

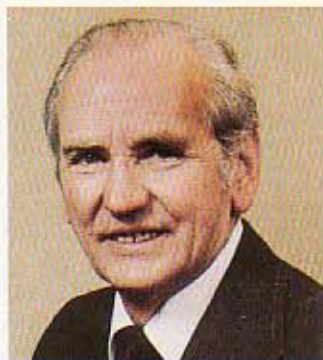
P&H DELTA

CHALLENGE

Design Analysis #1

P&H DELTA 5250/250-TON CRAWLER CRANE

- **Challenge:** Smoothest, most precise control of the load on the hook.
- **Challenge:** Provide maximum accessibility to the machinery deck for service.
- **Challenge:** A revolving frame with the versatility for multiple functions and the ruggedness required for duty-cycle work.
- **Challenge:** Provide a large-capacity drum configuration that will meet any rigging requirement.
- **Challenge:** Design the smoothest, most precise, safest boom hoist system.
- **Challenge:** The smoothest possible swing for accurate load handling...plus extra power for duty-cycle work.
- **Challenge:** Design a modular power plant for easy accessibility, interchangeability and option for all types of work.



"...the smoothest operating upper machinery ever designed for a big crawler crane... combined with optimum cost-efficiency, strength and ease of service access."

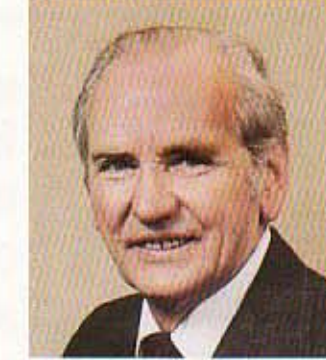
Dieter Juergens, Director of Engineering

P&H DELTA

RESPONSE

Design Analysis #1

P&H DELTA 5250/250-TON CRAWLER CRANE



"Our response to the challenge is the Delta 5250. We're out to convince you that money can't buy a smoother operating crane."

Dieter Juergens, Director of Engineering



Response:

The Delta 5250 has the smoothest and most precise control of the load on the hook of any crane in its class. The control system lets the operator easily perform three functions at once: load hoist, boom hoist and swinging.

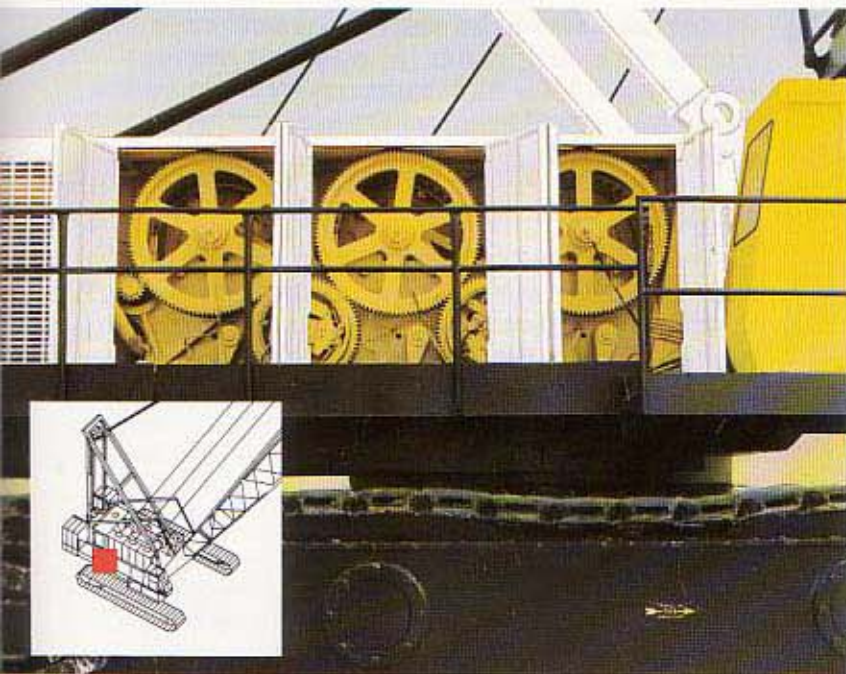
The load is raised through a torque converter with modulated clutch control. The engine runs at constant, full-load speed for greatest efficiency. The dual hoist drum clutches are set, through power hydraulics, by pulling back the hoist lever. The load can then be raised, floated or lowered by a twist grip on the swing lever, which controls the modulated clutch. Precision load lowering can be performed three ways:

Through the torque converter, by easing off on the modulated clutch control. The most precise method for lowering very heavy loads—easing the load down so slowly you can hardly see it move.

