

3M-Matic™
800rf Type 19000 and 29800
Automatic Random Case Sealer with
AccuGlide™ II Taping Heads

## Service Manual

### 3M-Matic<sup>™</sup> 800rf Service Manual

### **Revision History**

The original issue of this manual and subsequent revisions are identified as follows:

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#### Warning and Caution Labels

There are five different warning and caution labels used on the Model 800rf Case Sealer.

Two "WARNING - SHARP KNIFE" labels as shown in figure 1 (A) are positioned on the top of each belt drive assembly, adjacent to the side columns. These labels warn operators and service personnel of the very sharp knife used to cut the tape at the end of the tape application — located in the lower taping head.

Two "WARNING - Sharp Knife. Keep hands out of this area." labels as shown in figure 1 (B), are attached to the sides of the top taping head, adjacent to the internal cut-off assembly. The labels warn operators and service personnel of the upper taping head's very sharp knife used to cut the tape at the end of the tape application.

The "WARNING - Sharp Knife" label, shown in figure 1 (C), is attached to the orange cut-off blade guard on both taping heads. The label warns the operator and service personnel of the very sharp knife located behind the guard and to keep hands out of this area except for tape loading and servicing the taping heads.

### **MARNING**

THE TAPING HEADS ARE EQUIPPED WITH AN ORANGE BLADE GUARD THAT COVERS THE BLADE. THE TAPING HEADS MUST NEVER BE OPERATED WITH THE BLADE GUARDS REMOVED.





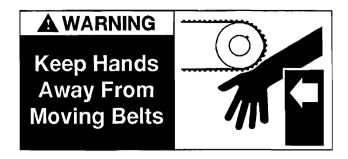
**B**)

800rf-79A

Figure 1

The "WARNING - Keep Hands Away From Moving Belts" label, shown in figure 2, is attached to the top surface of both side drive belt assemblies, at the case entry end. The label warns the operator to keep their hands from between the case and side drive belts when the drive belts are running.

The "CAUTION - Keep Hands Out Of This Area" label is attached to the end plate of the upper taping head, at the exit-end of the machine. This label warns operators to keep their hands from this area when the upper taping head is in operation or





800rf-85A

Figure 2



Figure 3

motion.

A "CAUTION - OPENING SAFETY SHIELDS WILL STOP MOTORS AND RETURN PNEUMATICS TO START POSITION" label is attached to the transparent front and rear shields. This label does not warn of possible hazards. Rather, it warns of accidental stopping of the machine. Opening the shields "homes" the machine, stopping any ongoing case sealing actions.

**ACAUTION OPENING SAFETY SHIELDS WILL STOP MOTORS AND RETURN PNEUMATICS TO** START POSITION

800rf-65

Figure 4

The "DANGER - Hazardous Voltage Unplug Power Before Servicing" label, shown in figure 5, is attached at two locations:

- on the front of the electrical panel, at the front of the machine. When power is on, removal of the panel cover allows access to +24 VDC and 220 VAC.
- on the front panel of the operator console. The front door of the console cannot be opened when the main power switch is on. Once the console door is open however, power can be restored. Whenever the console door is open, with power on or power off, access to 220 VAC is possible.



Figure 5

#### Tape Threading Label

The Tape Threading Label shown in figure 6 is attached to the left side of both the upper and lower taping heads. This label provides a convenient tape threading diagram. More detailed tape loading and threading information is provided in this manual in the set-up procedure section.

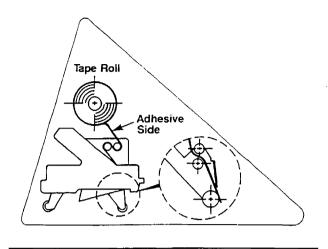


Figure 6

#### **STOP Switches**

The Model 800rf is equipped with three "STOP" switches. Their locations are shown in figure 7.

Pressing either of the conveyor-mounted STOP switches stops and "homes" the machine, removing electrical power from the controller. To restart the machine, you must turn and release the conveyor-mounted STOP switch and then press the consolemounted START switch.

Pressing the console-mounted STOP switch stops and "homes" the machine but does not remove power from the controller. To restart the machine, you must press the console-mounted START switch.

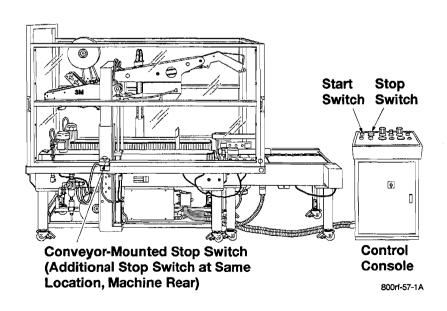


Figure 7

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Equipment Warranty and Limited Remedy: THE FOLLOWING WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, A CUSTOMER OR USAGE OF TRADE:

3M sells its 3M-Matic™ 800rf Fully Automatic Random Case Sealer with the following warranties:

- 1. The Taping Head knife blades, springs and rollers will be free from all defects for ninety (90) days after delivery.
- 2. All other Taping Head parts will be free from all defects for three (3) years after delivery.
- 3. All other parts will be free from all defects for ninety (90) days after delivery.

If any part is proved to be defective within its warranty period, then the exclusive remedy and 3M's and seller's sole obligation shall be, at 3M's option, to repair or replace the part, provided the defective part is returned immediately to 3M's factory or an authorized service station designated by 3M. A part will be presumed to have become defective after its warranty period unless the part is received or 3M is notified of the problem no later than five (5) calendar days after the warranty period. If 3M is unable to repair or replace the part within a reasonable time, then 3M at its option, will replace the equipment or refund the purchase price. 3M shall have no obligation to provide or pay for the labor required to install the repaired or replacement part. 3M shall have no obligation to repair or replace: (1) those parts failing due to operation misuse, carelessness or due to any accidental cause other than equipment failure, or (2) parts failing due to non-lubrication, inadequate cleaning, improper operating environment, improper utilities or operator error.

Limitation of Liability: 3M and seller shall not be liable for direct, indirect, special, incidental or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability or any other legal theory.

The foregoing Equipment Warranty and Limitation of Liability may be changed only by a written agreement signed by authorized officers of 3M and seller.

#### 1-1. Description

The 3M-Matic<sup>™</sup> Model 800rf Series 19000
Automatic Random Case Sealer with AccuGlide<sup>™</sup>
II taping heads, shown in figure 1-1, is designed to accept filled, regular slotted containers from an existing conveyor, fold the top flaps and apply a "C" clip of Scotch<sup>™</sup> brand Pressure-sensitive Film Box Sealing Tape to the top and bottom center seams. The case sealer automatically adjusts itself for a wide range of case sizes while a pair of side-drive belts convey the cases through the machine.

The case sealer is controlled from an operator's console bringing the most-used controls within easy reach of the operator. The console is microprocessor-based and firmware controlled to maintain maximum and precise control over all operations within the case sealer.

Troubleshooting and testing the case sealer is simple. Active input and output lines to and from the controller are indicated by light emitting diodes (LEDs). This makes problem solving easy.

#### Note

In this manual, the end of the case sealer that accepts cases for taping is the infeed end. The end of the case sealer where the taped cases leave is the exit end. The side containing the electrical power panel and air controls is the front or left of the machine, and the side containing the pneumatics panel is the back or right.

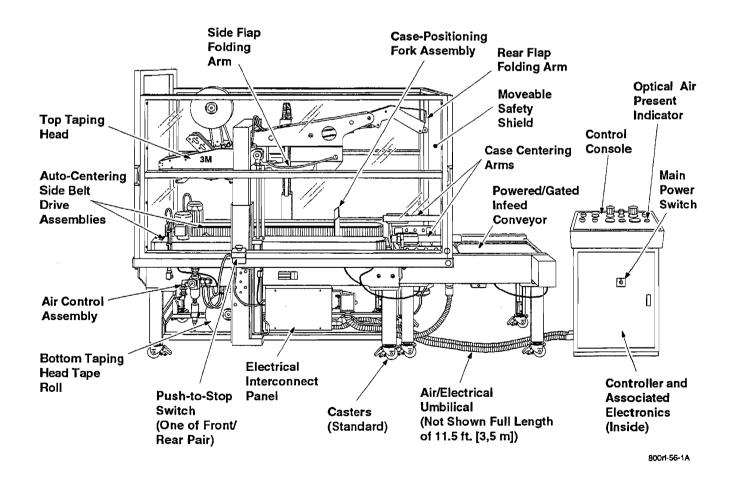


Figure 1-1

<sup>&</sup>quot;3M-Matic," "AccuGlide" and "Scotch" are trademarks of 3M, St. Paul, MN 55144-1000

### 1-2. Specifications

#### Tape:

Most Scotch<sup>™</sup>, Highland<sup>™</sup>, and Tartan<sup>™</sup> brand Pressure-sensitive Film Box Sealing Tape.

#### Tape Width:

1-1/2 inches [36 millimetres] minimum, to 2 inches [48 millimetres] maximum.

#### Tape Roll Diameter:

Up to 15-1/2 inches [394 millimetres] maximum, on a 3-inch [76,2 millimetres] diameter core.

#### **Box Dimensions:**

Height: 6 inches [152 millimetres] minimum,

20 inches [508 millimetres] maximum

Length: 8 inches [203 millimetres] minimum,

24 inches [610 millimetres] maximum

Width: 8 inches [203 millimetres] minimum,

19-1/2 inches [495 millimetres] maximum

#### Box Weight Capacity: (filled)

65 pounds [30 kilograms] maximum; minimum must be sufficient to hold case on the conveyor bed with bottom flaps flat.

#### Box Type:

Box board, 125 to 275 PSI bursting test, single wall A, B or C flute.

#### Note

The case sealer accommodates most boxes within the size range identified above. However, if the ratio of box length (in the taping direction) to box height is 0.6 or less, several boxes should be testrun to ensure proper machine performance.

DETERMINE THE BOX LIMITATIONS BY COMPLETING THIS FORMULA:

 $\frac{Box (tape) Length}{Box Height} > 0.6$ 

#### **Operating Conditions:**

Use in dry, relatively clean environments at 40° to 120°F [5° to 49°C] with clean, dry boxes. The machine should not be washed down or subjected to conditions causing moisture condensation on components.

#### **Machine Specifications:**

Length: 73-1/4 inches [1,86 metres]

100.75 inches [2,56 metres] with infeed

Width: 49 inches [1,24 metres]

Height: 73-1/2 inches [1,87 metres] minimum,

with casters, to 80 inches [2,03 metres]

maximum, with casters

Weight: Main unit, uncrated = 790 pounds

[358 kilograms]

Main unit, crated = 1200 pounds

[544 kilograms]

Infeed unit, crated = 250 pounds

[113 kilograms]

Case sealer bed height: Adjustable up from factory-set height of 25-1/2 inches [650 millimetres] to 32 inches [815 millimetres] with casters.

#### **Console Specifications:**

Width: 23-3/4

23-3/4 inches [603 millimetres]

Length:

17-3/4 inches [451 millimetres]

Height:

39-7/8 inches [1,015 metres]

#### **Power Requirements:**

Electrical: 220 VAC, 60 Hz, 2.2 Amps, 3-phase. Pneumatic: 90 - 100 PSIG [6.5 BAR] 7.0 SCFM

[11,89 m<sup>3</sup>/h 21°C, 101 kPa] maximum

at maximum cycle rate.

#### **CAUTION**

Do not connect a lubricator or lubricated air to this machine. This machine has a non-lubricated air circuit.

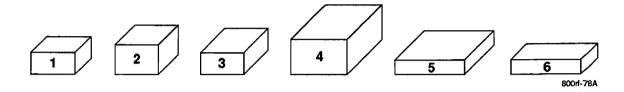
"Scotch," "Highland" and "Tartan" are trademarks of 3M, St. Paul, MN 55144-1000

### 1-3. Case Sealing Rate Approximation Formula

To determine the case sealing rate for your application:

a. Obtain a representative sample of boxes in the proportion that will be run through the machine. Use as many boxes as necessary to get an accurate sample.

Example:



- b. Determine (add up) the total length of all boxes.
- c. Determine (add up) the total width of all boxes.
- d. Determine (add up) the total height of all boxes.

Total length (inches)

Total width (inches)

Total height (inches)

e. Divide the dimension totals by the number of boxes — to determine average length, width and height.

Total length
Number of boxes

Total width
Number of boxes

Total height
Number of boxes

Average length
Average width

Average width

Average height
Number of boxes

800rf Case Sealing Rate (cases per minute)

 $Rate = 6.37 - (0.03 \ X \ ave. \ length) + (0.02 \ X \ ave. \ width) + (0.24 \ X \ ave \ height)$ 

#### 1-4. Machine Dimensions

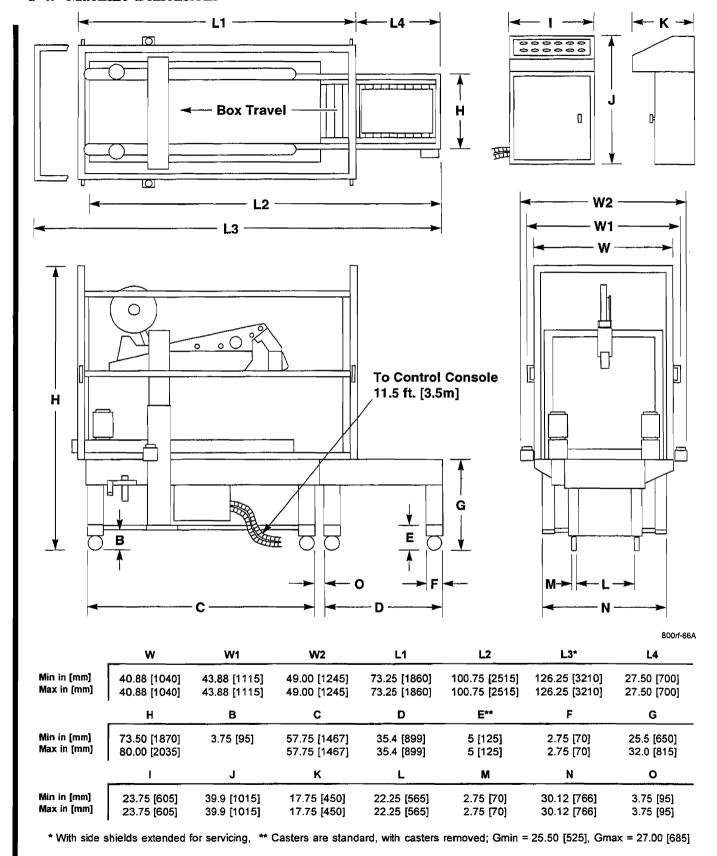


Figure 1-2

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#### 2-1. General

The following instructions are presented in the order recommended for installing and setting up the case sealer, as well as for learning the operating functions and adjustments. Following these instructions step by step results in a thorough understanding of the case sealer and its installation in a production line that best uses the many features of case sealer. Refer to figure 2-1 for nomenclature.

Uncrating and set-up consist of 4 steps:

- 1. Uncrating the equipment.
- 2. Assembling the case sealer as described in this section.
- 3. Providing the electrical and pneumatic connections.
- 4. Installation of the case sealer and console in a production line.

Once the preceding steps have been completed, contact:

3M Masking and Packaging Systems Division National Service Center Phone 1-800-328-1390

A technician will be sent for a final check-out inspection.

#### Note

We recommend that you do not operate the case sealer in a production situation until the final check-out inspection is complete.

#### Note

For the final check-out inspection, have a sufficient supply of cases in representative size and weight to check the case sealer under normal operating conditions.

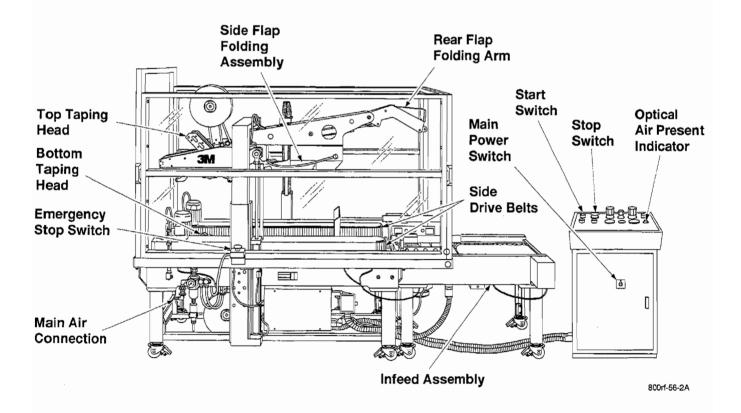


Figure 2-1

#### 2-2. Unpacking

#### Note

It is the responsibility of the customer to uncrate the case sealer, operator's console, and infeed conveyor. Lifting equipment (fork lift, overhead crane etc.) is necessary to lift the case sealer from its pallet.

The case sealer is delivered in two crates; a large crate for the case sealer, and a smaller one containing the infeed conveyor and the operator's console.

Perform the following inspection upon receipt of the case sealer.

1. Inspect the shipping crates for damage that could indicate internal damage to the case sealer, infeed conveyor, or console.

Report any damage, missing parts or other problems to:

3M Masking and Packaging Systems Division National Service Center Phone 1-800-328-1390

- Dismantle both crates.
- 3. Inspect the case sealer, infeed conveyor, console, and un-installed components for damage or missing parts. The large crate should also contain the following:

One upper tape drum bracket (taped to conveyor bed)

Two photocell assemblies (electrically connected to the case sealer but not mounted in place)

Two emergency switches with brackets (electrically connected but not mounted in place)

One safety shield assembly consisting of:

2 Side frames w/ PVC inserts

1 End-frame, high (exit end)

1 End-frame, low (entrance end)

16 Cap screws, 8 mm x 45 mm long

16 Plain washers, 8 mm I.D. x 24 mm O.D.

Two safety shield detent/latch assemblies consisting of:

2 Brackets

2 Compression springs

2 Steel Balls

4 Cap screws, 8 mm x 25 mm long

2 Spacer plates

One tool box containing:

1 BOTTLE, Oil

1 WRENCH, open-end, 17 mm

1 WRENCH, box/open, 13 mm & 10 mm

1 WRENCH, box/open, 8 mm & 7 mm

1 WRENCH, hex key, 2,5 mm

1 WRENCH, hex key, 3 mm

1 WRENCH, hex key, 4 mm

1 WRENCH, hex key, 5 mm

1 WRENCH, hex key, 6 mm

1 WRENCH, hex key, 8 mm

1 SPRING, Bottom ext. (78-8054-8850-1)

1 SPRING, Top ext. (78-8052-6589-5)

2 SPRINGS, Cutter (78-8052-6602-6)

2 BLADES, Cutter (78-8017-9173-8)

2 TOOLS, Tape threading (78-8017-9433-6)

4. Report any damage, missing parts or other problems to:

3M Masking and Packaging Systems Division National Service Center Phone 1-800-328-1390

### 2-3. Set-Up Procedure

#### Case Sealer Bed Height

The legs on the case sealer can be adjusted to obtain different bed heights from the factory-set height of 25-3/8 inches [645 mm]. Set the bed height as follows:

- 1. Block up the case sealer frame to allow adequate leg adjustment.
- 2. Using a 6 mm hex key wrench, loosen, but do not remove, two M8 x 16 mm socket-head cap screws in one leg. Refer to figure 2-3A.

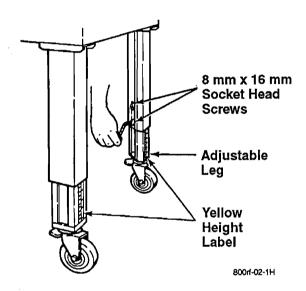


Figure 2-3A

3. Using the yellow height label as a guide, adjust the leg length to the desired conveyor bed height. Re-tighten the two screws to secure the leg. Adjust the three remaining legs in the same way.

### 2-3. Set-Up Procedure (Cont.)

Safety Shield Installation

### **MWARNING**

TWO PEOPLE ARE REQUIRED TO LIFT THIS ASSEMBLY. PERSONAL INJURY AND/OR MACHINE DAMAGE COULD RESULT IF IMPROPER LIFTING TECHNIQUES ARE USED.

1. Assemble the safety shield as shown in figure 2-3B.

#### Note

Please note that the shield side-frames are not interchangeable. To ensure correct assembly, one of the side-frames has a half circle in its bottom right corner and the shorter end-frame has a similar half circle near the bottom of its front leg. Position the short end-frame so that its half circle is adjacent to the half circle on the front side-frame thus forming a complete circle.

2. Install the assembled safety shield on the rails.

#### Note

The front rail has a solid black circle at its right-hand end. Install the shield on the rails so that the two half-circles on the shield are adjacent to the circle on the front rail. Refer to the enlarged portion of figure 2-3B.

### **∆**CAUTION

In the future, if the safety shield is removed and then re-installed, take care to avoid damage to the safety shield interlock switch (located on the inside of the front safety shield rail).

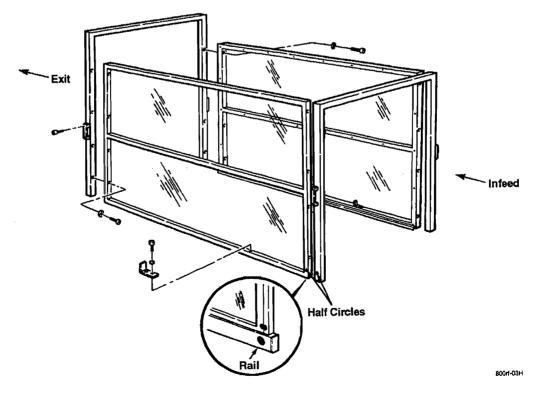


Figure 2-3B

#### Safety Shield Detent/Latch Installation

- Secure the safety shield detent/latch bracket, spacer plate and emergency stop switch bracket (with switch) on the support assembly. Use 8 mm x 25 mm cap screws and washers. Refer to figure 2-3C.
- 2. Install the steel ball, spring and slotted set screw as shown in figure 2-3C. Tighten the set screw until resistance is felt. Final adjustment is made later.

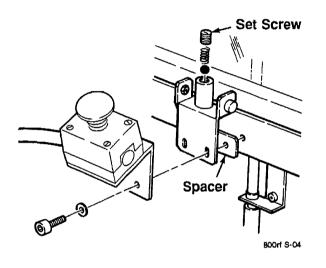


Figure 2-3C

- 3. Repeat the procedure for the second safety shield detent/latch assembly.
- 4. Adjust each of the slotted set screws so that when the spring-loaded balls enter the detents in the shield, the shield is held firmly in place but not so firmly that shield movement is difficult.

#### Infeed Conveyor Height

The legs on the infeed conveyor can be adjusted to obtain different heights from the factory-set height. Set the infeed conveyor height to the same height as the case sealer as follows:

- 1. Block up the infeed conveyor frame to allow adequate leg adjustment.
- 2. Using a 6 mm hex key wrench, loosen, but do not remove, two M8 x 16 mm socket-head screws in one leg. Refer to figure 2-3D.
- 3. Using the yellow height label as a guide, adjust the leg length to the same height as the legs on the case sealer bed. Re-tighten the two screws to secure the leg. Adjust the remaining three legs in the same manner.

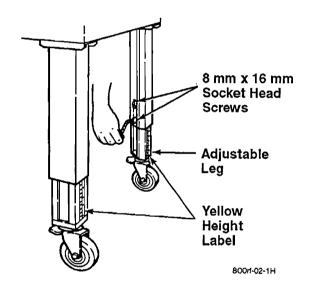


Figure 2-3D

#### 2-3. Set-Up Procedure (Cont.)

#### Attaching the Infeed Conveyor

 Using a 6 mm hex key wrench, remove the four outer socket-head cap screws from the shield rail supports at the infeed end of the case sealer. Refer to figure 2-3E.

Save the screws for reinstallation.

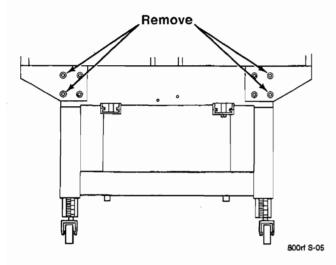


Figure 2-3E

- Move the infeed conveyor to its approximate position at the infeed end of the case sealer.
- Align the holes on the infeed conveyor mounting plate with the holes on the case sealer safety shield supports (where the cap-screws were removed in step 1).

Install the screws removed in step 1, and tighten them securely. Refer to figure 2-3F.

#### Note

If the holes do not align exactly, it may be necessary to readjust the infeed conveyor height. This should be done before installing the screws.

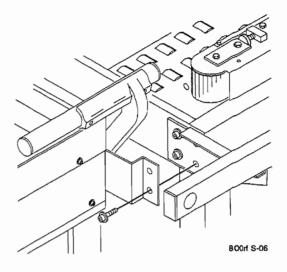


Figure 2-3F

4. Refer to figure 2-3G. Connect the black electrical cable from the infeed conveyor motor to the small connector on the side of the electrical box on the case sealer. Fasten the connector by moving the latch into the locked position.

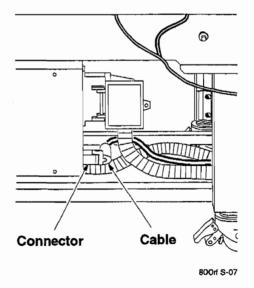


Figure 2-3G

#### Attaching the Infeed Conveyor (Cont.)

 Connect the grey pneumatic cable from the pneumatic box on the case sealer to the connector on the left underside of the infeed conveyor frame as shown in figure 2-3H. The connector is keyed and fits only one way.

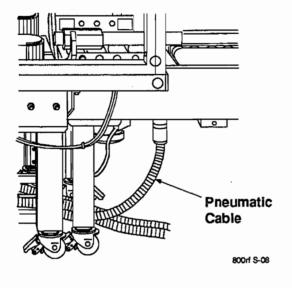


Figure 2-3H

- 6. Install the infeed index photocell PC1 into the position opposite the reflector as shown in figure 2-31. The photocell has the number 1 on its label.
- 7. Install the long box control photocell (PC2) in the position opposite the reflector as shown in figure 2-3I. The photocell has the number 2 on its label.

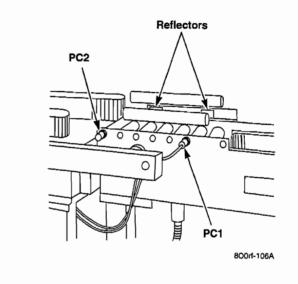


Figure 2-3I

### 2-3. Set-Up Procedure (Cont.)

#### Connecting the Console

- 1. Loosen the captive screw on the far side of the spring loaded door on the large connector on the electrical box on the case sealer.
- 2. Hold the door open and connect the black electrical cable with the large 48-pin connector from the console to the connector on the case sealer. Fasten the connector by pulling the latch into the locked position as shown in figure 2-3J.

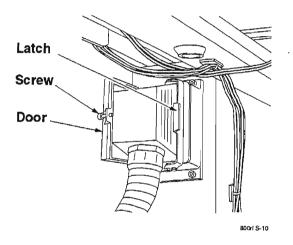


Figure 2-3J

- 3. Open the door in the lower front of the console pedestal and locate four compressed air lines on the left side wall.
- 4. Pick up the grey pneumatic cable coming from the pneumatic box on the Case Sealer and remove the locking ring from the end.
- Feed the four black hoses through the vacant hole at the bottom left side of the console.
   Feed the end of the grey cover through the hole and fasten it with the locking ring on the other side.

6. Refer to figure 2-3K. Match the numbers on the hoses from the case sealer to the numbers on the hoses inside the console. Fasten each hose into the connectors by pushing up on the red ring. Push the hose into the connector as far as it will go and then pull the red ring down to lock it into place.

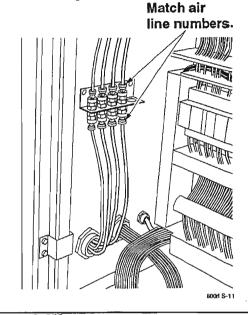


Figure 2-3K

#### **Tape Drum Bracket Assembly**

1. Install the upper tape drum bracket as shown in figure 2-3L.

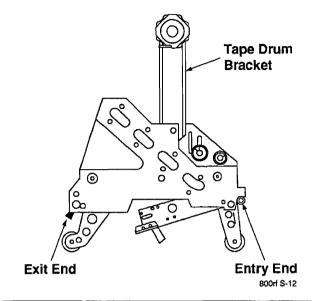


Figure 2-3L

2. Check the lower tape drum bracket assembly. The bracket should be assembled as shown in figure 2-3M. If it is not, remove the bolts that secure it and reassemble the bracket.

A full roll of tape can not be installed on the lower tape head if its bracket is assembled incorrectly.

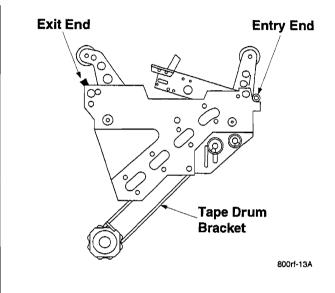


Figure 2-3M

### 2-3. Set-Up Procedure (Cont.)

#### **Pneumatic Connection**

The case sealer requires a 100 PSIG [6.5 BAR] 7.0 SCFM [11,89m³/h21°C, 101kPa] compressed air supply. As shown in figure 2-3O, an on/off valve, pressure regulator and filter are provided to service the air supply.

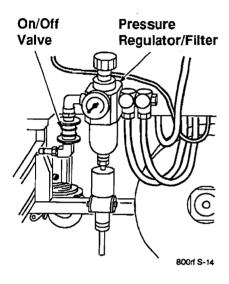


Figure 2-3N

The air supply line should be connected to the pressure outlet regulator by means of a quick-connect fitting. If any other type of connector is required it should be installed in place of the quick-connect fitting, leaving the air on/off slide valve in place.

#### Air Pressure Indicator

The operator's console is equipped with an air pressure indicator to show, in yellow, when the air circuit is energized. The air pressure indicator is located on the right hand side of the front panel and is labeled AIR INDICATOR.

#### Air Pressure Regulators

There are three air pressure regulators located on the front panel of the operator's console. Refer to the Adjustments section of this manual for the specific setting for each regulator.

To adjust these regulators, turn the knob CW to increase pressure and CCW to reduce pressure.

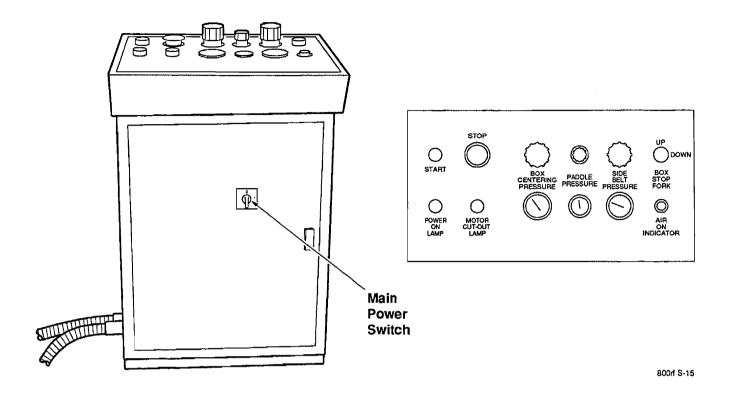


Figure 2-30

#### **Electrical Connection**

### **▲ CAUTION**

Before making the electrical connection, make sure that the red STOP pushbutton on the console front panel is depressed and that all packaging materials and tools are removed from the case sealer.

The case sealer and its console are wired for 220 VAC, 60 Hz, 3-phase power and a power cord is connected. However, no power plug is supplied. The power cord can be wired directly into a power distribution box or a plug can be installed. The recommended plug is a L15-20, 4-pin twist-lock. Possible wire code combinations are:

Black - Phase X

or

Black - Phase X

White - Phase Y Red - Phase Z

Brown - Phase Y

Green - Ground

Blue - Phase Z Yel/Grn - Ground

- a. Turn the electrical power on by rotating the main power switch on the console pedestal, CW to the 1 (ON) position. The white POWER ON indicator lights to show that power is available.
- b. The red STOP button on the console is one of the emergency stop switches.
- c. The green button is the START switch. Depressing this button applies power to the case sealer.

#### Note

If the unit runs in reverse, interchange any two of the three black, white, or red 220 VAC wires.

#### 2-4. Tape Loading

#### WARNING

BOTH TAPING HEADS USE
EXTREMELY SHARP BLADES ON THE
ORANGE CUTTER LEVER
ASSEMBLIES LOCATED UNDER THE
BLADE GUARDS. REFER TO FIGURE
2-4A. KEEP HANDS OUT OF THESE
AREAS EXCEPT AS NECESSARY TO
SERVICE THE TAPING HEADS.

NEVER ATTEMPT TO WORK ON THE TAPING HEADS OR LOAD TAPE WHEN THE SIDE BELTS ARE RUNNING. PERSONAL INJURY OR EQUIPMENT DAMAGE MAY RESULT.

Two tape threading tools are shipped with the case sealer for tape loading convenience. Retain these for continued use in the tape loading operation. For operator assistance, a threading diagram is applied to the taping heads. However, it is recommended that the more detailed instructions and illustrations in this manual be referred to the first few times the tape is loaded until the operator becomes thoroughly familiar with the tape loading operation.

For convenience in loading, the bottom taping head can be removed from the Case Sealer by lifting it out. The top head must be raised to load tape.

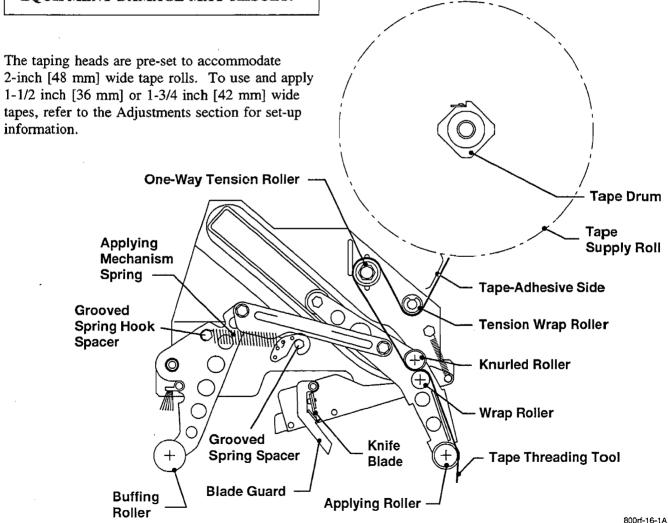


Figure 2-4A

#### Top Tape Head Loading

### **MWARNING**

NEVER ATTEMPT TO LOAD TAPE WHEN THE SIDE BELTS ARE RUNNING. PERSONAL INJURY OR EOUIPMENT DAMAGE MAY RESULT.

- 1. Turn the main power switch on the console pedestal to the 0 (OFF) position.
- 2. Turn the main air pressure slide valve to the ON position. This causes the top head to raise, providing clearance.
- 3. Insert the tape threading tool downward around the rollers as shown in figure 2-4B.

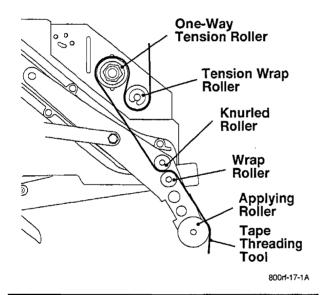


Figure 2-4B

4. Place the tape roll on the drum to dispense tape from the bottom of the roll toward the infeed end of the machine with the tape adhesive-side up. Attach the tape leading end to the upper end of the tape threading tool as shown in figure 2-4C.

5. Manually turn the tape roll to create slack tape while pulling the tape threading tool through the tape applying mechanism until the tool is in alignment with the applying roller.



Figure 2-4C

6. Cut off the excess tape with a scissors or knife below the applying roller. Refer to figure 2-4D. Retain the tape threading tools for future use.

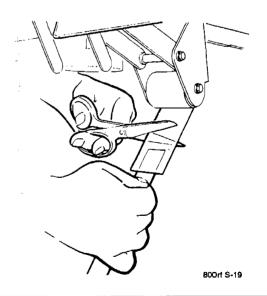


Figure 2-4D

### 2-4. Tape Loading (Cont.)

#### **Bottom Tape Head Loading**

The bottom taping head is loaded and threaded in the same manner as the top taping head. For ease in loading, lift the bottom taping head from the conveyor bed and follow the top tape head loading procedure. Refer to figure 2-4E.



NEVER ATTEMPT TO LOAD TAPE WHEN THE SIDE BELTS ARE RUNNING. PERSONAL INJURY OR EQUIPMENT DAMAGE CAN RESULT.

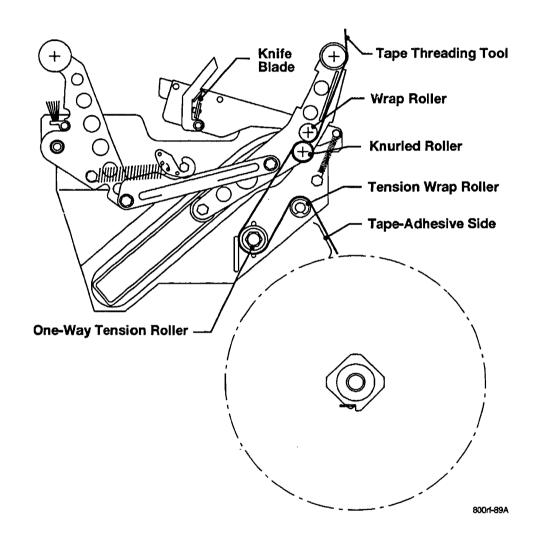


Figure 2-4E

### 2-5. Tape Drum Friction Brake

- 1. Refer to figure 2-5. Turn the knurled adjusting ring clockwise to increase the braking force or counterclockwise to decrease the force.
- 2. Adjust for the minimum braking force that prevents excessive overtravel.

#### Note

Excessive braking force causes poor tape application and tape tabbing on the trailing tape leg.

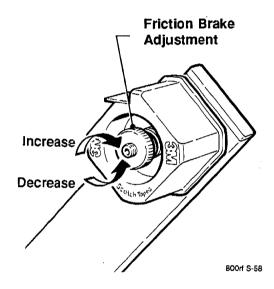


Figure 2-5

# 2-6. Check-Out Inspection (to be performed by an authorized 3M Service Technician)

#### Static Tests

- Connect the air and power supplies to the case sealer and turn on the air supply slide valve. Refer to figure 2-6A. Verify the following conditions:
  - AIR INDICATOR on the console is yellow showing that air pressure is applied to the system, flap folding arm extends and the flap folder is retracted,
  - · paddle is down,
  - · fork is up,
  - side belts are out,
  - · infeed conveyor centering rails are out,
  - · infeed conveyor is up,
  - LED IO0 in the console controller is on.
- Check the main pressure regulator. The pressure gauge should read 100 PSIG [6,5 BAR].
  - If the pressure is lower, check the input pressure at the source. If the pressure is lower than 80 PSIG [5,2 BAR] there is not enough pressure to operate the case sealer properly.
  - If the pressure is between 90 100 PSIG [6 6,5 BAR], this is the maximum operating pressure shown on the gauge.
  - If the pressure is above 100 PSIG [6,5 BAR], adjust the air pressure regulator to read 100 PSIG [6,5 BAR]. (CW increases pressure, CCW - decreases pressure)

- Check the BOX CENTERING PRESSURE gauge on the console. The gauge should read between 40-50 PSIG [2,6-3,3 BAR]. If the pressure does not fall within this range, adjust the pressure regulator (CW increases pressure, CCW decreases pressure). Refer to figure 2-6A.
- Check the SIDE BELT PRESSURE gauge on the console. Refer to figure 2-6A. The gauge should read 50 PSIG [3,3 BAR]. If necessary, adjust the SIDE BELT PRESSURE regulator to this setting. (CW - increases the pressure, CCW - decreases pressure).
- 5. Check the PADDLE PRESSURE gauge on the console. Refer to figure 2-6A. The gauge needle should be raised just off the zero mark.
- 6. Turn on electrical power by rotating the power switch on the console pedestal to the 1 (ON) position. Verify that the head rises to its upper position and the POWER ON indicator on the console lights. Verify also that the LED indicator I01 in the console is on.
- Press and hold the START pushbutton on the console. Verify that the side belts and the infeed conveyor all start and the LED indicator 102 in the console is on.

#### Note

If pressing the START pushbutton does not result in continuous running of the side belt drive motors, check motor cutouts RT01-11, RT02-12, and RT03-13 inside the console pedestal. Make sure the green START buttons are all pushed in.

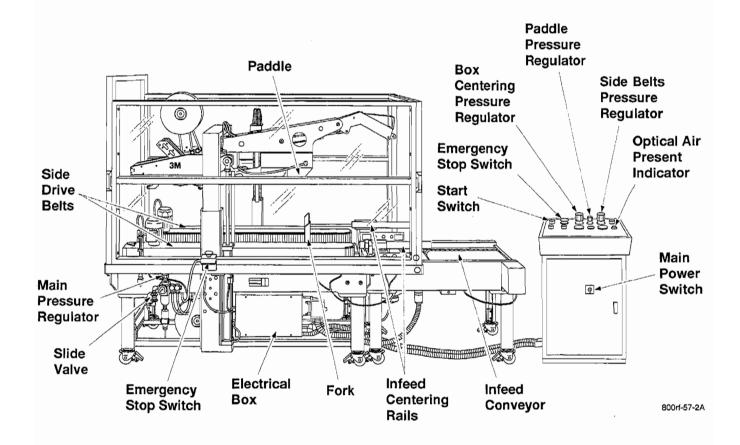


Figure 2-6A

#### Static Tests (Cont.)

8. Check the operation of the EMERGENCY STOP (red) pushbuttons and the STOP pushbutton on the console. Verify that the drive motors stop when an EMERGENCY STOP pushbutton or the STOP pushbutton on the console is pressed. The case sealer must be restarted (using the START pushbutton) each time before checking the next switch.

#### **CAUTION**

If the conveyor-mounted EMERGENCY STOP pushbuttons or the STOP pushbutton on the console do not function properly, do not continue with the check-out. Refer to the Theory of Operation and Troubleshooting sections and correct the situation before continuing.

#### **WARNING**

STEPS 9 AND 10 REQUIRE OPENING THE CONSOLE DOOR. THIS EXPOSES 220 VAC. BE CAUTIOUS OR PERSONAL INJURY CAN RESULT.

- 9. Check the operation of the safety shield electrical interlock. With the drive motors running, move the safety shield from its home position. Verify that the motors stop and that they can not be restarted until the safety shield is again in its home position. Verify also that LED indicator I01 is off when the safety shield is out of its home position.
- 10. Refer to figure 2-6B. Check the operation of the photocells PC1 through PC6. Cover each photocell in turn and observe the associated LED indicator in the console.

Photocell	LED Indicator
PC1	I03
PC2	I04
PC3	105
PC4	I06
PC5	I11
PC6	I17

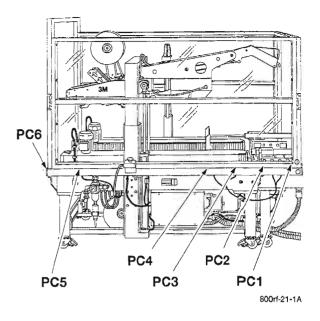


Figure 2-6B

# Initializing the Programmable Logic Controller (PLC)

The following tests check the input and output operations of the microcomputer in the controller. Refer to figure 2-6C throughout.

- If not already done, connect the electrical and air supplies to the case sealer. Ensure that the main power switch on the console is off and the air on/off slide valve on the case sealer is off.
- Turn the main power switch to ON. Ensure that the STOP switch is up. Verify that the STOP LED on the controller keyboard is on. (Refer to figure 2-6C).
- 3. On the controller keyboard, press the CLR key to clear any messages in the 7-segment display.

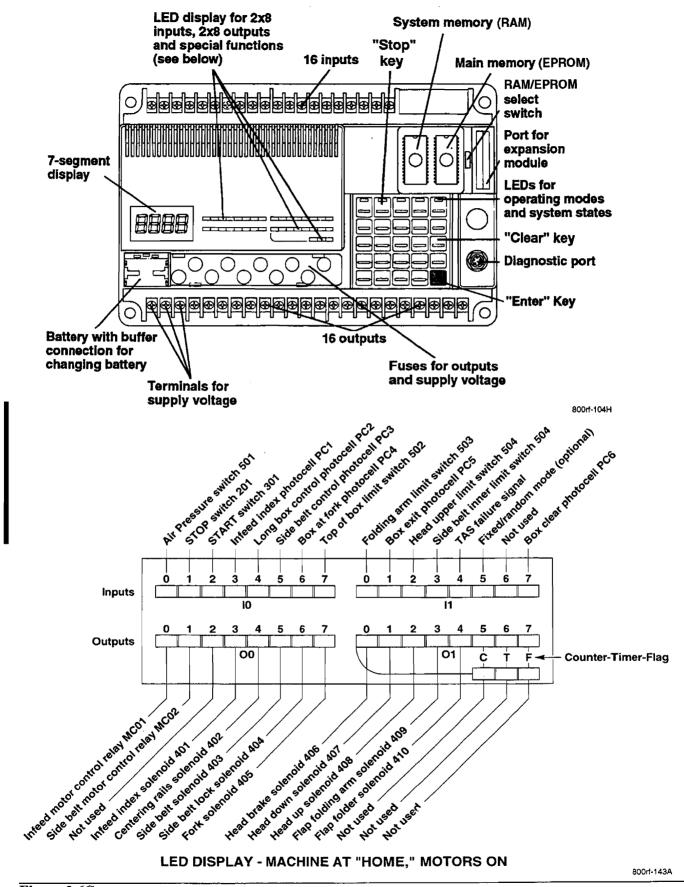


Figure 2-6C

#### **Testing the Controller Inputs**

The following chart provides a list of the PLC controller inputs, their associated LEDs, the conditions present when each input is ON or OFF, and any special information which could be of value.

The chart lists the PLC controller inputs in numerical order, but it is not necessary to perform checks in any special order.

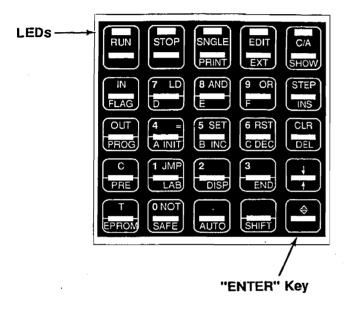


Figure 2-6D

Input	LED	LED ON/OFF Conditions	Notes
00	100	<ol> <li>ON when air on/off valve is ON.</li> <li>OFF when air on/off valve is OFF.</li> </ol>	Air on/off valve should be OFF.
01	<b>IO</b> 1	<ol> <li>ON when safety shield is in the detent position.</li> <li>OFF when:         <ul> <li>a. the safety shield is <u>not</u> in the detent position, or;</li> <li>b. either of the two conveyor-mounted emergency switches is pressed, or;</li> <li>c. the console-mounted STOP switch is pressed.</li> </ul> </li> </ol>	Air on/off valve should be OFF. LED I01 should be ON. When any STOP switch is pressed, <u>all</u> power will be removed from the machine.
02	I02	<ol> <li>ON when console START switch is pressed.</li> <li>OFF when console START switch is released.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
03	103	<ol> <li>ON when photocell PC1 is blocked.</li> <li>OFF when photocell PC1 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
04	IO4	<ol> <li>ON when photocell PC2 is blocked.</li> <li>OFF when photocell PC2 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
05	105	<ol> <li>ON when photocell PC3 is blocked.</li> <li>OFF when photocell PC3 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
06	106	<ol> <li>ON when photocell PC4 is blocked.</li> <li>OFF when photocell PC4 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
07	107	<ol> <li>ON when the paddle is moved up.</li> <li>OFF when the paddle is moved down.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
10	I10	<ol> <li>ON when the flap folding arm goes up.</li> <li>OFF when the flap folding arm goes down.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
11	<b>I</b> 11	<ol> <li>ON when photocell PC5 is blocked.</li> <li>OFF when photocell PC5 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
13	I13	<ol> <li>ON when the side drive belt assemblies are moved to the inner limit.</li> <li>OFF when the side drive belt assemblies are moved away from the inner limit.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
14	I14	ON when optional Tape Application Sensor (TAS)     detects an error condition.     OFF when no error condition exists.	Air on/off valve should be OFF. LED I01 should be ON.
15	I15	<ol> <li>ON when operating in fixed mode (optional).</li> <li>OFF when operating in random mode.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
17	117	<ol> <li>ON when photocell PC6 is blocked.</li> <li>OFF when photocell PC6 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.

#### **Testing the Controller Outputs**

The following chart provides a list of the PLC controller outputs, the sequence of buttons to be pushed to set or reset an output, the display for each, LEDs and their conditions, and the condition of various components.

The chart lists the PLC controller outputs in numerical order. Outputs 10, 11, and 12 must be performed in the order shown on the chart since they are dependent on one another. All other outputs can be checked in any order.

