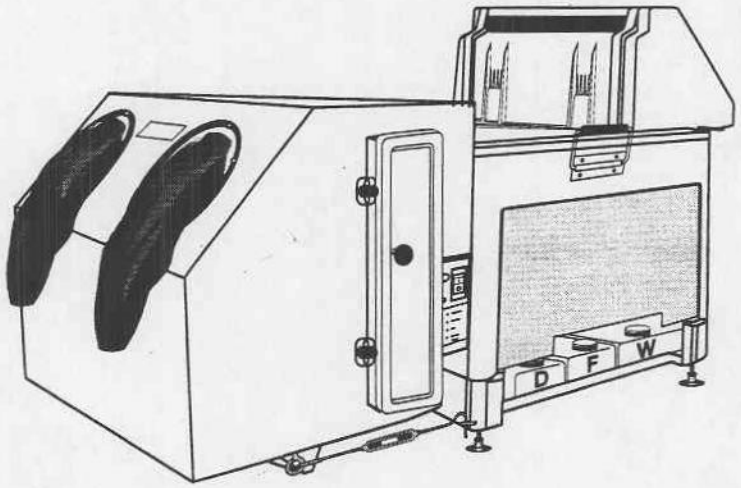
AFP MINI-MEDICAL

MILITARY

PROCESSING MACHINE, RADIOGRAPHIC FILM

WITH DAYLIGHT LOADER

NSN# 6525-01-422-6122



120 VAC, 60 Hz, 15 Amps

Installation, Operation,
Service & Parts Manual

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Elmsford, N.Y. 10523
(914) 592-6100

January 1996

P/N 0000061152

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- Changes in characteristics or process procedures made by suppliers of sensitized materials or chemicals after delivery of the AFP product to the purchaser;
- Lack of sufficient volume of sensitized materials for economical AFP product operation;
- Failure to follow the maintenance, venting, or safety procedures recommended for AFP product operation;
- Unusual physical or electrical stress;
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AFP Mini-Medical Military
X-Ray Film Processor
115VAC

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IMPORTANT SAFETY INFORMATION

TO REDUCE THE RISK OF INJURY OR ILLNESS, READ, UNDERSTAND, AND HEED THE INFORMATION ON THIS SHEET, ALL PRECAUTIONARY LABELS ON THE EQUIPMENT, AND ALL INSTRUCTIONS INCLUDED WITH THE EQUIPMENT, BEFORE ATTEMPTING INSTALLATION, USE, OR MAINTENANCE.

⚠ **WARNING: SERIOUS BODILY INJURY can result from improper handling or usage.**

⚠ **WARNING: NEVER move the equipment without enough help and/or lifting tools.**

⚠ **WARNING: ALWAYS use care when opening the shipping carton. Strapping bands can snap and injure you.**

⚠ **WARNING: NEVER operate the equipment without its protective panels and guards installed. Beware of rotating gears and belts, rollers and chains, and keep from becoming entangled in them.**

⚠ **DANGER: POTENTIALLY FATAL VOLTAGES ARE PRESENT IN THIS EQUIPMENT.**

⚠ **CAUTION: NEVER make electrical connections to the equipment unless you are a qualified electrician.**

⚠ **WARNING: ALWAYS route power supply wiring through a nearby disconnect device.**

⚠ **WARNING: NEVER attempt electrical service on the equipment unless you are a qualified electronics technician.**

⚠ **CAUTION: ALWAYS shut off power at the disconnect device before making electrical connections or servicing electrical components.**

⚠ **CAUTION: ALWAYS replace fuses with those of the same type and rating.**

⚠ **WARNING: NEVER touch supply voltages; they can be lethal.**

⚠ **CAUTION: NEVER operate the equipment until it is reliably electrically grounded, not through the water system.**

PROCESSORS, AND PROCESSOR ACCESSORIES:

☠ **DANGER! POISON!** ☠ **PROCESSING CHEMICALS MAY BE HARMFUL OR FATAL IF SWALLOWED. KEEP OUT OF REACH OF CHILDREN. Always review and follow the hazard warnings and the ventilation, use and disposal instructions of the chemicals manufacturer. Install all fluids correctly before operating.**

⚠ **CAUTION: TO AVOID POSSIBLE DRINKING WATER CONTAMINATION, make certain that all plumbing complies with local codes.**

⚠ **WARNING: PROCESSING CHEMICALS CAN CAUSE SEVERE BURNS. Do not get in eyes, on skin, on clothing. Avoid breathing vapor, mist or dust, and use only with adequate ventilation. ALWAYS FOLLOW THE SAFETY RECOMMENDATIONS OF THE CHEMICALS MANUFACTURER.**

LITERATURE. The following publications relate to safety in film processing.

Publication	Available From
ANSI. PH 4.37, Photographic Processing Effluents	American National Standards Institute 1430 Broadway New York, N. Y. 10018
Technical Data Sheet, Photographic Processing Wastes (6 pages)	E. I. DuPont DeNemours and Co. (Inc.) Photo Products Department Wilmington Delaware 19898
J4, Safe Handling of Photographic Chemicals J28, Disposal of Photographic Processing Effluents and Solutions J43, A Simple Waste-Treatment System J50, Sampling and Flow-measurement Methods J52, Disposal of Small Volumes of Photographic Processing Solutions K13, Photolab Design S39, Water Conservation in Photographic Processing	Dept. 412-L Eastman Kodak Co. 343 State Street Rochester, New York 14650

The preceding information is presented as a guide to precautions associated with photographic processing. No claim is made as to the currency, accuracy or completeness of the listed information. Please do not fail to contact your chemicals supplier to obtain additional advice and assistance.

Section 1
Introduction

- General Index -

AFP Mini-Medical Military
X-Ray Film Processor

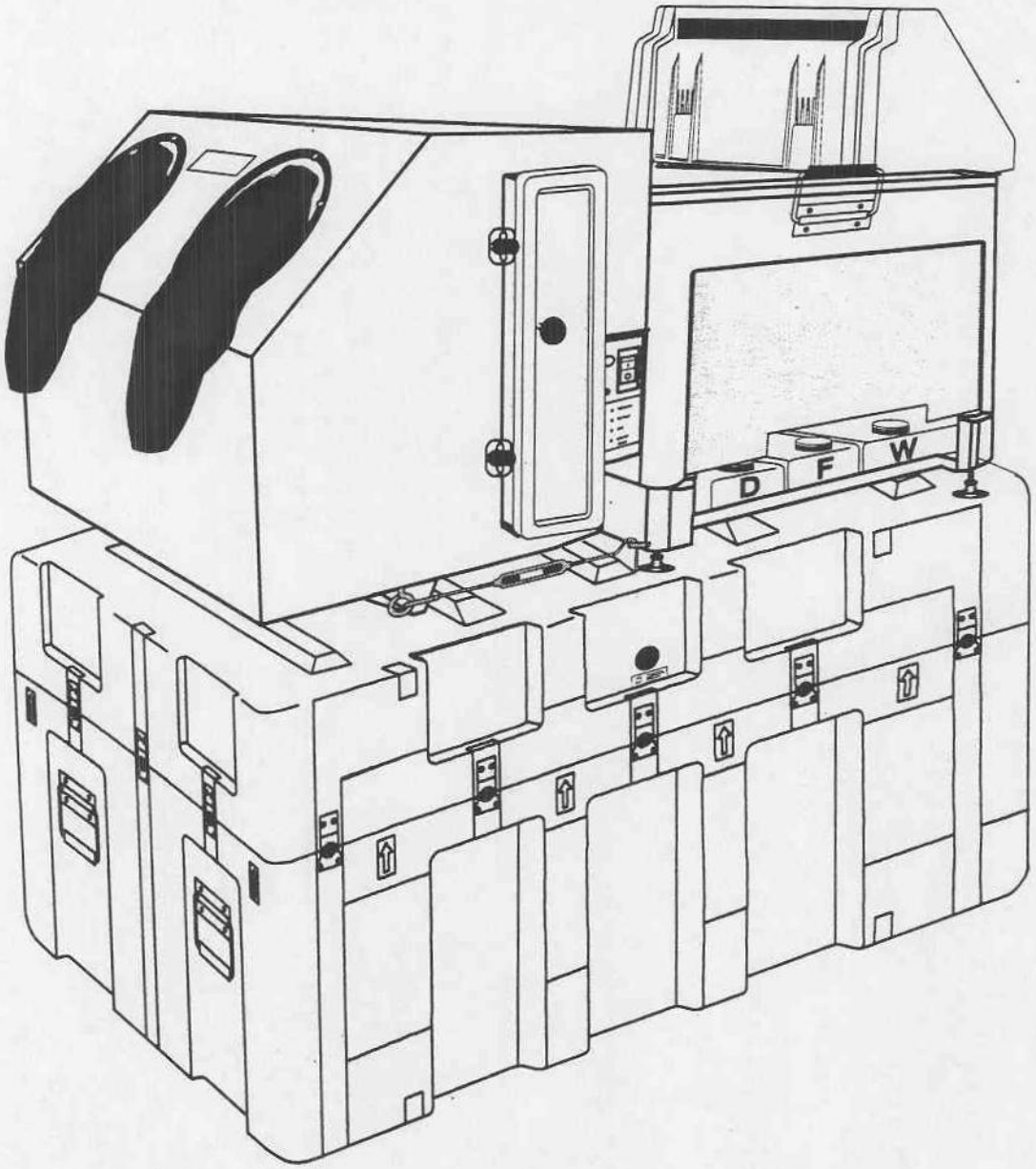


Figure 1-1, AFP Mini-Medical Military X-Ray Film Processor with Daylight Loader, Storage and Transport case #1

Content

This manual contains instructions for unpacking, installing, operating and maintaining the AFP **Mini-Medical Military** X-Ray film processor with Daylight Loader.

Description

The **Mini-Medical** system includes the processor, with daylight tight (Zero Light) film loader, transport /support case (stand), replenishment tanks, film storage bin, hardware, necessary hoses and this manual.

The processor is shown in Figure 1-1.

Operation

The processor is operated from the control panel. Basic processor functions are described in the following paragraphs. Figure 1-2 is a diagram of the film transport system.

Capabilities

The Mini-Medical Military processor will develop, fix, wash and dry exposed RP type medical X-ray films of all sizes, from 4" X 4" (10 X 10 cm) to 14" X 36" (35 X 91 cm).

Hourly production capacity of 14" X 17" (35 X 45 cm) sheets of film, at the indicated, pre-set, lead edge in to lead edge out time of 90 seconds, is 85 sheets per hour. The dry to dry time for a single 14" X 17" sheet of film is 120 seconds.

Transport System

Four removable roller transport modules transport the film being processed through the developer, fixer, wash and dryer sections.

The developer, fixer and wash sections make use of "Deep Tank" transports to maintain developing quality and improve productivity. The dryer section includes a long path length vertical dryer to assure film drying at short developing times, reduce space requirements and return the film to the operator's position for ease of pickup.

All transports and rollers in the wet sections and dryer are driven from a common drive shaft by a fractional horsepower AC motor.

For ease of use, and accuracy of processing, developing times and developing temperatures are factory set at 22 seconds at 95 degrees.

Transport System, (Cont'd)

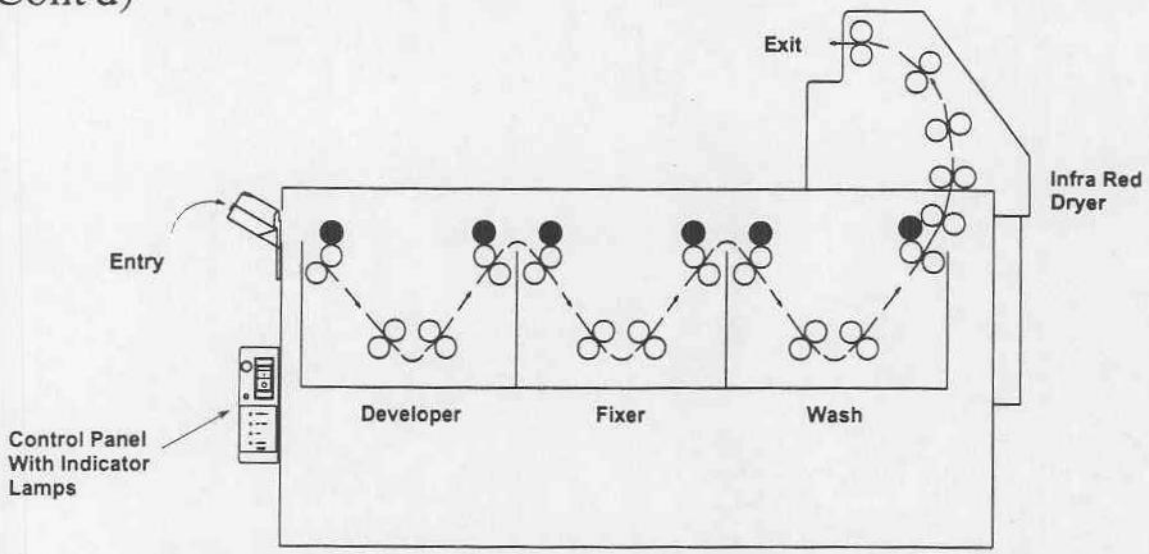


Figure 1-2, Transport System (Daylight Loader System not shown)

Before processing film, the processor must first be turned ON and allowed to bring the developer up to operating temperature. Typically this will take approximately 15 minutes, when starting from an ambient temperature of 68 to 70 degrees F.

As the processor warms up, it remains in the Stand-By mode. In this mode, the developer heater, dryer heater, one dryer blower and the circulation pumps operate.

Film being fed into the processor is detected by film feed switches located in the feed slot. When film is sensed, the Wait lamp will illuminate and stay illuminated until shortly after the trailing edge of the film has passed the sensor.
Note: The Wait lamp is also illuminated for the duration of the Anti-Crystallization Cycle as discussed on page 1-5.

The above activation of the film feed switch(s) also places the processor into the Process mode, starting the transport system, the dryer blower, wash water pump and replenishment system (for the duration that the switch(s) are activated).

Shortly after the Wait lamp extinguishes, an audible signal will sound, indicating to the operator that additional film may now be fed into the processor.

An electronic holding circuit will keep the processor in the Process mode for approximately 4 minutes after the feed switch is released. This will allow complete processing of the film, after which time the processor will return to the Stand-By mode to conserve energy and wear on the processor.

Transport System, (Cont'd)

Film is pulled into the processor by the input roller set on the developer transport. The film being processed then passes through the recirculating developer bath. As it leaves the developer, excess chemicals are stripped off by the exit rollers. This process is repeated in the fix, wash and dryer sections.

Processed and dried film is then deposited in the film delivery area on top of the processor.

Developer System

As the film being processed passes through the developer tank, developer is continuously circulated and agitated around the rollers in the developer transport.

This developer circulation and agitation is provided by the developer chemistry being drawn down into the developer circulation pump, located in the base of the tank and then being pumped back through the bottom and side of the tank at a rate of approximately 2 gallons per minute.

The developer is replenished during operation by chemicals being drawn from the replenishment tank by a pump controlled by the replenishment circuit. This circuit operates the pump continuously with the actual output rate (in ml/minute) being electronically controlled by the processor's circuitry.

Developer heat is provided by a 500 watt heater located in a thermal well below the tank.

Developer temperature is sensed by a temperature sensor, located in the bottom of the developer tank.

Developer temperature is factory set for 95 degrees and may be readjusted by a technician to temperature values from 80 to 115 degrees f (46 C) using the temperature adjustment potentiometer located on the control panel.

Fixer System

The film being processed is fixed in the fix tank. Fixer is agitated, circulated and replenished in the same manner as the developer. The fixer is heated by transfer in a heat exchanger as it passes through the rubber jacket installed around the outside of the thermal well.

Developer & Fixer Replenishment

The Mini-Medical processor is designed to operate in either "Batch" or "Replenishment" mode. As such, replenishment chemicals may be replenished as necessary with tank overflow being directed into a drain or collection container for disposal (replenishment), or recycled back into the replenisher holding tank installed inside the machine until exhausted, discarded and fresh chemicals are installed (batch). For additional information refer to the Operation and Maintenance sections of this manual. Units are assembled, tested and delivered in the replenishment configuration.

Anti-Crystallization

To prevent the buildup of chemicals on the processing rollers, an anti-crystallization or "Jog" feature is built into the Mini-Medical processor.

When the power is on, this feature automatically runs the drive system at process speed for 20 seconds every 4 minutes, allowing fresh chemistry to be washed over the air-exposed rollers, effectively preventing crystallization of chemistry on the roller surfaces.

Wash System

The film being processed is washed in the wash tank before entering the dryer. The wash water pump is actuated during film feed and refreshes the water in the wash tank with fresh water from the wash water replenisher holding tank located inside the machine.

Dryer System

As film passes through the dryer it is subjected to warm air from two linear infrared quartz heating elements and a pair of blowers.

Upon leaving the dryer the film being processed is deposited in the receiving bin.

Cover Interlock Switch

To prevent accidental injury from moving parts, a magnetic safety switch is interlocked with the processor's dryer cover. If the dryer cover is removed, the processor automatically shuts down all logic board controlled functions such as; the drive motor, the developer and dryer heaters and the blower mounted to the dryer transport. Replacing the dryer cover will allow the machine to operate normally.

