



ME5 MAGNETIC CAP ELEVATOR OPERATING MANUAL

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1. TROUBLESHOOTING

1.1 Installation Instructions

A proper ME set up will ensure outstanding performance. Review the following checklist. Gather the appropriate materials, tools, and resources required for this installation. Follow the instructions carefully.

1. Fasteners can vibrate loose during shipping. Check and tighten all screws, as necessary.
2. Check the drive chain for adequate tension, and adjust as necessary.
3. Stand the elevator upright using the included bracket and eyebolt.
Caution: Do not lift the machine by any means other than the included bracket and eyebolt. To do so will damage the machine.
Install the six leveling pads. Use the four pads on the column base to plumb the column. Then level the hopper bin with the two pads on the bin legs. Drill and mount to the floor.
Note: Do not adjust the column using the hopper bin front leg pads. These pads are to level the bin only after the column has been plumbed.
4. Secure the elevator to a structural member of the building to prevent a tipping hazard.
5. Install the chute work between the hopper and capper.
6. Install the inductive sensor into the chute work.
7. Connect a source of clean, dry air to the pressure valve. Adjust to 100 psi. A 1/2" minimum supply line is recommended.
8. Connect to a protected 480 volt power source.
9. Position the main switch to **on**. Switch the operation mode to **manual**.
10. Jog the conveyor belt drive. Check the direction of belt travel. Reverse the polarity of the motor if necessary. Recheck belt travel direction.
11. Remove the motor cover and agitator cover. Run the machine to test tracking of the belt. The belt should be centered on the top, bottom, and drive pulleys. Adjust as required.
Note: The belt should not be stretched more than 1% of its overall length during tensioning.
12. Set the operation mode switch to **auto** for production.

2. SET UP PROCEDURES

2.1 Set Up Procedures

This section is intended as a guide for change-overs. It may also be used for resetting the machine after maintenance. The following adjustments are pre-set at the factory for the cap size/type specified in the equipment order. All settings are approximate and must be modified by trial and error to achieve maximum output.

2.1.1 Set Up Magnets

Set the gap beneath the cap metering tunnel to one cap diameter plus $\frac{3}{8}$ ". This is located inside the hopper bin. Alter this setting as necessary. Maintain the cap level at approximately the height of the upper adjusting bar on **magnet #1**. This is approximately 40" below the bottom of the sorting cabinet (Figure 2-1).

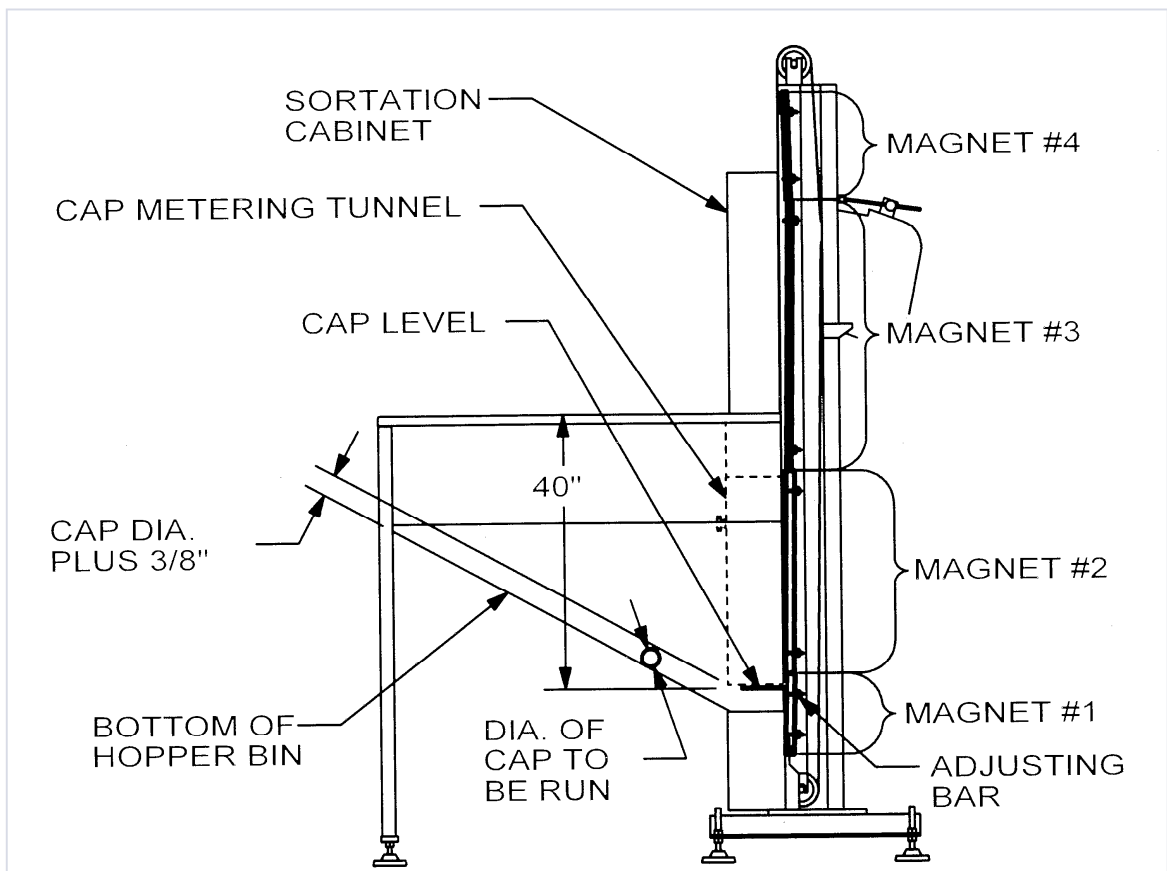


Figure 2-1: Magnet Area / Position Overview

2. SET UP PROCEDURES

Position **magnets #3 & #4** all the way back in the slots, away from the belt (*Figure 2-1*). Adjust the magnets toward the belt until caps can be held lightly in place. Center the magnets in relation to the belt by sliding the magnets all the way to the right on the adjusting bars. Place several caps along the belt and position the left side guides even with the left side of the caps. Adjust the right side guides for 1/4" cap clearance (*Figure 2-2*).

