



The MultiLine logo consists of the word "MultiLine" in a bold, blue, sans-serif font. A red triangle is positioned above the "M". A trademark symbol (TM) is located at the top right of the "e".

# A200 MULTILINE CONVEYOR

**3 POSITION - 48" MACHINES  
20" BELT WIDTH**

## USERS GUIDE

**CVP P/N: M-0243-0864  
REV. A**

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# **SECTION: 1**

# **OVERVIEW**



## **FOREWORD**

This manual contains information which is vital to the proper installation, operation, and maintenance of the CVP A200 Multiline Conveyor.

Failure to follow the procedures herein outlined shall void the limited warranty.

Additions, modifications, or deletions from the procedures herein outlined may be made by CVP Systems Inc., at its sole option, without liability of any sort accruing to CVP Systems Inc.

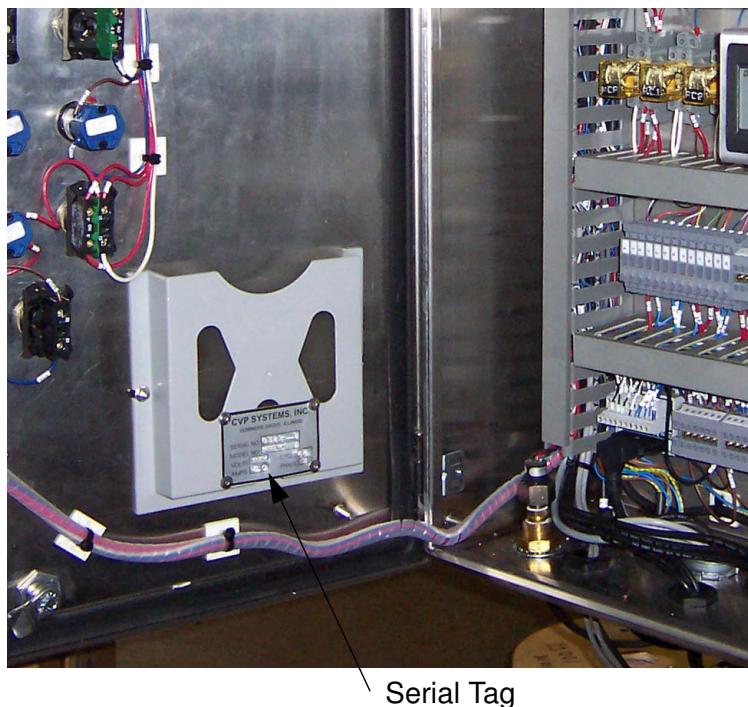
This manual shall be considered current as of the date of any such addition, modification or deletion.

Photos, drawings, and illustrations used in this manual are representative and may vary from your equipment.

## CUSTOMER SERVICE

When calling, either for parts or service, have the model and serial numbers available for our customer service representative. This will allow us to more accurately assist you with your machine.

The serial number tag for the A200 Multiline is located on inside of the main electrical enclosure door. Figure 1-1 shows the location inside the enclosure.



**Figure 1-1.** Serial Tag Location

### Ordering Parts

Ordering parts from CVP Systems can be accomplished in three different ways; by phone, fax or e-mail. Please include model and serial numbers in all correspondents to CVP Systems.

Phone: 800-422-4270 (US, Canada, & Mexico)  
630-852-1190 (All others)

Fax: 630-852-1386  
E-Mail: [spareparts@cvpsystems.com](mailto:spareparts@cvpsystems.com)

## USING THE MANUAL

The following sections of this manual provide an overview for your A200 Multiline and installation. They describe the utility requirements, installation instructions and maintaining the A200 Multiline system.

Information about basic A200 Multiline operation and maintenance is also provided. It is recommended that anyone involved with the operational mechanics of this machine read the manual before operating or servicing the unit.

The prints and manuals included with the machine contain information which is important to service the unit. They should be stored in a cool, dry location away from the machine so that they are not exposed to high humidity and harsh chemicals.

# SAFETY

## Safety Precautions

It is important that all SAFETY PRECAUTIONS are followed closely when working around the A200 Multiline.

Get acquainted with all of the warning labels and safety features of the machine. They are provided for your safety and benefit.

- DO NOT ATTEMPT TO STAND OR WALK ON THE CONVEYOR. RISK OF FALLING WHICH COULD RESULT IN SERIOUS INJURY OR DEATH
- ONE OF TWO EMERGENCY STOPS IS LOCATED ON THE FRONT OF THE ELECTRICAL ENCLOSURE. THE SECOND IS LOCATED ON THE OPPOSITE END OF THE TOP CONVEYOR.
- KEEP HANDS AND LOOSE CLOTHING AWAY FROM THE CONVEYOR, PUSHERS AND STOPS DURING OPERATION.
- DO NOT OPERATE EQUIPMENT WITH BROKEN AND/OR MISSING PARTS.
- DO NOT WORK ON MACHINE WHILE POWER IS ON, UNLESS INSTRUCTED TO DO SO BY OUTLINED PROCEDURES WITHIN THIS MANUAL, OR BY QUALIFIED CVP SERVICE PERSONNEL.

**SERIOUS INJURY OR DEATH** COULD RESULT IF THE POWER SUPPLY IS NOT TURNED OFF BEFORE WORKING WITH CERTAIN COMPONENTS SUCH AS HIGH VOLTAGE LEADS!!!

- DO NOT BYPASS OR ALTER ANY SAFETY COMPONENT.
- DO NOT OPERATE IF GUARDS AND SAFETY DEVICES ARE REMOVED.
- WHEN POSSIBLE, USE RECOMMENDED TOOLS FOR REPAIR AND ADJUSTMENT.

## Operational Safety

It is important to develop good safety habits to ensure a safe and efficient packaging process. Please adhere to the following:

- USE MACHINE AS DIRECTED BY THIS MANUAL AND CVP PERSONNEL.
- KEEP SURROUNDING AREA FREE OF CLUTTER AND HIGH VOLUMES OF TRAFFIC.
- ONLY USE MACHINE FOR INTENDED PURPOSE.
- FOR APPLICATIONS OTHER THAN PACKAGING, PLEASE CONSULT WITH YOUR CVP SALES REPRESENTATIVE.

# MSDS SHEETS

A Material Safety Data Sheet (MSDS) is an instructional sheet concerning a specific chemical that explains hazards and emergency procedures.

CVP provides MSDS sheets for vacuum pump oils we sell upon request.

Before using vacuum pump oil or any other chemical supplied by CVP, read its MSDS sheet to learn the following:

## Physical and Chemical Changes

- Normal appearance and odor
- Temperature, boiling or melting point, at which its form changes
- How fast it evaporates and rises in air
- Solubility in water

## Fire and Explosion Risks

- Lowest temperature at which vapors catch fire
- Highest and lowest vapor concentrations that can catch fire or explode
- Fire fighting instructions

## Reactivity Risks

- Chance of chemical change or disintegration
- Dangerous reactions to air, water, or specific chemicals
- Decomposition by-products

## Exposure Health Risks

- Hazards and symptoms of inhaling, swallowing, skin, or eye contact
- Fast (acute) or gradual (chronic) appearance of health problems
- Cancer hazard
- Health conditions exposure could make worse
- First aid until medical help arrives

## Precautions to Reduce Risks

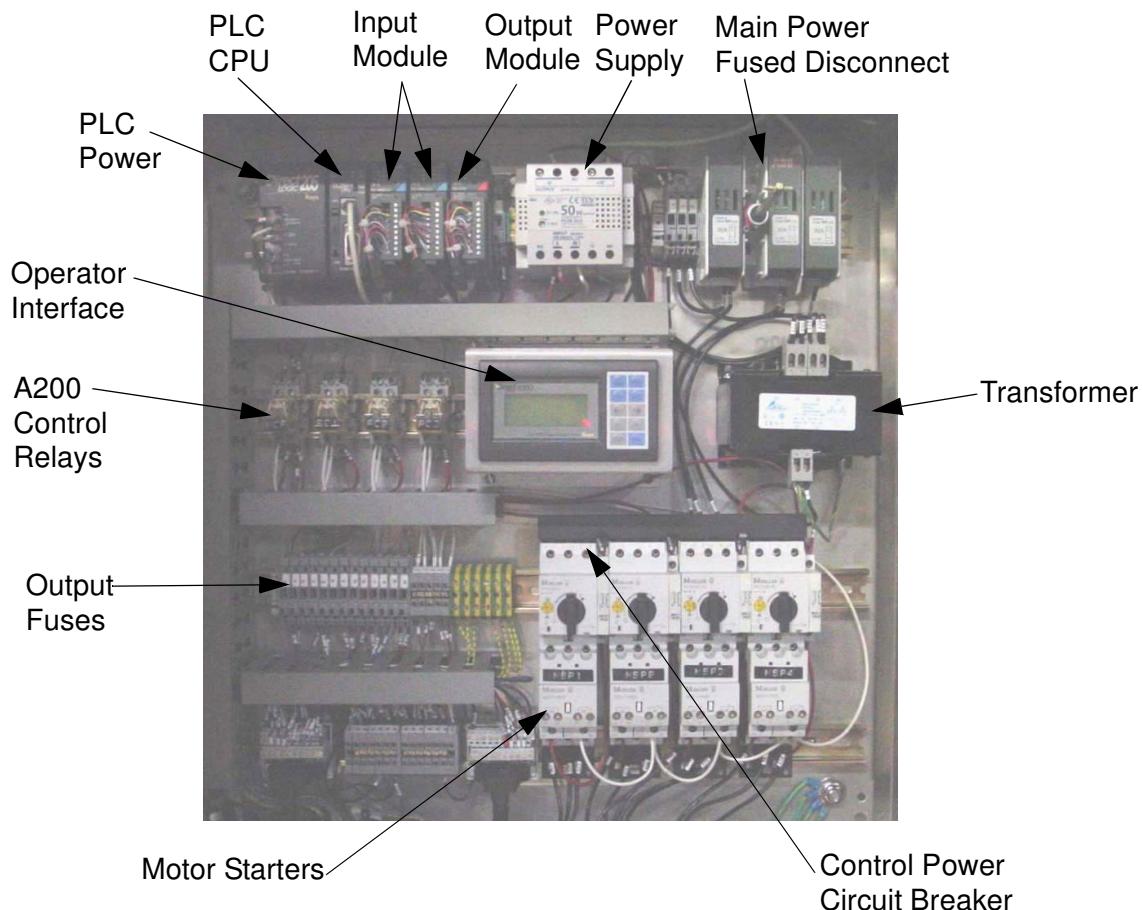
- Controls such as ventilation and hygiene
- Respirators, gloves, or other personal protective equipment (PPE)
- Handling spills, leaks, or accidental release

## ABOUT THE MULTILINE

The Multiline is an automated distribution system consisting of a distributing upper conveyor and a discharging lower conveyor. The Multiline distributes a container into one of two or three A200 "Heads". The A200 machine for the Multiline has a special base frame to accept the containers and transfer them to the lower conveyor. The lower conveyor discharges the container out from the Multiline on to a takeaway conveyor. The Multiline uses a PLC to efficiently and safely control the distribution of the containers. Sensors monitor critical areas of the Multiline to prevent avoidable jams and inform the operator when a fault has occurred.

**Note:** "Container(s)", as referenced throughout the manual, can be either a plastic tote or a corrugated box. See "BAG AND CONTAINER INFORMATION" on page 9 for additional information about containers

The figure below shows the components of the A200 Multiline's Electrical Panel.



**Figure 1-2.** Electrical Enclosure

# MACHINE UTILITY REQUIREMENTS

## Electrical

The A200 Multiline requires a dedicated electrical service. The required voltage and amperage is indicated on the serial plate.

The supply line can be connected via rigid conduit, or flexible cord, depending on local codes and/or plant procedures. Three phase power supply should be four-wire cord with one wire (usually green) used as a ground. Your supply and conductors must be capable of delivering the specified power to the A200 Multiline. If you choose to use a flexible cord with a plug, make sure the plug ends are waterproof. This type of connection will make your machine more convenient to move and adjust when necessary.

Power Requirements are as follows

- 208/220 Volts, 3 Phase, 20 Amps
- 460 Volts, 3 Phase, 15 Amps

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**Note:** A cord connector is provided at the upper right corner of the electrical enclosure. If rigid conduit is to be used, simply remove the cord connector and replace with the proper conduit connector.

---

## Compressed Air

A supply of clean, dry, compressed air is required for proper functioning of the A200 Multiline. The air supply regulator is factory preset to the recommended 80 PSI (5.4 bar).

For your convenience, we have provided a quick disconnect adapter on the air supply regulator/lubricator. If a quick disconnect is not used, mount a shut off valve near the regulator. The size of the air supply line is critical to the performance of the machine. Before connecting air to the A200 Multiline make sure the supply line can supply adequate air pressure to the machine. The supply lines noted below in the air requirements is based on a main supply line running within 50 feet (15.2 m) of the machine.

Compressed air requirements are as follows:

- Standard machines - 80 PSI\* (5.4 bar), 5 CFM (141.5 L/min), 1/2" (12.7 mm) supply line

\*The recommended air pressure supplied to the machine is 100 PSI (6.8 bar), the indicated air pressure is the regulator setting.

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**Important:** A dedicated air supply is required for the A200 Multiline conveyor. Separate air supplies must be supplied to the A200 machine heads.

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## PRODUCTION LAYOUT

### Planning the Layout

The Multiline configuration is required before the A200 Multiline can be assembled. Due to existing plant layouts and floor space the plant layout must be planned out, this will determine the flow of the Multiline. The flow direction of the A200 Multiline is best described as "In From, Out To" as viewed from the operator's position.

For example a "Left to Right" Multiline means the tote or box enters the A200 Multiline on the upper conveyor from the left side of the A200 machines. They are then discharged or exit the A200 Multiline to the right of the A200 Machine. The machine flows are as follows:

- Left to Left
- Left to Right
- Right to Left
- Right to Right

To plan the layout contact your CVP Systems representative for assistance. CVP System's engineers will assist in the layout to assure proper placement of the A200 Multiline.

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**Important:** CVP Systems does not supply Infeed and Take-Away conveyors. Damage to the A200 Multiline caused by the infeed or takeaway conveyors is not the responsibility of CVP Systems.

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**Important:** Poor performance of the A200 Multiline caused by the infeed and/or the takeaway conveyor renders the performance guarantee null and void.

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### Infeed Conveyor

The Infeed Conveyor transports containers to the Multiline. The infeed conveyor must allow accumulation of the containers. As containers enter the upper conveyor of the Multiline the containers are indexed, one at a time, into the Multiline. Positive drive conveyors with anti slip surfaces, will cause damage to boxes and possibly dump totes off of the conveyor on to the floor.

### Take-Away Conveyor

The Take-Away conveyor transports containers from the A200 Multiline to the next stage of production. There are no specific requirements for this conveyor other than where the product is going to next. If accumulation will take place, the lower conveyor of the Multiline is capable of accumulating 80 Lb. (36.3 kg) containers for the full length of the conveyor. However this back up will also continue on the top and infeed conveyor.

# BAG AND CONTAINER INFORMATION

## Container Handling

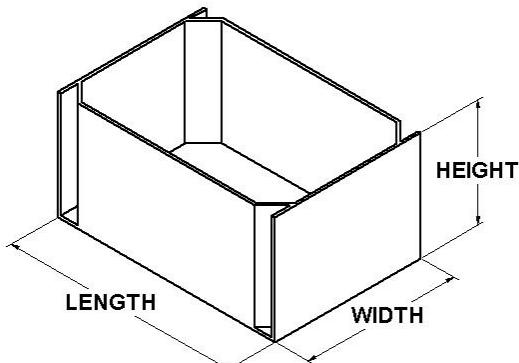
"Containers" are considered plastic totes and corrugated boxes, including wax coated boxes. Corrugated boxes with flaps must have the flaps folded to the outside of the box. Flaps not folded down could prevent the box from transferring onto the A200 head. The box could also be damaged by the A200 head when the adjustable head lowers. The A200 Multiline is designed for packaging a top loaded tote or box only.

## Bag and Container Sizes

The correct bag size is important for packaging products. There are 4 factors to determine the size of a bag:

- Width of Container
- Length of Container
- Height of Container
- Style of Container (Top or End Load, this is not a factor since only top loaded boxes are used on the A200 Multiline)

## Top Loaded Bag Formula



**Figure 1-3.** Top Loaded Box Dimension Reference

Bag Width (Opening) = Width (Box) + Length (Box) + 3" (76.2 mm)

Bag Length = Width (Box) + Height (Box) + 6" (152.4 mm)

### EXAMPLE:

Using the formula a bag size will be determined based on an end loaded box with the following dimensions:

Length = 21 inches

Width = 15 inches

Height = 10 inches

Bag Width (Opening) = 15 (Box Width) + 21 (Box Length) + 3 = 39 inches

Bag Length = 15 (Box Width) + 10 (Box Height) + 6 = 31 inches

BAG SIZE = 39 inch (W) X 31 inches (L)

With the bag in the box, check to see that the end of the bag will reach above the heat seal bar. The bag should extend a short distance above the top surface of the rear manifold rubber support.

## **SECTION: 2**

# **INSTALLATION**



# INSTALLATION PREPARATION AND REQUIREMENTS

To ensure a successful installation, it is important to adhere to the requirements for installation. Be sure that you can meet all of these requirements so that your installation will go as smooth as possible.

## Work Area

The area used to setup the A200 Multiline should be open and clear for you to work, allowing room for a fork truck to lift the Multiline.

## Required Equipment

Below is a list of equipment and tools needed to uncrate and install the A200 Multiline:

- **FORK LIFT WITH FORK EXTENSIONS** (To lift the Multiline off the crate and move in place)
- **ADJUSTABLE WRENCH** (10 or 12 inch).
- **COMBINATION WRENCH** (3/4 and 9/16 inch).
- **PLIERS** (standard or channel lock).
- **SCREWDRIVERS** (large standard tip & #2 Phillips)
- **VOLTMETER** (minimum rating of 500 VAC)
- **SIDE CUTTERS** (to cut wire ties)

## Utilities

Run the utilities to the operating location prior to setting the machine in place. Refer to Section 1 for details.

## UNPACKING THE MULTILINE

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### Warning:

**WHEN MOVING THE MULTILINE CONVEYOR ON THE CRATE, DO NOT LIFT MORE THAN TWO FEET OFF THE FLOOR. DAMAGE TO THE CONVEYOR AND INJURY MAY OCCUR.**

---

#### Uncrating the Multiline

In most cases, this step has already been completed by the time you are reading this manual. However, in the event you received the manual prior to the machine, follow the next steps to uncrate the machine:

1. Remove the stretch wrap from around the Multiline.
2. Locate and remove the clamp brackets securing the Multiline frame to the crate.
3. Remove boxes and additional items sitting on the lower conveyor of the Multiline.

#### Contents of the Crate

Before continuing, inspect the contents of the crate and the condition they are in. Below is a list of what you will find with the machine:

1. Electrical schematic and Pneumatic drawings for the machine. (Located inside the electrical enclosure.)
2. Parts Box

Before continuing, check the contents of the parts box. You should find the following items:

3. Oil-CVP Vacuoil: Use for maintenance of the rotary vacuum pump, if equipped, and air supply lubricator.
4. Spare fuses: One for each used on the Multiline.
5. Spare Conveyor Belt: two to three feet of each width.

There may be additional items inside the crate depending on the options purchased with the machine.

#### Spare Parts

In addition to the spare fuses an optional New Customer Spare Parts Kit is also available. A list of these parts is available upon request.

## ASSEMBLING THE MULTILINE

### Lifting the Multiline

To remove the Multiline from the crate, a forklift with fork extensions must be used. If fork extensions are not available, then two forklifts must be used. Follow these steps to safely lift the Multiline.



### Warning:

**DO NOT LIFT THE MULTILINE BY THE CONVEYOR SIDE RAILS.  
SEVERE DAMAGE TO THE CONVEYORS WILL OCCUR.**

1. Using a forklift with fork extensions, position the fork truck on either side of the Multiline. Depending on the options, the center of gravity can be anywhere from 6" (152.4 mm) to 24" (610 mm) from the center toward the electrical enclosure. Forks must reach the tube frame on the opposite side of the Multiline. If two fork trucks are used, position the trucks on each end of the Multiline.
2. Slowly raise the Multiline off the crate, making sure to balance or keep the Multiline level at all times.
3. Move the Multiline into the area in which the machine will be operated.
4. While the Multiline is raised, set the six adjustable legs in the base frame to the required height.
5. Set the machine back down on the floor
6. Level and adjust the machine to the desired height.
7. It may be necessary to lift and adjust the leveling feet until the desired height is achieved.

Additional height adjustment is covered in the A200 Multiline Head manual.

## CONNECTING UTILITIES

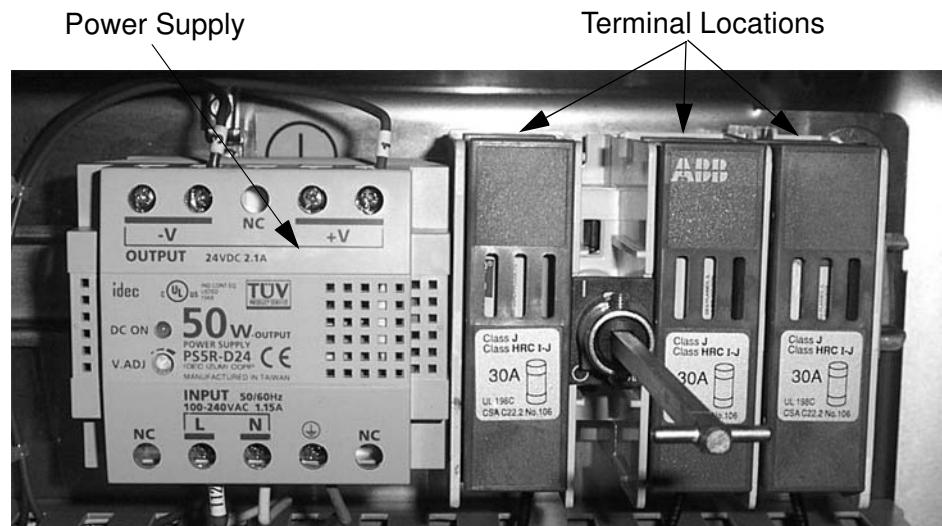
### Electrical Connections



### Warning:

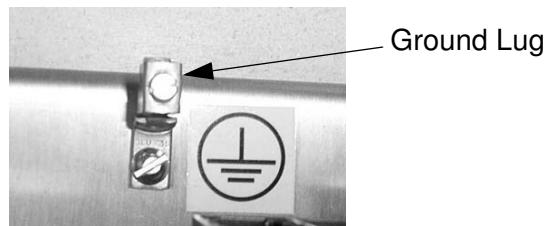
**HIGH VOLTAGE! WHEN WORKING ON THE A200, THE POWER SUPPLY MUST BE OFF. SERIOUS INJURY OR DEATH CAN RESULT FROM ELECTRICAL SHOCK.**

1. Insert the SO cord through the cord connector and tighten. (Rigid conduit may also be attached to the enclosure with the wire to connect to the machine.)
2. Strip approximately 1/2" (12.7 mm) of insulation off from all 4 conductors.
3. Place the green ground wire in the ground terminal and tighten securely.
4. Place remaining three wires in the terminals at top of main disconnect fuseholder and tighten securely.



**Figure 2-1.** Fuse Block

5. Verify that the power supply is properly grounded to the ground lug at the top of the electrical panel.



**Figure 2-2.** Power Supply Ground Lug

6. Turn on the electrical power to the unit.
7. Check the position of the “EMERGENCY STOP” switches, located on the front of the electrical enclosure and on the remote station at the opposite end of the Multiline. Make sure the switches are pulled out in the reset position.
8. On the lower right section of the electrical panel are three motor starter/overloads labeled MSP1 to MSP3. MSP1 and MSP2 are for the two conveyor drive motors. MSP3 is for the vacuum pump, if equipped” Turn the manual switches on the overloads to the off (“O”) position
9. If equipped with vacuum pumps, remove the clear sediment bowls to allow air flow into the vacuum pump.
10. With the enclosure door open, turn the MAIN DISCONNECT to the “ON” position by turning the square shaft on the fuse disconnect block.
11. Turn the manual switch on the overload labeled MSP1 to the on (“I”) position.
12. Depress the recessed button on the MS1 contactor for overload MSP1. This will start the top conveyor, check the flow of the conveyor.
13. If the conveyor flow is incorrect, switch either two of the three wires on the overload terminals labeled T1, T2 and T3. The flow should be correct.
14. Repeat steps 11 through 13 on overload MSP2 for the lower conveyor.
15. If equipped with electric vacuum pumps, repeat steps 11 through 13 on MSP3. However, in step 13 feel the pump exhaust. If pump rotation is correct, you will notice air expelling from the pump exhaust. If rotation is reversed, you will notice a suction at the pump exhaust and the pump will be very noisy.



## Warning:

**DO NOT RUN VACUUM PUMP IN REVERSE! SERIOUS DAMAGE CAN OCCUR FROM A REVERSED PUMP. THE PUMP SHOULD ROTATE IN THE DIRECTION INDICATED ON THE PUMP HOUSING. IF**

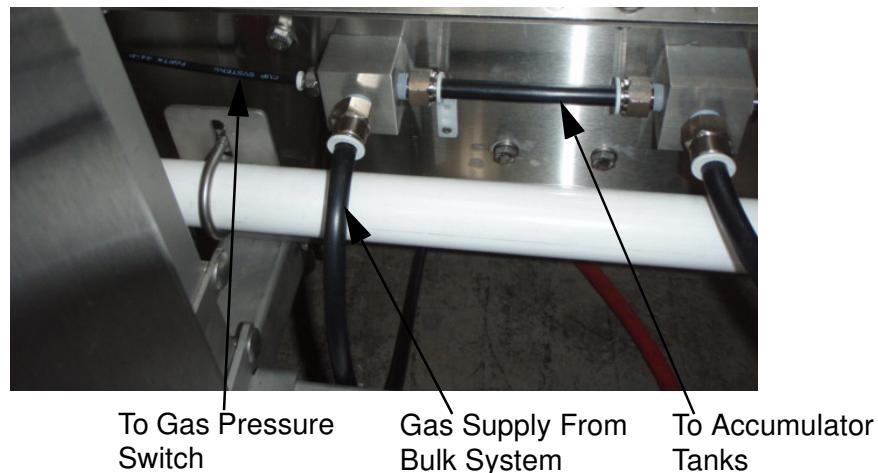
THE PUMP IS REVERSED SIMPLY SWITCH THE LOCATION OF ANY TWO OF THE THREE ELECTRICAL SUPPLY LEADS.

**Main Air Supply**

Connect your air supply line to the air regulator. Turn the air supply line "ON" and check regulator. It must read a minimum of 80 PSI (5.6 bar).



**Figure 2-3.** Air Connection



**Figure 2-4.** Gas Manifold

**Gas Supply**

1. Install a high flow gas regulator to your gas supply line or gas cylinder.
2. Connect a gas supply hose from the gas regulator to the center fitting of the first gas manifold block, located on the face of the lower conveyor, behind the electrical enclosure. The push-to-connect style fittings feature integral shut-off valves. Turn the gas supply "ON". Set gas regulator from 60 to 80 PSI (4.1 bar to 5.4 bar).

3. Connect the A200 heads to the Multiline and connect the gas lines to the accumulator tank on the heads
4. Check for gas pressure in the accumulator tank by pulling the ring on the pressure relief valve. If no gas is expelled check the fittings and hose for obstruction.
5. Move to the remaining machines and repeat the last step.

## ADJUSTMENTS TO MULTILINE COMPONENTS

The Multiline conveyor relies on several controls and components to allow proper operation of the system. While most of these are preset at the factory, adjustments will be necessary before the Multiline can be operated. The following describes how to adjust these controls and components, additional information is available throughout this manual.

### Clamp Stop

The clamp stop is the first mechanism a container encounters, it's located at the infeed of the top conveyor. The clamp holds the container and those behind it from entering the Multiline.

The clamp uses a pneumatic cylinder to clamp. Two adjustments can be made to the cylinder for efficient operation. A flow control protrudes through the base plate of the clamp stop, above the electrical enclosure. In addition to the flow control the cylinder is equipped with cushions built into the nose and end. For additional information see Section 7.

### Blade Stops

The blade stops control the flow of the containers for the remainder of the conveyor. The mounting bracket is slotted to adjust the blade stop in a position that centers the containers to the A200 head. When multiple container sizes are used, adjust the blade stop for the longest. For additional information see Section 7.

### Pushers

The pushers transfer the containers into the A200 head. Two factors that effect how well the containers transfer into the A200 head are weight and material. To control the pushers flow controls on the valve manifold are used. Located on both side of the tubing ports a recessed screw head, straight blade, are used to adjust the flow. For additional information see Section 7.

### Transfer Conveyor

The transfer conveyor bridges the gap between the upper conveyor and the tilt conveyor on the A200 head. If improperly adjusted, the containers will not transfer into the A200 head. The top of the transfer conveyor should be parallel to the tilt conveyor on the A200 head. For additional information see Section 7.

### Photoeyes

The photoeyes are critical to the safe and proper operation of the Multiline. The Multiline uses a diffuse type of photoeye, this eliminates the need for a reflector. The photoeyes position can be adjusted by pivoting the bracket. The distance the photoeye can read is also adjustable, however the photoeyes located at each station for the A200 head on the upper and lower conveyor need to read the maximum distance. The distance for the photoeye located at the first blade stop must not extend beyond the side of the conveyor. For additional information see Section 4.

# **SECTION: 3**

# **OPERATION**



# MACHINE OPERATION

## Machine Cycle

The Multiline distributes containers to the A200 head, an automated process with no interaction from the operator. The following is a step by step sequence of how the Multiline operates with the A200 head. To better understand how the Multiline operates two containers will be followed through the Multiline. Container "A" is the first to enter the upper conveyor followed by container "B".

1. Container "A" enters the upper conveyor infeed and stops at the first blade stop, also called the staging stop.
2. The location on the conveyor where the containers are pushed into the A200 head are called zones. Zone 1 is the first zone the containers enter, this feeds the first A200 nearest to the Multiline enclosure. When a container is needed for one of the zones the clamp stop extends holding container "B".
3. The staging stop lowers allowing container "A" to proceed to the first zone.
4. When container "A" is clear from the photoeye at the staging zone the staging stop raises and the clamp stop retracts allowing container "B" to proceed to the staging stop.
5. In the first zone one of two actions will occur to container "A".
  - A container may be needed in the next zone. If so, the blade stop would lower and container "A" proceeds to the next zone. Once the container is clear from the photoeye in the first zone the stop will raise and container "B" will move to the first zone.
  - The A200 head may request a load. The pusher would extend, transferring container "A" into the A200 head.
6. Before the container can be "Dumped" to the lower conveyor, the A200 head checks the network for a "clear to dump" signal. The discharge photoeye of the machine and the one upstream must be clear for the DUMP DELAY time set in the conveyor interface. For the machine at the exit end only, the lower exit photoeye must also be clear. When the signal is given, the A200 head dumps its container onto the lower conveyor and the container is transported off the Multiline.

