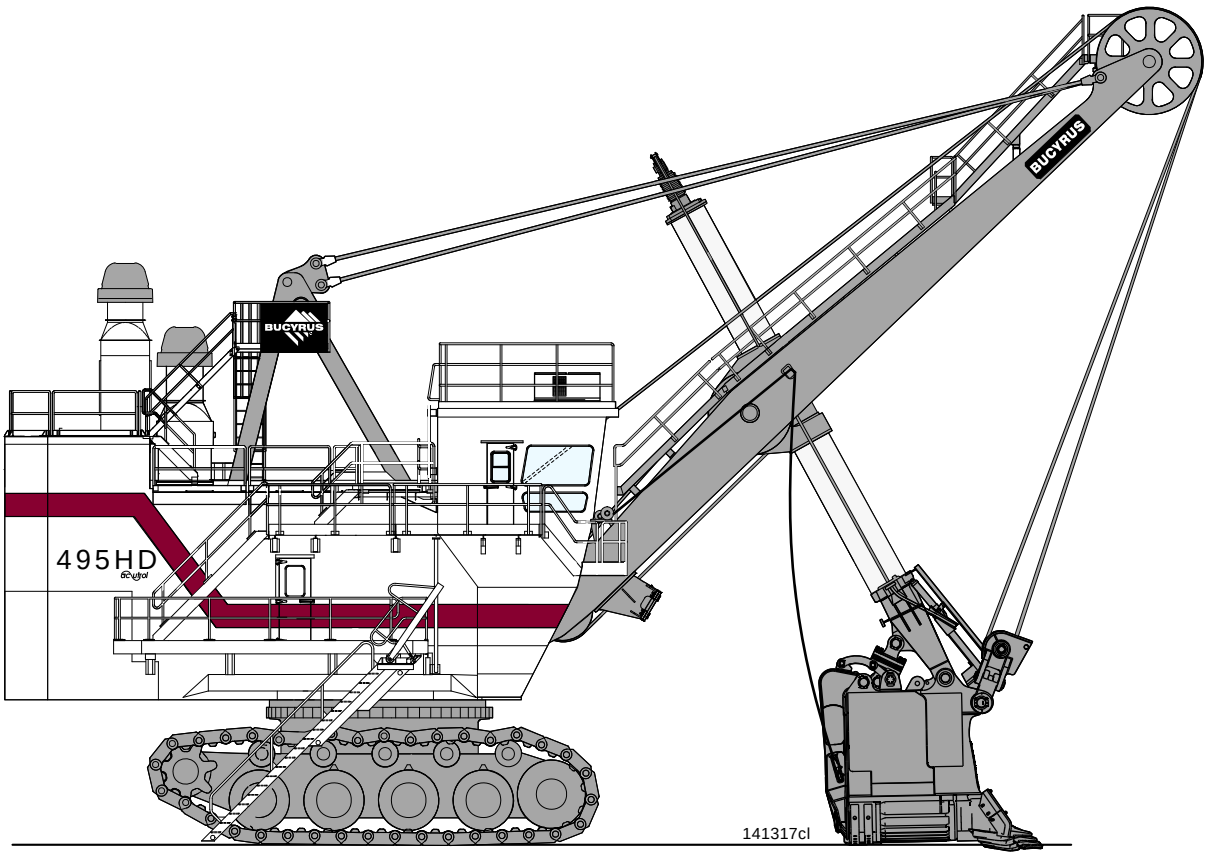
BI010672

BUCYRUS®

495HD
MINING SHOVEL
OPERATOR'S MANUAL

SN: 141317
SN: 141319

Manual No.*10758*



141317mc.cdr Pg. 2

Bucyrus International, Inc.

