

Success Story:
Trinder Engineering Ltd.

Market Served
Forestry



Eaton helps improve user safety in new Steep Slope Harvester

Segment:
Forestry

Location:
Nelson, New Zealand

Challenge:
Design a hydraulic system for tree harvesting machinery that helps improve lumberjack safety on steep terrains where traditional harvesting machines are unusable due to instability.

Solution:
A complete control solution package to ensure precise control of machine on uneven terrain.

Results:
A logic control solution using Eaton's Pro-FX™ portfolio aided in the development of a one-of-a-kind machine that is expected to become an industry standard for safety.

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"This harvester is the first of its kind in New Zealand. Forest owners in New Zealand are stipulating that a winch-assisted machine be used on slopes over a certain angle."

*Mike Grooby
Senior Sales Engineer, Eaton*

Background

With a specialty in serving forestry customers in New Zealand, Trinder Engineering Ltd., with support from Eaton's hydraulics distributor Fluid Power Solutions Ltd., manufactures heavy machinery to help lumberjacks efficiently harvest trees. When working on varied terrain, lumberjacks face treacherous conditions where falling trees can potentially cause injury or death. On flat ground, forest owners typically rely on harvesting machines to reduce the risk to lumberjacks. On steep hills, however, traditional harvesting machines are not suitable due to their lack of stability, lending itself to unsafe working conditions.

Challenges

To enhance lumberjack safety, Trinder set out to design and build a new harvesting machine that could maneuver steep slopes and overcome the issues created by sharp angles, such

as traction control and engine and hydraulic oil levels. Trinder knew that attaching a winch cable to the machine would provide the needed traction to counterbalance the steep incline, but safety concerns still lingered. If a cable broke, it would be dangerous for workers and the harvester would need to stay in place.

For forestry companies, keeping workers safe is paramount, which means the new machine had major obstacles to overcome – functioning safely on extreme angles with heavier construction and different boom geometry. For the Trinder team, the new machine had to include complex logic control and sensors for self-monitoring to ensure the machine stayed in place regardless of conditions. The harvesting machine's hydraulics needed a redesign to manage the winch system, as well as to handle the sharp angles of the boom, which holds the felling head – key to the cutting operation.

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Capping off Trinder's challenges, the machine was a totally new concept, so the design team had no comparison for their creation.

Solution

Trinder invented and built a new harvester by disassembling and rebuilding the flat ground harvester with heavier construction.

Working with distributor Fluid Power Solutions Ltd., Eaton delivered a complete control solution package and helped Trinder's programmer overcome circuit design issues. In addition to a 7 inch Moeller color touch screen, Eaton recommended three controllers, as well as directional control valves, hoses and fittings and slip-in and screw-in cartridge valves for hydraulic control—all of which ensure precise control even under the toughest of conditions.

Trinder also benefited from Eaton's global resources to ensure it received products on time, meeting design deadlines.

Results

Trinder delivered a first-of-its-kind machine to the market, the Steep Slope Tree Harvester (branded ClimbMAX). The harvester gives forestry companies the ability to safely operate in terrain that was difficult or unreachable previously.

"There were two big challenges with this design," said Gary Allen, Technical Sales & Service, Fluid Power Solutions Ltd. "First, we wanted the winch to be controlled automatically, allowing the operator to concentrate on driving the felling machine."

"The second challenge was achieving a high standard of safety, giving the operator the confidence to operate the machine on the steepest of slopes with differing ground conditions. Thanks to the system's technology, we can now safely operate a complex hydraulic system with a high level of confidence," said Allen.

With Eaton's control solution, the winch and tracks work in unison with the operator having the ability to change modes for different terrain and manoeuvres via three buttons on one of his joysticks.

There is also a blade on the machine which doubles as a safety device and is automatically driven into the ground to provide stability in case of a power failure.

The new machine features the option of using the boom to stabilize the machine. The software program embeds the monitoring of all electrical hardware components to ensure that everything is working correctly.



Steep Slope Harvester

"This harvester is the first of its kind in New Zealand," said Mike Grooby, senior sales engineer in Eaton's hydraulics business. "Forest owners in New Zealand are already stipulating that a winch-assisted machine will be used on slopes over a certain angle. This is likely to become an industry-wide standard. Ultimately, the benefit for the forestry market is that they can operate more safely and harvest more efficiently."

Though it will take years to fully determine how the new harvester is helping reduce forestry accidents, its use has already helped minimize the number of lumberjacks who have to work on steep slopes, increasing safety by reducing the potential for accidents.

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