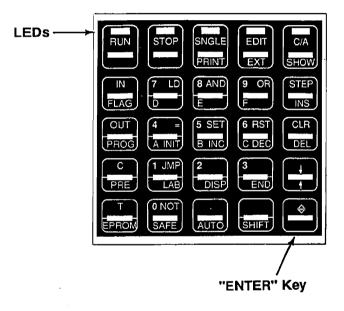


Figure 2-6E

Output	Press (in sequence):	Display reads:	Press:	LED is on/off.	Condition
00	SET, OUT, 0	SO0	Enter	O00 is ON.	Infeed motor STARTS.
	RST, OUT, 0	RO0	Enter	O00 is OFF.	Infeed motor STOPS.
01	SET, OUT, 1	SO1	Enter	O01 is ON.	Drive belt motors START.
	RST, OUT, 1	RO1	Enter	O01 is OFF.	Drive belt motors STOP.
02	SET, OUT, 2	SO2	Enter	O02 is ON.	Alarm relay 101 ENERGIZES.
	RST, OUT, 2	RO2	Enter	O02 is OFF.	Alarm relay 101 DE-ENERGIZES.
03	SET, OUT, 3	SO3	Enter	O03 is ON.	Solenoid 401 on the infeed index valve V4 is ENERGIZED and the infeed rollers are DOWN.
	RST, OUT, 3	RO3	Enter	O03 is OFF.	Solenoid 401 on the infeed index valve V4 is DE-ENERGIZED and the infeed rollers are UP.
04	SET, OUT, 4	SO4	Enter	O04 is ON.	Solenoid 402 on the centering rails valve V5 is ENERGIZED and the centering rails are IN.
	RST, OUT, 4	RO4	Enter	O04 is OFF.	Solenoid 402 on the centering rails valve V5 is DE-ENERGIZED and the centering rails are OUT.
05	SET, OUT, 5	SO5	Enter	O05 is ON.	Solenoid 403 on the side belt valve V6 is ENERGIZED and the side belts are IN.
	RST, OUT, 5	RO5	Enter	O05 is OFF.	Solenoid 403 on the side belt valve V6 is DE-ENERGIZED and the side belts are OUT.
06	SET, OUT, 6	SO6	Enter	O06 is ON.	Solenoid 404 on the side belt lock valve V7 is ENERGIZED, the side belt locks are ON, and the paddle RETRACTS.
	RST, OUT, 6	RO6	Enter	O06 is OFF.	Solenoid 404 on the side belt lock valve V7 is DE-ENERGIZED, the side belt locks are OFF, and the paddle EXTENDS.
07	SET, OUT, 7	SO7	Enter	O07 is ON.	Solenoid 405 on the fork valve V3 is ENERGIZED and the fork is UP.
	RST, OUT, 7	RO7	Enter	O07 is OFF.	Solenoid 405 on the fork valve V3 is DE-ENERGIZED and the fork is DOWN.

Note
Outputs 10, 11, and 12 are dependent on one another and must be tested in the following sequence:

Output	Press (in sequence):	Display reads:	Press:	LED is on/off.	Condition
12	SET, OUT, 12	SO12	Enter	O12 is ON.	Head assembly is UP.
10	SET, OUT, 10	SO10	Enter	O10 is ON.	Head assembly brakes are RELEASED.
11	SET, OUT, 11	SO11	Enter	O11 is ON.	Head assembly is DOWN.
11	RST, OUT, 11	RO11	Enter	O11 is OFF.	Head assembly is UP.
10	RST, OUT, 10	RO10	Enter	O10 is OFF.	Head assembly brakes are APPLIED.
12	RST, OUT, 12	RO12	Enter	O12 is OFF.	Head assembly is UP.
13	SET, OUT, 13	SO13	Enter	O13 is ON.	Solenoid 409 on the flap folding arm valve V2 is ENERGIZED and the flap folding arm moves DOWN.
	RST, OUT, 13	RO13	Enter	O13 is OFF.	Solenoid 409 on the flap folding arm valve V2 is DE-ENERGIZED and the flap folding arm moves UP.
14	SET, OUT, 14	SO14	Enter	O14 in ON.	Solenoid 410 on the flap folder valve V1 is ENERGIZED and the flap folder is DOWN.
	RST, OUT, 14	RO14	Enter	O14 is OFF.	Solenoid 410 on the flap folder valve V1 is DE-ENERGIZED and the flap folder is UP.

#### **Dynamic Tests**

#### Note

The following procedures check the actual operation of the case sealer and the following conditions must be observed.

- Electrical power and compressed air are available, and turned on at the console and case sealer, respectively.
- b. The safety shield is in its home position.
- c. Cases used should have:
  - the bottoms folded closed
  - a minimum weight to hold the case on the conveyor bed with the bottom flaps flat
  - the front and rear flaps inside the side flaps
- Apply air pressure and electrical power and press the START pushbutton on the console.
- 2. If applicable, run the longest box (19 inches to 24 inches) through the case sealer. Check the following sequence of events.
  - a. The box feeds from the infeed conveyor belt. It is centered by the centering rails and the infeed conveyor belt drops.
  - b. The box is released and moves to the side belts.
  - c. The side belts move inward and hold the box, driving it toward the fork.
  - d. The box arrives at the fork and the side belts stop driving the box.
  - e. The head lowers to the box, stopping at the top of the box without distorting it.

- f. The side belts restart.
- g. Just before the sides of the box are folded down, the rear flap of the box is **folded** down into place.

#### Note

Sequence steps f and g may be reversed, depending on length of box.

- h. The sides of the box are folded down.
- i. The top flap compression rollers touch the sides of the top of the box without causing the side flaps to overlap.
- j. C-clips of tape are applied to both the top and bottom seams of the box.
- The box exits the case sealer.
- The head rises to its upper position, and the side belts home to their outer position. The fork rises to its normal position, and the infeed conveyor rises to allow the next box to be fed.

#### Note

If any of the steps outlined above do not occur correctly, refer to the appropriate adjustment in the Adjustment section of this manual.

- 3. If applicable, repeat the procedure outlined in step 2 using the shortest box (8 inches to 13 inches).
- 4. If applicable, repeat the procedure outlined in step 2 using a box between 12 and 19 inches.
- 5. Now that a representative sample of boxes has been checked and appropriate adjustments have been made, flood the infeed line with a random array of boxes and check for consistent operation of the case sealer.

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#### 3-1. Case Sealer Bed Height

#### Specification

Adjust the case sealer bed height so that it is the same height as the conveyor line to which it is attached.

#### Adjustment

- 1. Raise and support the case sealer frame to allow adequate leg adjustment.
- 2. Using a 6 mm hex key wrench, loosen, but do not remove, two M8 x 16 mm socket-head cap screws in one leg. Refer to figure 3-1.

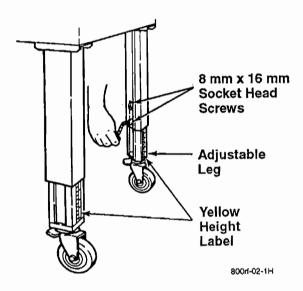


Figure 3-1

 Using the yellow height label as a guide, adjust the leg length to the desired conveyor bed height. Retighten the two screws to secure the leg. Adjust the three remaining legs the same way.

### 3-2. Infeed Conveyor Height

#### Specification

Adjust the legs of the infeed conveyor so that the infeed bed height is the same height as the conveyor line to which it is attached.

#### Adjustment

- 1. Raise and support the infeed conveyor frame to allow adequate leg adjustment.
- 2. Using a 6 mm hex key wrench, loosen, but do not remove, two M8 x 16 mm socket-head screws in one leg. Refer to figure 3-2.

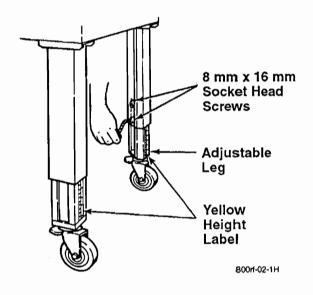


Figure 3-2

3. Using the yellow height label as a guide, adjust the leg length so that the infeed conveyor height is the same as the case sealer bed and conveyor line to which it is attached. Adjust the remaining three legs in the same manner.

July

#### 3-3. Main Air Pressure

#### **Specification**

The case sealer requires a 90 - 100 PSIG [6,5 BAR gauge pressure], 7.0 SCFM [11,89 m³/h, 21°C, 101 kPa] compressed air supply.

Optimum pressure is 100 PSIG [6,5 BAR].

#### Adjustment

#### Note

If the pressure is lower than that specified, check the input pressure at the source. If the source pressure is lower than 80 PSIG [5,2 BAR] there is not enough pressure to operate the case sealer properly. Also note that the inner diameter and length of the incoming air supply can affect final air pressure.

If the pressure at the source is between 90 - 100 PSIG, this is the maximum pressure shown on the gauge.

 Refer to figure 3-3. Adjust the pressure regulator CW to increase the pressure, CCW to decrease the pressure.

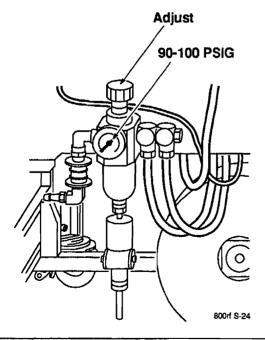


Figure 3-3

#### 3-4. Infeeding Unit Pressure

#### Specification

Adjust the infeeding unit pressure to lift the heaviest box when the system is indexed to feed the next box. Normal pressure is between 40 - 50 PSIG [2,6 - 3,3 BAR] with the main air pressure set correctly.

#### Adjustment

 Refer to figure 3-4. Adjust the BOX CENTERING PRESSURE regulator on the console CW to increase pressure and CCW to decrease pressure.

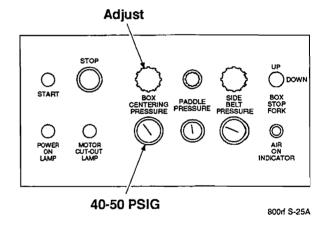


Figure 3-4

#### 3-5. Side Belt Pressure

#### **Specification**

Adjust the SIDE BELT PRESSURE regulator on the console so that cases drive smoothly through the sealing process without being deformed by excessive side pressure.



Excessive belt wear occurs when side belts are allowed to slip on the boxes.

#### Adjustment

 Refer to figure 3-5. Adjust the SIDE BELT PRESSURE regulator on the console so that the gauge reads 50 PSIG [3,3 BAR] with the main air pressure set correctly. (CW - increases air pressure, CCW - decreases air pressure)

#### Note

Air pressure can be reduced for light-weight cases. Adjust side belt pressure so that the case is centered and is driven smoothly.

# STOP START BOX PADDLE SIDE STOP CENTERING PRESSURE PRESSURE PRESSURE PRESSURE PRESSURE PRESSURE ON LAMP STOP PRESSURE PRESSURE ON INDICATOR BOX N INDICATOR BOX IND

Figure 3-5

#### 3-6. Side Belts Closure Drive Chain

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

#### **Specification**

Adjust the side belts closure drive chain so that the side drive belts are equally spaced from the center of the case sealer bed at their outermost position. The tension of the drive chain must be tight enough to ensure smooth inward drive.

#### Adjustment

- 1. Remove the case sealer bed plates as described in section 4-6, steps 4 and 5 of this manual.
- 2. Loosen the lock nuts on the drive chain.
- 3. Turn the adjustment bolts to obtain the proper position and tension. Refer to figure 3-6.

#### Note

If correct belt position can not be obtained by means of the adjustment bolts, it is necessary to remove the chain and reposition it.

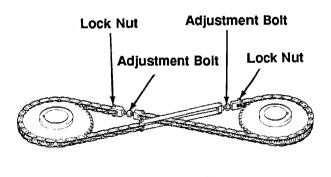


Figure 3-6

4. Reinstall all parts removed in step 1.

July

#### 3-7. Side Belts Closure/Return Rates

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

#### **Specification**

Adjust the side belts closure/return speed flow controls to allow the side belts to move to the center of the case sealer bed at approximately the same speed as they return. The rate of closure is the primary measure of a good speed. It must be slow enough to help center but not bounce a small box, and not so slow as to reduce the overall production rate.

#### Note

If the side belts do not return from the center of the case sealer bed when no box is present, refer to the following Side Belt Inner Limit adjustment before proceeding.

#### Adjustment

- Pass an average size box through the case sealer.
- 2. Observe the rates of side belt closure and return.
- Adjust the side belt closure/return speed control valves, as shown in figure 3-7 (CW reduces the speed, CCW - increases the speed).

#### Note

If there is any confusion as to where to set the speed control valves, turn the valves fully CW and then turn them CCW 3 full turns. Fine adjustments can be made from this point if necessary.

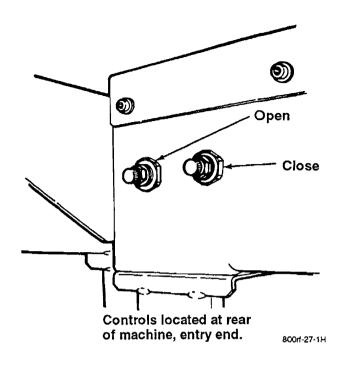


Figure 3-7

#### 3-8. Side Belt Inner Limit

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

#### Specification

With no box in the case sealer, adjust the side belt inner limit proximity switch so that the side belts move to the center of the case sealer bed. All drive motors stop and the belts return to their outermost position.

#### Adjustment

- 1. Raise the head to its uppermost position. Refer to section 4-6, steps 4 and 5, and remove the center roller assembly.
- 2. With air and electrical supplies on, press START. Verify that all motors start.
- 3. Block the light path from PC1 and then PC3. Blocking the light path of PC3 causes the side drive belts to move in to the center and then back out, and all drive motors stop.
- 4. If the side belts do not move back out, press STOP. The side belts move out so that the following adjustment can be made.
- 5. Refer to figure 3-8. Using a 3 mm hex wrench loosen the screws on the proximity switch. Move the switch to the right (facing the infeed end). Retighten the screws and repeat steps 2 and 3.
- 6. Replace the center roller assembly.

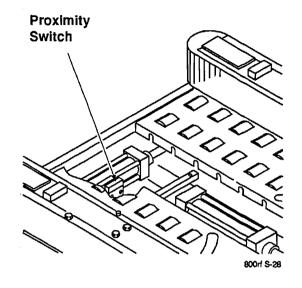


Figure 3-8

#### 3-9. Side Belt Tension

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

#### **Specification**

Adjust the tension of the side belts so that the cases move through the machine positively and the belts wrap tightly around the surface of the idler pulleys at each end of the frame.



TURN ALL ELECTRICAL POWER OFF AND DISCONNECT THE POWER CORD FROM THE POWER OUTLET BEFORE DOING THIS ADJUSTMENT.

#### Measurement

- 1. Turn the case sealer off and disconnect the power cord.
- 2. Use a force gauge to pull each side belt outward 1 inch [25,4 mm], near its mid-span. The gauge should read 7 lb. [3,5 kg]. Refer to figure 3-9A.

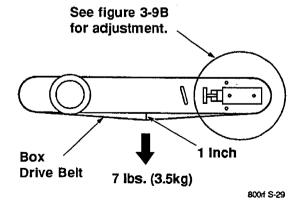


Figure 3-9A

#### Adjustment

# **A** CAUTION

In the following adjustment, be sure to adjust BOTH belt tension assemblies!

- 1. Remove the side belt assembly. (Refer to procedure 4-6.)
- 2. Loosen the lock nuts on both the upper and lower belt tension assemblies. Refer to figure 3-9B.

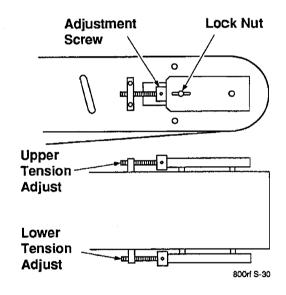


Figure 3-9B

3. Turn the adjustment screws equally on both the upper and lower belt tension assemblies. Turn the screws CW to reduce belt tension, CCW to increase belt tension.

#### Note

If you decrease belt tension, be sure to push the idler (end) pulley inward, toward the adjustment screw, **before** tightening the adjustment nut.

4. Secure both the upper and lower adjustment nuts.

# 3-10. Motor Drive Belts, Upper and Lower

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

#### Specification

Adjust the motor drive belts to maintain proper belt tension.

#### Adjustment



TURN THE MAIN AIR SUPPLY AND ELECTRICAL POWER OFF BEFORE MAKING THIS ADJUSTMENT.

1. Remove the cover from the side belt assembly. Refer to figure 3-10A.

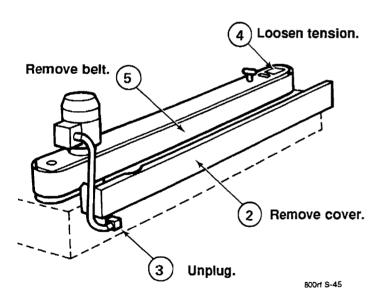


Figure 3-10A

- Unplug the drive motor using the quickdisconnect plug.
- 3. Release side belt tension. Refer to the Side Belt Tension adjustment in section 3-9.

4. Loosen, but do not remove, the four screws securing the motor to its base. Refer to figure 3-10B.

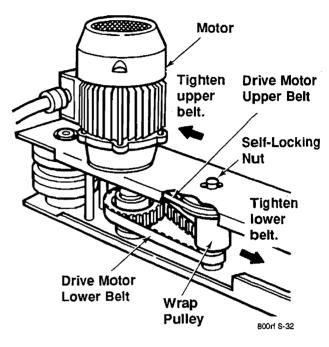


Figure 3-10B

- 5. Loosen, but do not remove, the lower self locking nut of the jockey pulley.
- 6. Move the jockey pulley toward the belt to tighten the drive motor lower belt. Secure the lower self-locking nut on the jockey pulley. Refer to figure 3-10B.
- 7. Move the drive motor toward the exit end of the case sealer to tighten the drive motor upper belts. Tighten the four motor mounting screws.
- 8. Reinstall the side drive belt and adjust the belt tension as described in Side Belt Tension in section 3-9.
- 9. Reinstall the belt cover and reconnect the drive motor.

#### 3-11. Drive Chain

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

There is no exact chain tension specification. Adjust the chain so that it is just tight enough to drive reliably without slack.

#### Note

If you adjust the drive chain, it is also necessary to adjust the upper and lower motor drive belts. Refer to section 3-10.

Loosen 3 bolts, adjust chain, retighten.

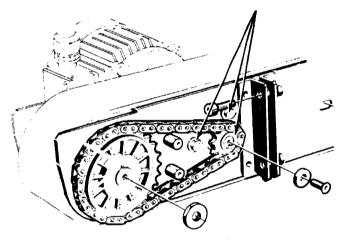


Figure 3-11

# 3-12. Safety Shield Electrical Interlock

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

#### **Specification**

Adjust the interlock switch so that it de-actuates when the safety shield is in the home position and actuates when the safety shield moves from the home position.

#### Adjustment

Reposition or replace the switch as needed to obtain the desired operation. Refer to figure 3-12.

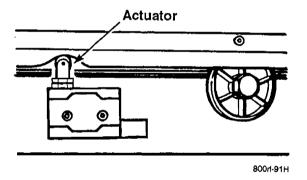


Figure 3-12

# 3-13. Flap Folder and Flap Folding Arm Flow Controls - Speed Control

#### Specification

Adjust the flow control speed controls for optimum operation during the majority of the cylinder stroke.

#### Adjustment

There is no specific setting for the Flap Folder and Flap Folding Arm speed adjustments:

Flap Folder

Set the adjustments for smooth

up/down motion.

Flap Folding

Set the adjustments for smooth

Arm in/out Arm motion.

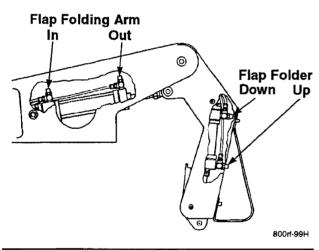


Figure 3-13

# ■ 3-14. Flap Folder Flow Control - Cushions

#### **Specification**

Adjust the flow control cushions so the cylinder does not bottom out hard at the end travel of its stroke.

#### Adjustment

No specific setting is available for this adjustment. Set the cushion adjusting screws for the setting which allows proper operation as described in the above specification. See figure 3-14 for adjusting screw locations.

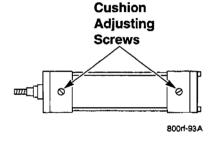


Figure 3-14

#### 3-15. Paddle Pressure

#### **Specification**

Adjust the PADDLE PRESSURE regulator on the console so that the paddle pushes up manually with relative ease and when released, returns to its extended position.

#### Adjustment

- 1. Slide the safety shield out of the home position.
- Decrease paddle pressure (CCW on PADDLE PRESSURE regulator) until when the paddle is pressed upward and then released, it remains in its up position.

The PADDLE PRESSURE regulator on the console is shown in figure 3-15A, and the paddle in figure 3-15B.

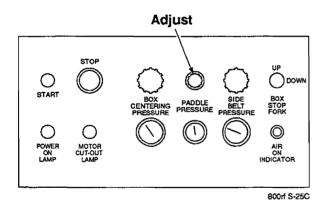


Figure 3-15A

3. Slowly increase paddle pressure (CW on the PADDLE PRESSURE regulator) until the paddle extends fully. At this point increase the pressure by 1/4 turn on the PADDLE PRESSURE regulator.

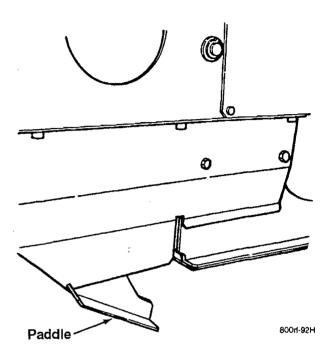


Figure 3-15B

4. Check the paddle actuation again to ensure that the paddle can be easily actuated and that it returns to its fully extended position.

#### 3-16. Case Top Sensitivity

#### Specification

Adjust the case top sense proximity switch so that the head lowers just enough to ensure that the case side flaps are held securely against the top of the case during the taping operation. The downward pressure of the top head must not be great enough to distort the box in any way.

#### Adjustment

- 1. Slide the safety shield out of the home position.
- 2. Loosen the fastening screws of the case top sense proximity switch. Refer to figure 3-16. (The switch is inside the paddle assembly.)

#### Note

The normal position for the case top sense proximity switch is almost fully toward the infeed end of the case sealer.

- 3. Loosen the screw of the case top sense proximity switch and move the switch toward the infeed end of the conveyor to decrease sensitivity (increase pressure on the top of the case). Loosen the screw of the case top sense proximity switch and move the switch toward the exit end of the conveyor to increase sensitivity (decrease pressure on the top of the box). Refer to figure 3-16.
- 4. When case top sensitivity is correct, fasten the screw of the proximity switch. Avoid switch movement while doing this.

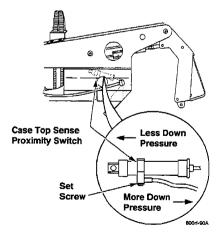


Figure 3-16

#### 3-17. Fork Speed

#### Specification

Adjust the fork speed flow controls so that:

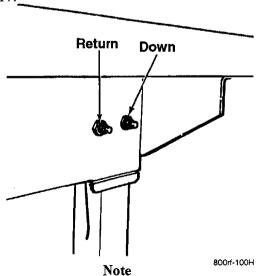
- the fork automatically moves down to its horizontal position before case movement forces it down.
- 2. the fork returns to its vertical position before the side belts begin to move inward (after case exit).
- 3. fork movement occurs without banging or rebound.

These controls are factory-set and normally do not need adjustment unless related components are replaced.

#### Adjustment

Before making any adjustments on these flow controls, the main air pressure and the fork pressure must be adjusted correctly, and the FORK switch on the console must be ON.

 Adjust the down speed flow control CCW to increase the speed that the fork goes down and CW to decrease the speed. Refer to figure 3-17.



Controls located on left side of machine when looking from infeed.

Figure 3-17

2. Adjust the return speed flow control CCW to increase the fork return speed and CW to decrease it. Refer to figure 3-17. The fork must return to its normal position before the belts start to drive inward at the end of a case cycle.

#### Note

To determine the proper starting position for these flow controls, first tighten them fully CW and then turn them CCW six full turns. From this setting further adjustments can be made if necessary.

#### 3-18. Head Speed

This is not a routine adjustment. Normally, it is necessary only after major disassembly or repair of related components.

#### Specification

Adjust the head speed flow controls to set the speed at which the head either raises or lowers.

#### Adjustment

- Remove the cover from the pneumatics panel on the rear of the machine. Refer to figure 3-18 and locate the head speed flow controls C1A and C1B.
- Adjust the related (head raising, head lowering)
  flow control to change the speed of head
  assembly raising and lowering motion.
  Turning the flow control adjustment screw CW
  increases speed; CCW decreases speed.

When installing a replacement flow control, turn the adjustment screw fully CW and then turn it eight full turns CCW. This establishes a good starting point if further adjustments are necessary.

#### Note

If any head speed adjustment is made, check the Case Top Sensitivity adjustment in section 3-16.

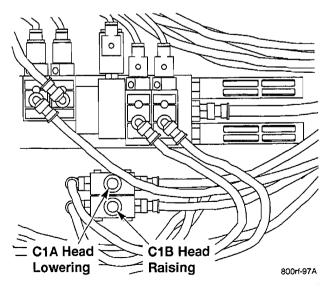


Figure 3-18

#### 3-19. Top Flap Compression Rollers

#### **Specification**

Adjust the top flap compression rollers to hold the top flaps of the case together during the taping process. The flaps should not overlap or have space between them after the taping process.

#### Adjustment

- 1. Adjust all compression rollers:
  - a. inward to hold the top of the box more securely
  - b. outward if the box binds. Refer to figure 3-19.

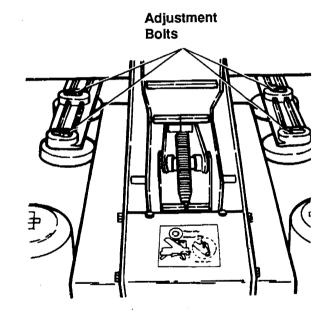


Figure 3-19

#### 3-20. Tape Web Alignment

#### **Specification**

Position the tape drum shaft so that the tape is centered on the centerline of the taping head.

#### Adjustment

The tape drum assembly on each taping head is pre-set to accommodate 2 inch [48 mm] wide tape, but is adjustable to provide alignment of narrower tapes. If adjustment is necessary to center the tape width on the centerline of the taping head, and therefore the box center seam, make the adjustment as follows:

- 1. Using a 25 mm open end wrench, loosen the nut on the tape drum shaft behind the tape drum. Refer to figure 3-20.
- 2. Use a 5 mm hex key wrench to turn the tape drum shaft CW (in) or CCW (out) to center the tape web on the centerline of the taping head.

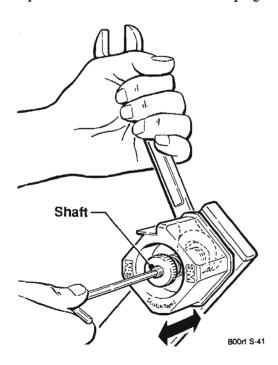


Figure 3-20

3. Tighten the nut to secure the shaft in this new position.

No other components require adjustment for tape web alignment.

#### 3-21. Tape Applying Mechanism Spring

#### **Specification**

Adjust the position of the tape applying mechanism spring so that:

- 1. There is sufficient pressure to seal the box.
- 2. After sealing the box, the tape buffing roller returns to its rest position.

#### Adjustment

1. Decrease or increase the pressure applied by the tape applying mechanism spring by removing the end loop from the spring holder and moving it to another hole. Refer to figure 3-21.

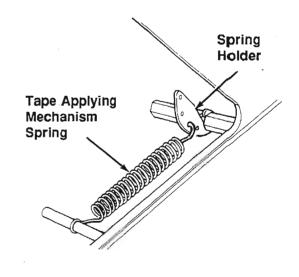


Figure 3-21

#### 3-22. One-Way Tension Roller

#### **Specification**

Adjust the one-way tension roller so that it slips under a tangential force of 1 to 2 lbs. [0,5 to 1,0 kg]. Refer to figure 3-22.

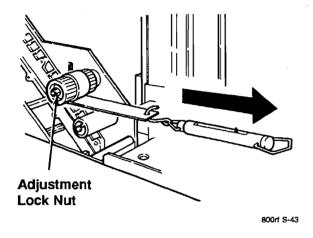


Figure 3-22

#### Measurement

- 1. Wrap a cord or small strap (non-adhesive) 4 to 6 turns around the tension roller.
- Attach a spring scale to the end of the cord or strap.
- 3. Pull the spring gauge until the one-way tension roller slips. The spring gauge should read 1 to 2 lbs [0,5 to 1,0 kg] when slippage occurs.

#### Adjustment

 To increase the holding force of the tension roller, turn its locknut CW. To decrease the holding force of the tension roller, turn its locknut CCW.

#### 3-23. Tape Drum Friction Brake

#### **Specification**

Adjust the tape drum friction brake to prevent excessive tape overtravel caused by a flywheel effect.

#### Measurement

The tape must not have excessive overtravel during operation.

#### Adjustment

1. Refer to figure 3-23. Turn the knurled adjusting ring clockwise to increase the braking force or counterclockwise to decrease the force.

Adjust for the minimum braking force that prevents excessive overtravel.

#### Note

Excessive braking force causes poor tape application and tape tabbing on the trailing tape leg.

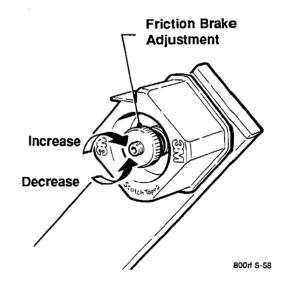


Figure 3-23

# 3-24. Head Assembly Air Cylinder Brakes

#### Specification

Adjust the head assembly air cylinder brakes equally so that:

- the head assembly moves into its upper position and locks into place without any other movement, or:
- boxes are not crushed by the head assembly. (This assumes that this condition cannot be corrected by adjusting the case top sensitivity switch or the flow controls.)

#### Adjustment

For each brake:

- 1. Loosen the locking setscrew.
- 2. Turn the adjusting sleeve clockwise until slight resistance occurs.
- 3. Tighten the locking setscrew.
- 4. Make the same adjustment to the opposite end of the air cylinder brake.
- 5. Run boxes through the case sealer to verify proper operation.
  - a. If the brake is too loose, the head assembly will not stop in the same position each time it has cycled. Instead, it will drop slightly each time it comes to rest.
  - b. If the brake is too tight, the head assembly will bind and not operate smoothly.

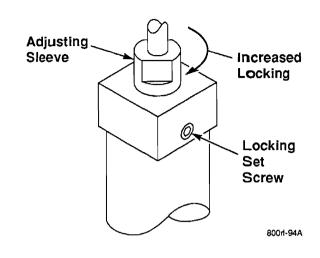


Figure 3-24

#### 3-25. Air Pressure Switch

#### **Specification**

Adjust the air pressure switch so the case sealer shuts down if the main air pressure drops below 75 psi and a box feed is attempted.

#### Measurement

- 1. Set the air gauge to 74 psi.
- 2. Run a sample box through the case sealer.
- 3. The case sealer should shut down when boom drops.
- 4. Set the air gauge to 76 psi.
- 5. Run a sample box through the case sealer.
- 6. The case sealer should operate properly.
- 7. If the case sealer does not operate properly at the above settings, perform the following adjustment procedure. If the case sealer operates properly, reset the air gauge to 100 psi.

#### Adjustment

- Remove the cover from the pneumatic components panel on the rear of the case sealer.
- 2. If the case sealer <u>did not shut down</u> when operated at below 75 psi:
  - a. Turn the adjusting screw on top of the air pressure switch CW 1/4-turn and run a box through the case sealer.
  - Continue to turn the adjusting screw on top of the air pressure switch CW in 1/4turn increments until the case sealer shuts down when a box is fed through it.

- 3. If the case sealer <u>did shut down</u> when operated at above 75 psi:
  - a. Turn the adjusting screw on top of the air pressure switch CCW 1/4-turn and run a box through the case sealer.
  - b. Continue to turn the adjusting screw on top of the air pressure switch CCW in 1/4-turn increments until the case sealer does not shut down when a box is fed through it.
- 4. Replace the pneumatics component panel cover.
- 5. Reset the air gauge to read 100 psi.

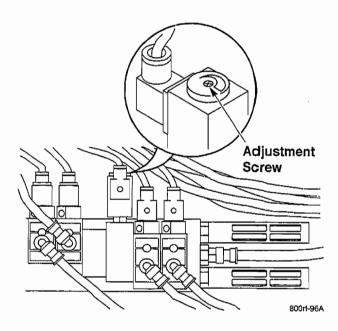


Figure 3-25

#### 3-26. Overcurrent Thermal Switches

#### **Specification**

Adjust the setting screw on the overcurrent thermal switches to the 1.6 Amp setting.

#### Adjustment

Use a Phillips-head screwdriver to set the alignment mark to the 1.6 Amp setting.

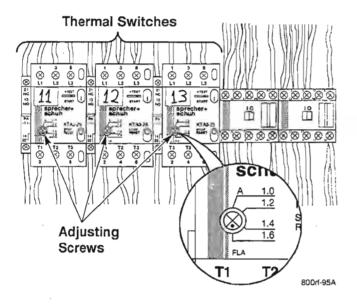


Figure 3-26

#### 3-27. Head Travel Limit Switch

#### **Specification**

Adjust the Head Travel Limit Switch so when the head is at the rest position, it is approximately 3 inches above the highest box being run.

#### Adjustment

- 1. Loosen the two securing screws.
- 2. Move the switch up or down as required.
- 3. Tighten the screws.
- 4. Check the head rest position.

Repeat Steps 1 through 4 until the head rest position is approximately 3 inches above the

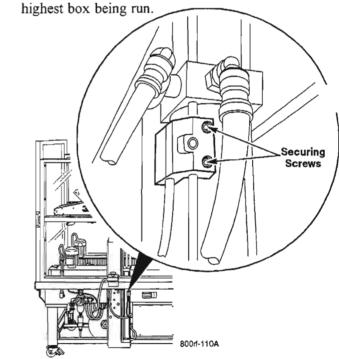


Figure 3-27

#### 3-28. Infeed Clutch

#### Specification

Adjust the clutch so:

- · It engages properly to drive boxes in.
- It disengages after a box has passed into the machine.

#### Adjustment

- 1. Remove the two screws securing the cover.
- 2. Push the hose clamp up and disconnect the hose.
- 3. Remove the cover.
- 4. Loosen the lock nut.
- 5. Do one of the following:
  - If the clutch slips, turn the adjusting nut clockwise.
  - If the clutch does not disengage, turn adjusting nut counterclockwise.
- 6. Connect the hose.
- 7. Observe that the clutch engages properly to drive boxes in and disengages after a box has passed into the machine.

If, after adjustment, the clutch does not disengage, refer to Section 6, Troubleshooting.

8. Replace cover.

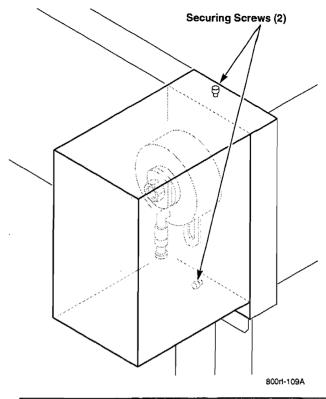


Figure 3-28

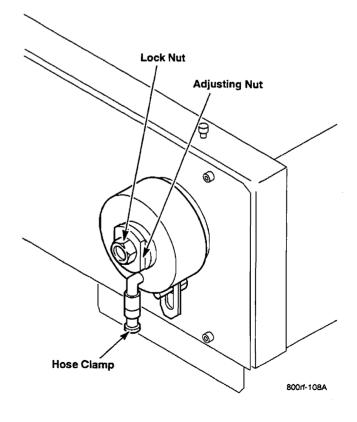
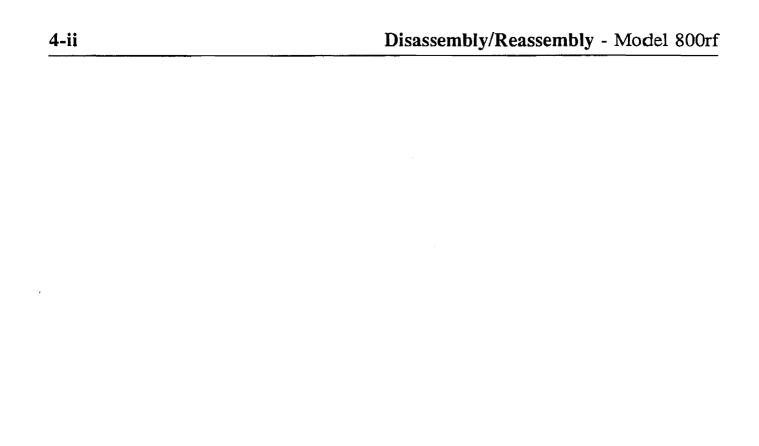


Figure 3-29

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#### 4-1. General

This section provides instructions for removing components and major assemblies from the case sealer. Disassembly should be done only to replace a faulty part. Be sure the component is out of tolerance as defined in section 3, Adjustments, before assuming it is worn or defective.

#### 4-2. Format

The disassembly procedures in this section are illustrated views with a minimum of supporting text. The order of disassembly is indicated by circled numbers with 1 being the first step, 2 the second step, and so on.

Reassembly is in the reverse order of disassembly except where noted by triangle-boxed numbers with 1 being the first reassembly step, 2 the second reassembly step, etc.

Carefully review and understand each procedure before the disassembly of any component. Often, reference to the exploded view in section 7, Illustrated Parts Breakdown, aids disassembly and subsequent reassembly.

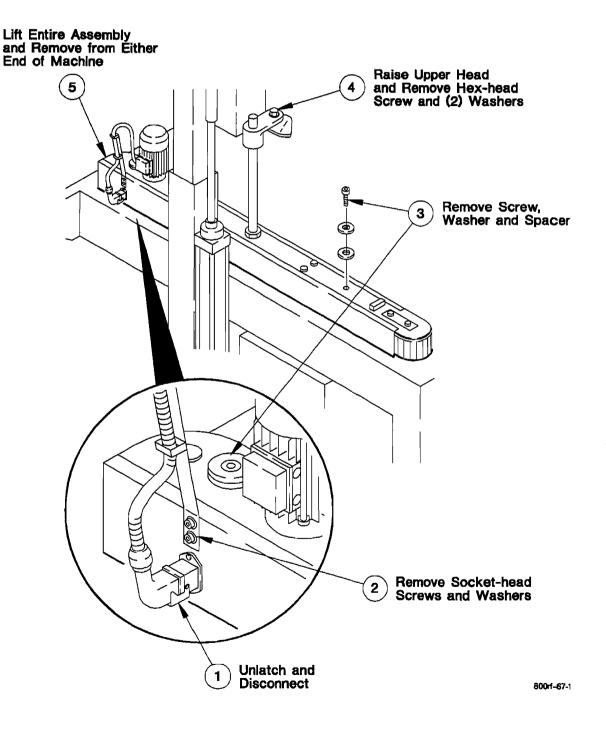


TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

# 4-3. Side Drive Belt Assembly

# **M** WARNING

TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

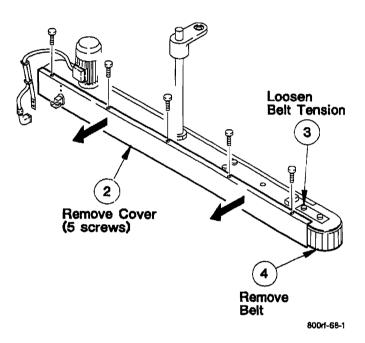


## 4-4. Side Drive Belt

# **MARNING**

TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

1. Remove the side drive belt assembly. (Refer to procedure 4-3.)



Note
After reinstalling the belt, adjust side drive belt tension. Refer to section 3, paragraph 3-9.

# 4-5. Motor Drive Belts, Upper and Lower

## **MARNING**

TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

#### Note

A gear puller will be needed to complete this procedure. Ensure that one is available before beginning this procedure.

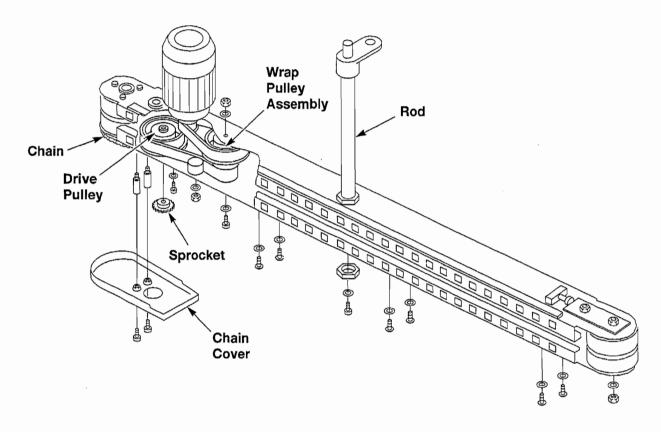
- 1. Remove the side drive belt assembly using procedure 4-3 in this section.
- 2. Remove the side drive belt using procedure 4-4 in this section.

#### Note

If the side drive belt being removed is without pin and lacing, it must be cut to remove it. A replacement side drive belt with pin and lacing will be needed to reassemble the unit.

- 3. Remove the self-locking nut and the washer from the top of the wrap pulley assembly.
- 4. Remove the bolt and washer from the bottom of the rod. Slide the rod out of the threaded sleeve.
- 5. Remove the M22 nut from the bottom of the threaded sleeve.
- 6. Loosen but do not remove the self-locking nut on the jockey pulley assembly.
- 7. Remove the hex head screw and the washer from the bottom of the wrap pulley assembly.
- 8. Remove the nut and washer from the bottom of the idler roller assembly.

- 9. Remove the two screws holding the chain cover in place and remove the chain cover.
- 10. Remove the chain by disconnecting the removable link.
- 11. Remove the two standoffs on which the chain cover is mounted.
- 12. Remove the screw and washer holding the sprocket on the bottom of the drive pulley assembly.
- 13. Remove the 3/8-inch keyed sprocket, using a gear puller, and being careful not to lose the key.
- 14. Remove the three (3) hex head bolts and washers holding the drive pulley assembly.
- 15. Remove the drive pulley assembly.
- 16. Remove the six (6) hex head bolts which hold the two halves of the side belt drive assembly together from the bottom of the assembly.
- 17. Lift the lower half of the belt drive assembly and move it aside from the upper half, pivoting on the belt drive pulley assembly shaft.
- 18. Remove the wrap pulley assembly.
- 19. Remove the timing belt(s) to be replaced.
- 20. To reassemble and reinstall the side drive belt assembly, perform steps 1 through 19 of this procedure in reverse order.
- 21. When the side drive belt assembly has been reassembled and reinstalled, perform the following adjustment procedures:
  - 3-10. Motor Drive Belts, Upper and Lower
  - 3-9. Side Belt Tension



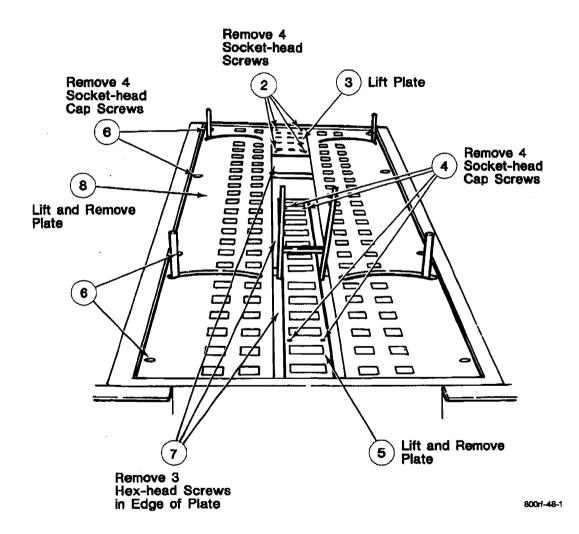
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### 4-6. Case Sealer Bed Plates

# **MARNING**

TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

1. Remove the side drive belt assembly using procedure 4-3, in this section.

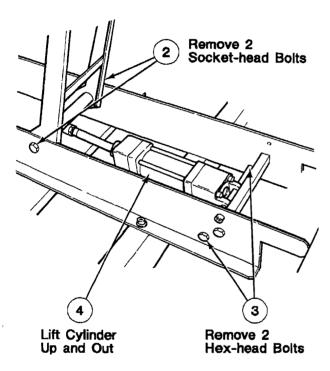


## 4-7. Fork Cylinder

# **MARNING**

TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

1. Remove case sealer bed plates using sections 4-3 and 4-6.



800rf-49-1

5. Remove the associated air lines and hardware from the cylinder.

#### Note

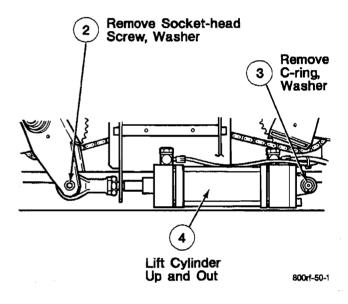
Re-assembly requires adjustment of fork speed (procedure 3-16).

## 4-8. Side Drive Belts Cylinder

# **M**WARNING

TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

1. Remove the case sealer bed plates using sections 4-3 and 4-6.



5. Remove air lines etc.

Before removing the limit switch (sensor) attached to the cylinder housing, note the switch position on the cylinder. The position of the limit switch affects cylinder extension, timing etc.

#### Note

Re-assembly requires adjustment of side drive belt pressure (procedure 3-5) and side drive belts closure/retract rates (procedure 3-7).

## 4-9. Flap Folder Cylinder

# **MWARNING**

TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

Steps 1 through 3 on the figure below refer to removal of the flap folder cylinder.

4. Remove associated hardware, air lines, and flow control valves.

#### Note

If a flow control is replaced, adjust the new flow control to match the one removed. To do this, count the number of CW turns it takes to fully seat the old flow control adjustment screw. Fully seat the adjustment screw on the new flow control and then turn the adjustment screw CCW the same number of turns.

## 4-10. Flap Folding Arm Cylinder

## **MARNING**

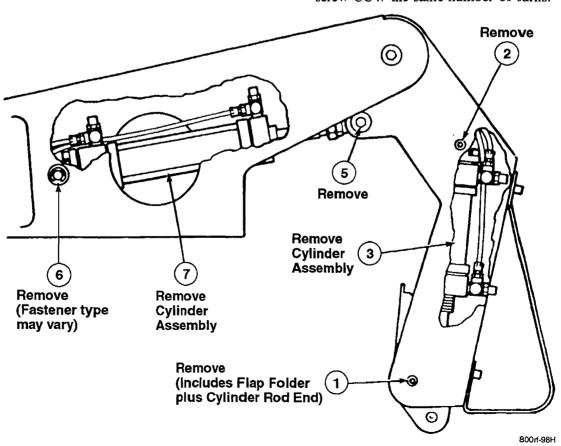
TURN OFF THE MAIN AIR SUPPLY AND ELECTRICAL POWER BEFORE REMOVING ANY COMPONENTS.

Steps 5 through 7 on the figure below refer to removal of the flap folding arm cylinder.

8. Remove associated hardware, air lines and flow controls. Especially note the position of the limit switch (sensor) attached to the cylinder housing. The position of this switch affects cylinder extension, timing etc.

#### Note

If a flow control is replaced, adjust the new flow control to match the one removed. To do this, count the number of turns it takes to fully seat the old flow control adjustment screw. Fully seat the adjustment screw on the new flow control and then turn the adjustment screw CCW the same number of turns.



# 4-11. Blade Replacement, Upper Taping Head

## **↑** WARNING

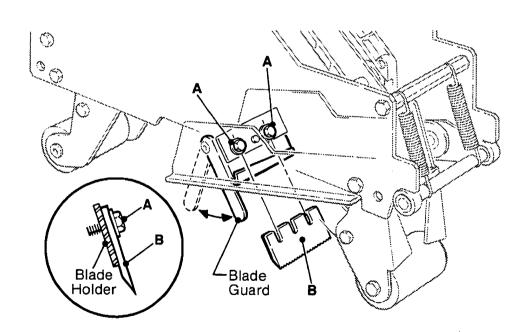
THE BLADES ARE VERY SHARP. TO AVOID PERSONAL INJURY, HANDLE THE BLADES WITH SPECIAL CARE. ALSO, DISCONNECT THE POWER BEFORE STARTING THIS PROCEDURE.

- 1. Apply air pressure to the machine and raise the top taping head to its full upward position.
- 2. Pivot the blade guard back and hold it in this position.
- 3. Carefully cover the blade teeth with tape.
- 4. Loosen, but do not remove, the blade fastening screws (A). Remove and discard the old blade.
- 5. Clean the blade mounting bracket.

- 6. Carefully cover the teeth on the new blade with tape.
- 7. Position the new blade (B) with the beveled side away from the mounting bracket.
- 8. Mount the blade so that the screws bottom out in the slots. This position automatically gives the proper mounting and cutting angle.
- 9. Tighten the screws that secure the blade.
- 10. Slowly pivot the blade guard back and forth to ensure proper clearance.
- 11. Remove the tape from the new blade.

# **A**CAUTION

Be sure the blade does not interfere with the blade guard.



# 4-12. Blade Replacement, Lower Taping Head

# **MARNING**

THE BLADES ARE VERY SHARP. TO AVOID PERSONAL INJURY, HANDLE THE BLADES WITH SPECIAL CARE. ALSO, DISCONNECT THE POWER BEFORE STARTING THIS PROCEDURE.

Remove the taping head from the unit and lay it on a flat work surface. Use the same blade replacement procedures as for the upper taping head.

## 4-13. User Memory Replacement

Please refer to PLC Addendum page A-3 at the back of this manual.

# **CAUTION**

To prevent static electricity damage to microprocessor components, work performed on the controller requires the technician to use an anti-static wrist strap.

# 4-14. Belt Drive Pulley Assembly O-rings

- 1. Remove the side drive belt assembly using assembly procedure 4-3 in this section.
- 2. Remove the side drive belt using procedure 4-4 in this section.

#### Note

If the side drive belt being removed is without pin and lacing, it must be cut to remove it. A replacement side drive belt with pin and lacing will be needed to reassemble the unit.

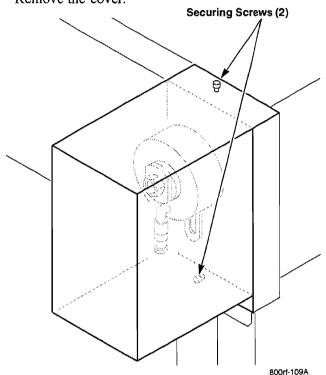
- Remove the bolt and washer from the bottom of the rod. Slide the rod out of the threaded sleeve.
- 4. Remove the self-locking nut and the washer from the top of the wrap roller assembly.
- 5. Remove the nut and washer from the top of the idler roller assembly.
- 6. Remove the M22 nut from the top of the threaded sleeve.
- 7. Remove the three (3) hex head bolts and washers from the top of the drive belt pulley assembly.
- 8. Remove the eight (8) hex head bolts and washers from the upper half of the side drive belt assembly.
- 9. Lift the upper half of the side drive belt assembly off of the lower half, disengaging the upper timing belt, and lay it aside.
- 10. If necessary, remove the old O-rings.
- 11. Slide the replacement O-rings into place, ensuring that the ribbed surface faces outward.

