



SINCE 1869



Granulizer mounted to roll feeder. Inspection door with flip up guard open to view product stream

Installation, Operation and Configuration Guide

Positive Displacement Roll Feeder and Granulizer Conversion

Includes a Mill Parameters Worksheet for Proper Sizing to Your Mill

A.T. Ferrell Company Inc.

Manufactures of:

Ferrell-Ross

1440 South Adams Street

Bluffton, Indiana 46714

Phone (260) 824-3400----Fax (260) 824-5463

(800) 248-8318

www.atferrell.com/ferrell-ross

info@atferrell.com



Ferrell-Ross Roll Feeder & Granulizer Conversion

BE SAFE AVOID ACCIDENTS



Carefully read and understand this manual before operating the machine. Do not attempt to install, connect power to, operate or service any machine without proper instruction and until you have been thoroughly trained and approved by your employer.



Make certain all electric motors and control panels are properly grounded.



Danger - Keep hands, feet and clothing clear from rotating belts, pulleys, rolls and gears when machine is operating. Failure to do so will cause severe injury or death.



Danger - Never operate machine without protective covers, guards, or grates properly installed.



This equipment was manufactured in compliance with existing OSHA regulations. It is the responsibility of the owner/user to maintain OSHA compliance when operating the equipment.



Replace all guards and shields after servicing and before starting up the machine.



After servicing, make sure all tools, parts and service equipment are removed from the machine.



Do not start the machine until you are sure that everyone is clear.

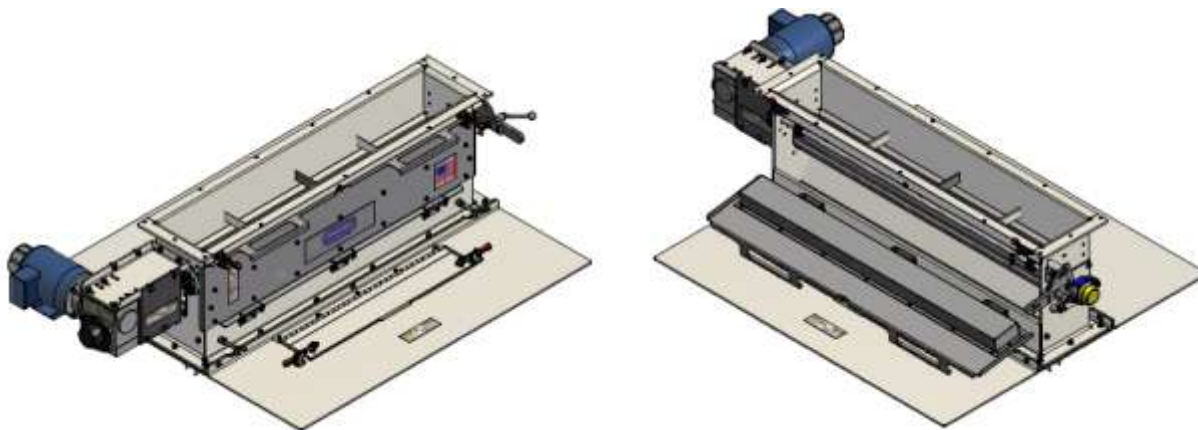
Do not clean, lubricate or adjust equipment while it is in operation.



Ferrell-Ross Roll Feeder & Granulizer Conversion

Feeder Overview

The Ferrell-Ross roll feeder assembly is designed to replace existing vibratory feeders on multiple brands of flaking and roller mills. The roll feeder assembly provides ease of setup, operation and cleanout. Mild steel housing and welds are smooth and beveled to resist the capture and buildup of material. The feed roll is fluted aluminum that is hard-coat anodized for strength and durability. It is driven by an inverter duty motor, ordered to your voltage specification, allowing for remote speed control of the feed roll. A gear reduction transmission couples the motor to the feed roll reducing the variable speed range while increasing torque. An adjustable feed gate allows control of material flow and cleanout.



Front view motor end operator door closed

Front view operator door open showing magnet

On the front of the feeder is an operator door that when opened, allows access to the magnet assembly. The door requires a tool for access. The magnet is mounted to the back side of the door which swings the magnet out and away from the feeder for cleaning.

