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READ

INSTALLERS AND OPERATORS OF THIS EQUIPMENT SHOULD READ THIS ENTIRE DOCUMENT BEFORE ATTEMPTING TO HANDLE OR OPERATE THE PINCH BAG CLOSER (PBC 6000) SYSTEM.

BE SURE TO LOCATE AND READ THE ADDITIONAL COMPONENT MANUALS STORED IN THE ELECTRICAL ENCLOSURE.

1. INTRODUCTION

The Fischbein Company is a premier packaging company that specializes in bag closing systems. The original one-man business, founded and established by Dave Fischbein in Minneapolis, Minnesota in 1910, has now grown to an international firm recognized as the global leader in bag closing technology which manufactures a variety of state-of-the-art bag closing and handling machines for diverse packaging applications. Fischbein's first portable sewing machine for bag closing was developed over 50 years ago and is still widely used throughout the world for a variety of bag closing applications. Through our bag sewing, closing and sealing technologies, Fischbein offers automated solutions for nearly every powder and bulk material packaging requirement.

The product line has greatly expanded from those early days, and the company continues to lead the industry in helping customers increase productivity through improved product production with efficient, up-to-date automated packaging solutions.

This Operator's Manual is intended to help our customers set up, operate and maintain their new Fischbein **P**inch **B**ag **C**loser System (**PBC**). For information not covered in this manual, you can contact Fischbein through the worldwide web at **www.fischbein.com** or by writing or calling our North American or European offices:

North American Office
Fischbein Company
151 Walker Road
Statesville, NC 28625
Phone: (704) 871-1159
FAX: (704) 872-3303

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Paepsem Business Park
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1070 Brussels, Belgium
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1.1 GENERAL SAFETY PRECAUTIONS

The PBC 6000 system is driven by strong motors, contains moving parts with pinch points and sharp edges and hot machine surfaces. Therefore, technical training and familiarity with this type of equipment are required to operate and maintain the system. Installers and operators of PBC 6000 should wear proper eye, foot, and hand protection. Turn off and lock out air and power sources when cleaning or performing maintenance. Once the air source has been locked out, existing air pressure in the system will be released.

1.2 SAFETY STATEMENT

FISCHBEIN IS NOT RESPONSIBLE FOR DAMAGE OR INJURIES CAUSED BY MISUSE OF THE EQUIPMENT, FOR CARELESS OPERATION OR IF IT IS USED TO SEAL MATERIALS FOR WHICH IT WAS NEVER DESIGNED. Installers of this machine should wear eye and foot protection at all times and gloves when working around the hot machine surfaces. Operators must always wear proper eye protection when operating this machine and not wear loose clothing or jewelry. Long hair must be pulled back and tied to avoid getting caught in the belts and rollers.

1.3 REVISION CHANGES

The revision of this manual has been upgraded to D to reflect the improvements to the assemblies on drawings 17708 and 17701A in the back of this manual.

2. WARRANTY STATEMENT

Nothing contained in this document is intended to extend any promise, warranty or representation, expressed or implied, regarding the FISCHBEIN products described herein. Any such warranties or other terms and conditions of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request. FISCHBEIN reserves the right to make changes and improvements to products without notice and without incurring any obligation to make such changes or add such improvements to products sold previously.

3. WARNINGS

- Always use ***genuine*** Fischbein parts. Our parts are specifically designed for Fischbein equipment to provide optimum performance and safety. Use of non-Fischbein parts can also void the product warranty.

- Employees shall receive training by the employer on proper equipment operation and shutdown of this machine.
- Let the machine do the work. Do not pull the bag or materials through it.
- This PBC 6000 system is not suitable to operate in an area where explosive materials are present (explosive gas, powders, vapors or liquids).

- Read and follow the manuals for the devices used in the PBC 6000 System. The accompanying manuals are in the electrical enclosure. These manuals will provide the appropriate instructions for operating and maintaining individual components.

- When used in a dusty environment, NEMA12 (IP54) electrical equipment must be used.

- Frequently clean the machine to prevent accumulation of dust, bag and glue materials. Doing this prevents the accumulation of material that may cause malfunctions or poor bag seals.

- Frequently, clean the compression rollers by using a dull edge to remove excess glue. Be careful not to cut or gouge the belt surface.

- The PBC 6000 utilizes two HI-temperature heater cartridges. The surfaces surrounding the hot air manifold will become **hot** and can cause burns if touched. **Never operate the machine without the guards**. Be careful while operating the machine to avoid being injured.

- Electrical service and troubleshooting of this unit must be performed by trained and qualified personnel. Any OSHA regulations such as electrical and pneumatic lockouts must be followed.

- Turn off the Pinch Bag Closer at the main switch and remove all power going to the electrical box before making adjustments to the machine.

- Do not operate this machine with guards removed!

- Replacement of the quick release air coupling (P/N P4945) may violate OSHA safety regulation #1910 for controlling hazardous energy, which may cause serious personal injury. See equipment shutdown procedures.

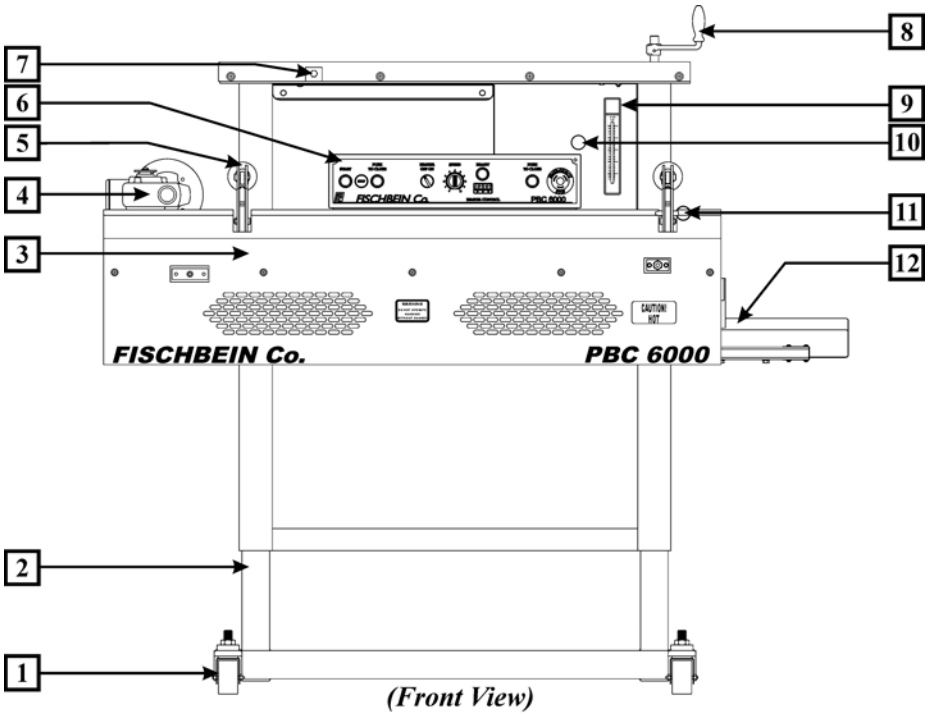
4. COMMON APPLICATIONS OF THE PBC 6000

The PBC 6000 is a heavy-duty, production line system that folds and closes pre-glued, multi-wall paper bags with a fold of up to **1 7/8 inches (48 mm).** Note: the PBC is also available with the option to fold 2 3/8" folds. The system is designed for easy opening as a primary safety factor in case of an emergency. This feature also prevents the motor from overload if a bag becomes jammed.

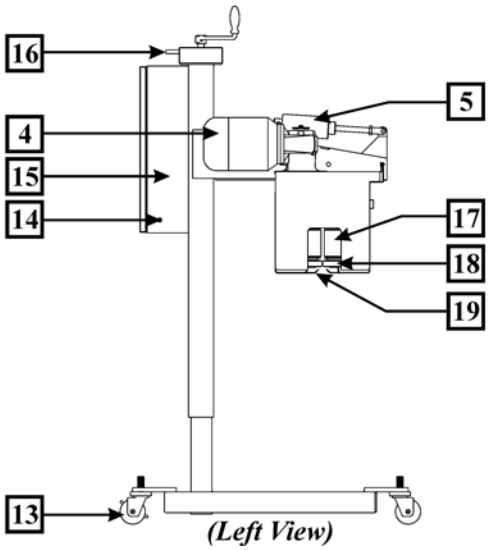
The patented break-away feature provides immediate access to the machine's heating assembly, drive belts, and other moving parts requiring maintenance. The unit is compact and adjustable to allow various bag sizes, conveyor speeds, and heights.

This equipment services the bagging needs of a broad range of products. Common uses include flour, pet food, agricultural seed, animal feeds, feed additives, lawn fertilizers, absorptive materials, industrial and agricultural chemicals, powdered dairy products, and bakery mixes.

4.1 SYSTEM ILLUSTRATION



(Front View)



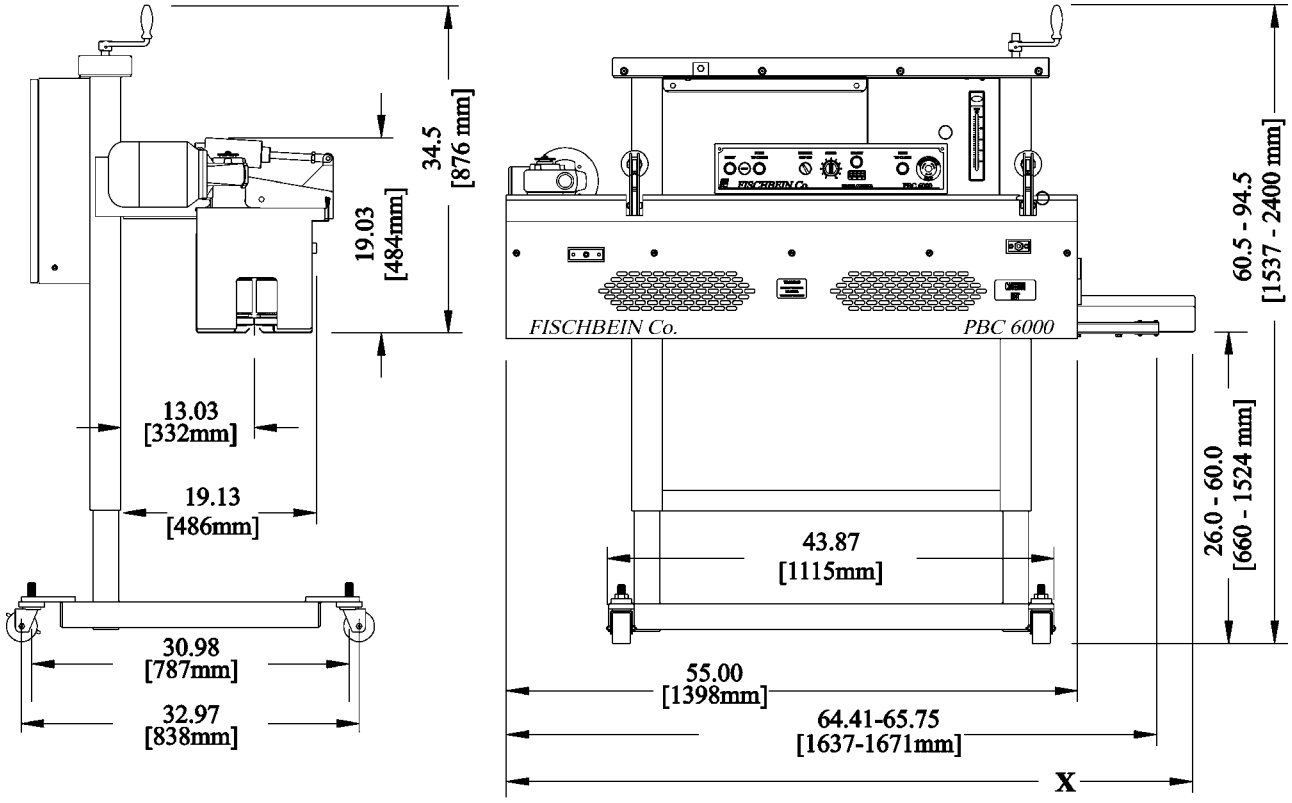
(Left View)

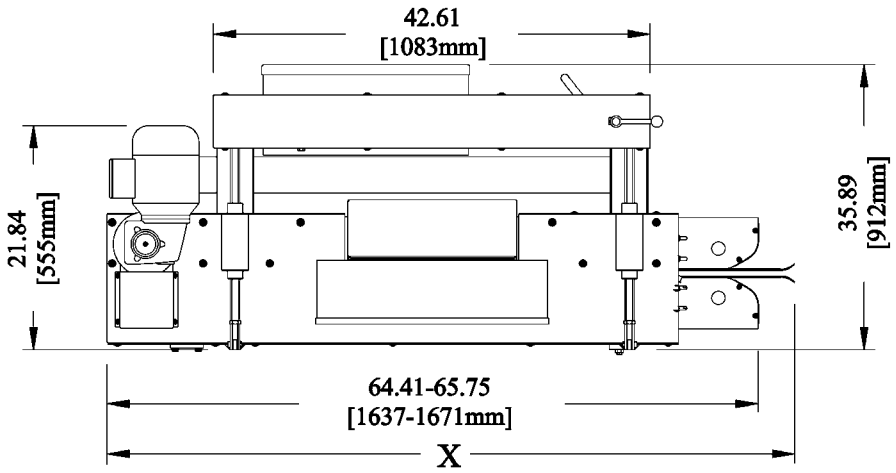
1. Casters (2) standard
2. Frame (pedestal and overarm)
3. Swing Arm Assembly
4. Motor, Drive – Gear
5. Cylinder, Pneumatic – Swing Channel
6. Electrical Control Panel
7. Chain Tension Assembly
8. Height Adjustment Handle
9. Flowmeter
10. Air Flow Regulator
11. Pin, Swing Arm-Holding (for shipping only)
12. Infeed (*Automated Style Shown*)
13. Locking Casters (2)
14 Electrical Connection
15. Electrical Enclosure
16. Height Adjustment Lock
17. Compression Belts
18. Carry Through Belts
19. Belt Guards

4.2 SYSTEM CHARACTERISTICS

PHYSICAL CHARACTERISTICS

Total palletized system weight: 770 lbs. (350 kg)
Total system weight: 710 lbs. (323 kg) (standard machine)
System Dimensions:





NOTE: The X-dimension can have the following values:

Infeed for Automated Line:	**X = 67.33in (1710mm)**
Infeed for Manually fed Bags:	**X = 72in (1829mm)**
Extended Infeed for Automated Line:	**X = 82.33in (2091mm)**

Air Consumption Minimum Requirement: 420 SCFH (11,9 SCMH)
Air Pressure Requirement: 90 PSI (6,2 bar) (with ½ inch air line)
Swing Channel Design: The PBC 6000 is designed with a front breakaway channel, which swings outward. This allows quick access into the machine for safety, to clear bag jams, cleaning and maintenance.
Air Scrubber: Blows debris from the bag top that could otherwise prevent a good seal.
Caster Wheels: Two locking in the back and two standard wheels in the front.

Electrical Requirements: The following electrical information is in accordance with provision 4.7.1 from NFPA 79 (National Fire Protection Association) Electrical Standard for Industrial Machinery, 1997 Edition:

TABLE 1

MODEL	VOLTAGE	PHASE	HERTZ	F.L.A.	MAX. COMP. LOAD
PBC 6000	230	1	60	22	14
PBC 6000	230	3	60	19	14
PBC 6000	380	3	50	12	8
PBC 6000	460	3	60	10	7
PBC 6000	575	3	60	9	5.5

PERFORMANCE CHARACTERISTICS

System Speed Ranges:
(Range 1): Standard: 30-85 feet per min (9,1 – 25,9 meters per min)
(Range 2): Greater than 85 feet per minute (25,9 meters per minute)
(Range 3): Less than 30 feet per minute (9,1 meters per minute)
NOTE: Speeds above 85 FPM (25,9 MPM) are obtainable upon request, but are dependent upon bag types; please consult the Fischbein representative to determine the machine capabilities, given the closing requirements.

Fold Size Maximum: **1 7/8 inches (48mm)**

Bag Jam Detector: A proximity switch that shuts the heaters off and swings open the front channel in the event of a detected bag jam.

Bag Size Range (empty):

Width:	Variable
Length:	56 inches (1422mm) maximum
Minimum Free Top:	6 inches (153mm) (standard fold minimum)
Overheat Sensor:	Shuts down the heaters if the temperature rises above a set maximum. Still allows air to flow through the hot air manifold to cool the heaters and prevent any damage.

4.3 ACCESSORIES AND OPTIONS

The PBC 6000 is available by request with some special options:

Larger Folder:	Kits are available to convert Left-to-Right and Right-to-Left PBC machines with 1 ¾" folders to 2 3/8" folders and to convert 2 3/8" folder to 1 ¾".
Extended Infeed:	An automated 17inch (432mm) infeed is available for specific applications.
Infeed Options:	The PBC is available with an automated infeed or a manual infeed. The manual infeed is extended and has a bag guide to assist the operator in properly feeding a bag top into the machine. Some kits are available to convert between automate and manual infeeds.
Bag Counter:	The PBC 6000 is capable of having a digital bag counter mounted on the face of the electrical control panel.
Coder:	An ink coder is available for printing on the front or back side of the bag.
Air Dryer:	For compressed air systems that do not dry their air, an air dryer is available for the PBC pneumatic system.
Height Extension:	The PBC frame is available with an extension for the vertical range of motion. The extension adds about 12 inches (304,8mm) to the height range of the machine.
Motorized Height Adjustment:	The standard PBC 6000 comes with a manual system to raise and lower the machine. A motorized system is available, with a control switch on the front control panel. The system also has electrical limit switches to prevent the machine from going too far on the ACME screws within the frame.
Left to Right:	The standard PBC 6000 transports and seals bags through its system in a right to left direction. The machine can be ordered to seal the bags in a left to right orientation.
Reverse Fold:	The standard PBC 6000 folds the bag top towards the front of the machine. It can be ordered to seal the bag by folding the top towards the rear of the machine. This option is also available in the left to right oriented machines.
NEMA 4:	The PBC 6000 is available in a NEMA 4 configuration.
Bearings Kit:	Optional drive shaft upgrade bearing kit (#17896). Includes heavy duty flange bearings and drive shafts.

5 INSTALLATION

5.1 RECOMMENDED WORK AREA LAYOUT

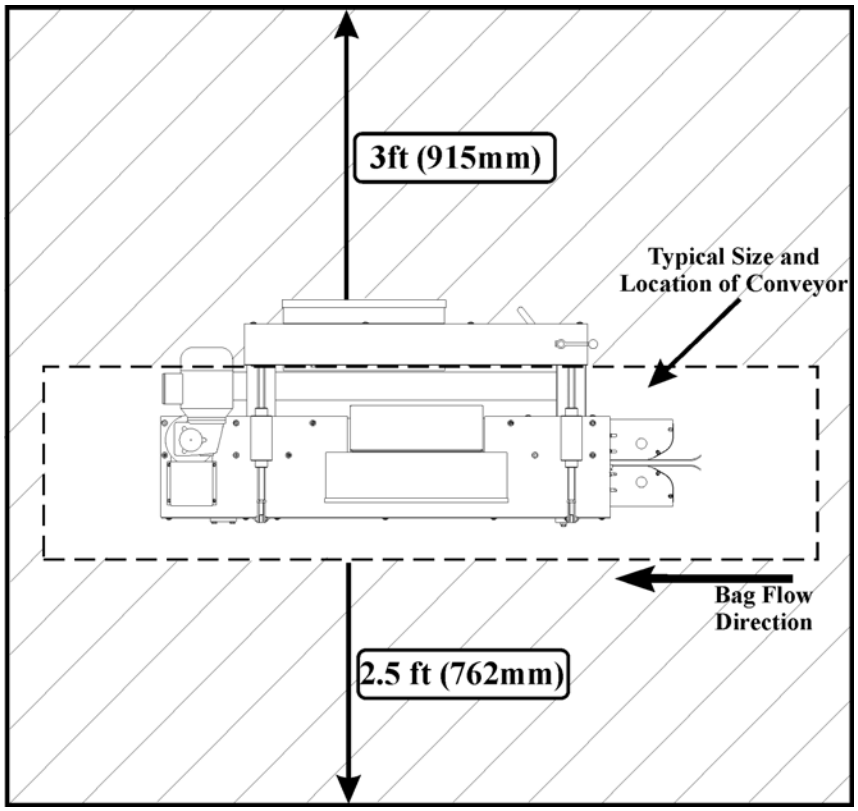


Illustration 5.1 *(Top View)*

5.2 SITE AND SYSTEM PREPARATION

ELECTRICAL POWER HOOKUP

The system is wired at the factory for the voltage specified when ordered. Customers are required to supply incoming electrical connections. SO 12/4 (12 AWG/4 wire) (4 mm^2) is recommended. **CAUTION: Be sure machine is connected to building electrical ground**. Follow National Electrical Code (NEC) and all local electrical codes during installation. **Note:** *Electrical schematics for each unit's particular voltage option are shipped inside the electrical connection box on the back of the unit.* For load specifications refer to **TABLE 1 on page 8**.

PNEUMATICS HOOKUP

Connect the air source with a female quick release air coupling (Foster Series 3, #3003 or equivalent) to the safety shut-off valve, located on the pneumatic control panel (**Illustration 6, page 14**). Air hose connections must have a minimum 1/2 in. (13 mm) ID. The PBC 6000 requires compressed, clean, dry, non-lubricated air. The supply must be capable of sustaining 90 PSI (6,2 bar) of pressure and a volume flow rate of at least 400 SCFH (11,3 SCMH).

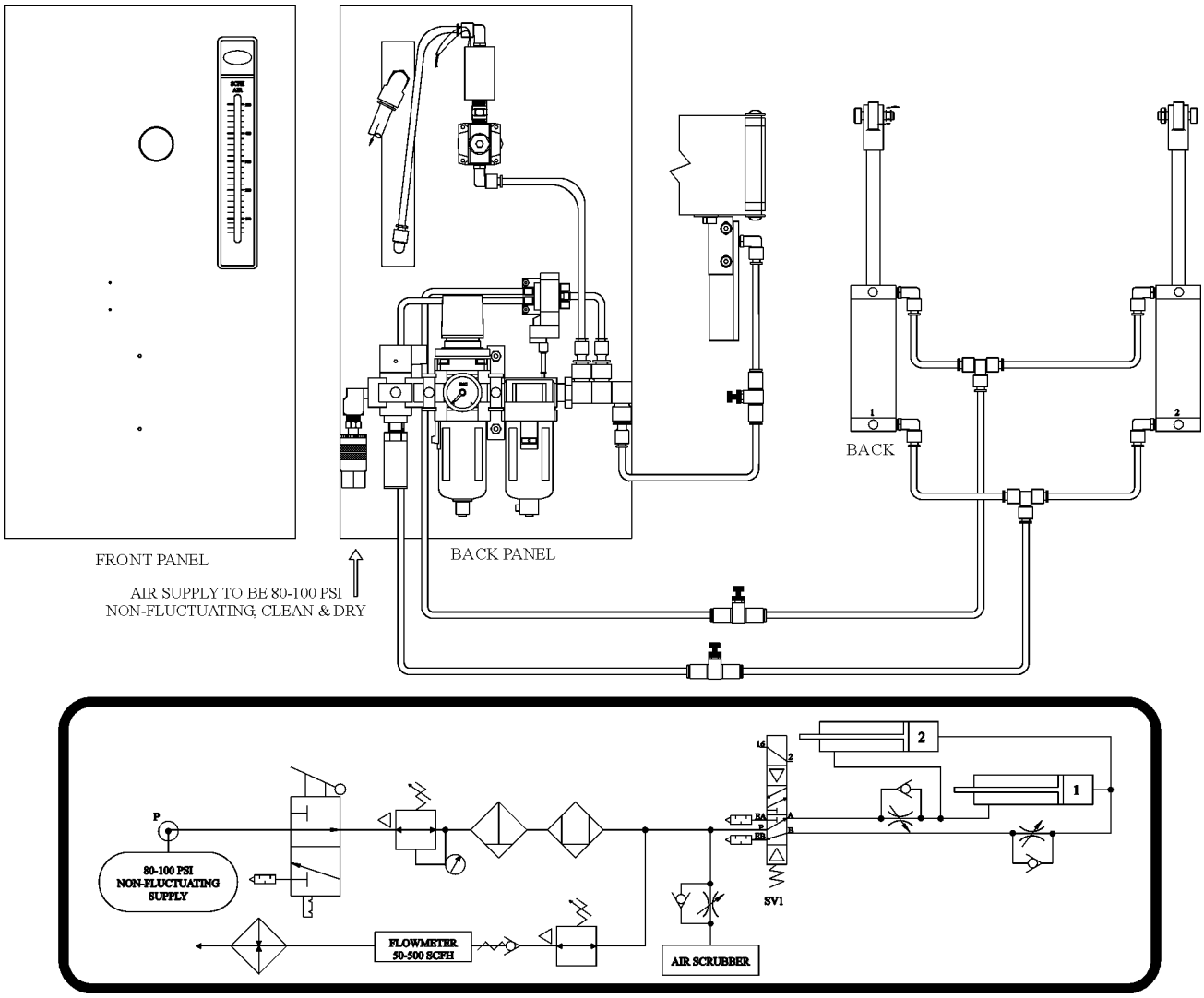


Illustration 5.2 *(Pneumatics Diagram and Schematic)*

5.3 UNPACKING PROCEDURE

Every Fischbein system is packaged to protect the unit during normal shipping, storage and handling. Before the unit is unpacked, inspect the box and skid for any signs of shipping damage. If possible, record any suspected shipping damage with a digital or Polaroid® camera. Report anything missing or any damages in writing to the shipper and your Fischbein representative.

CAUTION: ***A packaged, palletized PBC 6000 system with all options weighs approximately 820 lbs. or 373kg and is dimensionally (74"x 56"x 71") (1880mm x 1422mm x 1803mm) in size.***

1. Cut the two plastic straps and remove the lid. At least 7 feet (2,13 m) overhead clearance will be needed to remove the box itself.

2. Using a pry bar and claw hammer, pry out the nails that fasten the box to the pallet. With the aid of a forklift, carefully lift the box up and off the PBC system.

3. Any system that is exported will have a ferrous shroud film or bag covering the unit inside the box. Simply cut this away and remove. Also, a yellow Zerust® vapor capsule (approx. 2.25" x 1.5" x 1.0") or (57mm x 38mm x 25,4mm) will be attached to a hidden surface of the frame at its approximate center or a sample of moisture-absorbing powder will be placed in the bottom of the ferrous film. Find and remove this before continuing to unpack and install the system.

