Reliability at work

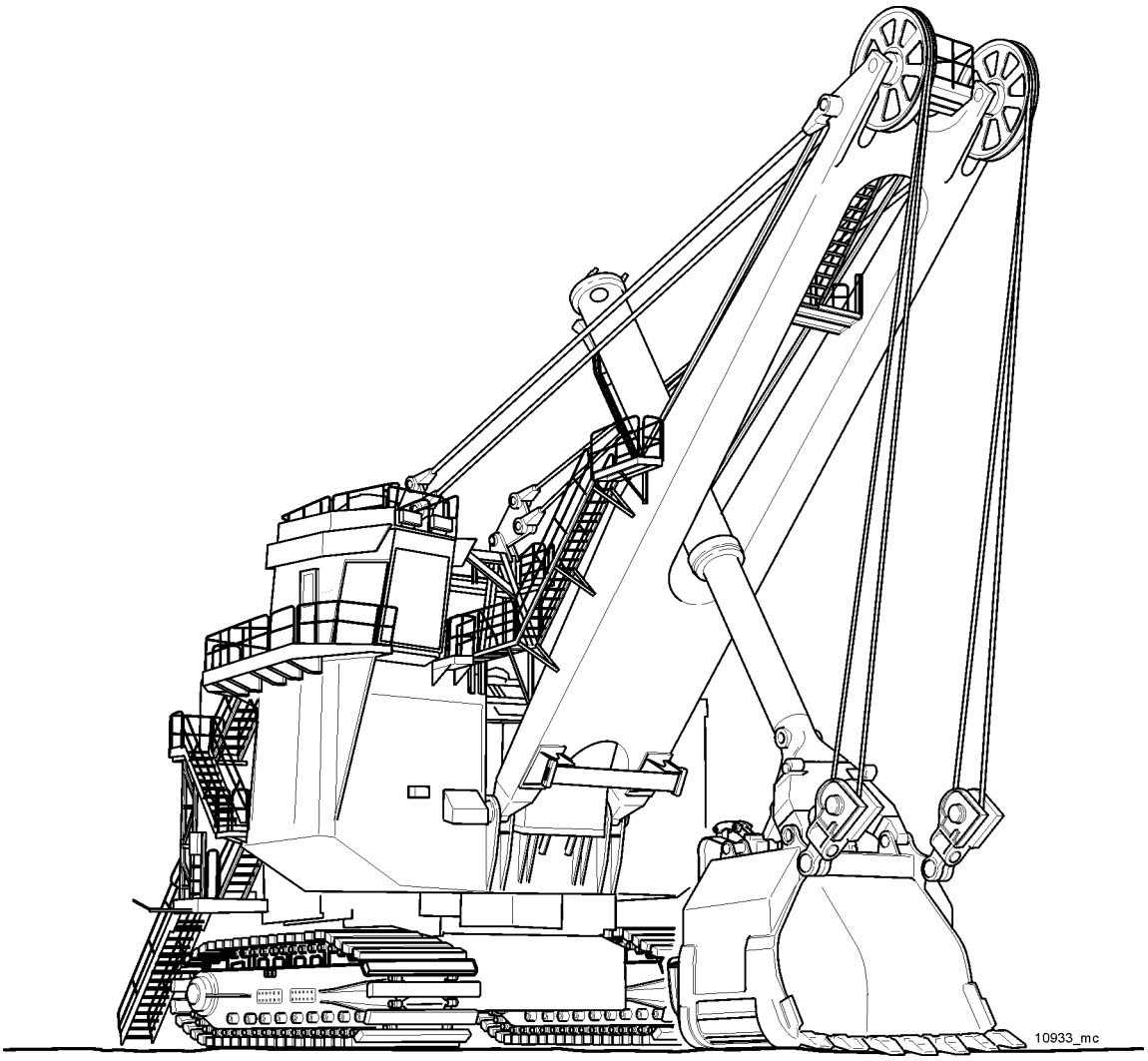
BUCYRUS®

495HD

Mining Shovel

Operator's Manual

Manual No. OM141432-EN



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S.2.1 General Precautions

- **The employment of qualified maintenance personnel, through a scheduled maintenance program, is the best way to minimize machine downtime and maximize productivity of equipment.**
- **Keep hands, feet and clothing away from rotating parts.**
- **Wear a hard hat, safety shoes and protective lenses at all times.**
- **Replace any and all safety and warning placards if they are defaced or removed from the machine.**
- **Think before you act. Carelessness is one luxury the service person cannot afford.**
- **Excessive or repeated skin contact with sealants or solvents may cause skin irritation. In case of skin contact refer to the Material Safety Data Sheet (MSDS) for that material and the suggested method of cleanup.**
- **Inspect safety catches (keepers) on all hoist hooks. Do not take a chance, the load could slip off of the hook if they are not functioning properly.**
- **If a heavy item begins to fall, let it fall, don't try to catch it.**
- **Keep your work area organized and clean. Wipe up oil or spills of any kind immediately. Keep tools and parts off of the ground. Eliminate the possibility of a fall, slipping or tripping.**
- **Floors, walkways and stairways must be clean and dry. After fluid draining operations be sure all spillage is cleaned up.**
- **Electrical cords and wet metal floors make a dangerous combination.**
- **Regularly inspect for any loose bolts or locking devices and properly secure them.**
- **Use extreme caution while working near any electrical lines or equipment whether it be high or low voltage. Never attempt electrical repairs unless you are qualified.**
- **Check limit switches for proper operation.**
- **After servicing, be sure all tools, parts or servicing equipment are removed from the machine and secured in an appropriate storage area.**
- **Mechanical Brakes are designed for use as static holding brakes only. Use as a motion (dynamic) brake in emergency situations only.**
- **Use proper interior and exterior lighting.**
- **Install and maintain proper grounding and ground fault protection systems.**
- **Allow electrical inspection and maintenance to be performed only by a qualified electrician.**

1.1.4 Revisions

This manual may be revised without notice. The most recent electronic version is available online.

1.1.5 Precautions and Disclaimers

- Carefully study and follow all procedures in this manual. Safe operation of the machine minimizes production delays and costly damage to equipment.
- Safety guidelines are intended to prevent accidents and are provided in the interest of all mine personnel. Overall safety depends on the use of good judgment and the alertness of the entire mining crew.
- It is the owner/mine's responsibility to perform the necessary risk assessment to outline proper safety precautions. A minimum of unplanned machine downtime and more reliable machine operation should result when a systematic and thorough maintenance/service procedure is adhered to for this machine.
- It is the policy of Bucyrus International, Inc. to improve its products whenever possible and practical to do so. The company reserves the right to make changes or add improvements to its machines at any time. This will be without incurred obligations to install such changes on machines sold previously. Due to this ongoing program of product research and development some procedures, specifications and parts may be altered in a constant effort to improve our machines.

1.1.6 Contact

For more information or factory service assistance, contact your regional service representative or:

Caterpillar Global Mining LLC

6744 S. Howell Ave.
Oak Creek, WI, USA 53154

Tel. (+1) 414.768.4000

1.3.4 Roller Circle

The roller circle is composed of the upper rails, lower rails, thrust rails, 50 tapered rollers and inner/outer roller cages. The lower rail segments are secured to the top surface of the swing rack forming a continuous rolling path for the rollers. The upper rails are attached to the bottom of the revolving frame, fore and aft of the center pintle. Upper rail ends are tapered to provide a smooth approach for the rollers. Rollers are tapered to ensure non-skid contact with rails. The rollers are spaced and aligned with pins and low maintenance polyurethane bushings.