A three piece adapter plate is included that can be fabricated to the top of the mill and provides for mounting of the feeder. The front adapter plate includes a guarded inspection door for observation of the feed stream of product into the nip of the rolls.



Ferrell-Ross Roll Feeder & Granulizer Conversion

Advantages Of The Ferrell-Ross Roll Feeder Design

- ✓ Positive Displacement means more control in production output
- ✓ Uniform feed volume across roll length providing even surface wear
- ✓ Extends time between resurfacing increasing productivity over lifecycle of rolls
- ✓ Adjustable baffle plates allow you to direct a uniform flow of material to the rolls
- ✓ Baffle plates have side to side adjustability to tightly fit against roll saddles (cheek plates)
- ✓ Guarded inspection door for viewing product curtain to roll nip
- ✓ Powerfull ceramic industrial magnet mounted to swing-out door for easy access
- ✓ Feeder can be preceded by a Granulizer (de-lumper) to reduce clumped material

Feeder Location and Orientation

Positioning the feeder to the nip of the rolls is crucial to the proper operation and maximum efficiency of the flaking system. Changing the geometry of the feed impact location has several effects on machine operation. The rolls of an Oil Flaking mill are running at different speeds. This differential of roll speed is the critical factor in determining location.

It has been found through field trials, that there is a “sweet spot” for the grain to fall upon that provides smoothest and most efficient pull-in through the nip. The curtain of feed falling from the roll feeder is approximately 1 inch thick. The center point of the feed stream should be ½ inch from the nip on the slow roll.

If the feed stream falls outside of the one inch wide area on the slow roll it tends to bounce off the slow roll and strikes the fast roll. Feed material that strikes the fast roll before entering the nip bounces around causing chaos in the product stream. This causes a loss of productive energy in two ways;

First, less material flow through the nip results in buildup of material above the rolls. This reduced capacity requires the operator to slow down the feed rate to the mill. Second, the temperature of the flaking mill rolls will go up out of optimum range. Since hot material is not passing through the nip as rapidly as possible it is transferring heat to the rolls along with the additional friction. This is all caused by the flaked material not carrying the heat away.



Ferrell-Ross Roll Feeder & Granulizer Conversion

Figure 1 below shows the optimum feed impact zone on the roll or “sweet spot” that conveys the material into the roll nip most efficiently.

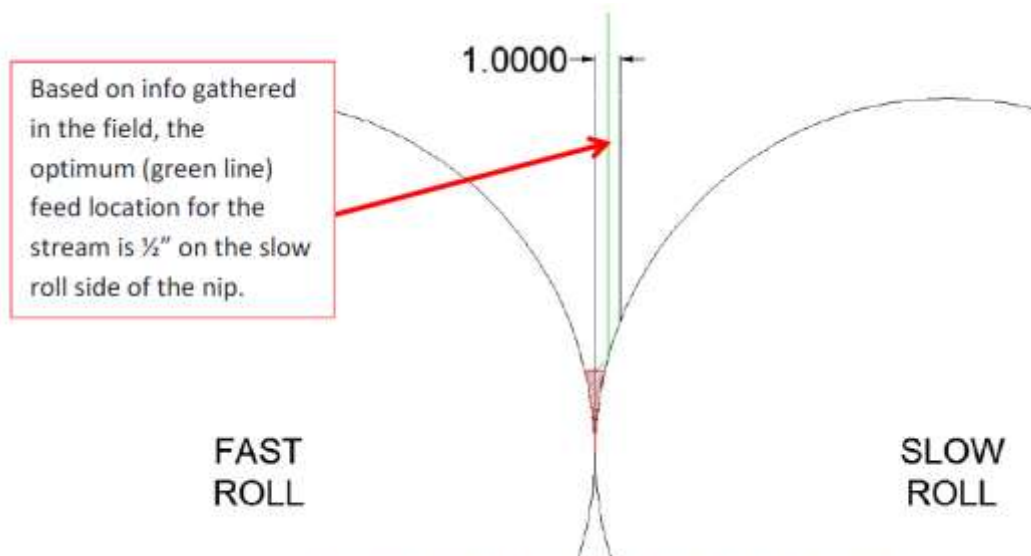


Figure 1: Green line depicts optimum path of material feed.

