Chapter 8
Troubleshooting

This chapter describes problems that can occur on the bundler EDL Bundler, cites probable causes for each problem, and lists possible solutions.

This chapter contains the following sections:

8.1 SUMMARY

All machines are designed and programmed to perform logical and repeatable operations in a manner predetermined by the control system.

It should be noted that the majority of machine stoppages are of a simple nature and usually involve the variable items like product or materials, the peripheral elements of the system (such as photocells and proximity switches) rather than the main control system.

In addition, familiarity with the machine and its normal mode of operation can save considerable time and it should be stressed that all maintenance personnel become fully familiar with the machine and its sequence of operation.

POINTS TO REMEMBER:

1. Never overlook the obvious such as E-stop switches, safety interlocks and mains power.
2. Don't be too proud to ask the machine operator what happened.
3. Take a good look around the machine before diving into the control box.

Having done all that, then you may read on where some common methods of fault finding are explained.

!!!!!! WARNING !!!!!!
CONTROL BOXES CONTAIN HAZARDOUS VOLTAGES, WHICH ARE POTENTIALLY LETHAL. ONLY COMPETENT AND QUALIFIED PERSONNEL SHOULD BE ENGAGED ON SUCH EQUIPMENT.

Ok, so we have tried all the obvious things and the machine still won't go. We now have to establish the next logical operation stage for the machine.

There are so many possibilities here, that only you can find the answer to.

1. Is there a pack in the infeed machine ready for wrapping?
2. Are there packs out of place on the conveyor.

Having established the next operation, look at the sensing devices around that area.

1. Do the indicating LED's indicate true conditions? If no, the sensor should be checked.
2. If the sensor seems ok, look up the number on the PLC input listing and check that signal is reaching the PLC by monitoring the input LED.

If the signal is ok at this stage, don't delve into the program listing at this moment.

1. Remove the packs from the machine, reset it, start and monitor what happens.
2. You may need to do this a couple of times to establish a pattern, but it should lead you to the right path to the fault.

Remember if a machine has been running for some time, a program fault is the most unlikely cause of failure. We need to get the right set of input conditions to match the program requirements to switch the outputs. There are two similar types of faults, product or operations related i.e. bags or products falling over. Alternatively component failure caused faults.

8.2 Troubleshooting Table

Problem	Possible Cause(s)	Possible Solution(s)
The bundler is making poor film seals.	A heating element in one of the seal jaws is not functioning properly. A fault will register on panel.	Replace and rebuild the seal jaw. See CH 6 P. 6-2
	There is product and debris caught in the seal jaws.	Clean the seal jaw, using a soft cloth or compressed air.
The film web is breaking.	The film is not threaded properly.	Check the film path and rethread the film as necessary.
The film feed motor runs continuously and is overfeeding film to the film feed assembly.	The dancer bar proximity sensor is out of alignment or malfunctioning.	Readjust or replace the proximity sensor.
	The dancer bar is stuck.	Free the dancer bar.
	The film was not threaded properly.	Rethread the film per the Thread Path on the Diagram
The film wraps are not centered around the pack.	The pack is not centered on the film web @ Pusher 2	Reposition the pack by adjusting the position of the pack stop.
Film is not even on the bundle.	A film roll is not aligned properly on the active carriage.	Reposition the roll according to the film roll scale.
The film seal is not being cut properly.	The knife blade in the lower seal jaw is dull, broken, or bent.	Remove and rebuild the seal jaw assembly.
The film is sticking to the seal jaw.	The seal bar coating damaged.	Remove and rebuild the seal jaw assembly.
Erratic Conveyor Speed	Overload of conveyor	Reduce load on conveyor. Check conveyor settings.
	Faulty motor controller	Check controller
	Fluctuation of power supply	Check control voltage phase to neutral. Check & repair mains supply to machine
Machine operates but heat tunnel fails to reach temperature	Heater contactors unserviceable	Check all heater contactors. Replace as required.
The heat tunnel temperature must continually be increased in order to shrink the film properly.	The heat tunnel temperature was set too high and caused the heating elements to burn out.	Contact Maintenance before increasing the heat tunnel temperature.
	The heat tunnel was not cooled down properly during shutdown.	Follow the long-term shutdown procedure.

Problem	Possible Cause(s)	Possible Solution(s)
Heat Tunnel runs over temperature or fails to run up to temperature	Temperature controller out of specification and unserviceable	Have qualified electrician test & replace if faulty
	Thermocouple unserviceable	Have qualified electrician test & replace if faulty
NOTES		

8.3 SEALING FAULTS

This synopsis is included in the manual to help the operator achieve an acceptable seal. It applies only to the EDL jaw arrangement and no other. The points mentioned must be taken as a guide rather than the rule.

