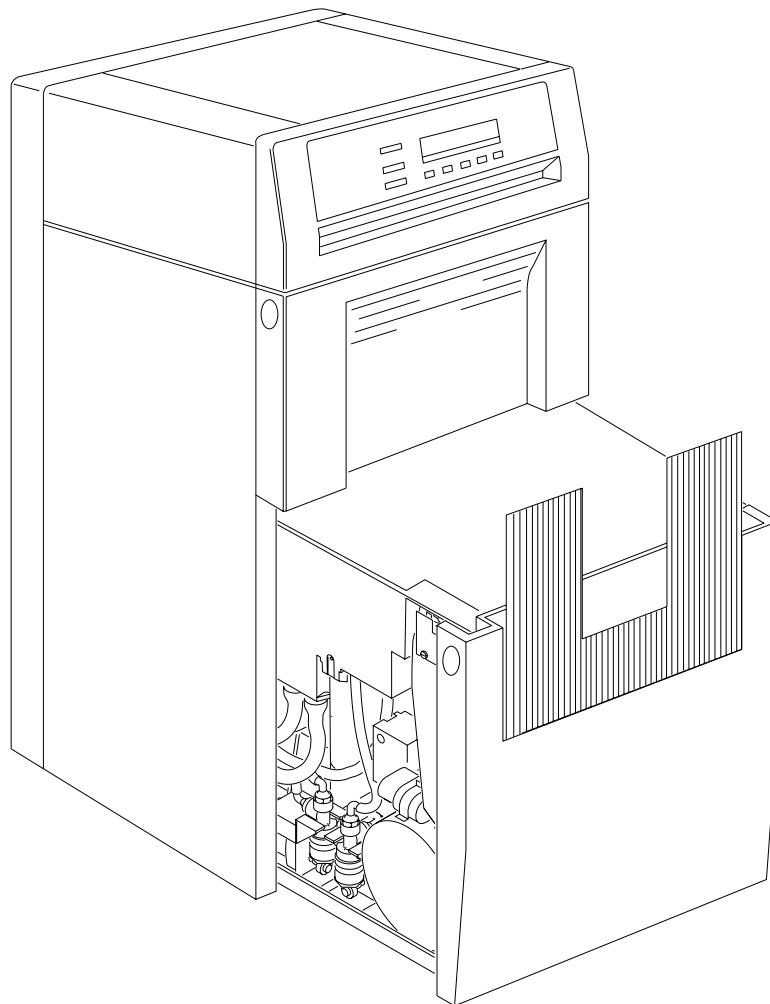

Publication No. SM3058-3

May 1996

Supersedes SM3058-3

3/94

SERVICE MANUAL
for the *Kodak X-Omat 270* RA PROCESSOR
in a
***Kodak X-Omat* MULTILOADER 300**



H104_0192DA



HEALTH IMAGING

PLEASE NOTE The information contained herein is based on the experience and knowledge relating to the subject matter gained by Eastman Kodak Company prior to publication.

No patent license is granted by this information.

Eastman Kodak Company reserves the right to change this information without notice, and makes no warranty, express or implied, with respect to this information. Kodak shall not be liable for any loss or damage, including consequential or special damages, resulting from any use of this information, even if loss or damage is caused by Kodak's negligence or other fault.



This equipment includes parts and assemblies sensitive to damage from electrostatic discharge. Use caution to prevent damage during all service procedures.



Important

Use qualified personnel to service the PROCESSOR.



Warning

To avoid hazardous conditions, keep floors and floor coverings around your *Kodak X-Omat* PROCESSOR and associated drains clean and dry at all times. Any accumulation of fluids from mixing tanks, drain lines, etc, should be cleaned up immediately. In the event of an accumulation of liquid due to backup, overflow, or other malfunctions of the drain associated with your *X-Omat* PROCESSOR, call a plumber or other contractor to correct any problem with the drain. Kodak accepts no responsibility or liability whatsoever for the serviceability of any drain connected to or associated with a *Kodak X-Omat* PROCESSOR. Such drains are the sole responsibility of the customer.

Table of Contents

Description	Page
Service Overview	4
Special Tools	4
Electrostatic Discharge	4
Overview	4
Preventive Measures	4
Processor Overview	5
Identifying and Removing the COVERS and PANELS	5
De-energizing and Energizing the PROCESSOR	6
Removing the RACKS with Solutions in the TANKS	6
Draining and Filling the TANKS	7
ROLLER TRANSPORT	8
Adjusting the Squareness of the RACKS	8
MAIN DRIVE	9
Removing the DRIVE SHAFT, DRIVE CHAIN, DRIVE MOTOR, WORM GEARS, and DRIVE SHAFT BEARINGS	9
Adjusting the Tension on the DRIVE CHAIN	11
DRYER ASSEMBLY	12
Removing the DRYER OVER-TEMPERATURE THERMOSTAT or the DRYER THERMISTOR	12
Removing the DRYER HEATER HR3, DRYER BLOWER, or AIRFLOW SWITCH	13
Plumbing	14
General Information	14
Removing the DEVELOPER or FIXER HEATER and THERMISTOR	15
Removing the DEVELOPER COOLING SOLENOID L2	16
Removing the WATER SOLENOID VALVE	16
Removing the POPPET VALVES from the REPLENISHMENT PUMPS	17
Electrical	18
Removing the AUTOTRANSFORMER T1 or EMI LINE FILTER	18
Removing the 500 CIRCUIT BOARD, the Microprocessor	19
Removing a SOLID STATE RELAY	21
Removing the DRIVE MOTOR CONTROLLER A2	22
Removing the LEVEL SENSOR HOUSING and the LEVEL SENSOR PROBES	23
Removing the QUAD POWER SUPPLY A1	23
Checking the DETECTOR SWITCHES	24
Adjusting the Film DETECTOR SWITCHES	25
Adjusting the DETECTOR SWITCHES from Side to Side	25
Adjusting the DETECTOR SWITCHES Up and Down	26
Preventive Maintenance	28
Weekly Preventive Maintenance	28
Monthly Preventive Maintenance	29
3 Month Preventive Maintenance	31
Preventive Maintenance Schedule	34
Publication History	35

Section 1: Service Overview

Special Tools

Tool No.	Description
TL-2431	AIR METER
TL-1434	Carpenter's LEVEL, approximately 30 cm (12 in.) long
TL-2170	CLAMPS (Order 2)
5B6278	Diagnostics Diskette
TL-4430	EXTRACTION TOOL
TL-3346	GROUNDING KIT
TL-4391	INTERFACE CABLE
TL-2324	LITHIUM BALL and ROLLER BEARING GREASE
TL-1926	Magnetic Power Warning Sign
-----	PORTABLE COMPUTER ¹
1C8022	SEALANT
TL-2192	THERMAL GREASE

- ¹ The PORTABLE COMPUTER must meet the criteria listed below:
- be an IBM compatible computer
 - have MS-DOS version 3.0 or higher installed on the HARD DISK
 - have a 720 KB 3 1/2 in. DISK DRIVE
 - have a serial communications port configured as COM 1: See the User Manual for the PORTABLE COMPUTER

Electrostatic Discharge

Overview

ESD--electrostatic discharge--is a primary source of:

- product downtime
- lost productivity
- costly repairs

While one cannot feel a static charge of less than 3,500 volts, as few as 30 volts can damage or destroy essential components in electronic equipment.

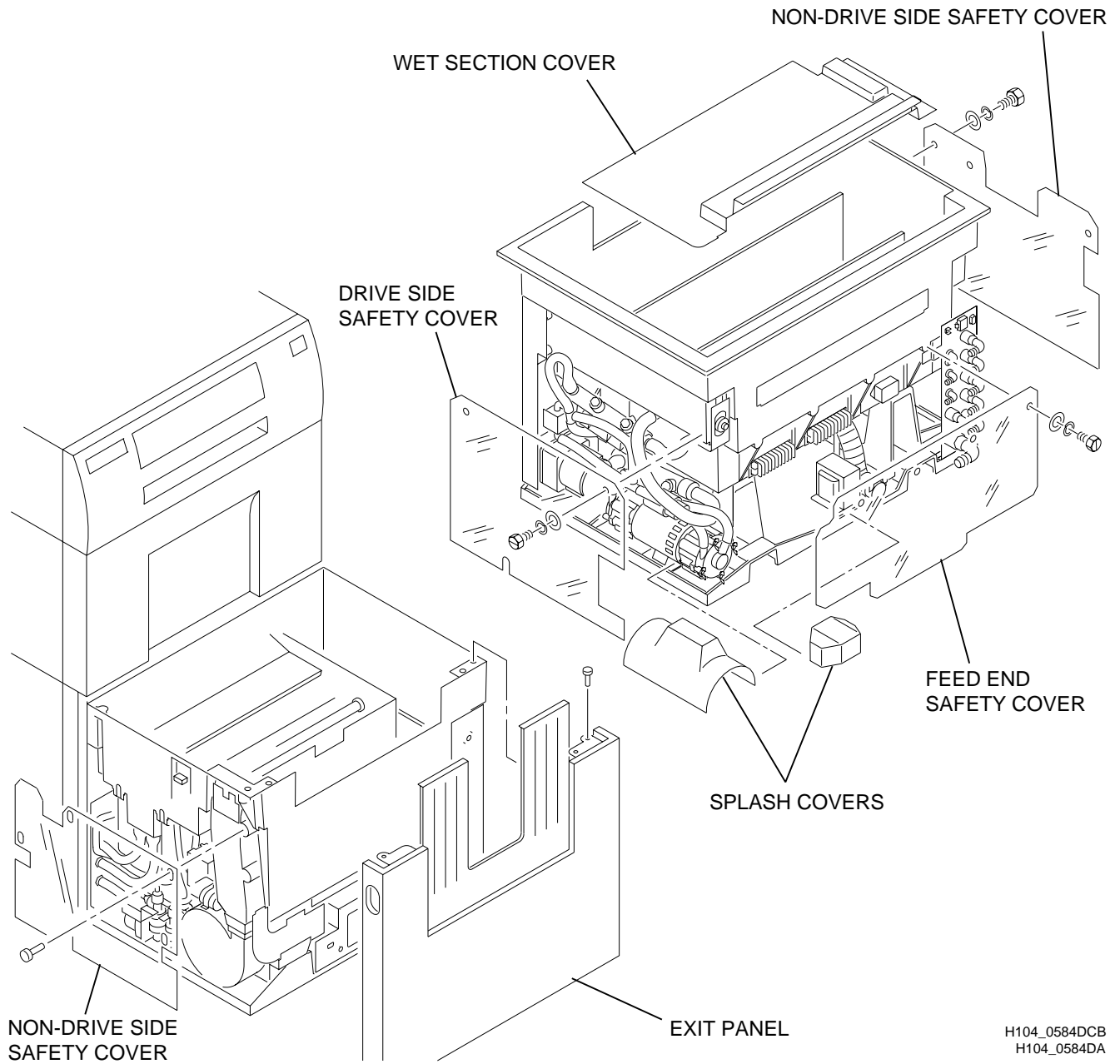
Preventive Measures

- Always look for an ESD warning label before doing any procedure involving static-sensitive components such as CIRCUIT BOARDS. All static-sensitive components are marked with bright graphic labels, which frequently include instructions. Follow all label instructions.
- Wear a grounding strap when handling static-sensitive components. Always make certain that the clip remains attached to a properly grounded, unpainted, clean surface.
- Repair static-sensitive components at an ESD-protected work station or use a portable grounding mat. For help in setting up an ESD-protected work station, contact your Kodak representative.
- When moving static-sensitive components from one area to another, insert and transport the components in ESD-protective packaging.

Processor Overview

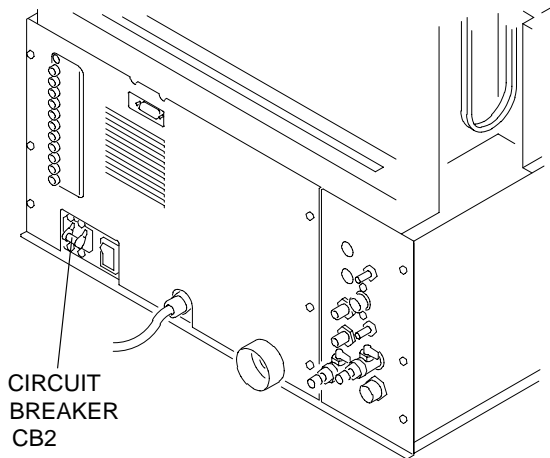
Identifying and Removing the COVERS and PANELS

Before you do most of the procedures in this service manual, you must remove certain PANELS or COVERS from the PROCESSOR.



H104_0584DCB
H104_0584DA

De-energizing and Energizing the PROCESSOR



CIRCUIT
BREAKER
CB2

H104_0390ACA
H104_0390AC

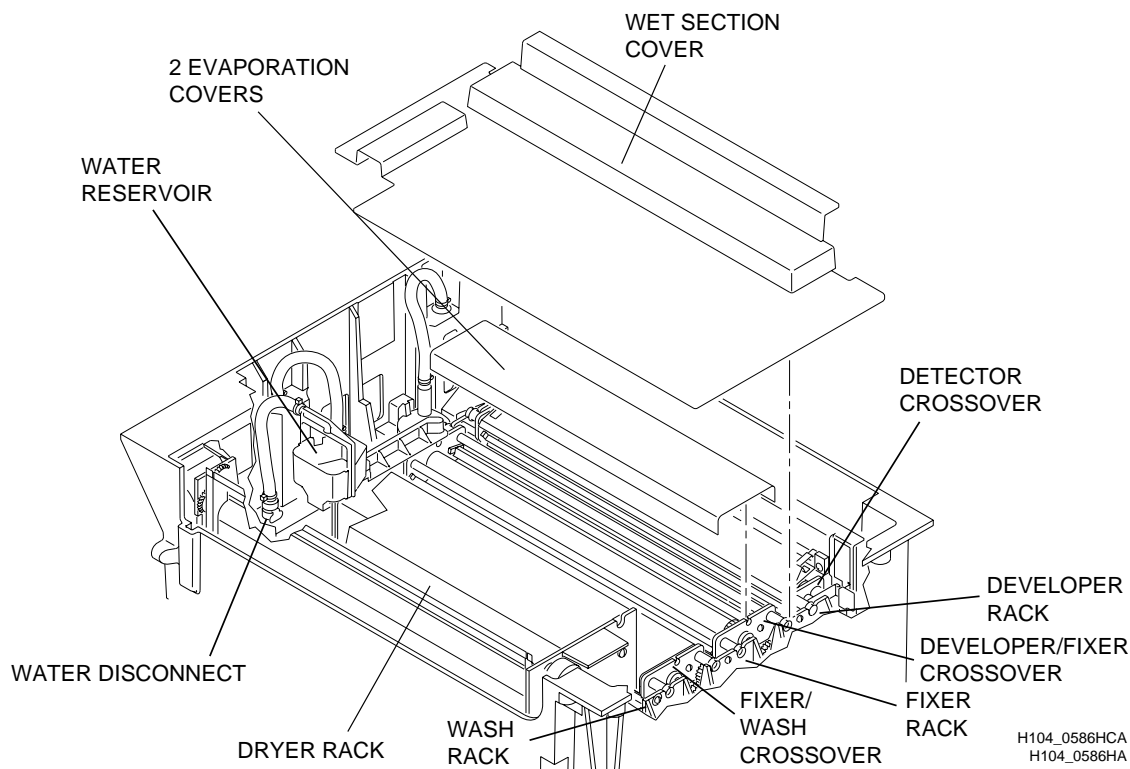
Warning

Dangerous Voltage. Before you replace electrical components, move the main wall **CIRCUIT BREAKER** to “OFF”. Lock the wall **CIRCUIT BREAKER** and attach a **MAGNETIC POWER WARNING SIGN TL-1926** to warn others not to energize the **PROCESSOR** while you are performing service.