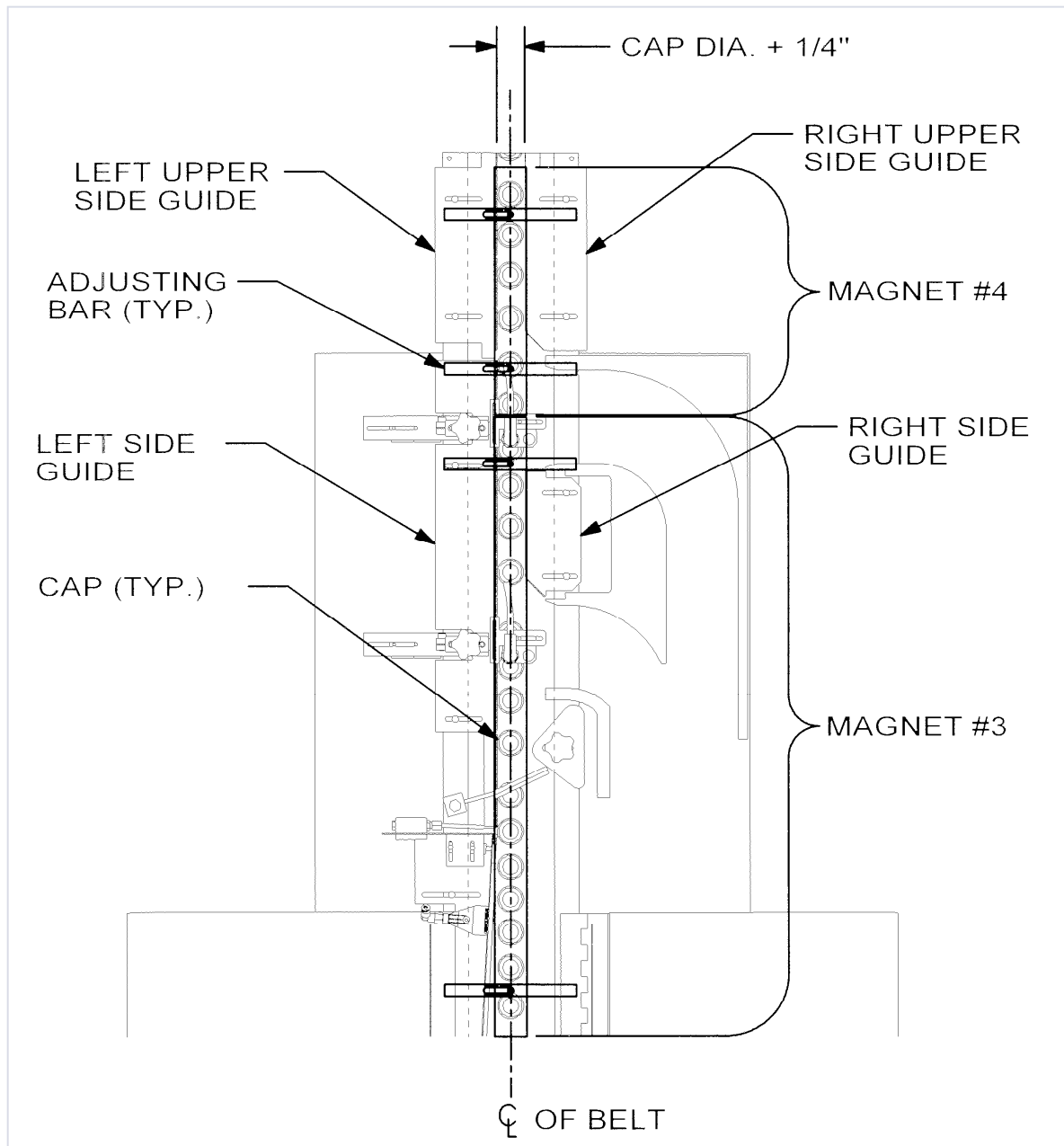


Figure 2-2: Magnet & Belt Area / Position Overview

2. SET UP PROCEDURES

Center magnet #1 (the bottom magnet) in the adjustment slots. With the belt running, adjust the magnet toward the belt as required to achieve maximum cap pickup without creating excessive belt drag.

Magnet #1 contains two magnetic fields which are spaced 2-1/2" apart and run the length of the magnet. Position the magnet to the left on the adjusting bars so that caps will be loaded onto the left side of the belt.

Magnet #2 and the lower side guide work together to funnel caps into a single-file, single-layer row with little or no gaps. Caps that do not merge should fall off to the right. Start by positioning the magnet all the way back in the slots (away from the belt). Then adjust the magnet toward the belt, bottom first. Use the minimum setting required to convey caps. Some minor slippage is acceptable.

