

National Series 400A Proposal

Date: _____
 Prepared for: _____

 Submitted by: _____

 (Firm Name)

 (Address)

 (City & State)

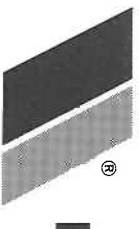
 (Zip)

 (Phone)
 Signed: _____

National reserves the right to change designs, prices, and specifications at any time without notice.

Your National Dealer

Description	Price
1. Series _____	\$ _____
2. Deduct: if torsion box not required _____	(_____)
3. Boom _____	_____
4. Jib _____	_____
5. Rear Stabilizers <input type="checkbox"/> ASH <input type="checkbox"/> RSH 18"	_____
6. Front Stabilizers <input type="checkbox"/> Std. <input type="checkbox"/> Tilt <input type="checkbox"/> Single	_____
7. Line Block <input type="checkbox"/> 2 Part <input type="checkbox"/> 2 & 3 Part <input type="checkbox"/> 4 Part	_____
Accessories	
8. PD-12 Planetary Winch _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
Mounting	
12. Installation: Behind Cab _____	_____
13. Installation: Rear Mounting (add to installation charge above)	
<input type="checkbox"/> ASH Behind Cab Stabilizers _____	_____
<input type="checkbox"/> Air Throttle _____	_____
<input type="checkbox"/> Rear Mounting Group _____	_____
<input type="checkbox"/> HO Outriggers _____	_____
14. Frame Reinforcement: <input type="checkbox"/> Weld <input type="checkbox"/> Bolt-Extra _____	_____
15. Platform Body _____ ft. <input type="checkbox"/> Wood <input type="checkbox"/> Steel _____	_____
16. Weight in bed _____ lbs. (if required) _____	_____
17. Boom rest: <input type="checkbox"/> Parallel <input type="checkbox"/> Low <input type="checkbox"/> Other _____	_____
18. Mount Stabilizers (Rear) _____	_____
19. Mount Stabilizers (Front) _____	_____
20. Chassis _____	_____
21. Rear Bumper Underride Protection <input type="checkbox"/> Ordered <input type="checkbox"/> Not Ordered _____	_____
22. Freight _____	_____
This quotation will remain firm for _____ days.	
Accepted by: _____ (Name)	\$ _____ TOTAL PRICE
_____ (Firm Name)	_____ (Date)



