

CLARKES ERO FEEDER MANUAL

It is the sole responsibility of the Owner and/or the Responsible Supervising Operators of this equipment to properly instruct their employees, either direct or contact, in the safe and proper operation of this equipment.

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INTRODUCTION

This manual contains instructions for the installation, operation and maintenance of Clarke's equipment. Reliable operation, safety and long service life of this equipment depends on three important considerations.

1. The care exercised during installation.
2. The quality, frequency of maintenance and periodic inspection.
3. A common sense approach to its operation.

This system and its components have been designed for a specific duty. The material to be conveyed, the rate of transport, dimensions, drive assembly and operating conditions are the facts under which this system has been prepared. Within limits this system is designed with an adequate safety factor, but its use is intended for a specific design and should not be used otherwise; or if so used, at the owner's own responsibility.

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SAFETY INFORMATION

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There is always a safety hazard around operating machinery, especially for untrained personal. Management and their delegated safety supervisors should train their operating and maintenance personnel to observe the safety precautions as set forth in this Manual.

Listing all safety hazards is impossible, but the primary precautions for safe operation are set forth in the Manual.

CLARKE'S SHEET METAL, INC. CANNOT BE HELD RESPONSIBLE FOR ANY ACCIDENT.

The precautions listed may not necessarily be all-inclusive and others might occur to the user which are peculiar to a particular operation or industry. In addition, nearly all employees are now subject to the Federal Occupational Safety and Health Act of 1970, as amended, which will continue to be issued under its authority.

At all times this equipment must be operated in accordance with the instructions and precautions in this manual and on the caution plates attached to the equipment. Only persons completely familiar with the instructions and precautions in the manual should be permitted to operate the unit. The operator should thoroughly understand these instructions and precautions before attempting to operate this equipment.

NOTICE: FAILURE TO OBSERVE AND FOLLOW THESE PRECAUTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE

CAUTION

1. **ALWAYS** operate unit accordance with instructions in this manual.
2. **DO NOT** open inspection doors while unit is in motion.
3. **NEVER** work on unit and related components unless electrical power and motor drive has been locked out and tagged.

NOTE: *The National Electrical Code requires a manually operable disconnect switch located within sight of motor, or a controller disconnecting means capable of being locked if not in sight of the motor.*

4. **DO NOT** put unit to any other use than for which it was designed.
5. **AVOID** poking or prodding into unit openings with a bar or stick.
6. **ALWAYS** have a clear view of unit loading and unloading points and all safety devices.
7. **KEEP** area around the unit, drive and control station free of debris and obstacles.
8. **NEVER** operate unit without guards and all safety devices in position and functioning.
9. **ALWAYS** allow unit to stop naturally. **DO NOT** attempt to artificially break or slow motion of unit.
10. **CAUTION** signs should be attached near all openings and service panels.

GENERAL

Operating machinery always presents a hazard to the safety of personnel who must operate or move among the machines. This is especially true for personnel who are untrained, inexperienced or just passing through the area. Therefore it is the responsibility of management and the safety supervisor to train or instruct all personnel who will come into contact with these units in the proper safety procedures.

Operating and maintenance personnel should be thoroughly trained in the Safety Procedures governing their areas of responsibility.

All personnel should be trained to **THINK SAFETY** and **PRACTICE SAFETY**. The following Safety Precautions should be observed during the operation or maintenance of these units.

INSTALLATION

1. Anchor the machine to a suitable and level foundation.
2. Equip infeed system to assure proper flow of material.

OPERATION

1. **DO NOT** allow personnel to climb or walk on the unit or its drive, inlet or discharge equipment.
2. **DO NOT** allow personnel to operate product-actuated safety switches by hand or manual means.
3. **DO NOT** allow personnel to stand or pass between components that close together.
4. Keep hand, heads, feet, etc., and tools clear of product inlet and outlet chutes and drive components of operational units. Never unlock or open the cover on a unit that is operational.
5. Ensure that all personnel and tools are clear of working areas of the unit before placing in operation.
6. **DO NOT** operate machines with safety guards removed.