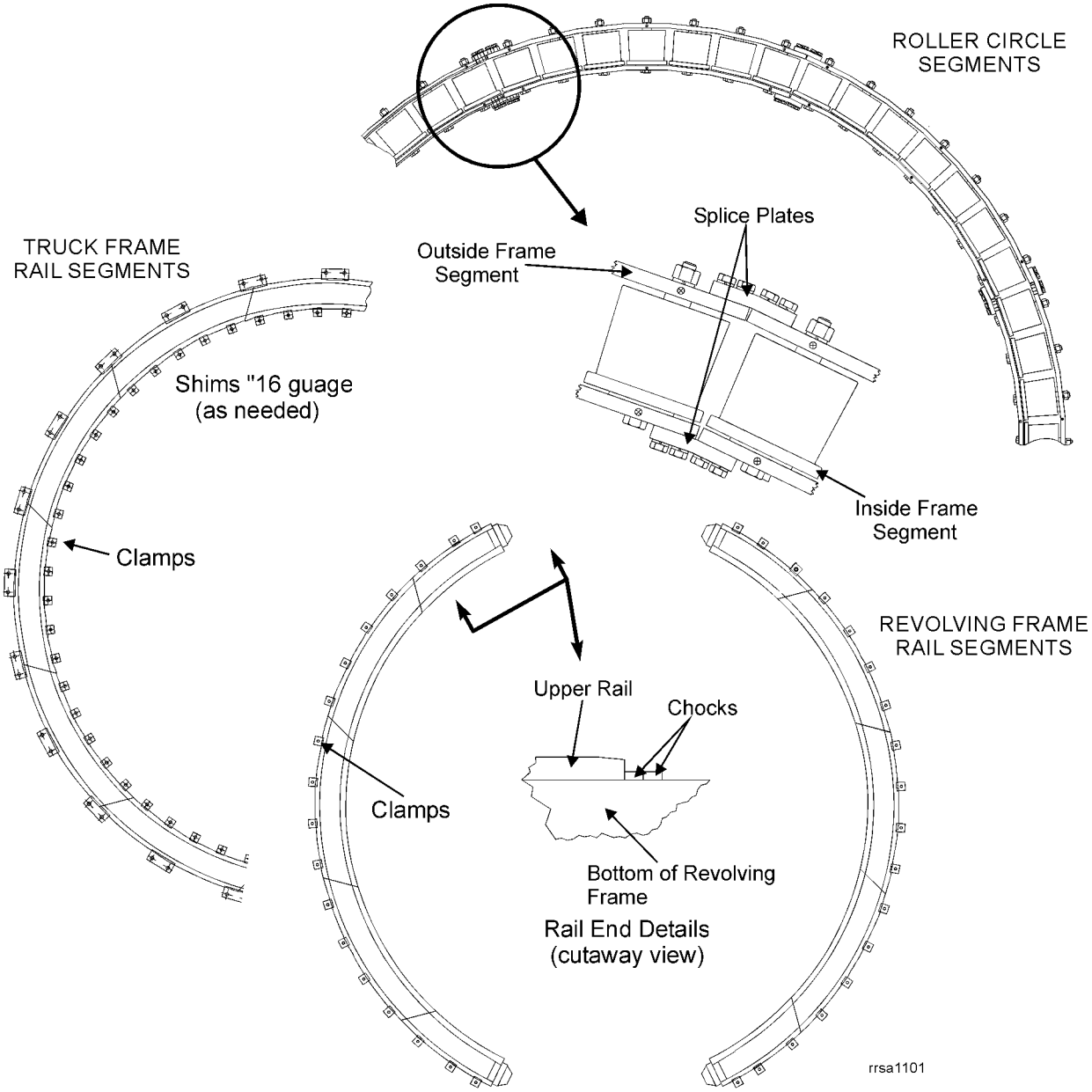

Figure 1-5 Roller Circle Assembly

1.4.7 A-Frame

An A-frame with seamless tubular alloy steel front legs provides ample space for the retracted dipper handle end. The rear legs are cold weather steel fabricated beams. Both front and rear legs are pin connected to lugs integral with the revolving frame. The A-frame supports the boom via structural strands.