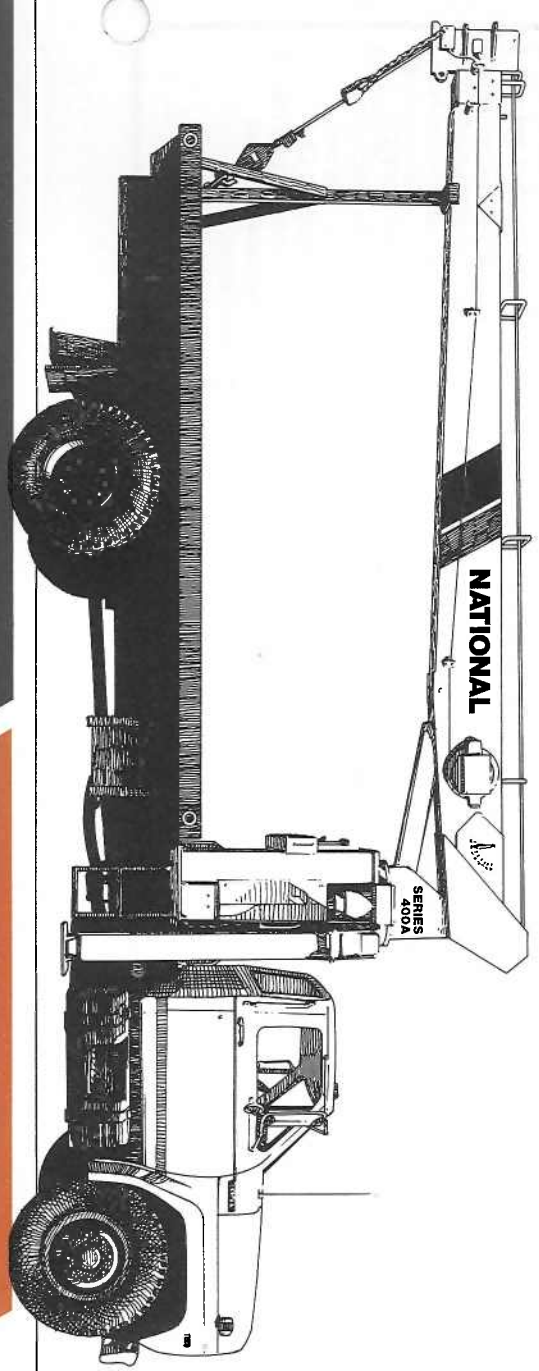
NATIONAL CRANE

General Offices: 11200 North 148th Street/Waverly, NE 68462
 Phone: 402/786-2240; Telex: 438061; Fax: 402/786-3636

National Series 400A

Truck-Mounted Telescoping Cranes and Accessories

Maximum Vertical Reach: 95 Feet (28.9 Meters)
 Maximum Capacity: 20,000 Pounds (9.1 Metric Tons)



A NEW medium-duty telescoping crane from National, America's truck-mounted hydraulic crane leader!

Preliminary Specifications

Why buy a National Series 400A?

ALL NEW!



To provide our customers with products where Quality and Reliability are integral with design and manufacturing.

National Crane, America's truck-mounted hydraulic crane leader, features the industry's premier lineup of hard working telescoping and articulating cranes. The medium duty Series 400A telescoping crane with its 10-ton (9.1MT) capacity and 95-foot (28.9m) vertical reach offers many advantages:

- **National's field-proven durability**
- National has manufactured cranes since 1963.
- Nearly 17,000 field-proven cranes verify National's manufacturing expertise.

Attention to quality

- National's industry-leading testing program subjects all prototype models to state-of-the-art strain gauge and life cycle testing to verify structural integrity.
- Each 400A undergoes numerous quality inspections at all levels of manufacture and assembly.

Retained market value

- National cranes traditionally retain higher resale value year after year.

Responsive service

- Each 400A is backed by strong after-sale and service support. Our professional, factory-trained dealer network spans the nation.

- Authorized National dealers maintain a parts stocking program for your 400A.

- When a dealer cannot immediately supply a part, the factory's backup program provides 24-hour parts shipping in 90% of all breakdown rush orders.

Strong warranty protection

- The 400A is backed by a solid warranty covering defects in materials and workmanship for six months from the date of shipment.

Our Series 400A telescoping crane gives you everything you want and need in a tough, compact, medium-duty crane. Here are all-new features that make the 400A the top crane in its class:

- 10-ton (9.1MT) rated capacity (two full tons more than the 400A predecessor model) makes this unit the **highest capacity crane in its class in the industry**
- Higher reach — up to 95 feet (28.9m) (with Model 456A with a 29-foot manual pull-out jib)
- Stronger booms that lift more
- Proportional boom design provides smoother, more efficient boom operation, higher capacities (particularly in normal lifting

