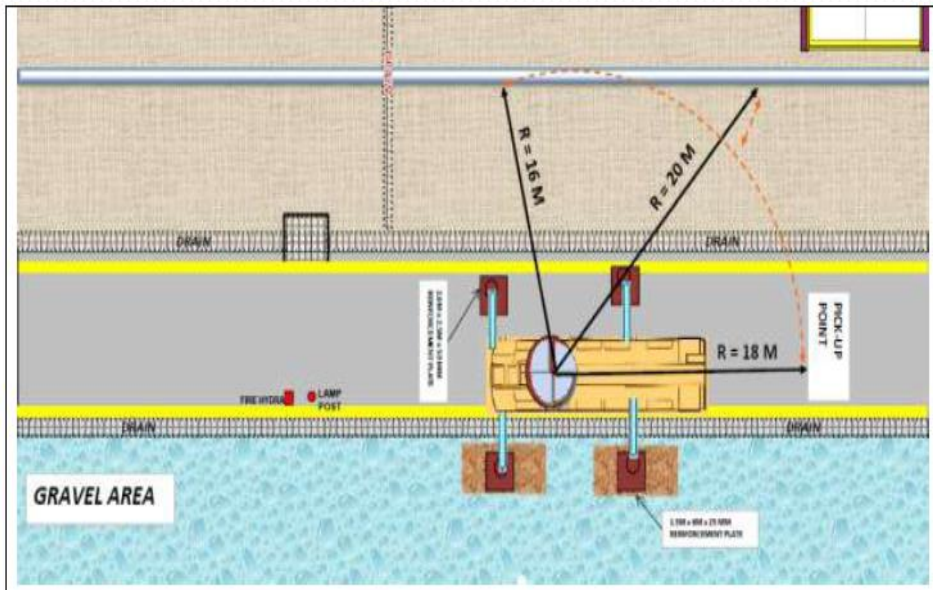


m	m												m	
	11 m	14,6 m	18,2 m	21,8 m	25,4 m	28,9 m	32,5 m	36,1 m	39,7 m	43,3 m	46,9 m	50 m		
2,5	70													2,5
3	61,4	51,1	50,9	48,8										3
3,5	54,3	46,4	46,3	46,5	38,9	31,9								3,5
4	48,7	42,4	42,4	42,5	38,1	31,4	25,6							4
4,5	44	38,9	38,9	39,1	37,4	31	25,3	20,6						4,5
5	39,3	35,7	35,8	35,9	35,6	30,4	25,1	20,5	16,3					5
6	32,2	30,5	30,9	31	31	28,9	24,5	20,1	16,1					6
7	27,1	26,3	26,7	26,9	26,9	27,2	24	19,6	16	13	10,2			7
8	23	22,6	23,1	23,3	23,6	23,6	22,7	18,3	15,8	12,8	10,1	8		8
9			20,4	20,4	20,8	20,7	19,6	17	15,1	12,6	9,9	7,9	6,7	9
10			17,8	18,1	18,2	18,1	17	15,7	14,2	12,2	9,7	7,8	6,6	10
12			13,4	13,9	13,9	13,8	13,4	13,1	12,4	11,1	9,1	7,5	6,5	12
14				10,8	11	11	10,9	10,7	10,4	9,7	8,4	7,1	6,2	14
16					8,9	8,9	8,9	8,8	8,6	8	7,7	6,6	5,9	16
18					7,4	7,5	7,4	7,4	7,2	7,2	6,6	6,1	5,5	18
20						6,4	6,2	6,3	6,2	6	5,7	5,5	5,1	20
22						5,4	5,4	5,4	5,3	5	5,1	4,8	4,6	22
24							4,8	4,7	4,6	4,5	4,3	4	3,9	24
26							4,2	4,1	4	3,9	3,7	3,4	3,4	26
28								3,6	3,5	3,4	3,2	2,9	2,9	28
30								3,1	3	2,9	2,7	2,5	2,5	30
32									2,6	2,5	2,3	2,1	2,1	32
34										2,1	2	1,7	1,7	34
36										1,8	1,7	1,4	1,4	36
38											1,4	1,1	1,2	38
40											1,2	0,9	0,9	40

