



## LVO Manufacturing, Inc.



### SM224 Production Table Owner's Manual



\*Sanitation Listing on 6ft & 9ft Tables Only



## LVO Manufacturing, Inc.

808 N. 2<sup>nd</sup> Avenue E., P.O. Box 188

Rock Rapids, IA 51246

www.lvomfg.com

(712) 472-3734

1-800-346-5749

Fax (712) 472-2203

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### Warranty

LVO Manufacturing Inc. warrants equipment manufactured by it to be free from defects in material and workmanship for a period of one (1) year from date of delivery except as noted below.

LVO will **not** be held responsible for damage or unsatisfactory performance due to negligence, accident, alteration, unauthorized repair, improper installation or startup (see owner's manual), improper application, or improper maintenance (see owner's manual).

Parts found, on factory inspection, to be defective in workmanship or materials during the warranty period will be replaced (parts and labor, not overtime), provided the Buyer returns the defective parts to LVO Manufacturing Inc. within 30 days, transportation prepaid. LVO Manufacturing Inc. will pay UPS 2nd Day Air shipping charges for parts (with the exception of excessively large or heavy items) covered on warranty if the machine is not operational.

LVO Manufacturing Inc. reserves the right to make changes in design and construction of its products without imposing any obligation upon itself toward products previously manufactured.

This warranty is in lieu of any other warranties, expressed or implied, made on the part of LVO Manufacturing Inc. who does not accept responsibility to any purchaser of its products for any representation or warranty made by dealers or salespersons beyond those herein expressed including any implied warranties of merchantability or fitness for a particular purpose.

### Warranty Procedure

1) Locate and record the 12 digit serial number located on the side of the Production Table.

2) Gather as much information about the problem as possible.

**3) Call LVO Manufacturing Inc. at 1-800-346-5749 and request technical service. Prior to performing any warranty work, you must call the factory for a warranty authorization number (WA-\_\_\_\_). This warranty authorization number must be on every invoice we receive for services rendered on the machine. Without this authorization number the invoice will not be paid. The warranty number must also be included with the defective part returned.**



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## **SM224 Specifications**

### **Overall Dimensions**

Width – 35”

Table Height – 35 ½”

Height – 54 ¼”

Depth (Standard 9’ Table) – 115 ¾” (124” with Catch Tray)

### **Electrical Information**

	115 Volt	230 Volt
Full Load Amps	10.0	5.0

## **Warnings & Cautions**

### **General Warnings and Cautions:**

1. Service work on the machine should be done by either a factory representative or qualified local service company. **Contact the factory if the machine is under warranty.**
2. Failure to follow the cleaning guidelines described in this manual will damage the machine and will void the warranty.

## **Safety Features**

This machine is equipped with several safety features.



**Warning:** Do not operate this machine without all of these safety features installed and operational.

All of the features listed here are shown on the General View in the drawings section.

- |                                   |   |
|-----------------------------------|---|
| 1. Front Belt Roller Finger Guard | Prevents unintentional insertion of fingers into the gap between the front roller and the conveyor belt.  |
| 2. Dough Roller Safety Guard      | When guard is lifted, power is disconnected, shutting off the machine. The machine is designed not to restart until the guard is closed and the Start Button is pushed. |
| 3. Chain Guard Cover              | When cover is opened, power is disconnected, shutting off the machine. The machine is designed not to restart until the cover is closed and the Start Button is pushed. |
| 4. Rear Cover                     | When cover is opened, the machine will stop. The machine is designed not to restart until the cover is closed and the Start Button is pushed.                           |



**CAUTION:** Before doing any service work on this machine, be sure it is unplugged.



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### **Introduction**

This manual should be read and understood by everyone involved with the installation and operation of the Production Table. Keep this manual in a safe place for future reference. Extra copies or replacement copies can be purchased from the manufacturer.

Service work on the machine should be done by either a factory representative or qualified local service company. **Contact the factory if the machine is under warranty.**

The LVO Production Table is designed for use in bakeries and restaurants for sheeting and cutting dough for doughnuts, long johns, cookies, etc. LVO Production Tables are constructed from stainless steel with 4" dough rollers made from FDA approved materials. The control system is assembled with UL approved components housed in the rear of the machine.

