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INSTITUT CANADIEN DE RECHERCHES EN CENIE FORESTIER Division de l'est

Field Note N°: Loading & Trucking-26 Previous Reference Sheet N°: Loading & Trucking-19 & 20

THE WORKHOIST 1500 -A LOW-COST LOADING DEVICE FOR SAWLOGS

This Field Note is the third in a series describing low-cost loading devices suitable for small-scale woodlot operations.

INTRODUCTION

In eastern Canada, there are many woodlot owners who extract wood on a seasonal basis. Some accumulate their sawlogs until the quantity is sufficient to warrant the hiring of a self-loading logging truck for deliveries to the sawmill. However, some seasonal producers do not obtain sufficient sawlog volumes to justify this form of transport and thus are discouraged from recovering sawlogs at all.

FERIC's Woodlot Technology group has been evaluating the effectiveness of smaller-scale devices for occasional log loading. In July 1991, the Workhoist model 1500 folding bumper crane, which has a 680-kg lift capacity, was demonstrated mounted on a 3/4-ton pickup truck for FERIC staff near Barrie, Ont. It was utilized as a vertical hoisting crane and as a towing winch (when retracted into its horizontal position).

The Workhoist is manufactured in the USA, and is available in lift capacities from 450 to 1360 kg. About 3000 units are in use in the USA, with the largest users being the armed forces, municipalities and general building contractors. The unit observed by FERIC was one of two in use in Canada.

DESCRIPTION

The Workhoist has four main components: the support frame, the column, the boom and the winch head.

- The *support frame*, which replaces the standard bumper on the pickup truck, is bolted to the truck's chassis with two mounting brackets. Its primary function is to support the crane when it is in a vertical position. The frame also serves to cradle the column, boom and winch head during transport. A standard towing hitch is provided on the support frame.
- The tubular *vertical column* is attached to the right end of the support frame with a pivot pin. Inside the

tube are the electrical components for controlling winching direction. A circuit breaker safeguards against over-loading. Two axial-type bushings at the top end of the column allow the rotator to turn 355° . A support wedge provides the appropriate inclination (25°) for the boom during hoisting.

- The *boom* is extendable from within the column. When erected, it extends 1.0 m away from the column's vertical position. In this position, the winch fairlead is 1.3 m above the deck of the truck.
- The winch head, which is mounted axially on the end of the boom, contains the winch and cable spool. The winch on the unit observed was a 12-volt DC model V33-SR manufactured by Rule Industries. Powered by the truck's battery, it can hoist 680 kg based on a single-line, bare-drum pull. If the Workhoist is in the transport (horizontal) position, the winch can pull 1365 kg (bare-drum pull). The winch contains 10 m of 5.5-mm aircraft cable with a rated breaking strength of 2500 kg. Two sets of parallel rollers permit cable feeding at any angle. Line speed varies from 5 m/min with no load, to 3.3 m/min at a 455 kg load. Winching direction is activated by means of a hand-held remote cable control. The winch lacks a free-spooling mechanism to allow rapid "playing-out" of the cable. Under load, the unit's electrical consumption is rated at 100 amps.

To prepare the Workhoist for loading, the following steps must be taken:

- Release the tensioning lever on the centre of the column. Remove the transport pin from the left underside of the support frame. Using the slotted tip on the end of this pin, loosen the security bolt which holds the winch head and boom within the column. Also, loosen the fastener which clamps the winch head to the support frame.
- Then, the winch head and boom are manually pulled out (horizontally) and rotated 90°. The security bolt is tightened and the tensioning lever is re-engaged to prevent the boom from swinging while the column is being raised.

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• On the right underside of the support frame is a telescopic tube with an eye hook attached. When pulled out into position, it becomes the anchor point for the winch cable. A steel post is inserted into a slot on the right side of the frame. By placing the cable over a pulley on the top of this post, and affixing the end hook to the eye of the telescoping tube, the crane is raised from its horizontal position and is locked vertically into position (Figure 1). A stabilizer foot is then lowered and adjusted for height. Total setup time is approximately 2.5 minutes. The sequence is reversed to lower the crane into transport position.



Figure 1. Setting up the Workhoist (upper photo) and loading sawlogs (lower photo).

TRIAL RESULTS

To test the Workhoist for loading/unloading sawlogs, the operator backed the pickup truck alongside six hardwood sawlogs and loaded and off-loaded them several times. Each log weighed from 100 to 200 kg and was 2.5 to 3.0 m in length. Their total weight was approximately 900 kg and their solid wood volume was about 0.75 m³. Using the remote control, one person was able to hoist, swing and load the logs, one at a time, onto the truck bed (Figure 1). Each log required about two minutes to load; loading the six logs required about 12 minutes. Unloading required less time; average unloading time was 1.2 minutes per log. NOTE: The cable had to be wrapped around each log and fastened using the end hook. The use of log tongs would have reduced the loading/unloading time slightly.

CONCLUSIONS

Advantages of the Workhoist include:

- The compact, folding design of the Workhoist does not reduce the cargo space of the truck.
- No modifications to the truck's frame or deck are required.
- The list price (\$3350 Cdn) is competitive with other small cranes tested by FERIC (see FN: Loading & Trucking-20).

Disadvantages of the Workhoist:

- Possible problems resulting from accumulation of ice, snow and road salt. Components of this loader must slide freely to prepare it for action. NOTE: All components are zinc-plated; thus rust was not a problem on the unit that we observed. It had been in use for one winter in southern Ontario.
- The limited hoisting height (1.3 m) restricts the size of objects being loaded.
- The lack of a free-spooling mechanism on the winch results in longer cycle times and increases the wear on the motor and drive.
- Although not a problem during the demonstration, the point where the support wedge contacts the boom appeared weak and may require reinforcement.

To summarize:

The Workhoist is unlikely to be used primarily as a log loader since there are other loaders that are better suited to this task. However, the Workhoist may satisfy the needs of truck owners who occasionally require a multi-purpose loading device, e.g. log loading, lifting fuel barrels, engines, heavy timbers, etc., as well as a winch that can pull the vehicle out when it gets stuck.

INFORMATION

For more information, contact:

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