

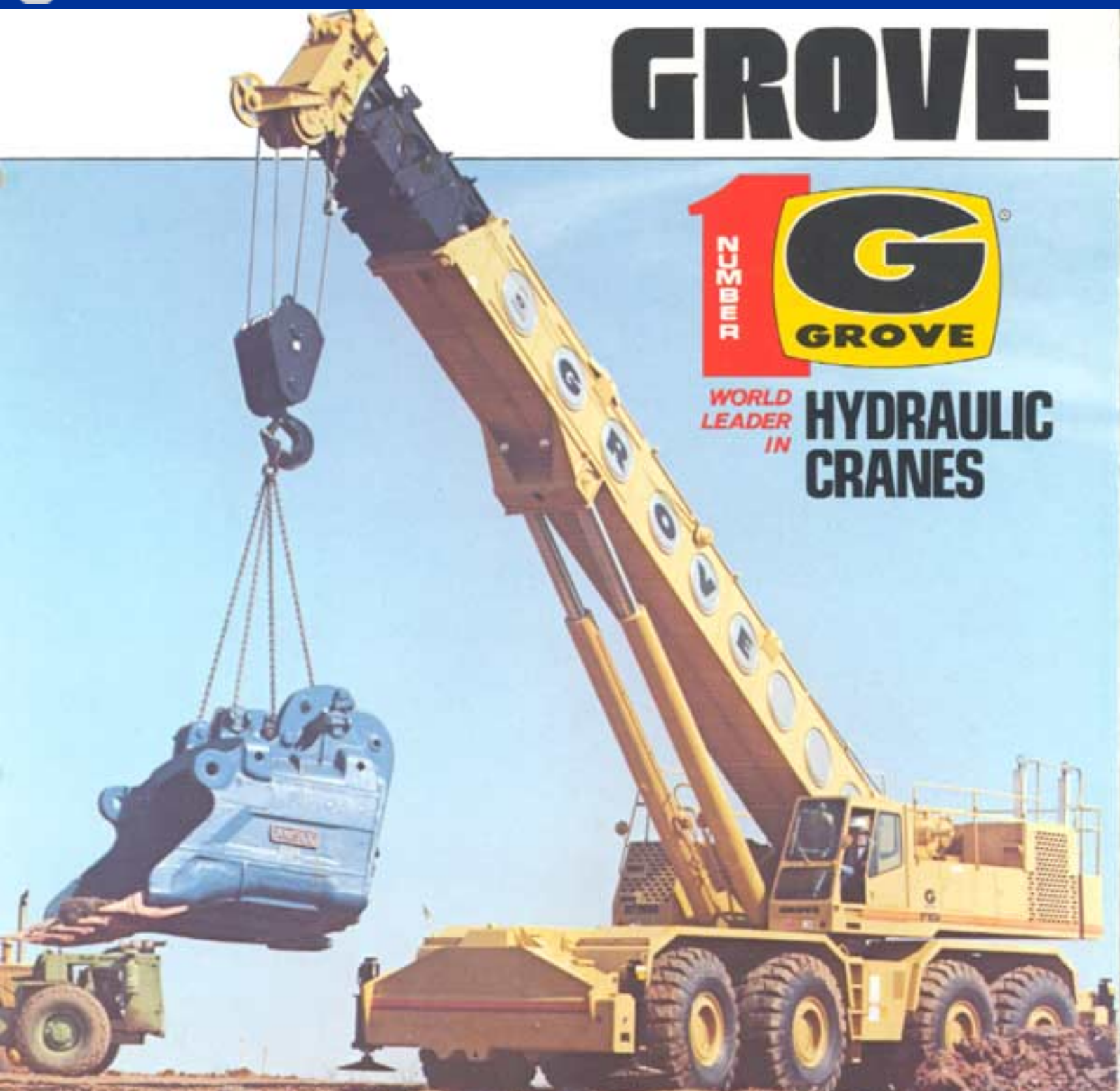


GROVE



WORLD
LEADER
IN

**HYDRAULIC
CRANES**



RT1650

165 TONS CAPACITY

(150 TONNES METRIC)

Convenience & PERFORMANCE

At last, crane users seeking greater equipment utilization have a better choice!

The Grove RT1650 rough terrain crane offers big advantages over conventional crane equipment - the convenience of self-contained mobility . . . and superior lifting, carrying, and placing capabilities!

Enter a new giant into the lifting arena: an off highway hydraulic crane engineered to pick-and-carry the really tough and unweildy objects; designed to quickly handle the "must be positioned today" loads; and ready to roll into action where it's needed.

With a maximum on-outriggers capacity of 165 tons (150 mt) and an on-rubber capacity of 100 tons (90 mt), the Grove RT1650 is the ideal heavy-duty lifting tool for a variety of work applications requiring prompt, dependable and precise crane performance.

Its quick response, self-contained boom is ideal for off highway operations such as mining equipment assembly and service, shipyard material handling, offshore platform fabrication, petrochemical refineries, and dockside freight handling. Also, for rigging, loading, offloading and placing operations, and many other demanding applications where time and labor saving factors are critical.