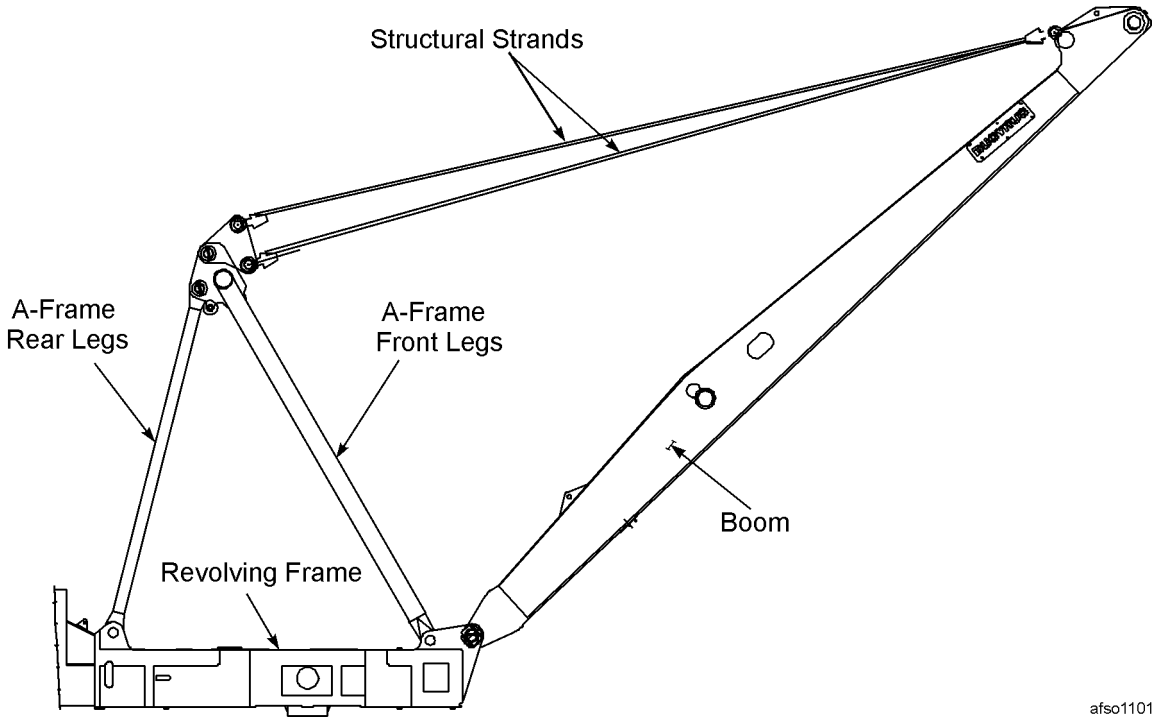

Figure 1-7 A-Frame and Front End Support Components

1.5.2 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.

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. A boom limit switch with soft setdown prevents boom jacking shock loads.

