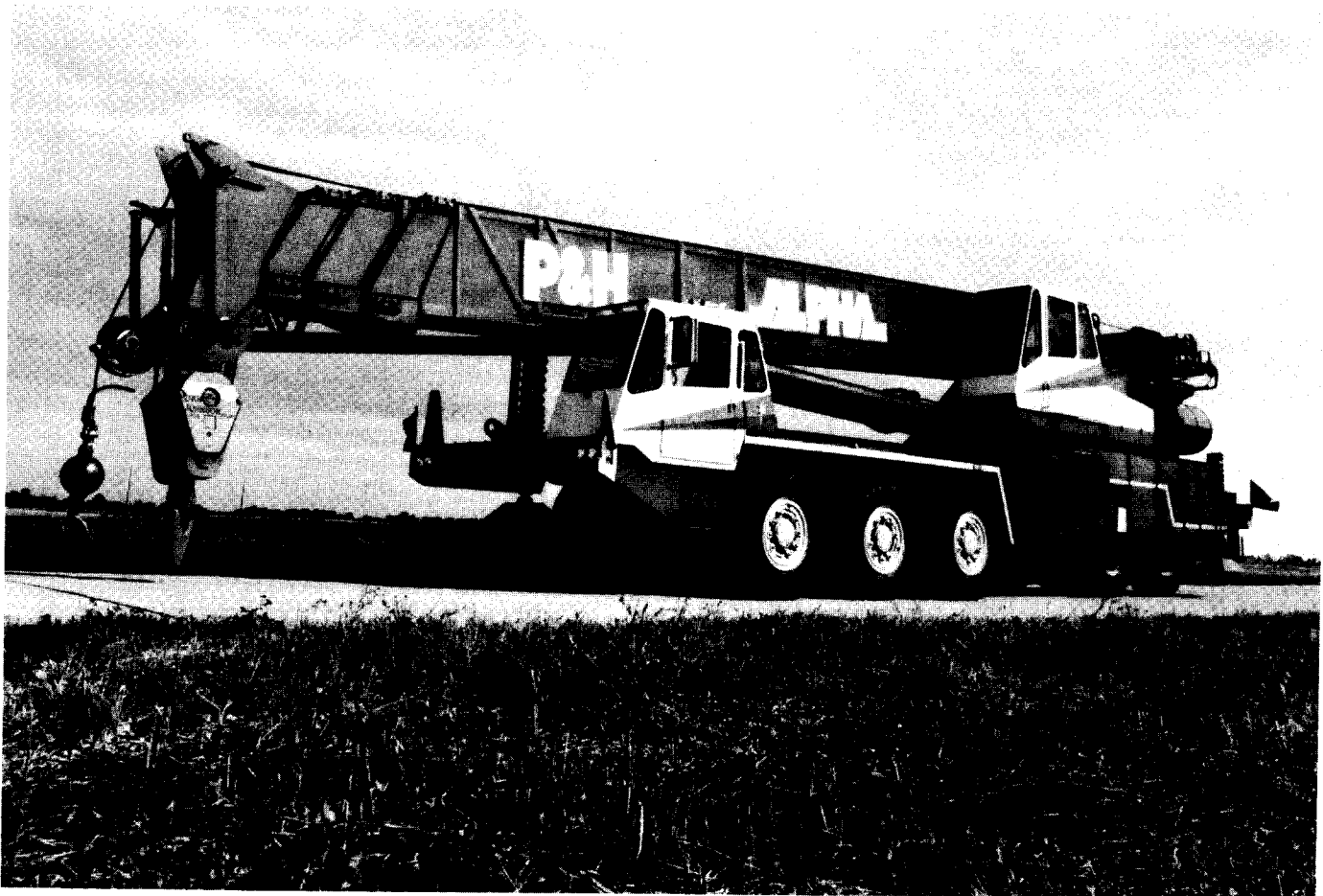


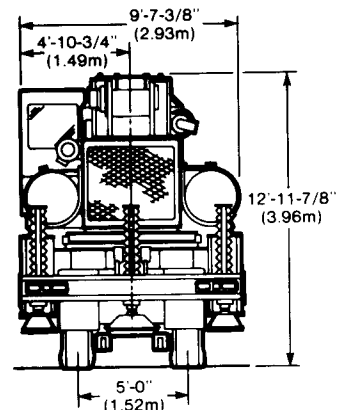