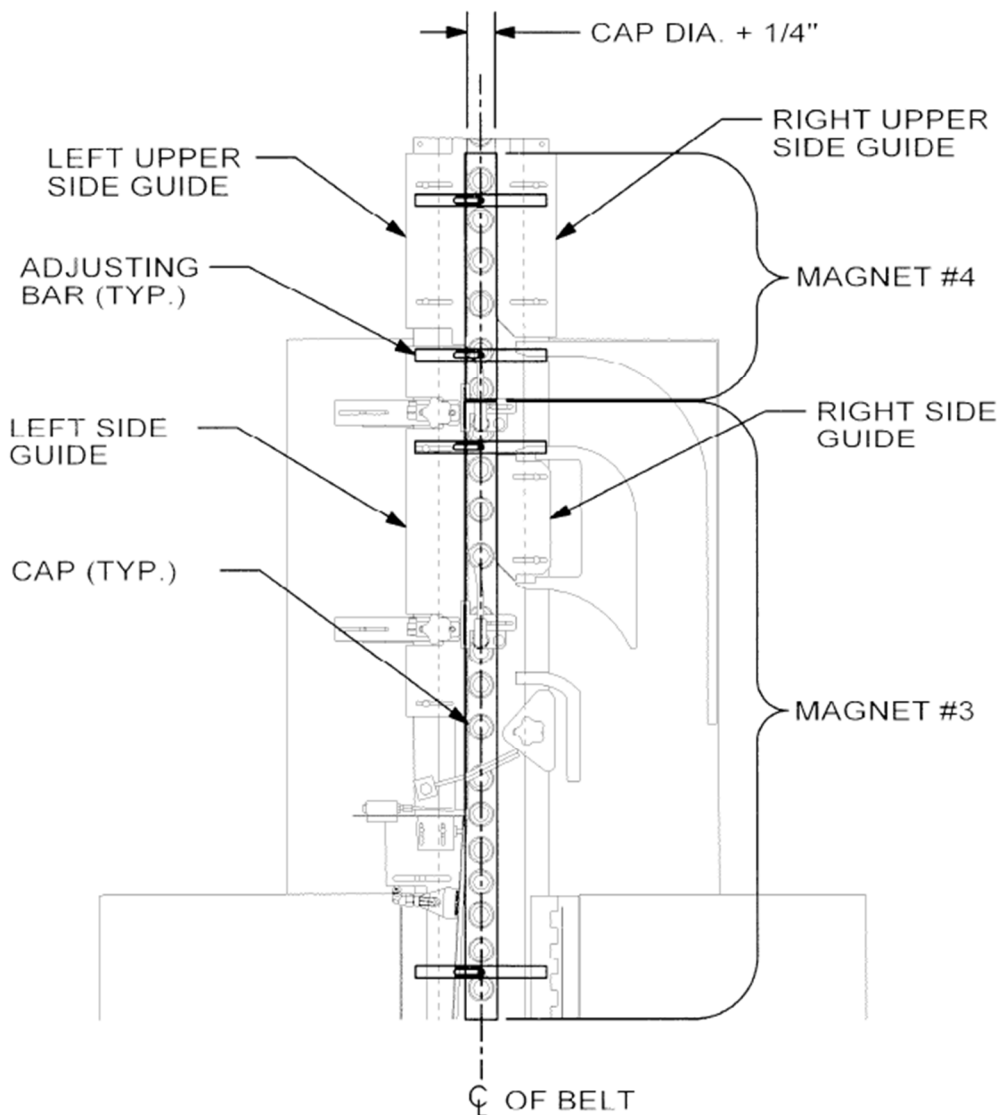


Figure 2-3: Magnet & Belt Area / Position Overview

2. SET UP PROCEDURES

This magnet contains two converging magnetic fields. The fields are spaced 2-1/2" apart on the bottom of the magnet and 7/8" apart at the top. Using the slots on the adjusting bars, align the bottom of magnet #2 with the top of magnet #1. Set the top of magnet #2 to slant 5/8" to the left. Adjust the top right edge of the lower side guide 3/8" to 1/2" to the right of the upper side guide. Adjust the bottom of the lower side guide far enough to the left to pick up all caps traveling up the belt but no further.

The function of magnets numbers 3 and 4 is to lightly hold caps to the belt and against the left side guides without slippage. The bottom of magnet #3 is biased to the left to approximately match the angle of the lower side guide. This allows caps that have not been merged into the single-file cap column to fall to the right. Position the lower right corner of magnet #3 1/2" to the left of the upper right corner of magnet #2.

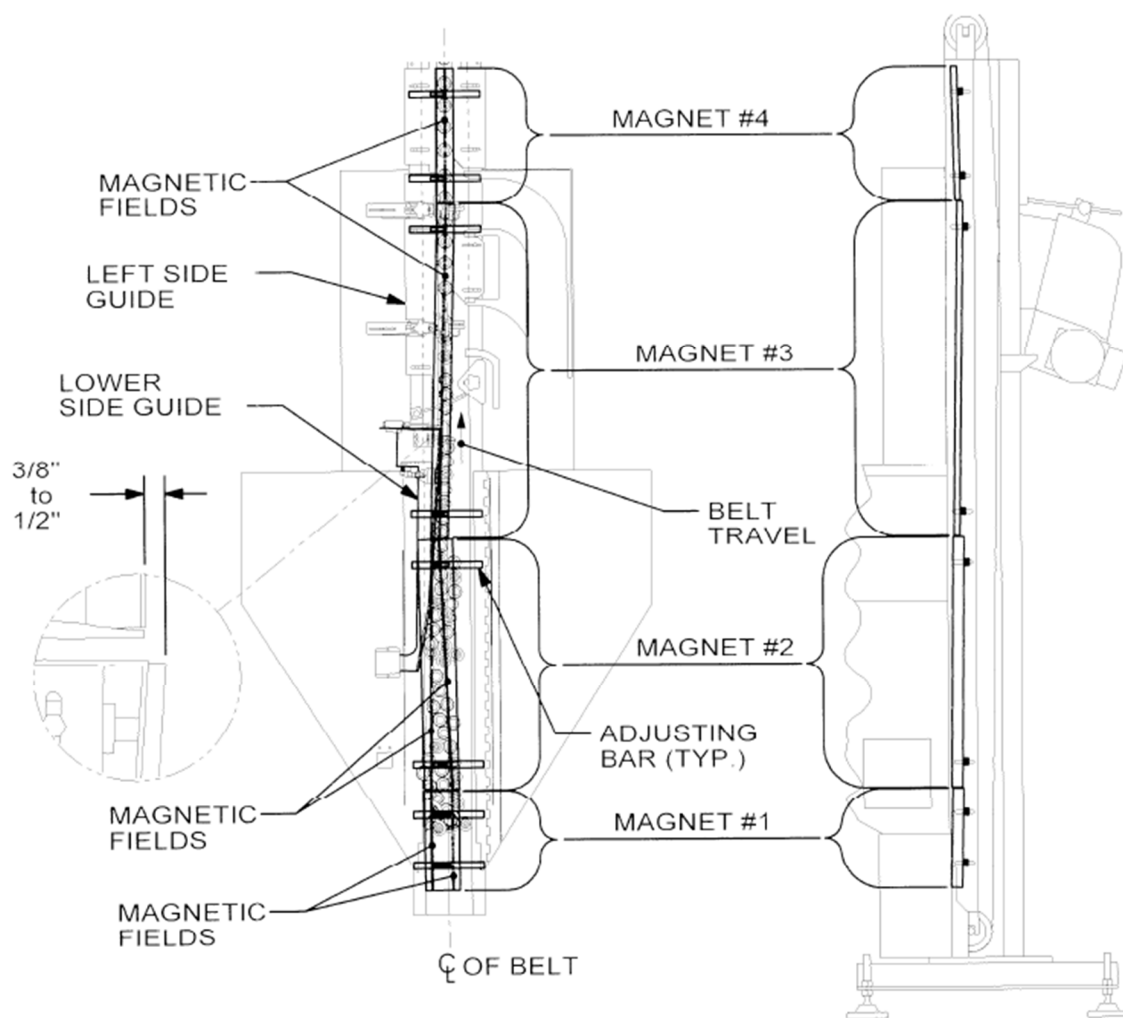


Figure 2-4: Magnet & Belt Area / Position Overview

2. SET UP PROCEDURES

Using spacer washers, position the air knife (located on the lower side guide) so that the air flow is directed approximately 1/8" over the caps. Position the triangular guide block as required to guide caps between the side guides. Set the plastic striker arm to approximately 30 degrees from horizontal. Adjust the arm to allow only a single layer of caps to pass between the belt and the arm. Adjust the double cap sensor toward the belt until it is triggered by a single cap. Then back it off until a single cap just clears the sensing range. Position the discharge end of the double cap blow off nozzle to be flush with the right edge of the left side guide.