The orientation of the feeder on the mill should be with the front operator door accessible to the operator. This allows for cleaning of the magnet and inspection of the roll and feed gate assembly. The motor and gear box can be located on the left or right hand side of the feeder, depending on your service. Positioning of the feeder with the front facing the fast or slow roll of the mill is not necessary for proper operation.

Another critical position of the feeder is being centered over the working width of the rolls. This working width is from roll saddle to roll saddle which is the operating nip length. When ordering a feeder, the required width of the material stream should be from saddle to saddle, using new rolls which will be the widest possible for your machine. Old rolls which are worn or damaged on the ends many times have the saddle adjusted in to divert product from these areas. As rolls are replaced and the saddles are moved back apart, in order to get full capacity you will need to feed the full width.



Ferrell-Ross Roll Feeder & Granulizer Conversion

Feeder Installation

Please refer to the provided installation drawing for installation of the feeder to your mill.

The adapter plates provided with the feeder must be fabricated to the mill using the above information for proper positioning. There are three plates provided. The first for in the front of the feeder contains the guarded inspection door. A second for the rear of the feeder is a solid plate. The third is a mounting base for the feeder shown in figure 2 below. Note that that there are welded studs on three of the four sides. It is important to remember that the side with studs is for the rear side of the feeder where the adjustable rear lower baffle plate is mounted and adjusted into place.



Figure 2: Feeder mounting base



Ferrell-Ross Roll Feeder & Granulizer Conversion

To position the feeder, use temporary blocking or supports under the feeder mounting base that allows it be slid over the roll nip. Open the operator door and place a plumb line against the front of the feed roll. Position the feeder as explained above. Be sure that the feeder is parallel across the entire width of the unit to the nip. Remember that you want the flow of material to land $\frac{1}{2}$ inch from the nip on the slow roll. Remember that the front and rear adjustable baffles will help guide the product further after installation.

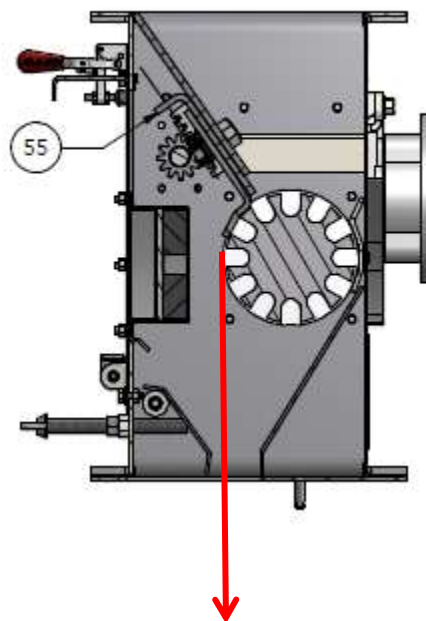


Figure 3: Red arrow denotes a plumb line from the front edge of the feed roll

Mount the feeder mounting base using light tack weld or hardware so product testing can be completed and final adjustments can be made to the feed stream.

The next section on the feeder adjustment procedure should be used to make final adjustments to your product stream prior to final mounting. It is recommended that the mill not be running and the rolls left open so product can fall through the nip as adjustments are made. If the mill must be running it must be properly enclosed prior to making these adjustments. Use the inspection door to observe the product stream under the feeder.



Ferrell-Ross Roll Feeder & Granulizer Conversion

Feeder Operation and Adjustment

When the feeder is energized, the motor drives the feed roll using a gear reduction transmission. The feed roll turns from the top down toward the operator access door. The rate of material passing through the unit is controlled by the speed of rotation of the feed roll. A feed gate next to the roll prevents material from free flowing through the unit when not turning. A lift handle on the side of the unit allows the feed gate to be raised and lowered for cleaning and passage of debris. In operation, it should be left close enough to the roll so when stopped material will not flow by.