MAINTENANCE

1. Keep hand and tools away from rotor until the electrical drive motor has been locked out and the rotor has been blocked to prevent rotation.
2. Assure that material feed equipment is shut down to prevent operation and accidental delivery of material.
3. Before working on any component of the unit, assure that it has been adequately blocked or supported.
4. Before restarting the unit, clear all tools and equipment away and ensure all personnel are clear of the unit and drive. Replace drive guard.

SAFETY HAZARDS

1. Mark or code all machine or floor areas with the appropriate methods that are a hazard to personnel.
2. Place appropriate warning signs or lights where necessary to indicate a hazard to personnel moving through the area.
3. Place appropriate guards or barriers, etc., to prevent personnel from coming into contact with hazardous components of a machine or its area of operation.

3.0 SAFETY INSPECTION

ER Feeder

Any rotary airlock/feeder is part of a system or used in conjunction with other equipment such as dust collectors, screw conveyors, etc. In connecting ducting or other equipment to the airlock/feeder, care should be taken to insure that it is not possible to be able to reach in where the rotor is turning.

SAFETY NOTE

DANGER! DO NOT OPEN OR ATTEMPT ANY FORM OF INSPECTION UNTIL ALL OF THE FOLLOWING ARE DONE:

1. UNIT HAS STOPPED ALL MOTION (*Do not assist unit slow down by any means mechanical or otherwise*).
2. ELECTRICAL DISCONNECT HAS BEEN PLACED IN OPEN POSITION AND LOCKED WITH A KEY LOCK.

DANGER ! Never run the airlock/feeder in a manner where the rotor is exposed.

START UP, OPERATING AND SHUTDOWN INSTRUCTIONS

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1.0 'ER' FEEDER START-UP CHECK LIST AND STARTUP

CAUTION: *WHENEVER WORKING ON AIRLOCK/FEEDER, ENSURE THAT THE ELECTRICAL CIRCUIT BREAKER IS LOCKED-OUT. NEVER WELD ON AIRLOCK/FEEDER HOUSING OR ATTACHED ELECTRICAL CONDUIT BRACKETS.*

1. Check the airlock/feeder and all associated equipment for foreign material and clean if required.
2. Check the level and alignment of the airlock/feeder unit.
3. Measure and record the airlock/feeder rotor clearances and record the feeder nomenclature:

Rotor to Housing:

Knife Side Top: _____
 Opposite Top Knife: _____
 Knife Side Bottom: _____
 Opposite Bottom Knife: _____

Brass to Rotor

Drive End: _____
 Opposite End: _____

Top Knife to Rotor: _____

4. Check bearings, etc., for proper lubrication. See manufacturer's manual for correct level and grade of oil.
5. Check the rotation of the airlock/feeder by 'jogging' the motor. Airlock/Feeder should rotate toward top knife.
6. Run the airlock/feeder (*while checking motor load*) to be certain it does not bind.
7. Check that the material flow is evenly distributed into the airlock/feeder opposite the knife.
8. If used on high pressure system: Inspect the check valve on inlet end of tee injector for proper functioning.
9. If used on high pressure system: Check that all piping has been installed properly.
10. Examine and check the operation of the discharge receiving equipment (*cyclone, valve, airlock, filter, etc.*).
11. If used on high pressure system: Check that the pressure gauge and switches are installed and operating correctly.
12. If used on high pressure system: Record the free running pressure with and without feeder operating.

13. Start the airlock/feeder and operate without material for approximately 15 minutes. Check for rubbing or misalignment and inspect the reducer for overheating, etc.
14. If used on high pressure system: Raise the blower pressure by gradually closing the check valve by adjusting position of the set screw. Record the blower motor load and corresponding line pressure at several points until the blower pressure switch stops the blower. Re-adjust check valve to normal position.
15. If used on high pressure system: Re-start the system and feed material into the feeder gradually (*if possible*) until the designed material load has been reached. Observe operating pressure and reset feeder Mercoid if required.
16. Check all components frequently through the first day of operation to ensure they are operating satisfactorily.

NOTE: *It is important that this list be followed and the points mentioned above be carefully checked. This will result in proper operation for many years.*

2.0 'ER' FEEDER SHUTDOWN PROCEDURE

1. Prior to shutting down the Feeder, all material infeed equipment leading to the Feeder must be sequentially shut down. All material should be purged out of the Feeder infeed equipment and the Feeder.
2. If the material is being fed into the Feeder using a Metering Bin, the Metering Bin should be shut down prior to stopping the Feeder. All material should be purged out of the chutes between the Bin outfeed and the Feeder infeed.
3. Once material flow through the Feeder has stopped, the Feeder controller can be put in the OFF position (Shutdown).