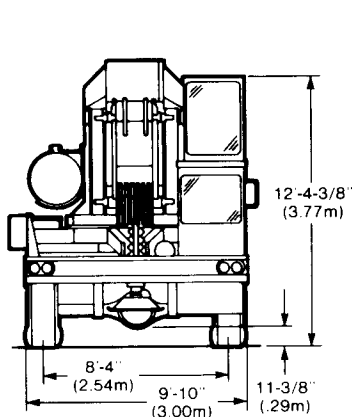
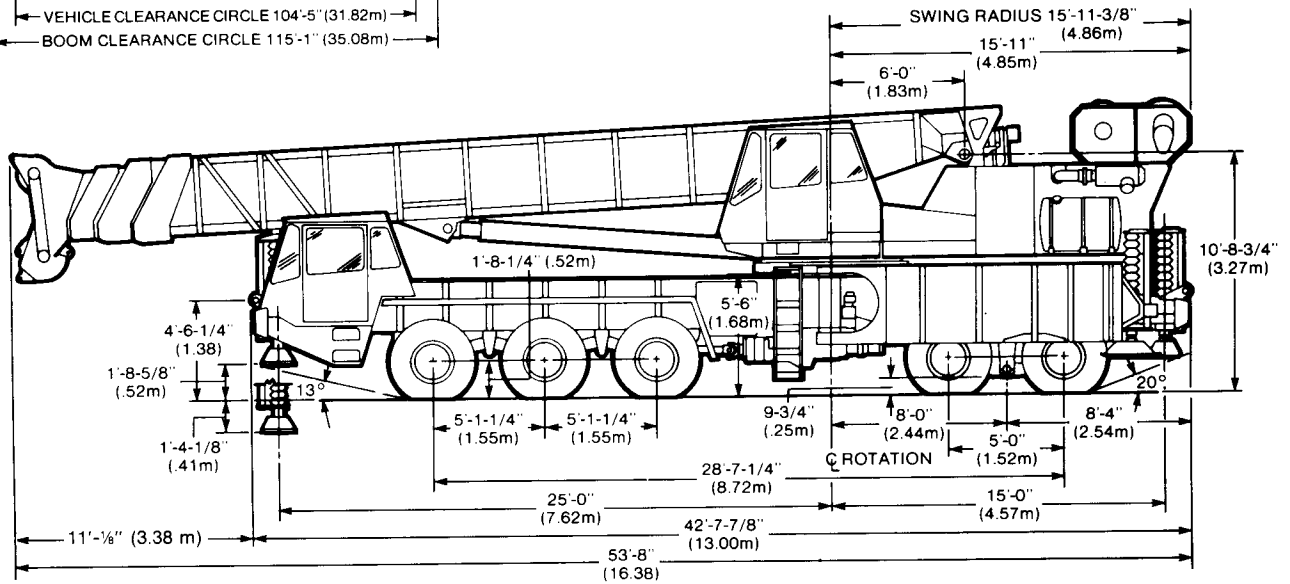
