# TROUBLE SHOOTING

# GUIDE

# SE SERIES

SECTION NINE

AX300 SERIES

TROUBLE SHOOTING GUIDE

**Itemized Sub-Sections**

9.3.10 No Water Flow
9.3.11 Developer Temperature Control Circuitry
9.3.11.1 Too Much Heat
9.3.11.2 No Developer Heat
9.3.11.3 Developer Temperature Display
9.3.12 No Dryer Heat

IV 9.4 Film Artifacts
9.4.1 Scratches
9.4.1.1 Identification/Isolation
9.4.1.1.1 Top Or Bottom
9.4.1.1.2 Spacing Identification
9.4.1.1.3 Isolation of Artifacts to an Individual Rack
9.4.1.2 Solution
9.4.1.2.1 Top Crossover Guides
9.4.1.2.2 Inner Rack Guides
9.4.1.2.3 Bottom Turnaround Guides
9.4.1.2.4 Dryer Feed Guide
9.4.1.2.5 Dryer Rack Guides
9.4.1.2.6 Ladder Guides
9.4.1.2.7 Random Scratches
9.4.2 Water Spots
9.4.3 Drying Patterns
9.4.4 Roller Marks
9.4.5 Static Marks
9.4.6 Wet Films

## 9.1 MECHANICAL

This section incorporates all moving components and their adjustment requirements for the AX300 Series Processor.

Some components are mechanical as well as electrical and troubleshooting the component(s) may require cross-referencing another section. This will be noted within this section.

### 9.1.1 MAIN DRIVE MOTOR

The Main Drive Motor is powered and regulated by the Standby Board Assembly.

If the motor fails to run properly when the micro-switch is activated (replenishment pump is working), follow this procedure to isolate problem(s):

Disconnect wire #17 from Standby Board and attach to any open neutral line on the terminal strip. (See Wiring Diagram)

If the motor begins to operate, replace the Standby Board Assembly. If board replacement is required, leaving #17 on neutral terminal will allow the end user to continue to process films until the board is replaced.

> **NOTE: The motor will now run continuously as you have bypassed the Standby Board. Also, since the Water Solenoid is wired parallel to the motor you will also have continuous water flow.**

If the motor does not operate after re-wiring, the drive chain may be too tight and may cause motor's internal gearing to seize. Remove chain from main drive motor gear. If, after removing chain from the motor sprocket the motor still does not start, replace motor.

If removing of the chain from the motor sprocket allows the motor to start, see Section 9.1.2 and 9.1.3.

> **NOTE: The motor is thermally protected. If the motor should overheat, the motor will turn itself off.**

### 9.1.2 MAIN DRIVE CHAIN

The drive chain is connected from the Main Motor to the Main Drive Shaft. The proper tension for the chain should allow you to squeeze the chain almost together without much effort. If the chain tension is too tight, it may cause the motor to bind. If the chain is too loose, a "thumping" noise/"Chain-Slap" may occur.
**NOTE:** It is important when adjusting the chain that the alignment of the driveshaft gear and the motor gear be adjusted "in line" with one another. If the chain is on an angle, excessive vibration and/or "thumping" may occur.

### 9.1.3 ADJUSTMENT BLOCKS

There are two Adjustment Blocks at each end of the Main Drive Shaft. Inside each Adjustment Block is a bronze bearing suspended between two set-screws (allen screws). The Main Drive Shaft sits inside these bearings. The bearing height is adjustable by changing the setting of the allen screws. This height setting will allow you to properly engage the Main Drive Shaft Gears with the Rack Drive Shaft Gears.

When making adjustments to the bearing height, be sure not to over tighten the setscrews into the bearing. If set too tight the bearing's "floating action" might be restricted and cause possible binding with the Main Drive Shaft.

Without the transport racks or Main Drive Chain engaged, the Main Drive Shaft should spin freely when rotated in the adjustment blocks.

Once the proper setting of the main drive bearings are achieved within the Adjustment Blocks, tighten the top and bottom jam nuts on the set-screws.

> **NOTE: Ensure Adjustment Blocks are square and not on an angle as this will cause the Drive Shaft to bind.**

### 9.1.4 MAIN DRIVE SHAFT ASSEMBLY

This assembly has four worm gears, which drive the transport racks. The vertical position of the shaft relative to the rack drive gears of each transport rack is adjustable as mentioned in Section 9.1.3.