- 12. To reassemble and reinstall the side drive belt assembly, perform steps 1 through 10 in reverse order.
- 13. When the side drive belt assembly has been reassembled and reinstalled, perform the following adjustment procedures:
  - 3-10. Motor Drive Belts, Upper and Lower3-9. Side Belt Tension

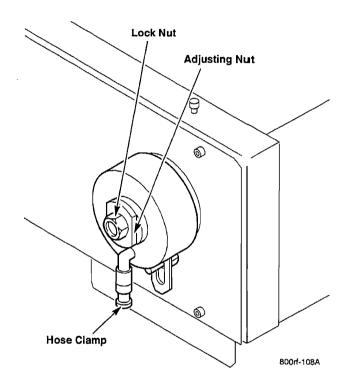
#### 4-15. Infeed Clutch

## **Disassembly**

- 1. Remove the two screws securing the cover.
- 2. Push the hose clamp up.
- Disconnect the hose.
- 4. Remove the cover.



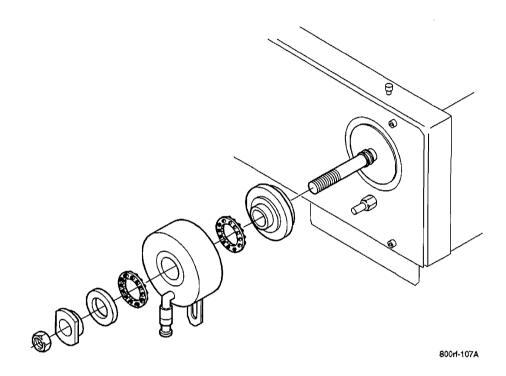
- 4. Hold the adjustment nut and remove the lock
- 5. Measure and note the distance from the end of the shaft to the adjustment nut.
- 6. Carefully remove the adjustment nut (the assembly is spring-loaded).
- 7. Carefully remove the clutch components.



### **Assembly**

Assembly is essentially disassembly in reverse order. However, observe the following.

- 1. Replace the components as shown in the illustration.
- 2. Turn the adjustment nut until it is the distance from the end of the shaft noted in Disassembly, Step 6.
- 3. After installation, be sure the clutch operates properly. Refer to Section 3, Adjustments.



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## Model 800rf - Theory of Operation

## 5-1. Operation Summary

When a box enters and passes through the case sealer, it passes six photocells in sequence. As the box blocks the light path of the first photocell, the infeed conveyor drops to prevent the entry of the next box. A pair of centering rails then center the box on the infeed conveyor.

Infeed drive rollers move the box past a second photocell which senses the presence of the box to subsequently control the timing of the side belt restart circuit.

The box continues to move, blocking the light path of the third photocell. This causes the side belt assemblies to move inward and press against the sides of the box. Thus, the box is carried forward, blocking the light path of the fourth photocell. An output from the controller turns the side belt drive motors off, and the box stops at the fork beneath the head assembly.

When the box blocks the light path of the fourth photocell, the head assembly begins to move downward. This downward movement continues until a paddle presses against the front flap of the box, folding the flap inward. Downward movement of the head assembly continues until resistance of the box leading edge moves the paddle upward, actuating the top-of-box limit switch which in turn causes an output from the controller to stop downward movement of the head assembly. At this time, the head assembly, paddle, and side-belt drive assemblies lock in position and the rear flap-folding process occurs.

Rear flap folding begins with the action of the flap folding arm. As this arm moves downward, an associated limit switch actuates an output from the controller which causes the rear flap folder to extend, folding the rear flap of the box inward.

5-1

The side belt drive motors restart, moving the box toward the taping heads. As the box moves forward, the side flaps are folded inward and then held in position by pressure rollers. The box passes between the taping heads and a C-clip of tape is applied to the top and bottom box seams. As the box exits the case sealer, it blocks the light path of the fifth photocell and an output from the controller homes the case sealer, preparing it for the next box.

In the event that boxes back up on the exit end of the case sealer, the sixth photocell remains blocked. If it remains blocked for more than a few seconds, the infeed is shut down, preventing more boxes from being fed into the case sealer until the blockage is removed.

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## Special Circuits/Components

## PLC Programmable Logic Controller

The Festo FPC 202 contained in the 800rf is a programmable logic controller (PLC). A PLC processes binary (one - zero, on - off, high - low) input signals to produce output (control) signals which directly affect electrical or mechanical processes, operations, or sequences.

In the 800rf, the PLC controls the drive motors and all pneumatic components to ensure that all of the steps in the case sealing sequence occur in the correct order, with event timing coordinated with case length.

#### 910N

Refer to the PLC Addendum at the back of this manual for more PLC-related information.

#### Limit Switches

The limit switches used in the 800rf are air cylinder-mounted, solid-state proximity sensors, +24 VDC-powered. They magnetically sense the presence of the cylinder's internal piston base. When non-activated, the limit switch output is low (0V). When activated, by the presence of the cylinder piston, the limit switch output is high cylinder piston, the limit switch output is high (+24 VDC).

Note that (as with the head-raising cylinders) cylinder extension length is determined by the position of the limit switch on the body of the cylinder.

### <u>Photocells</u>

Six photocells positioned along the left side (front) of the case sealer detect the presence of cases as they pass through the case sealer. Each photocell comits infrared light that is normally reflected back (rear) of the case sealer. In their light-sensing condition, the photocells provide a low (0V) input to their respective PLC inputs. When a moving to their respective PLC inputs. When a moving case blocks a photocell light path, the photocell output to the PLC becomes +24 VDC, signalling the case's presence.

5-2. Electrical System

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Power Distribution

The **S300 power on/off switch** controls input 3-phase 220 VAC. Turning S300 ON applies:

3-phase 220 VAC to the 1-3-5 contacts of motor control relays MC01 and MC02. Motor drive does not occur until later, when MC01 and MC02 energize.

Single-phase 220 VAC to the primary windings of the the TI power transformer. Output voltage of the TI secondary is approximately 24 VAC and is used to energize the POWER ON lamp, the MOTOR CUTOUT lamp, the optional alarm hom and lamp, the 24-volt power supply, the shield interlock switch, and the rear and front stop switches.

The **POWER ON lamp** lights to show that 24 VAC is present.

The MOTOR CUTOUT lamp provides an external indication that one of the motor over-one of the over-current cutouts operated. If motor overload), the lamp-related, normally open RT01, RT02 or RT03 contacts close to apply 24 RT01, RT02 or RT03 contacts close to apply 24 VAC to the MOTOR CUTOUT lamp.

The alarm horn and lamp operate (if present) when the controller detects a machine error and energizes, the 101 alarm, relay. When the alarm relay energizes, its contacts close to apply 24 VAC to the alarm horn and lamp.

With 24 VAC supplied to it, the 24-volt power supply provides +24 VDC (via wires 3 and 4) for operation of all photocells, limit switches, valve programmable logic controller. In addition, 24 VDC is used as direct signal input to the controller via the AIR PRESSURE switch 501; the console STOP switch 201; and the console STOP switch 201.

## Model 800rf - Theory of Operation

## 5-3

#### Motor Control Circuits

There are two motor control circuits in the 800rf: one for the infeed drive motor, and one for the side belt drive motors.

The infeed drive motor control circuit consists of the MC01 motor control relay plus the RT01 over-current cutout and their related contacts. Energizing MC01 closes the MC01 contacts, providing AC (through the RT01 contacts) to the infeed drive motor. The RT01 over-current cutout protects the infeed drive motor from burnout due to overload conditions. If an over-current condition occurs, all RT01 contacts actuate. The contacts in series with the motor open to remove drive AC. The contact in series with the coil of MC01 opens to prevent unintentional operation of the motor when RT01 automatically resets. The RT01 contacts in series with the MOTOR CUTOUT lamp close to energize the lamp.

The side belt drive motor control circuit consists of the MC02 motor control relay plus the RT02 and RT03 over-current cutouts and their related contacts. Energizing MC02 closes the MC02 contacts, providing AC (through the RT02 and RT03 contacts) to the side belt drive motors. The RT02 and RT03 over-current cutouts protect the side belt drive motors from burnout due to overload conditions. If an over-current condition occurs in either motor, all of the motor-related RT02 or RT03 contacts actuate. The contacts in series with the motor open to remove drive AC. The contact in series with the coil of MC02 opens to prevent unintentional operation of the motor when the over-current cutout automatically resets. The RT02 or RT03 contact in series with the MOTOR CUTOUT lamp closes to energize the lamp.

RT01-11, RT02-12, and RT03-13 can be adjusted to actuate at different current settings within their
 1-amp to 1.6-amp operating range. Normally, they are set at 1.6 amp.

#### Stop Switch Circuit

This circuit consists of three switches connected in series; the SHIELD INTERLOCK switch 202, STOP switch 203 (rear) and STOP switch 204 (front). The switches are all normally closed, presenting 24 VAC to the 24 volt power supply. If any of the switches open, removing 24 VAC from the 24-volt power supply, +24 VDC is removed from the system to stop all case sealer operation.

The SHIELD INTERLOCK switch operates whenever the safety shield is moved out of its detent position.

The conveyor-mounted STOP switches are placed one on each side of the case sealer. They are large red palm-button switches easily operated from either side of the case sealer.

When either conveyor-mounted STOP switch is pressed, it locks in the down (open) position and the case sealer cannot be restarted until the switch is unlocked.

The console STOP switch 201 is normally closed, presenting a +24 VDC "enable" signal to PLC input 0-1. Pressing the console STOP switch removes +24 VDC from PLC input 0-1, causing the PLC to stop case sealer operations and return the case sealer to its "home" condition.

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At the fork valve V3, air is supplied through port I to port 2 and through line GC2B to the rod end of the fork cylinder C2 causing it to retract and lower

At the infeed index valve V4, air is supplied through port 1 to port 2, through flow control GRA4 and through line AS5, through the connector AS to the infeed conveyor. Here it is supplied to the cap ends of the infeed index cylinders ClO causing them to extend raising the belted section of the infeed conveyor. A tee function also supplies air through line AS4, through the AS connector to engage the infeed drive belt clutch to drive the belted section of the infeed conveyor.

At the centering rails valve V5, air is supplied from the BOX CENTERING PRESSURE regulator to port 1. At port 2 air is supplied through line AS2 and connector AS to the rod end of the centering rails cylinder C9 causing it to retract.

At the side belt valve V6, air is supplied to port I and through the valve to port 2. Then through line GC3B to the rod end of the side belt cylinder C3 to retract it and open the side belts.

At the head brake valve V8 and the side belt lock valve V7, air is supplied to blocked input ports. Therefore, the head brakes are off and the side belts are unlocked.

Air is supplied through the head up valve V9 through air line CIB to the rod ends of the head cylinders CI. At the same time, air is supplied through the head down valve VIO through air line CIA to the cap ends of the head cylinders CI. However, the air pressure in the rod ends of the cylinders plus the weight of the head assembly cylinders plus the weight of the cap ends and itself overcome the pressure in the cap ends and keep the head assembly down.

# 5-3. Pneumatic System

The main feature of the pneumatic system in the case sealer is that all the directional control valves are solenoid-operated. Each solenoid receives operating voltages of either 24 VDC to energize it from the microprocessor-based controller in the console. Whenever a controller output is active (at 24 VDC), an output-associated light emitting diode (LED) lights to show that the solenoid is energized and the valve is active.

Valves VI through V6 are 5-way, 2-position valves, and valves V7 through V10 are 3-way, 2-position valves.

Facility compressed air of 100 psi [6,5 bat] minimum is applied to the quick disconnect fitting on the front of the case sealer at the exit end. An case sealer. The air is filtered and then regulated to between 90 and 100 psi [6 and 6,5 bat]. Air is also branched to the AIR INDICATOR, the BOX PRESSURE regulator, and SIDE BELT PRESSURE regulator, and SIDE BELT pressor shows red to indicate that the air supply indicator shows red to indicate that the air supply is on. Air is also applied to the main manifold in the case sealer through line PRSP.

Air from the main manifold is supplied to port 1 of the flap folder valve VI. From port 2 of VI, air is supplied through line C5B to the cap end of the flap folder cylinder C5 causing it to extend. The flap folder itself is retracted back into the folding arm.

At the flap folding arm valve V2, air is supplied through port 1 to port 2 and through line C4B to the cap end of the flap folding arm cylinder C4 and it also extends. The flap folding arm with the flap folder extends out.

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## Model 800rf - Theory of Operation

## 5-4. Operation Detail

When reading this section, refer to the electrical schematic, pneumatic diagram, and PLC program flowchart. This review assumes that (1) the case sealer and console are connected to a 220 VAC, 60Hz, 3-phase supply and the main power switch S300 on the console pedestal is off; (2) the case sealer is connected to a source of compressed air, the on/off valve is off, and all regulators are set to their proper pressures.

## Air supply on

Set the air supply valve to on. The flap folding arm extends, the flap folder retracts into the folding arm, the side belts and centering rails move out, and the fork is down. Details are explained in section 5-3.

#### Main power switch on

Set the main power switch to on. A 24 VDC output on controller output 1-2 energizes solenoid 408 on the head up valve V9. The valve spool moves to its active position and provides an air path through line C1B to exhaust the rod ends of the head cylinders. Air is exhausted through ports A and R2 of V9 to the exhaust line of the manifold.

Air in the cap ends of the cylinders from air line C1A allows the cylinders to extend and the head to raise. When the head reaches its highest position, the head upper limit switch 504 operates, applying 24 VDC to controller input 1-2. 24 VDC on controller output 1-0 then energizes solenoid 406 on the head brake valve V8. The valve spool moves to its active position and provides an air path through line C7P to apply the head brakes.

## Start switch pressed

Before pressing the START switch on the console, the safety shield on the case sealer must be in place.

Pressing the START switch applies 24 VDC to controller input line 0-2, prompting the controller to begin its control program. The controller checks (to see) if the air pressure switch, the shield interlock switch, the console-mounted STOP

switch, and the conveyor-mounted STOP switches are all closed, providing 24 VDC to controller inputs 0-0 and 0-1. If so, 24 VDC appears at outputs 0-0 and 0-1 to energize motor control relays MC02 and MC01, and start the infeed motor and the side belt motors. (If any of the STOP switches are open, 24 VDC does not appear at outputs 0-0 and 0-1 and the motors do not start.)

5-5

If the BOX STOP FORK switch on the console is set to the down (off) position, the energizing circuit to solenoid 405 is opened, preventing operation of fork valve V3 and the fork remains in the down position. Conversely, if the BOX STOP FORK switch is set to the up (on) position, solenoid 405 energizes actuating fork valve V3 and the fork raises.

The case sealer rests in this condition until a box is placed on the conveyor for sealing.

#### Case sealing

When a box is placed on the infeed conveyor, the conveyor belt carries it forward and it breaks the light beam from photocell PC1. PC1 then applies 24 VDC to controller input 0-3. The controller then activates output 0-4 energizing solenoid 402 on the centering rails valve V5. The valve spool moves to its active position and provides an air path from the BOX CENTERING PRESSURE regulator on the console, through the centering rails valve V5 to airline AS1, and to the cap end of the centering rails cylinder C9. The cylinder extends closing the centering rails on the box.

The controller then activates output 0-3 to energize solenoid 401 on the infeed index valve V4. The valve spool moves to its active position and provides an air path from the manifold to air line AS3 and to the rod ends of the infeed index cylinders C10. Air in the cap ends of the cylinders is exhausted through air line AS5. Air in the infeed drive belt clutch is exhausted through air line AS4. The infeed index cylinders retract causing the infeed conveyor to drop and prevent the entrance of the next box. The infeed drive belt clutch disengages and stops the infeed conveyor belt.

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As the head descends, the paddle contacts the leading edge of the box and retracts into the bottom section of the head assembly. As it does so, it activates the top-of-box switch 502 inside the head, applying 24 VDC to controller input 0-7. The controller activates output 0-7, energizing solenoid 405 on the fork valve V3. The valve spool moves to its active position and opens air

The controller now makes a decision based on the condition of the long box photocell PC2. If the beam from the photocell is still broken, the box length is greater than 19 inches [483 mm] and is considered a long box. If the light beam is restored, the box length is less than 19 inches [483 mm] and is considered a short box.

rod end, through air line GC2B, and to the

line GC2A to the cap end of the fork cylinder. As the cylinder extends, air is exhausted through the

#### Long box, non-delayed cycle

manifold. The fork is raised.

At this point, the controller checks for two things; is the top-of-box switch 502 closed, and is the light beam from the long box, both of these checks are positive.

Controller inputs 0-4 and 0-7 are both active. The controller drops output 0-7, de-energizing solenoid 405 on the fork valve V3. The valve spool returns to its rest position and opens air line GC2B to the rod end of the fork cylinder C2. As the cylinder retracts, the fork lowers and allows the box to continue.

Controller output 0-6 becomes active, energizing solenoid 404 on the side belt lock valve V7. The valve spool moves to its active position and opens an air line R4P to distributor D1. Air is supplied to the cap ends of the side belt lock cylinders C8 through air lines C8P. Air is also supplied to the cap end of the paddle cylinder C6. This air supply is at maximum pressure, 100 psi le,5 bar, 693 kPa], and easily overcomes the pressure at the rod end supplied from the PADDLE pressure at the rod end supplied from the PADDLE pressure at the rod end supplied from the PADDLE

Controller output 0-1 becomes active, energizing the motor control relay MC02 and the side belts restart.

Case sealing (cont.)

After a delay of 0.5 seconds, created by the controller, output 0-4 drops and de-energizes solenoid 402. The centering rails valve V5 returns to its rest position. Air on line AS2 is supplied to the rod end of the centering rails cylinder C9. The cylinder retracts and opens the centering rails. Air is exhausted from the cap end of the cylinder through air line AS1.

The box continues its travel through the case sealer and breaks the beam from the long box control photocell PC2. PC2 then applies 24 VDC to controller input 0-4. However, there is no action until the photocell is uncovered.

As the box continues through the case sealer, it blocks the light path from side belt photocell PC3. PC3 then applies 24 VDC to controller input 0-5. 24 VDC then appears at output 0-5, energizing side belt solenoid 403. The spool on the side belt valve air path from the SIDE BELT PRESSURE air path from the SIDE BELT PRESSURE through air line GC3A to the cap end of the side through air line GC3A to the cap end of the side belt cylinder C3. The cylinder extends and the side belt smove inward to the box.

At this time, the controller initiates an internal timer T3. The box must travel all the way through the case sealer before T3 times out. If it becomes its starting state. The operator can press any one of the "stop" switches to raise the head assembly of the "stop" switches to raise the head assembly and remove the jammed box.

When the box reaches the fork, it blocks the light from the box-at-fork photocell PC4. PC4 then applies 24 VDC to controller input 0-6, prompting the controller to drop outputs 0-1 and 1-0. The side belt drive motors stop and the head brakes are released. 24 VDC then appears at output 1-1, energizing solenoid 407 on the head down valve the head cylinders ClA is opened to the cap ends of V10. Air line ClA is opened to the cap ends of the head cylinders Cl, and the cap ends of the manifold. The upper head assembly moves down towards the box.

## Model 800rf - Theory of Operation

Controller output 1-0 energizes solenoid 406 of the head brake valve V8. The valve spool moves to its active position and opens an air line C7P from the main manifold to the head brakes C7 and the head brakes are applied. Any further movement of the head assembly is prevented during the flap folding and taping operation.

At this time the controller drops output 1-1 to de-energize solenoid 407 on the head down valve V10. The valve spool returns to its rest position connecting the cap ends of the cylinders through air lines C1A to the air supply port in the manifold. The head cannot move at this time because the brakes are applied.

The firmware in the controller waits until the box moves far enough along to uncover photocell PC2.

#### Short box, delayed cycle

When the controller firmware checks photocell PC2 and finds it uncovered, it drops output 0-7 to de-energize solenoid 405 on the fork valve V3. The valve spool returns to its rest position and opens an air line GC2B to the rod end of the fork cylinder C2. As the cylinder retracts, the fork lowers and allows the box to continue.

Controller output 0-6 energizes solenoid 404 on the side belt lock valve V7. The valve spool moves to its active position and opens an air line R4P to distributor D1. Air is supplied to the cap ends of the side belt lock cylinders C8 through air lines C8P. Air is also supplied to the cap end of the paddle cylinder C6. This air supply is at maximum pressure, 100 psi [6,5 bar, 693 kPa], and easily overcomes the pressure at the rod end supplied from the PADDLE PRESSURE regulator.

Controller output 1-0 energizes solenoid 406 of the head brake valve V8. The valve spool moves to its active position and opens an air line C7P from the main manifold to the head brakes C7 and the head brakes are applied. Any further movement of the head assembly is prevented during the flap folding and taping operation.

At this time the controller drops output 1-1 to de-energize solenoid 407 on the head down valve V10. The valve spool returns to its rest position connecting the cap ends of the cylinders through air lines C1A to the air supply port in the manifold. The head assembly cannot move at this time because the brakes are applied.

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Output 1-3 energizes solenoid 409 and the flap folding arm valve V2 actuates. This opens air line C4A from the valve to the rod end of the flap folding arm cylinder C4. The cylinder retracts causing the arm to move down. The cap end of the cylinder exhausts through air line C4B and valve V2 to the manifold exhaust.

When the folding arm limit switch 503 actuates, controller output 1-4 energizes solenoid 410 on the flap folder valve V1. The valve spool moves to its active position and transfers air from line C5B to C5A and to the rod end of the flap folder cylinder C5. The cylinder retracts pushing the flap folder out to fold the rear flap on the box.

If a short box is being taped, belts do not start until after the flap folding arm has folded the rear flap of box. Controller output 0-1 energizes motor control relay MC02 and restarts the side belts. However, for a long box these two steps are redundant. These actions are already taking place.

The box now proceeds through the taping stations where a C-clip of tape is applied to the top and bottom seams.

At the exit end of the case sealer, the sealed box breaks the light beam from exit photocell PC5. PC5 then applies 24 VDC to controller input 1-1. The controller then drops outputs 1-4 and 1-3. Solenoids 410 and 409 de-energize allowing the flap folder valve V1 and the flap folding arm valve V2 to return to their rest positions. At V1, air is supplied through air line C5B to the cap end of the flap folder. At V2, air is supplied through air line C4B to the cap end of the flap folding arm cylinder C4. The cylinder extends causing the arm to move up.

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8-2

Output 0-7 is activated to energize solenoid 405. The fork valve V3 moves to its active position and the fork cylinder C2 extends to raise the fork.

Output 1-2 is activated to energize solenoid 408. The spool on the head up valve V9 moves to its active position and opens air line CIB. Air is exhausted from the rod ends of the head cylinders CI so that air in the cap ends can raise the head assembly. At the same time, output 1-0 drops to de-energize solenoid 406 and release the head brakes.

When the head upper limit switch 504 closes, output 1-0 activates and energizes solenoid 406 1-2 drops and de-energizes the head up solenoid V9.

If both switches are closed (head upper limit front and rear), the controller drops output 0-3, deenergizing infeed index solenoid 401. The infeed index valve V4 returns to its rest position and opens air line AS4 to the cap ends of the infeed index cylinders C10. At the same time, air is supplied to re-engage the infeed drive belt clutch.

The case sealer waits for the entry of the next box.

If the photocell PC6 light beam is broken momentarily, this is normal operation and allows the next box to enter the machine.

If the photocell PC6 light beam is blocked, the infeed conveyor will not pivot up and the next box will not enter the machine. If a box is pushed back into the machine, the next box will enter the machine but the fork will not lower and the upper head assembly will remain in the raised position to prevent further box progress and taping.

## Final housekeeping

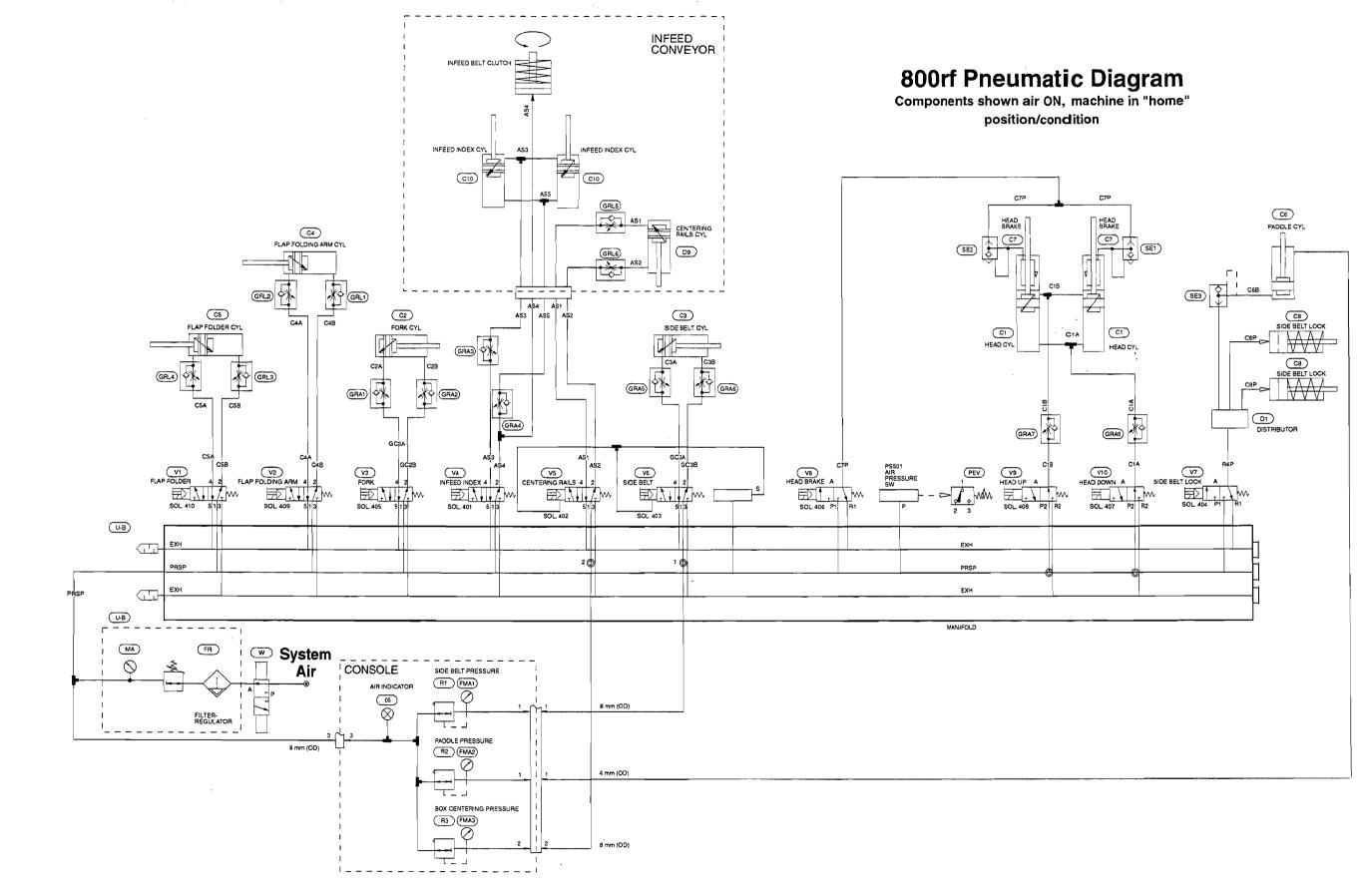
The firmware checks to see if timer T3 has timed out indicating a box jam. If the timer has timed out, the controller energizes the alarm relay 101. Controller outputs 0-0 and 0-1 drop, de-energizing the motor control relays MC01 and MC02 to stop the infeed and side belt motors.

If there is no jam, and the box is able to leave the case sealer, it uncovers the box exit photocell PC5. Switch contacts 605 open and drop the input to 1-1. Output 0-6 drops and de-energizes solenoid 404. The side belt lock valve V7 returns to its rest position and the cap end of the paddle cylinder C6 exhausts through the quick exhaust valve SE3. The cap ends of the side belt lock cylinders exhaust through lines C8P to distributor D1, and through line R4P and valve V7 to the exhaust port of the main manifold.

Output 0-5 drops and de-energizes solenoid 403. The side belt valve V6 returns to its rest position and the side belt cylinder C3 retracts to open the side belts.

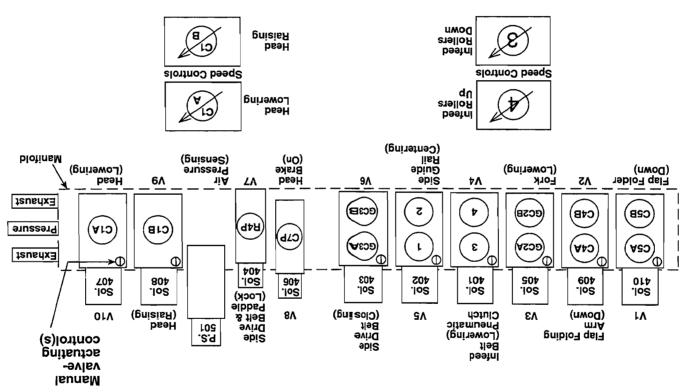
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800rf-62F

# Component Location - 800rf Pneumatics Panel



Special Note: To manually actuate and deactuate valves V1 - V6 and V9/V10, turn the screw in the top left corne r of the valve housing. Operate the valves one-at-a-time only, deactuating one before actuating another.

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5-1.	General	6-1
5-2.	Troubleshooting Guide	6-1
5.2	Component Tests	6.6

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## 6-1. General

Read the Theory of Operation, Section 5, so that the operational characteristics of the machine are thoroughly understood.

To assist in troubleshooting the case sealer, run the output tests outlined in Section 6-3. Use the SET OUT X and the RST OUT X commands (where X is the number assigned to an output line) to exercise each case sealer function.

## 6-2. Troubleshooting Guide

The following Troubleshooting Guide lists some possible machine problems, causes and corrections.

Problem	Cause	Correction
The tape is not centered on the case seam.	Cases not centered on conveyor.	Check/adjust the infeed centering function and the side belt drive centering linkage.
	Case flaps are not of equal length.	Check case specifications.
	The tape drum is not centered.	Reposition the tape drum.
Drive belts do not turn.	Electrical disconnect.	Check power and electrical plug.
	Side belt drive motor thermal cutouts (RT02-12/RT03-13) not at correct amperage setting.	Set to correct amperage. (1.6 amps)
	Motor not turning.	Evaluate problem and correct.
	Drive belt tension too low.	Adjust tension.
	Worn rubber drive ring(s).	Replace ring(s).
Drive belts do not convey cases.	Side belt pressure too low.	Check/adjust SIDE BELT PRESSURE control on console to 50 PSIG.
	Worn drive belts.	Replace drive belts.
	Top flap compression rollers set too far inward.	Reposition compression rollers.
	Tape tension is too high.	Check threading path, tension adjustments and operation of taping head rollers
	Taping head applying spring tension set too high.	Reduce spring tension.

# 6-2. Troubleshooting Guide (cont.)

Problem	Cause	Correction	
Infeed conveyor does not convey boxes into case sealer.	Friction clutch out of adjustment.	Adjust friction clutch (refer to Section 3).	
	Infeed belt loose.	Adjust belt tightness (refer to Section 3).	
Infeed clutch does not disengage.	Friction clutch out of adjustment.	Adjust friction clutch (refer to Section 3).	
	Friction material has transferred to clutch plate.	Disassemble clutch and clean with 3M Citrus Brand Industrial Cleaner (Refer to Section 4).	
Upper taping head assembly drops a few inches after returning to uppermost position.	Air cylinder brakes out of adjustment.	Adjust brakes (refer to Section 3).	
Box rear flap pulled back out of box.	Rear flap folder out of adjustment.	Adjust rear flap folder (refer to Section 3).	
	Flaps not properly positioned before entering case sealer.	Position flaps properly.	
Front of box crushed by upper head.	Paddle is not returning after previous box.	Adjust paddle pressure (refer to Section 3).	
Crease marks on upper surface of box.	Upper head assembly is coming down too far.	Adjust case top sensitivity (Procedure 3-16).	
		Adjust flow controls located on V4 valve.	
Box drives to fork, belts don't stop, head doesn't come down, unit times out.	PC 6 blocked.	Remove blockage.	
The tape leg on the front of the case is too long.	The tape is threaded incorrectly.	The tape must go around the tension wrap roller before going around the one-way tension roller.	
	The tape tension is too low.	Adjust the one-way tension roller.	
	The knurled roller drags.	Check for adhesive build-up between the knurled roller and its shaft - or an oversize roller dragging on the applying roller frame. If the problem continues, replace with a new flanged roller 78-8060-7942-8.	
(continued)	The tape tracks to one side or drags on support tabs of the applying frame.	Adjust the tape web alignment.	

Problem	Cause	Correction
The tape leg on the front of the case is too long. (cont.)	The one-way tension roller is not correctly positioned.	Position the roller in its mounting slot so that tape extends beyond the centerline of the applying roller.
	The applying roller is dragging on the frame.	Reposition the applying roller. Replace the roller bushings with flanged-type bushings. 2-inch = 78-8060-8395-8 3-inch = 78-8060-8396-6
	Head not set up properly.	Check leg length adjustments.
The blade does not cut tape or the tape end is jagged or shredded.	The blade is dull and/or has broken teeth.	Replace the blade.
	Tape tension is not sufficient.	Adjust the one-way roller to increase tape tension.
	Adhesive has built up on the blade.	Clean and adjust the blade.
	Cutoff force is not sufficient.	Install an additional cutoff spring.
	The cutoff blade is dry.	Lubricate the blade oiler pad on the blade guard.
	The blade is not properly positioned.	See the blade replacement procedure in the related taping head technical manual.
Top tape not cutting.	Upper head assembly is not coming down on top of box.	Adjust case top sensitivity (Procedure 3-16).
		Adjust flow controls located on V4 valve.
	The blade is installed "backwards."	Mount the blade so that its bevelled edge is away from the entrance-end of the taping head.
	The cutter spring(s) is/are missing or stretched.	Replace the spring(s).
	The tension roller surface is not fully contacting the taping head frame.	Make sure that the one-way bearing is below the surface of the tension roller. If not, press the bearing in farther or replace the roller.
Tape is tabbing on the trailing le on the back of the case.	There is excess tension on the tape drum assembly and/or the one-way tension roller assembly.	Adjust the tape drum assembly and/or the one-way tension roller.
(continued)		

# 6-2. Troubleshooting Guide (cont.)

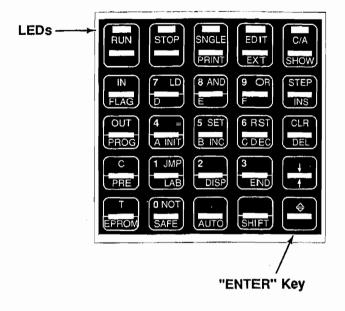
Problem	Cause	Correction
Tape is tabbing on the trailing leg on the back of the case (cont.)	Rollers in the tape path do not rotate freely.	Clean deposits from surface, ends and shafts of the rollers. Use 3M Natural Cleaner, part number 62-4615-1730-2. After cleaning, lubricate the rollers with 3M 5-Way Spray Lubricant, part number 62-4608-2926-0 or equivalent.
	The blade is not cutting the tape properly.	See tape cut problems in the preceding panels.
	The tape is threaded incorrectly.	Rethread the tape.
	Rollers in the tape path do not rotate freely.	Clean adhesive deposits from surface, ends, and shafts of rollers. Then, lubricate the rollers. Use:  • 3M Natural Cleaner, part number 62-4614-1730-2  • 3M 5-Way Penetrant, part number 62-4608-4935-9
The tape end does not stay in the application position in front of the applying roller.	The tape is threaded incorrectly.	Rethread the tape.
	The flanged knurled roller overruns on return of the applying mechanism to its rest position.	Adjust tension roller position mounting slot to lengthen tape leg.
	•	Install new type flanged knurled roller - P/N 79-8070-1367-3.
	The applying roller overruns on return of the applying mechanism to its rest position.	There should be a slight drag when rotating the applying roller. If not, check the friction spring(s) and/or friction pins and replace if necessary.
	The one-way tension roller is not correctly positioned.	Position the tension roller in its mounting slot so that the tape end extends beyond the centerline of the applying roller.
	The one-way tension roller is defective.	Replace the one-way tension roller.
	The tape support finger is worn or missing.	Replace the tape support finger.

Problem	Cause	Correction
Tape adheres to itself or machine frame.	The tape roll is overtravelling.	Increase tension on the friction brake tape drum until the problem is eliminated. If tabbing occurs, reduce tension.
The tape leg on the rear of the case is too long.	The taping head is not set up properly.	Check tape leg length adjustment.
	Cutoff bracket "hangs up."	Check for and eliminate any interference.
The tape edge folds over, providing an unsatisfactory seal.	The tape drum is not aligned.	Adjust the tape web alignment.
	The tape roll is "telescoped."	Replace the tape roll.
	The tape drum bracket is bent.	Straighten/replace the tape drum bracket.
The leading edge of the case is crushed or the edge of the flaps is folded over.	Applying/buffing roller pressure is too high.	Reduce pressure by repositioning the applying mechanism spring.
Tape releases from the case while in storage.	The tape or case being used is incorrect.	Contact a 3M sales representative. Generally, if the case exits the machine with the tape correctly applied, the machine is not at fault.

## 6-3. Component Tests

To determine whether or not sensor/signal inputs to the controller are defective, complete the following controller input tests.

## **Controller Input Tests**



Input	LED	LED ON/OFF Conditions	Notes
00	100	<ol> <li>ON when air on/off valve is ON.</li> <li>OFF when air on/off valve is OFF.</li> </ol>	Air on/off valve should be OFF.
01	I01	<ol> <li>ON when safety shield is in the detent position.</li> <li>OFF when:         <ul> <li>a. the safety shield is <u>not</u> in the detent position, or;</li> <li>b. either of the two conveyor-mounted emergency switches is pressed, or;</li> <li>c. the console-mounted STOP switch is pressed.</li> </ul> </li> </ol>	Air on/off valve should be OFF. LED I01 should be ON. When any STOP switch is pressed, all power will be removed from the machine.
02	102	<ol> <li>ON when console START switch is pressed.</li> <li>OFF when console START switch is released.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
03	103	<ol> <li>ON when photocell PC1 is blocked.</li> <li>OFF when photocell PC1 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
04	104	<ol> <li>ON when photocell PC2 is blocked.</li> <li>OFF when photocell PC2 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
05	105	<ol> <li>ON when photocell PC3 is blocked.</li> <li>OFF when photocell PC3 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
06	106	<ol> <li>ON when photocell PC4 is blocked.</li> <li>OFF when photocell PC4 is uncovered.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
07	107	<ol> <li>ON when the paddle is moved up.</li> <li>OFF when the paddle is moved down.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.

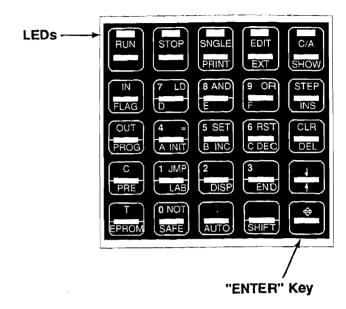
Input	LED	LED ON/OFF Conditions	Notes
10	I10	1. ON when the flap folding arm goes up.	Air on/off valve should be OFF.
		2. OFF when the flap folding arm goes down.	LED I01 should be ON.
11	I11	1. ON when photocell PC5 is blocked.	Air on/off valve should be OFF.
		2. OFF when photocell PC5 is uncovered.	LED I01 should be ON.
13	I13	<ol> <li>ON when the side drive belt assemblies are moved to the inner limit.</li> <li>OFF when the side drive belt assemblies are moved away from the inner limit.</li> </ol>	Air on/off valve should be OFF. LED I01 should be ON.
14	I14	ON when optional Tape Application Sensor (TAS)  detects an error condition.	Air on/off valve should be OFF.
		2. OFF when no error condition exists.	LED I01 should be ON.
15	I15	1. ON when operating in fixed mode (optional).	Air on/off valve should be OFF.
		2. OFF when operating in random mode.	LED I01 should be ON.
17	I17	1. ON when photocell PC6 is blocked.	Air on/off valve should be OFF.
		2. OFF when photocell PC6 is uncovered.	LED I01 should be ON.

## 6-3. Component Tests (cont.)

The following tests exercise all "driven" components: solenoids and associated valves/cylinders and motors.

If any one of the solenoid/valve/cylinder tests is defective, the probable cause can be further defined by manually actuating the associated valve. (See the diagram and instructions on the rear of the pneumatic schematic.) If the controller output test of a valved function is defective, yet manual actuation of the valve results in correct operation, the probable cause is then the controller or the associated valve solenoid.

#### **Controller Output Tests**



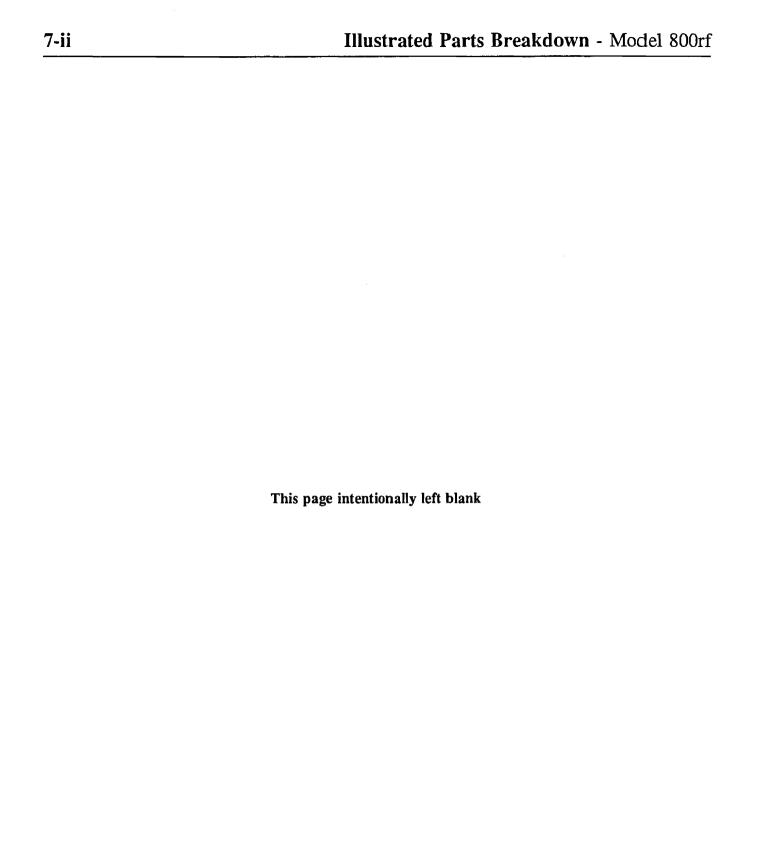
Output	Press (in sequence):	Display reads:	Press:	LED is on/off.	Condition
00	SET, OUT, 0	SO0	Enter	O00 is ON.	Infeed motor STARTS.
	RST, OUT, 0	RO0	Enter	O00 is OFF.	Infeed motor STOPS.
01	SET, OUT, 1	SO1	Enter	O01 is ON.	Drive belt motors START.
	RST, OUT, 1	RO1	Enter	O01 is OFF.	Drive belt motors STOP.
02	SET, OUT, 2	SO2	Enter	O02 is ON.	Alarm relay 101 ENERGIZES.
	RST, OUT, 2	RO2	Enter	O02 is OFF.	Alarm relay 101 DE-ENERGIZES.
03	SET, OUT, 3	SO3	Enter	O03 is ON.	Solenoid 401 on infeed index valve V4 is ENERGIZED and infeed rollers are DOWN.
	RST, OUT, 3	RO3	Enter	O03 is OFF.	Solenoid 401 on infeed index valve V4 is DE-ENERGIZED and infeed rollers are UP.
04	SET, OUT, 4	SO4	Enter	O04 is ON.	Solenoid 402 on the centering rails valve V5 is ENERGIZED and the centering rails are IN.
	RST, OUT, 4	RO4	Enter	O04 is OFF.	Solenoid 402 on the centering rails valve V5 is DE-ENERGIZED and the centering rails are OUT.

Output	Press (in sequence):	Display reads:	Press:	LED is on/off.	Condition
05	SET, OUT, 5	SO5	Enter	005 is ON.	Solenoid 403 on the side belt valve V6 is ENERGIZED and the side belts are IN.
	RST, OUT, 5	RO5	Enter	O05 is OFF.	Solenoid 403 on the side belt valve V6 is DE-ENERGIZED and the side belts are OUT.
06	SET, OUT, 6	SO6	Enter	O06 is ON.	Solenoid 404 on the side belt lock valve V7 is ENERGIZED, the side belt locks are ON, and the paddle RETRACTS.
	RST, OUT, 6	RO6	Enter	O06 is OFF.	Solenoid 404 on the side belt lock valve V7 is DE-ENERGIZED, the side belt locks are OFF, and the paddle EXTENDS.
07	SET, OUT, 7	SO7	Enter	007 is ON.	Solenoid 405 on the fork valve V3 is ENERGIZED and the fork is UP.
	RST, OUT, 7	RO7	Enter	O07 is OFF.	Solenoid 405 on the fork valve V3 is DE-ENERGIZED and the fork is DOWN.
Note Outputs 10, 11 and 12 are dependent on one another and must be tested in the following sequence:					
12	SET, OUT, 12	SO12	Enter	O12 is ON.	Head assembly is UP.
					·
10	SET, OUT, 10	SO10	Enter	O10 is ON.	Head assembly brakes are RELEASED.
11	SET, OUT, 11	SO11	Enter	O11 is ON.	Head assembly is DOWN.
11	RST, OUT, 11	RO11	Enter	O11 is OFF.	Head assembly is UP.
10	RST, OUT, 10	RO10	Enter	O10 is OFF.	Head assembly brakes are APPLIED.
12	RST, OUT, 12	RO12	Enter	O12 is OFF.	Head assembly is UP.
13	SET, OUT, 13	SO13	Enter	O13 is ON.	Solenoid 409 on the flap folding arm valve V2 is ENERGIZED and the flap folding arm moves DOWN.
	RST, OUT, 13	RO13	Enter	O13 is OFF.	Solenoid 409 on the flap folding arm valve V2 is DE-ENERGIZED and the flap folding arm moves UP.
14	SET, OUT, 14	SO14	Enter	O14 is ON.	Solenoid 410 on the flap folder valve V1 is ENERGIZED and the flap folder is DOWN.
	RST, OUT, 14	RO14	Enter	O14 is OFF.	Solenoid 410 on the flap folder valve V1 is DE- ENERGIZED and the flap folder is UP.

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7-1.	How to	How to Order Replacement Parts7-1					
7-2.	Spare I	Spare Parts					
7-3.	Suggested Spare Parts						
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	7-39.	Tape Drum Assembly					



#### 7-1. How to Order Replacement Parts

1. Refer to the following figures and their related lists of parts on the following pages to determine the individual part number and description.

#### Note

Complete descriptions have been included for most commercially available components. This has been done to allow the customer/service person to obtain parts locally, should they choose to do so.

2. Order parts by machine model number, part number, description, and quantity required. (An order form is attached to the back section of this manual.)

Minimum billing on parts is \$25.00. Replacement part prices are available on request.

3. Replacement parts and part prices are available directly from:

3M Tape Dispenser Parts 241 Venture Drive Amery, WI 54001-1325

1-800/344 9883 FAX # 715/268 8153

#### Note

Outside the U.S., contact the local 3M subsidiary for parts order information.

#### 7-2. Spare Parts

A set of suggested spare parts for those components that will periodically require replacement due to normal wear or breakage is suplied with the case sealer. The set includes the following items which should be reordered as they are consumed to keep the case sealer in good operating condition.

Part Number	Description	Quantity	Figure No.	Item No.			
78-8070-1274-1	SPRING, Top Extension	1	34	10			
78-8017-9173-8	BLADE, Cutoff, 2.56 in. [65 mm]	2	35	2			
78-8052-6602-6	SPRING, Cutter	2	35	12			
78-8070-1273-3	SPRING, Bottom Extension	1	38	10			
These parts are available as a kit. The kit part number is 78-8098-8893-2.							

#### 7-3. Suggested Spare Parts

In addition to the preceding minimum spare parts, it is suggested that the following items be maintaned as spare parts.