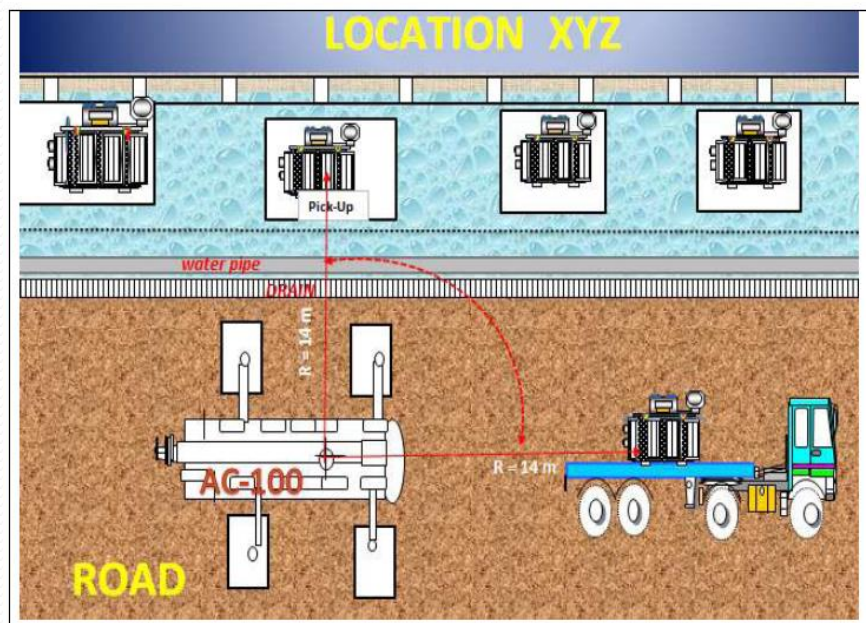
\* nach hinten - over rear - en arrière - sul posteriore - hacia atrás - при выдвинутой назад стреле

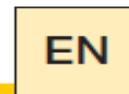
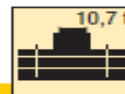
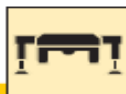
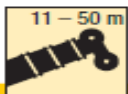
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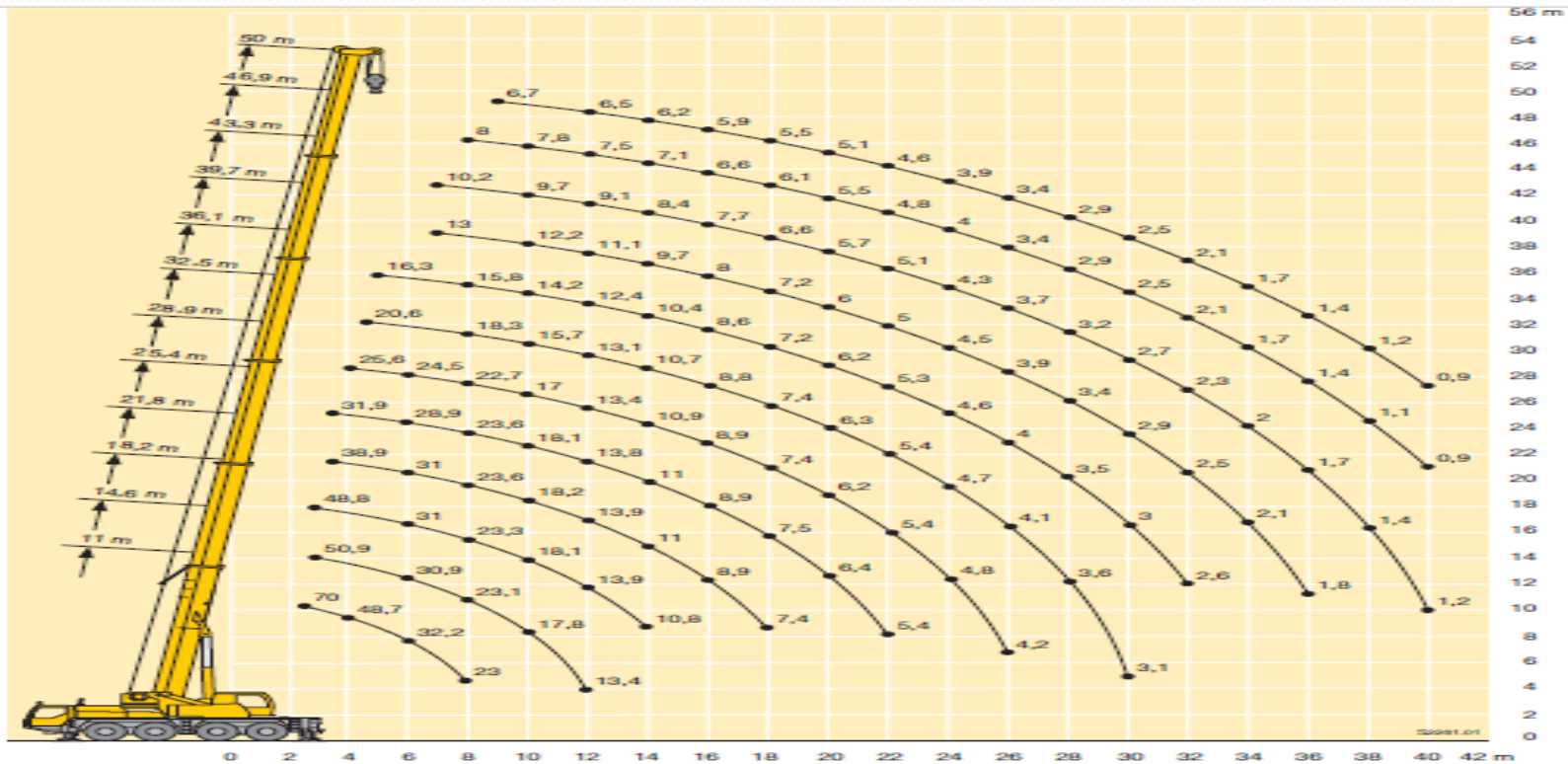


