LOAD CHART
PRACTICE EXERCISES

STIFF BOOM TRUCK CRANE
40 TONNES & UNDER

National 400B

CraneSafe Certification

Stiff Boom Truck Crane – 40 Tonnes & Under
PRACTICE EXERCISES
LCR.SB40.NA400B.PE1

30 July 2009

CraneSafe CERTIFICATION

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

Introduction to Load Chart Practice Exercises

These 5 questions are samples of the load chart part of your CraneSafe Certification Assessment.

We have not included all of the charts for this crane - but everything you need to answer the questions is included in the load and jib charts you have here. You do not need the crane manual or full load chart package to answer the questions.

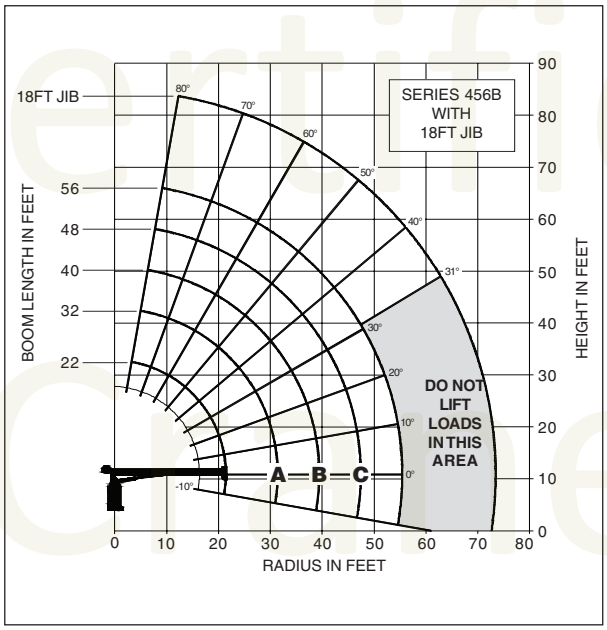
The crane industry in BC has stated that operators must get a minimum of 70% correct on the load chart and rigging part of the assessment to be competent.

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 Charts – Capacities

Load Rating Chart: Series 456B with 18 ft. Jib

Other series 400B Load Rating Charts are available. National will send you a chart on request – or you may secure needed load rating information through your nearest National dealer.



CAUTION:

- **Do not operate crane booms, jib extensions, any accessories or loads within 10 ft (3m) of live power lines or other conductors of electricity.**
- Jib and boom capacities shown are maximum for each section.
- Do not exceed capacities at reduced radii.
- Load ratings shown on the load rating charts are maximum allowable loads with the outriggers properly extended on a firm, level surface and the crane leveled and mounted on a factory recommended truck.
- Always level the crane with the level indicator located on the crane.
- The operator must reduce load to allow for factors such as wind, ground conditions, operating speeds and their effects on freely suspended loads.
- Overloading this crane may cause structural collapse or instability.
- Weights on any accessories attached to the boom or loadline must be deducted from the load chart capacities.
- Do not exceed jib capabilities at any reduced boom lengths.
- Do not deadhead lineblock against boom tip when extending boom or winching up.
- Keep at least three wraps of loadline on drum at all times.
- Use only specified cable with this machine.

SERIES 456B WITH 18 FT JIB

NOTE:

1. Operate with jib by radius when main boom is fully extended. If necessary increase boom angle to maintain loaded radius.
2. Operate with jib by boom angle when main boom is not fully extended. Do not exceed rated jib capacities at any reduced boom lengths.

LOADLINE EQUIPMENT DEDUCT (lb)

Downhaul weight _____ 90
One sheave block _____ 185
Two sheave block _____ 355

Load Rating: Series 456B with 18 ft. Jib

LOAD RADIUS (FEET)	LOADED BOOM ANGLE	22FT BOOM (lb)	LOADED BOOM ANGLE	A 32FT BOOM (lb)	LOADED BOOM ANGLE	B 40FT BOOM (lb)	LOADED BOOM ANGLE	C 48FT BOOM (lb)	LOADED BOOM ANGLE	56FT BOOM (lb)	LOAD RADIUS (FEET)	LOADED BOOM ANGLE	18FT JIB (lb)
5	77.5	20,000											
6	74.5	17,300											
8	70	12,800	76.5	10,950	79.5	10,400							
10	63	10,000	73	8,850	77	8,650							
12	56.5	8,800	69	7,650	74	7,250	76.5	7,150					
14	50	7,800	65	6,850	70.5	6,350	75	6,150	77	5,900	14	80	2,800
16	42.5	6,900	61	6,050	68.5	5,650	72.5	5,400	75.5	5,150	16	78.5	2,700
18	34	6,100	57.5	5,450	65	5,150	69.5	4,900	73.5	4,600	18	77	2,500
20	23	5,400	53	5,050	62	4,750	67.5	4,600	71	4,200	20	75.5	2,300
25			40.5	4,050	53.5	3,850	61	3,700	65.5	3,400	25	72	2,050
30			22.5	3,200	43.5	3,150	53.5	3,000	60	2,800	30	68	1,750
35					31	2,600	45.5	2,600	53.5	2,400	35	63.5	1,500
40							36	2,100	46.5	2,000	40	59	1,300
45							22.5	1,750	39	1,650	45	54.5	1,100
50									29	1,400	50	49.5	1,000
55									13	1,050	55	44	850
60											60	38	750
65											65	31	650
	0	4,050	0	2,350	0	1,650	0	1,250	0	850			

THIS CHART IS ONLY A GUIDE AND SHOULD NOT BE USED TO OPERATE THE CRANE. The individual crane's load chart, operating instructions and other instructional plates must be read and understood prior to operating the crane.