Part Number	Description	Quantity	Figure No.	Item No.
78-8057-6178-6	ROLLER, Buffing	1	34	5
78-8057-6179-4	ROLLER, Applying	1	33	15
78-8054-8841-4	DRIVE BELT	2	15	55
78-8076-5056-5	PHOTOCELL, PNP	1	4	55
78-8054-8974-3	ROLLER, Pressure, Top Flap	1	11	9
78-8052-6713-1	RING, Polyurethane, Side Belt Drive	4	15	17
78-8070-1390-5	SPRING, Tension, Tape Cutting Assy	2	36	6
<b>7</b> 8-8094-6472-6	MOTOR, 200/220V, 50/60 Hz, 3-Phase	1	14	94

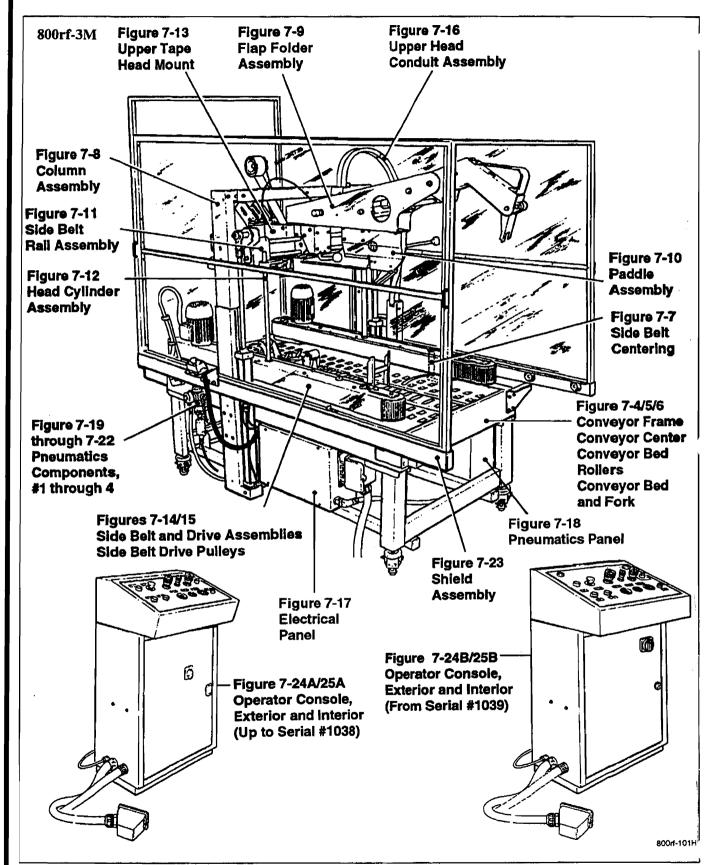


Figure 7-1. Conveyor Section Breakdown

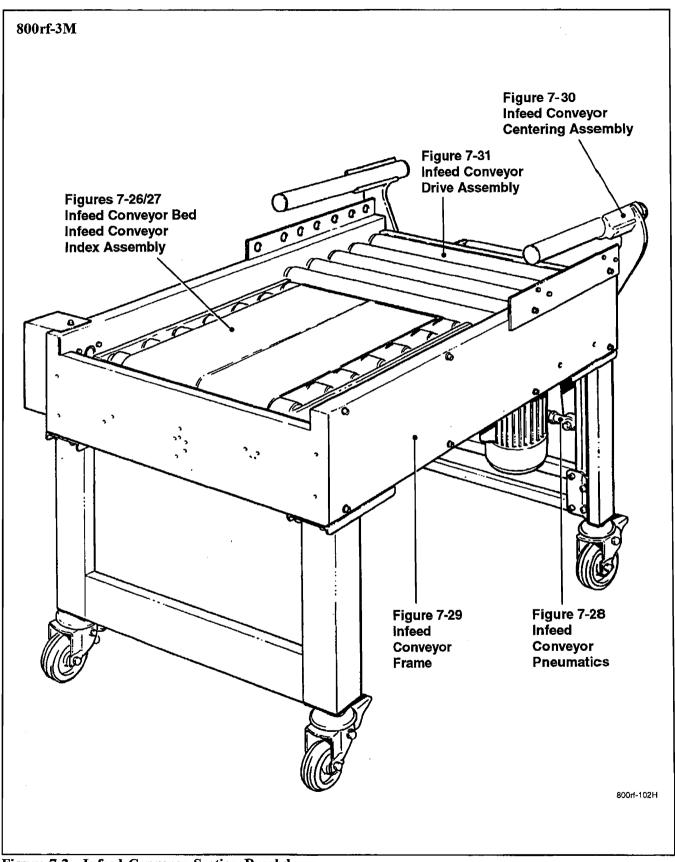


Figure 7-2. Infeed Conveyor Section Breakdown

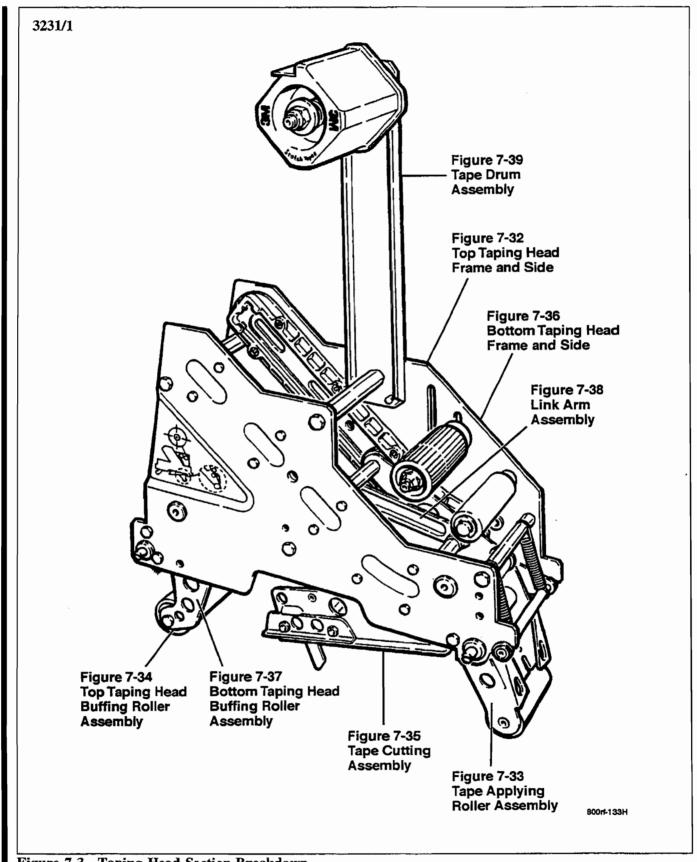


Figure 7-3. Taping Head Section Breakdown



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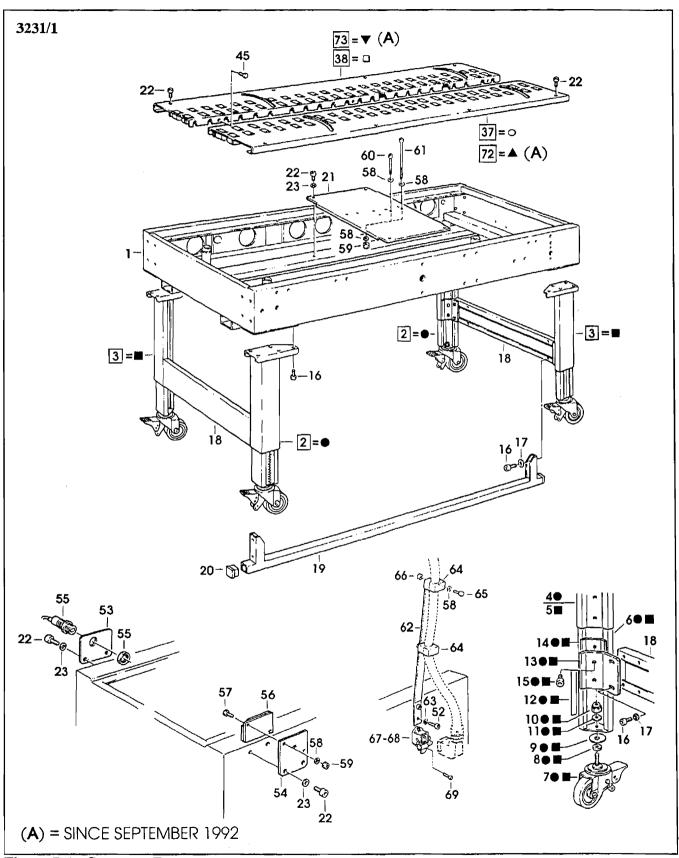


Figure 7-4. Conveyor Frame

Parts List - Conveyor Frame

Item Number	Part Number	Description	Qty
1	78-8076-5037-5	BED, Conveyor LEG ASSEMBLY, Right LEG ASSEMBLY, Left	1
2	78-8076-5038-3		2
3	78-8076-5039-1		2
4	78-8076-5040-9	LEG, Right	2
5	78-8076-5041-7	LEG, Left	2
6	78-8052-6678-6	LEG, Inner	4
7	78-8060-7847-9	CASTER/100	4
8	78-8060-8124-2	SPACER, Caster	4
9	78-8060-7699-4	WASHER/12-45, 5 x 4	4
10	78-8060-7532-7	NUT, M12 Self-Locking	4
11	78-8017-9059-9	WASHER, Flat for M12 Screw	4
12	78-8052-6680-2	LABEL, Height	4
13	78-8060-7697-8	BRACKET, Special CLAMP, Inner SCREW, Soc. Hd., M8 x 16	4
14	78-8052-6677-8		4
15	26-1003-7963-0		10
16	26-1003-7964-8	SCREW, Soc. Hd., Hex Soc. Dr., M8 x 20 WASHER, Plain, Metric 8mm CROSS MEMBER, Leg	36
17	78-8017-9318-9		18
18	78-8076-5042-5		2
19	78-8076-5043-3	REINFORCEMENT, Leg	2
20	78-8060-7704-2	CAP, Plastic, 40 x 40	4
21	78-8076-5044-1	SUPPORT	1
22	78-8060-7896-6	SCREW, Soc. Hd., Hex Hd., M6 x 14	32
23	26-1000-0010-3	WASHER, Flat M6	32
37	78-8076-5046-6	ROLLER CONVEYOR ASSEMBLY, R/H	1
38	78-8076-5047-4	ROLLER CONVEYOR ASSEMBLY, L/H	1
45	26-1003-5829-5	SCREW, Hex Hd., M6 x 12	6
52	26-1003-7949-9	SCREW, Soc. Hd., Hex Soc., M5 x 12	12
53	78-8076-5054-0	SUPPORT, Photocell	3
54	78-8076-5055-7	SUPPORT, Reflector	3
55	78-8076-5056-5	PHOTOCELL, PNP, E3F, R2, B4 /18	3
56	78-8076-5057-3	REFLECTOR, E39-R1	3
57	83-0002-7336-3	SCREW, Hex Hd., M4 x 14, Zinc. Pl	6
58	78-8005-5740-3	WASHER, Plain, Metric 4mm Nick.	18
59	78-8010-7416-8	NUT, Metric, Hex, Steel M4	10
60	26-1003-7946-5	SCREW, Soc. Hd., M4 x 25	2
61	78-8076-5058-1	SCREW, Soc. Hd., Hex Hd., M4 x 55	2
62	78-8076-5059-9	STRAP, Wire	2
63	78-8005-5741-1	WASHER, Metric, Plain, M5	4
64	78-8060-7630-9	LOCK, TUBE	4
65	78-8010-7157-8	SCREW, Hex Hd., M4 x 10	4
66	26-1003-6914-4	NUT, Plastic Insert M4	4
67	78-8060-7872-7	COVER Plug, Straight	2
68	78-8060-7873-5	PLUG, Female	2
69	78-8028-8208-0	SCREW, 6P x 9,5	4
72	78-8091-0385-2	CONVEYOR ASSEMBLY, Right	1
73	78-8091-0386-0	CONVEYOR ASSEMBLY, Left	1

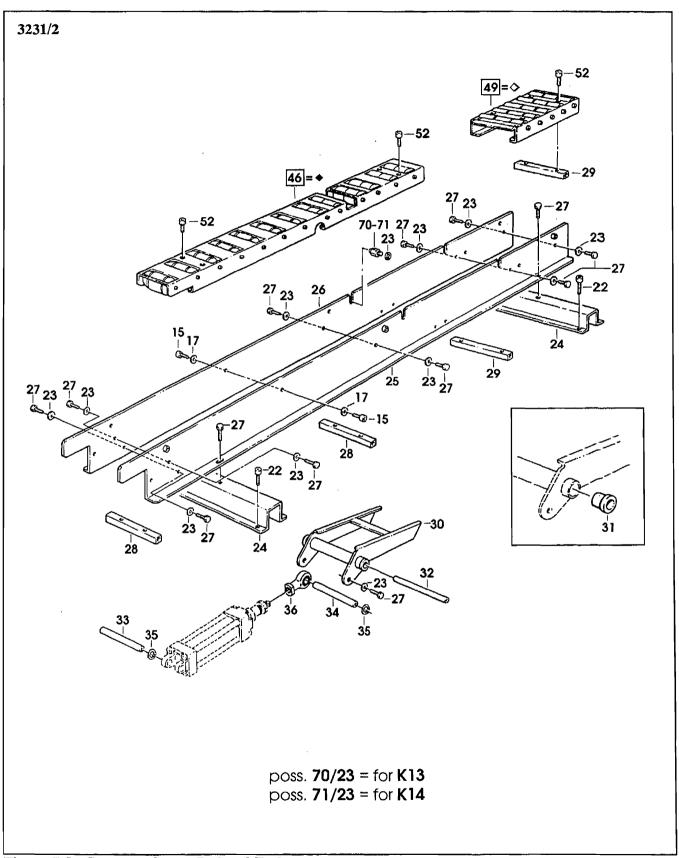


Figure 7-5. Conveyor Center Bed and Fork

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Parts List - Conveyor Center Bed and Fork

	Item Number	Part Number	Description	Qty
	15	26-1003-7963-0	SCREW, Soc. Hd., M8 x 16	10
	17	78-8017 <b>-</b> 9318-9	WASHER, Plain, Metric 8mm	18
	22	78-8060-7896-6	SCREW, Soc. Hd., Hex Hd., M6 x 14	32
	23	26-1000-0010-3	WASHER, Flat M6	32
	24	78-8076-5060-7	SUPPORT	2
	25	78-8060-7712-5	SHOULDER, Lower, Right	1
	26	78-8060-7710-9	SHOULDER, Lower, Left	1
	27	78-8010-7169-3	SCREW, Metric, M6 x 12, Hex Hd.	16
	28	78-8060-7714-1	STRIP	2
ı	29	78-8060-7722-4	SPACER, L=144	2
	30	78-8076-5045-8	FORK	1
	31	78-8060-7718-2	BUSHING	2
	32	78-8060-7717-4	SHAFT, Flap Straightener	1
	33	78-8060-7721-6	STUD, Cylinder Mount	1
	34	78-8060-7719-0	SHAFT, 10 x 115	1
	35	78-8052-6733-9	RING, Special M10	4
	36	78-8057 <b>-</b> 5748-7	MOUNT, Cylinder Rod End	1
	46	78-8076-5050-8	ROLLER CONVEYOR ASSEMBLY, Center	1
	49	78-8076-5052-4	ROLLER CONVEYOR ASSEMBLY, R/H	1
	52	26-1003-7949-9	SCREW, Soc. Hd., Hex Soc., M5 x 12	12
I	70	78-8060 <b>-</b> 8467-5	STUD, 2-inch Bottom Head Mount	4
	71	78-8091-0384-5	STUD, 3-inch Bottom Head Mount	4

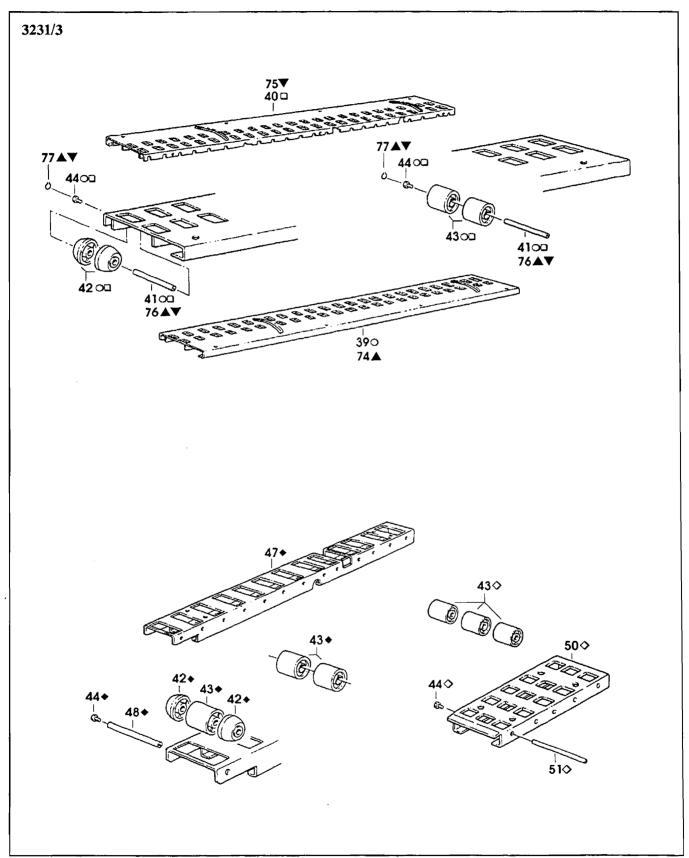


Figure 7-6. Conveyor Bed Rollers

# Parts List - Conveyor Bed Rollers

Item	Part		
Number	Number	Description	Qty
39	78-8076-5048-2	ROLLER ASSEMBLY, Right	1
40	78-8076-5049-0	ROLLER ASSEMBLY, Left	1
41	78-8060-7691-1	SHAFT, 8 x 114,5	46
42	78-8060-7692-9	ROLLER, Tapered	62
43	78-8060-7693-7	ROLLER, 32 x 38	102
44	78-8010-7163-6	SCREW, Metric, M5 x 10, Hex Hd.	64
47	78-8076-5051-6	ROLLER ASSEMBLY, Center	1
48	78-8060-7708-3	SHAFT, 8 x 92	13
50	78-8076-5053-2	ROLLER ASSEMBLY, Rear	1
51	78-8060-7706-7	SHAFT, 8 x 132	5
74	78-8091-0387-8	CONVEYOR, Right	1
75	78-8091-0388-6	CONVEYOR, Left	1
76	78-8060-7965-9	SHAFT, 8 x 120, Hex Hd.	23
77	78-8060-8035-0	E-RING	23

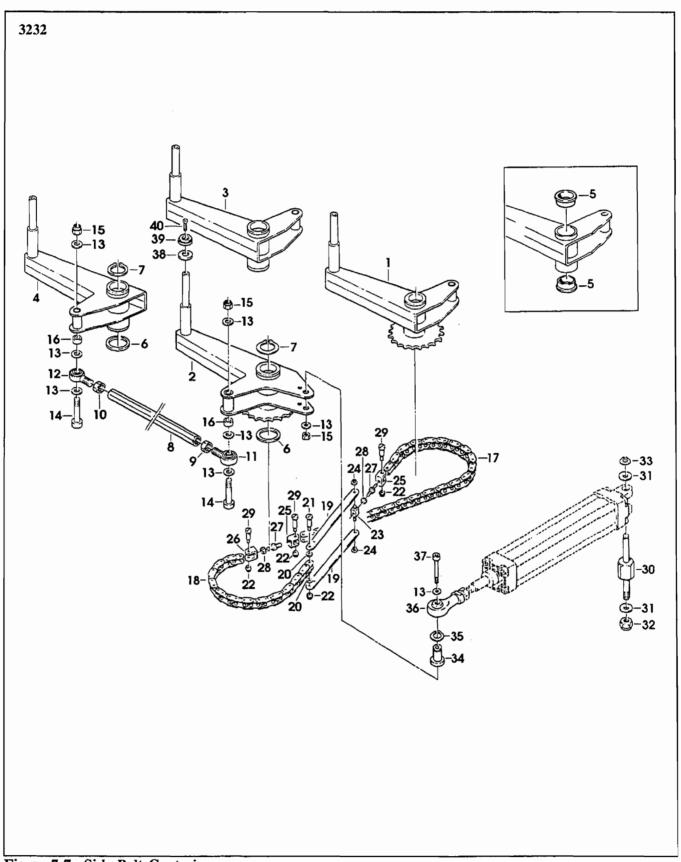


Figure 7-7. Side Belt Centering

# Parts List - Side Belt Centering

Item Number	Part Number	Description	Qty
1	78-8076-4787-6	ARM ASSEMBLY, Front, Right	1
2	78-8076-5061-5	ARM ASSEMBLY, Front, Left	1
3	78-8076-5062-3	ARM ASSEMBLY, Rear, Right	1
4	78-8076-5063-1	ARM ASSEMBLY, Rear, Left	1
5	78-8076-4791-8	BUSHING	8
6	78-8060-7534-3	WASHER	4
7	78-8060-7521-0	LOCK RING	4
8	78-8060-7527-7	ROD	2
9	78-8060-7525-1	NUT, M10, Right, Flat	2
10	78-8060-7546-7	NUT, M10, Left, Flat	2
11	78-8076-4793-4	BALL JOINT, KA 10 D	2
12	78-8076-4794-2	BALL JOINT, KAL 10 D	2
13	78-8052-6566-3	WASHER, Friction	14
14	78-8076-4796-7	SCREW, Soc. Hd., Hex Hd., M10 x 80	4
15	26-1003-6918-5	NUT, Plastic Insert, M10 Hex	5
16	78-8076-4795-9	SPACER CHAIN, 3/8-inch, 60 Pitch Long CHAIN, 3/8-inch Pitch, 41 Pitch Long	4
17	78-8060-7518-6		1
18	78-8054-8777-0		1
19	78-8054-8787-9	LINK, Chain	2
20	78-8054-8783-8	WASHER, Special	2
21	78-8060-7519-4	SCREW, M3 x 25	1
22	78-8059-5517-2	NUT, Self-Locking, M3, Zinc. Pl.	4
23	78-8054-8784-6	BLOCK, Chain	1
1 24	78-8656-3945-0	E-RING, M-4	2
25	78-8054-8786-1	CONNECTOR, Chain CONNECTOR, Chain ROD, Threaded Right/Left	2
26	78-8054-8788-7		1
27	78-8054-8785-3		2
28	78-8010-7418-4	NUT, Metric, Hex, Stl., M6	2
29	78-8060-7520-2	SCREW, M3 x 20	3
30	78-8060-7531-9	STUD, Cylinder	1
31	78-8017-9059-9	WASHER, Flat for M12 Screw	2
32	78-8060-7532-7	NUT, M12 Self-Locking	1
33	78-8056-3965-8	E-RING, M-8	1
34	78-8060-7538-4	BUSHING, Cylinder	1
35	78-8060-7533-5	LOCK RING	1
36	78-8060-7724-0	NUT, M22 x 1,5	1
37	78-8060-7535-0	SCREW, M10 x 60, Soc. Hd., Hex Soc. WASHER WASHER, Special	1
38	78-8060-7541-8		4
39	78-8054-8577-4		4
40	26-1001-9843-6	SCREW, Flat Soc. Hd., M6 x 16	4

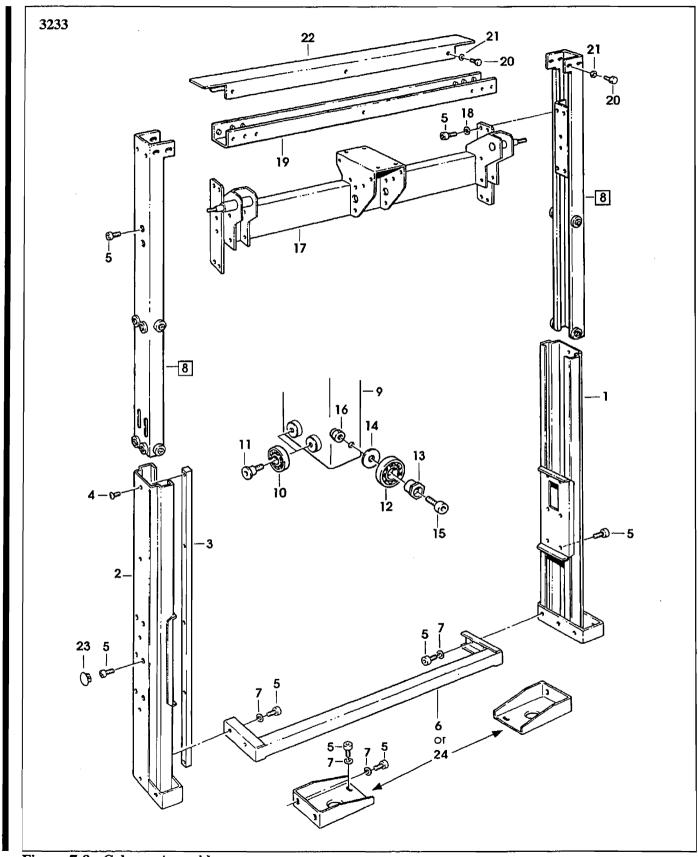


Figure 7-8. Column Assembly

# Parts List - Column Assembly

Item Numb	Part er Number	Description	Qty
1	78-8076-5064-9	COLUMN ASSEMBLY, Right, Outer	1
2	78-8076-5065-6	COLUMN ASSEMBLY, Left, Outer	1
3	78-8076-5066-4	GUIDE, Column	2
4	78-8076-4503-7	SCREW, M6 x 12	10
5	26-1003-7964-8	SCREW, Soc. Hd., Hex Soc. Dr., M8 x 20	28
6	78-8076-5067-2	CROSS-MEMBER, Columns	1
<b>■</b> 7	78-8017-9318-9	WASHER, Plain, Metric, 8mm	8
<del>-</del> 8	78-8076-5068-0	COLUMN ASSEMBLY, Inner	2
9	78-8076-5069-8	COLUMN, Inner	2
10	78-8059-5625-3	BEARING	8
11	78-8076-4815-5	SCREW, Bearing	8
12	26-1000-4350-9	BEARING, 6002, 2RS	8
13	78-8076-4816-3	BUSHING, Eccentric	8
14	78-8076-5070-6	SPACER	8
15	26-1003-7957-2	SCREW, Soc. Hd., Hex Hd., M6 x 16	8
16	26-1003-6916-9	NUT, Locking, Plastic Insert, M6	8
17	78-8076-5071-4	CROSS BAR, Upper Assembly	1
18	78-8005-5736-1	LOCKWASHER, for M8 Screw	8
19	78-8076-5072-2	CROSS MEMBER, Upper	1
20	78-8032-0375-7	SCREW, Metric, M6 x 16, Hex Hd.	14
21	26-1000-0010-3	WASHER, Flat M6	14
22	78-8076-5073-0	COVER, Cross Member	1
23	78-8054-8821-6	CAP	12
24	78-8100-0894-2	BRACKET, Column	2

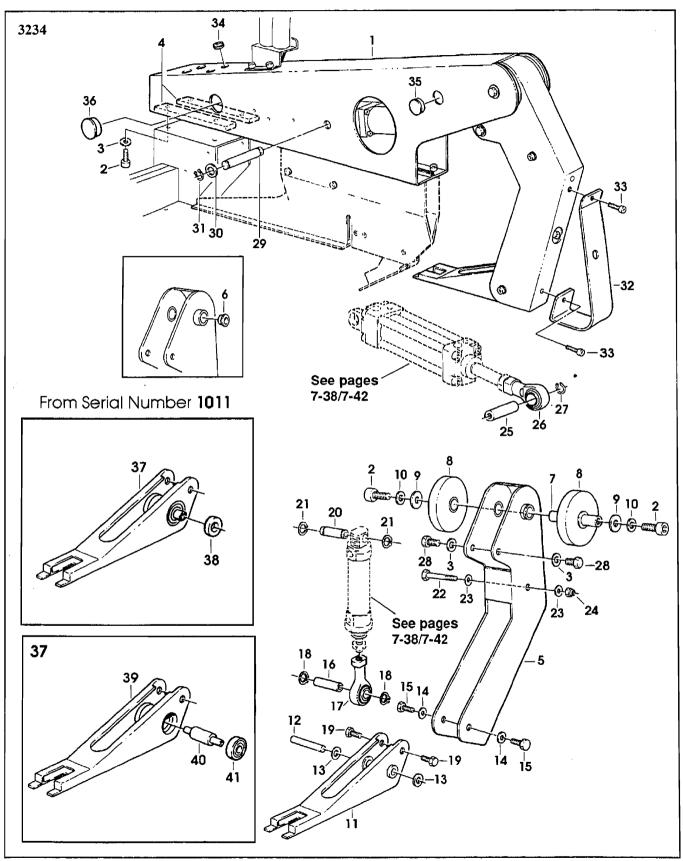


Figure 7-9. Flap Folder Assembly

# ■ Parts List - Flap Folder Assembly

Item Number	Part Number	Description	Qty
1	78-8076-5074-8	SUPPORT, Flap Folder	1
2	26-1003-7963-0	SCREW, Soc. Hd., M8 x 16	6
3	78-8017-9318-9	WASHER, Plain, Metric 8mm	6
4	78-8060-7759-6	PLATE, Threaded	2
5	78-8076-5075-5	ARM, Rear Flap Folder	1
6	78-8060-7718-2	BUSHING	2
7	78-8054-8950-3	SHAFT, 12 x 81mm	1
8	78-8060-7765-3	FLANGE, Flap Folder	2
9	26-1004-5507-5	WASHER, M8	2
10	78-8005-5736-1	LOCKWASHER, for M8 Screw	2
11	78-8060-8083-0	FLAP FOLDER	1
12	78-8054-8954-5	SPACER, 10 x 51mm	1
13	78-8052-6566-3	WASHER, Friction WASHER, Flat M6 SCREW, Metric, M6 x 12, Hex Hd.	2
14	26-1000-0010-3		2
15	78-8010-7169-3		2
16	78-8060-7764-6	SPACER, 10 x 39	1
17	78-8057-5748-7	MOUNT, Cylinder Rod End	1
18	78-8052-6733-9	RING, Special M10	2
19	26-1003-5828-7	SCREW, Hex Hd., M6 x 10	2
20	78-8054-8946-1	SHAFT, 5/8 x 51mm	1
21	78-8052-6732-1	RING, Special M8	2
22	78-8057-5895-6	SCREW, Hex Hd., M5 x 60	1
23	78-8005-5741-1	WASHER, Metric, Plain, M5	2
24	26-1005-6859-6	NUT, Self-Locking, M-5	1
25	78-8054-8944-6	SHAFT, 12 x 51mm	1
26	78-8057-5747-9	MOUNT, Cylinder Rod End	1
27	78-8656-3972-4	E-RING, M12	2
28	26-1003-5841-0	SCREW, M8 x 16	2
29	78-8054-8937-0	SHAFT, 12 x 100mm	1
30	78-8017-9059-9	WASHER, Flat for M12 Screw	2
31	78-8656-3965-8	E-RING, M-8 EXTENSION, Flap Folder SCREW, Soc. Hd., Hex Hd., M6 x 14	2
32	78-8076-5076-3		1
33	78-8060-7896-6		2
34	78-8060-7758-8	FAIRLEAD/20	2
35	78-8060-7885-9	END CAP/25 x 1,2	1
36	78-8060-8184-6	CAP/35 x 1,5	1
37	78-8091-0360-5	FLAP FOLDER ASSEMBLY, Rear	1
38	78-8091-0389-4	BEARING, Spacer	1
39	78-8091-0553-5	FLAP FOLDER, Rear	1
40	78-8091-0554-3	SHAFT, Flap Folder	1 2
41	78-8023-2410-9	BEARING, 6000-2RS	

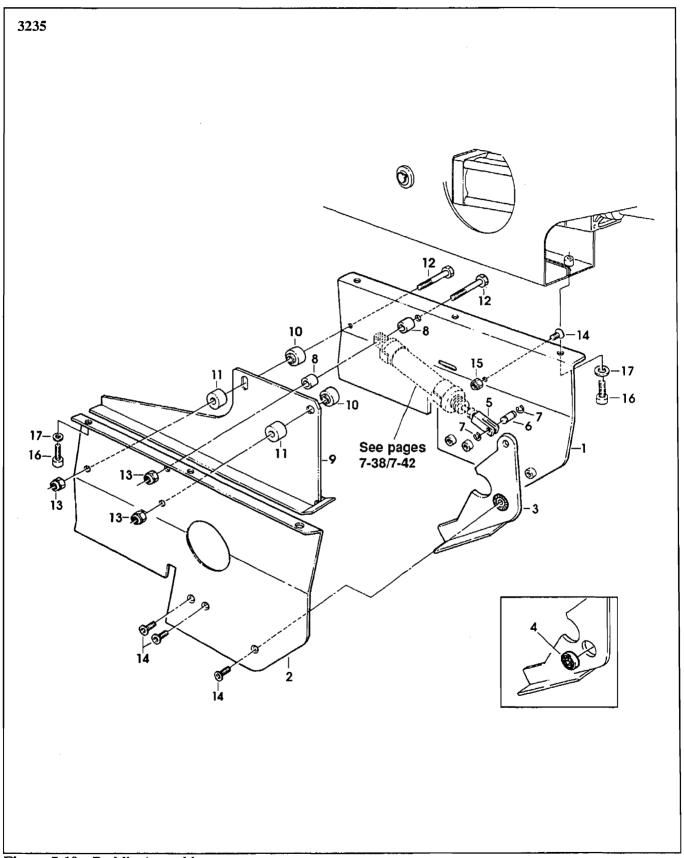


Figure 7-10. Paddle Assembly

Parts List - Paddle Assembly

Item Number	Part Number	Description	Qty
Number	- TAGITIDEI	Description	Qiy
1	78-8076-5077-1	SUPPORT, Right	1
2	78-8076-5078-9	SUPPORT, Left	1
3	78-8076-5079-7	PADDLE, Box Height	1
4	78-8060-7568-1	BEARING 618/9	1
5	78-8076-5081-3	FORK, Cylinder	1
6	78-8060-7566-5	STUD, Fork	1
7	78-8060-7565-7	RING	2
8	78-8060-7558-2	SPACER, Cylinder	2
9	78-8076-5080-5	GUIDE, Box	1
10	78-8060-7561-6	SPACER	2
11	78-8060-7562-4	SPACER	2
12	26-1002-5836-2	SCREW, Hex Hd., M6 x 40	3
13	26-1003-6916-9	NUT, Locking, Plastic Insert, M6	3
14	78-8017-9170-4	SCREW, Phillips, FH M4 x 8	4
15	26-1003-6914-4	NUT, Plastic Insert M4	1
16	26-1003-7957-2	SCREW, Soc. Hd., Hex Hd., M6 x 16	6
17	26-1000-0010-3	WASHER, Flat M6	6

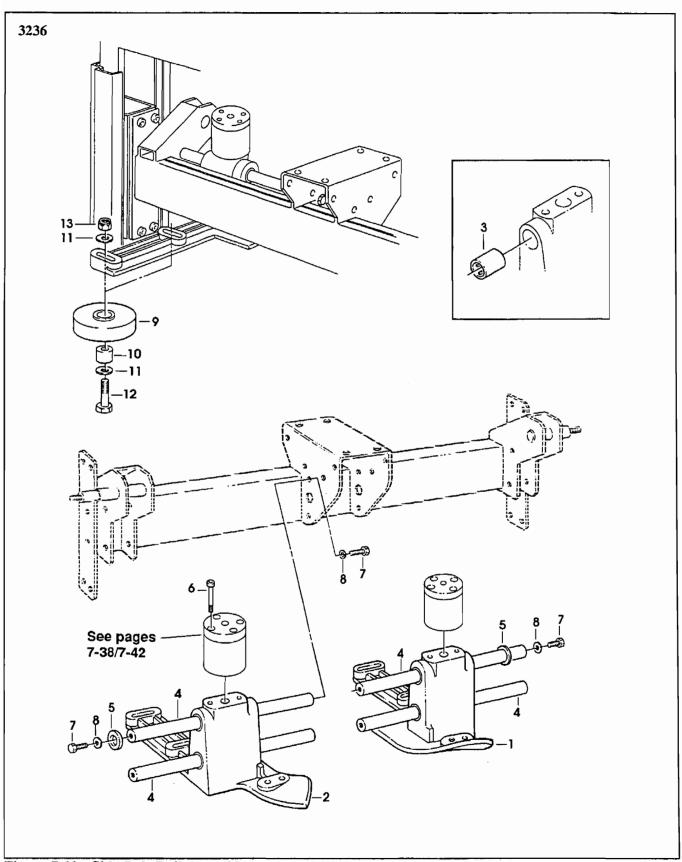


Figure 7-11. Side Belt Rail Assembly

# Parts List - Side Belt Rail Assembly

Item Number	Part Number	Decarintion	Oter
Number	Number	Description	Qty
1	78-8076-5082-1	SIDE FLAP FOLDER, Right	1
2	78-8076-5083-9	SIDE FLAP FOLDER, Left	1
3	78-8060-7555-8	BEARING, L-bar	8
4	78-8060-7554-1	STUD, Flap Folder	4
5	78-8060-7747-1	RUBBER RING	4
6	78-8060-7551-7	SCREW, Soc. Hd., Hex Soc., M6 x 65	4
7	26-1003-5841-0	SCREW, M8 x 16	8
8	78-8017-9318-9	WASHER, Plain, Metric 8mm	8
9	78-8054-8974-3	ROLLER, Pressure	4
10	78-8055-0622-3	BUSHING	4
11	26-1004-5507-5	WASHER, M8	8
12	26-1002-5949-3	SCREW, Hex Hd., M8 x 60	4
13	78-8017-9313-0	NUT, Self-Locking, M8, Nick. Pl.	4

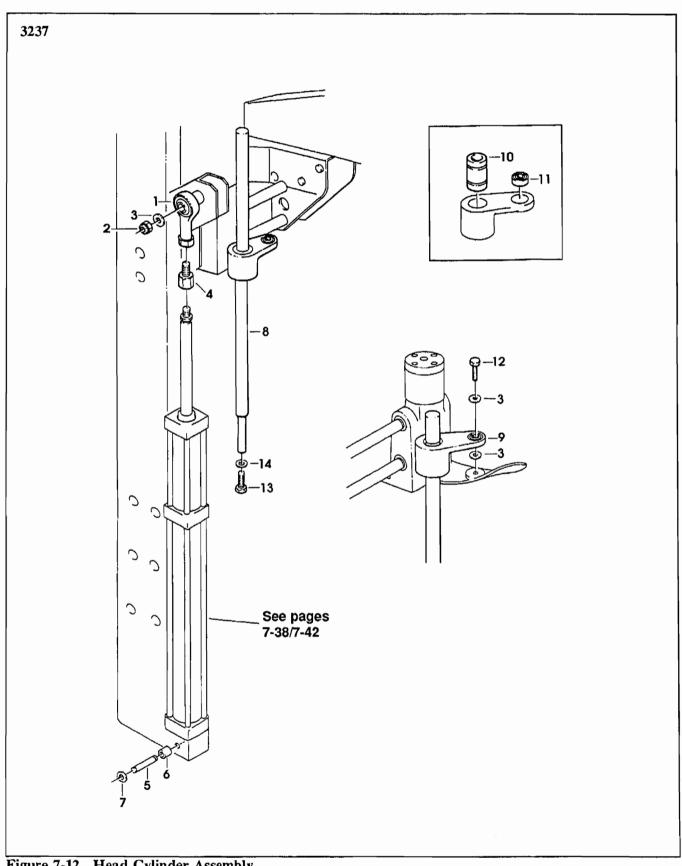


Figure 7-12. Head Cylinder Assembly

# Parts List - Head Cylinder Assembly

	Item Number	Part Number	Description	Qty
	1	78-8060-7724-0	NUT, M22 x 1,5	2
	2	26-1003-6918-5	NUT, Plastic Insert, M10 Hex	2
	3	78-8052-6566-3	WASHER, Friction	6
	4	78-8076-5084-7	STUD, Cylinder	2
	5	78-8076-5085-4	STUD, Cylinder	2
	6	78-8076-5086-2	SPACER	4
ı	7	78-8656-3965-8	E-RING, M-8	4
	8	78-8060-7748-9	ROD L=583	2
	9	78-8076-5087-0	ROD, Connecting	2
	10	78-8060-7752-1	BEARING, L-bar, 20-32 x 45	2
	11	78-8076-5225-6	JOINT	2
	12	78-8076-5088-8	SCREW, Hex Hd., M10 x 30	2
	13	26-1003-5841-0	SCREW, M8 x 16	2
	14	26-1004-5507-5	WASHER, M8	2

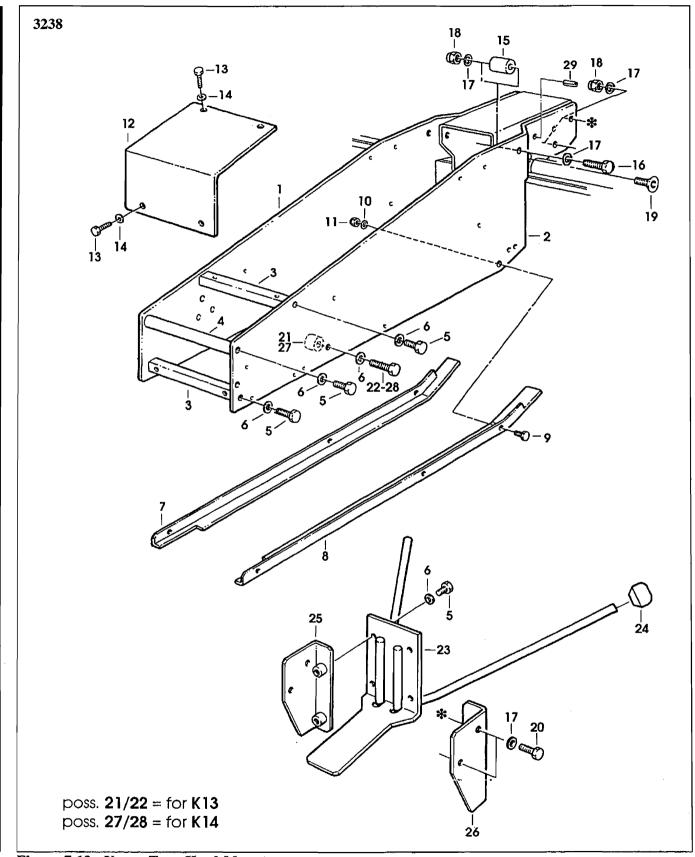


Figure 7-13. Upper Tape Head Mount

Parts List - Upper Tape Head Mount

Item Number	Part Number	Description	Qty
1	78-8076-5089-6	SHOULDER, Right	1
2	78-8076-5090-4	SHOULDER, Left	1
3	78-8054-8931-3	SPACER, 10 x 10 x 140mm	2
4	78-8054-8929-7	SPACER, 10 x 140mm	1
5	78-8032-0375-7	SCREW, Metric, M6 x 16, Hex Hd.	10
6	26-1000-0010-3	WASHER, Flat M6	14
7	78-8076-5091-2	SKI, Right	1
8	78-8076-5092-0	SKI, Left	1
9	78-8010-7157-8	SCREW, Hex Hd., M4 x 10	6
10	78-8005-5740-3	WASHER, Plain, Metric, 4mm, Nick.	6
11	26-1003-6914-4	NUT, Plastic Insert, M4	6
12	78-8076-5093-8	COVER, Top	1
13	78-8010-7163-6	SCREW, Metric, M5 x 10, Hex Hd.	4
14	78-8005-5741-1	WASHER, Metric, Plain, M5	4
15	78-8054-8933-9	SPACER, 8,5/20 x 25mm	2
16	26-1002-5942-8	SCREW, Hex Hd., M8 x 45	2
17	78-8017 <b>-</b> 9318-9	WASHER, Plain, Metric, 8mm	12
18	78-8017-9313-0	NUT, Self-Locking, M8, Nick. Pl.	8
19	78-8054-8567-3	SCREW, Soc. Hd., Special	2
20	78-8017-9301 <b>-</b> 5	SCREW, Hex Hd., M8 x 25	4
21	78-8054-8935-4	SPACER, Mounting, 2-inch, Top Head	4
22	26-1003-5833-7	SCREW, Hex Hd., 6 x 30, 2-inch, Top Head	4
23	78-8076-5094-6	SIDE FLAP FOLDER	. 1
24	78-8060-7869-3	END CAP	2
25	78-8076-5096-1	PLATE, Right	1
26	78-8076-5097 <b>-</b> 9	PLATE, Left	1
27	78-8076-5036-7	SPACER, Mounting, 3-inch, Top Head	4
28	78-8010-7193-3	SCREW, Metric, M6 x 20, Hex Hd., 3-inch, Top Head	4
29	78-8100-0895-9	PIN, Roll, 6 x 12	4

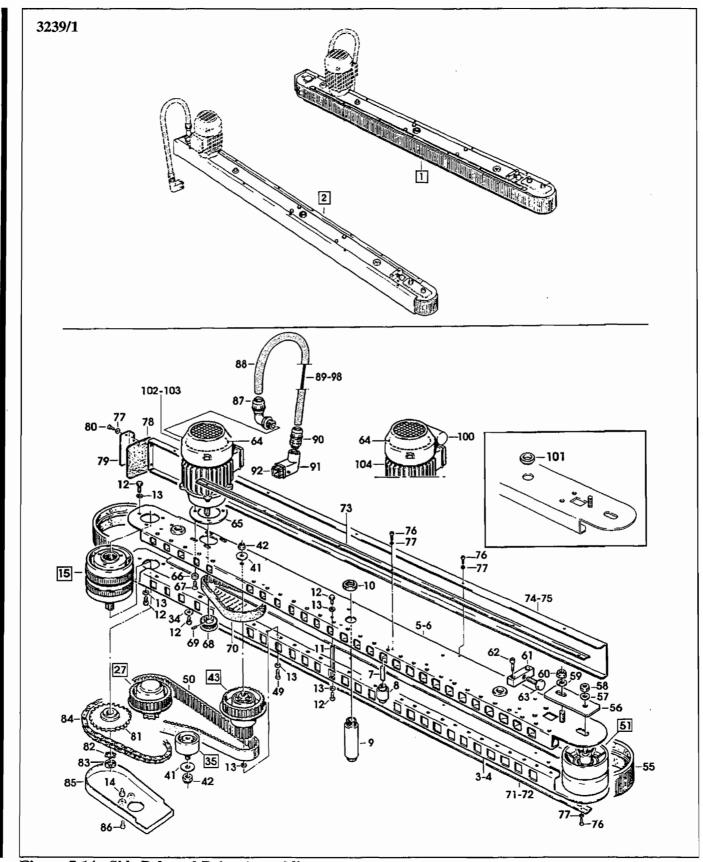


Figure 7-14. Side Belt and Drive Assemblies

Parts List - Side Belt and Drive Assemblies

Item Number	Part Number	Description	Qty
1	78-8076-5098-7	DRIVE ASSEMBLY, Right, w/o Motor DRIVE ASSEMBLY, Left, w/o Motor GUIDE, Lower, Right	1
2	78-8076-5099-5		1
3	78-8076-5100-1		1
4	78-8076-5101-9	GUIDE, Lower, Left GUIDE, Upper, Right GUIDE, Upper, Left	1
5	78-8076-5102-7		1
6	78-8076-5103-5		1
7	78-8060-7995-6	PIN, Roller	112
8	78-8060-7996-4	ROLLER	112
9	78-8060-7728-1	SLEEVE, Threaded	2
10	78-8076-5104-3	NUT, Special, M22 x 1.5, H=8 SPACER, Hexagonal SCREW, Metric, M6 x 12, Hex Hd.	4
11	78-8054-8910-7		16
12	78-8010-7169-3		46
13	26-1000-0010-3	WASHER, Flat M6	48
14	78-8054-8891-9	SCREW, Special	4
15	78-8060-8000-4	BELT DRIVE PULLEY ASSEMBLY	2
16	78-8076-5105-0	PULLEY ASSEMBLY, Drive	2
17	78-8052-6713-1	RING, Polyurethane	4
■ 18	78-8054-8878-6	SHAFT, Pulley Keyed	2
19	78-8057-5739-6	KEY, M5 x 5 x 30mm	2
20	78-8054-8879-4	WASHER, 20.5mm	4
21	78-8017-9096-1	NUT, Special, M18 x 1	2
22	78-8060-7648-1	BEARING, Flanged WASHER, 5.5/20 x 4 SCREW, Flat Hd., Soc., M5 x 12	4
23	78-8054-8877-8		4
24	26-0001-5862-1		4
25	78-8060-8037-6	CAP, Flange	2
26	78-8046-8135-7	KEY, 5 x 5, 12mm	2
27	78-8060-8003-8	DRIVE PULLEY ASSEMBLY, Keyed	2
28	78-8055-0825-2	PULLEY, Keyed	2
29	78-8054-8889-3	SUPPORT, Pulley Keyed	2
30	26-1000-6036-2	BEARING, 6003-2RS	4
31	78-8060-7547-5	SPACER, Bearing	2
32	78-8028-8244-5	KEY, 4 x 4 x 10mm	2
33	78-8060-8005-3	SPROCKET, 3/8", 11 Teeth	2
34	78-8042-2919-9	WASHER, Triple, M6	6
35	78-8060-8006-1	JOCKEY PULLEY ASSEMBLY	2
36	78-8060-8009-5	JOCKEY PULLEY	2
37	78-8060-8008-7	BEARING, 6004-2RS	2
38	78-8060-8010-3	SNAP RING, 42mm Shaft	2
39	78-8060-8007-9	PIN, Jockey Pulley	2

(continued on next page)

Parts List - Side Belt and Drive Assemblies (cont.)

Item Number	Part Number	Description	Qty
40	78-8017-9061-5	SNAP RING, For 20mm Shaft	2
41	26-1004-5507-5	WASHER, M8	4
42	78-8017-9313-0	NUT, Self-Locking, M8, Nick.	4
43	78-8060-8011-1	WRAP PULLEY ASSEMBLY PULLEY ASSEMBLY, Idler BEARING, 6203-2RS	2
44	78-8076-5106-8		2
45	78-8023-2544-5		2
46	78-8023-2410-9	BEARING, 6000-2RS	2
47	78-8054-8887-7	SHAFT, Pulley Wrap	2
48	78-8016-5855-6	E-RING, 10mm	2
49	78-8032-0375-7	SCREW, Metric, M6 x 16, Hex Hd. BELT, Timing, 210 L 075 IDLER ROLLER ASSEMBLY	2
50	78-8060-8013-7		2
51	78-8060-8014-5		2
52	78-8052-6710-7	ROLLER, Idler	2
53	78-8054-8913-1	SHAFT, Roller	2
54	12-7997-0272-0	E-RING, M-25	2
55	78-8054-8841-4	DRIVE BELT 12AF	2
56	78-8076-4864-3	TENSIONER, Belt	4
57	78-8-17-9318-9	WASHER, Plain, Metric, 8mm	4
58	26-1000-1347-8	NUT, Metric, Hex Stl., M8 WASHER, Friction NUT, Plastic Insert, M10 Hex	4
59	78-8052-6566-3		4
60	26-1003-6918-5		4
61	78-8054-8903-2	BLOCK, Belt	4
62	78-8010-7210-5	SCREW, Soc. Hd., Hex Soc., M6 x 20	8
63	78-8054-8904-0	SCREW, Belt Adjustment	4
64	78-8076-5226-4	FAN, Motor, F.63	2
65	78-8094-6050-0	SPACER, Motor	2
66	78-8060-8073-1	WASHER, Motor	8
67	26-1005-4757-4	SCREW, Flat Hd., Soc. Dr., M5 x 20	8
68	78-8060-8015-2	PULLEY 17 x L050	2
69	26-1003-8816-9	SCREW, Set, M5 x 6	2
70	78-8060-8016-0	BELT, Timing, 190 x L050 PLATE, Roller, Right PLATE, Roller, Left	2
71	78-8076-5107-6		1
72	78-8076-5108-4		1
73	78-8076-5109-2	PLATE, Roller	2
74	78-8076-5110-0	COVER, Right	1
75	78-8076-5111-8	COVER, Left	1
76	26-1002-5753-9	SCREW, Self-tapping	38
77	78-8005-5740-3	WASHER, Plain, Metric, 4mm, Nick.	42
78	78-8054-8897-6	BELT, Guard	2

(continued on next page)

Parts List - Side Belt and Drive Assemblies (cont.)