It is important that these mated gears are properly aligned. If too tight, the gears will squeak. If too loose, the racks will jump. If squeaking or jumping occurs, determine which rack meshes with the drive shaft too tightly by lifting each rack individually (Developer, Fix, Wash & Dry) until the problem area is found. Adjust Drive Shaft accordingly.

### 9.1.5 INFEED ROLLER

This phenolic roller is suspended on a stainless steel shaft and is mounted above the infeed tray just before the entrance of the Developer Rack. This roller is designed to spin "freely" on its shaft. If this roller is bowed for any reason, random scratching may occur.

**NOTE: For film artifact troubleshooting, refer to the film artifact Section 9.4**

### 9.1.6 TRANSPORT RACKS

Each transport rack is a direct gear driven system consisting of opposed rollers. These rollers are suspended between the side plates by either a bearing or a bearing/rubber grommet combination. All Alphatek transport racks share the majority of the same parts.

#### 9.1.6.1 FILM JAMS

A variety or combination of reasons may cause film jams. Listed below are some of the more common reasons and their solutions:

#### 9.1.6.1.1 LOW CHEMICAL LEVELS

If chemical levels have fallen below the top of the over flow tubes, check Replenishment Tanks for solution. If no solution in the Replenishment Tanks, fill replenishment tanks accordingly and processing tanks to the top of the overflow tubes. Run clean-up film. If Replenishment Tanks have chemistry, check Micro-switch and Replenisher Pump (See Section 9.2.5 and 9.3.2) for proper operation.

Also, chemical activity levels will fall from oxidation. Make sure replenishment rates are sufficient to offset any oxidation, especially in low volume accounts. Check if "Jog Cycle" is operating properly (See Section 9.3.8.). Chemical level might also drop if chemicals are siphoning into replenishment tanks or if there is a leak (See Section 9.2.4.).

#### 9.1.6.1.2 DEPLETED CHEMISTRY

Lack of chemical strength in either the developer or fixer might cause film jams. Be sure both chemicals are at proper working strength.

#### 9.1.6.1.3 GEAR BREAKAGE

Each rack should turn freely by hand. If any rack does not turn freely gear breakage will occur. Inspect any "tight" rack for obstructions or foreign materials. If an idler gear mounting has been over tightened, this will cause a binding in the rack. Problems will persist if either an adjustment or replacement of the bad component does not isolate the cause of the tightness. Discoloration and/or flaking of some gears in the fix rack are normal. Their mechanical integrity has not been compromised by either of these conditions.

### 9.1.6.1.4 GUIDE MISALIGNED

There are various guides throughout the film transport system. Guides may need to be replaced or repositioned as a normal maintenance function. For film scratch identification and elimination refer to Sec. 9.4.

Remove each rack from processor and hand-feed a film through each rack. Look for any kink or unusual bending/binding of film. Listen for any unusual "snapping" or "buckling" noises. If any of these conditions occur, check the following for proper positioning.

A.) ***INNER RACK GUIDE***

This guide is located just below the entrance rollers of each of the wet racks. This guide directs the film from the entrance rollers to the interior rollers of the rack. This guide should be positioned straight up and down for best results.

B.) ***LADDER GUIDES***

These guides are located in the Developer Rack to ensure the film doesn't "waver" from its designated path. These guides are very flexible. Be sure the guide is properly set in its respective mounting holes in the side plates. If "bowing" has occurred, replace the ladder guide. Proper mounting of the guide will always have the ribs of the guide positioned toward the inside of the rack.

C.) ***STAINLESS STEEL TURNAROUND GUIDE***

These guides can be found at the turnaround at the bottom of each solution rack and at the "turn-up" and "turn-out" of the Dryer Rack. These guides are suspended by support blocks, which are attached to the side plates. Repositioning the crossover support blocks to the side plates makes adjustment. The clearance holes in the side plates for mounting the support blocks are over size, which will allow slight adjustment of these guides. Set guide with the exit edge of the guide as close to the next small roller (without touching it) as possible.

