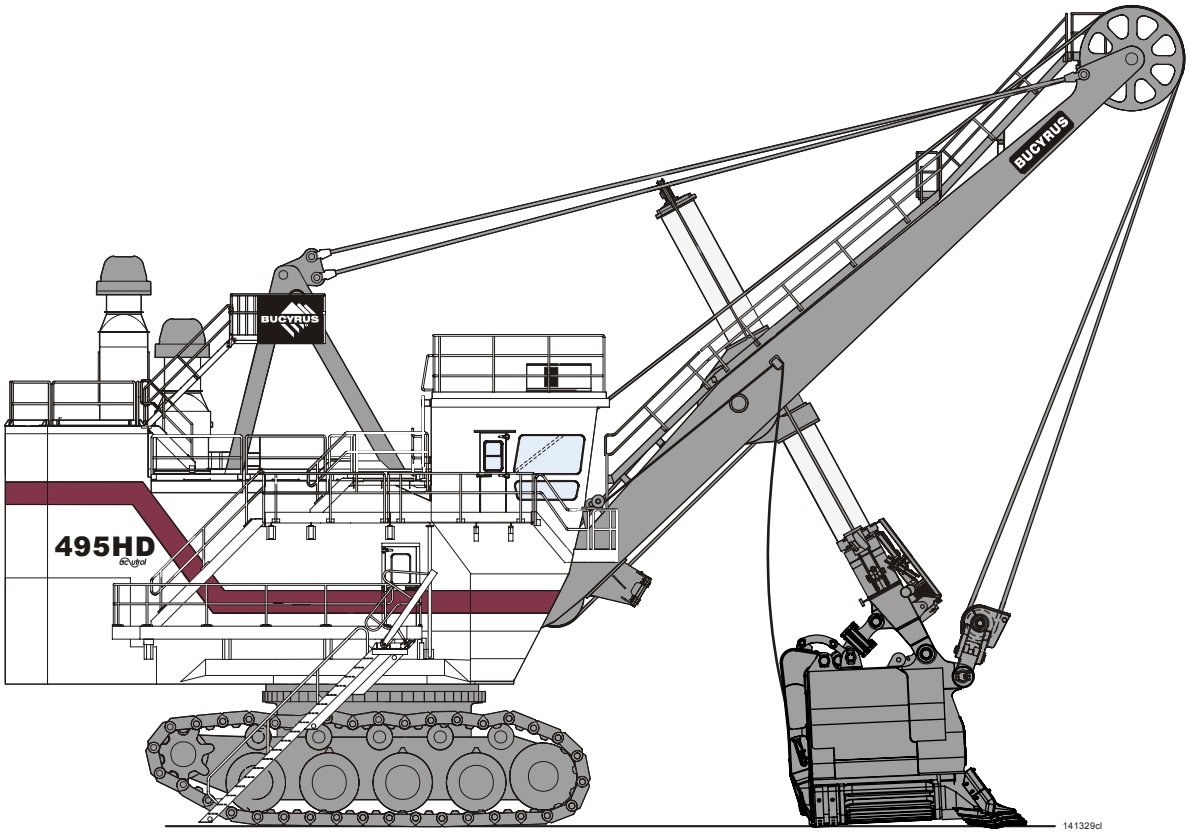
# 495HD
# MINING SHOVEL
# OPERATOR'S MANUAL

***SN: 141329***
***SN: 141358***
***SN: 141359***

**Manual No. *10841***

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**Bucyrus International, Inc.**

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# 495HD Electric Mining Shovel
# Operator's Manual

## Manual No. 10841

*SN: 141329 Lot 126*

*SN: 141358 Lot 133*

*SN: 141359 Lot 134*

*Always refer to the safety section in this manual before starting any maintenance procedure on this machine.*

## SAFETY



## SECTION 1 - INTRODUCTION

## MACHINE OVERVIEW

This mining shovel is designed and constructed to provide efficient service under the most severe conditions. The machine is built to the highest possible standards and will provide trouble free operation if properly maintained. This section of the manual introduces the machine and its functional capabilities and limitations.