Note: A clamping tool provided to allow machine operation with the covers removed during the service and routine maintenance of the processor is provided in the A, B1, B2 & C Support Kits.

General Specifications

Materials

RP type medical X-Ray films and compatible chemicals designed for RP type processing.

Material Size

Minimum Size:	4" X 4" (10 X 10 cm)
Maximum Size:	14" X 36" (35.6 X 91.4 cm)
Base thicknesses	0.004 - 0.008"

Developing Time

Factory set as follows:

Model	**Dev. Time**	**Linear Speed**
Mini-Medical Military	22 sec.	36" (91.5 cm) per minute

Developer, Fix, & Wash Systems

Capacity: 1.9 gallons (7.2 L.).

Temperature Control:

Developer is Factory Set as follows:
Control Panel variable from 80 to 110 degrees F. (26.8 - 37.7 C)

Fixer approximates the developer temperature

Wash: Ambient temperature; Volume equivalent to developer replenishment during film feed cycle. There is no water flow in standby mode.

Integral Replenisher System

Two (2) 1 gallon (3.76 L.) replenisher bottles, one each for the Developer and Fixer and one (1) 2.2 gallon (8.27 L.) replenisher bottle for the Wash are located inside the base of the processor and are an integral part of the machine. Solutions are delivered to the working tanks by means of three self-priming pumps. These are also located in the base of the processor and as such, are an integral part of the machine.

Dryer System

Twin Infrared lamps with air circulation blowers and overtemperature safety cutoff thermostat.

Temperature: Factory set at 130 degrees f. (54.5 C).

General Specifications (Cont'd)

Daylight Loader

A rigid, zero-light enclosure with:

- dual arm holes
- cassette entry door
- removable, 2 compartment film bin with light tight cover
  (each compartment has a capacity of 50 films - 14"x 17" maximum size)

Environmental Operating Conditions

Temperature:	40-90 Degrees F.
Humidity:	40% - 60% RH.

Electrical Requirements

120 VAC, 15 amps, 60 Hz.

Dimensions

Table top operation:

Width 28" (71.2 Cm)
Height: 27" (68.6 Cm), with dryer cover in place
Total Length: 44.25" (112.4 Cm), including daylight loader
Footprint: 28"x36" (7 square feet)

Weight - Processor

Approximate Shipping Wt.: 110 lbs. (without chemical solutions)
Approximate Operating Wt.: 160 lbs. (with chemical solutions)
Approximate Shipping weight in transport case #1: 200 lbs. (processor)
Approximate Shipping weight in transport case #2: 87 lbs. (daylight loader)

Transport / Storage / Support Stand Cases

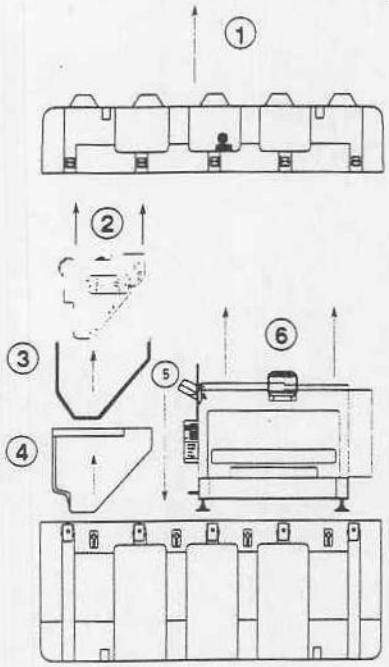
Case # 1 - 42.75" L. x 31" W. x 27.125" H. (for processor)
Case # 2 - 30" L. x 30" W. x 34.375" H. (for daylight loader)

Section 2
Installation

- General Index -

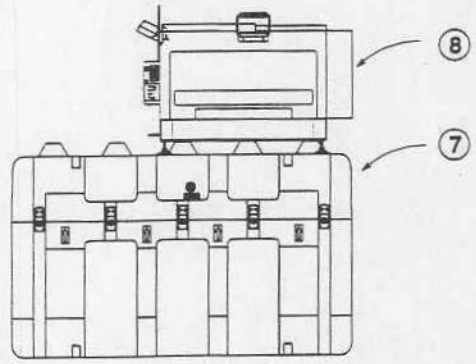
UNPACKING & SETUP INSTRUCTIONS FOR TRANSPORT CASE #1

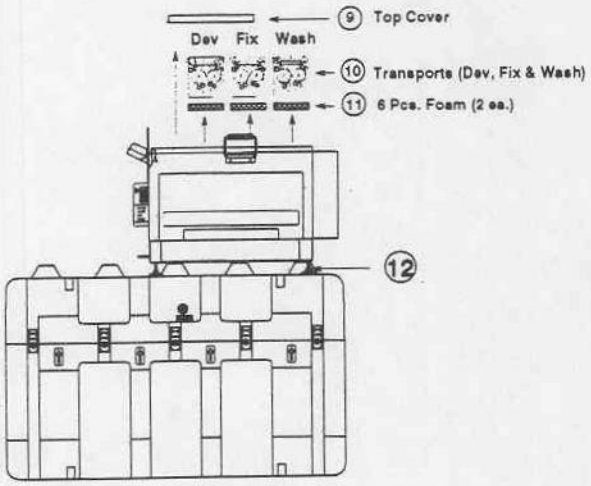
Note: First Operation

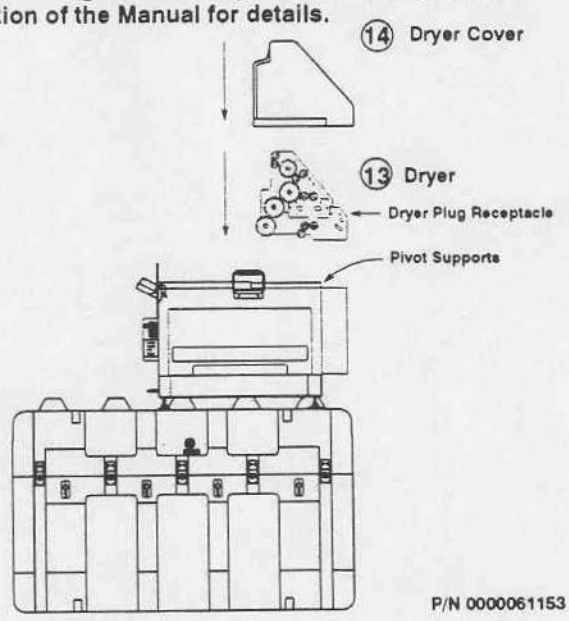


Refer to Drawing Numbers (1) .....

1. Remove top cover (1) from Case #1.
2. Remove the Dryer, (2) Packing Foam (3) and Dryer Cover (4) . Save Foam.
3. There is no need to remove the Packing Foam (5) that is between the Processor and the Dryer Parts.
4. Using two (2) people, lift the processor by lift handles (6) out of the case and set aside in a safe location.
5. Replace the cover (7) on Transport Case #1 and secure all snaps.
6. Place the Processor (8) onto the Top Cover of Transport Case #1 near one end as shown.
7. Remove the Front Top Cover (9) from the Processor. Remove each of the three (3) Transport Modules (10) and the 6 pieces (2 ea.) of Packing Foam (11) from the Solution Tanks. Save Foam.
8. Using the bull's eye level that is installed on the top cover, adjust each of the four (4) leveling feet (12) as needed with a 9/16" open end wrench. Secure the locking nut on each foot against the machine frame.
9. Replace the three (3) Transport Modules in their respective Tanks for Developer, Fixer and Wash.
10. Replace the Processor Front Top Cover.
11. Install the Dryer Assembly (13) on the pivot support and engage with the Wash Transport.
12. Plug in the electrical cable to the rear of the Dryer and replace the Dryer Cover (14) .
13. Save all pieces of Packing Foam for re-use and store in Transport Case #2. (See instructions for Transport Case #2 - "Last Operation").
14. Refer to Pages 2-4 through 2-8 in the Installation section of the Manual for details.







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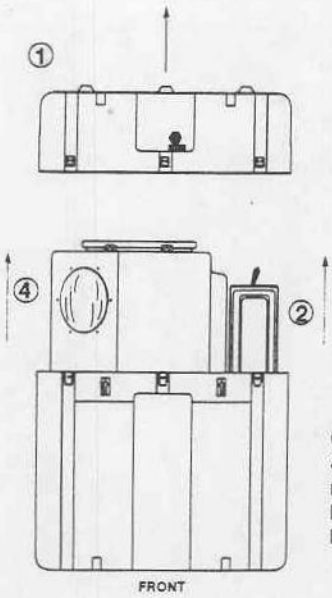
UNPACKING & SETUP INSTRUCTIONS FOR TRANSPORT CASE #2

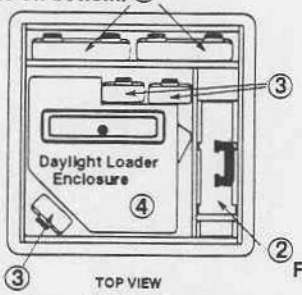
Note: Last Operation



Refer to Drawing Numbers ① .....

1. Remove Case #2 Top Cover ① .
2. Remove Film Storage Box ② with handle and set aside.
3. Remove two (2) of the four (4) refillable 1 gallon replenishment bottles, ③ (1 ea. Dev & Fix) from around the loader and one (1) of the two (2) 2.2 gallon replenishment bottles (for Wash) from the compartment in back of Transport Case. Second set of three (3) bottles will be used for future replacement.
4. Remove Daylight Loader Enclosure ④ and set aside in a safe location.
5. Place all Packing Foam pieces ⑤ removed from Transport Case #1 in Transport Case #2. Replace and secure cover.

One (1) 1 gal. & Two (2) 2 gal. repl bottles stored here. Smaller bottle on bottom. ③

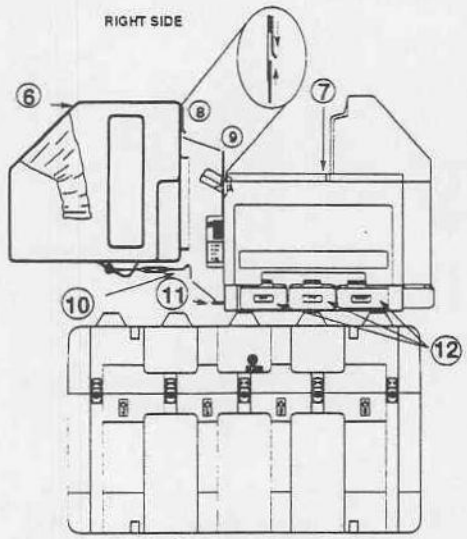


Film Storage Box

Three (3) chemical replenishment bottles stored around loader.

Included are:

- (1) piece, P/N 001-026041-1 Ethafoam 1/2" X 6" X 21" (used between Dryer Cover and Processor is not to be removed.)
- (1) piece, P/N 001-026041-2 Ethafoam 1/2" X 17" X 21" (used between Dryer and Dryer Cover.)
- (6) pieces, P/N 001-026014 Urethane Foam 1 1/4" X 3" X 6" (2 pcs. ea. used between each Transport and its respective tank.)



Transport Case #1 W/Processor

6. Carefully lower Daylight Loader Enclosure ⑥ towards front of Processor ⑦ (already sitting on Transport Case #1, as per First Operation), ensuring that Mounting Bracket ⑧ on Loader fits over Mounting Plate ⑨ attached to front of Processor ⑦ .
8. Engage Tension Hooks ⑩ on each side of Daylight Loader into Eyebolts provided ⑪ on processor Base, (right side) and Film Storage Box Support Bracket, (left side).
9. Tighten Turnbuckles lightly (as required to prevent light-leaks).
10. Place Film Storage Box on left side of processor (Not Shown) into the opening at left rear of Daylight Loader and engage collar into Daylight Loader. Engage the latch on top of Daylight Loader with the latch plate on top of Film Box and close.
11. Fill bottles with appropriate chemistry and water for film processing and replace bottle cap for handling.
12. Place each full bottle ⑫ into base of Processor. Locate Developer Fixer and Wash front to rear.
13. Remove each bottle cap and replace each with replenisher cap with pick up tube. Tighten in place. Note: Red - Developer, Blue - Fix, Black - Water.
14. Refer to Pages 2-4 through 2-8 in the Installation Section of Manual for details.

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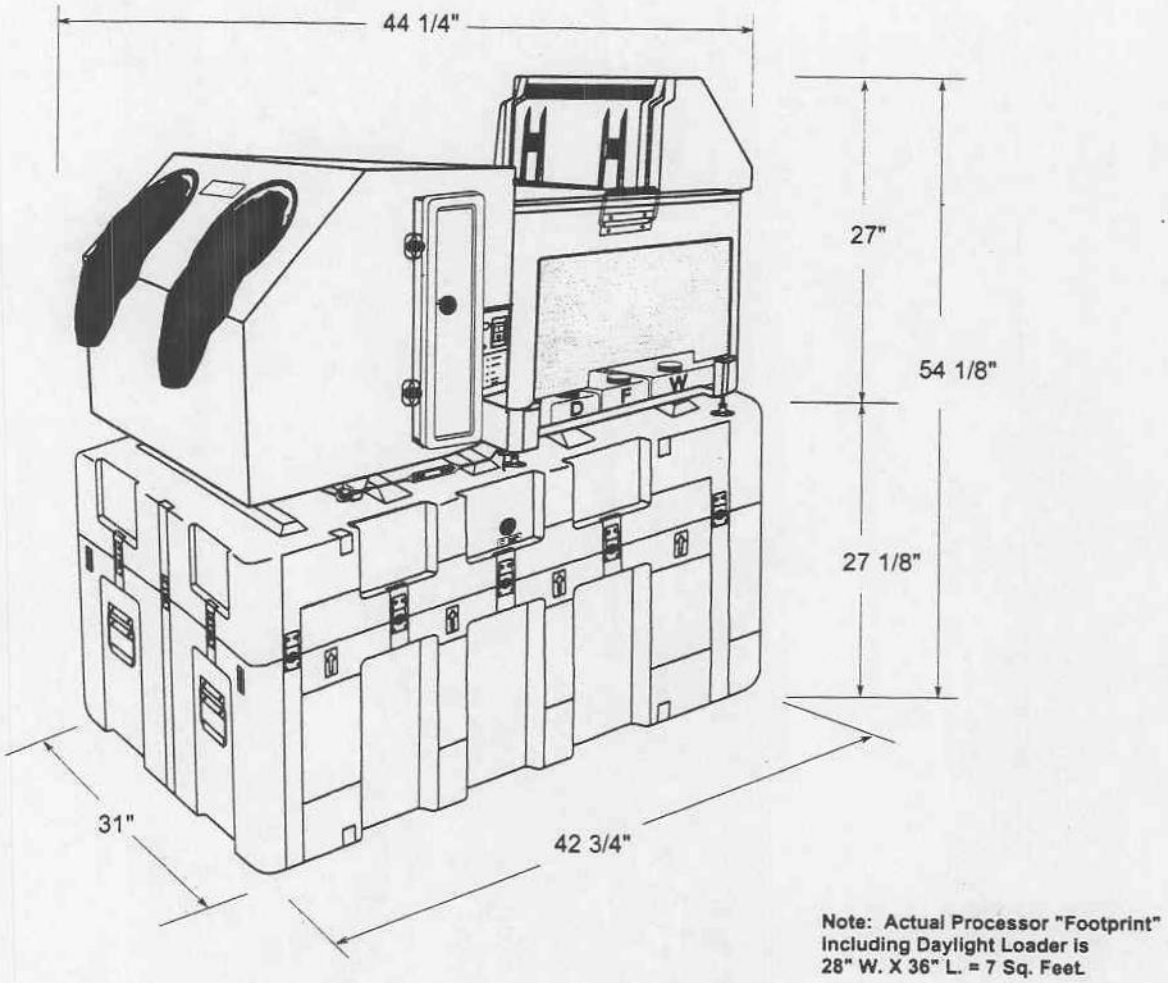


Figure 2-1, Processor & Stand Dimensions

Introduction

This section includes instructions for Pre-Installation, Installation and Check Out of the **AFP Mini-Medical Military** X-Ray film processor.

Pre-Installation

Pre-installation includes instructions for preparing the processor operating site.

Location

AFP Mini-Medical Military processors may be operated in a daylight environment. This is made possible by the Daylight Loader Assembly mounted to the feed end of the processor. Packing Case #1 is intended for use as the processor stand, and should be placed on a level surface.

Dimensions

Mini-Medical Processors occupy approximately 7.0 square feet (28" x 36" actual footprint) of work space. The processor should be positioned to allow easy access to all sides of the unit for routine cleaning and preventive maintenance. Drain tubes, leading out of the "front" of the processor below the feed tray must be routed to be readily accessible. The Packing Case #1 is of sufficient size to be used as the support stand for processor operation.

Weight

The **Mini-Medical Military** Processor weighs approx. 110 lbs. when empty, and approximately 160 lbs. when operating.

To support this weight Packing Case #1 is used as a stand. See figure 2-3.

Ventilation

WARNING: Some processing chemical fumes may irritate eyes and/or respiratory systems when used in a poorly ventilated area. If the processor is to operate in a confined area, provide for at least ten complete changes of air per hour.