MAINTENANCE INSTRUCTIONS

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6.0 Lubrication Information <i>(Refer to attached Manufacturer's recommendations)</i>	

Service your Clarke's 'ER' Feeder per check list, giving special attention to:

1. Sharpness of shear knife.
2. Clearances between rotor and housing.
3. General state of wear.
4. Housing distortion.
5. Condition of drive equipment.
6. Maintain and lubricate components per mfg's recommendations attached.

2.0 TROUBLESHOOTING CHECK LIST

No matter how well equipment is designed and manufactured, there may be times when servicing will be required due to normal wear or various external causes. Whenever equipment needs attention, the operator or maintenance personnel should be able to locate and correct the trouble quickly. The following chart (Page 11) will assist the mechanic in those respects:

3.0 MAINTENANCE CHART*ER Feeder*

PROBLEM	POSSIBLE CAUSE	SOLUTION
'ER' Feeder "squealing" (Most likely accompanied by over heating of motor)	Housing or the frame distortion	Re-Level base and then check clearances
	Pitch build-Up on barrel or rotor tips	Add water, diesel or kerosene spray into material flow
	Insufficient knife clearance	Adjust clearance of knife
	Bent Rotor	Grind rotor edge until sufficient clearance is obtained. Severe distortion may require a complete rebuild of the feeder & rotor.
Material Leakage	Worn Shaft Seals	Replace Seals
Rotor drag or stoppage	Material build-Up in end of the bell (between end of the rotor and the housing)	Remove material with air hose and or bar. Enter through the tee injector door
	Pitch build-Up	See Above
	Material between rotor tip and the knife	Back-Up rotor and extract material. Enter through knife door

3.1 ER FEEDER MAINTENANCE CHECK LIST

ER Feeder

			INITIAL
1.	<u>Lubrication</u>		
	Bearings	(Per Manufacturer's Spec)	---- ----
	Seals	(Per Manufacturer's Spec)	---- ----
	Gearbox	(Per Manufacturer's Spec)	---- ----
	Motor	(Per Manufacturer's Spec)	---- ----
2.	<u>Shear Knife - Top & Bottom Knives</u>		
	Clearance <i>Adjustment</i>	Bi-Weekly	---- ----
	Grinding <i>Regular basis</i>	As Required	---- ----
3.	<u>Brass End Seal</u>		
	Clearance <i>(Adjustment)</i>	As Required	---- ----
4.	<u>V-Belt Drive</u>		---- ----
			---- ----