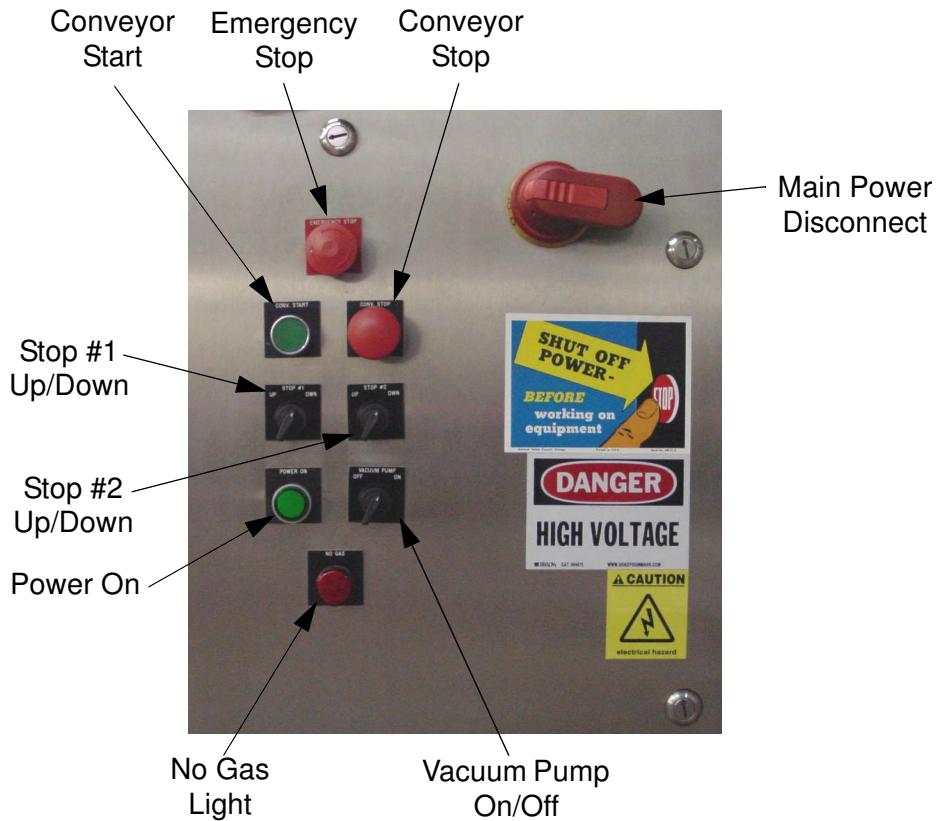
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**Note:** Step by step sequence of operation for the A200 are found in the A200 head's manual.

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## OPERATOR CONTROLS

### Electrical Enclosure



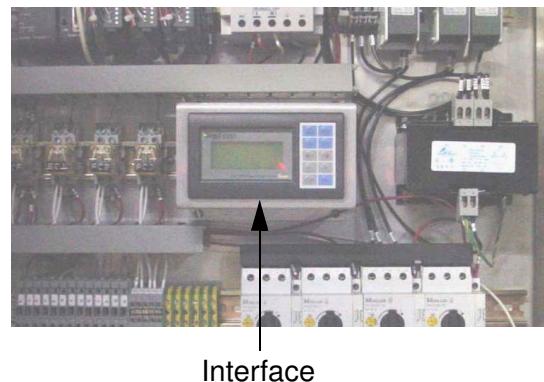
**Figure 3-5.** Multiline Control Panel

The electrical enclosure, located at the infeed of the upper conveyor, houses all the necessary controls for the Multiline.

The emergency stop is located to the top of the push buttons and switches. Below the emergency stop is the conveyor start and stop buttons.

The “Stop #1” and “Stop #2” up/down switches raise the blade stops in zone 1 and 2. This prevents containers from proceeding beyond these blade stops. This is helpful if a machine has been removed for maintenance or production levels are slow enough that one or two machines can easily keep up.

The “Power On” button energizes the controls for the Multiline. The Vacuum On/Off switch allows the pumps to operate independent of the conveyors. The “No Gas” light illuminates when gas pressure in the gas manifold drops below 20 PSI (1.4 bar).

**Operator Interface**

**Figure 3-6.** Operator Interface

The operator interface is located inside the electrical enclosure mounted to the electrical panel. The interface gives the operator access to PLC control timers and will also display faults detected by the PLC.

## OPERATION PRECAUTIONS

### Safe Operating Practices

It is important to know and understand the safety precautions before operating the A200 Multiline. Improper and unsafe operating habits will cause injury to the operator.

- **Do not lean on or near areas of the machine that move.** Loose clothing or parts of your body may become pinched in the machine.
- **Do not operate with loose or damaged parts.** This will only cause harm to the operator and/or additional damage to the machine. Repair or replace faulty parts before operating the machine.
- **Use the machine in the manner for which it was designed.** Operate the machine as directed in this manual or as instructed by a CVP representative. Again, improper use of this machine will result in injury or cause additional damage to the machine.
- **Do not exceed weight limits of the Multiline.** Exceeding the weight limits will cause damage to Multiline belt and frame.

## **SECTION: 4**

# **CONTROL DETAILS**



# OPERATOR SWITCHES

**Power On**

After the conveyor is installed with the A200 machines in place and connected, the Multiline conveyor is ready to be powered up. Make sure the E-stop button is pulled out. Turn on the main power disconnect by turning the handle clockwise to the ON ("I") position to supply power to the conveyor. Next, enable control power by pressing the "POWER ON" pushbutton. When illuminated, conveyors and electric vacuum pumps (if any) can be started.

**Vacuum Pump**

The Multiline conveyor may be equipped with optional electric vacuum pumps. In this case, the pumps will start when the "POWER ON" button is pressed. Manual motor starters for the vacuum pumps can be shut off inside the enclosure and the conveyor will still operate. This is useful when the A200 machines are in "BYPASS" or "SEAL ONLY" modes and do not require the vacuum pumps.

**Conveyor Start/Stop**

With the "POWER ON" light illuminated, press the "CONV START" pushbutton on the main panel or remote station to start the upper and lower conveyor drive motors. Pressing the "CONV STOP" pushbutton will stop the conveyor drive motors.

**Emergency Stop**

There is an emergency stop push-pull switch on the main panel. When pushed in, vacuum pump and conveyor operation is disabled. All PLC outputs are disabled. Stops will be down and pushers back. No conveyor clear signal can be sent to the machines so they cannot automatically dump. When ready to operate again, pull the E-stop button to reset and press the "POWER ON" button again.

**Stop Up/ Down**

The STOP selector switch controls the position of the stop blades. Position #1 stops containers in front of the pusher behind the A200 machine closest to the infeed (Machine #1). Position #2 stops containers in front of Machine #2.

When operating all positions of the Multiline the stop switch should be in the "0" position. Then the stops will automatically raise and lower to control the flow of the containers being transferred into the A200 machines. By turning the switch to the 1 or 2 position the corresponding blades will stay in the up position, preventing containers from passing beyond them.

With the STOP switch in the "2" position, containers will only transfer into the #1 and #2 machines. No containers would be transferred into the #3 machine. With the switch in the "1" position, containers will only transfer to the #1 A200 machine.

This is useful if less than 3 machines would keep up with production or a machine is removed from the Multiline for maintenance.

**No Gas Light** When illuminated, gas pressure is below 20 PSI (14 bar). Pusher operation is disabled. Restore gas pressure to clear the alarm.

**Feed Conveyor Run Light** When illuminated, the feed conveyor system is running.



**Figure 4-7.** Conveyor front pushbuttons

## MAIN MESSAGE SCREEN

### Display Areas

The upper display area shows operator prompts and alarm messages. For example, at powerup the operator is prompted to "PRESS POWER ON". When alarms occur a message is displayed and the screen background will change from green to flashing red.

The lower display line shows the menus that can be jumped into by pressing their function keys below.



**Figure 4-1.** Main Message Screen

### Function Keys

Press the PRE key (F1) and the display jumps to the PRESET menu.

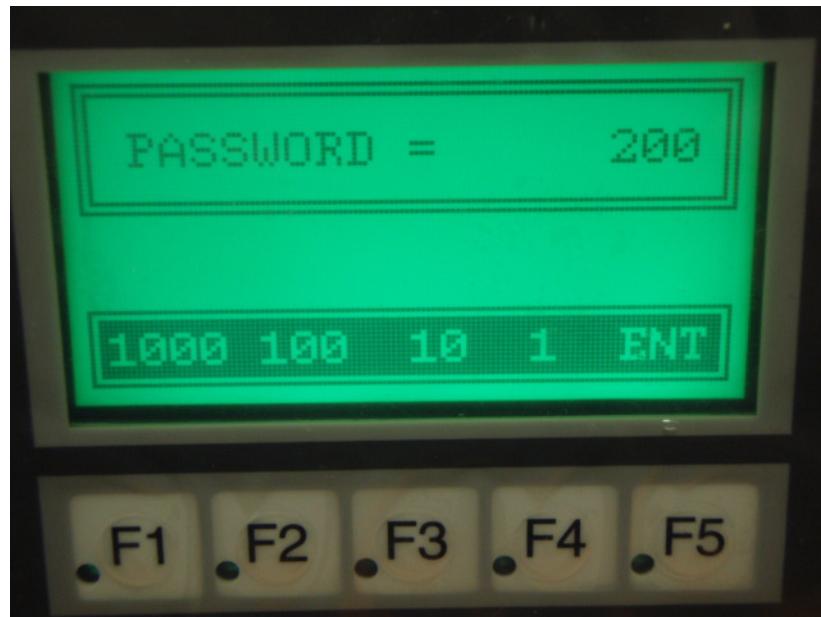
Press the CNT key (F3) and the display jumps to the COUNTS menu.

Press the MORE key (F5) for more information.

### Preset Mode

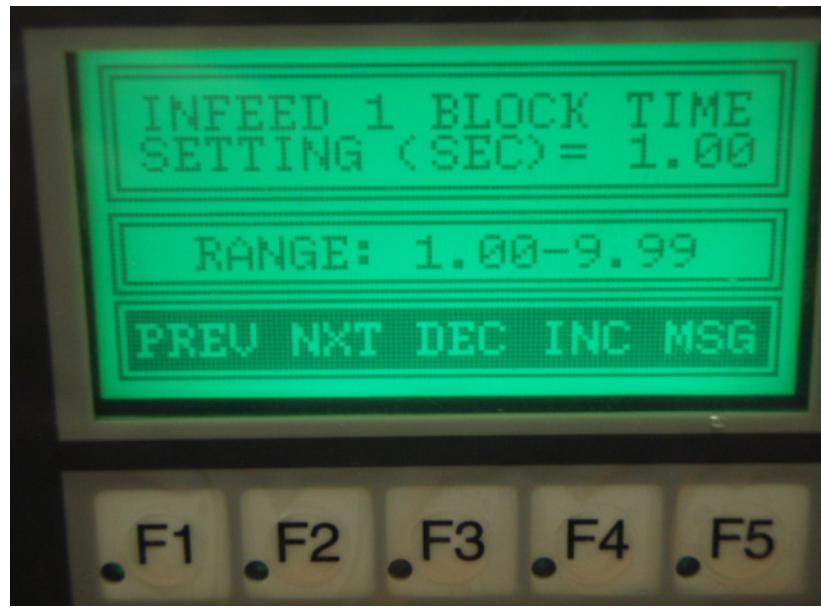
Press the PRE key to enter the Preset Mode

The ENTER PASSWORD popup menu appears. The password is "200". Press the 100 key twice to enter 200. Press the ENTER key at the lower right to enter the password and advance to the PRESET menu. If the wrong password is entered, access will be denied.



**Figure 4-2.** Enter Password Popup Screen

There are 10 presets in the menu. The top preset item is Infeed #1 Block time.

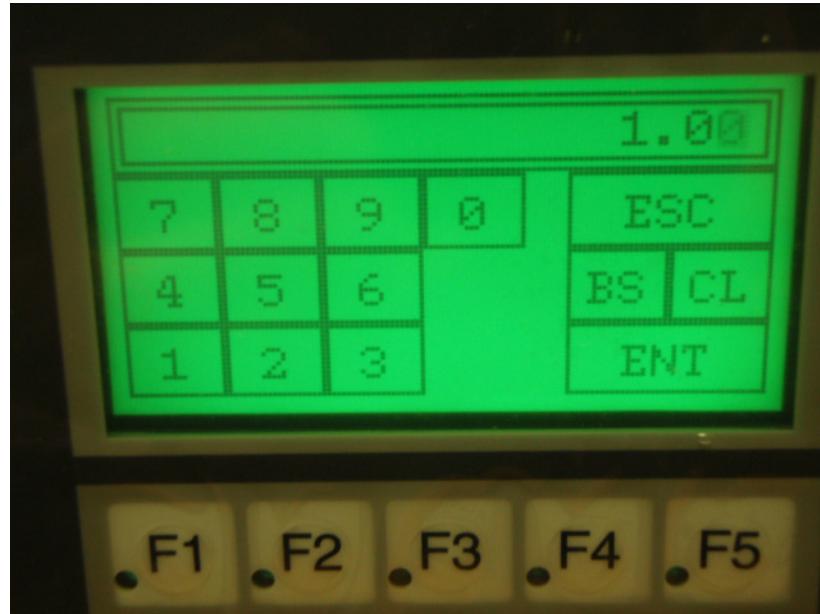


**Figure 4-3.** Top Preset Item (Infeed #1 Block Time)

The upper box shows the current value of the preset. Use the DEC key (F3) and INC key (F4) to change the value. The middle box gives the units and adjustable range. Use the PREVIOUS key (F1) and NEXT key (F2) to

advance through the 10 individual Preset parameters. Hit the MSG key (F5) to return to the main menu and enable the changed settings.

**Hint:** To change preset values using the numeric keypad, touch the value you want to change (0.0 in the figure above) on the touchscreen. The popup keypad will appear. Type the new value in and press ENT. You will see the new value in the settings menu.



**Figure 4-4.** Numeric Keypad popup screen

#### Preset Functions

Preset functions are described below in their order on the menu:

##### TOP OF MENU

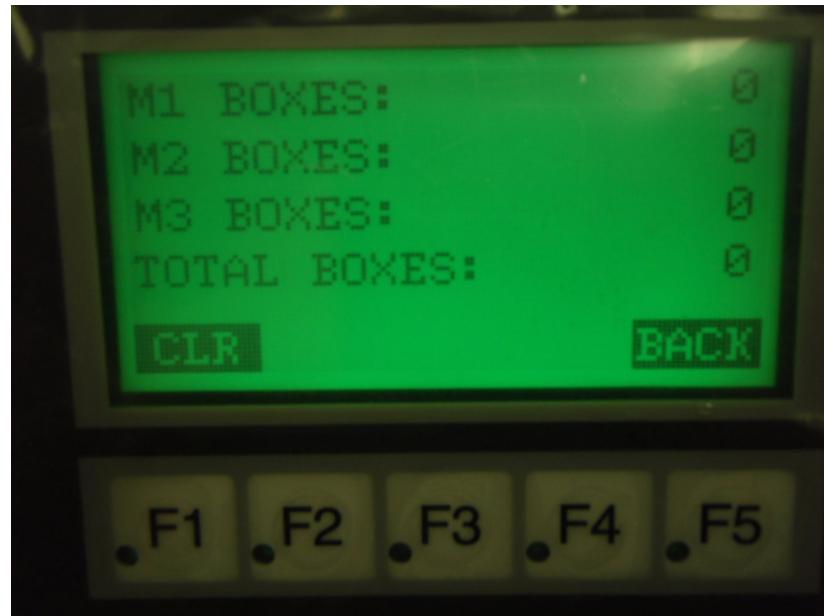
1. The Infeed conveyor loading section 1 photoeye blocked time: Upon a box entering loading section 1, the timer starts. After it times out, the #1 pusher loader is enabled and will push if a load is requested with stop #1 up. Factory setting: 1.00 second
2. The Infeed conveyor loading section 2 photoeye blocked time: Upon a box entering loading section 2, the timer starts. After it times out, the #2 pusher loader is enabled and will push if a load is requested with stop #2 up. Factory setting: 1.00 second
3. The Infeed conveyor loading section 3 photoeye blocked time: Upon a box entering loading section 3, the timer starts. After it times out, the #3 pusher loader is enabled and will push upon a load request from machine #3. Factory setting: 1.00 second

4. The Exit conveyor shutdown time: A photoeye must be mounted on the exit conveyor to indicate when containers are backing up. When the photoeye input X11 is on, the timer starts. After it times out, the exit conveyor will shut down. The exit conveyor will remain shut down until the photoeye is clear and the CONV. START pushbutton is pressed again. This timer only is set in tenths of seconds. Factory setting: 30.0 seconds
5. The Invert photoeye preset: It should be set to 1 on conveyor models when the exit conveyor flow is the same direction as the top conveyor. These conveyors are on Multilines with “Left to Right” or “Right to Left” configurations. It should be set to 0 on conveyor models where exit conveyor flow is opposite that of the top conveyor. These are on Multilines with “Right to Right” or “Left to Left” configurations. The program needs to know if a particular machine’s exit zone and the upstream exit zone are clear before it can send a “clear-to-dump” signal to that machine. Do not change from factory setting.
6. The Infeed Stop Timer. When the Infeed tote photoeye no longer senses a box in the zone, the timer starts and when it times out, the Infeed stop goes up. Factory setting: 0.30 second
7. Dump2 Delay timer should be set to the time it takes a dumped box to clear the downstream machine’s dump zone. Factory setting: 4.00 seconds
8. Dump0 Delay timer should be set to the time it takes a box dumped from the most upstream machine to NOT reach the most downstream machine’s dump zone. Add the “Dump2” and “Dump0” times and that should be enough time for a box dumped from the most upstream machine to clear the most downstream machine’s dump zone. Factory setting: 2.50 seconds
9. Clamp ON delay is the time delay to energise the box clamp and turn off output Y16 after the Infeed approach photoeye senses a second box in the staging area . Y16 energizes a relay for feed conveyor control thru N.O. contacts. When de-energised, the feed conveyor goes OFF. Factory setting 0
10. Clamp OFF delay is the tote clamp release time. Factory setting 0.10 seconds

#### BOTTOM OF MENU

**Box Count**

Check the running count by pressing the CNT key (F3) in the main menu.



**Figure 4-5.** Box Count screen

Counters increment every time a box is pushed into a machine. There is a count for each machine and a running total. At 99999999, counters wrap around to zero again. Pressing CLR (F1) resets all counters to zero. Press BACK (F5) to return to the main menu.

**Information Menu** Enter the Information menu by pressing the INF key (F5) in the main menu. Contact information for CVP Systems is displayed as well as the program name for the screen. Press BACK (F5) to return to the main menu.

**Alarms** Alarms that occur during operation of the A200 Multiline Conveyor must be acknowledged. When alarms occur, an alarm popup window appears on the interface. The background color of the screen will change from green to flashing red to alert the operator.



**Figure 4-6.** Alarm condition - Pusher 3 Fault

The above figure shows a typical alarm popup screen. The following alarm messages may appear:

1. Pusher #1, #2 or #3 Jam

Indicates that the corresponding pusher has been retracted and disabled due to a jam. A jam will occur if the pusher retracted limit switch fails to make within one second after extension. A jam will also occur if the loading photoeye still senses a load immediately after the pusher retracts. Clear the jam by removing the load from the photoeye path. Pressing the CONVEYOR START button will clear the alarm if the load remains in front of the photoeye and attempt to push it again.

2. No Gas Alarm

Indicates that gas pressure is below 20 psi. Pusher operation is disabled. Restore gas pressure to clear the alarm.

3. Exit Conveyor Backup

The exit conveyor photoeye has been blocked for longer than the alarm timer. The lower conveyor will stop. Clear the jam by removing the load from the photoeye path. Press conveyor START pushbutton to restart exit conveyor.

## PHOTOEYE SETUP AND ADJUSTING

**Photoeye Display** All photoeyes on the multiline conveyor and machines are wired for “dark on” operation. When a target is sensed, the orange operation indicator light on the photoeye will illuminate. The black wire from the photoeye cable is wired to the PLC input which should light at the same time.

There is an adjustment trimmer on top of the photoeye that adjusts its sensitivity. Maximum detection range (fully CW) is 3 feet.

**Photoeye setting** On the upper conveyor, the function of the photoeyes is to sense when a box is in a loading zone, ready to be pushed onto a machine for processing.

There is a photoeye for each loading zone. It is mounted just upstream of the zone on the machine side of the conveyor pointing downstream diagonally so that it can see any box in the zone yet not pick up the rail on the opposite side.

These three photoeyes should be set to read the maximum range. Set the adjustment screw fully CW. There are timers for each photoeye that set the delay time for pushing the box after the photeye senses a load in the zone.

For zone 1(closest to the feed conveyor), the timer is “InfdBlk1”. For zone 2 it is “InfdBlk2” and for zone 3 it is “InfdBlk3”. These timers are in the Preset menu of the operator interface. The factory settings are all 0100 = 1 second.

There is an additional photoeye on the upper conveyor that senses when a box is in front of the Infeed Stop.

This photoeye is mounted on the machine side just upstream of the Infeed Stop. It should be set so that it can sense halfway across the conveyor. Set the adjustment screw about midrange. Do not aim it straight across the conveyor or it can pick up reflections. Point it 5 degrees upstream of straight across (away from the Stop) for best results.

The infeed approach photoeye senses when there is a second box in the staging area. Set similiarly to the Infeed stop photoeye except to sense the second box in line.

Three photoeyes on the lower conveyor should be set to read the maximum range. Set the adjustment screw fully CW. These photeyes sense blockages on the lower conveyor and will inhibit dumping from that machine zone and the upstream zone when lit up.

## MACHINE COMM. CABLES

The conveyor to machine communication cables must be plugged in for each machine to be able to dump and for the conveyor to be able to push in a box. One of the yellow 19-wire cables is for inputs from the machine head and the other is for outputs to the machine head. It is not possible to run a machine if the cables are not hooked up.

The input and output cable at each station are opposite gender and cannot be confused.

When a machine along the conveyor has a load request, its output Y14 will be lit. This appears as a load request in the conveyor PLC if the machine cables are connected. If a box stops in the machine's loading zone and there is a load request from that machine, the conveyor will push the box onto the machine load shelf.

When a station along the conveyor is clear to dump, the conveyor PLC sends an output that appears as a conveyor clear signal in the machine PLC. X15 will be lit. When X15 is lit and the machine has finished processing a box, it will automatically dump to the lower conveyor.

## **SECTION: 5**

# **VACUUM SYSTEM**



## GENERAL INFORMATION

There are two vacuum systems offered on the Multiline system.

1. Vacuum manifold system with high capacity, rotary vane, vacuum pumps mounted on the Multiline conveyor

See Section 10 for maintenance information regarding this style of vacuum pump.

2. Individual venturi vacuum pumps on the A200 heads.

For additional information on this style of vacuum system see the manual supplied with the A200 machines.



# **SECTION: 6**

# **GAS SYSTEM**



# GAS FLUSH SYSTEM

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**Important:** Do not connect compressed air to the gas system. Compressed air is not a modified atmosphere gas and will contaminate the product.

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## Warning:

**APPLICATIONS USING OXYGEN REQUIRES SPECIAL “OXYGEN CLEAN” COMPONENTS. CONSULT WITH YOUR CVP REPRESENTATIVE FOR FURTHER DETAILS.**

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### General Information

The Multiline has a Gas Manifold system to distribute gas to each A200 head. This provides for a single point connection requiring only one gas supply line run to the Multiline.

### Determining Gas Time

For each pound of product a certain amount of gas, in cubic inches, is required to backflush into the bag. The gas amount is controlled by timers in the PLC. The timers can be adjusted through the operator interface, see section 4. To set the timers, cycle an empty bag on the A200 and check the final gas amount in the bag, see below for instruction on how to check the gas amount. Adjust the timers accordingly. If more gas is needed increase the gas timers, if less is needed decrease the timers.

To check the amount of gas follow the instructions below:

1. Place the bag on a flat surface and place another flat object on top of the bag, i.e. a sheet of card board, parallel to the lower flat surface. This will sandwich the bag.
2. Measure the length and width of the bag as well as the distance between the two flat objects.
3. Multiply these dimensions to determine the volume in the bag.
4. Compare this amount to the amount required.

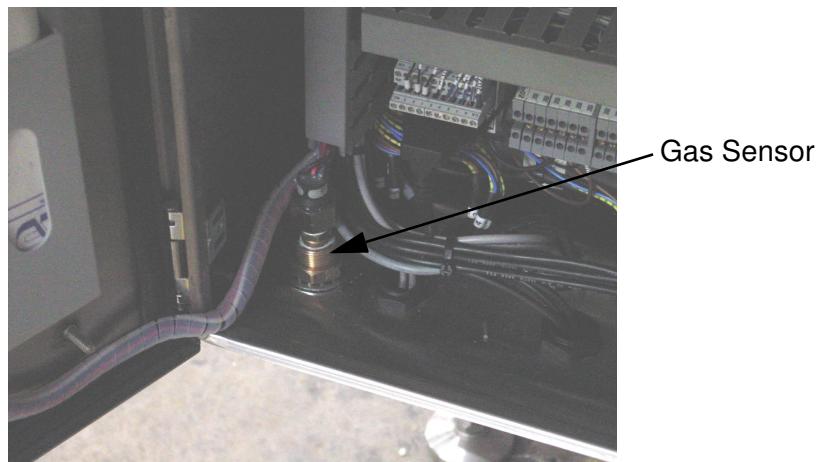
Consult a CVP Systems representative for the amount of gas per pound required for your application.



**Figure 6-1.** Gas Connection

**Gas Connection** Connect the gas supply to the center fitting of the first gas manifold block. The manifold blocks are located on the operator side of the lower conveyor frame. The push-to-connect style fitting features an integral shut-off valve.

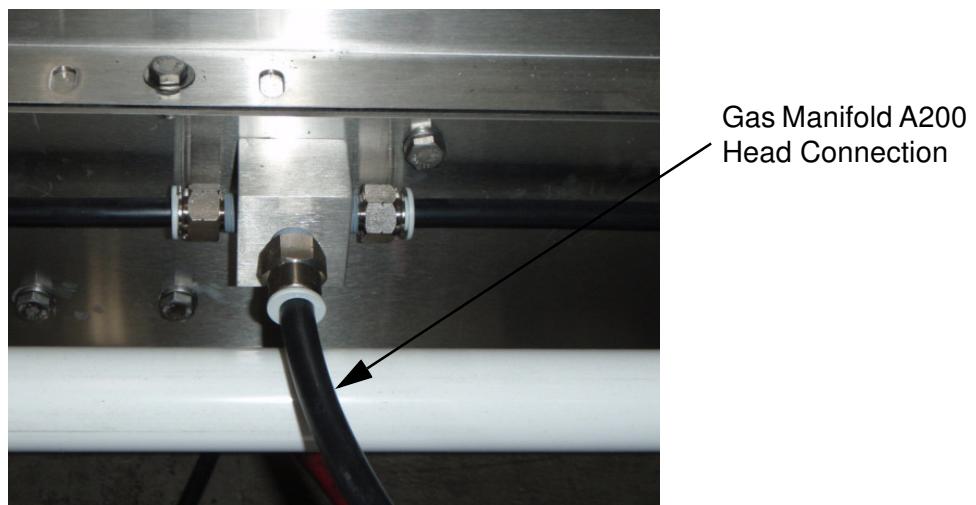
**Gas Sensor** The gas sensor is located in the bottom of the electrical enclosure. The gas line runs from the gas manifold to an elbow fitting on the gas sensor. If the gas pressure drops below 20 PSI (1.4 bar), the “NO GAS” light illuminates and the Multiline will not transfer containers in or out of the A200 head.



**Figure 6-2.** Gas Sensor Location

**A200 Head Connection**

The push-to-connect fittings on the gas manifold blocks feature integral shut-off valves. To remove an A200 head from the Multiline, push the collet on the fitting and pull out the tubing to disconnect the hose. This allows the remaining heads to continue gas flushing.



**Figure 6-3.** Gas Manifold Block



# **SECTION: 7**

# **CONVEYORS**



## CONVEYOR SAFETY

- Lockout the main power disconnect before performing maintenance on the conveyors.
- Remove or shut off air supply to the multiline when performing maintenance on pneumatically operated components.
- Do not operate the conveyor with the guards removed unless necessary for maintenance purposes.
- Keep all body parts and loose clothing away from the conveyors during operation.
- Do not walk or stand on the conveyor. Injury could occur if the conveyor starts unexpectedly.

## GENERAL INFORMATION

The Multiline consists of an upper and lower conveyor. The upper conveyor indexes and transfers containers into the A200 heads. The lower transports the containers out of the Multiline.

### Conveyor Belts

The Multiline uses a modular plastic style conveyor belt. The upper conveyor uses a dual chain belt to allow blade stops to raise between the belts and stop the containers in the needed positions. The lower conveyor is a full width belt to allow containers to slide across the belt as it exits the A200 head. The belt is perforated to allow fluids spilled on the belt to drain off.

The conveyors do not have a belt take up to tension the belt; modular plastic belts do not require tension to operate. If the belts become loose, simply remove a link from the belt.

The belts are USDA 3A approved and can be removed for sanitation and maintenance.

The belts run on UHMW rails that provide support and prevent wear to the conveyor belts. The upper conveyor uses an "L" shaped rails to guide the two chains. The lower uses a "T" shape rail on the top carrier belt and a serpentine rail system for the return. The rails can be replaced as they become worn.

### Conveyor Drives

The upper and lower conveyor on the Multiline have an independent drive motor and reducer. Both units are identical, as both conveyors operate at the same speed. Proper maintenance will prolong the life of the drives.

The reducer is filled with gear oil, check with the manufacturer's documentation for type and grade of oil. The oil level should be to the middle of the output shaft.

The reducer is equipped with a breather plug located on the side near the top of the housing. The breather plug relieves pressure that builds inside the reducer as the oil heats while in operation. If the vent on the breather plug becomes blocked, pressure in the box could cause the seals to fail.

Each drive and idler has a bearing mounted to the outside of each conveyor frame rail. These bearings have a grease fitting pointed towards the end of the conveyor for easy access. The bearings are packed with food grade grease from the factory and should be greased on a regular basis depending on operating time. The bearings have a cap to prevent grease from dripping during operation.

# REPLACING THE CONVEYOR BELTS

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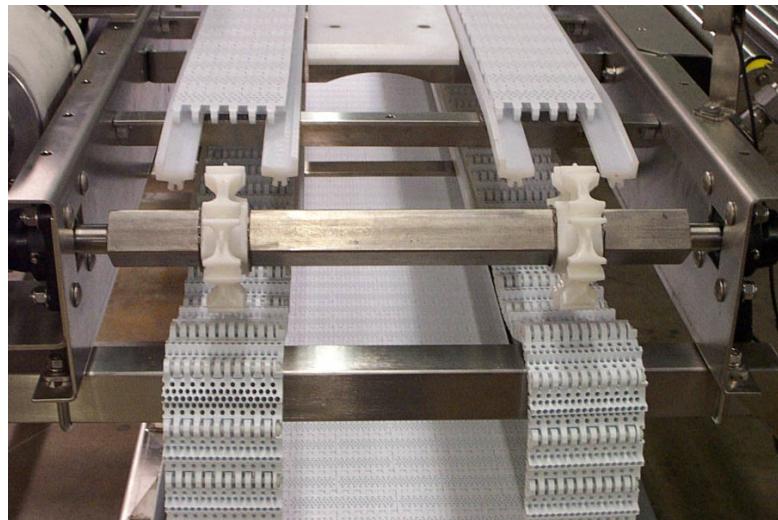
**Important:** At least two people will be needed to remove and replace the conveyor belt.

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## Removing the Belts

To properly and safely remove the conveyor belts, follow the instructions below.

1. Lockout power on the Multiline.
2. Remove the cover on the end of the conveyor.
3. Locate the end of the hinge pin with the flanged head. The head keeps the pin locked in the belt to prevent it from sliding out. Using a 1/4" (6.4 mm) diameter or smaller punch and hammer tap on the pin opposite the head until the pin pops free of the belt.
4. Remove the pin, the belt will now be free.



**Figure 7-1.** Upper Conveyor Belts with Pin Removed at Drive

5. Go to the drive end of the conveyor and pull the top belt off the conveyor. With the top belt removed, pull the lower belt off the conveyor.