Example of drawing with dimension and standard unit of measurement





m	m												m	
	11 m	14,6 m	18,2 m	21,8 m	25,4 m	28,9 m	32,5 m	36,1 m	39,7 m	43,3 m	46,9 m	50 m		
3	50,9	50,8	48,8											3
3,5	46,1	46,1	46,3	38,9	31,9									3,5
4	42,1	42,1	42,3	38,1	31,4	25,6								4
4,5	38,4	38,4	38,6	37,3	31	25,3	20,6							4,5
5	35,2	35,4	35,4	35,2	30,4	25,1	20,5	16,3						5
6	29,9	30,4	30,6	30,5	28,9	24,5	20,1	16,1						6
7	25,4	25,8	26	26	25,3	23,3	19,6	16	13		10,2			7
8	21,5	22,2	22,3	22,4	21,1	19,7	18,1	15,8	12,8	10,1	8			8
9		19	19,4	18,9	17,9	17	16,4	15	12,6	9,9	7,9	6,7		9
10		15,8	16,3	16,3	15,5	14,9	14,3	13,6	12,2	9,7	7,8	6,6		10
12		11,5	12	12,2	12,1	11,9	11,4	10,9	10,1	9,1	7,5	6,5		12
14			9,2	9,5	9,7	9,5	9,2	8,7	8,6	8	7,1	6,2		14
16				7,7	7,8	7,6	7,7	7,5	7,1	6,8	6,4	5,9		16
18				6,4	6,4	6,4	6,4	6,2	6	5,8	5,4	5,2		18
20					5,4	5,5	5,4	5,3	5,1	4,9	4,5	4,3		20
22					4,5	4,7	4,6	4,5	4,3	4,1	3,8	3,6		22
24						4	3,9	3,9	3,7	3,5	3,1	3		24
26						3,4	3,3	3,3	3,1	2,9	2,6	2,5		26
28							2,8	2,8	2,6	2,5	2,2	2,1		28
30							2,4	2,4	2,2	2	1,8	1,7		30
32								2	1,8	1,7	1,4	1,4		32
34									1,5	1,4	1,1	1,1		34
36									1,3	1,1	0,8	0,8		36
38										0,8				38