D.) ***CROSSOVER GUIDES***

These guides transport film from one rack to another in the solution section. Processors manufactured prior to November 1993 have either "Insert and Snap" or slide on Crossover Guides. These guides slide over the rack support pins on the Developer & Fix and Fix &Wash Racks. If the guide is bowed, cocked, twisted etc., remove from processor and set on "flat-even" surface. Ensure "ribs" are sitting flat and guide is square and doesn't "rock" on surface. Loosen bolts and reset. If a guide cannot be squared, replace the assembly. Processors manufactured after November 1993 have a fixed setting. There is a conversion kit, which allows the fixed crossovers to be installed on older processors.

E.) ***DRYER FEED GUIDE***

This guide "feeds" the film from the wash exit to the dryer entrance. If the guide is set too low or too high, scratches will occur, or the film may jam at this location. Processors manufactured after June 1995, have a fixed setting.

F.) ***DRYER RACK GUIDE***

The Dryer Rack Guide may cause scratches or "Dog Earring" of the film.
The Dryer Rack is positioned by the location and mounting of the Lower Blower Assembly. The blower assembly is adjustable side-to-side.

If a film has been folded over (usually on lead edge/drive side), remove Upper Blower Assembly and Dryer Rack. Loosen the four screws/nuts that mount the Lower Blower Assembly to the main frame. Move/slide the blower assembly slightly toward the Main Drive Shaft. Run film through the processor with the Upper Blower removed; observe film transport through the Dryer Rack. Film should clear the Dryer Guide brackets.

### 9.1.6.2 ROLLER TENSION

**9.1.6.2.1** Each outside 1" acrylic roller is suspended between the side plates by a bearing that "floats" inside a rubber grommet. (Exception to this is the entrance and exits of each transport rack.) The rubber grommet absorbs the increased tension created by the passage of a film. It is important that the grommet maintains its resiliency to perform its designed function. Rubber grommets should be checked semi-annually and replaced if necessary.

**9.1.6.2.2** The exits of the solution transport racks and the entrance of the Fix and Wash have adjustment screws that determine the tension of rollers at these locations. These screws should be adjusted to ensure that squeegee rollers "just" touch each other at both ends of roller. Do not over-tighten; damage may occur. The bearings will wear over time, possibly causing gaps between the rollers. Check the tension periodically.

## 9.2 PLUMBING

This section incorporates all the components used in the plumbing of the AX300Series Processor.

### 9.2.1 WATER SOLENOID (P/N 4180.350.01)

During the "full-on" condition 120V or 240V is supplied to the solenoid. The valve opens allowing a maximum flow rate of 1/2-gallon (1.9L) per minute. This flow is restricted by a rubber diaphragm located behind the sediment screen at the input port of the valve. The solenoid will generate some noise during normal operation. If the solenoid is dry, there will be an excessive amount of noise.

### 9.2.1.1 NO WATER FLOWING INTO PROCESSOR

If no water flows during the "full-on" condition, check for voltage at solenoid. (120V/240V operation) If you measure line voltage across the solenoid, check screen for sediment build-up and/or the rubber diaphragm for foreign obstructions. If there isn't any voltage across the solenoid see Section 9.3.10.

### 9.2.1.2 WATER FLOWING DURING STANDBY

Water will run constantly during standby if the unit has the continuous drain feature. If the unit does not have this feature, there should be no water flow during standby.

### 9.2.2 WATER FLOODING

If the water level has risen within wash tank and is overflowing the tank wall check the drain lines. There are three drain lines incorporated into the Wash Tank. One drain line is connected to the drain valve and two are for the overflows. The two overflow lines should never be "hooked-up" together, as this will reduce the drain capacity by 50%. Most drain problems occur when "air locks" form due to poor gravity feed to the floor drain. Ensure a gradual slope of the drain lines to the floor drain. All hose connections should be checked on a regular basis to ensure there is not any leaking at those locations.

**CAUTION: The water inlet hose is always under pressure when the wall valve is opened. This valve must be turned off when power to the processor is turned off. This should be done nightly as part of the "shut-down" procedure. The water inlet hose fittings must be checked monthly for corrosion. The rubber washers and the hose itself must be checked for drying or cracking. If these problems are spotted, the hose must be replaced.**

### 9.2.3 RECIRCULATION

The 300 Series Processor has a recirculation pump for the developer chemical. The fix is agitated by means of a gear driven "agitator paddle". The recirculation pump for the developer is a magnetically driven impeller pump. The developer rack should be removed to check for turbulence within the developer chemistry. If no agitation is noted, check back of pump for shaft rotation. If pump shaft is turning, check for "air locks" in the recirculation lines. If air locks are observed lift and wiggle vinyl tubing at the input side of pump until fluids begin to pump. If pump is not operational, check interior of pump for obstructions. If obstructions are noted, clean interior of pump, re-assemble and power-up. If still no operation, disconnect insulated male/female connections at the pump and check for voltage. If voltage is present at pump, pump is faulty and should be replaced.