The LVO Production Table can be used for both sheeting dough flat for use in pie crust and various pastries or, by attaching the cutter or moulding carriage, for making numerous other bakery products.

In addition, the LVO Production Table is equipped with a variable speed drive. This lets the operator change the speed of the machine up or down depending on their own level of experience or type of dough being used. This increases the machines versatility, allowing it to be used for a wide range of products and operators.



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## **Operation of Machine**

### **General Operation**

1. Position cutter or moulding carriage onto the conveyor table carriage pins, making sure adjustment handle is on the same side as the roller adjustment handle. There are two sets of carriage notches; one to lock the carriage in place while in use, and a second smaller set to raise the carriage off the belt.
2. Select the proper cutter or pressure plate. For moulding position the pressure plate on the moulding carriage linkage with the approach/rise toward the machine sheeting rollers. Adjust plastic moulding carriage dough guides next to pressure plate.
3. For moulding, place curling chain rings (light or heavy depending on product type or weight) onto hooks on the front scrapper under infeed chute.
4. Position carriage adjustment handle to desired setting; lower for lighter weight, higher for heavier weight products.
5. Adjust infeed chute guides so that the dough enters at the middle of the rollers.
6. Set roller adjustment handles to desired thicknesses. The position of the handle will vary with the product type, and multiple passes may be necessary depending on the product type and stiffness.
7. Dust the sheeting rollers with flour to prevent the dough from sticking to the rollers. A flour tray is supplied to hold flour for dusting.
8. Select desired belt/roller speed. Speed will vary with product type and user experience. It is recommended to start at a slower speed until machine experience and product knowledge is gained.
9. For sheeting, remove and store all carriages, pressure plates, and curling chains. The LVO Production Table is supplied with pressure plate, cutter, and carriage storage hangers and curling chain hooks. Sheeting will require several passes, starting with a larger roller gap and reducing every pass until desired thickness is reached. For pie and pizza crust, rotate dough by 180° on the second pass to give the dough a round shape.
10. A catch tray is provided to catch product as it leaves the carriage.

### **Bread Moulding**

Remove excess flour dust from the conveyor belt when changing from various pressure plate sizes. Space is provided for storing pressure plates under the conveyor table when not in use. Position the bread moulding attachment slots to the conveyor table studs and slide the moulding carriage away from the sheeting head. Place the appropriate curling chain onto the front scraper hooks; light for buns and rolls, and heavy for larger bread products. Attach desired pressure plate to carriage and adjust dough guides to proper width (see General Operation instructions). You are now ready to begin bread moulding.



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Piece the mixed dough into the desired sizes. Position the dough guides on the in-feed tray so the dough pieces travel down the middle of the conveyor belt to assure proper moulding.

To mould bread, place the dough pieces on the in-feed tray using the dough guides for positioning. It may be necessary to flatten the dough slightly to allow for smooth flow into the sheeting rollers. The dough will be sheeted through the rollers and will exit onto the conveyor belt. The sheeted dough pieces will be “curled” as it travels under the curling chain and the pressure plate will “mould” the product as it passes under the bread moulder attachment.

Due to the difference in nature of various doughs, it may be necessary to do some experimenting with the position of the pressure plate relative the conveyor belt. The correct setting is determined when the sheeted dough piece is moulded to the exact width of the pressure plate. When the correct setting is determined, it should be noted for future reference.

### **Dough Sheeting**

When sheeting dough, regardless of the product being sheeted, the adjustment rollers should be set progressively. To obtain the desired thickness, several passes may be required. Before each pass, the roller setting should be reduced until desired thickness is achieved.

To obtain uniformity of the finished product, it is important that uniform pieces are prepared for feeding to the machine. The dough should be taken from the bowl in approximately 10 pound pieces, put on a bench and shaped into a rectangle. With the least amount of handling, the pieces should be shaped uniformly in length, width, and thickness, and should fit  $\frac{2}{3}$  of the width and full length of a standard 18” x 26” baking sheet. Keep pieces as free from wrinkles as possible (let it have 20-30 minutes intermediate proof before feeding the machine).

