A heavy-duty telescoping crane from America’s truck-mounted hydraulic crane leader

- Maximum Capacity: 46,000 Pounds (20.86 Metric Tons)
- Maximum Vertical Reach: 146 Feet (44.5 Meters)
Why Buy the National Series 900
Telescoping Crane?

Uncompromising Standards
Unequaled Performance

National Crane Corporation, America's truck-mounted hydraulic crane leader, offers these excellent reasons to buy the Series 900, top of its class in the world of commercial truck-mounted cranes:

Extra-heavy lifting power
The National Series 900 has a rated capacity of 46,000 lb. (20.86 MT).

Extra-long reach
The Series 900 reaches vertically to 98 ft. (29.9 m) under hydraulic power. With the 48-foot (14.6 m) jib, Model 990 reaches to a height of 146 ft. (44.5 m).

Load Moment Indicator
The Series 900 is equipped with a Load Moment Indicator (LMI) that provides the operator with a continuous capacity reading as the crane makes a lift. When capacity is reached, an audio/visual alarm alerts the operator to take corrective action while the system deactivates functions that could contribute to an overload. (See p. 5.)

Proportional boom extension
National pioneered the proportional boom used with the Series 900. All four sections telescope proportionally, providing more efficient weight distribution, fast set up, extra-long reach and heavy-duty lifting power. (See p. 4.)

Operator-friendly controls
Dual controls are standard on the Series 900. Identical crane function controls are located on each side of the crane and in SAE-recommended orientation—same controls, same hand positioning. (See p. 6.)

High performance winch
A high performance planetary winch offers high line pull and fast standard speed, while requiring less horsepower and generating less heat. Its efficient orbit motor allows extra-smooth control, even at maximum load. (See p. 5.)

Mounts on standard trucks
The Series 900 mounts on standard, commercial tandem rear axle trucks, yet meets DOT and stability standards. Wide-span hydraulic outriggers, out-and-down rear stabilizers and the unitized mount take most of the stress, increasing truck life. (See p. 7.)

Heavy-duty triple pump hydraulics
A high pressure/high speed, balanced vane triple pump is standard on the Series 900, increasing productivity and ease of operation. This replaceable pump provides three individual hydraulic circuits for the independent operation of the winch, swing and crane functions. (See p. 7.)
Responsive service and parts support
- Each National crane is backed by strong after-sale service and support through a nationwide professional dealer network. A typical dealer has been associated with National for over a decade and knows our products from top to bottom. Authorized dealers stock parts to support the National cranes in their area. If your dealer cannot immediately supply a part, National maintains a back-up program and is committed to providing 24-hour shipping in over 90 percent of all break-down rush orders. That means your crane will be back on the job without needless delay.
- National also maintains a fully equipped service center at the plant to handle factory crane mounting, special modifications and repairs. However, most dealers can accommodate all but the most unusual or serious service needs.

Easier maintenance and less downtime
- When maintenance is necessary, you’ll appreciate the way National design and manufactured to simplify service and limit downtime.
- The National warranty
  - Our warranty covers your crane against defects in materials and workmanship for one year from date of shipment, subject to the conditions of the warranty. When you purchase a National, along with this protection and our long-standing commitment to quality, you have access to a nationwide dealer warranty service network.

Efficient boom design
- Computerized design allows higher lifting capacities by maximizing the weight efficiency of National booms.
- • Welds are made with automatic, low hydrogen techniques to ensure strength, fatigue-resistant seams. These are ultrasonically tested to verify proper weld penetration.

Proportional boom extension
- Each boom extends and retracts proportionally during the teleoperating operation. This four-section proportional (cable crowd) boom design—pioneered by National Cranes—provides fast set up, more efficient boom weight distribution, minimum overlap for extra-long hydraulic reach with minimum retracted length, and higher capacities in normal working radii. Reduced boom overall (when stowed) also increases truck maneuverability.
- Dual load high load carrying cables and the fourth stage boom. The use of cable (or chains than chains) increases capacity and service life while reducing maintenance. Reduced friction cable sets are used for durability and reliability.
- All boom sections are supported by one hydraulic extended cylinder, minimizing hydraulic maintenance. There are no fittings, tubes or hoses inside the booms, while access holes simplify wear pad and holding valve maintenance.