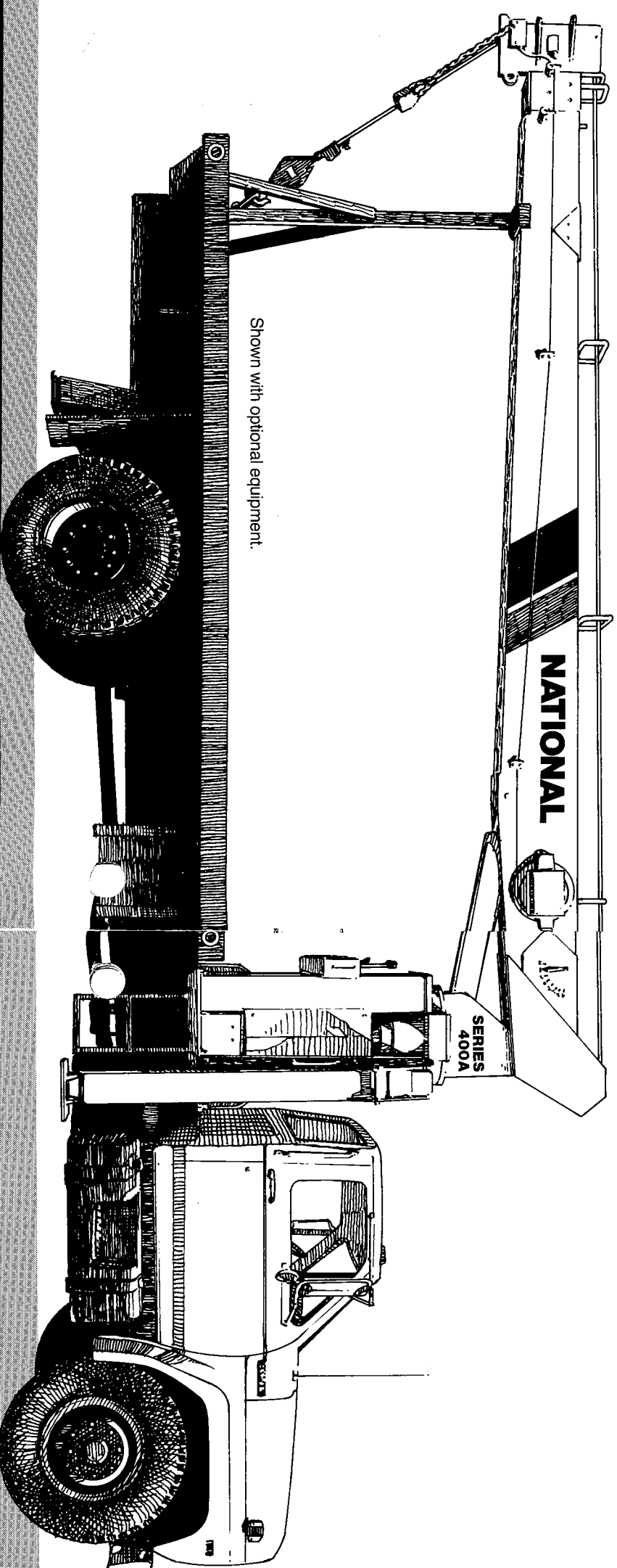
areas), more efficient weight distribution, and utilizes a single extend cylinder (eliminating 18 potential leak points and minimizing hydraulic maintenance)

- Increased payload capacity (up to 7,000 pounds can be hauled on a standard truck)
- Accomplished through a wider outrigger span and increased gross rear axle weight rating
- New, extra-wide outrigger span provides solid stability without adding extra counterweight
- New state-of-the-art O-ring seal fittings on all high pressure lines reduce downtime by eliminating fitting leakage

- New boom pivot and lift cylinder bearings provide longer life and lower maintenance
- A new standard tandem pump system isolates the winch from other crane functions to provide better overall performance

Here are other typical features that National 400A crane users will appreciate:

- Extra large wear pads in the boom last longer and are easier to replace
- Dual controls in SAE recommended orientation of functions (you always work the same control with the same hand)
- Each operating station is equipped with a foot throttle and a precision machine level
- Standard high-performance planetary winch with rotation-resistant cable
- Standard anti-two-block feature to prevent cable damage when winching up or extending the boom without paying-out the winch cable
- Planetary rotation gear box with a hydraulic release brake and a slip-through feature that helps protect the rotation system against damage from accidental side loading
- Outrigger location (behind the operator) allows occasional 360-degree working area without front stabilizers when the crane is mounted on a recommended truck
- Larger outrigger pads provide greater stability in soft footing
- Mounts on standard, single-rear-axle trucks with the versatility of five mounting configurations
- Horn and stop switches are located at both control stations
- Complete accessory line adds to the versatility of the 400A



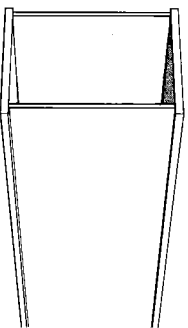
Shown with optional equipment.