	Item Number	Part Number	Description	Qty
	79 80 81	78-8076-4870-0 26-1002-4955-1 78-8060-8019-4	PLATE SCREW, Self-Tap, 8P x 13 SPROCKET, 3/8-inch, 28 Teeth	2 4 2
	82 83 84	78-8057-5834-5 78-8057-5835-2 78-8060-8020-2	TAB WASHER CENTERING WASHER CHAIN, 3/8-inch Pitch, L=50	2 2
	85 86 87	78-8076-5112-6 26-1003-7948-1 78-8076-5113-4	COVER, Chain SCREW, Soc. Hd., Hex Soc., M5 x 10 UNION, PG11, /12	2 4 2
	88 89 90	78-8060-8181-2 78-8060-8052-5 78-8060-7626-7	SLEEVING, 0.710 Mt. CABLE 4 x 1.5 Mt. 3PH CONNECTOR, PG 11/12	2 1 2
ı	91 92 93	78-8060-7874-3 78-8060-7875-0 78-8094-6472-6	PLUG HOUSING, Lateral PLUG, Male MOTOR, 200/220V, 50/60 Hz, 3-Phase, H63 Japan	2 2 2
	94 95 96	78-8094-6472-6 78-8094-6378-5 78-8094-6378-5	MOTOR, 200/220V, 50/60 Hz, 3-Phase, H63 North, Central, South America, Some Asiatic Countries MOTOR, 200/460V, 50/60 Hz, 3-Phase, H63 Europe (Except UK) MOTOR, 200/460V, 50/60 Hz, 3-Phase, H63 Australia, New Zealand, Some Asiatic Countries, South Africa	2 2 2
	97 98 100	78-8094-6378-5 78-8091-0433-0 78-8017-9163-9	MOTOR, 200/460V, 50/60 Hz, 3-Phase, H63 UK (440V) CABLE, 3 x 1.5, 1 Ph, 5 Meter CONDENSER, 5 microfarad, 240V, 50 Hz	2 1 2
	101	78-8091-0500-6	BUSHING, Side Drive	4

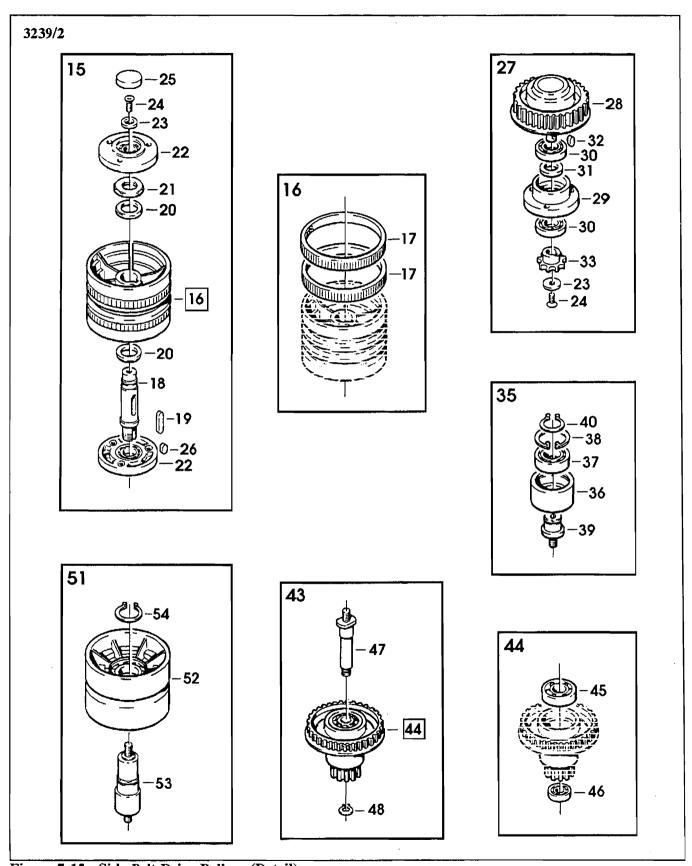


Figure 7-15. Side Belt Drive Pulleys (Detail)

Parts List - Side Belt Drive Pulleys (Detail)

Item Numbe	Part r Number	Description	Qty
15	78-8060-8000-4	BELT DRIVE PULLEY ASSEMBLY PULLEY ASSEMBLY, Drive RING, Polyurethane	2
16	78-8076-5105-0		2
17	78-8052-6713-1		4
18	78-8054-8878-6	SHAFT, Pulley, Keyed	2
19	78-8057-5739-6	KEY, M5 x 5 x 30mm	2
20	78-8054-8879-4	WASHER, /20,5mm	4
21	78-8017-9096-1	NUT, Special, M18 x 1	2
22	78-8060-7648-1	BEARING, Flanged	4
23	78-8054-8877-8	WASHER, 5,5/20 x 4	4
24	26-0001-5862-1	SCREW, Flat Hd., Soc., M5 x 12	4
25	78-8060-8037-6	CAP, Flange	2
26	78-8046-8135-7	KEY, 5 x 5 12mm	2
27	78-8060-8003-8	DRIVE PULLEY ASSEMBLY, Keyed	2
28	78-8055-0825-2	PULLEY, Keyed	2
29	78-8054-8889-3	SUPPORT, Pulley, Keyed	2
30	26-1000-6036-2	BEARING, 6003-2RS	4
31	78-8060-7547-5	SPACER, Bearing	2
32	78-8028-8244-5	KEY, 4 x 4 x 10mm	2
33	78-8060-8005-3	SPROCKET, 3/8-inch, 11 Teeth JOCKEY PULLEY ASSEMBLY JOCKEY PULLEY	2
35	78-8060-8006-1		2
36	78-8060-8009-5		2
37	78-8060-8008-7	BEARING, 6004-2RS	2
38	78-8060-8010-3	SNAP RING, 42mm Shaft	2
39	78-8060-8007-9	PIN, Jockey Pulley	2
40	78-8017-9061-5	SNAP RING, for 20mm Shaft	2
43	78-8060-8011-1	WRAP PULLEY ASSEMBLY	2
44	78-8076-5106-8	PULLEY ASSEMBLY, Idler	2
45	78-8023-2544-5	BEARING, 6203-2RS	2
46	78-8023-2410-9	BEARING, 6000-2RS	2
47	78-8054-8887-7	SHAFT, Pulley Wrap	2
48	78-8016-5855-6	E-RING, 10mm	2
51	78-8060-8014-5	IDLER ROLLER ASSEMBLY	2
52	78-8052-6710-7	ROLLER, Idler	2
53	78-8054-8913-1	SHAFT, Roller	2
54	12-7997-0272-0	E-RING, M-25	2

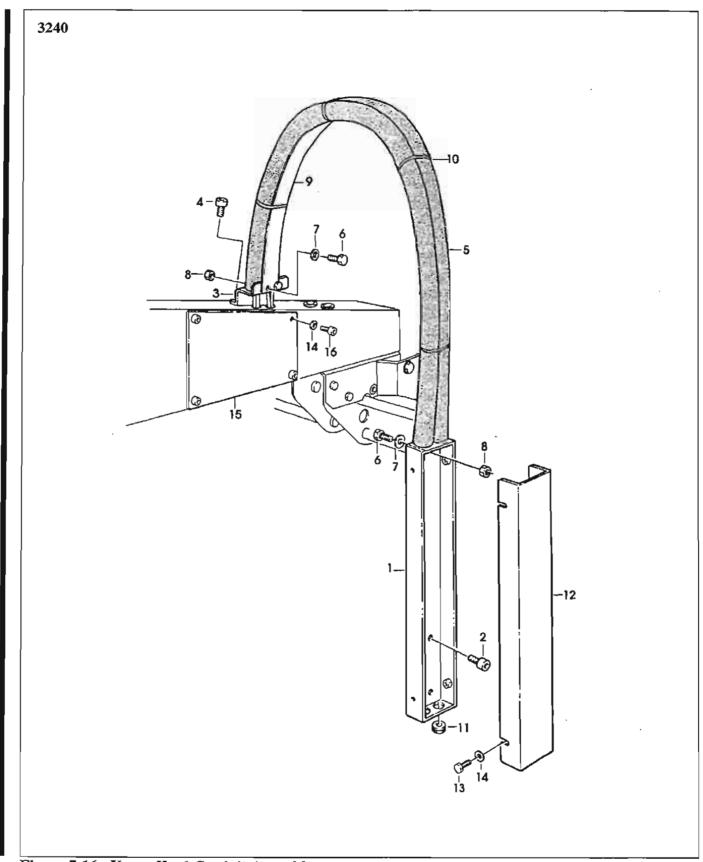


Figure 7-16. Upper Head Conduit Assembly

# Parts List - Upper Head Conduit Assembly

	Item Number	Part Number	Description	Qty
ı	1	78-8100-0897-5	CHANNEL, Wire	1
_	2	26-1003-7963-0	SCREW, Soc. Hd., M8 x 16	2
	3	78-8076 <b>-</b> 5115-9	PLATE, Strap	1
	4	78-8060-7896-6	SCREW, Soc. Hd., Hex Hd., M6 x 14	2
	5	78-8076-5116-7	SLEEVING/22, 1.11 M.	2
_	6	78-8010-7163-6	SCREW, Metric, M5 x 10, Hex Hd.	4
	7	78-8005-5741-1	WASHER, Metric, Plain, M5	6
	8	78-8010-7417-6	NUT, Metric, Hex Stl., M5	4
	9	78-8076-5117-5	STRAP, Wire	1
	10	78-8060-7632-5	CLAMP	5
	11	78-8060-7785-1	FAIRLEAD/22	1
	12	78-8076-5118-3	COVER, Channel	1
	13	26-1003-5810-5	SCREW, Hex Hd., M4 x 8	4
	14	78-8005-5740-3	WASHER, Plain, Metric, 4mm, Nick.	8
	15	78-8076-5119-1	COVER	1
ı	16	26-1003-7943-2	SCREW, Soc. Hd., M4 x 12	4

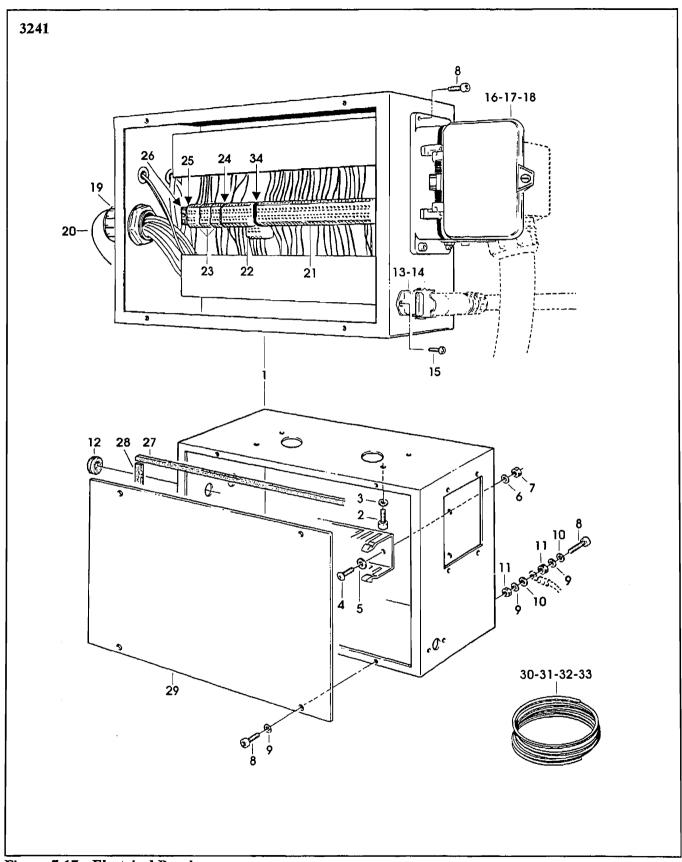


Figure 7-17. Electrical Panel

Parts List - Electrical Panel

Item	Part		_
Number	Number	Description	Qty
1	78-8076-5120-9	BOX, Electric	1
2	26-1003-7957-2	SCREW, Soc. Hd., Hex Hd., M6 x 16	4
3	26-1000-0010-3	WASHER, Flat M6	4
4	78-8017-9257-9	SCREW, Phillips Hd., M4 x 10	9
5	78-8017-9018-5	WASHER, Metric, Plain, M4 Spec.	9
6	78-8005-5740-3	WASHER, Plain, Metric, 4mm Nick.	9
7	78-8010-7416-8	NUT, Metric, Hex, Steel, M4	9
8	78-8032-0382-3	SCREW, Soc. Hex Hd., M516 Zinc. Pl.	9
9	78-8005-5741-1	WASHER, Metric, Plain, M5	6
10	78-8046-8217-3	WASHER, Special	2
11	78-8010-7417-6	NUT, Metric, Hex Stl., M5	2
12	78-8052-6659-6	GROMMET	2
13	78-8060-7872 <b>-</b> 7	PLUG COVER, Straight	1
14	78-8060-7873-5	PLUG, Female	1
15	78-8028-8208-0	SCREW, 6P x 9,5	2
16	78-8076-5121-7	CASE	1
17	78-8076-5122-5	PLUG, CNE 24FS	1
18	78-8076 <b>-</b> 5123-3	PLUG, CNE 24FSN	1
19	78-8076-5124-1	UNION, 1.1/4-inch Gas	1
20	78-8076-5125-8	SLEEVING /35, 1.4 M.	1
21	78-8060-7602-8	TERMINAL, VR3-2,5	45
22	78-8076-5126-6	TERMINAL, VRD 3-2.5	10
23	78-8076 <b>-</b> 5127-4	TERMINAL, VRE 3-2.5	3
24	78-8076-5128-2	PLATE	1
25	78-8060-7603-6	PLATE	1
26	78-8060-7604-4	BLOCK, Terminal	2
27	78-8076-5129-0	GASKET, 44cm	2
28	78-8076-5130-8	GASKET, 24.5cm	2
29	78-8076-5131-6	COVER, Box	1
30	78-8076-4605-0	CABLE, 2 x 1, 5 meter	6
31	78-8076 <b>-</b> 5177-9	CABLE, FROR 07, 4 x 0.75, 5 meter	2
32	78-8060 <b>-</b> 8052-5	CABLE, 4 x 1.5, 3-phase, 5 meter	1
33	78-8076-4603-5	CABLE, 3 x 1.5, 1-phase, 5 meter	1
34	78-8091-0413-2	PLATE	1
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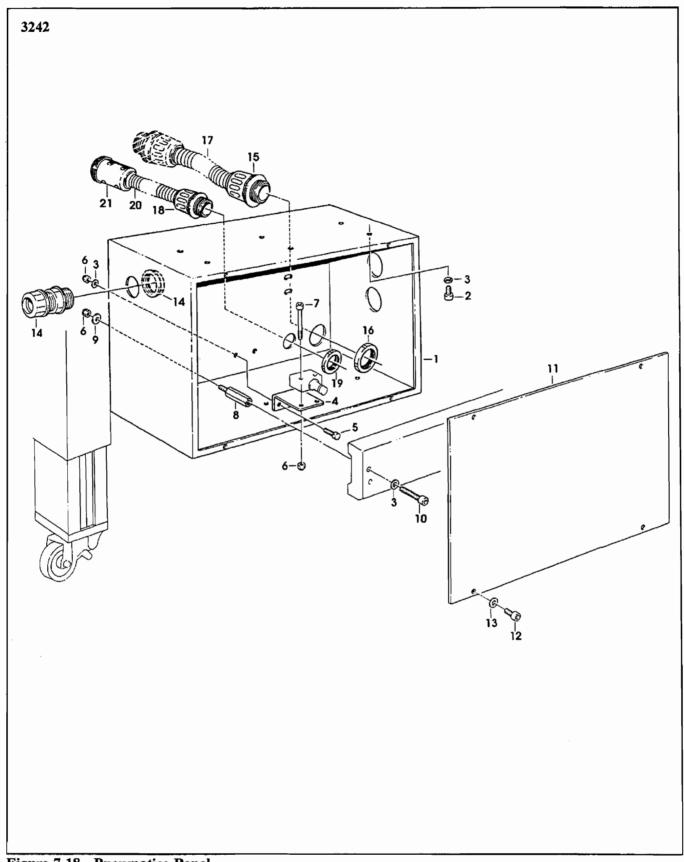


Figure 7-18. Pneumatics Panel

## ■ Parts List - Pneumatics Panel

Item Number	Part Number	Description	Qty
-			
1	78-8076-5132-4	BOX, Pneumatics	1
2	26-1003-7957-2	SCREW, Soc. Hd., Hex Hd., M6 x 16	6
3	26-1000-0010-3	WASHER, Flat M6	14
4	78-8076-5133-2	PLATE	2
5	78-8010-7169-3	SCREW, Metric, M6 x 12, Hex Hd.	4
6	26-1003-6916-9	NUT, Locking, Plastic Insert M6	12
7	78-8060-7551-7	SCREW, Soc. Hd., Hex Soc., M6 x 65	4
8	78-8076-5134-0	SPACER	4
9	78-8042-2919-9	WASHER, Triple, M6	8
10	26-1003-7962-2	SCREW, Soc. Hd., M6 x 40	4
11	78-8076-5135-7	COVER, Box	1
12	26-1003-7949 <b>-</b> 9	SCREW, Soc. Hd., Hex Soc., M5 x 12	4
13	78-8005-5741-1	WASHER, Metric, Plain, M5	4
14	7 <b>8-8076-</b> 5124 <b>-</b> 1	UNION, 1.1/4-inch Gas	1
15	78-8076-5136-5	UNION, MKVV-PG-29	1
16	7 <b>8-8</b> 07 <b>6-</b> 5137-3	SET NUT, MKVM-PG-29	1
17	78-8076-5138-1	SLEEVING, MKV-PG-29, 3 M.	1
18	78-8076-5139-9	COUPLING, MKVV-PG-21	1
19	78-8076-5140-7	RING, MKVM-PG-21	1
20	78-8076-5141-5	SLEEVING, MKV-PG-21, 3 M.	1
21	78-8076-5142-3	JOINT, Multiple	1

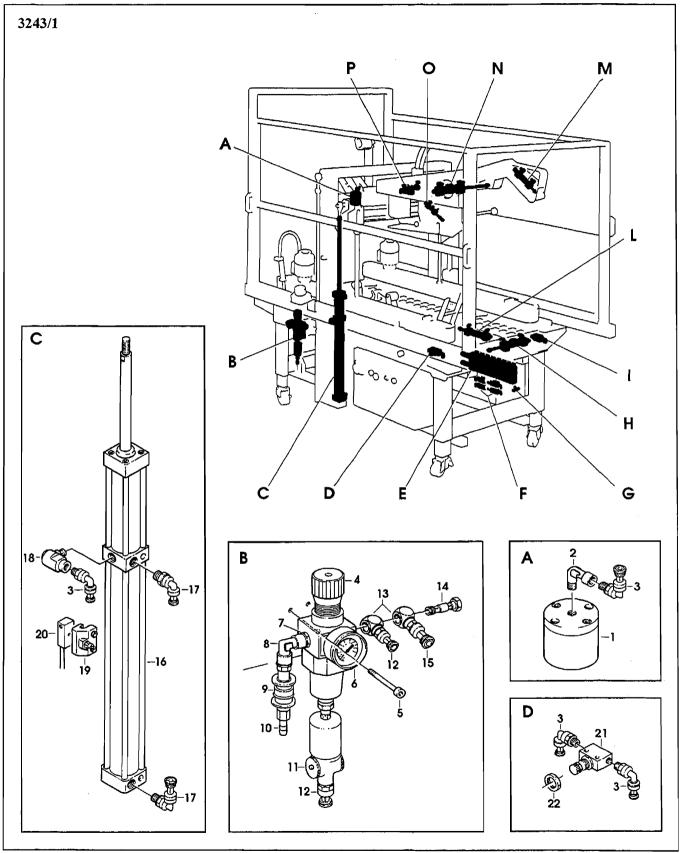


Figure 7-19. Pneumatic Components, #1

Parts List - Pneumatic Components, #1

Item Number	Part Number	Description	Qty
		2 000	
1	78-8060-7553-3	LOCK CYLINDER, Head Brake	2
2	26-1005-6895-0	ELBOW, 90-degree	2
3	78-8060-7674-7	UNION, LCS 1/8-inch, PK4	21
4	78-8060-7572-3	REDUCER, Filter	1
5	78-8057-5895-6	SCREW, Soc. Hd., Hex Soc. Dr.	2
6	78-8060-7578-0	GAUGE	1
7	78-8060-7899-0	NIPPLE, RA 012 1/4-inch x 1/4-inch	2
8	78-8076-5143-1	UNION, RA 021 1-4-inch x 1/4-inch	1
9	78-8060-7576-4	VALVE, Air On/Off, W-3-1/4-inch	1
10	78-8060-7577-2	UNION, C-1/4-inch=P9	1
11	78-8060-7849-5	RELIEF, Condensate WA-1	1
12	78-8060-7581-4	UNION, CS 1/4-inch-PK6	6
13	78-8060-7580-6	UNION, LK 1/4-inch	3
14	78-8060-7585-5	SLOT SCREW	2
15	78-8076-5144-9	UNION, CS-1/4-inch-PK8	1
16	78-8076-5145-6	CYLINDER, Head, DKE-40-400-PPV-A-SN	2
17	78-8060-7587-1	UNION, LCS 1/4-inch PK6	21
18	78-8076-5146-4	QUICK EXHAUST, SE-1/8-inch-B	2
19	78-8076-5147-2	MOUNTING KIT, SMB-2	2
20	78-8076-5148-0	SWITCH, Magnetic, Box Height Limit	4
21	78-8061-2675-7	REGULATOR, Speed, Fork Up/Down	2
22	78-8060-7537-6	NUT GRM 1/8-inch	2

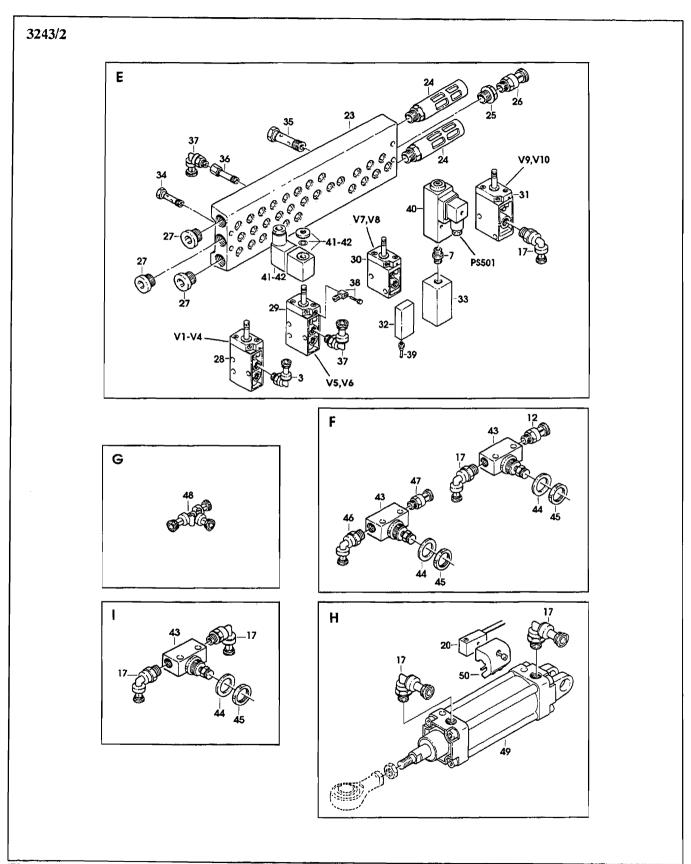


Figure 7-20. Pneumatic Components, #2

Parts List - Pneumatic Components, #2

Item Number	Part Number	Description	Qty
3	78-8060-7674-7	UNION, LCS 1/8-inch, PK4	21
7	78-8060-7899-0	NIPPLE, RA 012 1/4-inch x 1/4-inch	2
12	78-8060-7581-4	UNION, CS 1/4-inch-PK6	6
17	78-8060-7587-1	UNION, LCS 1/4-inch PK6	21
20	78-8076-5148-0	SWITCH, Magnetic	4
23	78-8076-5149-8	BLOCK, PRS-1/8-inch x 1/4-inch-12	1
24	78-8060-7663-0	MUFFLER, U-1/2-inch	2
25	78-8076-5150-6	UNION, FM RA 015 1/2-inch x 3/8-inch	1
26	78-8076-5151-4	UNION, CS-3/8-inch-PK8	1
27	78-8076-5152-2	CAP	3
28	78-8076-5153-0	SOLENOID VALVE, V1, V2, V3, V4, MFH-5-1/8-inch	4
29	78-8076-5154-8	SOLENOID VALVE, V5, V6, MFH-5-1/8-inch	2
30	78-8076-5155-5	SOLENOID VALVE, V7, V8, MFH-3-1/8-inch	2
31	78-8076-5156-3	SOLENOID VALVE, V9, V10, MOFH-3-1/4	2
32	78-8076-5157-1	PLATE, PRSB-1/8	1
33	78-8076-5158-9	BLOCK, Pressure Switch (PS501)	1
34	78-8076-5159-7	SCREW, Special, VT-1/8-inch-PRSK	7
35	78-8076-5160-5	SCREW, Special, VT-1/4-inch-PRS	3
36	78-8076-5161-3	SCREW, Special, VT-1/8-AJ-P	2
37	78-8060-7675-4	UNION, LCS, 1/8-inch PK6	8
38	78-8060-7672-1	UNION, LCK-M5-PK3	3
39	26-1005-6359-7	FITTING, BARB, 2,5mm	2
40	78-8076-5162-1	PRESSURE SWITCH, PS501, PEV-1/4-B	1
41	78-8076-5163-9	COIL, Electromagnetic MSFG24	10
42	78-8076-5164-7	LED, Coil, MFLZ-24 REGULATOR, Speed, Side Belts Closure SPACER	10
43	78-8060-7530-1		6
44	78-8076-5165-4		6
45	78-8060-7529-3	NUT, GRM, 3/8-inch	6
46	78-8060-7676-2	UNION, LCS 1/4-inch, PK4	4
47	78-8060-7670-5	UNION, CS 1/4-inch, PK4	3
48	78-8060-7678-8	UNION, FCS3-PK4	1
49	78-8076-5166-2	CYLINDER, Side Belt, DNU-50-120-PPV-A-SN	1
50	78-8076-5167-0	MOUNTING KIT, SMBU-1	2

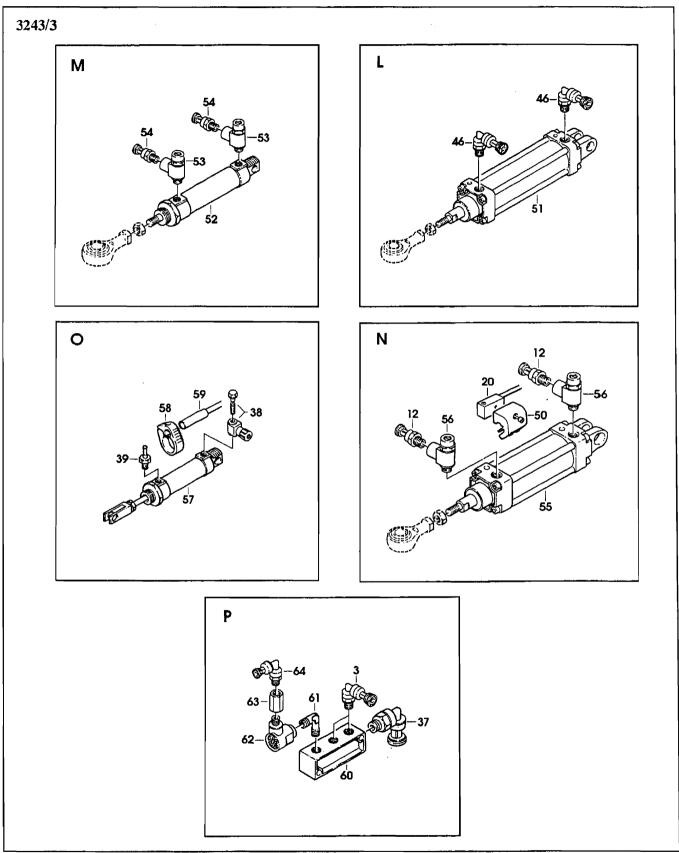


Figure 7-21. Pneumatic Components, #3

Parts List - Pneumatic Components, #3

Item	Part		
Number	Number	Description	Qty
3	78-8060-7674-7	UNION, LCS 1/8-inch, PK4	21
12	78-8060-7581-4	UNION, CS 1/4-inch-PK6	6
20	78-8076-5148-0	SWITCH, Magnetic, Folding Arm Limit	4
37	78-8060-7675-4	UNION, LCS, 1/8-inch PK6	8
38	78-8060-7672-1	UNION, LCK-M5-PK3	3
39	26-1005-6359-7	FITTING, BARB, 2,5mm	2
46	78-8060-7676-2	UNION, LCS 1/4-inch, PK4	4
50	78-8076-5167-0	MOUNTING KIT, SMBU-1	2
51	78-8076-5168-8	CYLINDER, Fork, DNU-32-60-PPV-A-SN	1
52	78-8076-5169-6	CYLINDER, Kicker, DSN-25-60-P	1
53	78-8057-5731-3	FLOW CONTROL, GRLA, 1/8-inch	2
54	78-8060-7552-5	UNION, CS, 1/8-inch, PK4	2
55	78-8076-5170-4	CYLINDER, Folding Arm, DNU-40-100-PPV-A-SN	1
56	78 <b>-</b> 8059-5551-1	AIR REGULATOR	2
57	78-8076-5171-2	CYLINDER, Paddle, DSNU 16-50-PPV-A	1
58	78-8076-5172-0	MOUNTING KIT, SMBR16	1
59	78-8076-5173-8	LIMIT SWITCH, Top of Box, SMEO-4-K-LED-24	1
60	78-8059-5633-7	AIR DISTRIBUTOR, D1	1
61	78-8017-9426-0	ELBOW, 90°, 1/8-inch, Male, 1/8-inch x 1/8-inch	1
62	78-8013-9935-9	VALVE, Quick Exhaust	1
63	78-8059-5518-0	COUPLING, 1/8-inch x 1/8-inch	1
64	78-8060-7579-8	UNION, LCS, 1/8-inch, PK3	4

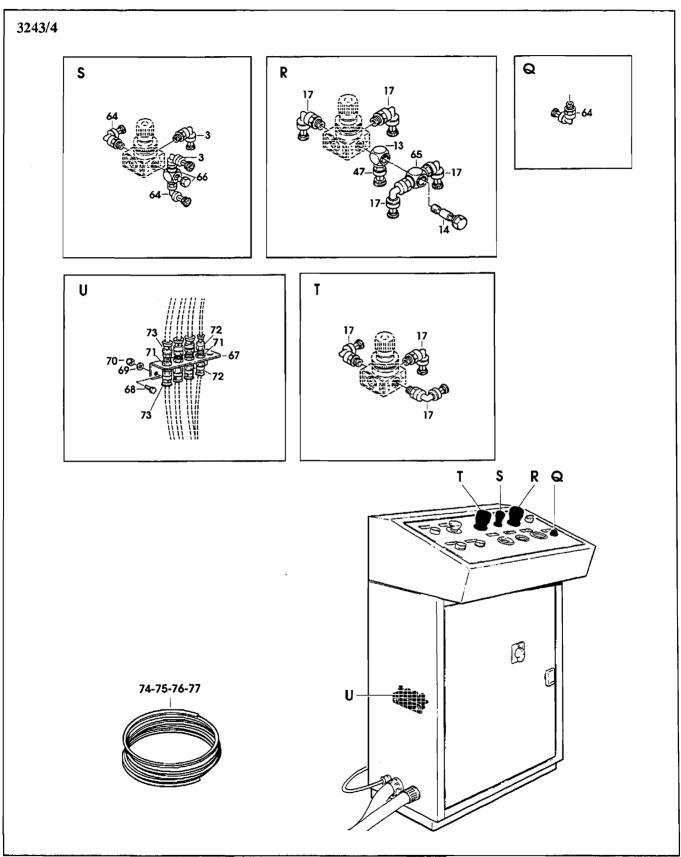


Figure 7-22. Pneumatic Components, #4

Parts List - Pneumatic Components, #4

Item Number	Part Number	Description	Qty
3	78-8060-7674-7	UNION, LCS 1/8-inch, PK4	21
13	78-8060-7580-6	UNION, LK 1/4-inch	3
14	78-8060-7585-5	SLOT SCREW	2
17	78-8060-7587-1	UNION, LCS 1/4-inch PK6	21
47	78-8060-7670-5	UNION, CS 1/4-inch, PK4	3
64	78-8060-7579-8	UNION, LCS, 1/8-inch, PK3	4
65	78-8076-5174-6	UNION, TK, 1/4-inch	1
66	78-8060-7682-0	UNION, TJK, 1/8-inch	1
67	78-8076-5175-3	PLATE	1
68	26-1003-5829-5	SCREW, Hex Hd., M6x12	2
69	26-1000-0010-3	WASHER, Flat M6	2
70	26-1003-6916-9	NUT, Locking, Plastic Insert, M6	2
71	78-8060-7688-7	UNION, SCM, 1/8-inch	4
72	78-8060 <b>-</b> 7668-9	UNION, CS, 1/8-inch, PK3	2
73	78-8060-7669-7	UNION, CS, 1/8-inch, PK6	6
74	78-8076-5374-2	TUBE, Air, PV3, 5 meter	2
75	78-8076-5335-3	TUBE, Air, PV4, 5 meter	6
76	78-8076-5375-9	TUBE, Air, PV6, 5 meter	7
77	78-8076-5376-7	TUBE, Air, PV8, 5 meter	1
997	78-8076-5459-1	SEAL KIT, for FESTO Cylinder DNU 32 (not shown)	
998	78-8076 <b>-</b> 5460-9	SEAL KIT, for FESTO Cylinder DNU 40 (not shown)	
999	78-8076-5461-7	SEAL KIT, for FESTO Cylinder DNU 50 (not shown)	

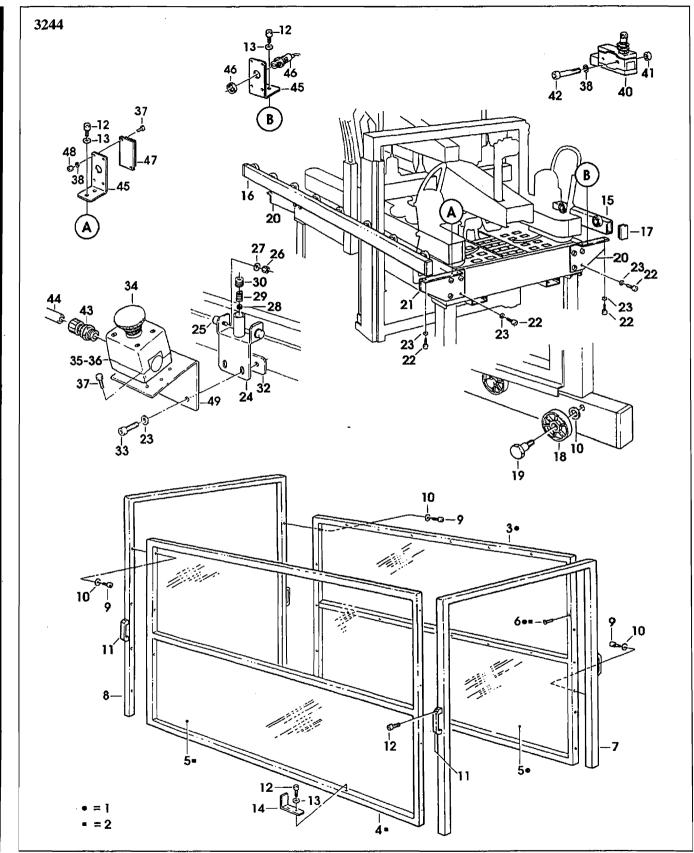


Figure 7-23. Shield Assembly

Parts List - Shield Assembly

Item Number	Part Number	Description	Qty
1	78-8076-5178-7	FLANK ASSEMBLY, Right	1
2	78-8076-5179-5	FLANK ASSEMBLY, Left	1
3	78-8076-5180-3	FLANK, Right	1
4	78-8076-5181-1	FLANK, Left	1
5	78-8076-5182-9	PROTECTION	. 2
6	78-8060-7803-2	RIVET, /4	72
7	78-8076-5183-7	SUPPORT, Protection, Front	1
8	78-8076-5184-5	SUPPORT, Protection, Rear	1
9	26-1003-7969-7	SCREW, Soc. Hd., Hex Soc., M8 x 45m	16
10	26-1004-5507-5	WASHER, M8	32
11 12	78-8060-7807-3	HANDLE	4
	26-1003-7957-2	SCREW, Soc. Hd., Hex Hd., M6 x 16	16
13 1 <b>4</b>	26-1000-0010-3	WASHER, Flat M6	8
15	78-8076-5185-2 78-8076-5186-0	STOP, Protection RAIL, Right	2
16		<del>-</del>	_
1 <del>0</del> 17	78-8076-5187-8 78-8076-5188-6	RAIL, Left CAP, 60 x 30	1 4
18	78-8070-3188-0 78-8060-7798-4	WHEEL/50	16
19	78-8060-7799-2	SHAFT, Wheel	16
20	78-8091-0786-1	SUPPORT, R/H	2
21	78-8091-0787 <b>-</b> 9	SUPPORT, L/H	2
22	26-1003-7964-8	SCREW, Soc. Hd., Hex Soc. Dr., M8 x 20	20
23	78-8017-9318-9	WASHER, Plain, Metric 8mm	28
24	78-8076-5191-0	STOP, Protection	2
25	78-8060-8080-6	GUARD, Stop	4
26	78-8010-7417-6	NUT, Metric, Hex Stl. M5	4
27	78-8005-5741-1	WASHER, Metric, Plain, M5	4
28	78-8060 <del>-</del> 7794-3	BALL /12	2
29	78-8060-7793-5	SPRING /12	2
30	78-8060 <b>-</b> 7792-7	GRAIN, M14 x 1	2
32	78-8060-7796-8	PLATE, 25 x 70 x 2	. 2
33	26-1003-7965-5	SCREW, Soc. Hd., Hex Soc., M8 x 25	4
34	78-8076-5193-6	E-STOP, DN3-R-01	2
35	78-8076-5194-4	BOX, E-Stop	2
36 27	78-8076-5195-1	CONTACT, DE 3-01	2 6
37	83-0002-7336-3	SCREW, Hex Hd., M4 x 14, Zinc. Pl.	
38	78-8005-5740-3	WASHER, Plain, Metric, 4mm, Nick.	4
40 41	78-8076-5196-9 78-8060-7788-5	LIMIT SWITCH, D4NC-5020 SPACER, Micro	1 2
42	78-8060-7778-6		
+2 <b>4</b> 3	78-8060 <b>-</b> 7778-0	SCREW, Soc. Hd., Hex Soc., M4 x 40 CONNECTOR, PG 11/12	2 2
<del>1</del> 3 14	78-8076-5197 <b>-</b> 7	SLEEVING, /12, 800mm	2
45	78-8091-0788-7	BRACKET	2
46	78-8076-5056 <b>-</b> 5	PHOTOCELL, PNP E3F R2 B4 /18	1
47	78-8076 <b>-</b> 5057-3	REFLECTOR, E39-R1	1
48	78-8010 <b>-</b> 7416-8	NUT, Metric, Hex, Steel M4	2

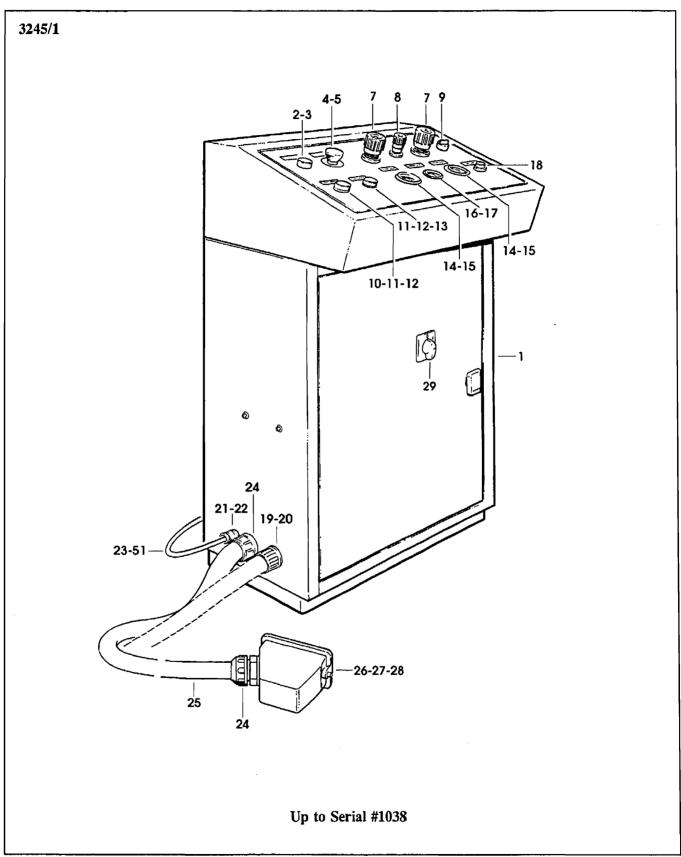


Figure 7-24A. Operator Console Exterior

Parts List - Operator Console Exterior (Up to Serial #1038)

Item	Part	To	04
Number	Number	Description	Qty
1	78-8076-5198-5	CABINET	1
2	78-8076-5199-3	PUSH BUTTON, DT 3-L-G	1
3	78-8076-5230-6	CONTACT, DE 3-10	1
4	78-8076-5377-5	E-STOP, DP3-L-R	1
5	78-8076-5195-1	CONTACT, DE 3-01	2
7	78-8060-7586-3	AIR PRESSURE REGULATOR	2
8	78-8060-7649-9	PRESSURE REGULATOR, 1/8-inch	1
9	78-8076-5201-7	SELECTOR, DSKE-L-A	1
10	78-8076-5202-5	CAP, Lamp, White	1
11	78-8076-5203-3	CONTACT, Lamp	2 2
12	78-8060-7611-9	LAMP, BA9S, 36V, 2W	
13	78-8076-5204-1	CAP, Lamp, Red	1
14	78-8076-5205-8	GAUGE, Pressure FMA-50-10	2
15	78-8076-5206-6	UNION, ACK, 1/4-inch PK6	2
16	78-8076-5207-4	GAUGE, Pressure, FMA-40-10	1
17	78-8076-5208-2	UNION, ACK 1/4-inch PK4	1
18	78-8060-7657-2	GAUGE, Optical, OH-22	1
19	78-8076-5136-5	UNION, MKVV-PG-29	1
20	78-8076-5137-3	SET NUT, MKVM-PG-29	1
21	78-8076-4715-7	CORD GRIP	1
22	78-8076-5211-6	SET NUT, GMP13.5	1
23	78-8060-8052-5	CABLE, 4 x 1.5 5MT, 3PH	1
24	78-8076-5124-1	UNION, 1.1/4-inch Gas	2
25	78-8091-0409-0	SLEEVING, Wire, 3500mm, /35	1
26	78-8076-5213-2	HOUSING, Plug	1
27	78-8076-5214-0	TAP, CNE 24FP, Grey	1
28	78-8076-5215-7	TAP, 24FPN, Black	1
29	78-8076-5216-5	SWITCH	1
51	78-8091-0433-0	CABLE, 3 x 1.5 5MT, 1PH	1

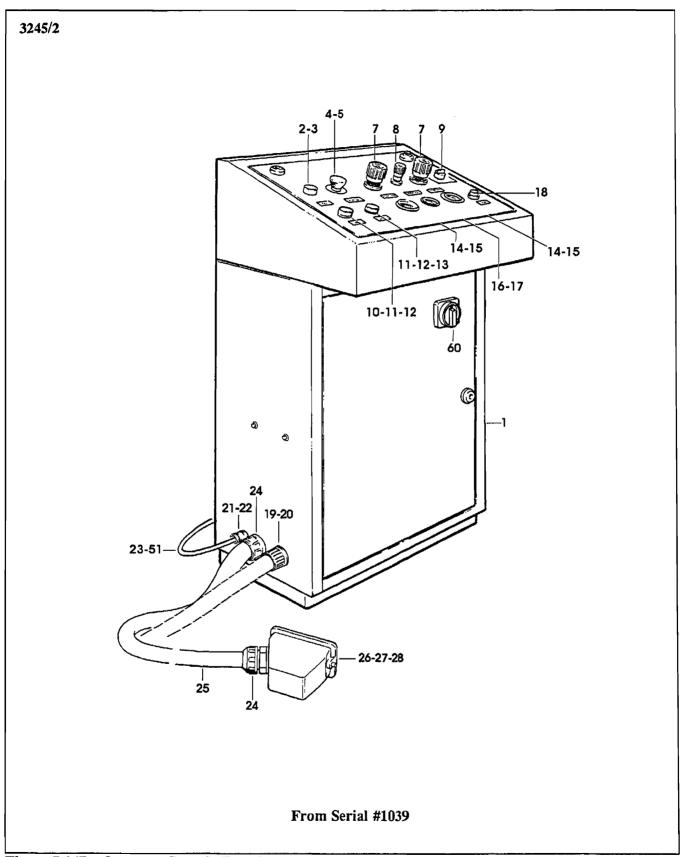


Figure 7-24B. Operator Console Exterior

Parts List - Operator Console Exterior (From Serial #1039)

Item Number	Part Number	Description	Qty
1	78-8076-5198-5	CABINET	1
2	78-8076-5199-3	PUSH BUTTON, DT 3-L-G	1
3	78-8076-5230-6	CONTACT, DE3-10	1
4	78-8076-5377-5	E-STOP, DP3-L-R	1
5	78-8076-5195-1	CONTACT, DE 3-01	2
7	78-8060-7586-3	AIR PRESSURE REGULATOR	2
8	78-8060-7649 <b>-</b> 9	PRESSURE REGULATOR, 1/8-inch	1
9	78-8076-5201-7	SELECTOR, DSKE-L-A	1
10	78-8076-5202-5	CAP, Lamp, White	1
11	78-8076-5203-3	CONTACT, Lamp	2
12	78-8060-7611-9	LAMP, BA9S, 36V, 2W	2
13	78-8076-5204-1	CAP, Lamp, Red	1
14	78-8076-5205-8	GAUGE, Pressure FMA-50-10	2
15	78-8076-5206-6	UNION, ACK, 1/4-inch PK6	2
16	78-8076-5207-4	GAUGE, Pressure, FMA-40-10	1
17	78-8076-5208-2	UNION, ACK 1/4-inch PK4	1
18	78-8060-7657-2	GAUGE, Optical, OH-22	1
19	78-8076-5136-5	UNION, MKVV-PG-29	1
20	78-8076-5137-3	SET NUT, MKVM-PG-29	1
21	78-8076-4715-7	CORD GRIP	1
22	78-8076-5211-6	SET NUT, GMP13.5	1
23	78-8060-8052-5	CABLE, 4 x 1.5 5MT, 3PH	1
24	78-8076-5124-1	UNION, 1.1/4-inch Gas	2
25	78-8091-0409-0	SLEEVING, Wire, 3500mm, /35	1
26	78-8076-5213-2	HOUSING, Plug	1
27	78-8076-5214-0	TAP, CNE 24FP, Grey	1
28	78-8076-5215-7	TAP, 24FPN, Black	1
51	78-8091-0433-0	CABLE, 3 x 1.5 5MT, 1PH	1
60	78-8100-0898-3	SWITCH ASSEMBLY, LA2-16	1

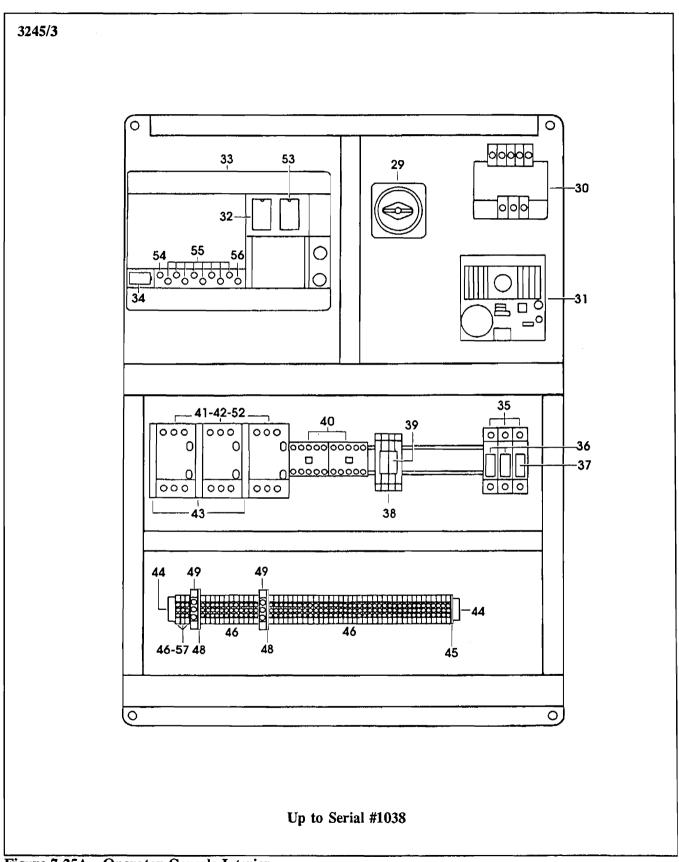


Figure 7-25A. Operator Console Interior

July

Parts List - Operator Console Interior (Up to Serial #1038)