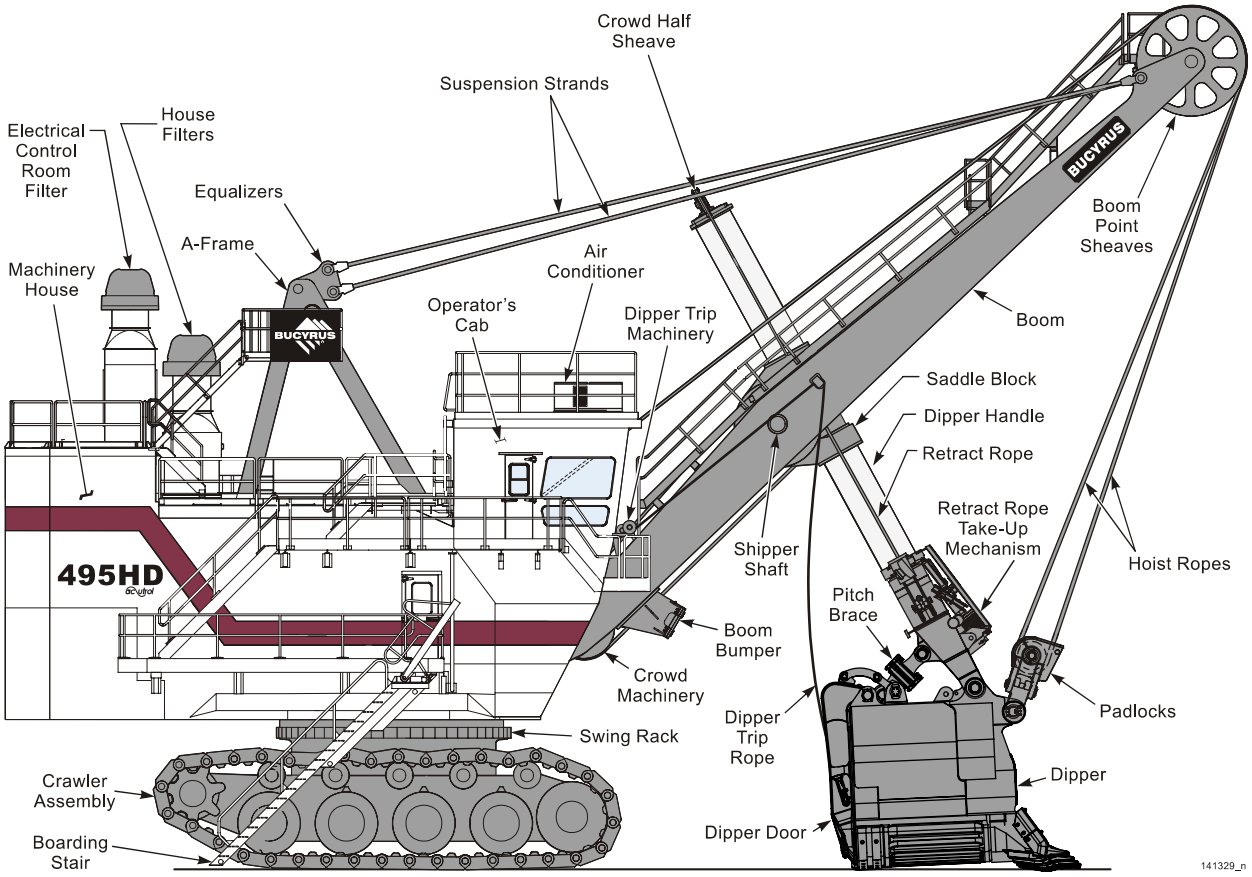
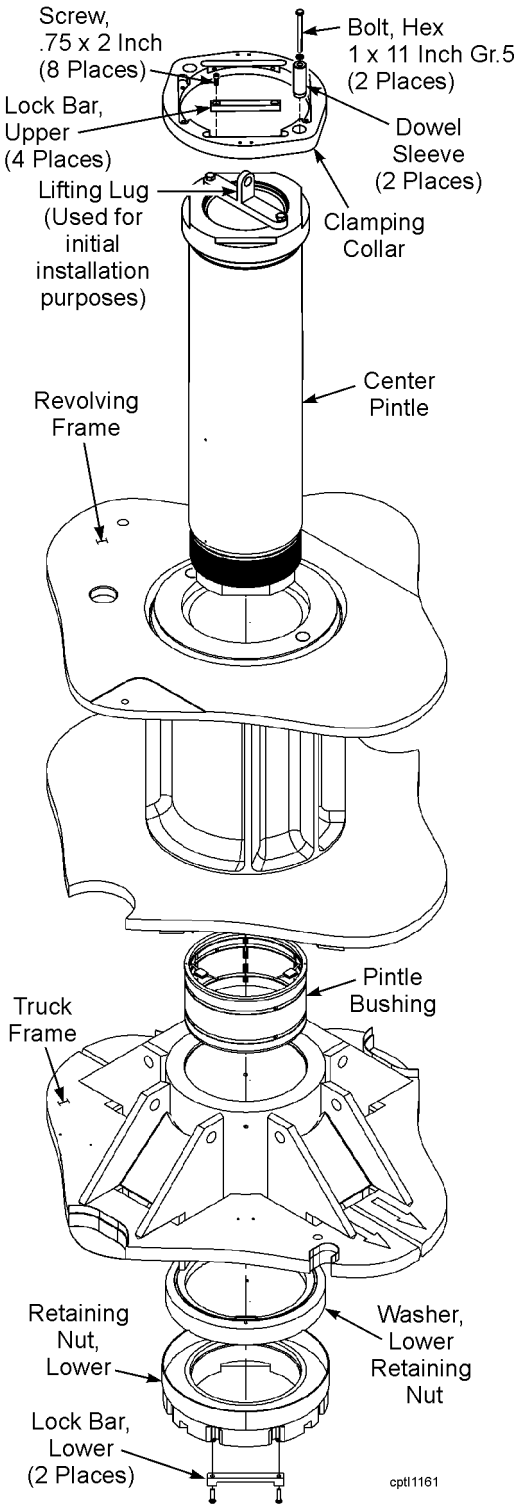