National Series 400A

Strong Four-Plate Booms

Through computer aided design, National has improved weight efficiency of the Series 400A boom sections. We fabricate our telescoping boom sections from four high-strength steel members welded with perpendicular corners. This box-section construction lets us use thicker top and bottom plates for extra strength. The use of thinner side plates means increased capacity through lower boom weight. Only strong, low alloy steel is used in National booms. It is welded with automatic, low-hydrogen techniques for extra strong seams. Corner seams are ultrasonically tested for proper penetration.

The National Series 400A is equipped on all sides with large nylon wear pads impregnated with lubricants, providing a smooth, long-life operation. The wear resistance of the material used in the Series 400A pads is unexcelled by competitive models.



Proportional Boom Extension

Proportional (cable crowd) boom design (each boom section extends and retracts proportionally during the telescoping operation) provides more efficient boom weight distribution. This means smoother, more efficient boom operation and higher capacities for you. Since the system utilizes only one extend cylinder, hydraulic maintenance is minimized. Boom telescope cylinder is fully protected with a direct mount holding valve.

Anti-Two-Block

The 400A is equipped with a standard anti-two-block attachment. Two blocking occurs when the winch cable and attachments contact the underside of the boom sheave case, whether by winching up or extending the boom without paying out the winch cable. When this happens, the cable can be damaged by crimping or over-tensioning. The anti-two-block attachment prevents cable damage by sensing the position of the winch cable end attachments with respect to the sheave case and shutting down the functions that can cause two blocking.

Easy Service, Low Downtime

The Series 400A frame allows easy access to control valves and plumbing for minor adjustments and fitting tightening. The complete console is easily removable for major repair.

Dual Controls

Dual controls are standard on the Series 400A. The extra fine metering and low spool forces give you smoother, more precise control. Crane controls are identical on each side with SAE recommended orientation of functions. That means you always work the same control with the same hand. Dual stations provide more efficient operations and greater load visibility. Each station is equipped with kill and audible warning switches. A system pressure gauge is standard for easily checking pressures on all control functions. Foot throttles allow identical foot operation of engine speed from either side. Control rods are supported by nylon bearings, promoting smooth operation and reducing lubrication requirements.

High Performance Planetary Winch

The 400A comes standard with a high-performance planetary gear drive winch. Anti-friction bearings are used throughout to maximize efficiency and seal life. A winch drum rotation indicator has been added.

This high-capacity winch has increased efficiency and, therefore, requires less horsepower and generates less heat. For fine control, both brake and counter-balance valves are standard. New winch covers improve visibility of drum and cable. The winch is filled with $\frac{1}{2}$ " diameter rotation resistant cable. See the winch data chart on page seven for further information.

Positive Planetary Turret Rotation

The planetary rotation gearbox with a hydraulic release brake allows the gearbox to backdrive whenever excessive side load is applied to the boom, reducing shock loads on the upper and lower crane structure and gearbox. The turret drive is designed with extra heavy bearings below the drive pinion. The gearbox and rotation bearing mounting surfaces are precision machined after welding. This ensures constant tooth alignment for smooth rotation and low wear, even under

maximum loads. The entire turret glides smoothly on a low inertia ball bearing race. Rotation is 375° noncontinuous. The 400A is equipped with a turret rotation indicator to aid the operator in positioning loads.