Note: If caps stand on edge against the left side guides, adjust magnets to the right until the problem is corrected. Properly oriented caps may "flutter" and fall back onto belt in the blow off region if magnet strength is not sufficient. Excess magnet strength may inhibit blow off. It is recommended that section three, page one be updated with changes made to the magnet settings.

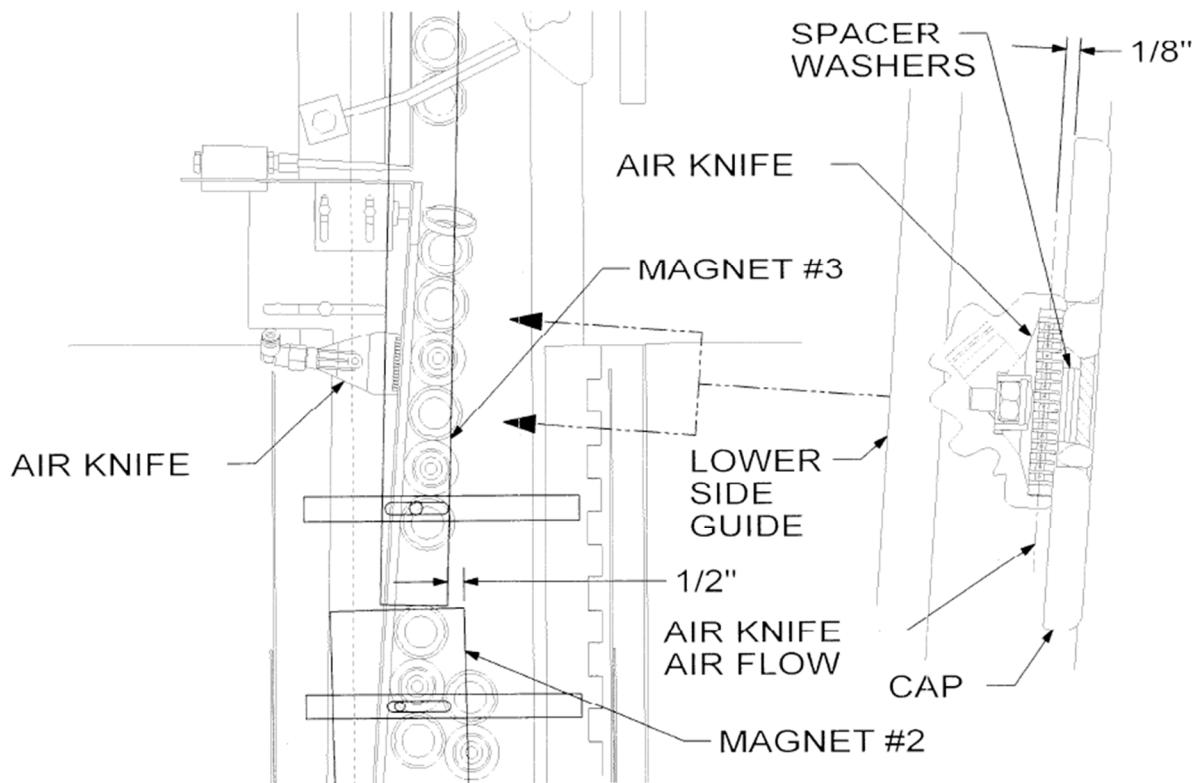


Figure 2-5: Air Knife and Air Flow

2. SET UP PROCEDURES

Aim the nozzle to knock off a doubled cap and the cap it is riding on. Timing of the blow off is set by adjusting the sensor up or down vertically. Center each of the two reverse-cap blow off sensors horizontally over a cap. Set to a distance from the belt that will trigger the blow off when the rims of two adjacent caps pass beneath. Back the sensor out until the sensor is no longer triggered by the adjacent rims.

