TREE LOADING SYSTEMS USED IN THE PACIFIC NORTHWEST

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The stupendous job of handling large logs in the woods is multiplied by the variety of conditions under which the logger is forced to work. These conditions have necessitated the invention of many different loading systems and loading devices to help do the job.

There are three major ways to load logs with a tree rigged spar. These are: One, the tree rigged boom; two, the guy line and three, the tight line method. All of these methods are designed for use with power equipment.

BOOM LOADING SYSTEMS

McLean Boom

One of the most popular methods of loading in the woods is the method devised by Claude McLean. This method uses both the single and double spar.

The boom which is constructed before rigging is approximately 70 feet long. It is constructed from two straight poles and is held together by four cross members and buckle braces. These cross pieces are 12"x16"x6' long and are placed along the length of the poles in the following manner: One approximately six feet from the butt end, one 40 feet from the butt end, one 15 feet from the tip of the boom and one at the
In rigging a McLean boom, a tree is chosen, topped and guyed. The boom end or heel end, is hung and tied against the tree about 15 feet above the ground. The boom is hung in a horizontal position and secured there by a line from buckle guys called the sail guy. The butt end of the boom straddles the spar and is held in that position by a heavy cable bridle. The boom should be approximately parallel to the ground at all times.

The loading line is threaded from the loading donkey up through a loading block which is fastened to the tree directly under the sail line. From the block the line is threaded through a second loading block attached to the traveling block. This traveling block is free to move along the sail guy. The loading line is then returned and secured to the tree. This gives a block purchase on the carriage.

Two tong lines, also called loading lines, are threaded upward through two blocks attached to the outer cross members of the boom. These two lines continue upward and are attached to the above mentioned secondary loading block. The tong line which runs through the terminal cross member block must be longer in order that the tongs will hanging at the same level.

Usually the weight of the tongs and carriage are enough to pull the slack out of the tong lines. If they are not heavy enough more weight may be added.

This rigging constitutes the normal McLean loading system.
Aside from the loading rigging, lines must be established to move the boom laterally. Either of two methods may be used to accomplish this.

The first method uses only one powered line and a counterweight. A haul back line from the loading donkey is threaded through a block on the tree and then outward at a right angle to the boom when it is over the position where the trucks will be loaded. The line is threaded through a corner block and returned to the tip of the boom where it is secured. This will move the boom in one direction. To move the boom in the opposite direction, a counterweight or squirrel is used. A line is secured to the tip of the boom opposite to the powered line. This second line is taken outward to a corner block, thence to a block attached to one of the guy lines. From this block the line hangs downward and a counterweight is attached to the end. The counterweight usually is a log of sufficient weight to swing the boom easily. This rigging arrangement allows the counterweight to be lifted off the ground when the haul back line is tightened, when it is released, the counterweight pulls the boom back to its original position.

These lines are so arranged that the power line pulls the boom around to the cold deck while the counterweight pulls the boom back to the loading position.

The second method of moving the boom involves the use of two powered lines instead of one line powered and a counterweight. Both powered lines are rigged as was the single pow-
ered line mentioned above.

The McLean boom is one of the safest methods of loading logs. The weight of the log is well distributed between the two tongs that are used in this method. Thus the chances of the log pulling free from the tongs is greatly reduced. Even if one pulls loose the other tong should hold one end of the log in the air thus reducing the danger of falling and careening logs. This is in direct contrast to the heel boom method of loading in which only one set of tongs is used.

Heel Boom

The tree rigged spar heel boom is the fastest loading system of all tree rigged loading systems.

Basically the only difference between McLean and Heel boom loading is the number of tongs used, the construction of the boom and the number of tong lines.

The boom is approximately 40 feet long and has cross members placed about four feet apart. A minimum of six cross members should be used. Fastened to these cross members and parallel with the long axis of the boom are channel irons or railroad rails. The flanges on the railroad rails should be on the bottom side.

Only the front tong is connected to the fall block as compared to two in the hayrack method. The loading line is threaded from the loading donkey through a loading block on the tree and then through a fall block and back to the tree where it is secured just below the lead block or sail block. The yoke of this fall block is attached to the traveling or
sail block. The tong line is fastened to this fall block after it has been threaded upward through the tong block.