For most of the service procedures, the **PROCESSOR** must be de-energized. To **de-energize** the **PROCESSOR**, move the **CIRCUIT BREAKER CB2** on the bottom left corner on the back of the **MULTILOADER** to the “O” position and the main wall **CIRCUIT BREAKER** to “OFF”.

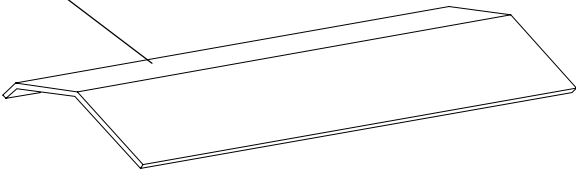
To **energize** the **PROCESSOR**, move the main wall **CIRCUIT BREAKER** to “ON” and the **CIRCUIT BREAKER CB2** to the “I” position.

Removing the RACKS with Solutions in the TANKS



H104_0586HCA
H104_0586HA

SPLASH
GUARD



DRIP
TRAY

H108_0035ACC
H108_0035AA

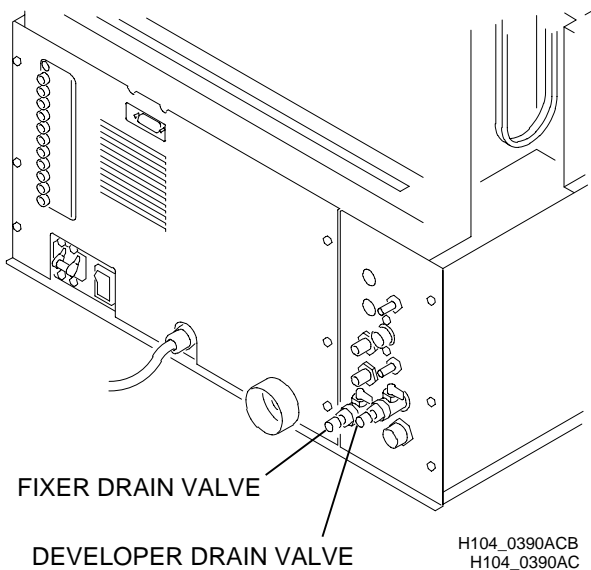


Caution

When you remove or install the RACKS, use the techniques listed below:

- Do not allow the fixer solution to contaminate the developer solution.
- Install the SPLASH GUARD between the DEVELOPER TANK and the FIXER TANK when you remove the DEVELOPER RACK.
- Use DRIP TRAYS under the DEVELOPER and FIXER RACKS.
- When you remove the RACKS, lift them out of the PROCESSOR slowly and tilt them so that the processing solution drains into the Tank
- When you install the RACKS, insert them in the TANK slowly to prevent the processing solutions from splashing over the TANK.

Draining and Filling the TANKS



FIXER DRAIN VALVE

DEVELOPER DRAIN VALVE

H104_0390ACB
H104_0390AC

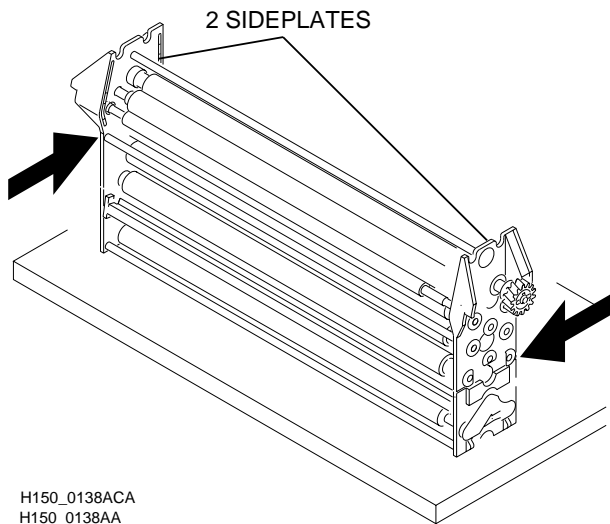
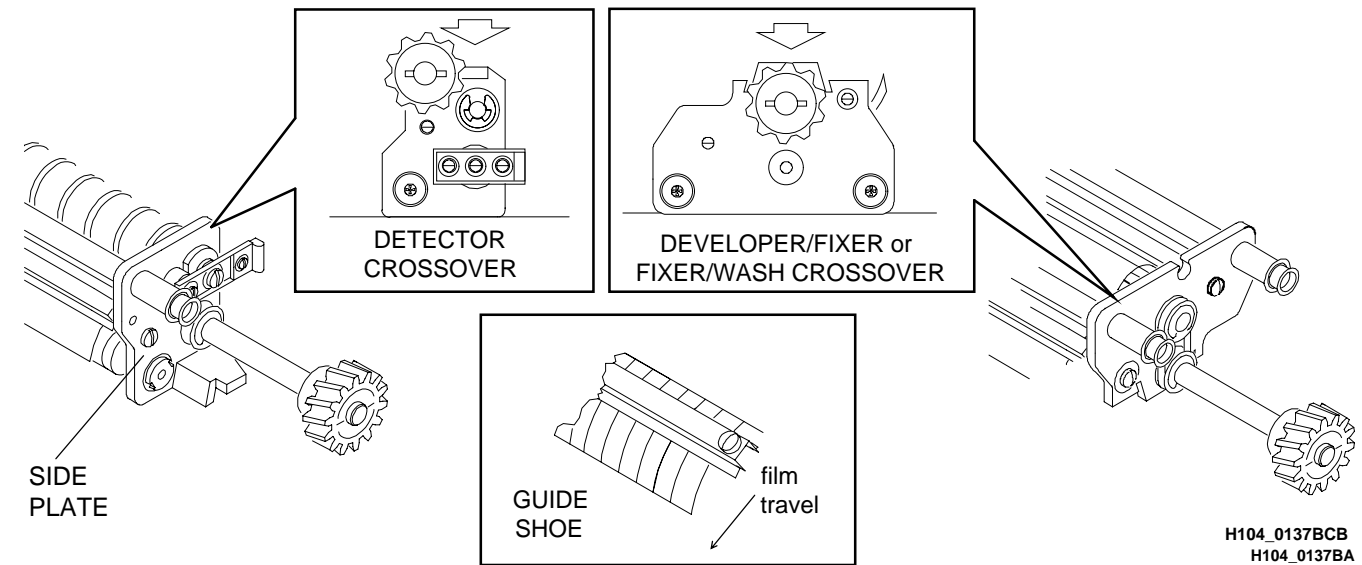
- [1] To drain the TANKS, de-energize the PROCESSOR and open the DEVELOPER and FIXER DRAIN VALVES.
- [2] To fill the TANKS, do the steps below.
 - (a) Close the DRAIN VALVES and push the PROCESSOR into the MULTILoader.
 - (b) Energize the PROCESSOR.
 - (c) From the main menu on the DISPLAY PANEL, select **PROC.** Then press:
 - **GO TO SETUP** key
 - 4-digit access code, **4213**
 - **OPTIONS** key
 - **REPLEN MODE** key
 - **TANK FILL** key

Note

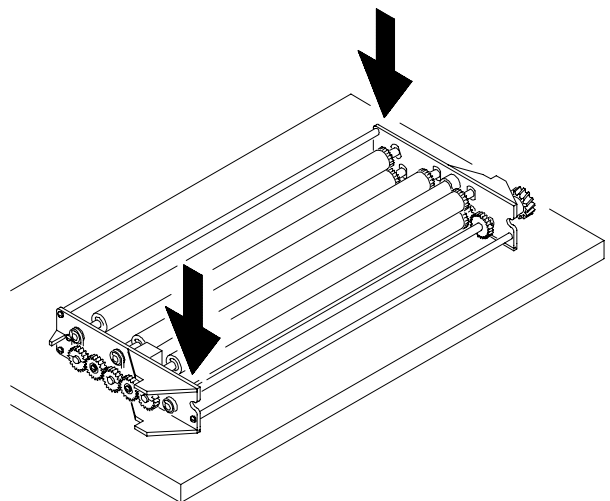
See the Operator Guide, Publication Part No. 240990, for more details on draining and filling the processing TANKS.

Section 2: ROLLER TRANSPORT

Adjusting the Squareness of the RACKS



H150_0138ACA
H150_0138AA

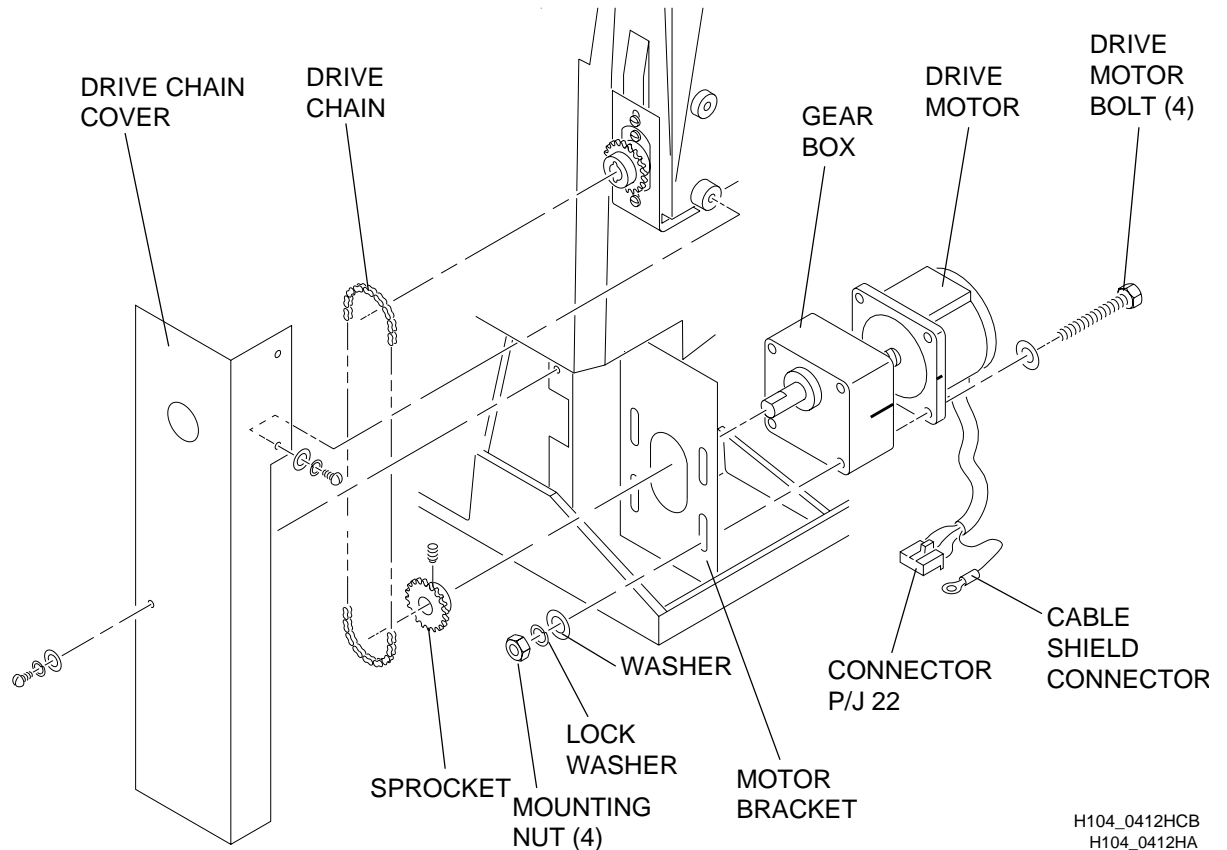


H104_0139AA

- [1] Place the RACK on a smooth, flat surface.
- [2] Check whether the SIDEPLATES of the RACK touch the flat surface evenly. If they do not touch evenly, apply pressure to the assembly. See the figure at the left for where to apply pressure to the DEVELOPER and FIXER RACKS. See the figure below for where to apply pressure to the WASH RACK.

Section 3: MAIN DRIVE

Removing the DRIVE SHAFT, DRIVE CHAIN, DRIVE MOTOR, WORM GEARS, and DRIVE SHAFT BEARINGS



H104_0412HCB
H104_0412HA

Note

It is not necessary to remove the DRIVE MOTOR to remove the DRIVE SHAFT.

[1] De-energize the PROCESSOR.

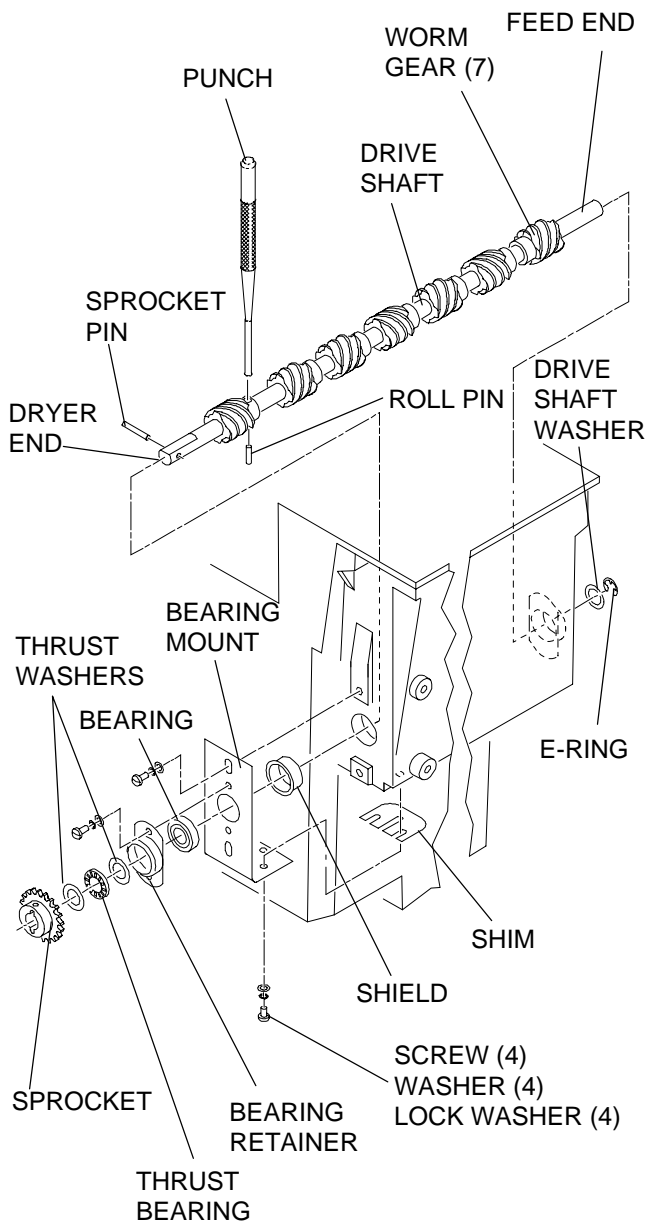
[2] Remove:

- DRIVE CHAIN COVER
- DRIVE CHAIN
- DRIVE MOTOR (if desired)

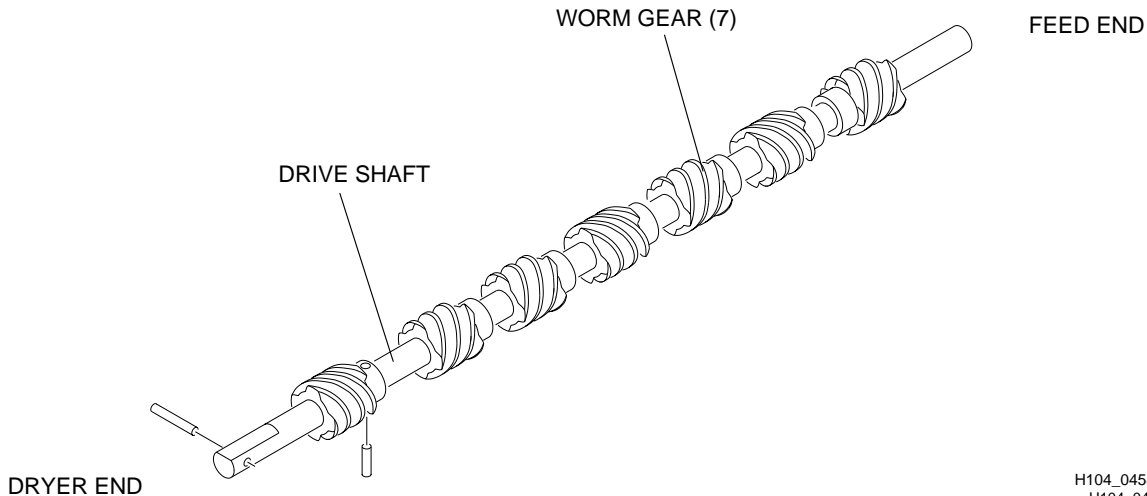
[3] Remove from the FEED END of the DRIVE SHAFT:

- E-RING
- DRIVE SHAFT WASHER (quantity may vary)

[4] For access to the SPROCKET PIN, move the DRIVE SHAFT toward the RECEIVE END of the PROCESSOR.



H104_0148CCB
H104_0148CA



H104_0458BCA
H104_0458BA

[5] Remove from the DRYER END of the DRIVE SHAFT the:

- SPROCKET PIN and SPROCKET
- 2 THRUST WASHERS
- THRUST BEARING
- BEARING RETAINER and BEARING
- BEARING MOUNT
- any SHIMS and SHIELD



Important

Observe the quantity of SHIMS removed. When assembling the DRIVE SHAFT, install the same quantity of SHIMS.

[6] Remove the DRIVE SHAFT by slowly pulling it toward the DRYER END of the PROCESSOR.

[7] If necessary, remove any WORM GEARS that have wear from the DRIVE SHAFT. Use a PUNCH to remove the ROLL PIN from the WORM GEAR.



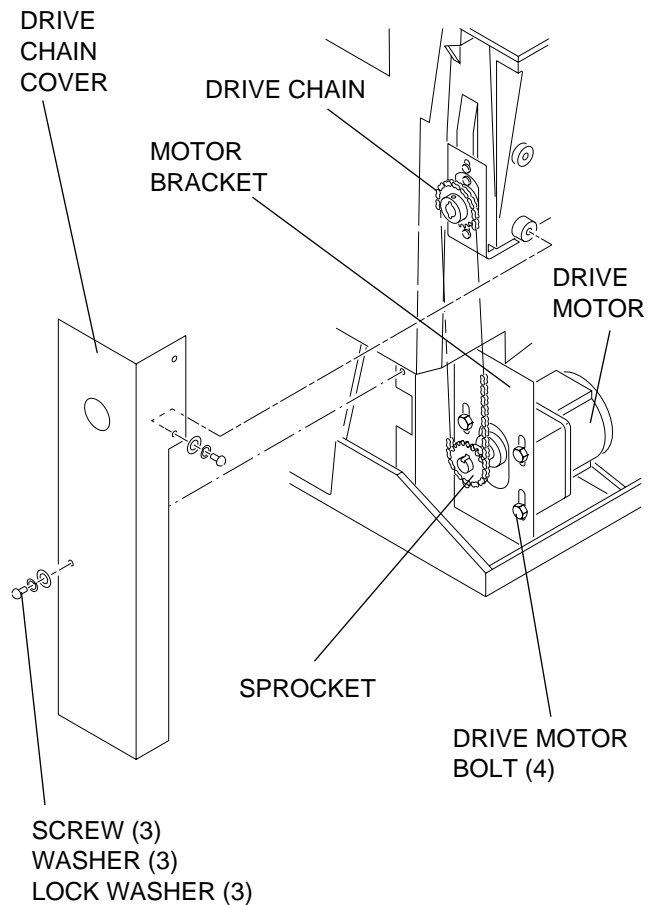
Important

- Check the direction of the WORM GEARS. See the figure below for correct installation on the DRIVE SHAFT.
- When you install the DRIVE SHAFT, install a quantity of DRIVE SHAFT WASHERS until the DRIVE SHAFT has minimum play from side to side.

[8] Reverse the above procedure to install a new DRIVE SHAFT. Install the same quantity of SHIMS that you removed in Step 5.

[9] Adjust the tension on the DRIVE CHAIN.

Adjusting the Tension on the DRIVE CHAIN



- [1] De-energize the PROCESSOR.
- [2] Remove the DRIVE CHAIN COVER.
- [3] Loosen the 4 DRIVE MOTOR BOLTS from the MOTOR BRACKET.
- [4] Press down on the DRIVE MOTOR to tighten the DRIVE CHAIN. Allow **5 mm (1/4 in.) deflection** of the DRIVE CHAIN at the center of the DRIVE CHAIN.
- [5] Tighten the 4 DRIVE MOTOR BOLTS.

H104_0593CCA
H104_0593CA

Section 4: DRYER ASSEMBLY

Removing the DRYER OVER-TEMPERATURE THERMOSTAT or the DRYER THERMISTOR

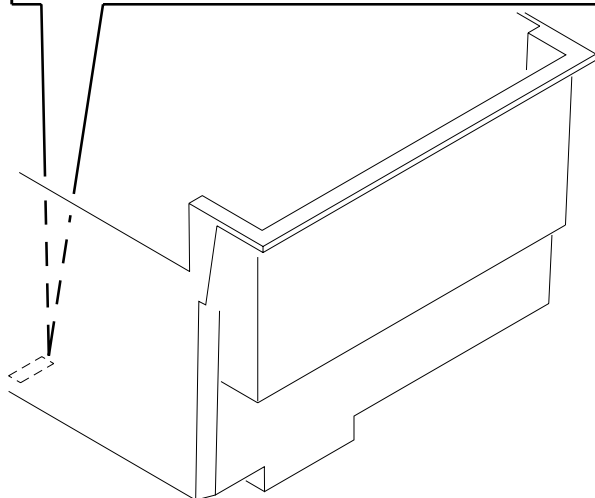
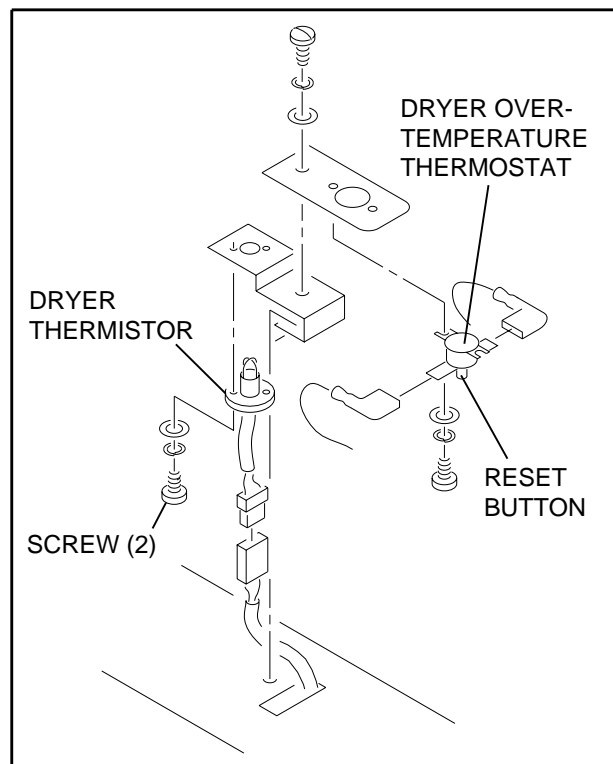


Important

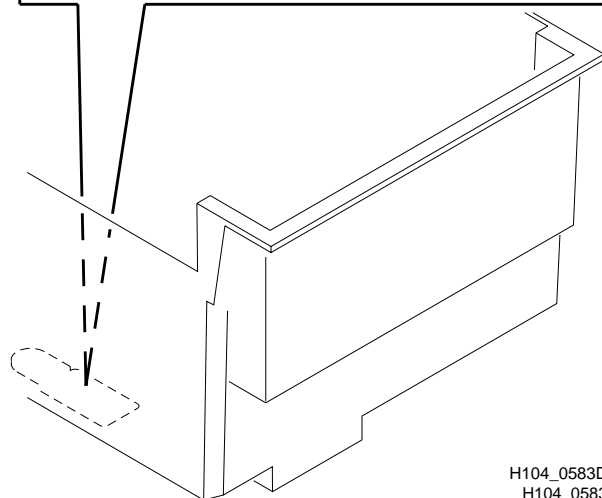
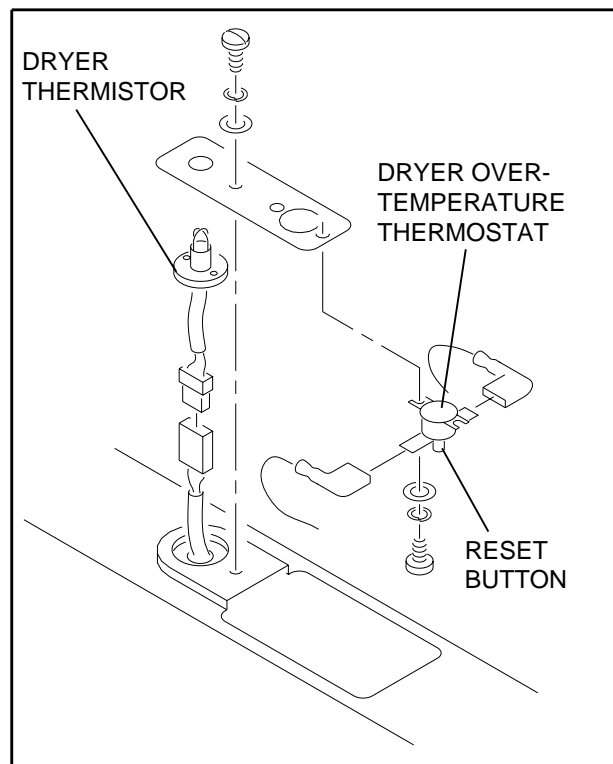
The DRYER OVER-TEMPERATURE THERMOSTAT does not automatically reset after an over-temperature condition. To reset the DRYER OVER-TEMPERATURE THERMOSTAT manually, press the RESET BUTTON.

- [1] De-energize the PROCESSOR.
- [2] See the illustrations below to remove the desired component.

Old Style THERMISTOR BRACKET



New Style THERMISTOR BRACKET



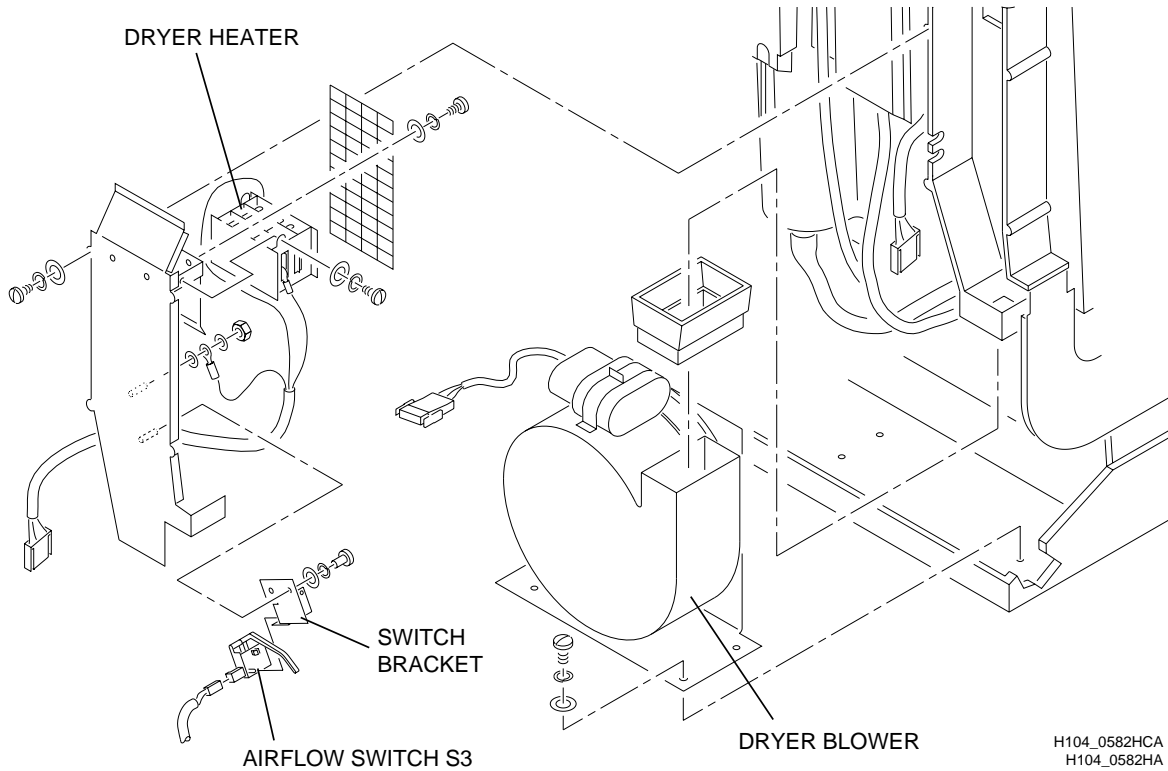
H104_0583DCB
H104_0583DA

Removing the DRYER HEATER HR3, DRYER BLOWER, or AIRFLOW SWITCH

- [1] De-energize the PROCESSOR.
- [2] See the illustration to remove the desired component.