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**Note:** If removing the belt on the upper conveyor, remove the belt furthest from the drive first. The free tail sprocket will prevent the other belt from moving making the removal easier.

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6. Inspect the sprockets and UHMW rails for wear and damage, replace if necessary.

**Replacing the Belts**

To properly and safely replace the conveyor belts follow the instructions below

1. From the drive end of the conveyor feed the belt through the belt return with the belt's top surface facing down.

---

**Note:** When replacing the upper conveyor belt, start with the drive side.

---

2. When the belt reaches the tail side, one person can pull the belt while the other continues to feed the belt.
3. As the belt reaches an opening in the side rails, the remaining belt can be rolled across the top conveyor.
4. Pull both ends of the conveyor belt to remove all slack from the belt.
5. With the slack removed lay one end of the belt on the rails and hold in position.
6. Pull the other end of the belt over the top of the other and locate where the overlapping belts meet.
7. Remove the excess belt and splice the two ends together.
8. Take a new pin at least 2" (50.8 mm) longer than the belt width and cut the end at approximately a 45 degree angle. Insert the pin into the belt splice until the head hits the belt.
9. Using a punch and hammer, tap the head until it is locked into the belt.
10. With the pin in location, cut the remaining pin extending from the other side using a pair of side cuts. Cut the pin flush to the side of the belt to prevent it from snagging on the conveyor frame.
11. Replace the covers on the end of the conveyor.
12. Turn power back on and start the conveyor. Inspect for improper tracking and adjust if necessary.

**Adjusting the Tension of the Belt**

In time, the belts will stretch to the point that too much slack causes the belt to skip on the drive sprockets. This can be repaired by removing a small section of the belt. Below is instruction to adjust the tension of the belt.

1. Lock out the main power.
2. Remove one of the pins to split the belt.
3. Hold one end of the belt in position and overlap the other end.
4. Note where the belts met and remove the excess belt, usually one or two links.
5. Splice the two ends together and replace the pin.
6. Lock the pin into position and remove any excess pin.
7. Restore power and start the conveyor and inspect for proper tracking.

# **SECTION: 8**

# **COMPONENTS**



## CLAMP STOP

### Clamp Stop Description

The clamp stop is located at the infeed of the upper conveyor, above the electrical enclosure. The clamp stop stroke length will accommodate all container widths capable of running on the Multiline.

### Clamp Stop Operation

The clamp stop is activated when a container is needed in the machine zones. Once the clamp stop is activated and the container is clamped, the first blade stop lowers releasing the container ahead of the clamped container. When the container entering the machine zones is clear, the blade stop will raise and the clamp stop retracts releasing the container

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**Important:** The clamped container can stop additional containers accumulating behind it on the infeed conveyor. However, positive drive conveyors limit the number of containers that can accumulate. Eventually enough pressure will build to cause the container to be pushed into the Multiline, even with the clamp stop activated. Containers with tapered sides can cause the containers to lift and spill off of the conveyor when enough pressure is produced.

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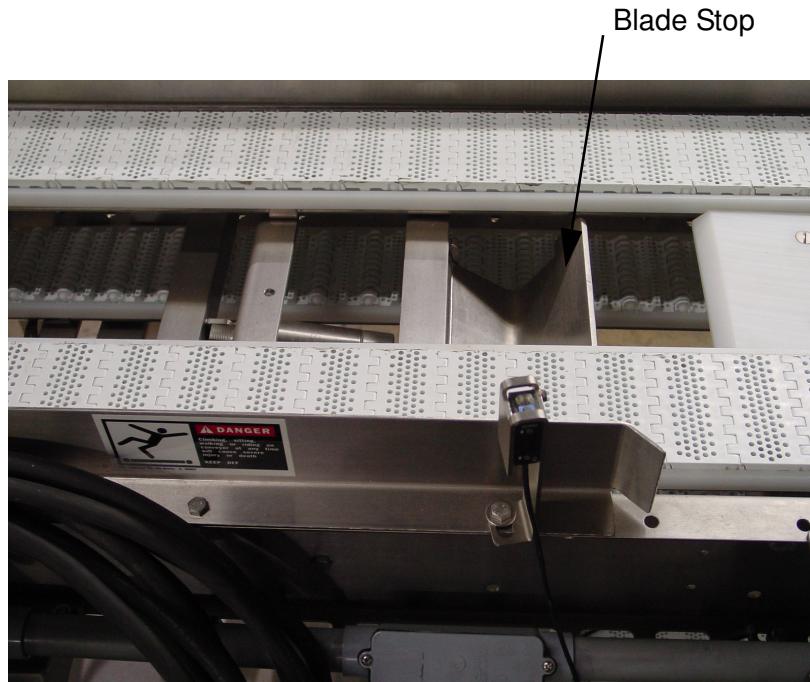
### Clamp Stop Adjustments

The clamp stop uses a linear guided cylinder to extend and retract. The cylinder is equipped with a regulator and air cushions at the end of the stroke. On the rear of the cylinder, a flow control slows the clamp stop as it retracts. This reduces the slamming that occurs when the cylinder has reached the end of its stroke, prolonging the life of the clamp mechanism. The cushions and flow control are adjusted to the proper settings at the factory and should not be readjusted. The air regulator may be adjusted to change the clamping force of the stop to prevent carton damage.

## BLADE STOPS

**Blade Stop Description**

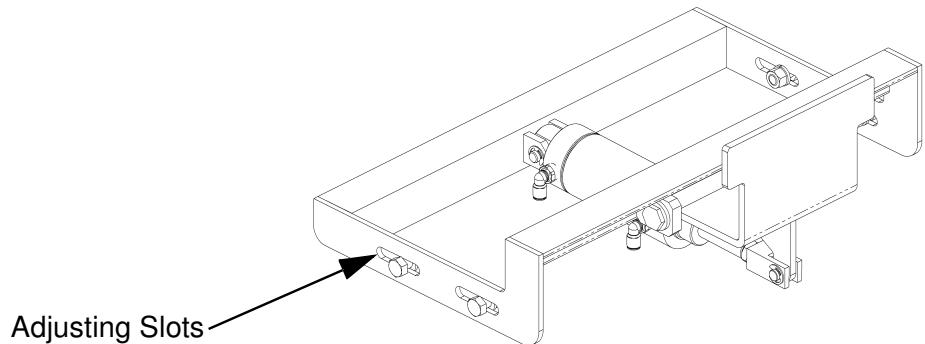
The blade stops are located in the upper conveyor of the Multiline. The blade of the pneumatically operated mechanisms pivots between the belts.



**Figure 8-1.** Blade Stop in Down Position

**Blade Stop Operation**

There are two blade stops on a two head Multiline and three on a three head Multiline. The first blade stop is in the indexing, or staging, zone. This blade stop releases one container at a time into the machine zones. In the machine, zones up to two additional blade stops hold the containers behind the A200 heads. The last machine zone uses the end cover to stop the containers.



**Figure 8-2.** Blade Stop Adjustment

### Blade Stop Adjustment

The blade stop mounting bracket has slots that allow the mechanism slide into different positions for different box lengths. This will center the container to the A200 machine as it is transferred. To adjust the blade stop, loosen the four mounting bolts and slide the blade stop into the needed position.

## PUSHERS

<b>Pusher Description</b>	The pusher is located in each machine zone behind the A200 head. The pusher has a 12" (305 mm) stroke cylinder to push the containers off the upper conveyor into the A200 head.
<b>Pusher Operation</b>	When the A200 machine requests a container and one is in the machine zone on the conveyor, the pusher extends, transferring the container into the A200 head. The pusher stays extended for 1/2 second then retracts. After the pusher is retracted, the infeed photoeye must be clear or it generates a jam alarm. Two seconds after pusher extension, the pusher retracted input must go on again or it generates a jam alarm. If the pusher retracted signal is not received, containers will not be released into that zone.
<b>Prox Switches</b>	A Prox switch on each pusher detects when it is in the retracted position. The switches detect the end of one of the thrust rods on the linear guide when the pushers are fully retracted.



**Figure 8-3.** Pusher Retracted Prox Switch

<b>Pusher Adjustments</b>	The pusher cylinders are equipped with cushions at each end of the stroke. This reduces the slamming effect that is produced when the cylinders reach
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the end of the stroke. The cushions are adjusted to the required setting at the factory and should not be readjusted. Below are instructions to adjust the prox switches.

1. Remove the cover from the pusher. There are 4 bolts holding it to the frame.



## Warning:

**THE POWER TO THE MULTILINE CONVEYOR SHOULD REMAIN ON. HOWEVER, TURN OFF THE POWER TO THE A200 HEADS TO PREVENT A LOAD REQUEST. IF A LOAD REQUEST IS MADE AND THE PHOTOEYE BECOMES BLOCKED, SEVERE INJURY WILL OCCUR WHEN THE PUSHER ACTUATES.**

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2. The switches can be adjusted by loosening the locknuts and adjusting the switch higher or lower off the pusher frame. Adjust so that the end of the prox switch is 1/4 inch from the rod when extended. Never set boxes on the pusher frame because it will flex the frame and may cause the prox switch to come out of range. Sensing range is up to 1/2 inch. The prox switch cable has a quick disconnect to allow for easy replacement.
3. Slide the prox switch along the slot on the pusher frame until the orange light on the switch illuminates.
4. Retighten the lock nuts to secure the switch into position.
5. Identify the valve that actuates the pusher and lock the manual override to keep the pusher fully extended. The valve is located in the bank of valves behind the electrical enclosure. The valve can be identified by the electrical schematic, the pneumatic circuit drawing or by manually overriding the valves until the valve is identified.



## Warning:

**WHEN MANUALLY OVERRIDING THE VALVES, KEEP PEOPLE AWAY FROM THE PNEUMATIC MECHANISMS TO PREVENT INJURY.**

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6. Verify that the orange light on the prox switch goes off.
7. Replace the cover and test the pusher with a container. When working properly, containers will index into the machine zone and the pusher will extend and retract.

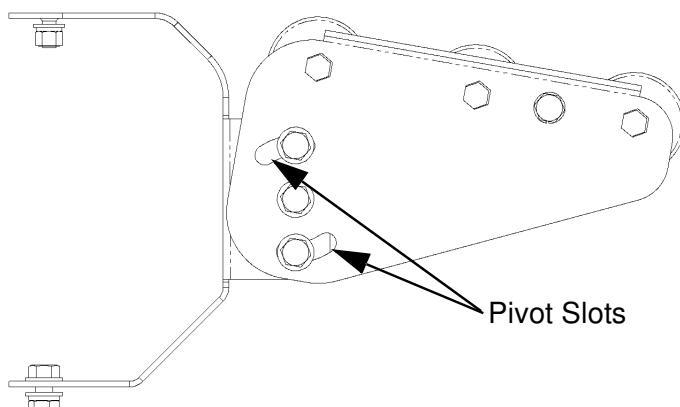
## TRANSFER COMPONENTS

**Transfer Filler**

The transfer fillers are located between the conveyor belts in each machine zone on the upper conveyor behind the A200 heads. The fillers provide a surface to support the containers to slide across the gap in between the belts while being transferred into the A200 Heads. The plate sits slightly below the top surface of the belts to prevent drag on the containers as they travel down the conveyor. The filler is a fixed component requiring no adjustments.

**Transfer Conveyor**

The transfer conveyor is mounted to the side of the upper conveyor in each machine zone. There are three rollers in each transfer conveyor to support the containers as they are pushed into the A200 head. The angle of the transfer conveyor is adjustable to efficiently and smoothly transfer the containers.



**Figure 8-4.** Profile of Transfer Conveyor Showing Pivot Slots

To adjust the angle of the transfer conveyor, loosen the three bolts on each side plate. The upper and lower bolts are in radius slots that allow the transfer conveyor to pivot. Raise the tilt conveyor on the A200 machine. Align the transfer conveyor to the angle of the tilt conveyor. Retighten the bolts and transfer a container into the A200 machine.

**SECTION: 9**

**CLEANING**



## CLEANING INFORMATION

Keeping the equipment clean should become part of your routine maintenance schedule. It will help to prevent mechanical breakdowns and will keep your A200 PLC ML machine in optimal working condition.

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**Important:** Keeping the equipment clean is required by the USDA to prevent bacteria contamination.

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### Types of Sanitizers

There are several types of cleaning solvents currently used in the food industry. The majority of these contain chlorine, which is safe to use for cleaning the A200 PLC ML machine. If you prefer not to use Chlorine based cleaners on the unit, use hot water or cover the machine up during "washdowns".

---

**Note:** Best results will occur when hot water is utilized.

---

The exterior of the machine is best cleaned by hand with a mild soap and water solution. Care should be taken that all electrical enclosures are securely closed.

Plants that use acid or chlorine based foam to washdown should cover the A200 machine so that the machine surfaces are protected. In the event that a brownish film or salt crystals appear on the machine, they can easily be removed with a hot soapy water solution. Never use metal scrub pads. White 3M style scrub pads can be used to remove stubborn product buildup but their use should be limited. Continued use can remove anodizing over aluminum parts.

---

**Important:** The machine should be covered if the area around the A200 PLC machine is foamed as part of your cleaning procedures.

---

Machines can be wiped with a light coating of mineral oil to prevent hard water deposits.

## VACUUM MANIFOLD CLEANING INSTRUCTIONS

1. Press E-stop on the main conveyor panel. The electric pump for the manifold is disabled. This is a good time to clean the sediment bowl in the line just before the pump inlet.
2. There is also an inlet filter under the inlet block on top of the vacuum pump. Loosen the plastic union and remove the 4 bolts holding the inlet block to access this filter. This needs to be cleaned only in very dusty conditions.
3. Make sure filter and bowl are back in place with o-ring snug before running vacuum in Pack 1,2 or 3 again. Reassemble all piping.
4. Release E-stop and press POWER ON button on the conveyor panel. Vacuum will draw residual water in the system back into the clear sediment bowl.

---

**Important:** Make it standard practice to empty all filter and sediment bowls of water before starting the conveyor.

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# **SECTION: 10**

# **MAINTENANCE**



## MULTILINE MAINTENANCE SCHEDULE

It is recommended to maintain the Multiline on a regular basis to prevent production down time. The figure below shows the maintenance schedule for the Multiline conveyor.

PROCEDURE	DAILY	3 MONTHS	DONE
OIL LEVEL IN OPTIONAL VACUUM PUMPS	X		
OIL LEVEL IN GEAR BOXES		X	
OIL LEVEL IN AIR LUBRICATOR	X		
EMPTY WATER FROM SEDIMENT BOWLS	X		
INSPECT CONVEYOR BELTS FOR DAMAGE	X		
INSPECT CONVEYOR FOR LOOSE OR MISSING HARDWARE	X		
GREASE BEARINGS ON CONVEYOR DRIVES AND TAILS	X		
INSPECT FOR AIR LEAKS	X		
INSPECT GAS MANIFOLD FOR LEAKS	X		
INSPECT OPTIONAL VACUUM MANIFOLD FOR LEAKS	X		
REPLACE OIL AND FILTERS IN VACUUM PUMP		X	

**Figure 10-1.** Maintenance Schedule

## REGULAR MAINTENANCE

Regular maintenance is the key to product longevity with the A200 PLC machine or any other machine. When a preventive maintenance schedule is followed, the operating efficiency of the machine is maintained and breakdowns are reduced. This section of the manual will take you through an extensive routine check of the unit. This is the same type of inspection used by CVP Service personnel to evaluate the condition of older equipment.

Items which need regular attention and/or service are brought to your attention below.

### Visual Inspection

1. Check overall appearance of the machine. Look for things which obviously need attention such as broken/ missing parts, worn out parts, etc.
2. Observe the machine while it is running.
3. Determine if the machine is operating satisfactorily. Get input from the operators and area supervisors. They can readily inform you of any recent malfunctions.
4. Start the conveyor and cycle the machines.

### Air Supply Regulator / Lubricator

Check air pressure:

- Air supply regulator: 80 PSI (5.4 bar)
- Check oil level in lubricator DAILY(if equipped)

Remove air pressure from the system (this can be accomplished by either removing air supply line, when quick disconnect is used, or by turning regulator pressure down to zero), remove oil bowl and check contents. Fill with CVP Vacuoil or 10W pneumatic oil.

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**Note:** Do not use mineral oil to lubricate the pneumatic system. Mineral oil is chemically incompatible with the seals in the pneumatic cylinders and will result in premature failure.

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The rate of oil delivery is controlled by turning the adjusting screw CCW for more or CW for less oil delivered. CVP sets the oil rate at one drop of oil every 17-20 cycles.

### Gas Supply

Check gas pressure:

- Recommended pressure is 60 to 80 PSI (4.1 to 5.4 bar).

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***Important:*** Inspect supply line for kinks, leaks, or any other physical damage which may adversely affect gas flow.

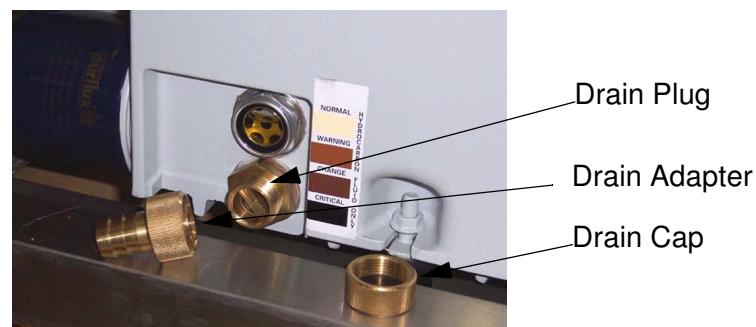
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## VACUUM PUMP MAINTENANCE

High capacity vacuum pumps oil level should be to the top of the sight glass located on the pump's side (facing outward from rear of Multiline). Notice the color of the oil. Compare it to the color chart near the sight glass. Oil will range in color from almost clear to brown. Change oil and oil filter when color is darkened. Use only recommended oils, such as CVP Vacuoil III (CVP P/N 7707-VO3). Do not use detergent type oils, like hydraulic oil, motor oil, penetrating oil, etc.



**Figure 10-2.** High Capacity Pump



**Figure 10-3.** High Capacity Pump Drain Components

The drain plug on the high capacity pump is equipped with a spring loaded shut off valve. A supplied drain adapter opens the plug when threaded on the drain plug. The hose can be attached to this adapter to allow the oil to be drained into a container, providing a cleaner oil change. During normal operation of the A200 the drain plug cap must be in place.

### Primary Sediment Bowl

**Check primary sediment bowl** (clear acrylic): Water or other foreign particles must be emptied from the bowl. Turn vacuum pump off. Press the red button on top of the filter cap to relieve the vacuum pressure. Make sure to

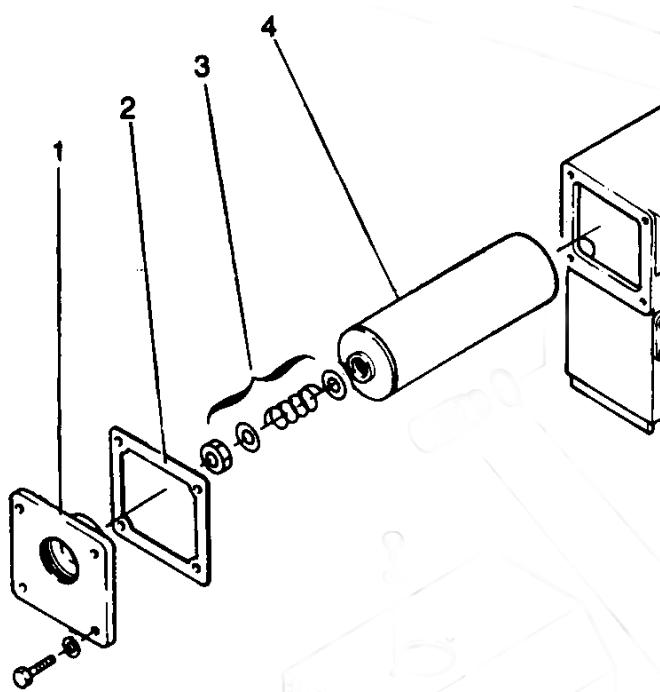
replace the black O-ring after emptying. Vacuum loss will occur if the O-ring is missing or improperly installed.

**Secondary  
Sediment Bowl**

**Check the secondary sediment bowl** (aluminum filter can): Empty any water or other foreign particles. Check condition of filter, (brown in color). If filter is noticeably dirty, damaged or missing, replace at once. Vacuum loss, pump overheating or pump failure can result from operating pump without adequate filtration. These filters are relatively inexpensive and should be kept in stock for immediate replacement.

**Vacuum  
Exhaust  
System**

Located inside the exhaust port is a demister filter. This filter removes the oil mist from the air circulating inside the pump. This filter needs to be replaced periodically. A plugged demister filter will cause the pump expel smoke from the exhaust port.



**Figure 10-4.** Demister Filter Assembly

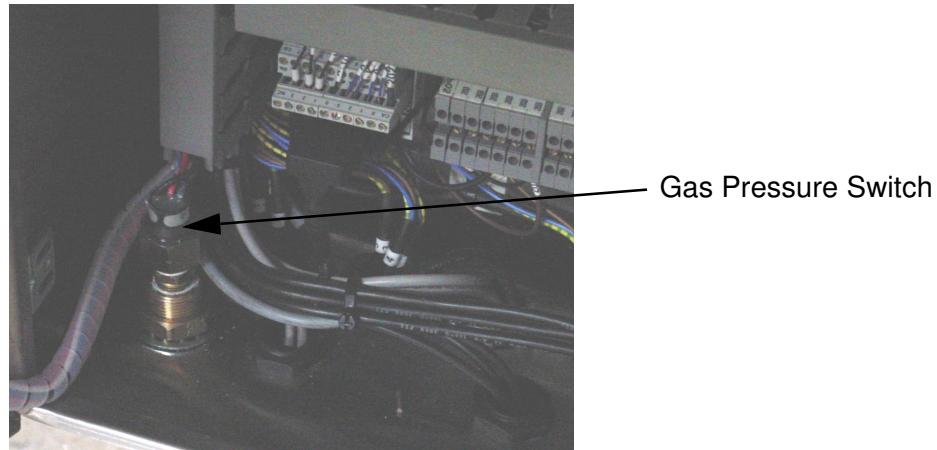
The figure “Demister Filter Assembly” has four items called out. These items are as follows:

1. Exhaust flange
2. Gasket
3. Nylon stop nut with washers and spring
4. Exhaust demister filter element (CVP P/N 7707-2099)

## SWITCHES

### Gas Pressure Switch

The Gas Pressure Switch is actuated when gas pressure falls below 20 PSI (1.4 bar). If gas pressure drops below 20 PSI, the “NO GAS” alarm will appear on the electrical enclosure.



**Figure 10-5.** Gas Pressure Switch

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**Note:** The pressure switch (pictured) is preset to 20 PSI and does not require further adjustment.

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### Prox Switches

A Prox switch on each pusher detects when it is in the retracted position. The switches detect the end of one of the thrust rods on the linear guide when the pushers are fully retracted. These switches can be adjusted by loosening the locknuts and adjusting the switch higher or lower off the pusher frame. Adjust so that the end of the prox switch is 1/4 inch from the rod when extended. Never set boxes on the pusher frame because it will flex the frame and may cause the prox switch to come out of range. Sensing range is up to 1/2 inch. The prox switch cable has a quick disconnect to allow for easy replacement.



**Figure 10-6.** Pusher Retracted Prox Switch



## **SECTION: 11**

# **TROUBLESHOOTING**



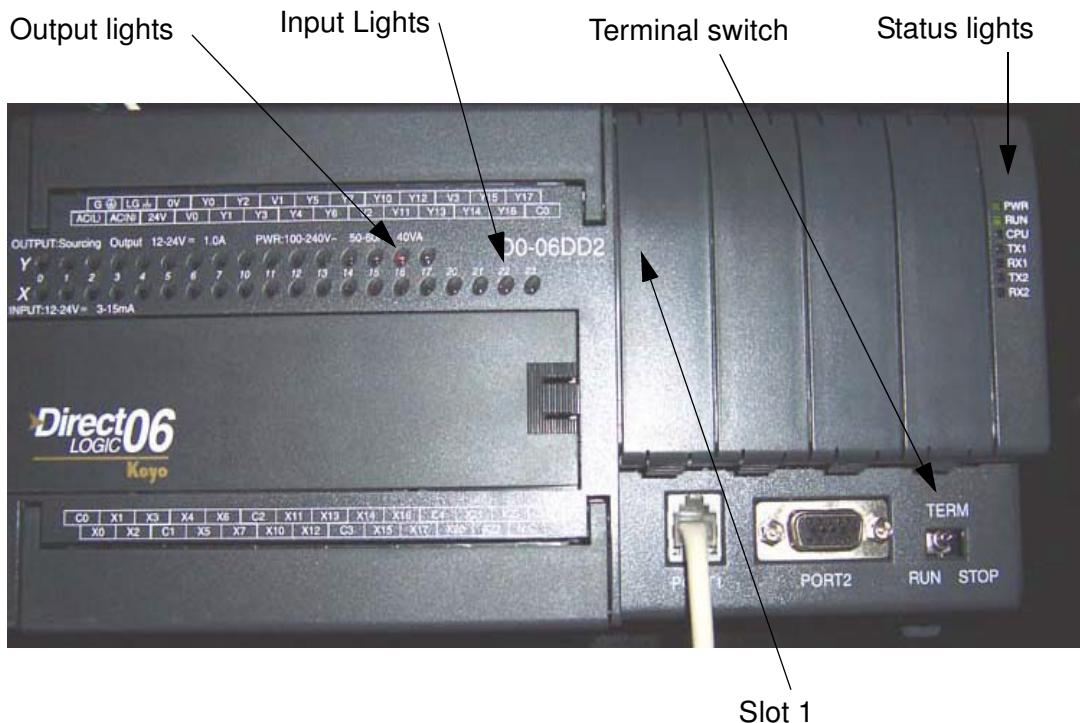
## TROUBLESHOOTING THE PLC

### Reading The I/O Status Lights

The I/O status lights on the PLC and valve bank are important tools used in troubleshooting the Multiline conveyor. There are 16 outputs wired to the top terminals and the output lights are labelled Y0 thru Y17. There are 20 inputs wired to the bottom terminals and the input lights are labelled X0 thru X23.

If you wish to check the status of an input or output, determine which input or output is used. Check the electrical schematic included with your machine. The inputs are arranged to the left side of the drawing and the outputs to the right. Make a note of the input or output you wish to check.

Check the I/O light, if it is on then the input or output you are checking is on. The solenoid connectors on the pneumatic valve bank illuminate when energized by a PLC output.



**Figure 11-1.** Status Lights on the PLC

Normally, the RUN and PWR status lights should be on steady and the TX1 and RX1 lights should be flashing. This indicates data is being transmitted and received at serial port 1 where the interface is plugged in.

**Network Card**

A network card is installed in slot 1 of the conveyor PLC and in each of the machines along the conveyor. To swap or replace a network card, open the pinch tabs outward and lift the card straight out. The card in machine 1 is labelled “1” on the outside. The card in machine 2 is labelled “2” on the outside. The card in machine 3 is labelled “3” on the outside. The card in the conveyor PLC is labelled “4” on the outside. Make sure the module ID dipswitch on the card is set as below for cards 1-4. The numbers 0-7 printed on the circuit board by the dipswitch identify each switch.

1. Set “0” on all others off.
2. Set “1” on all others off.
3. Set “2” on all others off.
4. Set “0”, “1” and “2” on, all others off.

When reinserting the network card in slot 1, locate the module so the printed information is oriented to match the PLC printing. Carefully align the female connector on the card with the male connector on the rack. Press the module into the slot until the front of the module is flush with the front of the PLC. Lock the pinch tabs by pressing them inward.

---

**Note:** When swapping machines along the conveyor, network cards must be swapped also. The network card identifies the machine’s position 1, 2 or 3.

---

**Troubleshooting  
The I/O Status  
Lights**

- The exact point in the machine’s sequence of operations where a problem is occurring can be pinpointed by monitoring the status lights.
- Determine where in the sequence of operation the machine is failing to function. For example, “the #2 pusher is not coming out”; or “the exit conveyor should be on at this point, but it isn’t”.
- Consult the electrical schematic and note which output controls the action that is at issue. For example, Y3 extends pusher #2; or Y15 energizes the exit conveyor starter.
- Check to see if the output is in the proper state. For example, does Y3 come on when pusher #2 extends?
- If the output is correct, then check the output’s fuse, solenoid, valve, and relay (if any). The goal is to examine each component between the PLC and the activating component, and discover which is not functioning.
- If the output is not being activated then most likely the machine is waiting for an input. Determine from the schematic which inputs must be made before the required output will trigger. For example, for pusher #2 to push, inputs for infeed #2 (X7), pusher #2 retracted (X3) and gas pressure (X2) must be on. If they are not on it can be seen that the problem is with missing input signal(s), not the pusher output circuit. For this example, machine 2 must also be plugged into the network switch activating the “Machine 2 online” output of the conveyor PLC. Machine 2 must also be sending a load request.

# TROUBLESHOOTING CONVEYOR COMPONENTS

- |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>No Control Power</b>               | If the POWER ON pushbutton is pressed and doesn't illuminate, check the following items. <ol style="list-style-type: none"><li>1. Power to the machine is connected.</li><li>2. Main disconnect is in the ON ("I") position.</li><li>3. E-stop on the main panel and at the remote station are pulled out.</li><li>4. Check main power fuses.</li><li>5. Check control power fuse FU-101.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Conveyors don't start</b>          | <ol style="list-style-type: none"><li>1. Confirm that the machine has power. POWER ON light must be on.</li><li>2. Check the MCR relay for power. If there is no power, check fuse FU-101 and FU-102.</li><li>3. Verify that there is 24 VDC at the output of power supply PS-1.</li><li>4. Check the operator interface for error messages. Press the MSG button. If there is an error message, troubleshoot as shown in the error messages section.</li><li>5. Verify that the switch on the CPU is in the <b>Term</b> position.</li><li>6. Verify that the <b>Power</b> and <b>RUN</b> lights on the PLC are lit. Confirm that there is AC power feeding the PLC.</li><li>7. If the PLC <b>Power</b> light is lit but the <b>RUN</b> light is not, see if toggling the switch from <b>RUN</b> back to <b>Term</b> will bring it back into RUN mode. If the PLC is powered and the <b>Power</b> or <b>Run</b> lights are unlit then the PLC may need to be replaced.</li><li>8. Check the conveyor motor overloads.</li><li>9. Check the Infeed conveyor run signal to the variable speed drive.</li></ol> |
| <b>Stops 1 and/or 2 Not Operating</b> | <ol style="list-style-type: none"><li>1. If the stops on the conveyor are not working at all, check the air supply to the conveyor system. Moving the STOP switches on the panel to the up position should raise the stops if the air supply is connected. Move STOP switches back to the down position for automatic operation.</li><li>2. If the #1 or #2 stops are not working, check the infeed section photoeye downstream of the stop for function. Placing a hand over the face of the photoeye should illuminate the corresponding Infeed input light on the PLC. The infeed photoeyes should be aimed horizontally and from one corner of the loading section to the other. #1 and #2 stops are normally down and go up if the downstream loading zone is filled.</li><li>3. If the output light for the stop is illuminated, check the output fuse and solenoid for the valve. Check connections inside the solenoid connector and junction block.</li></ol>                                                                                                                                       |

**Tote Stop not operating**

1. If the stops on the conveyor are not working at all, check the air supply to the conveyor system.
2. If the tote stop is not working, check the #1 infeed section photoeye for function. Placing a hand over the face of the photoeye should illuminate the corresponding Infeed input light on the PLC. The #1 infeed photoeye should be aimed horizontally and from one corner of the loading section to the other. The tote stop is normally up and goes down if the #1 loading zone is free.
3. If the output light for the tote stop is illuminated, check the output fuse and solenoid for the valve. Check connections inside the solenoid connector and junction block.
4. “T\_StopUp” is the Infeed Stop Timer. When the Infeed tote photoeye no longer senses a box in the zone, the timer starts and when it times out, the Infeed stop goes up. Lengthen this timer if the tote stop hits the tail end of the first box leaving the loading station. Lower this timer if the second box goes past the stop before it goes up.