In order to lift a log with only one tong, the tong must be sunk in the log so that the tongs are between the center of gravity of the log and the end of the log which you wish to heel against the boom. When the donkey operator heels the log against the boom he continues to reel in the loading line thus bringing the protruding end of the log up to a horizontal position. The loading drum is braked with the log in this position and operator swings the boom over the desired position. The front end of the log is lowered by releasing the drum brake. When the log end is in the desired position on the truck, the tail end of the log may be adjusted by moving the boom laterally.

The swinging of the boom may be accomplished in the same manner as was used on the McLean boom.

The main advantages of the heel boom are many but the main advantages are that it is fast, requires a smaller crew around a crowded and dangerous landing, and that the log is under complete control after it has been heeled.

GUY LINE LOADING

One of the simplest and most inexpensive methods of loading from the standpoint of machine and rigging requirements is the Guy Line method.

Guy Line loading with a double drum donkey is sometimes
referred to as duplex loading. Both drums are loading line drums and have the same power and speed. They are generally equipped with a slack roller to provide slack on the loading lines. The drums can be operated independently or simultaneously.

Both loading lines lead from the drum to two lead blocks on the tree which are secured below the top guys. From the lead blocks the lines are threaded through secondary lead blocks hung from loading jacks. Each line is then equipped with a heavy set of tongs which are cleved to the line.

The loading jacks are suspended directly over the roadway on which the trucks will travel. These loading jacks are fastened to the guy lines by a chain and clevis on the top, and to the jack guy on the bottom by another chain and clevis. The jack guy is secured to the same stump as is the guy line.

To prevent the log swinging directly under the lead blocks when it is lifted, a brow log is placed parallel to the truck being loaded.

Another advantage of the brow log is that it discourages the swing of logs once they have cleared the cold deck. This makes the loading process faster and safer.

This system of loading has to some extent been replaced in the woods today by the more efficient Heel boom and McLean boom loading systems.
TIGHT LINE OR CROTCH LINE

The rigging of a Tight Line loading system is one of the quickest and simplest processes encountered in tree rigged cable loading.

Requisites for this loading method are two spar trees approximately 150 feet apart and a double drum donkey equipped with double brakes on each drum.

The loading line is threaded from the drum to a loading line block which is fastened under the haul back block on the front spar tree. From this block the line goes directly to the spreader bar. Here the line is split and one line goes to each end of the spreader bar.

When large logs are to be moved, the loading line may be threaded through a lead block on the head tree, thence through a main line fall block and fastened back to the head tree, thus giving a block purchase to the lifting line.

The haul back line is threaded through the haul back block on the front spar tree, across to the haul back block on the tail spar tree and thence to a third haul back block attached to the spreader bar by lines from each end of the spreader bar. To provide a block purchase the haul back is then returned to the tail tree and fastened there.

The spreader bar which has loading tongs suspended from each end is usually made from heavy steel such as a railroad rail. The length of the tong lines is determined by the length of the bar.
The loading engineer now has both the loading line and haul back line attached to the spreader bar which will allow him to move it back and forth between the two spar trees. In order to move the log toward the tail spar tree the operator goes ahead on the haul back line and slacks off the loading line. A reverse of this procedure will move the log to the head tree. When the log is to be lifted the operator brakes the haul back line and goes ahead on the loading line.

The tight line system has several advantages over other types of loading systems. Beside being simple and quick to rig it is an efficient method of cold decking logs or poles.

One very definite advantage this system maintains is it's ability to coordinate with a tractor logging show. There is plenty of room between the two spar trees for the tractors to maneuver and unhook from their turns. The logs may be left at any point under the lines between the spar trees. In winter the tractors are not required to come to the same place on the landing which often results in the tractors becoming stuck or at least making working conditions unfavorable.

Another way of applying this loading method is to exploit it's ability to swing short distances. If it is unadvisable to build a road across a steep gulley or stream to a tractor setting, the trees may be rigged and logs swung across the gulley or stream from the tractor landing to the point where the trucks may be loaded. In this case logging costs are reduced by combining the two operations.
This system is not without faults. The two chief disadvantages to using this system is the lack of control over the logs by the loading engineer. The other disadvantage is that the system is slow. This is mainly due to the distance the logs have to be moved.

This method should be used only under certain circumstances.
SUMMARY

This report has covered briefly the tree rigged cable systems most commonly used in the Douglas-fir region of the Pacific Northwest. There are many modifications in use that have been devised to meet some local problem or to make up for lack of equipment. However the systems described form the fundamental guides on which the modifications are based.

For the sake of simplicity the complete rigging at each tree is not completely described.
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