Load Charts – Specifications

Boom and Jib Combinations Data

Available in three basic models.

Model 437B – Equipped with a 15' 2"-37 ft (4.62-11.28 m) three-section boom. Maximum tip height is 47 ft (14.32 m).

15'2"-37 (4.62-11.28 m) three-section

Model 446B – Equipped with an 18' 2"-46 ft (5.54-14.02 m) three-section boom. This model can be equipped with an 18 ft (5.49 m) single section jib. Maximum tip height w/18 ft (5.49 m) jib is 74 ft (22.55 m).

18'2"-46 (5.54-14.02 m) three-section boom

18'2"-46 (5.54-14.02 m) three-section boom **4FJ18** 18 ft (5.49 m) jib

Model 456B – Equipped with a 21' 6"-56 ft. (6.55-17.07 m) three-section boom. This model can be equipped with an 18 ft (5.49 m) single section jib. Maximum tip height w/18 ft (5.49 m) jib is 84 ft (25.60 m).

21'6"-56 ft (6.55-17.07 m) three-section boom.

21'6"-56 ft. (6.55-17.07 m) three-section boom **4FJ18** 18 ft (5.49 m) jib

***Note:** Maximum tip is measured with outriggers/stabilizers fully extended.*

400B Winch Data

- All winch pulls and speeds in this chart are shown on the third layer
- Winch line pulls would increase on the first and second layers
- Winch line speed would decrease on the first and second layers
- Winch line pulls may be limited by the winch capacity or the ANSI 5 to 1 cable safety factor
- Hook blocks are rated at maximum capacity for the block. **Do not exceed rated cable pull with any block.**

Winch	Cable Supplied	Average Breaking Strength	1 Part Line Lift and Speed	2 Part Line Lift and Speed	3 Part Line Lift and Speed	4 Part Line Lift and Speed
Standard Planetary Winch	Standard 1/2" Diameter Rotation Resistant	29,200 lb (13 250 kg)	5,840 lb (2650 kg) 184 fpm (56 m/min)	11,680 lb (5300 kg) 92 fpm (28 m/min)	17,520 lb (7950 kg) 61 fpm (19 m/min)	20,000 lb (9075 kg) 46 fpm (14 m/min)
Optional High-pull **Planetary Winch**	Standard 9/16" Diameter Rotation Resistant	38,500 lb (17 463 kg)	7,700 lb (3493 kg) 110 fpm (34 m/min)	15,400 lb (6985 kg) 55 fpm (17 m/min)	20,000 lb (9075 kg) 37 fpm (11 m/min)	N/A N/A

Winch	Bare Drum Pull	Std. Cable Limited
Standard Planetary	6,900 lb (3130 kg)	5,840 lb (2650 kg)
Optional Planetary	10,200 lb (4627 kg)	7,700 lb (3493 kg)

Load Chart Questions

1. What is the Gross Capacity based on the following configuration?

   - Radius 20 feet
   - 48 feet of main boom extended
   - One sheave block two parts of line
   - Rigging 20 lbs

2. What is the boom truck's Net Capacity based on the previous questions configuration?

3. What is the boom truck's Gross Capacity based on the following configuration?

   - Radius 17 feet
   - Main boom fully extended
   - Downhaul weight single part of line
   - Rigging 40 lb.

4. What is the boom truck's Net Capacity based on the following configuration?

   - Main boom extended to 45 feet
   - Radius 35 feet
   - One sheave block two parts of line
   - Rigging 60 lbs

5. What is the boom truck's Net Capacity based on the following configuration?

- Boom length 56 feet
- Main boom angle 68 degrees
- One sheave block two parts of line
- Rigging 35 lbs

6. What is the boom truck's Gross Capacity based on the following configuration?

- Radius 27 feet
- Main boom length 36 feet

7. What is the boom truck's Gross Capacity based on the following configuration?

- Boom length 49 feet
- Boom angle 31 degrees

8. What is the maximum radius the load can be placed based on the following configuration?

- Load weight 3,200 lbs
- Boom length 42 feet
- Downhaul weight single part of line
- Spreader bar 120 lbs
- Slings 30 lbs

9. What is the lowest boom angle the load can be placed based on the following configuration?

- Main boom fully extended
- Two sheave block three parts of line
- Rigging 85 lbs
- Load weight 3,800 lbs

10. What is the boom trucks net capacity based on the following configuration?

- Main boom fully extended
- 18 foot jib erected
- Downhaul weight single part of line
- Rigging 40 lbs
- Radius 45 feet