Power load lowering. Optional, modular power load lowering units can be installed on any or all of the four drums. By pushing forward on the hoist lever, the unit reverses the direction of the drum and drives the load down in a positive manner. Speed is controlled through the modulated clutch and brake.

Free-falling the load on the brake. Placing the hoist lever in neutral releases the clutches and allows the drum to turn freely, lowering the load by gravity. This method is used for light loads and for duty-cycle work when lowering an empty bucket. The load is stopped by the brake. The Delta 5250 has dual brakes on each full drum, applied by a variable-assist hydraulic system. A light touch on the pedal applies the brake with direct hydraulics for extra "feel" on light loads. Further pedal-pressure releases measured hydraulic fluid under power for heavier loads. The "feel" is adjustable to the operator's preference. The free-fall feature can be eliminated by installing automatic brakes that set when the hoist lever is returned to the neutral position.

H17.06.23
Hydra crane



Response:

The Delta 5250 sets the industry standard for serviceability. For example, the hinged doors which guard the gears from inadvertent contact can easily be removed by lifting them out of the hinges. A separate engine enclosure dampens noise and protects the engine from weather. This enclosure is easily removed without tools. Strong, wide catwalks provide easy access to both sides of the machine. These and other easy access design features make adjustments from outside the machine faster and more economical.

That's not all there is to Delta 5250 serviceability:

- Brake band adjustment is quickly completed through the access doors on the machinery cab roof.
- Drum assemblies can be quickly removed for service by removing only part of the machinery cab and the four pillow block bolts.
- Modular design of the swing drive unit, propel drive unit, boom hoist unit, power lowering unit and the power plant allows quick, easy removal and replacement to reduce equipment downtime.
- Gantry has a self-lubricating bearing completely eliminating the need for regular maintenance.
- Fluid levels can be quickly checked with sight gauges and dip sticks.
- Hydraulic fluid filters are quickly checked via easy-to-read indicators.
- Inspecting electrical and hydraulic systems is quick and easy because all wires and hoses are number-coded. In addition, "T" fittings on selected hydraulic lines allow quick checking of hydraulic pressure.
- The automatic track lubrication system option eliminates the need for regular maintenance.

Response:

The Delta 5250's all-welded revolving frame represents the optimum combination of cost efficiency, strength and versatility.