1100 Milwaukee Ave. • P.O.Box 500 • South Milwaukee, Wisconsin 53172-0500 USA

SAFETY - SWINGING RESTRAINT & BALLAST BOX SUPPORT

BALLAST BOX SUPPORT

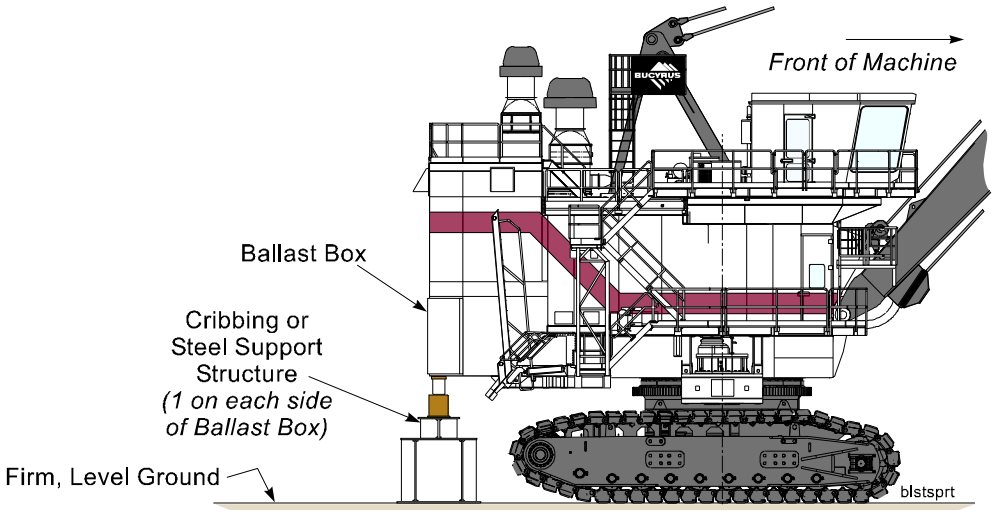
Before performing any maintenance on the mining shovel, it should be resting on a firm, level surface.

Any mining shovel field work that requires the removal or lowering of the boom must incorporate additional support of the ballast box. The supports may be wooden cribbing or steel structures. Two supports positioned side-by-side on level ground are recommended. These supports are intended to accept vertical loads only. To prevent machine rotation use the swing brakes, cable stays, welded ties, etc. Refer to SWING RESTRAINT in this section of the manual.

When electric-powered, cable-style mining shovels are properly ballasted and operational, the center of gravity for the machine's upper works lies within the roller circle area. This assumes that the boom is attached to the machine and in its elevated, working position. As such, the machine should not be prone to tipping.