11. If the boom is telescoped in to a radius of 18 feet in the previous question, what is the boom truck's net capacity?

12. What is the lowest boom angle the load can be placed based on the following configuration?

- Load weight 880 lbs
- Downhaul weight single part of line
- Lift from 18 foot jib
- Rigging 25 lbs
- Main boom length 48 feet

Load Chart Answers

1. What is the Gross Capacity based on the following configuration?

- Radius 20 feet
- 48 feet of main boom extended
- One sheave block two parts of line
- Rigging 20 lbs

4,600 pounds

2. What is the boom truck's Net Capacity based on the previous questions configuration?

Gross Capacity	**4,600 lbs**
Minus the weight of	
One sheave block	**185 lbs**
Rigging	**20 lbs**
Net Capacity	**4,395 lbs**

3. What is the boom truck's Gross Capacity based on the following configuration?

- Radius 17 feet
- Main boom fully extended
- Downhaul weight single part of line
- Rigging 40 lbs

Because the Radius is between values listed, you must go to the next longer radius listed in the loaded radius column 18 ft.

Gross Capacity 4,600 lbs

4. What is the boom truck's Net Capacity based on the following configuration?

- Main boom extended to 45 feet
- Radius 35 feet
- One sheave block two parts of line
- Rigging 60 lbs

The gross capacity when the boom length is between values listed is determined by:
Going to the next longer boom length 48 ft. in the capacity chart at a 35 ft. radius

Gross capacity	**2,600 lbs**
Minus the weight of	
One sheave block	**185 lbs**
Rigging	**60 lbs**
Net Capacity	**2,355 lbs**

5. What is the boom truck's Net Capacity based on the following configuration?

- Boom length 56 feet
- Main boom angle 68 degrees
- One sheave block two parts of line
- Rigging 35 lbs

The gross capacity when the boom angle is between values listed is determined by:
Going to the next Lower boom angle 65.5 degrees at a boom length of 56 ft.

Gross capacity	**3,400 lbs**
Minus the weight of	
Rigging	**35 lbs**
One sheave block	**185 lbs**
Net Capacity	**3,180 lbs**

6. What is the boom truck's Gross Capacity based on the following configuration?

- Radius 27 feet
- Main boom length 36 feet

Go to the next longer radius 30 feet
Go to the next longer boom length 40 feet

Gross capacity	**3,150 lbs**

7. What is the boom truck's Gross Capacity based on the following configuration?

- Boom length 49 ft.
- Boom angle 31 degrees

Go to the next longer boom length: 56 feet

Go to the next lowest boom angle: 29 degrees

Gross capacity 1,400 lbs

8. What is the maximum radius the load can be placed based on the following configuration?

- Load weight 3200 lbs
- Boom length 42 feet
- Downhaul weight single part of line
- Spreader bar 120 lbs
- Slings 30 lbs

Total Gross Load

Load weight	**3,200 lbs**
Downhaul weight	**90 lbs**
Spreader bar	**120 lbs**
Rigging slings	**30 lbs**
Gross Load	**3,440 lbs**

The boom length is between values listed so you must go to the next longer boom length: 48 feet

Follow down the 48 feet column until you come to a gross capacity equal to or greater than the gross load of 3440 lbs.

Follow the line across the capacity chart to the load radius column to determine a maximum Radius of 25 feet

9. What is the lowest boom angle the load can be placed based on the following configuration?

- Main boom fully extended
- Two sheave block three parts of line
- Rigging 85 lbs
- Load weight 3,800 lbs

Gross Load

Load weight	**3,800 lbs**
Two sheave block	**355 lbs**
Rigging	**85 lbs**
Gross load	**4,240 lbs**

Follow down the 5f feet column until you come to a capacity equal to or greater than 4,240 lbs

At 71 degrees the capacity of 4,200 lbs is lower than the gross load on the boom truck.

At 73.5 degrees the capacity of 4,600 lbs is greater than the gross load on the boom truck.

Lowest boom angle 73.5 degrees

10. What is the boom trucks net capacity based on the following configuration?

- Main boom fully extended
- 18 foot jib erected
- Downhaul weight single part of line
- Rigging 40 lbs
- Radius 45 feet

Gross capacity	**1,100 lbs**
Minus the weight of	
Downhaul weight	**90 lbs**
Rigging	**40 lbs**
Net capacity	**970 lbs**

11. If the boom is telescoped in to a radius of 18 ft. in the previous question,

- What is the boom truck's net capacity?

The net capacity remains the same; note # 2 applies under jib notes:

Operate with jib by boom angle when main boom is not fully extended. Do not exceed rated jib capacities at any reduced boom lengths.

12. What is the lowest boom angle the load can be placed based on the following configuration?

- Load weight 880 lbs
- Downhaul weight single part of line
- Lift from 18 foot jib
- Rigging 25 lbs
- Main boom length 48 feet

Gross Load

Load weight	**880 lbs**
Downhaul weight	**90 lbs**
Rigging	**25 lbs**
Gross load	**995 lbs**

Go down the jib's loaded boom angle chart till you come to a capacity greater than 995 lbs.

At 49.5 degrees the capacity is 1,000 lbs.