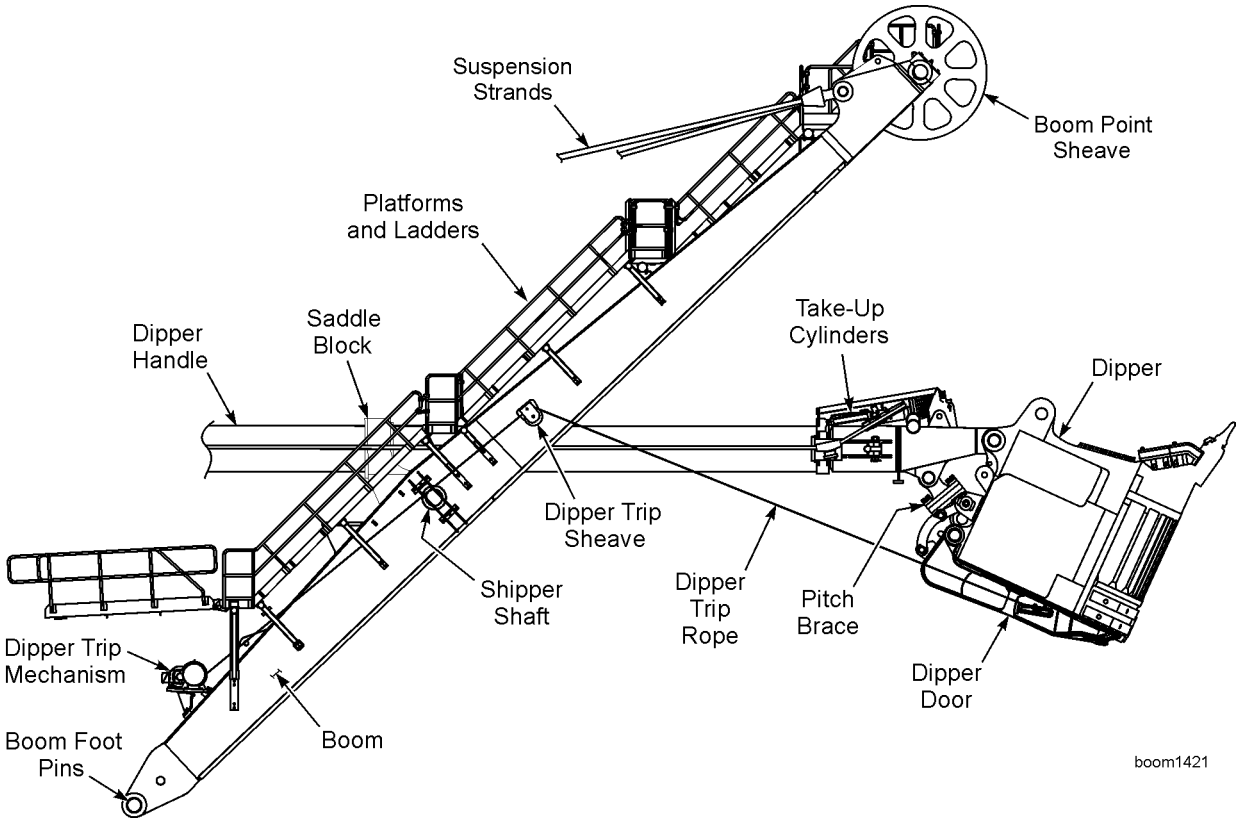

Figure 1-13 Boom Assembly

2.2.1 Primary Operating Controls

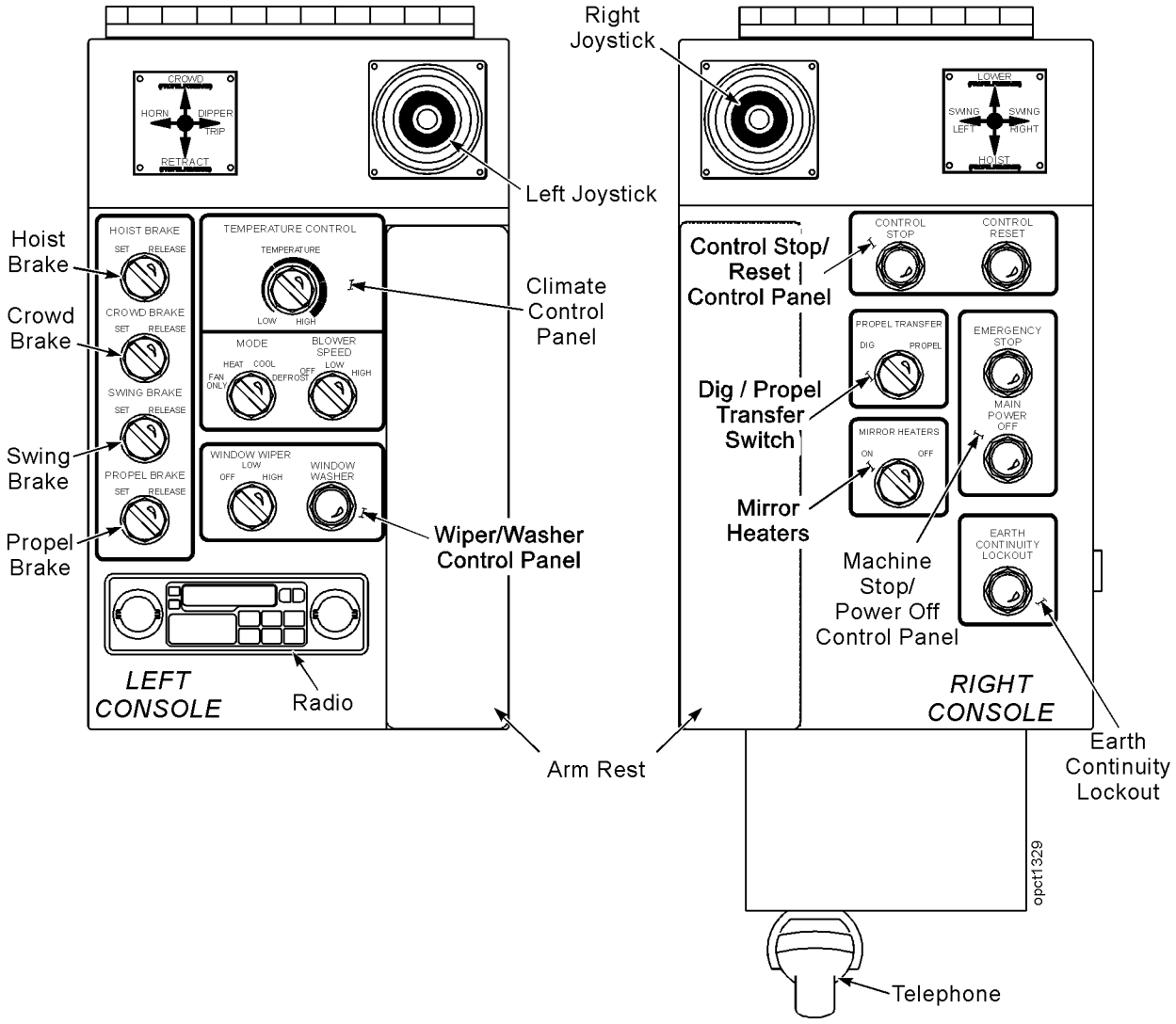

Figure 2-2 Operator's Control Consoles in Cab

2.4 Operator's Display

A PC based Operator's Display is used to provide the operator with an interface to the machine and it's functional areas. From this informational display the operator can make inputs that effect machine operation, monitor systems, and make system adjustments. Through this display terminal the operator will receive pertinent fault data to identify potential problems and prevent machine damage.

The display panel is mounted on an articulated arm assembly protruding from the seat base on the left side of the operator. The articulated arm allows individual operators to locate the screen in any desired position. The monitor screen can be rotated along the horizontal and vertical axis.