At normal RPM's, the material displaced by the groves in the feed roll will empty over a 45 degree turn of the roll. This creates an approximate 1 inch wide product stream from the unit. Figure 4 below gives an example of this;

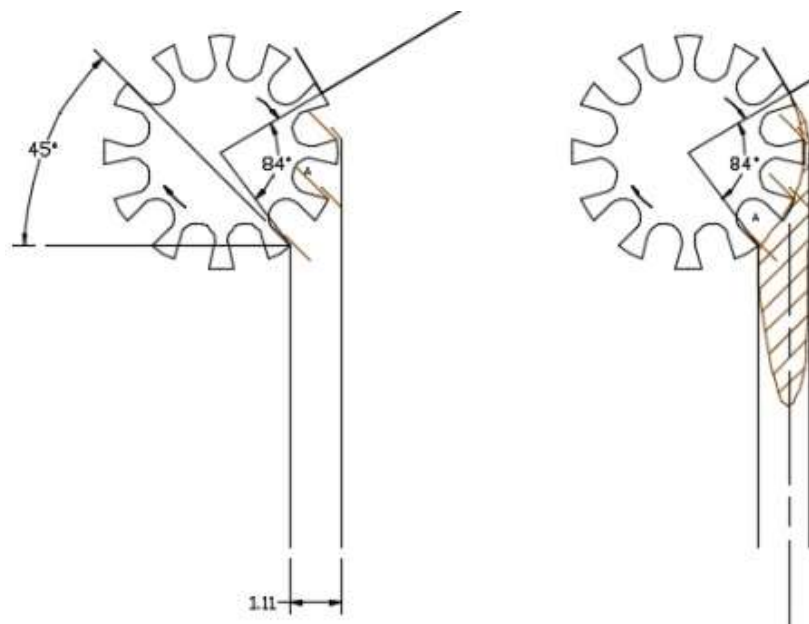


Figure 4: Example of product stream from operating feed roll

To aid in the positioning of the product stream to the “sweet spot” at the roll nip, adjustable baffles are provided to help guide the material. Figure 5 shows the location of these baffles and the function of each.



Ferrell-Ross Roll Feeder & Granulizer Conversion

- A. Front nip guide pivot adjustment screw
- B. Flip up guard on observation door
- C. Front nip guide pivot adjustment flow baffle
- D. Rear adjustable lower material flow baffle, slotted bolt design
- E. Product stream representation to center of roll nip
- F. Rear fixed material flow baffle

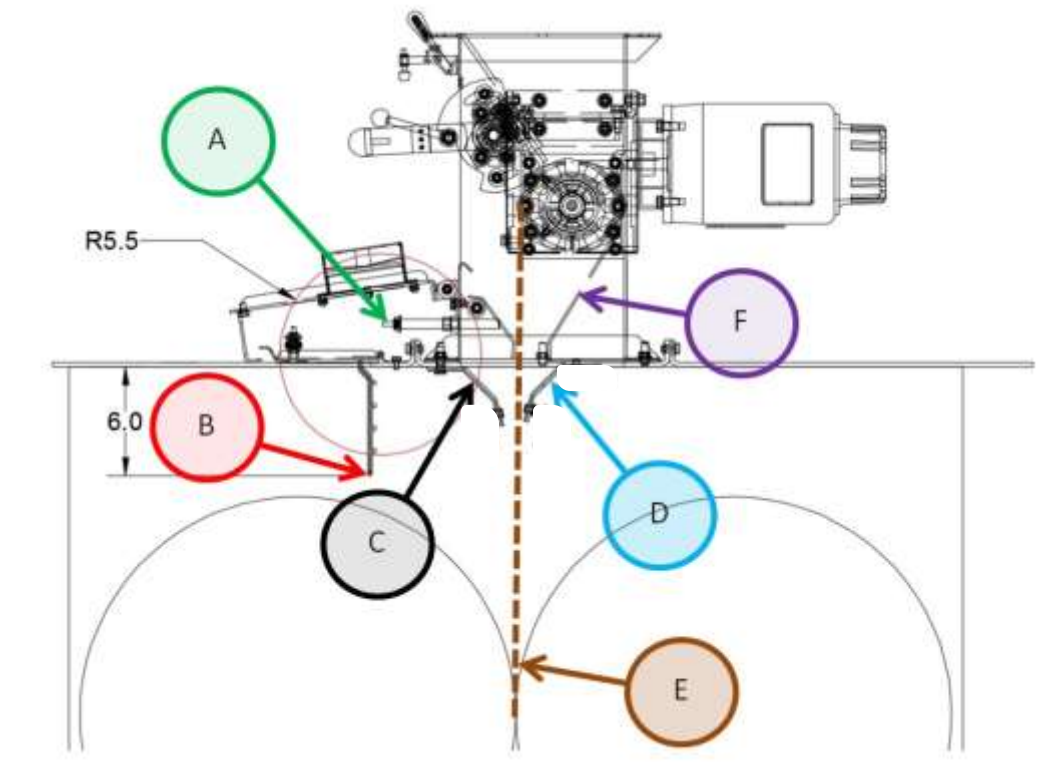


Figure 5: Baffle identification and inspection door guard. Note that the inspection door guard extends 6 inches (152mm) from bottom of feeder base.