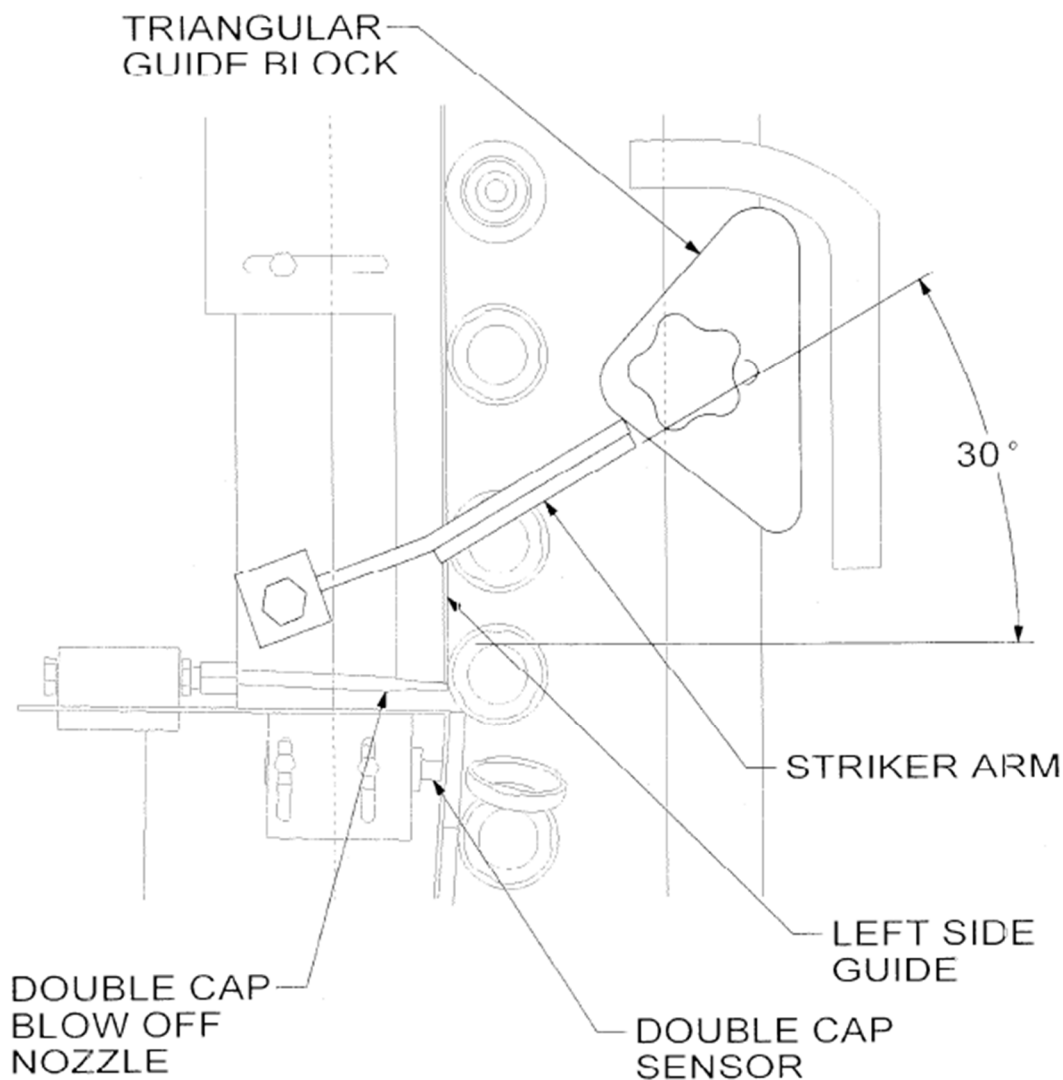


Figure 2-6: Blow Off System

2. SET UP PROCEDURES

Align the two reverse cap blow off nozzles with the mid-point of the cap wall. Recess the tip of the nozzle approximately 1/16" from the right edge of the left side guide. Reverse cap blow off timing is set by adjusting the sensor up or down vertically. When timing is correct caps will eject at a slight upward angle across the belt. Check adjustment of the cap chute between the hopper and the capper for smooth cap travel.

The sensor for automatic operation of the elevator must be installed on the cap chute approximately 5' from the elevator. This sensor starts the elevator automatically if there are no caps at the sensor. It also switches the conveyor off if caps are stopped at the sensor for longer than the timer relay has been set. The time delay should be just long enough to fill the cap chute work to capacity. Excessive delay will result in overloading caps on the belt.

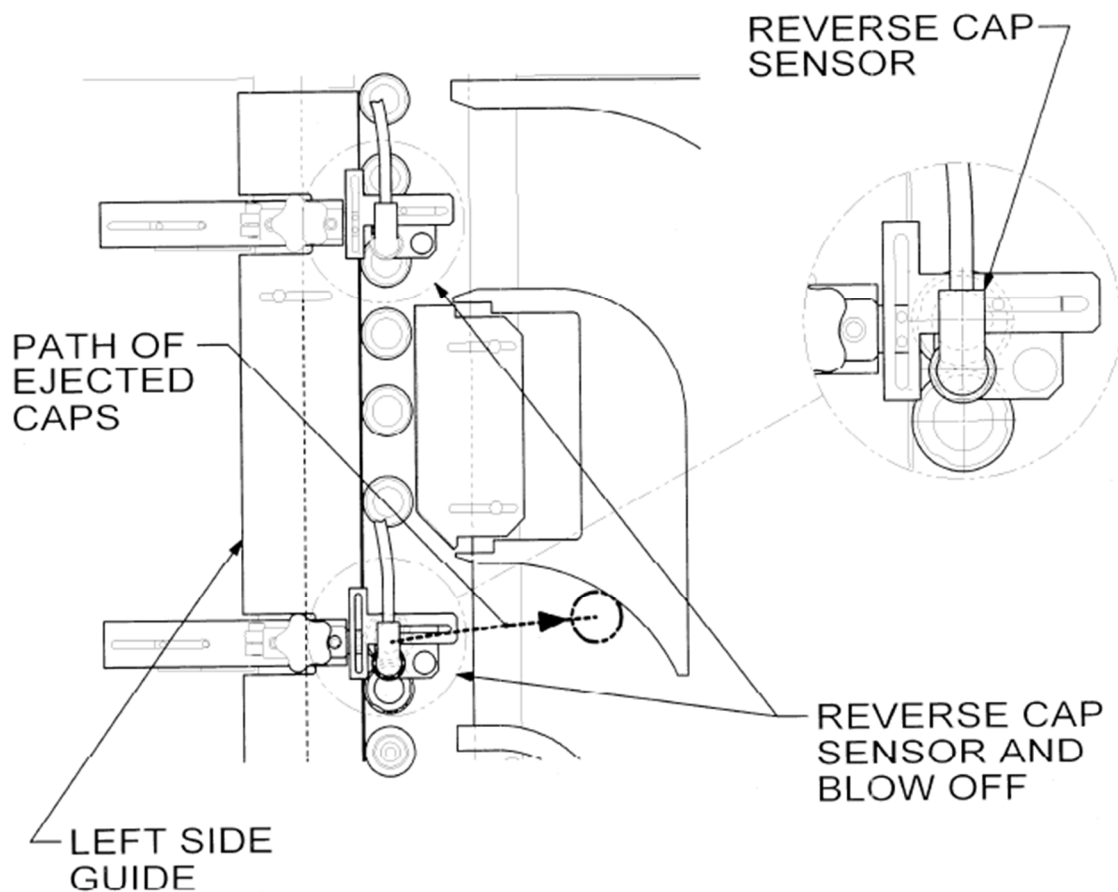
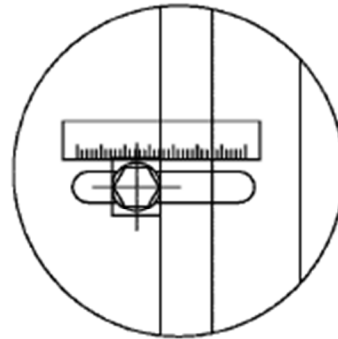