Easy Glide boom wear pads
- Extending or retracting, even at slow operating speeds, Easy Glide wear pads provide smooth, reduced friction boom movement. A unique technology pioneered by National, these self-lubricating wear pads deposit and last-longling film on boom sections and pads surfaces.
- Although boom surfaces still require some routine greasing, Easy Glide pads are both easy to replace and efficient, reducing the conditions that cause noisy boom chatter, vibration, and accelerated wear.

High performance planetary winch
- A high performance planetary gear drive winch increases efficiency requires less horsepower and generates less heat. The efficient gear motor, brake and overdrive assembly, and anodized roller bearings provide smooth, precise up and down control, even under maximum load.

Load Moment Indicator
- A state-of-the-art P.A.T. DS150 LMI offers a console display of boom length and angle, load on hook and available capacity. This features provide the operator with a continuous capacity reading during lifts.
- Keyed system override is provided to address a boom position emergency. When loads are relieved, the system automatically adjusts to allow use of all functions.

As load capacity is approached, a caution light illuminates on the console. When capacity is reached, a red warning light and horn are activated. When crane movement halts to prevent overload. The LMI then allows only the use of functions that will relieve the load condition (boom up, winch down, telescope in).

Anti-Two-Block system
- Two-block occurs when winch cable and attachment contact the underside of the boom or jib sheave case, due to winching up or extending the boom without paying out cable. This can cause cramping or overextension damage to the cable. The ATB attachment senses the position of the winch cable end attach-ments with respect to the sheave case and, when necessary, shuts down functions that can cause two-blocking.

National’s own cylinders
- National Crane controls the manufacture of its lift, outrigger and stabilizer cylinders and seal pack- ing, ensuring that stan-dardized replacements fit properly.
- All load carrying cylinders are equipped with a direct mount holding valve for protection in the event of hose failure. Quiet, smooth and stable, these valves ensure precise load placement.

Stronger sheaves, multi-part reeving
- The sheaves on the Series 900 consist of stronger, longer-wearing iron, not plastic. These rough flank- ing and wire rope core damage.
- The sheave case is rigid with two lower sheaves to allow (optional block) four-part reeving without attaching additional equip-ment at the boom tip. Multiple load blocks offer a range of increased lifting capacities while using the winch. Refer to the Winch Data section for line block options and speed/pull capabilities.

National’s Operator aids
- National Crane’s Load Moment Indicator (LMI) and Anti-Two-Block (ATB) systems share common components and work together as a dual-purpose protection system, standard on the Series 900.

National made-quality, field-proven durability
- National Crane has manufactured cranes since 1903, with over 90 percent of them still on the job.
- National’s consistently have the highest resale value in the industry.
- With an American-made National, you get more for every dollar you invest in a crane. Materials and com-ponents used are often of higher quality and greater value than those found in competitive products.
- Each crane undergoes numerous quality inspections at all levels of manu-facture and assembly. No crane is shipped without a rigid final inspection.
- National Crane maintains a materials and components inspection program, ensuring that your National meets factory requirements.

Industry-leading test program
- Each crane prototype must pass the stringent test requirements of SAE J1065.
- National’s test program subjects all crane prototypes to state-of-the-art strain coat and strain gauge testing, measuring metal deformation as slight as one-millionth of an inch (.002 microns).
- Prototypes undergo the toughest life cycle tests in the industry, receiving more punishment than most cranes encounter in a lifetime of rigorous use. Every structural compo-nent is cycle-tested, some through 60,000 cycles at full capacity. This requires thousands of working hours and takes months to complete.

Overloading (when stowed) also increases truck maneuverability.
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Positive planetary turret rotation

- Planetary rotation, with hydraulic release brake and slip-through, allows the gearbox to backdrive when excessive side load is applied to the rotation system. This reduces damaging shock loads on the gearbox and crane structure.

- The turret drive is designed with extra-heavy bearings below the drive position. The turntable bearing's full-circle bolt pattern ensures uniform loads, extending bearing life. The entire turret glides smoothly on a low-inertia ball bearing race.

- Gearbox and rotation bearing mounting surfaces are precision-machined after welding to ensure consistent tooth alignment, smooth rotation and low wear at all times.

- Rotation is 375-degree non-continuous. The rotation stop design gradually slows rotation of the boom, eliminating the sudden stop typical of non-continuous rotation.

Precise controls

- For greater efficiency and load visibility, the Series 900 is equipped with identical dual controls located on each side of the crane. Control functions are oriented according to SAE guidelines, while labeled knobs allow function identification.