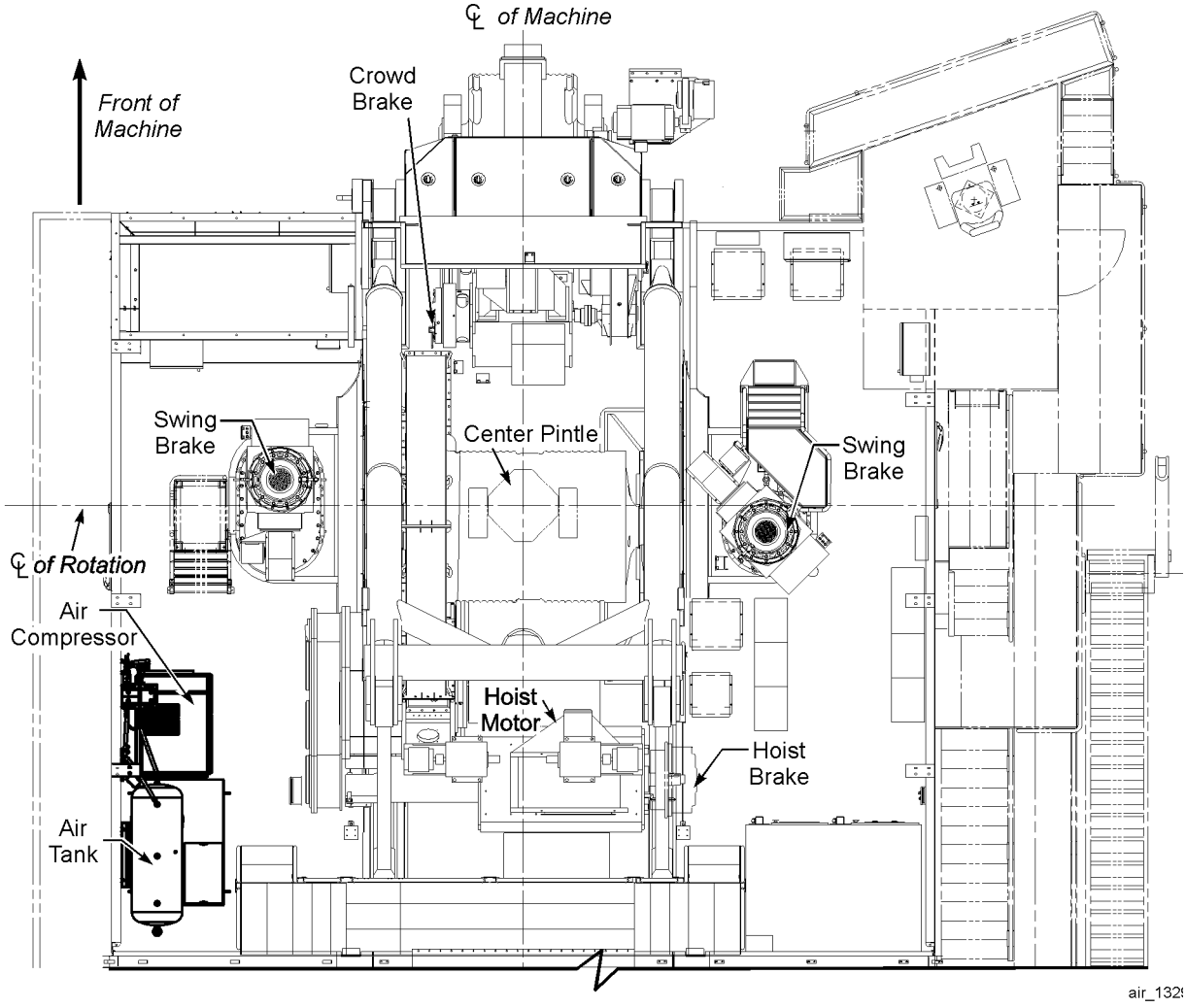