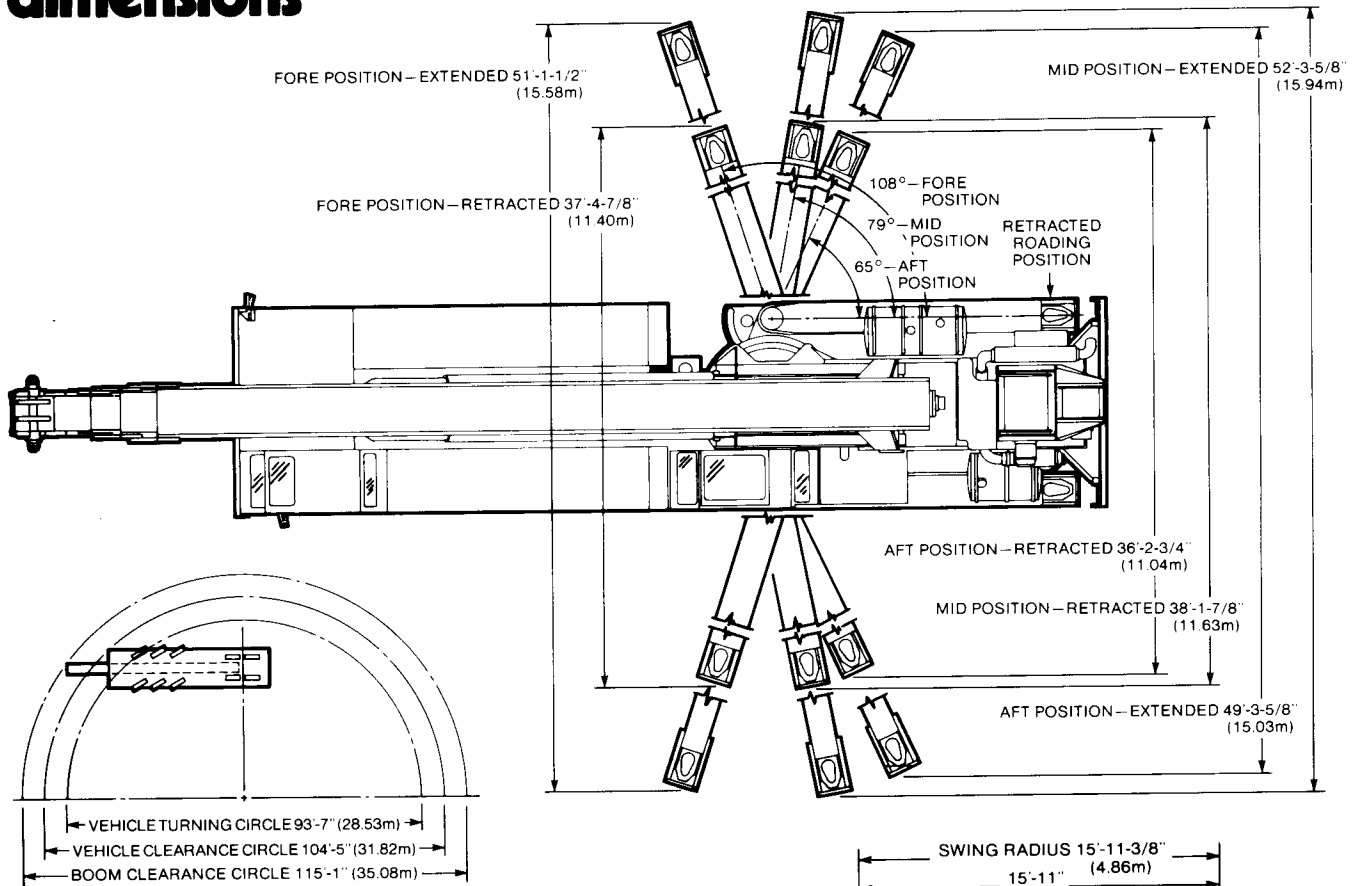
# P&H<sup>®</sup> ALPHA<sup>™</sup> 100