- Extra-fine metering and low speed forces are coupled with adjustable levers to provide smooth, precise fingertip control of crane functions. Control rods are supported by smooth operating, easy-service bearings.

- Each console is equipped with a gauge that measures hydraulic system pressure and a level indicator that helps level the unit during set up. Each control station also includes a foot throttle, horn and stop switch.

- Extra-high back rest increase operator control and comfort.

- For maintenance, the control enclosure allows easy access to conveniently positioned control valves.

Heavy-duty hydraulic system

- A high pressure/hight speed, vane-type triple pump system provides smooth, fast, simultaneous hydraulics. The winch is isolated from other crane functions for independent operation. Control valve spools are hard chrome-plated for long life and corrosion resistance. Contact the factory for continuous duty cycle applications.

- The extra-capacity 75-gallon (284-liter) hydraulic oil reservoir has a sight gauge, breather, suction strainer, clean-out and magnetic plug to reduce heat buildup and keep oil clean for longer life. The aluminumized reservoir inhibits rust accumulation and, like the oil filters, is located externally for easy maintenance.

Lower truck requirements

- National are engineered to lower your truck requirements, mounting on standard, heavy-duty commercial trucks, yet meeting DOT and stability standards with ease. Unitized mounting, out-and-down rear stabilizers and wide outrigger spans take the stress instead of the truck, making for a smaller investment in a longer lasting truck.

- Unitized mounting includes a one-piece subbase that supports the crane and bed for increased stability, while eliminating or reducing counterweight and truck reinforcing. Reinforcing is not required on trucks with 15.9 inch (200.6 cm) section modulus frame of 310,000 psi (2150 bar) minimum yield steel. The crane and subbase sit separately, then solidly bolt together to form an integrated unit.

- Outriggers arch outward and down

- Feet don’t 'skid' into position

- Outriggers equidistant from center line

- Balanced stability and consistent span

Wide stance

- The Series 900 is equipped with A-frame hydraulic outriggers ranging 21 feet (6.4 m) and out-and-down rear hydraulic stabilizers with a 14-foot (4.3 m) span. The outriggers retract smoothly without binding under load, while their hydraulic power is sufficient to allow leveling of a fully loaded truck.

Boom rests

- Cranes are tough when in use, but can be severely damaged during transport if not supported by a solid boom rest. All Nationals must be fitted with a boom rest to protect rotation gear from transport damage and spread crane load more evenly, reducing stress on the crane and truck frames. National boom rests fit various mounting configurations, reducing maintenance and adding years of crane life.

CAUTION
Do not operate crane booms, jib extensions, any accessories or loads within 10 feet (3 meters) 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.
National Series 900
Booms and Jibs

Boom and Jib Combinations

The Series 900 is available in two basic models: the Model 906, equipped with a 694-ft. (21.0-m) three-section hydraulic boom; and the Model 990, equipped with a 904-ft. (27.4-m) four-section hydraulic boom.

Each model can also be equipped with one of two folding (side-stowing) jibs: the 9J15A, a 154-ft. (4.6-m) single-section angling jib (for use with personnel carriers); and the 9JE48M, a 484-ft. (14.6-m) two-section jib with manual pull-out.

Model 906

27 to 694 ft. (8.2 to 21.0 m) boom
774 ft. (23.5 m) max. vertical reach

with 9J15A 154 ft. (4.6 m) jib
924 ft. (28.0 m) max. vertical reach

with 9JE48M 27 to 484 ft. (8.2 to 14.6 m) jib
1254 ft. (38.1 m) max. vertical reach

Model 990

27 to 904 ft. (8.2 to 27.4 m) boom
984 ft. (29.9 m) max. vertical reach

with 9J15A 154 ft. (4.6 m) jib
1134 ft. (34.4 m) max. vertical reach

with 9JE48M 27 to 484 ft. (8.2 to 14.6 m) jib
1464 ft. (44.5 m) max. vertical reach

* Includes Anti-Twist Block (ATB) system

This photo sequence demonstrates how a National jib folds out into working position.