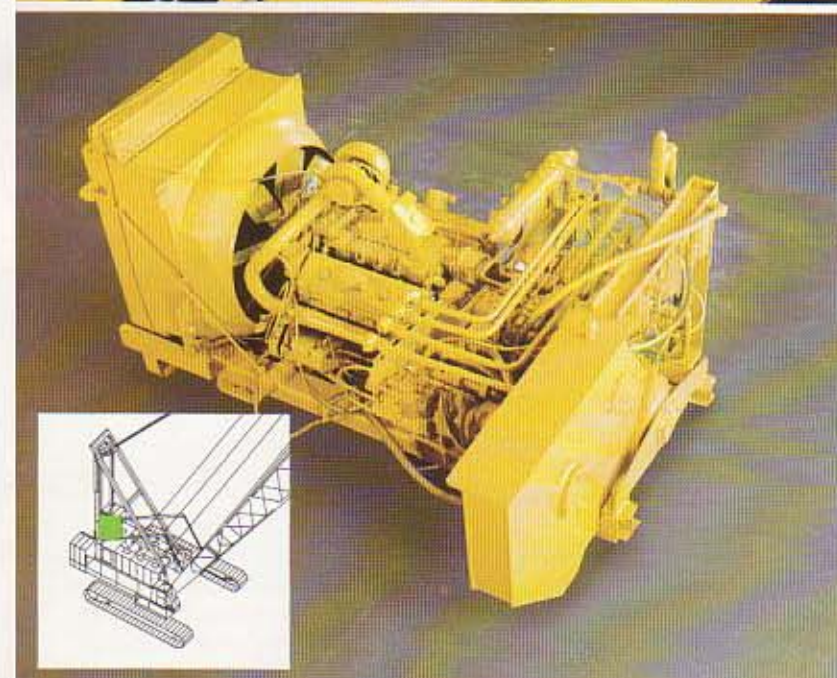
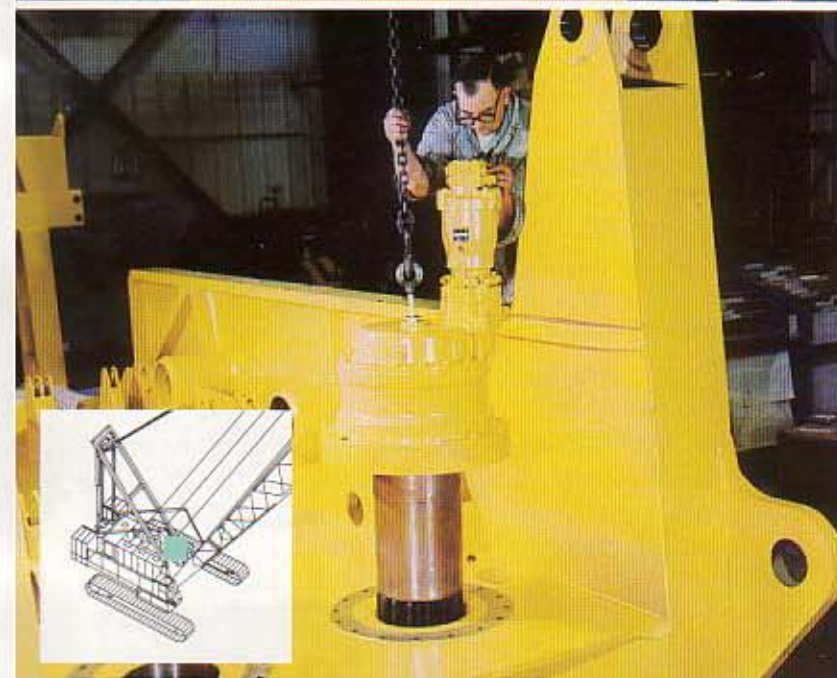
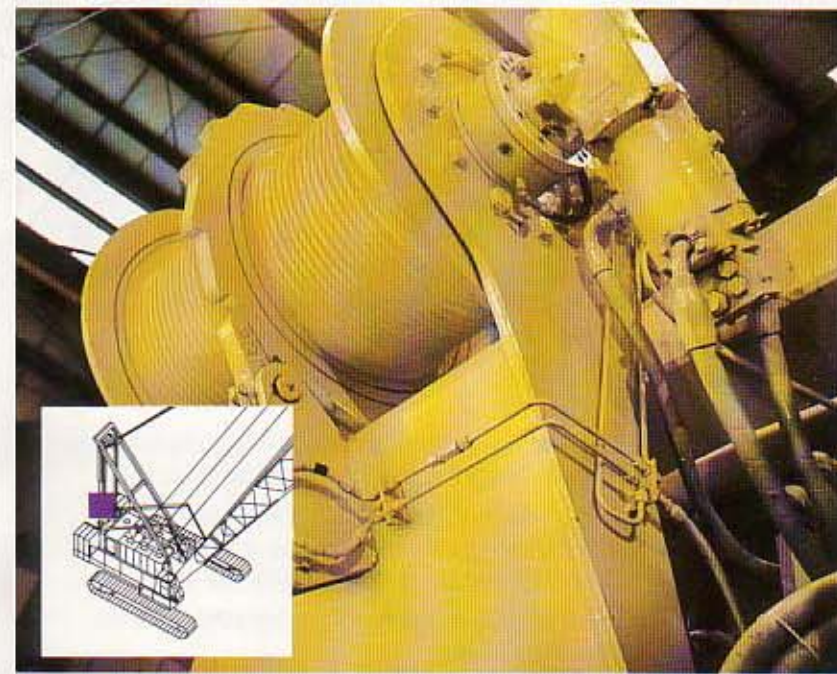
The Delta 5250 has the widest boom foot in its 250-ton class—106". It better distributes stresses under full load and better enables the Delta 5250 to take side loading, making it ideal for duty-cycle work. The Delta's thrust and moment capability is the industry's highest in its class.