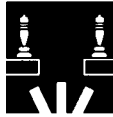
## 100-ton hydraulic LiftCraft 238-ft. (72.5m) maximum tip height specifications



- **Excellent reach** afforded by telescoping 132 ft. (40.2 m) 4-section boom, 42 ft. (12.8 m) swing around lattice boom extension and 60 ft. (18.3 m) lattice jib for total length of 234 ft. (71.3 m).
- **Advanced boom design** provides an extremely high strength to weight ratio.
- **Unique P&H screw type boom telescope mechanism** with semi-fixed screw mounts provides simultaneous and equal extension of boom powered sections, eliminates internal hydraulic components, decreases telescope screw deflection under load increasing telescoping capacity.
- **P&H computer — designed transporter** with radial outriggers provides an extremely weight efficient and rigid lifting platform. Stress levels and torsional effects are reduced to absolute minimum.
- **Fast, solid set-up** with P&H radial swing-out outriggers. Excellent stability with 49'-2 3/4" (15.0 m) maximum outrigger stance.
- **Turbocharged engine** offers low sound levels, low fuel consumption, excellent high altitude performance and superior torque for optimum horsepower usage.
- **A duty-cycle machine** — Seven (7) pump hydraulic system with high pressure — variable displacement pumps provides optimum pressure and flow for fast crane functioning. Closed-loop swing and main winch circuits provide infinite speed control for precise positioning.
- **Operating safety**, efficiency and reliability enhanced by Krueger Load Moment and electric anti-two block devices.
- **Roadable practically everywhere** — less than 90,000 lbs. G.V.W. fully rigged, or 18,000 lbs. (8165 Kg) per axle.

# dimensions





**CONTROLS:** Two front console mounted joy stick controls for swing, boom hoist, main and auxiliary winches. Front console mounted toggle switches for high speed telescope and swing holding brake. Floor mounted foot pedals for boom telescope, engine throttle and swing brake. Pump disconnect is floor mounted on left side of operators seat. Side console has hand lever for 360 degree house lock, hand throttle, and electric outrigger control panel. Swing horn and high speed controls for winches are located on joy sticks.

Left joystick — fore and aft movement controls auxiliary winch direction and speed — left and right movement controls swing direction and speed.

Right joystick — fore and aft movement controls main winch direction and speed — left movement lowers boom — Right movement raises boom.

Diagonal movement of joystick controls two functions simultaneously.

**SAFETY DEVICES:** Kruger Mark III load moment device includes load moment, boom length, boom angle, and radius indicators located in control console in operator's cab. Has audible and visual warning when approaching maximum load moment and deactivates controls when 100 percent of load moment is reached. System also includes electric anti-two block device.

Valve in operator's cab deactivates crane controls when seat is slid back from normal operating position. Valve must be manually activated when seat is moved back into operating position. System allows for safe operator entry and exit from crane cab.



**MAIN WINCH:** Aluminum base integral with auxiliary winch, mounted on upper frame. Hydrostatic closed loop circuit with two speed hydraulic motor and counterbalance valve driving through a single reduction plus double planetary gear box provides infinitely variable control. A spring applied, hydraulically released wet multiple disc holding brake is mounted on gear box.

**DRUM:** Aluminum grooved drum, 18.875" (479 mm) pitch dia., 30.25" (768 mm) flange dia. x 31.71" (805 mm) wide.

**WIRE ROPE:** 7/8" (22 mm) dia. 8 x 19 spin resistant, extra improved plow steel, with 7 x 7 I.W.R.C. 745' (227 m) wire rope furnished.

**DRUM CAPACITY:** 1307 ft. (398 m) 6 layers.

**LINE PULL: (MAXIMUM)** 27,000 pounds (12247 kg.) 1st layer

**LINE PULL: (PERMISSIBLE)** 17,000 pounds (7711 kg.) per part of line, 20,000 lb. (2172 Kg) based on strength of recommended wire rope.

**LINE SPEED: (MAXIMUM)** 416 F.P.M. (127 M.P.M.) 6th layer

**AUXILIARY WINCH:** Aluminum base integral with main winch, driven by two speed hydraulic motor through a double reduction plus single planetary gear box. Infinitely variable control valve with spring applied wet multiple disc brake.

**DRUM:** Aluminum grooved drum, 16.5" (419 mm) pitch dia., 26.25" (667 mm) flange dia., 17.8" (452 mm) wide.

**WIRE ROPE:** 3/4" (19 mm) dia. 8 x 19 spin resistant, extra improved plow steel, with 7 x 7 I.W.R.C. 640' (195 m) wire rope furnished.

**DRUM CAPACITY:** 744 ft. (227 m) 6 layers

**LINE PULL: (MAXIMUM)** 19,300 pounds (8754 kg) 1st layer

**LINE PULL: (PERMISSIBLE)** 17,000 pounds (7711 kg.) per part of line, 20,000 lb. (2172 Kg) based on strength of recommended wire rope.