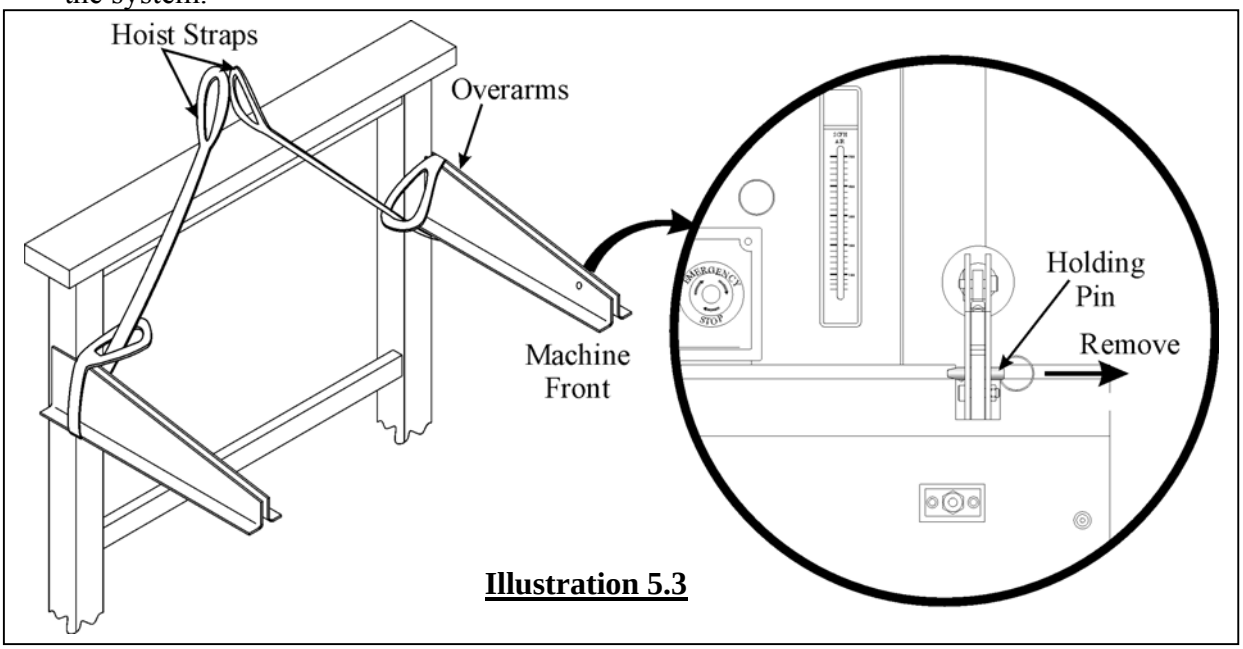


Illustration 5.3

4. Remove the lag bolts securing the frame to the crate's pallet. Locate the box of casters in the crate and prepare to mount them on the machine.
5. Use 1000 lb-rated hoist straps and loop them around the overarms of the machine's frame. (**Illustration 5.**3) Make sure they are do not pinch and wires or pneumatic hoses. Loop the straps securely over the forks of a forklift or an overhead hoist.
6. Use the forklift from the front or back of the machine to raise the machine above the pallet, just enough to slide the pallet from under the machine. (**Illustration 5.3**) Each side of the machine must be monitored as the machine is slowly lifted. Monitors must allow the machine to gently tilt forward, but prevent the machine from swinging.
7. Remove the pallet, mount the casters (locking casters in the rear) and lower the machine to the floor.
8. Roll the machine to the desired work area. Be sure to provide the needed space around the system as shown in **Illustration 5.1**.
9. Lock the rear caster wheels once the machine is in place.
10. The swing channel is held in the down position by a holding pin, installed for **shipment only**. Remove the pin. ***The machine should never be operated with the pin installed!*** (**Illustration 6.1**) ***NOTE:*** **The front swing channel will rotate open once the pin is removed.**

Once the machine is completely unpacked, inspect it for physical damage or missing components. Report anything missing or any damages in writing to the shipper and your Fischbein representative.

6 ON LINE PREPARATION

6.1 SAFETY GUIDELINES

Operators of the PBC 6000 system must be fully trained on the performance, operation, adjustments and safety standards of this machine before attempting to operate it. Long hair must be pulled back and tied to avoid getting caught in any moving parts of the system. Operators of this machine must wear eye and foot protection at all times and gloves when working around the hot or sharp machine surfaces. Operators must always wear proper eye protection when operating this machine and not wear loose clothing or jewelry.

The surrounding area around the machine must be kept clear of objects and potential hazards so the operator can have quick easy access to any part of the PBC. The PBC 6000 must never be operated without all of its components. The covers, guides, guards and shrouds must be installed on the machine when being operated. Only use the PBC 6000 for its intended use.

The PBC 6000 is equipped with a three position Motor Enabled Switch, located on the side of the electrical enclosure. (**Illustration 8.5, page 28**) The "**AUTO**" position is used during normal operation of the machine. The drive motor will only activate when the swing channel begins to close. The "**STOP**" and "**RUN**" positions are provided ***only*** for technicians, to perform maintenance on the machine. The "**STOP**" position disables the drive motor, but will still allow the pneumatic controls to work. The "**RUN**" position is used to enable the drive motor only when the machine is powered. This mode does permit the drive motor to rotate, when the swing channel is open.

Illustration 6.1

6.2 ELECTRICAL SYSTEM

The system is wired at the factory for the voltage specified when ordered. Customers are required to supply incoming electrical connections. SO 12/4 (12 AWG/4 wire) (4 mm^2) is recommended. **CAUTION: <u>Be sure machine is connected to building electrical ground</u>**. Follow National Electrical Code (NEC) and all local electrical codes during installation. **Note:** *Electrical schematics for each unit's particular voltage option are shipped inside the electrical connection box on the back of the unit.* For load specifications refer to **TABLE 1 on page 8**.

While performing maintenance to the machine, always turn "OFF" and lock out the electrical supply. (**Illustration 6.1**) Operate the PBC 6000 with the designed electrical needs. The electrical system of the machine should never be altered.

6.3 PNEUMATIC SYSTEM

Connect the air source with a female quick release air coupling (Foster Series 3, #3003 or equivalent) to the safety shut-off valve located on the pneumatic control panel (**Illustration 6.2**). Air hose connections must have a minimum 1/2 in. (13 mm) ID. The PBC 6000 requires compressed, clean, non-lubricated air. The supply must be capable of sustaining 90 PSI (6,2 bar) of pressure and a volume flow rate of at least 400 SCFH (11,3 SCMH).

The pneumatics control panel is equipped with a safety control valve. While performing maintenance on the PBC 6000, the pneumatic supply must be turned "OFF" and locked out. (**Illustration 6.2**) When shutting down the machine, always be sure that the heaters have COMPLETELY cooled before turning off the pneumatic supply. Not allowing the heaters to cool will damage the heater cartridges and the pneumatic tubing. The machine usually takes approximately 10-20 minutes to cool down enough to turn off the air supply under normal conditions.

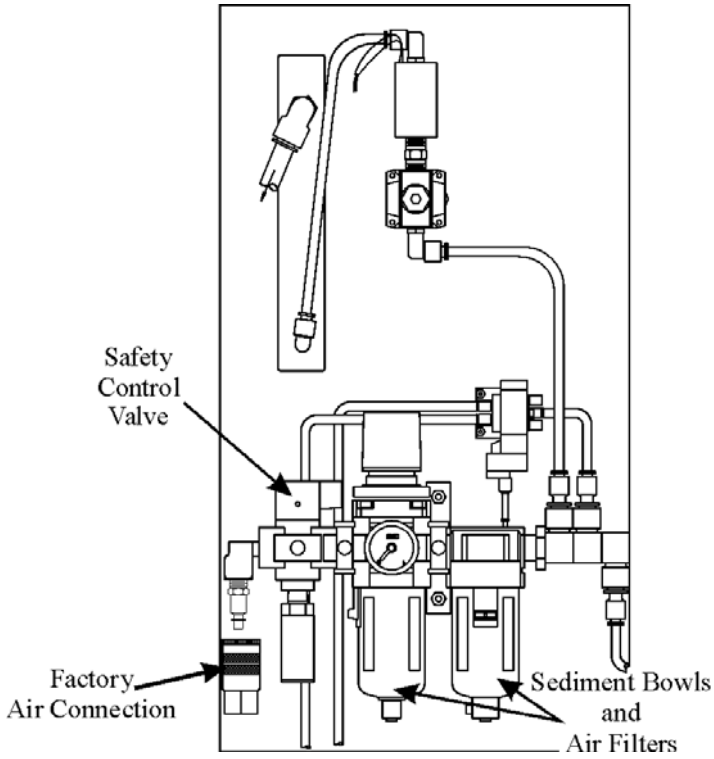


Illustration 6.2

6.4 LEVELING AND CENTERING

The quality of the bag seal depends on a number of factors. The most basic of these factors is whether the bag is being fed into the machine correctly. When first preparing the machine for operation, it must be properly placed vertically and horizontally in relation to the conveyor system.

LEVELING

To maintain an even fold on the bag top, the sealing operation of the PBC must run parallel to the conveyor. To check this, measure the distance between the bottom of the carry through belts and the surface of the conveyor belts. This distance should be the same at both the input and output ends of the PBC. (**Illustration 6.3**) If there is a significant difference, the bag seal will be uneven from leading to trailing edge of the bag. Make the necessary adjustments to achieve a parallel and straight seal line.

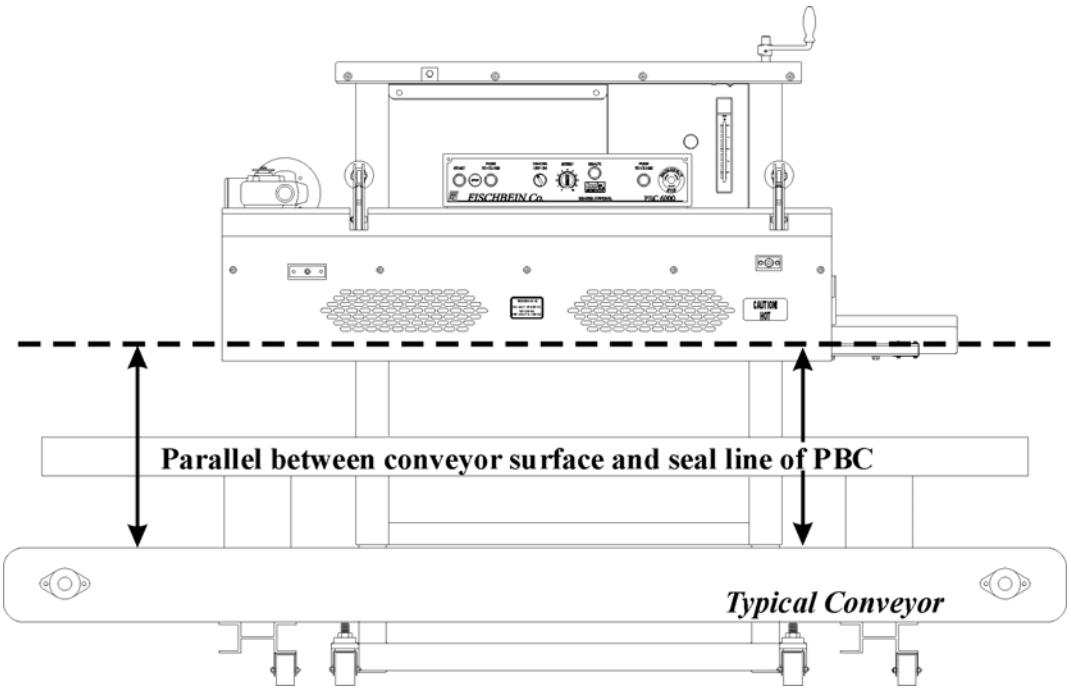


Illustration 6.3

CENTERING

There are two conditions to satisfy the centering required for a good seal. Where the two carry through belts come together to grasp the bag top, must be centered above the middle of the conveyor (i.e. the centerline of travel for the bags' path). (**Illustration 6.4**) If a bag enters the system too far towards the back or front of the machine, the bag may not enter the system straight (affecting the seal quality) or the bag may be tilted too far and tip over. If the bags are being fed into the system manually, the operators should be careful to center the bags between the carry through belts. For automated systems, the PBC 6000 can easily be moved after unlocking the two rear casters.

The second condition involves centering the bag top vertically with the carry through belts. The height adjustment on the PBC 6000 is used to bring the machine's creaser wheel (the device used to create the crease-line for the fold) to the correct elevation with the entering bags. To determine the correct height, allow a filled bag sample to come up to the infeed on the PBC and then stop the conveyor system. Note the location of the glue line on the bag top. The bottom edge of the glue line should be just above the creaser wheel. It can be a little higher, but the crimp must be made below the bottom of the glue edge. (**Illustration 6.5**)

For the manual infeed, once the creaser wheel has been adjusted to the correct height, the bag top guide can be adjusted (vertically) to match the height of the bag top. (**Illustration 6.6**) The guide is provided to help operators feed the bag into the machine at the correct height.

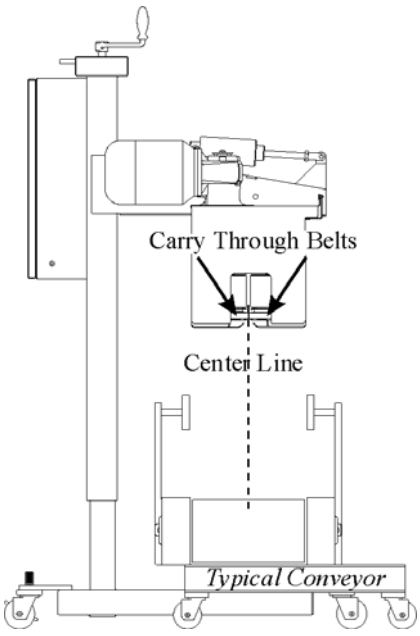
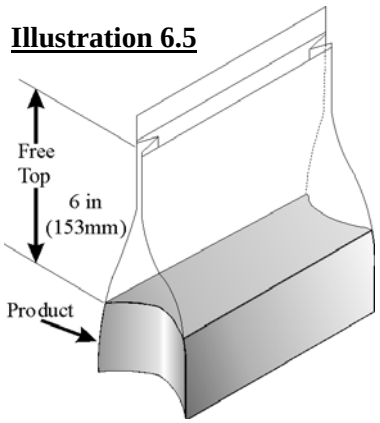


Illustration 6.4

Free top is the term used to describe the distance between the top edge of the unfolded bag and the top surface of the product in the bag. (**Illustration 6.5**) For best results, the PBC 6000 requires a free top of 6 inches (153 mm) for standard size folds and greater than 6 inches for wider folds. Using a shorter free top may cause the bag to bulge and be torn by the shrouds.

Illustration 6.5



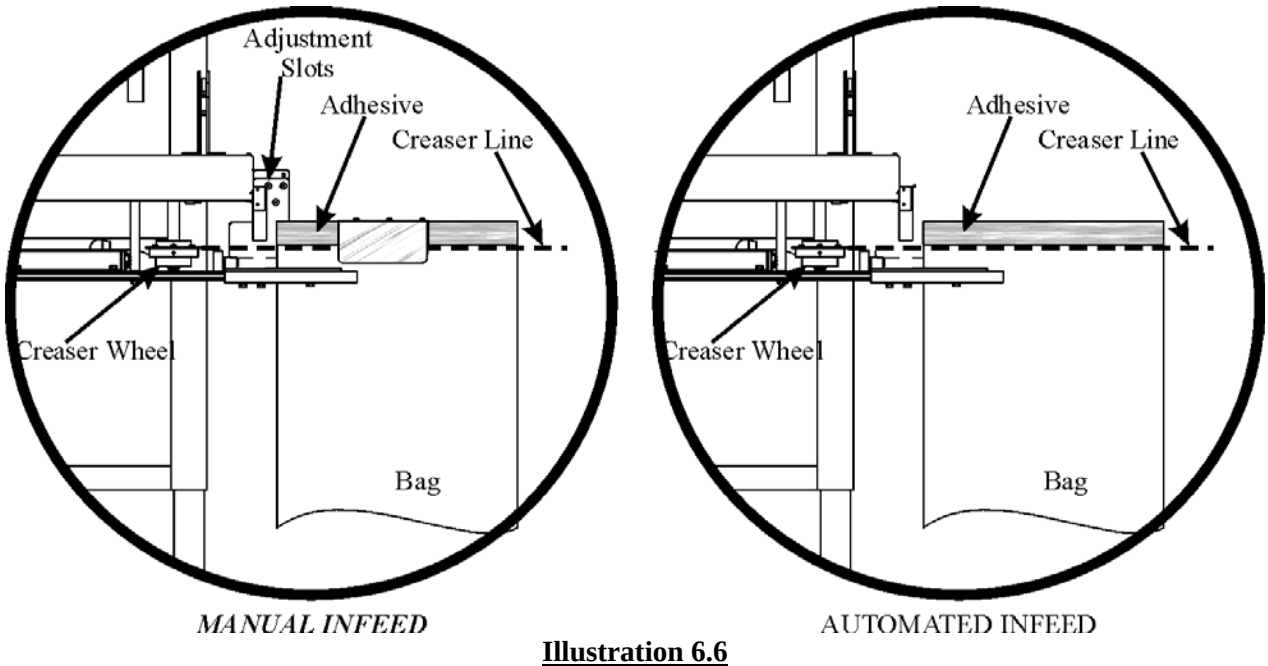


Illustration 6.6

6.5 SPEED CHECKS AND SYNCHRONIZATION

Synchronizing the PBC 6000 involves adjusting external and internal rates to provide a good strong seal. The external synchronization is between the machine and the conveyor system. The carry through belts of the PBC provide the machine speed for folding and sealing the bag top.

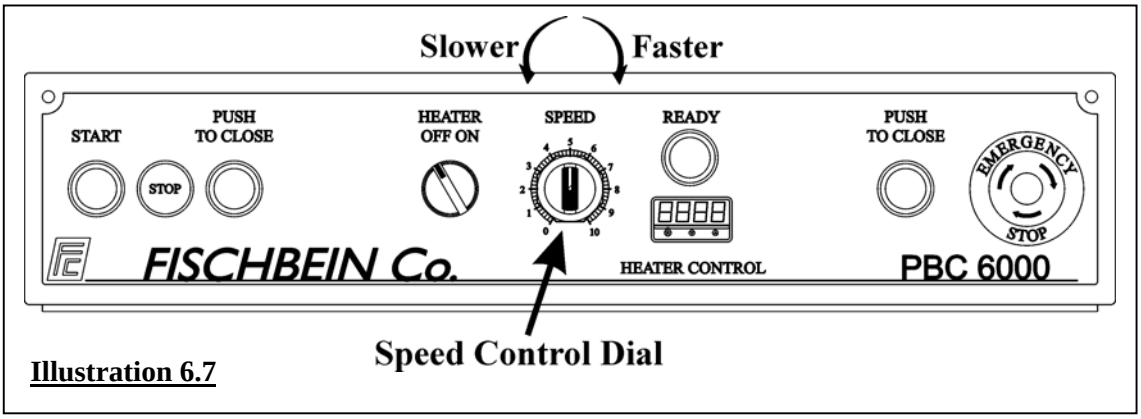


Illustration 6.7

These belts must be set to run at the same linear rate as the conveyor system. If the timing between the two systems does not match, the bag will be tilted forward or backward and will not completely seal the bag. Use a hand-held tachometer set for measuring feet per minute or meters per minute and check the linear speeds of the two systems. The PBC 6000 can easily be adjusted by turning the "Speed" dial on the electrical control panel. (**Illustration 6.7**) Always remember to adjust the speed of the PBC, when the line speed changes.

The internal synchronizing of the PBC is between the rear (fixed channel) and front (swing channel) belts. The drive system within the two channels is synchronized by two large spur gears, beneath the drive gear motor. (**Illustration 6.8**) A pulley drives the carry through belts at the end of the drive shafts on the underside of the machine. If the belts are loose, they may slip while passing over the drive pulleys and skew the bag top as a result. Make sure the belts are tight before operating or synchronizing the machine. To tighten the carry through belts, refer to **Section 8.5.1, page 28**. Although the compression belts must also be synchronized, it is not likely that they will be different since they are toothed timing belts, turned by timing sprockets. However, if they become loose, refer to **Section 8.5.2, page 30**, to adjust and tighten them.

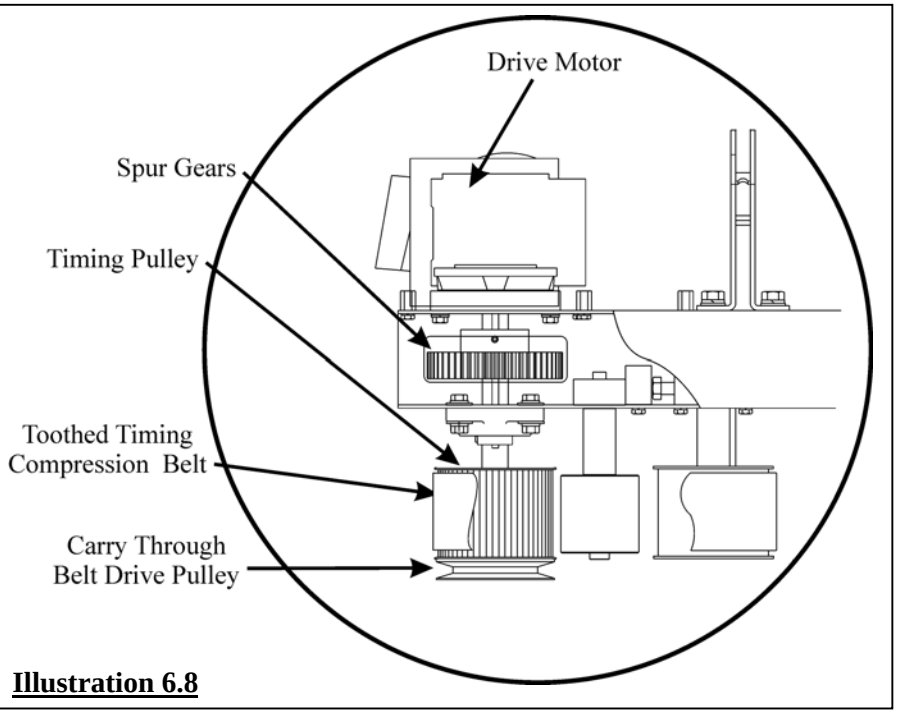


Illustration 6.8

6.6 FOLDER

Check the folder assembly to ensure that it is not loose and remove any glue build up on the edges. The bag must be able to flow through the folder without catching on edges or glue remnants. If the bag thickness is being changed, run test bags through the machine first to ensure that the folder is set properly to make a complete, even seal. The folder should not have to be adjusted for most common bag types and thicknesses. If minor adjustments are required, refer to **Section 8.7, page 49**.

6.7 COMPRESSION BELTS AND ROLLERS

Check the compression belts for gouges and glue buildup. Carefully remove the glue with a dull edged tool. The belt should be tight on the rollers and wheels. Where the two compression belts come together, they should just be touching. If they are coming together with too much or too little force, the seal on the bag could be wrinkled or not completely sealed. To adjust the compression section of the machine, refer to **Sections 8.5.2 - 8.5.4, pages 30-39**.

6.8 SETTING THE TEMPERATURE

The temperature of the heaters is controlled and regulated by the temperature controller located on the control panel. (**Illustration 6.9**) The temperature should be set based on the following criteria:

1. Type of adhesive used on the bag. (i.e. glue melting point)
2. Speed of the conveyor system.
3. Room temperature.
4. Ambient bag temperature.
5. Relative humidity of the bag material.

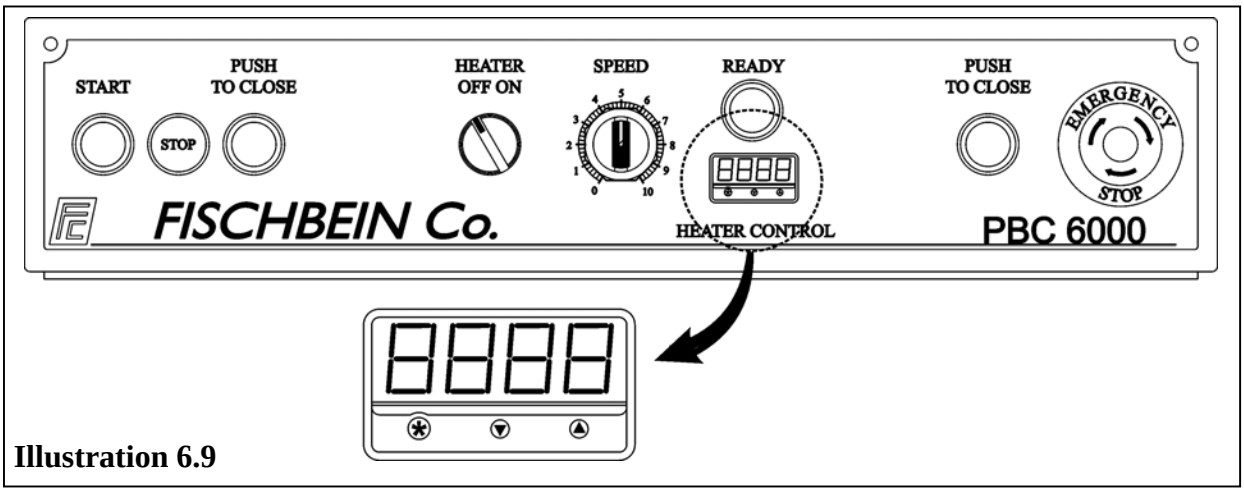


Illustration 6.9

Since the bag and glue take time to heat up, the faster the system is required to seal bags, the higher the temperature setting must be. Keep in mind that every time the conveyor and machine speed is changed the temperature should be changed. ***Leaving the temperature set higher than needed for a new setting, my cause the bag or glue to char.*** ***THIS IS A FIRE HAZARD AND MUST ALWAYS BE AVOIDED!***

6.8.1 DETERMINING THE CORRECT TEMPERATURE

The PBC 6000 is designed to accommodate a variety of heat-activated glues. Each type of bag could require a different temperature setting for a variety of production line speeds. Check with the bag supplier, to determine the temperature needed to melt the glue. Due to the rate at which the bags pass through the system and the thermal properties of the bag, the temperature will have to be set higher than the glue's melting point. ***For safety, always start at a lower temperature and slowly increase the setting as needed.*** For many common bag types and a line running at **40 –45 FPM (12,2 –13,7 MPM)**, the temperature can be set at **450°F (232°C)**.

The room temperature and humidity can affect the seal quality. It is important to always keep in mind all conditions while operating the PBC 6000. The temperature of the bag material when it passes into the machine will also determine the setting for the temperature. It is best to allow the bags to reach room temperature before filling and sealing them. Always allow the machine to heat up completely before adjusting the temperature. (Approximately: 20-30 minutes)

The temperature should be adjusted accordingly while the machine is being operated. Take time during the operation of the machine to inspect the seal quality and then adjust the temperature as needed. Keep a record of the ambient room temperature, bag type and the production line speed in order to reduce the set up time for determining the temperature settings, when changes occur.