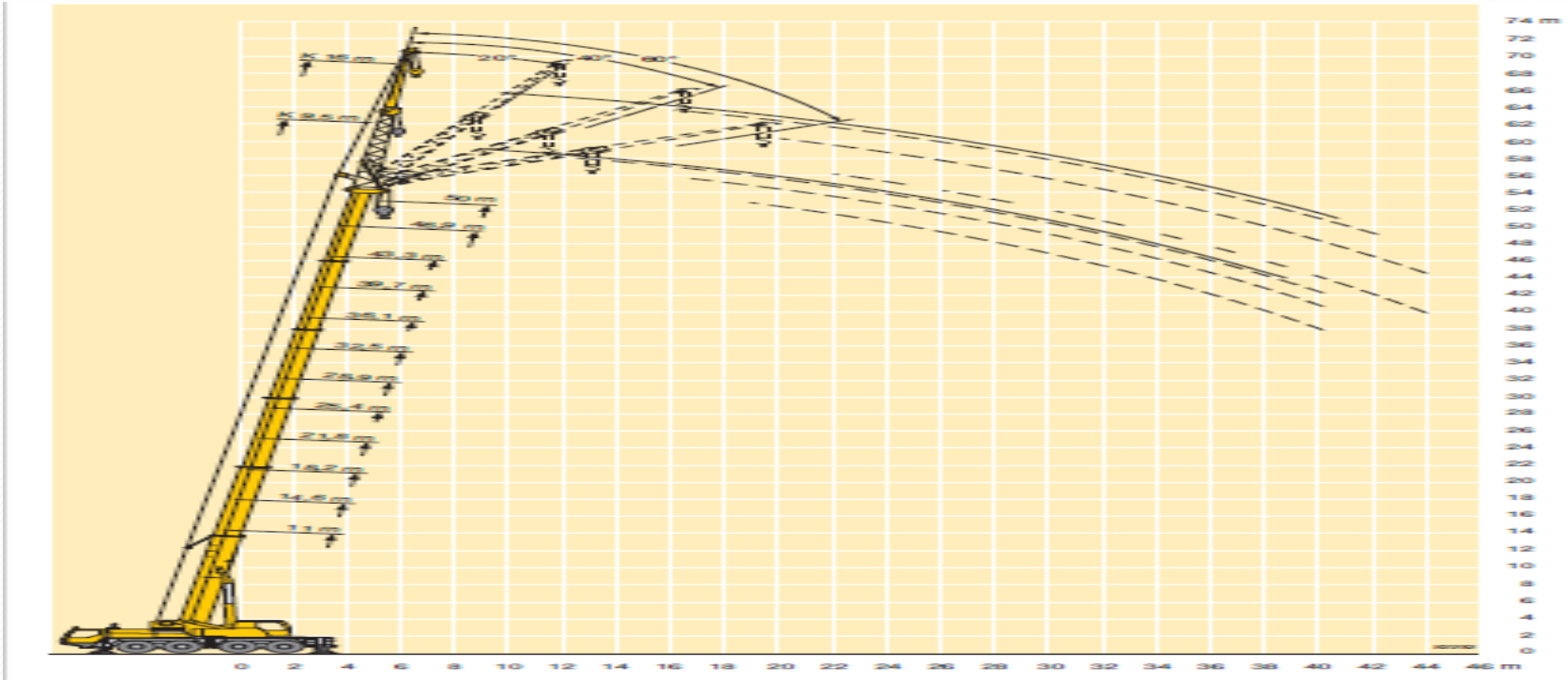


m	11 m				14,6 m				18,2 m				21,8 m				25,4 m				28,9 m				m
	9,5 m				9,5 m				9,5 m				9,5 m				9,5 m				9,5 m				
	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°	
3	11,4				11,4				11,4				11,4				11,4				11,4				3
3,5	11,4				11,4				11,4				11,4				11,4				11,4				3,5
4	11,4	9,4			11,4				11,4				11,4				11,4				11,4				4
4,5	11,4	9,1			11,4	9,4			11,4				11,4				11,4				11,4				4,5
5	11,4	8,7			11,4	9,1			11,4	9,2			11,4				11,4				11,4				5
6	11,3	8,1			11,4	8,5			11,4	8,7			11,4	8,7			11,4	8,7			11,4				6
7	10,8	7,6	6,2		11,4	8	6,3		11,4	8,2			11,4	8,2			11,4	8,3			11,2	8			7
8	10,1	7,1	5,9	4,8	11,1	7,5	6,1		11,4	7,8	6,1		11,2	7,9	6,1		11,4	8			11	7,7			8
9	9,4	6,7	5,7	4,7	10,5	7,2	5,9	4,7	11,3	7,5	6	4,8	11	7,5	6		11,2	7,7	6		10,8	7,5			9
10	8,7	6,4	5,4	4,5	9,9	6,8	5,7	4,6	10,8	7,1	5,8	4,7	10,7	7,2	5,8	4,7	10,9	7,4	5,9	4,7	10,6	7,2	5,7		10
12	7	5,8	5,1	4,4	8,6	6,3	5,3	4,5	9,8	6,6	5,4	4,5	10	6,8	5,5	4,6	10,2	6,9	5,5	4,6	9,9	6,8	5,4	4,6	12
14	5,8	5,3	4,8	4,4	7,3	5,8	5	4,4	8,4	6,2	5,2	4,4	8,9	6,4	5,2	4,4	9,4	6,5	5,3	4,5	9,2	6,5	5,3	4,5	14
16	4,9	5	4,7	4,4	6,1	5,3	4,8	4,4	7,3	5,8	5	4,4	8	6	5,1	4,4	8,3	6,1	5,1	4,4	8,3	6,2	5,1	4,4	16
18	4,3	4,8			5,2	5,1	4,7	4,4	6,3	5,4	4,8	4,4	7,1	5,7	4,9	4,4	6,8	5,8	5	4,4	7	5,9	5	4,4	18
20					4,6	4,9	4,7		5,5	5,1	4,7	4,4	5,9	5,4	4,8	4,4	5,6	5,5	4,9	4,4	5,9	5,6	4,9	4,4	20
22									4,9	5	4,7	4,4	5	5,1	4,7	4,4	4,7	5	4,8	4,4	4,9	5,2	4,8	4,4	22
24									4,4	4,5	4,5		4,2	4,4	4,5	4,3	3,9	4,2	4,3	4,3	4,1	4,4	4,6	4,4	24
26													3,6	3,7	3,8	3,6	3,2	3,4	3,6	3,6	3,5	3,7	3,9	4	26
28													3	3,1			2,6	2,8	2,9	2,8	2,9	3,1	3,3	3,3	28
30																	2,2	2,3	2,3		2,4	2,6	2,7	2,7	30
32																	1,8	1,9			2	2,2	2,2	2,1	32
34																					1,7	1,8	1,8		34
36																					1,4	1,4			36



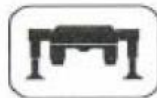
m	32,5 m				36,1 m				39,7 m				43,3 m				46,9 m				50 m				m			
	9,5 m				9,5 m				9,5 m				9,5 m				9,5 m				9,5 m							
