

# Braking the Cycle

## Oak Crest Lumber's Switch to Oil Shear Clutch-Brakes Yields Years of Trouble-Free Service

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Tucked away in the south-west quadrant of the state of Georgia, amid stately pine stands, pecan farms and cotton fields, sits Oak Crest Lumber. While the scenery may be bucolic, the pace within this lumberyard is anything but serene, as the facility surfaces 45,000 board feet of lumber daily. Maintaining that pace of production means that all of the company's equipment must be working. When the dry magnetic clutch-brake on their tilt-hoist began to wear out frequently (it needed to be replaced each six months or so), Oak Crest officials knew it was time for a change. They installed an oil shear clutch-brake, and it has been working steadily for the past four years.

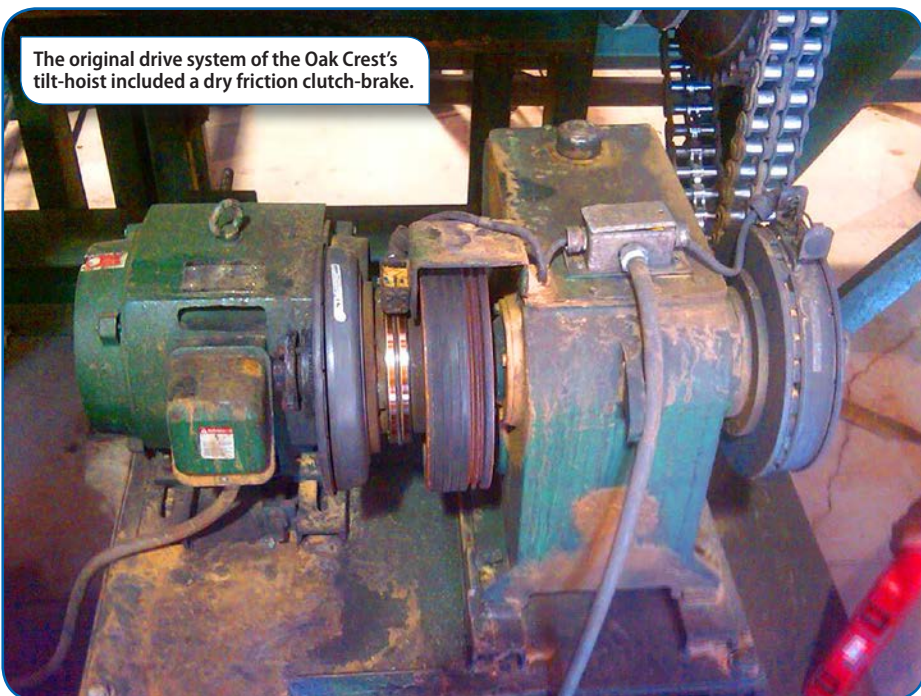
Surfacing is the next to last step before the boards are bundled and tallied for shipment. Prior to being fed into the planer machine, lumber packs are placed into the tilt-hoist. Its lift arms incline and index every inch and a half, thus feeding the 1 $\frac{3}{16}$ " thick boards to the surfacing line. The tilt-hoist works all day long, 42 layers per pack, processing 20 or more packs per day.

While the current oil shear clutch-brake is up to the challenges of this demanding application, the dry, magnetic, friction-type clutch-brake that was previously installed was not. Plant technician Johnnie Thomas Jr. recalls that when the machinery was first installed, the dry clutch-brake performed well, lasting five years or so. But once the replacements started, they kept coming.

"We had to replace clutch-brakes every 6-8 months," Thomas says.



One of the key machines in the Oak Crest manufacturing facility is the tilt-hoist that positions the lumber for final surfacing.



The original drive system of the Oak Crest's tilt-hoist included a dry friction clutch-brake.



To complicate matters, the clutch-brake virtually always failed while processing a pack of lumber.

“The clutch-brake always seemed to fail in the up position,” Thomas says. This was problematic for several reasons. “Once you break the magnet away from the clutch-plate, the whole load would come crashing down.”