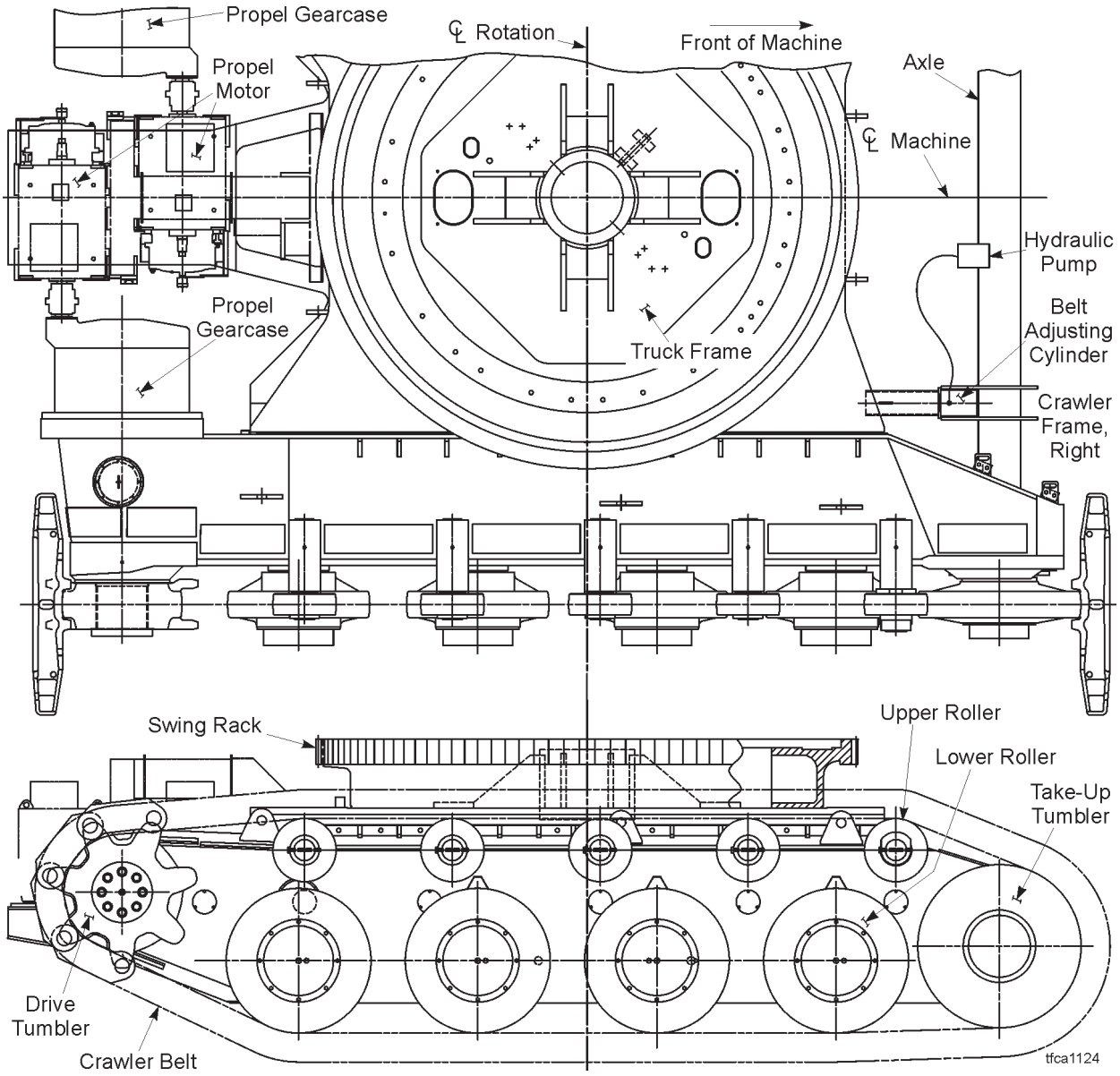
Boom removal or lowering will cause the center of gravity to shift toward the ballast box, decreasing machine stability. Stability is further dependent on the orientation of the upper works relative to the undercarriage. The machine may tip more easily over one of the four quadrants of the crawler mounting than it may over others.

Normally the machine is more likely to tip over the rear-most lower-roller than over the side of a crawler. Therefore, with the boom removed and the ballast box sitting over the rear of the crawlers, the machine may be unstable. Because ballast quantities differ from machine to machine and model to model, it is recommended that the ballast box be supported *before* beginning any procedure to lower and/or remove the boom.



LOWER WORKS

The lower works is comprised of the truck frame, right and left crawler frames, crawler belts, propel machinery, swing rack, roller circle and collector ring system.