	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°	0°	20°	40°	60°				
4,5	11				8																				4,5			
5	10,9																								5			
6	10,7				7,9				6,9																6			
7	10,5				7,7				6,8				4,7						4,2						7			
8	10,3	7,5			7,5				6,6				4,7						4,2				3,6		8			
9	10,1	7,3			7,3	6,5			6,5				4,7						4,2				3,5		9			
10	9,9	7,1	5,7		7,2	6,4			6,3	5,6			4,7	4,2					4,1				3,5		10			
12	9,4	6,8	5,5	4,6	6,9	6,2	5,4		6,1	5,5	5,1		4,5	4,1					4,1	3,7			3,4	3,2	12			
14	8,9	6,5	5,2	4,5	6,5	5,8	5,2	4,4	5,8	5,3	5	4,4	4,4	4,1	4				4	3,7	3,6				14			
16	7,7	6,2	5,1	4,4	6,1	5,4	5	4,4	5,6	5,2	4,9	4,4	4,2	3,9	4				3,8	3,6	3,6	3,7	3,3	3,1	3	16		
18	6,4	6	5	4,4	5,6	5,1	4,7	4,3	5,3	4,9	4,6	4,4	4	3,8	3,8				3,8	3,7	3,6	3,5	3,7	3,2	3,1	3	18	
20	5,4	5,7	4,9	4,4	5,2	4,7	4,5	4,3	5	4,7	4,4	4,3	3,8	3,6	3,6	3,6			3,6	3,5	3,4	3,5	3,1	3,1	3	3,1	20	
22	4,7	4,9	4,8	4,3	4,7	4,5	4,3	4,2	4,3	4,5	4,2	4,2	3,5	3,4	3,4	3,4			3,4	3,4	3,4	3,3	3,3	3	3	2,9	3	22
24	4,3	4,1	4,4	4,3	4,1	4,2	4,1	4,1	3,6	4,1	4	4,1	3,3	3,2	3,2	3,2			3,2	3,2	3,2	3,1	3,2	2,9	2,9	2,8	2,9	24
26	3,7	3,9	3,8	3,9	3,4	3,7	3,9	3,9	3,1	3,4	3,7	3,8	3,1	3	3	3			3	3	3	3	2,8	2,8	2,7	2,8	2,8	26
28	3,1	3,3	3,5	3,6	2,9	3,1	3,4	3,4	2,8	2,9	3,1	3,2	2,9	2,9	2,9	2,9			2,9	2,5	2,8	2,8	2,9	2,4	2,6	2,6	2,6	28
30	2,6	2,8	3	3	2,4	2,6	2,8	2,9	2,6	2,6	2,6	2,7	2,4	2,7	2,7	2,7			2,1	2,3	2,6	2,7	2	2,3	2,5	2,5	30	
32	2,2	2,4	2,5	2,5	2	2,2	2,4	2,4	2,2	2,4	2,5	2,5	2	2,3	2,4	2,5			1,7	2	2,1	2,2	1,6	1,9	2,1	2,2	32	
34	1,9	2	2,1	2	1,7	1,8	2	1,9	1,9	2,1	2,2	2,2	1,7	1,9	2	2,1			1,4	1,6	1,8	1,8	1,3	1,5	1,7	1,8	34	
36	1,6	1,7	1,7	1,6	1,3	1,5	1,6	1,5	1,6	1,7	1,8	1,8	1,4	1,6	1,7	1,7			1,1	1,3	1,4	1,5	1	1,2	1,4	1,4	36	
38	1,3	1,4	1,3		1,1	1,2	1,3	1,2	1,3	1,4	1,5	1,4	1,1	1,3	1,4	1,4			0,8	1	1,1	1,2	0,8	1	1,1	1,1	38	
40					0,8	0,9	0,9	0,8		1	1,2	1,2	1,1	0,9	1	1,1			0,6	0,8	0,9	0,9		0,7	0,8	0,8	40	
42					0,6	0,7	0,6		0,8	0,9	0,9	0,8	0,6	0,8	0,8						0,6						42	
44									0,6	0,7	0,7																44	