Flour the in-feed belt and the top of the dough pieces. Place the pieces on the in-feed tray and flatten out some by hand, both width and length. Set dough guide on in-feed tray so that the dough will travel down the center of the conveyor table. Set the sheeting rollers so they progressively sheet to the desired thickness. As you gain experience and the machine becomes “broke in,” less flour dust will be needed and more uniform results will be obtained.



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## **Operational Tips**

The dough condition and type has a dramatic effect upon settings and satisfactory Production Table performance. Various problems and their solutions are listed below.

<b>Problem</b>	<b>Correction</b>
Dough Tearing	Increase gap between the dough rollers. The dough may need to rest before working.  Reduce Belt Speed.
Too Many Crumbs	Decrease the pressure on the pressure plate.





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### **Scheduled Maintenance**



**Always disconnect the power before servicing the machine.**

#### **Daily:**

Remove and clean all scrapers:

##### Front Scraper Removal

1. Lift the spring handles off from the infeed chute.
2. Lift the scraper assembly off the scraper positioning rod.

Note: Reassemble in reverse order.

##### Rear Scraper Removal

1. Close the rollers.
2. Open the upper back cover.
3. Lift the spring handles off from the rear scraper.
4. Lift the scraper of the roller adjustment shaft.

Note: Reassemble in reverse order.

#### Conveyor Belt Tension and Location:

Inspect the belt for condition and location. Belt should be centered on the table. If the belt is closer to one side, tighten the adjustment nut on that side ¼ turn. Run the belt and observe for correct centering and adjust as required. Several adjustments may be required.

Belt Tightness – The conveyor belt needs to be tight enough to not slip when held by hand.

**DO NOT OVER TIGHTEN THE BELT!!**

The belt tension is adjusted by turning the adjustment nuts on both sides an equal amount.



**CAUTION: BE SURE TO REINSTALL BOTH ROLLER FINGER GUARDS AFTER ALL ADJUSTMENTS HAVE BEEN MADE.**

#### **Monthly:**

Drive Chain:

1. Lightly oil the drive chain
2. Inspect for loose or worn components
3. Repair or replace as needed



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## **Cleaning Instructions**



**Always disconnect the power before cleaning the machine.**

At the end of each day's use, the operator of the machine must clean the machine according to the following procedure:

1. Remove all scrapers (see Scheduled Maintenance section) and pressure plates and clean in sink or washer.
2. Remove carriage (if attached).
3. Clean all food contact surfaces of machine, i.e. rollers, infeed, belt.
  - a. Remove all excess flour and dough crumbs with dry cloth or brush.
  - b. Thoroughly clean all surfaces with hot water and soap/detergent and a clean cloth.
  - c. Rinse all surfaces with fresh warm water and a clean cloth. Do NOT reuse cloth from washing.
  - d. Mix a sanitizing solution of fresh warm water and chlorine bleach to a mixture of 1 teaspoon of bleach per gallon of water.
  - e. Wipe all food surfaces with sanitizing solution and a clean cloth. Do NOT reuse cloth from rinse. Keep cloth in the sanitizing solution when not in use.
  - f. Let all surfaces air dry.
  - g. In order to clean the entire surface of the rollers and belt, it may be necessary to run the machine for a short period of time to turn the roller/advance the belt. To do this, first replace all covers and reconnect power. Next start the machine until a new area is accessible for cleaning. Then re-disconnect the power, remove covers and continue cleaning.



**CAUTION: DO NOT ATTEMPT TO CLEAN MACHINE WHILE RUNNING OR RUN WITHOUT ALL COVERS/SAFETY DEVICES IN PLACE.**

4. Clean food contact surfaces on the carriages using same method as the machine.
5. Wipe down all other exposed surfaces of the machine with a clean cloth. This should be done before replacing scrapers and cover.