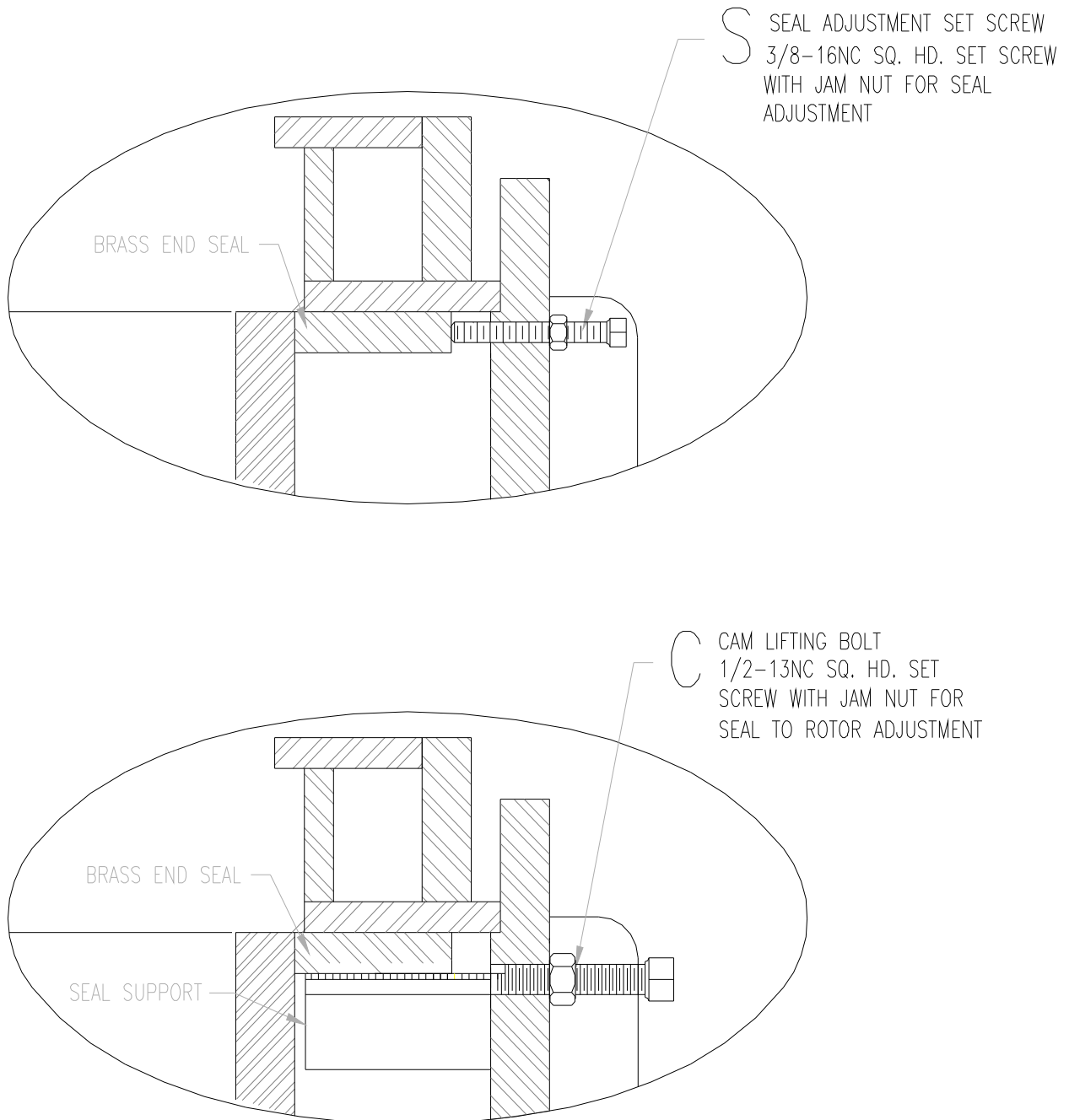
NOTE: Refer to Page 13 for clearance settings.

FEEDER SEAL ADJUSTMENT

ER FEEDER

BRASS END SEAL ADJUSTING INSTRUCTIONS

Turn the cam bolts (C) a partial turn to the left to release end seal from housing. Adjust the brass end seal by turning the set screws (S) in the proper direction. There should be .002" to .004" clearance between the brass end seal and the rotor. Excessive clearance will cause blowby. Insufficient clearance could cause a frictional load on the feeder. Turn the cam bolts (C) to the right, again locking the brass end seal in position. Repeat on opposite end of feeder.