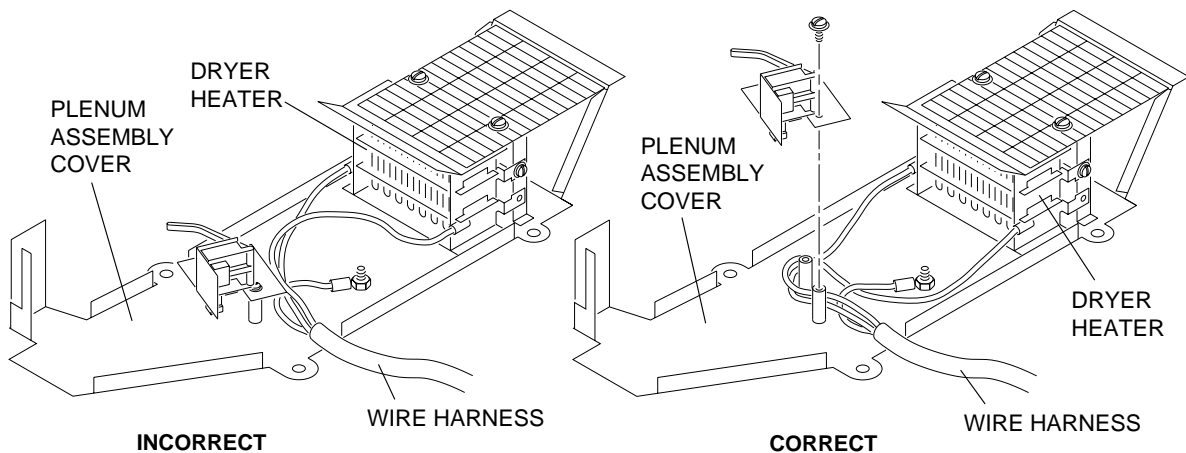
Note

The AIRFLOW SWITCH snaps into the SWITCH BRACKET. It is not necessary to remove the SWITCH BRACKET.



Caution

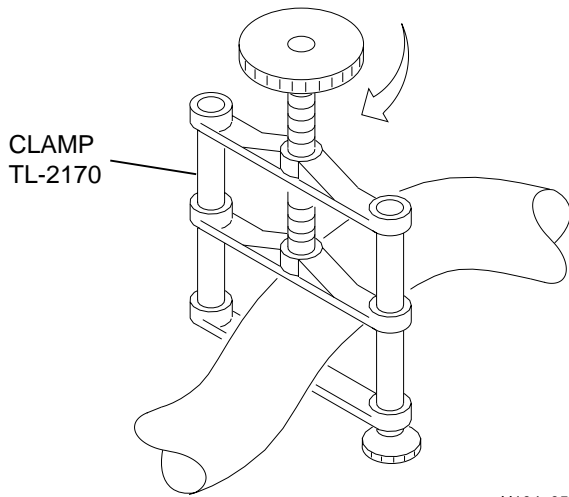
- When you install a new DRYER HEATER, check that all wires are in the correct openings in the PLENUM ASSEMBLY COVER and are not pinched.
- Install the WIRE HARNESS correctly. If the WIRE HARNESS is too close to the DRYER HEATER, the insulation on the wires may be damaged. See the “CORRECT” figure below **on the right**.



H104_0387BCB
H104_0387BA

Section 5: Plumbing

General Information



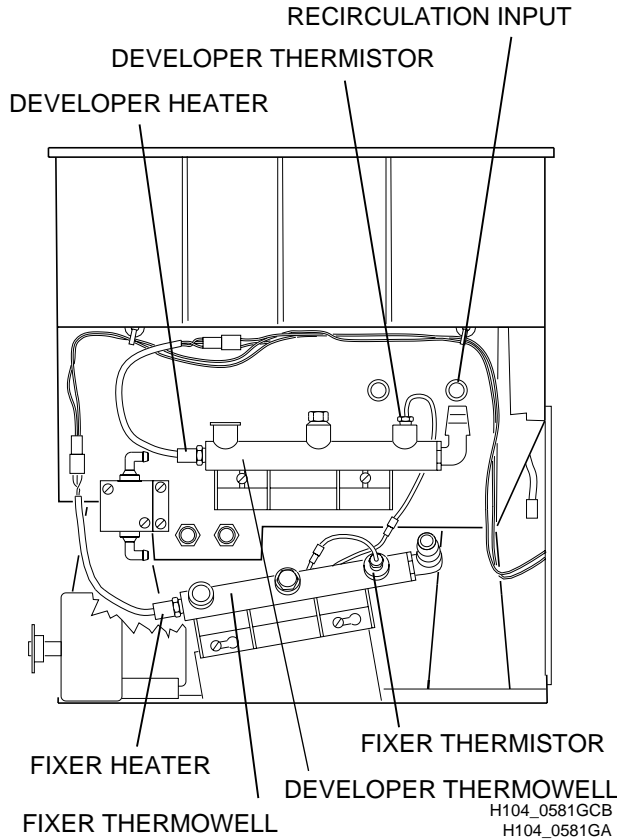
H104_0587ACA
H104_0587AA



Important

- When you disconnect plumbing connections, use CLAMP TL-2170 to stop the flow of solution in the HOSES. If you use CLAMP TL-2170, in most cases, you will not need to drain the TANK.
- When you remove plumbing components, see this section, as well as the COMPONENT LOCATOR manual and the PARTS LIST for illustrations that show the location of parts and show the parts exploded off the components.

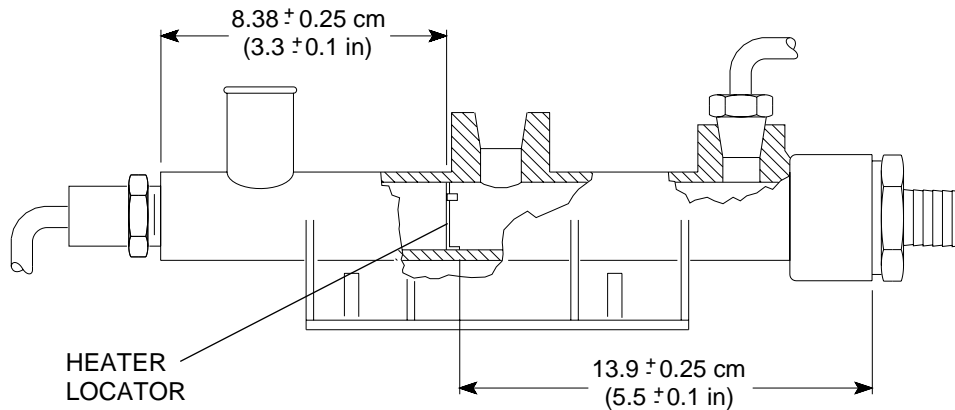
Removing the DEVELOPER or FIXER HEATER and THERMISTOR



 **Important**

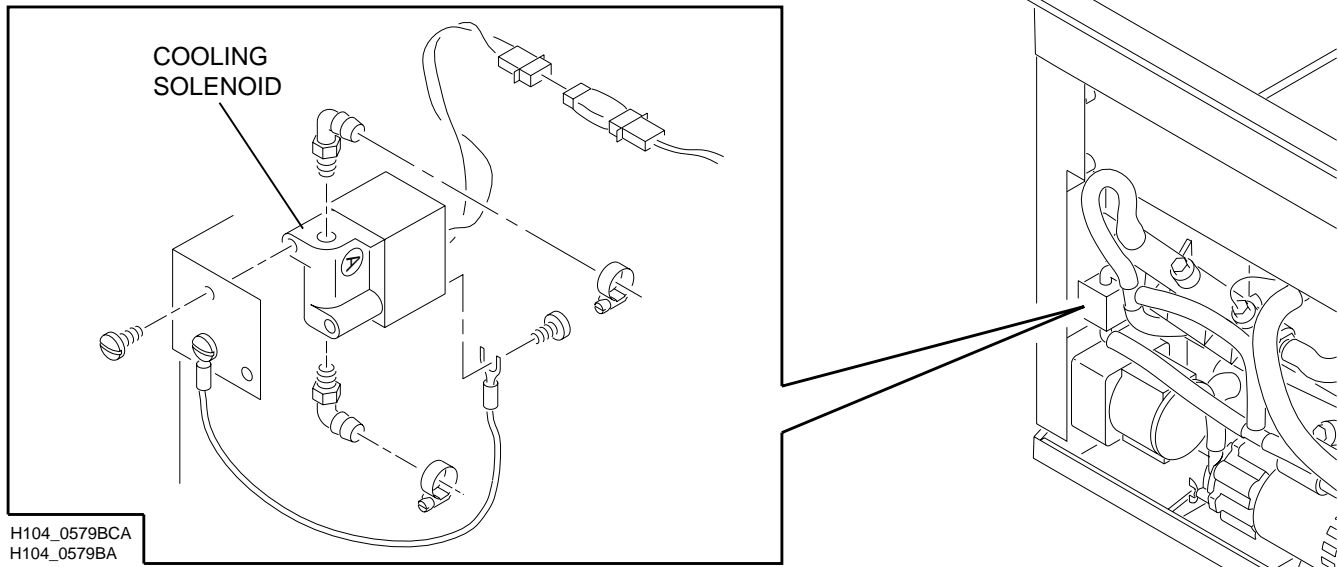
- When you install the HEATERS or THERMISTORS, do not overtighten the parts.
- Use only SEALANT TL-3230 when you install the HEATERS or THERMISTORS into the THERMOWELL. Other SEALANTS will corrode the plastic in the THERMOWELL. See the instructions packed with the SEALANT.
- It is not necessary to remove the THERMOWELLS from the PROCESSOR to remove the HEATERS or THERMISTORS.
- Before you remove the DEVELOPER HEATER or THERMISTOR, drain the DEVELOPER TANK to below the recirculation input opening. (The CLAMP TL-2170 will not work correctly on the short length of HOSES.)

- [1] See the illustration to remove the desired part.
- [2] When you install the HEATERS, check that the internal LOCATOR is positioned correctly inside the THERMOWELL. See the illustration below.



H104_0592BCA
H104_0592BA

Removing the DEVELOPER COOLING SOLENOID L2



[1] See the illustration to remove the SOLENOID.

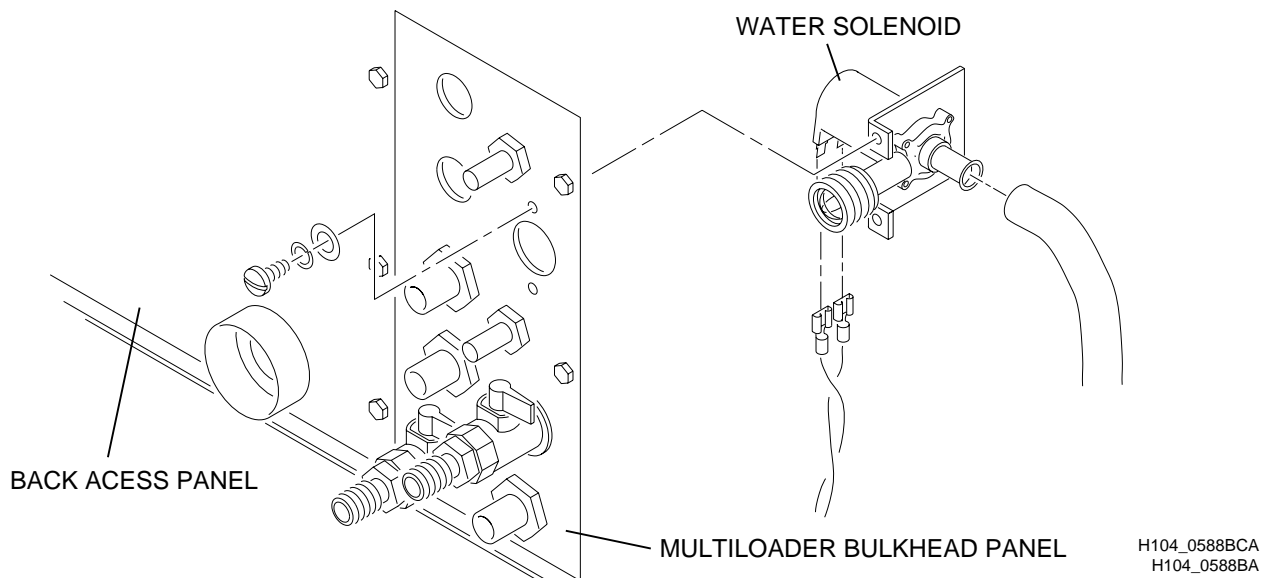


Caution

When you install the new SOLENOID:

- install the SOLENOID so that the A is at the top and the C is at the bottom.
- apply only SEALANT TL3230 on the FITTINGS.
- do not overtighten the parts.

Removing the WATER SOLENOID VALVE



[1] Remove the BACK ACCESS PANEL and the MULTILOADER BULKHEAD PANEL to gain access to the VALVE.

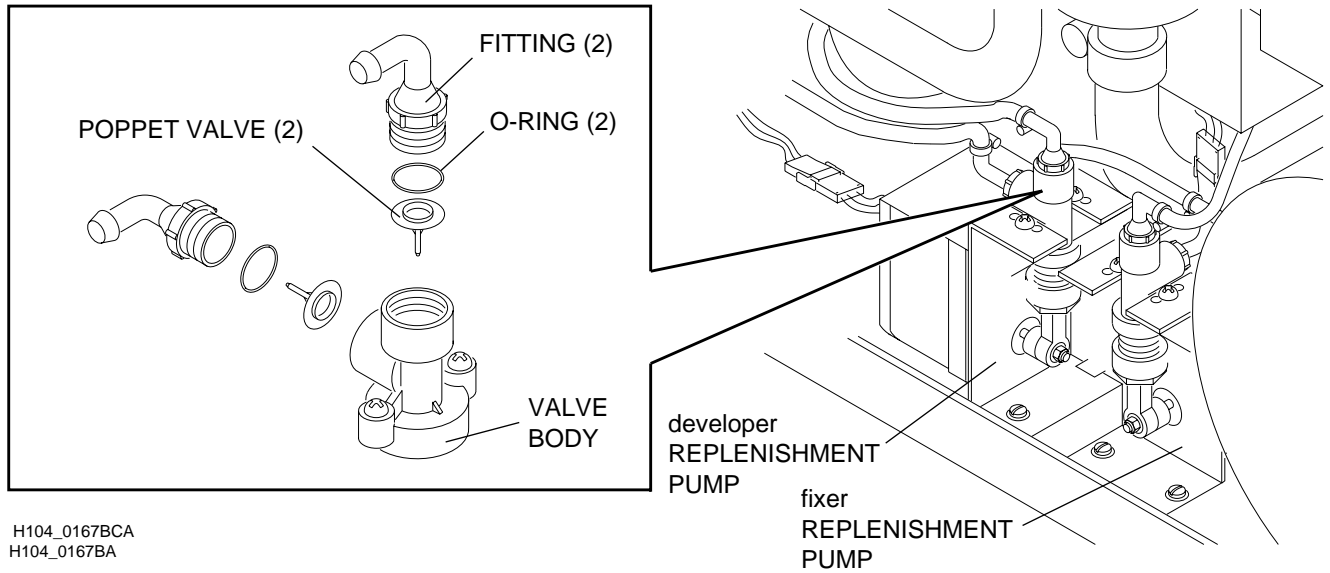
[2] See the illustration to remove the VALVE.