Item	Part		
Number	Number	Description	Qty
29	78-8076-5216-5	SWITCH	1
30	78-8076-5217-3	TRANSFORMER, 63VA	1
31	78-8076-5218-1	POWER SUPPLY, 24V, CC 3A	1
32	78-8076-5219-9	OPERATING SYSTEM (Memory), SEI-202	1
33	78-8076-5209-0	PLC CENTRAL UNIT	1
34	78-8076-5210-8	BATTERY, ZE	1
35	78-8060-7622-6	FUSE CARRIER	3
36	78-8060-7623-4	FUSE 2A	2
37	78-8060-7624-2	FUSE 4A	1
38	78-8076-5220-7	BASE, HC4-SFD	1
39	78-8076-5221-5	RELAY, HC4-24V-DC	1
40	78-8076-5222-3	SWITCH, CA4-5C-10-24V-CC	2
41	78-8076-5223-1	SWITCH, Thermal, KTA 3-25	3
42	78-8076-5227-2	SWITCH, Thermal, KTA-3-25-0.63-1A	3
43	78-8076-5224-9	CONTACT KT, 3-25-PA-11	3
44	78-8060-7604-4	BLOCK, Terminal	2
45	78-8060-7603-6	PLATE	2
46	78-8060-7602-8	TERMINAL, VR3-2,5	47
48	78-8055-0854-2	PLATE, Insulating	1
49	78-8055-0847-6	TERMINAL	2
52	78-8076-5378-3	SWITCH, Thermal, KTA 3-25	3
53	78-8091-0300-1	EPROM, AC70	1
54	78-8091-0301-9	FUSE 1.6 A - 5 x 20	1
55	78-8091-0302-7	FUSE 2 A - 5 x 20	8
56	78-8091-0303-5	FUSE 3.15 A - 5 x 20	1
57	78-8091-0415-7	COVER, Terminal	3

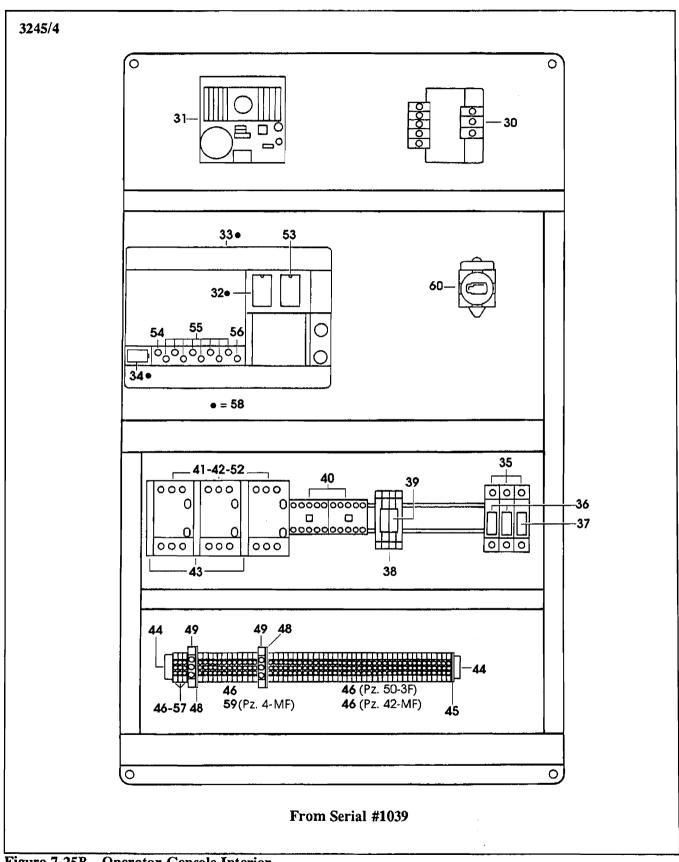


Figure 7-25B. Operator Console Interior

Parts List - Operator Console Interior (From Serial #1039)

Item Number	Part Number	Description	Qty
30	78-8076-5217-3	TRANSFORMER, 63VA	1
31	78-8076-5218-1	POWER SUPPLY, 24V CC 3A	1
32	78-8076-5219-9	OPERATING SYSTEM SEI-202	1
33	78-8076-5209-0	PLC CENTRAL UNIT	1
34	78-8076-5210-8	BATTERY ZE	1
35	78-8060-7622-6	FUSE CARRIER	3
36	78-8060-7623-4	FUSE, 2 A - 10.3 x 38	2
37	78-8060-7624-2	FUSE, 4 A - 10.3 x 38	1
38	78-8076-5220-7	BASE, HC4-SFD	1
39	78-8076-5221-5	RELAY, HC4-24V-DC	1
40	78-8076-5222-3	SWITCH, CA4-5C-10-24V-CC	2
41	78-8076-5223-1	SWITCH, Thermal, KTA 3-25	3
42	78-8076-5227-2	SWITCH, Thermal, KTA 3-25-0.63-1A	3
43	78-8076-5224-9	CONTACT, KT-3-25-PA-11	3
44	78-8091-0410-8	BLOCK, Terminal	2
45	78-8091-0411-6	PLATE, VA 4-2.5/4	1
46	78-8091-0412-4	TERMINAL, VU 4-2.5	50
48	78-8091-0413-2	PLATE, VT 4-2.5/4	2
49	78-8091-0414-0	TERMINAL, VUPE 4-4	2
52	78-8076-5378-3	SWITCH, Thermal, KTA-3-25	3
53	78-8091-0300-1	EPROM AC70	1
54	78-8091-0301-9	FUSE, 1.6 A - 5 x 20	1
55	78-8091-0302-7	FUSE, 2 A - 5 x 20	8
56	78-8091-0303-5	FUSE, 3.15 A - 5 x 20	1
57	78-8091-0415-7	COVER, Terminal	3
58	78-8091-0697-0	PLC UNIT w/Operating System and Battery	1
59	78-8091-0474-4	TERMINAL - VU 4-2.5	4
60	78-8100-0898-3	DISCONNECT SWITCH, ASSEMBLY, LA2-16	1

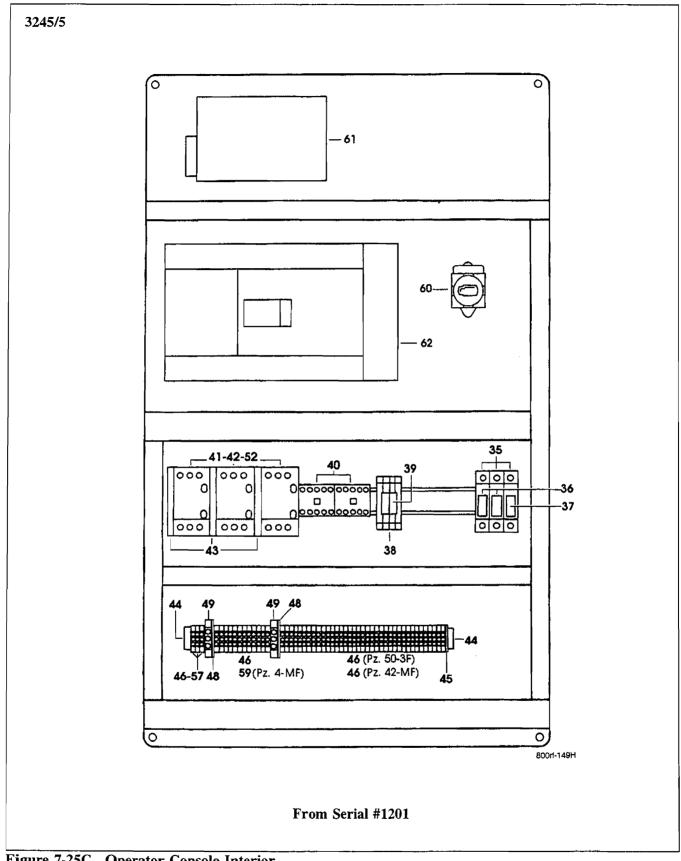


Figure 7-25C. Operator Console Interior

Parts List - Operator Console Interior (From Serial #1201)

Item	Part		_
Number	Number	Description	Qty
35	78-8060-7622-6	FUSE CARRIER	3
36	78-8060-7623-4	FUSE, 2 A - 10.3 x 38	2
37	78-8060-7624-2	FUSE, 4 A - 10.3 x 38	1
38	78-8076-5220-7	BASE, HC4-SFD	1
39	78-8076-5221-5	RELAY, HC4-24V-DC	1
40	78-8076-5222-3	SWITCH, CA4-5C-10-24V-CC	2
41	78-8076-5223-1	SWITCH, Thermal, KTA 3-25	3
42	78-8076-5227-2	SWITCH, Thermal, KTA 3-25-0.63-1A	3
43	78-8076-5224-9	CONTACT, KT-3-25-PA-11	3
44	78-8091-0410-8	BLOCK, Terminal	2
45	78-8091-0411-6	PLATE, VA 4-2.5/4	1
46	78-8091-0412-4	TERMINAL, VU 4-2.5	50
48	78-8091-0413-2	PLATE, VT 4-2.5/4	2
49	78-8091-0414-0	TERMINAL, VUPE 4-4	2 3
52	78-8076-5378-3	SWITCH, Thermal, KTA-3-25	3
57	78-8091-0415-7	COVER, Terminal	3
59	78-8091-0474-4	TERMINAL - VU 4-2.5	4
60	78-8100-0898-3	DISCONNECT SWITCH, ASSEMBLY, LA2-16	1
61	78-8114-4999-6	DC POWER SUPPLY - OMRON Type S82J-6024	1
62	78-8114-4998-8	A+B PLC Type SCL500-1747-L40F	1

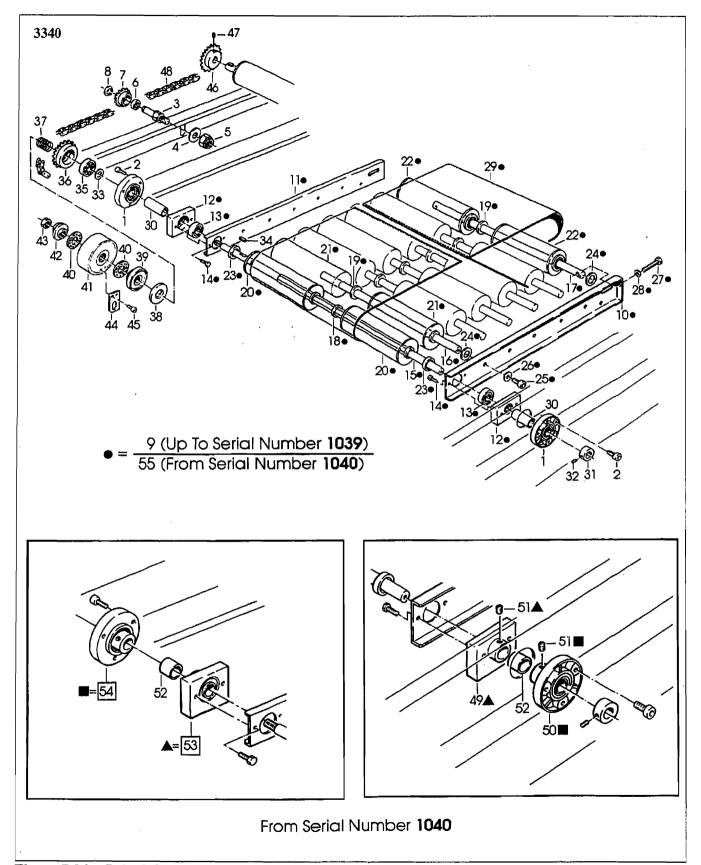


Figure 7-26. Infeed Conveyor Bed

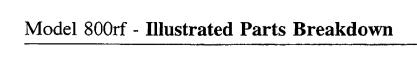
Parts List - Infeed Conveyor Bed

Item Number	Part Number	Description	Qty
1	78-8060-7648-1	BEARING, Flanged	2
2	78-8010-7209-7	SCREW, Soc. Hd. M6 x 12	6
3	78-8076-5291-8	SHAFT, Chain Tension	1
4	78-8052-6566-3	WASHER, Friction	1
5	26-1003-6918-5	NUT, Plastic Insert M10 Hex Flange	1
6	78-8076-5292-6	BEARING 6000	1
7	78-8076-5293-4	SPROCKET, Z=14, 3/8-inch	1
8	78-8016-5855-6	E-RING, 10mm	1
9	78-8076-5294-2	LIFTER ASSEMBLY, (up to serial number 1039)	1
10	78-8076-5295-9	FRAME, Lifter, R/H	1
11	78-8076-5296-7	FRAME, Lifter, L/H	1
12	78-8076-5297-5	FLANGE	2
13	26-1000-4350-9	BEARING, 6002, 2RS	2
14	78-8060-7886-7	SCREW, Hex Hd., M6 x 16 Special	4
15	78-8076-5298-3	SHAFT	1
16	78-8076-5299-1	SHAFT, Roller SHAFT, with Tensioner DIVIDER, Roller	5
17	78-8076-5300-7		1
18	78-8076-5301-5		1
19	78-8076-5302-3	SPACER, Roller ROLLER, Drive ROLLER, Intermediate	6
20	78-8076-5303-1		2
21	78-8076-5304-9		10
22	78-8076-5305-6	ROLLER, Front	2
23	78-8076-5306-4	SPACER, Roller	2
24	78-8076-5307-2	WASHER, 15.5 - 25 x 2	12
25	26-1003-7963-0	SCREW, Soc. Hd., M8 x 16 WASHER, Plain, Metric 8mm SCREW, Hex Hd., Metric M6 x 55	10
26	78-8017-9318-9		10
27	26-1005-5318-4		2
28	26-1000-0010-3	WASHER, Flat M6 BELT, 300 x 1085 SPACER, Bearing	2
29	78-8076-5309-8		1
30	78-8076-5310-6		2
31	78-8076-5311-4	BUSHING, Shaft	1
32	26-1003-8816-9	SCREW, Set M5 x 6	1
33	78-8076-5312-2	WASHER, Special	1
34	78-8059-5611-3	KEY BEARING, Oblique SPROCKET, Chain, Z=20, 3/8-inch	1
35	78-8076-5313-0		1
36	78-8076-5314-8		1
37	78-8028-8212-2	SPRING FRICTION WASHER, Friction	1
38	78-8076-5315-5		1
39	78-8076-5316-3		1

(continued on next page)

## Parts List - Infeed Conveyor Bed (cont.)

Item Number	Part Number	Description	Qty
40	78-8076-5317-1	BEARING, Thrust	2
41	78-8076-5318-9	CYLINDER, with Friction	1
42	78-8076-5319-7	NUT, Bearing	1
43	78-8091-0775-4	NUT, M12 x 1.25	1
44	78-8076-5321-3	PLATE, Piston	1
45	78-8032-0382-3	SCREW, Soc. Hex Hd., M5 x 16, Zinc Pl.	2
46	78-8076-5322-1	SPROCKET, Z=20, 3/8-inch	1
47	78-8076-5323-9	SET SCREW, M5 x 12	1
48	78-8076-5457-5	CHAIN, 138 Pitch	1
49	78-8091-0724-2	SUPPORT, Bearing	2
50	78-8091-0725-9	FLANGE	2
51	78-8091-0726-7	SET SCREW, M5 x 5	4
52	78-8091-0727-5	SPACER	2
53	78-8091-0728-3	SUPPORT, Bearing	2
54	78-8091-0729-1	FLANGE, Roller	2
55	78-8091-0730-9	LIFTER ASSEMBLY, (from serial number 1040)	1



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**7-61** 

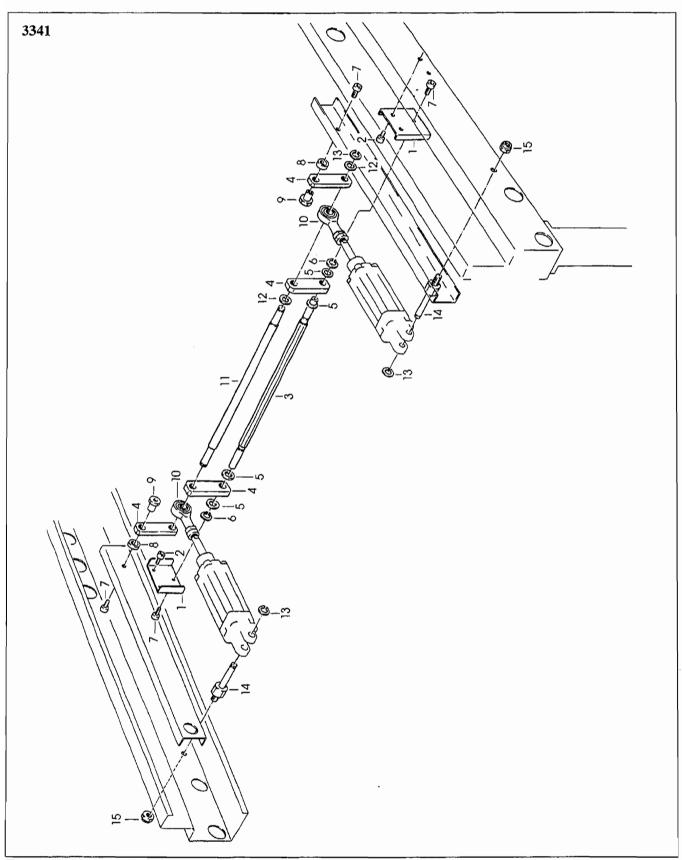
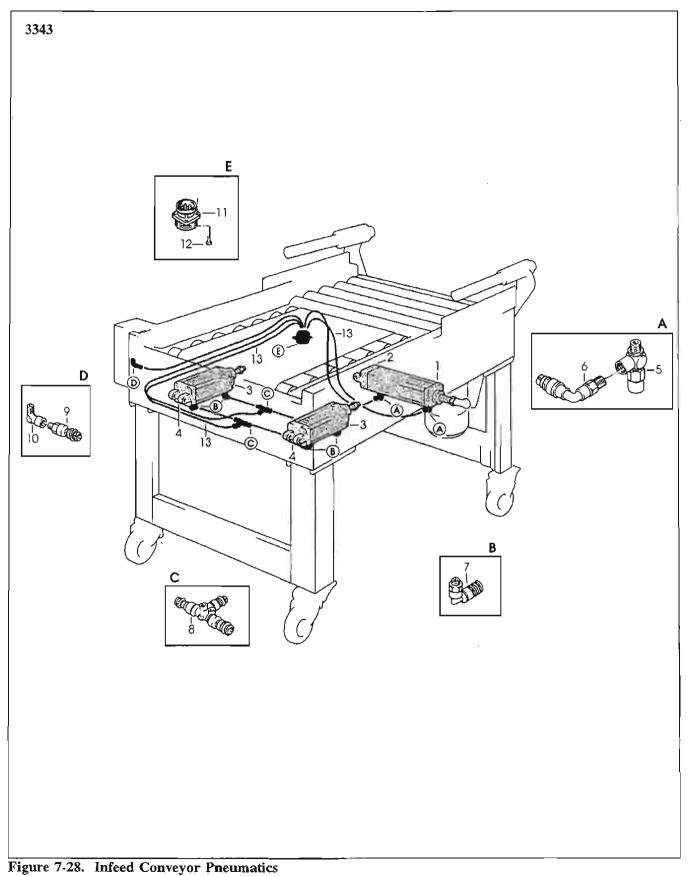


Figure 7-27. Infeed Conveyor Index Assembly

## Parts List - Infeed Conveyor Index Assembly

Item Number	Part Number	Description	Qty
1	79.9076.5324.7	MOLINITING	2
1	78-8076-5324-7	MOUNTING, Hinge	
2	78-8010-7229-5	SCREW, Soc. Hd., M6 x 10	4
3	78-8076-5325-4	SHAFT, Rod Mounting	1
4	78-8059-5587-5	LINK	4
5	78-8017-9059-9	WASHER, Flat for M12 Screw	4
6	78-8023-2234-3	RING, Snap for 12mm Shaft	2
7	26-1003-7963-0	SCREW, Soc Hd., M8 x 16	4
8	78-8076-5327-0	SPACER, Shaft	2
9	78-8076-5328-8	SHAFT, Lifter	2
10	78-8057-5748-7	MOUNT, Cylinder Rod End	2
11	78-8076-5329-6	SHAFT, Toggle	1
12	78-8052-6566-3	WASHER, Friction	4
1.2	70 001/ 5055 /	E DING 10	1
13	78-8016-5855-6	E-RING, 10mm	4
14	78-8059-5589-1	POST, Air Cylinder	2
15	26-1003-6918-5	NUT, Plastic Insert, M10, Hex Flange	2



## Parts List - Infeed Conveyor Pneumatics

Item	Part		04
Number	Number	Description	Qty
1	78-8076-5330-4	CYLINDER, Centering Rails, DNU-40-140-PPV-A-SN	1
2	78-8076-5331-2	MOUNTING, Floating	1
3	78-8076-5332-0	CYLINDER, Infeed Index, DNU-32-40-PPV-A-SN	2
4	78-8076-5333-8	MOUNTING, Floating, SN-32	2
5	78-8059-5551-1	AIR REGULATOR	2
6	78-8060-7676-2	UNION, LCS, 1/4-inch PK4	2
7	78-8060-7674-7	UNION, LCS, 1/8-inch PK4	4
8	78-8060-7678-8	UNION, FCS3-PK4	2
9	78-8060-7552-5	UNION, CS, 1/8-inch PK4	1
10	26-1005-6895-0	ELBOW, 90-degree	1
11	78-8076-5334-6	TAP, Multiple	1
12	26-1002-5753-9	SCREW, Self Tapping	4
13	78-8076-5335-3	TUBE, Air, 5 meters	1
998	78-8076-5459-1	SEAL KIT, for FESTO Cylinder DNU 32 (not shown)	
999	78-8076-5460-9	SEAL KIT, for FESTO Cylinder DNU 40 (not shown)	

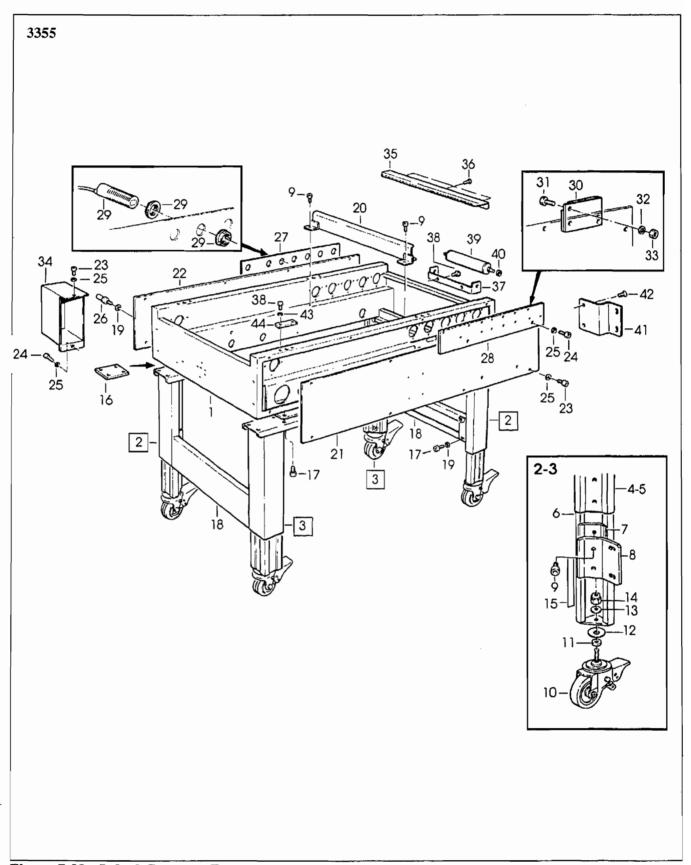


Figure 7-29. Infeed Conveyor Frame

Parts List - Infeed Conveyor Frame

Item Number	Part Number	Description	Qty
1	78-8076-5336-1	FRAME, Conveyor	1
2	78-8076-5337-9	LEG ASSEMBLY W/Caster, Left	2
3	78-8076-5338-7	LEG ASSEMBLY W/Caster, Right	2
4	78-8076-5041-7	LEG, Left	2
5	78-8076-5040-9	LEG, Right	2
6	78-8052-6678-6	LEG, Inner	4
7	78-8052-6677-8	CLAMP, Inner	4
8	78-8060-7697-8	BRACKET, Special	4
9	26-1003-7963-0	SCREW, Soc. Hd., M8 x 16	10
10	78-8060-8061-6	CASTER /80	4
11	78-8060-8124-2	SPACER, Caster	4
12	78-8060-7699-4	WASHER, 12-45, 5 x 4	4
13	78-8017-9059-9	WASHER, Flat for M12 Screw	4
14	78-8060-7532-7	NUT, M12, Self-Locking	4
15	78-8052-6680-2	LABEL, Height	4
16	78-8076-5339-5	PLATE, Leg	4
17	26-1003-7964-8	SCREW, Soc. Hd., Hex Soc Dr., M8 x 20	28
18	78-8076-5326-2	CROSS BAR, Leg	2
19	78-8017-9318-9	WASHER, Plain, Metric 8mm	9
20	78-8076-5340-3	HOLDER, Box	1
21	78-8076-5341-1	COVER, Side, Right	1
22	78-8076-5342-9	COVER, Side, Left	1
23	26-1003-7949-9	SCREW, Soc. Hd., Hex Soc., M5 x 12	11
24	78-8032-0382-3	SCREW, Soc. Hex Hd., M5 x 16, Zinc. Pl.	5
25	78-8005-5741-1	WASHER, Metric, Plain, M5 SHAFT SUPPORT, Photocell	16
26	78-8076-5343-7		1
27	78-8076-5344-5		1
28	78-8076-5345-2	SUPPORT, Reflector	1
29	78-8076-5056-5	PHOTOCELL, PNP, E3F, R2, B4,/18	2
30	78-8076-5057-3	REFLECTOR, E39-R1	2
31	78-8010-7157-8	SCREW, Hex Hd., M4 x 10	4
32	78-8005-5740-3	WASHER, Plain, Metric 4mm, Nickel.	4
33	78-8010-7416-8	NUT, Metric, Hex, Steel, M4	4
34	78-8076-5346-0	COVER GUARD SCREW, Self Tapping	1
35	78-8076-5347-8		1
36	26-1002-5753-9		3
37	78-8076-5348-6	SUPPORT, Roller	1
38	26-1003-5829-5	SCREW, Hex Hd., M6 x 12	2
39	78-8076-5349-4	Roller /32 x 198	1
40	78-8052-6668-7	SNAP, Roller	1
41	78-8076-5350-2	BRACKET, Mounting	2
42	78-8057-5716-4	SCREW, Flat Head Soc., M8 x 15	4
43	26-1000-0010-3	WASHER, Flat, M6	8
44	78-8091-0425-6	PLATE	4

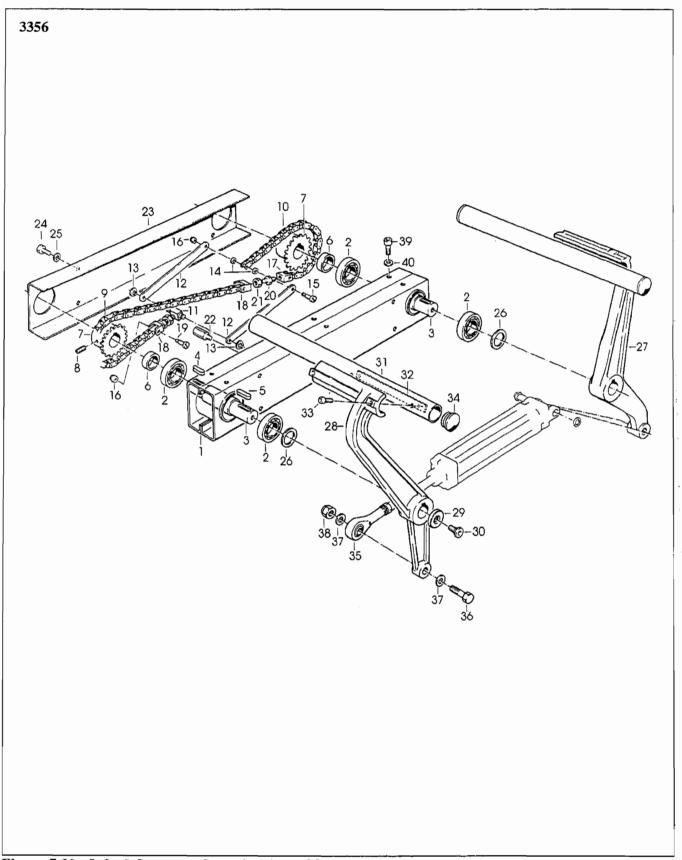


Figure 7-30. Infeed Conveyor Centering Assembly

Parts List - Infeed Conveyor Centering Assembly

Item Number	Part Number	Description	Qty
1	78-8076-5351-0	BOX	1
2	78-8023-2551-0	BEARING, 6005-2RS	4
3	78-8076-5352-8	SHAFT, Lever	2
4	78-8057-5811-3	KEY, 6 x 6 x 20mm	2
5	78-8076-5353-6	KEY, 6 x 6 x 25	2
6	78-8076-5354-4	SPACER, Bearing	2
7	78-8076-5355-1	SPROCKET, Z=20, 3/8-inch	2
8	78-8059-5617-0	SET SCREW, M6 x 8	2
9	78-8054-8777-0	CHAIN, 3/8-inch Pitch, 41 Pitch Long	1
10	78-8054-8782-0	CHAIN, 3/8-inch Pitch, 23 Pitch Long	1
11	78-8054-8784-6	BLOCK, Chain	1
12	78-8054-8787-9	CHAIN LINK	2
13	78-8656-3945-0	E-RING, M-4	2
14	78-8054-8783-8	WASHER, Special	2
15	78-8060-7519-4	SCREW, M3 x 25	1
16	78-8055-0528-2	NUT, Self-Locking, M3, Zinc. Pl.	4
17	78-8054-8788-7	CHAIN CONNECTOR	1
18	78-8054-8786-1	CHAIN CONNECTOR	2
19	26-1003-5807-1	SCREW, M3 x 20	3
20	78-8054-8785-3	ROD, Threaded Right/Left	2
21	78-8010-7418-4	NUT, Metric, Hex, Stl., M6	2
22	78-8076-5356-9	SPACER, Mounting COVER, Chain SCREW, Metric M6 x 16, Hex Hd.	4
23	78-8076-5357-7		1
24	78-8032-0375-7		4
25	26-1000-0010-3	WASHER, Flat, M6	4
26	78-8076-5358-5	SPACER, Bearing	2
27	78-8076-5359-3	LEVER, Right	1
28	78-8076-5360-1	LEVER, Left	1
29	78-8076-5361-9	WASHER, Special	2
30	78-8057-5716-4	SCREW, Flat Hd., Soc., M8 x 15	2
31	78-8076-5362-7	BAR, Centering PLATE, Bar SCREW, Soc. Hd., Hex Hd., M6 x 16	2
32	78-8076-5363-5		2
33	26-1003-7957-2		4
34	78-8054-8779-6	END, Cap	4
35	78-8057-5747-9	MOUNT, Cylinder Rod End	1
36	78-8076-5364-3	SCREW, Hex Hd., M12 x 55	1
37	78-8017-9059-9	WASHER, Flat for M12 Screw	2
38	78-8060-7532-7	NUT, M12, Self-Locking	1
39	26-1003-7964-8	SCREW, Soc. Hd., Hex Soc. Dr., M8 x 20	6
40	78-8017-9318-9	WASHER, Plain, Metric 8mm	6

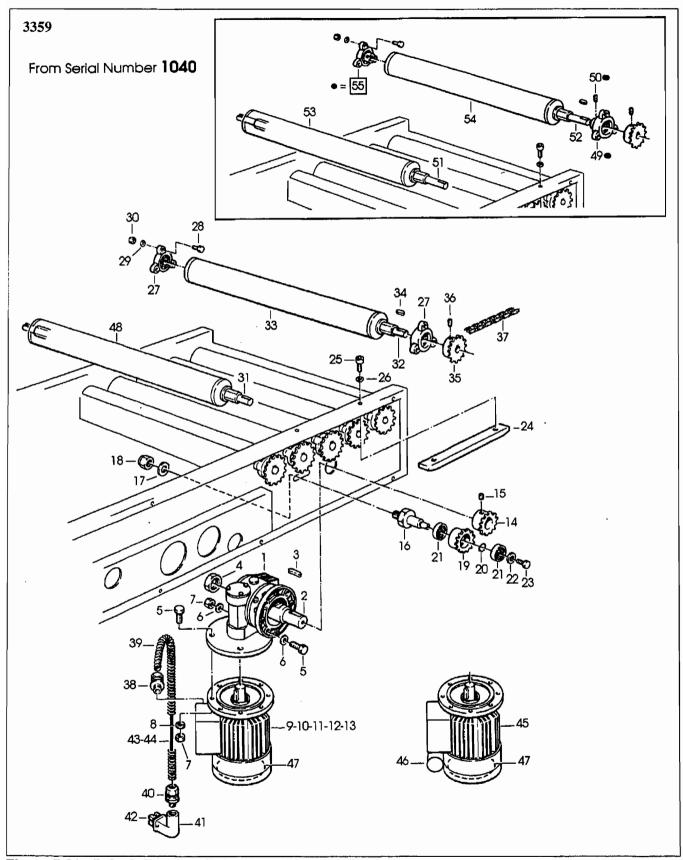


Figure 7-31. Infeed Conveyor Drive Assembly

Parts List - Infeed Conveyor Drive Assembly

Item Number	Part Number	Description	Qty
1	78-8059-5620-4	GEAR BOX	1
2	78-8076-5365-0	SHAFT, Gear Box	1
3	78-8057-5811-3	KEY, 6 x 6 x 20mm	2
4	78-8017-9169-6	NUT, M18 x 1	1
5	78-8017-9301-5	SCREW, Hex Head, M8 x 25	8
6	78-8017-9318-9	WASHER, Plain, Metric, 8mm	8
7	78-8059-5619-6	NUT, M8	8
8	78-8005-5736-1	LOCKWASHER, for M8 Screw	4
9	78-8059-5621-2	MOTOR, 200V, 60 Hz, 3 Phase	1
10	78-8052-6718-0	MOTOR, 200/380V, 50 Hz, 3 Phase	1
11	78-8060-8158-0	MOTOR, 200V, 60 Hz, 3 Phase	1
12	78-8052-6720-6	MOTOR, 240/415V, 50 Hz, 3 Phase	1
13	78-8052-6719-8	MOTOR, 260/440V, 50 Hz, 3 Phase	1
14	78-8076-5366-8	SPROCKET, Z=16, 3/8-inch	1
15	78-8059-5617-0	SET SCREW, M6 x 8	1
16	78-8076-5367-6	SHAFT, Chain Tension	1
17	78-8059-5623-8	WASHER	1
18	26-1003-6918-5	NUT, Plastic Insert, M10 Hex Flange	1
19	78-8076-5368-4	SPROCKET, Z=15, 3/8-inch	1
20	78-8060-7830-5	LOCK RING, /28	2
21	78-8059-5625-3	BEARING	2
22	78-8042-2919-9	WASHER, Triple, M6	1
23	78-8010-7169-3	SCREW, Metric, M6 x 12, Hex Hd.	1
24	78-8059-5615-4	CHAIN RAIL	1
25	26-1003-7957-2	SCREW, Soc. Hd., Hex Hd., M6 x 16	2
26	26-1000-0010-3	WASHER, Flat M6	2
27	78-8059-5584-2	HUB ASSY	10
28	83-0002-7336-3	SCREW, Hex Hd., M4 x 14 Zinc Pl	30
29	78-8005-5740-3	WASHER, Plain, Metric 4mm Nick.	30
30	78-8010-7416-8	NUT, Metric, Hex, Steel M4	30
31	78-8076-5369-2	SHAFT	1
32	78-8059-5612-1	HEX SHAFT	4
33	78-8060-7829-7	ROLLER, 48 x 482	4
34	78-8059-5611-3	KEY	6
35	78-8076-5370-0	SPROCKET, Z=17, 3/8-inch	5
36	78-8059-5613-9	SET SCREW, M5 x 14	5
37	78-8059-5616-2	CHAIN	1
38	78-8060-7631-7	CONNECTOR, 3/8-inch	1
39	78-8060-8154-9	SLEEVING (0,90 mt)	1

(continued on next page)

Parts List - Infeed Conveyor Drive Assembly (cont.)

Item	Part		
Number	Number	Description	Qty
40	78-8060-7626-7	CONNECTOR, PG 11/12	1
41	78-8060-7874-3	PLUG HOUSING LATERAL	1
42	78-8060-7875-0	PLUG MALE	1
43	78-8060-8052-5	CABLE, 4 x 1.5 3 Phase, 5MT	2
44	78-8091-0433-0	CABLE, 3 x 1.5 1 Phase, 5MT	2
45	78-8076-5371-8	MOTOR, 240V, 50 Hz, Single-Phase	1
46	78-8017-9163-9	CONDENSER-5 MFD, 240V, 50 Hz	1
47	78-8076-5372-6	FAN, Motor	1
48	78-8076-5458-3	ROLLER, /48 x 482	1
49	78-8091-0731-7	FLANGE	10
50	78-8091-0726-7	SET SCREW, M5 x 5	20
51	78-8114-4999-6	SHAFT, Sprocket	1
52	78-8114-4891-5	SHAFT, Sprocket	4
53	78-8091-0734-1	ROLLER ASSY, Rubber Coated	1
54	78-8091-0735-8	ROLLER ASSY	4
55	78-8091-0736-6	FLANGE, Rollers	10

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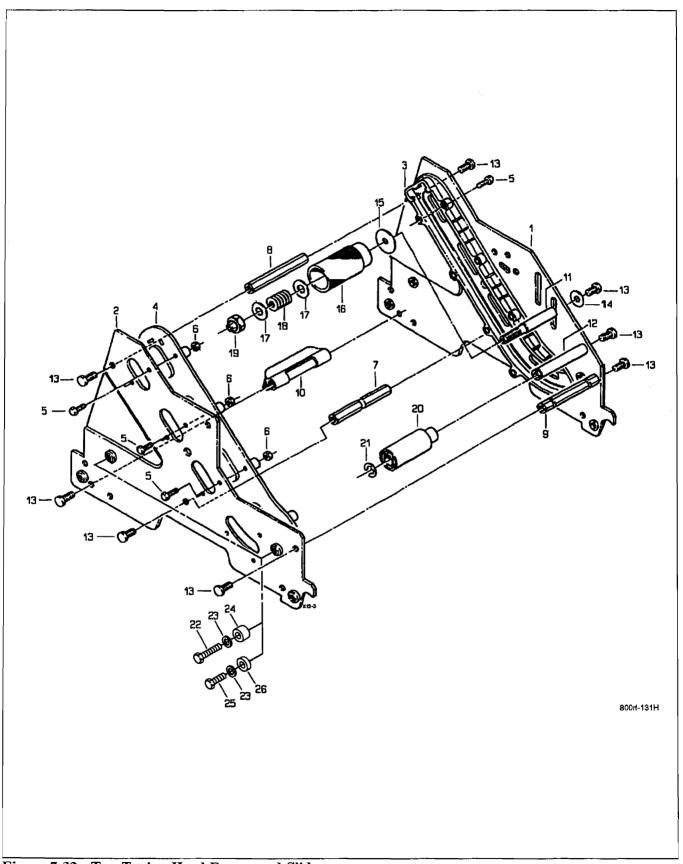


Figure 7-32. Top Taping Head Frame and Slide

## Parts List - Top Taping Head Frame and Slide

Item Number	Part Number	Description
1 2 3	78-8070-1386-3 78-8070-1387-1 78-8068-4143-9	FRAME, Tape Mount Upper Assembly FRAME, Front Upper Assembly GUIDE, R/H
4 5 6	78-8060-8414-7 83-0002-7336-3 78-8010-7416-8	GUIDE, L/H SCREW, hex. head, M4x14 NUT, hex. M4
7 8 9	78-8070-1251-9 78-8052-6559-8 78-8052-6560-6	SPACER, Spring SPACER, Upper SPACER, Front
10 11 12	78-8060-7936-0 78-8052-6564-8 78-8052-6568-9	ASSEMBLY, Brush SHAFT, Tension Roller SHAFT, Wrap Roller
13 14 15	26-1003-5828-7 78-8042-2919-9 78-8070-1268-3	SCREW, hex. head M6x12 WASHER, Triple, M6 WASHER, Roll Back Up
16 17 18	78-8052-6565-5 78-8052-6566-3 78-8052-6567-1	ROLLER, Top Tension WASHER, Friction SPRING, Compression
19 20 21	78-8017-9077-1 78-8052-6569-7 26-1000-1613-3	NUT, Self Locking M10x1 ROLLER, Wrap RING, Retaining 10DIN6799
22 23 24	26-1003-5833-7 26-1000-0010-3 78-8054-8935-4	SCREW, Metric, M6x16, Hex Hd., 2-inch Top Head WASHER, Flat M6 SPACER, Mounting, 2-inch Top Head
25 26	78-8010-7193-3 78-8076-5036-7	SCREW, Metric, M6x20, Hex Hd., 3-inch, Top Head SPACER, Mounting, 3-inch, Top Head

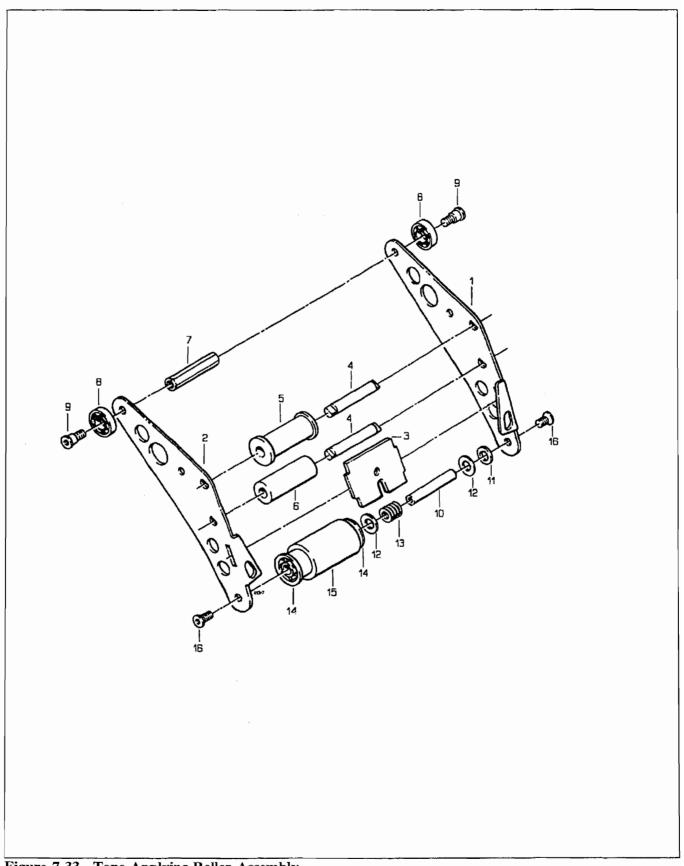


Figure 7-33. Tape Applying Roller Assembly

Parts List - Tape Applying Roller Assembly

Item Number	Part Number	Description
1	78-8070-1206-3	ARM, Applying R/H
2	78-8070-1200-3 78-8070-1207-1	ARM, Applying L/H
	78-8070-1221-2	PLATE, Tape
; ;	78-8070-1309-5	SHAFT, Roller
	78-8070-1367-3	ASSEMBLY, Knurled Roller
	78-8070-1266-7	ROLLER, Wrap
	78-8052-6580-4	SPACER, Rear
	78-8017-9082-1	BEARING, Special 30 mm
	78-8017-9106-8	SCREW, Bearing Shoulder
	78-8052-6575-4	SHAFT, Roller
l 2	78-8017-9074-8 78-8052-6566-3	WASHER, Nylon 15 mm
		WASHER, Friction
	78-8052-6567-1	SPRING, Compression
	78-8060-8395-8 78-8057-6179-4	BUSHING, Applying Roller ROLLER, Applying NM
		••••
,	26-1005-4759-0	SCREW, Flat Head M6x12

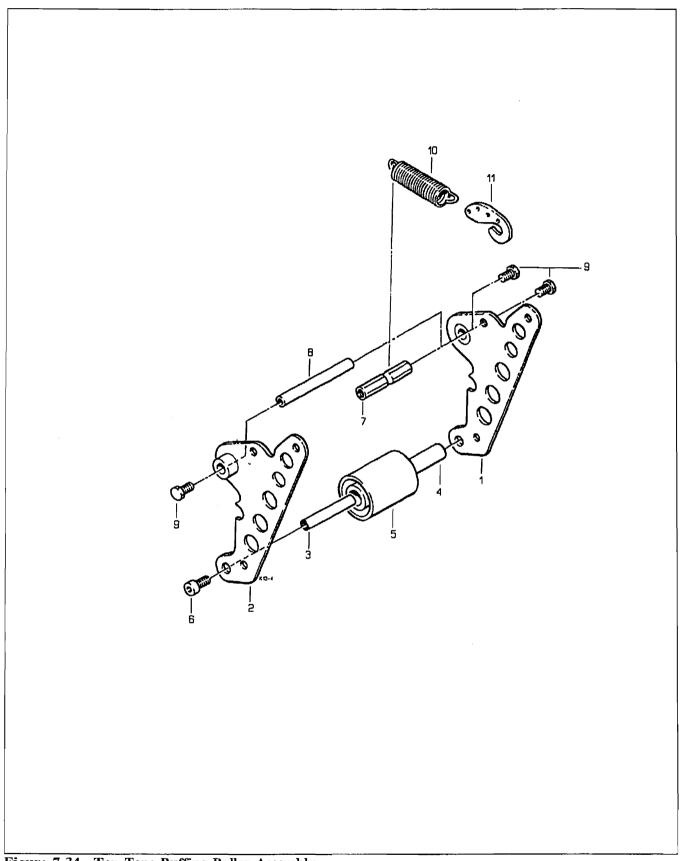
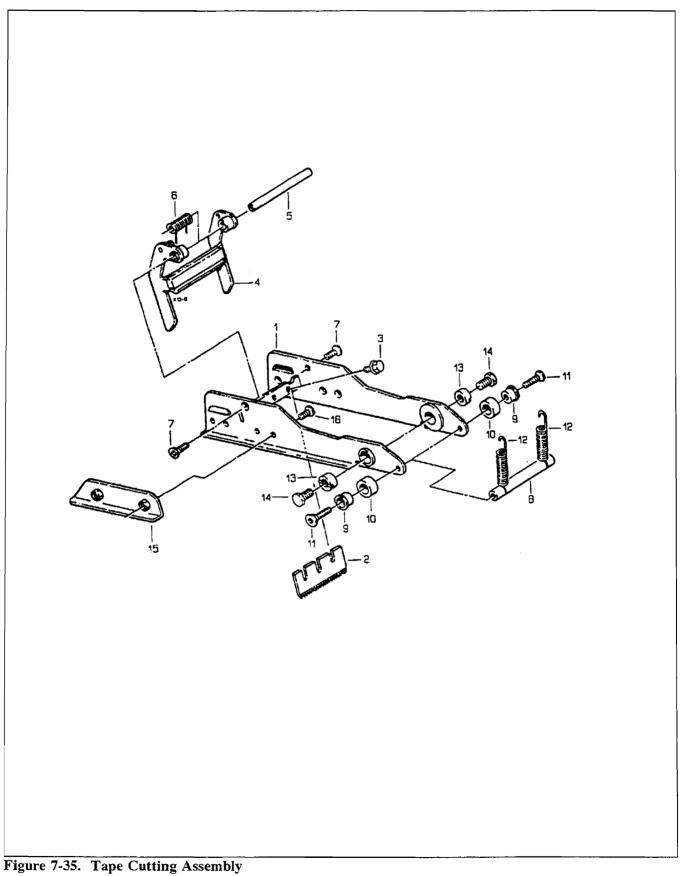


Figure 7-34. Top Tape Buffing Roller Assembly

## Parts List - Top Tape Buffing Roller Assembly

Item Number	Part Number	Description
1 2 3	78-8070-1392-1 78-8070-1391-3 78-8052-6575-4	SUB ASSEMBLY, Buffing Arm SUB ASSEMBLY, Buffing Arm SHAFT, Roller
4 5 6	78-8052-6586-1 78-8057-6178-6 78-8076-4503-7	BUSHING, Buffing Roller ROLLER, Buffing NM SCREW, M6x12
7 8 9	78-8070-1220-4 78-8017-9109-2 26-1003-5828-7	SPACER, Spring SHAFT, 10x90 mm SCREW, hex. head M6x12
10 11	78-8070-1274-1 78-8070-1244-4	SPRING, Extension, Upper, (silver color) HOLDER, Spring