The RT1650 with 80" (2032mm) diameter high flotation, earthmover type tires, reduces the need for site preparation, and maneuvers with remarkable agility thanks to its 8-wheel hydraulic full power coordinated steering.

ADDITIONAL FEATURES

Other noteworthy features and their related benefits include:

- Operator's control cab can be elevated hydraulically 45 inches (1143mm) to a height of 17.5 feet (5.3m) above ground for increased operator visibility.
- Outer (fly) section is remotely pinned and latched aerially from the control cab by the operator alone, thus eliminating extra manpower, and reducing total set-up time.
- High performance, high pressure hydraulic system enhances overall lifting efficiency.
- Cummins 600 horsepower 4-cycle turbo-charged diesel engine drives two power-shift transmissions for rugged off-highway traction and mobility.
- Triple box frame design provides extremely rigid support during both travel and lifting operations.



TIP HEIGHT

270' (82.5m)
w/89' (27m)
Fixed Offset Jib

183' (55.9m)
Main Boom

EXCLUSIVE TRAPEZOIDAL† BOOM

The best keeps getting better! For more than a decade, the exclusive world acclaimed Grove Trapezoidal Boom design has been delivering superior jobsite performance. Grove engineers are constantly incorporating finely tuned improvements on each succeeding new Grove Crane model. Now, the powerful RT1650, equipped with a five section 46' - 173' (13.9 - 52.8m) boom introduces a new standard for lifting performance. The RT1650's exclusive boom will not only lift a maximum load of 165 tons (150mt) on outriggers, and 100 tons (90mt) in pick-and-carry operation, but it also has a main boom tip height of 183 feet (55.9m). Carried on board is a Swingaway extension for extra offset-able reach to a tip height of 215 feet (65.7m) with the standard fixed-length extension, or 240 feet (73.3m) with an optional stowable telescoping Swingaway. Offset can be up to 30° by merely pinning -- no hassle with turnbuckles, pendants and hardware!

With an available 89' (27m) five section lattice offsettable jib, the RT1650 achieves a working tip height of 270 feet (82.5m) - reaching to the top of a 24-story building!