Removing the POPPET VALVES from the REPLENISHMENT PUMPS



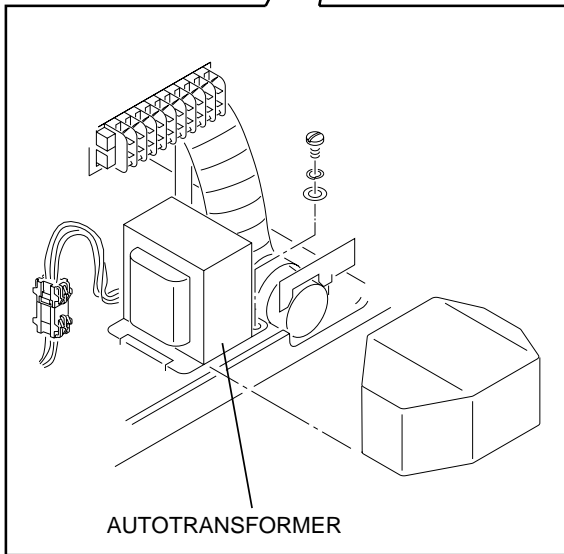
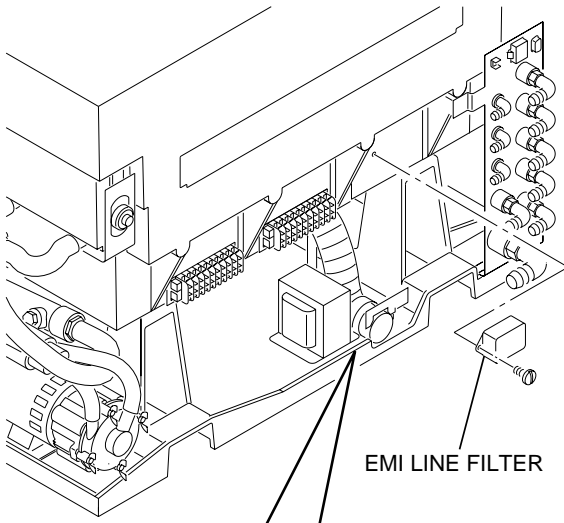
Important

- Observe the direction of the POPPET VALVES and the location of the O-RINGS before you remove them.
- For easier access to the POPPET VALVES, you may want to remove the REPLENISHMENT PUMP.



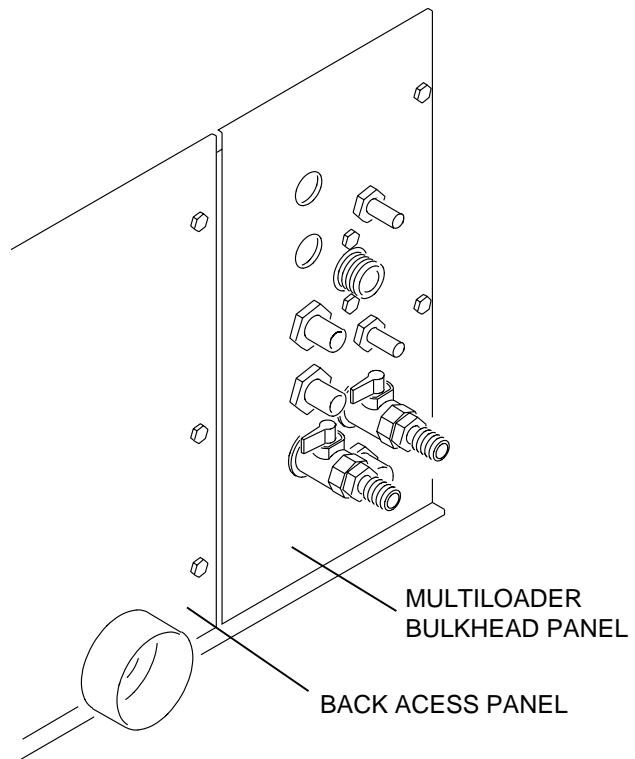
Section 6: Electrical

Removing the AUTOTRANSFORMER T1 or EMI LINE FILTER



H104_0580CCA
H104_0580CA

- [1] De-energize the PROCESSOR.
- [2] For easier access, remove the BACK ACCESS PANEL and the MULTILOADER BULKHEAD PANEL.
- [3] For more play in the HOSES, place the MULTILOADER BULKHEAD PANEL inside the MULTILOADER.
- [4] Fully extend the PROCESSOR from the MULTILOADER.
- [5] Remove the FEED END SAFETY COVER.
- [6] For easier access to the AUTOTRANSFORMER and LINE FILTER, push the PROCESSOR back into the MULTILOADER.
- [7] Working from the back of the MULTILOADER, remove the desired part. Record the position of the wires for the installation of the new part.



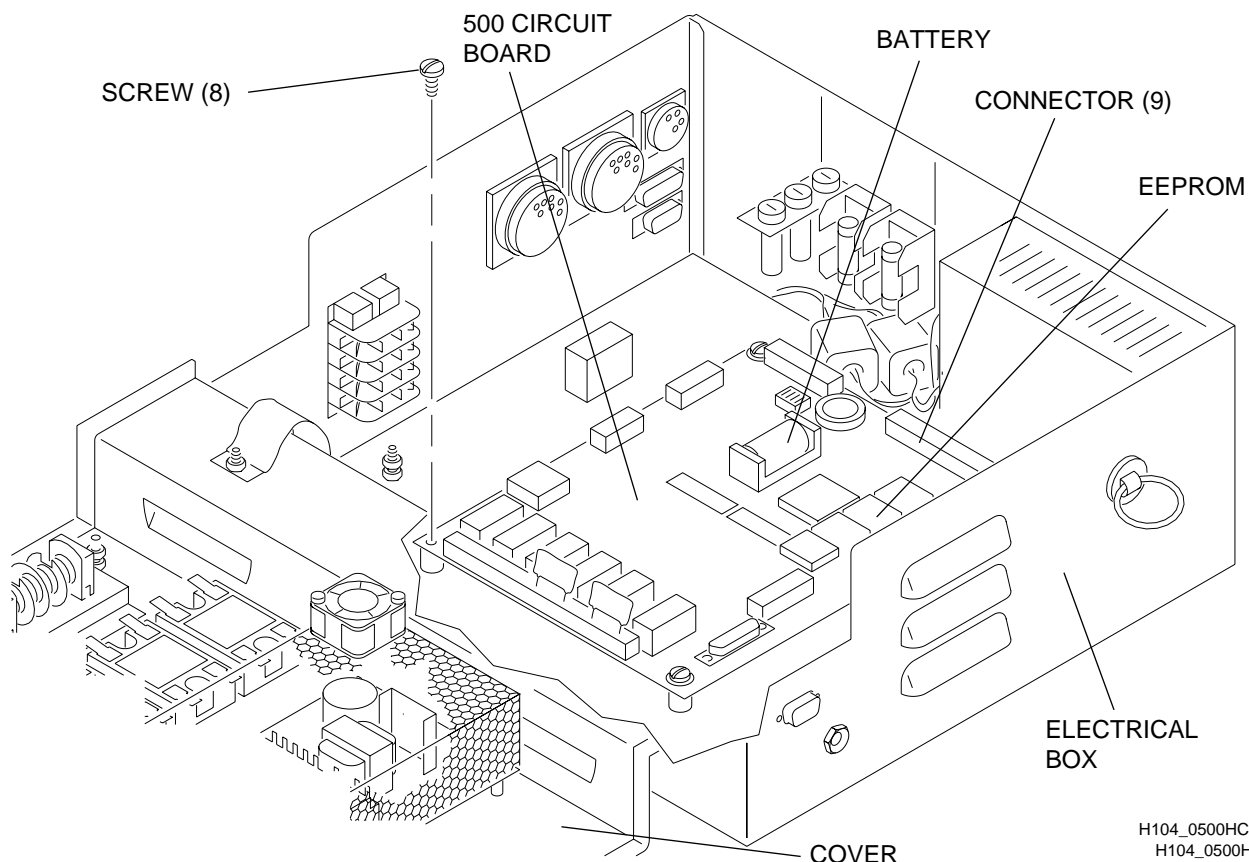
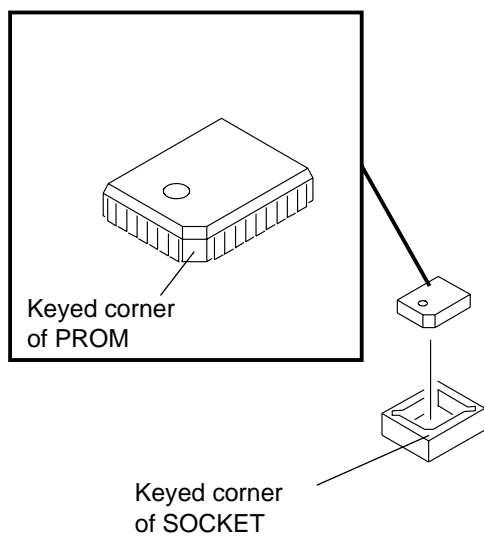
H104_0585GCA
H104_0585GC

Removing the 500 CIRCUIT BOARD, the Microprocessor



ESD

Possible damage from electrostatic discharge.

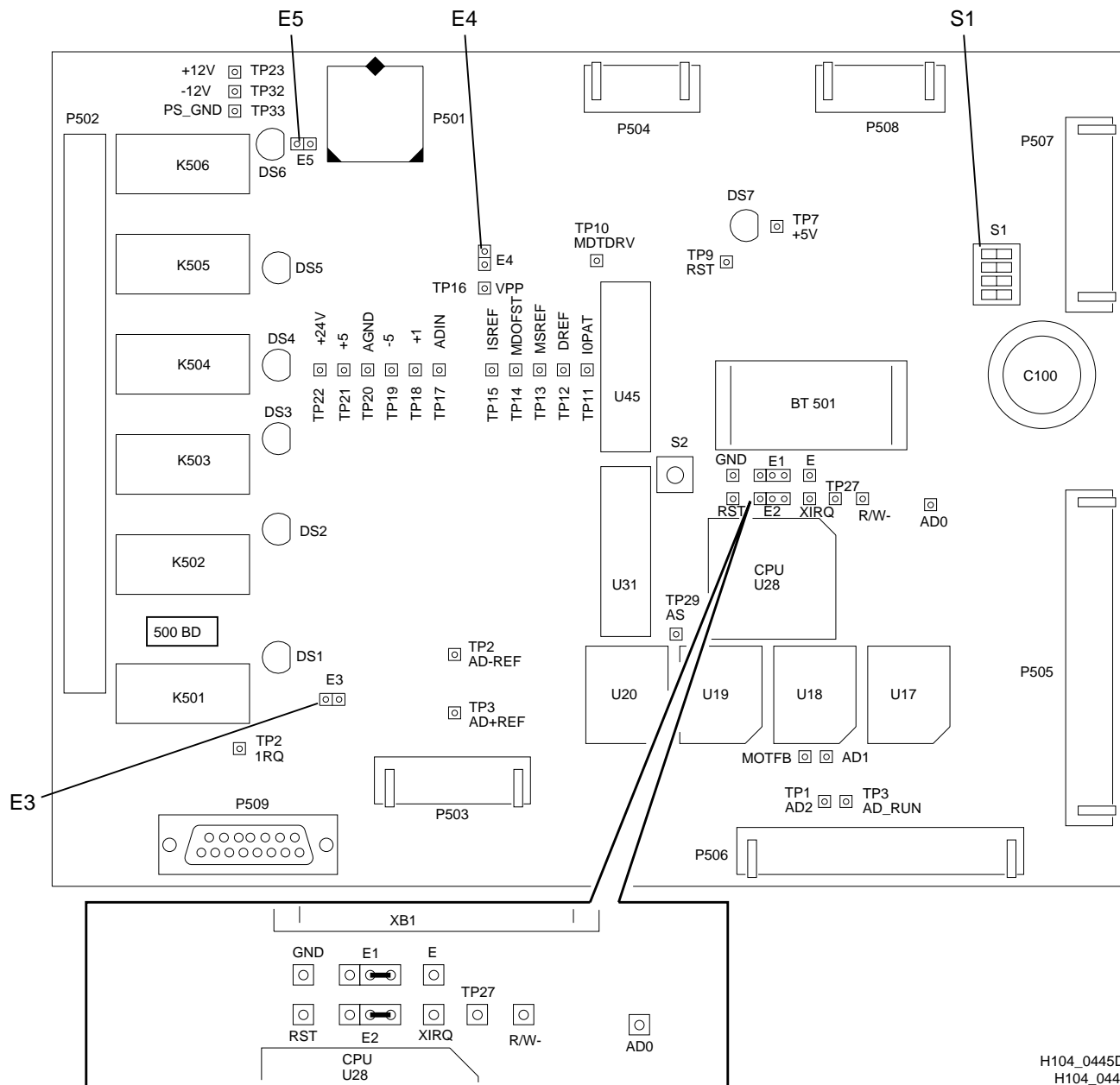
H104_0500HCA
H104_0500HAKeyed corner
of PROMKeyed corner
of SOCKETH104_0312ACA
H104_0312AC

- [1] De-energize the PROCESSOR.
- [2] Using EXTRACTION TOOL TL-4430, remove and transfer the 4 PROMS/EEPROMS U17, U18, U19, and U20 from the existing 500 CIRCUIT BOARD:
 - (a) Move the 4 PROMS/EEPROMS U17, U18, U19, and U20 to the new 500 CIRCUIT BOARD.
 - (b) Place each EEPROM carefully on the SOCKET.
 - (c) Check that the keyed corners are aligned.
 - (d) Press the EEPROM firmly into the SOCKET.
- [3] Check that the EEPROMS are installed in the correct SOCKETS.
- [4] Remove the BATTERY from the existing 500 CIRCUIT BOARD and install the BATTERY on the new 500 CIRCUIT BOARD.

[5] Check the positions of the SWITCHES and the JUMPERS:

Position	Installation
S1 Switch	All positions off
Jumper E1	Jumper Pins 1 and 2
Jumper E2	Jumper Pins 1 and 2
Jumper E3	None
Jumper E4	None
Jumper E5	None

[6] Install the new 500 CIRCUIT BOARD.