Provide adequate ventilation for proper machine operation and operator comfort. The processor generates a moderate amount of heat when operating and must not be placed in a confined space. Daylight Loader allows for flexibility in selecting processor site and conditions.

Electrical

Electrical connections must include a ground and conform to military codes. The processor plugs into a standard 120 VAC, 60 Hz, 15 amp., 3 wire outlet. A hospital grade (green dot) grounded plug assembly is provided.

Pre-Installation, (Cont'd)

Plumbing

WARNING: Obey all instructions of the chemical manufacturer, and follow all recommended safety precautions when handling, using and disposing of chemicals.

The following plumbing requirements are recommended for installation of the **Mini-Medical Military** Processor:

1. A water source for wash water and for cleaning the processor.
2. A sink or tub, with running tempered water, approximately 12" X 16", for use when cleaning film transport modules.
3. A drain or collection system suitable for disposing of photographic chemical wastes.

Caution: In some situations, regulations may require the capturing and safe disposal of photographic processing wastes other than in the sanitary sewer system.

Installation

NOTE: Do not unpack the processor until you have thoroughly inspected the shipping container for evidence of damage.

Contents: **Packing Case #1** (Will serve as the processor stand during operation)

1. Main Processor Assembly (includes three [3] film transports for Developer, Fixer and Wash installed in the Processor solution sections). The Film Storage Support Bracket is attached to the Processor Base Pan.
2. Front Top Cover (1)
3. Infrared Dryer transport (1); Dryer cover (1) - (Includes reusable foam packing pad.)
4. Manuals (2)

Contents: **Packing Case #2**

1. Daylight Loader Assembly (1)
2. Film Storage Box with hinged cover and security straps (1)
3. Replenishment Chemistry Containers (6), with (8) solid screw caps for safe storage & transport of solutions.

Note: Three (3) containers are to be filled with replenishment solutions and installed in the Processor Base for use during processing and three (3) are to be filled with replenishment solution and held ready for later use.

Set Up

Unpack

1. Open Packing Case #1 and identify the contents referenced above.

2. Carefully lift and remove the Processor Assembly using the two handles provided. Carefully lift and remove the Rear Cover and Dryer Transport. Unwrap the transport and set aside in a safe location. Remove the two (2) Manuals provided next to the Processor. Close Packing Case #1 (This case serves as the Stand for operation). Locate Packing Case #1 in the desired position for processing X-Ray films. Consider proximity to 120VAC 60HZ power source and solution waste collection point.

Position Processor

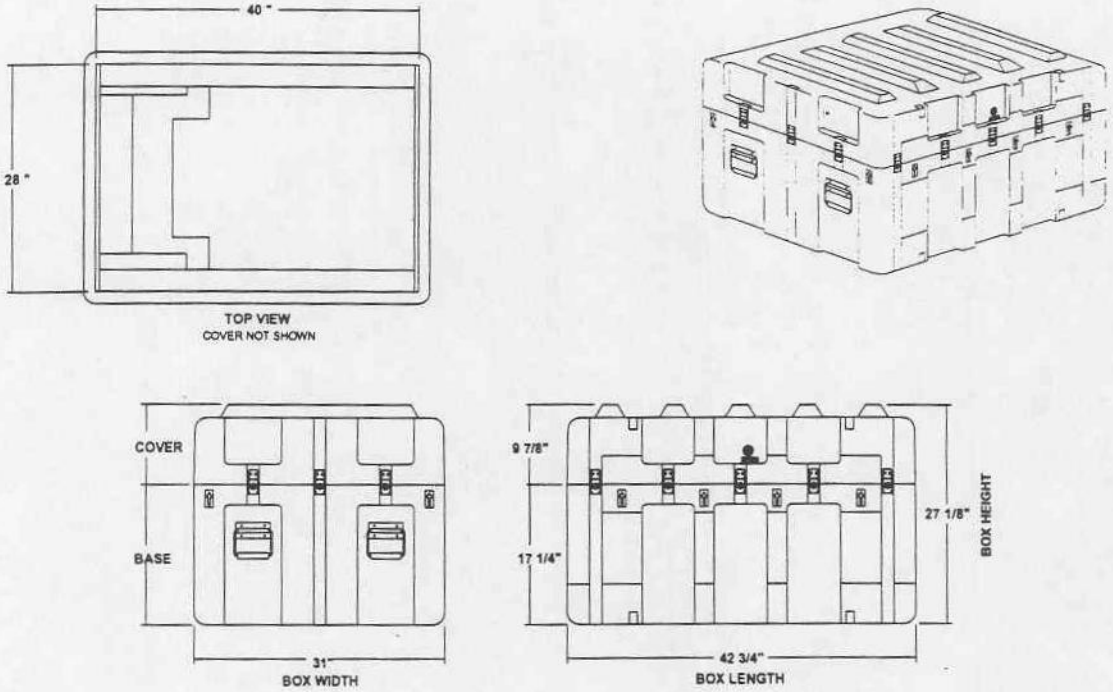
Position Packing Case #1 on a flat, level surface within 4 feet of a 120 VAC 60 HZ power supply. Use a trenching tool if necessary to prepare the surface.

3. Using two people, carefully position the processor on Packing Case #1 (See Fig. 2-3). Using the bull's eye level that is installed on the top cover, adjust the four (4) leveling feet with the 9/16" open-end wrench provided until the processor is level in both directions. Tighten the locking nuts against the machine frame.

4. Identify and remove from the Processor Assembly the Developer, Fixer and Wash Transports. Inspect all components at this time for any visible shipping damage. Inspect each of the racks for loose parts or screws. Remove the foam packing material from under each transport in its respective tank. Retain the packing material for later use when packing for redeployment. Store all packing material in Packing Case #2 after its contents are removed.

Packing Cases #1 & #2

Processor Case #1 P/N 001-026041



Daylight Loader Case #2 P/N 001-026042

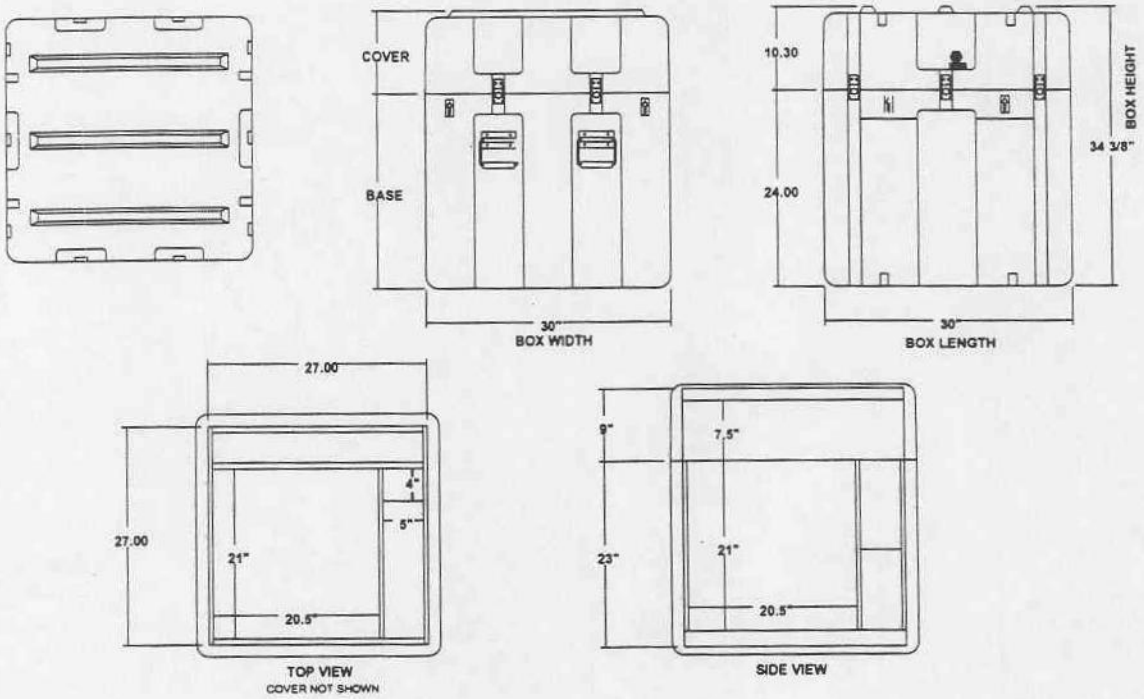


Figure 2-2, Packing Cases

Set Up (Cont'd)

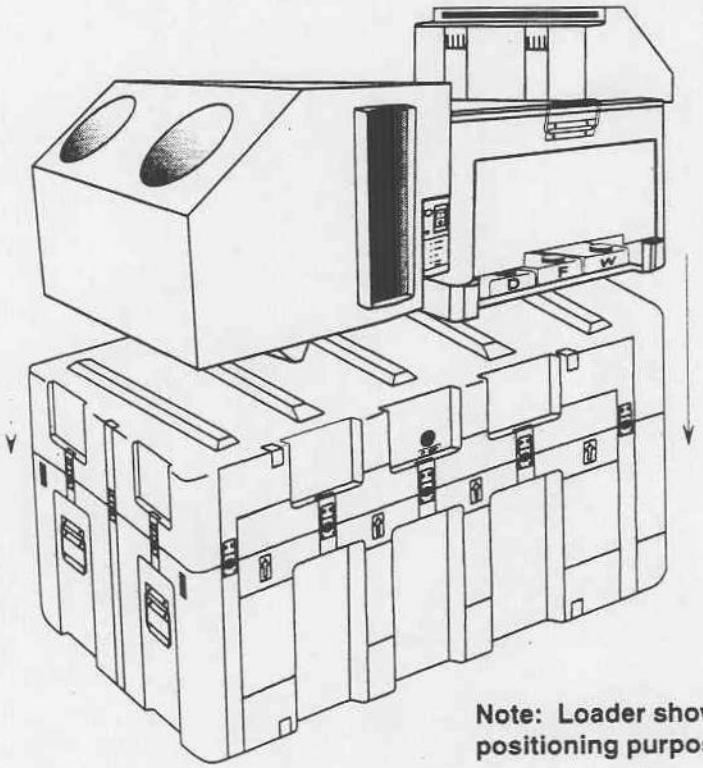
Processor Assembly

5. Position the Developer, Fixer and Wash Transport assemblies into their appropriate tanks. The Dev (red label) goes into the front tank, FIX (blue label) into the middle tank and WASH (no label) into the rear tank.

6. Position the Dryer Transport above the Wash Transport, placing the pivot pins securely into the pivot blocks at the rear of the Processor Assembly.

7. Plug the electrical supply harness into the Dryer Transport power receptacle located on the rear airknife under the cover plate (See Figure 2-4). To open the cover plate for access, loosen the Phillips screws in the lower left and right corners of the plate and swing the plate upwards. After plugging in the supply harness, close the cover plate, capturing the cable in the space between the cover plate and the right side plate. This functions as a cable drape to keep the cable in the proper position when pivoting the Dryer Transport up and back for access to or removal of the Wash Transport.

8. Remove the processor side covers.



Note: Loader shown for processor positioning purposes only.

Figure 2-3, Placing Processor onto Packing Case #1.

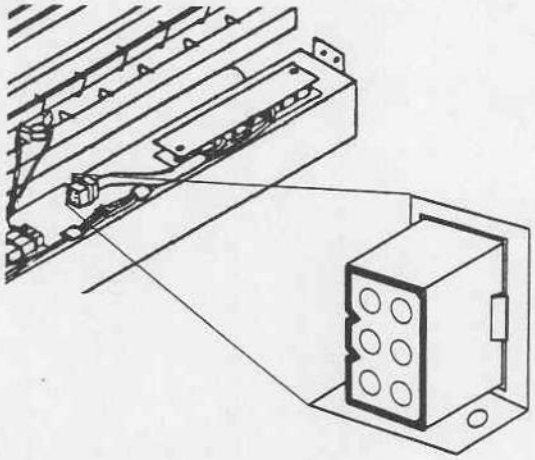


Figure 2-4, Dryer Power Receptacle

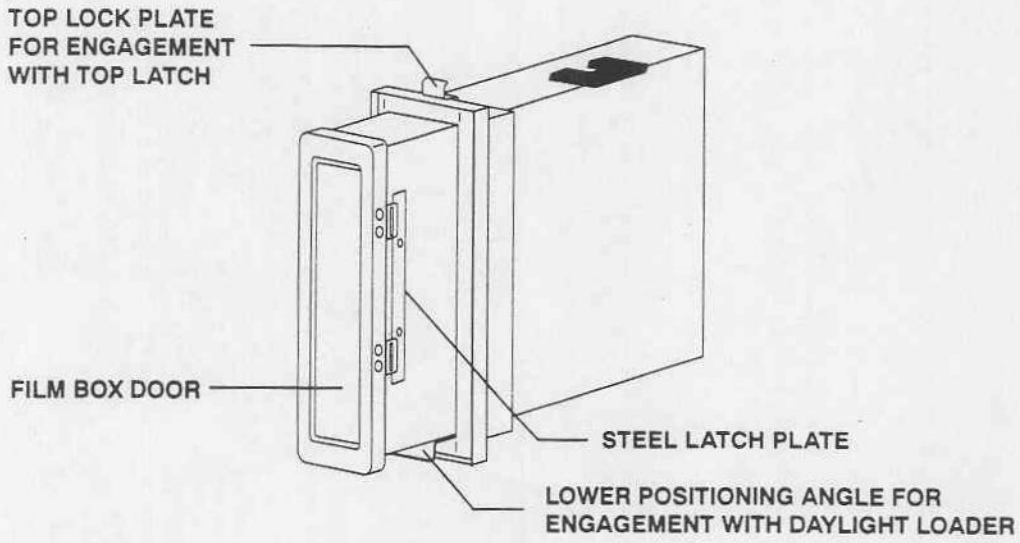


Figure 2-5, Film Storage Box and Cover.

Set Up (Cont'd)

9. Open Packing Case # 2. Remove contents (referenced on page 4) and put aside in a safe location. Store all processor packing materials in this case for later use when repacking for redeployment..

Daylight Loader Assembly

10. The Daylight Loader Assembly Mounting Plate is supplied secured to the front of the processor by four (4) 1/4-20 screws. The Film Feed Tray is supplied secured to the front of the processor by three (3) 8-32 screws.

11. Mount the Daylight Loader Assembly to the Mounting Plate (See Figure 2-6). **Note:** Arm holes face forward in front of the Processor Assembly.

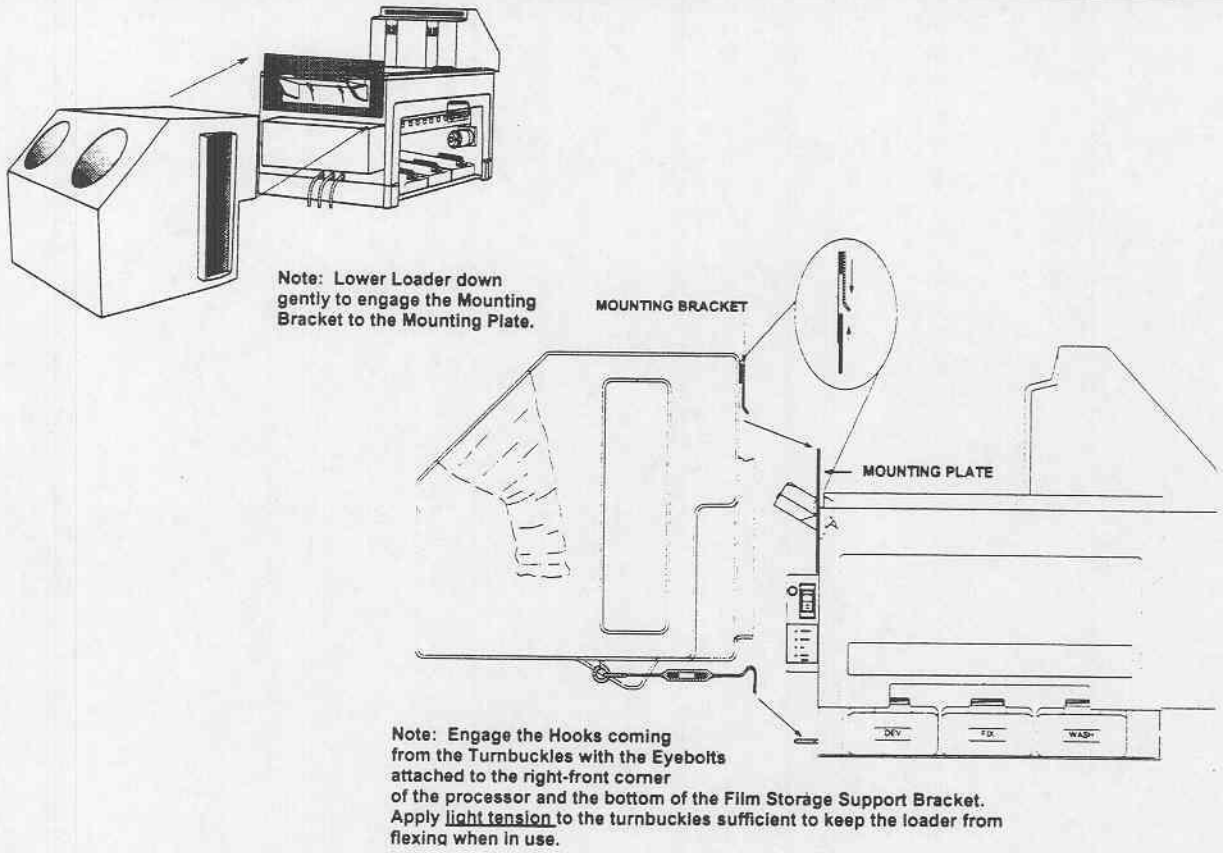


Figure 2-6, Mounting Daylight Loader

Set Up (Cont'd)

12. Insert the Film Storage Box into the opening at the rear left of the Daylight Loader Assembly by pushing the hinged cover end through the opening close to the top of the loader and then pushing down to engage the lower positioning bracket. Ensure that the box is secured in place by engaging and locking the clamp located on the top of the loader with the small angle plate located on top of the Film Box. Lock the clamp by pressing down the lever after engaging with the angle plate before loading the box with unexposed film. (See Figure 2-7).