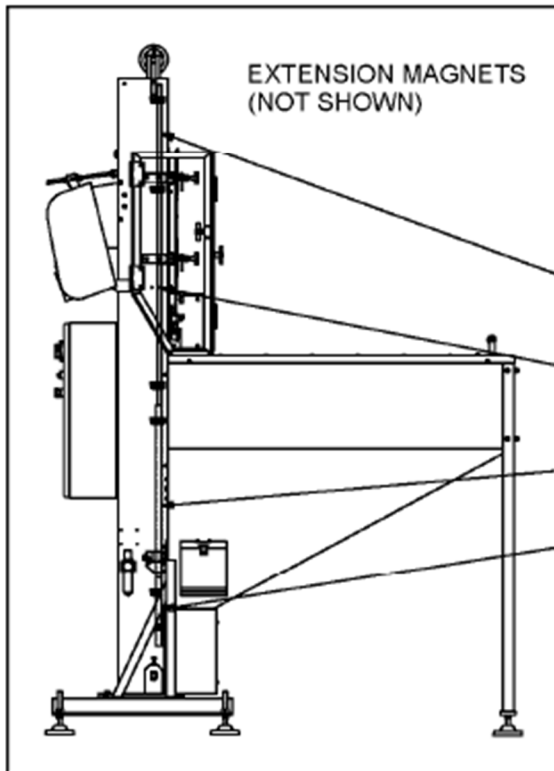
Figure 2-7: Blow Off System

2. SET UP PROCEDURES

See hard copy original manual sent by Silgan Equipment for factory Magnet Settings.



TYPICAL ENLARGED
VIEW OF MAGNET
ADJUSTING SCREWS



MAGNET NO.	MOUNTING SCREW	SCALE NO. SETTING (1)	SCALE NO. SETTING (2)
8	TOP		
	BOTTOM		
7	TOP		
	BOTTOM		
6	TOP		
	BOTTOM		
5	TOP		
	BOTTOM		
4	TOP		
	BOTTOM		
3	TOP		
	BOTTOM		
2	TOP		
	BOTTOM		
1	TOP		
	BOTTOM		

NOTE:
RECORDING MAGNET POSITIONS
MAY BE HELPFUL TO RESTORE
SETTINGS IF THE ADJUSTMENTS
ARE MOVED.

SUBJECT: SET-UP PREPARATION FOR XXXXXXXX

APPROVED BY: XXXXXXXXXXXX

Approval Date: XXXXXXXXXXXX

3. INSTALLATION, ASSEMBLY, AND OPERATION

3.1 Electrical Specifications & Operator Controls

Electrical Specifications

Option - Standalone Controls 480Vac, 60 Hz., 3 phase

Incoming power fuse protection: 30 amps

Full load current: 17.2 amps (with max. number of air conveyors), 2.5 amps (with no air conveyors)

Short circuit current rating: 65 kA RMS symmetrical at 480VAC

Option - Auxiliary

Powered from capper either WC500 or WC200, power is sourced from the capper control panel. Refer to capper electrical specifications.

Control voltage: 24VDC

NEMA 4X enclosure rating

Operator Controls

Emergency Stop & Safety Circuit: Pressing the emergency stop button will stop all machine operations and remove power from the electrical devices. The emergency stop button must be pulled back out before machine will restart.



Danger

Do not use the emergency stop button as a substitute for a machine lockout.

When the machine is first powered, and after the emergency stop button has been pressed, the safety circuit will be disengaged. Before the machine can be restarted, press the safety reset button. The button will illuminate, indicating the safety circuit is now engaged, and the machine can be restarted.

When the hopper is auxiliary powered from the capper control panel, the capper and hopper share the same estop safety circuit. Pressing the emergency stop button at either the hopper or capper will shutdown both machines.

3. INSTALLATION, ASSEMBLY, AND OPERATION

Hopper start / stop: Pressing the **hopper start** button will start, or arm the hopper. The hopper motor may not immediately turn on, but it may start running whenever cap feed is called for. The hopper stop button will disarm the hopper.

There are remote hopper start and stop buttons at the capper HMI control box. This may be connected into the hopper run circuits. When connected, these pushbuttons will also arm and disarm the hopper.

Feed on/auto/off: Three pushbuttons determine the state of the feed control of the hopper. The pushbutton will illuminate according to the current state of the feed control.

Pressing the **feed auto** pushbutton will latch in the auto feed control. This is the normal operating state during production. The hopper conveyor belt will start and stop according to the demand seen by the control sensor prox21. When prox21 sees caps backed up, the belt will not run. When prox21 sees no backup of caps, the belt will be allowed to run.

Pressing the **force feed on** pushbutton forces on the hopper conveyor belt as long as the hopper is armed, regardless of the state of prox21. This function is useful during setup and to empty the hopper and run caps through the system at the end of a production run.

Pressing the **force feed off** pushbutton forces off the hopper conveyor belt, regardless of the state of prox21. This function can be useful during system setup.

The operator pendant has these three pushbutton controls, so that the belt can be manually started and stopped while doing setups around the machine.

If the **hopper start** pushbutton is pressed for more than two seconds, the feed mode latches to the auto state. This is useful for arming the hopper and ensuring auto feed is active while at the capper pushbutton station.

Normally, the upside-down cap blowoffs will not activate when the hopper is not running. While setting up the upside-down cap blowoffs, it may be desired to allow the solenoid valves to be energized when the prox sensor is activated. This can be achieved by pressing the **feed auto** and **force feed on** buttons at the same time. You will know this **test mode** is active by the pushbutton lights flashing. Cancel this **test mode** by pressing any of the 3 feed control buttons.

3. INSTALLATION, ASSEMBLY, AND OPERATION

Timed Adjustments

Timing adjustments are made from the front of the PLC, which is located inside the pushbutton box mounted on the hopper.

Feed Stop: This is the delay from backup control sensor prox21 seeing a cap backup (solid caps in sensing range) to the time when belt conveyor will stop. Too long of a delay will allow caps to backup into the exit of the hopper, which can result in too many cap jams on restart.

Feed restart delay: This is the delay from backup control sensor prox21 no longer seeing a cap backup (solid caps in sensing range) to the time when belt conveyor will restart. Too long of a time delay will cause the caps at the inlet to the capper to run out, resulting in a capper shutdown.

Bin low level alarm: This is the delay from bin level sensor prox23 seeing caps in the bin, to the time when the alarm light at the top of the hopper will illuminate.