Truck Frame and Crawlers

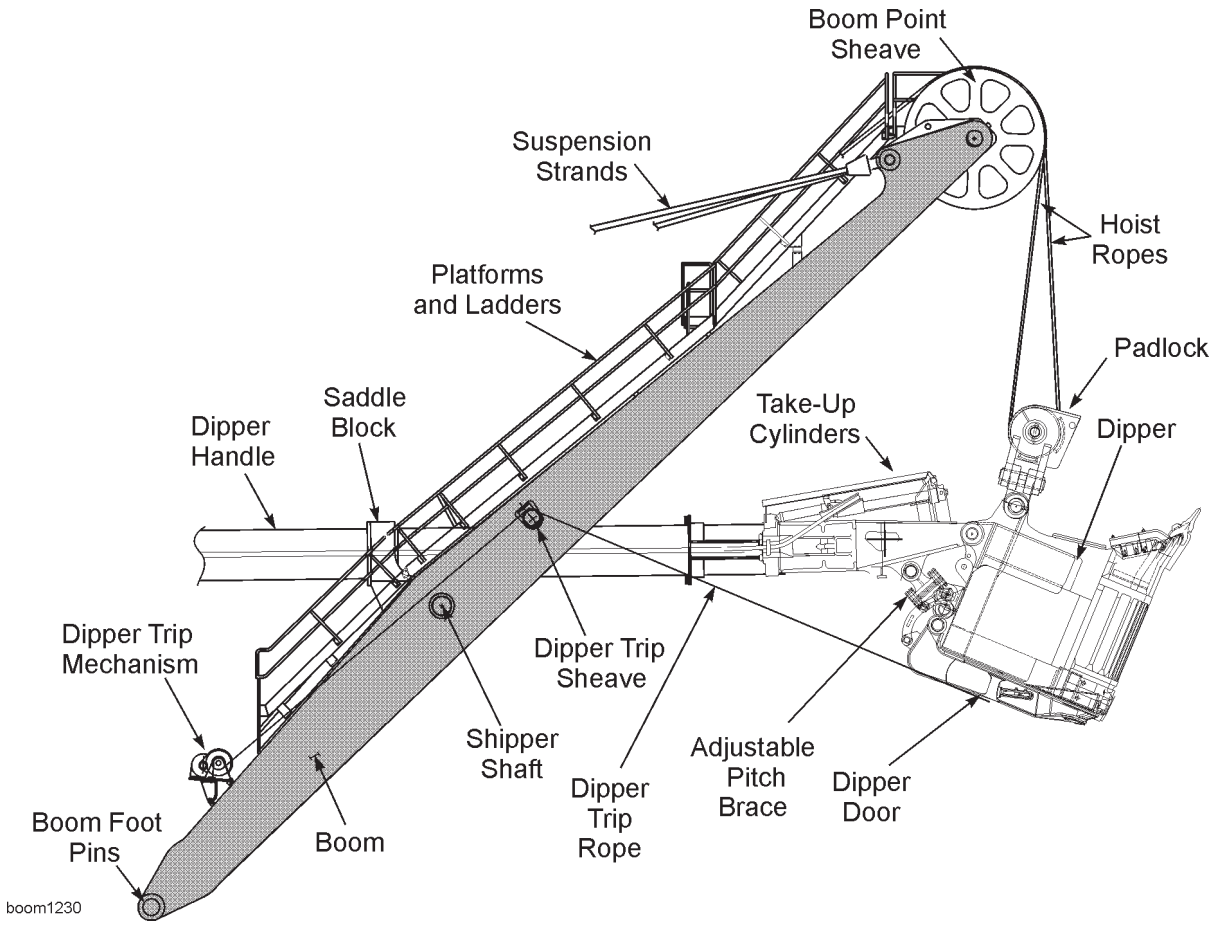
The ladder is a movable structure with a bracket and two rollers at four locations on the ladder. The rollers straddle a rail on each side of the ladder frame. Wire ropes (one on each side of the ladder) connect to the top of the ladder, pass up through sheaves and down to a counterweight inside each side of the ladder mounting frame.

The ladder should be in the UP position when at rest, with the weight of the counterweights holding it in place. If not, or if rough action is noted, check for binding in the rail structure, damaged or missing rollers, or binding with the counterweights.

Periodically check for lubricant in the sheaves at the top of the ladder.

BOOM

The boom is a welded steel structure consisting of twin box girders integrally connected at the boom point and in the lower section between the shipper shaft and boom feet. Impact resistant steel is utilized, coupled with 100% penetration and UT quality welds on all main splice joints. Design optimization has resulted in heavier outside skin plates, minimizing the need for internal diaphragms. This reduction in weld related stress concentrations further enhances structural life. Open manholes have been incorporated in the boom as a standard feature permitting periodic structural inspection. Integral “ladders” within the upper boom sections permit internal access without lowering the boom.