13. The Film Storage Box may be refilled with fresh, unexposed X-Ray film from within the daylight Loader Assembly. Two compartments are available in the Film storage Box, each capable of securing 50 sheets of 14" X 17" medical X-Ray film A light tight, hinged cover equipped with two (2) brackets that engage with a spring loaded latch is provided. To avoid damaged (light fogged or exposed) film, always keep the cover on the Film Storage Box closed and secured unless loading or unloading film.

    CAUTION: Do not open the Film Storage Box cover or release the latch in daylight if unexposed film is stored in the film box when the box is not installed in the daylight loader. Damaged (light-fogged or exposed) film may result.

    Do not open cassettes or film cartons in daylight if the Film Storage Box is not installed or if the cassette access door (on the right side of the Daylight Loader Assembly) is open. Damaged (light-fogged or exposed) film may result.

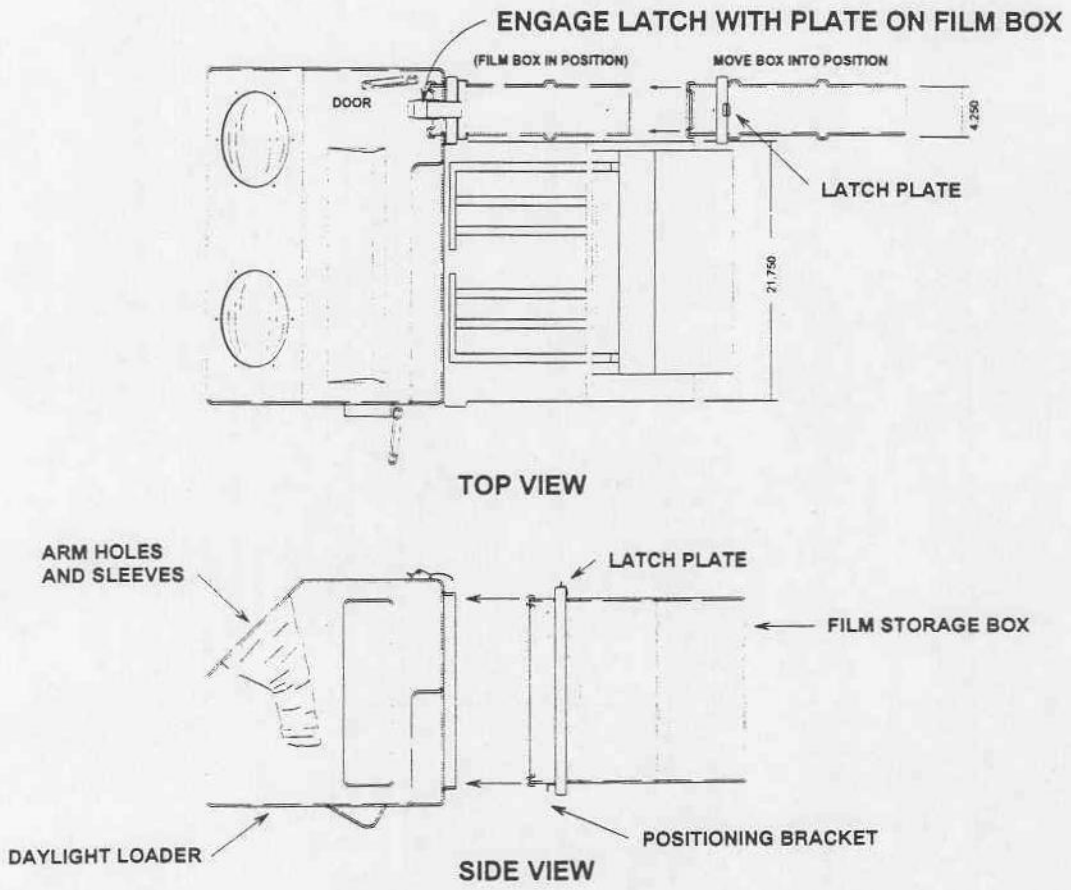


Figure 2-7, Mounting Film Storage Box to Daylight Loader

Replenishment Set Up

The processor may be set up to operate its replenishment system in either "Replenish" or "Batch" mode. **Note:** Equipment is tested and shipped in "Replenish" configuration.

In "Replenish" mode the chemicals will be replenished with fresh chemicals from the replenisher supply and the overflow will be collected for disposal or routed directly to a drain.

In "Batch " mode the developer and fixer chemicals will be recycled from the replenisher supply to the processing tank and back to the replenisher supply.

Replenish Mode

In "Replenish" mode, fresh replenisher will be pumped from the replenisher supply to the processing tank. Excessive chemicals in the processing tank will flow out of the tank at an overflow port and into either a container for disposal or an appropriate drain line. In this manner, constant processing chemical strength may be maintained for longer periods of operation. To install the processor for "Replenish" mode replenishment operation, proceed as follows.

1. Place the three (3) Replenishment Chemistry Containers in their proper positions under the corresponding tanks in the Base Pan of the Processor Assembly (See Figure 2-8). Note identification labels; Developer, Fixer, Wash.

2. Attach the screw cap on the red developer replenisher pickup hose from the developer replenisher pump (front position) to the fitting on the developer replenishment container.

3. Route the red developer drain hose and red overflow hose from the processor to an overflow container or drain line.

4. Attach the screw cap on the blue fixer replenisher pickup hose from the fixer replenisher pump (middle position) to the fitting on the fixer replenishment container.

5. Route the blue fixer drain hose and blue overflow hose from the processor to an overflow container or drain line.

6. Attach the screw cap on the clear wash water replenisher pickup hose from the wash water replenisher pump (rear position) to the fitting on the wash water replenishment container.

7. Place the clear wash water drain hose and clear wash water overflow hose from the processor to the overflow container or drain.

CAUTION: If you are draining your processor directly into a sanitary sewer, be certain that such connections are in accordance with codes.

DO NOT drain the processor into any drain lines that are made of copper pipe as chemical reactions will quickly damage the pipes.

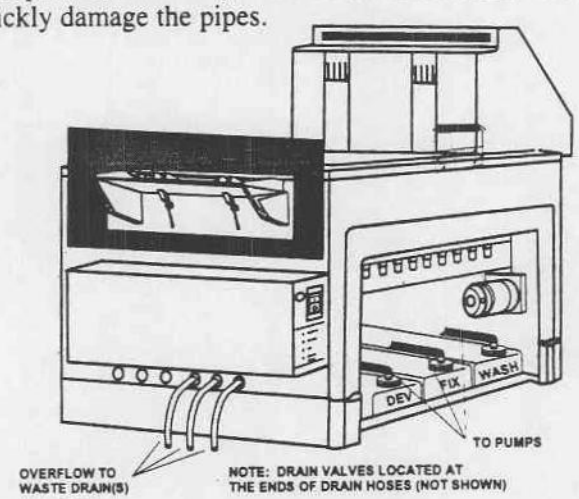


Figure 2-8, "Replenish" Mode Operation

Batch Mode

In "Batch" mode the replenisher will be recycled from the replenisher supply to the processing tank and will then, via the tank overflow port, return to the replenisher supply to be recycled again. As the chemical's processing strength becomes depleted, the entire batch is disposed of and new chemistry installed.

To install the processor for "Batch" mode replenishment operation proceed as follows: (See Figure 2-9)

1. Route the red developer replenisher pickup hose from the developer replenisher pump to the developer replenishment container filled with developer chemistry.

2. Route the red developer drain hose and red overflow hose from the processor to the same container as the developer replenisher pickup tube.

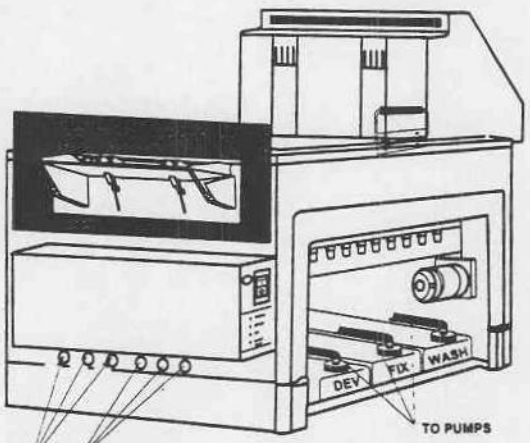
3. Route the blue fixer replenisher pickup hose from the fixer replenisher pump to the fixer replenishment container filled with fixer replenisher.

4. Route the blue fixer drain line and blue overflow hose from the processor to the same container as the fixer replenisher pickup hose

5. Route the clear wash water replenisher pickup hose from the wash water replenisher pump to the wash water replenisher container containing clean wash water.

6. Route the clear wash water drain hose and the clear wash water overflow from the processor to the same container wash water replenisher pickup hose.

   Note: In all of the above cases, a 7/8" diameter hole must be added to accept the overflow hose.



NOTE: DRAIN HOSES (NOT SHOWN) EXIT THE MACHINE HERE AND ARE 24" IN LENGTH. THE DRAIN VALVES (NOT SHOWN) ARE REMOTED TO THE END OF THE HOSES TO ALLOW USE WITH THE DAYLIGHT LOADER.

NOTE: INSTEAD OF OVERFLOW HOSES EXITING HERE TO GO TO SEPARATE CONTAINERS OR DRAIN(S), THEY ARE ROUTED INTERNALLY BACK TO THE REPLENISHMENT CHEMISTRY CONTAINERS.

Figure 2-9, "Batch" Mode Operation

Processor Inspection Before Adding Chemicals

Following set up, inspect the processor as described below to make sure it is ready for use.

CAUTION: DO NOT POUR CHEMISTRY INTO THE PROCESSOR TANKS UNTIL READING THE NEXT PAGE.

WARNING: During this inspection, be sure that the processor power is disconnected at the wall plug.

Inspect and clean the processor tanks, film transports and hoses as described below:

1. Open the drain valves on the front of the processor for the developer, fixer and wash tanks. Use warm water to rinse each tank clear of dust and debris. Close all drain valves.

2. Inspect all hoses to check for foreign matter. To remove debris if found, disconnect hose at one end, flush with water and reconnect.

3. Check and tighten if necessary, loose hose clamps and/or hardware on the processor.

4. Check that processor is level from front-to-rear and side-to-side. Correct as necessary.

Test Checkout With Water in Tanks

Read these instructions completely before starting the processor. For testing, do not use Developer or Fixer solutions in the tanks or replenisher containers.

WARNING: Never operate the processor without an electrical ground connection.

1. Close the tank drain valves.
2. If not already done, remove the three film transports and set aside.
3. Carefully pour about 1.5 gallons of warm water into each of the solution tanks. Fill to the plastic fill mark located on the inside of the tank wall on the non-drive side, 4" up from the bottom. Do Not attempt to fill the tank to the overflow. THIS IS FOR TEST PURPOSES ONLY. FILM WILL NOT BE PROCESSED OR FIXED.
4. Replace top front cover and check bull's eye level. Re-level the unit if necessary.
5. Remove top front cover and install all three film transports in their appropriate tanks.
6. With the Power Switch OFF, plug in the power cord.

   Caution: Never attempt to operate the processor without liquid in the tanks.
7. Switch the Power Switch to ON.
8. The transport system will run at Process speed for the duration of one processing cycle, the recirculation pumps will operate and the dryer heaters and fans will be activated.
9. Inspect all rack modules to verify that they are turning freely.
10. Carefully inspect the underside of the processor for any signs of leakage. Correct if necessary.
11. Operate the Manual Replenishment switch to run the replenishment pumps until the developer,fixer and wash tanks are full of water to the overflow port.
12. Activate either Film Feed switch with a piece of material. The Wait light will turn ON and every few seconds the replenishment pumps will cycle. Remove the film from the sensor. In a few seconds the Wait light will go out and the beeper will sound.
13. Set the Temperature Potentiometer located on the control panel to 95 degrees F.
14. When the Dev Temp lamp turns OFF, check the temperature of the developer with a metallic thermometer. If it is not correct for the film you will be using or if the actual temperature does not agree with the potentiometer dial setting, adjust the temperature as outlined in Section 5, Service.

Transporting Film

Transport several pieces of film of your usual size(s) through the processor. Inspect and if necessary, correct for the following:

1. Film Feed switch operation. The Wait lamp should stay on continuously until a few seconds after the trailing edge of the film being processed is clear of the Film Feed switch.

   As the Wait light turns off, an audible beeper will sound indicating it is safe to feed in another piece of film.

   The processor will remain in the process mode for approximately 4 minutes after the film feed switch is released.

2. Drift or Skewing. The film should feed through the processor in a straight line. If it drifts, skews or wrinkles, check the racks for proper seating or loose assembly screws. Be certain you are feeding the film in straight before checking racks. Check to ensure that the processor is level.

3. Drying. Be sure the dryer is operating properly. Film processed in water alone may still be slightly tacky or damp when exiting the processor.

Final Cleaning Before Operation as a Processor

1. Turn the Power Switch OFF. Unplug the power cord.

2. Drain test water from each of the processing tanks and the replenishment containers for the developer,fix and wash replenishment systems. Close all drain valves.

3) Wipe any excess water from the film transports and tanks.

The processor is now ready to be charged with fresh Developer, Fixer and water as instructed in Section 3, OPERATION.

Processor Set Up Checklist

1. Uncrate processor, daylight loader assembly, brackets, hardware, and replenisher supply tanks. Inspect for shipping damage.
2. Position processor on Packing Case No. 1.
3. Level processor on Packing Case No. 1.
4. Inspect tank and racks for loose parts. Adjust as required.
5. Install replenisher containers. Set up for replenish or batch mode.
6. Connect wash water system and drain.
7. Rinse out solution tanks, inspect recirculation lines.
8. Perform Operational Checkout.

Figure 2-10, Setup Checklist

Operational Test Checklist

1. Close drain valves.
2. Remove film transports.
3. Partially fill tanks with warm water.
4. Replace racks.
5. Plug in processor, turn on Power.
6. Inspect transport drive system.
7. Check recirculation plumbing for leaks.
8. Top off tanks using Manual Replenishment switch.
9. Confirm if filled unit is level. Re-level if necessary.
10. Check Film Feed switch and "Beeper" operation.
11. Check temperature control systems.
12 Check developing time.
13. Check for dryer heat and operation of both fans.
14. Check transport of material.
15. Drain Processor.
16. Charge with fresh chemistry.