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## **Replacement Parts List**

### **SM224**

#### **Rollers & Scrapers**

##### **Part Number**

##### **Description**

200-2043

Dough Roller Assembly

200-2044

Rear Belt Roller Assembly

201-2020

Rear Infeed Belt Roller Assembly

200-6123

Front Belt Roller Tube

200-6124

Front Belt Roller Shaft

200-6117

24" Scraper Blade

201-2007

Lower Rear Scraper Assembly

201-2008

Upper Rear Scraper Assembly

201-2009

Lower Front Scraper Assembly

201-2010

Upper Front Scraper Assembly

200-6080

Lower Front Scraper Tensioning Hook

200-6072

Upper Front & Rear Scraper Tensioning Hook

523-5001

Scraper Tensioning Spring

#### **Pressure Plates**

##### **Part Number**

##### **Description**

200-2001

6" Plate

200-2002

9" Plate

200-2003

12" Plate

200-2032

14" Plate

200-2004

16" Plate

200-2034

18" Plate

200-2031

20" Plate

200-2039

22" Plate

200-2009

Bolillo Plate



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## Cutters

### Part Number

527-5004

527-5005

527-6006

### Description

Hex Doughnut Cutter

Long John Cutter

Hex Bismarck Cutter

## Miscellaneous Parts

### Part Number

200-2025

200-2026

200-6114

201-6012

200-6009

200-6010

200-2010

201-2027

200-6064

201-6023

200-6177

200-6176

200-6178

201-2024

523-5003

200-6182

200-6179

523-5009

519-5020

524-5001

527-5001

517-5010

517-5043

### Description

Light Curling Chain

Heavy Curling Chain

Catch Tray

In-feed Guide

Moulding Carriage Dough Guide – L/H

Moulding Carriage Dough Guide – R/H

Moulding Carriage

Cutter Carriage

Front Belt Roller Finger Guard

Infeed Belt Roller Finger Guard

Roller & Moulding Carriage Adjustment Handle

Carriage Handle Hub

Moulding Carriage Adjustment Rack

Cutter Carriage Handle

Carriage Handle Spring

Roller Adjustment Hub

Roller Adjustment Rack

Roller Adjustment Handle Spring

Adjustment Handle Pin – Carriage & Roller

Knob – Moulding Carriage

Flour Tray

Caster – Plate Mount

Caster – Stem Mount



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### Electrical Parts

#### Part Number

#### Description

512-5014

1 HP DC Motor – 90 VDC

512-5019

Motor w/Gearbox – 90 VDC

511-5246

DC Speed Control

511-5247

Speed Potentiometer

511-5205

NO Contact Block

511-5107L

On/Off Station – Left Side

511-5107R

On/Off Station – Right Side

511-5105

Miniature Limit Switch

511-5286

Rear Cover Safety Switch Sensor

511-5287

Rear Cover Safety Switch Magnet

### Drive Parts

#### Part Number

#### Description

525-5007

Idler Sprocket

200-2053

Idler Base & Shaft

525-5010

Chain Tensioner

525-5024

32 Tooth Spur Gear – Roller Adjustment

525-5021

Roller Adjustment Bearing (with Flange)

200-6136

84 Tooth Eccentric Spur Gear

525-5025

$\frac{3}{4}$ " Eccentric Spur Gear Bearing

525-5003

$\frac{3}{4}$ " Cam-Lock Bearing – Stationary Dough Roller

525-5004

Stamped Bearing Flangette – Stationary Dough Roller

525-5015

19 Tooth Sprocket – Upper Dough Rollers

525-5027

14 Tooth Sprocket – Lower Dough Rollers

525-5027

14 Tooth Sprocket – Rear Belt Roller

525-5003

$\frac{3}{4}$ " Cam-Lock Bearing – Rear Belt Roller

525-5004

Stamped Bearing Flangette – Rear Belt Roller

525-5012

12 Tooth Sprocket – Motor

525-5021

Infeed Bearing (with Flange)