### 9.2.4 NO SOLUTION IN TANKS

#### 9.2.4.1 DRAIN VALVES

The three drain valves should be checked for closure. When valve is closed, the handle will be perpendicular to body of valve. If valve is closed and you see liquid still draining, replace valve.

#### 9.2.4.2 SIPHONING

If the level is decreasing overnight, check for "siphoning "through the replenishment pump to the holding tanks. Mark the holding tank prior to leaving and check to see if solution level has increased by morning.

**NOTE: Due to evaporation, the levels in tank(s) will drop overnight. If the processor has not been used for several days, the chemical levels will drop below the top rollers on each rack. Chemicals must be brought back to their proper level, otherwise roller marks/artifacts will occur.**

### 9.2.5. REPLENISHER PUMP

Upon initial start-up the pump will activate for 8 seconds. The pump will also activate when the micro-switch is depressed or when the "jog cycle "has been activated. After the micro-switch lever has been released, the pump will run an additional eight seconds and the developer temperature display will re-illuminate. This 8-second delay is a fixed time determined by an R/C circuit on the Standby Board. Newer AX300 Series processors are equipped with a "Jog Cycle" built into the Standby P/C assembly. When the Jog Cycle is activated the replenisher pump will run for 8 seconds.

#### 9.2.5.1 PUMP WILL NOT ACTIVATE

If pump will not operate when micro-switch is activated/depressed, ohm-out switch for fault. If switch is found to be working, disconnect pump wire #16 from Standby P/C and then attach to any "open" neutral terminal on the terminal strip. This will supply 120V/240V to the pump. If the pump begins to function, replace the Standby P/C. if pump will not function, pump should be replaced.

### 9.2.5.2 PUMP RUNS BUT CHEMICAL WILL NOT REPLENISH

The pump works on a vacuum principle. If the vacuum pressure is violated, the chemicals will just "float" within the vinyl tubing with no advancement. If this occurs:

Check the clamps at tubing hook-up for tightness.
Is there chemical in the holding tanks? Refill if lower than 2 gallons.
Check for leaks around bellow and elbows. If leak is found, replace failed component.
Check the poppet valves that are internal to the pump bellows. They may need to be cleaned of foreign artifacts that will not allow them to seat thus causing loss of vacuum.
If poppet valves have been cleaned, but problem persists, replace the poppet valves.

## 9.3 ELECTRICAL

Prior to referring to this section for assistance, refer to Section 4 on "Circuit Function". Section 4 will explain the "Theory of Operation" for each component. This will make it easier to troubleshoot component failure.

**NOTE: Each service technician must have a digital meter and amprobe to properly diagnose any electrical problem.**

### 9.3.1 15 AMP BREAKER (10 Amp for 240V Rated Processors)

The 300 Series processors are rated for 15 amps. If current draw is greater than 15 amps, the breaker will trip.

### 9.3.1.1 BREAKER TRIPS IMMEDIATELY

If the breaker trips immediately once the unit has been turned on, one of the electrical components has shorted. Check the resistance's of the major components (to ground) to determine faulty part. Once isolated, replace component.

### 9.3.1.2 BREAKER TRIPS AFTER A SHORT PERIOD OF TIME

Check total amp draw by attaching amprobe around the incoming "hot" wire from the power cord which is attached at terminal #21 on the power-strip. If amp draw is less than15 amps, and the breaker continues to trip, replace the circuit breaker.