Figure 2-11, Operational Checklist

Notes:

Section 3
Operation

- General Index -

AFP Mini-Medical Military
X-Ray Film Processor

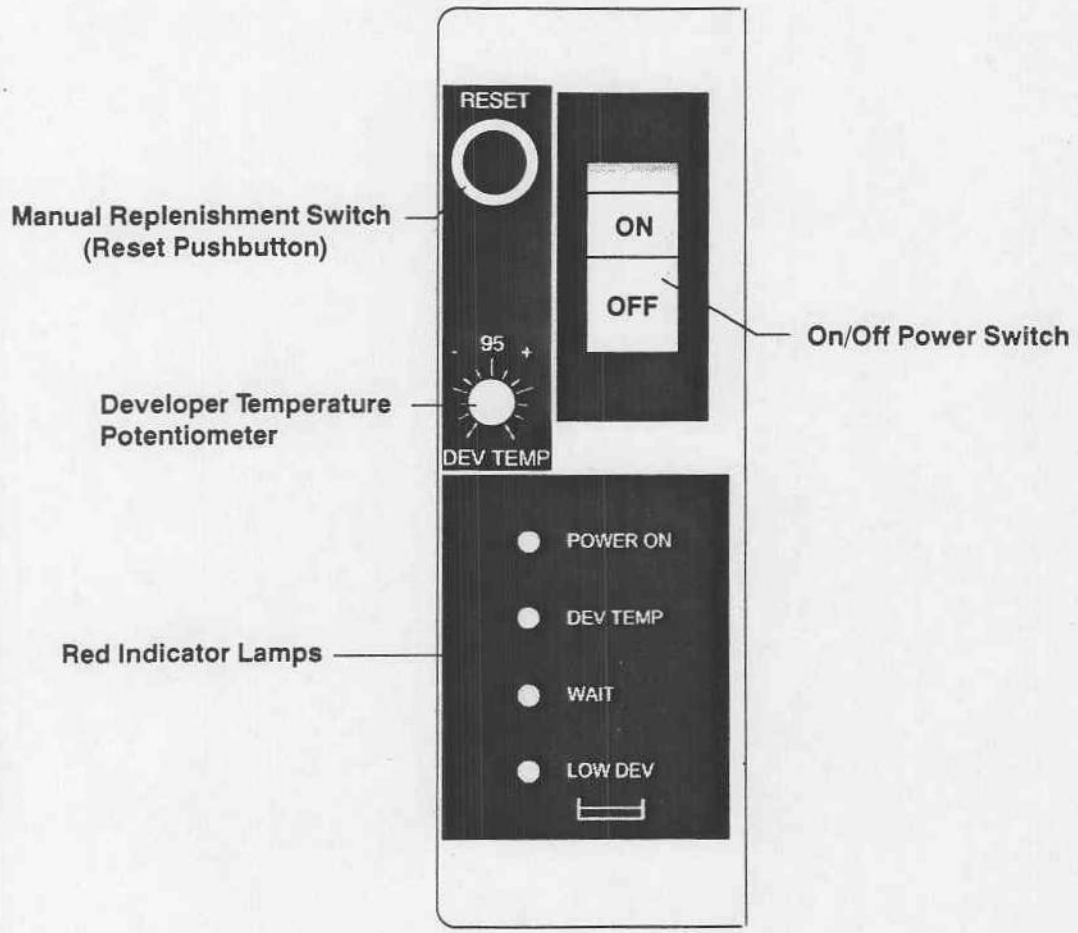


Figure 3-1, Control Panel

Controls and Indicators

All of the user controls and indicators for operation of the **Mini-Medical Military** Processor are located on the front right side of the processor. These controls are described below and on the following page.

User Controls

1. Power Switch

OFF	All power to processor is OFF.
ON	Processor is ON, in standby mode. Circulation pumps, developer heater and air circulation fan are ON. Transport, replenishment system and dryer will operate when Film Feed switch is activated. Power On lamp will light.
CENTER	This switch also serves as the circuit breaker for the processor. If tripped to the center position reset to OFF, then turn ON. If the switch trips again, the processor probably needs service. Do not attempt to use the processor if it trips off repeatedly.

User Controls, (Cont'd)

2. Manual replenishment (Reset Switch)

   Provides for manual operation of replenishment pumps. Use to "top off" tanks or to turn over chemistry when activity levels have dropped.

3. Power ON/OFF Lamp

   Lights when Power Switch is ON.

4. Dev. Temp. Lamp

   Lights when developer heater is ON. Wait for light to cycle OFF before first use each day.

5. Wait Lamp

   Illuminates when Film Feed switch is activated and during Anti-Crystallization cycle. To prevent fogging of film, wait until lamp goes OFF or beeper sounds before opening the side door of the Daylight Loader.

6. Low Dev.

   Lamp ON indicates that developer is too low for safe operation. To prevent damage to the processor, the developer heat function is turned OFF when a low level condition exists.

7. Drain Valves (3)

   One (1) each to drain the Developer, Fixer, Wash tanks and recirculation pumps.

8. Overflow Lines

   Drain lines from developer, fix & wash overflow ports.

9 Top Cover Interlock Switch

   To prevent accidental injury from moving parts, a safety switch is interlocked with the processor's dryer cover. If the dryer cover is removed, the processor automatically shuts down. This interlock may be overridden for service use only by using the hold down bracket provided under the feed tray.

   Caution: DO NOT attempt to process film in this unit when the interlock is overridden.

Loading Chemicals

Always begin with a clean processor. The processor should have been cleaned in the normal course of installation or maintenance.

With the developer and/or fixer tank cleaned and drained, add processing chemicals as described below:

WARNING: Read and heed safety precautions given by the chemical manufacturer in mixing, using and disposing of processing solutions. Do not allow the fixer to contaminate the developer solution.

To prevent chemical splashing and the risk of contamination follow these instructions carefully.

1) Close the tank drain valves on the ends of the hoses coming from the front of the processor.

2) If not already done, remove the three film transports and set aside.

3) Cover the developer tank with a sheet of film, paper or other material to protect it from accidental splashes of fixer. **Caution: Minute amounts of fixer chemical (5 ppm) is sufficient to contaminate the developer solution. Always add fixer to the processor first so that any splashes into the developer tank can be wiped up or flushed out before the addition of developer.**

4) Carefully pour about 1.5 gallons of fixer working solution into the fix tank up to the plastic fill mark located on the inside of the tank wall on the non-drive side (4" from bottom). Do Not attempt to fill the tank to the overflow. Inspect the developer tank to insure that no fixer has splashed or spilled into it. Wipe up or flush out if fixer is found.

5) Cover the fixer tank with a sheet of film or paper, or other material, to protect it from accidental splashes of developer.

6) Carefully pour about 1.5 gallons of developer working solution into the developer tank up to the plastic fill mark located on the inside of the tank wall on the non-drive side (4" from bottom). Do Not attempt to fill the tank to the overflow.

7) Carefully pour about 1.5 gallons of warm water into the wash tank up to the plastic fill mark located similarly to the other two. Do Not attempt to fill the tank to the overflow.

8) Replace the film transports. Lower them into the tanks slowly to prevent splashing or tank overflow. Check for correct seating on the locating pins and driveshaft. Verify that the main drive gears on the transport drive shafts are properly engaged with the worm gears on the main drive shaft.

9) Attach the screw caps on the replenisher hoses to the fittings on the replenisher supply containers.

10) Turn the Power Switch-ON. Operate the Manual Replenishment switch to run the replenishment pumps until the developer, fixer and wash water are seen in the overflow drain tubes.

Daily Start Up

The daily start up procedure is as follows:

Processor ON, Fill Wash Tank

1) Close the wash tank drain valve. Carefully pour about 1.5 gallons of warm water into the wash tank up to the plastic fill mark located on the inside of the tank, 4" up from the bottom on the non-drive side of the unit.. Do Not attempt to fill the tank to the overflow.

2) Switch the Power Switch to the ON position. The processor will start in the process mode and run for approximately 4 minutes.

3) Allow the developer to warm up to operating temperature (Dev Temp light will cycle OFF). Check for leaks around all hose fittings.

Caution: Always inspect to see that all drain tubes are properly positioned and draining correctly. All drain tubes must be routed in a continuously downward direction, without dips or loops that can cause airlocks.

Caution: A kink or twist in a drain tube can cause a serious chemical or water spill in the processor.

Check Developer, Fixer and Wash Water Levels

If not previously done, check the developer, fix and wash tanks to see that they contain adequate solution. Prepare fresh replenisher if necessary and using the Manual Replenishment switch, top off each tank with chemistry to the overflow port.

Check Drive

With the Power Switch in the ON position, check all turning drive gears to see that they mesh properly and turn without binding. Make sure the transport rollers are turning freely, without interference or binding. Replace the lower front cover and check the Bull's Eye level provided to ensure that the machine is level. Make adjustments as necessary

Processing Film

Daylight Loader Operation

The front of the Daylight Loader has two (2) arm holes through which the operator's arms are inserted. Film may be loaded into and accessed from the Film Storage Box (located in the front left corner of the loader), by opening the door on the front of the box. A similar door is located on the right side of the loader. Boxes of film and cassettes are fed into and removed from the loader through this door.

A typical cassette loading sequence is as follows:

Ensure that the Film Storage Box door is securely shut. Open the door on the right side of the loader. Insert film cassette (14" X 17" maximum size), hinged side down into the cassette recess in the bottom of the loader and close the door. Make sure the door is tightly shut. Put arms through the sleeved holes in front of the loader (Note: It is recommended jewelry, etc., be removed first) and open the cassette. Open the door to the Film Storage Box, located in the left rear side of the Daylight Loader Assembly by pressing the stainless steel plate inward on the right side of the box (See Figure 2-5) to disengage the two (2) steel snaps. Carefully pull a film towards you while gently bending it to the right and place it between the two halves of the open cassette. When the film is in position, close the cassette.

Caution: Close Film Storage Box door before removing arms from loader to avoid light fog damage to stored film.

Open the door on the right side of loader and remove the cassette to be exposed.

After exposure, return the cassette hinged edge down to the cassette recess in the bottom of the Daylight Loader Assembly and close the door tightly. Put arms into the loader sleeves and open the film cassette. Pull the film upward from the cassette, rotate it 90 degrees and bend it forward into the film feed tray.

Caution: When feeding film sizes 8" X 10" or smaller, make sure that the film is placed against the right or left inside edge of the feed tray to ensure that one of the film sensors is activated and to maintain a straight film path.

The machine will go into the process mode and begin to pull the film into the processor. Once the film is accepted and is feeding into the processor, it is safe to let go of the film and reload the cassette. **Do not remove arms from the loader or open the cassette entry door on the right side of the loader or remove the Film Storage Box from the left rear of the loader until the "WAIT" lamp (located on the Control Panel) goes out and the Tone sounds, indicating that the trailing edge of the film has cleared the entry rollers and is safe from potential light fogging.**

After the processor completes its processing cycle it will automatically return to Stand-By mode awaiting the next film.

Shutdown and Daily Cleaning

Basic care of the processor goes hand-in-hand with its operation. Following each day's work, allow 15 minutes to clean the processor as described below.

Drain Wash Tank

Open the wash tank drain valve and allow the wash water to drain. Rinse out the wash tank with fresh warm water, then close the drain valve.

Clean Top Cover, Guides & Rollers

Using a separate wet cloth for developer and fixer, wipe the exposed rollers on each transport.

Caution: Do not use the same cloth for fixer and developer transports. Fixer may contaminate the developer.

Wipe off Processor

Thoroughly wipe the inside and outside surfaces of the top cover and side panels with a damp cloth. Replace the top cover, leaving a slight opening over the drive shaft to prevent condensation of chemistry vapors.

Quality Control

A good quality control program is essential to the production of quality radiographs.

It is recommended that a quality control program for the processor be established and maintained to assure the quality of your output.

Following are some suggestions for those areas that should be monitored. Contact your film and chemistry technical representative for additional information and assistance.

Developer

Developer activity can be monitored by use of pre-exposed control strips or by careful monitoring of your production work.

Fixer

Exhausted fixer will usually result in dark streaks in your film's emulsion that may appear immediately after processing or may not appear until hours or even days after processing.

Exhausted fixer can also contribute to transport problems such as jams and will frequently prevent proper drying from taking place, resulting in sticky film surfaces.

The general quality of your fixer can be determined by monitoring the pH of the chemistry.

When pH is too high, films may jam in the wash tank and the dryer. To determine pH, immerse pH test strips in the fixer and read its pH value from the resultant color change on the strip. If the pH rises toward the chemical manufacturer's recommended upper limit, discard the old fixer and replace with fresh chemicals.

NOTE: Only terminal-type silver recovery systems are recommended for use with this processor. Do not try to reuse fixer after silver has been removed.

Replenishment

Manual Pushbutton (Reset Switch)

The Manual Pushbutton (Reset Switch) activates all functions in the machine when depressed, including the developer, fixer and wash water replenishment pumps. When it is released, the machine timing functions are initiated and the machine goes through a process cycle, after which it returns to standby. Manual replenishment in the Mini-Medical Military Processor consists of "topping" off the developer, fixer and wash water tanks with fresh working solution at the start of each shift and automatic replenishment by the replenishment system, triggered by film presence.

Quality Control (Cont'd)

Replenishment (Cont'd)

Automatic

Automatic replenishment is accomplished by the film tripping the Film Feed Switch which, in turn, actuates the electronic replenishment circuitry. Depending on technician set adjustments, the developer, fixer and wash pumps will cycle on and off during film feeding to replenish the working solution in their respective tanks.

Manual Replenishment may be required for one of three reasons. They are:

1) To top off the tanks at start-up.

2) To restore chemical strength after several days of shut down.

3) To compensate for a basic under-replenishment condition. (See NOTE below)

NOTE: Chemistry requirements vary by the type of work and average size of films you are processing. If you find that you must frequently use the Manual Replenishment switch to add fresh chemistry, it is recommended that you have your technician adjust the replenishment control circuits as required to allow for adequate automatic replenishment.

Checklists for Daily Use

Start-up

1. Check solution levels.
   Top off processing tanks and fill wash tank.

2. Power Switch to ON, check drive gears for meshing;
   allow 15-30 minutes warm up.

3. Clean feed tray, receiving bin.

4. Check developer activity, fixer pH.

Operation

1. Feed film to start processing cycle.

2. Wait until Wait Lamp goes out or Tone sounds before removing arms from the Daylight Loader or opening the side door on the Daylight Loader or removing the Film Storage Box from the Loader.

Shutdown and Daily Cleaning

1. Switch power off.

2. Drain and rinse wash tank. Close valve.

3. Clean:
   a) Roller surfaces, transport and tank area.
   b) Splashes from inside top cover.

4. Wipe outside surfaces of the processor, inside surfaces of feed tray and both side panels.

5. Leave top cover and Daylight Loader side door slightly open to prevent condensation.

NOTE: Duplicate these checklists and post them near the processor.

Section 4
Maintenance / Storage

- General Index -

Maintenance Program

Maintenance of the **Mini-Medical Military** Processor consists of cleaning and adjustment operations, routinely performed, to keep the processor operating correctly. The processor has a set maintenance program, with specific operations responsible for maintenance of quality performance.

Maintenance Records

Good preventive maintenance is essential to assure a long and trouble free life of the processor. Keeping on-going records of maintenance will help assure that the work is performed when scheduled.

Figure 4-1 is a *Maintenance Schedule* that lists tasks to be performed at prescribed maintenance intervals.

Figure 4-2 is a *Maintenance Log* for keeping monthly records of maintenance performed. Make additional copies and post near the processor.

Cleaning

Cleaning is the most important form of maintenance. If chemicals are allowed to accumulate on processor parts they can cause corrosion or other damage which may seriously affect production and output quality.

Perform daily cleaning, as outlined on the Maintenance Schedule, Figure 4-1, as part of the shutdown procedure.

Weekly cleaning, should take about thirty minutes following the last shutdown and daily cleaning. Additional cleaning schedule should be performed before disassembly for transportation and storage.

Do not replace items removed for daily cleaning until after weekly cleanup has been completed.

Caution: Never use harsh abrasive material to clean racks or processing tanks. Never use scrub pads such as "Scotchbrite" on rollers.

Mini-Medical Military Processor
Maintenance Schedule

Daily

Clean:

Developer Rollers
Top Covers, Side Panels
Feed Tray, Receiving Bin

Check:

Chemical Levels
Replenisher Levels
Processor Level

Weekly

Clean:

Developer Rack
Fix Rack
Wash Rack
Wash Tank
Tank Exteriors

NOTE: THE MONTHLY MAINTENANCE SCHEDULE SHOULD BE PERFORMED BEFORE DISASSEMBLY FOR TRANSPORT OR STORAGE.

Monthly

Clean:

Developer Tank, Circulation & Replenishment System
Fixer Tank, Circulation & Replenishment System
Wash Tank, Drain & Overflow System

Check:

Hose Clamps & Plumbing
Rack Bearings
Lubrication Points

Yearly Or After Long Term Storage

Clean:

Developer & Fixer Circulation Pumps

Check:

Drive Belt
Drive Motor Brushes
Lubrication Points

Figure 4-1, Maintenance Schedule

Mini-Medical Military Processor
Maintenance Log

MONTH		RECORD	DAILY								WEEKLY				NOTES
DAY	INITIAL UPON COMPLETION	CLEAN DEV. ROLLERS	CLEAN TOP COVERS	CLEAN SQUEEGEE ROLLERS	CLEAN FEED TRAY	CLEAN RECEIVING BIN	CHECK CHEMICAL LEVELS	CHANGE WASH WATER	CLEAN DEV. TRANSPORT	CLEAN FIX TRANSPORT	CLEAN WASH TRANSPORT	CLEAN WASH TANK	CLEAN TANK EXTERIORS	CHANGE DEVELOPER	CHANGE FIXER	
1																
2																
3																
4																
5																

	HRS	DATE	OPERATION	INIT
6				
7			MONTHLY MAINTENANCE	
8			CLEAN DEVELOPER SYSTEM	
9			CLEAN FIXER SYSTEM	
10			CLEAN WASH SYSTEM	
11			CHECK HOSE CLAMPS	
12			CHECK LUBRICATION DIAGRAM	
13				
14				
15				
16				
17			YEARLY MAINTENANCE	
18			CLEAN FIX & WASH PUMPS	
19			CHECK DRIVE BELT	
20			CHECK MOTOR BRUSHES *	
21			CHECK LUBRICATION DIAGRAM	
22				
23			LUBRICATION	
24			DRIVE SHAFT BRGS (MONTHLY)	
25			TRANSPORT BEARINGS (MONTHLY)	
26			DRIVE SHAFT GEARS (MONTHLY)	
27				
28				
29				
30				
31				

Note: If Processor is run 80 hours or more a week, perform maintenance twice as often.

1. Duplicate this copy to provide a supply of log sheets.
2. Perform operations as instructed in User's Manual.
3. List operating hours at each operation and initial.
4. Retain completed log sheets for continuing history.