**Tote Clamp not operating**

1. If the tote clamp on the conveyor will not close, check the air supply to the conveyor system. Try to manually close the clamp by pressing the yellow button on V7.
2. If the tote clamp is not working, check the tote infeed photoeye for function. Placing a hand over the face of the photoeye should illuminate the X21 input light on the PLC. The tote infeed photoeye should be aimed horizontally and across the conveyor in front of the tote stop. Tune the photoeye so it can “see” about halfway across the conveyor. Aiming it slightly away from perpendicular toward the infeed will prevent reflections from the conveyor rail causing false readings.
3. Also check the infeed approach photoeye for function. Placing a hand over the face of the photoeye should illuminate the X4 input light on the PLC. The infeed approach photoeye should be aimed horizontally and across the conveyor just in front of the second box in the loading station. Tune the photoeye so it can “see” about halfway across the conveyor. Aiming it slightly away from perpendicular toward the infeed will prevent reflections from the conveyor rail causing false readings.
4. “InfeedAp” is the time delay to turn on output Y16 after the Infeed approach photoeye senses a second box is in the staging area . Inputs X4 and X21 must be on before the timer starts. Y16 energizes a relay for feed conveyor control thru N.C. contacts. Or Y16 may energize a tote clamp.
5. If the Y16 output light for the tote clamp is illuminated, check the output fuse and solenoid for the valve. Check connections inside the solenoid connector and junction block.

- |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tote Guide not operating</b>             | <ol style="list-style-type: none"><li>1. V7 when wired to output Y7 is used as a tote guide. In this case, "InfeedAp" is the time delay to turn on output Y7 after the Infeed approach photoeye senses a passing box.</li><li>2. "Gd_Pulse" is the length of time the Tote guide will extend to align the passing box.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Pushers not operating</b>                | <ol style="list-style-type: none"><li>1. If the pushers on the conveyor will not extend, check the air supply to the conveyor system. Try to manually extend pusher #1, #2 or #3 by pressing the yellow button on V3, V4 or V5.</li><li>2. Check that the pusher retracted reed switch on the cylinder is lit. This switch must be lit in order to energize the extend output solenoid. Check the corresponding input light on the PLC. If this is not lit but the reed switch is, the cable might be faulty.</li><li>3. Check that there is not a Pusher Jam message on the interface. Pusher operation is disabled until the jam is cleared. Check photoeye operation in the loading zone. One second after the pusher begins to retract, the infeed photoeye must be clear or it generates a jam alarm. One second after pusher extension, the pusher retracrted input must go on or it generates a jam alarm.</li><li>4. If the output light for the pusher is illuminated, check the output fuse and solenoid for the valve. Check connections inside the solenoid connector and junction block.</li><li>5. Check gas pressure. Pushers are disabled if gas pressure drops below 20 psig. Input X2 must be lit.</li><li>6. Check that the load request signal for the pusher zone is received. The network cable from the machine to the conveyor must be plugged in. The load request output Y14 in the machine head control panel for that zone must be on (lit). When connected, the machine network card indicators 100, ACT and LINK will glow green and the machine online output on the conveyor PLC will light</li></ol> |
| <b>Load won't dump to the exit conveyor</b> | <ol style="list-style-type: none"><li>1. The network interface cable between the A200 and the conveyor is disconnected or faulty. When connected, the machine network card indicators 100, ACT and LINK will glow green and the machine online output on the conveyor will light.</li><li>2. The discharge photoeye (X10) on the machine or its upstream neighbor looking at the exit conveyor flow is blocked by a jam. This photoeye is below the tilt shelf on the right side of the machine. This photoeye must be clear for the shelf to go back up also.</li><li>3. The tilt shelf up reed switch on the cylinder must be lit indicating that the shelf is up before it can go down. The corresponding input (X11) in the machine head control panel must also be lit up. Check cable connections.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

**Boxes crash on the exit conveyor**

1. “Dump2Dly” should be set to the time it takes a dumped box to clear the downstream machine’s dump zone. Factory setting: 4 sec.
2. “Dump0Dly” should be set to the time it takes a box dumped from the most upstream machine to NOT reach the most downstream machine’s dump zone. Factory setting: 2.5 sec.
3. Add the “Dump2Dly” and “Dump0Dly” times and that should be enough time for a box dumped from the most upstream machine to clear the most downstream machine’s dump zone.

**Photoeye Indicators**

All photoeyes on the multiline conveyor and machines are wired for “dark on” operation. When a target is sensed, the orange operation indicator light on the photoeye will illuminate. The black wire from the photoeye cable is wired to the PLC input which should light at the same time.

The green indicator light on top of the switch next to the operation light should be lit whenever the photoeye has power.



**Figure 11-2.** Photoeye in Upper Conveyor Load Zone

Photoeyes on the upper conveyor loading zones should be adjusted for maximum sensitivity by turning the adjustment pot fully clockwise.

The photoeye before the tote infeed stop should have the pot adjusted down so that it only senses about halfway across the conveyor. Similarly, the photoeye on the loading zone of each machine should sense about halfway across the load shelf. This will prevent false readings.

# CONVEYOR OPERATOR INTERFACE FAULT DISPLAY

## Error Messages

1. Pusher #1, #2 or #3 Jam

Indicates that the corresponding pusher has been retracted and disabled due to a jam. A jam will occur if the pusher retracted limit switch fails to make within one second after extension. A jam will also occur if the loading photoeye still senses a load immediately after the pusher retracts. Clear the jam by removing the load from the photoeye path. Pressing the CONVEYOR START button will clear the alarm if the load remains in front of the photoeye and attempt to push it again.

2. No Gas Alarm

Indicates that gas pressure is below 20 psi. Pusher operation is disabled. Restore gas pressure to clear the alarm.

3. Exit Conveyor Backup

The exit conveyor photoeye has been blocked for longer than the alarm timer. The lower conveyor will stop. Clear the jam by removing the load from the photoeye path. Press conveyor START pushbutton to restart exit conveyor.

The conveyor operator interface display is mounted on a bracket inside the conveyor control cabinet.

## ASSISTANCE

When calling, for technical assistance or service, have the model (A200 Multiline) and serial numbers available for our customer service representative. This will allow us to more accurately assist you with your machine.

The serial number tag for the A200 Multiline Conveyor is located inside the main electrical enclosure door on the print pocket.

Contacting CVP Systems can be accomplished in three different ways; by phone, fax or e-mail. Please include model and serial numbers in all correspondents to CVP Systems.

Phone: 800-422-4270 (In the US, Canada, & Mexico)  
630-852-1190 (All others)  
Fax: 630-852-1386  
E-Mail: [spareparts@cvpsystems.com](mailto:spareparts@cvpsystems.com)

# **SECTION: 12**

# **ASSEMBLIES**

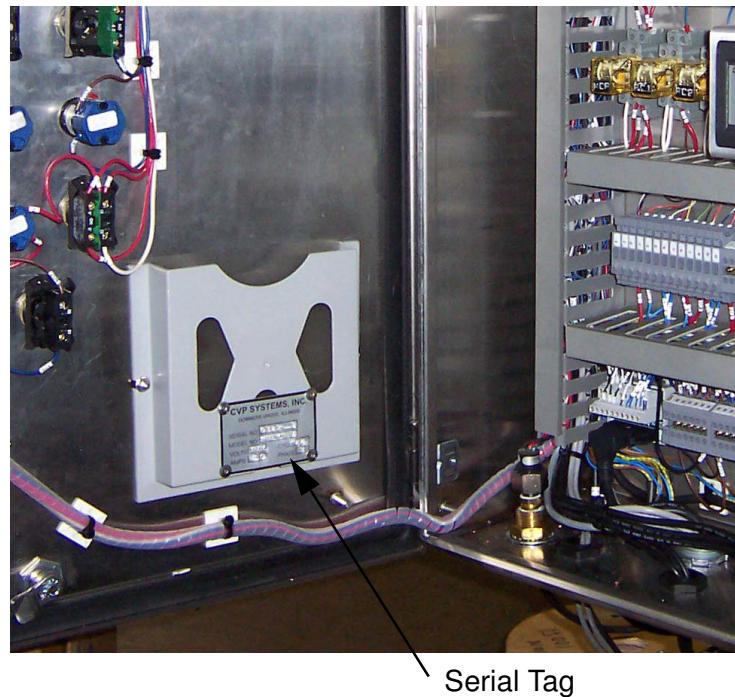


## MACHINE ASSEMBLIES

### Customer Service

This section contains subassemblies for the A200 Multiline conveyor. By using the subassembly drawings, you will be able to find the part(s) needed to repair the conveyor. If you can not find the part(s) needed, contact CVP customer service for assistance. When calling for parts or service, have the model and serial numbers available for our customer service representative to more accurately assist you:

The serial number can be found on the front cover of this manual. The Serial number is also on a serial tag located inside the electrical enclosure. (See Figure 12-1)



**Figure 12-1.** Serial Tag Location

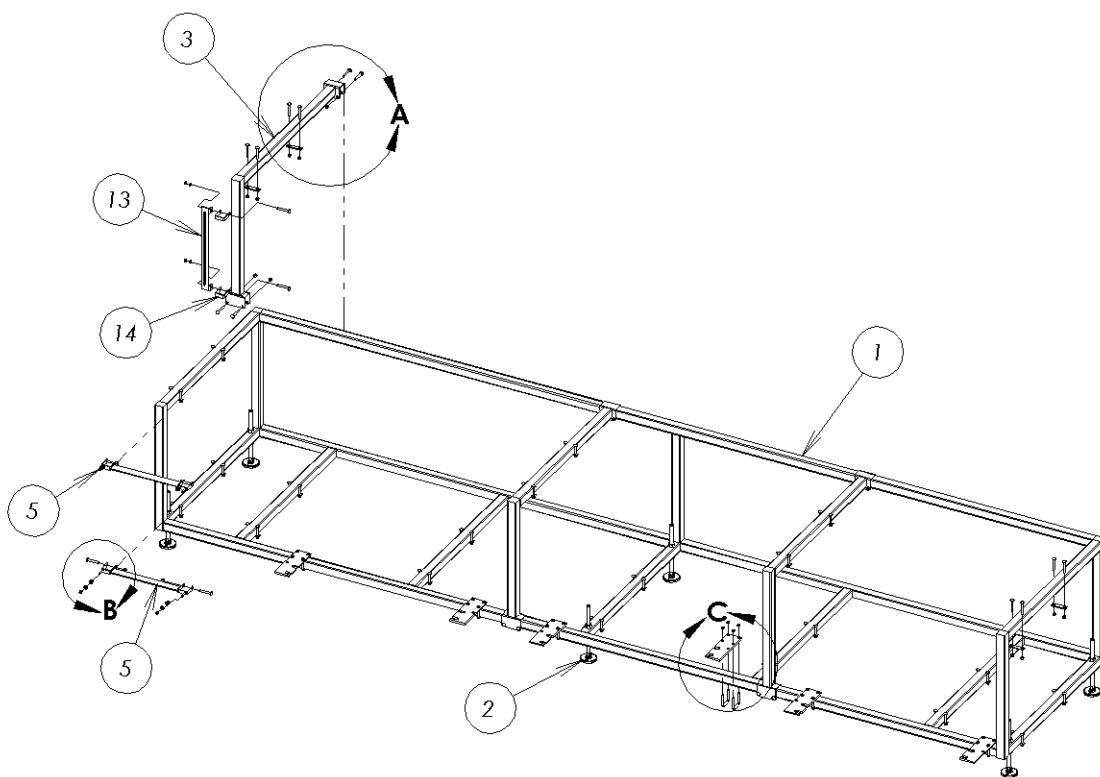
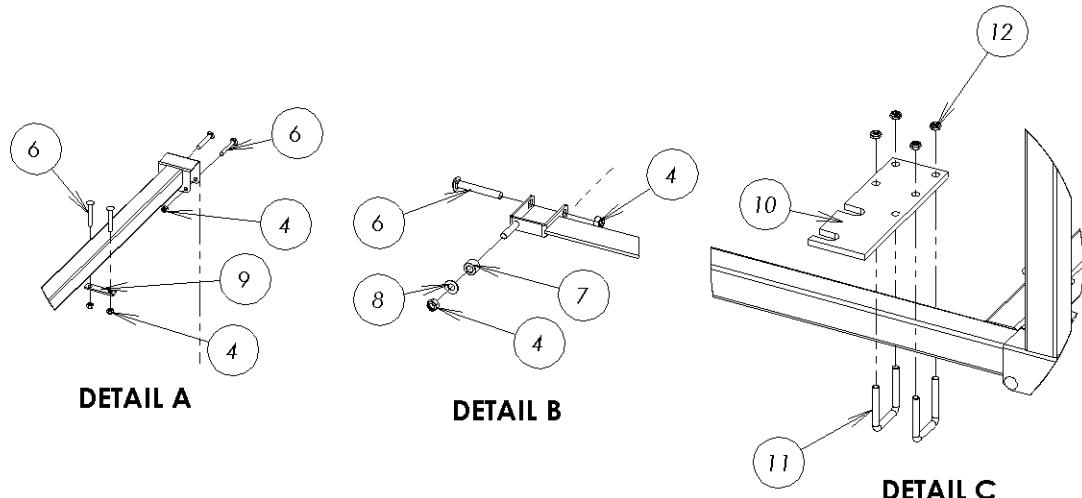
### Ordering Parts

Ordering parts from CVP Systems can be done by phone, fax or e-mail. Please include model and serial numbers in all correspondents to CVP Systems.

Phone: 800-422-4270 (In the US, Canada, & Mexico)  
630-852-1190 (All others)  
Fax: 630-852-1386  
E-Mail: [spareparts@cvpsystems.com](mailto:spareparts@cvpsystems.com)

## BASE FRAME ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	D-0243-0860	WELD, A200ML CONV FRAME
2	6	7707-1925	FEET, LEVELING 12"
3	3	C-0243-0792	WELD, MOVEABLE LEG
4	68	LN3/8-16	NUT, LOCK
5	2	C-0243-495	WELD, ELECTRICAL CABINET MOUNT
6	66	CB3/8-16X2-3/4	BOLT, CARRIAGE
7	4	B-7707-295	SPACER, ENCLOSURE
8	4	FW3/8-A	WASHER, FLAT
9	24	B-9743-1133	BRACKET
10	6	B-9743-1273	BRACKET MACHINE CLAMP 3-6 ADJ
11	12	3060T71	SQUARE U-BOLT
12	24	LN3/8-16LP	NUT, LOCK, LOW PROFILE
13	1	B-0243-0621	CONVEYOR TIE BAR, CONVEYOR BOTTOM
14	2	B-0243-495.02	BRACKET, ELECTRICAL CABINET MOUNT
15	2	LW3/8	WASHER, LOCK
16	2	JN3/8-16	NUT, JAM

**ASSEMBLY NUMBER: D-0243-0859**

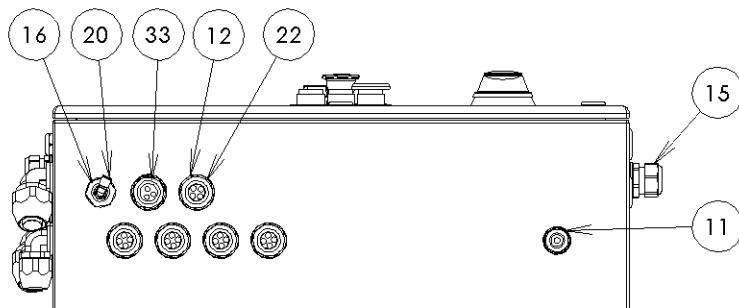
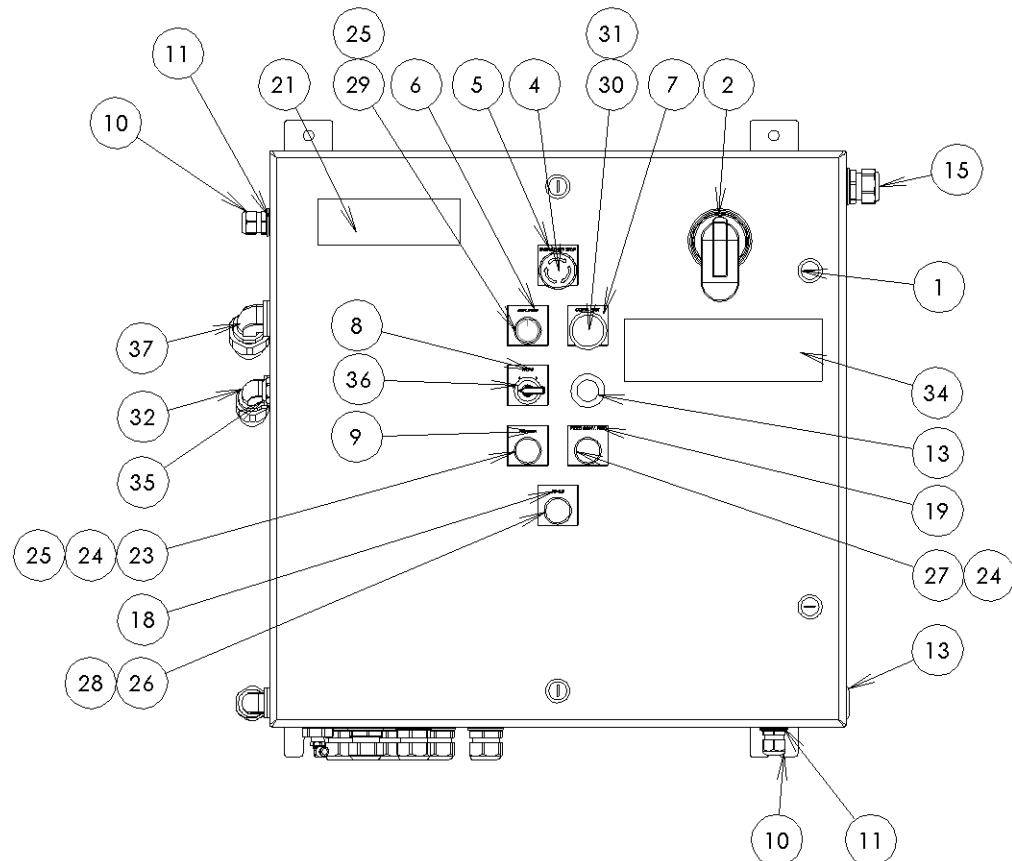
## ELECTRICAL ENCLOSURE ASSEMBLY

ITEM NO.	-0/QTY.	-1/QTY.	PART NUMBER	DESCRIPTION
1	1	1	D-9743-1460	ENCLOSURE, ELEC, A200 MULTILINE
2	1	1	7707-2744	HANDLE, DISCONNECT
3	1	1	7707-2745	SHAFT DISC. HANDLE
4	1	1	0550-1154	EMERGENCY STOP
5	1	1	C-7707-1754-S	LEGEND PLATE , EMERGENCY STOP
6	1	1	C-7707-1754-L	LEGEND PLATE , CONV. START
7	1	1	C-7707-1754-M	LEGEND PLATE.CONV. STOP
8	1	1	C-7707-1754-HH	LEGEND PLATE , STOP 1-2-3
9	1	1	C-7707-1754-P	LEGEND PLATE , POWER ON
10	4	4	7707-1634	CORD GRIP, 1/2", 1 HOLE DOME
11	4	5	5262	SEALRING
12	7	7	5263	SEAL, 3/4" RING
13	4	3	AS050SS	HOLE SEAL.1/2NPT
14	1	-	AS075SS	HOLE SEAL.3/4NPT
15	1	1	7707-1655	CORD GRIP.3/4NPT.1-HOLE.NYL
16	1	1	129B-04-15	ADAPTER, BULKHEAD, BRASS
17	1	1	7707-1504	SWITCH, PRESSURE
18	1	1	C-7707-1754-H	LEGEND PLATE , NO GAS
19	1	1	C-7707-1754-AA	LEGEND PLATE , FEED CONV. RUN
20	1	1	269P-04-04	FITTING.TBG.ELB.1/4OD X 1/4NPT
21	1	1	0210-1034	WARNING LABEL, READ MANUAL
22	5	5	7707-1633	CORD GRIP.3/4NPT.4-HOLE.NYL
23	1	1	0651-1511-1	GREEN LIT PB
24	2	2	0651-1517-1	120V LIGHT UNIT
25	2	2	0651-1520-1	NO CONTACT
26	1	1	0651-1514-1	RED LIGHT
27	1	1	0651-1515-1	AMBER LIGHT
28	1	1	0651-1516-1	24V LIGHT UNIT
29	1	1	0651-1518-1	GREEN FLUSH PB
30	1	1	0651-1521-1	RED MUSHROOM PB
31	1	1	0651-1519-1	NC CONTACT
32	2	2	ST9050	1/2" SEALTITE CON, 90DEG
33	1	1	9537-1193	CORD GRIP.3/4NPT.3-HOLE.NYLON
34	1	1	7707-532	LABEL, DANGER HIGH VOLTGE
35	1	1	7707-2885	RJ45 THRU DOOR CONNECTOR
36	1	1	7707-2056	4 POSITION SWITCH
37	-	2	ST9075	3/4" SEALTITE CON, 90DEG

Options:

-0: STANDARD

-1: ELECTRIC VACUUM PUMP

**ASSEMBLY NUMBER: D-9743-1482**

## ELECTRICAL PANEL ASSEMBLY, VENTURI PUMP

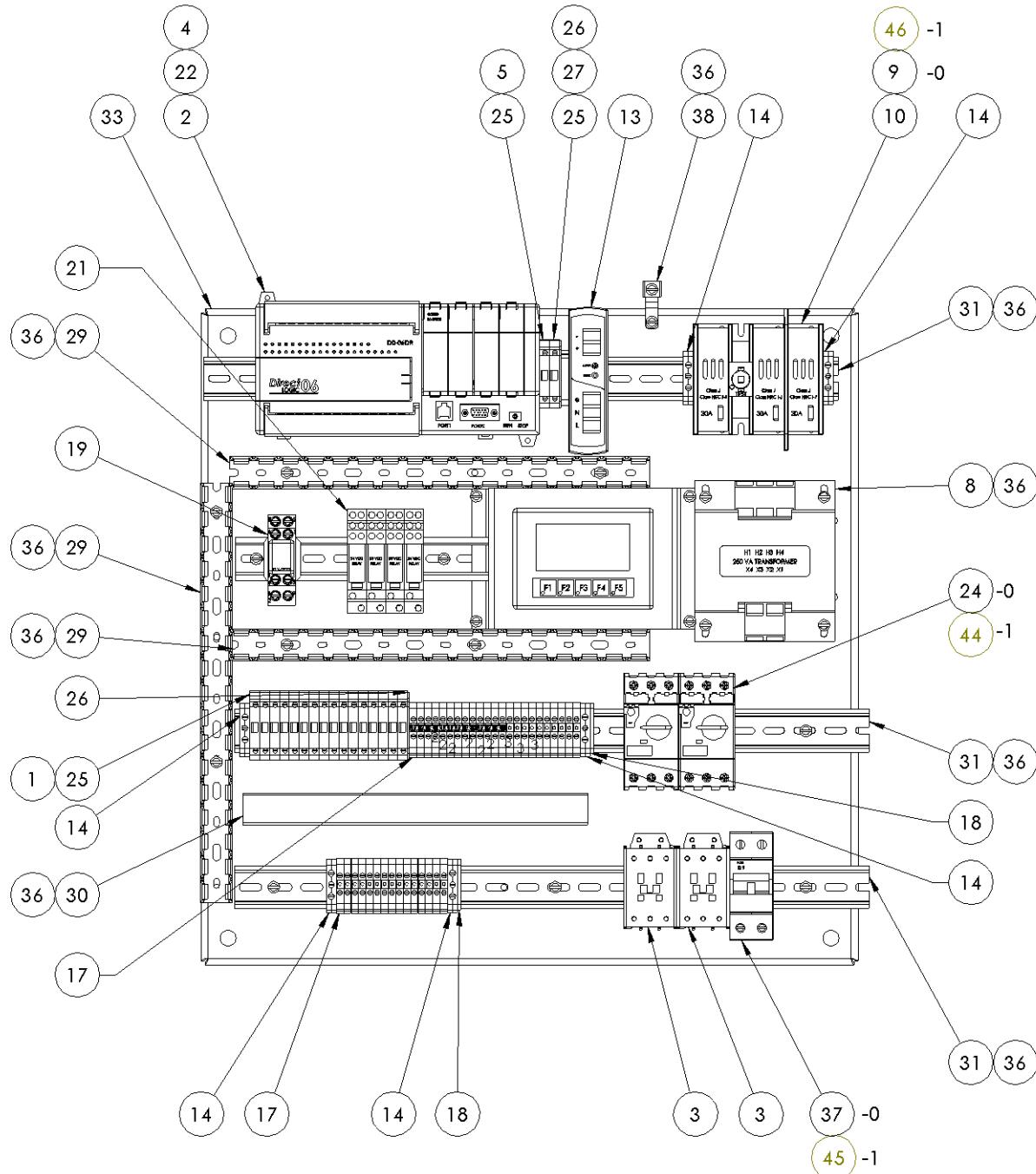
ITEM NO.	-0/QTY.	-1/QTY.	PART NUMBER	DESCRIPTION	NOTES
1	16	16	217.315	FUSE.5 X 20MM.0.315A	
2	1	1	0550-1201	PLC, 20 DC INPUT, 16 RELAY OUTPUT	
3	2	2	0550-1209	CONTACTOR 24 VDC	
4	1	1	0550-1378	COMBO MODULE	
5	1	1	2173.15	FUSE.5 X 20MM.3.15A	
6	1	1	7707-508	RELAY IDEC 120V-2PDT	
7	1	1	7707-783	TERMINAL BLOCK GREY	
8	1	1	7707-1610	250 VA TRANSFORMER	
9	3	-	7707-1886	FUSE.600V.15A	
10	1	1	7707-2743	DISCONNECT SWITCH	
11	2	2	7707-2784	RJ45 CABLE	
12	3	3	7707-2785	CABLE RJ45 30'	
13	1	1	7707-2794	POWER SUPPLY, 60W	
14	6	6	8013-429	TERM BLOCK.8MM.22-8AWG.GRN/YEL	
15	1	1	8013-432	JUMPER ENTRELEC, 10 POLE	
16	1	1	8013-432	JUMPER ENTRELEC, 10 POLE	
17	38	38	8013-434	TERM BLOCK.6MM.22-10AWG.GRAY	
18	2	2	8013-437	TERM BLOCK.END SECTION.GRAY	
19	1	1	8013-1666	SOCKET RELAY IDEC FS	
20	2	2	9431-22-AWG	CABLE, 20 WIRE, 22 AWG	
21	4	4	9537-1023	RELAY OMRON, 24VDC	
22	1	1	9537-1327	BATTERY	
23	1	1	9537-1753-P	OPERATOR INTERFACE	
24	2	-	9743-1478	MANUAL MOTOR STARTER 1.0-1.6A	
25	18	18	115131.06	FUSE BLOCK.8MM.5 X 25MM.GRAY	
26	2	2	118624.27	FUSE BLOCK.END SECTION.GRAY	
27	1	1	218004	FUSE.5 X 20MM.4.00A	
28	1	1	B-0243-0741	BRACKET CMORE	
29	3	3	B-7707-1644	WIREWAY 13-13/32"	
30	1	1	B-7707-1645	WIREWAY 11"	
31	3	3	B-7707-1646	RAIL DIN 20-1/4"	
32	1	1	B-9537-1444	DIN RAIL	
33	1	1	D-9743-1130	PANEL, ELECTRICAL, MULTILINE CONV	
34	1	1	DV-1000CBL	CABLE INTERFACE	
35	7	7	MLW14-AWG	WIRE, WHITE, TYPE M	
36	29	29	PH10-32X5/16	SCREW, PAN HEAD	
37	1	-	S272-K1	CIRCUIT BREAKER.2-POLE.1.0A	
38	1	1	SLU-35	GROUND LUG	
39	5	5	WBL 18-AWG	BLUE WIRE	QTY = FT
40	15	15	WBR 18-AWG	BROWN WIRE	QTY = FT
41	4	4	WG 18-AWG	GREEN WIRE	QTY = FT
42	10	10	WR 18-AWG	RED WIRE	QTY = FT
43	5	5	WW 18-AWG	WHITE WIRE	QTY = FT
44	-	2	0550-1471	MANUAL MOTOR STARTER 2.5 - 4.0	
45	-	1	7707-2098	CIRCUIT BREAKER.2-POLE.2.0A	
46	-	3	7707-1887	FUSE.600V.20A	

This assembly is for Multilines without rotary vacuum pumps mounted on the conveyor.

Options:-0: 440 Volts

-1: 220 Volts

## ASSEMBLY NUMBER: D-0243-0857



# ELECTRICAL PANEL ASSEMBLY, ELEC. PUMP

QTY	QTY	ITEM	PART NO.	DESCRIPTION
		OPT	LIST OF MATERIAL	
3	3	62	7707-2785	PATCH CABLE, CAT5, 30'
1	1	61	7707-2885	RJ45 THRU DOOR CONNECTOR
2	2	60	7707-2784	PATCH CABLE, CAT5, 3'
0	0	59	E18068	MALE M12 CABLE
0	0	58	9743-1045	FEMALE M12 CABLE
0	0	57	9743-1198	MALE SPLICE
0	0	56	9743-1197	FEMALE SPLICE
1	1	55	7707-2779	ETHERNET SWITCH, 5 PORT
0	3	54		FUSE, 600V, 30A
1	0	53	S272-K1	CB, 2 POLE, 1A
1	0	52	0550-1209	STARTER, 1.6-2.5 FLA
3	3	51	9537-1023	RELAY, 24VDC
0	1	50	7707-2098	CB, 2 POLE, 2A
1	0	49	7707-2614	AC DRIVE, 1 HP, 480V
0	1	48	7707-2374	AC DRIVE, 1 HP, 240V
2	2	47	118624.27	BARRIER
1	1	46	9537-1327	BATTERY
5	5	45	WBL 18-AWG	WIRE 18Ga. MTW BLUE
5	5	44	WBR 18-AWG	WIRE 18Ga. MTW BROWN
5	5	43	WW 18-AWG	WIRE 18Ga. MTW WHITE
10	10	42	WR 18-AWG	WIRE 18Ga. MTW RED
4	4	41	WG 18-AWG	WIRE 18Ga. MTW GRN/YEL
7	7	40	WB 14-AWG	WIRE 14Ga. MTW BLACK
1	1	39	7707-1610	TRANSFORMER, 250 VA
1	1	38	DV-1000CBL	DV-1000 INTERFACE CABLE
4	4	37	PH 1/4-20x1/2	SCREW PAN HEAD
24	24	36	PH 10-32x5/16	SCREW PAN HEAD
1	1	34	8013-1666	2 POLE RELAY BASE
16	16	33	217.315	FUSES 5mm (315mA)
1	1	32	2172.00	FUSES 5mm (2A)
1	1	31	2173.15	FUSES 5mm (3.15A)
3	0	30	7707-1887	FUSE 600V 20A
2	2	29	8013-432	JUMPER BAR
1	1	28	SLU-35	TERMINAL LUG
1	1	27	B-7707-1645	DUCT IBCCO (20")
3	3	25	B-7707-1644	DUCT IBCCO (13 1/2")
1	1	24	B-9537-1444	RAIL, DIN (10")
3	3	23	B-7707-1646	RAIL, DIN (20")
3	3	22	8013-437	END BARRIER
23	23	21	8013-434	TERMINAL BLOCKS (GREY)
7	7	20	8013-429	TERMINAL BLOCKS (GRN/YEL)
18	18	19	115131.06	FUSE HOLDER
6	6	18	7707-783	TERMINAL STOP
0	3	13	0550-1210	STARTER, 6.3-10 FLA
3	1	12	0550-1471	STARTER, 2.5-4 FLA
2	2	11	0550-1209	CONTACTOR, 24VDC
1	1	10	B-9743-1468	MOUNTING BRACKET
1	1	9	9537-1019	OPERATOR INTERFACE -DV1000
1	1	8	7707-508	RELAY 120 VAC
1	1	7	7707-2743	ABB DISC. SW.
1	1	6	7707-2794	24 VDC SUPPLY
2	2	3	9413-22AWG	20 COND. CABLE
1	1	2	0550-1201	KOYO PLC DL06
1	1	1	D-9743-1130	ELECTRICAL PANEL
QTY		ITEM	PART NO.	DESCRIPTION
-0	-1	OPT	LIST OF MATERIAL	

## ASSEMBLY NUMBER: D-0243-0651

This assembly is for Multilines with rotary vacuum pumps mounted on the conveyor.