During operation, material drops from the feeder to the roll nip as depicted by line E. To direct the product stream to the correct position baffles C and D are used. Baffle C is adjusted by two wing nuts on the front of the feeder. Baffle D is adjusted using the hardware slots in its base.



Ferrell-Ross Roll Feeder & Granulizer Conversion

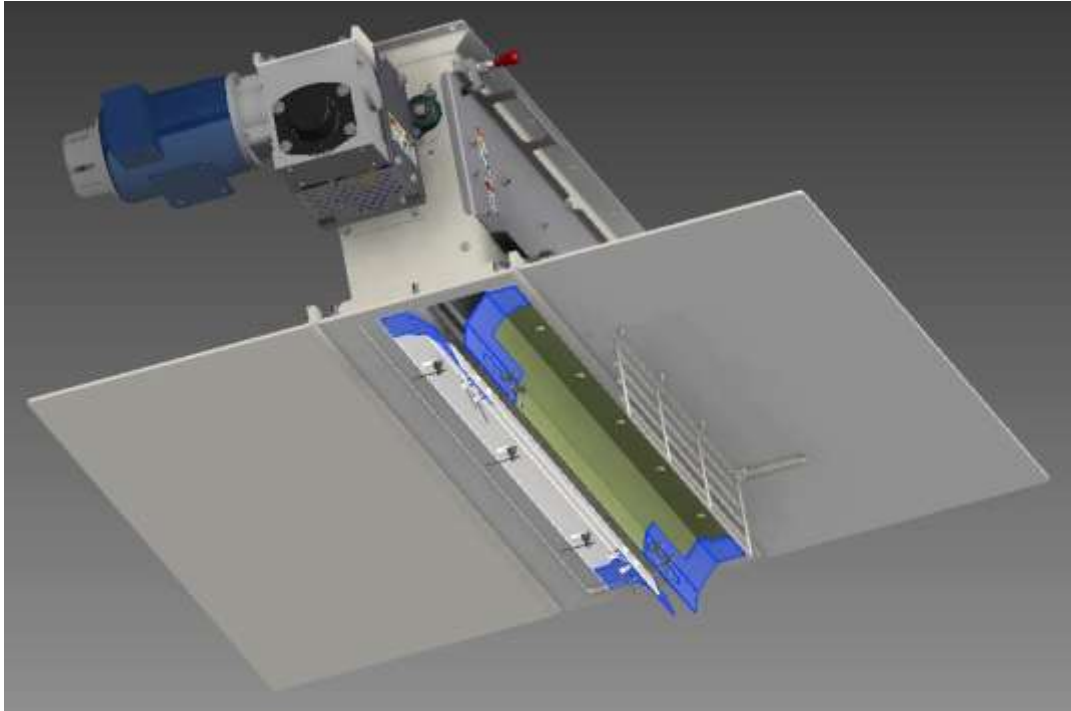


Figure 6: Shows underside of assembly.

Figure 6 above is the underside of the assembly with the front and rear baffles shown green and white respectively. You can also see that the rear baffle mounting holes are slotted allowing front and back adjustability. The blue on the ends of each baffle show the four outer flanges slotted for 4 inches of adjustability left or right. This allows them to be extended at installation against the face of the saddle or cheek plate. This provides the best seal at the end of the nip so material will be unlikely to escape.

Once all adjustments have been made and operation has been verified, the feeder base plate and adapter plates can be fixed by weld or hardware to the mill.