If amp draw is greater than 15 amps, check individual components to determine which part(s) is drawing excessive amps. The following is a list of components and their normal amp draw at 120V: (continued next page)

600 Watt Developer Heater - 5.0 Amp
800 Watt Developer Heater (240V units)- 3.33 Amp
600 Watt Dryer Heater - 5.0 Amp (Upper 390 Heater Only)
400 Watt Dryer Heater - 3.3 Amp (Top & Bottom Mammo 300 & AX300SE; Bottom of AX390SE Only)
All other Fans and Motors Combined - 1.2 Amp

**NOTE: The above ratings are for 120V operation. For 240V operation the amp draw will be halved.**

### 9.3.2 MICRO-SWITCH

The micro-switch is an Electro-mechanical component that senses film insertion to the processor. This switch closes the circuit for the replenisher pump and opens a circuit through a relay on the standby board for the illumination of the Developer Temperature Display. In addition, this switch activates the Main Drive Motor and Water Solenoid from the "Standby" mode. When the switch is working correctly, you will hear a "clicking" noise each time you depress and release the arm of the switch. This switch may be bent by the removal/insertion of the Developer Rack. Also, the operator trying to correct a mis-fed film which has-already entered the Developer Rack can damage the activator arm of the switch. If the operator pulls a film back, which has developer chemistry on its surface, the chemical may rollback on the activator of the micro-switch and may cause the plunger to stick. The cross-section of micro-switch adjustment is shown in the parts section. The contact plunger is under the activator arm. When the arm is depressed it will also depress the plunger. This action will close the circuit. If arm is set too low, the plunger will be pushed down continuously, causing the pumps to run continuously and the developer temperature display to remain extinguished. If the micro-switch arm does not sense a film, the arm is not adjusted high enough. To adjust arm, hold finger on top of micro-switch and gently bend-up arm's overhang. An ohmmeter should be used to confirm correct electrical operation of the switch if there is any doubt.

### 9.3.3 NO REPLENISHMENT

The replenisher pump completes its circuit through the Standby P/C Assembly. The micro-switch closes the circuit on the P/C Board and energizes the triac on the P/C board and activates the pump.

With the micro-switch closed, there should be 120/240V across terminals #29 & #30. (See Section 9.3.2) If voltage is present at these connections, check wiring to pump. If wiring is correct, replace pump.

If there is no voltage across terminals #29 & #30, as described above, replace Standby P/C Assembly.

### 9.3.4 CONTINUOUS REPLENISHMENT

Either a faulty micro-switch (See Section 9.3.2) or a bad Standby P/C Assembly creates this condition. If micro-switch operates properly, replace Standby P/C Assembly.

### 9.3.5 PROCESSOR WILL NOT COME OUT OF STANDBY

Either a faulty micro-switch (Section 9.3.2) or a bad Standby P/C Assembly creates this condition. If micro-switch operates properly, replace Standby P/C Assembly.

### 9.3.6 PROCESSOR WILL NOT GO INTO STANDBY

The Standby P/C Assembly will start "counting" after the microswitch circuit has "opened" (See Section 9.3.2). The timing of the Standby circuit is based on the setting made on P1 (Potentiometer). Turning P1 clockwise will increase the "Run" time before the unit reverts to a "Standby" condition. Turning P1 counter-clockwise as far as it will travel should cause the processor to go into "Standby" immediately. If processor does not go into Standby, after turning P1 completely counter-clockwise replace Standby P/C Assembly

### 9.3.7 PROCESSOR GOES INTO STANDBY TOO SOON

First check microswitch setting to ensure it is activated for the film's entire length. (See Section 9.3.2) If the microswitch is set properly, increase P1 setting as described in Section 9.3.6.

If processor goes into Standby approximately 8 seconds after a film has cleared the microswitch and P1 has been turned all the way clockwise, replace the Standby P/C Assembly.

### 9.3.8 JOG CYCLE OPERATION

Each AX300SE Series processor has an adjustable jog cycle. The processor will go through one complete "run cycle" if no films have been processed in the last 15 - 60 minutes depending on the setting of "P2" on the standby board. Turning P2 clockwise will increase the time before the processor will start a jog cycle. If you have turned P2 completely counterclockwise and the processor has not started a jog cycle after 20minutes, replace the Standby Board Assembly.

### 9.3.9 MAIN DRIVE MOTOR

The motor completes its circuit through the Standby P/C Assembly. (See Section 9.1.1 & 9.3.2.)