Options:

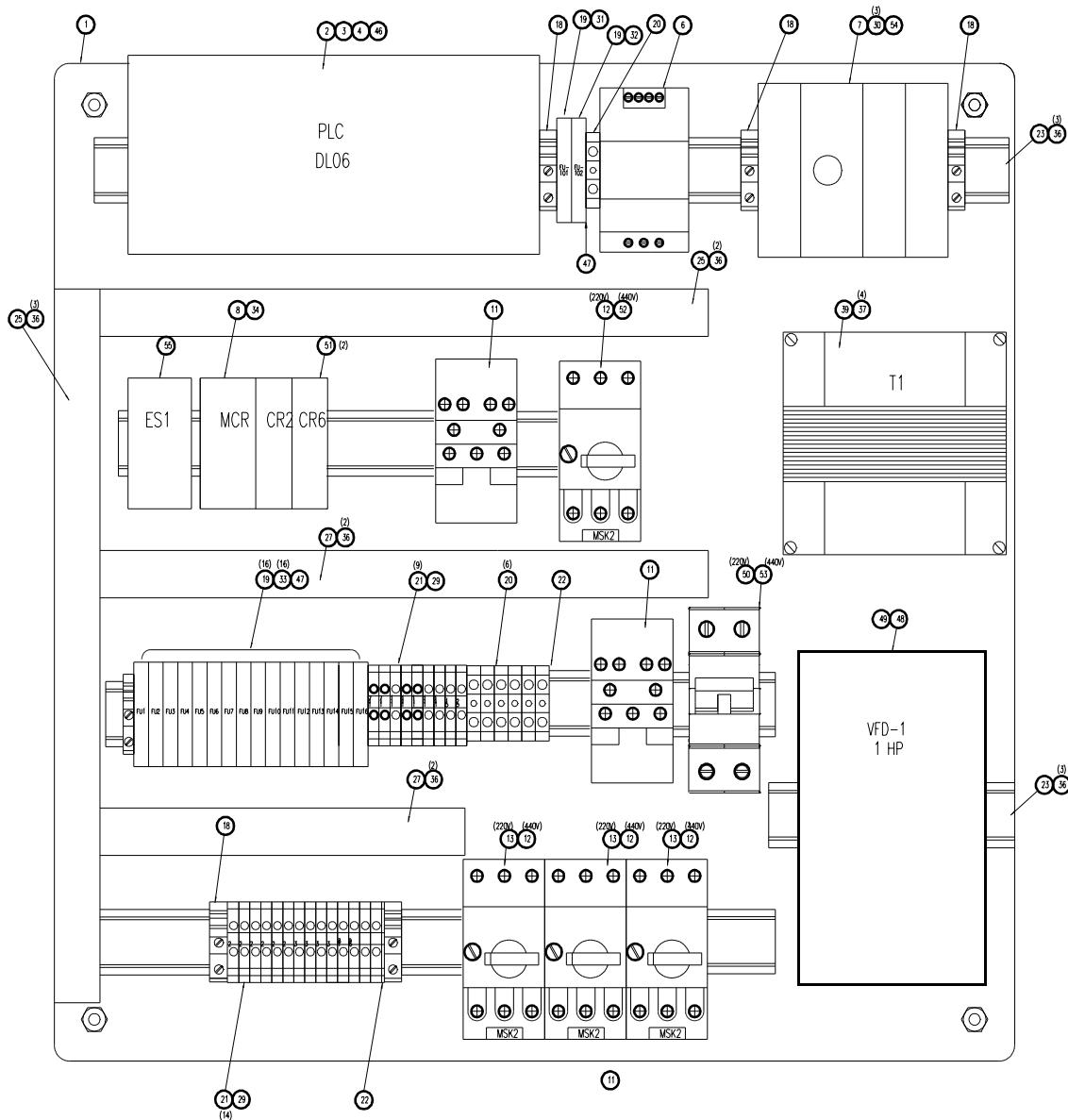
-0: 440 Volts

-1: 220 Volts

**ELECTRICAL PANEL ASSEMBLY, ELEC. PUMP**

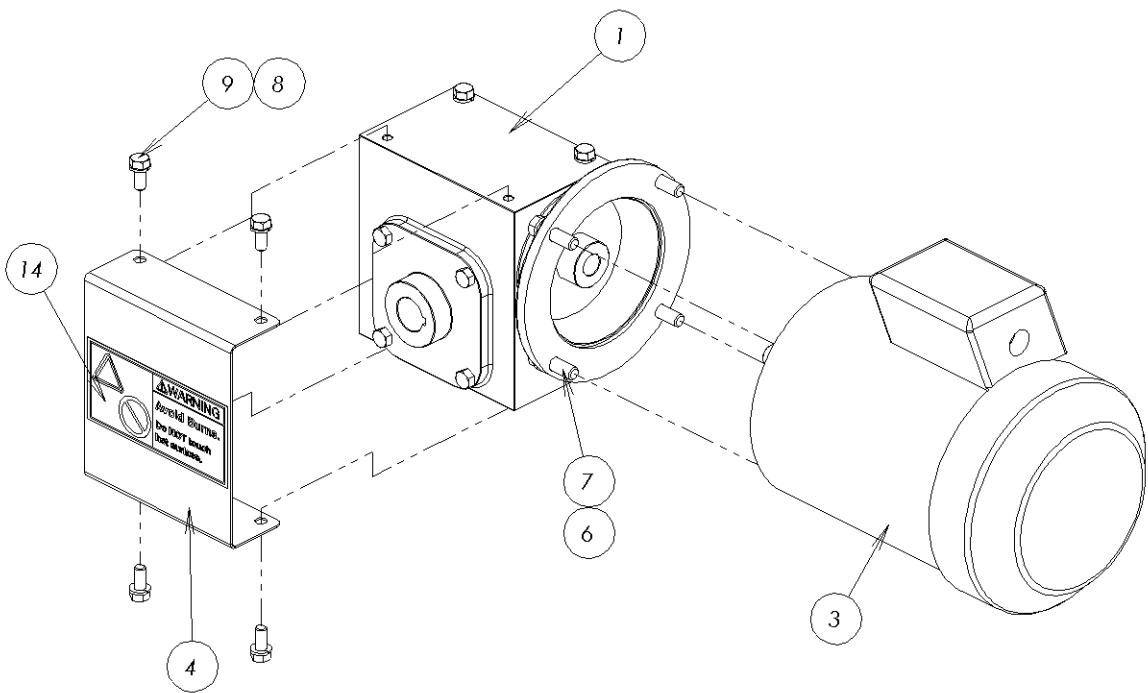
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## ASSEMBLY NUMBER: D-0243-0651 (Cont'd)



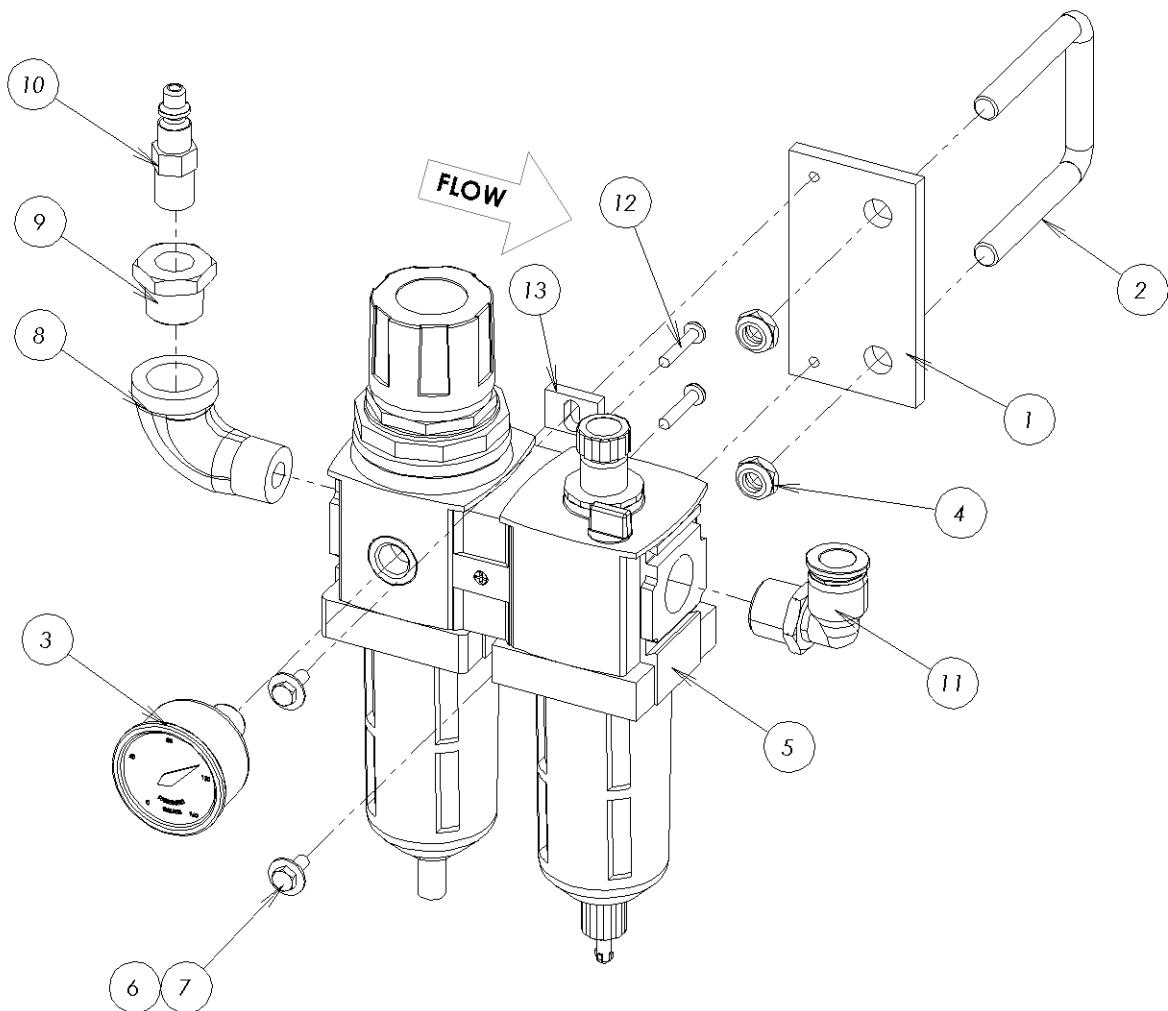
## MOTOR/REDUCER ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0243-0617	20:1 GEAR REDUCER
2	1	0243-0089	MOTOR.1.00HP.SS.1750RPM.56C
3	1	B-0243-0591	REDUCER COVER
4	1	B-0243-0509	KEY, 1/4" SQ X 5-1/4"
5	4	LW3/8	WASHER, LOCK
6	8	LW5/16	WASHER, LOCK
7	4	HH3/8-16X1-1/4	SCREW, HEX HEAD
8	8	HH5/16-18X3/4	SCREW, HEX HEAD
9	6	30-073	WIRE NUT
10	1	ST9050	1/2" SEALITE CON, 90DEG
11	1	ST50	CONNECTOR.SEALTITE.STR.1/2"
12	2	PN12-14HDRL	RING, TERMINAL
13	1	7707-2359	LABEL, DANGER HOT - AVOID BURNS

**ASSEMBLY NUMBER: B-0243-0644**

## FILTER/ REGULATOR LUBRICATOR ASSEMBLY

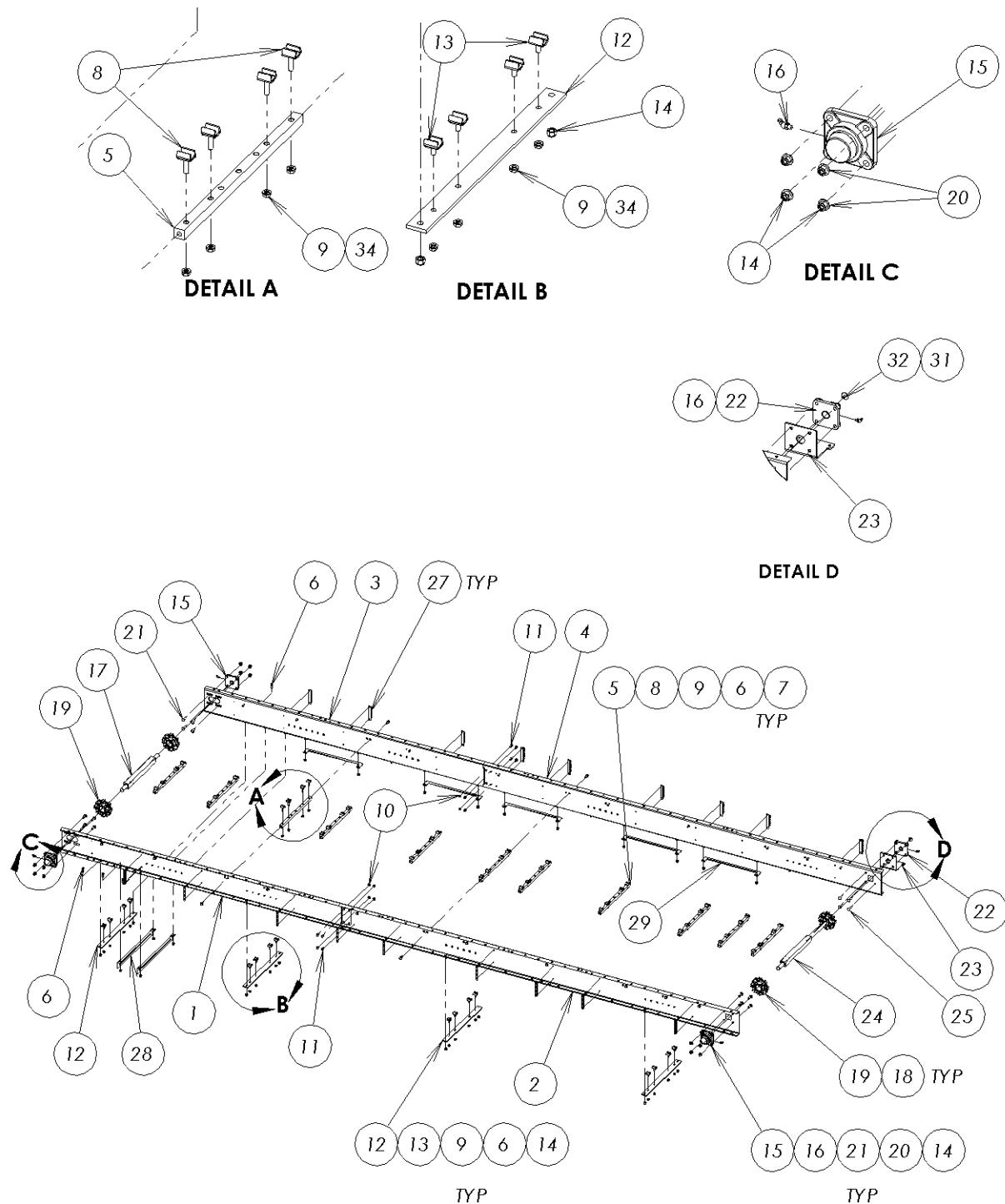
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-7707-1588	BRACKET, REGULATOR MOUNT
2	1	3060T71	SQUARE U-BOLT
3	1	7501-162	GAUGE.PRESSURE.0.25NPT
4	2	LN3/8-16LP	NUT, LOCK, LOW PROFILE
5	1	0243-376	FILTER/ REGULATOR/ LUBRICATOR
6	2	FW10-B	FLAT WASHER
7	2	HH10-32X1/2	SCREW, HEX HEAD
8	1	SSE1/2NPT	ELBOW.SS.0.50NPT X 90DEG.STREET
9	1	SSB1/2NPTX1/4	BUSHING.HEX.SS.0.50NPT X 0.25NPT
10	1	8013-2036	ADAPTER.AIR.SS.0.25NPT
11	1	269P-08-08	FITTING.ELB.1/2 NPT TO 1/2 OD
12	2	PH8-32X7/8	SCREW, PAN HEAD
13	1	8807-125	MOUNTING BRACKET

**ASSEMBLY NUMBER: C-9743-1206**

## TOP CONVEYOR FRAME ASSEMBLY

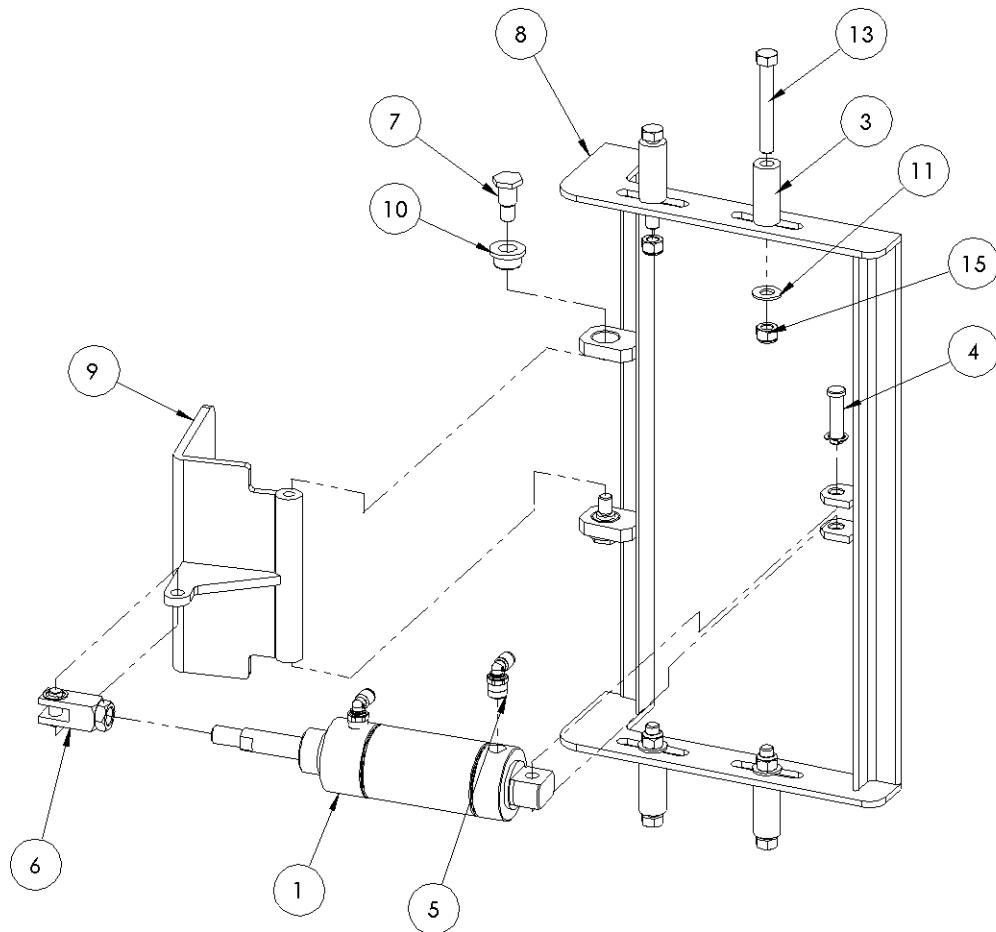
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	D-0243-0504	IDLER CONVEYOR PANEL, TOP RIGHT
2	1	D-0243-0505	DRIVE CONVEYOR PANEL, TOP RIGHT
3	1	D-0243-0506	IDLER CONVEYOR PANEL, TOP LEFT
4	1	D-0243-0507	DRIVE CONVEYOR PANEL, TOP LEFT
5	11	B-0243-0770	CROSSMEMBER BAR, 20.5" BR
6	30	HH3/8-16X7/8	SCREW, HEX HEAD
7	22	LW3/8	WASHER, LOCK
8	44	VG-018-04	RAIL CLIP, LONG
9	60	JN5/16-18	NUT, JAM
10	8	LN3/8-16LP	NUT, LOCK, LOW PROFILE
11	8	HH3/8-16X1/2	HEAD HEAD 3/8-16-1/2 STAINLESS STEEL
12	4	B-0243-0775	BRACKET, BELT RETURN
13	16	VG-018-02	RAIL CLIP
14	38	LN3/8-16	NUT, LOCK
15	3	0550-1117	BEARING, 4-BOLT, 1" BORE, CL CVR
16	4	1293K23	FITTING, GREASE, 1/4-28, 45 DEGREE
17	1	B-0243-0777	IDLER SHAFT, 1.5 SQ, 20.5" BR, DBL SPROCKET
18	8	0243-0136	RETAINING RING, 1.5 SQ SHAFT
19	4	0243-0135	DRIVE SPROCKET, 1.5 SQ SHAFT
20	16	FW3/8-A	WASHER, FLAT
21	12	CB3/8-16X1-1/4	BOLT, CARRIAGE
22	1	0550-1118	BEARING, 4-BOLT, 1"ID, OPEN CVR
23	1	B-0243-0590	REDUCER MOUNT
24	1	C-0243-0776	DRIVE SHAFT, 1.5 SQ, 20.5" BR, DBL SPROCKET
25	4	CB3/8-16X1-1/2	BOLT, CARRIAGE
26	9	0243-0568	TIE PLATE
27	9	2216T14	TUBING MOUNT
28	2	B-0243-0774	CONVEYOR TIE BAR, CONVEYOR BOTTOM
29	5	B-0243-0622	WIRE TIE BAR 16"
30	14	HH3/8-16X3/4	SCREW, HEX HEAD
31	1	90313A107	WASHER.FLAT.SS.1.0OD X 0.28ID
32	1	HH1/4-20X1/2	SCREW, HEX HEAD
33	6	30-073	WIRE NUT
34	60	LW5/16	WASHER, LOCK

# ASSEMBLY NUMBER: D-0243-0861



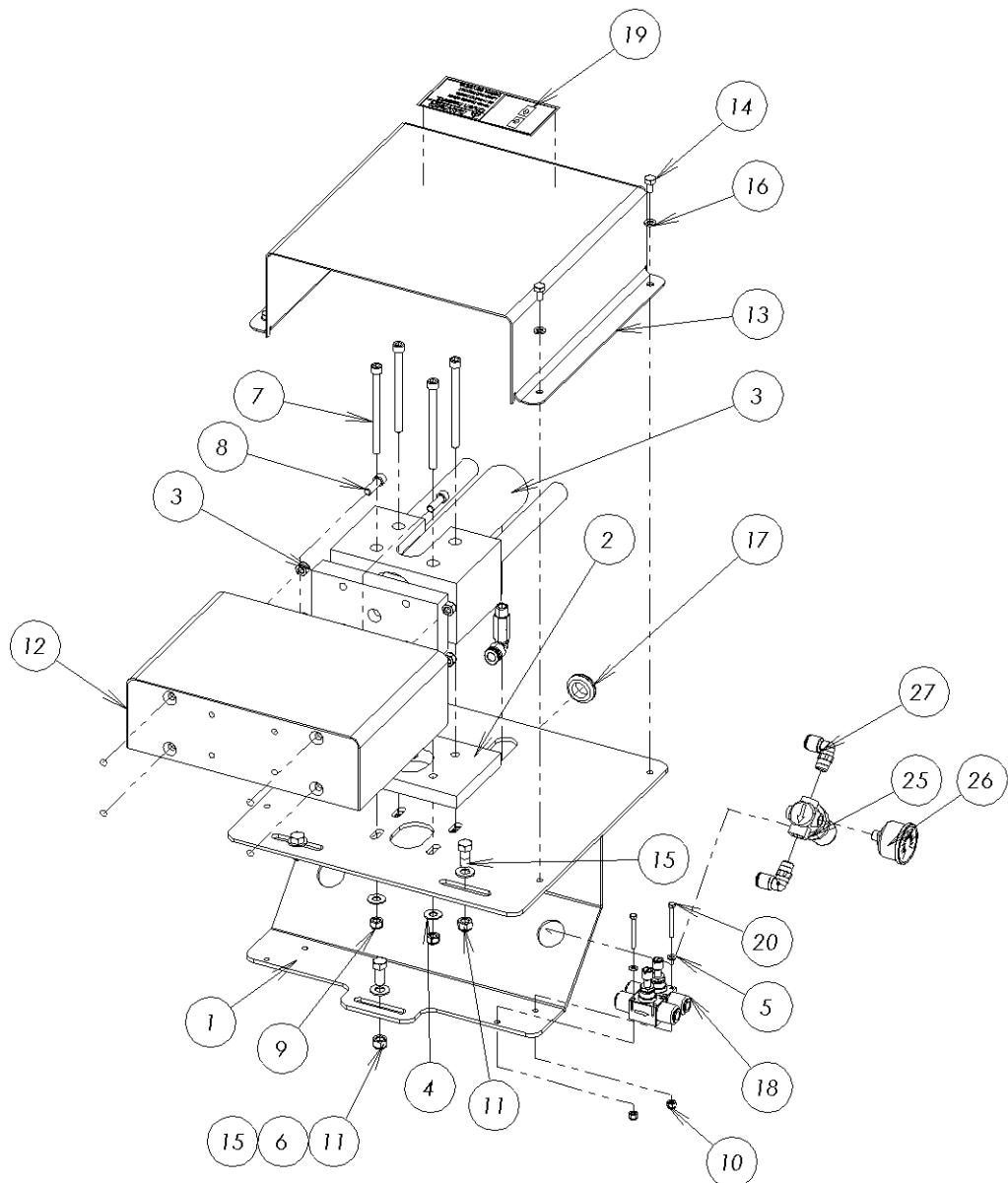
**BLADE STOP ASSEMBLY**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0243-0187	CYLINDER, BLADE STOP
3	4	0243-0788	SPACER, 1.75"L
4	1	0243-0863	CLEVIS PIN W/ RET RING, 3/8" X 1 5/16"
5	2	269P-04-04	FITTING.TBG.ELB.1/4OD X 1/4NPT
6	1	8013-1788	CLEVIS.CYL.2.00BORE.SS
7	2	B-9537-1033	BOLT, SHOULDER - LOW HEAD
8	1	D-0243-0143	WELD, MOUNTING FRAME, BLADE STOP
9	1	D-0243-0144	STOP, BLADE
10	2	FB812-4	BEARING, FLG, BR, 0.5ID X 0.75OD X 0.5LG
11	4	FW3/8-A	WASHER, FLAT
13	4	HH3/8-16X2-3/4	SCREW, HEX HEAD
15	4	LN3/8-16	NUT, LOCK

**ASSEMBLY NUMBER: D-0243-0154-2**

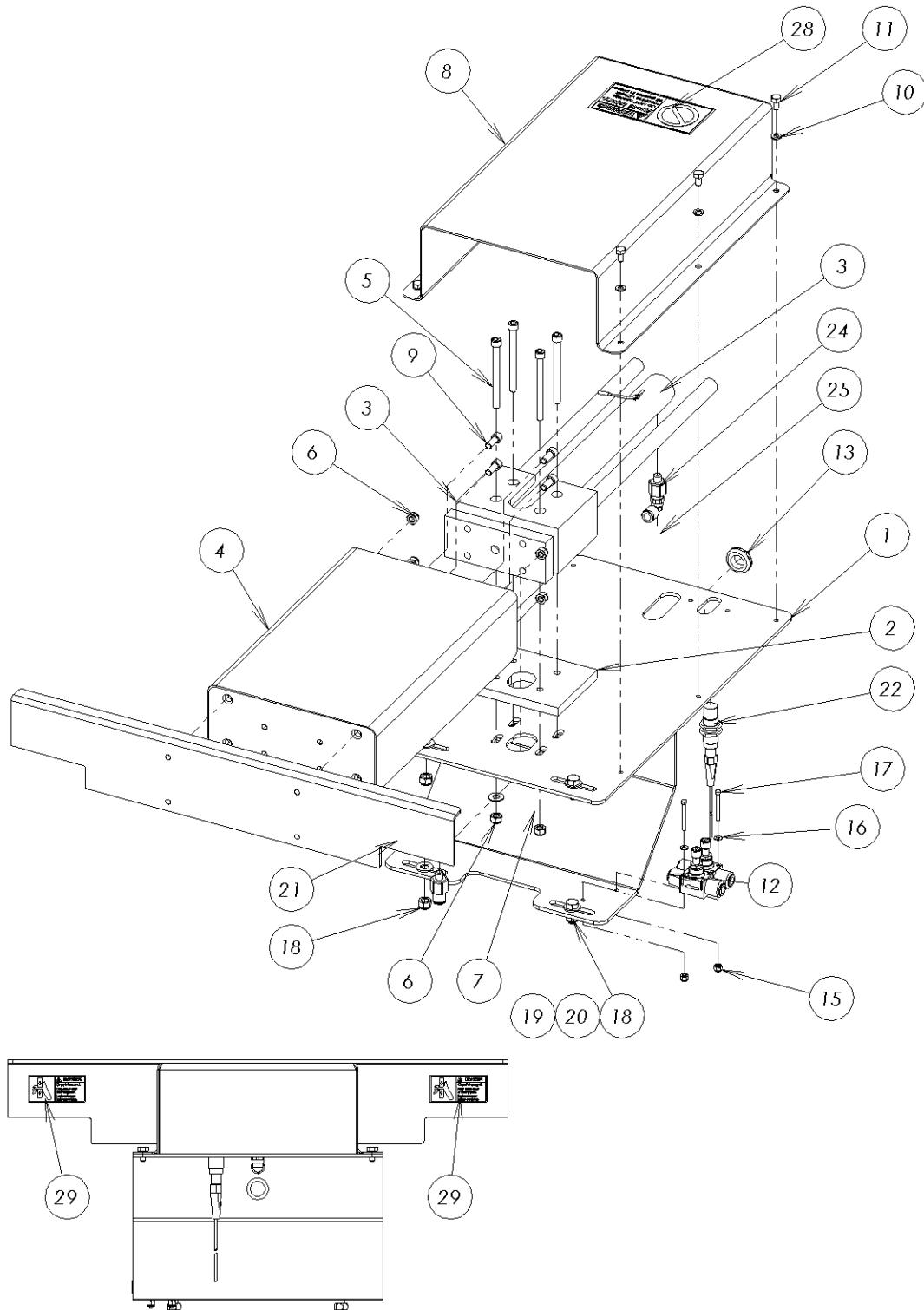
## SQUEEZE STOP ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-0541	WELDMENT, SQUEEZE STOP MOUNT
2	1	B-0243-0539	SQUEEZE STOP SPACER
3	1	0243-0094	THRUSTER, SQUEEZE STOP
4	4	FW5/16-A	WASHER, FLAT
5	2	FW8-A	WASHER, FLAT
6	3	FW3/8-A	WASHER, FLAT
7	4	SH5/16-18X4	SCREW, SOCKET HEAD
8	4	SH5/16-18X1	SCREW, SOCKET HEAD
9	8	LN5/16-18	NUT, LOCK
10	2	LN8-32	NUT, LOCK
11	3	LN3/8-16	NUT, LOCK
12	1	B-0243-0543	WELDMENT, SQUEEZE STOP
13	1	C-0243-0540	SQUEEZE STOP COVER
14	4	HH1/4-20X1/2	SCREW, HEX HEAD
15	3	HH3/8-16X7/8	SCREW, HEX HEAD
16	4	LW1/4	WASHER, LOCK
17	1	9602K12	GROMMET, RUBBER, 23/32" I.D.
18	2	9130-1765	VALVE, FLOW CONTROL, 3/8"
19	1	7707-2360	LABEL, DANGER - MANIFOLD
20	2	HH8-32X1-1/2	SCREW, HEX HEAD
21	-	C-0243-0611	WELDMENT 24" PUSHER PLATE
22	4	FH5/16-18X7/8	SCREW, FLAT HEAD, SLOTTED
23	1	266P-06-04	FITTING, 3/8 TUBE X 1/4 NPT
24	1	SN1/4NPT	NIPPLE.SS.0.25NPT X 0.88LG
25	1	7707-118	REGULATOR, 1/4NPT
26	1	7707-489	GAUGE, PRESSURE
27	2	269P-06-04	FITTING.TBG.ELB.3/8OD X 1/4NPT
28	1	7707-2406	FITTING, ELBOW, EXTENDED