After reaching the desired temperature setting, test a couple of bags and inspect them. The glue must be making a strong bond to the bag. You can test this by gently pulling open the bag, after it has cooled. If the glue is bonding correctly, fibers of bag material will be sticking in the entire adhesive area. If the bag opens easily and you can tell that parts of the glue are not bonding to the bag, the temperature setting will likely have to be increased, if the compression rollers are set correctly. Be sure to only increase the temperature in small increments of 10 – 20 degrees at a time, until the desired bond is achieved. After changing the temperature, allow the machine time to fully adjust.

If the setting is too high, parts of the glue may be charred or burnt. If the glue appears to have darkened, then the glue has begun to char. When the temperature is set too high, the glue may begin to drip off the bag and land on the manifold. Glue build up on the manifold will clog the air holes. Lower the temperature significantly and begin testing again. Always start at a lower temperature and slowly increase the setting until the desired bond is achieved.

If the glue does not appear to be making a strong bond with the bag, although the temperature is high enough to melt the adhesive, and the compression rollers are set correctly, then check the surface of the bag. If the bag surface is too dusty or has a liquid contamination on it, the glue may not properly bond with the bag fibers. The PBC is equipped with an air scrubber at the infeed end of the machine. Make sure it is directed at the seal area and that it is effectively removing the debris. The airflow can be adjusted through the scrubber by rotating the flow control valve in the air line to the scrubber. (**Illustration 8.3, page 26**)

At the factory the machine is set to the specifications defined at the time the order was taken. If sample bags were sent to Fischbein prior to shipment, the machine will be adjusted to the materials sent.

6.8.2 USING THE TEMPERATURE CONTROLLER

The temperature controller is very easy to understand and use. The manual that comes with the controller (located in the electrical enclosure) contains more detailed information and instructions that are available. This PBC 6000 manual will only cover how to read, change and autotune the controller.

STARTUP

When the system's main power is ON, the heater switch turned ON and the green START button is pushed, the controller's display will light up. After a few seconds the display will alternate between displaying the current temperature in the heater manifold and **–AL-**. The temperature will begin to increase indicating that the heaters are heating to bring the manifold to the set point. Once the temperature reaches the set point, the display will stop alternating displays and only show the current temperature in the manifold.

SET POINT DISPLAY AND CHANGES

To display the set point, push and hold in the "*" button. The display (**Illustration 6.10**) will alternate between the set point temperature and the temperature scale (^{o}C for Celsius and ^{o}F for Fahrenheit). To change the set point, push and hold in the "*" button and then press the "▲" or "▼" keys to increase or decrease the setting. Release the buttons when done. Only make small

increment changes to the set point until the desired closure is achieved. Be sure to allow five to ten minutes for the heaters to reach their optimum level before sealing bags in the PBC 6000.

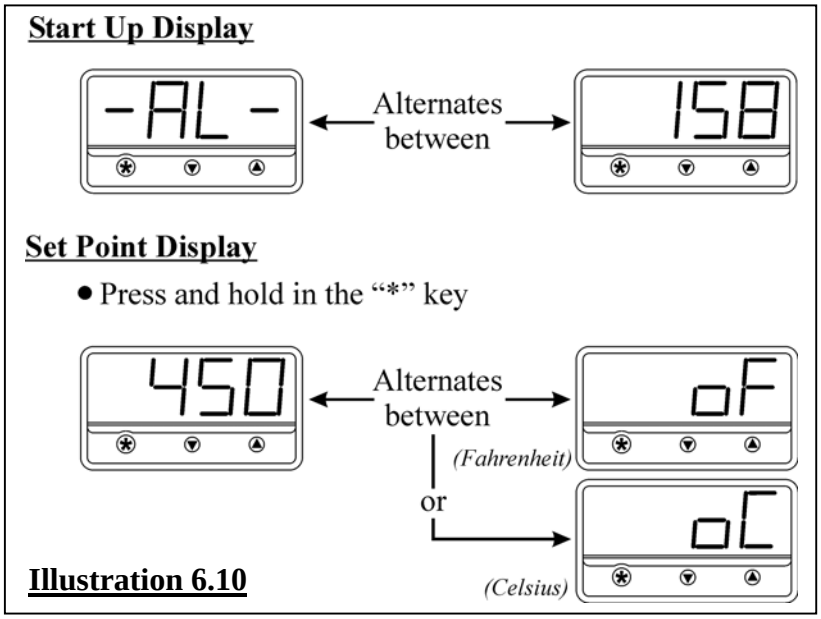


Illustration 6.10

7.0 OPERATING THE PBC 6000

The PBC 6000 system is designed to fold, heat and then seal the top edge of a PBC bag. The system forms a crease line and then proceeds to fold the adhesive side of the bag top. When properly heated the adhesive flap will adhere to the opposite bag surface and seal the bag from product leaking out through the top of the bag. Following is the precise details on how the PBC 6000 processes a bag to seal it.

7.1 PROCESS DESCRIPTION

Once the system has been properly prepared (**Section 6, pages 13**), the pneumatic and electrical systems are turned "ON". The airflow gage for the manifold should be no less than 400 SCFH (11,3 SCMH). The heaters are activated and the machine is allowed to warm up for a minimum of 15-20 minutes.

A filled bag travels towards the PBC infeed after it has been prepared by the operator. The operator reforms the gussets on the bag, "breaks" the bag top and straightens the top of the bag in preparation for the PBC. (**Illustration 7.1**) In an automated system the operator does not have to manually feed the bag top into the PBC infeed. The PBC 6000 firmly grasps the bag top and transports it through the system. Just as the bag enters between the channels, the air scrubber blows dust and debris from the seal area to ensure a clean region for the glue to attach to the bag surface. After entering the machine the bag travels between the creaser wheels, where the bag is scored below the glue line to form a line for the fold.

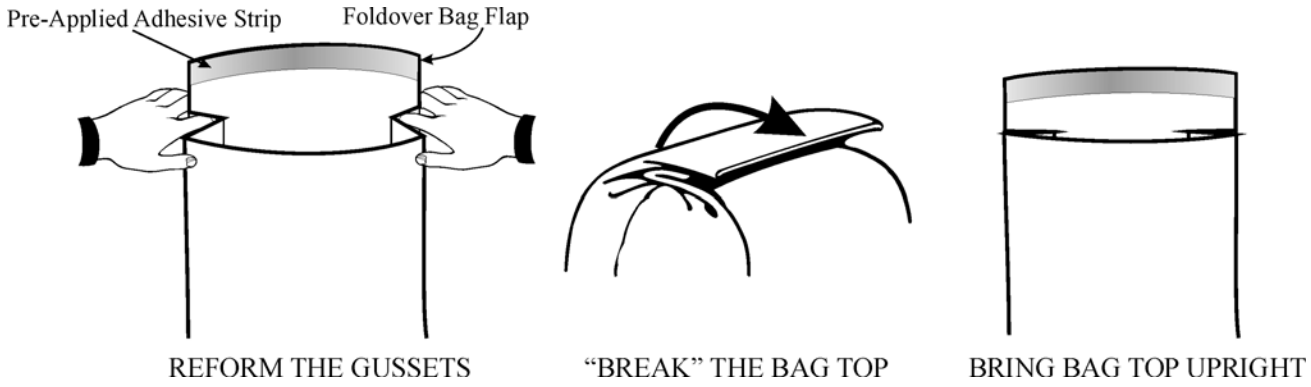


Illustration 7.1

After leaving the creaser, the bag is partially folded so that the top flap (with the pre-applied glue) is bent 90° or parallel with the floor. (**Illustration 7.2**) The top surface of the hot air manifold has a series of holes for the hot air to exit the manifold and melt the glue on the flap of the bag. The folder holds the flap horizontally over the holes.

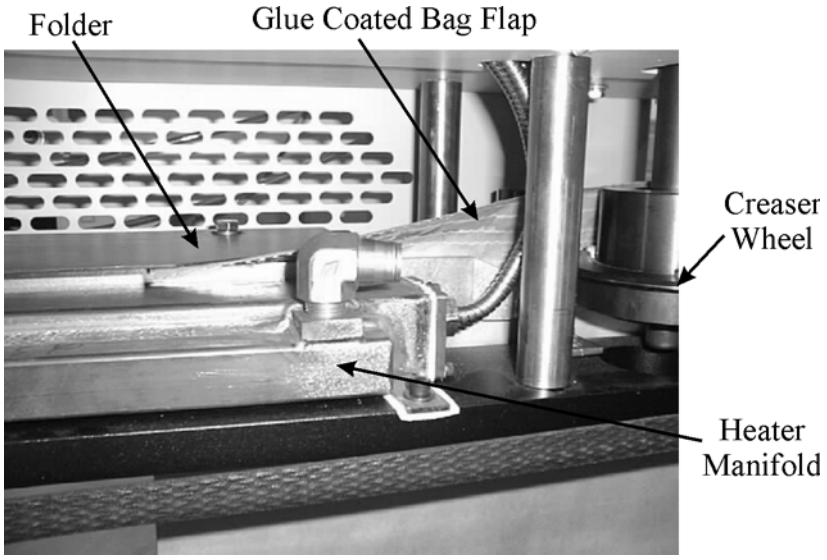


Illustration 7.2
(1 ¾" manifold shown)

After the manifold, the folder continues bending the heated flap another 90° to complete the fold. The adhesive begins to make contact with the outer bag surface as the fold is completed and the bag enters the compression area of the machine. The wide compression belts guide the bag top between the compression belts. The belts press the flap firmly against the bag, to force the adhesive to penetrate the bag fibers. The completed fold and compression yield a sharp, clean fold with a strong bond.

7.2 OPERATING THE PBC 6000 (START UP PROCEDURE)

PINCH BAG CLOSER START - UP

Be sure that all guards are in place. Do not operate without guards.

1. Check for any loose or missing fasteners or parts on the PBC. Never operate the machine without all the parts attached and secured.
2. Operators: Long hair must be pulled back and tied to avoid getting caught in any moving parts of the system. Operators of this machine must wear eye and foot protection at all times and gloves when working around the hot or sharp machine surfaces. Operators must **not** wear loose clothing or jewelry.
3. Connect clean, dry, and non-lubricated air to the pneumatics panel, using the quick disconnect fitting that is supplied with this unit. Turn the safety control valve "ON" to allow the compressed air to circulate through the system. For most common PBC bag types the flow meter can be set to read 400 SCFH (11,3 SCMH). (**Illustration 6.3, page 15**)

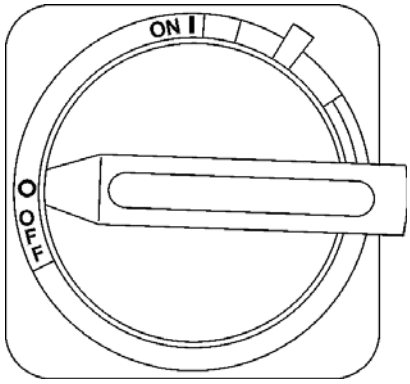


Illustration 7.3

4. Turn the heaters to the "OFF" position. (**Illustration 6.9, page 18**)
5. Turn "ON" the main control switch on the back of the electrical enclosure. (**Illustration 7.3**) Make sure the motor enable switch is turned to "AUTO". (**Illustration 8.5, page 28**)
6. Push the green "START" button to start the machine. The button should stay illuminated if there are no system errors. (**Illustration 6.9, page 18**)
7. Push and hold both blue "CLOSE" buttons at the same time until front channel closes completely. Release the buttons and the front channel should stay closed. Check belt direction to ensure that the machine is phased correctly.

CAUTION

When closing the front channel, the rear belts must be moving to allow the drive gears to mesh smoothly. Occasionally, there may be some noise when the gears first come together.

8. Synchronize the PBC with the conveyor speed by adjusting the speed control pot. (**Illustration 6.7, page 16**) A tachometer can be used to measure the linear speed of the conveyor and the machine's carry through belts. Do not measure belt speed near turns in the belt.
9. Turn heater switch to "ON". Set the temperature controller to the desired set point. (**Section 6.8, page 18**) For most common PBC bag types the initial setting should be about **450°F (232°C)**. Allow a minimum of 15-20 minutes for the machine to warm up. Use the "Trial Run / Bag Closure" technique mentioned below and adjust the temperature as necessary to get a good quality bag seal.

10. Push either the "STOP" or "EMERGENCY STOP" button at any time to open the front channel. Pushing the "STOP" button will open the front channel and keep the heaters on. The "EMERGENCY STOP" button will open the front (swing) channel, turn the electrical system and heaters "OFF" and leave the air flowing through the manifold.

WARNING

NEVER TURN THE AIR SUPPLY OFF WHILE THE HEATERS ARE STILL HOT. ALWAYS LET THE HEATERS COMPLETELY COOL BEFORE TURNING THE AIR SUPPLY OFF.

BAG CLOSURE TEST OF TRIAL RUN

The following procedure is a practical way to check the quality of bag closure on the PBC 6000 while making the initial set up. Using an empty bag, seal it in the machine, allow it to cool and then examine it.

1. Cut the entire bag top off about six inches (152mm) down from the top of the fold. This will allow you to examine the closure from the inside of the bag top.
2. Cut the gusseted side panels away.
3. Open the cutaway panel. Stress the bonded area between your hands by pulling and "popping" the seal.
4. Peel the glue joint. A good bond will require some strength to peel apart the closure. Most importantly, bag fibers should be found embedded in the glue, along the entire length of the seal. Shiny surfaces will indicate a lack of adhesion to the bag. A bad bond will snap open and will be seen as a shiny surface along the glue strip, without paper fiber. This is due to incorrect heating or insufficient compression of the closure.

7.3 SHUTDOWN PROCEDURE

1. Turn the heater switch to OFF. Let the machine cool until the temperature is about 100°F (38°C) before turning the electrical and pneumatic supplies off. Not allowing the manifold to cool completely will shorten the life of the heaters and cause damage to the pneumatic hoses.

WARNING

NEVER TURN THE AIR SUPPLY OFF WHILE THE HEATERS ARE STILL HOT. ALWAYS LET THE HEATERS COMPLETELY COOL BEFORE TURNING THE AIR SUPPLY OFF.

2. Push the STOP or EMERGENCY STOP switch. The swing channel will rotate up (open) and all belts will stop. The air will continue to flow through the hot air manifold.

3. Turn off the main disconnect switch on the door of the main electrical enclosure. ***Keep the switch off and locked out when not in use.***

4. Turn the pneumatic safety control valve to the OFF position and disconnect the air supply by releasing the quick disconnect. This allows stored energy to be released from the unit.

5. Remove all paper scraps, debris and glue from the machine.

8. MAINTENANCE AND ADJUSTMENTS

8.1 SCHEDULED MAINTENANCE

8.1.1 DAILY MAINTENANCE

CAUTION

Turn off and lock out the main switch and the air supply to the PBC before performing maintenance procedures.

1. While the front swing channel is in the open position:
   - **A.** Inspect the belts after opening the breakaway assembly. Remove any glue on the belts with a dull flat edged tool. Be careful not to gouge the surface of the belts
   - **B.** Remove all paper scraps and debris from the machine.
   - **C.** Remove any glue build-up on the folder, hot air manifold, guides and belts.
2. Open the bleed valve on the pre-filter and filter to remove oil and moisture from the pneumatic system. ***If oil is found in the air supply, this problem must be corrected immediately. Change filters as needed and regularly.*** The PBC 6000 is designed to use clean, dry, non-lubricated compressed air.

WARNING

OIL IN THE COMPRESSED AIR MAY CAUSE FIRE!

3. Check the compression belt's tension and adjust if needed.
4. Check the hot air manifold, ensuring the air holes are free of debris.
5. Center the PBC with the conveyor.
6 Replace any burned out lamps.

8.1.2 MONTHLY MAINTENANCE

CAUTION

Turn off and lock out the main switch and the air supply to the PBC before attempting maintenance procedures.

1. Check the air pressure to the PBC 6000. Minimum pressure should be 90 PSI (6,2 bar) with the capacity to provide 400 SCFH (11,3 SCMH) and the airflow gage should be set to at least 400 SCFH (11,3 SCMH).
2. Examine all belts for wear and determine if they need to be tightened or adjusted.
3. Check creaser wheel groove and blade for cleanliness, wear and proper alignment. Make sure the set screws are tight.
4. Lubricate the spur drive gears to the channel assemblies. Use high-temperature grease only, to prevent grease contamination to other parts of the machine. Use sparingly!
5. Check the drive chain tension for the lift mechanism of the frame. Make sure that the tension completely holds the chain on the teeth of the sprocket gears. Lubricate the drive chain and gears at least twice a year.
6. Replace air pre-filter and filter if dirt or oil is in the air system. Check the pneumatic lines for wear and replace them as needed.
7. Check the shoulder bolts for the swing channel pivot points (**Illustration 8.1**) for excessive wear that will warrant replacement.

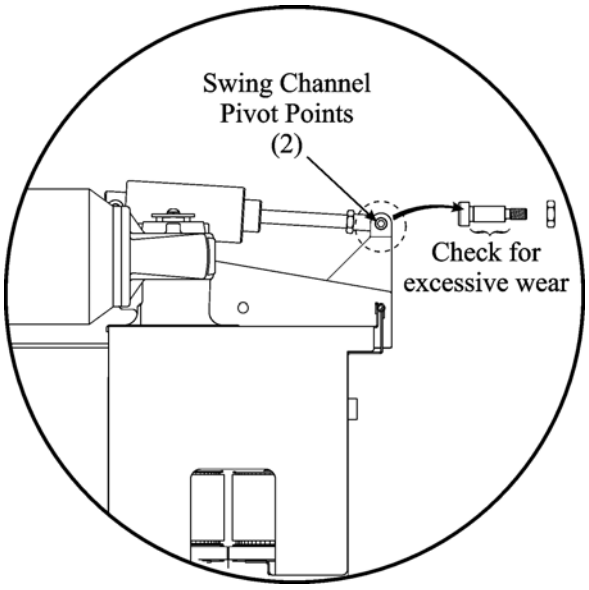


Illustration 8.1

8. Test the bag jam detection to make sure that the swing channel will open if a bag jams in the system. Fold over a sample bag twice to make the bag thick and insert it into the infeed so that the bag is only going to contact the carry through belts. The swing channel should open due to the proximity switch within the fixed channel.
9. Check the airflow sensor, by reducing the flow using the main regulator. Perform this test while the system is "ON", without any bags going through the system. The machine should turn "OFF", when the flow has gone below the safe margin.

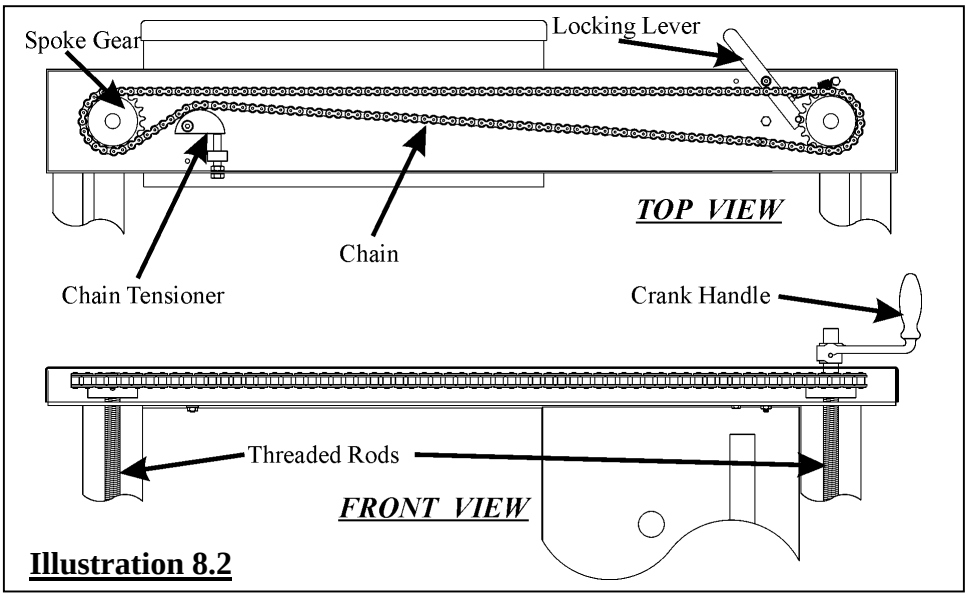


Illustration 8.2

8.2 SYSTEM FRAME

CASTERS

Occasionally check and lubricate the casters to ensure that they are firmly attached to the frame. Two of the casters are capable of be locked for stabilizing the machine while in operation. Check the locks to ensure that they are functioning properly. If the locks fail to work, replace as soon as possible.

HEIGHT ADJUSTMENT SYSTEM

The frame is designed to allow the operator to adjust the vertical height of the PBC system. The vertical adjustment is controlled by two threaded rods, located within the two main vertical tubes of the frame. (**Illustration 8.2**) The standard PBC 6000 utilizes a crank handle, sprocket gears and a chain to turn threaded rods. A locking lever is located near the handle to keep the machine at the specific height. The PBC 6000 can be ordered with a motorized system to turn the threaded rods.

To prevent the threaded rods from going too far to the ends of the threads on a motorized lift system, proximity switches have been installed on the vertical tubes of the frame. The lift motor is automatically turned off before either end of the threaded rod is reached. Weld beads on the threaded rods help prevent the manual systems from turning too far.

8.3 PNEUMATICS

The air source connection has a female quick release air coupling (Foster Series 3, #3003 or equivalent) which connects to the safety shut-off valve located on the pneumatic control panel (**Illustration 8.3**). Air hose connections should have a minimum 1/2 in. (13 mm) ID. The PBC 6000 requires compressed, clean, non-lubricated air. The supply should be capable of sustaining 90 PSI (6,2 bar) of pressure and a volume flow rate of at least 420 SCFH (11,9 SCMH).

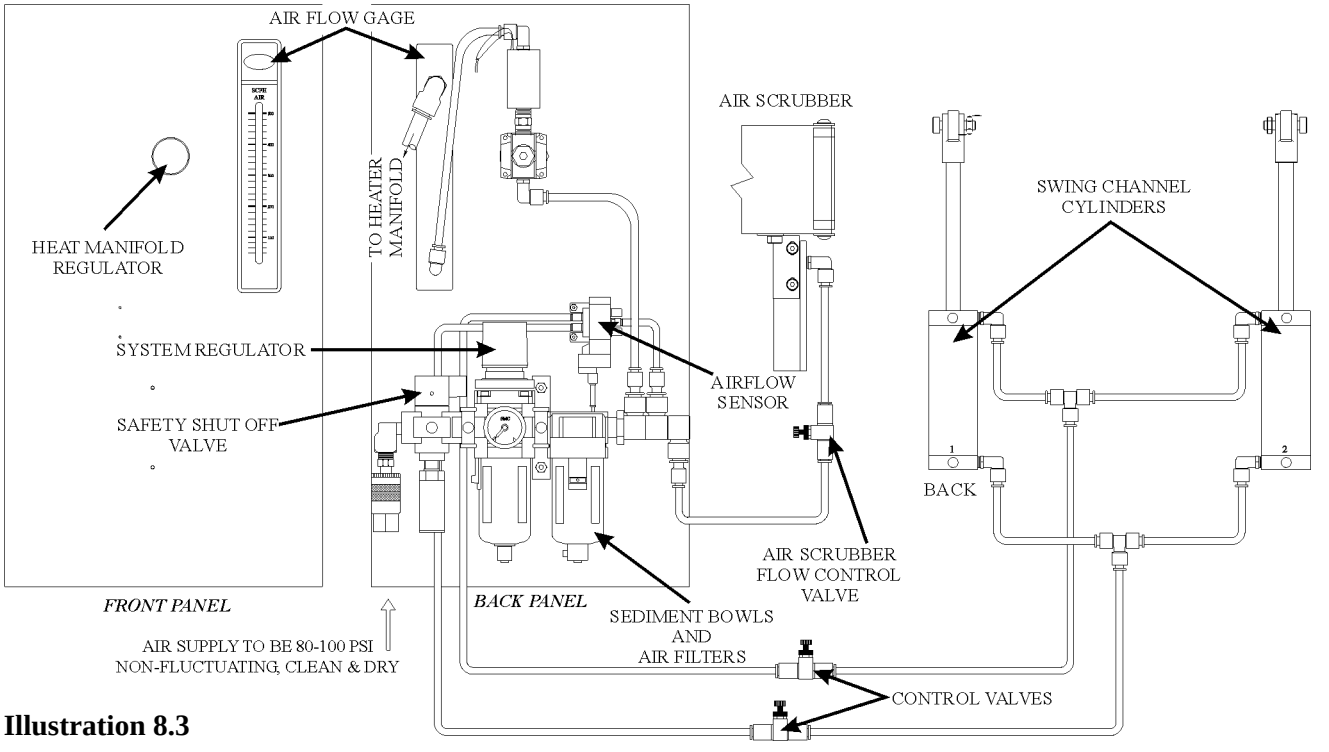


Illustration 8.3

SEDIMENT BOWLS AND AIR FILTERS

Check the pneumatic system for air leaks at the connections and control panel. Inspect the sediment bowls and air filters for debris and oil. If oil is found in the filters, replace the filters and correct the air supply problem immediately.

AIRFLOW VALVES AND GAGE

The flow valves are shipped from the factory adjusted to allow the swing channel to open slowly and to maximize the cleaning effect of the air scrubber on the bag top. In most cases the swing channel valve can be left in this position. The air scrubber should be adjusted based on your application and need.

8.4 SENSORS

8.4.1 THERMOCOUPLES

The thermocouples of the PBC are located inside the heater cartridges. If you suspect that a thermocouple has become defective, the cartridge must be replaced. It is recommended that both cartridges be replaced at the same time. To replace the cartridges, follow the replacement instructions in **Section 8.8, page 51**.

8.4.2 PROXIMITY SENSORS

The standard PBC 6000 uses a proximity switch above the swing channel to determine when the swing channel has completely engaged. As the swing channel is "CLOSED" into position to run, the proximity switch rises up until it reaches the underside of the top cover, near the electrical control panel. For this reason, the "CLOSE" buttons are simultaneously pushed and held until the swing channel has completely closed. If the buttons are released before the swing channel has completely rotated into position, the channel will disengage and rotate open. If the buttons are pushed and held, but the swing channel never stays in the closed position, the proximity switch may have come loose or needs to be replaced. Carefully follow the electrical prints in the electrical enclosure to replace the switch.

If your PBC 6000 has a motorized frame lift system (rather than the standard hand crank), then the vertical members of the frame have proximity switches installed. They are used to determine the locations of the highest and lowest positions of the frame. This option protects the motor and the threaded rod assemblies used in the frame assembly.

8.4.3 AIRFLOW SENSOR

An airflow sensor has been installed with the pneumatic system to protect the machine's heaters. (**Illustration 8.3**) The heaters in the manifold can overheat and become defective if insufficient air flows through the manifold. The airflow sensor continuously monitors the pneumatic system for a minimum amount of airflow, necessary for safe operation. If the airflow drops below a safe level, the heaters will automatically be turned "OFF" and the machine deactivated. If there is sufficient airflow through the system, but the sensor will not allow the heaters to activate, then the sensor may need to be replaced.

Be sure to always use clean, dry, non-lubricated compressed air for the PBC 6000. Regularly check the air filters and sediment bowls for signs of contaminants.