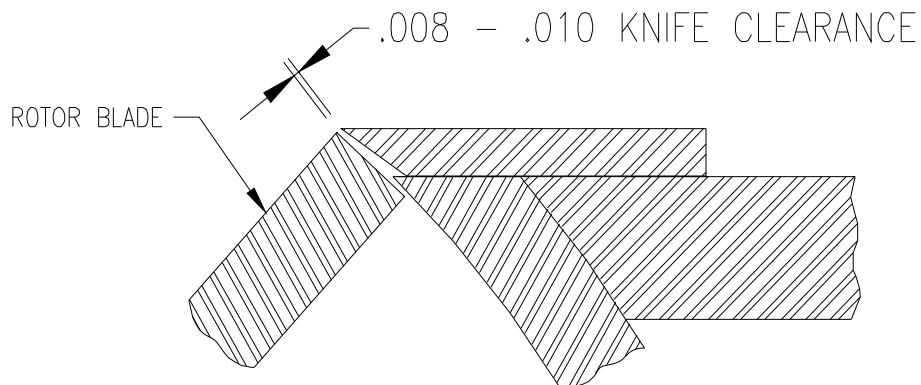
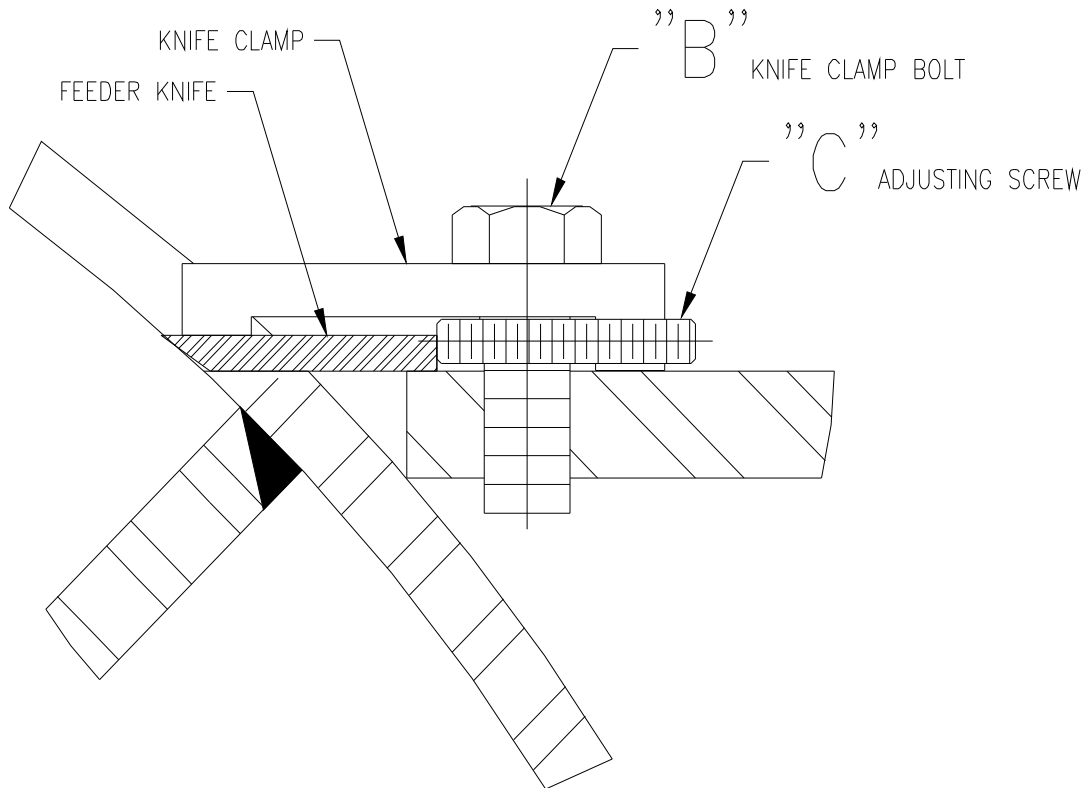