**LINE SPEED: (MAXIMUM)** 574 F.P.M. (175 M.P.M.) 6th layer



**HOIST CYLINDERS:** Two 10" (254 mm) I.D. double acting cylinders with holding valves. Elevation from minus 4 degrees to 80 degrees.



**BOOM:** All boom sections are full depth rectangular box construction, welded inside and out, having corner "T" sections, thin plate panels and variable spaced transverse stiffeners. An extremely high strength to weight ratio design. Long, narrow "rocker type" slider pads on top and bottom insure distribution of point loadings.

Four section, 42 feet to 132 feet (12.8 m - 40.2 m) long main boom consists of a base section, 2 full powered sections, and one power extended and retracted pinned section. Manual pinning arrangement allows for a one man operation with all pins automatically aligned and accessible from the ground. Boom point contains six 21.0" (533 mm) P.D. main sheaves mounted on roller bearings and two 15.75" (400 mm) P.D. idler sheaves mounted on bronze bushings. All are light weight non-metallic sheaves. Removable rope guards allow for easy reeving.

**TELESCOPIC MECHANISM:** P&H screw type design. Two 5.75" (146 mm) dia. double acting screws extend each powered section 30 feet (9.1 m). Lower screw extends first powered section and is driven by a hydraulic motor driving through a double reduction single planetary gear box. A spring applied multiple wet disc brake is mounted on input side of gear box. The upper screw is driven by the lower screw with a self-lubricating double strand roller chain, providing simultaneous synchronous extension of both powered sections. Semi-fixed telescope screw mountings provide capacity to telescope full rated loads.

**LATTICE EXTENSION:** 42 foot (12.8 m) swing around lattice boom extension with 5° offset, stowed on side of base section, provides 174 ft. (53 m) of boom length. Self storing pins connect extension to boom and are insertable with special tool from ground. Point contains one 21.0" (533 mm) P.D. sheave mounted on roller bearings.

**JIB: (OPTIONAL)** For extending reach of boom extension. 30' (9.1 m) lattice structure with single 14.125" (359 mm) P.D. non-metallic sheave mounted on bronze bushing. Extendible to 60 ft. (18.3 m) with 15' (4.6 m) inserts. Cable suspended. All jib lengths capable of 0, 12.5 and 25 degree offsets.

**AUXILIARY SHEAVE: (OPTIONAL)** Boom point mounted with single 15.75" (400 mm) P.D. non-metallic sheave on bronze bushing. For use with single auxiliary winch line.

**HOOK BLOCKS: (OPTIONAL)**

- 100 Tons            6 sheaves with swivel hook and safety latch  
                          (for 3/4" (19 mm) and 7/8" (22 mm) wire rope)
- 55 Tons             3 sheaves with swivel hook and safety latch  
                          (for 3/4" (19 mm) and 7/8" (22 mm) wire rope)
- 30 Tons             1 sheave with swivel hook and safety latch  
                          (for 3/4" (19 mm) and 7/8" (22 mm) wire rope)
- 10 Tons             weighted hook with swivel and safety latch  
                          (for 3/4" (19 mm) wire rope)
- 9.5 Tons            weighted hook with swivel and safety latch  
                          (for 3/4" (19 mm) and 7/8" (22 mm) wire rope)



**OPERATOR'S CAB:** All weather environmental cab has full vision Lexan windows and locking slide-by door. Hinged top window has safety glass. Cab is cushion mounted for vibration isolation. Contains all crane function controls. Instrumentation includes: gages for voltmeter, water temperature, fuel level, hydraulic oil temperature, oil pressure, air pressure, hourmeter, and tachometer. Indicator lights for ignition, pump and axle drive engagement, outriggers, high speed winch, oil filter bypass, engine water temperature and oil pressure, hydraulic oil temperature, and air pressure. Standard equipment also includes ignition key, engine start and stop buttons, hot water heater and defroster fan, wipers for top and front windows, dash and dome lights, main and auxiliary winch drum turn indicators, seat belt, fire extinguisher, and circular level. Operator's six-way adjustable seat has torsion suspension.