* Where applicable

Figure 4-2, Maintenance Log

Weekly Cleaning

1) Remove the developer, fixer and wash transport assemblies. To prevent chemical contamination, wash off each assembly separately with clean, lint-free cloths and warm water. Clean each roller over its entire surface. Use isopropyl alcohol if necessary to remove traces of adhesives.

NOTE: Soft scrub pads, such as nylon net over sponge, work well on rollers. Metallic, or non-metallic, scrub pads such as "Scotchbrite", must not be used on rollers as they will damage the roller surface.

2) Inspect each transport thoroughly. Verify that the rollers turn freely and that all guides and baffles are properly in place. Carefully set each transport assembly aside to drain and dry while you are cleaning the rest of the processor.

3) Clean the outside surfaces of the processing tank, using warm water with a sponge or non-metallic scrub pad.

Caution: Never use steel wool on any part of the processor as its residue may cause rust to form on the metallic parts of the processor.

4) Clean the dryer rollers and transport parts with a damp cloth and wipe dry.

5) Replace all removed transports and other parts.

Monthly Cleaning or Before Transport or Storage

As film is processed, by-products are released into the developer, fix and wash systems. These must be removed by regular cleaning. Every month, schedule two hours of processor downtime to thoroughly clean the developer, fixer and wash systems.
NOTE: This cleaning will replace the scheduled Weekly Cleaning due on the same date.

1) Open the drain valves, drain and dispose of the used developer, fixer and wash water. Allow the tanks and recirculation systems to drain completely. Remove the pickup tubes from the developer, fixer and wash replenishment bottles, remove the bottles from the machine and pour out any residual chemistry or water that may remain. Rinse all replenishment bottles thoroughly. Replace the solid caps onto the containers if they are going to be stored or transported. **OR** Fill with fresh chemistry and water and replace into the machine with the appropriate pickup tube assemblies if the machine is going to continue to be used.
Caution: When filling or rinsing the processor tanks, use water no hotter than 120 degrees F (54 degrees C).

2) Rinse out each tank and then close the drain valves and fill the wash tank with warm water.

3) Systems Cleaning.

The use of Developer Systems and Fixer Systems Cleaners are recommended for cleaning the developer and fixer system. Carefully follow the manufacturer's instructions and precautions. Dissolve any powdered chemicals in water before adding to the tank. Be sure to accomplish the neutralizing and rinsing steps recommended by the systems cleaner manufacturer.

WARNING: Beware of all rotating gears, shafts and drive belts when operating the processor with its access panels removed.

4) After the developer and fixer systems are thoroughly cleaned, neutralized and rinsed, fill each tank with fresh warm water and install the transport assemblies. Switch processor ON and allow the transport and recirculation systems to run for about 15 minutes as a final rinse.

5) Systems cleaning will remove most, if not all, of the chemical residue from the transport assemblies. For additional cleaning and inspection, proceed as outlined below:

A) Remove the transport from the tank.

B) Clean the developer and fix transports without disassembling them.

C) Appropriate Systems Cleaner may be used to remove stubborn deposits. Never use "Scotchbrite" type pads on roller surfaces. Rinse the transport thoroughly after it has been cleaned.

D) Inspect all transport assembly end plates for wear. Be sure the rollers turn freely. Bearing wear differs according to the solution in which the transport is used. Since bearings tend to wear more quickly in the fixer solution, the fixer transport end plates should be checked more frequently for wear.

6) Inspect the empty processing tank for foreign matter and, if necessary, use a soft scrub pad or brush and warm water to clean the tank interior. Flush the tank with warm water and drain.

Monthly Cleaning or Before Transport or Storage (Cont'd)

7) Check the hose clamps on the developer, fixer and wash pumps and the base of each pump for leaks. Secure as necessary.
Caution: Do not over-tighten clamps. This can cause leakage or damage to the pump heads.

8) Refer to Figure 4-2, Maintenance Log and Figure 4-3, Lubrication Points and lubricate as indicated. Be sure to clean off all old lubricants and any excessive new lubricants.

Annual Maintenance or After 90 Day Plus Storage Periods

Once a year or after extended (90 day plus) storage periods and following a routine monthly cleaning, perform the following tasks on the processor:

1) Inspect the drive gears on each transport assembly and replace any gears that are excessively worn or damaged.

2) Refer to Service Procedure 5-1. Inspect, and adjust or replace if necessary, the main drive belt.

3) Refer to Service Procedure 5-2. Inspect and clean the fixer and wash circulation pumps. Developer pumps are usually cleaned adequately by systems cleaning and do not require additional servicing.

4) Refer to Service Procedure 5-3. Inspect and clean the developer and fixer replenishment pumps.

5) Refer to Figure 4-2, Maintenance Log and Figure 4-3, Lubrication Points and lubricate as indicated.

Be sure to clean off all old lubricants and any excessive new lubricants.

Special Maintenance Notes and Information for Long Term Storage & Inspection

The processor may be stored indefinitely, as shipped, indoors without requiring air conditioning or other temperature controls. Outdoor storage would require the units be protected from precipitation by waterproof tarpaulin or other comparable covering. No adjustment to calibration or other settings are required during storage.

Certain elastomer items, specifically O-rings and replenishment pump poppet valves have a projected shelf life for 60 months. They should be examined for loss of resiliency at this time interval and replaced if necessary.

These parts are listed below:

Item	Location	Qty\Unit	AFP P/N
O-Ring	Dev. Temp Sensor	2	0000045805
O-Ring	Chemical Recirc. Pump	8	0000045822
O-Ring	Chemical Recirc. Pump	2	0000045825
Poppet Valve	Chemical Replen. Pump	2	0000083915

Section 5
Service

- General Index -

WARNING: Never attempt to perform any electrical troubleshooting, adjustment or service unless you are a qualified electrician, electronics technician or factory trained service technician.

Content

This section contains information on trouble-shooting and repairing the **AFP Mini-Medical Military** Processor.

Always consult the Troubleshooting Chart before attempting service or repair, or before calling a service representative.

Even if you do not plan to service the processor yourself, the chart will help you explain the problem to a service representative.

WARNING: Be extremely careful when trouble-shooting or servicing the processor with the power on. Dangerous, potentially lethal, electrical voltages are present at several points.

Following the Troubleshooting Charts are instructions for performing adjustment and repair procedures that may be required to keep the processor functioning.

Also in this section is a description of the control electronics in the processor, with applicable schematics and a wiring diagram. These will enable users who are trained and equipped for electronics trouble-shooting to trace failures in the electronics.

NOTE: The circuit cards in this processor are not considered field repairable and in the event of a component failure, should be replaced.

Attempting to repair them could invalidate any remaining warranty, or may cancel the exchange credit value that some cards may have.

Troubleshooting

The Troubleshooting Charts are divided into three columns. To use either chart, find on the left, under symptom, a problem that sounds like yours. In the middle column, in diminishing order of likelihood, are the Probable Causes for such a symptom. The right-hand column, Remedy, provides corrective action(s) for each probable cause.

Test Equipment and Tool Kit List Required for Service and Repair

Multimeter, Digital
Oscilloscope, Dual Trace Storage
Portable Densitometer
Portable Sensitometer
Tool Kit, Medical Equipment, Repairman
Dryer Cover Hold-Down Bracket

Service Procedures

Following the Troubleshooting Charts are service procedures for repair and maintenance of the processor.

Below is an index to those procedures:

Procedure	Title
5-1	Inspecting, Adjusting & Changing the Main Drive Belt
5-1A	Film Sensors and Adjustments
5-2	Servicing Circulation Pumps
5-3	Servicing Replenisher Pumps
5-4	Calibration Procedures
5-5	Theory of Operation
	Waveforms & Voltages

Schematics

The following illustrations and schematics are included for servicing the **AFP Mini Medical Military** X-Ray film processor.

Illustration A	Film Sensor Configuration
Illustration B	Recirculation Pump
Illustration C	Disassembly of Replenisher Pump
Figure 5-1	Main Wiring Diagram
Figure 5-2	Dryer Rack Wiring Diagram
Figure 5-3	AC Interface Board
Figure 5-4	AC Interface Board Schematic
Figure 5-5	Logic Board Layout
Figure 5-6	Logic Board Schematic
Figure 5-7	Ready Tone Generator Layout & Schematic
Figure 5-8	LED Board Schematic

Troubleshooting
Processor Problems

Symptom	Probable Cause	Remedy
1. Developing time not constant.	A. Excessive load on drive motor. B. Solution levels low.	A. Check that racks are seated and turn freely. B. Add chemicals as required.
2. Solution temperature too high.	A. Temperature control setting moved. B. Shorted heater triac. C. Defective temperature sensor. (Open) D. Logic failure.	A. Restore correct setting. B. Replace heater triac. C. Replace temperature sensor. D. Replace logic board.
3. Solution temperature too low.	A. Heater failed. B. Heater triac failed. (Open) C. Temperature control setting moved. D. Shorted temperature sensor. E. Logic failure.	A. Replace heater. B. Replace heater triac. C. Restore correct setting. D. Replace sensor. E. Replace logic board.
4. Dryer temperature too low.	A. Failed heating element. B. Open overtemp switch on dryer. C. Shorted temperature sensor.	A. Replace element. B. Will reset when cool. Inspect for cause; fan not running, dirt build-up, etc. C. Replace sensor
5. Dryer temperature too high.	A. Open temperature sensor. B. Blower failure. C. Logic failure.	A. Replace sensor. B. Replace blower. C. Replace logic board.
6. Film jams.	A. Film not fed in squarely. B. Improper fixing, fixer too old, pH too high, or improperly mixed fixer or fixer replenisher.	A. Feed film in carefully, leading edge parallel to rollers. B. Check pH. If pH is above 5.0, dump and mix fresh. Follow the mfg's instructions exactly.

Troubleshooting Processor Problems, Continued

Symptom	Probable Cause	Remedy
7. Films overlap or become skewed during transport.	A. Bound rollers.	A. Clean each roller; check for causes of binding.
	B. Rack end plate bearings worn.	B. Replace bearings.
	C. Missing rack springs.	C. Replace springs.
8. Film is tacky, wet or curled when leaving dryer.	A. Improper fixing.	A. See 5B.
	B. Dryer temperature too low.	B. Check dryer for proper operation.
9. Dirt particles on film.	A. Foreign particles in dryer or on squeegee rollers.	A. Run several outdated sheets of unexposed film.
	B. Algae deposits on film.	B. Clean wash tanks & racks with nylon scrub brush and warm water. Drain wash tank each night.
	C. Foreign particles on squeegee roller(s).	C. Clean squeegee roller(s).
10. Scratches on film emulsion.	A. Dirt on feed rollers	A. Clean feed rollers.
	B. Chemicals crystallized on underside of top fiml guides.	B. Clean film guides.
	C. Dirt or silver accumulation on rollers.	C. Clean rollers using a nylon scrub pad and warm water, or developer systems cleaner for developer racks/fixer systems cleaner for fix racks.
	D. Roller in rack not turning.	D. Check all rollers for operation; repair as required.
	E. Dirty feed tray surface.	E. Clean feed tray.

Troubleshooting Processor Problems, Continued

Symptom	Probable Cause	Remedy
11. Increase in image density.	A. Film is over exposed.	A. Coordinate exposure with developing time.
	B. Developer temperature too high.	B. Have service technician adjust developer temperature.
	C. Excessive developing time due to mechanical binding.	C. See symptom 1.
	D. New developer improperly mixed.	D. Dump and mix fresh following mfg's instructions exactly.
	E. Developer temperature completely haywire.	E. Check solution temperature.
12. Decrease in image density.	A. Film is under exposed.	A. Coordinate exposure with developing time.
	B. Developer under replenished or exhausted.	B. Change developer. Check replenishment rates.
	C. Developer temperature too low.	C. See Symptom 3.
	D. Developer time too short.	D. Check developer for low level.
	E. New developer improperly mixed.	E. Dump developer and mix fresh.
13. Over replenishing.	A. Shorted film presence switch.	A. Replace switch.
	B. Shorted manual replenishment switch.	B. Replace switch.
	C. Pendulum magnet weak or stuck in the up position.	C. Clean or replace pendulum.
	D. Logic failure.	D. Replace logic board.
14. No functions.	A. Interupter switch not activated.	A. Put top cover in place.
	B. Interupter switch defective.	B. Replace switch.

Note: The interupter switch may be bypassed **for troubleshooting purposes only** by either utilizing the hold down tool (P/N 0000021801) to keep the switch activated. Jumping the pins on J-14 on the logic board is an alternate method.

Service Procedure 5-1

Inspecting, Adjusting & Changing the Main Drive Belt

The main drive belt requires only minimal maintenance and normally lasts many years with normal use.

Inspection

The belt should be inspected yearly. Replacement is indicated if any of the following conditions are found:

1) Excessive slack that cannot be corrected.

2) Frayed or badly worn edges.

3) Missing or damaged drive lugs on the belt surface.

Adjustment

Adjusting slots to tension the drive belt are provided in the motor mounting plate. Adjust in the following manner:

1) Unplug the processor from its power outlet.

2) Loosen the four motor mounting plate screws. These are accessible on the back of the processor, below the dryer.

3) Slide the motor to make the belt just snug.

4) Tighten the four screws.

5) If all slack cannot be removed, the belt is worn excessively and should be replaced.

Replacement

The following procedure is to be followed when replacing a worn drive belt:

1) Unplug the processor from its power outlet.

2) Remove all four racks (dev, fix, wash & dryer) and carefully set aside.

3) .Loosen the four drive motor mounting plate attaching screws on the rear of the processor. Move the motor to remove the drive belt.

4) Remove the cotter pin holding the drive belt pulley to the driveshaft.

Service Procedure 5-1

Drive Belt Replacement, Continued

5) Slide the driveshaft pulley forward far enough to allow removal of the belt around the end of the driveshaft.

6) Install the new belt in the reverse order.

7) Adjust the new belt as described above.

Service Procedure 5-1A

Film Sensors and Adjustments

The **Mini-Medical Military** processor features dual switch film sensing. This is in the form of two hall-effect magnetic digital sensors (P/N 21878) located approximately three inches in from the inner right and left sides of the feed tray. There are now two magnetic pendulum assemblies (P/N 21893), located above the feed tray, that are used in conjunction with these sensors.

Activation of either switch will put the machine into the process mode. The purpose of the dual switch arrangement is to accommodate smaller size films. The feed tray assembly is P/N 21876. (The part numbers given above are for 1 each of the parts.)

Illustration A shows the vertical sensor configuration currently being used.

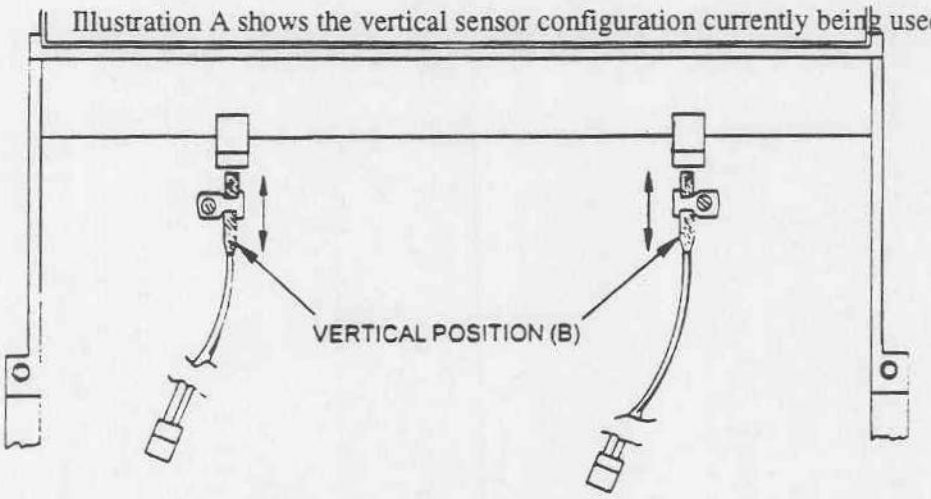


Illustration A, Film Sensor Configuration

Film Sensor Adjustment: These sensors are adjusted at the factory and normally do not need adjustment. However, should adjustment be required, follow this procedure:

1) Loosen the screw on each small bracket securing the sensors to the molded feed tray adapter; the sensors may be moved up or down.

2) Locate each sensor upward close enough to the magnet opposing it so that the machine remains in standby. Raising either magnet by inserting a film should put the machine into the process mode. If this does not occur in either case, lower the sensor in question until it does.