### 9.3.10 NO WATER FLOW

The Water Solenoid is wired parallel to the Main Drive Motor (See Section 9.2.1 & 9.3.2)

## 9.3.11 DEVELOPER TEMPERATURE CONTROL CIRCUITRY
(SEE SECTION 4.5 PRIOR TO PERFORMING THE FOLLOWING)

### 9.3.11.1 TOO MUCH DEVELOPER HEAT

**NOTE: Prior to troubleshooting this circuit, check for proper developer recirculation.**
**NOTE: The small red light connected in parallel with the Developer Heater on #31 and #32 on the terminal strip will advise when there is power to the heater.**

1) **THERMOMETER**
Placing a calibrated thermometer in the Developer Tank and comparing the readings will check thermometer accuracy. The Developer Temperature should always be measured on the non-drive side between the tank wall and the rack sideplate.

2) **DEVELOPER THERMISTOR**
Check the resistance of the thermistor with an ohmmeter, attached to wires #2 & #3. Be sure to disconnect the wires from #2 & #3 on the P/C Board (See values below).

Thermistor Resistance Values:
1894 ohms @85°
1667 ohms @90°
1471 ohms @95°
1301 ohms @100°

3) **TRIAC**
Remove wire #6 from the triac to P/C Board. The Developer Indicator Light which is parallel to the Developer Heater at the terminal block should turnoff. Reconnecting the wire should turn the light on again. If the light doesn't turn off, there is an internal short in the triac and it must be replaced.

4) **DEVELOPER TEMPERATURE CONTROL P/C BOARD**
Disconnect wires #2 & #3 and short the two terminals on the board with a jumper wire. The light should turn off because you are lowering the resistance to "O" ohms which tells the board that the developer temperature is too high and therefore, turns off the heater. If the light stays on, check for a short to ground through one of the heater leads. If the developer heater is okay, replace the board.

### 9.3.11.2 NO DEVELOPER HEAT

**NOTE: Prior to troubleshooting this circuit, check for proper developer recirculation.**
**NOTE: The small red light connected in parallel with the Developer Heater on #31 and #32 on the terminal strip will advise when there is power to the heater.**

1) **THERMOMETER**
Check accuracy with a calibrated thermometer in the developer tank and compare readings. The developer temperature should always be measured on the non-drive side between the tank wall and the rack sideplate.

2) **DEVELOPER HEATER**
Check the heater's resistance, which should be 24 ohms for 120V Processors (600 watts) and 72 ohms for 240V Processors (800 watts). If the heater's ohms are outside of +/- 5 ohms, replace heater. Also, check for proper amperage with an amprobe. The normal operating range is 4.5 to 5.5 amps for 120V Processors, and 2.75 to 3.5 for 240V Processors.

3) **DEVELOPER THERMISTOR**
Disconnect wires #2 & #3 from P/C board & measure resistance of thermistor with an ohmmeter (see values on next page).

Thermistor Resistance Values:
1894 ohms @85°
1667 ohms @90°
1471 ohms @95°
1301 ohms @100°

4) **TRIAC & P/C BOARD**
Measure voltage with voltmeter between wires #1 and #6 on the P/C board. Normal voltage should be between .1 & .5 VDC

0 Volts = Bad Board
.6 Volts or more = Bad Triac

### 9.3.11.3 DEVELOPER TEMPERATURE DISPLAY (also see section 4.4)
This display has its own D.C. power supply. This circuit is completed through a relay on the Standby P/C Assembly. This relay opens whenever the micro-switch has been closed. This action will in turn extinguish the L.E.D. readout on the display panel.

If the LED readout is off and the micro-switch is "open" (See Section 9.3.2):
Check the connection from the Power Supply to the back of the display module. If connection is secure check to see if relay on Standby P/C is opened. If relay is okay, replace D.C. Power Supply and LED readout.
For calibration on the display, refer to Section 4.4.

### 9.3.12 NO DRYER HEAT (ALSO SEE SECTION 4.3.3)

Check for line voltage across each individual heating element. If line voltage is present, but element is not heating, replace element.

**NOTE: The unrestricted airflow from the blowers will cool the heating element. This will make the air feel cool even with heat present. You must restrict the incoming air by briefly placing your hand over the fan. Place your hand on the output side, closest to the heater and then feel for heat. The dryer temperature will not rise with any of the external panels removed.**

If there is no line voltage across the heating element, check for voltage across terminals #23 & #24. Turn Dryer Thermostat up to 140°F (60°C) If no voltage is present, replace Dryer Thermostat.