National Series 900
Winch Data

<table>
<thead>
<tr>
<th>National Crane Series 900 Winch Data</th>
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<tbody>
<tr>
<td>Cable Supplied</td>
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<tr>
<td>Standard 9/16-inch Diameter Rotator-Resistor</td>
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<tr>
<td>Optional 9/16-inch Diameter General Purpose*</td>
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Winch Lift and Speed Data

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<tr>
<th>Standard Planetary Winch</th>
<th>Lift</th>
<th>Speed</th>
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<tr>
<td>7,700 lb. (3,493 kg)</td>
<td>164 fpm (50 m/min)</td>
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<td>15,400 lb. (6,985 kg)</td>
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<td>23,100 lb. (10,478 kg)</td>
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<td>30,800 lb. (13,971 kg)</td>
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<td>38,500 lb. (17,464 kg)</td>
<td>35 fpm (10 m/min)</td>
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<td>46,000 lb. (20,865 kg)</td>
<td>27 fpm (8 m/min)</td>
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<tr>
<th>Burst of Speed</th>
<th>Lift</th>
<th>Speed</th>
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<tr>
<td>3,000 lb. (1,361 kg)</td>
<td>265 fpm (81 m/min)</td>
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<td>6,000 lb. (2,722 kg)</td>
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<td>9,000 lb. (4,082 kg)</td>
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<td>12,000 lb. (5,443 kg)</td>
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<td>15,000 lb. (6,804 kg)</td>
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<td>18,000 lb. (8,165 kg)</td>
<td>44 fpm (13 m/min)</td>
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* Non-rotation resistant

CAUTION
- Do not deadhead line-block against boom tip when extending boom
- Keep at least three wraps of loadline on drum at all times
- Use only specified cable with this machine
- 3,000 lb. maximum capacity with Burst of Speed

CAUTION
- Do not operate crane booms, jib extensions, any accessories or loads within 10 feet (3 meters) 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.
National Series 900 Load Ratings
Model 969 Without Jib

Notes:
1. Shaded portions of these charts are the structural strength ratings.
2. Load ratings shown are maximum allowable loads under optimal conditions.
3. Rated loads do not exceed 85 percent of the tipping load.

CAUTION
- These charts show maximum allowable loads with the crane properly leveled and maneuvered on a factory-recommended truck, and the outriggers properly extended on a firm, level surface.
- Always level the crane with the lever indicator located on the crane frame.
- The operator must reduce loads to allow for factors such as wind, ground conditions, operating speeds and the effects of freely suspended loads.
- Weights of any accessories attached to the boom or load line must be deducted from the load capacity charts.
- Crane overload may cause instability or structural collapse.

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LOADLINE EQUIPMENT DEDUCT

DOWNHAUL WEIGHT = 150
ONE SHEAVE BLOCK = 200
TWO SHEAVE BLOCK = 355
THREE SHEAVE BLOCK = 850

National Series 900 Load Ratings
Model 969 With 48-Foot Jib

Notes:
1. Shaded portions of these charts are the structural strength ratings.
2. Load ratings shown are maximum allowable loads under optimal conditions.
3. Rated loads do not exceed 85 percent of the tipping load.

CAUTION
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National Series 900
Truck Specifications

Mounting configurations
The versatility of your National crane can be enhanced by the mounting configurations described at right, based on the Series 900 with an 85 percent stability factor. The complete unit must be installed in accordance with factory requirements and (since individual truck chassis vary) a test performed to determine actual stability and component requirements. Contact the factory for details.

Configuration 1 (with torsion box): 180-degree capacity
This configuration, with the crane mounted behind the track cab, is the least expensive mounting method available. Requiring the least weight for stability, this mount lets you haul larger payloads. Standard subbase and rear (RSOD) stabilizers are required.

Configuration 2 (with torsion box): 360-degree capacity
This mount requires front stabilizers to give the machine full capacity for 360 degrees around the truck. Careful track selection is necessary, as it must meet the minimum requirements shown below. The front stabilizer gives the machine a solid base, helping the operator control loads with precision. Front and rear down-and-out stabilizers and a subbase are required. The truck frame must be constructed from 110,000 psi (7,590 bar) steel (50,000 psi option not applicable).