525-5027

14 Tooth Sprocket – Infeed Belt Drive

525-5015

19 Tooth Sprocket – Infeed Belt Drive

525-5036

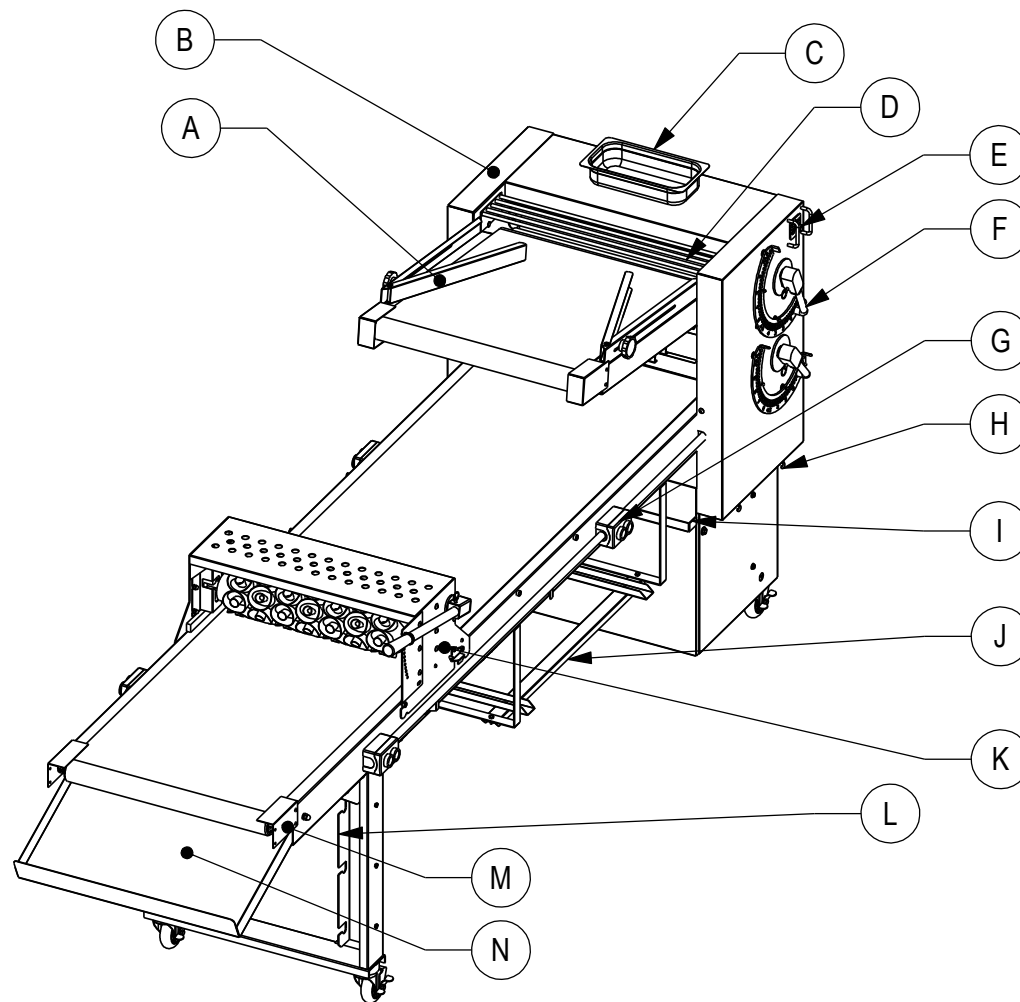
Front Belt Roller Bearing (no Flange)

201-6100

Main Drive Chain

201-6101

Infeed Drive



- A. Dough Guide  
 B. Chain Guard Cover  
 C. Flour Tray  
 D. Dough Roller Safety Guard  
 E. Speed Control Knob  
 F. Roller Adjustment Handle

- G. Start/Stop Station  
 H. Curling Chain Storage Hook  
 I. Pressure Plate Storage Hanger  
 J. Carriage Storage Hanger  
 K. Cutter Carriage  
 L. Cutter Storage Rack

- M. Front Belt Roller Guard  
 N. Catch Tray



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 808 N 2nd Ave E  
 Rock Rapids, IA 561246  
 Phone: (712) 472-3734

