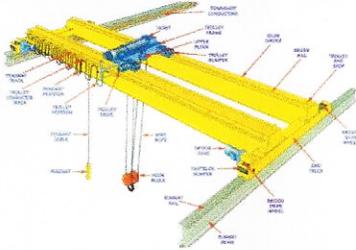


Overhead Gantry Cranes: Preventing Side Picks/Drops

Operation: Overhead gantry cranes are used across many different industries. They provide users with the ability to move large loads quickly and efficiently. Although there are many manufacturers and suppliers of cranes, the fundamental designs are consistent.

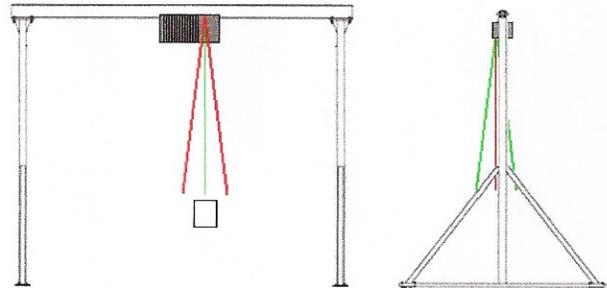


The *bridge* moves along *runways* travelling the length of the bay. The *trolley* runs along the *bridge* and is used to position the *hoist* between the *runways* above the load. The *hoist* lifts the *block* or *load* with a fixed anchor for the *cable* on one end. The *cables* are wrapped around a rotating cylinder or drum, in a manner that prevents them from overlapping.

Scenario: When lifting a load, it is important that the trolley be directly above the object. This ensures that the loading on the cable is in the correct direction and that the force applied is uniform. When the trolley is not directly above the load, an angle is created at the drum and at the fixed anchor. The angle and the direction of this pull can cause damage to the crane assembly.

If the pull or force is against the flow or groove of the drum, as shown with the red lines, the cable will typically wrap on top of itself causing damage. The maximum allowable angle will vary by drum design and manufacturer.

If it is with the curve of the drum, as shown with green lines, there is a reduced chance for the cable to overlap on itself. A greater angle would be permissible in this direction.



The same concept applies when releasing a load under tension. It is never recommended to release a load while there is tension on the cable, however when angled the negative impacts are exponentially higher and damage to the cable and equipment assembly is far more likely.

Solution: Utilizing an inclination sensor from TR Electronic, and a PLC system from Lovato; Primary Controls provided a complete drop in solution for Munck Cranes. Using the inclination sensor on the fixed end of the cable, the angle is measured and communicated to the PLC via an analog input. The PLC program continuously evaluates the analog signal and provides 2 different digital outputs. Output 1 warns the operator that they are approaching the stop angle. Output 2 prevents the operator from raising or releasing the load.

Benefits: The cost of replacing a cable can be in excess of \$1500, with an added cost of downtime on the crane and labour costs for cable replacement. If a cable kinks or breaks, damage to the hoist and product could also occur.