Section 6
Parts

- General Index -

General Assembly

Item	Part Number	Description	No. Used
1	0000021257-2	Tank/Frame Unit	1
2	0000021421-1	Side Cover (Not Shown)	2
3	0000022025	Cover, Electronics, Military	1
4	0000084469-1	Fan Assembly, Daylight Loader, Mil	1
5	0000022029	Darkwall Panel, Daylight Loader, Mil	1
6	0000022029-1	Darkwall Foam Seal	1
7	0000021700	Panel, Drain	1
8	0000086709-1	Water Tank, 2.2 Gal. (1 used/1 spare)	2 total
9	0000086709	Bottle, 1 Gal. Replenisher (2 ea dev/fix)	4 total
10	801-049281	Assembly, Developer Pickup	1
11	801-049291	Assembly, Fixer Pickup	1
12	801-049291-1	Assembly, Wash Pickup	1
13	0000021801	Int. Switch Hold down tool (Not Shown)	1
14	0000021845	Front Top Cover	1
15	0000021846	Rear Top Cover	1
16	0000021865	2-Piece Top Cover Set (includes 2 covers listed above)	
17	0000022003-1	Foot, Plastic, Modified, Military	4
18	0000021876-1	Film Feed Tray, MM, Military	1
19	0000022142	Feed Tray Cover	1
20	0000044501	Level, Circular Bull's Eye (Not shown)	1
21	0000022053	Wrench, 9/16" X 13mm (level foot)	1
22	0000037112	Manual Replenishment/Reset Switch	1
23	0000037283	Switch/Circuit Breaker, 15 Amp	1
24	0000080000	Leveling Foot	4
25	0000037051	Interrupter Switch (Not Shown)	1
26	0000046251-C	Elbow, 1/2"	3
27	0000049004	Ball Valve, Drain	3
28	9526062640	Tubing, 1/2" I.D. X 11/16" O.D. Clear	14 ft.
29	9527062640	Tubing, 1/2" I.D. X 11/16" O.D. Red	14 ft.
30	9528062640	Tubing, 1/2" I.D. X 11/16" O.D. Blue	13 ft.
31	9902001201	Daylight Loader Assembly	1
32	9902001202	Film Box Assembly	1

Introduction

This section is an illustrated catalog of repair and replacement parts for the **Mini-Medical Military** processor. Illustrations show the locations of replaceable parts and corresponding lists give the part number, description and quantity per assembly for each.

How Parts Are Listed

Most parts shown in the illustrations are identified with reference numbers which are repeated on the accompanying parts list(s). The list(s) will include the part number, description and quantity of the parts.

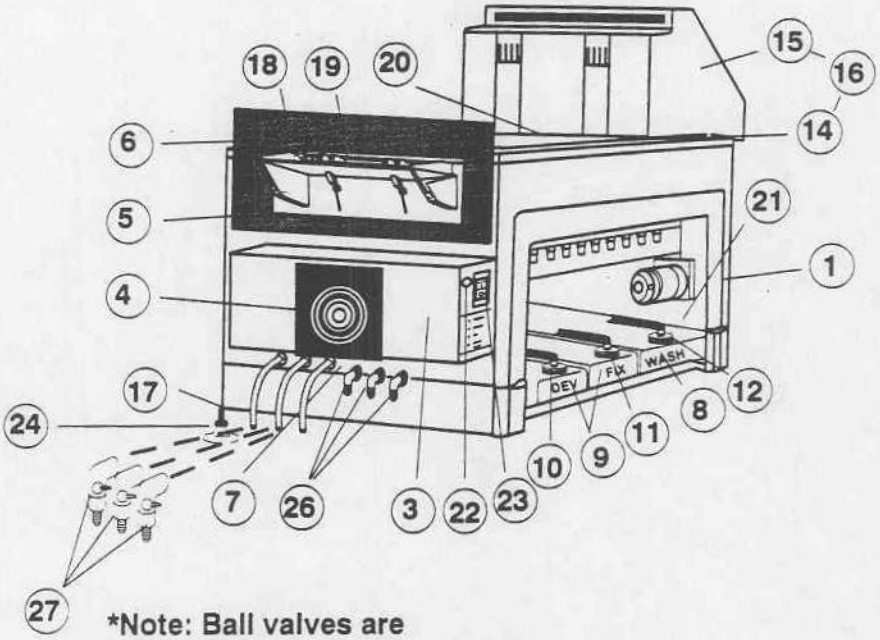
Attaching parts, when listed, are shown below the listing for that part or assembly.

When Ordering Parts

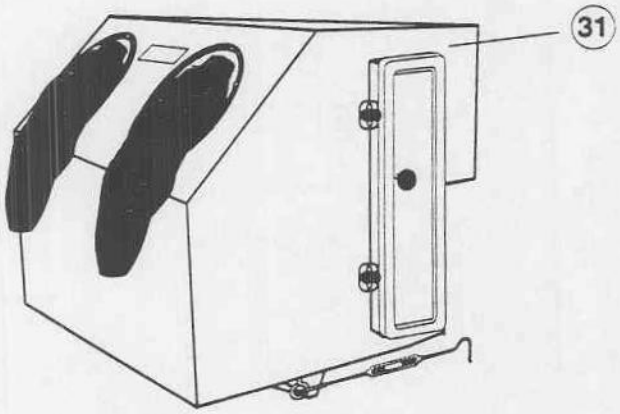
Give the part number, description and quantity required for each part. Give also the model and serial number of the processor for which the parts are needed.

Documentation

Mini Medical Military Manual, P/N 0000061152



***Note: Ball valves are remoted to the ends of the attached hoses**



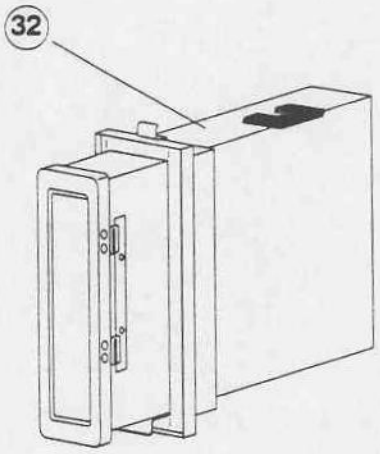


Figure 6-1, General Assembly

Daylight Loader Assembly P/N 9902001201

Item	Part Number	Description	No. Used
1	0000022023	Box, Daylight Load	1
2	0000022021-1	Cover, Door, Daylight Loader	1
3	0000022032	Hinge, Modified	1
4	0000022044	Shim, Door Hinge,	1
5	0000022026	Sleeve, Arm	2
6	0000022027-1	Clamp Ring, Outer	2
7	0000022027-2	Clamp Ring, Inner	2
8	000-01108-AW-R	Screw, Thumb, 1/4-20 X 1/2" Nylon	12
9	0000022038	Hanger, Daylight Load Box	1
10	0000022039	Shim, Hanger, Daylight Load Box	1
11	0000022040	Shim, Hinge, Daylight Load Box	1
12	000-01116-BS-B	Eye Bolt, 1/4-20 X 1"	2
13	000-05400-AA-H	Nut, Hex, 1/4-20 SST	2
14	0000044760	Turnbuckle 4 RH/LH	2
15	0000044759	Gate Hook, 5 In.	2
16	0000047806	Door Catch Spring	2
17	0000022041	Latch, Door, Male	2
18	0000044773	Latch, Southco, 97-60-320-11	1
19	0000045451	Label, Caution: Film right or Left	1
20	0000044043	Knob, Door	1
21	0000048262	Stand-Off Assembly	2

Film Box Assembly P/N 9902001202

Item	Part Number	Description	No. Used
1	0000022022	Film Storage Box	1
2	0000022021-2	Cover, Door, Film Box Military	1
3	0000022032	Hinge, Modified	1
4	0000022044	Shim, Door Hinge, MMed Military	1
5	0000022031	Divider, Film Box, MMed Military (Not Shown)	1
6	L4083390002	Fastener, Black F1-10-106-12 (Not Shown)	4
7	0000044006	Handle, Case	1
8	0000022045	Latch Bar, Film Box	1
9	0000022046	Latch Catch, Film Box Door	2
10	0000047833-1	Spring, Compression, Modified (Not Shown)	2
11	0000022030	Seal, Film Storage Box	1
12	0000022049	Mount, Angle, Film Box	1
13	0000022048	Retainer, Film Box	1

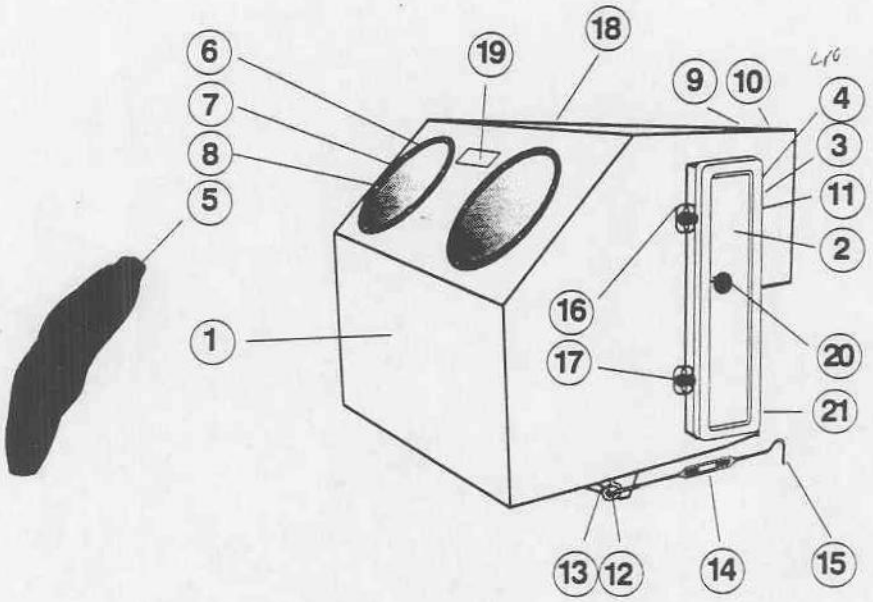


Illustration A, Daylight Loader Assembly

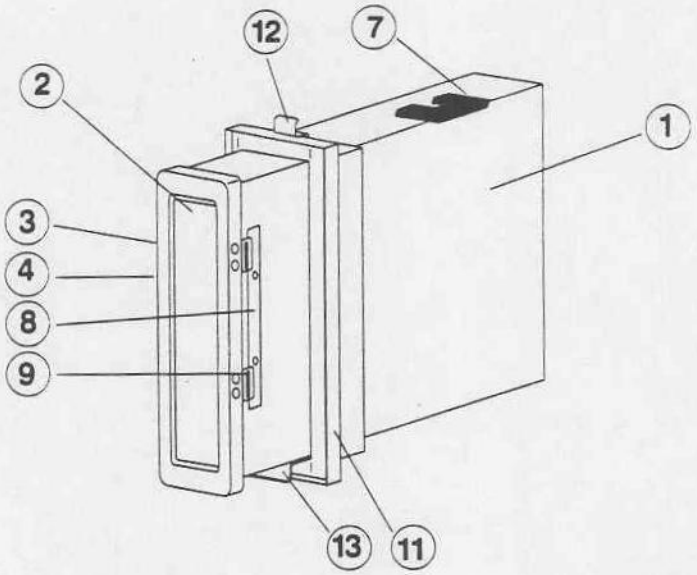


Illustration B, Film Box Assembly

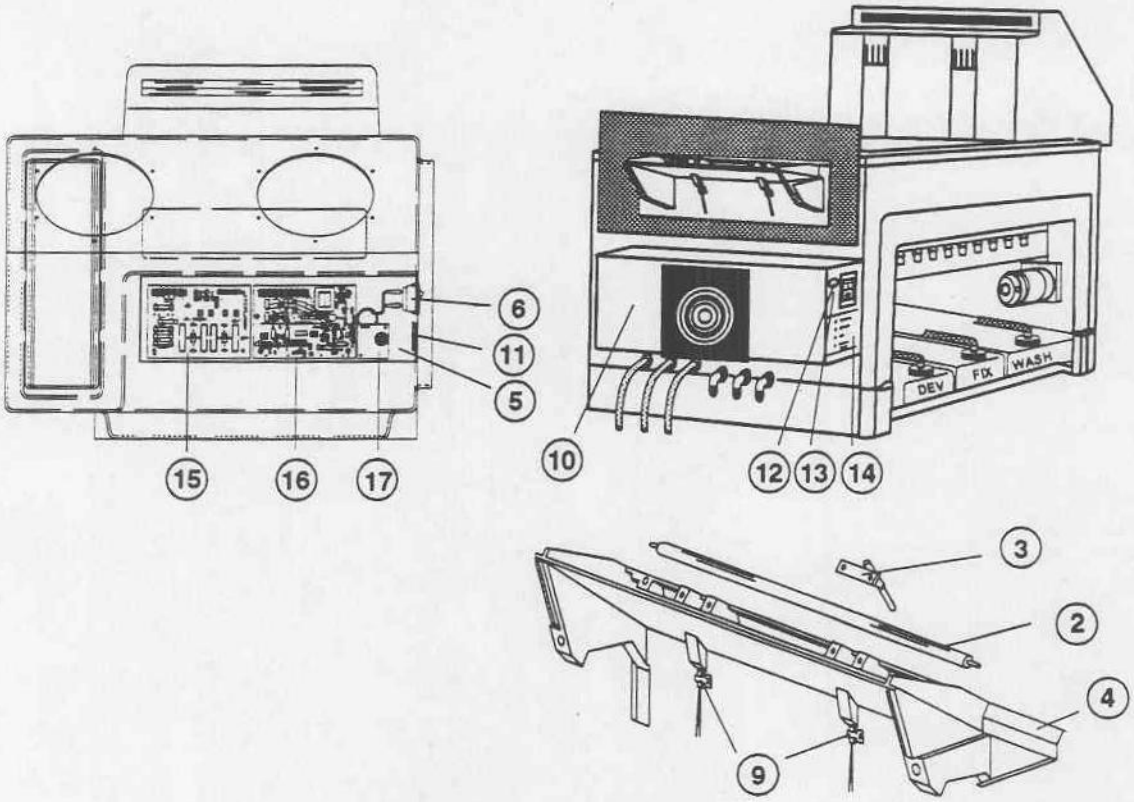


Figure 6-2, Feed Tray & Control Chassis Assembly

Item	Part Number	Description	No. Used
1	0000021871-1	Film Feed Tray, (2 Sensor, Not Shown)	1
2	0000020692	Roller Assy, Feed Tray	1
3	0000021893	Pendulum Assy, (2 Sensor)	2
4	0000021874-1	Adaptor, Feed Tray, (2 Sensor)	1
5	0000022024	Plate, PCB Mount, Military	1
6	0000037283	Switch, Circuit Breaker, 15 Amp	1
7	0000031713	Mount, Tie, (Not Shown)	2
8	000-00706-BA-H	Screw, 6-32 X 3/8", Slot Pn Hd (Not Shown)	10
9	0000021878	Film Presence Switch Assy (2 Sensor)	2
10	0000022025	Cover, Electronics, Military	1
11	0000035299	P.C.B. Assembly, L.E.D., Mini Med	1
12	0000037112	Switch, Manual Replenishment	1
13	0000045588	Label, Replen Switch, Push/Hold	1
14	0000045584	Label, Contrtol Panel, Mini-Med	1
15	0000035233	P.C.B. Assy, AC Interface	1
16	0000035348	P.C.B. Assy, Logic, 110V	1
17	0000035306-1	P.C.B. Assy, Beeper, Double Sensor	1
18	0000035685	Assembly, Dev Temp Pot (Not Shown)	1

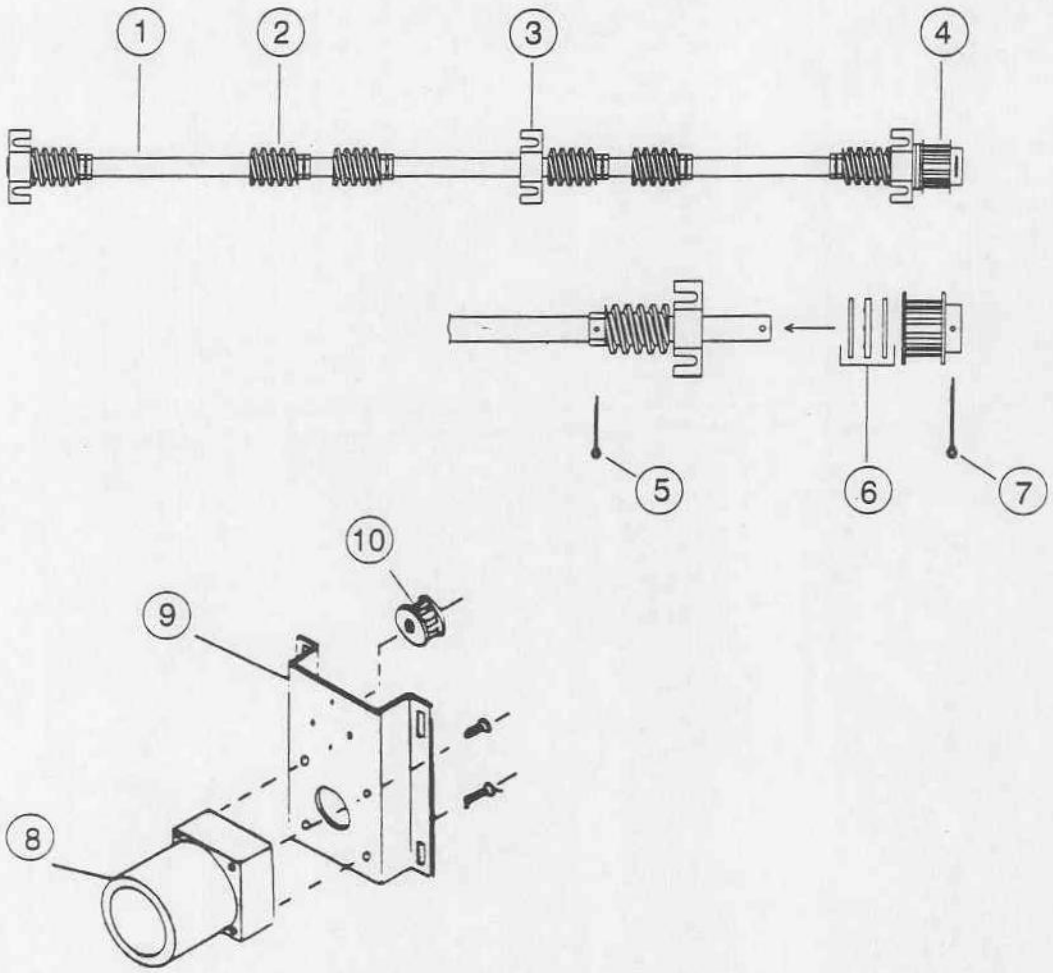


Figure 6-3, Drive System

Item	Part Number	Description	No. Used
1	0000021302	Driveshaft	1
2	0000020145-1	Worm	6
3	0000021406-1	Saddle Bearing, Flanged	3
4	0000021002	Pulley, Driveshaft	1
5	0000041552-B	Cotter Pin	6
6	0000083799	Bearing, Thrust Ball	1
7	0000041550-B	Cotter Pin	1
8	0000021483	Drive Motor Assy	1
9	0000021309	Motor Bracket	1
10	0000021671	Motor Pulley	1
11	0000041028	Belt (Not Shown)	1
12	L3081901041	Bead Shield (Not Shown)	1