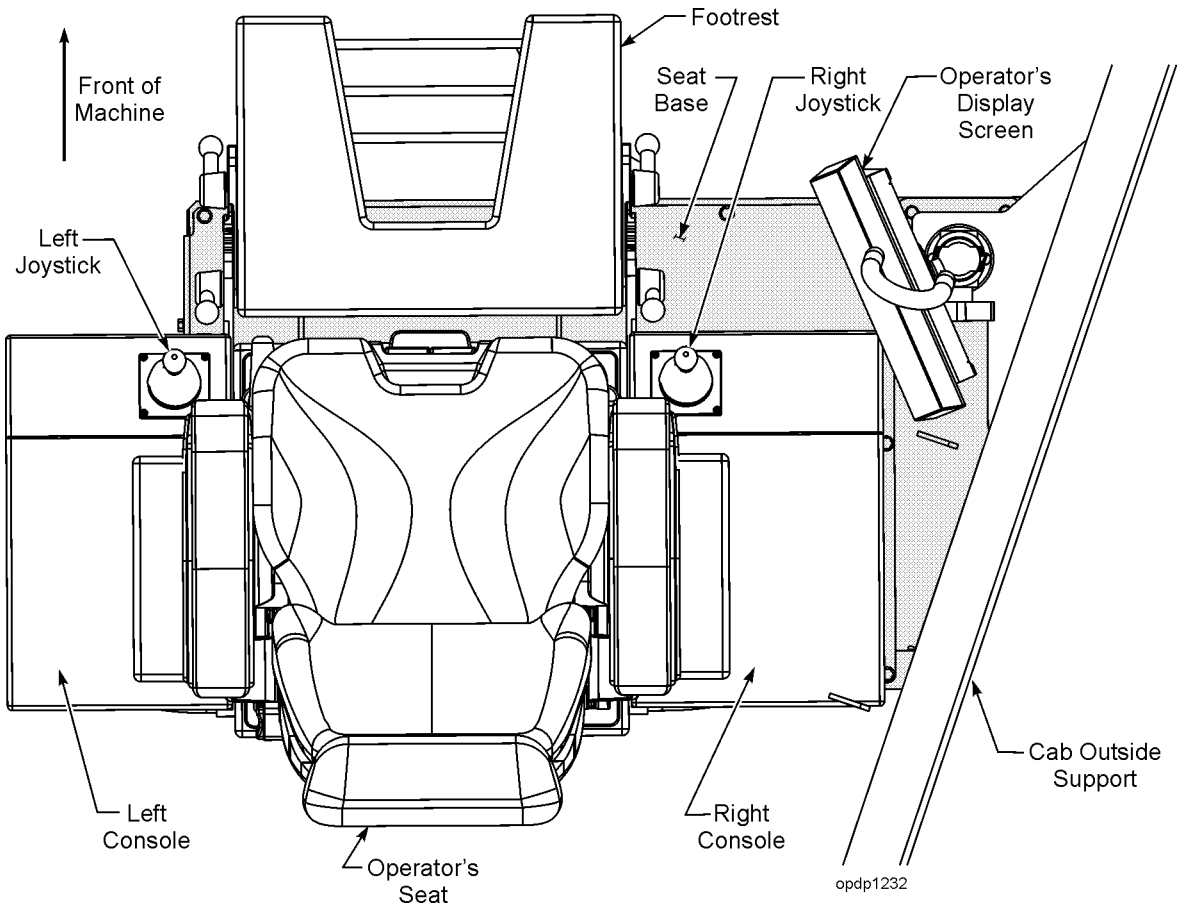

Figure 2-6 Operator's Display Panel

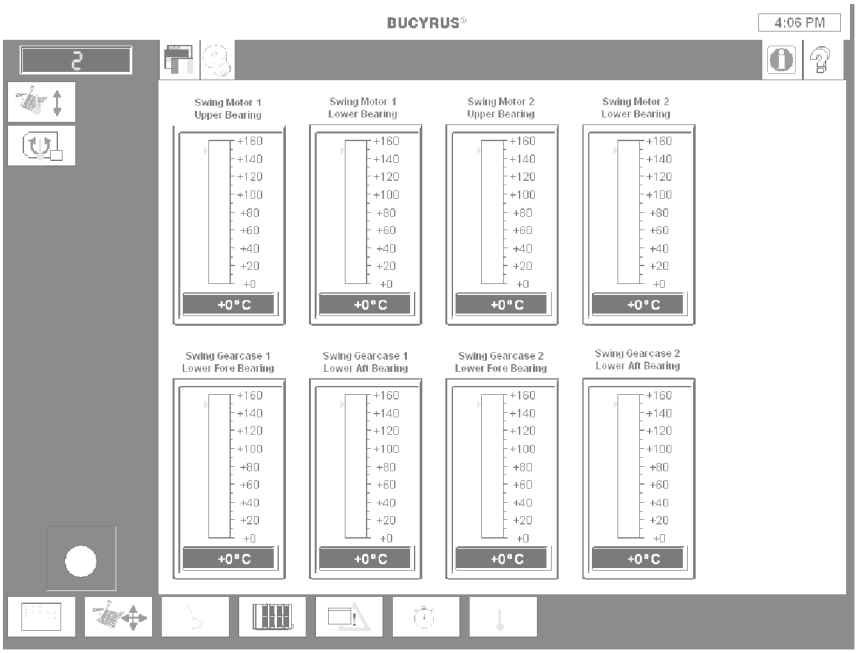

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Figure 2-19 Typical Bearing Temperature Screen

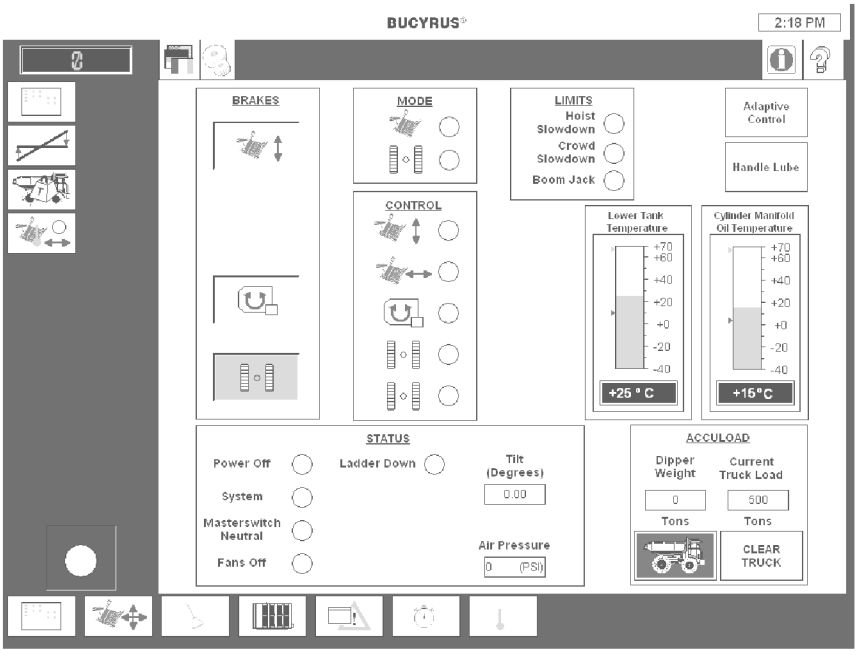

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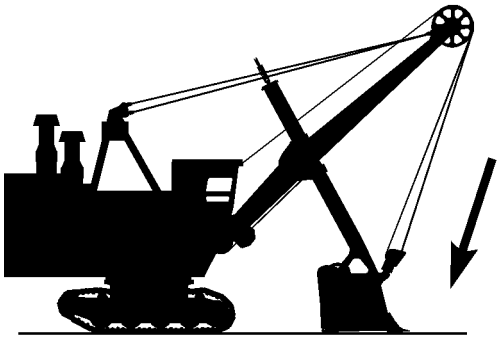
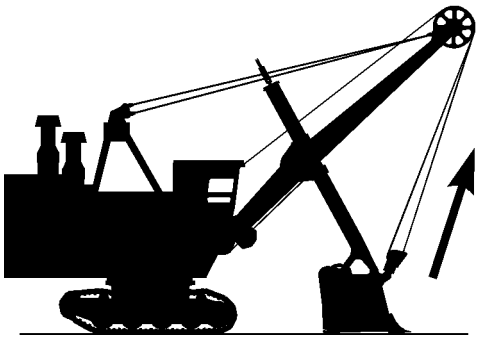
Figure 2-20 Operator's Screen

Machine Specifications
General Estimated Component Weights

LOWER WORKS (Continued)

	Quantity	Weight Each (U.S. Pounds)
Roller, Upper	8	620
Shaft, Upper Roller	8	400
Washer, Thrust,Lower Roller	8	50
Collar, Lower Roller	8	210
Center Pintle Sleeve Assy	1	7,900
Center Pintle Lower Nut	1	1,450
Collar, Center Pintle, Upper	1	380
Washer, Thrust, Center Pintle	1	400