## SHEAVE AND DRUM TO WIRE ROPE RATIOS: (Pitch Diameter)

	Sheave to Wire Rope	Drum to Wire Rope
Boom Main Sheave	24 to 1	---
Boom Idler Sheave	18 to 1	---
Boom Ext. Sheave	24 to 1	---
Jib Sheave	18.83 to 1	---
Main Winch	---	21.57 to 1
Aux. Winch	---	22 to 1



### POWER PLANT:

#### ENGINE

Model Type	Detroit Diesel 6V-92TA Direct Injection — 9B90 Injectors
No. of cylinders	6
Cycle	2
Bore x Stroke, in (mm)	4.84 x 5.0 (123 x 127)
Displacement, cu. in. (Liters)	552 (9.05)
Air Induction	Turbo-charged
Air Cleaner	Single-stage dry type — replaceable element
Oil Filter	Fullflow with replaceable element
Fuel Filter	Heavy duty with replaceable element
Fuel tank	Aluminum, FHWA approved (Left side of upper) 100 gal. (378.5 liters) cap.
Cooling	Liquid-pressurized, recirculating by-pass
Radiator	Fin and tube core, thermostat controlled
Fan	6 Blade, suction type, 26 in. (660 mm) dia.
Starting	24 volt motor
Charging	24 volt system with 65 amp. alternator, negative ground
Battery	4 — 475 amp. hour batteries in series — parallel circuit
Compressor, air	12 CFM
Governor, air	105-120 PSI
Horsepower, Gross	335 @ 2100 RPM SAE (168 kw)

**ENGINE EQUIPMENT: (OPTIONAL)** Jacobs engine brake, engine starting aid.

**VOLU-MATIK® HYDRAULIC SYSTEM:** This system utilizes 7 pumps and is designed to provide ample volume and pressure for optimum performance.

**PUMP DRIVES:** Upper pump drive driven off rear of engine, right hand drive pads (facing the engine flywheel) 1.156:1 overspeed, left hand drive pads 1:1. Lower pump drive off of the right angle gearbox 1:1. All with upper cab controlled cable disconnect.

**PUMPS:** All pump flows rated at governed full load speed. One variable displacement closed loop **main winch pump** — 72 GPM (273 L/M), one variable displacement open loop **auxiliary winch and telescope pump** — 62 GPM (235 L/M), one tandem vane **boom hoist** (shaft end) — 57 GPM (216 L/M) and **pilot/main winch auxiliary replenishment pump** (cover end) — 37 GPM (140 LPM). One variable displacement closed loop **swing pump** — 20 GPM (76 L/M). One tandem piston type lower pump — 36 GPM (136 LPM) for **outriggers and steering**. Total seven (7) pump flow 284 GPM (1075 LPM).

**OIL RESERVOIRS:** 130 gal. (492 L) cylindrical aluminum upper reservoir pressurized to 7 PSI (.5 bar) mounted on the right hand side of the upper. 15 gal. (57 L) rectangular aluminum lower reservoir mounted on the right hand side of the transporter.

**OIL COOLER:** Oil to air, integral fin and tube with cold oil bypass.

**FILTERS:** One 2 micron upper reservoir return line filter (internally mounted), one 10 micron swing charge pump suction filter, one 10 micron main winch charge pump pressure filter, one 20 micron main winch auxiliary replenishment filter, one 10 micron lower reservoir return line filter (externally mounted).

**CONTROL VALVES:** One two-spool, pilot operated load sensing valve for auxiliary winch and telescope, one single spool pilot operated valve for boom hoist. Closed-loop, variable volume circuits used on main winch, and swing circuits do not require directional control valves.



**SWING UNIT:** Hydraulic motor driving through double reduction plus single planetary gear reducer (119.2:1) to pinion gear. 360° continuous rotation to 2.2 RPM.