*Figure 1-1: Nomenclature*


Screw, .75 x 2 Inch (8 Places)
Bolt, Hex 1 x 11 Inch Gr.5 (2 Places)
Lock Bar, Upper (4 Places)
Dowel Sleeve (2 Places)
Lifting Lug (Used for initial installation purposes)
Clamping Collar
Center Pintle
Revolving Frame
Pintle Bushing
Truck Frame
Retaining Nut, Lower
Washer, Lower Retaining Nut
Lock Bar, Lower (2 Places)
cptl1161

## COMPRESSED AIR SYSTEM

The compressed air system consists of a rotary screw type air compressor, air receiver, air brakes, controls and center pintle air swivel. Hydraulic high pressure hose is used throughout. The air system is used to operate all machinery motion brakes and lubrication components and to perform various other functions.



# Section 2
# Operation

## GENERAL INFORMATION

This section of the manual will assist in the operation of this machine. It provides the operator with the location and explanation of the controls, instructions for machine operation and certain maneuvering techniques. Throughout this section and the remainder of the manual, the use of the terms "*LEFT*, *RIGHT*, *FRONT* and *REAR*" refer to machine locations as viewed by the operator sitting in the operator's seat in the cab.

Safe operation of the machine minimizes production delays and costly damage to equipment. Carefully study and follow all recommended procedures in this manual. Safety guidelines are intended to prevent accidents from occurring and are provided in the interest of all mine personnel. Overall safety depends upon the use of good judgment and the alertness of the entire mining crew. Refer to Section 1 in this manual for specific safety precautions.

## OPERATION NEAR ELECTRICAL LINES

**DANGER: HIGH VOLTAGE! The following precautions shall be complied with whenever operating around or near electrical distribution and transmission lines.**

Working in the vicinity of electrical power lines presents a very serious hazard and special precautions must be taken. For purposes of this manual we are considering the entire machine or its load, in any position, that can reach to within the minimum distance specified by local, state and federal regulations.

Safe operating practices require that you maintain the maximum possible distance from the lines and never violate the minimum clearances.

Before working in the vicinity of power lines, always take the following precautions:

- Always contact the owners of the power lines or the nearest electric utility before beginning work.
- You and the electrical utility representative must jointly determine what specific precautions must be taken to ensure safety.
- It is the responsibility of the user and the electric utility to see that necessary precautions are taken.
- Consider all lines to be power lines and treat all power lines as energized even though it is known that the power is shut off and the line is visibly grounded.
- Slow down the operating cycle. Reaction time may be too slow and distances may be misjudged.
- Caution all ground personnel to stand clear of the machine at all times.

harshest braking of all motions. If the machine is in motion, power will remain on the motions in order to provide electrical braking for a few seconds. If the machine is in motion or stopped, this button will power the DC bus to approximately zero voltage quickly after the time delay.