Parts List - Tape Cutting Assembly

Item Number	Part Number	Description
1 2 3	78-8070-1217-0 78-8017-9173-8 26-1003-8596-7	FRAME, Cut-off Weldment BLADE, 2.56 inch [65 mm] SCREW, hex. head M5x8 W/Ext. Tooth Washer
4 5 6	78-8070-1371-5 78-8052-6597-8 78-8070-1390-5	GUARD, Blade Assembly SHAFT, Blade Guard SPRING, Tension
7 8 9	26-1005-4757-4 78-8017-9135-7 78-8052-6600-0	SCREW, Flat Head M4x10 SHAFT, Spacer SPACER
10 11 12	78-8070-1269-1 26-1005-4758-2 78-8052-6602-6	BUMPER SCREW, Flat Head M5x20 SPRING, Cutter
13 14 15	78-8017-9132-4 26-1003-5828-7 78-8070-1216-2	PIVOT, Cutter Lever SCREW, hex. head M6x10 SLIDE, Extension
16	26-1008-6574-5	SCREW, Phillips FH M4x10

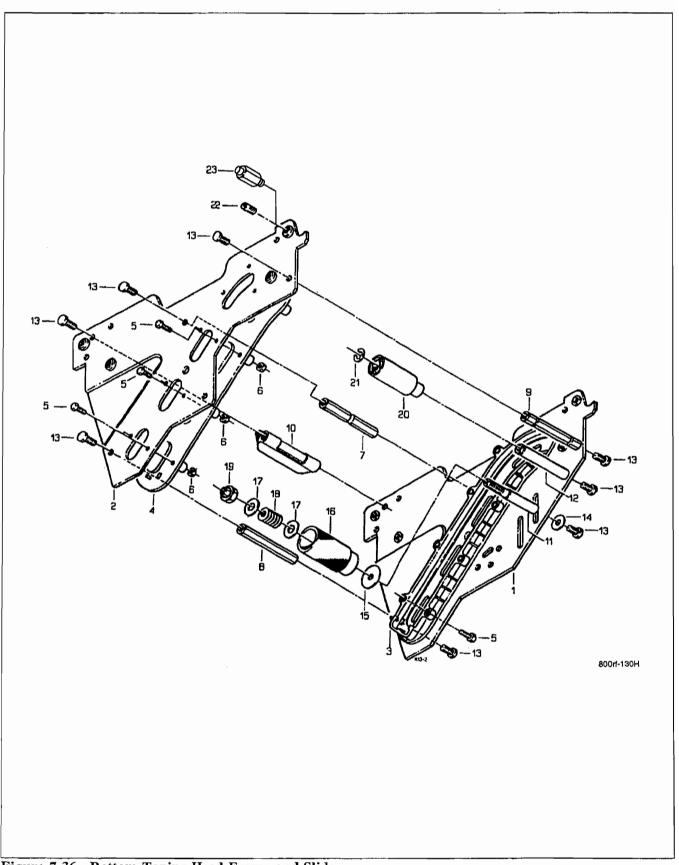
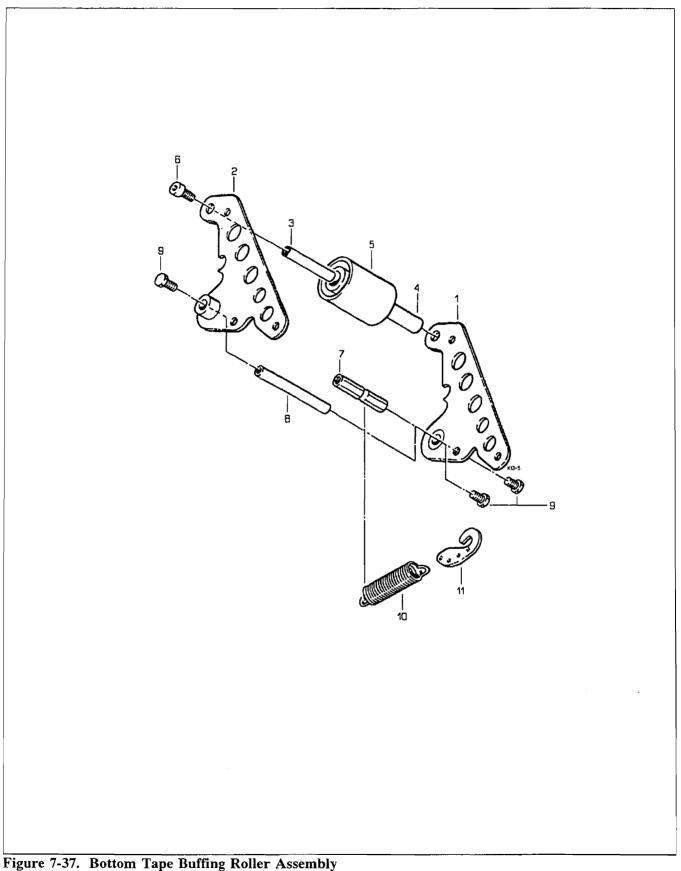


Figure 7-36. Bottom Taping Head Frame and Slide

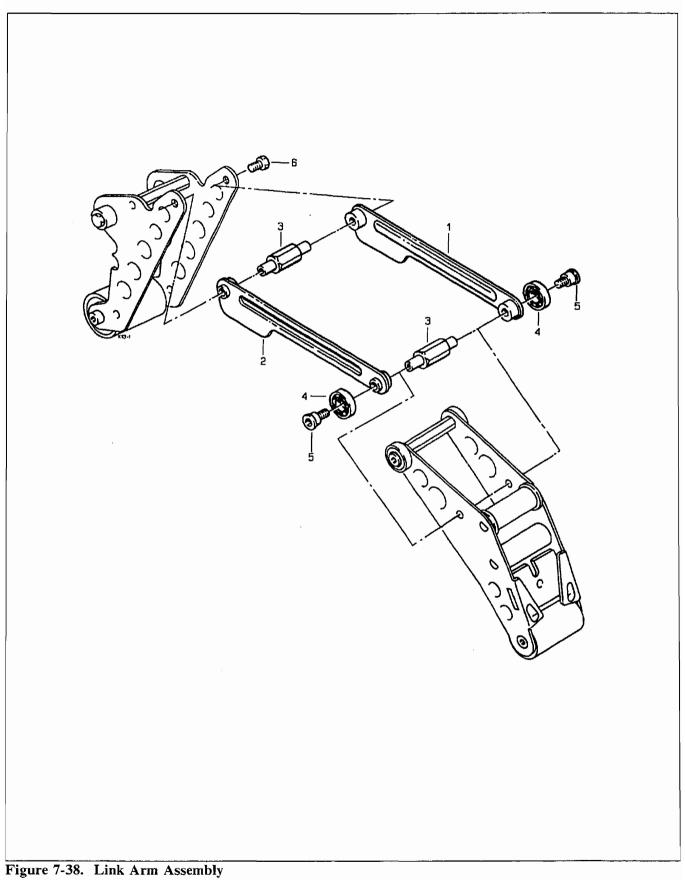
Parts List - Bottom Taping Head Frame and Slide

Item Number	Part Number	Description
1 2 3	78-8070-1370-7 78-8070-1369-9 78-8068-4143-9	FRAME, Front Lower Assembly FRAME, Tape Mount Lower Assembly GUIDE, R/H
4 5 6	78-8068-4144-7 83-0002-7336-3 78-8010-7416-8	GUIDE, L/H SCREW, hex. head M4x14 NUT, hex. M4
7 8 9	78-8070-1251-9 78-8052-6559-8 78-8052-6560-6	SPACER, Spring SPACER, Upper SPACER, Front
10 11 12	78-8060-7936-0 78-8052-6564-8 78-8052-6568-9	ASSEMBLY, Brush SHAFT, Tension Roller SHAFT, Wrap Roller
13 14 15	26-1003-5828-7 78-8042-2919-9 78-8070-1268-3	SCREW, hex. head M6x12 WASHER, Triple M6 WASHER, Roll Back Up
16 17 18	78-8052-6606-7 78-8052-6566-3 78-8052-6567-1	ROLLER, Tension Bottom WASHER, Friction SPRING, Compression
19 20 21	78-8017-9077-1 78-8052-6569-7 26-1000-1613-3	NUT, Self Locking M10x1 ROLLER, Wrap RING, Retaining 1DIN6799
22 23	78-8076-4500-3 78-8060-8460-0	STUD, Mounting, 3-inch, Bottom Head STUD, Mounting, 2-inch, Bottom Head



## Parts List - Bottom Tape Buffing Roller Assembly

Item Number	Part Number	Description
1	78-8070-1391-3	SUB ASSEMBLY, Buffing Arm
2	78-8070-1392-1	SUB ASSEMBLY, Buffing Arm
3	78-8052-6575 <b>-</b> 4	SHAFT, Roller
4 5 6	78-8052-6586-1 78-8057-6178-6 78-8076-4503-7	BUSHING, Buffing Roller ROLLER, Buffing NM SCREW, M6x12
7 8 9	78-8070-1220-4 78-8017-9109-2 26-1003-5828-7	SPACER, Spring SHAFT, 10x90 mm SCREW, hex. head M6x12
10 11	78-8070-1273-3 78-8070-1244-4	SPRING, Extension, Bottom (black) HOLDER, Spring



## Parts List - Link Arm Assembly

Item Number	Part Number	Description
1	78-8070-1388-9	LINK, Arm Bushing Assembly
2	78-8070-1389-7	LINK, Arm Bushing Assembly
3	78-8070-1271-7	SHAFT, Pivot
4	78-8017-9082-1	BEARING, Special 30 mm
5	78-8017-9106-8	SCREW, Bearing Shoulder
6	78-8010-7163-6	SCREW, hex. head M5x10

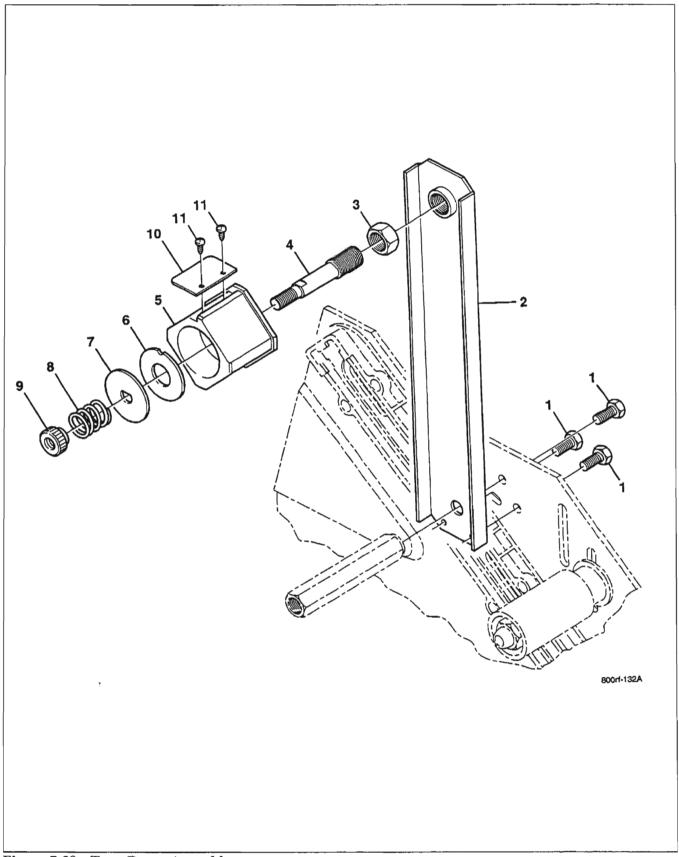


Figure 7-39. Tape Drum Assembly

## Parts List - Tape Drum Assembly

Item	Part	
Number	Number	Description
1	78-8010-7169-3	SCREW, hex. head M6x12
2	78-8070-1395-4	BRACKET, tape drum
3	78-8017-9169-6	NUT, M18x1
4	78-8076-4519-3	SHAFT, tape drum 2 inch
5	78-8052-6749-5	DRUM, tape assembly
6	78-8060-8172-1	WASHER, friction
7	78-8052-6271-0	WASHER, tape drum
8	78-8054-8826-5	SPRING
9	78-8060-7851-1	RING NUT, adjusting
10	78-8052-6268-9	LEAF, spring
11	26-1002-5753-9	SCREW, self tapping, 7SPx8
12	78-8060-8474-1	TAPE DRUM ASSEMBLY (items 1-11)
13	78-8070-1565-2	TAPE DRUM ASSEMBLY, mounting bracket (items 4-11)

## **Contents**

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8-2.	Cleaning	-1
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#### 8-1. General

#### Maintenance

The Model 800rf Case Sealer is designed for long, trouble-free service. The machine performs best when it receives routine maintenance and cleaning. Machine components that fail or wear excessively should be promptly repaired or replaced to prevent damage to other portions of the machine or to the product.

#### Tool Kit

Since the case sealer uses metric fasteners, a tool kit consisting of open-end and hex-socket wrenches is provided with the machine. An oil can for lubrication is also provided as a convenience item for a preventive maintenance program.

# **M** WARNING

TURN OFF ALL ELECTRICAL POWER AND COMPRESSED AIR SUPPLIES. DISCONNECT THE POWER CORD FROM THE ELECTRICAL SUPPLY AND DISCONNECT THE AIR SUPPLY LINE BEFORE BEGINNING MAINTENANCE. IF THE POWER AND COMPRESSED AIR ARE NOT DISCONNECTED, SEVERE PERSONAL INJURY COULD RESULT.

USE CARE WHEN REPLACING THE CUT-OFF BLADES. THEY ARE EXTREMELY SHARP AND COULD CAUSE SEVERE PERSONAL INJURY.

#### 8-2. Cleaning

Regular slotted containers produce a great deal of dust and paper chips when processed or handled in equipment. If this dust is allowed to build up on machine components, it can cause component wear and overheating of the drive motors. The dust buildup can best be removed from the machine by a shop vacuum.

Depending on the number of boxes sealed in the case sealer, this cleaning should be done approximately **once per month.** If the boxes sealed are dirty or if the environment that the machine operates in is dusty, more frequent cleaning may be necessary.

## **A** CAUTION

Never attempt to remove dirt by blowing it out with compressed air. This causes dirt to be blown inside the motors and between sliding surfaces. Dirt in these areas causes serious damage and rapid wear.

Never wash the machine with water or subject it to conditions that cause moisture condensation on components. Serious damage could result.

- 1. Vacuum the machine to remove dust and paper chips.
- Wipe off grime with a cloth dampened with 3M Natural Cleaner.
- 3. Wipe off the cut-off blades with a cloth dampened with 3M Natural Cleaner. Use a motion away from the sharp edge.
- 4. Drain any water from the bulb of the infeed air pressure regulator and clean it as necessary.
- 5. Wipe off the conveyor bed rollers with a cloth dampened with 3M Natural Cleaner. Check to see if rollers are free on their shafts. If not, spray with 3M Natural Cleaner.

July

#### 8-3. Lubrication

Like most other equipment, the case sealer must be periodically lubricated to ensure long, trouble-free service. Most of the machine bearings are permanently lubricated and sealed and do not need further lubrication. The drive motors and cylinders are also permanently lubricated and do not require additional lubrication.

# **A** CAUTION

During lubrication, wipe off all excess lubricant and grease. Excess lubricant attracts dust and dirt that can cause equipment wear and jamming.

Take care that no lubricant or grease remains on the surface of rollers around which tape is wrapped.

#### **Taping Heads**

Figures 8-3A, B and C illustrate the taping head points that should be lubricated after every 250 hours of operation.

For each taping head:

1. Apply a small amount of multi-purpose grease to the ends of each spring where the spring is secured. Refer to figure 8-3A.

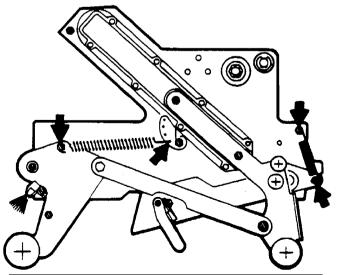


Figure 8-3A

2. Apply 3M 5-Way Penetrant to all pivot points of the taping head. Refer to figure 8-3B.

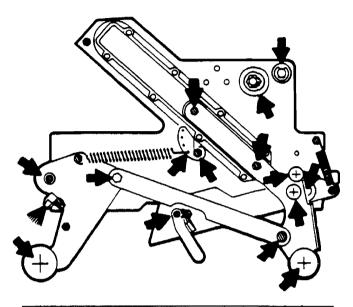


Figure 8-3B

3. Apply 3M 5-Way Penetrant to the cut-off blade oiler pads. Saturate the pads. Refer to figure 8-3C.

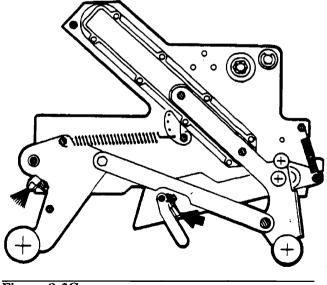


Figure 8-3C

#### Main Assembly

 With reference to figure 8-3D below and the associated figures in Section 7, Illustrated Parts Breakdown, apply 3M 5-Way Penetrant or multipurpose grease to the machine wear points.

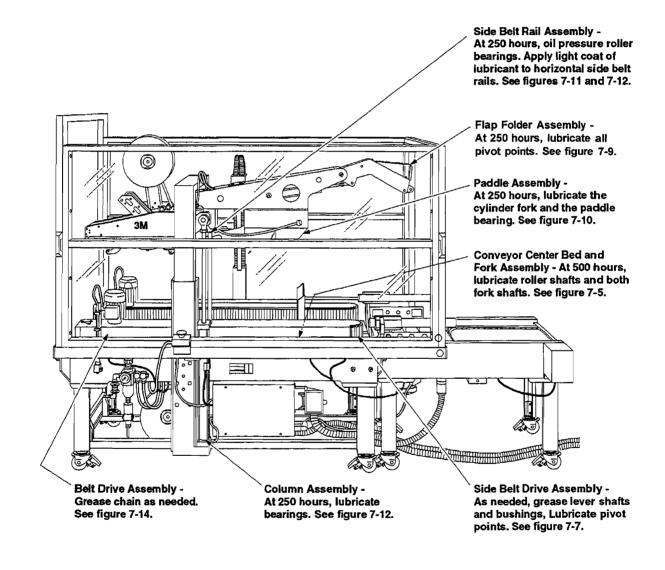


Figure 8-3D

### **Infeed Conveyor**

 With reference to figure 8-3E below and the associated figures in section 7, Illustrated Parts Breakdown, apply 3M 5-Way Penetrant or multipurpose grease to the infeed conveyor's wear points.

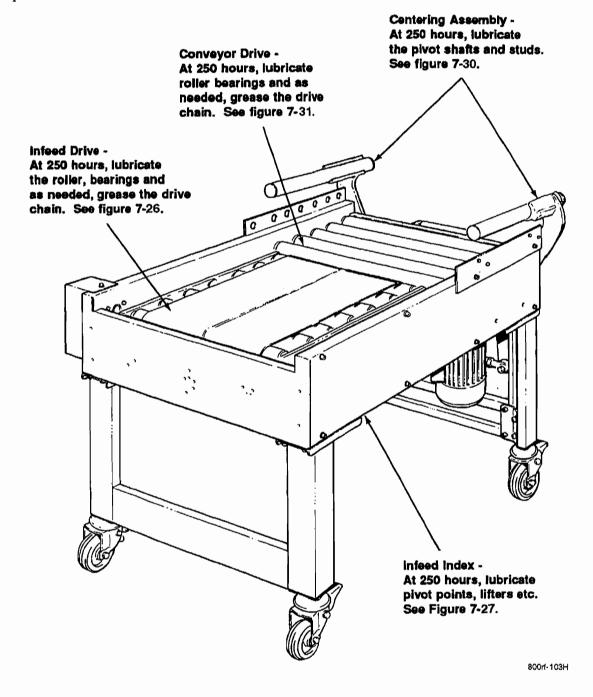


Figure 8-3E

## 8-4. Maintenance Schedule

### Maintenance Schedule

	As Needed	Weekly	250 Hours
Overall Machine		Clean (Vacuum or wipe with cloth)	Wipe with cloth
Cut-off Blades	Clean (3M 5-Way Penetrant on a cloth)		
Drive Belts	Clean (Vacuum or brush)		
Taping Heads			*3M 5-Way Penetrant
Spring Ends			* Multi-purpose Grease
Top Flap Compression Rollers	*3M 5-Way Penetrant		
Conveyor Rollers		*3M 5-Way Penetrant	
Infeed Regulator Bowl	**Drain		

Notes: \* Refer to the figures in Section 8-3.

\*\* Do not allow water to go above the filter element.

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# Model 800rf Type 19000 (Before Serial 1201) with Festo<sup>TM</sup> FPC 202 Programmable Logic Controller

## Contents

<b>A-</b> 1.	PLC (Programmable Logic Controller) Description A-1
A-2.	FPC 202 Specifications
A-3.	PLC Program Flowchart

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# A-1. PLC (Programmable Logic Controller) Description

The Festo FPC 202 contained in the 800rf is a programmable logic controller (PLC). A PLC processes binary (one - zero, on - off) input signals to produce output (control) signals which directly influence electrical or mechanical processes, operations or sequences.

In the 800rf, the Festo FPC 202 PLC controls the drive motors and all pneumatic components to ensure that all of the steps in the case sealing sequence are set in motion in the correct order and with their timing coordinated with case length.

Components of the 800rf PLC system consist of the following:

Hardware - the electronic modules and components of the controller, with the most important being the controller's central control unit (CCU) which controls all processes. The CCU corresponds to a computer's central processing unit (CPU).

Software - the programs in which controller logic operations and related operation of components within the machine are precisely specified.

Software is stored in the controller memory and can be modified if required.

Sensors - those components which detect the position or condition of driven components, cases etc. and in turn provide a zero-volt or +24-volt signal to the controller. Examples in the 800rf are case-detecting photocells, air cylinder piston-detecting proximity switches and mechanically actuated switches.

Actuators - the electrically actuated machine components whose actuation or deactuation starts or stops a controlled case sealing process. Examples in the 800rf are motor control relays, air valve solenoids, and the alarm relay.

## A-2. FPC 202 Specifications

#### Main Memory

32K RAM or 32K EPROM

#### Inputs/Outputs

16, +24 VDC inputs (electrically isolated via optocouplers) voltage signal for logic 1:

+15 VDC to +35 VDC voltage signal for logic 0: -30 VDC to +7 VDC

8, +24 VDC relay outputs (outputs O0-0 — O0-7) 2 amperes maximum each output (Relays are replaceable)

8, +24 VDC transistor outputs (outputs O1-0 — O1-7) (electrically isolated via optocouplers) output current for a single output: 2.0 amps total current for all 8 outputs: 2.0 amp

#### Special Features

Automatic start-up after power loss
Battery for buffer memory (RAM/EPROM)
Detection of "dead" battery
Battery changing without memory loss
Error display
Fuses in output stages
Diagnostics to verify input and output function

#### Cover Parts

Figure A-1 below shows the four covers which can be removed (by lifting at the arrow locations) to access the:

- 1. Input terminals
- 2. Output and input power terminals
- 3. Fuses and battery
- 4. Memory modules

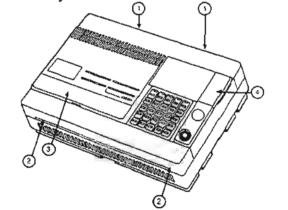


Figure A-1

## 910N

In the event of a short circuit at any one of the transistor outputs, all outputs are automatically switched off. To restore operation, it is necessary to remove and then reinstall the transistor output fuse — without removing power from the controller.

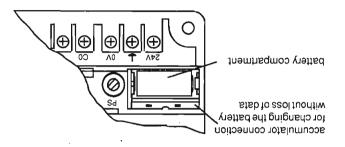
The power supply has a 1.6 ampere fuse at its input.

### Battery Replacement

The controller contains a lithium battery to preserve the program information stored in the RAM when the controller is turned off. Normal battery life is up to five years under normal case sealer operating conditions.

The PLC automatically detects when battery replacement is necessary and displays error message Er51 in the seven-segment display.

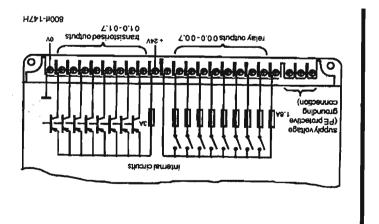
To replace the battery, remove the battery/fuse cover (see figure A-3). Remove the battery from the case and insert the new battery, observing correct battery position as shown in the bottom of the battery compartment and in the figure below.



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## Outputs

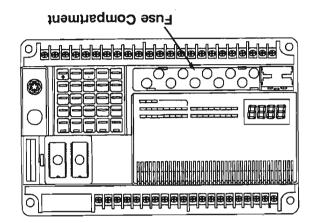
Figure A-2 below shows the bottom, output terminal strip, its output types (transistor/relay) and related fuses.



## Figure A-2

## <u>Fuses</u>

Note that each relay output is separately fused with a 2 ampere fuse and that the transistor outputs share a common 3 ampere fuse. Figure A-3 shows fuse locations.



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## Model 800rf - PLC Addendum

### **User Memory**

The machine program is stored in the dedicated system RAM chip, which is sustained by the battery. As an option, a previously programmed EPROM (Erasable, Programmable, Read-Only Memory) chip has been installed. This option eliminates the possibility of program loss if the battery is drained or the RAM program is accidentally changed or erased.

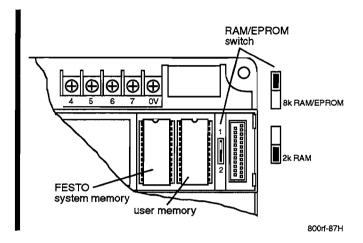


Figure A-5

To install a replacement RAM or EPROM memory module:

1. Turn off all machine power.

# **A** CAUTION

During the following steps, use a grounding wrist strap. Place the elastic strap around one of your wrists and clip the grounding lead to a known earth ground.

- 2. Remove the cover from the memory module compartment.
- 3. Using an IC chip holder, remove the existing RAM/EPROM memory module.
- 4. With the replacement memory module held by the IC chip holder, plug in the module. Note that the U-shaped recess in the edge of the module must align with the top edge of the unit. See figure A-5.

#### Error Messages

The following error messages may appear in the four-character, seven-segment display of the PLC. Note that most messages relate to programming or internal errors.

**A-3** 

Clear error messages by pressing the CLR key.

Er01	Program directory recreated
	•
Er05	EPROM faulty
Er06	Illegal deletion of 'program end'
	command
Er09	Step cannot be deleted - does not exist
Er10	Program directory empty or air not present
	or low
Er11	Program invalid or does not exist
Er12	Invalid program no. change, already exists
Er13	Illegal program # change
Er14	Program end after end OR
Erl7	No more program space
Er18	End of memory
Er20	Illegal change of program type
Er21	HEX EDIT illegal - program does not

exist
Er22 Preset value not defined

Er25 EDIT function illegal for RUN

Er28 Duplicate label or step number

Er29 Jump destination not found Er30 Step number does not exist

Er40 Label or step number does not exist

Er50 Error in command mode

Er51 Battery low

Er52 User memory is an EPROM

Er53 Program displayed is in error

Er99 Hardware error

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"ENTER" Key

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# Keyboard

# shows current system status or controller mode. Each key in the top row contains an LED that

allocated more than one function. Most of the keys on the FPC 202 keyboard are

are activated by simply pressing the key. The basic functions are written above the keys and

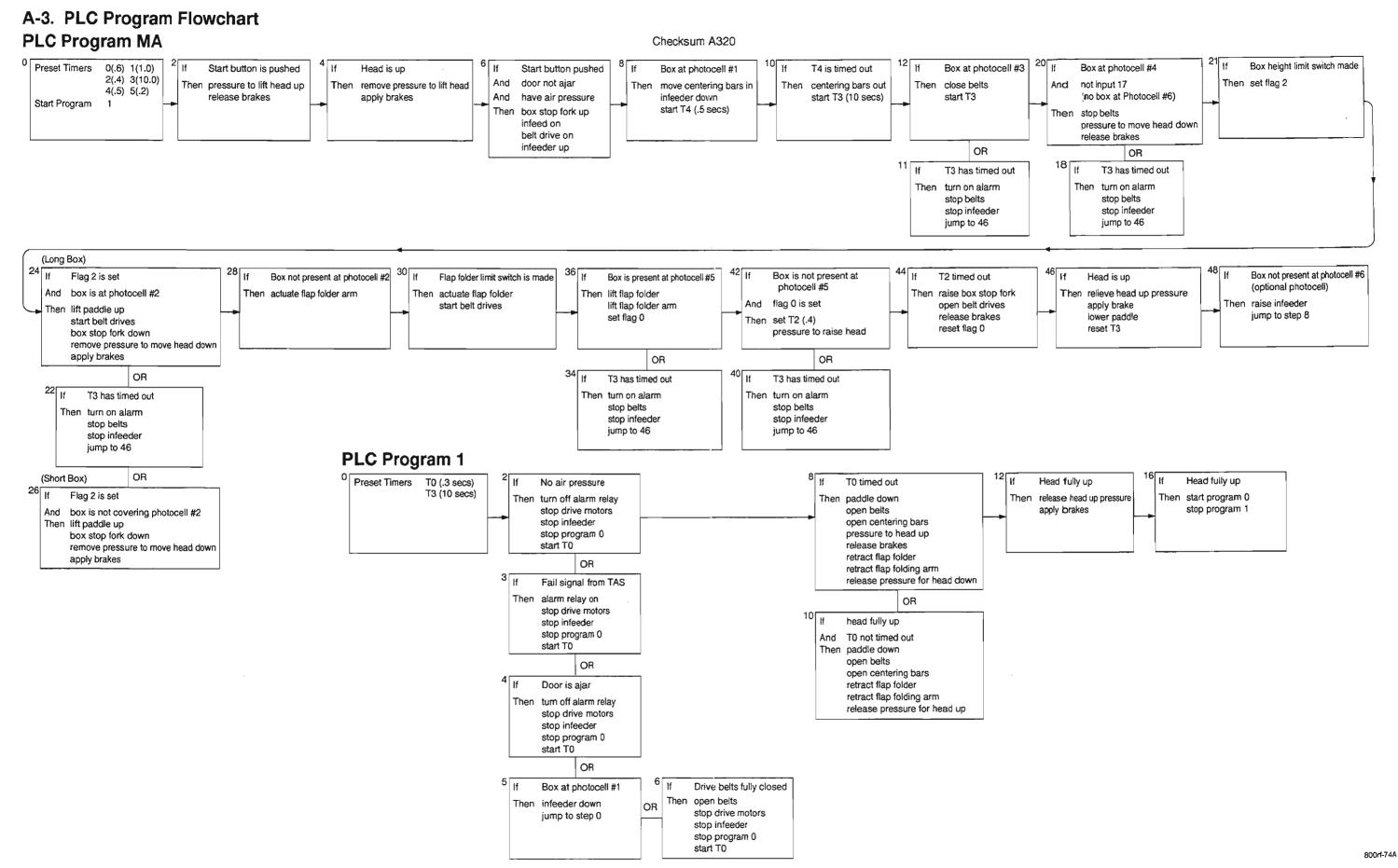
the key and are activated by pressing the SHIFT Secondary functions are written at the bottom of

automatically by the controller. programming-related and are determined Right-hand/left-hand functions (e.g., 6 or RST) are

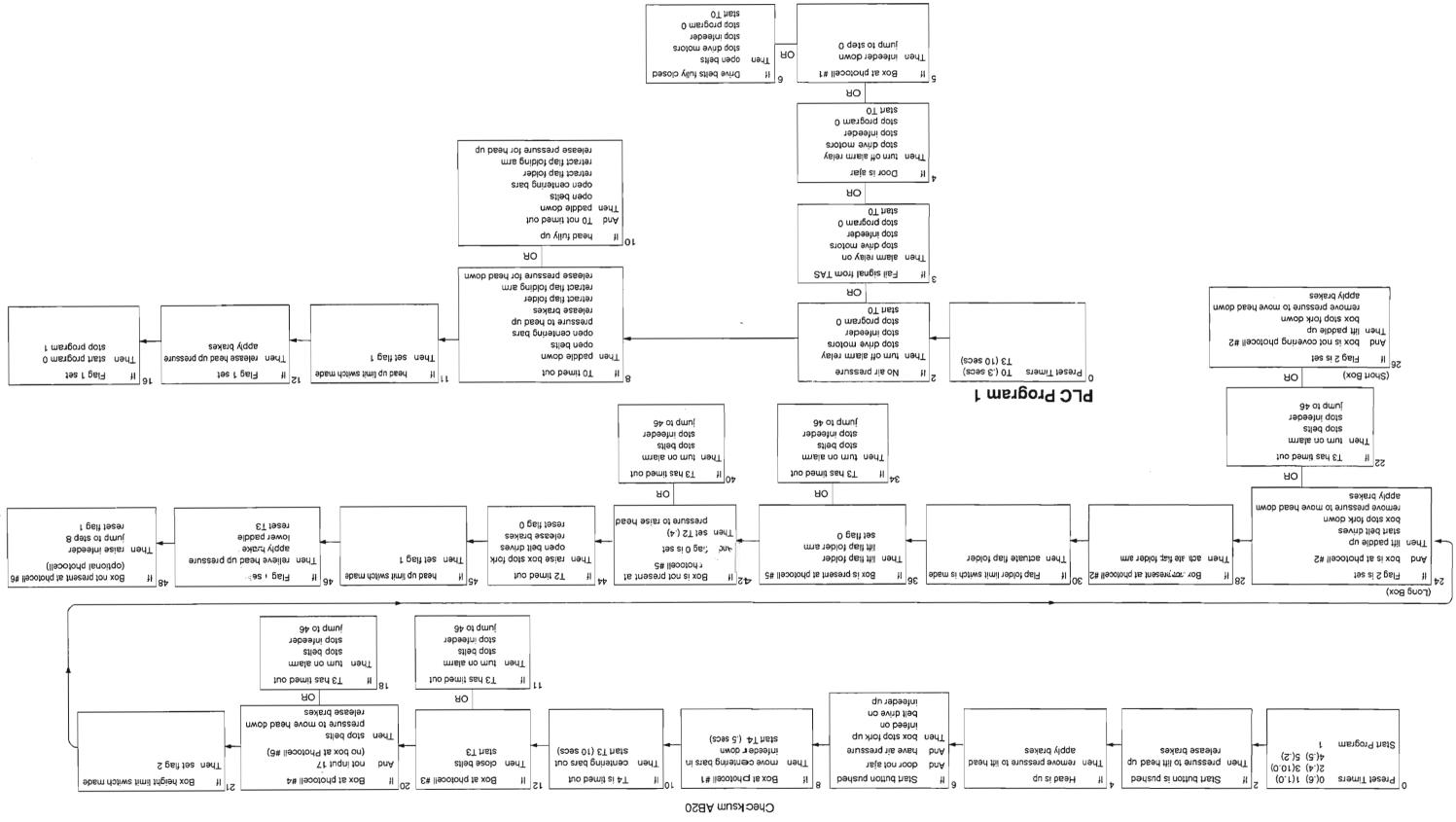
6-A stugiH

reps -

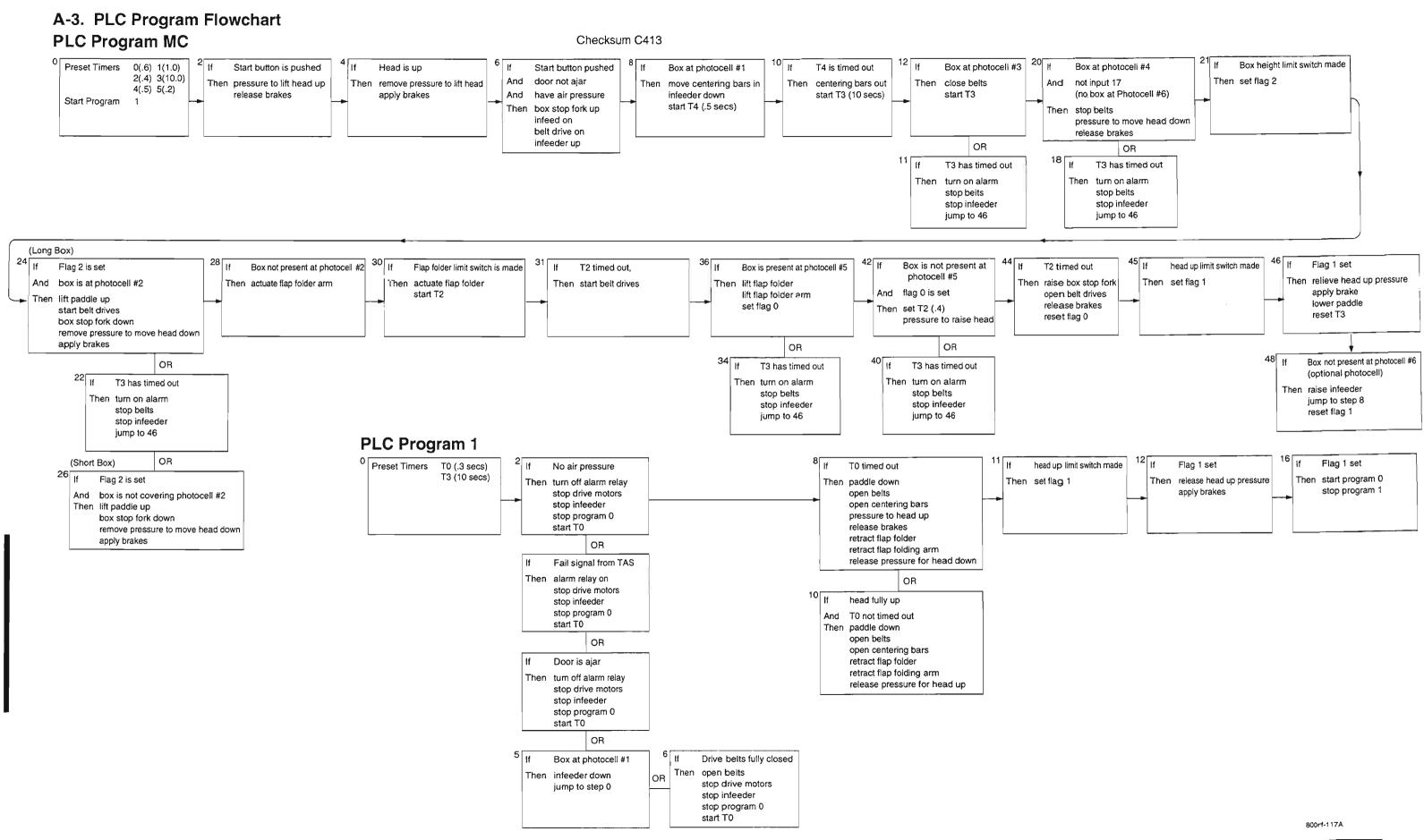
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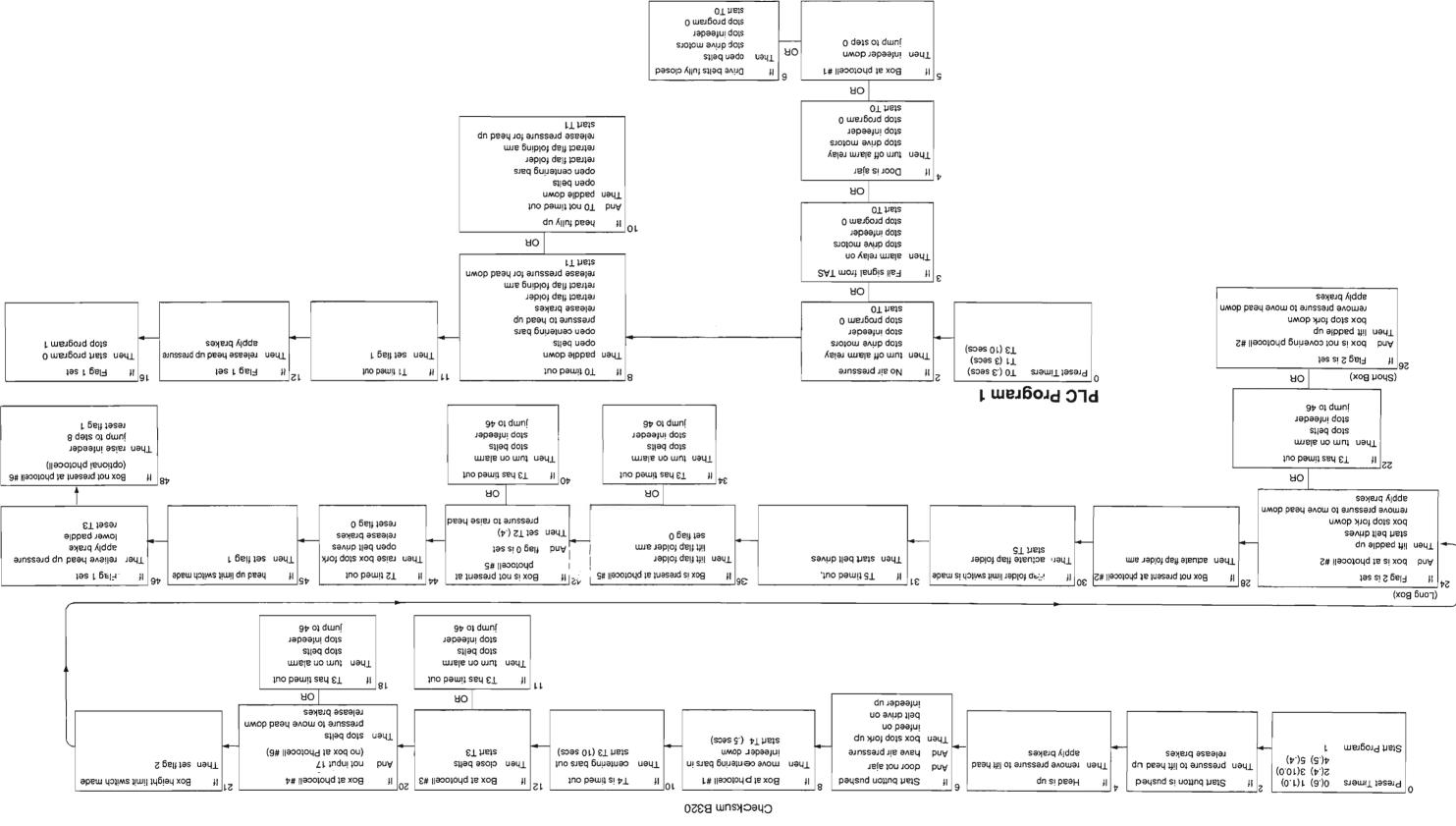
A-3. PLC Program Flowchart PLC Program MB



A311-h008



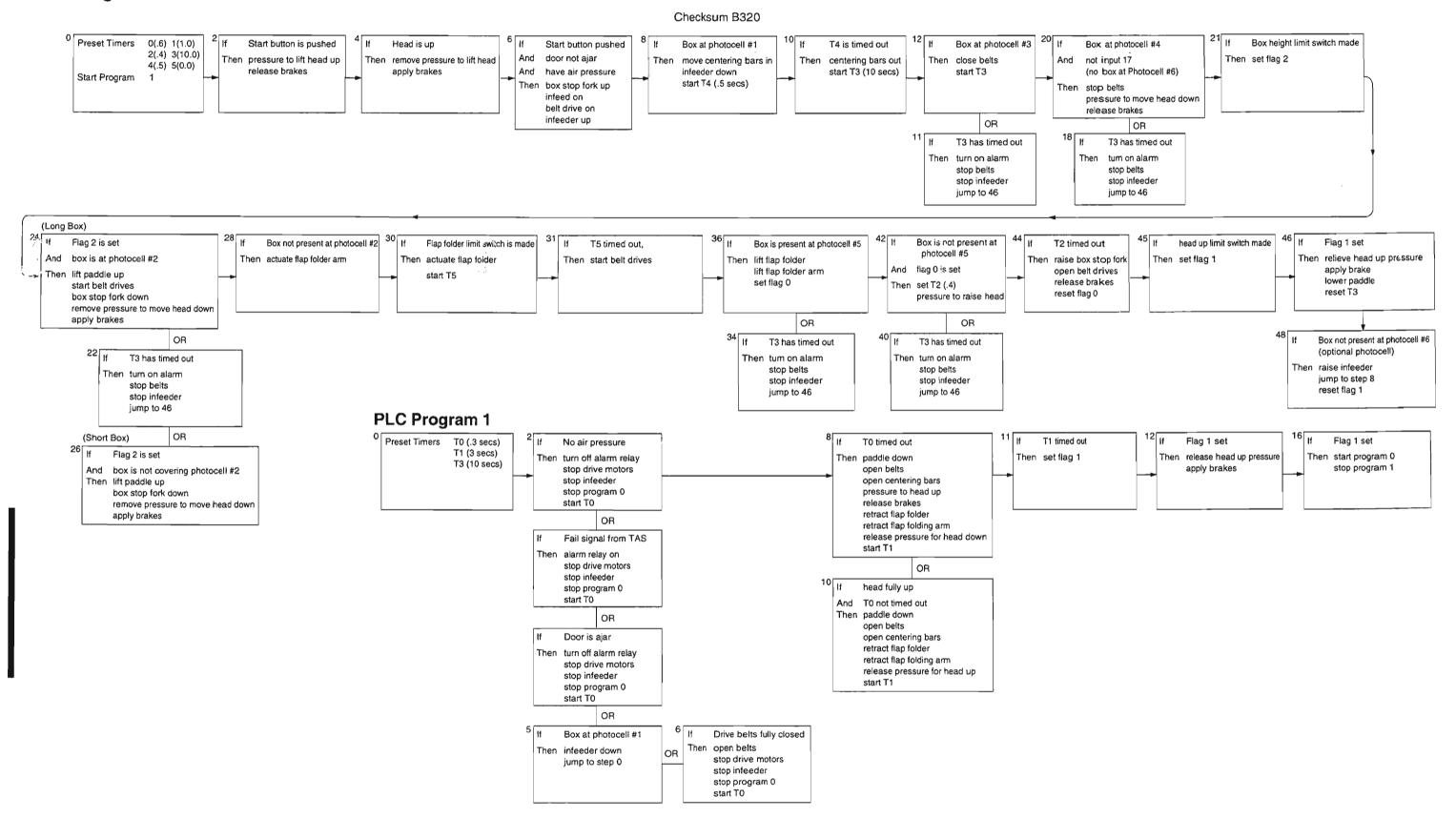
A-3. PLC Program Flowchart PLC Program MD



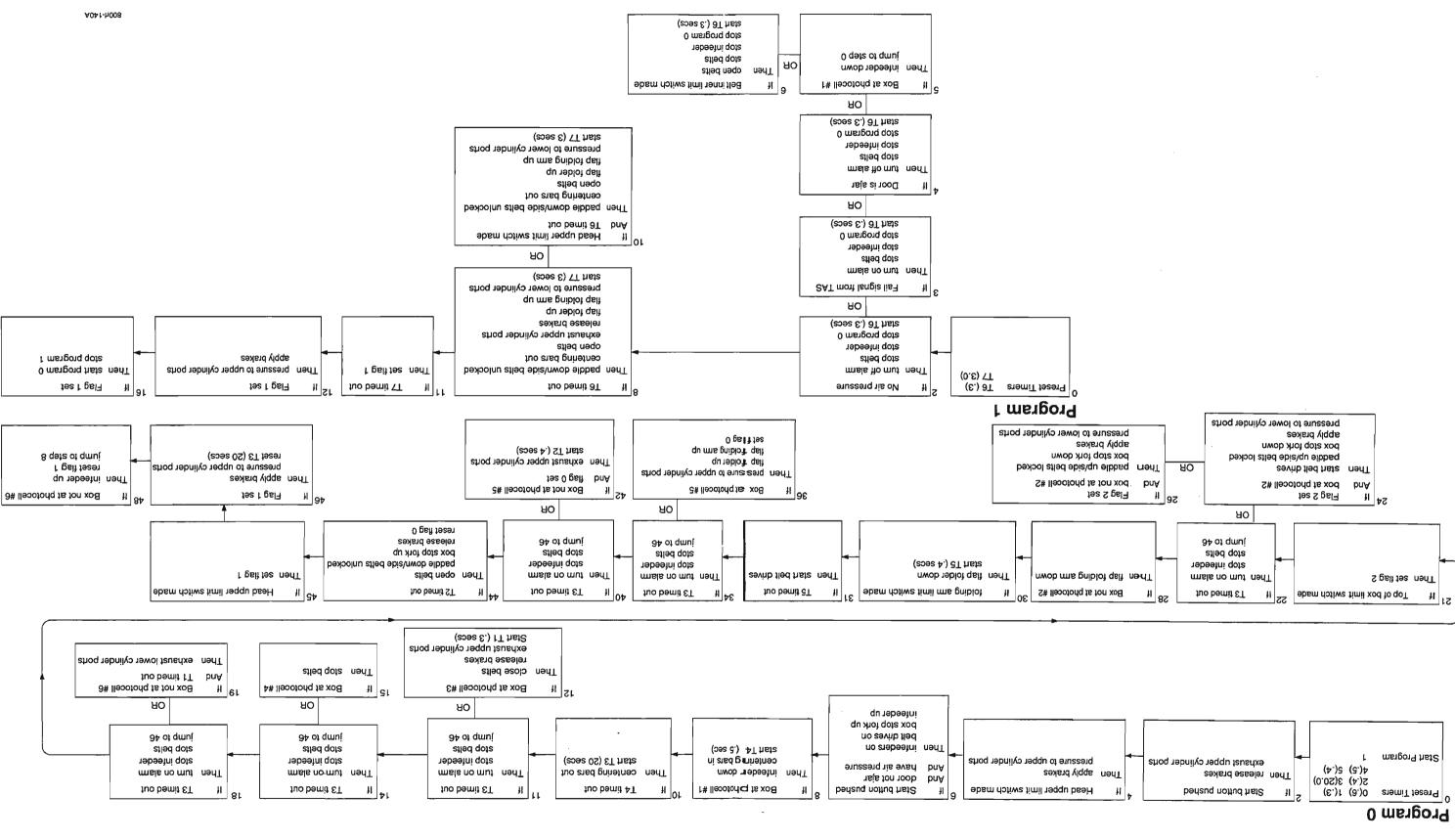
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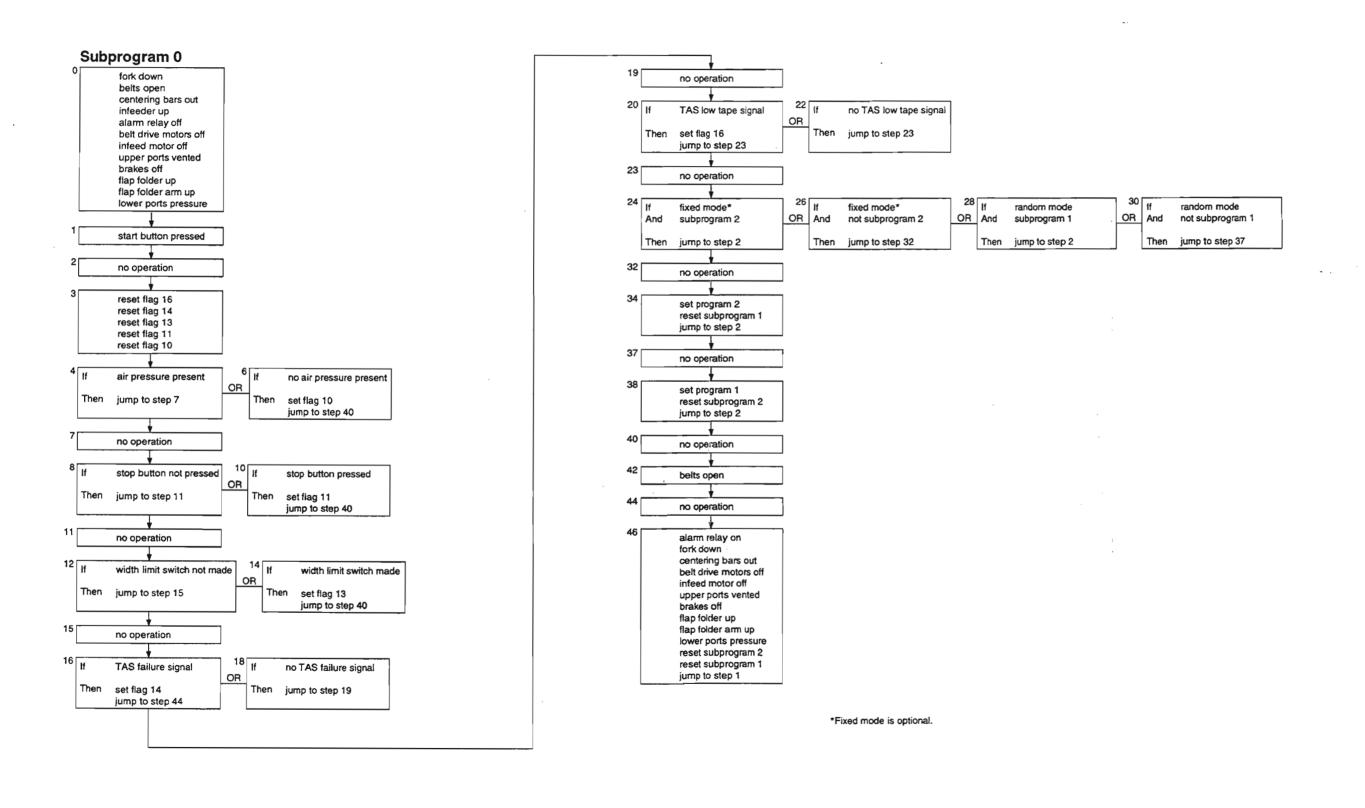
# A-3. PLC Program Flowchart PLC Program ME