Stable

180 degrees 360 degrees

Gross Axle Weight Rating (GAWR)—Front 16,000 lb. (7,258 kg) 16,000 lb. (7,258 kg)

Gross Axle Weight Rating (GAWR)—Rear 34,000 lb. (15,422 kg) 34,000 lb. (15,422 kg)

Wheelbase 254 in. (649 cm) 254 in. (649 cm)

Cab to Axle/Trailer 156 in. (396 cm) 156 in. (396 cm)

Frame Section Modules Under Crane

50,000 psi (3,450 bar) 35.0 inch² (573.7 cm²) (Not applicable)

110,000 psi (7,590 bar) 15.9 inch² (260.0 cm²) 20.0 inch² (327.8 cm²)

Frame Section Modules Over Rear Stabilizers

50,000 psi (3,450 bar) 17.0 inch² (278.6 cm²) (Not applicable)

110,000 psi (7,590 bar) 13.0 inch² (213.1 cm²) 13.0 inch² (213.1 cm²)

Stability Weight, Front 7,500 lb. (3,402 kg) minimum* 7,500 lb. (3,402 kg) minimum*

Stability Weight, Rear 9,100 lb. (4,128 kg) minimum, RSOD* 9,100 lb. (4,128 kg) minimum, RSOD*

Estimated Average Final Weight 37,500 lb. (17,010 kg) 37,500 lb. (17,010 kg)

Notes:
1. Gross Axle Weight Rating (GAWR) is dependent on all components of the vehicle (axles, tires, springs, frame, etc.) meeting manufacturer's recommendations. Always specify GAWR when purchasing trucks.
2. Minimum axle requirements may increase with use of a longer wheelbase, service bodies, diesel engines or front stabilizers.
3. Diesel engines require a variable speed governor and energize-on-off fuel solenoid for smooth crane operation.

* Ensured side scale weights prior to installation of crane, stabilizers and subbase for 85 percent stability.

Configuration 1 (with torsion box): 360-degree rear-mount
A rear-mounted crane gives the operator the advantage of lifting heavier loads within the close-in work area and offers 360-degree stability at full-rated load. Hydraulic outriggers are necessary, located behind the cab to keep total unit weight to a full-stability minimum. Front outriggers and a heavy-duty rear-outrigger subbase are required. Countermass may also be needed to ensure stability.

360 degrees

16,000 lb. (7,258 kg)
34,000 lb. (15,422 kg)
254 in. (649 cm)
156 in. (396 cm)
35.0 inch² (573.7 cm²)
15.9 inch² (260.0 cm²)
13.0 inch² (213.1 cm²)
7,500 lb. (3,402 kg) minimum*
7,500 lb. (3,402 kg) minimum*
9,100 lb. (4,128 kg) minimum, RSOD*
9,100 lb. (4,128 kg) minimum, RSOD*
37,500 lb. (17,010 kg)

Track Frame and Mounting Bolt Requirements for Front Stabilizer
The truck must have adequate strength from under the crane frame through the front suspension to the bumper assembly for front stabilizer installation. A track frame yield strength of 110,000 psi (7,596 bar) is required.

The following diagrams show the required section modulus at various stations along the front end of the track frame for a standard behind-the-cab mount.

Note: In the sample cross-sections that the track frame top flange width is decreased in the engine compartment area. Also note that almost half the track frame channel is removed at the very front of the frame on the standard track frame.

In order to safely mount a front stabilizer in place of the normal front bumper, a minimum bolt pattern as shown is required. The bracket must be capable of supporting 50 DIAs, Grade 8 bolts to its nominal breaking strength. Torque the mounting bolts supplied with the front stabilizer to 100 ft-lbs. Do not use spacers between the bumper bracket and the front stabilizer bumper assembly. If the bumper bracket and front of the truck frame do not meet these specifications, an extended frame truck must be used. Contact the factory for details.

Details for mounting a stabilizer on an extended frame truck are included in the installation instructions. However, the Section Modulus requirements outlined above do still apply.

Extended Track Frame—For angled or straight down single front stabilizer

Standard Track Frame—For angled single front stabilizer only

Diagram showing extended track frame and stabilizer mounting.
National Series 900 Accessories

Remote controls
- Model R3, cable remote for tilt, turn and telescope control
- Model R4, cable remote for tilt, turn, telescope and winch control
- Model R4B, cable remote for tilt, turn, telescope, winch and basket control

Radio remote controls
- Model R3B, cable-free performance of R3 functions
- Model R4BR, cable-free performance of R4B functions

Hydraulic Capacity Alert system
- Model HCA

Personnel platform
- Model SLP
- Model SLP3, 360-degree continuous manual rotation

Hydraulic oil cooler
- Model OC

Heavy-duty personnel basket
- Model Bsk-l

Loose material clam bucket
- Model LMC

Stabilizers and cross-frame outriggers
National Crane offers a complete range of front and rear stabilizers with all-hydraulic vertical and horizontal motion. All cylinders are fully enclosed for protection against dirt and on-the-job damage.