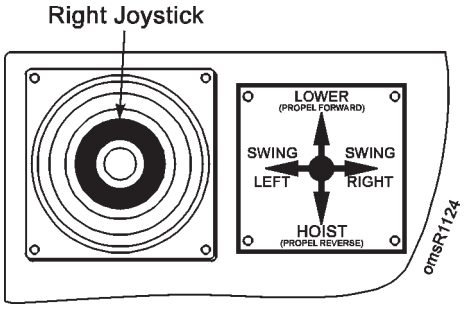
Boom Assembly

The boom is supported by four pre-stressed suspension (structural) strands attached to equalizer links on the A-frame. These inherent long life structural strands carry the working loads of the front end equipment. When structural fatigue finally does begin, it can start in the outside layer of wires which will be easily detected by visual inspection. Internal cracks in the suspension strands must be checked by x-ray. A boom limit switch with soft setdown prevents boom jacking shock loads.

CONTROLS ON THE RIGHT CONSOLE

RIGHT JOYSTICK

The Right Joystick controls the hoist/swing and propel. It is a joystick mounted on the right console of the operator's seat. The joystick is used to control the hoist, swing and right crawler motions of the machine. The position of the propel transfer switch will determine whether this joystick controls the hoist motion or the crawler motion.



With the propel transfer switch in the dig position, *and during normal operation,* pushing the joystick forward will lower the dipper. Pulling the joystick to the rear will hoist the dipper. The neutral position between the hoist and lower functions is defined by a detent that is easily felt. The speed of moving the dipper is controlled by varying the distance the joystick is moved from the neutral (center) position. The full forward or full rearward position provides maximum speed to the dipper. Moving the joystick to neutral will cause a braking action slowing the hoisting or lowering motion. Reversing the joystick will cause the motion to stop and if the joystick is held in this position, it will change the direction of the motion.

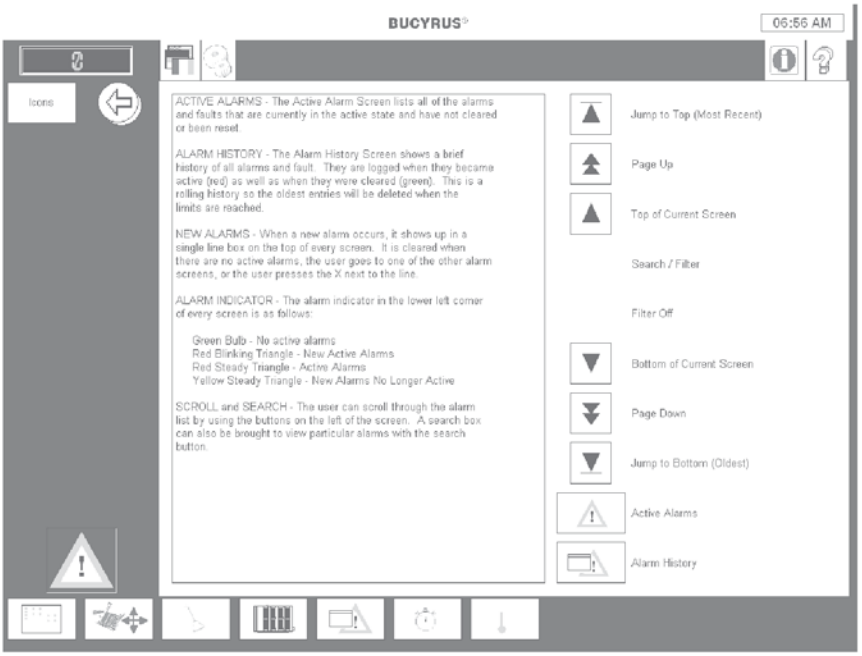
NOTE: When the right joystick is used in the hoist/lower mode it is a spring returned switch. That is, it will return to the neutral position when it is released.

Moving the joystick to the left from the neutral position will cause the machine to swing to the left. Moving the joystick to the right will cause the machine to rotate to the right. The swing motion is operational throughout the entire movement range of hoisting or lowering the dipper. The swing rate of acceleration is controlled by varying the distance the joystick is moved from the neutral position. Moving the joystick to the neutral position will not stop the swing motion but will allow the machine to coast. To stop or change direction the control joystick is moved past the neutral point in the opposite direction. The rate of deceleration is controlled by varying the distance the joystick is moved from the neutral position in the opposite direction.