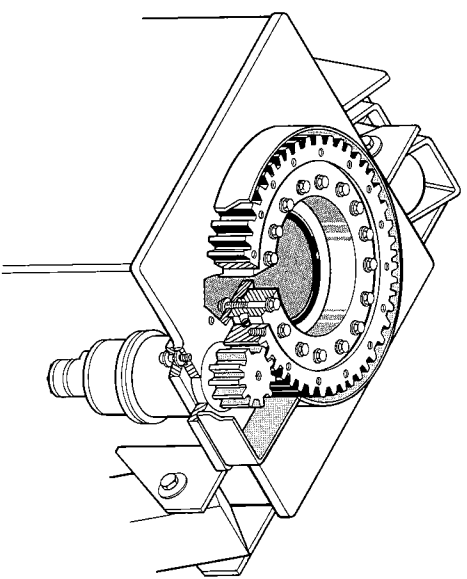
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Less Space

The National Series 400A is built tough, but compact, so it fits in just 36.75 inches (933mm) of bed space. That leaves ample payload space, making your Series 400A even more versatile. The 400A controls and operator platforms are designed with an improved access to the truck bed, permitting the operator to move from one control station to the other. The operator platforms are made with open mesh expanded metal to keep dirt and mud buildup to a minimum.

Less Weight

The Series 400A is designed with wider outriggers and a new rigid subframe to reduce the need for counterweight on virtually every truck on which it can be mounted. Even with its increased capacity, it weighs less than its predecessor model when mounted on the same minimum truck.

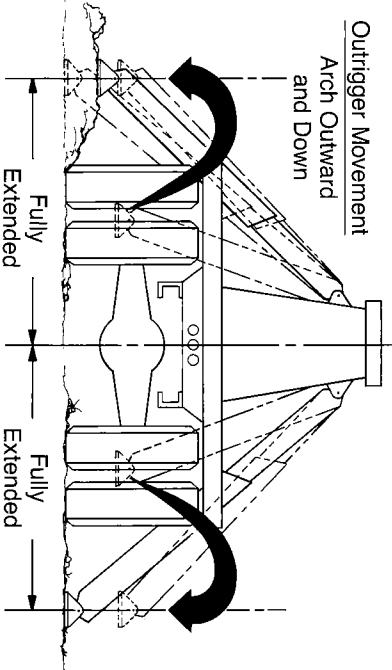


Wide Stance

We've given our Series 400A the industry-acclaimed National out-and-down outriggers for a consistently wide stance and better leveling on uneven ground. The outriggers retract smoothly, without binding under load, first moving up, then in. Their efficient design

and wider span — 16.4-feet (5,000mm) — gives you greater stability with less truck weight, so you can carry larger payloads. The 400A is equipped with larger pads for greater stability in soft footing. A precision mounted level indicator aids the operator in leveling the unit during the set-up procedure.

National's "Out-and-Down" Stable Outriggers CRANE



- Outriggers equally spaced from crane center line.
- Consistent outrigger span.
- Crane will be equally stable on both sides.

The National Parts System

Authorized National Crane dealers maintain a parts supply to support the National cranes in each dealer's area. If a dealer cannot immediately supply a needed part, the factory maintains a back-up parts supply that provides 24-hour parts shipping in 90% of all breakdown rush orders. National's responsiveness to dealer requests means that your crane will be back on the job fast. National maintains a highly trained Service and Parts staff to answer dealer service questions and expedite parts shipping.

The National Warranty

National's warranty covers your crane against defects in materials or workmanship for **six full months** from the date of shipment, subject to the conditions of the warranty. When you select a National crane, you're getting more than just a crane. You're getting a nationwide dealer warranty service network, strong warranty protection and our special concern for every product we make. Read our warranty. Then, don't settle for less. For

complete information, write National Warranty Service, Waverly, NE 68462.

The National Service Center

National maintains a well-equipped service center where we do all our factory crane mounting. The central location of our Service Center makes it easy to return cranes for special modifications or extreme repairs. Most National dealers can perform all but the most unusual modifications or most serious repairs. Should you need to return your crane to us for modification, warranty repair or other service, we will give it priority care and see it's returned as soon as possible.

Do not operate crane or accessories within 10 feet (3m) of live power lines.

to a multi-level inspection program during manufacture and assembly. National's attention to testing ensures that each crane delivered to the field is ready for on-the-job action.