**SWING GEAR:** Internal cut spur with 160 teeth 64" (1625.6 mm) P.D.

**SWING BRAKE:** Multiple wet disc brake integral with swing gear reducer. Master cylinder activated by swing brake pedal and spring released. Front console mounted lock.

**HOUSE LOCK:** A positive 360° position lock is engaged with house lock lever in cab.

**FASTENING TO LOWER:** Single row ball bearing Swing Circle® integral with swing gear. Bolted to transporter beam and bolted to rotating frame. Bearing is protected from dust by labyrinth seal.

**ROTARY MANIFOLD:** Sealed rotary swivel for air and electric connections between rotating upper and transporter. Upper driveshaft passes thru center of swivel to transporter.



**TRANSPORTER:** P&H 10 x 6 (10 wheels — 6 wheels drive/steer)

**WEIGHT:** Including swing circle, outriggers, and standard tires: 39,600 pounds (17962 kg).

**TRANSPORTER BEAM:** Deep rectangular box beam construction made of 80,000 and 100,000 PSI min. yield strength alloy steel with variable spaced transverse stiffeners. Beam also serves as housing for front and rear outriggers.

**LIGHTS:** Dual headlights, tail lights, stoplights, and rear direction signals with emergency flashers, rear license plate light, front, rear and side clearance lights with integral reflectors, dome light, and front identification lights.

**EQUIPMENT:** Aluminum bumpers front and rear, full reinforced aluminum fenders with anti-skid surface, tow hooks front and rear, and backup warning device.

**EQUIPMENT: (OPTIONAL)** 10,000 pound front bumper counterweight for increased stability over rear.



**OUTRIGGERS:** P&H hydraulic radial swing-out type. Two outriggers are stowed along side of beam for roading and are swung out and locked in any one of three positions by a hydraulic motor driving through a double planetary gear reducer, pinion and ring gear (total reduction of 194.8:1). The aft outrigger position provides for a maximum over rear capacity. The mid position is used for 360° operation and the fore position provides for a maximum over front capacity. Outrigger beams are extendible for greater stability by double acting hydraulic cylinders.

**OUTRIGGER HOUSINGS:** One housing mounted on each side of transporter beam. 80,000 and 100,000 PSI min. yield strength alloy steel deep box section construction.

**OUTRIGGER BEAMS:** 80,000 and 100,000 PSI min. yield alloy steel deep box section construction. Retracted length of 13'-7-1/2" (4.15 m) and extended length of 20'-10" (6.35 m) from outrigger pivot pin to jackscrew.

**OUTRIGGER JACKSCREWS:** Four jackscrews, one mounted on each outrigger and on each end of the transporter beam. Have self-locking thread design and powered by a hydraulic motor through a double planetary reducer and chain drive (total reduction of 23.5:1).

**OUTRIGGER FLOATS:** Self storing 29" x 18" (737 x 457 mm) aluminum floats with 522 sq. in. (.337 sq. m) contact area.

**OUTRIGGER FLOATS: (OPTIONAL)** 45" x 30" (1143 x 762 mm) aluminum floats that pin onto standard floats which will provide 1350 sq. in. (.871 sq. m) area.



**CAB:** Low profile environmental one-man cab of steel construction is mounted forward of front suspension on left of transporter. Cab is cushion mounted for vibration dampening and noise reduction. Safety glass windshield — other windows of Lexan, providing full view in all directions. Operators six-way adjustable seat has torsion suspension.

**CAB EQUIPMENT:** Contains all roading controls and instrumentation. Includes illuminated instrument panel with gages for speedometer, tachometer, hourmeter, voltmeter, air pressure, fuel level, water temperature, and oil pressure. Contains indicator lights for the following: turn signals, ignition, pump and axle drives, high beam, water temperature, low oil and air pressure. Air horn, west coast rear view mirror, windshield wiper, heater and defroster, and fire extinguisher are all standard.

**DUNNAGE BOX: (OPTIONAL)** Mounted on right front of transporter. Designed to hold 100 ton hook block and ball hook.

**POWER FLOW:**

In Upper — Engine — in main pump drive housing — to right angle drive housing — to drive shaft through rotary manifold (swivel) to transporter.