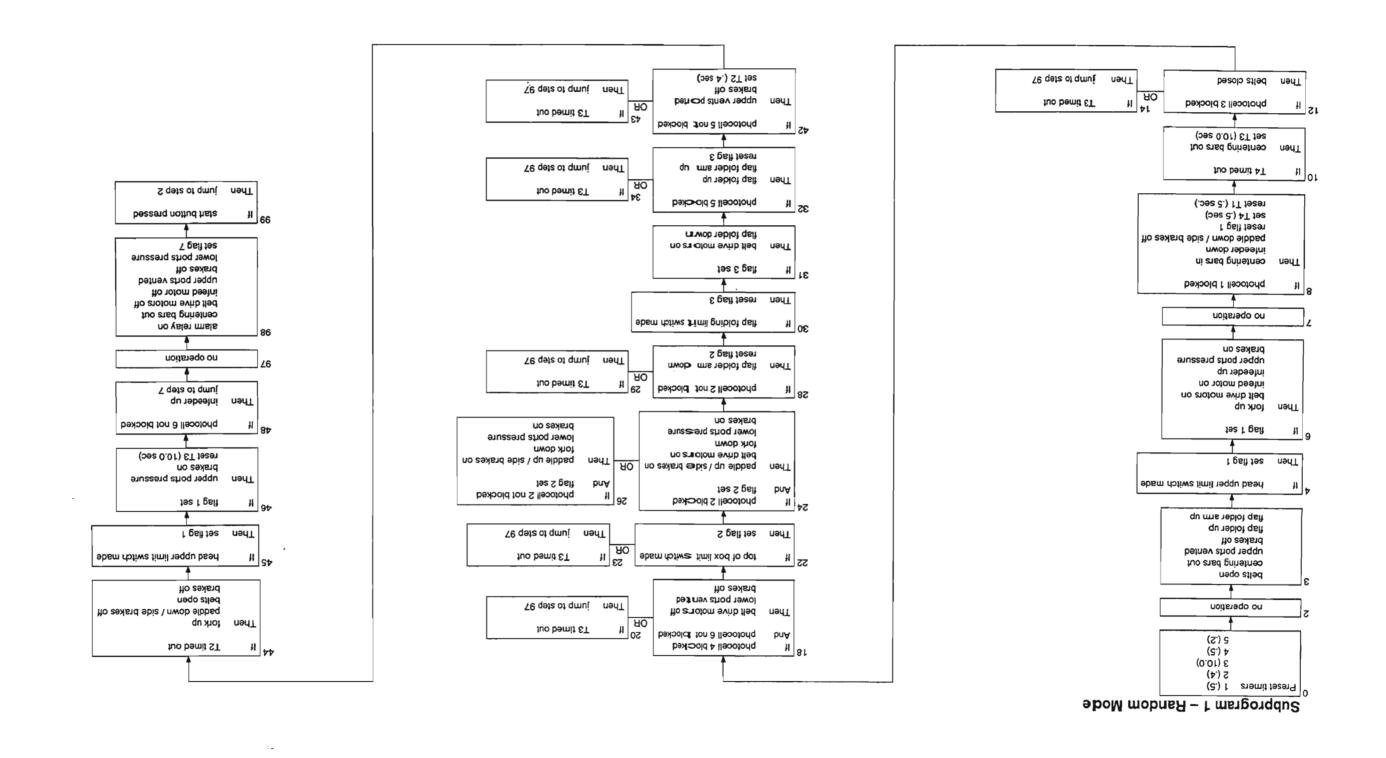
# A-3. PLC Program Flowchart PLC Program MF



# A-3. PLC Program Flowchart PLC Program Version 2.00



A-3. PLC Program Flowchart PLC Program Version 2.00



# Model 800rf Type 29800 (From Serial 1201) with Allen-Bradley SLC $500^{\text{TM}}$ Programmable Logic Controller

#### Contents

B-1.	SLC 500 Controller Description
B-2.	SLC 500 Specifications
B-3.	Programming
B-4.	Troubleshooting B-4
B-5.	Ladder Logic Diagram B-13
B-6.	Cross Reference
B-7.	Replacement Parts B-25
B-8.	Documentation

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#### **B-1. SLC 500 Controller Description**

The Allen-Bradley SLC 500<sup>TM</sup> contained in the 800rf is a programmable logic controller (PLC). A PLC processes binary (one - zero, on - off) input signals to produce output (control) signals which directly influence electrical or mechanical processes, operations or sequences.

In the 800rf, the Allen-Bradley SLC 500 PLC controls the drive motors and all pneumatic components to ensure that all of the steps in the case sealing sequence are set in motion in the correct order and with their timing coordinated with case length.

Hardware - the electronic modules and components of the controller, with the most important being the controller's processor, a power supply, and a fixed number of I/O signals contained in a single package, which controls all processes.

**Software** - the programs in which controller logic operations and related operations of components within the machine are precisely specified. Software is stored in the controller memory and can be modified if required.

Sensors - those components which detect the position or condition of driven components, cases, etc. and in turn provide a zero-volt or +24-volt signal to the controller. Examples in the 800rf are case-detecting photocells, air cylinder piston-detecting proximity switches and mechanically actuated switches.

Actuators - the electrically actuated machine components whose actuation or deactuation starts or stops a controlled case sealing process. Examples in the 800rf are motor control relays, air valve solenoids, and the alarm relay.

#### Year 2000 Compliance (Y2K):

This controller has no clock or calendar function; therefore, it will not be affected by the changing millenium.

#### **B-2.** SLC 500 Specifications

The case sealer uses an Allen-Bradley SLC 500 Fixed I/O PLC (Allen-Bradley part number 1747-L40F). The PLC requires a 24-volt DC input and has 40 I/O points. It has 24 24VDC sinking inputs and 16 AC/DC relay outputs.

Table B-1 provides the specifications for the SLC 500 Controller.

Table B-1. SLC 500 Controller Specifications

Description	Specification			
Memory Type	Capacitor-backed RAM memory. Battery back-up optional.			
Memory Backup	UVPROM			
Program Memory	1K Instruction Capacity			
Capacitor Memory Back-up Time	10 days if below 100° F			
Battery Life	5 years			
Typical Scan Time®	8 milliseconds/1K			
Bit Execution (XIC)	4 microseconds			
Program Scan Hold-up Time after Loss of Power	20 milliseconds to 700 milliseconds (dependent on loading)			
Power Supply Operating Voltage	DC units: 21.6-26.4 VDC (24 VDC ± 10%)			
Power Supply Fuse Protection	DC units: 24 VDC 1.6A			
Power Supply Inrush Rating	30 Amperes maximum			
Maximum Power Requirement	50 VA <sup>®</sup>			
24 VDC User Power Output Current®	200mA			
24 VDC User Power Output Voltage®	20.4 - 27.6 VDC (24 VDC ± 15 %)			
Wire Size	#14 AWG Max.			
I/O Electrical-Optical Isolation	1500 VAC at 1 minute			
1747–AIC Link Coupler Electrical-Optical Isolation	1500 VDC			
LED Indicators	POWER, PC RUN, CPU FAULT, FORCED I/O, and BATTERY LOW			
Noise Immunity	NEMA Standard ICS 2-230			
Ambient Temperature Rating	Operating: 0°C to +60°C (+32°F to +140°F) Storage: -40°C to +85°C (-40°F to +185°F)			
Humidity	5 to 95% without condensation			
	Displacement: .015 inch, peak-to-peak @ 5-57 Hz			
Vibration	Acceleration: 2.5 Gs @ 57-2000 Hz			
	Duration: 1 hr per axis (x, y, z)			
Certification	UL listed/ CSA approved			

The scan times are typical for a 1K ladder logic program consisting of simple ladder logic and communication servicing. Actual scan times depend on your program size, instructions used, and the DH-485 communication.

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 $<sup>^{\</sup>scriptsize \textcircled{2}}$  This specification does not include input and output values.

This applies only to fixed controllers that have AC line power and DC input circuits.

#### Memory

This unit is shipped with a 1K UVPROM installed (Allen-Bradley part number 1747-M3). The PLC loads the program from the UVPROM during every power up cycle.

#### Fuse

Under normal power-up conditions, the POWER LED turns on. If a power supply fuse is blown, the POWER LED will not turn on. One of the following conditions could cause a blown power supply fuse:

- Excessive line voltage
- Internal power supply malfunction



CONTACT WITH AC LINE POTENTIAL CAN CAUSE INJURY TO PERSONNEL. REMOVE SYSTEM POWER BEFORE ATTEMPTING FUSE REPLACEMENT. USE ONLY REPLACEMENT FUSES OF THE TYPE AND RATING RECOMMENDED FOR THE UNIT. IMPROPER FUSE SELECTION CAN RESULT IN EQUIPMENT DAMAGE.

After correcting the conditions causing the malfunction, replace the fuse:

1. Disconnect power to the processor.



WHEN POWER IS APPLIED TO THE CONTROLLER, HAZARDOUS ELECTRICAL POTENTIALS EXIST UNDER THE FRONT COVER.

2. Remove the cover on the processor.

3. Locate the fuse. See Figure B-1. Use a miniature fuse puller to grip the fuse and remove it from its holder.

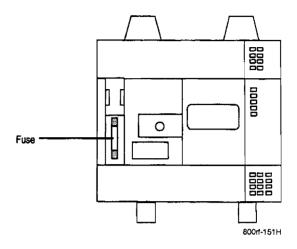


Figure B-1. Fuse Location

- 4. Discard the fuse and replace it with the recommended replacement fuse.
- 5. Replace the cover on the processor.
- 6. Restore power to the processor. The POWER LED should now turn on.

#### **B-3.** Programming

Because the 800rf is normally a standalone machine, additional programming is not normally required.

#### WARNING

IF RE-PROGRAMMING IS NEEDED, GREAT CARE MUST BE EXERCISED TO PREVENT THE CREATION OF A DANGEROUS CONDITION. THE STANDARD PROGRAM IS COMPLEX AND CONTAINS MANY INTERRELATED SEQUENCES. 3M DOES NOT SUPPORT UNAUTHORIZED ON-SITE PROGRAM CHANGES.

If all safety aspects have been considered, a competent programmer can accomplish programming in one of two ways: first, by using a computer interface (such as Allen-Bradley number 1747 PIC) and Allen-Bradley's RS-Logix software (or other compatible software); and second, by using a hand held programming terminal such as Allen-Bradley number 1747-PT1).

The ladder logic diagram is included later in this addendum.

#### **B-4.** Troubleshooting

To receive the maximum benefit of this troubleshooting section, we recommend you follow these steps:

- 1. Match your processor LEDs with the status LEDs located in the first column in the tables on the following pages.
- Once the status LEDs are matched to the appropriate table, simply move across the table identifying error description and probable causes.
- 3. Follow the recommended action steps for each probable cause until the cause is identified.

## **Identifying Fixed Controller Errors**

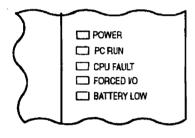
Refer to the following key to determine the status of the LED indicators:

Indicates the LED is OFF.

Indicates the LED is ON.

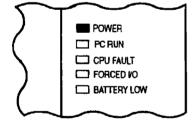
Indicates the LED is FLASHING.

#### If the LEDs indicate:



The Following Error Exists	Probable Cause	Recommended Action	
	No Line Power	Verify proper line voltage and connections on the power terminals.	
Inadequate System Power	Power Supply Fuse Blown	Check the incoming power fuse, check for proper incoming power connections. Replace fuse.     If fuse blows again, replace the fixed controller.	
System I one	Power Supply Overloaded	This problem can occur intermittently if power supply is lightly overloaded when output loading and temperature varies. If you are using a 2-slot chassis, verify the compatibility of the modules to prevent overloading the backplane power.	

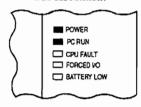
#### If the LEDs indicate:



The Following Error Exists	Probable Cause	Recommended Action		
Processor Not in Run Mode	Either Improper Mode Selected or User Program Logic Error	1. Verify selected processor mode. 2. If in program/test modes, attempt RUN mode entry. 3. Check user program logic for suspend instructions if in suspend mode.  Refer to either the Hand-Held Terminal User Manual, Catalog Number 1747-NP002, or the Advanced Programming Software User Manual, Catalog Number 1747-NM002.		
	Line Power Out of Operating Range	Check incoming power connections.     Monitor for proper line voltage at the incoming power connections.		

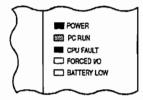
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#### If the LEDs indicate:



The Following Error Exists	Probable Cause	Recommended Action	
		Monitor logic in Run mode and verify desired I/O status.	
System Inoperable, No Major CPU	rable, No CPU	Refer to either the Hand-Held Terminal User Manual, Catalog Number 1747-NP002, or the Advanced Programming Software User Manual, Catalog Number 1747-NM002.	
Faults Detected	Detective I/O Devices or I/O Wiring	Test inputs and outputs according to I/O troubleshooting procedures starting on page B-9.	

#### If the LEDs indicate:



The Following Error Exists	Probable Cause	Recommended Action	
	CPU Memory Error	Cycle power.	
		Remove power and then remove the memory module from the controller.	
	Faulty Memory Module  Processor Firmware Installed Incornectly	2. Re-energize the controller.	
CPU Fault		If steady CPU FAULT LED changes to flashing, replace the existing memory module with a replacement module.	
		If upgrading the processor to a different firmware level, verify that the firmware chip orientation matches the upgrade kit directions.	

Refer to the following key to determine the status of the LED indicators:

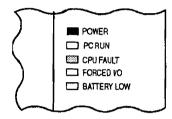
Indicates the LED is OFF.

Indicates the LED is ON.

Indicates the LED is FLASHING.

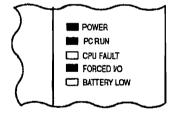
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#### If the LEDs indicate:



The Following Error Exists	Probable Cause	Recommended Action		
	Initial CPU Factory Power-up Condition	Perform the start-up procedures.     Clear processor memory to get rid of the flashing CPU FAULT LED.		
CPU Major Fault	Hardware/Software Major Fault Detected  Erratic repetitive power cycling can cause a processor major hardware fault.	1. Monitor Status File Word S:6 for major error code. 2. Refer to either the Hand-Held Terminal User Manual, Catalog Number 1747-NP002, or the Advanced Programming Software User Manual, Catalog Number 1747-NM002, for error codes and additional troubleshooting information. 3. Remove hardware/software condition causing fault. 4. Clear Status File S:1/13 major error bit, if set. 5. Clear Status File S:5 minor error bits, if set. 6. Clear Status File S:6 major error code (optional). 7. Attempt a processor Run mode entry. If unsuccessful, repeat recommended action steps above.		

#### If the LEDs indicate:



The Following Error Exists	Probable Cause	Recommended Action	
		Monitor program file online and identify forced I/O.	
System does	User Forced I/O Disabling Operation	Disable appropriate forces and test system conditions again.	
not operate per ladder logic.		Refer to either the Hand-Held Terminal User Manual, Catalog Number 1747–NP002, or the Advanced Programming Software User Manual, Catalog Number 1747–NM002.	

Refer to the following key to determine the status of the LED indicators:

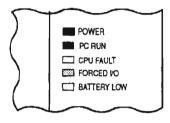
Indicates the LED is OFF.

Indicates the LED is ON.

Indicates the LED is FLASHING.

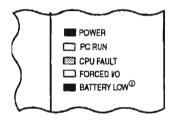
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#### If the LEDs Indicate:



The Following Error Exists	Probable Cause	Recommended Action
	Forces are Not	Monitor program file online and identify programmed forces.
System does not operate per programmed		Enable appropriate forces and test system conditions again. Once forces are enabled, the FORCED I/O LED goes on steady.
forces.	Enabled	Refer to either the Hand-Held Terminal User Manual, Catalog Number 1747-NP002, or the Advanced Programming Software User Manual, Catalog Number 1747-NM002.

#### If the LEDs indicate:



The Following Error Exists	Probable Cause	Recommended Action	
		Verify battery is connected.	
	Loss of RAM during Power	2. Replace the battery.	
CPU Major Error with Low		Refer to processor major fault recommended action steps.	
or No Battery Back-up	Down Period	Refer to either the Hand-Held Terminal User Manual, Catalog Number 1747–NP002, or the Advanced Programming Software User Manual, Catalog Number 1747–NM002.	

Refer to the following key to determine the status of the LED indicators:

Indicates the LED is OFF.

Indicates the LED is ON.

Indicates the LED is FLASHING.

Regardless of any other LED status indicator conditions, always replace the battery when the BATTERY LOW LED is on if you want RAM battery backup. If you want to back up RAM with a capacitor, add or replace the BATTERY LOW LED jumper.

800rl-156H

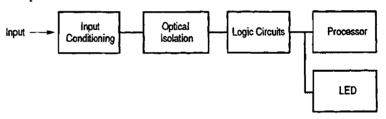
# Troubleshooting Your Input Modules

The following will assist you in troubleshooting your input modules.

#### **Input Circuit Operation**

An input circuit responds to an input signal in the following manner:

- An input filter removes false signals due to contact bounce or electrical interference.
- 2. Optical isolation protects the backplane circuits by isolating logic circuits from input signals.
- 3. Logic circuits process the signal.
- 4. An input LED turns on or off indicating the status of the corresponding input device.



5. The processor receives the input status for use in processing the program logic.

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## **Corrective Action**

If your Input Circuit LED is	And Your Input Device is	And	Probable Cause	Recommended Action
		Your input device will not turn off.	Device is shorted or damaged.	Verify device operation. Replace device.
	On/Closed/Activated	Your program operates as	Input is forced off in program.	Check the FORCED I/O or FORCE LED on processor and remove forces.
		though it is off.	Input circuit is damaged.	Try other input circuit. Replace module.
On	Off/Open/Deactivated	Your program operates as	Input device Off-state leakage current exceeds input circuit specification.	Check device and input circuit specifications. Use load resistor to bleed-off current.
		though it is on and/or the input circuit will not turn off.	Input device is shorted or damaged.	Verify device operation. Replace device.
			Input circuit is miswired or damaged.	Verify proper wiring. Try other input circuit. Replace module.
	On/Closed/Activated	Your program operates as though it is off and/or the input circuit will not turn on.	Input circuit is incompatible.	Check specification and sink/source compatibility (if DC input).
			Low voltage across the input.	Check the voltage across input circuit and check source voltage.
			incorrect wiring or an open circuit.	Check wiring and COMmon connections.
O#			Input signal turn on time too fast for input circuit.	Check timing specifications.
Off			Input circuit is damaged.	Verify proper wiring. Try other input circuit. Replace module.
		Your input device will not turn on.	Input device is opened or damaged.	Verify operation. Replace device.
	Off/Open/Deactivated	Your program operates as	Input is forced on in program.	Check processor FORCED I/O or FORCE LED and remove forces. Verify proper wiring. Try other input circuit.
		though it is on.	Input circuit is damaged.	Verify proper wiring. Try other input circuit. Replace module.

800rl-158H

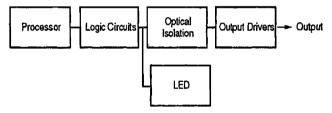
# Troubleshooting Your Output Modules

The following will assist you in troubleshooting your output modules.

#### **Output Circuit Operation**

An output circuit controls the output signal in the following manner:

- 1. The processor determines the output status.
- 2. Logic circuits maintain the output status.
- 3. An output LED indicates the status of the output signal.
- 4. Optical isolation separates logic and backplane circuits from field signals.
- 5. The output driver turns the corresponding output on or off.



800rf-159H

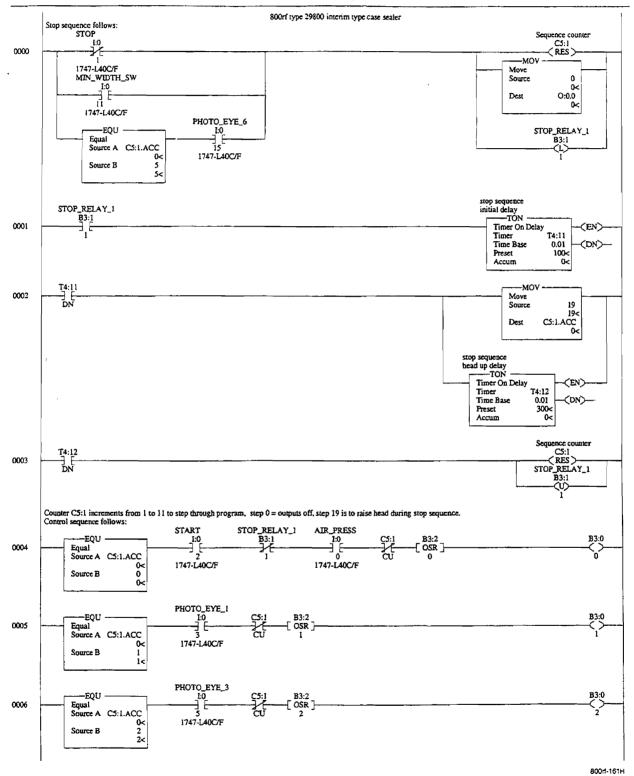
## **Corrective Action**

If your Output Circuit LED is	And Your Output Device is	And	Probable Cause	Recommended Action
	On/Energized	Your program indicates that the output circuit is off or	Programming problem.	Check for duplicate outputs and addresses using the search function.  If using subroutines, outputs are left in their last state when not executing subroutines.  Use the force function to force output off. If this does not force the output off, output circuit is damaged. If the output does force off, then check again for logic/programming problem.
	<b>-</b>	the output circuit will not turn off.	Output is forced on in program.	Check processor FORCED I/O or FORCE LED and remove forces.
On			Output circuit is damaged.	Use the force function to force the output off. If this forces the output off, then there is a logic/programming problem. If this does not force the output off, the output circuit is damaged. Try other output circuit. Replace module.
		Your output device	Low or no voltage across the load.	Measure the source voltage and check specifications.
	040	will not turn on and	Incorrect wiring or open circuit.	Check wiring and COMmon connections.
	Off/De-energized	the program indicates that it is on.	Output device is incompatible.	Check specifications and sink/source compatibility (if DC output).
			Output circuit is damaged.	Check wiring. Try other output circuit. Replace module.
			Output device is incompatible.	Check specifications.
	On/Energized	Your output device will not turn off and the program indicates that it is off.	Output circuit Off-state leakage current may exceed output device specification.	Check specifications. Use load resistor to bleed off leakage current. See output specifications.
			Incorrect wiring.	Check wiring. Disconnect from SLC and verify device operation.
			Output device is shorted or damaged.	Verify device operation. Replace device.
			Output circuit is damaged.	Check wiring. Try other output circuit. Replace module.
Off	Off/De–energized	Your program indicates that the output circuit is on or the output circuit will not turn on.		Check for duplicate outputs and addresses using search function.
Off			Programming problem.	If using subroutines, outputs are left in their last state when not executing subroutines.
				Use the force function to force output on. If this does not force the output on, output circuit is damaged. If the output does force on, then check again for logic/programming problem.
			Output is forced off in program.	Check processor FORCED I/O or FORCE LED and remove forces.
			Output circuit is damaged.	Use the force function to force the output on. If this forces the output on, then there is a logic/programming problem. If this does not force the output on, the output circuit is damaged. Try other output circuit. Replace module.

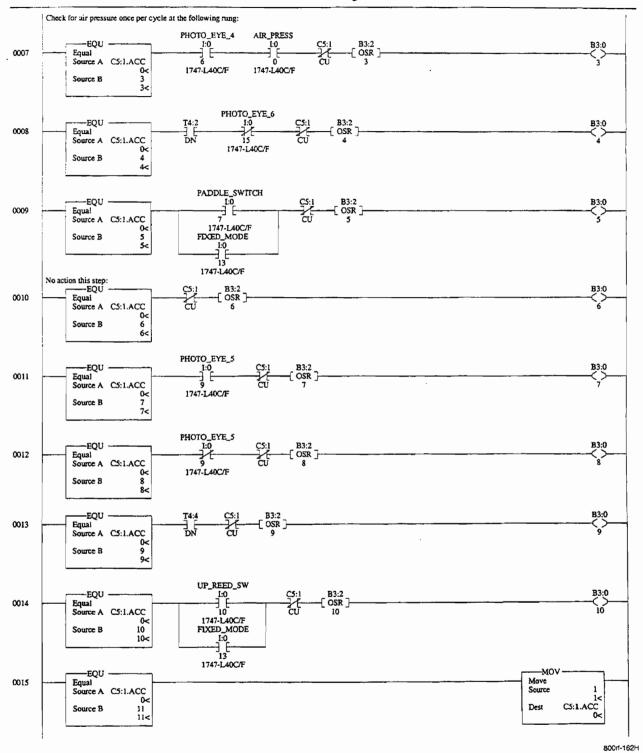
800rf-160H

## B-5. Ladder Logic Diagram

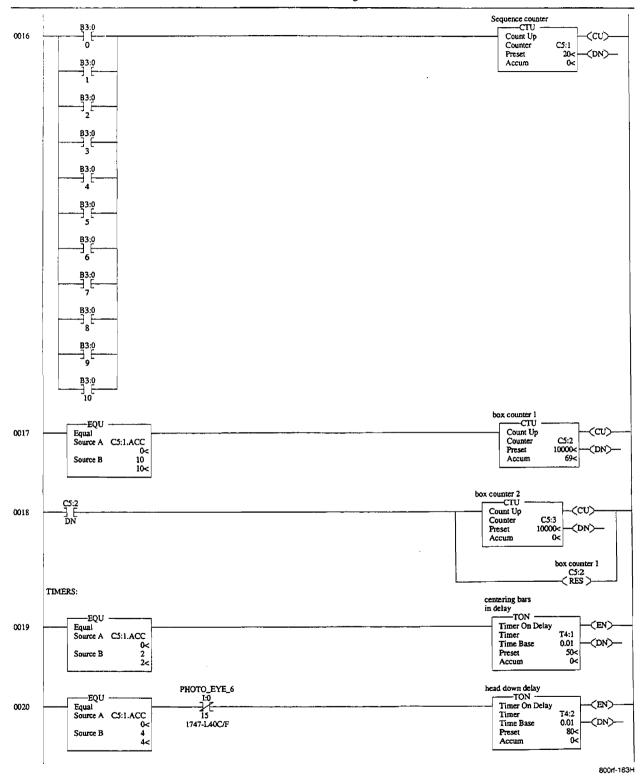
LAD 2 - - -- Total Rungs in File = 53



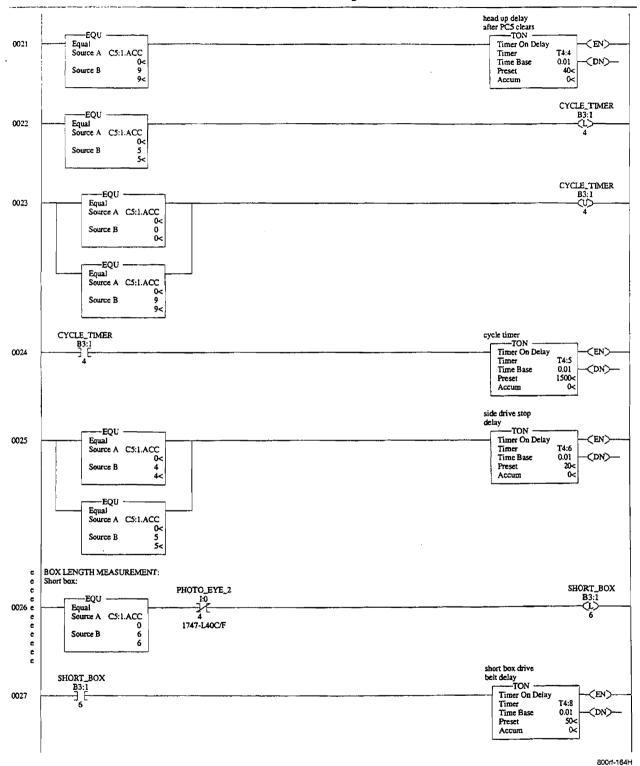
LAD 2 - - -- Total Rungs in File = 53



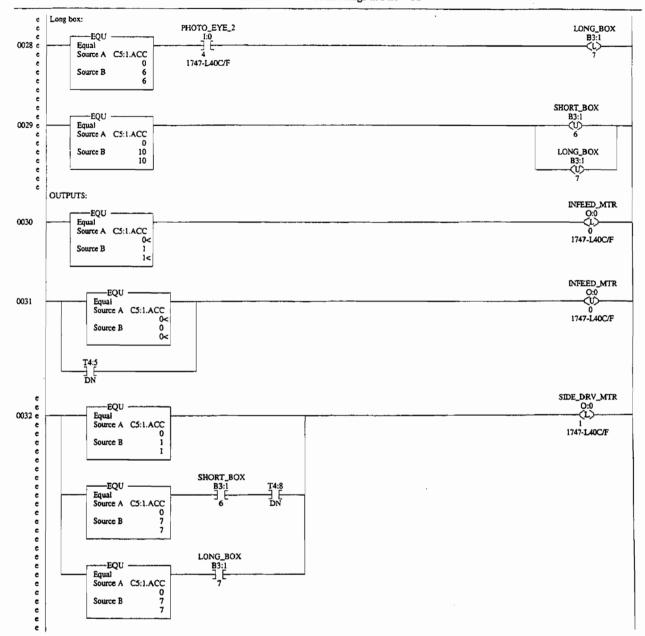
LAD 2 - - --- Total Rungs in File = 53



LAD 2 - - -- Total Rungs in File = 53

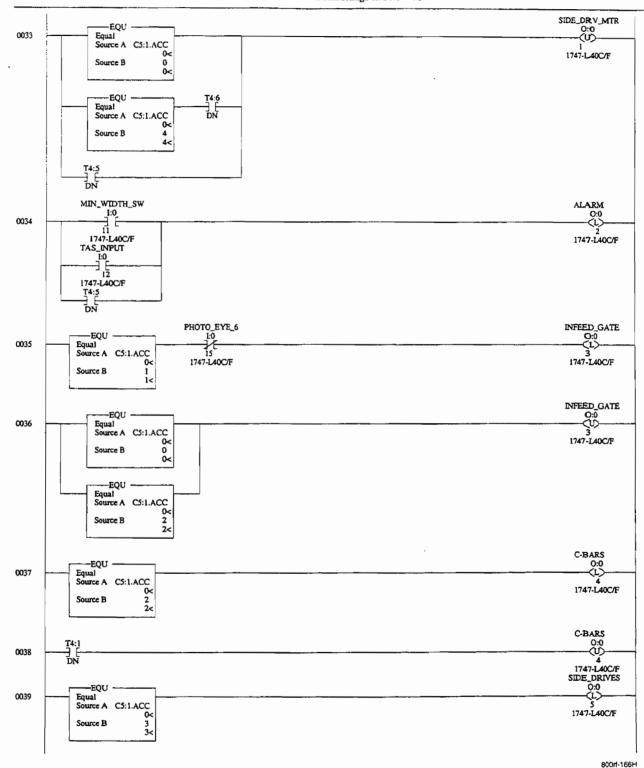


LAD 2 - - -- Total Rungs in File = 53

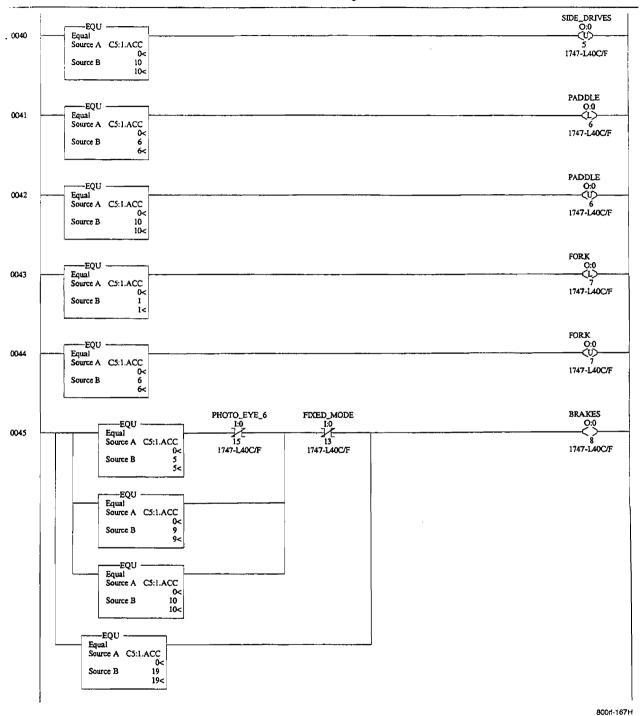


800rl-165H

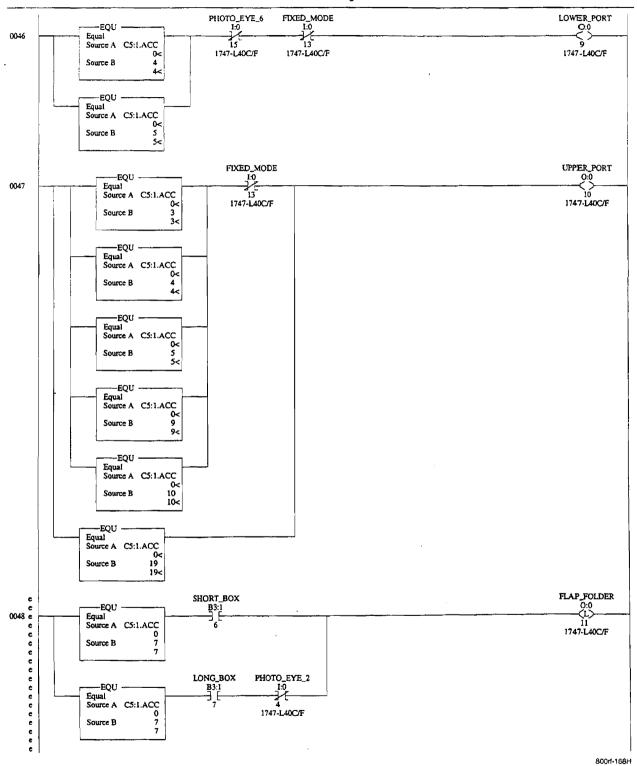
LAD 2 - - -- Total Rungs in File = 53



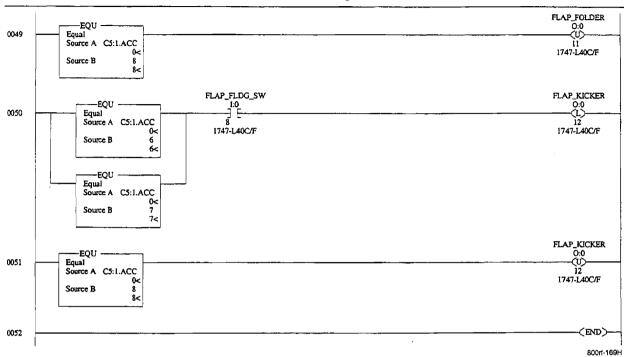
LAD 2 - - -- Total Rungs in File = 53



LAD 2 - - -- Total Rungs in File = 53



LAD 2 - - -- Total Rungs in File = 53



# **B-6.** Cross Reference

## 800rf Type 29800 Cross Reference

#### RSLogix 500 Cross Reference Report - Sorted by Address

0:0.0	- MOV - File #2 - 0
0:0/0	- {INFEED_MTR}
	OTL - File #2 - 30
	OTU - File #2 - 31
0:0/1	- {SIDE_DRV_MTR}
	OTL - File #2 - 32
	OTU - File #2 - 33
0:0/2	- {ALARM}
0.072	OTL - File #2 - 34
0:0/3	- {INFEED_GATE}
0.0/3	OTL - File #2 - 35
	OTU - File #2 - 36
0:0/4	- {C-BARS}
0:0/4	
	OTL - File #2 - 37
0.075	OTU - File #2 - 38
0:0/5	- {SIDE_DRIVES}
	OTL - File #2 - 39
5.045	OTU - File #2 - 40
0:0/6	- {PADDLE}
	OTL - File #2 - 41
	OTU - File #2 - 42
0:0/7	- {FORK}
	OTL - File #2 - 43
	OTU - File #2 - 44
0:0/8	- {BRAKES}
	OTE - File #2 - 45
0:0/9	- {LOWER_PORT}
	OTE - File #2 - 46
0:0/10	- {UPPER_PORT}
	OTE - File #2 - 47
0:0/11	- {FLAP_FOLDER}
	OTL - File #2 - 48
	OTU - File #2 - 49
0:0/12	- {FLAP_KICKER}
	OTL - File #2 - 50
	OTU - File #2 - 51
I:0/0	- {AIR_PRESS}
	XIC - File #2 - 4, 7
I:0/1	- {STOP}
	XIO - File #2 - 0
I:0/2	- {START}
	XIC - File #2 - 4
I:0/3	- {PHOTO_EYE_1}
	XIC - File #2 - 5
I:0/4	- {PHOTO_EYE_2}
	XIC - File #2 - 28
	XIO - File #2 - 26, 48
I:0/5	- {PHOTO_EYE_3}
	XIC - File #2 - 6
I:0/6	- {PHOTO_EYE_4}
<del>-</del>	XIC - File #2 - 7
I:0/7	- {PADDLE_SWITCH}
/	XIC - File #2 - 9
	and the second of the second o

#### 800rf Type 29800 Cross Reference

RSLogix 500 Cross Reference Report - Sorted by Address

```
- {FLAP_FLDG_SW}
I:0/8
               XIC - File #2 - 50
I:0/9
              - {PHOTO_EYE_5}
               XIC - File #2 - 11
               XIO - File #2 - 12
I:0/10
               {UP_REED_SW}
               XIC - File #2 - 14
I:0/11
             - {MIN_WIDTH_SW}
               XIC - File #2 - 0, 34
I:0/12
             - {TAS_INPUT}
               XIC - File #2 - 34
I:0/13
              - {FIXED_MODE}
               XIC - File #2 - 9, 14
               XIC - File #2 - 45, 46, 47
I:0/15
             - {PHOTO_EYE_6}
               XIC - File #2 - 0
               XIO - File #2 - 8, 20, 35, 45, 46
B3:0/0
             - OTE - File #2 - 4
               XIC - File #2 - 16
B3:0/1
             - OTE - File #2 - 5
               XIC - File #2 - 16
B3:0/2
             - OTE - File #2 - 6
               XIC - File #2 - 16
             - OTE - File #2 - 7
B3:0/3
               XIC - File #2 - 16
B3:0/4
             - OTE - File #2 - 8
               XIC - File #2 - 16
B3:0/5
             - OTE - File #2 - 9
               XIC - File #2 - 16
B3:0/6
             - OTE - File #2 - 10
               XIC - File #2 - 16
B3:0/7
             - OTE - File #2 - 11
               XIC - File #2 - 16
B3:0/8
             - OTE - File #2 - 12
               XIC - File #2 - 16
B3:0/9
             - OTE - File #2 - 13
               XIC - File #2 - 16
B3:0/10
             - OTE - File #2 - 14
               XIC - File #2 - 16
B3:1/1
             - {STOP_RELAY_1}
               OTL - File #2 - 0
               OTU - File #2 - 3
               XIC - File #2 - 1
               XIO - File #2 - 4
B3:1/4
             - {CYCLE TIMER}
               OTL - File #2 - 22
               OTU - File #2 - 23
               XIC - File #2 - 24
B3:1/6
             - {SHORT_BOX}
               OTL - File #2 - 26
               OTU - File #2 - 29
               XIC - File #2 - 27,
                                    32, 48
B3:1/7
              {LONG_BOX}
               OTL - File #2 - 28
               OTU - File #2 - 29
               XIC - File #2 - 32, 48
```

#### 800rf Type 29800 Cross Reference

#### RSLogix 500 Cross Reference Report - Sorted by Address

```
B3:2/0
              - OSR - File #2 - 4
B3:2/1
              - OSR - File #2 - 5
B3:2/2
              - OSR - File #2 - 6
B3:2/3
              - OSR - File #2 - 7
B3:2/4
              - OSR - File #2 - 8
B3:2/5
              - OSR - File #2 - 9
B3:2/6
              - OSR - File #2 - 10
              - OSR - File #2 - 11
B3:2/7
B3:2/8
             - OSR - File #2 - 12
B3:2/9
              - OSR - File #2 - 13
B3:2/10
              - OSR - File #2 - 14
T4:1
              - centering bars in delay
                TON - File #2 - 19
T4:1/DN
              - XIC - File #2 - 38
T4:2
              - head down delay
                TON - File #2 - 20
T4:2/DN
              - XIC - File #2 - 8
T4:4
              - head up delay after PC5 clears
                TON - File #2 - 21
T4:4/DN
              - XIC - File #2 - 13
T4:5
              - cycle timer
                TON - File #2 - 24
T4:5/DN
              - XIC - File #2 - 31, 33, 34
T4:6
              - side drive stop delay
                TON - File #2 - 25
             - XIC - File #2 - 33
T4:6/DN
T4:8
             - TON - File #2 - 27
T4:8/DN
             - XIC - File #2 - 32
T4:11
              - stop sequence initial delay
                TON - File #2 - 1
T4:11/DN
              - XIC - File #2 - 2
T4:12
              - stop sequence head up delay
                TON - File #2 - 2
T4:12/DN
             - XIC - File #2 - 3
C5:1
              - Sequence counter
                CTU - File #2 - 16
                RES - File #2 - 0, 3
C5:1/CU
             - XIO - File #2 - 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
C5:1.ACC
             - MOV - File #2 - 2, 15
                EQU - File #2 - 0, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17
                        19, 20, 21, 22, 23, 25, 26, 28, 29, 30, 31, 32, 33, 35
                        36, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50
                        51
C5:2
              - box counter 1
                CTU - File #2 - 17
               RES - File #2 - 18
C5:2/DN
             - XIC - File #2 - 18
C5:3
             - box counter 2
               CTU - File #2 - 18
```

# **B-7.** Replacement Parts

This section provides a list of replacement parts and a list of replacement terminal blocks for your SLC 500 controller.

# **Replacement Parts**

This table provides a list of replacement parts and their catalog numbers.

Description	Catalog Number
Pre-wired Interface Cable Available in 1.0m, 2.5m, and 5.0m lengths.	1492-CABLE <sup>©</sup> H
Replacement Fuses — Five fuses per package. Orders must be for live fuses or multiples of five.	
Replacement fuse for Fixed I/O AC units, MDL 1.25 Ampere	1746-F4
Replacement fuse for Fixed I/O DC units, MDL 1.6 Ampere	1746F5
Modular Card Slot Fillers — Two fillers per package. Orders must be for two fillers or multiples of two.	1746-N2
Connector — Mating Connector for 32 Point user-made cable	1746-N3
Cit consisting of four replacement terminal covers and labels for 4, 8, 16 I/O modules	1746-R9
Replacement Cover for Specialty I/O fwo covers per package. Orders must be for two covers or multiples of two.	1746-R13
Replacement Retainer Clips for Modules Four clips per package. Orders must be for four clips or multiples of four.	1746-R15
Lithium Battery Assembly  This is an optional part used for the SLC 500 Fixed and Modular Hardware Style processors and the Hand-Held Terminal.  Refer to product documentation for proper storage and handling instructions. For disposal information, consult your nearest Allen-Bradley Sales Office.	1747-BA
Processor to Peripheral Programming/Communication Cable	1747-C10
Processor to Isolated Link Coupler Cable	1747-C11
Specialty Module to Isolated Link Coupler Cable	1747-C13
EPROM with 1K User Instructions	1747-M1
JVPROM with 1K User Instructions	1747-M3
Adapter Sockets — Orders must be for five sockets or multiples of five.	1747-M5
Replacement Parts Kit for 20 I/O Fixed Hardware Style Processor Two Output Terminal Covers Two Input Terminal Covers Two Prom/Battery Covers One HHT/Comm Connector Cover	1747-R5
Replacement Parts Kit for 30 and 40 I/O Fixed Hardware Style Processors  Two Output Terminal Covers  Two Input Terminal Covers  Two Prom/Battery Covers  One HHT/Comm Connector Cover	1747-R7
Replacement Terminal Covers for 4, 8, & 16 I/O Modules This kit contains four blank covers and appropriate labels for replacement of any required I/O module cover.	1747-R9
HHT Keypad Replacement Overlay for English Memory Pak Firmware Releases 1.02, 1.07 and 1.10	1747-R20
HHT Keypad Replacement Overlay for French Memory Pak Firmware Releases 1.10	1747-R20F
HT Keypad Replacement Overtay for German Memory Pak Firmware Releases 1.10	1747-R20G
HT Keypad Replacement Overlay for Italian Memory Pak Firmware Releases 1.10	1747-R20l
HT Keypad Replacement Overlay for English Memory Pak Firmware Releases 2.00 and Later	1747-R21
HTT Keypad Replacement Overlay for French Memory Pak Firmware Releases 2.00 and Later	1747-R21F

Insert the cable length code into the catalog number. Cable length codes are as follows: 10=1.0m, 25=2.5m, and 50=5.0m. For example, 1492–CABLE25H is a 2.5m cable.

# Replacement Terminal Blocks

This table provides a list of replacement terminal blocks and their catalog numbers.

Description	Ca talog Number 1746RT25R		
Replacement Terminal Block (Red) — Used with AC I/O modules, Catalog Numbers 1746-IA16, OA16, IM16			
Replacement Terminal Block (Blue) — Used with DC I/O modules, Catalog Numbers 1746-IB16, IV16, OB16, OV16, IN16, IG16, OG16			
Replacement Terminal Block (Orange) — Used with relay output modules, Catalog Numbers 1746–OW16, OX8	1746-RT25C		
Replacement Terminal Block (Green) — Used with Specialty I/O modules, Catalog Numbers 1746-HSCE, IO12	1746-RT25G		
Replacement Terminal Block — 2 position terminal block used with analog output modules, Catalog Numbers 1746–NO4I, NO4V			
Replacement Terminal Block — 8 position terminal block used with analog output modules, Catalog Numbers 1746–NO4I, NO4V			
Replacement Terminal Block — Used with analog input modules, Catalog Numbers 1746-NI4, NIO4I, NIO4V	1746-RT28		
Replacement Terminal Block — Used with RIO Communication Modules, Catalog Numbers 1747-SN, DSN, DCM	1746-RT29		
Replacement Terminal Block — Used with DH-485 Link Coupler, Catalog Number 1747-AIC			

#### **B-8.** Documentation

To order Allen-Bradley<sup>TM</sup> documentation, contact your local Allen-Bradley representative for the most current information.

Allen-Bradley SLC 500<sup>™</sup> Fixed Hardware Style Installation and Operations Manual Publications 1747 - March, 1996 (or most current)