The National Testing Program

National Crane established its original product durability standards by carefully evaluating the performance of competitive machines. Taking the best performances from these tests, National engineers set their own standards **more than 50% higher!** This is the same testing standard each National must pass today. Before a new model is released for production manufacturing it is subjected to state-of-the-art testing. For example, a plastic-based "brittle lacquer" coating is

applied to the crane. After loading, test engineers inspect the coating for cracks. The special lacquer has virtually no elastic qualities, so stretching or deformation of the metal shows up in "fractures" of the coating, perpendicular to the direction of stretching. This procedure indicates where engineers are to place strain gauges, tiny chips printed with electronic circuitry which expand or contract with changes in the metal. Minute changes in electrical resistance are

measured by a computerized strain gauge monitor and printed out for engineering studies. Strain gauges measure metal deformation as small as one-millionth of an inch. After strain gauge testing, the prototype of each new model undergoes life-cycle testing. The crane is operated at full-load through a full life-cycle under close scrutiny. Outriggers, frames, and other components are loaded and rotated through a complete range of motion for the prescribed number of cycles. All components used on National cranes are subject

National Series 400A Booms and Jibs

Heights to 95 feet (28.9m) available
The National Series 400A is available with a choice of booms and jibs. One of these combinations is right for your 10-ton capacity lifting

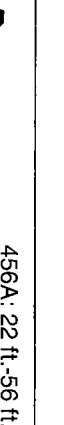
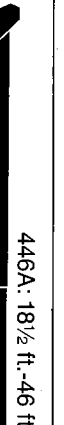
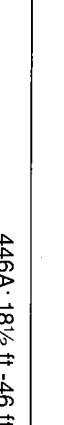
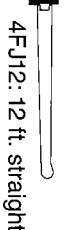
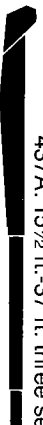
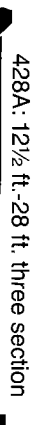
requirements. Select the telescoping boom you want, then add one of National's jib options as a cost-efficient way to increase the capacity and versatility of your Series 400A.

Do not operate cranes or accessories within 10 feet (3m) of live power lines.

1. Load ratings shown on these charts are maximum allowable loads with the outriggers properly extended on a firm, level surface and the crane leveled and recommended truck.
2. Always level the crane with the level indicator located on the crane frame.
3. The operator must reduce loads to allow for factors such as wind, ground conditions, operating speeds and the effect of freely suspended loads.
4. Overloading the crane may cause structural collapse or instability.
5. Weights of any accessories attached to the boom or loadline must be deducted from the load chart capacities.
6. Do not exceed jib capacities at any reduced boom lengths.

Boom and Jib Combinations

- Telescoping Booms**
- Model 428A: 12½-ft.-28-foot (3.8m to 8.5m) three section
 - Model 437A: 15½-ft.-to 37-foot (4.7m to 11.3m) three section
 - Model 446A: 18½-ft.-to 46-foot (5.6m to 14m) three section
 - Model 456A: 22- to 56-foot (6.7m to 17.1m) three section
- Jib Options (side stowing)**
- Model 4FJ12: 12-foot (3.7m) straight (for Model 428A)
 - Model 4FJ15: 15-foot (4.6m) straight (for Model 437A)
 - Model 4FJ18: 18-foot (5.5m) straight (for Models 446A, 456A)
 - Model 4FJ29M: 18- to 29-foot (5.5m to 8.8m) manual pull-out (for Models 446A, 456A)



456A Capacity* (without jib)
(Metric equivalents shown in parentheses)