In Transporter — Upper drive shaft — to right angle drive housing — to engine disconnect clutch — to transmission — to tridem front axles.

**RIGHT ANGLE DRIVE:** P&H design with truck type spiral bevel gears, bearings, seals and prop shafts.

**CLUTCH:** Spicer 14" (356 mm) two plate with upshift clutch brake. Hydraulically actuated.

**TRANSMISSION:** Fuller RT00-9513 Roadranger, thirteen speeds forward, two reverse.

**TRIDEM FRONT DRIVE AXLES:** Three Soma 16MRDITGF planetary drive/steer axles with a 8.36:1 reduction ratio.

**REAR AXLES:** Rockwell TKN4570 tandem axles.

**SUSPENSION:** Front — Reynolds single leaf suspension. Rear — Hendrickson solid bogie mounted tandem with torque rods.

**STEERING:** Ross steering gear with 32.5:1 ratio, power steering valve with four hydraulic power assist cylinders on front two axles of tridem, 17.375" (441 mm) diameter steering wheel.

**TIRES:** Standard — 16.5 x 22.5 16 ply rib duplex. Optional — 18.0 x 22.5 16 ply rib duplex. Optional — 14.0 x 24.0 24 ply radials.

**SERVICE BRAKES:** Midland Ross front brakes, Rockwell 12° wedge type brakes on rear. Air on all ten wheels with separate front and rear air reservoirs. All brakes are shoe type.

**PARKING BRAKES:** Spring set, air release on rear wheels.



**PERFORMANCE:** Low gear — 2.5 mph (4.0 kmph), high gear 54 mph (86.9 kmph), max. grade — 47.9%. Speed and gradeability based on 90,000 pounds G.V.W. and standard tires. Machine performance will vary due to vehicle weights and options.

**VEHICLE WEIGHTS:** Basic machine includes standard engine, 4-section manual boom (forward in travel position), load moment device, heaters and defrosters, electrical anti-two block, main winch with cable, auxiliary winch with cable, standard tires, full hydraulic reservoirs, full fuel tank, boom extension and 55 ton hook block secured to front bumper.

**WEIGHT DISTRIBUTION**

	G.V.W.	Front Axles (3)	Rear Axles (2)
	Lbs. 89,708	53,897	35,811
	Kg. (40,691)	(24,447)	(16,244)
<b>Effect on axle load by adding these items:</b>			
100 Ton 6 sheave Block	Lbs. 1,943	3,385	- 1,442
	Kg. (881)	(1,535)	(- 654)
30 Ton 1 sheave Block	1,092	1,092	- 810
	(495)	(863)	(- 368)
9.5 Ton Ball Hook	419	730	- 311
	(190)	(331)	(- 141)
10 Ton Ball Hook	600	1,045	- 445
	(272)	(474)	(- 202)
Auxiliary Boom Point	95	207	- 112
	(43)	(94)	(- 51)
60 ft. Jib (stowed)	1,588	1,452	136
	(720)	(659)	(61)
Front Bumper Counterweight	10,500	17,591	- 7,091
	(4,763)	(7,979)	(- 3,216)
Optional 45" x 30" floats	557	561	- 4
	(253)	(254)	(- 1)
Optional 18.0x22.5-16PR Tires	225	135	90
	(102)	(61)	(41)
Optional 14.0x24.0-24PR Tires	2,670	1,602	1,068
	(1,211)	(727)	(484)
Dunnage Box	574	833	- 259
	(260)	(378)	(- 118)



**NOTE:** All designs, specifications and components of the equipment described above are subject to change at the manufacturer's sole discretion at any time without advance notice. Data published herein is informational in nature and shall not be construed to warrant suitability of the machine for any particular purpose as performance may vary with the conditions encountered. The only warranty applicable is our standard written warranty for this machine. Manufactured and sold in conformance with U. S. Department of Commerce Commercial Standard CS-90-58.

**Harnischfeger**



Milwaukee, Wisconsin 53201