Refer to JOYSTICK CONFIGURATION in this section of the manual to view the alternate configurations for the Right and Left Joysticks.

With the propel transfer switch in the propel position, pushing the joystick forward will cause the right crawler to move forward. Pulling the joystick to the rear will cause the right crawler to move in the reverse direction. The hoist motion is locked out electrically when the machine is in the propel mode.

NOTE: When the JOYSTICK is used in the swing mode the switch is a spring returned switch. That is, it will return to the neutral position when it is released.



Alarms Help

The Alarms Help screen can be reached from any of the alarm message screens at any time. This screen will provide clarifying information related to the alarm system on your machine.

10. Inspect the dipper and tooth adapters for tightness and excessive wear.

11. Inspect padlocks for damage, wear and evidence of adequate lubrication.

12. Check both the running ropes and the boom structural strands for broken strands and loose sockets.

ON-BOARD INSPECTION

Check the following areas daily on board the machine:

1. Visually inspect the swing, crowd and hoist gearcases for oil levels and leaks. Repair or service as required.

2. Visually inspect all machinery for loose bolts, nuts, clamps or unusual deterioration. Repair as required.

3. Visually inspect the open gears of the swing, crowd and hoist machinery for proper lubricant film and evidence of adequate lubrication from the automatic lubricant dispensing system.

4. Visually inspect hoist and crowd ropes for wear, lubrication and evidence of birdcaging near the drum attachment beckets.

5. Check the oil level in the air compressor. Add oil if required.

6. Check lubricant supply level in the air system lubricator and lube system lubricators.

7. Inspect the automatic lubrication central pumping stations for any signs of malfunctioning. Check the lubricant supply and refill tanks if required.

8. Visually inspect swing, crowd and hoist brake assemblies for damage, wear and evidence of an overheated condition.

9. Check the operator’s cab for cleanliness and visual condition of controls and location of special equipment that may be required by the mine site. Check all operating controls for freedom of movement. Controls should move freely without binding.

10. Clean windows of operator’s cab.

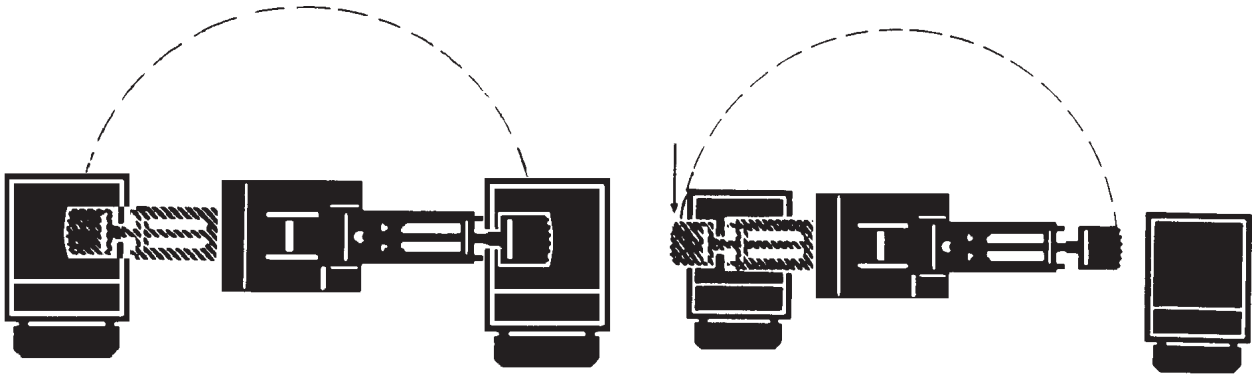
PROPER SWING MOTION

Proper swing motion means smooth control and an efficient swing cycle. The swing motion is begun toward the haulage unit when the dipper is filled and is clear of the bank.

DANGER: EXTENSIVE DAMAGE TO THE DIPPER HANDLE AND DIPPER CAN OCCUR IF THE MACHINE IS ROTATED BEFORE THE DIPPER CLEARS THE BANK.