8.5 BELTS, ROLLERS AND WHEELS

8.5.1 CARRY THROUGH BELTS

The carry through belts are responsible for grasping the bag top at the infeed and guiding it through the system to be heated, folded and sealed closed. If the belts are not synchronized or are worn, they will not effectively control the bag top. The following sections will describe proper settings for the belts, as well as how to maintain and replace them.

PRESSURE BETWEEN BELTS

The carry through belts must grasp the bag top so that the bag cannot be removed from the belt without considerable effort. The belts are set at the factory for most common bag types. If bag samples were sent at the time the machine was ordered, then the belts are set for their characteristics.

The pressure between the belts is determined by the placement of the carry through belt plates, located under the channels. (**Illustration 8.4**) They are attached to the channels by guide bar supports. The holes for the bolts holding the plates to the supports are slotted to allow the plates to move towards or away from the sealing centerline of the machine.

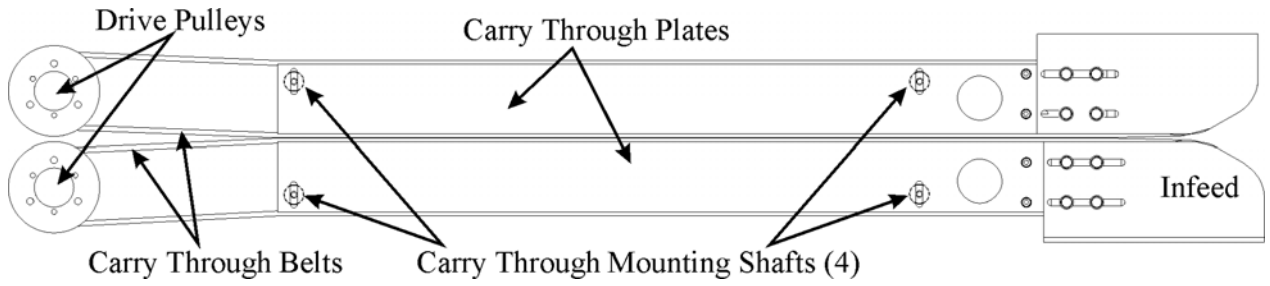


Illustration 8.4 *(Bottom View)*

WARNING

Be very careful when working on the machine when covers or shrouds are removed!

If the pressure between the belts must be adjusted, then follow these steps:

1. **While the system is electrically and pneumatically turned "OFF",** remove the front (swing channel) and rear (fixed channel) shrouds to access the folder area.
2. Turn the Motor Enable (keyed) Switch (**Illustration 8.5**) to the center "STOP" position. This will allow the pneumatic system to close the swing channel without the drive motor turning the belts.
3. Make sure the Heater control is "OFF".
4. Turn the pneumatic and electrical supplies "ON".
5. Push the green "START" button and then push and hold the blue "CLOSE" buttons until the swing channel closes completely. The swing channel will stay closed and the drive motor will not be turning the belts.

Illustration 8.5

6. Check the pressure between the carry through belts. Decide which plate needs to be moved or if both need to be adjusted. They should be evenly spaced on either side of the midline from between the creaser assembly and compression rollers. The midline should be centered between the channels.
7. Loosen the bolts that hold the plate to the carry through mounting shafts, but DO NOT remove them.
8. Gradually move the plate(s) to the desired position. Check to make sure that the pressure is consistently the same from one end of the plate to the other.
9. Tighten the bolts and check the pressure again.
10. Push the "STOP" button. Turn the Motor Enabled Switch to the "RUN" position.
11. Push the "START" button. The rear (fixed channel) belts will be activated.
12. Push and hold the "CLOSE" buttons until the swing channel closes completely. The swing channel will stay closed and the drive motor will be turning the belts.
13. Use a couple of empty sample test bags to ensure that the belts are properly grasping and holding the bag throughout the process in the machine. As they pass through the machine pull down on the bag to test how well the belts holds.

    Use a couple of filled sample test bags to ensure that the belts are still operating correctly.
14. Turn the system completely "OFF", install the shrouding and set the motor enable switch to "AUTO".

BELT TENSION ADJUSTMENT

After normal usage, the carry through belts will become stretched and will need to be tightened. To test the belt, pull the belt away from the carry through plate, when the swing channel is open. If it deflects farther than ¾ inch (19mm) from the plate, then the belt needs to be tightened. (**Illustration 8.15, page 38**) Loose belts may allow the bag top to be skewed as they pass between them. A belt with the proper tension will deflect (in the middle) between ½ to ¾ inch (13 to 19 mm), when gently pulled away from the carry through plate. Do not over-tighten the belts. While inspecting the belts, check for fraying or gouges in the working surface of the belt. In this case the belt will need to be replaced.

To adjust the tension in the carry through belts, follow these steps:

1. Turn "OFF" and lock out the electrical and pneumatic supplies.
2. (Option) Remove the fixed and swing channel shrouds.
3. Loosen the top and bottom holding bolts on the infeed. (**Illustration 8.16, page 40**)
4. Turn the tension bolt to adjust the tension in the carry through belt.
5. Once the desired tension is achieved, tighten the holding bolts.
6. Install the fixed and swing channel shrouds.
7. Turn "ON" the electrical and pneumatic systems.
8. Test the system to make sure the belts are running smoothly and grasping the filled bags properly.

WARNING: Over-tightening of the belts could cause excessive wear on the drive pulley bearings.

REPLACING THE CARRY THROUGH BELTS

Inspect the belts on a daily basis to check for excessive wear and fraying. Using belts that need to be replaced can lead to the bag slipping as it passes through the machine and possibly cause the bag to spill. Loose or worn belts may allow the bag top to be skewed as they pass between them. If the belts need to be replaced, be sure to use genuine Fischbein Parts. To replace the belts, follow these instructions:

1. Turn "OFF" and lock out the electrical and pneumatic supplies.
2. Remove the swing and fixed channel shrouds.
3. Remove the infeed's belt guards. (**Illustration 8.16, page 40**)
4. Loosen the top and remove the bottom holding bolts (**Illustration 8.16, page 40**) on the infeed. Also remove the idler pulley bolt (**I**).
5. Remove the infeed bottom plate.
6. Turn the take-up bolt to reduce the tension in the carry through belt. When the bolt is turned enough, the belt should be able to slip off of the drive pulleys.
7. Replace the belts with the new ones.
8. Install the infeed bottom plate using the holding bolts and the idler pulley bolt (**I**).
9. Turn the take-up bolt until the belt is tight on the pulleys. When the tension in the belt is correct, the belt can be pulled away from the carry through belt plate only ½ to ¾ inches (13 to 19mm) with a reasonable force.
10. Tighten the top and bottom holding bolts.
11. Check the pressure between the carry through belts. If the pressure needs adjusting, follow the "**Pressure Between Belts**" instructions on **page 28**.
12. Install the shrouds.
13. Turn "ON" the electrical and pneumatic supplies.
14. Use filled test bags to test the carry through belts. They should be able to grasp the bag top without allowing the bag to be pulled from the belts with a reasonable tug. The bags must not slip between the belts as they travel through the system.

8.5.2 COMPRESSION BELTS

The compression belts work with the compression rollers to create a secure bond in the fold. It is a specially coated timing belt that grasps the bag top after the carry through belts begin to release the bag and compresses the fold. After the folder, the carry through belts start to taper slightly away from the centerline of the machine and the compression belts finish transporting and compressing the bag. The coated belt is wide to accommodate a variety of fold widths.

COMPRESSION BELT UPKEEP

The compression belts must provide even pressure across the fold as bags pass through the machine. Belts with deep gouges or glue buildup will not produce even pressure area across the fold. Glue left on the belts will likely deposit on the following bags, defacing the appearance of the bag. Keep the belts clean and free of glue buildup. Use a dull edged tool to gently remove the glue from the belts. NEVER use a metal edge (such as a screw driver or putty knife) to remove the glue. A clean rag and some mild soap can be used to clean the dirt from the belts.

DETERMINING THE CORRECT SETTING AND PRESSURE BETWEEN COMPRESSION BELTS

The amount of pressure required to make a strong complete closure, varies depending upon the characteristics of the bag. The type of adhesive on the flap and the thickness of the bag may require more or less pressure. The PBC 6000 is designed to make adjusting the pressure quick and easy.

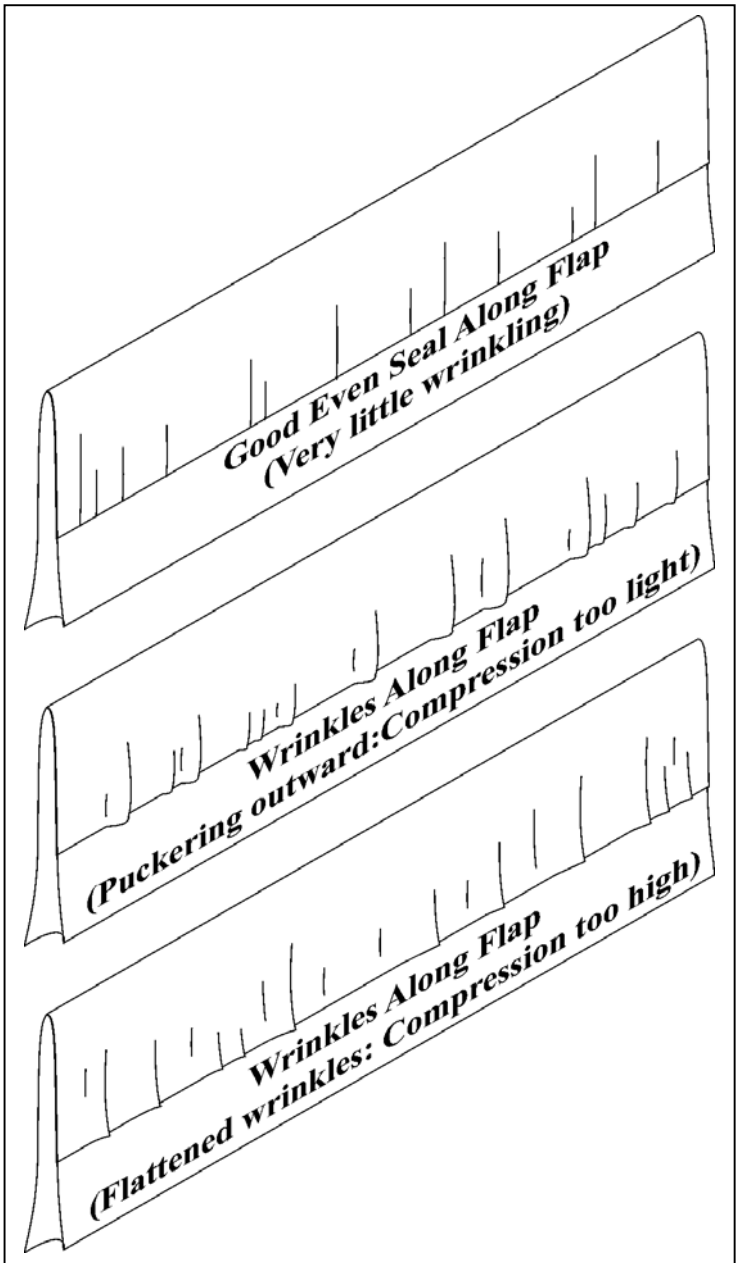


Illustration 8.6

The belts wrap around the compression take-up roller, compression roller and drive sprocket. The teeth on the inside of the belt mesh with the teeth on the drive sprocket to keep the belt rotating at a constant rate. If the belt becomes too loose, the teeth could begin to slip over the drive sprocket, changing the timing of the belt. In the middle of the belt the compression rollers push towards the centerline between the channels, to force the hot glue and fold together, completing the seal. The compression rollers come together so that the fixed and swing channel compression belts are in contact. The rear roller must be set based on the gap between the channels and then the swing channel roller is adjusted to yield the desired pressure.

Once the machine is "ON" and ready to run, test bags are fed into the machine. Carefully inspect the folded portion of the bag top after they have been sealed. A proper fold and seal will have a relatively flat and even fold. (**Illustration 8.6**) There should not be excessive amounts of wrinkles on the flap. When the bag has cooled and the seal is pulled apart, the adhesive should be bonding completely across the full length and width of the seal. There are two types of wrinkles that can appear to suggest an adjustment is needed. Wrinkles that are present, but NOT pressed flat, indicate that the pressure between the belts is too small and needs to be increased by bring the rollers closer together. The second type of wrinkle is large and pressed flat into the flap. This flat wrinkle indicates that the pressure is too large and needs to be reduced.

ADJUSTING THE PRESSURE BETWEEN THE COMPRESSION BELTS

The pressure between the belts is set based on the thickness of the bags being sealed. Generally, the thick bags only require that the belts come gently into contact. The thinner bags need to have a greater pressure between the belts. The best method for setting the compression between the rollers is by testing. To set the compression between the belts, follow these steps:

REAR COMPRESSION ROLLER

The rear compression roller should be set before adjustments are made to the front compression roller. Generally, once the rear compression roller is set, it should not need to be adjusted, except after the belt has become worn or replaced. The ideal placement of the rear compression roller places the working surface of the compression belt directly beneath the centerline between the two channels, when the swing channel is in the closed position. (**Illustration 8.7**) However, if the roller has moved or needs to accommodate a different set up, follow these steps:

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the machine.
2. Remove the top left channel cover that is located near the drive motor. Remove the rear (fixed) and swing channel shrouding.
3. The swing channel must be in the open position. When it is closed the gap formed between the channels is set at the factory to be 3/16 inches (4,76mm). The working surface of the rear compression belt should be directly beneath the middle of the gap or 3/32 inches (2,4mm) from the face of the channel. (**Illustration 8.7**)

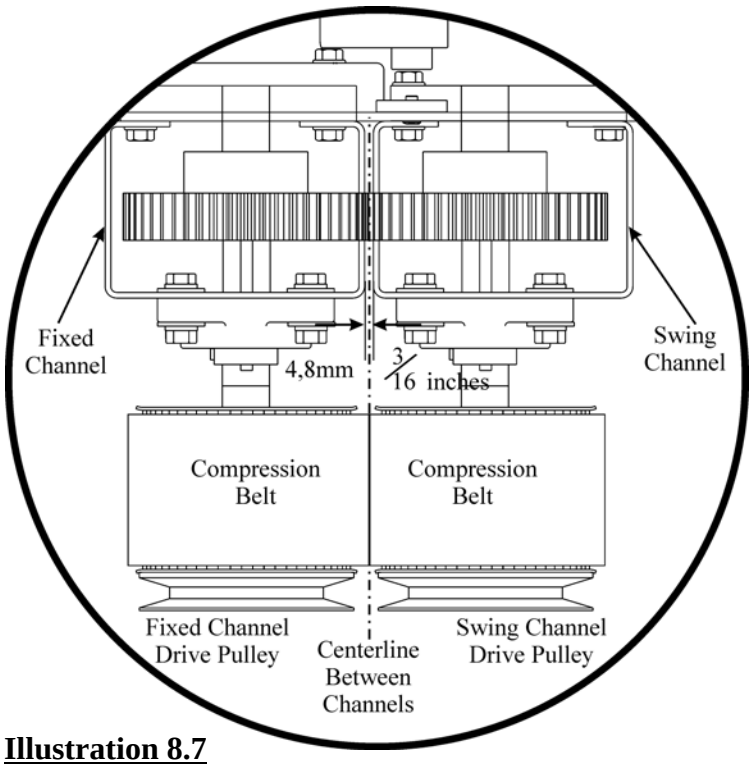


Illustration 8.7

4. The rear compression roller assembly is held in position by the ½ inch socket cap screw, which acts as the shaft for the roller. (**Illustration 8.8**) To move the compression roller, loosen the screw just enough to allow the roller to move. Loosening the screw too much will allow the screw (shaft) to skew too much to accurately align the compression belt.
5. The rear (fixed channel) compression roller's position is controlled by its block, inside the channel. Between the block and the back wall of the fixed channel is a hex-head bolt (**C**) locked into position by a jam nut. (**Illustration 8.9**) By unlocking the jam nut and then turning this bolt so that it rotates into the block, the roller can be moved away from the centerline between the channels. If the bolt is rotated out of the block, the block is pushed towards the centerline between the channels. Once the rear compression belt is in position (**Illustration 8.10**), lock the bolt into place with the jam nut.

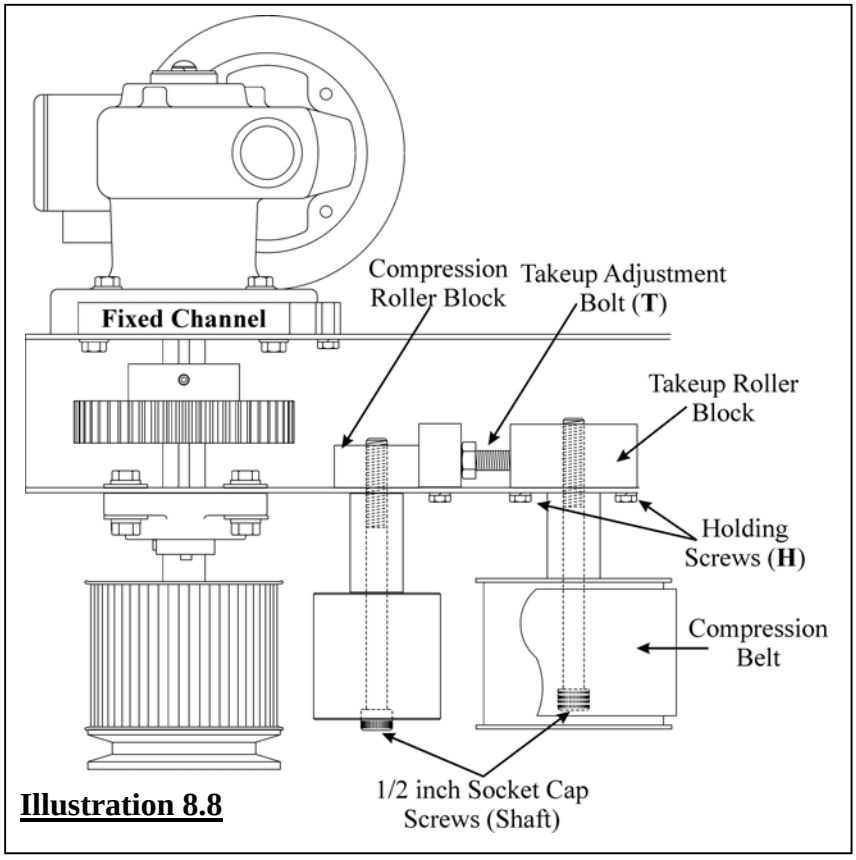


Illustration 8.8

6. Secure the compression assembly in place by tightening the ½ inch socket cap screw (shaft). Double check the alignment of the compression belt after the screw is tightened. (**Illustration 8.8**)
7. Push in on the belt between the takeup roller and the drive sprocket. If the tension in the belt is correct, the belt should deflect about ½ to ¾ inch (13 – 19mm). (**Illustration 8.10**)
8. Turn "ON" the electrical and pneumatic supplies to the PBC. You may wish to test a few bags with the heaters "OFF". Then test the compression roller settings with the heater "ON". Be sure to allow the manifold to heat up completely before testing begins. Follow the guidelines mentioned in the Quality Control section of this manual to determine a good seal.

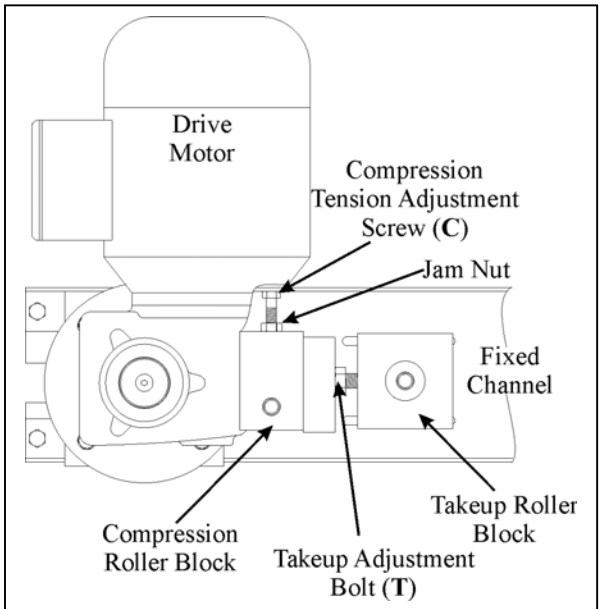


Illustration 8.9

9. Install the top cover over the channels and the rear shrouding.
10. If the rear compression belt is in the correct position, but adjustments need to be made to the compression force, then adjust the front compression roller as described in the next section.

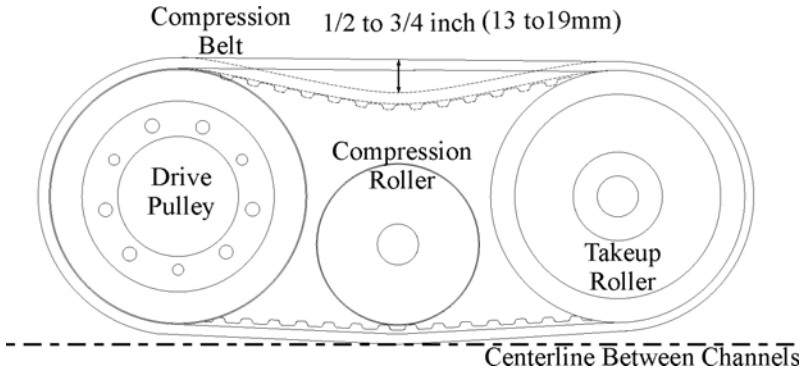


Illustration 8.10 *(Top View)*

FRONT COMPRESSION ROLLER

Once the rear compression roller and belt have been positioned correctly, the front roller can be adjusted to alter the pressure between the belts. The front roller is adjusted in a similar fashion to the rear. Its block within the swing channel is moved towards and away from the centerline between the two channels by turning a screw in the side of the block. The socket cap adjustment screw passes through the front face of the swing channel and shrouding for easier access. The top shrouding above the compression assembly does not have to be removed to adjust the pressure once the rear compression roller has been set. To adjust the front compression roller and belt pressure, follow these steps:

1. For large adjustments to the front compression roller, the swing channel shrouding should be removed. This will allow access to the compression belt for testing its tension.

WARNING

Never make adjustments to any rollers or sprockets while the machine's belts are moving.

2. The front compression roller can be adjusted with the PBC machine "ON" or "OFF". If you choose to perform the adjustment with the system "ON", you must turn the Motor Enable (keyed) Switch (**Illustration 8.5, page 28**) to the center "STOP" position. This will allow the swing channel to close without the drive motor turning the belts.
3. The front compression roller assembly is held in position by the ½ inch socket cap screw, which acts as the shaft for the roller. To move the compression roller, loosen the screw just enough to allow the block to move. Loosening the screw too much will allow the screw (shaft) to skew too much to accurately align the compression belt. (**Illustration 8.11**)
4. The front (swing channel) compression roller's position is controlled by its block inside the channel. Between the block and the front wall of the swing channel is a socket cap screw (**A**), which passes through the channel wall and front shrouding (**Illustration 8.11**). Turning the screw so that it rotates clockwise into the block, the roller is moved away from the centerline between the channels, which reduces the pressure between the belts. If the screw is rotated counterclockwise out of the block, the roller is pushed away from the front of the machine and causes the pressure between the belts to increase. (**Illustration 8.12**)
5. Tighten the ½ inch screw socket cap screw (shaft) to lock the compression roller assembly in place.

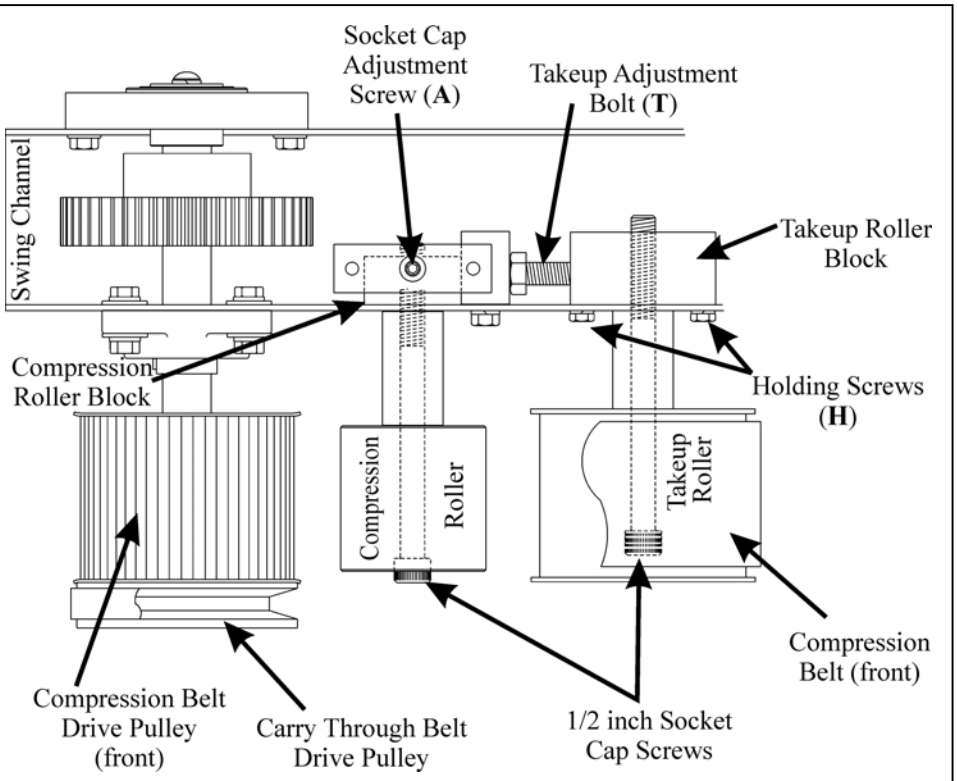


Illustration 8.11

6. Push in on the belt between the takeup roller and the drive sprocket. If the tension in the belt is correct, the belt should deflect about ½ to ¾ inch (13 – 19mm). (**Illustration 8.10**)
7. Install the swing channel shrouding, if it was removed.
8. Turn "ON" the pneumatic and electrical supplies to the PBC and turn the motor enable switch to the "AUTO" position. Push the "START" button and then the "CLOSE" buttons until the swing channel stays in the down position.