Pallet fork
- Model MKF

Cross-frame Outriggers
- Model SSR
- Model SROD
- Model SFO(A)

Augers
A 14,000 ft-lb (1.93 ft-lb), two-speed auger attachment with console control. Auger flightings in 12, 18, 24, 30, and 36 in. (31, 46, 61, and 91 cm) diameters. Additional weight, 1,605-1,870 lb (728-848 kg).

A auger with a 2 in. (50 mm) of loose material with each bite. Hooks easily to loadline. Includes manual control hose reel and hydraulic hose draped through bucket. Additional weight, 920 lb (417 kg).

* The SFO and SFOA are both single front-mounted hydraulic stabilizers. Neither is designed to lift the vehicle, but both will provide stability for the vehicle after it has been leveled. Model SFOA is for use only on extended-frame chassis. SFOA is for use on standard frame trucks.

Note: Personnel baskets/platform operation limitations vary because of crane configuration and basket type. Refer to the Owner’s Manual for details and operation restrictions.

Disc-brake locking system. Must not be operated where load chart shows less than 2,500 lb (1,093 kg).

One-person basket
- Model B14, with lock
- Model B284 (for dual baskets)

A strong, lightweight, fiber-glass basket with 500 lb (227 kg) capacity. An optional dual basket bracket is available for two-basket operation on main boom and jib. Safety belts included. Crane with baskets must not be operated where load chart shows less than the following capacities: one basket—1,100 lb (499 kg), two baskets—2,000 lb (907 kg).

Ground penetration
- 38 in. (97 cm) frame height
- 10 in. (25 cm)
- 10 in. (25 cm)
- 14 ft. (4.2 m)
- Single Controls
- Both are operable from either station

Ground penetration
- 38 in. (97 cm) frame height
- 10 in. (25 cm)
National Series 900
General Specifications

General construction
The Series 900 is constructed using low-alloy, high strength steel (1-1, Exten, Stress Proof and others), combined with special low-hydrogen weld techniques wherever advantageous. The standard painted color is National Ivory.

Subbase/frame
A unitized box construction, 8.75-in. (222-mm) deep subbase increases torsional stiffness and reduces truck frame requirements. The standard subbase attaches to both the truck frame and crane frame, fits on a 34-in. (86-cm) wide truck frame and will accommodate a 20-ft. (6.1-m) stringerless bed. Rotation bearing and level indicator surfaces are precision-machined after welding to ensure accurate alignment and flat surfaces for prolonged life.

Turret
The turret is a fabricated rigid structure, well braced for stability. The bearing surface, rotation gearbox mounting and pivot pins are line-bored and machined after welding to ensure accurate alignment and flat surfaces for prolonged life.

Rotation
Features 375-degree non-continuous rotation, and rotation force of 31,667 lb-ft (4,380 newton-meters). Turret rotation is powered by a hydraulic orbit motor and planetary gearbox driving a pinion. The turret rotates on a ball bearing race. A spring-applied hydraulic release brake provides positive no-drift lateral positioning.

Outriggers
An A-frame box type outrigger with 21 ft. (6.4 m) span (center of pad at ground level) that will not bind when raising or lowering the truck. It can be positioned to 10.5 in. (27 cm) below ground level when mounted on a truck with a frame height of 38 in. (97 cm).

Lift cylinder
A double-acting hydraulic cylinder raises and lowers the boom. A built-in safety holding valve prevents the boom from falling in the event of a hose failure. Trough, field-tested bearings in the lift cylinder and boom pivot, combined with micro-honed pins, provide long life with reduced maintenance.

Boom
Box construction sections telescope proportionately under rated loads using a double-acting hydraulic cylinder with proportioning valves. Nylon boom wear pads are impregnated with molybdenum disulphide for smooth, durable operation and extension of maximum loads at greater radii. Heavy-duty pivot bearings, boom cylinder and valves are easily serviced.

