

SPINNER II[®] *PROFIT* *BUILDER* →

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A Newsletter on Money-Saving Ideas From
Spinner II Products / T.F. Hudgins, Incorporated

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REFINERY / CHEMICAL

PB No. 115

Grid Switch Detects Failures in Process

An oil company's Louisiana refinery has three 6,000 HP Worthington BDC compressors driving a Norco hydrocracker. Changes in operating demands affected the reliability of the machines adversely. They experienced three separate failures, each involving severe damage to one connecting rod, one crosshead, and the crankshaft. The cost of repairs varied from \$120,000 to \$300,000. Production losses up to \$140,000 added to the cost of failure. One failure heavily damaged a connecting rod and crosshead. The crosshead barrel had to be rebored. Then the crankshaft required extensive weld repairs and straightening.

Although engineering improvements have generally improved reliability, questions about the reciprocating assemblies remain. During a turnaround beginning in early 1996, Grid Switch[®] Metal Particle Detectors were installed on each machine.

Six months after the turnaround, the Grid Switch Controller for one of the compressors sounded an alarm. When the operators arrived at the unit, they inspected the operating variables and when it began knocking, they shut the compressor down. The Grid Switch grid was found coated with

bronze and babbitt. The crosshead pin on one cylinder froze in the connecting rod and was beginning to freeze in the crosshead bushings. The crosshead shoes had begun to wipe. However, because the Grid Switch caught the failure in time, the crankshaft was undamaged. Repairs cost \$25,000 with \$30,000 lost production.

A similar failure occurred on another compressor about a month later. This time, the operators shut the machine down as soon as the alarm sounded. Because of the prompt shutdown, damage was less severe. Repair costs were about \$20,000. Due to lower production demands at the time of the failure, there were no production losses.

The most important results of these early warnings and early shutdowns were the reduction of total damage and the determination of the initiating cause. If a failure can be stopped before too many parts are destroyed or damaged, fixing the root cause is much easier.

The Grid Switch Metal Particle Detector is a simple, yet valuable tool to help managers head off expensive repairs on diesel and gas engines, compressors, hydraulic pumps and pressure-lubricated geartrains.



Grid Switch[®] **Metal Particle Detector**

The Grid Switch intercepts a small flow of oil from lubricated components; debris from accelerated wear conditions accumulates on the grid and trips an alarm **before** catastrophic failure.

Available From Spinner II