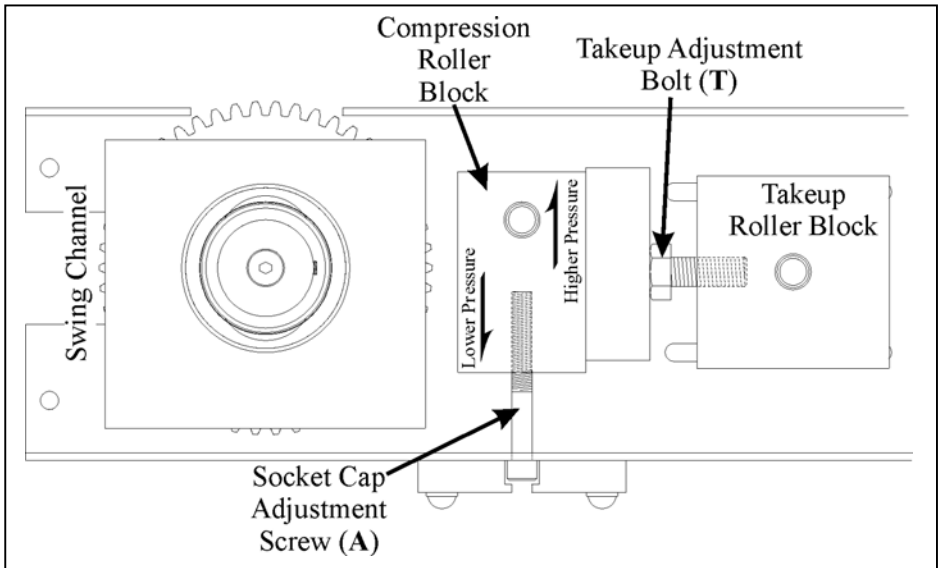


Illustration 8.12

9. You may wish to test a few bags with the heaters "OFF". Then test the compression roller settings with the heater "ON". Be sure to allow the manifold to heat up completely before testing begins. Follow the guidelines mentioned in the Quality Control section of this manual to determine a good seal.

WARNING

If the pressure between the belts is too high, the carry through belts (and channels) may begin to separate. Check the test bags to ensure that the carry through belts are holding the bags firmly.

If the carry through belts are not holding the bag top well enough, but the compression is at the desired pressure, adjust the front carry through belt guide just enough to achieve the needed hold.

CHANGING THE COMPRESSION BELTS

After normal use the compression belts will show wear at the compression surface and on the inner teeth. Belts with significant gouges will not provide the needed complete pressure across the adhesive area. When it is determined that the belts need to be replaced, always replace both belts. If the belt needs to be replaced, follow these instructions:

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the PBC.
2. Remove the front (swing channel) and rear (fixed channel) shrouds. Remove debris and dirt from the shrouds.
3. Remove the top cover shrouding that is above the compression assembly area. (near the drive motor)
4. Loosen the ½ inch screw of the swing channel compression roller from the bottom of the machine enough to allow the block to be moved. Turn the compression block adjustment screw (**A**) clockwise, to begin releasing the tension in the swing channel compression belt. (**Illustrations 8.11**)

   Loosen the ½ inch screw of the fixed channel compression roller from the bottom of the machine enough to allow the block to be moved. The rear (fixed channel) compression roller is moved by unlocking the jam nut and turning the (rear compression block) adjustment screw (**C**) into the block. This action will begin to release the tension in the rear compression belt. (**Illustrations 8.8 and 8.9**)
5. There are four (4) holding screws (**H**) that hold each of the takeup blocks to the channels. They pass through slots and are on the underside of the channels just above the takeup rollers. (**Illustration 8.8 and 8.11**) Loosen the screws (**H**) just enough to allow the block to move. Loosening these screws too much will permit the shaft to tilt (skew) too much, making it difficult to align the new belt.
6. Inside each channel the takeup roller blocks are positioned using a hex-head bolt (**T**). (**Illustrations 8.8 and 8.11**) Turn this takeup bolt (**T**) so that it rotates into the block, allowing the block to move towards the drive sprocket and compression roller. Keep doing this until the old compression belt can be removed.
7. Place the new compression belts (part no. 17423) around the assemblies. Be sure to use ***genuine*** Fischbein parts.
8. Turn the takeup bolt (**T**) so that it rotates out of the block. This should begin to tighten the compression belt. The holding screws (**H**) should be loose enough to allow the block to move without permitting the shaft to tilt too much.

9. Tighten the holding screws (**H**). Push in on the side of the belt between the drive sprocket and the takeup roller. The belt should deflect about ¾ inches (19mm). (**Illustration 8.13**)
10. Make sure that the holding screws (**H**) are tight before engaging the compression roller.

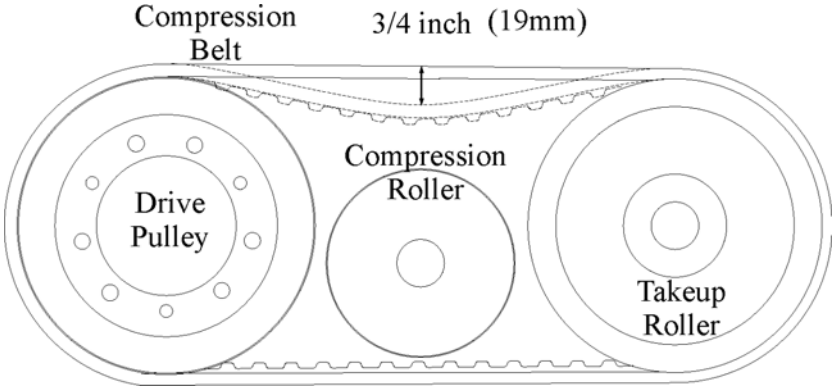


Illustration 8.13

11. To adjust the compression rollers refer to "**ADJUSTING THE PRESSURE BETWEEN THE COMPRESSION BELTS**" **page 32**.

8.5.3 COMPRESSION ROLLERS

The compression rollers are designed with two bearings that fit around the bushing of the assembly. (**Illustration 8.14**) After extended use of the PBC, the rollers and bearing will need to be replaced. Fischbein offers the rollers with the bearings mounted in the roller. To replace the rollers, follow these steps:

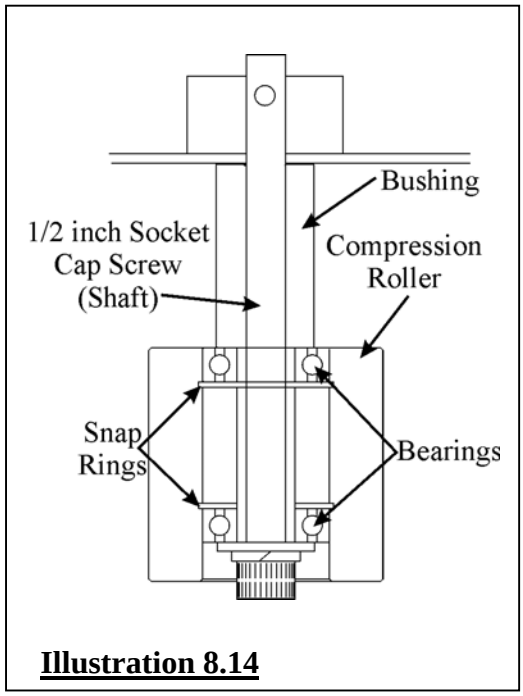


Illustration 8.14

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the PBC machine.
2. Remove the rear and front channel shrouds. Also remove the top channel cover, which is near the drive motor.
3. Loosen each of the two, ½ inch socket cap screws, which act as the shafts for the compression roller assemblies. (**Illustrations 8.8 and 8.11**)
4. **REAR CHANNEL**:
   To move the compression roller away from the compression belt, the block adjustment screw (**C**) must be turned into the block, after the jam nut is turned. (**Illustration 8.9**) This will allow the block to be moved away from the belt.

   FRONT CHANNEL:
   To move the front compression roller away from the belt, the adjustment screw (**A**) must be turned clockwise into the block. This will pull the block from the center of the machine so the roller mechanism can be replaced. (**Illustration 8.11**)

5. Remove the two ½ inch socket cap screws from their respective blocks. The screw and rollers should come loose from the bottom of the channels. (**Illustrations 8.8 and 8.11**)
6. If the bushing is still on the ½ inch screw, pull it off as well as the roller. Take careful note to the orientation of the bearings in the rollers and how they are placed on the shafts.
7. Place the new rollers (with bearings) onto the shafts as shown in **Illustration 8.14**. Place the bushings back in place.
8. Carefully thread the shafts back into the blocks in the channels. The socket cap screws should be turned enough to keep it fairly vertical and yet permit the block to be moved.
9. To properly set the rollers in position with the belts, follow the instructions in the "**ADJUSTING THE PRESSURE BETWEEN THE COMPRESSION BELTS**" **page 32**.

8.5.4 TAKUP ROLLERS

The takeup rollers provide the tension in the compression belts. They also act as guides for the bag tops as they begin to enter the compression process. After normal wear, the rollers and bearings will need to be replaced. The replacement rollers come with the bearings installed. (**Illustration 8.15**) When replacing the rollers, always replace the front and rear rollers at the same time. To replace the rollers, follow these steps:

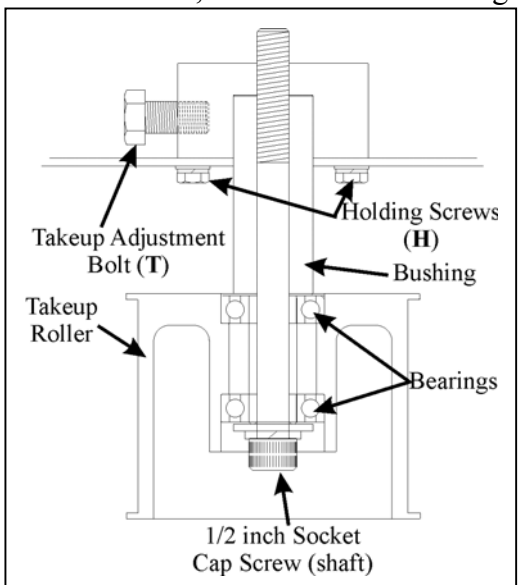


Illustration 8.15

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the PBC machine.
2. Remove the fixed and swing channel shrouds. Also remove the top cover closest to the drive motor.
3. To remove the takeup rollers, the tension in the compression belt must first be removed. This is done by turning the takeup block adjustment screw (**T**) into the block. (**Illustration 8.15**) Do not turn the screw too far into the block to the point where it begins to tighten again.
4. Loosen the ½ inch socket cap screws (takeup block only). (**Illustration 8.15**) This is done from the bottom of the rollers. Do not remove the screws.
5. Each takeup block is held in position by the four holding screws (**H**) on the bottom of the channels. These screws pass through slots to allow for adjustments. Loosen the holding screws (**H**), but do not remove them.
6. Remove the ½ inch socket cap screws from their respective blocks.
7. If the bushings are still on the screws, then remove them. (**Illustration 8.15**)

8. Remove and replace the takeup rollers. Take careful note as to the orientation of the rollers to the shafts.

9. Place the bushings back on the screws.

10. Screw the screws back into the blocks enough to keep them vertical and yet allowing the blocks to be moved.

WARNING

Make sure that the bushing go all the way up into the blocks. If the block adjustment screws (T)are into the block too far, the bushing will not be able to completely enter the block.

11. Begin turning the block adjustment screw (**T**) out of the block. This should start tensioning the compression belt. Do not over tighten the belt at this point.

12. Tighten the holding screws (**H**) and the ½ inch screw into the block.

13. Check the tension in the belt by pushing in on the belt between the takeup roller and the drive sprocket. The belt should deflect in by ½ to ¾ inch (13 to 19mm) with a reasonable amount of force. (**Illustration 8.10**) If the belt needs to be adjusted further, the ½ inch screws and screws (**H**) will have to be loosened (slightly) and the adjustment screw (**T**) turned.

14. Before mounting the shrouds and cover, make sure all the screws and bolts are tight. Also check the positioning of the compression rollers. Install the shrouds and top cover back into position.

15. Turn "ON" the electrical and pneumatic supplies to the machine.

16. Run some test bags through the machine with the heaters "OFF" and then "ON" to check the performance of the rollers.

8.5.5 PULLEYS, DRIVE SPROCKET AND TENSION

INFEED IDLER PULLEYS

The infeed assembly is designed to control the tension in the carry through belts. The belt passes through the infeed, around a pulley. After normal usage, the pulley will need to be replaced. The replacement pulley comes with a bearing set in it and a thrust washer. The top plate of the infeed has the pulley shaft welded to it. When replacing a pulley, always replace both pulleys. To replace the pulley, follow these steps:

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the PBC machine.

2. Remove the front and rear shrouds.

3. Remove the entrance belt guards from the leading edge of the infeed. (**Illustration 8.16**)

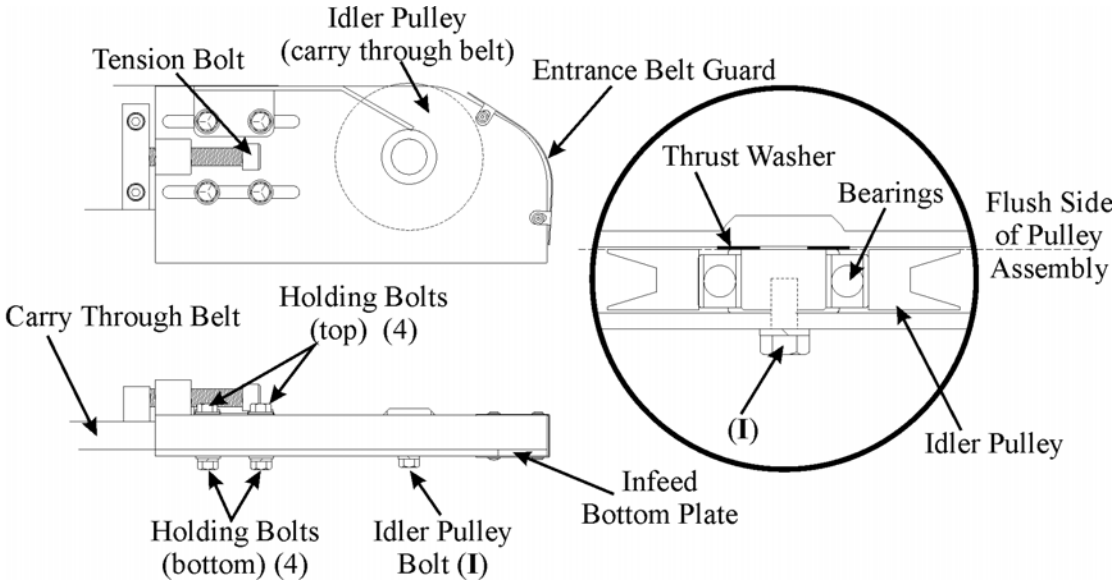


Illustration 8.16

4. Loosen, but do not remove, the four top holding bolts and four bottom holding bolts for the fixed and swing channel infeeds.

5. Turn the tension bolt to reduce the tension in the carry through belts.

6. Remove the four bottom holding bolts from the fixed and swing channel infeeds.

7. Remove the idler pulley bolt (**I**) from the bottom of the infeeds. The infeed bottom plate can now be removed from the assembly.

8. Turn the tension bolt enough to remove the carry through belt.

9. Carefully remove the pulley from its shaft. Be sure to remove the old thrust washer from between the pulley and the top plate of the infeed.

10. The new pulley comes with the bearing presses in place and a thrust washer. Install the thrust washer on the shaft first.

11. Install the pulley on the shaft with the flat (flush) side against the thrust washer (up). The bearing is pressed into the pulley so that it is flush with the pulley surface on one side and extending beyond the face of the pulley (slightly) on the other side. If the pulley is not installed correctly, the pulley will rub against the infeed plates.

12. Put the carry through belt on the pulley and turn the tension bolt enough to hold the belt on the pulley.

13. Install the infeed bottom plate using the four bottom holding bolts and the idler pulley bolt (**I**). The holding bolts should hold the plate in position and allow the infeed assembly to move. The idler pulley bolt (**I**) can be tightened, but not so much to prevent the pulley from freely rotating.

14. Turn the tension bolt until the desired tension is in the carry though belts. A belt with the proper tension will deflect between ½ to ¾ inch (13 to 19 mm), when pulled from the middle of the belt with a reasonable force. (**Illustration 8.17**)

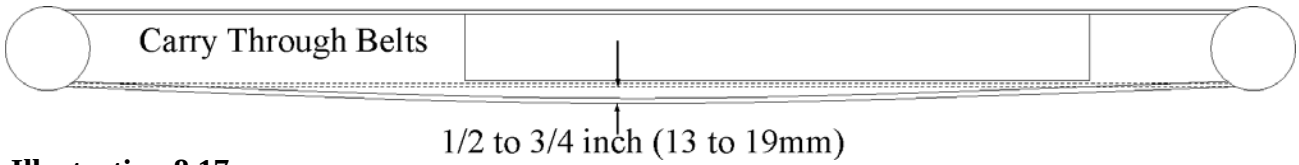


Illustration 8.17

15. Once the tension is set, tighten the four top and bottom holding bolts on both infeed plates. **Section 8.5.2, page 30**
16. Install the entrance belt guards on the infeed of the machine.
17. Install the fixed and swing channel shrouds.
18. Turn "ON" the electrical and pneumatic supplies and proceed to test the machine. Use test bags with the heater turn "OFF" to determine if the pulley is performing smoothly.

DRIVE PULLEY – CARRY THROUGH BELT

The drive shafts drive two belts, the compression belts and the carry through belts. The drive pulley for the carry through belt is attached to the bottom of the shaft. Occasionally check the screws, which hold the pulley to the compression drive sprocket. At the factory the screw threads are treated with Loctite® 222 to prevent them from coming loose. Since the pulleys attach directly to the compression sprockets, these do not contain bearings. Unless a pulley becomes damaged, it will not need to be replaced. If the pulley does need to be replaced, follow these steps.

1. Turn "OFF" and lock out the electrical and pneumatic supplies.
2. Remove the fixed and swing channel shrouds.
3. Loosen, but do not remove, the four top and bottom holding screws on the infeed. (**Illustration 8.16**)
4. Turn the tension bolt until the tension in the carry through belt has been removed and the belt can be removed. (**Illustration 8.16**)
5. Remove the three screws, (**D**) that hold the pulley to the compression sprocket bottom. (**Illustration 8.18**)

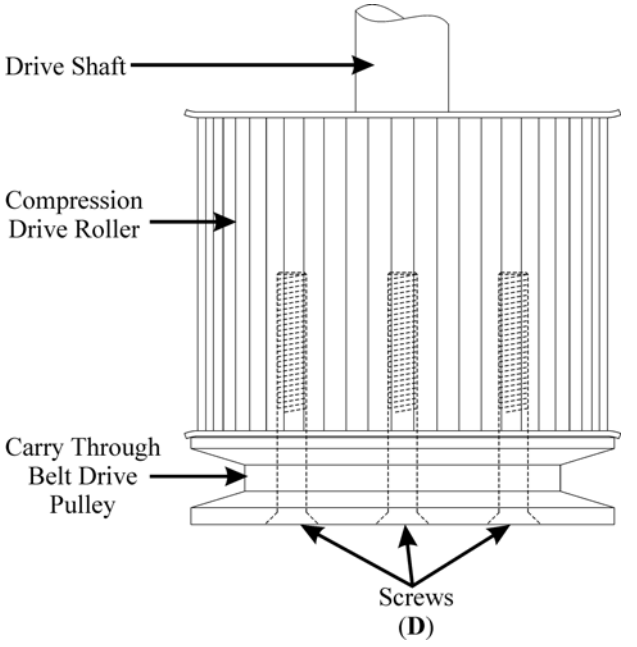


Illustration 8.18

Loctite is the registered trademark of the Loctite Corporation.

6. Use Loctite® 222 on the screw threads, (**D**) to mount the new pulleys on the bottom of the compression sprocket. Be sure the Loctite has completely cured before using the machine.
7. Place the carry through belt back on the pulley and turn the tension bolt, until the desired tension is achieved. A belt with the proper tension will deflect between ½ to ¾ inch (13 to 19 mm), when pulled from the middle of the belt with a reasonable force. (**Illustration 8.17**)
8. Tighten the top and bottom holding bolts for the infeed to keep the carry through belt at the desired tension.
9. Install the fixed and swing channel shrouds.
10. Turn "ON" the electrical and pneumatic supplies to the PBC 6000. Check the pulleys for proper functioning.

DRIVE SPROCKET – COMPRESSION BELT

The compression belt of the PBC 6000 is driven by a toothed sprocket (**Illustration 8.18**) for accurate timing. The sprocket should not need to be replaced unless it becomes damaged. Replacing the sprocket should only be done by a trained technician. If the sprocket needs to be replaced, please contact your Fischbein representative.

8.5.6 CREASER WHEEL

The creaser wheel of the PBC 6000 is responsible for forming a crease in the bag top to form the fold. The creaser assembly is divided into two main parts, one on the fixed channel and one on the swing channel. The swing channel portion forms the inside of the folded crease with a blade-type wheel. The fixed channel portion forms the top of the fold by using a grooved (die) roller that receives the creaser blade. (**Illustration 8.19**)

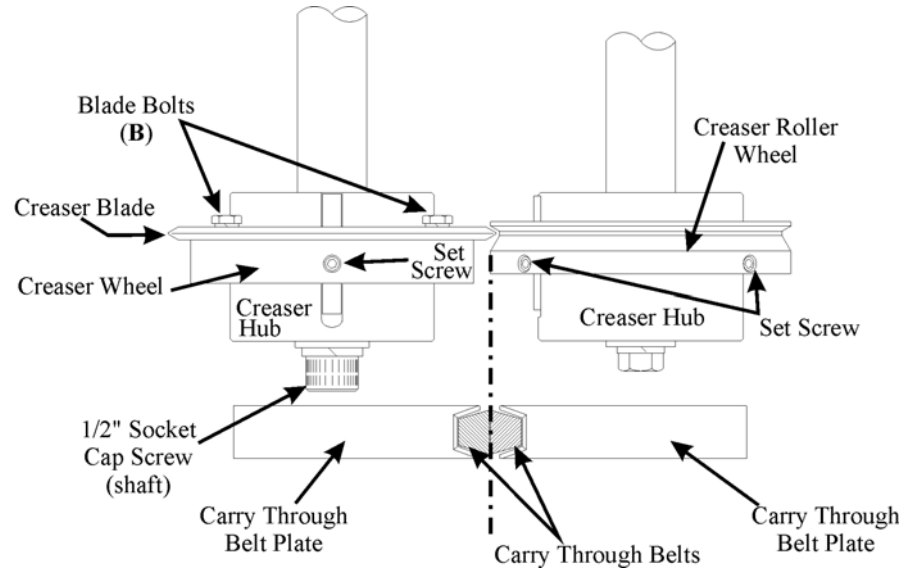


Illustration 8.19 {Right (infeed) view}

The creaser assembly must create the crease at the correct height in relation to the folder and glue line. There is a specific sequence for adjusting the setting for the creaser.

(A). The creaser roller wheel (die) is aligned with the carry through belts.

(B). The creaser roller is set to the correct height in relation to the folder.

(C). The creaser blade (front) is adjusted to the correct height based on the roller wheel (die).

(D). The gap between the creaser blade and the groove of the roller wheel (die) is set.

(E). The pressure between the blade and die is determined and set.

(F). For the manual infeed the bag guide is adjusted to introduce the bag's glue line to the machine at the correct height. For automated infeeds, the machine height may need to be adjusted to feed the glue line in at the correct height.

Before making any adjustments to the creaser area:

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the PBC.

2. Remove the swing channel shrouding. The adjustment can be made without the fixed channel shrouding being removed.

3. Turn the Motor Enable (keyed) Switch (**Illustration 8.5, page 28**) to the center "STOP" position. This will allow the swing channel to close without the drive motor turning the belts. The swing channel must be engaged to properly set the creaser components.

(A). Creaser Roller Wheel (die) Horizontal Adjustment

The carry through belts determine the centerline of travel for the bag passing through the system. The creaser hub face in the fixed channel must be centered directly above the centerline between the carry through belts. (**Illustration 8.19**) If the hub needs to be moved, follow these steps:

1. Loosen the two bolts, (**J**) holding the block to the channel. (**Illustration 8.20**) Do not remove the bolts, (**J**).

2. Insert a thin piece of metal between the carry through belts, below the hub of the creaser roller wheel.

3. Use the flat piece of metal to line the outer vertical surface of the hub with the centerline between the carry through belts. (**Illustration 8.19**) Move the assembly to the proper alignment.

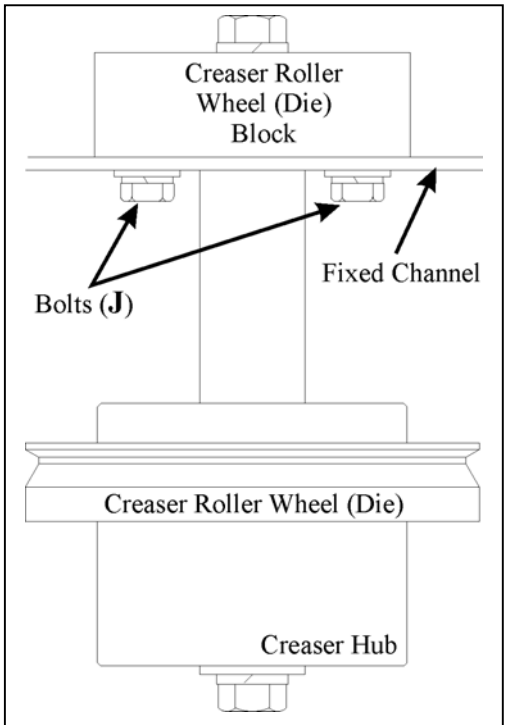


Illustration 8.20

4. Hold the assembly in position and tighten the bolts, (**J**) to hold the block in place. Turn the hub and make sure the hub surface aligns with the centerline completely. Also make sure that the wheel is directly behind the blade assembly. A line from the blade shaft to the die shaft must be perpendicular to the channel front face.

(B). Creaser Roller Wheel (Die) Vertical Adjustment

The crease of the bag top must enter the folder at the correct height after exiting the creaser assembly. The creaser die groove must be centered across from the underside of the folder. (**Illustration 8.18**) If the height of the creaser die needs to be adjusted continue to follow these steps:

5. Loosen the two set screws that hold the creaser roller wheel (die) to the creaser hub. (**Illustrations 8.20 and 8.21**)
6. Line the middle of the die creaser groove with the underside of the folder.
7. Begin to tighten the set screws enough to hold the wheel in place.
8. Turn the wheel to make sure that the entire wheel is level and not skewed.
9. Tighten the set screws after the wheel has been aligned.

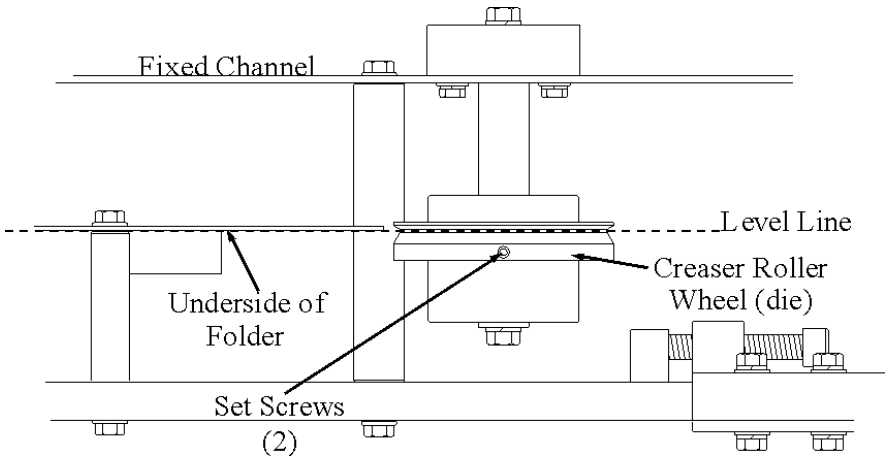


Illustration 8.21

(C). Swing Channel Creaser Blade Height Adjustment

The fold on a bag is properly formed when the blade is directly across from the vertical groove in the die (creaser roller wheel). If the blade is too high or low, the fold will not be completely made. The blade must break the fibers in the bag material to form a good fold. The blade is attached to the creaser wheel (swing channel) by three bolts. To adjust the height of the blade, the wheel must be adjusted. If the blade height needs to be adjusted, continue to follow these steps:

10. Loosen the two set screws that hold the creaser wheel-blade assembly to the hub. (**Illustration 8.22**)
11. Move the assembly until the blade edge is directly across from the center of the groove in the die.