13,5 m – 52 m



360°



14,5 t

75%

↙ m	13,5 m		18 m	22,4 m	26,8 m		31,2 m	35,7 m	40,1 m		44,5 m	48,9 m	52 m	↘ m
3	139	128												3
3,5	126	126	125											3,5
4	115	115	114	100	80	65								4
4,5	103	103	102	96	80	65	69							4,5
5	92	92	92	91	80	65	69	55						5
6	77	77	76	71	66	60	61	54	43	31				6
7	64	64	62	56	53	55	50	48	42,5	31	33			7
8	55	55	51	46	44	47	41,5	40	39	31	33	25		8
9	45	45	42	38,5	37	40	35	34,5	33,5	30	33	25	20	9
10	37	37	36	32,5	31,5	34,5	30,5	29,8	29,1	28,4	28,8	25	20	10
12			25,3	23,9	23,4	26,2	25,1	22,5	22,2	25,3	22,2	22,2	20	12
14			18,6	18	17,7	20,4	22,2	17,4	17,4	20,4	17,4	17,8	17,3	14
16				14,8	13,7	16,1	18,5	13,7	13,8	16,7	14,2	14,5	14,2	16
18				13,3	10,7	12,7	15,1	10,9	11,1	13,9	11,6	11,9	11,7	18
20					8	10,1	12,4	8,7	9	11,7	9,5	9,9	9,7	20
22					6	8	10,4	7	7,2	9,9	7,8	8,2	8,1	22
24					4,4	6,4	8,8	5,4	5,8	8,4	6,4	6,9	6,7	24
26							7,4	4,1	4,5	7	5,1	5,6	5,5	26
28							6,3	3,1	3,4	5,9	3,9	4,5	4,4	28
30								2,2	2,6	4,9	3,1	3,6	3,5	30
32								1,4		4,1	2,4	2,9	2,8	32
34										3,4	1,8	2,3	2,2	34
36										2,8		1,7	1,6	36



# Lifting Plan

## Stage 1.

### Gross Load Calculation

Net Load = Kg  
 +Accessories = kg  
 +Hook Block = kg  
 +Stored Fly Jib (If not used) = kg  
 Gross Load = kg

Details of lifting accessory weights:-

Change back into tonnes =

## Stage 2

### Crane Selection template

Crane selected model and capacity			
Counter weight used =		tonnes	
Boom length used =		metres	
(Length & Angle of Fly Jib if used)=		metres @	° Offset
Max radius used metres	SWL at radius used=	tonnes	
Quick check 90% utilisation minus 10% off SWL=		tonnes	
Minimum radius at boom length used=		metres	
Outrigger spread=		mm X	mm



*Thanks*  
*Any Question*