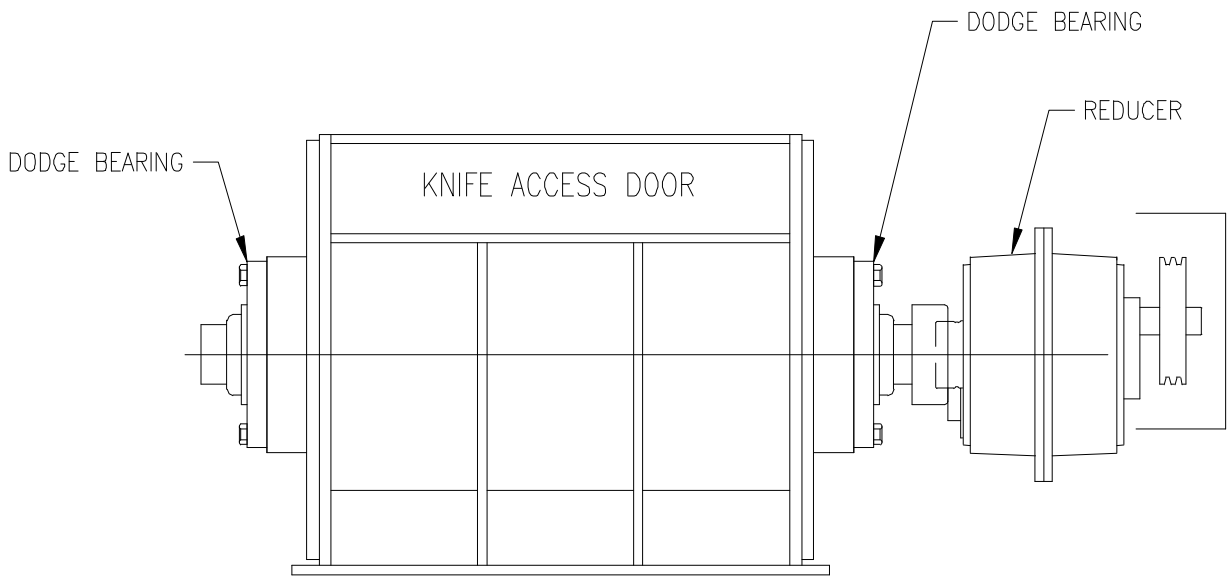
FEEDER KNIFE ADJUSTMENT

ER FEEDER

KNIFE ADJUSTING INSTRUCTIONS

Loosen (B) bolts, insert .008" shim or feeler gauge between rotor and knife, turn (C) in until feeler is snug. Remove feeler gauge, re-tighten bolts and re-check clearances. Readjust if needed to allow rotor to turn freely.





ER FEEDER

GENERAL SAFETY RULES

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NOTICE: FAILURE TO OBSERVE AND FOLLOW THESE PRECAUTIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.

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2. **NEVER** work on unit and related components unless electrical power and motor drive has been locked out and tagged.

NOTE: The National Electrical Code requires a manually operable disconnect switch located within sight of the motor, or a controller disconnecting means capable of being locked if not in the motor.

3. **DO NOT** put unit to any other use than for which it was designed.
4. **AVOID** poking or prodding into unit openings with a bar or stick.

GENERAL SAFETY RULES

5. **ALWAYS** have a clear view of unit loading and unloading points and all safety devices.
6. **KEEP** area around the unit, drive station free of debris and obstacles.
7. **NEVER** operate unit without all safety devices in position and functioning.
8. **ALWAYS** allow unit to stop naturally. **DO NOT** attempt to artificially break or slow motion of unit.
9. **CAUTION** signs should be attached near all service panels.

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All personnel should be trained to **THINK SAFETY** and **PRACTICE SAFETY**. The following Safety Precautions should be observed during the operation or maintenance of these units.

INSTALLATION

1. Anchor the machine to a suitable and level foundation.

OPERATION

1. **DO NOT** allow personnel to climb or walk on the unit or its drive.
2. **DO NOT** allow personnel to operate limit switches by hand or manual means.
3. **DO NOT** allow personnel to stand or pass between components that close together.
4. Keep hands, head, feet, etc., and tools clear of product inlet and outlet chutes and drive components of operational units.
5. Ensure that all personnel and tools are clear of working areas of the unit before placing in operation.

MAINTENANCE

1. Keep hands, tools away from moving parts until the electrical drive motors has been locked out.
2. Before working on any component of the unit, assure that it has been adequately blocked or supported.
3. Assure that material feed equipment is shut down to prevent operation and accidental delivery of material.
4. Before restarting the unit, clear all tools and equipment away and ensure all personnel are clear of the unit and drive.

GENERAL SAFETY RULES

SAFETY HAZARDS

1. Mark or code all machine or floor areas with the appropriate methods that are a hazard to personnel.
2. Place appropriate warning signs or lights where necessary to indicate a hazard to personnel moving through the area.
3. Place appropriate guards or barriers, etc., to prevent personnel from coming into contact with hazardous components of a machine or its area of operation.

IT IS EXTREMELY IMPORTANT THAT THE FOLLOWING PRECAUTIONS BE FOLLOWED TO PREVENT PERSONAL OR PROPERTY DAMAGE:

1. Only persons properly trained and familiar with the equipment should be permitted to operate or perform maintenance.
2. **LOCK OFF ALL POWER** prior to any inspection or any maintenance.
3. **PERIODICALLY** check for vibration, loose fasteners, noise, and bearing and drive temperatures.
4. **NEVER** walk on equipment or drive.
5. **DO NOT** place hands, head, feet, or clothing in openings, drive components
6. **ALWAYS** keep a clear view discharges and all safety devices.

Familiarize yourself with the control devices and the electrical start-up sequence of your system.