Mat. -

Ga. - Finish -

Rev. -

Scale 1:20

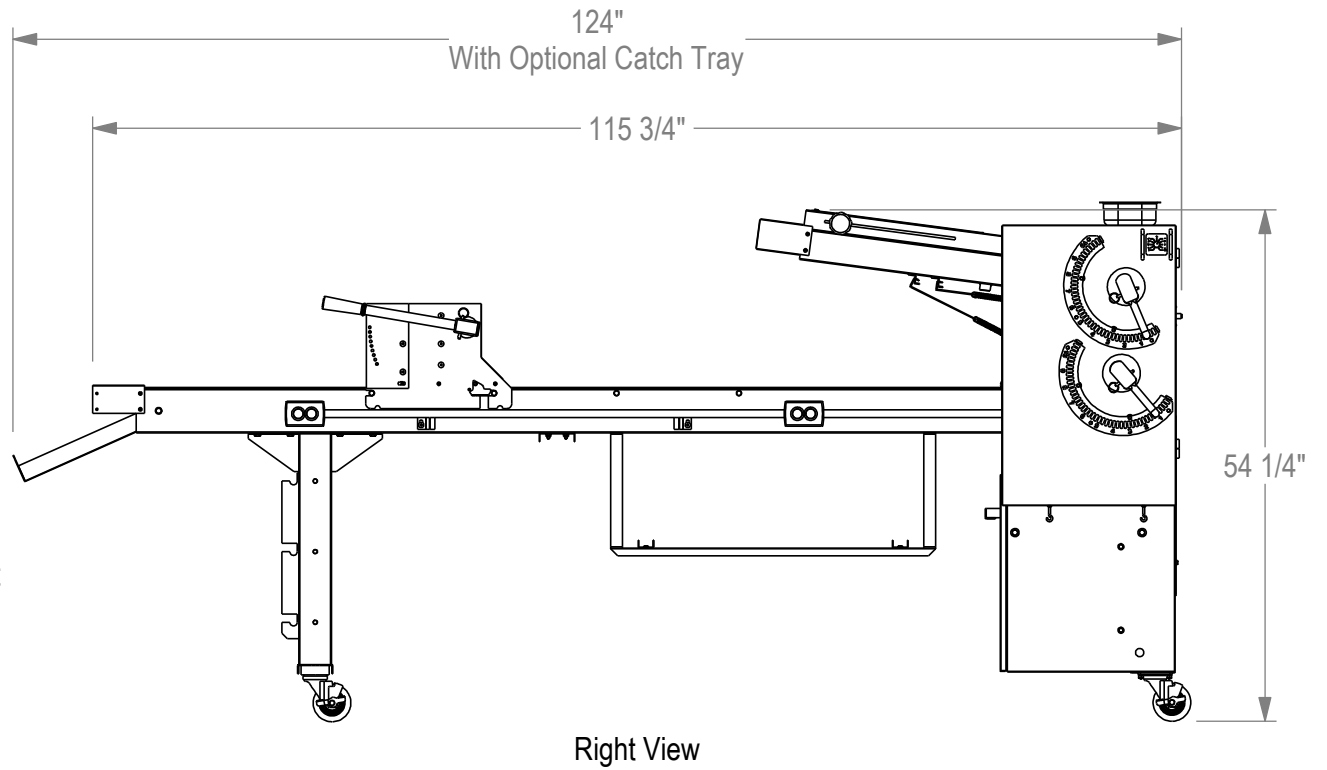
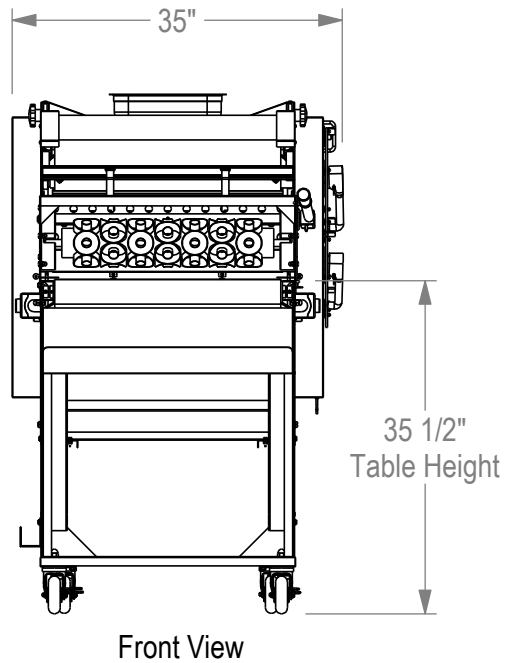
12/14/2011