Naturally, this is a safety concern, so the lumber pack had to be removed by hand, which was painstakingly slow and labor-intensive.

“We’d have to unload the lumber, then take a come-along to take the clutch off and let the bed down easy,” Thomas says.

With the lumber removed, the magnet broken free from the clutch-plate, and the tilt arms returned to the floor, the process still required several hours to complete. Oak Crest would keep a spare clutch-brake in stock to speed the process, which ultimately took the better part of a day from failure to re-start.

The raw cost of the clutch-brake — purchased in two pieces, the magnet and the clutch-plate — was around \$1,800 (up from \$1,200 on their original replacement order). Depending upon the market price of lumber, downtime is figured at between \$700 and \$800 per hour. So if the tilt-hoist clutch-brake failed while loaded with a pack of lumber in the up position, an 8-hour replacement could easily cost \$7,500 (including downtime and parts cost).

Thomas recalled lamenting to his local motor shop, Nelson Electric, about the situation. They suggested looking at the Force Control oil shear clutch-brake product. Jim McHugh, Force Control’s Southeast regional manager visited soon thereafter and determined that a size 5 fan-cooled Posidyne model SA clutch-brake would be sufficient. The initial cost of the oil shear clutch-brake, at \$6,500, was higher than the dry clutch-brake model it was replacing. However, the prospect for longer service life would more than make up the difference, he hoped. This is especially true considering that with a fully loaded tilt hoist, the plant might be looking at \$6,400 in downtime alone,

plus replacement clutch-brake costs.

Now, four-plus years later, that same oil shear clutch-brake is still in operation. “We put in the Force Control brake and haven’t had a problem with it since,” Thomas says.

Assuming an eight-month service life, Oak Crest would have gone through six of the old style clutch-brakes in this same time period — at a cost of \$10,800 for parts only (does not

include labor to install or downtime).

“I’ve been here for 25 years, and we’ve bought a lot of equipment in that time,” Thomas says. “This might be the best equipment investment that we’ve made.”

### How Oil Shear Technology Works

Normal dry clutches employ a sacrificial surface — a disc or pad — to en-

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gage the load. Having no good way to remove the heat caused from engagement between the disk and plate, this material must absorb the heat. These extremely high temperatures will eventually degrade the friction material. As the friction surface wears away and begins to glaze, the spring force is reduced, causing ensuing torque fade. This causes positioning errors, which

require adjustment or replacement of the friction surface.

Oil-shear technology plays a major role in ensuring that the planer tilt-hoist at Oak Crest Lumber can operate day-in and day-out. Since a fluid film flows between the friction surfaces, the fluid is compressed as the clutch is engaged. The automatic transmission fluid in shear transmits torque. This torque transmission causes the sta-

tionary surface to turn, bringing it up to the same relative speed as the moving surface. Since most of the work is done by the fluid particles in shear, by the time the surfaces actually meet or “lock up,” wear is virtually eliminated.

In addition to transmitting torque, the fluid also helps to dissipate heat, due to a patented fluid recirculation system. Along with torque transmission and heat removal, the fluid also serves to continually lubricate all components, thus extending service life. Oil shear technology also provides a “cushioned” engagement that reduces shock to the drive system, further extending service life. Unlike dry clutches, the totally enclosed oil shear system is impervious to external elements such as wet, dusty or dirty environments. Since the layer of oil eliminates wear, the oil shear clutch provides a long service life. With the elimination of wear comes the elimination of adjustment—and increased “uptime” for the surfacing operation.

As Oak Crest Lumber has grown, Thomas has purchased a lot of equipment to help fuel that growth. Sometimes the equipment is notorious for its repair history and need for frequent

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The old-style clutch-brake used a friction element to create the necessary stopping force.





replacement. But the oil shear clutch-brake purchased for the Salem planer-tilt-hoist is memorable because it requires virtually no maintenance or adjustment. That leaves more time for Thomas and his crew to focus on other aspects of the business — like continuing to fix the next weakest link in the production chain, so that they can continue their growth. **PTE**

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