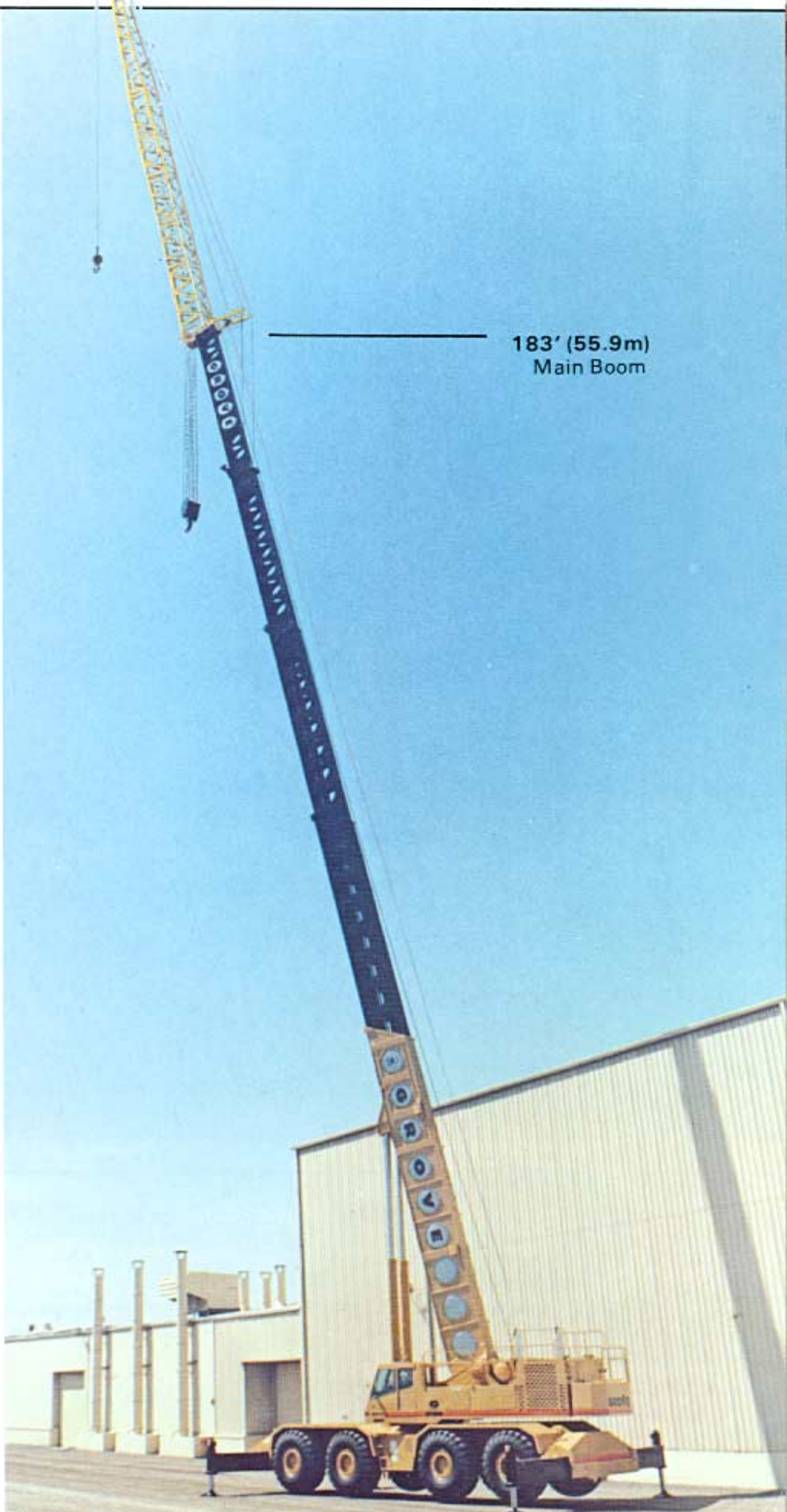
AERIAL LATCHING SYSTEM

To save time and manpower the RT1650 introduces a new Grove aerial fly pinning system that is remotely controlled by the operator from within the cab - increasing productivity!

LOAD-MOMENT INDICATOR SYSTEM

Provided as standard equipment on the RT1650 is a Krueger electronic load-moment indicator. Included are boom angle, length and radius display capabilities, coupled with an anti-two-block warning system and control function deactivation.