12. Carefully hold the assembly in place while beginning to tighten the set screws.
13. Rotate the hub and check the blade to ensure all sides are centered across from the die groove. The blade must be level to consistently function.
14. When the blade is positioned correctly, tighten the set screws and rotate the assembly again to ensure that it is level all the way around.

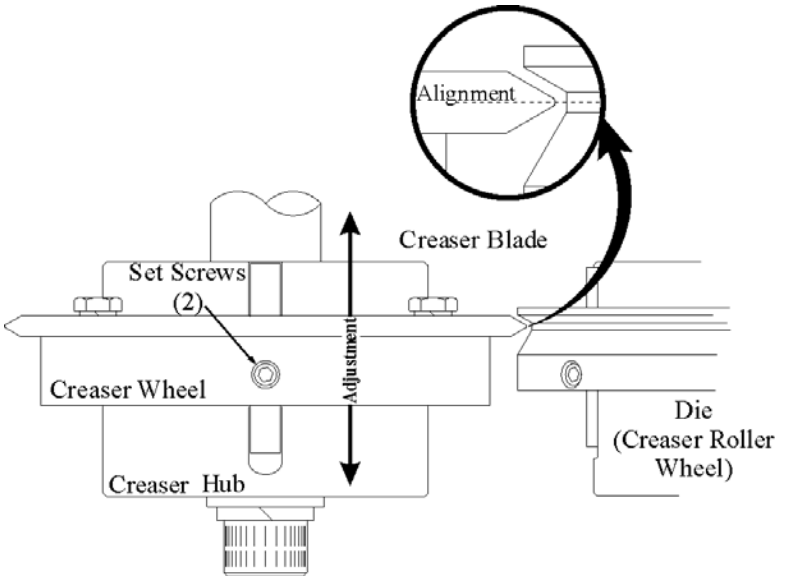


Illustration 8.22

(D). Setting the Gap: Blade Horizontal Adjustment

The gap between the blade and the die groove is determined by the type of bags being closed. The optimum range suggested for the gap is from 3/32 – 3/16 inch (2,4 – 4,8mm). Set the gap for the larger gap size for thicker bag materials and the smaller gap for the thinner materials. The gap can be easily and quickly changed. The horizontal location of the creaser blade is adjusted by a bolt in the block of the creaser blade assembly, located in the swing channel. (**Illustration 8.20**) To adjust the gap setting, continue to follow these steps:

WARNING

The creaser blade should never come into contact with the die (creaser roller wheel) groove.

15. Remove the top cover (guard) in the center of the machine, which surrounds the base of the electrical control box.

16. Loosen the Blade Gap Jam Nut. (**Illustration 8.23**)

17. Turn the Blade Gap Adjustment Screw, (**G**) in or out of the block to decrease or increase the gap size, respectively. The blade must never come into contact with the die.

18. Once the desired gap is achieved, lock the adjustment screw, (**G**) into position with the jam nut.

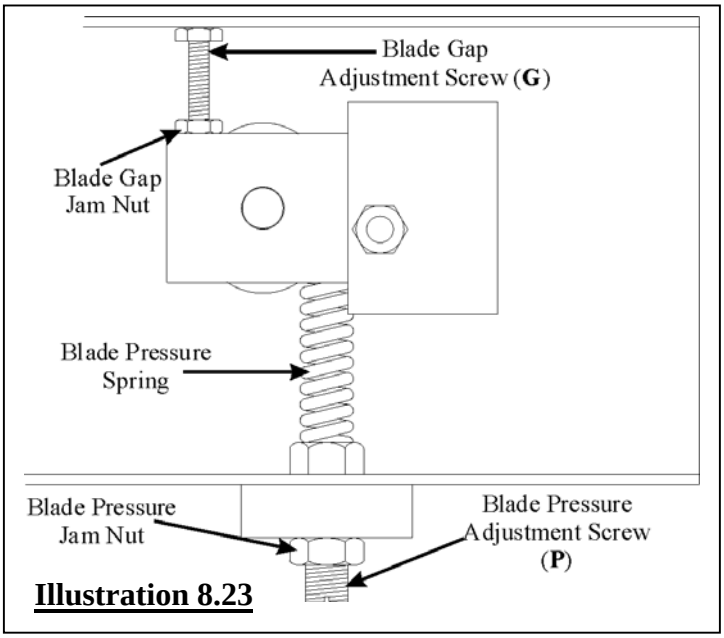


Illustration 8.23

(E). Creaser Blade Pressure

As a bag enters the creaser assembly, the creaser blade assembly is free to move, to allow for varying thicknesses in each bag's profile. Near the leading and trailing edges of the bags, the gussets double the thickness of the bag and yet still need to be effectively creased, folded and sealed. The blade assembly is designed with a compression spring to ensure a steady pressure is applied to the blade and to allow the blade to adjust to changing bag contours.

The blade pressure must be high enough to break the fibers in the bag material, but low enough to prevent problems in the folding and sealing process. It has been observed that for thinner bag materials, the pressure can be set at a lower pressure. For thicker or more rigid materials the pressure will have to be set to a higher pressure. If the pressure is set too high, the bag may jam while entering the creaser wheels, the flap may be excessively wrinkled or the crease line will be crescent in shape, rather than a straight line. Adjusting the pressure of the blade is a quick and easy procedure. To adjust the pressure, continue to follow these steps:

NOTE:
When making adjustments to the blade pressure, turn the adjustment screw in half-turn increments at a time.

19. Loosen the jam nut on the Blade Pressure Adjustment Screw (**P**). The nut and screws can be seen on the front face of the swing channel. (**Illustration 8.23**)
20. From the front of the machine, turn the screw, (**P**) clockwise to increase the pressure and counterclockwise to reduce the pressure. This changes the compression in the spring. For most instances, the pressure needed for most common bag types can be produced within a couple of turns of the lightest settings of the adjustment screw (**P**).
21. Once the desired pressure is achieved, lock the screw in position with the jam nut.

After the heights and horizontal adjustments have been completed, the creaser section of the machine should be tested on empty test bags. If the settings are correct, the bag will enter the creaser region without jamming and the crease line formed by the blade should be fairly straight. Some bending will occur in the blade line due to the gussets on the ends of the bags. The flap will have a few wrinkles in the material, but not large enough to prevent a consistent seal. The bag should enter the folder smoothly without hanging up.

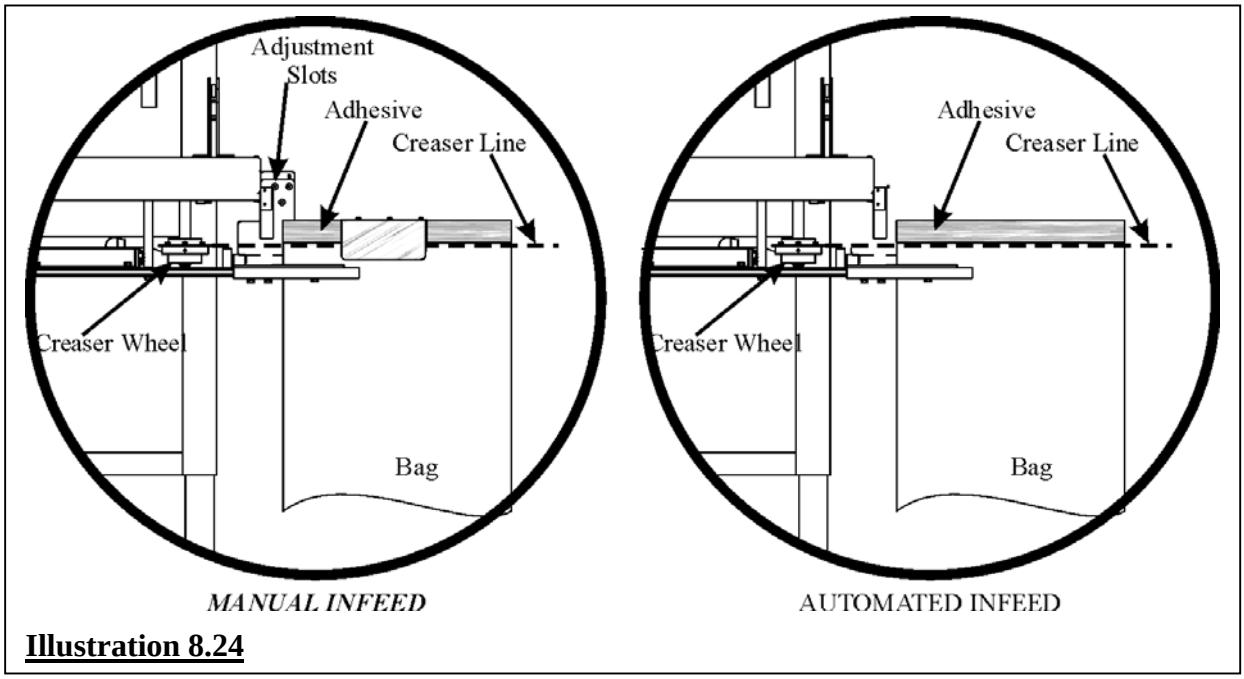


Illustration 8.24

8.6 BAG GUIDE (MANUAL INFEED)

(F). Glue line adjustment

Once the creaser system has been correctly set, the bag must be fed into the machine at the correct height in order to crease the bag in the correct location. The creaser blade should be running along the bag just below the glue line on the flap. (**Illustrations 8.24 and 8.25**)

If your machine is equipped with the manual infeed, the bag guide above the infeed must be set at the correct height and angle. The guide's height can easily be adjusted vertically and horizontally to line up the bag tops with the system. To adjust the bag guide, follow these steps:

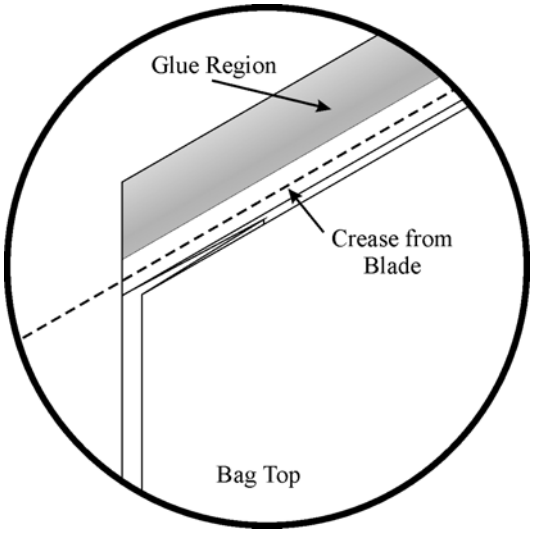


Illustration 8.25

Before making any adjustments to the bag guide area:

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the PBC.

2. Turn the Motor Enable (keyed) Switch (**Illustration 8.5, page 28**) to the center "STOP" position. This will allow the swing channel to close without the drive

motor turning the belts. The swing channel must be engaged to properly set the bag guide components.

Horizontal:

The metal plate of the bag guide should be centered above the centerline where the two carry through belts come together. The plate is mounted to a 90° angle bracket with six slotted holes. Three holes are used for the horizontal movement and three for the vertical. To move the guide horizontally, follow these steps:

3. Place a thin ruler or straight edge between the carry through belts below the bag guide.
4. Loosen the three bolts (**F**) as shown in **Illustration 8.26**.
5. Keeping the guide level to the machine, move the guide so that it lines up with the straight edge.
6. Tighten the bolts (**F**) to secure the bag guide in position. Make sure the guide is parallel to the infeed top surface.

Vertical:

Attached to the bag guide is a clear shield (bag insertion guide) to help the operator feed the bag top into the machine at the correct height. The operator should feed bags into the machine with the top edge of the bag (flap) against the underside of the shield. When these bags are carried into the creaser area, the bottom of the glue line (region) should be just above the creaser blade. The glue should not be in the crease of the fold. To adjust the height of the bag guide, continue to follow these steps:

7. Loosen the three screws, (**K**) as shown in **Illustration 8.26**.
8. Keeping the guide parallel to the infeed, move the guide to the correct height.
9. Tighten the screws, (**K**) when the guide is at the correct height.

Testing:

10. Turn the motor enabled (key) switch to the "AUTO" position and push the "START" button. Make sure that the heater control is turned "OFF".
11. Use test bags fed into the machine using the bag guide to determine if the creaser blade is running along the bag just below the glue region.

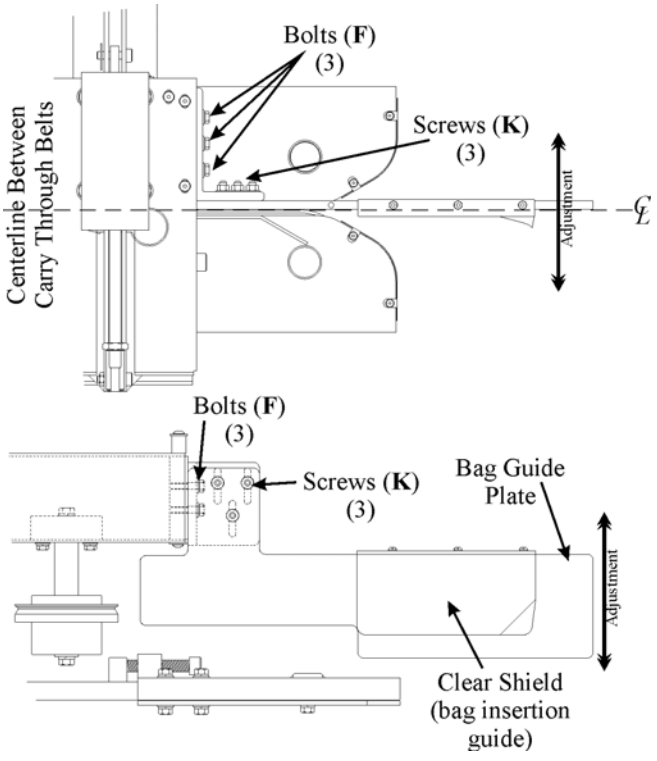


Illustration 8.26 *(Top and Front Views)*

Make further adjustments to the guide as needed when the electrical system is "OFF". Refer to the Quality Control section of this manual to determine proper bag closures.

8.7 FOLDER AND GUIDES

The PBC 6000 is equipped with a folder plate and bottom folder guide on the fixed channel and a hot air manifold guide on the swing channel. These components work together to gradually bend the bag flap at the crease line, expose the adhesive to the hot air manifold and then complete the fold before entering the compression assembly. If the folder and guides are not properly set, the bag flap will not make an attractive or effective closure.

This section of the manual is provided to act as a guide from which to start your adjustments. Each bag type has its own characteristics, which may require slight adjustments to a couple of components. If sample bags were sent to the factory at the time of the purchase, then the machine has been set for that specific bag type. If adjustments are required, generally the adjustments are slight and easily accomplished. Below you will find the instructions for setting the folders and guides for a general set up. From there the assembly can be fine tuned for specific applications.

FIXED (REAR) CHANNEL FOLDER AND BOTTOM FOLDER GUIDE

1. Turn the Motor Enable (keyed) Switch (**Illustration 8.5, page 28**) to the center "STOP" position. This will allow the swing channel to close without the drive motor turning the belts. With the swing channel in the "CLOSED" position, the folders and guides can be aligned correctly.
2. Remove the fixed and swing channel shrouds to access the folding components.
3. Place a stiff, thin, flat piece of metal between the carry through belts, to properly align the lower folder.
4. The bottom folder guide provides a surface for the rear of the bag to travel along, while the flap is heated and folded. The surface of the bottom folder guide must be parallel to the surface of the carry through belts and parallel to the top surface of the carry through belt plate. (**Illustration 8.27**)
5. The folder can be adjusted from the rear of the machine after the bolts holding it to the standoffs have been loosened.
6. The folder does the actual bending of the flap. During this process the flap is held above the hot air manifold to melt the adhesive. For most bag types the trailing edges of the folder and bottom folder guide should have a gap between them of about ¼ to 3/8 inch (6,4 to 9,5 mm). (**Illustration 8.27**)
7. While holding the gap between the bottom folder guide and the folder, adjust the folder so that it is parallel with the back edge of the carry through plate. There are three bolts and standoffs that hold the upper folder in position. Once the bolts are loosened, the upper folder can be adjusted.

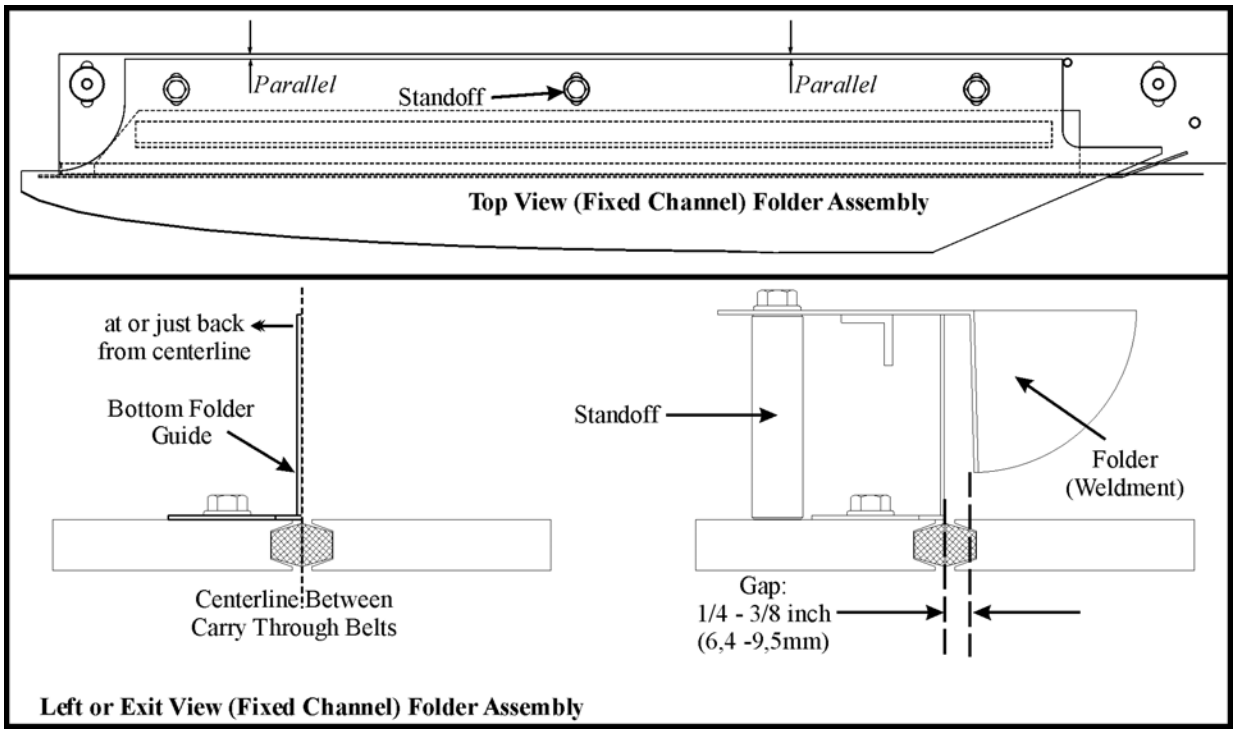


Illustration 8.27

SWING CHANNEL MANIFOLD HEATER GUIDE

Once the rear (fixed channel) folder and bottom folder guide have been set into position, the remaining "fine tuning" can be performed on the swing channel's manifold heater guide. The hot air manifold can also be adjusted horizontally. It is important that a gap is left between the hot air manifold and its guide. Left in contact or too close to each other, the guide will reach a high temperature, which can mar the surface of the bag, creating a build up of material on its surface.

The position of the manifold guide allows for the actual thickness of the bag top material. The guide must be aligned to be parallel with the carry though plate and the manifold top. Its top edge should rise above the hot air manifold's top by about ¼ inch (6,4mm). (**Illustration 8.28**) The guide must be above the manifold to prevent the glue strip from coming into contact with the manifold surface. If the guide is not high enough over the manifold, the flap will come into

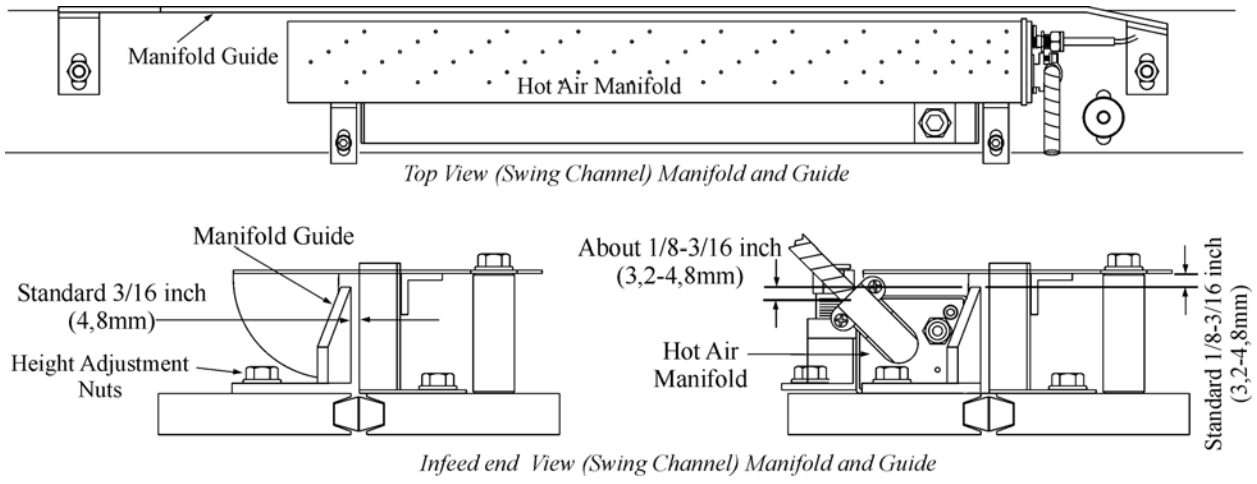


Illustration 8.28

contact with the manifold and the glue will begin clogging the holes in the manifold top. Obstructed holes prevent the hot air from exiting the manifold and will not allow the glue strip to completely heat.

8. Horizontally: To adjust the manifold guide loosen the two height adjustment bolts holding it to the carry through plate. The gap (directly above the centerline between the carry through belts) between the bottom folder guide and the manifold guide should be about 3/16 inch (4,8mm). This gap is a standard setting and may need to be adjusted based on the bag thickness. (**Illustration 8.28**)
9. Vertically: To adjust the height of the guide, nuts are used with a bolt to secure the guide at the desired height. The top edge of the manifold guide should be about 1/8-3/16 inch (3,2-4,8mm) above the top of the manifold and below the underside of the folder.
10. Once the guide is in place and aligned, secure it in position with the two bolts and nuts.
11. The hot air manifold must be placed in a position providing the maximum amount of hot air flow to the adhesive strip and flap. It is not only important to heat the glue, but also the bag material. The glue will always have difficulty penetrating a much colder bag material. The glue strip should be carried over the holes and not contact the guide. If the bag does come into contact with the manifold, raise the height of the guide. The hot air manifold is not to be raised or lowered. It is designed for horizontal adjustments only.
12. Install the fixed and swing channel shrouds.
13. Turn the Motor Enabled (keyed) Switch to the "AUTO" position.

For further assistance, please call your Fischbein representative or our Technical Services Department. (page 3)

TESTING

14. Turn "ON" the electrical and pneumatic supplies to the machine. Leave the heaters turned "OFF" for the initial test runs.
15. Close the swing channel and feed a couple of sample bags into the machine. Carefully inspect the bag tops as they pass through the system. Check for interruptions, snags or irregularities in the folding.
16. Turn the heaters "ON" and allow the machine time to completely warm up.
17. Feed sample test bags into the machine and check the quality of the closures. Also test filled bags through the machine. Use the Quality Control Guide of this manual to assist you in determining a good seal.

8.8 HOT AIR (HEATER) MANIFOLD

The PBC 6000 hot air manifold devise has been design as a self-contained assembly. The actual heaters are contained within the manifold. This design provides fast heating of the air, which is then directly blown on the bag top and adhesive. The strategically placed holes in the manifold top provide the means for the hot air to blow on the bag top.

If the holes become clogged with glue build up or debris, the effectiveness of the system is reduced. The holes must be kept clean and free of debris. Use a dull edged tool when cleaning glue from the manifold. Occasionally check the bolts that hold the manifold assembly to the carry through plate are tight.

After normal usage, the heater cartridges within the manifold will have to be replaced. Whenever the machine is being turned "OFF", be sure to always let the pneumatics continue to run until the cartridges have reached room temperature. Turning the pneumatic supply to the machine "OFF" while the cartridges are still hot will damage the heaters and the pneumatic lines. There are a couple of signs that a cartridge has burned out. If you suspect that a cartridge has burned out, the best way to verify is by checking for current through the cartridge lead wires. This can easily be checked with a current clamp meter when the system and heaters are turned on.

Since the life expectancy of the cartridges are consistent, it is best to replace both cartridges when one has been determined to have burned out. In some instances, after one cartridge has burned out the remaining cartridge works harder to compensate for the loss. This will shorten the second cartridge's life significantly. To replace the heater cartridges in the manifold, follow these steps:

NOTE:

Only qualified and trained electricians should replace the heating cartridges of the manifold assembly.