**CAUTION: PRESSING THIS BUTTON WHEN ANY DRIVE IS IN MOTION MAY RESULT IN COMPONENT DAMAGE.**

### MAIN POWER OFF PUSHBUTTON

The main power off pushbutton is located on the right operator's console. It is used only to immediately remove power from the drives in case of an electrical emergency involving component failure or fire.

**CAUTION: PUSHING THE "POWER OFF" PUSHBUTTON WHILE IN MOTION WILL IMMEDIATELY SET THE MECHANICAL BRAKES AND REMOVE INCOMING HIGH VOLTAGE FROM THE DRIVES. THIS ACTION MAY RESULT IN COMPONENT DAMAGE. It will also result in the inability to power the DC bus voltage down to a low value. This voltage will decay slowly, taking several minutes.**

### EARTH CONTINUITY LOCKOUT PUSHBUTTON

The earth continuity lockout pushbutton is used to trip the breaker that supplies power to the machine. When the machine is operating, this pushbutton should be used to shutdown the machine only when removal of power to the machine is required.

### TELEPHONE

A telephone is located at the rear of the right control console. This telephone is connected to other phone stations throughout the machine.

### HEATED MIRRORS

The heated mirror switch is a 2-position switch located on the right control console. It is used to activate the heating mechanism in the operator's cab outside mirrors.

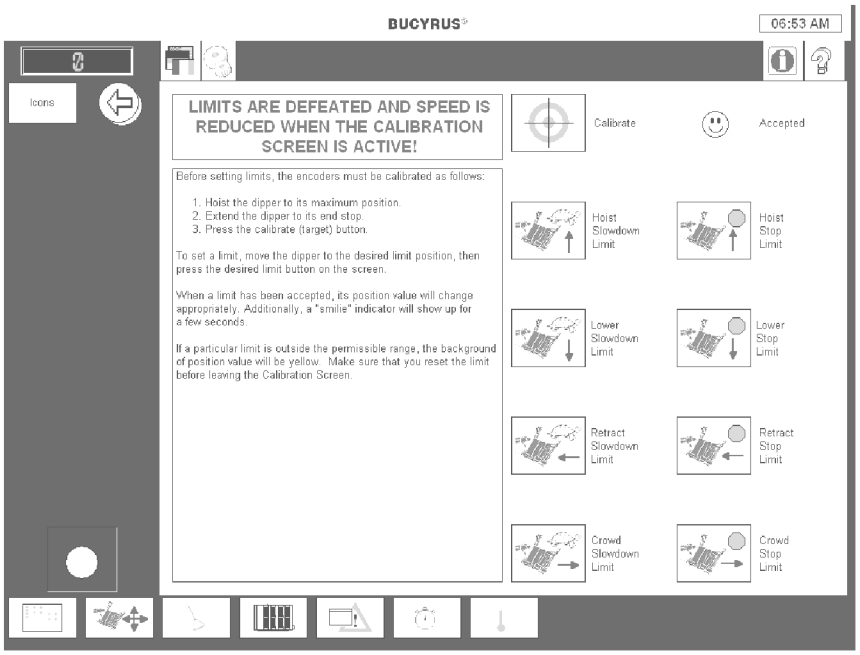



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*Figure 2-16: Limit Calibration Help*

This screen will provide clarifying information on the calibration process.