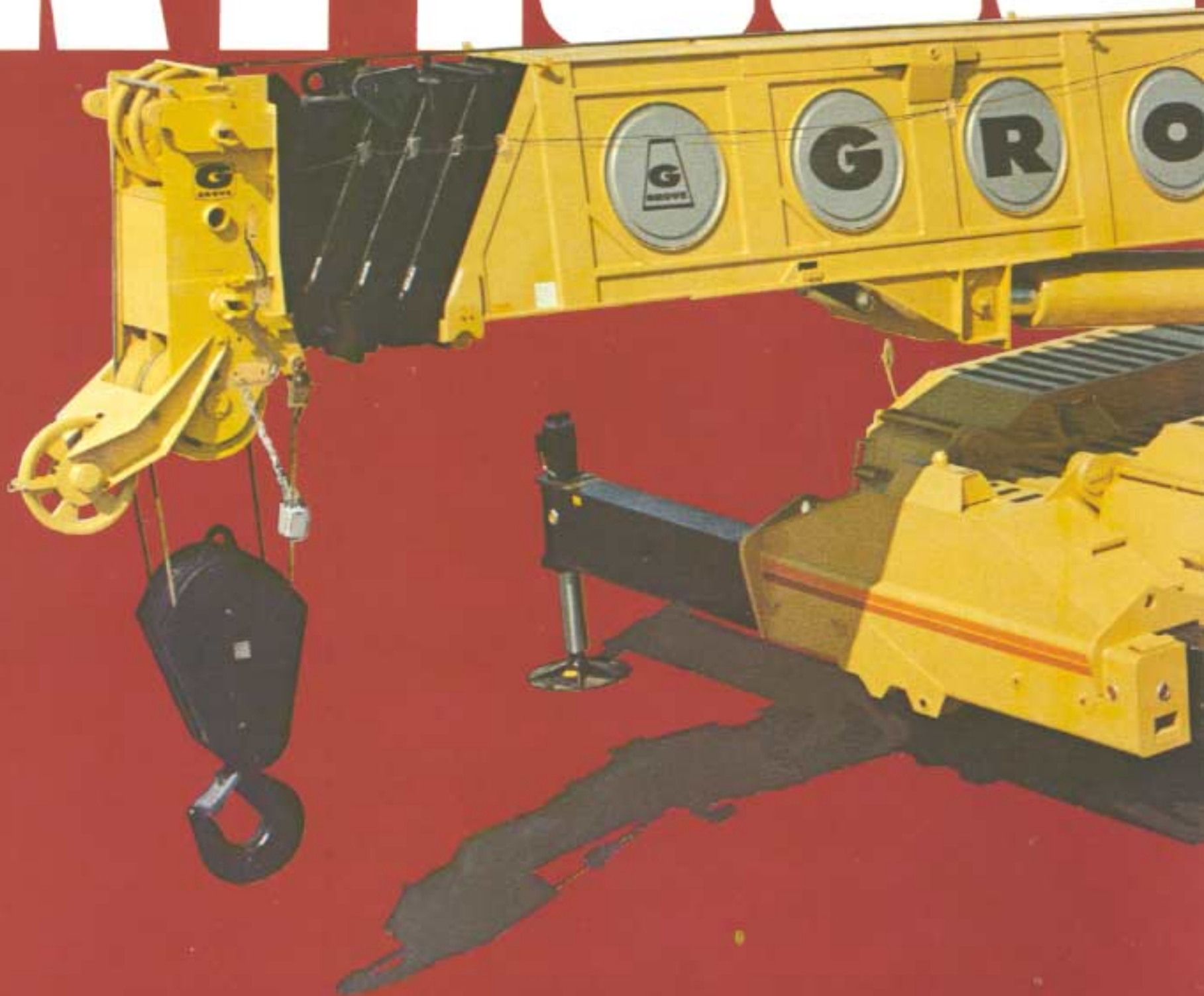
† Patented Grove Feature





GROVE

RT1050



Aerial Latching Fly Section

Permits 1-man set-up for more convenience and productivity

GROVE Trapezoidal† Boom

5 Sections, plus stowable lattice Swingaway extension

Operator-Oriented Control Cab

Can be elevated up to 45 in. (1143mm) for increased visibility

High-Pressure Hydraulics

Load-sensing, pressure compensating system enhances performance efficiency



165 TON ROUGH TERRAIN CRANE

(150 Tonnes Metric)

600-HP Turbocharged Diesel

6-Cylinder 4-Cycle Cummins drives two powershift transmissions

2-Speed Hydraulic Hoists

Both Main and Auxiliary units deliver impressive hoist power

8-Wheel Hydrostatic Power Drive

Plus 8-wheel full power coordinated steering

Hydraulically-Suspended Axles

Provide smooth mobility and positive rough terrain traction

GROVE RT1650

Heavy Duty HYDRAULIC SYSTEM

The advanced technology RT1650 is equipped with a special load-sensing, high pressure hydraulic system. By using a combination of heavy-duty gear pumps and open loop axial piston pumps with variable displacement, teamed with pressure compensated directional hydraulic valves, crane performance and efficiency is maximized.

HYDRAULIC SUSPENSION 8 Wheel/Drive – 8 Wheel/Steer

The RT1650's welded triple box frame and removable box beam outriggers with an extended stance of 29 feet (8.8m) provide a rigid lifting base for 360° operation. The rugged four axle chassis features eight-wheel planetary drive through two Powershift transmissions . . . 8-wheel air brakes . . . hydraulic suspension - all engineered for the demands of tough off highway travel and load handling.

200,000 lbs. PICK & CARRY CAPACITY

(90 Tonnes Metric)



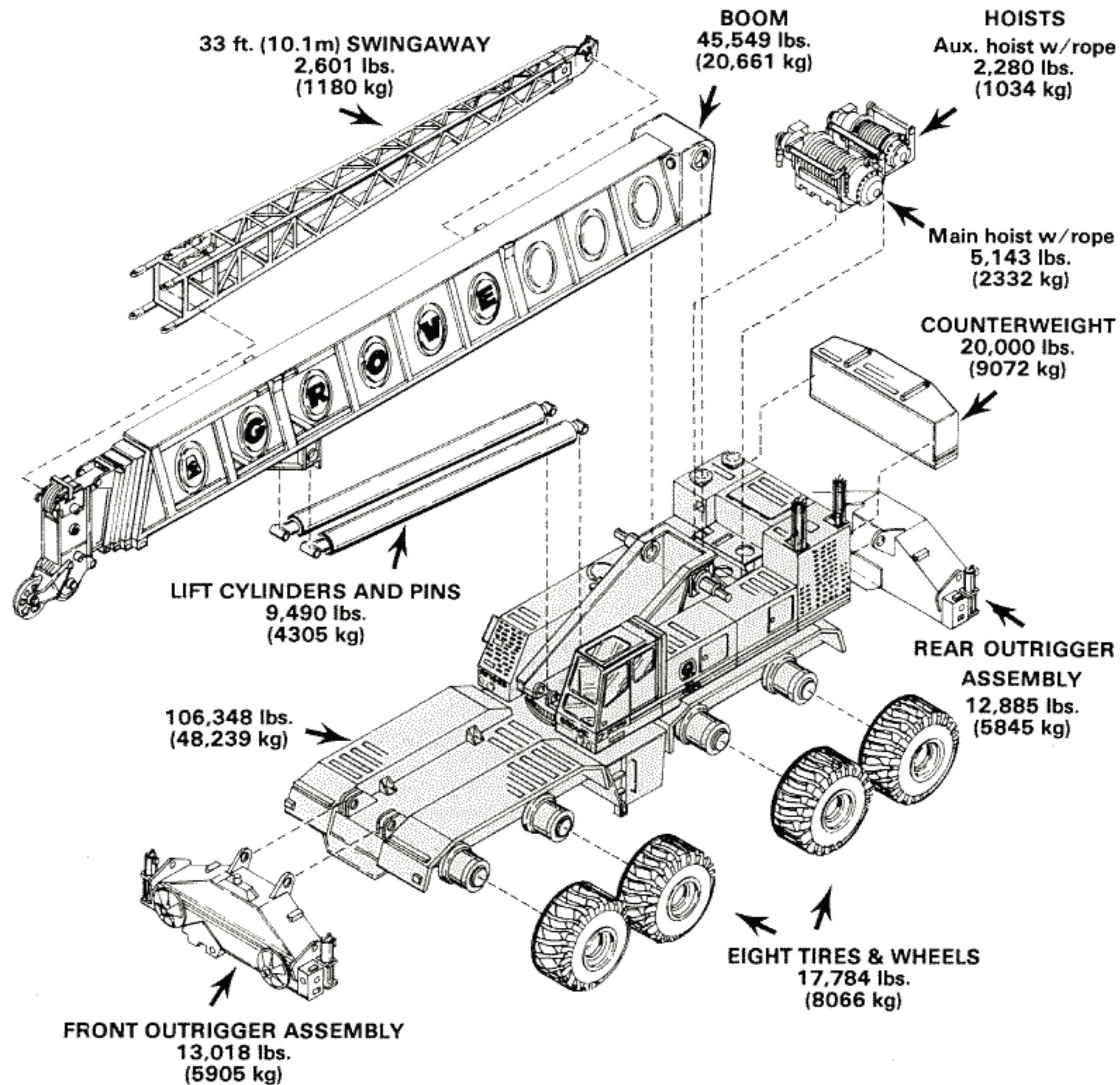
**WORLD
LEADER
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**HYDRAULIC
CRANES**