## 9.4 FILM ARTIFACTS

### 9.4.1 SCRATCHES

Scratches are caused by the film staying in contact with one of the various guides located within the transport section. All guides should be adjusted to allow the film to pull away from the guide.

#### 9.4.1.1 IDENTIFICATION/ISOLATION

To assist in isolating the area, from which the scratch is originating, follow the below procedure:

##### 9.4.1.1.1 TOP OR BOTTOM

Determine if scratch is on the Top or the Bottom of the film as it is processed. Remember the film turns over in the Dryer Rack prior to exiting. If scratch is on top of film as it exits, then scratch is on bottom of film as it is processed.

### 9.4.1.1.2 SCRATCH SPACING IDENTIFICATION

Each guide if mis-aligned, will leave a distinct, measurable mark on film.

Crossover Guides leave scratches 1-7/16" (3.6cm) apart on the top of the film as it is processed.

Inner Rack Guides leave scratch 1-1/2" (3.8cm) apart on the top of the film as it is processed.

Bottom Turnaround Guides leave scratches 1-1/2" (3.8cm) apart on the bottom of the film as it is processed.

Dryer Feed Guide leaves scratches 3/8" (.5cm) apart on the top of the film as it is processed, for processors manufactured prior to June 1995. After June 1995, they are1-7/16"(3.6cm) apart.

Dryer Rack Guides leave scratches 2" (5.1cm) apart on the top or the bottom of film as it is processed.

Ladder Guides leave scratches 2" (5.1cm) on the bottom of film as it is processed.

With a ruler you can now determine which type of guide is creating the scratch.

### 9.4.1.1.3 ISOLATION OF ARTIFACTS TO AN INDIVIDUAL RACK

If determining where the marks are originating from (i.e. Developer, Fix or Wash Rack) is not certain, process one 8"x 10" film (18cm x 24cm).

Process film the "long-way" (10" or 25.4cm) through the Developer Rack. Grab film as it exits from the Developer Rack and rotate the film 90ø and run the film the short-way (8") through the Fix Rack. Grab Film as it exits the Fix Rack and run the film diagonally through the Wash and Dryer Racks. This rotation will determine where the scratch is originating. (i.e. Developer, Fix, Wash & Dry Racks).

If the scratch is running (as film travels) the long-ways (10") then the scratch is originating from the Developer Rack.

If the scratch is running the short-ways (8") then the scratch is originating from the Fix Rack.

If the scratch is running on an angle, then the scratch is from the Wash/Dry area.

### 9.4.1.2 SOLUTION

Once it has been determined which side of film is marked and which rack (i.e. Developer, Fix, Wash & Dryer) is at fault, the following will list proper adjustments for any particular guide:

#### 9.4.1.2.1 TOP CROSSOVER GUIDES

Processors manufactured prior to November 1993 have a Crossover Assembly, which has a gray PVC end plate. The entrance end of this guide should be adjusted as close as possible-without touching-the top exit Squeegee Roller of the Developer Rack for the Developer/Fix crossover.

For the Fix/Wash crossover, the entrance edge of the guide should be as far away as possible from the Fix exit, but still able to transport the film without it catching on the lead edge of the guide. Also, make sure the guide is "square" by placing it on a flat surface. The end plates should also be square.

If after everything is properly aligned, and the scratches have not been eliminated, check for gaps between the entrance rollers of the rack after the guide which is causing the problem. If there are gaps, replace the bearings. If there is still a gap, place a second squeegee roller at the entrance. If after all the above has failed, replace guide assembly. If the scratches are starting approximately 1/3 of the way from the lead edge of the film, the guide alignment is ok, but the film is not being held in place because of lack of tension on the entrance rollers of the rack after the guide. Replace bearings or add a Squeegee Roller as needed.

**Note:** Processors manufactured after November, 1993 have Crossover Assemblies which are suspended by a tie bar that is attached to the large and small Rack Support Pins located at the entrance of the Fix and Wash Racks. These guides "flip" down into the preceding racks and the slide pins snap into their proper positioning holes. If guide is properly positioned and scratches are still occurring, check for gaps between the entrance rollers of Fix or Wash Racks depending on where the scratch is originating.

Isolate marks (Is it occurring Developer/Fix or Fix/Wash) by removing one Crossover Guide at a time and hand feeding the film between racks.