The jaw arrangement is particularly suitable for polyethylene films from 50 – 500 gauge (12.5 to 125 microns). It can also be used successfully for sealing some softer plasticised PVC's.

8.3.1 CONDITIONS FOR A GOOD SEAL

In order to ensure that a good seal is obtained the following conditions should be met:

8.3.1.1 GOOD, CONSISTENT QUALITY FILM

To ensure that a good, consistent quality of film is obtained it may be necessary to purchase the film from a major brand name manufacturer. Two of the most important qualities to look for are consistent gauge throughout the roll of film and freedom from foreign matter.

8.3.1.2 THE CORRECT SEAL TEMPERATURE

This condition is adjustable, and is related to film type and gauge. The seal temperature should be the correct temperature for the best impress weld.

NOTE: Always make temperature adjustments starting from the lower end of the scale. High initial settings may mask sealing problems. Normal operating temperatures for the seal jaw are: 120 – 145 deg C, 248 – 293 deg F

8.3.1.3 THE CORRECT SEAL PRESSURE

This condition can only be met by correct jaw adjustment. The pressure is achieved by the knife jaw cylinders on stretch machines. Excess pressure will cause split seals and may damage the top jaw.

8.3.2 JAW ALIGNMENT

Both top and bottom jaws must be in line. It is important that the jaw rubber is maintained in a good clean condition and be free from any damage. A chipped rubber will result in seal 'hot spots' and film adhesion to the seal blade and seal anvil.

8.3.3 SEAL ANALYSIS

To test a weld, pull by hand at right angles to the seal line. (Pulling or tearing from one end of the seal will give a false reading). Any tear, once begun, will spread fairly easily along the edge of a seal.

8.3.3.1 A seal that has been affected with the seal temperature set too high will tend to split along one edge of the impress seal. The seal may also show signs of bubbling or wrinkling.

8.3.3.2 A seal that has been affected with the seal temperature set too low will not weld at the impress seal.

8.3.3.3 An ideal weld that has been pulled apart will exhibit a mixture of web separation and tearing on the impress seal edges.

8.3.4 POOR WELDS AND THEIR CAUSES

8.3.4.1 Welds splitting along edge of impress seal, often leaving a trailing strip of weld attached to the pack about ¼" wide being the width of the film seal from the outside edge of the impress seal to the cut edge .

Causes:

a. Film tension
b. Clamp bar is not maintaining tension on the film. The film is allowed to shift during the sealing process.

8.3.4.2 Film adhesion to jaw blade.

Causes:

a. Dirty jaw rubber
b. Excess seal temperature
c. Damaged seal jaw coating

8.3.4.3 Seal pulling apart on jaws open

Causes:

a. Insufficient seal temperature
b. Insufficient seal pressures
c. No voltage connected to seal jaw

8.3.4.4 "Stitchy" weld

Causes:

a. Poor top jaw/lower jaw mating, either rubber surface is "bumpy" or badly fitted
b. The anvil rubber is not compressing solidly.

8.3.4.5 Welds which are better one side of jaw than other (left/right)

Causes:

a. Poor lower jaw alignment across the machine (check jaws for parallel)
b. Poor jaw rubber one end of jaw
c. Film gauge variation across reel

8.3.4.6 Welds which are better upstream than downstream, or vice-versa

Causes:

a. Film tension
b. Poor top jaw/lower jaw upstream/downstream alignment

8.3.4.7 Welds which are not consistent

e.g. welds which are good initially but become progressively hotter or cooler

Cause:

a. Fault or badly adjusted simulator (Adjust simulator trim pot to effect reproducible results. A clockwise adjustment will give an increasing heat with each successive weld. A counter-clockwise adjustment will give a decreasing heat with each successive weld.)

8.3.4.8 Failure of jaw to **CUT** (but continues **WELDING**)

Causes:

a. Film not being clamped due to damaged rubber
b. Blade damaged
c. Insufficient jaw travel

8.3.4.9 Welds which appear good but separate during shrink

A weld can be no stronger than the parent material so a reasonably good weld can often part owing to excessive shrink.

Causes:

a. Poor quality film (film may have a surface coating on one side only and seal better if reels are turned end for end)
b. Insufficient seal temperature
c. Insufficient seal pressure

NOTE: Dirty or damp film will be prone to give lower quality welds than clean material

Some pigmented films have similar sealing problems

Proper maintenance of the Seal Jaws on a machine will ensure good sealing. Particular care taken in maintaining the jaws in a clean condition and in correct adjustment is reflected in good consistent results.