RT1650

WEIGHT REMOVAL DIAGRAM



NOTE: WEIGHTS SHOWN ARE
SUBJECT TO CHANGE

RT1650

AXLE WEIGHT DISTRIBUTION FOR COMPONENT PARTS

ITEM	POUNDS			KILOGRAMS		
	GROSS	FRONT	REAR	GROSS	FRONT	REAR
Chassis Complete	104,136	52,008	52,128	47,236	23,591	23,645
Superstructure Complete	130,960	64,655	66,305	59,403	29,328	30,075
Complete Basic Standard Crane	235,096	116,663	118,433	106,639	52,919	53,720
Component Reduction Weights						
Chassis:						
Remove:						
-Front Outrigger Boxes, Beams and Pads	-13,018	-18,846	+5,828	-5,905	-8,549	+2,644
-Rear Outrigger Boxes, Beams and Pads	-12,885	+5,714	-18,599	-5,845	+2,592	-8,437
-Tires and Wheels (8)	-17,784	-8,892	-8,892	-8,066	-4,033	-4,033
Superstructure:						
Remove:						
-Boom (46 ft.-173 ft. [14m-52.7m])						
5 Section	-45,288	-53,584	+8,296	-20,543	-24,306	+3,763
-Lift Cylinders and Pins	-9,490	-9,745	+255	-4,305	-4,420	+115
-Gearmatic 36 Auxiliary Hoist With Rope	-2,280	+237	-2,517	-1,034	+107	-1,141
-Gearmatic 46 Main Hoist With Rope	-5,143	+79	-5,222	-2,333	+36	-2,369
-33 ft. (10m) Swingaway	-2,601	-3,840	+1,240	-1,180	-1,742	+562
-20,000 lbs. Std. Counterweight	-20,000	+9,373	-29,373	-9,072	+4,252	-13,324
-Auxiliary Boom Nose	-261	-609	+348	-118	-276	+158
Optional Equipment						
Add:						
-50 Ton Hookblock	+1,024	+2,303	-1,279	+464	+1,044	-580
-165 Ton Hookblock	+5,272	+9,379	-4,107	+2,391	+4,254	-1,863
Substitute:						
-33 ft.-58 ft. (10.1m-17.7m)						
Tele. Swingaway and Brackets	+1,055	+1,545	-490	+478	+700	-222

THIS CHART IS DEVELOPED TO DETERMINE AXLE WEIGHT DISTRIBUTION FOR VARIOUS CRANE CONFIGURATIONS AND ROAD REGULATIONS.



GROVE MANUFACTURING COMPANY
 Division of Kidde, Inc.
KIDDE
 Shady Grove, Pennsylvania 17256-0021