1. Turn "OFF" and lock out the electrical and pneumatic supplies to the machine.
2. Remove the swing channel (front) shrouding to access the hot air manifold assembly.
3. In order to place the manifold back into its original place after being removed, you may wish

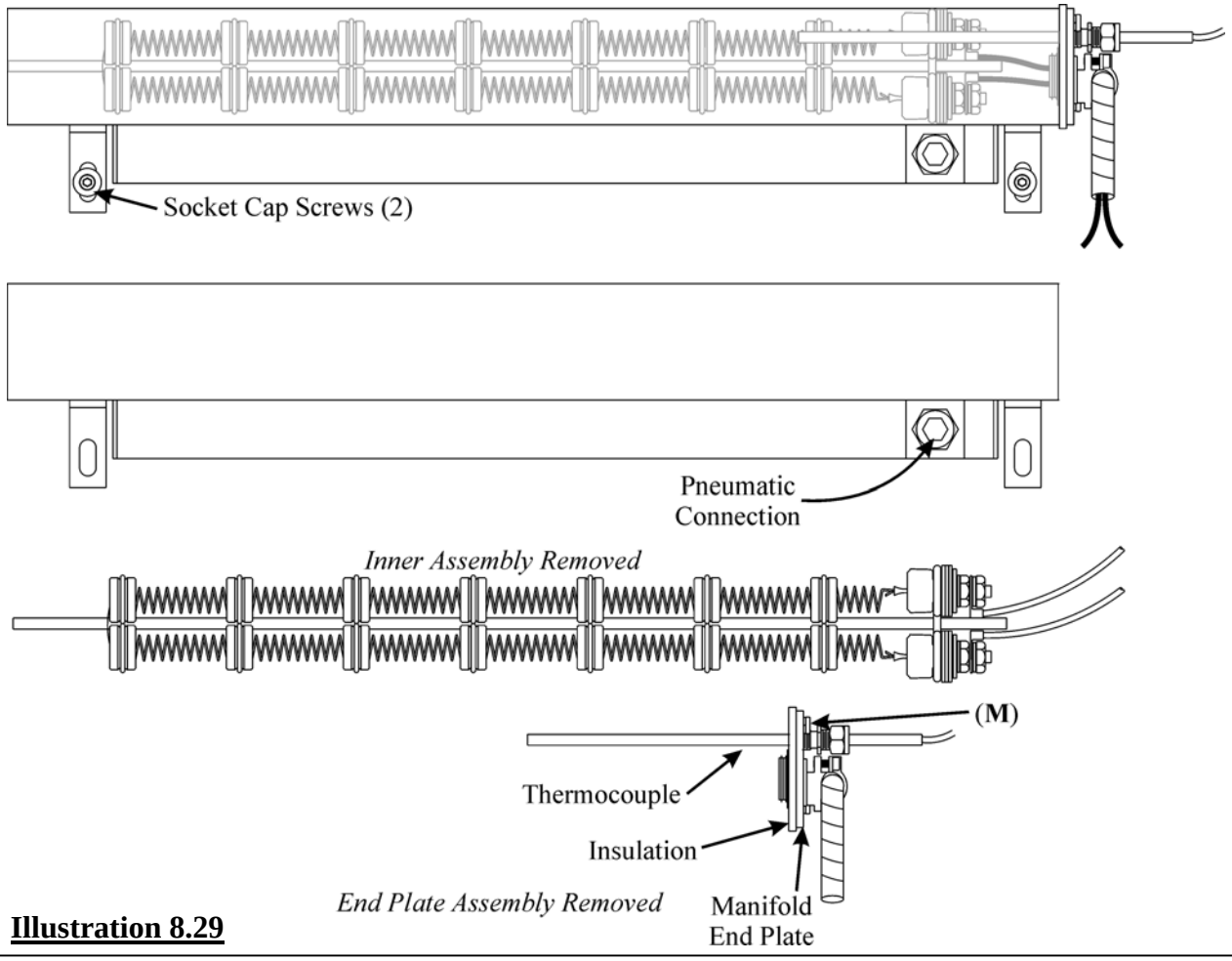


Illustration 8.29

to take some measurements or make some marks on the carry through plate before removing the manifold.

4. Open the rear main electrical control panel and locate the lead wires from the heating cartridges. Follow the electrical prints (in the pocket of the electrical enclosure door) to disconnect the heater cartridge wires.
5. Disconnect the pneumatic supply line from the connector on the manifold. (**Illustration 8.29**)
6. Remove the socket cap screws that secure the manifold to the carry through plate and remove the manifold.
7. Remove the screws, (**M**) which hold the manifold end plate to the rest of the manifold body. The entire inner assembly can be pulled out of the manifold body. Pay special attention to the orientation of the end plate and the cartridges. Mark the outside of the endplate.
8. Remove the heater cartridge unit from the manifold. Remove the lead wires from where they pass through the end plate. Carefully thread the new lead wires through the end plate and secure.
9. Insert the new heater cartridge assembly into the manifold.
10. Replace the insulator that goes between the endplate and the manifold body. The insulator is a special high temperature material used as a gasket.
11. Secure the end plate onto the end of the manifold in the same orientation that is was removed using the screws (**M**).
12. Position the manifold in place based on the prior measurements or markings you made in step 3. Secure the manifold assembly into position using the two screws. There should be a space of air between the manifold body and its guide and the guide should rise about ¼ inch (6,4mm) above the top surface of the manifold body. (**Illustration 8.28**) Use the supplied washers under the manifold feet to achieve the correct height.
13. Using the electrical drawings from the rear electrical enclosure, carefully wire the heater cartridges back into the panel. (**Illustration 8.29**) Check the lead wires as they pass through the channel systems to ensure that they are not interfering with the closing of the swing arm or tangling on any other components.
14. Connect the pneumatic supply to the manifold's connector. Secure the electrical cables from the manifold to the carry through plate mounting shaft with cable ties. Make sure that the cables do not interfere with the creaser assembly.
15. Install the swing channel shrouding.

NOTE:

The AUTOTUNE function on the heat controller should be turned ON and allowed to run after the following conditions:

1. ***The heater cartridges have been replaced.***
2. ***The heat controller PID has been replaced.***

TESTING and the AUTOTUNE FUNCTION

16. Turn the pneumatic and electrical systems "ON". Close the swing arm and check the cartridge lead wires to make sure they are not interfering with any components.

17. Turn the heaters "ON".

18. AUTOTUNE: To run the Autotune feature, press down and hold the ▲ and ▼ keys for three (3) seconds. The display will alternate showing **tunE** and **oFF**.

19. Press and hold down the ***** key and the press the ▲ or ▼ key until the display shows **on**. Release the keys and the display will alternate between **on** and **tunE**. This indicates that the controller is going through the autotune process, which can take about 10 minutes. After a couple of minutes the display will alternate between the current temperature and **tunE**. Once the cycle has completed the controller will either display the current temperature at or near the set point or will display the current temperature with **-AL-** to show that it is finishing the warm up cycle.

20. Adjust the set temperature for the type of bags being tested.

21. After the machine has completely heated and the "READY" light has illuminated, feed some test bags into the machine and inspect them for quality closures. Refer to the Quality Control section of this manual to determine proper closures.

8.9 TEMPERATURE CONTROLLER

The PBC 6000 utilizes a temperature controller that has useful options and controls. The digital display is easily read and adjustable. To understand more available options, be sure to read the Instruction Manual found in the electrical enclosure. The instructions in this PBC manual will only summarize the more utilized functions for a technician and operator.

Within the heater manifold is a thermocouple, monitored by the heat controller. The controller on the front electrical control panel uses the information from the thermocouple to monitor and adjust the heater cartridges. To adjust the temperature to the cartridges, use the controller on the electrical control panel. (**Illustration 8.30**)

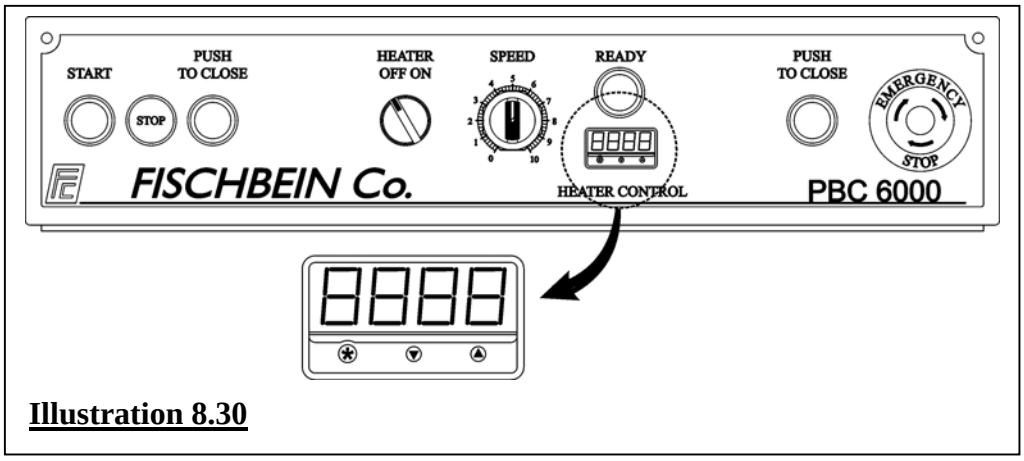


Illustration 8.30

CHANGING THE TEMPERATURE

To display the set point, push and hold in the "*****" button. The display (**Illustration 8.31**) will alternate between the set point temperature and the temperature scale (^{o}C for Celsius and ^{o}F for Fahrenheit). To change the set point, push and hold in the "*" button and then press the "▲" or "▼" keys to increase or decrease the setting. Release the buttons when done. Only make small increment changes to the set point until the desired closure is achieved. Be sure to allow five to ten minutes for the heaters to reach their optimum level before sealing bags in the PBC 6000.

Further information on options, error messages and settings of the temperature controller can be found in the controller's Instruction Manual (in the electrical enclosure). For assistance please contact your Fischbein representative or the Fischbein Technical Service Department (**page 3**)

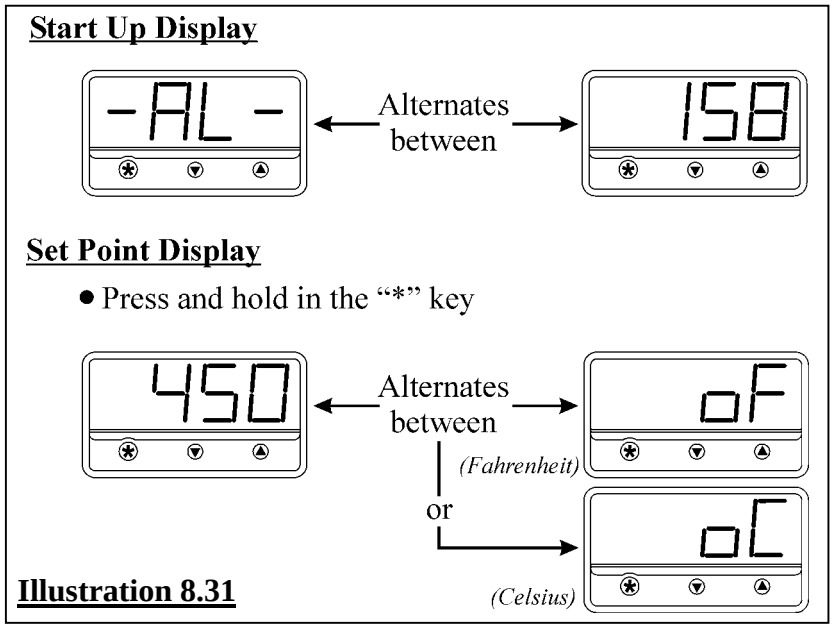


Illustration 8.31

8.10 DRIVE MOTOR AND GEARS

The PBC 6000 is powered by a drive motor, located above the compression area of the machine. The motor is responsible for turning the drive shafts that power all of the belts. The shaft in the fixed channel is directly connected to the drive motor. When the swing channel is closed, a set of spur gears on the drive shafts mesh together, providing power to the swing channel system. (**Illustration 8.7, page 32**)

The spur gears should be lubricated with grease at least once a month. The fasteners that connect the motor to the channel should be checked to ensure that they are secured to the frame. Once the fixed and swing channel shrouds are removed, the shafts, gears and blocks can be inspected for loose fasteners. It is imperative that the gears remain across from each other and that the shafts are parallel to each other, when the swing channel is closed.

After normal usage the bearings for the drive shafts may need to be replaced. If the drive assembly needs replacement, please contact your Fischbein representative.

9. QUALITY CONTROL GUIDE

The purpose of this section is to provide guidance for quality control departments in determining their own specifications for bag closures. It also outlines the conditions and adjustments needed to achieve the desired closure from the PBC 6000 system. The PBC has been designed to heat an adhesive -coated flap and then fold the flap over 180^{o} to seal the end of a bag top.

9.1 GENERAL CONDITIONS FOR A GOOD SEAL

CORRECT ADHESIVE TEMPERATURE

The temperature of the heater cartridges is determined and set based on the speed of the machine, the type of bag material and adhesive used, the ambient temperature of the bag, and the room temperature. Since any one of these factors may change through a working day, the seal should be inspected on a regular schedule to ensure a strong seal to the bag surface. Always start from a lower temperature and gradually increase as needed.

BAG SURFACE PREPARATION

As with most adhesives, the bonding surface must be clean and free of debris. If a residue (powder, dust, moisture, oil) or product is left on the surface of the bag, near the bond area, the adhesive will not make a good bond to the bag material. Operators handling the bag tops should ensure that the bag is clean before it enters the PBC system. In dustier environments modifications may need to be made to keep contaminants off the bag surface. The machine is equipped with an air scrubber, which is positioned to blow clean, non-lubricated air across the seal area. If contaminants are still preventing a good seal, the air scrubber can be adjusted (by its control valve) to blow more air.

As the bag top enters the PBC system, its bonding surface should be flat and free of wrinkles. The machine will make a few small wrinkles within the creaser area, but operators need to ensure that the bags are not wrinkled before entering the machine.

Most PBC bags are made so that their glue will adhere to the bag surface. If the bag has a high gloss surface, the bag manufacturer usually provides an area along the bag, which has been prepared for the hot glue. Test the bags to be sealed to ensure a compatible combination that will produce a strong seal.

PROPER BAG PRESENTATION

Part of the success of sealing a bag top is presenting it to the PBC 6000 at the correct height and parallel to the sealing line of the machine. The PBC must be aligned with the conveyor in order to receive the bag top at the correct height and so that the crease line is parallel to the seal line. If the crease is located in the wrong area of the bag top, it may not completely seal. To seal the top of the bag, the seal, flap and creaser lines must be parallel to the conveyor.

Bags entering the system must not have large wrinkles. Large wrinkles in the bag top flap will not provide a complete seal.

9.2 TYPICAL BAG CLOSURES

PROPER CLOSURES

A properly closed PBC bag prevents the sifting or leakage of products from its sealed ends. There are specific characteristics of properly closed bags. Properly closed bags have a strong complete seal along the entire length of the bag. After a bag has been sealed by the PBC 6000 and allowed to cool, try pulling the seal apart from the outside of the bag. As the flap is torn away, the adhesive should contain fibers of the bag material from the opposite piece. Glue should be found on both sides of the seal. Another way of testing the seal is to take a sealed bag that has cooled and cut the top 6 inches (153mm) bag top off. Begin pulling apart the seal from the inside of the bag. Check for unsealed areas within the gussets and along the entire length of the bag. Be certain to check for full contact between the two surfaces of the bag. A seal with many large wrinkles may provide an avenue for product to leak from the bag.

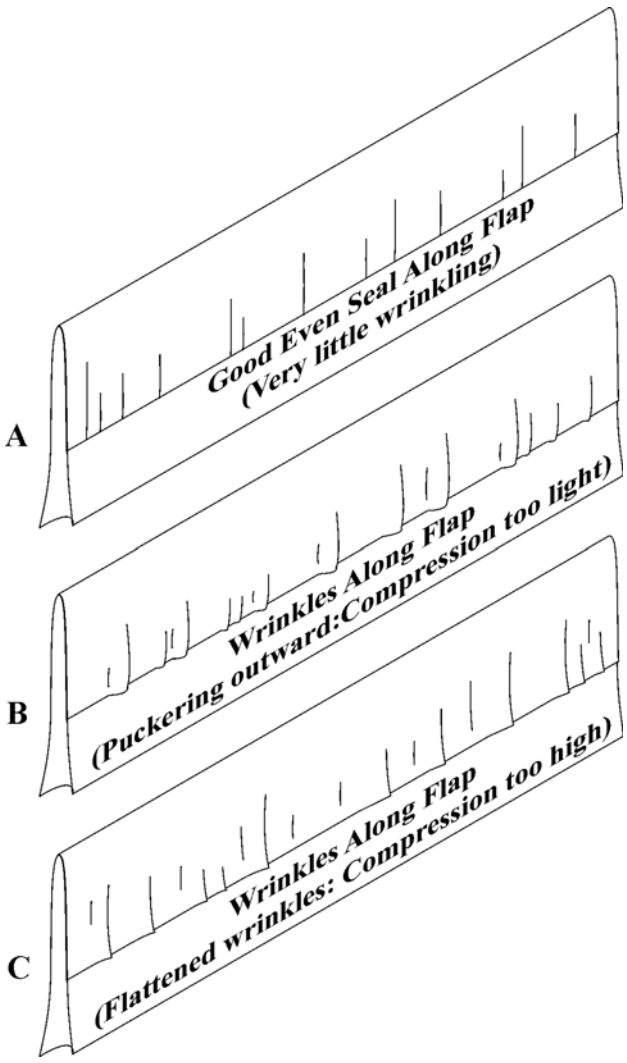


Illustration 8.32

The appearance of the bag is important to the end consumer. The PBC 6000 is fully capable of making a strong and attractive seal. The appearance of a seal becomes more important for bags that display artwork on the outside. The seal should be relatively straight and even. Some cresting can be expected at the gussets due to the changing thickness in the bag. If a flap has been sealed at an angle straight across the bag, adjustments should be made to correct the problem.

PROBLEM CLOSURES

An incorrect closure compromises the integrity of the seal. If a closure is not complete due to a wrinkled or angled seal, the adhesive strip has not made full contact with the bag surface. Below is a description of the common types of problem closures that may occur and how to solve them.

A. The diagram in **Illustration 8.32, A** represents a proper bag seal. Some cresting will occur near the gussets and small wrinkles will be present as a result of the creaser. The seal does make full contact along the bag when pulled apart and inspected.

B. This diagram shows that the flap has not been completely compressed. The adhesive was likely heated to the correct temperature, but the compression rollers must force the melted glue into the fibers of the bag material on both sides of the seal. The wrinkles are present, but are not pressed flat to the bag surface. (**Sections 8.5.2-3, pages 30 and 37**)

C. This picture indicates that the bag has been sealed for the most part, but there are an excess amount of large wrinkles in the flap. They are compressed to the surface, but still may allow leakage of the product. Here are some of the possible causes:

1. Compression set too high. If the pressure between the two compression rollers is too great, the flap will move too easily with the hot glue being extruded from the flap bottom and trailing edge of the bag. (**Sections 8.5.2-3, pages 30 and 37**)
2. The pressure between the creaser blade and die is set too high. The creaser assembly must break the bag fibers to produce a line for the fold. The radial design of the creaser produces some wrinkles in the flap. If the pressure is set too high, the bag will have difficulties entering between the die and blade, causing large wrinkles. (**Section 8.5.6, page 42**)

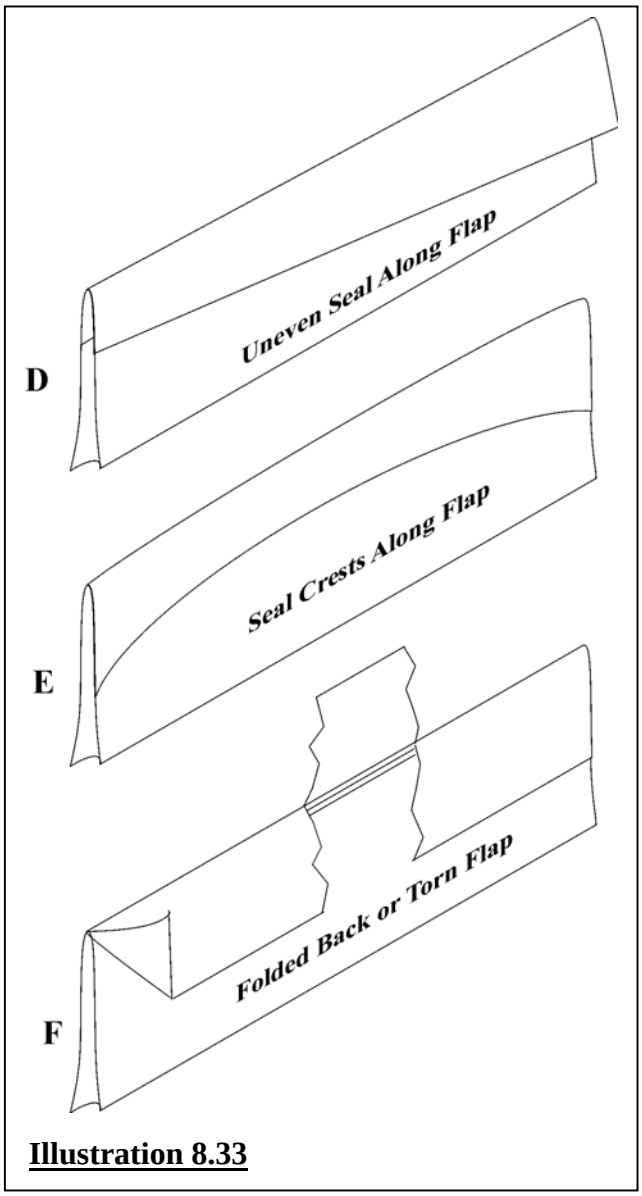


Illustration 8.33

D. **Illustration 8.33, D** shows the flap unevenly sealed. Uneven seals may leak product from one of the gussets and not provide sufficient strength along the entire seal. There are a couple of conditions that may cause this effect:

1. The most common cause is due to the angle that the bag top enters the machine infeed. Make sure your bag guides and operators are properly entering the bag tops into the infeed.
2. The machine carry through belts are not synchronized with the conveyor system. Use a tachometer with a surface wheel tip to measure and adjust the speeds of the two systems. If the speeds conflict, then the bag will either lean forward or backward as it passes through the PBC.
3. The bag top may be catching on an internal component as it passes through. Remove the front shrouding and inspect a bag as it passes through the machine. Check to see if any part of the bag is catching on machine components that would delay the top of the bag. Make adjustments to the component(s) as needed. Such as the pressure between the creaser wheels.

   A common problem is caused by the glue build up on the inside of the folder. Clean the folder and manifold, using a dull edged tool to prevent scratching the surfaces. A

gentle cleaning solution may be needed to remove the tacky film that remains. Check with your bag provider for a cleaning product recommendation.

E. This diagram indicates excessive cresting at the leading and trailing edges of the bag flap. Although some cresting can be expected, too much will compromise the integrity of the seal. Here are some possible reasons for the excessive cresting:

1. The pressure between the creaser blade and die is too great. As bags enter the creaser area, the creaser blade and die quickly compress a folding (crease) line below the glue region. The blade assembly is free to move towards and away from the die to compensate for varying thicknesses in bags, but still provides enough pressure to make an effective crease. If the pressure is too great, the bag will initially stall while entering the creaser area and cause the cresting effect at the leading and trailing edges. Adjust the pressure of the creaser blade. (**Section 8.5.6, page 42**)
2. The creaser assembly is not properly aligned with the folder. The crease line should be entering just below the underside of the folder, near its leading end. Follow the instructions in **Section 8.5.6, page 42** to properly align the creaser assembly with the folder.
3. The bag top may be catching on an internal component as it passes through. Remove the front shrouding and inspect a bag as it passes through the machine. Check to see if any part of the bag is catching on machine components that would momentarily delay the top of the bag. Make adjustments to the component(s) as needed.
4. The gap setting between the bottom folder guide and the folder is too close. Once the flap has been folded about 90^{o} and heated, the rest of the folder gradually folds the flap over onto the bag surface for bonding. If the gap between the upper and lower folders are too close (especially near the exiting portion of the assembly), the leading edge of the flap will attach to the bag too far back from the leading edge of the bag. The gradual folding effect near the end of the folders is designed to allow the flap to straighten out a little before making contact with the bag surface. Check the gap setting and adjust as needed. The standard setting for most bag types is about ¼ to 3/8 inch (6,4 to 9,5mm) (**Section 8.7, page 49**) May also cause effect **F.**
5. The creaser blade and die must be directly across from each other. The path that the bag travels while passing between the blade and die must run parallel with the centerline between the carry through belts. If the die or blade is further to the right or left than the other, the bag will be directed towards the front or rear of the machine instead of straight into the folder assembly. (**Section 8.5.6, page 42**)
6. The die is not properly aligned with the carry through belts. If the die is too far forward or backward from the carry through belts, then the bag top is deflected away from the folder assembly. Follow the instructions for setting the creaser die. (**Section 8.5.6, page 42**)

F. The bag is being torn or is catching on components as it passes through the machine. Remove the swing channel shrouding and inspect a couple of bags passing through the system. Try to isolate the component where the bag is being stalled or jammed. Make adjustments to the component.

10. TROUBLESHOOTING

This section of the manual has been provided to help address problems or situations that may possibly arise while operating the PBC 6000. For questions not answered in this manual please contact your local Fischbein representative or the Fischbein Technical Service Dept (**page 3**)

Questions concerning bag seals:

For troubleshooting the details surrounding the quality of a seal, please refer to the Quality Control Section of this manual.

1. Bag jams near creaser.

Bags jamming or wrinkling up near the creaser usually indicates one or more of the following:

A) The gap between the edge of the blade and the die needs to be increased. Generally for most common bag types, the gap is set to about 3/16 inch (4,8mm) (**Section 8.5.6, page 42**)

B) The pressure between the blade and die is too great. The blade assembly is designed to move towards and away from the die, compensating for varying thicknesses in the bags. However, a consistent force must be applied to the blade to effectively crease the bag material. If the pressure (force) is too great, the leading edge of the bag will have difficulty entering between the two components. (**Section 8.5.6, page 42**)

2. The green "READY" light takes a long time to illuminate.

Noticing that the machine is taking longer to achieve "READY" temperature, is an indication of one of the following:

A) One of the heater cartridges has become defective. After normal usage, the cartridge heaters will need to be replaced. If one of the cartridges becomes defective, the remaining cartridge has to work longer to heat the manifold. It is best to shut down the system and test each cartridge to determine if they need to be replaced. It is recommended that both cartridges be replaced at the same time, when one becomes defective. (**Section 8.8, page 51**)

B) The "READY" light has burned out. If the manifold assembly is working normally, then the bulb in the indicator light is probably broken and needs to be replaced.

C) The temperature controller needs to be replaced. If the cartridges have been determined to be functioning properly, check the temperature controller. Replace the controller. (**Section 8.9, page 54**)

D) The flow switch is faulting. If this switch is not correctly functioning, the "READY" light will not illuminate. If the compressed air to the system is not consistently within the parameters of the switch, it will prevent the system from reaching the ready state. If the air is not the cause, then replace the switch.

3. The machine keeps turning itself "OFF" after a short period of time.

The drive motor for the PBC 6000 is protected through a circuit, which monitors the load bearing on it. If the strain becomes too great for the motor, the controller in the electrical enclosure will turn the system "OFF" and display an error code on its LCD display. In most cases, the error was caused by too much load from one of the following:

A) The carry through belt tension is too high. If the tension in the carry through belts is set too high, the drive shaft will transfer a significant load through the gears and cause the motor to be stopped. Check the tension in the carry through belts. (**Section 8.5.1, page 28**) To clear the error from the display, turn the machine "OFF" and then "ON" after checking the belt tensions.

