Loadquip Low Loader

The Loadquip Hinge Hitch Low Loader is a rear-loading heavy equipment low loader that utilises a method of pitch pivoting that allows for loading on an inbuilt and fixed ramp which is located at the rear of the machine. CMP is a leading mining engineering company which lends its expertise to the Loadquip brand of mining equipment.

The judges said, "A unique solution to provide transport of extra heavy equipment in harsh mining environments."

Overall Design Merit

Of particular note is the simplicity of the hitch action. The hinge hitch permits raising of the front deck, while the deck pivots around the low loader wheel which then powers the rear of the deck to ground level.

The hinge hitch itself is actuated by hydraulic cylinders, before being positively located in place through the use of hydraulic cylinder driven locking pins. The park brakes on the prime mover and trailer secure the low loader, which prevents the trailer from making any unexpected motion during loading and unloading.

The oil cooled disc brakes are fully integrated with the braking system of the prime mover. This robust and straightforward braking system uses the cooling capacity of the prime mover, which in turn makes use of a resource that is otherwise under-utilised.

The design allows a complete load/unload cycle to be completed in just five minutes, with the most time devoted to the manoeuvring of plant onto or off the deck of the low loader trailer.

Safety is further enhanced by the deliberately slow hinge hitch motion, and the ability to control the tilting via a wireless remote control to the operator. This second feature means the operator can use the tilt from within the cab instead of the loader deck.

Access is both comfortable and safe, thanks to the set of retractable and self-levelling stairs on the right-hand side of the deck. These stairs operate according to a parallelogram principal, so the steps remain parallel to the deck surface regardless of the height of the stairs. The stairs can also be operated at both the bottom and the top.

The focus on high reliability and maintainability is proven in the use of Caterpillar parts, which makes finding spare parts easy and increases equipment uptime.

Trailer Float Design

The trailer floats have been designed to meet and exceed all standards related to structure and mechanics. Considerable attention has been placed into understanding the loading situation. The trailer float has been subject to various combinations of loads, and this information informed the design of every component.

This careful attention to design means that weld repairs will only be required in the event of accident or abuse. The float has been perfectly designed to cope with even the most unusual load events.

Machine Capabilities

The 3-axis hitch on the prime mover allows the weight to be partially applied to the prime mover, while also moving the towing point in between the axles instead of behind them. This shift in weight is key to the machine's success, as it increases traction and limits jack knife events.

Control Systems

The Hinge Hitch Loader features a complete control system and graphical user interface. The hydraulic systems are controlled via two IFM Effector PLC's, with one behind the cab of the prime mover and one mounted in the control cabinet. Operation is simple, via the six button wireless remote control unit, which includes a 'deadman' switch.

All functions are tied to the park brake in the prime mover and transmission, so it is impossible to move until it is safe to do so. The transmission can also only select gears inside the limits of the program. The PLC program provides all the necessary diagnostic and system integrity checking and reporting.

PROJECT TEAM

- **Structural Engineer:** Loadquip
- **Steel Fabricator:** Sun Engineering
- **Steel Distributor or Manufacturer:** Southern Queensland Steel
- **Steel Detailer:** Loadquip
- **Surface Treatment:** Tranzblast
- **Coatings Supplier:** International Paint