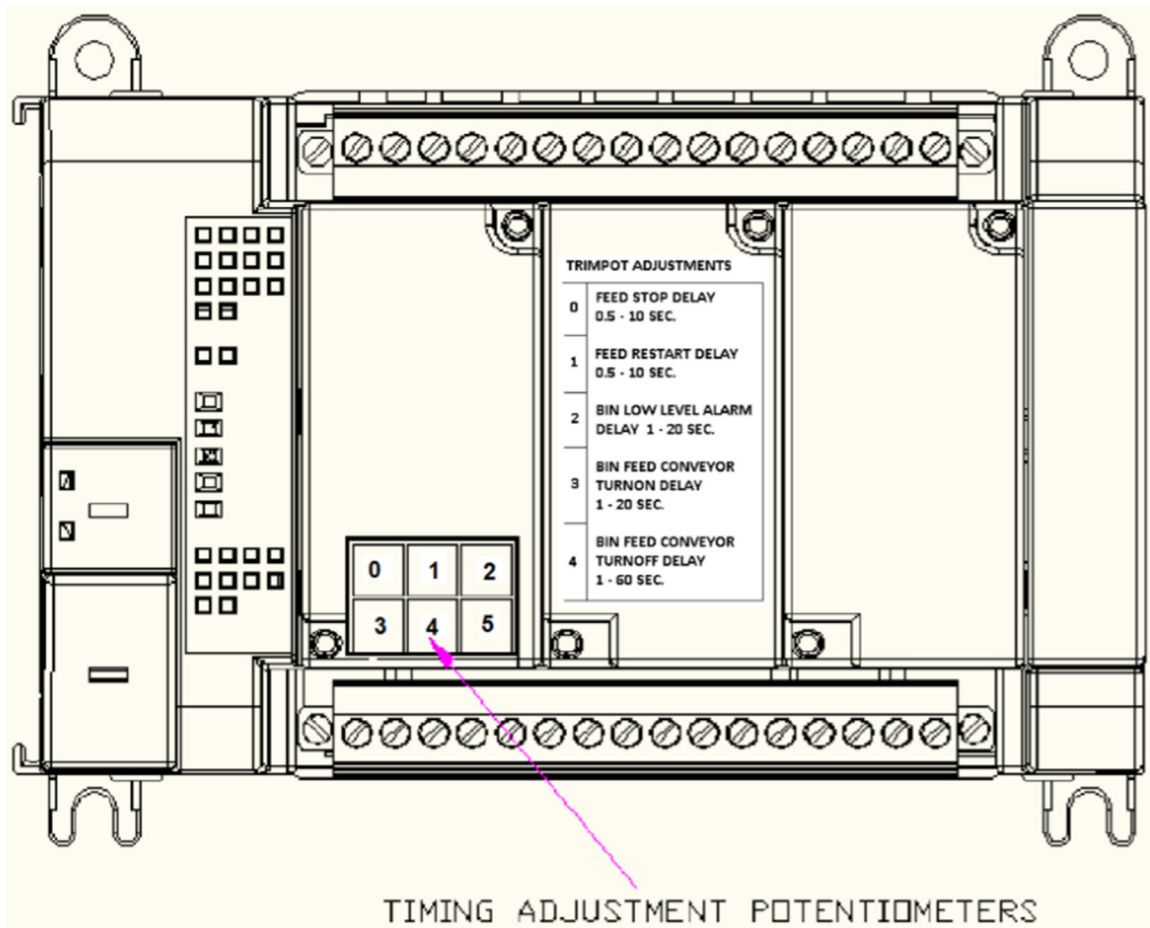


Figure 3-1: Timing Adjustment Potentiometers

3. INSTALLATION, ASSEMBLY, AND OPERATION

Bin Feed Conveyor Turn On Delay: Relay CR12 can be used to control a conveyor belt that delivers caps to the hopper bin. This is the delay from bin level sensor prox23 seeing no caps in the bin, to the time when CR12 will turn on (turning on the feed conveyor).

Bin Feed Conveyor Turn Off Delay: This is the delay from bin level sensor prox23 seeing caps in the bin, to the time when CR12 will turn off (turning off the feed conveyor).

4. LUBRICATION

4.1 Lubrication Schedule

Lubrication Schedule					
Item	Equipment	10 Hrs.	50 Hrs.	Monthly	Annually
1	Drive Pulley Bearings			X	

Figure 4-1: Lubrication Schedule

4. LUBRICATION



LUBRIPLATE®

MATERIAL SAFETY DATA SHEET

SECTION 1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

LUBRIPLATE® Lubricants Co.
129 Lockwood St.
Newark, NJ 07105

Emergency Telephone Number:
1-800-255-3924-CHEM-TEL (24 hour)
Telephone Number for information:
1-973-589-9150

SUBSTANCE: LUBRIPLATE FMO 2400-AW

NSF Registration H-1 Number: 122671

TRADE NAMES/SYNONYMS:

PRODUCT USE: Petroleum lubricating oil

CREATION DATE: 02/19/2008

REVISION DATE: 06/07/2012

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT: White mineral oil (petroleum)

CAS NUMBER: 8042-47-5

EC NUMBER (EINECS): 232-455-8

PERCENTAGE: 45-50

COMPONENT: Polybutene

CAS NUMBER: 9003-29-6

EC NUMBER (EINECS): 500-004-7

PERCENTAGE: 45-50

COMPONENT: Proprietary additive package

CAS NUMBER: NA

EC NUMBER (EINECS): NA

PERCENTAGE: 0-5

NOTE: The IP 346 value of the mineral oil is less than 3%

SECTION 3 HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: Irritation

LONG TERM EXPOSURE: Lung damage

SKIN CONTACT:

4. LUBRICATION

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SHORT TERM EXPOSURE: Irritation

LONG TERM EXPOSURE: Irritation, skin disorders

EYE CONTACT:

SHORT TERM EXPOSURE: Irritation

LONG TERM EXPOSURE: No information available

INGESTION:

SHORT TERM EXPOSURE: Diarrhea, difficulty breathing

LONG TERM EXPOSURE: no information on significant adverse effects

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM (HMIS):

Health – 1

Flammability – 1

Reactivity – 0

Not a Controlled Product under (WHMIS) – Canada

Special Protection: See Section 8

SECTION 4 FIRST AID MEASURES

INHALATION: Vapor pressure is very low and inhalation at room temperature is not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician.

SKIN CONTACT: Remove any contaminated clothing and wash with soap and warm water. If injected by high pressure under skin, regardless of the appearance or its size, contact a physician IMMEDIATELY. Delay may cause loss of affected part of body.

EYE CONTACT: Flush eyes with clear water for 15 minutes or until irritation subsides. If irritation persists, consult a physician.

INGESTION: If ingested, call a physician immediately. Do not induce vomiting.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard

EXTINGUISHING MEDIA: Foam, dry chemical, carbon dioxide or water spray (fog)

FIRE FIGHTING: Cool exposed containers with water. Use air-supplied breathing equipment for enclosed or confined spaces.