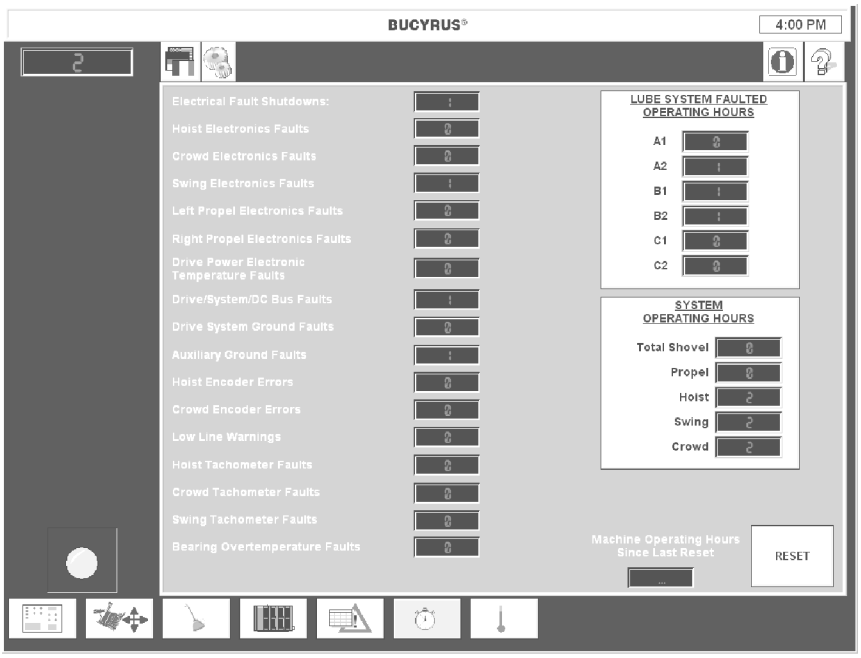


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*Figure 2-17: Fault Counters/Operating Hours*

The Fault Counter/Operating Hours screen provides the operator with information on the number of faults that have occurred since last RESET. It also provides the total operating hours.

## GENERAL ESTIMATED COMPONENT WEIGHTS

**CAUTION: These are estimated weights only. Contact your Bucyrus International service representative for the exact weight of components on your specific machine before rigging and lifting.**

## LOWER WORKS

| | *Quantity* | *Weight Each (U.S. Pounds)* |
|---|---|---|
| Truck Frame | 1 | 127,300 |
| Pintle Bushing | 1 | 300 |
| Lower Rail | 12 | 220 |
| Propel Brake Adapter | 2 | 400 |
| Propel Brake, Tach Drive | 2 | 1,230 |
| Propel Brake Hub | 2 | 60 |
| Propel Motor | 2 | 4,500 |
| Propel Motor Blower | 2 | 300 |
| Propel Brake Guard, Welded | 2 | 60 |
| Collector Ring Assembly, Propel | 1 | 230 |
| Crawler Belt (108 IN) | 2 | 284,000 |
| Crawler Link (108 IN) | 74 | 3,650 |
| Tumbler, Drive | 2 | 14,900 |
| Shaft, Drive | 2 | 5,800 |
| Drive Tumbler | 2 | 6,900 |
| Gearcase, Planetary Propel | 2 | 18,100 |
| Crawler Frame, LH | 1 | 67,700 |
| Crawler Frame, RH | 1 | 67,700 |
| Drive Tumbler Bearing | 2 | 1,400 |
| Take-up Tumbler | 2 | 6,400 |
| Take-up Shaft | 1 | 22,650 |
| Take-up Tumbler Hub Cap | 2 | 200 |
| Lower Roller Hub Cap | 8 | 300 |
| Lower Roller Shaft | 8 | 4,200 |
| Roller, Upper Front | 2 | 740 |
| Shaft, Upper Front | 2 | 460 |
| Lower Roller Bushing | 8 | 240 |
| Take-up Axle Shim | 6 | 30 |
| Seal, Duo Cone | 2 | 40 |
| Collar, Take-Up Axle | 2 | 140 |
| 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 |

## RESTARTING AFTER AN ELECTRICAL FAULT

To restart the machine after the electrical control system has gone into a fault condition, proceed as follows:

*NOTE:* Before any or all motions can be reset, the following conditions must be met:

a. No operator's monitor special screens are activated.

b. For hoist/propel motion the hoist/propel transfer switch is in the position called for by the operator's mode selector switch.

c. The master switch for the motion being reset must be in the NEUTRAL position.

d. The motion mechanical brake selector switch must be in the SET position.