**ASSEMBLY NUMBER: C-0243-0542**

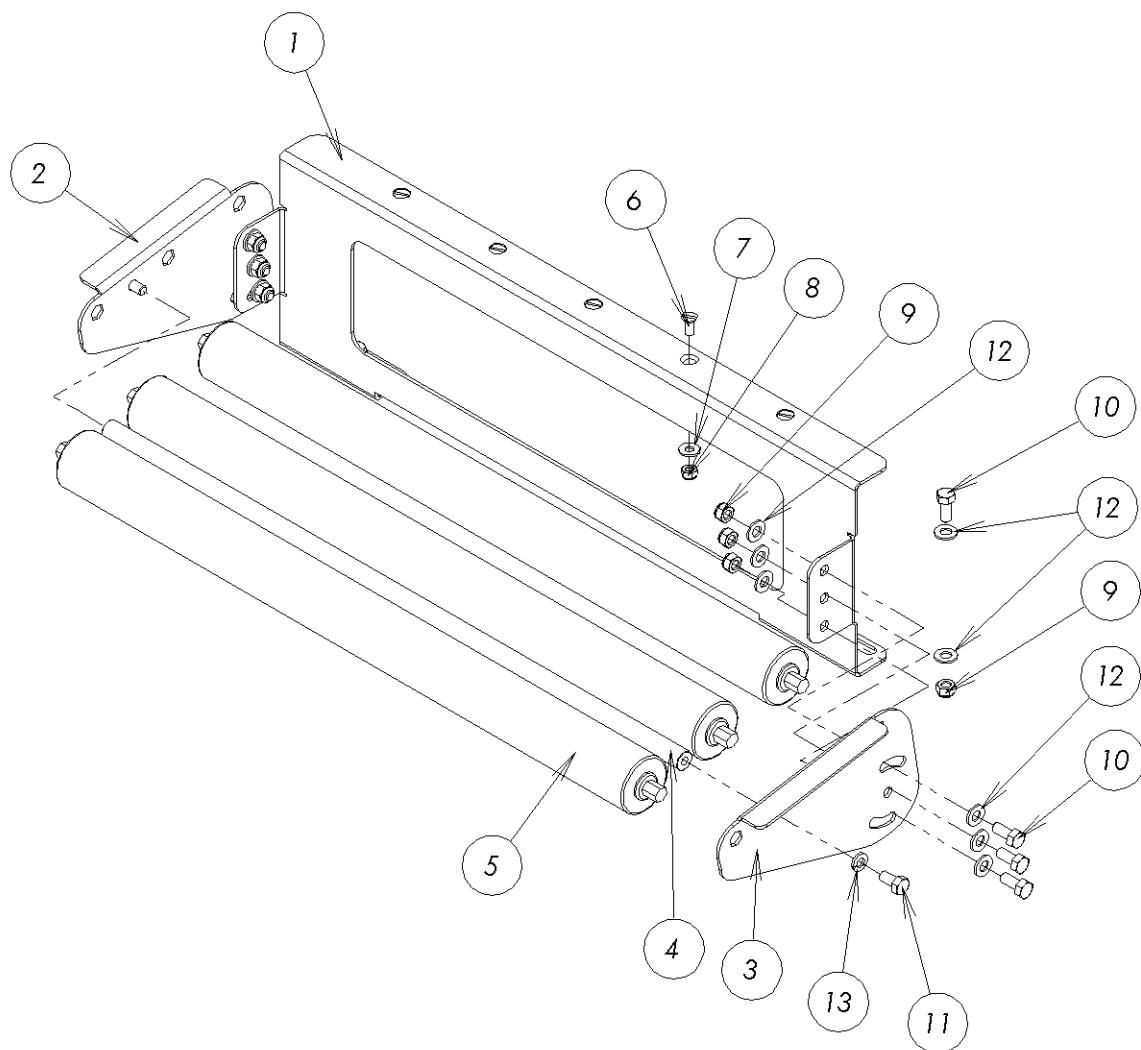
## PUSHER ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-0548	WELDMENT, PUSHER MOUNT
2	1	B-0243-0044	SPACER, PUSHER CYLINDER
3	1	0243-0093	THRUSTER, PUSHER
4	1	C-0243-0549	WELDMENT, PUSHER
5	4	SH5/16-18X3-1/2	SCREW, SOCKET HEAD
6	8	LN5/16-18	NUT, LOCK
7	4	FW5/16-A	WASHER, FLAT
8	1	C-0243-0550	PUSHER COVER
9	4	SH5/16-18X3/4	SCREW, SOCKET HEAD
10	6	LW1/4	WASHER, LOCK
11	6	HH1/4-20X1/2	SCREW, HEX HEAD
12	2	9130-1765	VALVE, FLOW CONTROL, 3/8"
13	1	9602K12	GROMMET, RUBBER, 23/32" I.D.
14	1	7707-978	SWITCH, REED
15	2	LN8-32	NUT, LOCK
16	2	FW8-A	WASHER, FLAT
17	2	HH8-32X1-1/2	SCREW, HEX HEAD
18	4	LN3/8-16	NUT, LOCK
19	4	HH3/8-16X7/8	SCREW, HEX HEAD
20	4	FW3/8-A	WASHER, FLAT
21	1	C-0243-0611	WELDMENT 24" PUSHER PLATE
22	1	0750-1131-1	SENSOR.PROX.IND.18MM.DC.3-WIRE
23	1	9743-1045	CABLE, PHOTOEYE, 10M
24	2	0243-0630	ADAPTOR BRASS
25	1	268P-06-04	FITTING.TBG.STR.3/8OD X 1/4NPT
26	1	269P-06-04	FITTING.TBG.ELB.3/8OD X 1/4NPT
27	1	FH 5/16-18 X 3/4	SCREW, FLAT HEAD SLOTTED
28	1	0210-1035	WARNING LABEL, GUARDS IN PLACE
29	2	8013-2107	LABEL, CRUSH HAZARD

**ASSEMBLY NUMBER: C-0243-0610**

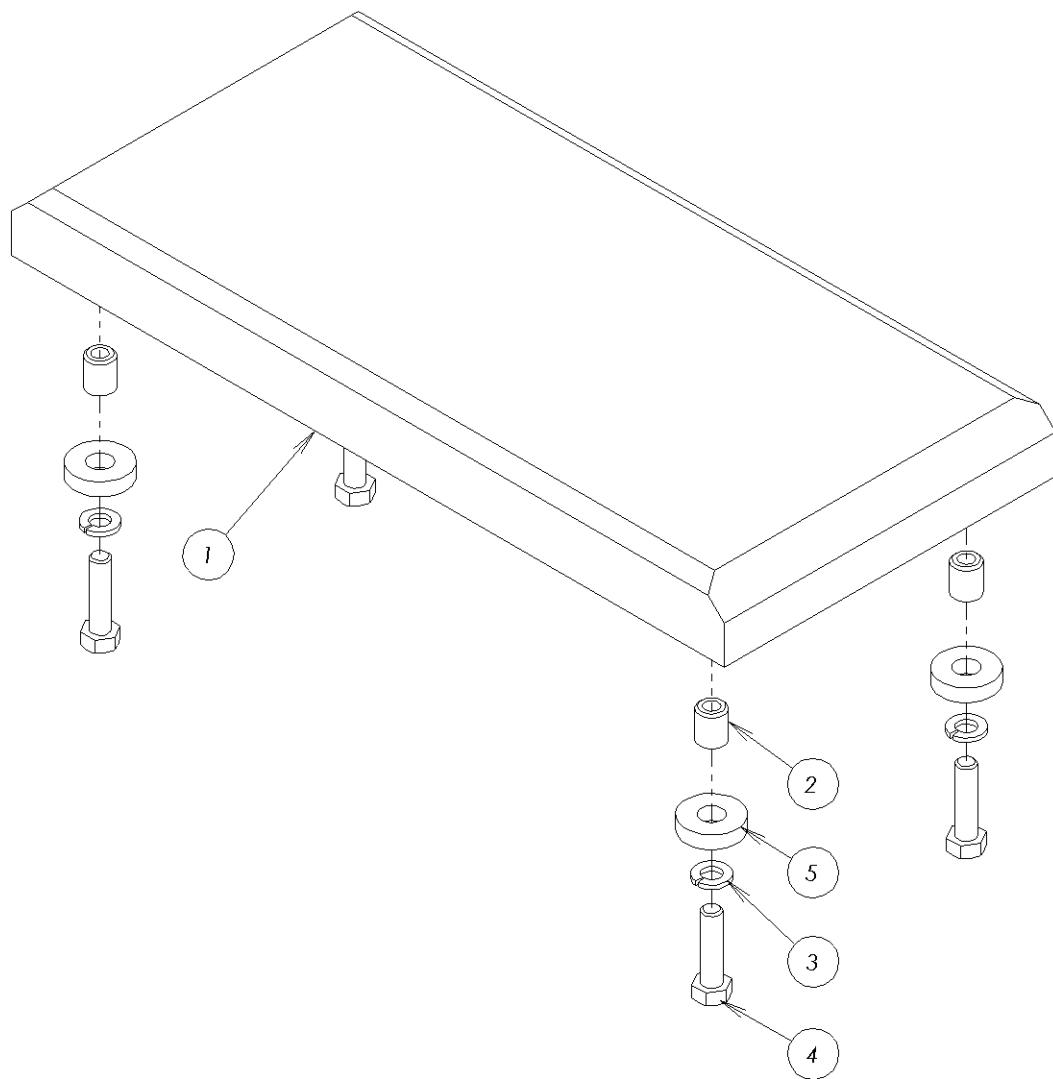
## TRANSFER CONVEYOR ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-0606	BRACKET, TRANSFER CONVEYOR
2	1	C-0243-0079L	PLATE, TRANSFER ROLLERS, LH
3	1	C-0243-0079R	PLATE, TRANSFER ROLLERS, RH
4	1	B-0243-0080	BAR, TRANSFER ROLLERS SPREADER
5	3	0243-0090	ROLLER
6	5	FH1/4-20X5/8	SCREW, SLOTTED FLAT HEAD
7	5	FW1/4-A	WASHER, FLAT
8	5	LN1/4-20	LN 1/4-20
9	8	LN5/16-18	NUT, LOCK
10	8	HH5/16-18X3/4	SCREW, HEX HEAD
11	2	HH5/16-18X5/8	SCREW, HEX HEAD
12	16	FW 5/16-C	WASHER, FLAT
13	2	LW5/16	WASHER, LOCK

**ASSEMBLY NUMBER: D-0243-0605**

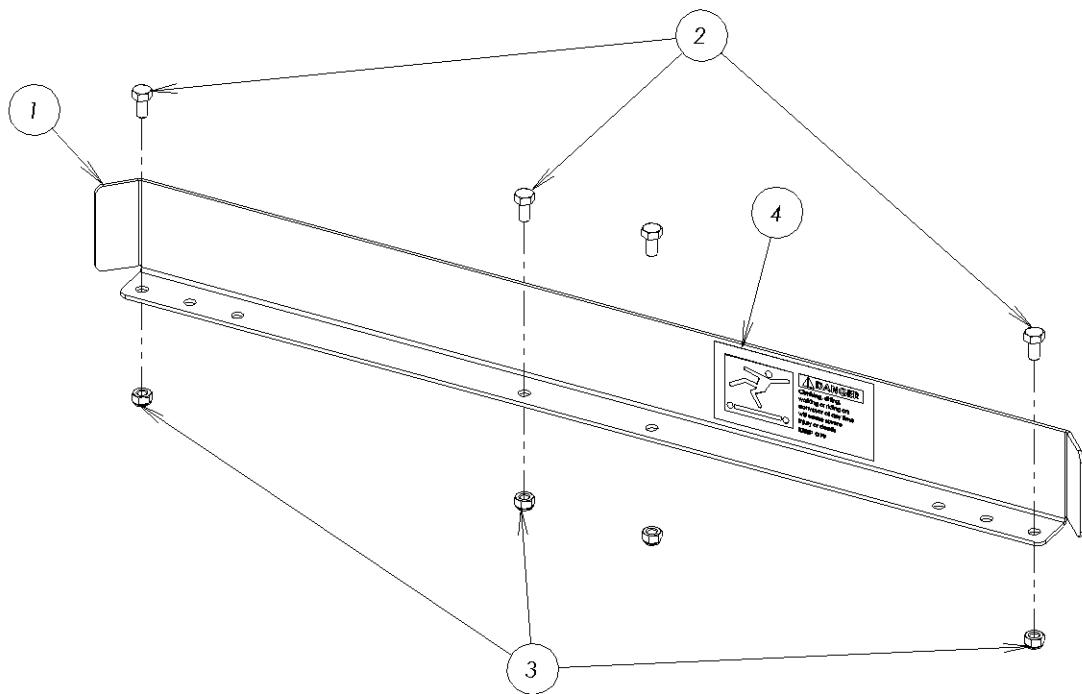
## TRANSFER FILLER ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-348	PLATE, TRANSFER FILLER
2	4	0243-326	THREADED INSERT, 5/16-18
3	4	LW5/16	WASHER, LOCK
4	4	HH5/16-18X1-1/4	SCREW, HEX HEAD
5	4	B-9537-1635	SPACER, 1"OD X 13/32"ID X 1/4"

**ASSEMBLY NUMBER: C-0243-347**

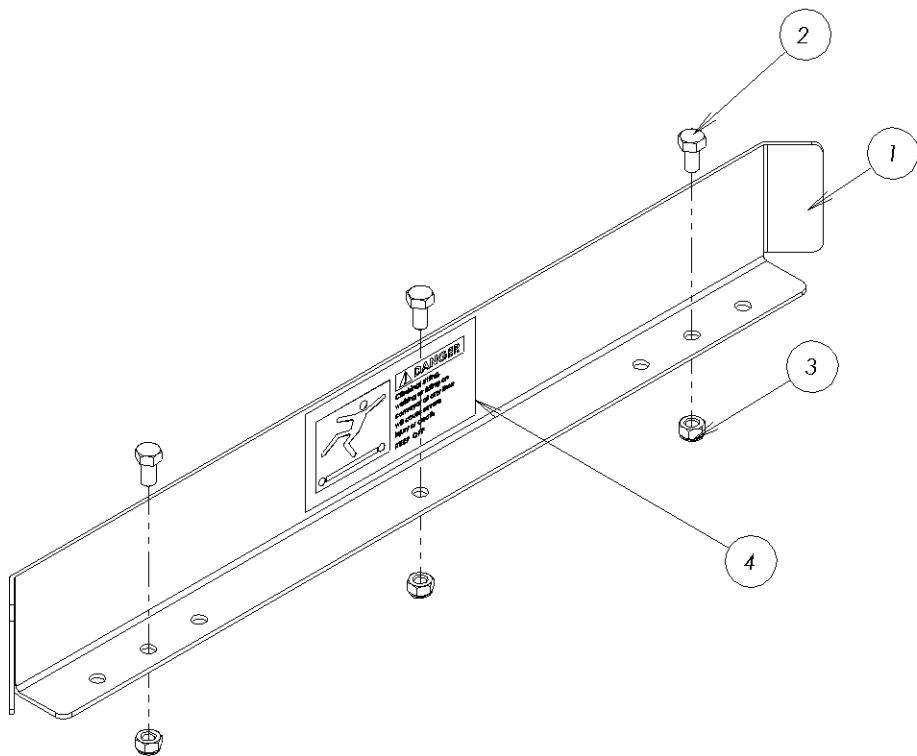
## ANGLE GUIDE RAIL ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-60	GUIDE RAIL, ANGLE ENDS
2	4	HH5/16-18X5/8	SCREW, HEX HEAD
3	4	LN5/16-18	NUT, LOCK
4	1	86075T71	LABEL, DANGER, CLIMBING-SITTING

**ASSEMBLY NUMBER: C-0243-0033**

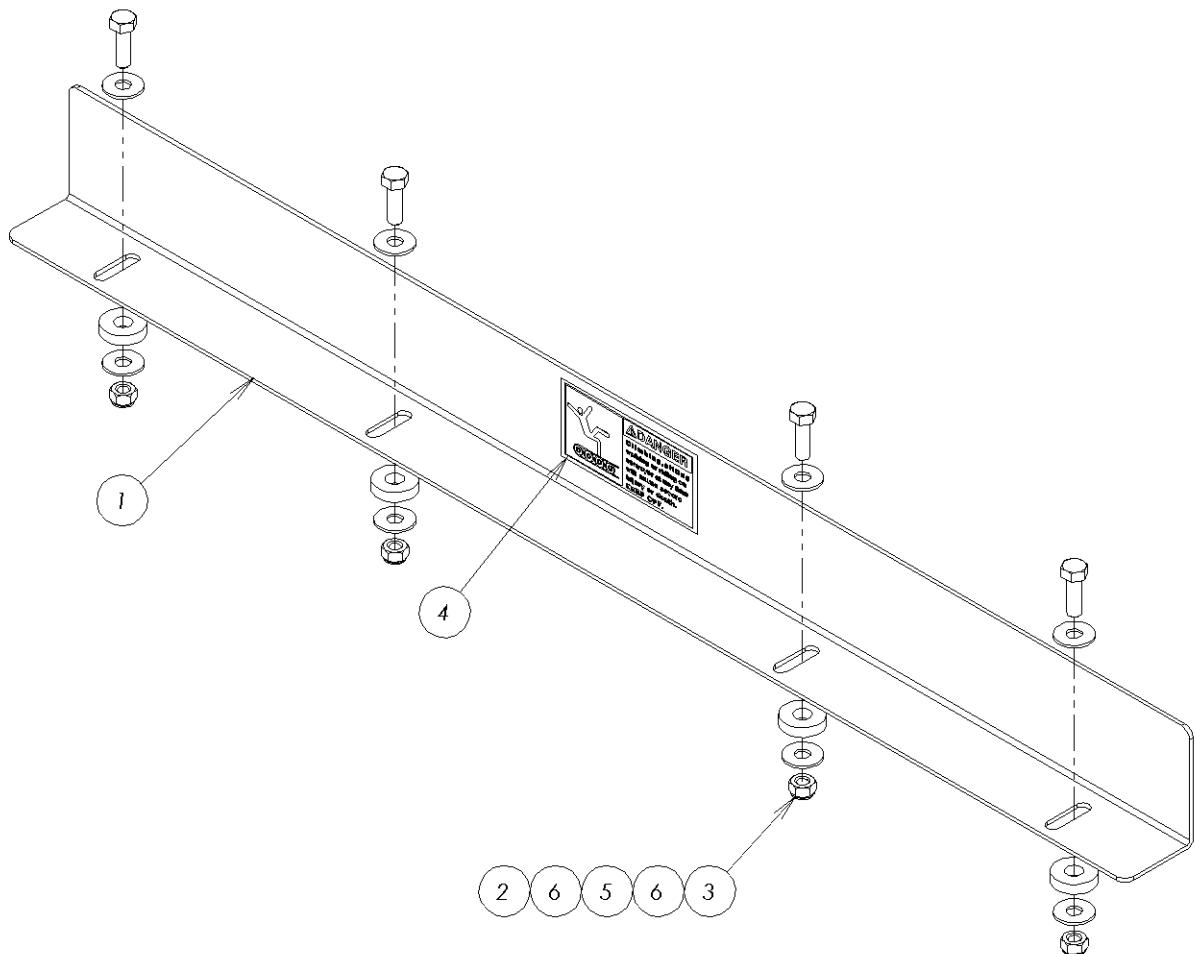
## INFEED GUIDE RAIL ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-0098	GUIDE ANGLE
2	3	HH5/16-18X5/8	SCREW, HEX HEAD
3	3	LN5/16-18	NUT, LOCK
4	1	86075T71	LABEL, DANGER, CLIMBING-SITTING

**ASSEMBLY NUMBER: C-0243-0100**

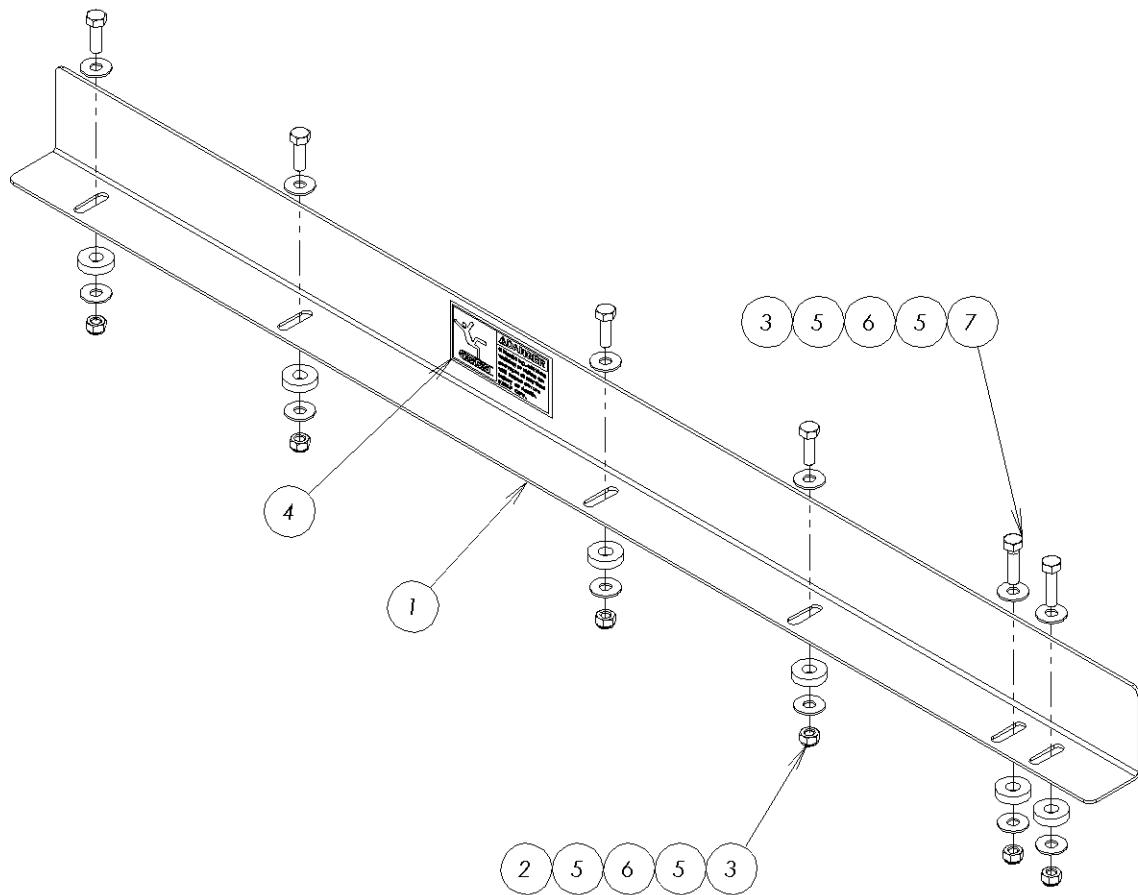
**GUIDE RAIL ASSEMBLY, 33"**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-0614	CONV GUARD RAIL, 33"
2	4	HH5/16-18X1	SCREW, HEX HEAD
3	4	LN5/16-18	NUT, LOCK
4	1	86075T51	WARNING LABEL, KEEP HANDS CLEAR
5	4	B-9537-1635	SPACER, 1"OD X 13/32"ID X 1/4"
6	8	FW5/16-B	WASHER.FLAT

**ASSEMBLY NUMBER: B-0243-0613**

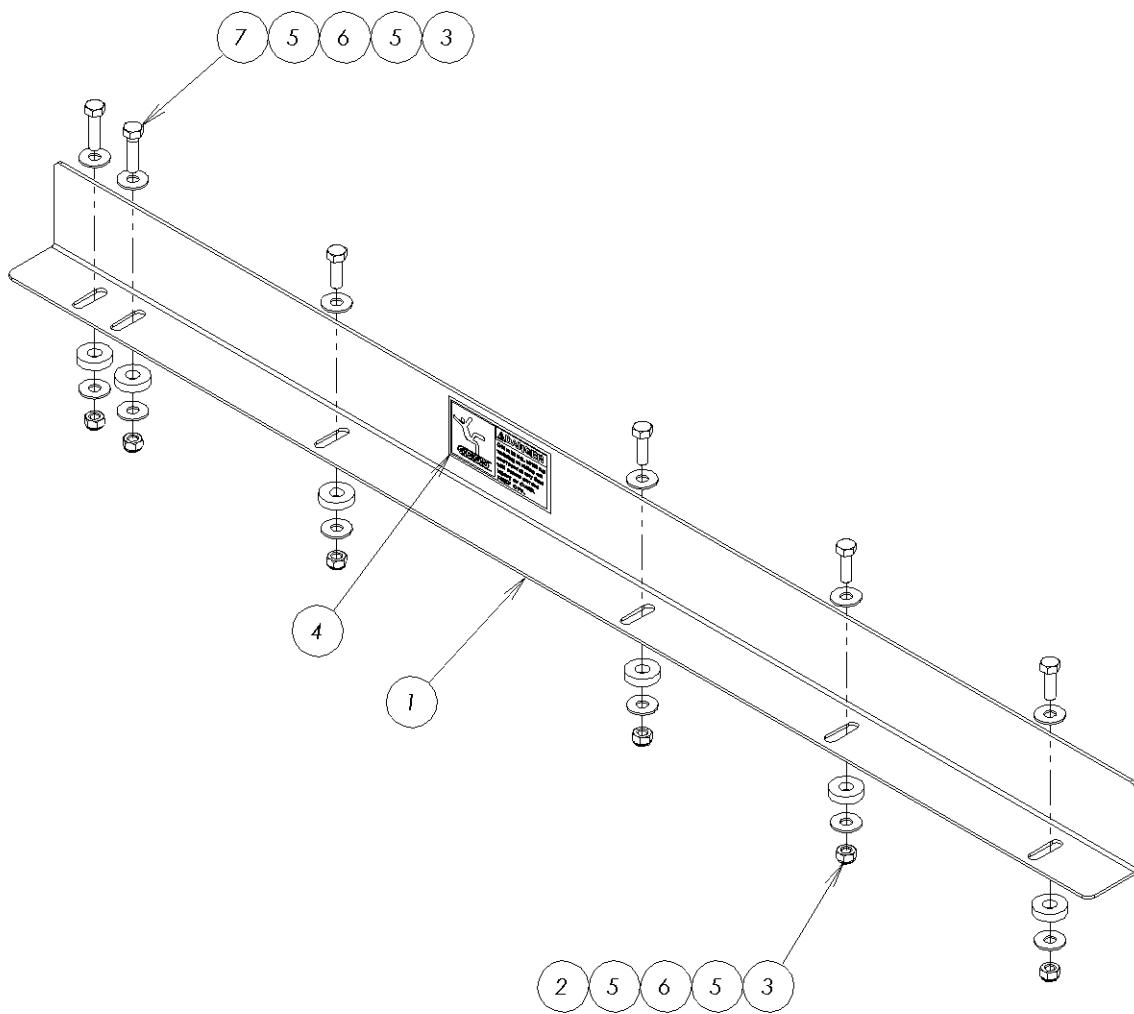
**GUIDE RAIL ASSEMBLY, 45.5" LEFT**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-0616L	CONV GUARD RAIL, 42.5", LH
2	4	HH5/16-18X1	SCREW, HEX HEAD
3	6	LN5/16-18	NUT, LOCK
4	1	86075T51	WARNING LABEL, KEEP HANDS CLEAR
5	12	FW5/16-B	WASHER.FLAT
6	6	B-9537-1635	SPACER,1"OD X 13/32"ID X 1/4"
7	2	HH5/16-18X1-1/4	SCREW, HEX HEAD

**ASSEMBLY NUMBER: B-0243-0615L**

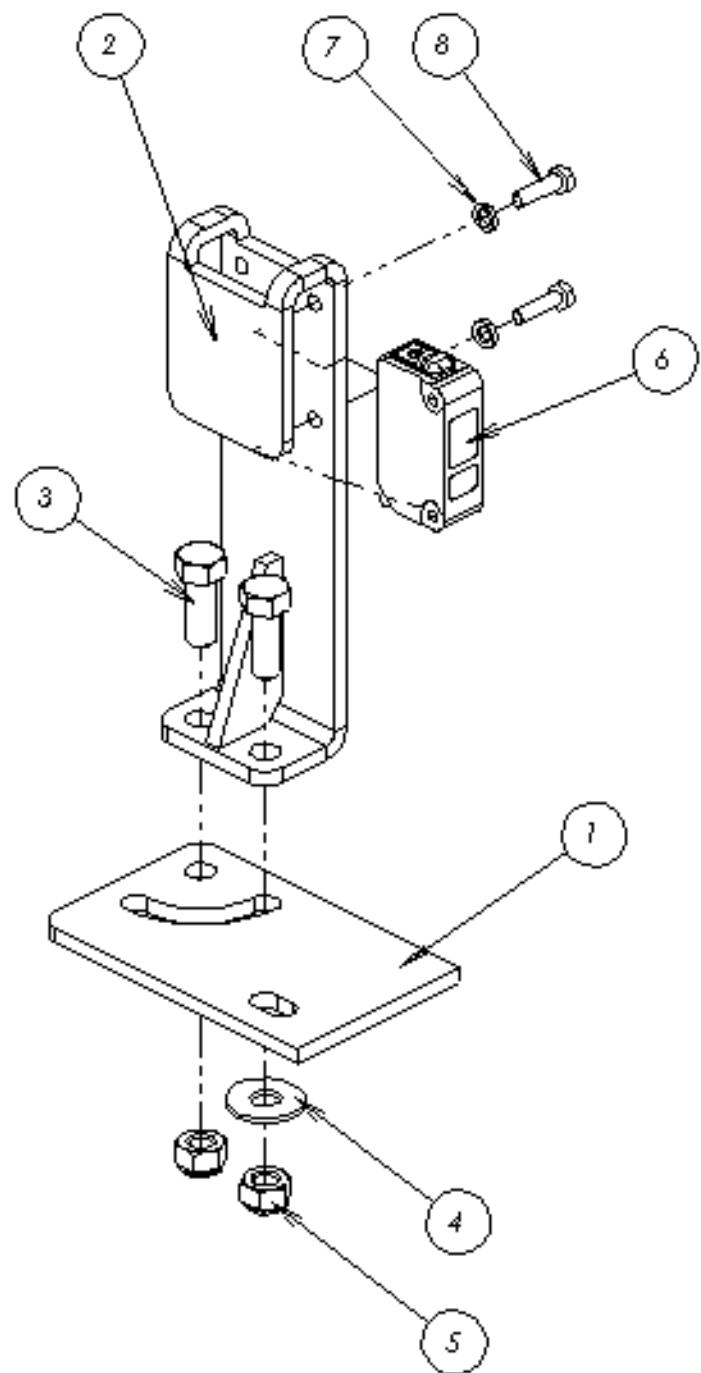
## GUIDE RAIL ASSEMBLY, 42.5" RIGHT

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-0616R	CONV GUARD RAIL, 42.5", RH
2	4	HH5/16-18X1	SCREW, HEX HEAD
3	6	LN5/16-18	NUT, LOCK
4	1	86075T51	WARNING LABEL, KEEP HANDS CLEAR
5	12	FW5/16-B	WASHER.FLAT
6	6	B-9537-1635	SPACER,1"OD X 13/32"ID X 1/4"
7	2	HH5/16-18X1-1/4	SCREW, HEX HEAD