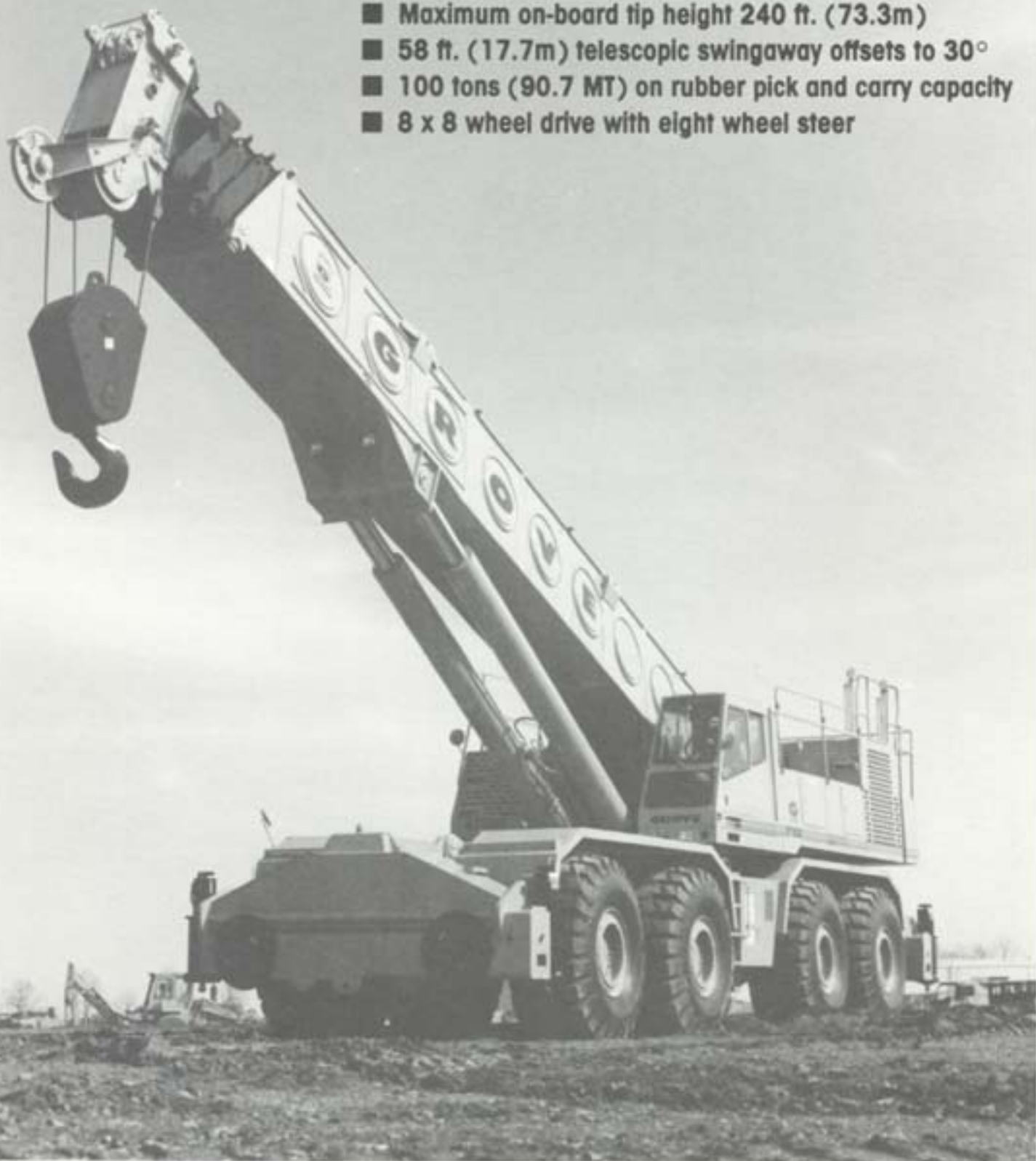
Constant improvement and engineering progress makes it necessary that we reserve the right to make specification, equipment, and price changes without notice. Illustrations shown may include optional equipment and accessories and may not include all standard equipment.



RT1650

Rough terrain hydraulic crane

- Maximum on-board tip height 240 ft. (73.3m)
- 58 ft. (17.7m) telescopic swingaway offsets to 30°
- 100 tons (90.7 MT) on rubber pick and carry capacity
- 8 x 8 wheel drive with eight wheel steer





Carrier specifications

Frame	High strength alloy steel all welded triple box-type construction with integral front/rear lifting, towing and tie down lugs.
Outrigger System	Hydraulic single stage double box removable, pinned to main frame. *Optional mechanical outrigger spin locks. All steel fabricated quick release type outrigger floats 30" (76cm) diameter.
Outrigger Controls	Located in cab on right side console requires two hand operation. Crane level indicator located in cab.
Engine	Cummins KTA-1150-C six cylinder turbo-charged water cooled diesel - 600 bhp (447 kw) (Gross) @ 2100 RPM. Maximum torque 1383 ft. lbs. (191 kg/m) @ 1600 RPM.
Fuel Tank Capacity	250 gallons (946 L)
Electrical System	Four 12 volt - maintenance free batteries, 425 CCA @ 0° F. 24 volt starting.
Drive	8 x 8
Steering	All wheel power assist hydraulic; coordinated type; controlled by steering wheel. Electric emergency auxiliary steering system.
Transmission	Twin powershift transmission (hydraulically motor driven) with 4 forward and 4 reverse speeds.
Axles	Four planetary drive steer type mounted in tandem front and rear with hydraulic suspension permitting up to 12" (305mm) of oscillation on the rear tandem axles.

Oscillation Lockouts	Automatic full hydraulic lockouts on rear tandem axles permits oscillation only with boom centered over the front. Standard oscillation lockout override control.
Tires	Standard 33.25 x 29 - 32 PR, earthmover type, tubeless.
Brakes	Dual braking system, full air on all wheels. Spring applied air released emergency/parking brakes on all eight wheels.
Lights	Full lighting package including turn indicators, head, tail, brake and hazard warning lights.
Maximum Speed	15 MPH (24 kph)
Maximum	55% (Theoretical based on 234,010 lbs. (106147) GVW
Gradeability	33.25 x 29 tires, 173 ft. (52.7m) boom plus 33 ft. (10m) swingaway.
Gross Vehicle Weight & Axle Loads	BASIC STANDARD MACHINE Front: 116,140 lbs. (52,681 kgs) Rear: 117,870 lbs. (53,466 kgs) G.V.W.: 234,010 lbs. (106,147 kgs)
Miscellaneous Standard Equipment	Full width steel fenders, catwalk railing around top of superstructure, dual rear view mirrors, hookblock tie down provisions, electronic backup alarm, light package, stowage compartment, tachometer, cold start aid (less canister), fire inflation kit.
Optional Equipment	* Worklights * 360° rotating beacon * Cab spotlight * Engine block heater * Hookblocks * Spare wheel assembly * Tool kit * Pintle hook front/rear * Low oil pressure, high water temperature A/V warning system