Ferrell-Ross Roll Feeder & Granulizer Conversion

Granulizer Overview

The Ferrell-Ross Granulizer reduces the clumping of cracked material in an Oil Seed Flaking operation. It is mounted directly on top of the Roll Feeder providing ease of installation in a compact design. The Granulizer housing and components are made of stainless steel. A full length shaft is studded with pins in a spiral design. These pins drive through a series of individually replaceable grates reducing lumps so the material will pass through the roll feeder. It has full length maintenance doors on both sides providing easy access for cleanout and repairs. Alternating bolt head design allows for the opening of the maintenance door by removal of bolts in the solid holes. Grates can then be removed by bolts installed in the pass through holes.

NOTE: It is strongly recommended that the surge hopper above the granulizer have an access door for cleanout purposes as well.

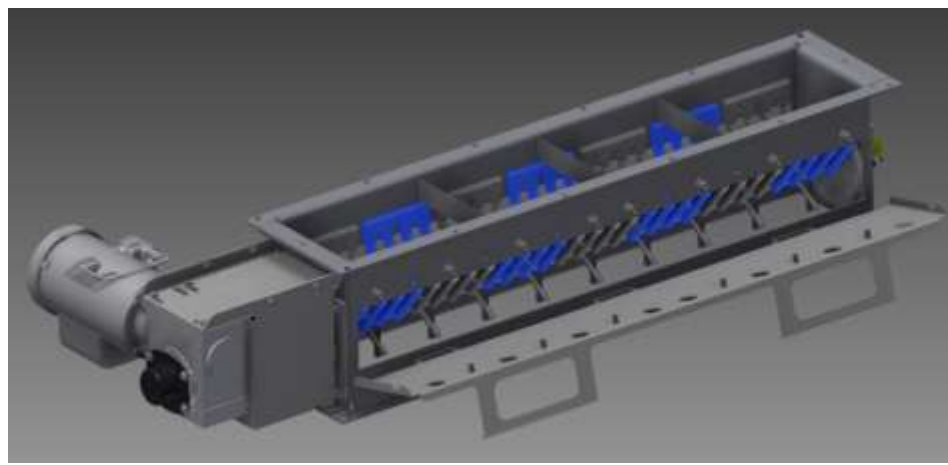


Figure 7: Granulizer with maintenance door open and individual grate sections highlighted



Ferrell-Ross Roll Feeder & Granulizer Conversion

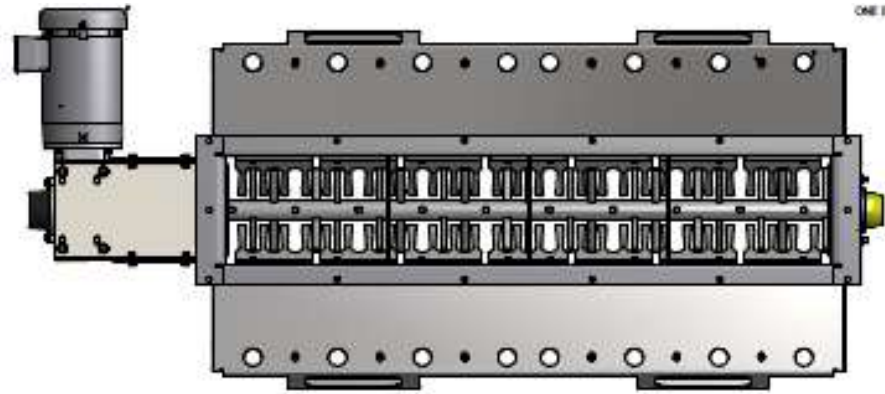


Figure 8: Top view of granulizer with doors open, shows grates & shaft with interlaced stainless steel pins

Advantages Of The Ferrell-Ross Granulizer Design

- ✓ Directly mounted to the Ferrell-Ross Roll Feeder
- ✓ Stainless steel housings and internal grates
- ✓ Stainless steel studded granulating shaft
- ✓ Stalled shaft flow through design to allow product to pass even if not running
- ✓ Easy to replace grate system, two bolts per grate

Properly Sizing Your Mill for Ordering a Roll Feeder Conversion

In order to receive the correct size Roll Feeder and Granulizer to match your mill, six measurements should be provided. You will also need to provide your correct motor voltage and frequency. Using the diagram on the next page, please fill in the dimensions and motor information from your unit(s):

This complete form should be returned by email or fax to the A.T. Ferrell Co. / Ferrell-Ross.