**ASSEMBLY NUMBER: B-0243-0615R**

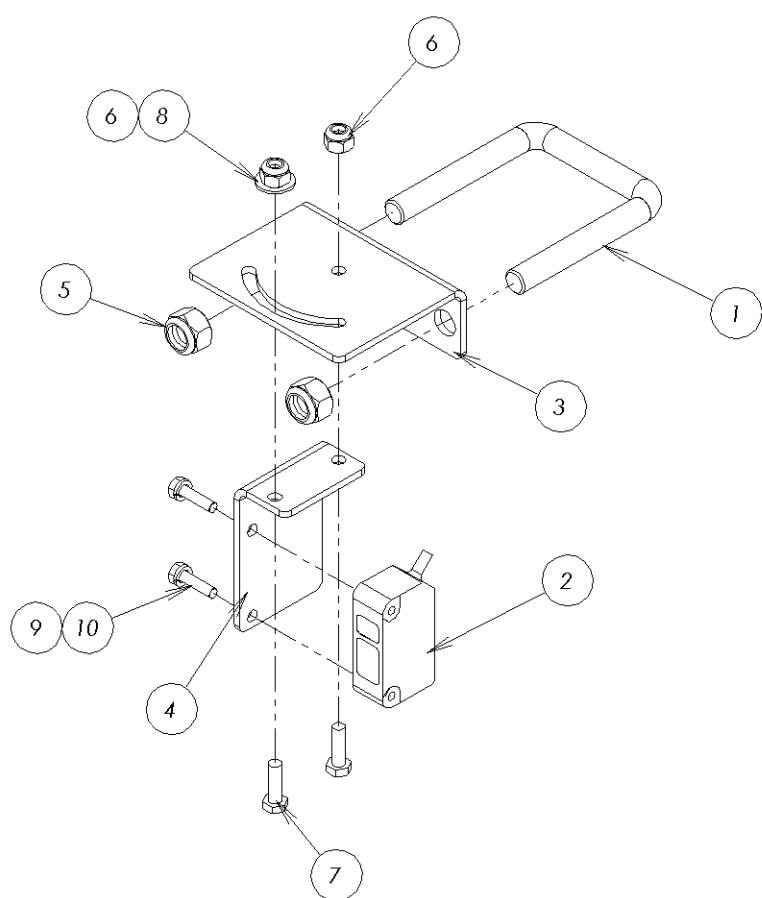
## PHOTOEYE ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-0618	MTG. BASE, PHOTO EYE
2	1	B-0243-0619	BRACKET, PHOTO EYE
3	2	HH5/16-18X7/8	SCREW, HEX HEAD
4	1	FW5/16-B	WASHER.FLAT
5	2	LN5/16-18	NUT, LOCK
6	1	9743-1281	PHOTOEYE, DIFFUSE
7	2	LW10	WASHER, LOCK
8	2	HHM4x.7x16	SCREW, HEX METRIC
9	1	9743-1045	CABLE, PHOTOEYE, 10M

**ASSEMBLY NUMBER: B-0243-0620**

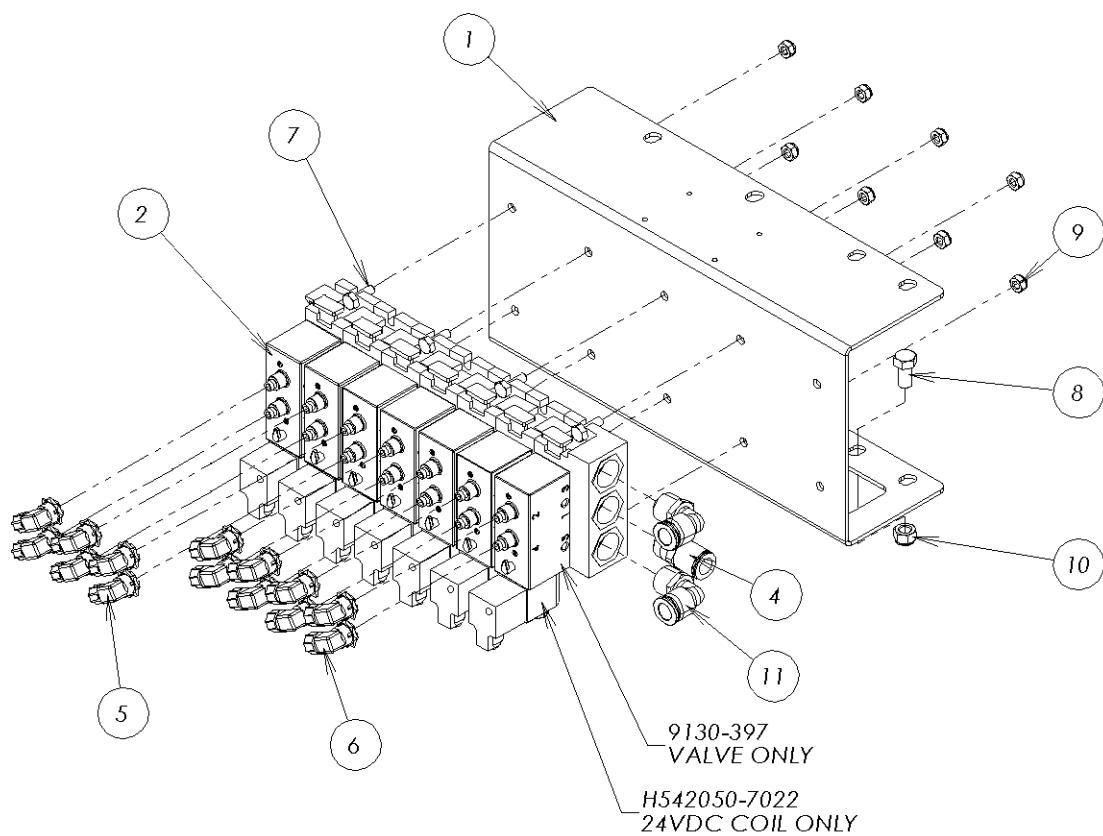
## PHOTOEYE ASSEMBLY, DOWN FACING

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	3060T71	SQUARE U-BOLT
2	1	9743-1281	PHOTOEYE, DIFFUSE
3	1	B-0243-0753	SENSOR BRACKET A
4	1	B-0243-0754	SENSOR BRACKET B
5	2	LN3/8-16	NUT, LOCK
6	2	LN10-32	NUT, LOCK
7	2	HH10-32X5/8	SCREW, HEX HEAD
8	1	FW10-B	FLAT WASHER
9	2	LW10	WASHER, LOCK
10	2	HJM4x.7x16	SCREW, HEX METRIC

**ASSEMBLY NUMBER: B-0243-0752**

## VALVE BANK ASSEMBLY

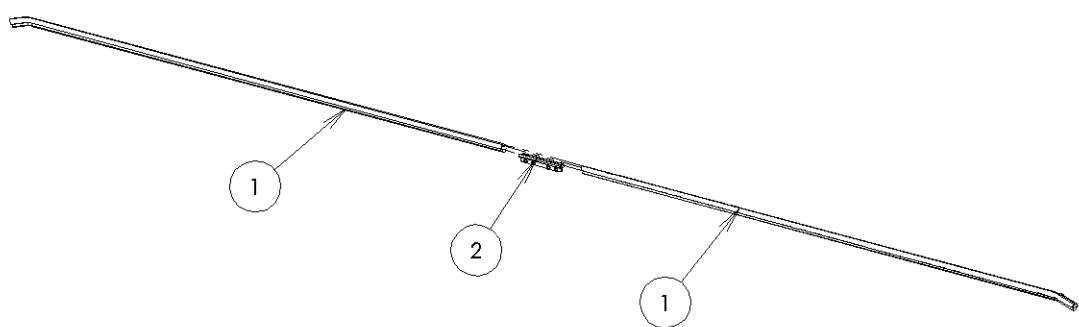
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-0556	VALVE BANK MOUNT
2	1	0243-0601	VALVE BANK, 7 STATION
3	7	0243-0624	CONNECTOR, 24VDC, 10M
4	1	268P-08-08	FITTING.TBG.STR.1/2OD X 1/2NPT
5	6	P68949	ADAPTER.VLV.ELB.1/4OD TUBE
6	8	P68392	ADAPTER.VLV.ELB.3/8OD TUBE
7	8	HH1/4-20X3/4	SCREW, HEX HEAD
8	2	HH3/8-16X3/4	SCREW, HEX HEAD
9	8	LN1/4-20	LN 1/4-20
10	2	LN3/8-16	NUT, LOCK
11	2	269P-08-08	FITTING.ELB.1/2 NPT TO 1/2 OD

**ASSEMBLY NUMBER: C-0243-0612**

**WEAR STRIP ASSEMBLY, TOP CONVEYOR**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	2	B-0243-0758	WEAR STRIP, CHANNEL, 96.5" LG
2	1	VG-113-08	CLAMP, RAIL SPLICE

**ASSEMBLY NUMBER: B-0243-0759**

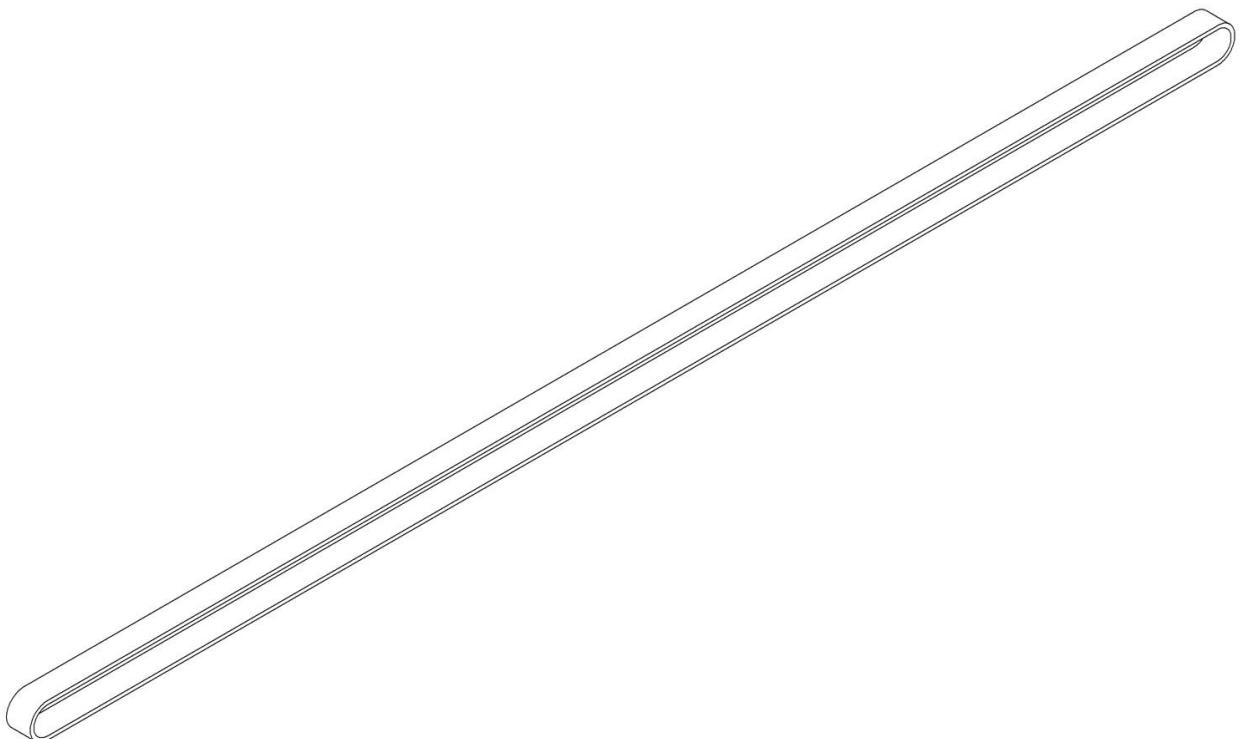


## TOP CONVEYOR BELT

### BELT SPECIFICATIONS:

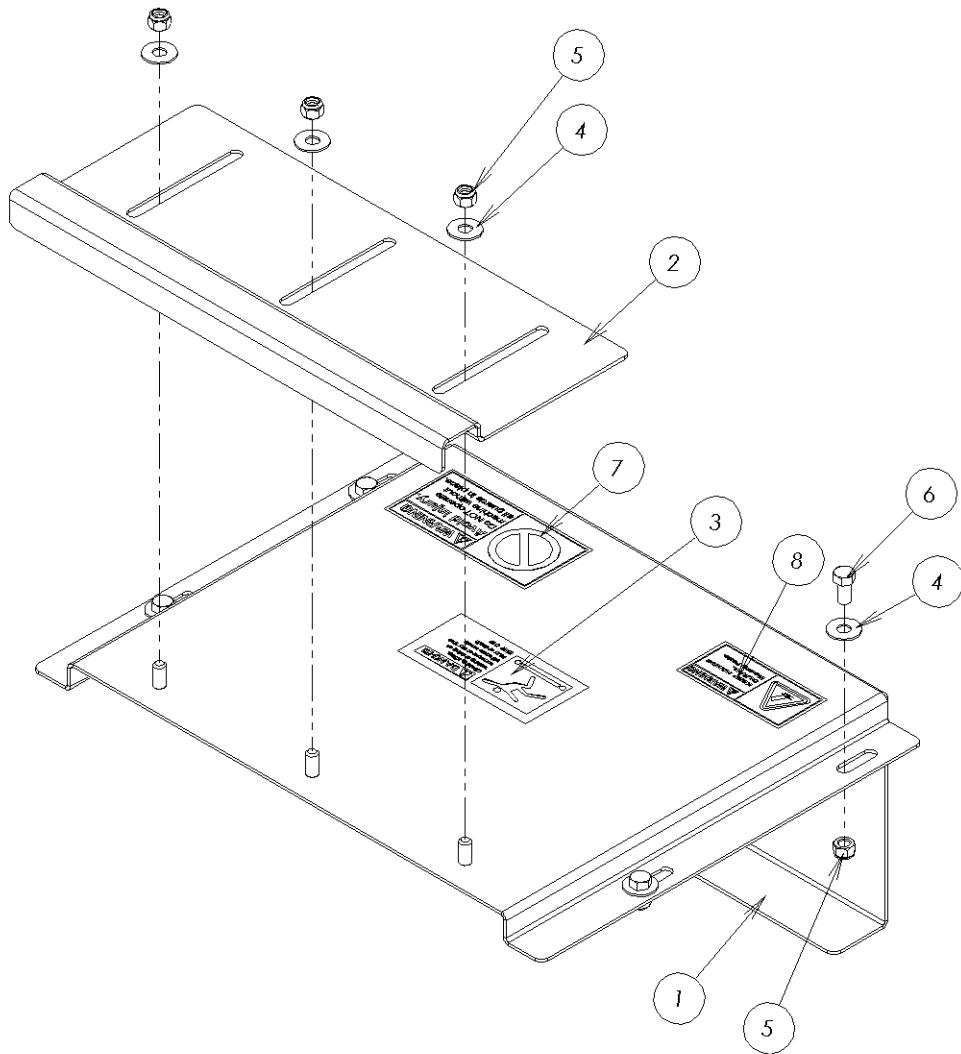
- SERIES 800 WHITE ACETAL
- FLUSH EDGE
- 5/32" DIAMETER PERFORATED ROUND HOLE
- 4" WIDE
- 75' LENGTH

**ASSEMBLY NUMBER: C-0243-0190**



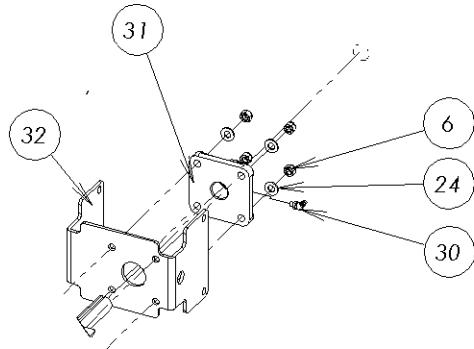
## TOP CONVEYOR COVER ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-0790	END COVER
2	1	B-0243-0609	BOX STOP
3	1	86075T71	LABEL, DANGER, CLIMBING-SITTING
4	7	FW3/8-C	WASHER, FLAT
5	7	LN3/8-16	NUT, LOCK
6	4	HH3/8-16X3/4	SCREW, HEX HEAD
7	1	0210-1035	WARNING LABEL, GUARDS IN PLACE
8	1	0210-1032	WARNING LABEL, KEEP HANDS CLEAR

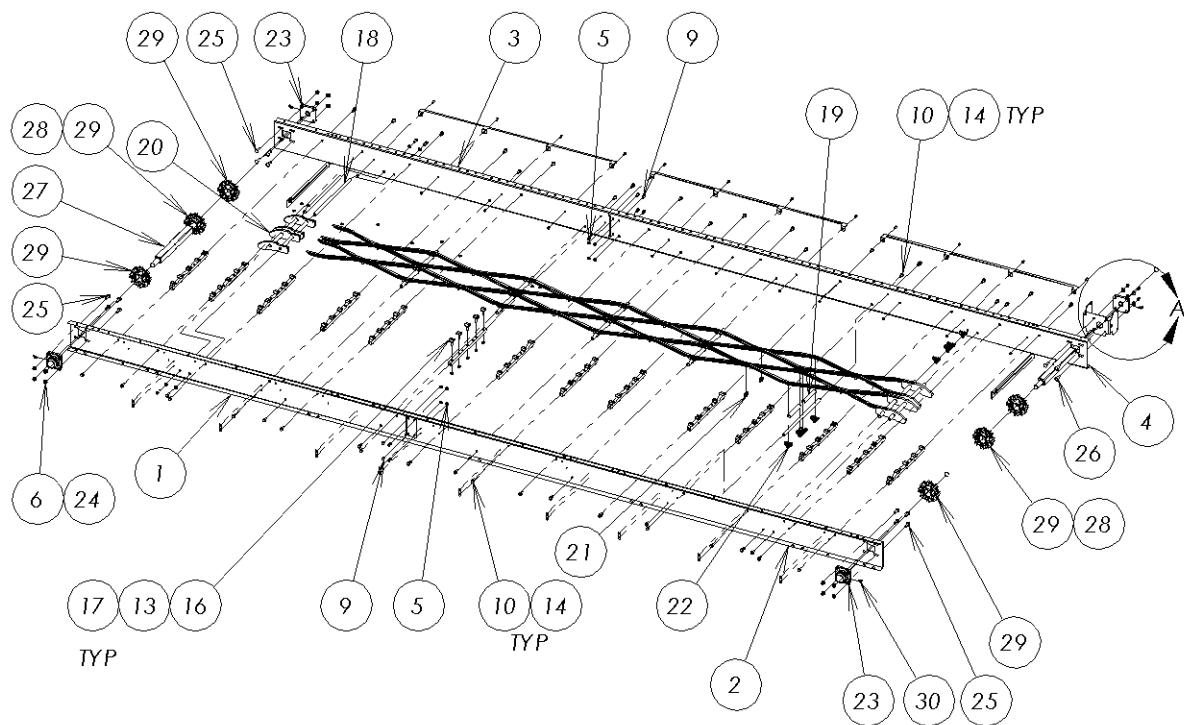
**ASSEMBLY NUMBER: C-0243-0789**

## BOTTOM CONVEYOR FRAME ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	D-0243-0512	IDLER CONV PANEL, BOTTOM RIGHT
2	1	D-0243-0513	DRIVE CONV PANEL, BOTTOM RIGHT
3	1	D-0243-0514	IDLER CONV PANEL, BOTTOM LEFT
4	1	D-0243-0515	DRIVE CONV PANEL, BOTTOM LEFT
5	8	LN3/8-16LP	NUT, LOCK, LOW PROFILE
6	16	LN3/8-16	NUT, LOCK
7	2	LN5/16-18	NUT, LOCK
8	12	LN1/4-20	LN 1/4-20
9	8	HH3/8-16X1/2	HEAD HEAD 3/8-16-1/2 STAINLESS STEEL
10	46	HH3/8-16X7/8	SCREW, HEX HEAD
11	2	HH5/16-18X3/4	SCREW, HEX HEAD
12	12	HH1/4-20X1/2	SCREW, HEX HEAD
13	14	B-0243-0770	CROSSMEMBER BAR, 20.5" BR
14	46	LW3/8	WASHER, LOCK
15	70	LW5/16	WASHER, LOCK
16	70	VG-018-04	RAIL CLIP, LONG
17	70	JN5/16-18	NUT, JAM
18	9	B-0243-0771	SHAFT, BELT RETURN SUPPORT
19	18	VF-CRP5-600	SPACER, FULL ROUND
20	8	VF-CRS-34-58	SHOE, CHAIN RETURN
21	12	VF-CRC-T	CLIP, PINCH LOCK
22	24	VF-CRCP-58	SNAPLOCK WITH PIN
23	3	0550-1117	BEARING, 4-BOLT, 1" BORE, CL CVR
24	16	FW3/8-A	WASHER, FLAT
25	12	CB3/8-16X1-1/4	BOLT, CARRIAGE
26	4	CB3/8-16X1-1/2	BOLT, CARRIAGE
27	1	B-0243-0773	SHAFT, TAIL, 1.5 SQUARE
28	4	0243-0136	RETAINING RING, 1.5 SQ SHAFT
29	6	0243-0135	DRIVE SPROCKET, 1.5 SQ SHAFT
30	4	1293K23	FITTING, GREASE, 1/4-28, 45 DEGREE
31	1	0550-1118	BEARING, 4-BOLT, 1"ID, OPEN CVR
32	1	B-0243-0592	REDUCER MOUNT, VERTICAL
33	1	B-0243-0774	SHAFT, DRIVE, 1.5 SQUARE
34	2	B-0243-0772	CONVEYOR TIE BAR, CONVEYOR BOTTOM
35	3	B-0243-0632	WIRE TIE BAR
43	9	0243-0631	TIE PLATE, SINGLE
37	6	30-073	WIRE NUT
38	1	VF-CR-3834-100	RETURN RAIL

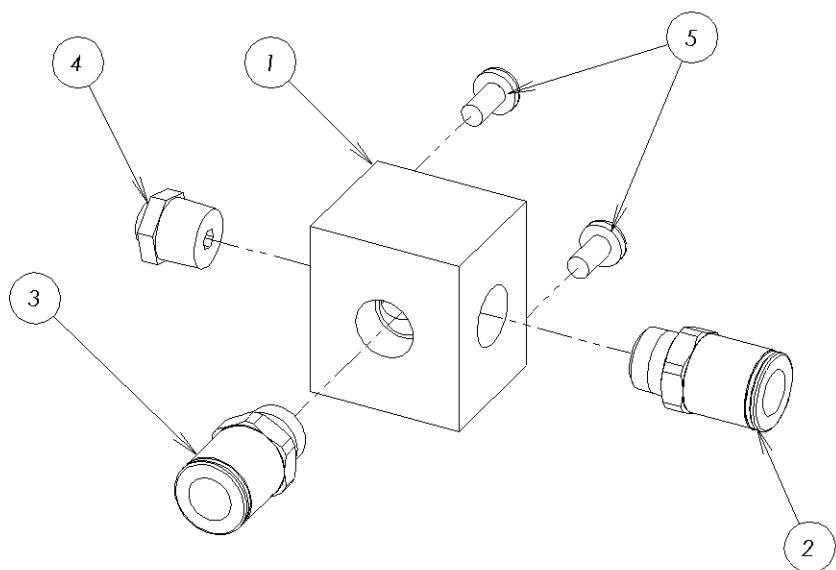
**ASSEMBLY NUMBER: D-0243-0862**

DETAIL A



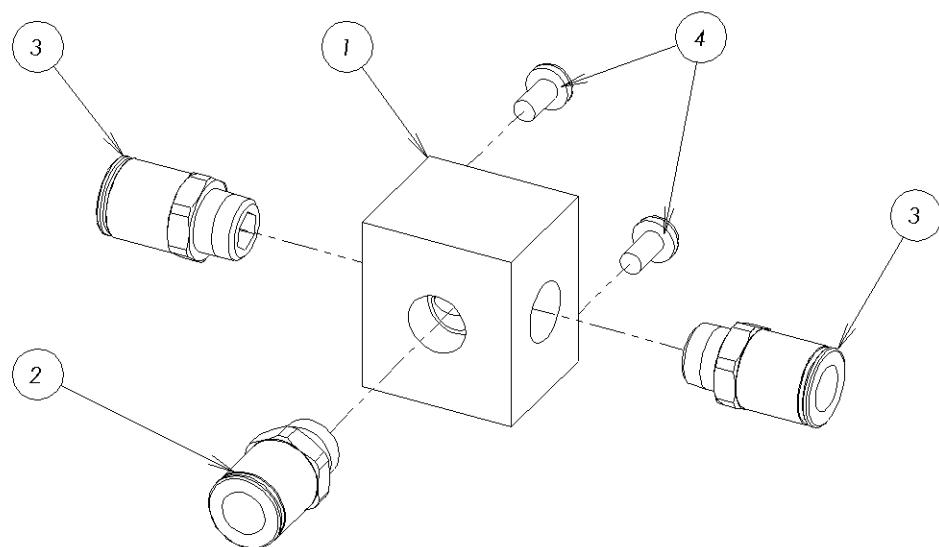
## GAS INLET STATION ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0243-424	BLOCK, MANIFOLD, 1 x 3/8NPT
2	1	268P-08-06	FITTING.TBG.STR.1/2OD X 3/8NPT
3	1	0243-0580	FITTING.TBG.SEAL.1/2OD X 3/8NPT
4	1	268P-04-06	FITTING.TBG.STR.1/4OD X 3/8NPT
5	2	PH1/4-20X1/2	SCREW, PAN HEAD

**ASSEMBLY NUMBER: B-0243-0544**

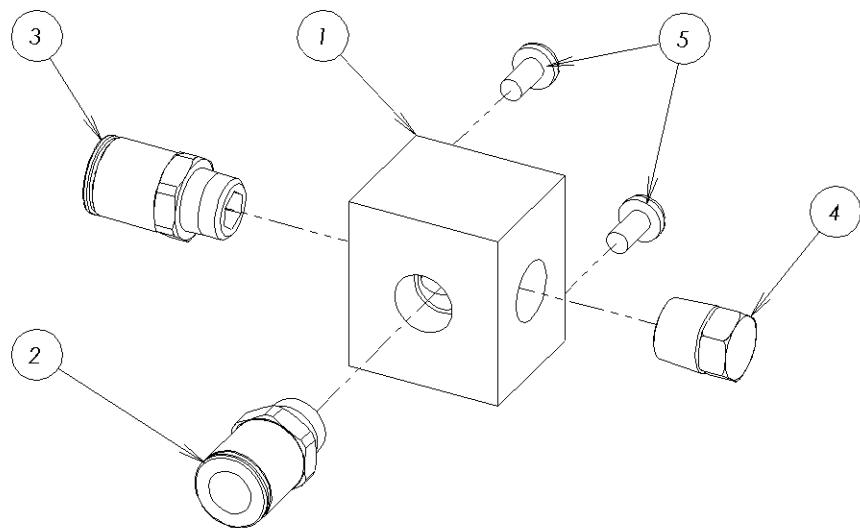
## GAS MIDDLE STATION ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0243-424	BLOCK, MANIFOLD, 1 x 3/8NPT
2	1	0243-0580	FITTING.TBG.SEAL.1/2OD X 3/8NPT
3	2	268P-08-06	FITTING.TBG.STR.1/2OD X 3/8NPT
4	2	PH1/4-20X1/2	SCREW, PAN HEAD

**ASSEMBLY NUMBER: B-0243-0545**

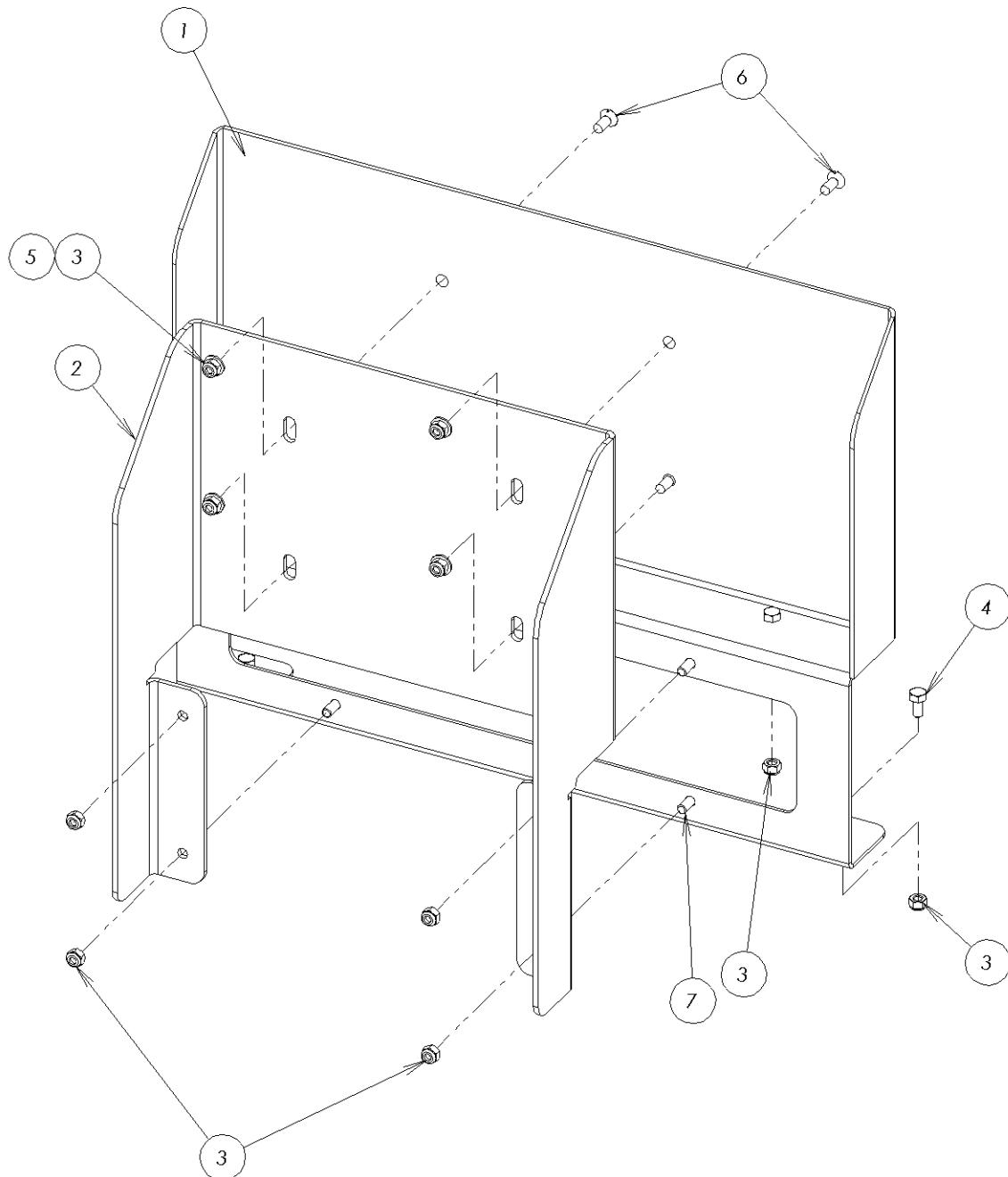
## GAS END STATION ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0243-424	BLOCK, MANIFOLD, 1 x 3/8NPT
2	1	0243-0580	FITTING.TBG.SEAL.1/2OD X 3/8NPT
3	1	268P-08-06	FITTING.TBG.STR.1/2OD X 3/8NPT
4	1	4464K333	PLUG.SS.0.38NPT
5	2	PH1/4-20X1/2	SCREW, PAN HEAD