		Auxiliary Hoist Gearmatic Model 36	
Make/Model		High Range	Low Range
Maximum single line speed	Bottom layer	496 FPM (151m/min)	248 FPM (76m/min)
	Intermediate layer	592 FPM (180m/min)	296 FPM (90m/min)
	Top layer	688 FPM (210m/min)	344 FPM (105m/min)
Maximum single line pull	Bottom layer	7,198 lbs. (3265 kg)	14,397 lbs. (6530 kg)
	Intermediate layer	6,027 lbs. (2734 kg)	12,054 lbs. (5468 kg)
	Top layer	5,184 lbs. (2351 kg)	10,368 lbs. (4703 kg)
Maximum permissible line pull w/5:1 F.O.S.		11,760 lbs. (5334 kg)	
Maximum rope stowage		850 ft. of 3/4" dia. rope (259m of 19mm)	

†Patented Grove feature or patent pending.
*Denotes optional equipment.

Superstructure specifications

Boom	46 ft. to 173 ft. (14m -52.7m) five section Trapezoidal† main boom consisting of a base section, three full power sections and one aerial latched section to 173 ft. (52.7m). Telescopic sections slide on adjustable and replaceable Nylatron wear pads. Maximum tip height: 183 ft. (55.9m).
Swingaway Extension	Standard 33 ft. (10.0m) lattice “swingaway” boom extension with integral offset mechanism, offsettable at 2°, 15° or 30°. Stows alongside base boom when not in use. Maximum tip height: 215 ft. (65.7m).
Optional Telescopic Swingaway	33 ft. to 48 ft. to 58 ft. (10.0m-14.6m-17.7m) telescopic lattice swingaway extension with integral offset mechanism offsettable at 2°, 15° or 30°. Stows alongside base boom when not in use. Maximum tip height: 240 ft. (73.3m).
Optional Jib	14 ft. lattice sections combine with standard 33 ft. (10.0m) swingaway boom extension to provide 47 ft. (14.3m), 61 ft. (18.6m), 75 ft. (22.9m) and 89 ft. (27.1m) jib lengths. Jib is cable suspended and can be offset at 5°, 17° and 30°. Maximum tip height: 270 ft. (82.5m).
Boom Nose	Eight sheaves mounted on heavy duty tapered roller bearings with removable pin-type rope guards. *Optional removable auxiliary boom nose with removable pin type rope guard.
Boom Elevation	Two double acting hydraulic cylinders with integral holding valve provides elevation from -3° to 80°.
LMI	Standard load moment and anti-two block system with audio-visual warning and control lever lockout to alert operator of impending two-block condition. Electronic display of: boom angle, length, radius, tip height, relative load moment, maximum permissible load and actual load indication is provided.
Cab	Full vision, all steel fabricated with accoustical lining and tinted safety glass throughout. Dash panel incorporates gauges for all engine functions. Other standard features include: hinged skylight, sliding left side door and sliding right side window, electric windshield wash-wipe, skylight wiper, circulating air fan, hot water heater, defroster, fire extinguisher, seat belt, cigar lighter and ashtray. Cab hydraulically elevates 45in.(1143mm) to a height of 17 1/2 ft. (5.3m) for increased visibility.