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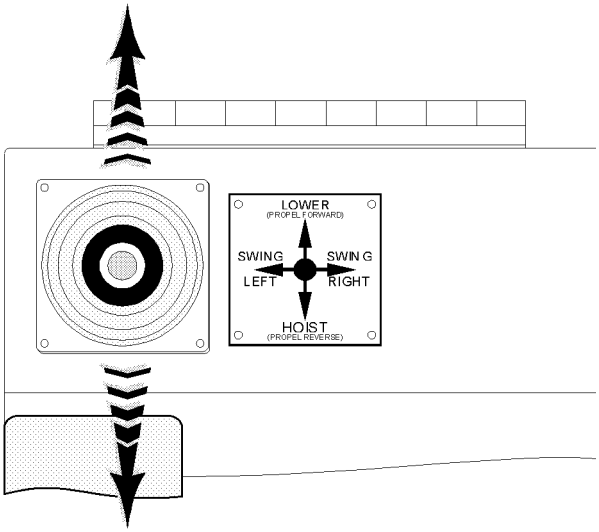
To ***LOWER*** the Dipper:
Push the *Right* Joystick Forward,
away from the Operator.



To ***HOIST*** the Dipper:
Pull the *Right* Joystick Back,
toward the Operator.

4.2.4.2 Crowd Motion

Crowd motion is controlled by the operator's left joystick. Move the joystick to crowd and retract the dipper handle until a "feel" is developed for the limits and speed of the motion.

⚠ CAUTION

This joystick also controls the signal horn and dipper trip.

NOTE: The following represents the standard configuration.

4.2.4.7 Start Of The Dig Cycle

The crowd motion forces the dipper lip into the bank at the start of the digging cycle. It is the crowd thrust which enables the dipper lip and front opening to get into a column of material of sufficient cross section to fill the dipper rapidly.

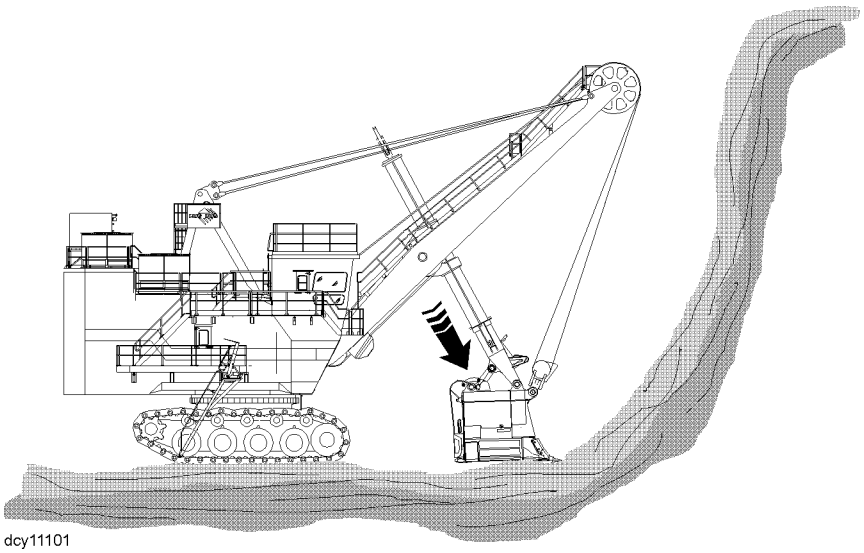


Figure 4-2 Force the Dipper Lip into the Bank

There is a direct relationship between crowd depth of bank penetration and the distance the dipper must rise in the bank to fill the dipper. The deeper the “bite” the quicker the dipper will be filled, providing the hoist force is sufficient to cut the column of material. Do not attempt to lift the entire bank with each pass. As soon as the dipper is full, retract it from the bank and swing the machine to fill the truck.

Crowd penetration should be rapid just at the arc of entry and rise as the dipper enters the bank. This will permit as much digging as possible near the base of the bank. This is of particular advantage when digging loose or blasted material. The greater the hoist force and crowd thrust, the faster the dipper filling time of the dig cycle. The crowd thrust should be maintained to hold the dipper in the bank while it is being hoisted. An added benefit of proper crowd thrust and hoist force is that the opposing vertical resistance of the bank material tends to have a “ramming” effect in the dipper front opening, minimizing voids and producing larger dipper loads.