Radius	Boom Fully Retracted 22' (6.7m)	Boom 32' Extended (9.8m)	Boom 40' Extended (12.2m)	Boom 48' Extended (14.6m)	Boom Fully Extended 56' (17.1m)
5' (1.5m)	20000 lbs. (9072 kg)				
6' (1.8m)	17000 lbs. (7711 kg)	10400 (4717)	9700 (4400)		
8' (2.4m)	12500 lbs. (5670 kg)	8800 (3992)	8450 (3833)		
10' (3.0m)	9650 lbs. (4377 kg)	7600 (3447)	7000 (3175)	6600 (2994)	
12' (3.7m)	8300 lbs. (3765 kg)	6550 (2971)	6100 (2767)	5800 (2631)	5600 (2540)
14' (4.3m)	7350 lbs. (3334 kg)	5850 (2654)	5500 (2495)	5200 (2359)	4900 (2223)
16' (4.9m)	6450 lbs. (2926 kg)	5360 (2427)	5000 (2268)	4600 (2087)	4350 (1973)
18' (5.5m)	5800 lbs. (2631 kg)	4850 (2200)	4550 (2064)	4300 (1950)	3900 (1769)
20' (6.1m)	5050 lbs. (2291 kg)	3850 (1746)	3600 (1633)	3400 (1542)	3150 (1429)
25' (7.6m)		3000 (1361)	3000 (1361)	2850 (1293)	2550 (1157)
30' (9.1m)			2400 (1089)	2400 (1089)	2200 (998)
35' (10.7m)			1500 (680)	2050 (930)	1900 (862)
40' (12.2m)				1700 (771)	1600 (726)
45' (13.7m)					1400 (635)
50' (15.2m)					1050 (476)
55' (16.8m)					

*Capacities shown are for the 456A with the load suspended, radius shown is for loaded boom. Capacities vary for cranes equipped with jibs or attachments. The capacities shown will be reduced when accessories are attached to the boom or loadline. Consult factory for specific load rating information.

Note: Rated loads do not exceed 85% of the tipping load. The structural strength ratings in the chart above are shaded.

NATIONAL SERIES 400A WINCH DATA

Winch	Cable Supplied	Average Breaking Strength	Lift and Speed			
			1 Part Line	2 Part Line	3 Part Line	4 Part Line
Standard Planetary Winch	Standard ½" diam. rotation resistant	29,200 lbs. (13,250 kg)	5,840 lbs. (2,650 kg) 184 fpm (56 m/min)	11,680 lbs. (5,300 kg) 92 fpm (28 m/min)	17,520 lbs. (7,950 kg) 61 fpm (19 m/min)	20,000 lbs. (9,075 kg) 46 fpm (14 m/min)
	Optional ½" diam. 6 x 19 or 6 x 25 IWRC	23,000 lbs. (10,436 kg)	5,840 lbs. (2,650 kg) 184 fpm (56 m/min)	11,680 lbs. (5,300 kg) 92 fpm (28 m/min)	17,520 lbs. (7,950 kg) 61 fpm (19 m/min)	20,000 lbs. (9,075 kg) 46 fpm (14 m/min)
Optional High-pull Planetary Winch	Standard 9/16" diam. rotation resistant	37,000 lbs. (16,788 kg)	7,400 lbs. (3,357 kg) 110 fpm (34 m/min)	14,800 lbs. (6,715 kg) 55 fpm (17 m/min)	20,000 lbs. (9,075 kg) 37 fpm (11 m/min)	-
	Optional 9/16" diam. 6 x 19 or 6 x 25 IWRC	29,750 lbs. (13,500 kg)	8,400 lbs. (3,811 kg) 110 fpm (34 m/min)	16,800 lbs. (7,622 kg) 55 fpm (17 m/min)	20,000 lbs. (9,075 kg) 37 fpm (11 m/min)	-

All winch pulls and speeds are shown on the third layer. Winch pulls would increase on the first and second layers. Winch line speeds would decrease on the first and second layers. Winch pulls may be limited by the winch capacity or the OSHA 5 to 1 or 3.5 to 1 safety factor. These are shown below.

Winch	Winch Limited	Standard	Optional
Standard Planetary	6,835 lbs. (3,101 kg)	5,840 lbs. (2,650 kg)	5,840 lbs. (2,650 kg)
Optional Planetary	10,200 lbs. (4,628 kg)	7,400 lbs. (3,357 kg)	8,400 lbs. (3,811 kg)