The swing motion begins with acceleration to an optimum point at which the excavator is brought to a stop over the haulage unit. Maximum efficiency and minimum swing machinery wear are direct results of mastering the swing motion.

NOTE: Improper swing motion results in erratic control and an inefficient swing cycle.



Proper spotting of trucks will result in more efficient load cycles.

Poor spotting of trucks will result in inefficient load cycles and reduced machine production.

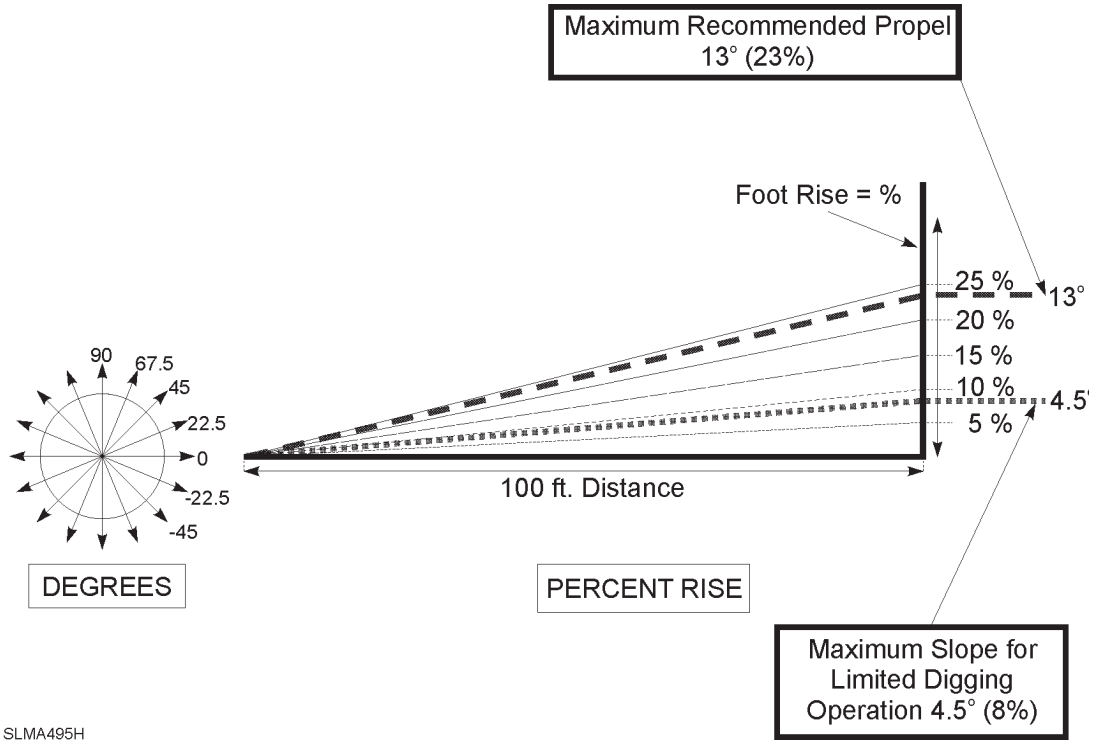
trsp1101

DANGER: THE DIPPER SHOULD NEVER BE POSITIONED OVER PERSONNEL, TRAIL CABLES, RELATED ELECTRICAL EQUIPMENT OR OTHER EQUIPMENT. When the dipper is loaded, accidental tripping of the dipper door could result in death or serious injury to personnel and extensive damage to equipment. Empty dippers may contain small fragments of material that can be extremely dangerous when dropped from a considerable height. On long moves open the door on an empty dipper and lower the dipper to a point that permits moving without striking the ground.

SLOPE LIMITATIONS

While it is strongly recommended that the machine dig on level ground for the greatest possible productivity and the longest component life, limited operation on slopes up to 8% is, however; acceptable with only minimal adverse effects.

NOTE: It is important to remember the difference between Slope Percent and Degrees!



Slope vs. Degrees