Swing	Ball bearing swing circle with 360° continuous rotation. Grove planetary “glide-swing” with foot applied multi-disc brake, spring applied hydraulically released parking brake and 360° position, cab controlled, positive turntable lock. Maximum speed: 1 RPM.
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Counterweight	Removable, pinned to turntable mast.
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HYDRAULIC SYSTEM Pumps	Five gear and two open loop axial piston pumps, combined capacity 355 GPM (1344 LPM) driven by superstructure engine through P.T.O. standard pump drive disconnect.
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Valves	Precision four way double acting control valves, 8 individual valve banks permit simultaneous control of multiple crane functions.
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Filter	Two full flow 10 micron remote mounted for both main pumps in super-charge loop. One full-flow 10 micron in tank return line. *Two inlet strainers - 100 mesh in tank. Five full-flow 10 micron remote mounted pressure filters for gear pumps.
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Reservoir	550 gallons (2082 L) with spin-on breather filter, external sight gauge and clean out access.
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Oil Cooler	Remote mounted with thermostatically controlled hydraulic motor driven fan.
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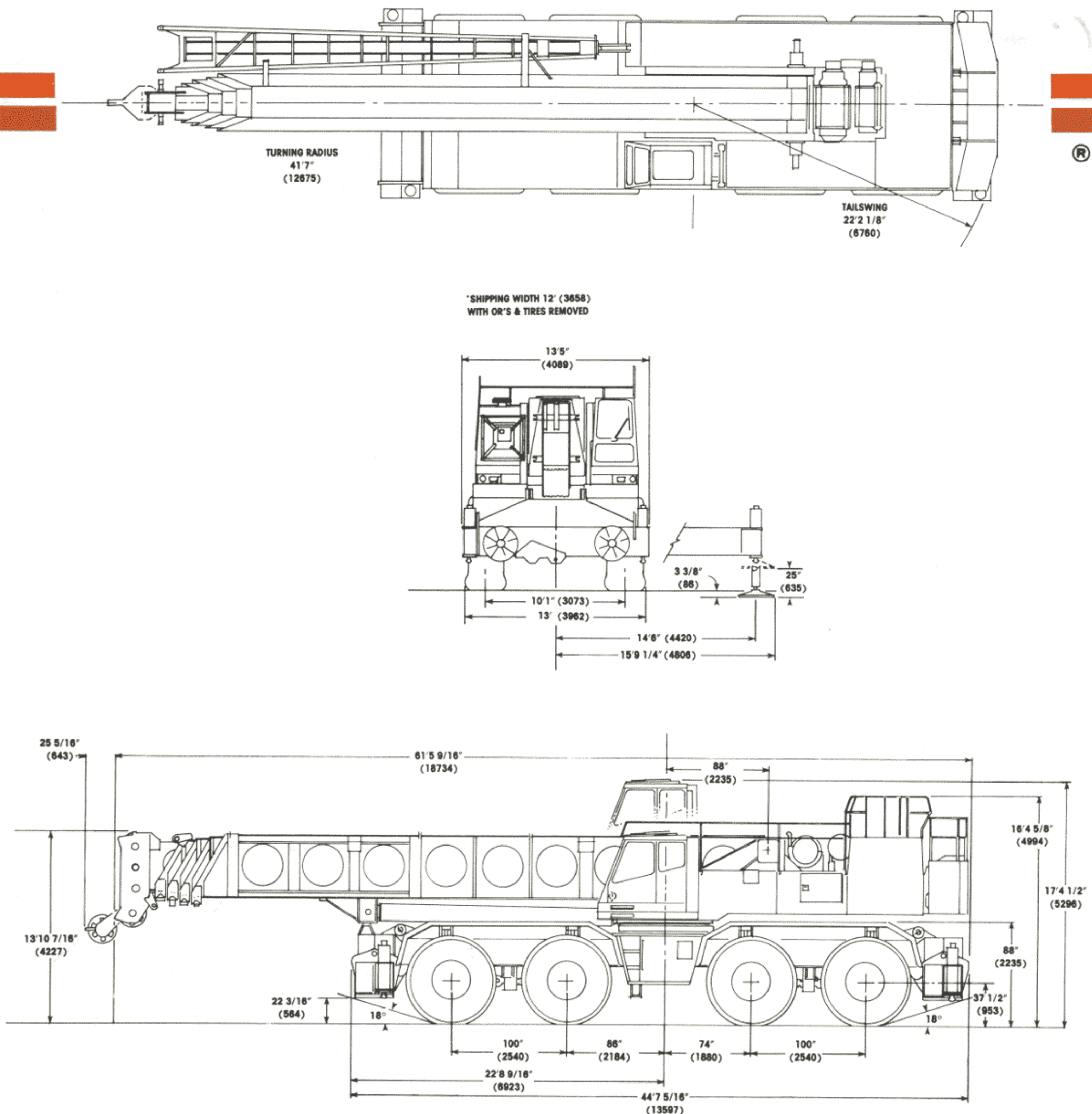
Pressure Check Panels	System pressure test panels with quick release type fittings.
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HOIST SPECIFICATIONS	Power up and down two speed, planetary reduction with integral automatic brake, electronic drum rotation indicators and cable followers.
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Main Hoist Gearmatic Model 46			
Make/Model		High Range	Low Range
Maximum single line speed	Bottom layer	274 FPM (84m/min)	137 FPM (42m/min)
	Intermediate layer	324 FPM (99m/min)	162 FPM (49m/min)
	Top layer	374 FPM (114m/min)	187 FPM (57m/min)
Maximum single line pull	Bottom layer	13,000 lbs. (5897 kg)	26,000 lbs. (11794 kg)
	Intermediate layer	11,008 lbs. (4993 kg)	22,016 lbs. (9986 kg)
	Top layer	9,545 lbs. (4330 kg)	19,090 lbs. (8659 kg)
Maximum permissible line pull w/5:1 F.O.S.		20,680 lbs. (9380 kg)	
Maximum rope stowage		1,150 ft. of 1" dia. rope (351m of 25mm)	
Note: 1,150 ft. (351m) length of wire rope supplied with basic standard unit.			

Dimensions

RT1650



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GROVE MANUFACTURING COMPANY

Division of Kidde, Inc.

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