C. Wiowood

Name: General View

SM224

No. 201-1009-7



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808 N 2nd Ave E  
Rock Rapids, IA 561246  
Phone: (712) 472-3734

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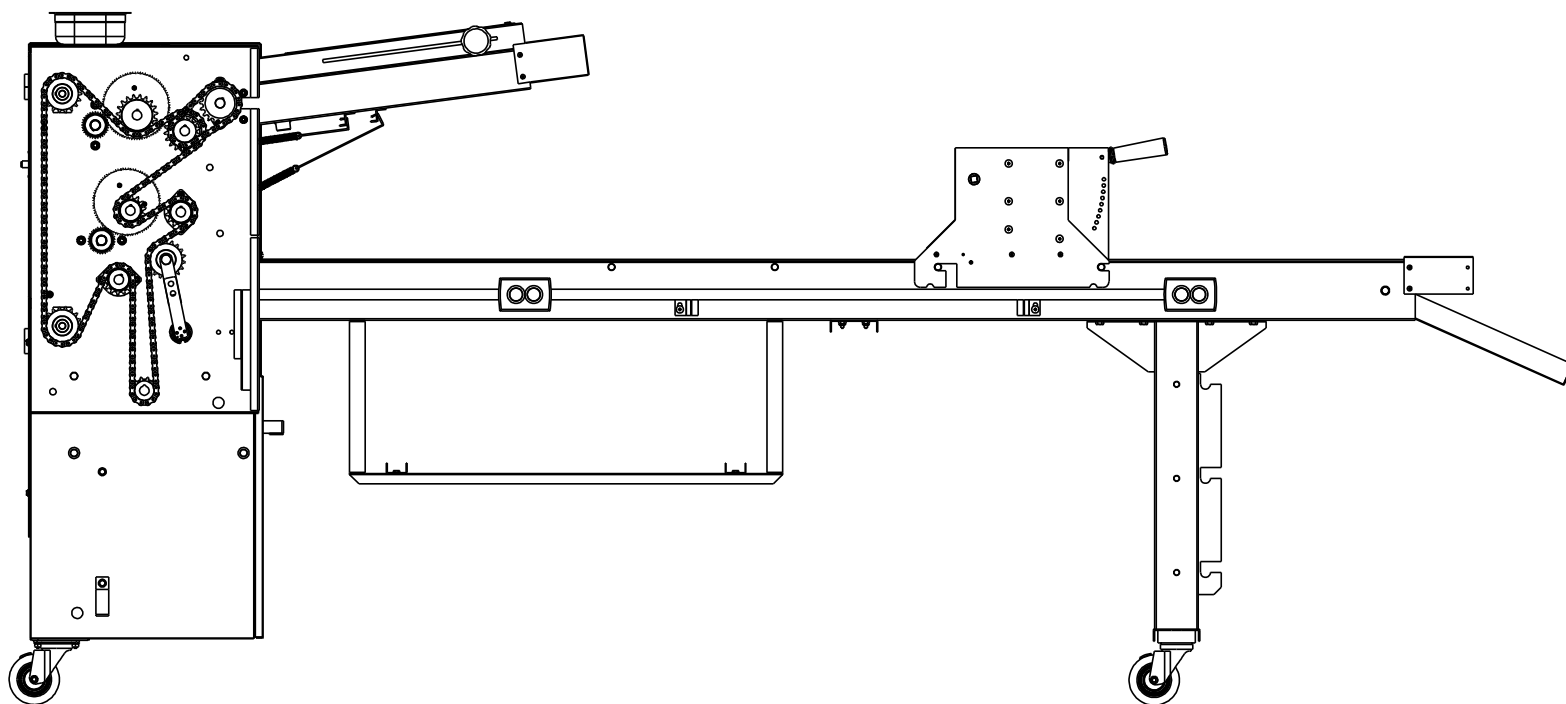
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C. Wiowood

Name: SM224-9

Informative

No. 201-1009-1



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Rock Rapids, IA 561246  
Phone: (712) 472-3734

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Rev. -

Scale 1:15

12/13/2011

C. Wiowood

Name: Left View

cover removed

No. 201-1009-3



USE 16 GA. WIRE



Rev. -

C. Wiowood

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