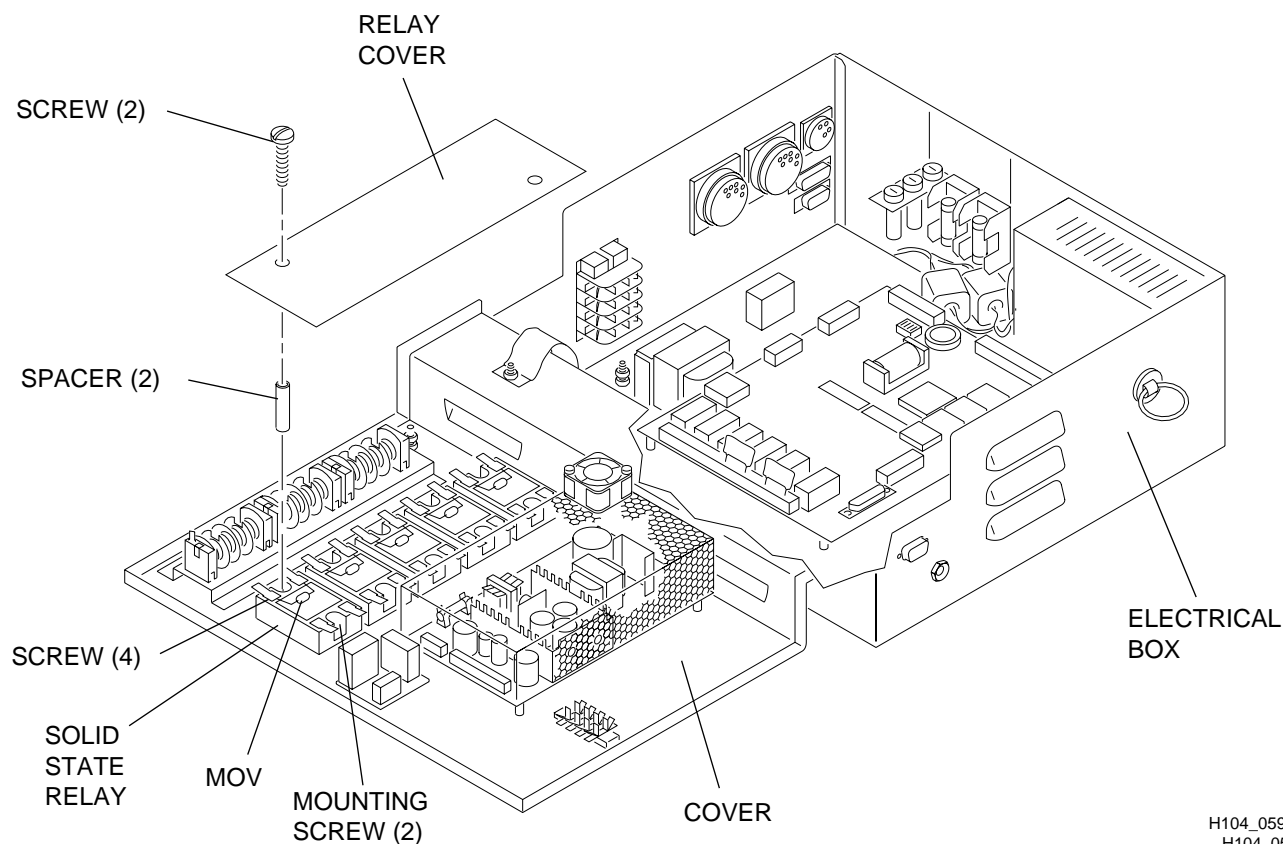
H104_0445DCA
H104_0445DA

Removing a SOLID STATE RELAY



ESD

Possible damage from electrostatic discharge.

H104_0591HCA
H104_0591HA

- [1] De-energize the PROCESSOR.
- [2] Record the 4 wire positions on the SOLID STATE RELAY that you want to remove.
- [3] Apply THERMAL GREASE TL-2324 under the new SOLID STATE RELAY. Use a thin application, but cover the area under the SOLID STATE RELAY completely.
- [4] Install a new METAL OXIDE VARISTOR (MOV) onto the new SOLID STATE RELAY.

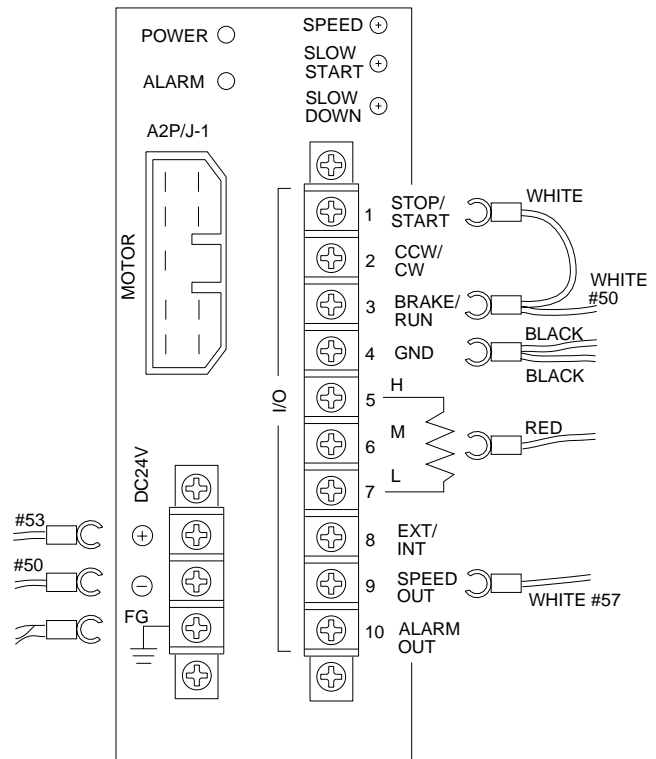
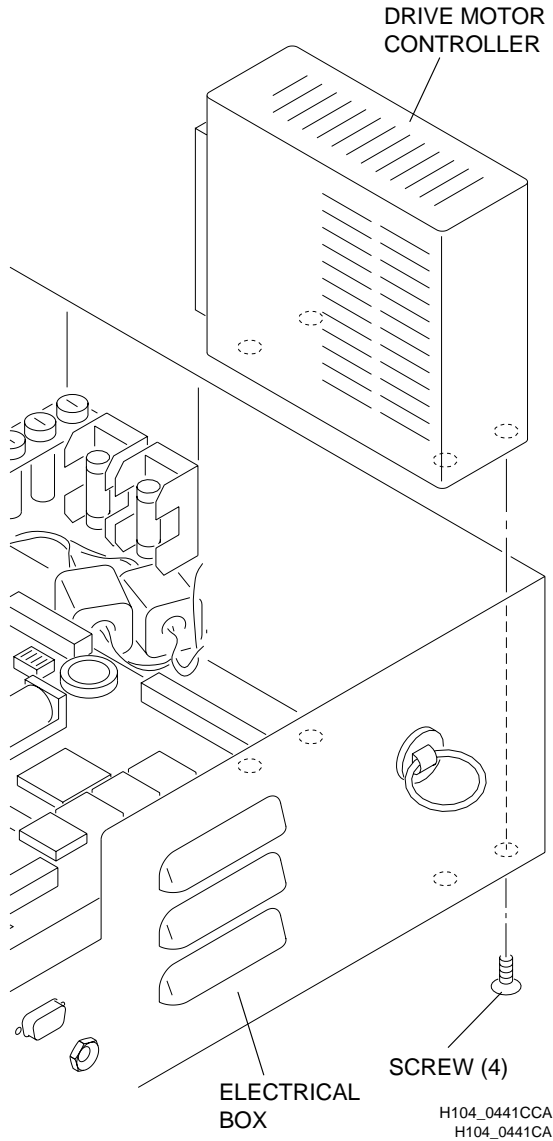
Removing the DRIVE MOTOR CONTROLLER A2



ESD

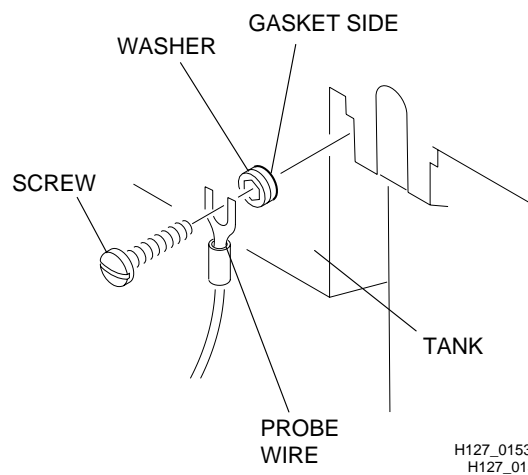
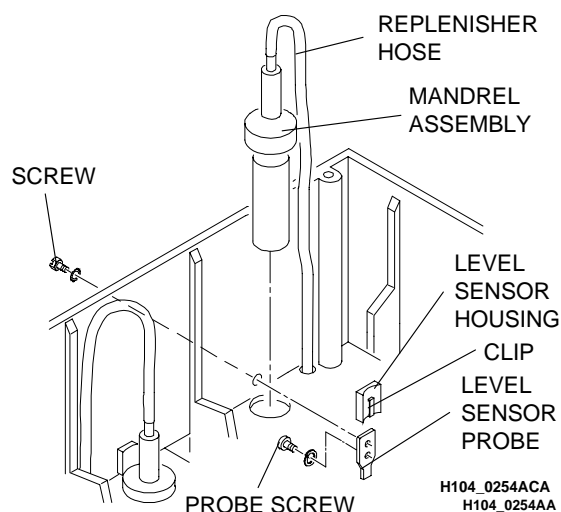
Possible damage from electrostatic discharge.

- [1] De-energize the PROCESSOR.
- [2] See the illustration at the left to remove the DRIVE MOTOR CONTROLLER.
- [3] See the illustration below for the correct wire connections.



H104_0590GA

Removing the LEVEL SENSOR HOUSING and the LEVEL SENSOR PROBES



ESD

Possible damage from electrostatic discharge.



Note

Corrosion deposits on the LEVEL SENSOR parts may prevent the level sense circuit from operating correctly. Clean or replace parts as necessary.

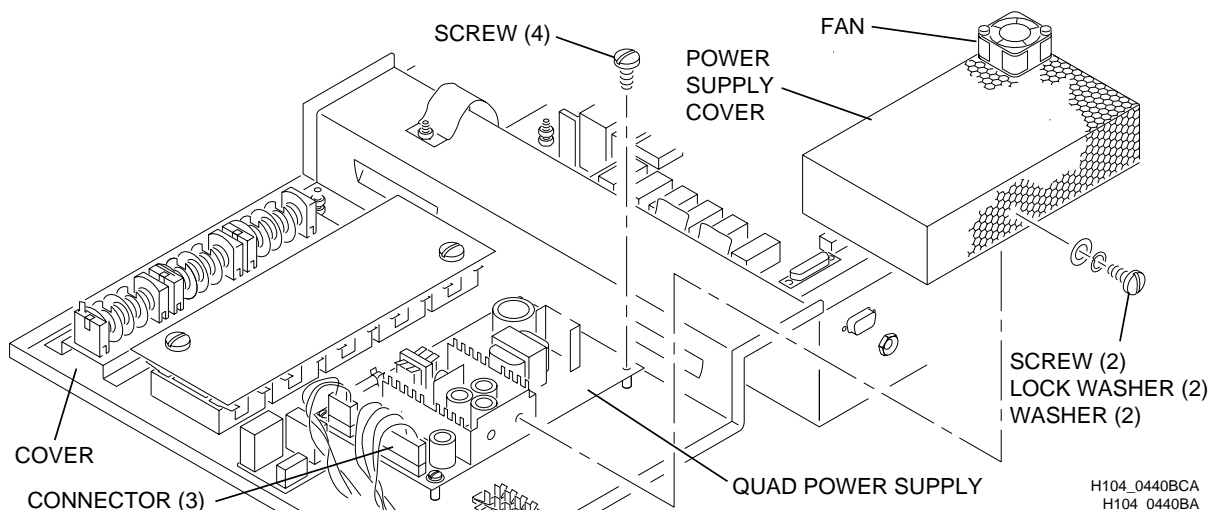
- [1] See the illustrations to remove the desired part.
- [2] When you install the new part, check that the PROBE WIRE is correctly attached to the SCREW and WASHER. Install the GASKET SIDE of the WASHER against the TANK. See the figure.

Removing the QUAD POWER SUPPLY A1



ESD

Possible damage from electrostatic discharge.



- [1] De-energize the PROCESSOR.
- [2] See the illustration to remove the QUAD POWER SUPPLY.

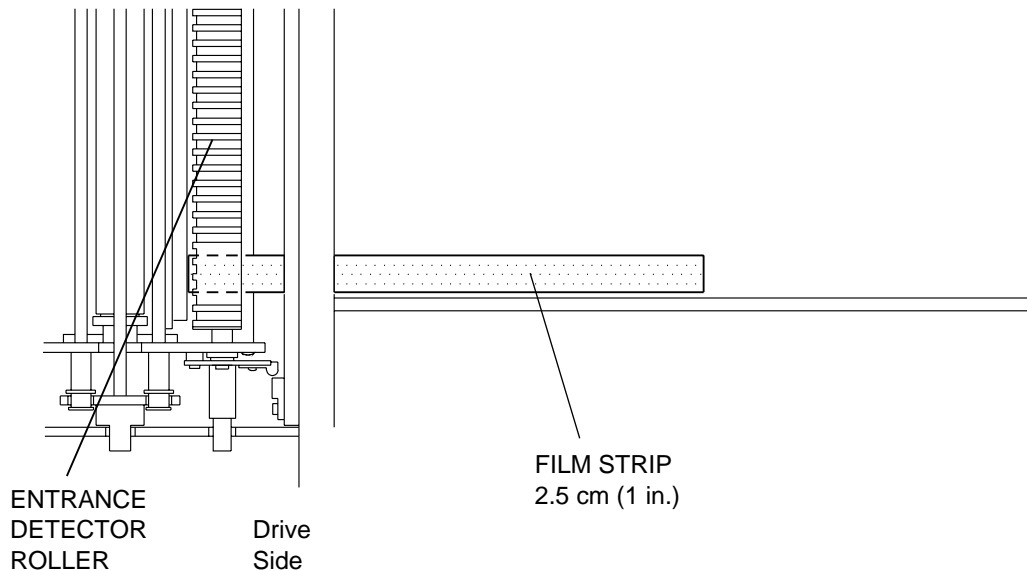
Checking the DETECTOR SWITCHES

- [1] Check that all film is removed from between the ENTRANCE DETECTOR ROLLERS.
- [2] Connect the PORTABLE COMPUTER to the 15-PIN DIAGNOSTIC CONNECTOR on the ELECTRICAL BOX.

Note

See the User Instructions, Publication Part No. 699614, for the operation of the diagnostic procedures.

- [3] Enter the "SPECIFIC TEST MODE" of the diagnostic program on the PORTABLE COMPUTER.
- [4] Select the "PROCESSOR SENSOR TEST". The "PROCESSOR SENSOR TEST" will provide you with the status of the 2 film DETECTOR SWITCHES.
- [5] Check that the message "No film detected" is displayed on the PORTABLE COMPUTER.



H104_0577BCA
H104_0577BC

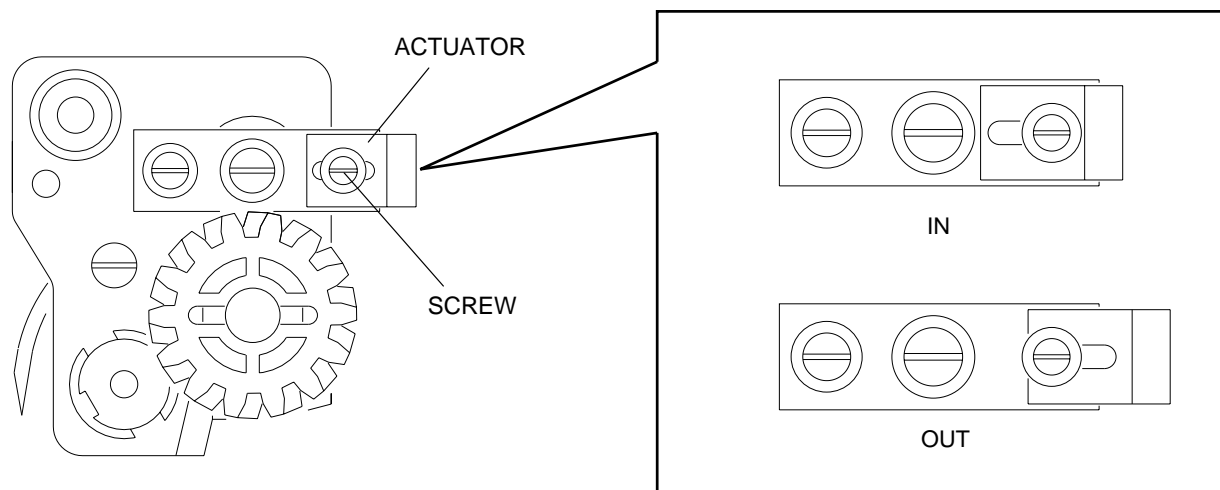
- [6] Lift the top ENTRANCE DETECTOR ROLLER, and insert the 2.5 cm (1 in.) FILM STRIP between the ENTRANCE DETECTOR ROLLERS on the drive side of the PROCESSOR.
- [7] Check that the message "Film detected" is displayed on the PORTABLE COMPUTER. Remove the film.
- [8] Do Steps 5-7 again for the non-drive side of the PROCESSOR. Remove the film.
- [9] Do Steps 5-7 again for the center of the PROCESSOR.
- [10] If necessary, adjust the position of the DETECTOR SWITCHES. See Page 25.