1. For hoist or crowd travel limit faults, the motion will first slow down and then will stop, but the controls will remain active. Reversing the master switch will remove the fault and allow continued operation.
2. For a boom jacking fault, ALL motions will stop but the controls will remain active. Reversing the crowd master switch will remove the fault and allow continued operation.
3. If the boarding ladder and/or stairs are pulled down while the machine is in operation, an alarm message will be sent to the operator, and swing and propel motions will be shut down. The hoist and crowd motions will remain active.
   a. Once the ladder and/or stairs are back in position, the motions may be restarted by pressing the control reset pushbutton.
4. For most other faults, the machine will be shut down and brakes set. In these situations, the controls cannot be reset until the fault has been corrected by an electrician.

## MACHINE OPERATION

Efficient operation is essentially the result of understanding and applying the basic techniques related to each machine motion, to achieve fast, smooth and safe load cycles. The interrelated coordination of the hoist, swing and crowd motions results in efficient machine operation.

Each motion is described in the following paragraphs. The operator should thoroughly learn each motion, its purpose and how this knowledge can be applied in becoming a better operator.

When learning to handle the controls, be sure that all personnel are clear of the machine. Be sure there is ample clearance with no danger spots around the machine, such as culverts, ditches, embankments, and that the machine is not too close to the digging face or overhanging ledge and large rocks.

Use the operator's display in the operator's cab to assist in the operation of the machine. The monitor allows a large number of messages to be sent to the operator from all portions of the control system. These messages fit into four basic categories:

- Normal routine operational messages
- Alarm only
- Delayed shutdown messages
- Immediate faults and shutdowns

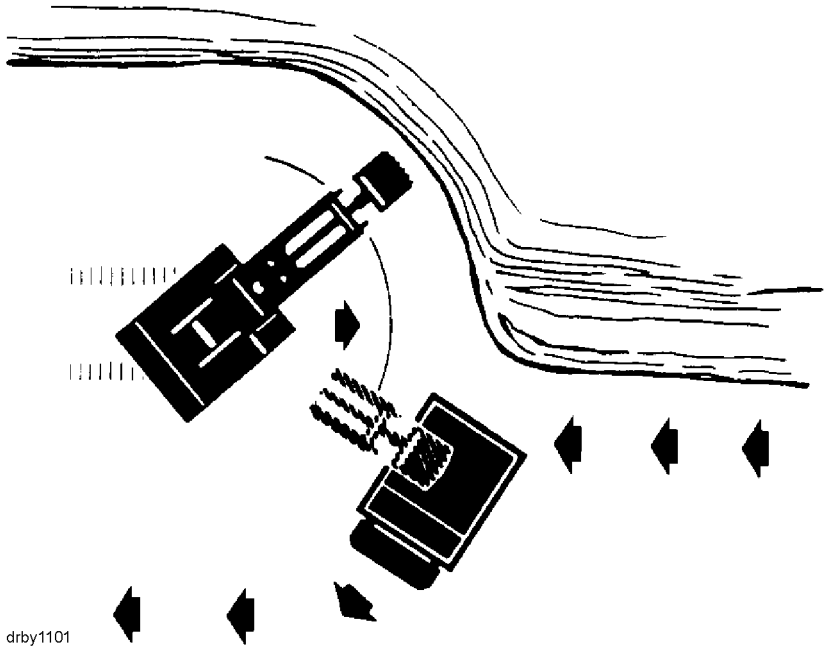
This display also allows the setting of certain operating parameters for the machine. Refer to OPERATOR'S DISPLAY in this section, as the proper use of the monitor messages is essential for the operation of the machine.

Lock the left track, propel forward turning the crawler in increments. When the right crawler is in line with the corner of the semicircle, move forward and proceed to load the haulage units.

The back-up method will minimize the swing arc and reduce moving time. Other advantages are less bank toe area clean up and simplified handling of the trail cable, cable standard and trail cable boat.

**DRIVE-BY METHOD**

*NOTE:* If the machine and haulage units cannot be set up as described below, the drive-by method should be avoided.




Position the machine crawlers parallel to the bank with the inside edge of the outer set of crawler tracks directly in line with the bank toe.

The trucks must approach the machine from the front making a turn away from the machine as the front wheel approaches the outside crawler. The truck should stop in a position to allow backing toward the point of the bank for loading.

During the load cycle, the swing arc should not exceed 90°. The time between finishing one truck to the first digging cycle of the next should not exceed that of any cycle during a load.