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products or combustion: oxides of carbon, oxides of sulphur

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE: Recover liquid, wash remainder with suitable petroleum solvent or add absorbent. Keep petroleum products out of sewers and watercourses. Advise authorities if product has entered or may enter sewers and watercourses.

4. LUBRICATION

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SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Keep container tightly closed. Keep away from heat, sparks, and flame. See original container for storage recommendations. Keep separated from incompatible substances.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:

White mineral oil:

MINERAL OIL MIST:

5 mg/m³ UK OES TWA

10mg/m³ UK OES STEL

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant (nitrile) gloves.

RESPIRATOR: Consider the need for appropriate protective equipment, such as self-contained breathing apparatus, adequate masks and filters.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid

APPEARANCE: transparent

COLOUR: colorless

PHYSICAL FORM: oil

ODOR: mineral oil odor

BOILING POINT: >288 C

FREEZING POINT: Not available

FLASH POINT: 229 C (COC)

LOWER FLAMMABLE LIMIT: 0.9% by volume

UPPER FLAMMABLE LIMIT: 7.0% by volume

AUTO IGNITION: 254 C (COC)

VAPOUR PRESSURE: <0.01 mm Hg

VAPOR DENSITY (air=1): >5

SPECIFIC GRAVITY (water=1): 0.88

DENSITY: not available

WATER SOLUBILITY: negligible

pH: not available

4. LUBRICATION

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VOLATILITY: not available

ODOR THRESHOLD: not available

EVAPORATION RATE: <0.01 (Butyl acetate-1)

VISCOSITY: 30 mm²/s @ 100 C

COEFFICIENT OF WATER/OIL DISTRIBUTION: not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressures

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with strong oxidants like liquid chlorine, concentrated oxygen.

INCOMPATIBLES: Oxidising materials, chlorine

HAZARDOUS DECOMPOSITION:

Thermal decomposition products or combustion: oxides of carbon, oxides of sulphur

POLYMERISATION: Will not polymerise.

SECTION 11 TOXICOLOGICAL INFORMATION

White mineral oil (petroleum):

TOXICITY DATA:

Greater than 5,000 mg/kg LD50 oral-rat

Polybutene:

TOXICITY DATA:

Greater than 34,600 mg/kg LD50 oral-rat

Proprietary additive package:

TOXICITY DATA:

No data available

SECTION 12 ECOLOGICAL INFORMATION

Not available

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations

4. LUBRICATION

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SECTION 14 TRANSPORT INFORMATION

LAND TRANSPORT ADR: No classification assigned.

LAND TRANSPORT RID: No classification assigned.

AIR TRANSPORT IATA: No classification assigned.

AIR TRANSPORT ICAO: No classification assigned.

MARITIME TRANSPORT IMDG: No classification assigned.

SECTION 15 REGULATORY INFORMATION

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not classified as dangerous.

SECTION 16 OTHER INFORMATION

The above information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of LUBRIPLATE Lubricants Company. The data on these sheets relates only to the specific material designated herein. LUBRIPLATE Lubricants Company assumes no legal responsibility for use or reliance upon this data.

5. TROUBLESHOOTING GUIDE

5.1 Troubleshooting Guide

Troubleshooting		
Problem	Possible Cause	Action
Insufficient Output	Belt Requires Cleaning	Inspect: - Use a mild household cleaner or plain soap and water. Allow sufficient dry time. - The belt may be dressed with bee's wax if necessary.
Insufficient Output	Cap Metering Tunnel Set Too Low	Inspect: Adjust to maintain the cap level at approximately the height of the upper adjusting bar on magnet #1 or about 40 inches below the bottom of the sortation cabinet.
Insufficient Output	Air Knife Output Too Strong or Poorly Positioned	Inspect: - Decrease air flow. - Adjust air knife away from belt.
Insufficient Output	Magnet #1 and/or Magnet #2 Setting Too Light or Poorly Positioned	Inspect: - Review setup procedures for correct magnet and side guide positioning. - Move magnet toward belt to increase cap flow. - Move top of magnet #2 to the right. (Overapplication of magnet #2 will sharply increase doubled caps) - Move top of lower side guide to the left.
Insufficient Output	Agitator Not Functioning	Inspect: Inspect and clear the agitator of any debris limiting its movement
Insufficient Output	Speed Dial Setting Too Low	Inspect: Increase setting to achieve desired output. Large speed changes may require resetting of blow off timing and adjustment of magnets.

5. TROUBLESHOOTING GUIDE

Troubleshooting		
Problem	Possible Cause	Action
Excess Doubled Caps	Magnet #2 Setting Too Strong or Poorly Positioned	Inspect: - Review setup procedures for correct magnet and side guide positioning. - Move magnet away from belt to allow doubles to fall away. - Move top of magnet #2 to the left. - Move top of lower side guide to the right.
Excess Doubled Caps	Air Knife Output Too Weak or Poorly Positioned	Inspect: - Increase air flow. - Adjust air knife position in relation to the belt.
Excess Doubled Caps	Doubles Blow Off Not Aimed and/or Timed Correctly	Inspect: - Adjust nozzle to eject the double <u>and</u> the cap it is riding on. - Adjust the sensor position. Early or late timing will disturb caps before or after the doubled cap and create excess doubles. - If the sensor is positioned too close to the belt or is angled toward the belt, multiple spurts of caps will be ejected resulting in the illusion of excessive doubles.
Caps “Flutter” and Fall Back in Blow Off Region	Magnet Setting Too Light	Inspect: Adjust magnet toward belt. (Over-application of magnet will inhibit blow off.)
Caps Stand on Edge and Roll Against Left Side Guide	Magnet Adjusted Too Far to Left	Inspect: Move magnet to right until the problem is corrected.

5. TROUBLESHOOTING GUIDE

Troubleshooting		
Problem	Possible Cause	Action
Ejected Caps Return To Belt	Incorrect Blow Off Timing	Inspect: Slide cap sensor up or down as required. See fig. 1, 2 & 3 on following page.
Ejected Caps Return To Belt	Weak Air Supply	Inspect: - Adjust pressure regulator to 100psi. - Restore air source.
No Caps Are Ejected	No Air Pressure	Inspect: Restore air source.
No Caps Are Ejected	Reverse Cap Sensor Not Functioning	Inspect: - Replace sensor. - Repair electrical control.

5. TROUBLESHOOTING GUIDE