Adjusting the Film DETECTOR SWITCHES



Important

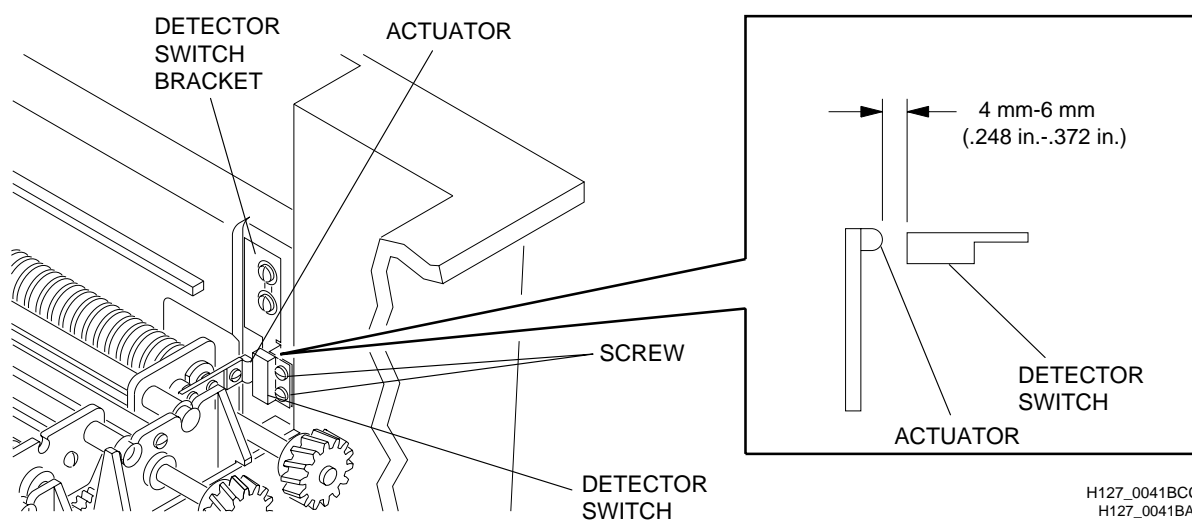
Do all 3 adjustments to the DETECTOR SWITCHES.



H104_0376BCA
H104_0376BA

- [1] Check that the drive side ACTUATOR on the DETECTOR CROSSOVER is in the “IN” position. See the figure. If the ACTUATOR is in the “OUT” position do the following steps:
 - (a) Loosen the SCREW.
 - (b) Move the ACTUATOR to the “IN” position.
 - (c) Tighten the SCREW.
- [2] Repeat for the non-drive side ACTUATOR.

Adjusting the DETECTOR SWITCHES from Side to Side



H127_0041BCC
H127_0041BA

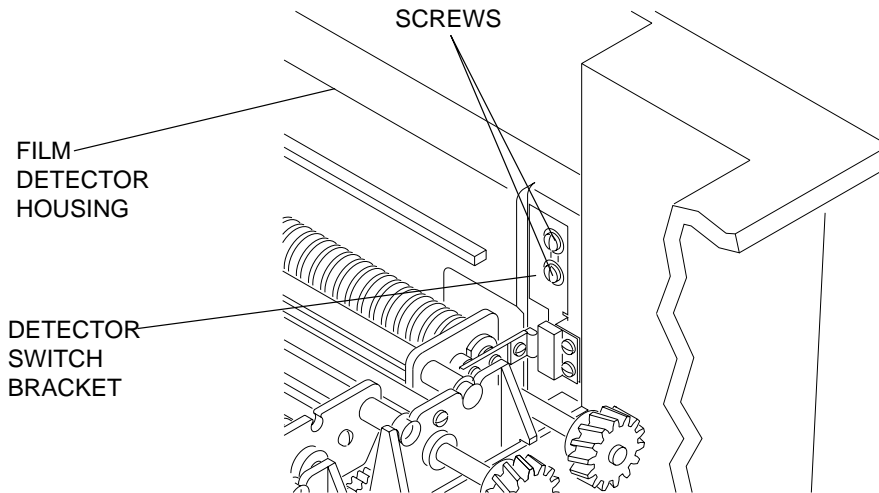
- [1] Loosen the 2 SCREWS that hold the drive side DETECTOR SWITCH to the DETECTOR SWITCH BRACKET.
- [2] Move the DETECTOR SWITCH until the DETECTOR SWITCH is 4 - 6 mm (3/16 - 1/4 in.) from the edge of the ACTUATOR.
- [3] Check that the DETECTOR SWITCH remains in the vertical position.
- [4] Tighten the 2 SCREWS.
- [5] Do Steps 1-4 again for the DETECTOR SWITCH on the non-drive side of the PROCESSOR.

Adjusting the DETECTOR SWITCHES Up and Down



Important

- Be sure that the DETECTOR ROLLER moves freely up and down.
- Before you can adjust the height of the drive or non-drive side DETECTOR SWITCH, **both** DETECTOR SWITCHES must be moved to the highest position because the diagnostic routine sees the SWITCHES in parallel.



H104_0377BCB
H104_0377BA

[1] On the drive side of the PROCESSOR:

- (a) Loosen the 2 SCREWS that hold the DETECTOR SWITCH BRACKET to the FILM DETECTOR HOUSING.
- (b) Move the DETECTOR SWITCH BRACKET to the highest position.

[2] Do Step 1 with the DETECTOR SWITCH BRACKET on the non-drive side of the PROCESSOR.

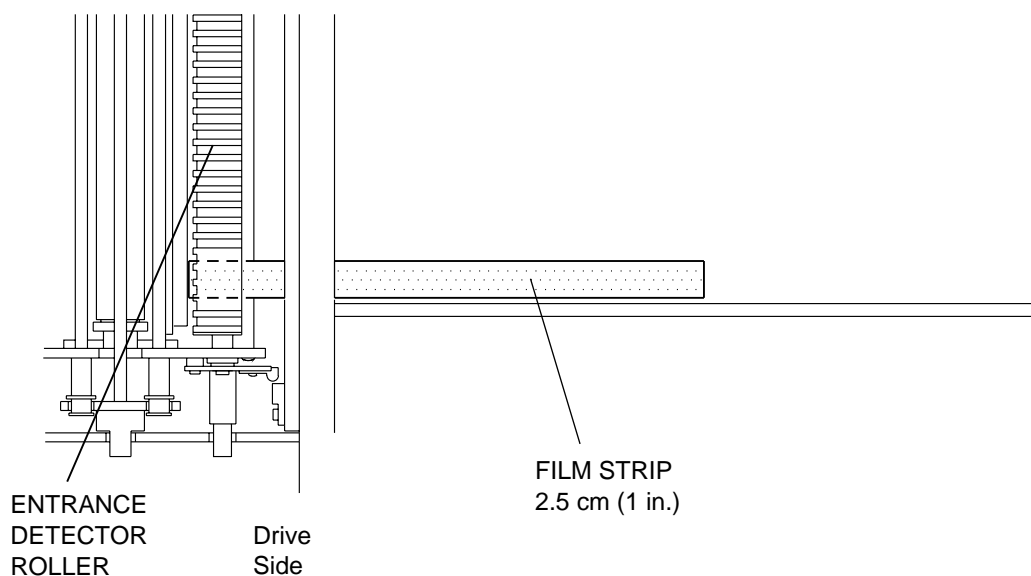
[3] Connect the PORTABLE COMPUTER to the 15-PIN DIAGNOSTIC CONNECTOR on the ELECTRICAL BOX.

Note

See the User Instructions, Publication Part No. 699614, for the operation of the diagnostic procedures.

[4] Enter the "SPECIFIC TEST MODE" of the diagnostic program on the PORTABLE COMPUTER.

[5] Select the "PROCESSOR SENSOR TEST". The "PROCESSOR SENSOR TEST" will provide you with the status of the 2 film DETECTOR SWITCHES.



H104_0577BCA
H104_0577BC

[6] Adjust the drive side DETECTOR SWITCH.

- (a) the top ENTRANCE DETECTOR ROLLER, and insert the 2.5 cm (1 in.) FILM STRIP between the ENTRANCE DETECTOR ROLLERS on the drive side of the PROCESSOR.
- (b) Slowly, move the DETECTOR SWITCH BRACKET down until the PORTABLE COMPUTER displays a "Film detected" message.
- (c) Move the DETECTOR SWITCH BRACKET down approximately another 1 - 2 mm (approximately $\frac{1}{16}$ in.).

Note

Be sure that the DETECTOR SWITCH BRACKET remains in the vertical position.

- (d) Tighten the 2 SCREWS to hold the DETECTOR SWITCH BRACKET in position.
- (e) Remove the 2.5 cm (1 in.) FILM STRIP from between the ENTRANCE DETECTOR ROLLERS.
- (f) Check the the PORTABLE COMPUTER displays the message "No film Detected".

[7] Adjust the non-drive side DETECTOR SWITCH.

- (a) Insert the FILM STRIP on the non-drive side of the PROCESSOR.
- (b) Do Steps 6a-f for the DETECTOR SWITCH BRACKET on the non-drive side of the PROCESSOR.

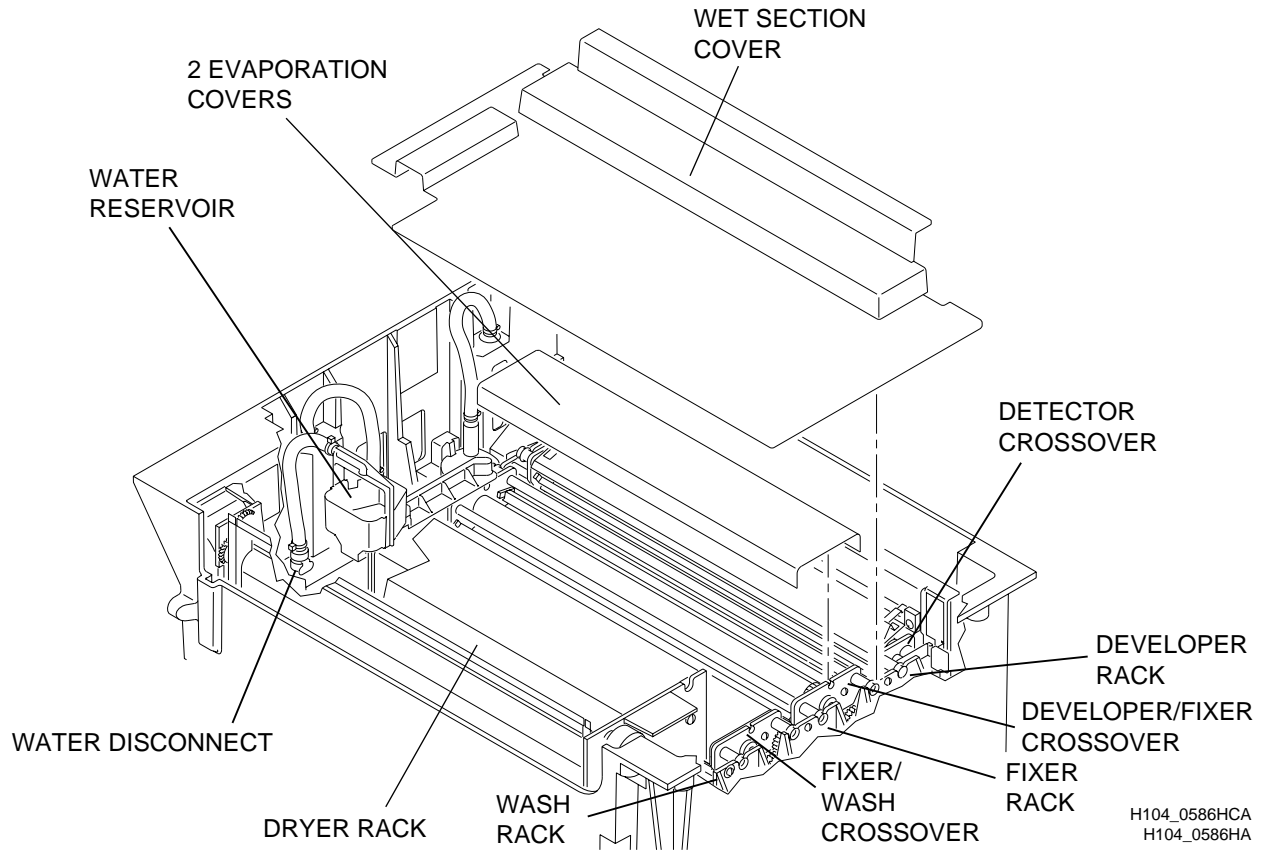
Section 7: Preventive Maintenance

Weekly Preventive Maintenance



Important

The operator of the PROCESSOR should perform the weekly preventive maintenance procedures in this section.



- [1] De-energize the PROCESSOR.
- [2] Remove the WET SECTION COVER.
- [3] Disconnect the WATER RESERVOIR or YOKE from the CROSSOVERS.
- [4] Remove the following parts:
 - a. EVAPORATION COVERS
 - b. all CROSSOVERS
 - c. WASH RACK
- [5] Rinse the 3 CROSSOVERS and the WASH RACK with warm water, 44°C (110°F) or less. Wipe the ROLLERS and the GUIDE SHOES with a damp, soft, synthetic sponge.
- [6] Allow the DETECTOR CROSSOVER to air dry before you install it in the PROCESSOR.
- [7] Check that all the ROLLERS on all the CROSSOVERS and on the WASH RACK rotate freely.
- [8] Check the squareness of the CROSSOVERS and the WASH RACK. See the procedures on Page 8.
- [9] Check that the CROSSOVER TROUGHs are clean, are without cracks, and are installed correctly.
- [10] Wipe any deposits from the processing section of the PROCESSOR.
- [11] Install the following parts. Check that each assembly seats firmly.
 - a. WASH RACK
 - b. all CROSSOVERS

- [12] Connect the WATER RESERVOIR or YOKE to the CROSSOVERS.
- [13] Check that the WATER DISCONNECT is positioned correctly.
- [14] Install the following parts. Check that each assembly seats firmly.
 - a. EVAPORATION COVERS
 - b. WET SECTION COVER
- [15] Energize the PROCESSOR.
- [16] Process a test film and check for correct operation of the PROCESSOR.