Winch
A hydraulic gear motor with planetary gear reduction and counterbalance valve for "power down" load lowering 10,000 lb. (4536 kg) bare drum single-line pull is available with 320 ft. (98 m) of rotation-resistant, 9/16-in. (14-mm) diameter, 38,500 lb. (17.46 MT) breaking strength loadline. Burst of Speed controls payout and pickup of unloaded cable by 60 percent over the normal operating speed.

Pump
One high pressure/high speed, vane-type three-section pump independent provides 34 gpm (129 L/min) to winch, 23 gpm (87 L/min) to crane and 8 gpm (30 L/min) to swing for smooth, fast, simultaneous operation.

Oil tank capacities
A 75-gal. (284-L) supply tank is equipped with breather, clean-out, suction strainers and magnetic plug.

Cylinders

Valves
Four-way, spring-centered spool-type valves with low spool force and extra-fine metering notches. Independent relief valves protect the hydraulic circuit from overload (crane functions set at 2,950 psi/204 bar, rotation system at 2,150 psi/145 bar and winch system at 3,050 psi/212 bar).

Hose
All high pressure hose is wire braided reinforced, with a minimum safety factor of 4 to 1.

Operating speeds
Winch third wrap: 150 fpm (46 m/min). Boom up and down: 25-27 sec. Boom out: 27-30 ft. (8.2-27.4 m). 80 sec. Boom in: 90-27 ft. 77 sec. Turn: 42 sec. When using the remote control, crane function speeds will be reduced by 40 percent to assure smooth operation (speeds assume no load).

National Series 900
Dimensional Specifications

<table>
<thead>
<tr>
<th>900 Model</th>
<th>Retracted Length</th>
<th>Extended Length</th>
<th>Center of Gravity (G)</th>
<th>Dry Weight*</th>
<th>Weight with Oil*</th>
</tr>
</thead>
<tbody>
<tr>
<td>969</td>
<td>27 ft. (8.2 m)</td>
<td>69 ft. (21.0 m)</td>
<td>90 in. (229 cm)</td>
<td>17,400 lb. (7,892 kg)</td>
<td>18,150 lb. (8,235 kg)</td>
</tr>
<tr>
<td>990</td>
<td>27 ft. (8.2 m)</td>
<td>90 ft. (27.4 m)</td>
<td>98 in. (249 cm)</td>
<td>19,000 lb. (8,618 kg)</td>
<td>19,800 lb. (8,981 kg)</td>
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</table>

* Weight includes all items except RILD (1,200 lb./544 kg).

Rear Stabilizer (RILD)
# National Series 900 Proposal

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>1. Series:</td>
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<tr>
<td>2. Boom:</td>
<td>$</td>
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<tr>
<td>3. Jib:</td>
<td>$</td>
</tr>
<tr>
<td>4. Rear Stabilizers:</td>
<td>☐ RSOD ☐ HO</td>
</tr>
<tr>
<td>5. Front Stabilizers:</td>
<td>☐ SFO</td>
</tr>
<tr>
<td>6. Line Block:</td>
<td>☐ 2 3 Part ☐ 4 Part ☐ 5 Part ☐ 6 Part</td>
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### Accessories:

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<tr>
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### Mounting:

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<tr>
<td>11. Installation: Behind Cab ☐ Standard ☐ Special</td>
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<td>12. Installation: Rear Mounting (add to installation charge above):</td>
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<tr>
<td>☐ Air Throttle</td>
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<tr>
<td>☐ Rear-Mount Hydraulic Group</td>
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<tr>
<td>☐ Heavy-Duty Rear Mount Subbase</td>
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<tr>
<td>☐ HO Outriggers</td>
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<tr>
<td>13. Frame Reinforcement:</td>
<td>☐ Weld ☐ Bolt Extra</td>
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<td>15. Weight in Bed:</td>
<td>lb. (if required)</td>
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<td>16. Boom Rest:</td>
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<td>17. Mount SFO:</td>
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<td>18. Mount Stabilizers:</td>
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<td>19. Chassis:</td>
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<td>20. Rear Bumper Underride Protection:</td>
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<td>21. Freight:</td>
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This quotation will remain firm for _______ days.

Accepted by:  

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Firm Name</th>
<th>Signature</th>
</tr>
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</table>

Total Price $
National Series 900
Telescoping Crane

NATIONAL CRANE
A Grove Worldwide Company

General Offices: 11200 North 148th Street • Waverly, NE 68462 U.S.A.
Phone: (402) 786-6300 • FAX: (402) 786-6363

Your National Dealer:

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