**ASSEMBLY NUMBER: B-0243-0546**

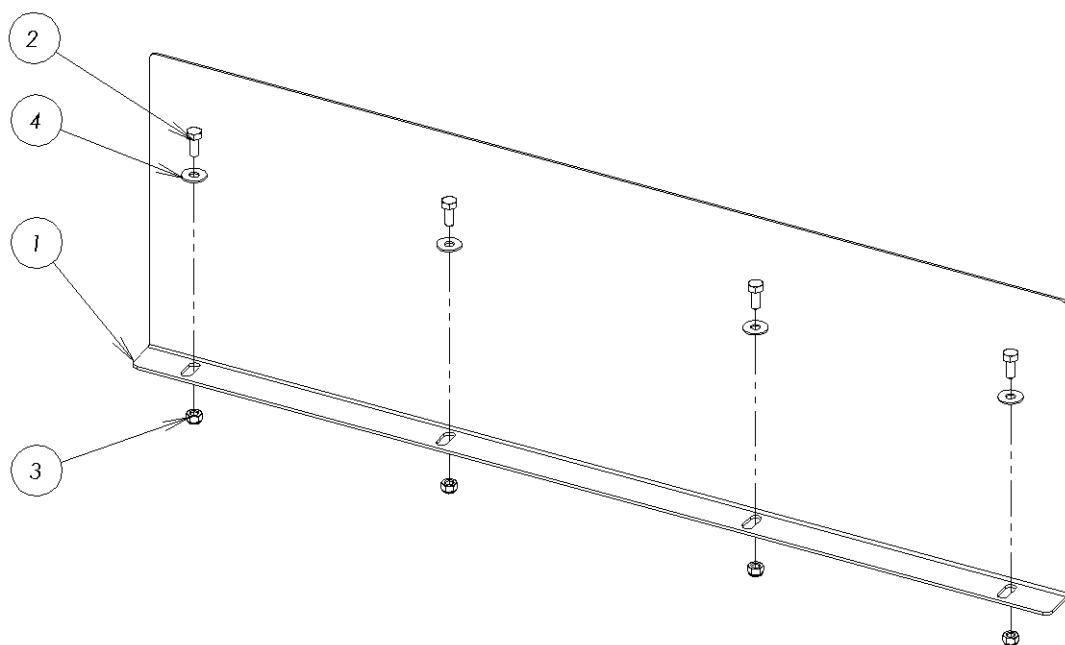
## BACKSTOP ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	C-0243-0740	BACKSTOP
2	1	C-0243-0532	BACKSTOP REINFORCEMENT
3	14	LN5/16-18	NUT, LOCK
4	6	HH5/16-18X5/8	SCREW, HEX HEAD
5	4	FW 5/16-C	WASHER, FLAT
6	4	FH 5/16-18 X 3/4	SCREW, FLAT HEAD SLOTTED
7	4	HH5/16-18X3/4	SCREW, HEX HEAD

**ASSEMBLY NUMBER: C-0243-0530**

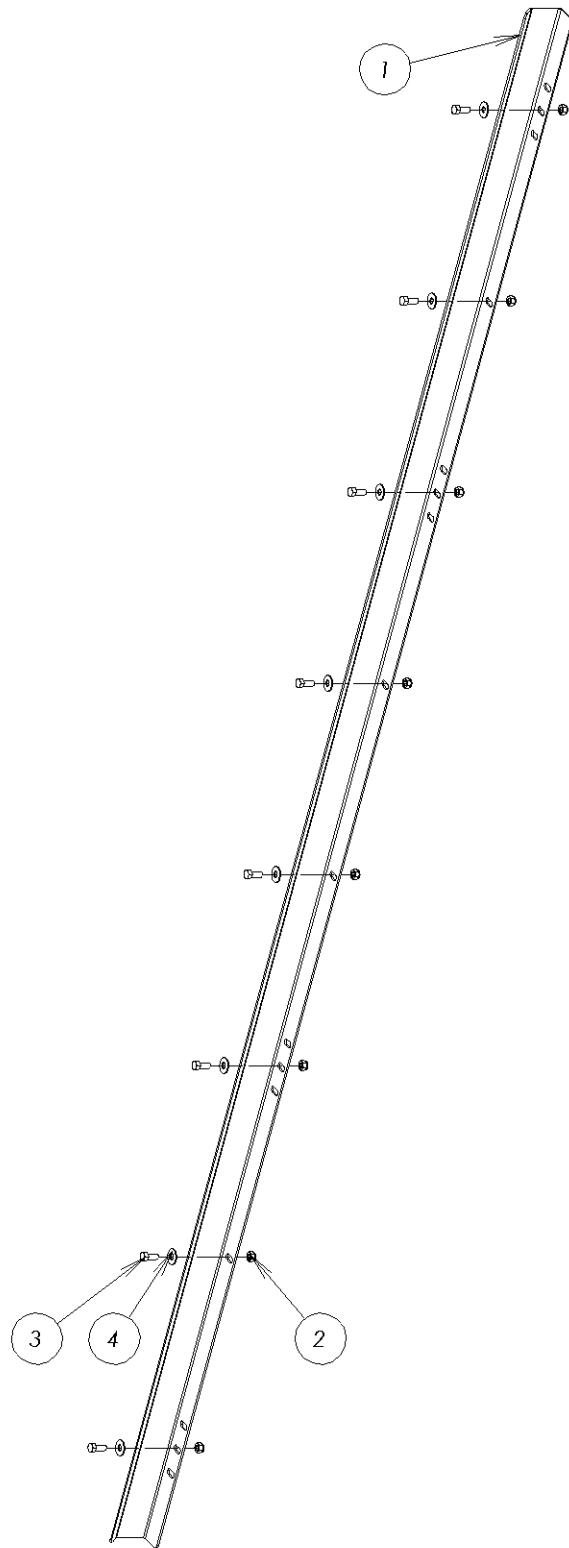
**GUIDE RAIL ASSEMBLY, 36"**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-417	GUARD RAIL, 36"
2	4	HH5/16-18X3/4	SCREW, HEX HEAD
3	4	LN5/16-18	NUT, LOCK
4	4	FW5/16-B	WASHER.FLAT

**ASSEMBLY NUMBER: B-0243-416**

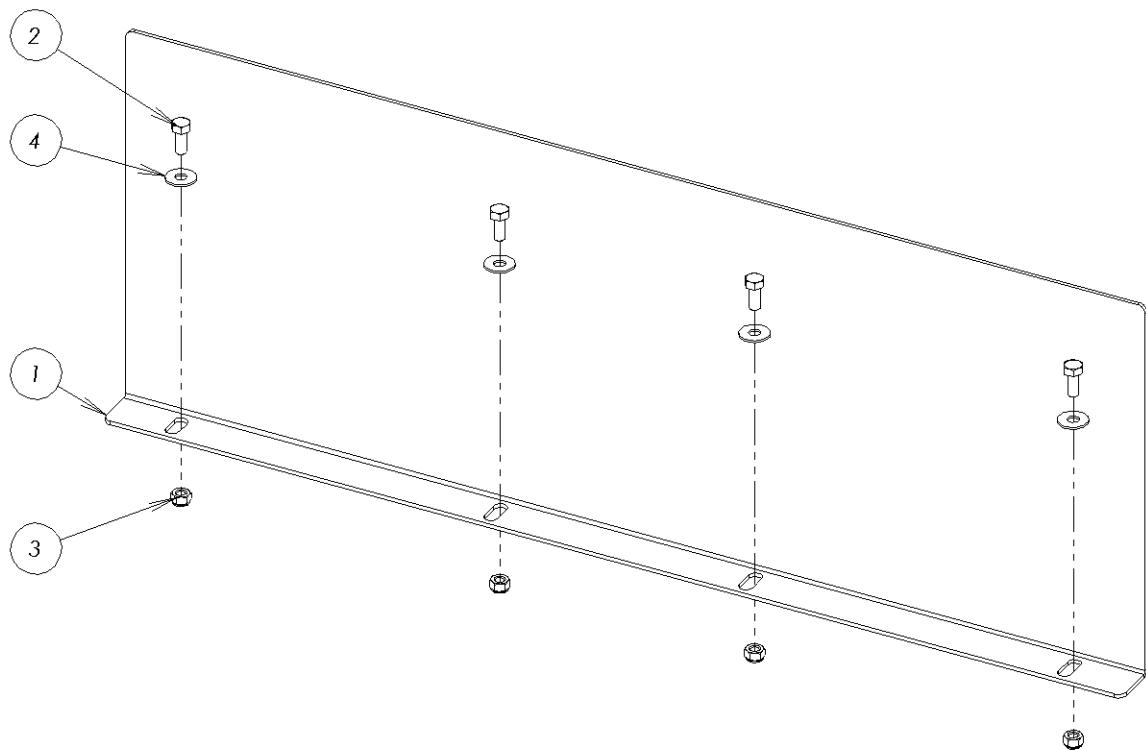
## ANGLED GUIDE RAIL ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-0525	ANGLE GUARD
2	8	LN5/16-18	NUT, LOCK
3	8	HH5/16-18X3/4	SCREW, HEX HEAD
4	8	FW5/16-B	WASHER.FLAT

**ASSEMBLY NUMBER: B-0243-0524**

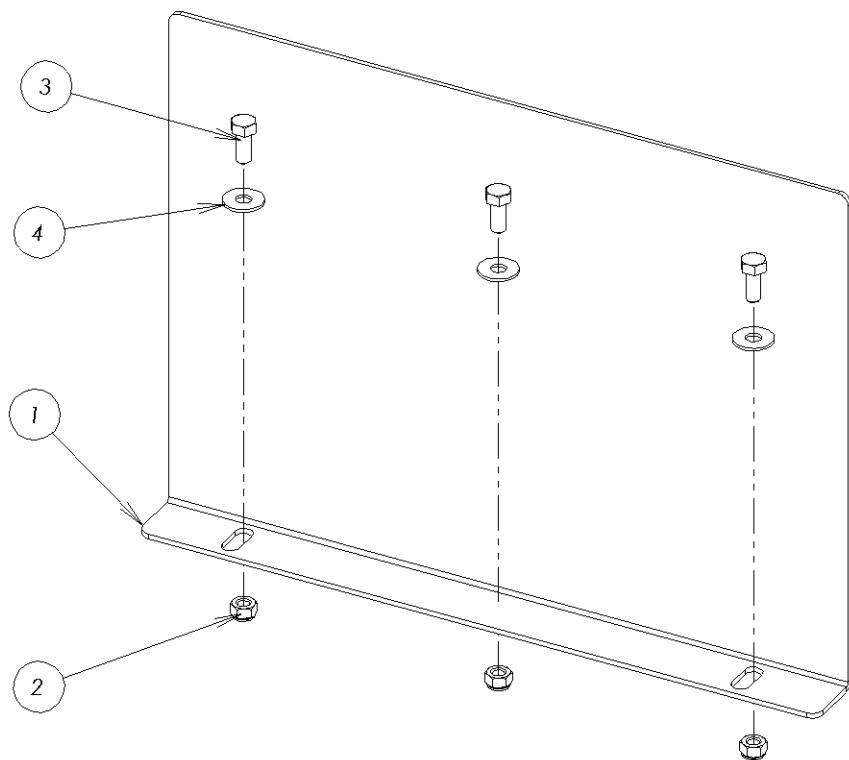
**GUIDE RAIL ASSEMBLY, 32"**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-0527	GUARD RAIL, 32"
2	4	HH5/16-18X3/4	SCREW, HEX HEAD
3	4	LN5/16-18	NUT, LOCK
4	4	FW5/16-B	WASHER.FLAT

**ASSEMBLY NUMBER: B-0243-0526**

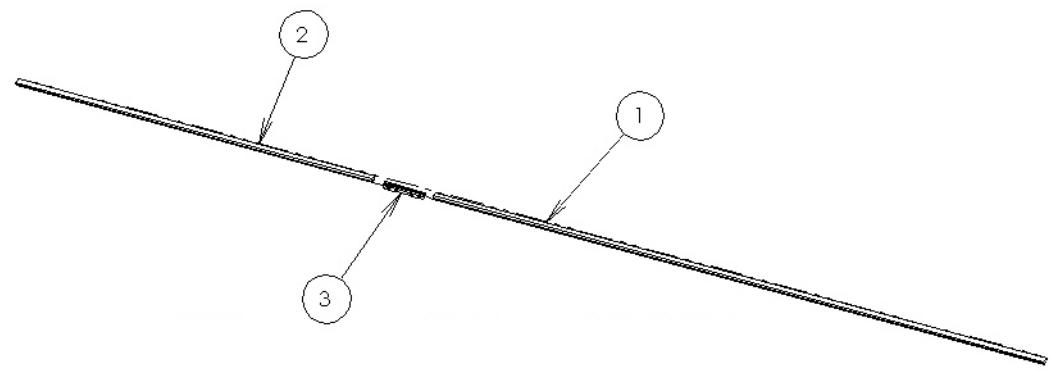
**GUIDE RAIL ASSEMBLY, 16"**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	B-0243-0529	GUARD RAIL, 16"
2	3	LN5/16-18	NUT, LOCK
3	3	HH5/16-18X3/4	SCREW, HEX HEAD
4	3	FW5/16-B	WASHER.FLAT

**ASSEMBLY NUMBER: B-0243-0528**

## WEAR STRIP ASSEMBLY, T-SHAPE

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	VG-SSTS-1.25-10	WEAR STRIP, SHAPE 'T', 120"
2	1	B-0243-0559	WEAR STRIP, "T" SHAPE, 70"
3	1	VG-113-08	CLAMP, RAIL SPLICER

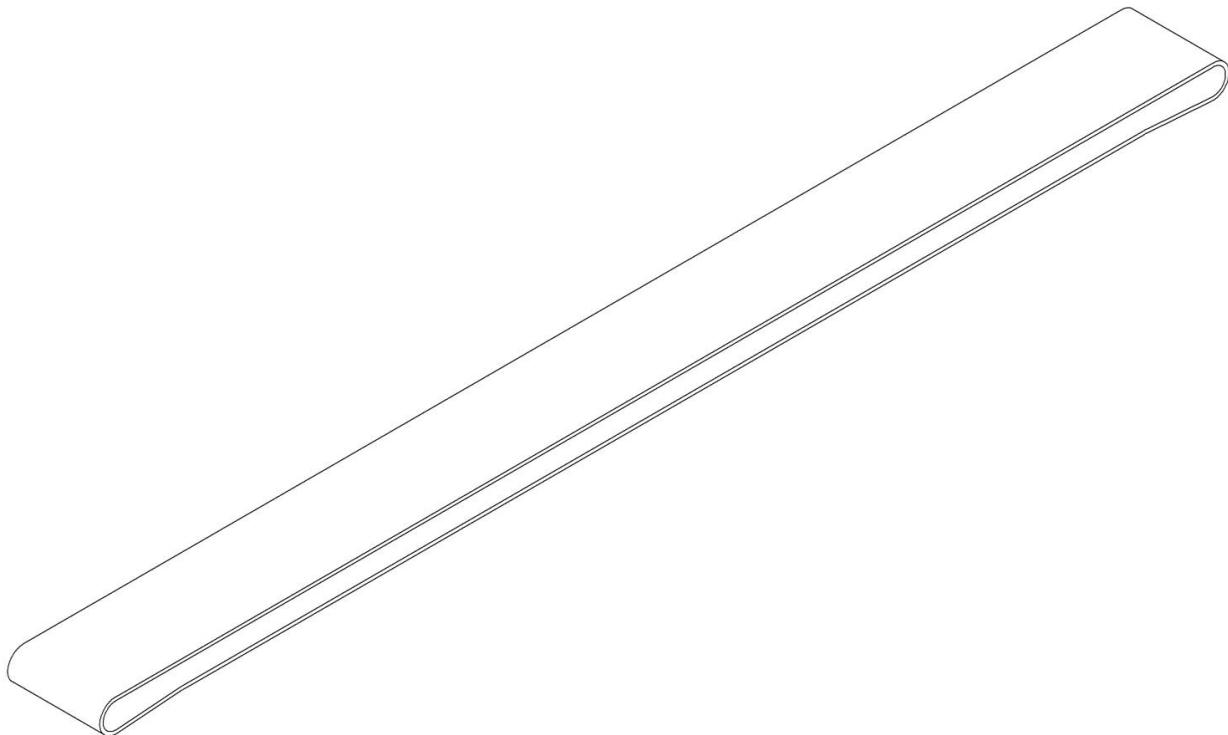
**ASSEMBLY NUMBER: B-0243-0558**

## BOTTOM CONVEYOR BELT

### BELT SPECIFICATIONS:

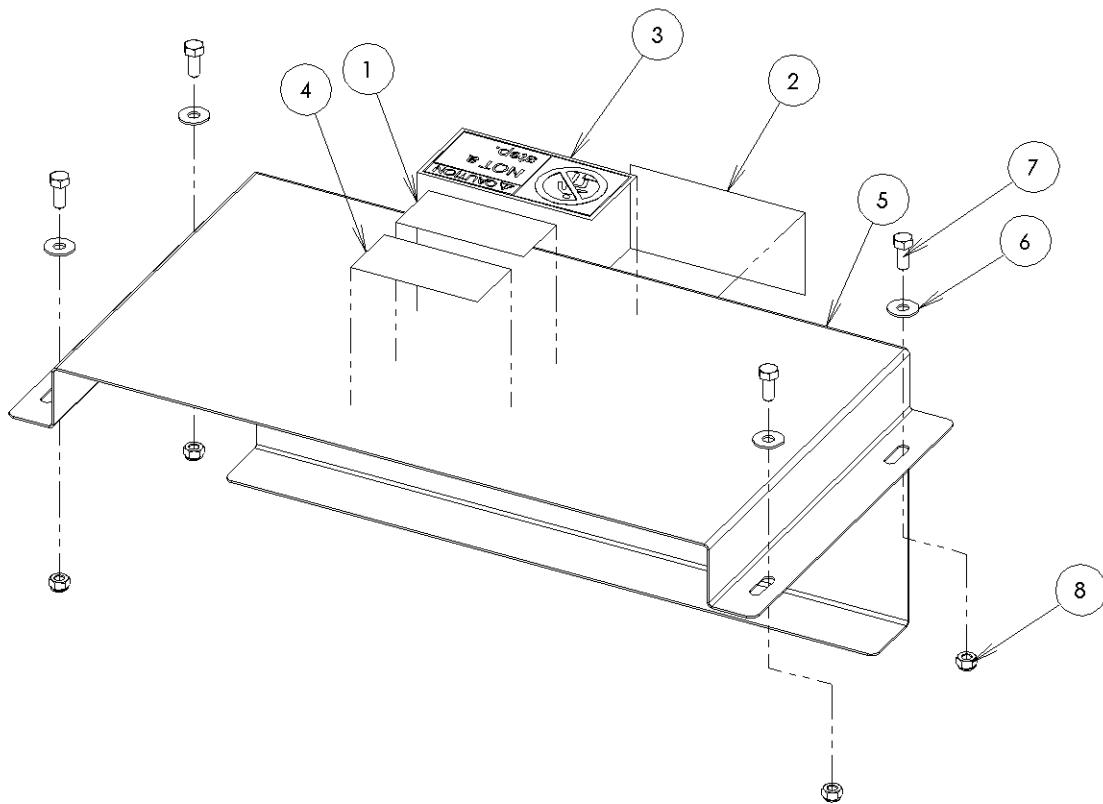
- SERIES 800 WHITE ACETAL
- FLUSH EDGE
- 5/32" DIAMETER PERFORATED ROUND HOLE
- 19.9" WIDE
- 37' LENGTH

**ASSEMBLY NUMBER: B-0243-0784**



**BOTTOM CONVEYOR COVER ASSEMBLY**

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	1	0210-1032	WARNING LABEL, KEEP HANDS CLEAR
2	1	0210-1035	WARNING LABEL, GUARDS IN PLACE
3	1	0243-0240	LABEL: NOT A STEP
4	1	86075T51	WARNING LABEL, NO CLIMBING
5	1	C-0243-0779	BOTTOM CONV GUARD
6	4	FW5/16-B	WASHER, FLAT
7	4	HH5/16-18X3/4	SCREW, HEX HEAD
8	4	LN5/16-18	NUT, LOCK

**ASSEMBLY NUMBER: C-0243-0778**

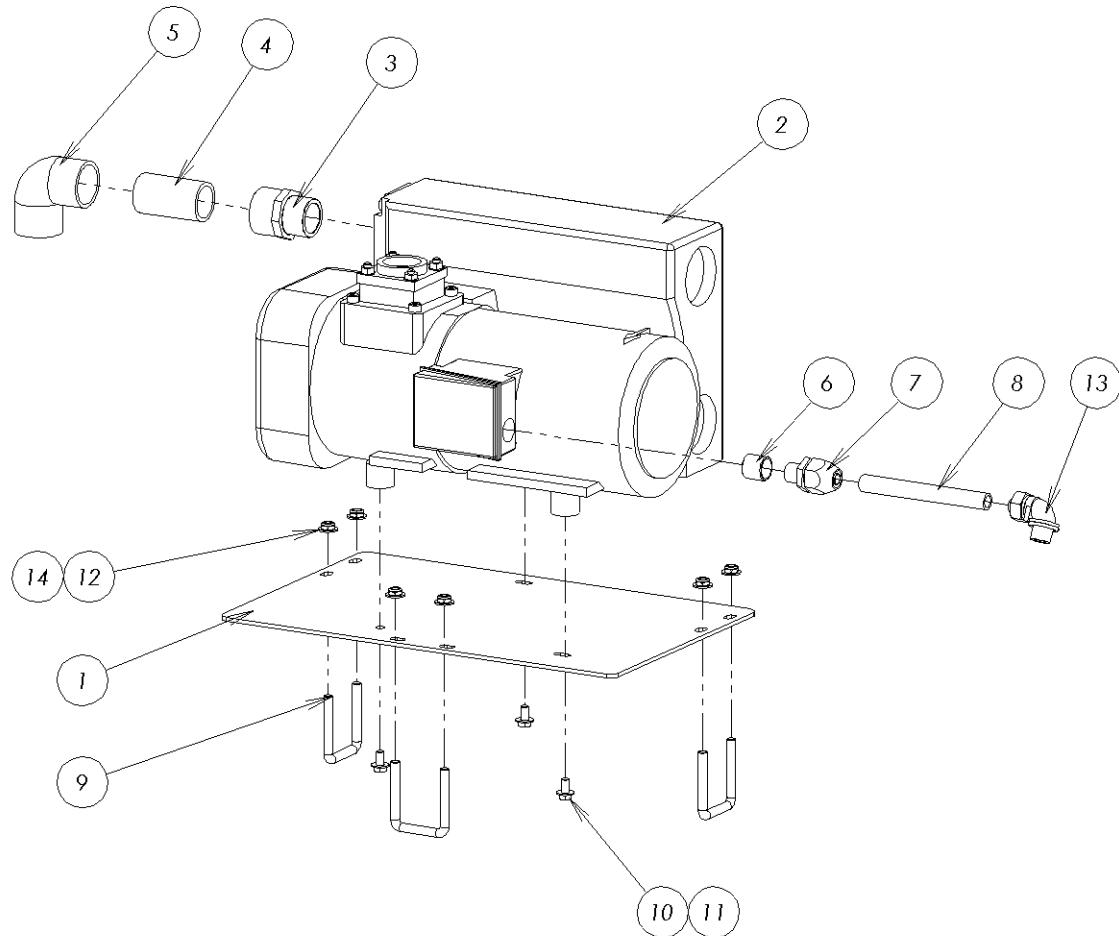
## ELECTRIC VACUUM PUMP ASSEMBLY

ITEM NO.	-0/QTY.	-1/QTY.	PART NUMBER	DESCRIPTION
1	6	6	30-073	WIRE NUT
2	3	3	3060T71	SQUARE U-BOLT
3	1	-	7707-2083	VACUUM PUMP
4	1	1	C-0243-0748	PLATFORM, VAC PUMP, SV40B
5	6	6	FW3/8-A	WASHER, FLAT
6	3	3	FW5/16-A	WASHER, FLAT
7	3	3	HH8MMX16MM	SCREW, HEX HEAD
8	1	1	LA10	SEALTITE, 3/8"
9	6	6	LN3/8-16LP	NUT, LOCK, LOW PROFILE
10	1	1	MA1-1/4	ADAPTER.PVC.1-1/4NPT X 1-1/4 PIPE.MALE
11	1	1	MLW14-AWG	WIRE, BLACK, TYPE M
12	1	1	PE1-1/4	ELBOW.PVC.1.25PIPE X 90DEG
13	1	1	PN10-10R-L	RING TERMINAL
14	1	1	PP1-1/4X3	PIPE
15	1	1	RE21	BUSHING, REDUCER
16	1	1	ST38	CONNECTOR, SEALTITE, 3/8
17	1	1	ST9038	CONNECTOR.SEALTITE.1/2NPT X 3/8
18	1	1	WG 14-AWG	WIRE, GREEN/YELLOW MTW, 48"
19	-	1	7707-1815	VACUUM PUMP
20			7707-2099	REPLACEMENT VAC PUMP EXHAUST FILTER
21			7707-VO3	VACUUM OIL, 1 GAL

Options:

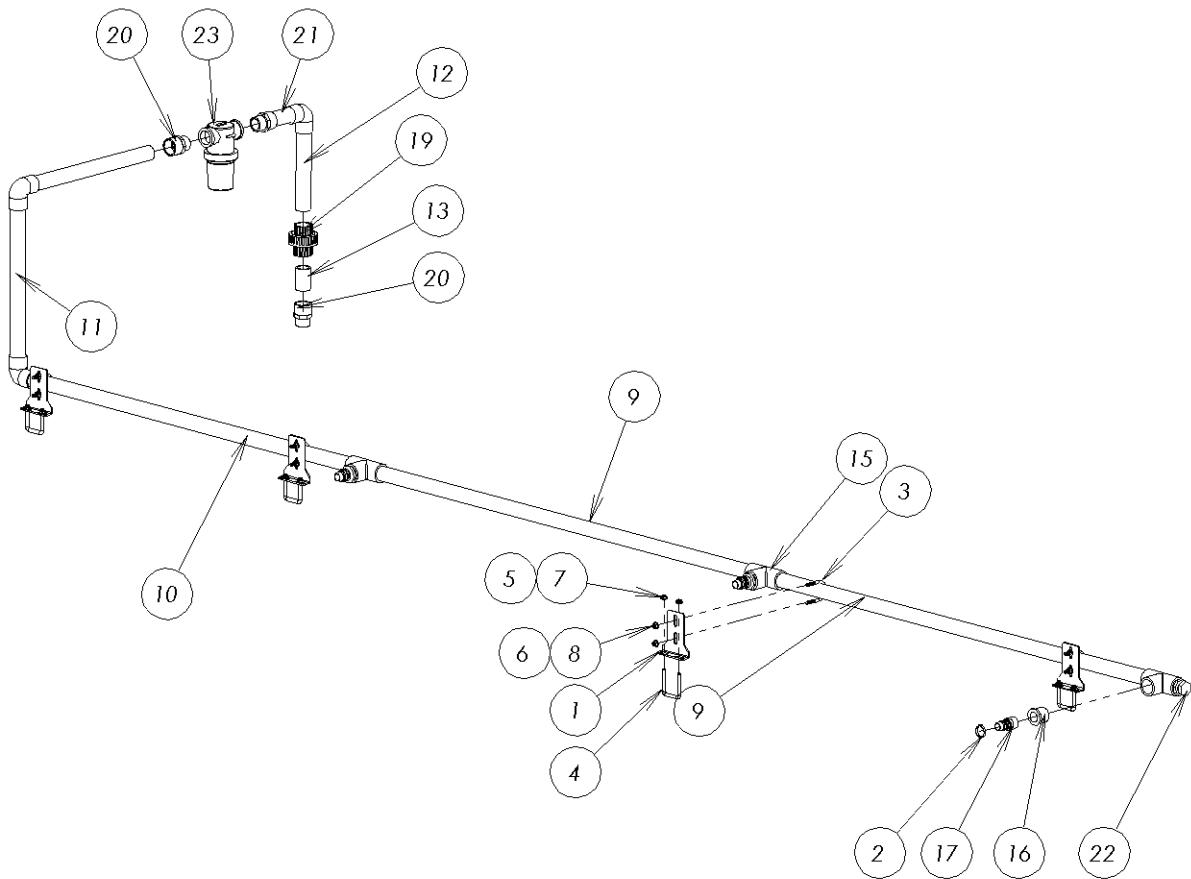
-0: 220/440 VAC

-1: 575 VAC

**ASSEMBLY NUMBER: C-0243-0749**

## VACUUM MANIFOLD ASSEMBLY

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
1	4	B-0210-1222	BRKT, PIPE SUPPORT
2	3	52545K58	CLAMP.CRIMP.1.00ID HOSE
3	4	0210-1221	U-BOLT, 1-1/4" PIPE
4	4	3060T71	SQUARE U-BOLT
5	8	FW3/8-A	WASHER, FLAT
6	8	FW5/16-A	WASHER, FLAT
7	8	LN3/8-16LP	NUT, LOCK, LOW PROFILE
8	8	LN5/16-18	NUT, LOCK
9	2	PVC1-1/4OD	PIPE.PVC.1-1/4 SCH40 X 60.00LG
10	1	PVC1.25OD	PIPE.PVC.1-1/4 SCH40 X 52.00LG
11	1	PVC1.25OD	PIPE.PVC.1-1/4 SCH40 X 19.00LG
12	1	PVC1.25OD	PIPE.PVC.1-1/4 SCH40 X10.00LG
13	1	PVC1-1/4OD	PIPE.PVC.1-1/4 SCH40 X 2.50LG
14	1	PVC1.25OD	PIPE.PVC.1-1/4 SCH40 X 12.00LG
15	3	0243-0750	TEE, 1-1/4"
16	4	0210-1214	BUSHING.PVC.1-1/4PIPE X 1NPT
17	3	0210-1213	HOSE BARB.1.00ID HOSE X 1.00NPT
18	3	PE1-1/4	ELBOW.PVC.1.25PIPE X 90DEG
19	1	0210-1219	UNION.PVC.1-1/4PIPE
20	3	MA1-1/4	ADAPTER.PVC.1-1/4NPT X 1-1/4 PIPE.MALE
21	1	PVC1-1/4OD	PIPE.PVC.1-1/4 SCH40 X 5.00LG
22	1	0243-0756	PLUG, PVC, 1" NPT
23	1	0210-1813	1 1/4 NPT FILTER BOWL

**ASSEMBLY NUMBER: D-0243-0751**



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