Monthly Preventive Maintenance



Important

Completion of the monthly preventive maintenance procedures is recommended to ensure the optimum reliability of the PROCESSOR.


- [1] De-energize the PROCESSOR.
- [2] Remove the following parts:
 - a. WET SECTION COVER
 - b. WATER DISCONNECT and WATER RESERVOIR or YOKE
 - c. EVAPORATION COVERS
 - d. all CROSSOVERS
 - e. DRYER RACK
 - f. WASH RACK



Caution

To prevent contamination of the developer and fixer solutions when you remove the FIXER RACK and the DEVELOPER RACK, place the SPLASH GUARD between the DEVELOPER TANK and the FIXER TANK. Use the DRIP TRAY whenever you remove or install the RACKS.

- [3] Install the SPLASH GUARD between the DEVELOPER TANK and the FIXER TANK.
- [4] Remove the following parts:
 - a. DEVELOPER RACK
 - b. FIXER RACK
 - c. SPLASH GUARD
- [5] Rinse all the RACKS and the CROSSOVERS with warm water, 44°C (110°F) or less. Wipe the ROLLERS and the GUIDE SHOES with a soft, synthetic sponge.
- [6] Remove and clean the CROSSOVER TROUGHS. Check that the holes in the CROSSOVER TROUGHS are free from biological growth or other obstructions.
- [7] Install the CROSSOVER TROUGHS.

- [8] On all RACKS, check that:
- (a) all ROLLERS rotate freely
 - (b) the ROLLERS are clean and smooth
 - (c) the GEARS do not have excessive wear
 - (d) the BEARINGS do not have excessive wear
 - (e) the E-RINGS and SPRINGS are not broken, missing, or corroded
- [9] If necessary, install new parts.
- [10] Check the RACKS for squareness. If necessary, see the procedure on Page 8.
- [11] Check that the SLOTS in the AIR TUBES are clean. If necessary, clean the AIR TUBES with a BOTTLE BRUSH and rinse with water.
- [12] Wipe any deposits from the processing section of the PROCESSOR.
- [13] Change the DEVELOPER FILTER.
- [14] Allow the DETECTOR CROSSOVER to air dry before you install it in the PROCESSOR.
- [15] For PROCESSORS with a WATER RESERVOIR, clean the WATER RESERVOIR. Check that the holes in the WATER RESERVOIR are free of biological growth and other obstructions.
- [16] Install the RACKS.
- [17] Install the following parts. Check that each part seats firmly.
- a. CROSSOVERS
 - b. WATER RESERVOIR or YOKE and WATER DISCONNECT
 - c. EVAPORATION COVERS
 - d. WET SECTION COVER
- [18] Clean the REPLENISHMENT STRAINERS that are between the REPLENISHMENT TANKS and the REPLENISHMENT PUMPS.
- [19] Check the water supply FILTER. If necessary, change the FILTER.
-  **Caution**
- Any obstruction such as biological growth, small bends, or an upward sloping WASH DRAIN HOSE can cause wash water to return to the WASH TANK causing an overflow of water.
 - Concentrations of chlorine bleach higher than 10% or allowing the chlorine bleach to remain in the PROCESSOR for longer than 30 minutes can cause damage to the PROCESSOR.
- [20] Check the WASH DRAIN for biological growth, small bends, or other obstructions. To remove biological growth do the steps below:
- (a) Fill the WASH TANK and DRAIN with a 10% solution of chlorine bleach.
 - (b) Wait a **minimum of 20 minutes and a maximum of 30 minutes**.
 - (c) Drain the chlorine bleach solution and rinse the TANK and DRAIN thoroughly with water before you return the PROCESSOR to normal use.
- [21] Energize the PROCESSOR.
- [22] Process a test film and check for correct operation of the PROCESSOR.

3 Month Preventive Maintenance

- [1] De-energize the PROCESSOR.
- [2] Open the FIXER and DEVELOPER DRAIN VALVES to drain the solutions from the PROCESSOR.
- [3] Remove the following parts:
 - a. WET SECTION COVER
 - b. WATER DISCONNECT and WATER RESERVOIR or YOKE
 - c. EVAPORATION COVERS
 - d. all CROSSOVERS
 - e. DRYER RACK
 - f. WASH RACK



Caution

To prevent contamination of the developer and fixer solutions when you remove the FIXER RACK and the DEVELOPER RACK, place the SPLASH GUARD between the DEVELOPER TANK and the FIXER TANK. Use the DRIP TRAY whenever you remove or installation the RACKS.

- [4] Install the SPLASH GUARD between the DEVELOPER TANK and the FIXER TANK.
- [5] Remove the following parts:
 - a. FIXER RACK
 - b. SPLASH GUARD
 - c. DEVELOPER RACK



Warning

- Carefully follow all safety precautions and directions included with the *Kodak* FIXER/WASH SYSTEM CLEANER and *Kodak* DEVELOPER SYSTEM CLEANER AND NEUTRALIZER.
 - The RACKS in the PROCESSOR have hollow ROLLERS. Use the instructions for cleaning RACKS with hollow ROLLERS. Do not immerse RACKS with hollow ROLLERS in SYSTEM CLEANER. SYSTEM CLEANER that remains inside the ROLLERS will contaminate the processing solutions.
 - When circulating SYSTEM CLEANER or water through the recirculation system, energize the developer COOLING SOLENOID and the RECIRCULATION PUMP using the PORTABLE COMPUTER. See the Diagnostics Manual. Otherwise the following may occur:
 - The effectiveness of the DEVELOPER SYSTEM CLEANER AND NEUTRALIZER will be greatly reduced because of the developer remaining in the HEAT EXCHANGER.
 - The DEVELOPER SYSTEM CLEANER AND NEUTRALIZER remaining in the HEAT EXCHANGER will contaminate the new developer when the PROCESSOR is returned to operation.
- [6] Clean the DEVELOPER RACK and the DEVELOPER TANK with *Kodak* DEVELOPER SYSTEM CLEANER AND NEUTRALIZER, CAT No. 843 4615.
 - [7] Clean the FIXER RACK, the WASH RACK, and the FIXER TANK with *Kodak* FIXER/WASH SYSTEM CLEANER, CAT No. 139 5110.
 - [8] Clean the WASH TANK with *Kodak* FIXER/WASH SYSTEM CLEANER or, if biological growth exists, with a 10% solution of chlorine bleach.
 - [9] If necessary, clean the LEVEL SENSOR PROBES with the correct SYSTEM CLEANER.

- [10] Rinse the following parts with warm water, 44°C (110°F) or less. Wipe the ROLLERS and the GUIDE SHOES with a soft, synthetic sponge.
- a. CROSSOVERS
 - b. EVAPORATION COVERS
 - c. WET SECTION COVER

 **Note**

If necessary, you may use DEVELOPER SYSTEM CLEANER AND NEUTRALIZER on the DEVELOPER/FIXER CROSSOVER and FIXER/WASH SYSTEM CLEANER on the FIXER/WASH CROSSOVER.

- [11] Remove and clean the CROSSOVER TROUGHS. Check that the holes in the CROSSOVER TROUGHS are free from biological growth or other obstructions.
- [12] Install the CROSSOVER TROUGHS.
- [13] On all RACKS, check that:
- (a) all ROLLERS rotate freely
 - (b) the ROLLERS are clean and smooth
 - (c) the GEARS do not have excessive wear
 - (d) the BEARINGS do not have excessive wear
 - (e) the E-RINGS and SPRINGS are not broken, missing, or corroded
 - (f) the CHAIN is not worn or out of adjustment
- [14] If necessary, install new parts.
- [15] Check the RACKS for squareness. If necessary, see the procedure on Page 8.
- [16] Check that the SLOTS in the AIR TUBES are clean and in the correct positions. If necessary clean the AIR TUBES with a bottle brush and rinse with water.
- [17] Wipe any chemical deposits from the processing section of the PROCESSOR.
- [18] Install a new DEVELOPER FILTER.
- [19] Allow the DETECTOR CROSSOVER to air dry before you install it in the PROCESSOR.
- [20] For PROCESSORS with a WATER RESERVOIR, clean the WATER RESERVOIR. Check that the holes in the WATER RESERVOIR are free of biological growth and other obstructions.
- [21] Install the following parts. Check that each part seats firmly.
- a. RACKS
 - b. CROSSOVERS
 - c. WATER RESERVOIR or YOKE and WATER DISCONNECT
 - d. EVAPORATION COVERS
 - e. WET SECTION COVER
- [22] Clean the REPLENISHMENT STRAINERS located between the REPLENISHMENT TANKS and the REPLENISHMENT PUMPS.
- [23] Check the water supply FILTER. If necessary, change the FILTER.


Caution

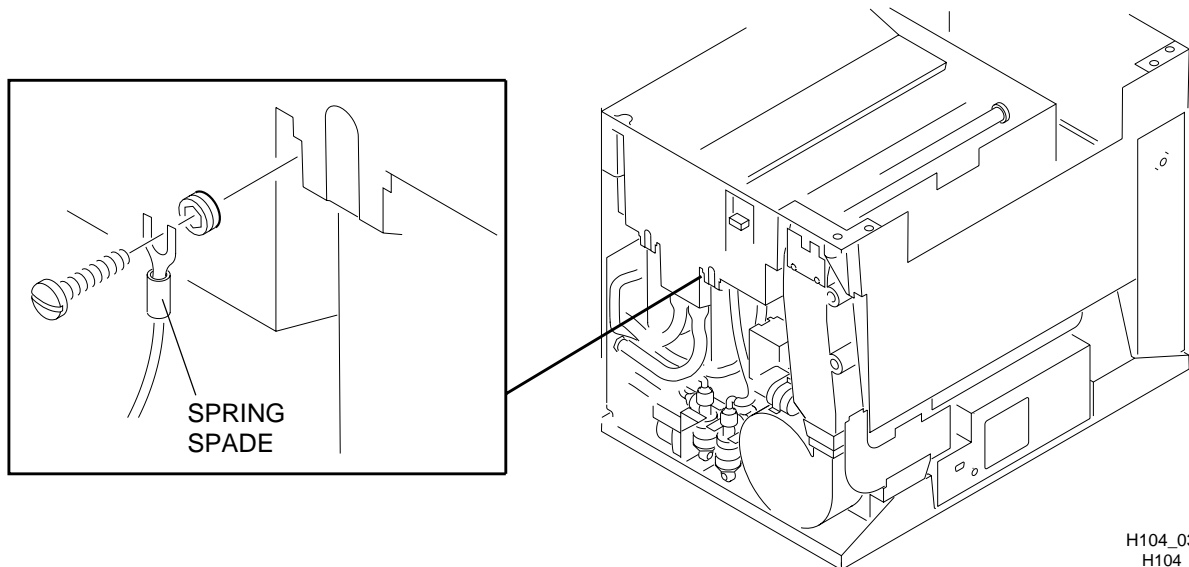
- Any obstruction such as biological growth, small bends, or an upward sloping WASH DRAIN HOSE can cause wash water to return to the WASH TANK causing an overflow of water and damage to the ELECTRICAL BOX.
- Concentrations of chlorine bleach higher than 10% or allowing the chlorine bleach to remain in the PROCESSOR for longer than 30 minutes can cause damage to the PROCESSOR.

[24] Check the WASH DRAIN for biological growth, small bends, or other obstructions. To remove biological growth do the steps below:

- Fill the WASH TANK and DRAIN with a 10% solution of chlorine bleach.
- Wait a **minimum of 20 minutes and a maximum of 30 minutes**.
- Drain the chlorine bleach solution, and rinse the TANK and DRAIN thoroughly with water before returning the PROCESSOR to normal use.

[25] Check the DRIVE CHAIN.

- If the DRIVE CHAIN is dry, apply lubricant to the DRIVE CHAIN. Use NLG1 - No. 2 LITHIUM BALL and ROLLER BEARING GREASE TL-2324.
- If the DRIVE CHAIN is rusty, remove it and install a new DRIVE CHAIN.
- Adjust the tension of the DRIVE CHAIN. If necessary, see the procedure on Page 11.



H104_0383BCB
H104_0383BA

[26] Check the SPRING SPADES on the LEVEL SENSOR PROBES for corrosion. If necessary, clean or install new SPRING SPADES.

[27] Check the operation of the DETECTOR SWITCHES. If necessary, adjust the DETECTOR SWITCHES. See the procedures on Page 25.

[28] Close the DRAIN VALVES and fill the processing TANKS with processing solutions and starter where necessary.

[29] Energize the PROCESSOR.

[30] Process a test film and check the PROCESSOR for correct operation.

[31] Check the negative pressure at the EXHAUST VENT for the DRYER. See the Installation Instructions.

[32] Calibrate the REPLENISHMENT PUMPS. See the section "Calibrating the Replenishment System" in the Operator Guide.

Preventive Maintenance Schedule

Part or Assembly	Weekly*	Monthly†	3 Month Schedule‡
DETECTOR CROSSOVER	C		
DEVELOPER/FIXER CROSSOVER	C		
FIXER/WASH CROSSOVER	C		
WASH RACK	C		C(2)
DEVELOPER RACK		I,C	C(1)
FIXER RACK		I,C	C(2)
DRYER RACK		I,C	
RACK BEARINGS, CHAINS, and DRIVE GEARS		I	
Squareness of RACKS		I	
DRYER AIR TUBES		I,C	
DEVELOPER FILTER		R	
REPLENISHMENT STRAINERS and FILTERS		C	
Water Supply FILTER		R	
DRAIN HOSES		I,R	
Ventilation Exhaust			T
DRIVE MOTOR CHAIN			I,L
LEVEL SENSOR PROBES			C
SPRING SPADES on the LEVEL SENSOR PROBES			C(3)
DEVELOPER PROCESSOR TANK			C(1)
FIXER and WASH PROCESSOR TANKS			C(2)
Calibration of the REPLENISHMENT PUMPS			T
DETECTOR SWITCHES			T
WATER RESERVOIR		C	

I	=	Inspect for condition and adjust or install new parts, if necessary.
L	=	Lubricate with recommended material.
R	=	Replace, if necessary.
T	=	Test and adjust, if necessary.

C	=	Rinse and clean carefully and completely using warm water and a soft synthetic sponge.
C(1)	=	Clean with <i>Kodak</i> DEVELOPER SYSTEM CLEANER AND NEUTRALIZER.
C(2)	=	Clean with <i>Kodak</i> FIXER/WASH SYSTEM CLEANER.
C(3)	=	Clean any corrosion from the SPRING SPADES.

* The weekly preventive maintenance procedures can be performed by either the operator of the PROCESSOR or by the trained service provider.

† Completion of the monthly preventive maintenance procedures is recommended to ensure the optimum reliability of the PROCESSOR.

‡ The 3 month schedule is a guideline for sites adhering to the site specifications issued by Kodak. Actual usage and site characteristics may require shorter intervals between maintenance.

Section 8: Publication History

Print Date	Pub. No.	Affected Pages	File Name	Notes
March 1994	SM3058-3	All	3058sm_d.txt	First Printing
May 1996	SM3058-3	All	sm3058_3.book (.1 through .8)	FRAME Conversion and Update

Kodak and X-Omat are trademarks.

sm3058_3.8

Printed In USA

HEALTH SCIENCES DIVISION
EASTMAN KODAK COMPANY ● ROCHESTER, N.Y. 14650