B) The compression belt tension is too great. In a similar manner to the carry through belts, if the tension in the compression belt(s) is too great, the motor will bear a greater load and be turned "OFF". Check the tension in the compression belts. (**Section 8.5.2, page 30**)

11. SPARE PARTS LISTS

Quantity	Part No.	Description
2	17423	BELT, TIMING with COATING (compression)(300H300)
2	17453	BELT, CARRIER PBC
1	17468	KIT, SOLENOID VALVE 24 V
2	17375	HEATER, 3000W, 230V, OPEN ELEMENT
2	17376	HEATER, 3000W, 460V, OPEN ELEMENT
1	67668	SENSOR, AIR FLOW (1/4 MALE NPT)
1	67840	THERMOCOUPLE, J TYPE, 5"3/16T X 7'L
1	67789	GEARMOTOR, 1 HP 230/460V 26:1
1	67313	TEMP CONTROL 0-1400F 24V
1	67312	TEMP CONTROL 24V, 1/32DIN
1	44600-LPO24	LAMP, INCANDESCENT, 24VAC, 757
1	67823	RELAY, SOLID STATE, 20A, 600V
2	17455	INSULATION, MANIFOLD BASE PBC
*1	17944	INSULATION, MANIFOLD MOUNTING 1 3/4
**1	17444	INSULATION, RIGHT END MANIFOLD

* For use with standard manifold only (17952)
** For use with wide 2 3/8" manifold (17452)

12. SAFELY DISPOSING OF A PBC 6000

If the PBC 6000 becomes damaged beyond repair or simply worn to a nonfunctional state after years of service, it should be put out of service only after it is safe to dispose of it. First, remove all lubricants from the machine. Dispose of the lubricants according to your appropriate local environmental regulations. After the lubricants and belts have been disposed of bring the system to a recycling center or metal scrap facility.

13. GLOSSARY

AWG – American Wire Gauge

FPM – Feet per minute

ID – Inside Dimension

MPM – Meters per minute

NEC – National Electrical Code

NEMA – National Electrical Manufacturers' Association

NFPA – National Fire Protection Association

OD – Outside Dimension (or Outside Diameter)

PBC – Pinch Bag Closer

PE – Polyethylene

PSI – Pounds per square inch

RPM – Revolutions per minute

SCFH – Standard Cubic Feet per Hour

SCMH – Standard Cubic Meters per Hour

14 ASSEMBLY DRAWINGS AND PARTS LISTS

Parts List for Drawing 17700- Rev. C

ITEM No.	QUANTITY	PART No.	DESCRIPTION
1	Ref	17708	ASSY, FRAME PBC 6000
2	1	A4022	CRANK
3	2	A5649	PIN, COTTER HAIR 5/16 X 3/8
4	2	A5648	PIN, (REAR)
5	1	A5616	PIN, QUICK RELEASE - PIVOT
6	2	A5615	CYLINDER, AIR
7	2	A5614	ROD, CLEVIS- AIR CYLINDER
8	2	A4014	SPROCKET, #40ID-19T 40B19
9	8.412	24019	CHAIN, #40-1/2P SINGLE STRAND
10	2	B2149	LINK, CONNECTING
11	1	A5136	TENSIONER, CHAIN - ELEVATING
12	1	A5142	BOLT, SHOLDER 3/8 DIA X 1 LG
13	1	A1705	SPRING, EXTENSION
14	1	A1708	SCREW, ANCHOR
15	1	A5226	LEVER, BRAKE
16	1	11442	BUSHING, UPPER PRESSER & NEEDLE BAR
17	1	A5229	BOLT, SHOULDER 5/16 DIA X 1/2 LG
18	1	17475	GUARD, TOP ELEVATING CHAIN
19	1	H103234	BOLT, HEX HD #10-32 UNF X 3/4
20	1	H14201	BOLT, HEX HD 1/4-20 UNC X 1
21	1	H38162	BOLT, HEX HD 3/8-16 UNC X 2
22	8	H1213114	BOLT, HEX HD 1/2-13 UNC X 1 1/4
23	1	NH1032	NUT, HEX HD #10-32 UNF-2B
24	1	NH1420	NUT, HEX HD 1/4-20 UNC-2B
25	1	NJ3816	NUT, JAM HD 3/8-16 UNC-2B
26	8	NJ1213	NUT, JAM HD 1/2-13 UNC-2B
27	1	PD516114	PIN, DOWEL 5/16 X 1-1/4
28	1	PS316118	PIN, SPRING 3/16 X 1-1/8
29	2	PS142	PIN, SPRING 1/4 X 2
30	6	SB142038	SCREW, SOC BTTN 1/4-20 UNC X 3/8
31	8	WF12	WASHER, FLAT 1/2
32	16	WL12	WASHER, LOCK 1/2
33	6	WS14	WASHER, SPRING 1/4
34	REF	44600-MTL2A	SWTICH, 22mm KEYED 3 POS ALL REMOVA
35	REF	66846	LEGEND PLATE, 22mm AUTO-STOP-RUN
36	2	17489	SUPPORT, ACME SCREW
37	4	WL14	WASHER, LOCK 1/4
38	4	H142012	BOLT, HEX HD 1/4-20 UNC X 1/2
39	1	17461	CHANNEL, REAR FIXED PBC R/L
40	1	17462	WELDMENT, FRONT SWING PBC R/L
41	2	A6288	SCREW, 3/8 SHOULDER BOLT 3/4"
42	2	NJ51618	NUT, HEX JAM 5/16-18 UNC
43	1	17766	ENC, PBC 6000, 20X20X8, LIGHT GRA
44	4	NH3816	NUT, HEX 3/8-16 UNC
45	4	WF38SS	WASHER, FLAT 3/8 SS
46	4	SB38161SS	SCREW, SOC BTTN 3/8-16 UNC X 1 SS
47	4	REF	WASHER, SPRING – SEALING

Parts List for Drawing 17701A- Rev. C

Item	Quantity	Part No.	Description
1	REF	17461A	CHANNEL, REAR FIXED PBC
2	REF	**	GEARMOTOR, 1 HP (SEE NOTE)
3	1	17458	KEY, .215 X .248 X 3.50 LG
4	1	66292	WASHER, 11/32 ID X 1 1/2 OD X .06 THK
5	1	55377	PLATE, REDUCER MOUNTING
6	1	17820	SHAFT, DRIVE PBC PILS
7	3	18062	KEY, 1/4 SQ X 2" LONG
8	1	52076	GEAR, SPUR (PILS)
9	3	SF51618212	SCREW, SOC FLAT 5/16-18 UNC X 2 1/2
10	1	50052	BEARING, FLANGE UNIT 1" DIA
11			
12			
13	1	17411	BUSHING, TAPERLOCK (#SD X 1" ID) W/ SCREWS
14	1	17410	SPROCKET, DRIVE COMPRESSION 3"
15	2	17495	PLATE, CARRY-THRU STIFFNER PBC
16	1	50041	PULLEY, DRIVE 4.55 PD NARROW
17	1	A5076	BLOCK, ROLLER-COMPRESSION
18	1	17921	BUSHING, COMP ROLLER PBC 1 3/4 FOLD
19	1	17415	ASSY, ROLLER-COMPRESSION BELT
20	1	52085	BLOCK, COMPRESSION ADJUSTMENT
21	1	52048	BLOCK, COMPRESSION SHAFT SUPPORT
22	1	17922	BUSHING, COMP IDLER ROLLER 1 3/4 FOLD
23	1	17414	ASSY, ROLLER TAKEUP COMPRESS 3"
24	1	17758	BELT, TIMING W/COATING (300H300)
25	2	17429	SHAFT, CARRY THRU MOUNTING PBC
26	1	52028	BLOCK, BUSHING MTG (STATIONARY)
27	1	17916	SHAFT, CREASER ROLLER PBC
28	1	A5067	WHEEL, CREASER ROLLER
29	1	A5068	ASSY, WHEEL HUB (MALE)
30	13	67274	STANDOFF, 1/2 HEX 1/4-20 UNC X 3/4 LG
31	1	17433	BRACKET, CONTROL MOUNTING (REAR)
32	4	NJ3816	NUT, JAM 3/8-16 UNC-2B
33	2	SC12137	SCREW, SOC CAP 1/2-13 UNC X 7
34	2	SS103212	SCREW, SOC SET #10-32 UNF X 1/2
35	2	SS142038	SCREW, SOC SET 1/4-20 UNC X 3/8
36	17	H142012	BOLT, HEX HD 1/4-20 UNC X 1/2
37	2	H142058	BOLT, HEX HD 1/4-20 UNC X 5/8
38	2	H5161812	BOLT, HEX HD 5/16-18 UNC X 1/2

Parts List for Drawing 17701A- Rev. B (cont.)

Item	Quantity	Part No.	Description
39	8	H5161834	BOLT, HEX HD 5/16-18 UNC X 3/4
40	6	H516181	BOLT, HEX HD 5/16-18 UNC X 1
41	1	H516182FT	BOLT, HEX HD 5/16-18 UNC X 2 FULL THD
42	2	H381612	BOLT, HEX HD 3/8-16 UNC X 1/2
43	1	H121334	BOLT, HEX HD 1/2-13 UNC X 3/4
44	1	NH51618	NUT, HEX HD 5/16-18 UNC-2B
45	2	WF14	WASHER, FLAT 1/4
46	4	WF516	WASHER, FLAT 5/16
47	9	WF38	WASHER, FLAT 3/8
48	2	WF12	WASHER, FLAT 1/2
49	23	WL14	WASHER, LOCK 1/4
50	13	WL516	WASHER, LOCK 5/16
51	10	WL38	WASHER, LOCK 3/8
52	2	WL12	WASHER, LOCK 1/2
53	4	WS516	WASHER, SPRING 5/16
54	1	SB5161812	SCREW, SOC BTTN 5/16-18 UNC X 1/2
55	2	SB142038	SCREW, SOC BTTN 1/4-20 UNC X 3/8
56	1	55342	BRACKET, CONTROL MOUNTING (FRONT)
57	2	H14201	BOLT, HEX HD 1/4-20 X 1
58	4	NJ1420	NUT, JAM 1/4-20 UNC-2B
59	1	17494	PLATE, SENSOR REFLECTOR
60	2	17495	PLATE, CARRY-THRU STIFFNER PBC
61	4	H3816114	BOLT, HEX HD 3/8-16 UNC X 1 1/4

Parts List for Drawing 17702A- Rev. B

Item	Quantity	Part No.	Description
1	REF	17462A	CHANNEL, FRONT SWING PBC
2	1	66292	WASHER, 11/32 ID X 1 1/2 OD X .06 THK
3	2	50052	BEARING, FLANGE UNIT 1" DIA
4	4	NJ3816	NUT, JAM HD 3/8-16 UNC-2B
5	12	WF38	WASHER, FLAT 3/8
6	3	18062	KEY, 1/4 SQ X 2" LONG
7	1	52076	GEAR, SPUR (PILS)
8	3	SF51618212	SCREW, SOC FLAT 5/16-18 UNC X 2 1/2
9	1	17824	SHAFT, DRIVEN PBC
10	1	17411	BUSHING, TAPERLOCK (#SD X 1" ID) W/ SCREWS
11	8	WL38	WASHER, LOCK 3/8
12	1	17410	SPROCKET, DRIVE COMPRESSION 3"
13	1	17412	BUSHING, DRIVE PULLEY PBC
14	REF	17453	BELT, CARRIER, PBC
15	1	50041	PULLEY, DRIVE 4.55 PD NARROW
16	1	52013	BLOCK, COMPRESSION ADJUSTING
17	1	A5076	BLOCK, ROLLER-COMPRESSION
18	1	17921	BUSHING, COMP ROLLER PBC 1 3/4 FOLD
19	1	17415	ASSY, ROLLER-COMPRESSION BELT
20	1	52085	BLOCK, COMPRESSION ADJUSTMENT
21	1	52048	BLOCK, COMPRESSION SHAFT SUPPORT
22	1	17414	ASSY, ROLLER TAKEUP COMPRESS 3"
23	1	17922	BUSHING, COMP IDLER ROLLER 1 3/4 FOLD
24	1	17758	BELT, TIMING W/COATING (300H300)
25	2	17429	SHAFT, CARRY THRU MOUNTING PBC
26	1	52043	BUSHING, COMPRESSION PIVOT
27	1	52034	BRACKET, PIVOT MOUNTING
28	1	67209	BOLT, SHOULDER 1/2 DIA X 1 3/4 LG
29	1	17917	BUSHING, CREASER ROLLER PBC
30	1	A5060	BLADE, CREASER
31	1	A5061	WHEEL, CREASER
32	1	A5068	ASSY, WHEEL HUB (MALE)
33	1	52033	BLOCK, PIVOT
34	1	A5071	SPRING, CREASER
35	1	A5070	SCREW, CREASER TENSION
36	1	A5069	BLOCK, TENSION CREASER
37	2-FT	17288	TUBING, PFA TEFLON 1/2 OD
38	1	17484	FITTING, UNION ELBOW 1/2 T X 1/2 T

Parts List for Drawing 17702A- Rev. B (cont.)

Item	Quantity	Part No.	Description
39	1	17467	FITTING, STRAIGHT UNION 1/2 T X 1/2 T
40	REF	17001	TUBING, POLY 1/2 OD (RED)
41	REF	67649	SENSOR, PROXIMITY 18mm 20-250VAC W/ NUTS
42	2	SB1420114	SCREW, SOC BTTN 1/4-20 UNC X 1 1/4
43	1	SB5161812	SCREW, SOC BTTN 5/16-18 UNC X 1/2
44	2	17495	PLATE, CARRY-THRU STIFFNER PBC
45	2	SC142058	SCREW, SOC CAP 1/4-20 UNC X 5/8
46	1	SC51618212	SCREW, SOC CAP 5/16-18 UNC X 2 1/2
47	4	H38161	BOLT, HEX HD 3/8-16 UNC X 1
48	1	SC12137	SCREW, SOC CAP 1/2-13 UNC X 7
49	2	SS103212	SCREW, SOC SET #10-32 UNF X 1/2
50	2	SS142038	SCREW, SOC SET 1/4-20 UNC X 3/8
51	3	H103212	BOLT, HEX HD #10-32 UNF X 1/2
52	2	H142012	BOLT, HEX HD 1/4-20 UNC X 1/2
53	1	H1420114	BOLT, HEX HD 1/4-20 UNC X 1 1/4
54	6	H5161812	BOLT, HEX HD 5/16-18 UNC X 1/2
55	4	H5161834	BOLT, HEX HD 5/16-18 UNC X 3/4
56	1	H121334	BOLT, HEX HD 1/2-13 UNC X 3/4
57	1	NH1420	NUT, HEX HD 1/4-20 UNC-2B
58	1	NJ51618	NUT, JAM HD 5/16-18 UNC-2B
59	1	NJ1213	NUT, JAM HD 1/2-13 UNC-2B
60	8	WF516	WASHER, FLAT 5/16
61	3	WF12	WASHER, FLAT 1/2
62	3	WIT10	WASHER, INTERNAL TOOTH #10
63	4	WL14	WASHER, LOCK 1/4
64	13	WL516	WASHER, LOCK 5/16
65	3	WL12	WASHER, LOCK 1/2
66	2	H516181	BOLT, HEX HD 5/16-18 X 1
67	1	52059	GUARD, SWING CHANNEL END
68	4	WS8	WASHER, SPRING #8
69	4	SB83212	SCREW, SOC BTTN #8-32 UNC X 1/2
70	1	50093	PLATE, MOUNT FLANGE BEARING (PILS)
71	4	H3816114	BOLT, HEX HD 3/8-16 UNC X 1 1/4
72	2	SC1213612	BOLT, SOC CAP 1/2-13 UNC X 6 1/2

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Parts List for Drawing 17703- Rev. D

Item	Quantity	Part No.	Description
1	1	17434	PLATE, CARRY THRU PBC
2	1	17947	GUIDE, HEAT MANIFOLD 1 3/4 FOLD
3.1	1	17377	ASSY, PBC HEATER, 230V, 3000W, R/L
3.2	1	17378	ASSY, PBC HEATER, 230V, 3000W, R/L
4	1	66058	FITTING, PLUG C'SK HEX 1/8 NPT
5	1	A5672	MANIFOLD, BLOWER-AIR SCURBBER
6	REF	17429	SHAFT, CARRY THRU MOUNTING PBC
7	1	17488	BRACKET, BLOWER AIR SCRUBBER PBC6000
8	1	52165	BLOCK, FIXED CHANNEL END
9	1	52018	BLOCK, BELT TENSIONING
10	1	52020	PLATE, ENTRANCE MOUNTING (RIGHT)
11	1	17453	BELT, CARRIER PBC
12	1	66028	BEARING, BALL 1.0 ID X 2.0 OD X .75
13	1	67202	WASHER, THRUST 1.002 ID X 1.562 OD
14	1	52023	PULLEY, ENTRANCE IDLER (PILS)
15	1	52167	GUIDE, EXTENDED, BAG SWING
16	1	H5161812	BOLT, HEX HD 5/16-18 UNC X 1/2
17	8	H5161858	BOLT, HEX HD 5/16-18 UNC X 5/8
18	2	H51618114	BOLT, HEX HD 5/16-18 UNC X 1 1/4
19	2	H516182FT	BOLT, HEX HD 5/16-18 UNC X 2 FULL THD
20	2	NH1032	NUT, HEX HD #10-32 UNF-2B
21	2	SB103234	SCREW, SOC BTTN #10-32 UNF X 3/4
22	4	SB142012	SCREW, SOC BTTN 1/4-20 UNC X 1/2
23	2	SC103238	SCREW, SOC CAP #10-32 UNF X 3/8
24	2	SC51618114	SCREW, SOC CAP 5/16-18 UNC X 1 1/4
25	1	SC12133FT	SCREW, SOC CAP 1/2-13 UNC X 3 FULL THD
26	14	WF516	WASHER, FLAT 5/16
27	13	WL516	WASHER, LOCK 5/16
28	4	WS10	WASHER, SPRING #10
29	6	WL14	WASHER, LOCK 1/4
30	REF	17027	FITTING, ELBOW 1/8 NPT X 1/4 T
31	1	SS142038	SCREW, SOC SET 1/4-20 UNC X 3/8
32	2	H142034	BOLT, HEX HD 1/4-20 UNC X 3/4
33	4	NJ51618	NUT, JAM HD 5/16-18 UNC-2B
34			
35	1	52038	PLATE, ENTRANCE SUPPORT
36	4	WF14	WASHER, FLAT 1/4
37			

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Parts List for Drawing 17704- Rev. B

Item	Quantity	Part No.	Description
1	1	17434	PLATE, CARRY THRU PBC
2	1	52164	BRACKET, BAG GUIDE
3	1	52165	BLOCK, FIXED CHANNEL END
4	1	52166	GUIDE, BAG PILS
5	1	A5186	GUIDE, BAG INSERTION
6	REF	17429	SHAFT, CARRY THRU MOUNTING PBC
7	2	67274	STANDOFF, 1/2 HEX X 1/4-20 UNC X 3/4
8	3	17926	STANDOFF, 2 1/8 TALL, 1 3/4 FOLD
9	1	17927	PLATE, GUIDE FOLDER 1 3/4 FOLD
10	1	52019	PLATE, ENTRANCE MOUNTING (LEFT)
11	1	17453	BELT, CARRIER PBC
12	1	66028	BEARING, BALL 1.0 ID X 2.0 OD X .75
13	1	67202	WASHER, THRUST 1.002 ID X 1.562 OD
14	1	52023	PULLEY, ENTRANCE IDLER (PILS)
15	1	17928	ASSY, UPPER FOLDER 1 3/4 FOLD
16	7	H5161812	BOLT, HEX HD 5/16-18 UNC X 1/2
17	8	H5161858	BOLT, HEX HD 5/16-18 UNC X 5/8
18	5	H51618114	BOLT, HEX HD 5/16-18 UNC X 1 1/4
19	3	H142058	BOLT, HEX HD 1/4-20 UNC X 5/8
20	3	NH1420	NUT, HEX HD 1/4-20 UNC-2B
21	3	SB103238	SCREW, SOC BTTN #10-32 UNF X 3/8
22	2	SB142012	SCREW, SOC BTTN 1/4-20 UNC X 1/2
23	2	SS142058	SCREW, SOC SET 1/4-20 UNC X 5/8
24	2	SC51618114	SCREW, SCO CAP 5/16-18 UNC X 1 1/4
25	1	SC12133FT	SCREW, SOC CAP 1/2-13 UNC X 3 FULL THD
26	19	WF516	WASHER, FLAT 5/16
27	20	WL516	WASHER, LOCK 5/16
28	3	WS10	WASHER, SPRING #10
29	10	WS14	WASHER, SPRING 1/4
30	3	SF1420114	SCREW, SOC FLAT 1/4-20 UNC X 1 1/4
31	1	52038	PLATE, ENTRANCE SUPPORT
32	1	52018	BLOCK, BELT TENSIONING
33	REF	17461	CHANNEL, REAR FIXED PBC
34	REF	17495	PLATE, CARRY-THRU STIFFNER PBC

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Parts List for Drawing 17405 (1 of 2)- Rev. C

Item	Quantity	Part No.	Description
1	1	17469	GUARD, FRONT PBC
2	1	19028	LABEL, FISCHBEIN
3	1	17479	LABEL, PBC 6000
4	1	A5668	LABEL, WARNING (CAUTION HOT)
5	1	10757	LABEL, WARNING-GUARDS
6	8	SB142038	SCREW, SOC BTTN 1/4-20 UNC X 3/8
7	6	WS14	WASHER, SPRING 1/4
8	2	WF14	WASHER, FLAT 1/4
9	2	WL14	WASHER, LOCK 1/4

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Parts List for Drawing 17405 (2 of 2)- Rev. C

Item	Quantity	Part No.	Description
1	1	66154	NAMEPLATE, SERIAL - VOLTAGE
2	1	17471	GUARD, LEFT TOP PBC
3	1	50074	GUARD, FRONT DRIVE PLATE
4	2	A5668	LABEL, WARNING (CAUTION HOT)
5	5	10757	LABEL, WARNING-GUARDS
6	19	SB142038	SCREW, SOC BTTN 1/4-20 UNC X 3/8
7	19	WS14	WASHER, SPRING 1/4
8	2	WF14	WASHER, FLAT 1/4
9	4	WL14	WASHER, LOCK 1/4
10	4	SB103238	SCREW, SOC BTTN #10-32 UNF X 3/8
11	4	WS10	WASHER, SPRING #10
12	1	17476	GUARD, TOP CENTER PBC
13	1	17477	GUARD, RIGHT TOP PBC
14	1	17478	GUARD, BACK PBC
15	2	52053	GUARD, ENTRANCE BELT
16	8	SB83238	SCREW, SOC BTTN #8-32 UNC X 3/8
17	8	WS8	WASHER, SPRING #8
18	4	SB142012	SCREW, SOC BTTN 1/4-20 UNC X 1/2
19	2	NJ1420	NUT, JAM HD 1/4-20 UNC-2B
20	REF	**	ASSY ELEC, PBC 6000 CONTROL

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Parts List for Drawing 17406- Rev. E

Item	Quantity	Part No.	Description
1	1	17464	KIT, FILTER/REG/MIST SEP 1/4" NPT
2	1	17468	KIT, SOLENOID VALVE 24VAC
3	1	17465	REGULATOR, 1/4" NPT SMC
4	1	10763	LABEL, WARNING-PNEUMATIC QUIK
5	3	67480	FLOW CONTROL, IN-LINE
6	2	17002	FITTING, TEE 1/4" POLYFLO
7	7	18108	ELBOW, SWIVEL (1/4 MALE X 1/4 TUBE)
8	1	P1911	FITTING, HEX NIPPLE 1/4 NPT
9	1	67706	SENSOR, AIR FLOW, CHEM-TEC 375
10	1	P4987	FITTING, STREET 1/4 FNPT
11	1	43M14-HD500	FLOWMETER, DYER 50-500 SCFH
12	1	17027	FITTING, ELBOW 1/8 NPT X 1/4T
13	1	17483	FITTING, ELBOW 1/4 NPT X 1/2 T
14	3	17001	TUBING, POLY 1/2" OD (RED)
15	13	P4968	TUBING, POLYFLO 1/4 OD
16	1	P4945	FITTING, MALE COUPLING 1/4 NPT
17	1	10718	SOCKET, COUPLING (1970 CTL SYS REF)
18	2	SB440316	SCREW, SOC BUTT #4-40 UNC X 3/16
19	REF	66058	FITTING, PLUG 1/8 NPT
20	2	SB103238	SCREW, SOC BUTT #10-32 UNF X 3/8
21	2	WS10	WASHER, SPRING #10

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Parts List for Drawing 17708- Rev. H

Item	Quantity	Part No.	Description
1			
2	2	66461	CASTERS, 3/4 DIA THREAD STEM W/ BREAK
3	2	A6180	CASTERS, 3/4 DIA THREADED STEM
4	2	A6288	SCREW, 3/8 SHOULDER BOLT 3/4"
5			
6	1	17441	ASSY, ACME SCREW DRIVEN
7	4	T3129	WASHER, THRUST .752 ID X 1.240 OD
8	2	P4024	BEARING, THRUST .752 ID X 1.240 OD
9	1	17440	ASSY, ACME SCREW DRIVE
10			
11	2	SS142012	SCREW, SOC SET 1/4-20 UNC X 1/2
12			
13			
14	8	NJ3410	NUT, JAM HD 3/4-10 UNC-2B
15			
16			
17	4	WL34	WASHER, LOCK 3/4
18	2	WF34	WASHER, FLAT 3/4

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Parts List for Drawing 17377- Rev. A

Item	Quantity	Part No.	Description
1	3	16036	WIRE TIE, SELF-LOCKING
2	1	17376	HEATER, 3000W, 460V, OPEN ELEMENT
2	1	17375	HEATER, 3000W, 230V, OPEN ELEMENT
3	1	17379	CONNECTOR, FLEX 3/8" 90%%d/SEAL
4	1	17778	PLATE, 1 3/4 F HEATER END CAP
5	1	17783	WELDMENT, MANIFOLD, L/R 1-3/4 FOLD
5	1	17780	WELDMENT, MANIFOLD, R/L 1-3/4 FOLD
6	1	17782	INSULATION, MANIFOLD END 1 3/4
7	12-ft	44B50-AWG12	WIRE, 12 AWG HIGH TEMP
8	1	50117	FITTING, MALE CONN 3/8NPT X 1/2T
9	1	66889	CORDGRIP, PG-16, .394-.551 W/NUT
10	1	67894	CORDGRIP, 1/2NPT - .125-.187, ORANG
11	3	67828	WIRE FERRULE, 12AWG, GRAY
12	1	67840	THERMOCOUPLE, J TYPE 5"3/16T X 7" L
13	5.25-ft	67886	CONDUIT, 3/8" FLEX
14	1	67887	TERMINAL, RING, 10-12AWG, #10 NON-I
15	2	67898	BUSHING, ANTI SHORT, 3/8" CONDUIT
16	2	SC83212	SCREW, SOC CAP #8-32 UNC X 1/2
17	2	WF14	WASHER, FLAT 1/4
18	2	WS8	WASHER, SPRING #8
19	1	A3570	SCREW, GROUND GREEN