Scratches coming from Crossover Guides on processors manufactured since November1993 usually occur from mis-adjusted tension the entrance or exit rollers of any of the transport racks. This roller tension is determined by set-screws in the side plates. The proper adjustment has the rollers just touching one another with no gaps visible end to end. You should rotate the rack manually and observe for any gaps prior to re-installing the rack into the processor. If scratches still occur after rollers and guide has been adjusted or properly positioned, replace the guide and\or Squeegee Rollers which may have swollen.

#### 9.4.1.2.2 INNER RACK GUIDE

This guide should be positioned almost straight up and down. Remove rack from processor and transport a film manually. Observe if the film is pulling away from the guide. If not, adjust guide accordingly.

#### 9.4.1.2.3 BOTTOM TURNAROUND GUIDES

These guides are suspended between two plastic blocks (one at each end of the guide). The blocks are mounted to the side plates. The guide's exit edge should be positioned as far away as possible from the Large Roller without touching the Small Roller.

#### 9.4.1.2.4 DRYER FEED GUIDE

This guide should have its exit edge (closest to dryer entrance roller) approximately 1/8"above intersecting point of entrance rollers of the Dryer Rack. For processors manufactured after June 1995 the position of the guide is fixed. If this guide is scratching the film, check for proper roller tension of the exit wash rollers. If tension is okay replace the guide.

#### 9.4.1.2.5 DRYER RACK GUIDES

These guides are suspended on the drive side of the Dryer Side Plate by an off set bracket and attached into the non-drive side by screws. These guides should be positioned so that the exit edge of the guide is slightly outside the normal film path. If guide is too low, jamming may occur. If set too high, scratches will occur.

### 9.4.1.2.6 LADDER GUIDES

These guides insert into the side plates. If guide is not seated properly, scratches and/or jamming will occur.

### 9.4.1.2.7 RANDOM SCRATCHES

These are either caused by improper handling of the film or by the infeed roller. The infeed roller should be free spinning. Check this roller and repair or replace as necessary.

### 9.4.2 WATER SPOTS

Spots are a result of a drying pattern, which is caused by the water level touching the exit Silicone Rollers of the Wash Rack. With the processor in the "Full-On" mode, remove the Wash Rack by lifting straight up out of the water. Feel the underside of the Silicone Rollers. If they are wet, turn down the water flow so they remain dry. This should eliminate the water-spotting problem. Also, check for gaps between the silicone rollers. If there is a gap, increase tension on the rollers by turning "in" the set-screws in the side plates. The rollers should be just touching one another. Too much tension will cause the rack to bind. Inspect each roller.

### 9.4.3 DRYING PATTERNS

These patterns are wavy in appearance (like a "shoreline") and can be observed in reflected light. To verify, turn off dryer heaters using the Dryer Thermostat and process another film. If pattern is now gone, check the following to isolate problem area(s).

Silicone Roller tension too loose (exit of Wash Rack)
Water level in tank too high (must be below Silicone Roller surface)
Dryer Temperature too high. The dryer heat (temperature) should always be as low as possible and still process dry films.

### 9.4.4 ROLLER MARKS

Roller marks usually are repetitious and occur either 3.14" (8cm) or 6.28"(16cm) apart. These marks usually occur due to a dirty roller or an "out-of-round roller". If the marks are 3.14" (8cm) apart the problem is being caused by a 1" diameter roller (1" acrylic or Squeegee Roller). A 2" diameter (5cm) roller causes a mark that is 6.28" (16cm). Use the described method for isolation as found in the Section 9.4.1.1.2. After problem has been isolated to a particular rack, clean and inspect each roller in that rack. Check for buildup and/or "out of round" rollers.

### 9.4.5 STATIC MARKS

Static marks can come in a variety of shapes. They will always be a plus density. They will be caused by excessive dryness (low humidity) in the darkroom. See installation specifications for proper humidity requirements. If static persists after raising the air moisture levels, install two acrylic rollers at the entrance of the developer rack.

### 9.4.6 WET FILMS

A variety or a combination of factors may cause wet or tacky films. Listed below is a checklist of items, which should be investigated:

Check Dryer Thermostat setting
Check both fixer and developer chemical strength
Check amperage for both upper and lower heating elements (See Section 9.3.1.2)
Check Replenishment rates
Check relative humidity (See Section 2.2)
Check Feed Sensor (Microswitch)
Try a different type of film