Long and wide sidestands provide space for three extra-large tandem drums. The rear portion of the revolving frame is reinforced to withstand the stresses induced by duty-cycle service. Precise location of all machined surfaces is guaranteed by machining on tape-controlled gantry mills. Precise location and rigidity of all brake anchors and operating components assure optimum hoist brake performance.

Response:

The Delta 5250 has unmatched hoist drum capacity. Three wide drum shafts with lebus-type cast laggings each provide over 1765 ft. of working capacity with 1 1/8" wire rope. Each allows storage of more than 2500 ft. and is equipped with double clutches and double brakes. Large-diameter drum shafts mounted in pillow blocks are designed to withstand the shocks induced by duty-cycle service.

The rear drum can be split to provide two independent drums for use with 7/8" rope. Each of the four independent hoist drums can be equipped with a power load lowering option and drum turn indicators. The fourth drum can be equipped with high-speed lagging to provide 550 ft. line speed with 10,000 lbs. line pull.



For clamshell or muck-bucket work, the drum shafts can be equipped with spiral laggings for 1 1/8" or 1 3/8" rope providing a working range of 278 or 165 ft., respectively. For dragline service, the 1 3/8" spiral grooved lagging provides an excellent digging reach of 165 ft.

Response:

The Delta 5250's dual drum hydrostatic boom hoist with large-diameter lebus grooved drums is designed to provide improved rope life and protection against rope crushing. Automatic locking pawl and automatic disc brakes—plus one-way sprag clutch—provide optimum protection against unsafe boom conditions. The Delta's fine metering controls provide exceptionally smooth, infinitely variable speed control over the boom for pinpoint spotting of heavy loads.

Response:

Harnischfeger has put special emphasis on providing the smoothest swing ever. To accommodate the wide range of swing performance requirements, P&H has designed two modular swing units. Both modules are identical—complete with hydraulic motor, planetary reducer, swing shaft and pinion. A single swing module provides ample swing torque for regular lift crane service. For duty-cycle work such as clamshell or dragline—or when the heavy lift attachment is used—the second swing module is required. Swing torque is doubled.

The Delta 5250's pressure-sensitive control provides unmatched smoothness by giving infinitely variable torque. For extra light steel setting work, Harnischfeger can provide an additional swing-torque range selector which enables the operator to selectively lower the entire swing torque range. The spring set hydraulically released disc brake provides a positive swing lock.

The Delta 5250 starts and stops without the characteristic bump or jerk of some swing systems, and load sway is held to a minimum.

Response:

The Delta 5250's power module is a complete, isolated unit including:

- Engine, radiator, oil to water cooler
- Single stage, type-four converter with pump tower for mounting of eight pumps
- Converter output housing with chaincase.

All are mounted on a frame which is fastened through load mounts to the deck. The power module has its own isolated enclosure which provides easy access to daily service points.

Standard Delta 5250 engine is the Cummins NTA 855-C360 (360 hp). The 362-hp Detroit Diesel 8V71T is optional. Caterpillar 3406 DITA (402 hp) and Cummins NTA 855-C400 (400 hp) will soon be available as options. These larger engines are recommended for duty-cycle work.

All engines are designed to work in temperature ranges from -20°F to +130°F. All are turbocharged for economy and high-altitude efficiency.

Let us prove to you that the Delta 5250 works. Call Dieter Juergens at 906.786.6020 to arrange an application analysis. Or write DELTA, Harnischfeger Corporation, P.O. Box 554, Milwaukee, Wisconsin 53201 for more information.

Harnischfeger
P&H