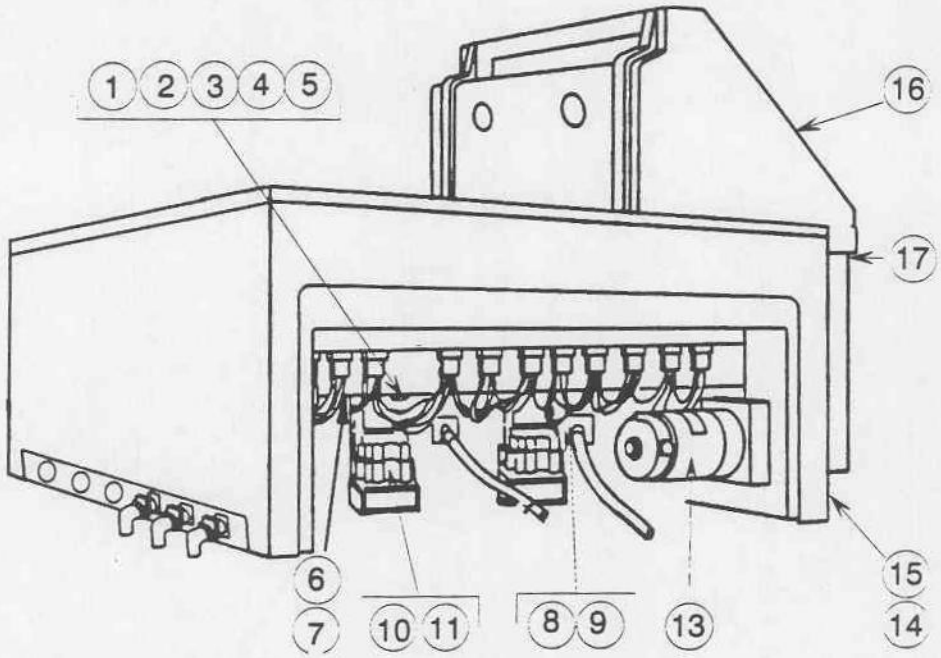


Figure 6-4, Tank/Frame Assembly

Frame/Tank Assembly

Item	Part Number	Description	No. Used
1	0000021869	Overtemp Safety Thermostat	1
2	0000021848-1	Heater Weldment, 500W	1
3	0000038150	Temperature Sensor	1
4	0000045805	"O" Ring, Temperature Sensor	1
5	000-06000-AA-R	Nylon Nut, Temperature Sensor	1
6	0000045822	"O" Ring, Size 008	4
7	0000045825	"O" Ring, Size 025	1
8	0000020995	Replenisher Pump	3
9	0000083915	Poppet Valve, Replenisher Pump	3
10	0000021145	Recirculation Pump	2
11	0000021436	Rubber Tee	2
12	0000021642	Restrictor For Dev Inlet Elbow (Not Shown)	1
13	0000021483	Drive Motor (See Fig 6-3)	1
14	0000038920	Line Cord Assy, 14/3, 6' W/Plug	1
15	0000021308	Nut Bar For Motor Mount Bracket	1
16	0000021668	Rear Cover	1
17	0000021666	Dryer Support	2
18	0000020354	Replenishment Gooseneck (Not Shown)	3
19	0000021210	Diffuser, (Curved Baffle Dev - Not Shown)	1
20	568-007038	Recirc. Dev. Inlet Elbow (Not Shown)	1
21	0000045824	"O" Ring For Above Elbow (Not Shown)	1
22	0000048326	Recirc. Pump Screen (Inlet - Not Shown)	3

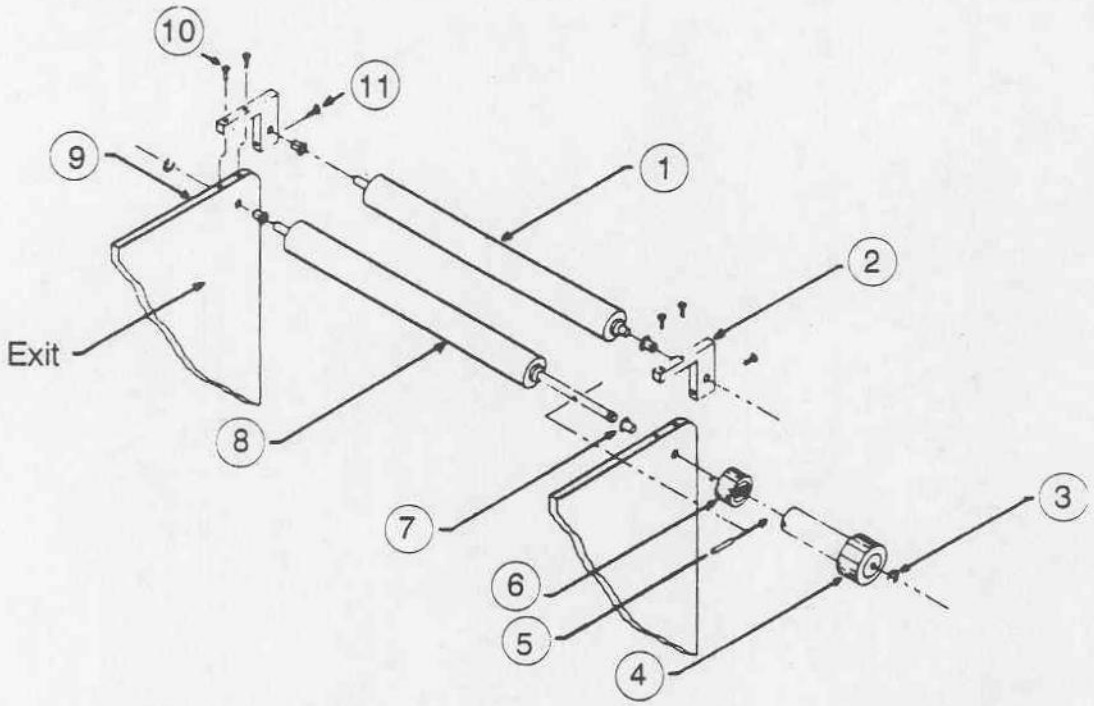


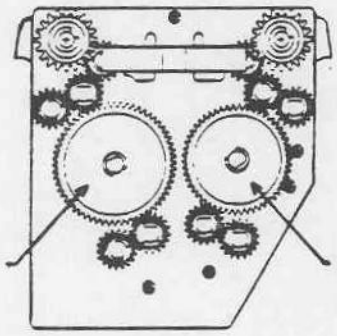
Figure 6-5, Wash Transport, Squeegee Roller Group

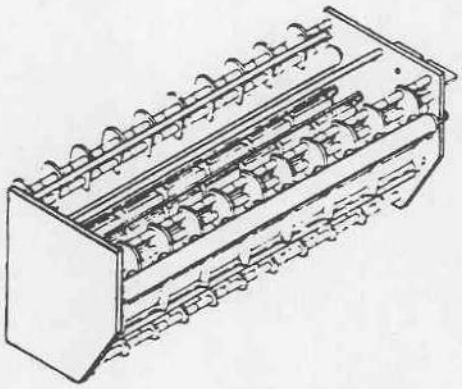
Wash Transport Squeegee Roller Group

Item	Part Number	Description	No. Used
1	0000020261-4	Rubber Roller, Driven	1
2	0000021704	Bracket, Squeegee Roller, Reworked	2
3	0000021346	Retaining Ring, 1/4" Noryl	2
4	0000021759	Worm Gear, Reworked	1
5	000-15304-AE-H	Pin, Plain, 3/32" Dia X 5/8" Long	1
6	0000021562	Gear, Dryer Drive	1
7	0000040803	Bushing, Nyliner, 1/4" Dia	4
8	0000020261-5	Roller, Driving, Long Shaft	1
9	0000021705	Side Plate, Modified, Wash Rack	2
10	000-00510-BR-H	Screw, #4 X 5/8" Self-Tap, Phillips	4
11	000-00514-BR-H	Screw, #4 X 7/8" Self-Tap, Phillips	2

Wet Transport Assembly

Item	Part Number	Description	No. Used
1	000-15304-AE-H	Pin, Plain, 3/32" X 5/8" Long	2
2	0000040803	Bushing, Nyliner 1/4"	4
3	000-00808-BQ-H	Drive Screw 8 X 1/2"	2
4	0000047802	Spring, Extension	8
5	0000021468	Driveshaft	2
6	0000020474	Roller, 3/4" Rubber	8
7	0000020433	Bushing, Grooved	16
8	000-09500-AA-H	Washer, Flat, 1/4" (Exit, Wash Only)	2
9	0000048205	Spacer, 1/4" I.D. X 3/8" O.D. (Entrance & Exit, Dev and Fix)	2
10	0000020576	Gear, Drive, 24P, 18T D Bore	8
11	568-007004-1	Washer, Retaining, .640 Dia	8
12	0000021306-K	Worm Gear	2
13	0000021467	Gear, Drive, 24P, 24T	2
14	0000021085	Gear, Idler, 24P, 18T	2
15	0000047701	Ring, Retaining, 5/16" Noryl	4
16	000-09200-AF-H	Washer, #6 Split Lock, S.S.	4
17	000-00706-AM-H	Screw, 6-32 X 3/8" Phil Pan Head	4
18	0000020654	Idler Post	4
19	0000021346	Ring, Retaining, 1/4" Noryl	2
20	0000048204	Spacer, 1/4" I.D. X .084 (Entrance, Wash Only)	1
21	0000021796	Gear, Idler, 54T	1
22	0000021797	Gear, Idler, 60T	1
23	0000021238-1	Roller, 3/4" Dia. Polyurethane (Bottom Roller Group, Wash Rack Only)	4
24	0000021546	Film Guide, Entrance/Exit, (Dev & Wash)	1
24	0000021546	Film Guide, Entrance/Exit (Fix)	2
25	0000021602	Diffuser (Dev Rack Only)	1
26	0000021603-1	Side Plate (Dev & Fix)	2
27	0000021705	Side Plate (Wash Only)	2
28	0000020652	Shaft, Film Guide	2
29	000-05100-AA-H	Nut, Hex, 8-32	18
30	0000020577	Guide, Film	10
31	0000021493-2	Guide, Film	4
32	000-00808-AM-H	Screw, 8-32 X 1/2", Philips Pan Head	19
33	000-00816-BL-H	Screw, 8-32 X 1", Philips Pan Head	4
34	0000021616	Rack Support, Molded	2
35	000-00810-AM-H	Screw, 8-32 X 5/8" Philips Pan Head	2
36	0000021492-2	Handle, Extruded	1 Ea
37	503-000746	Lable, Dev Rack Handle	1 Ea
38	503-000747	Lable, Fix Rack Handle	1 Ea
39	0000021658	Key, Rack Locater, 2-Hole, Non Drive Side	1 Ea
40	0000020664	Key, Rack Locater, 1-Hole, Drive Side	1 Ea





Developer Transport	-	P/N 0000021764
Fixer Transport	-	P/N 0000021765
Wash Transport	-	P/N 0000021766

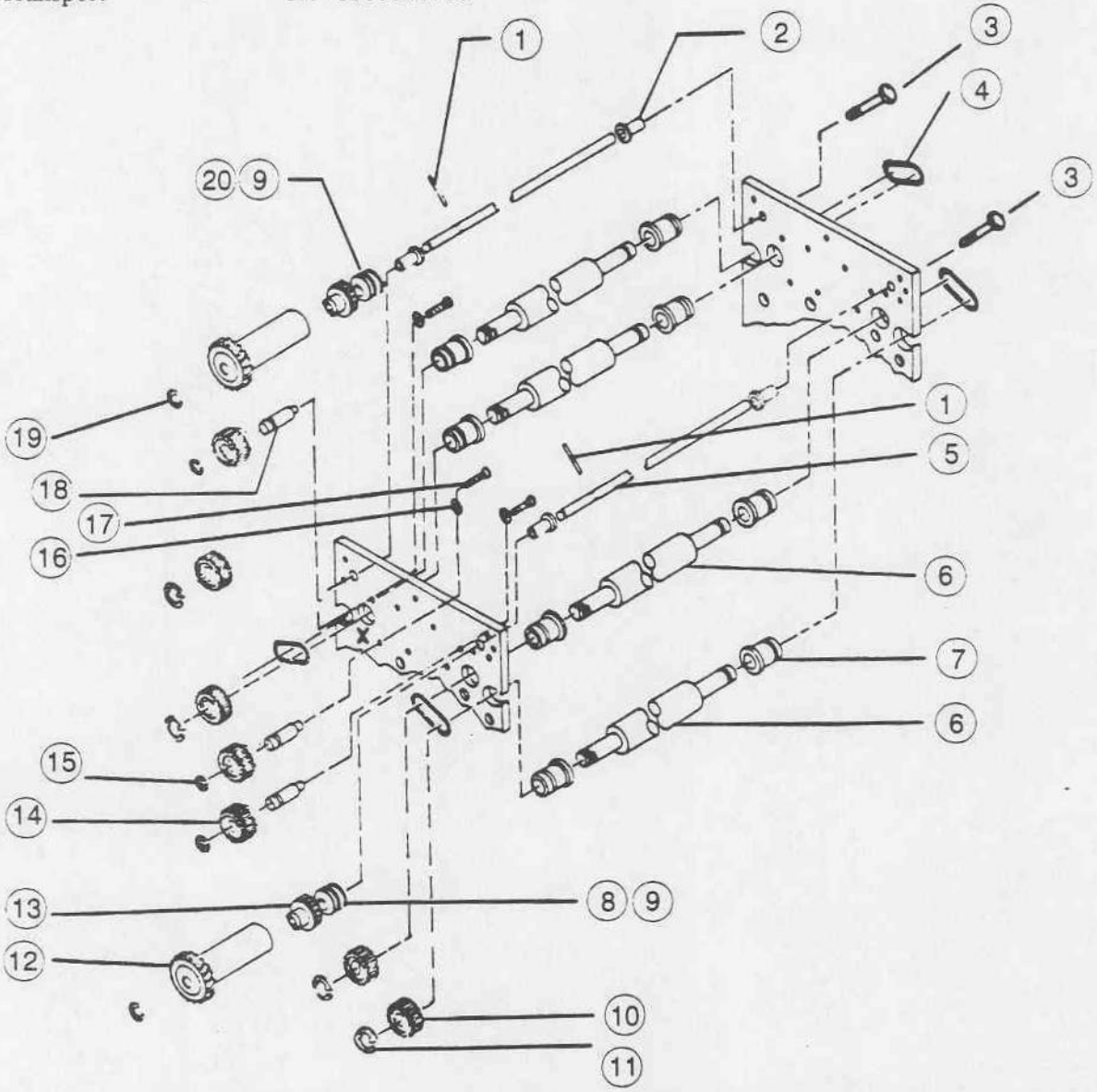
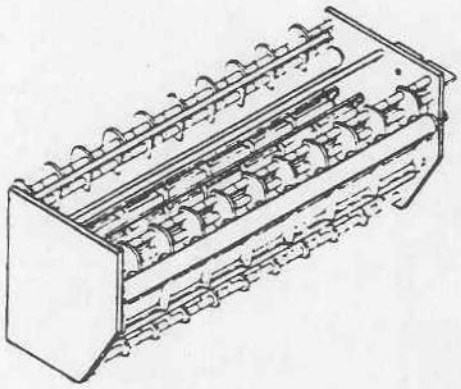


Figure 6-6, Wet Transports, Top Roller Group



Developer Transport - P/N 0000021764
Fixer Transport - P/N 0000021765
Wash Transport - P/N 0000021766

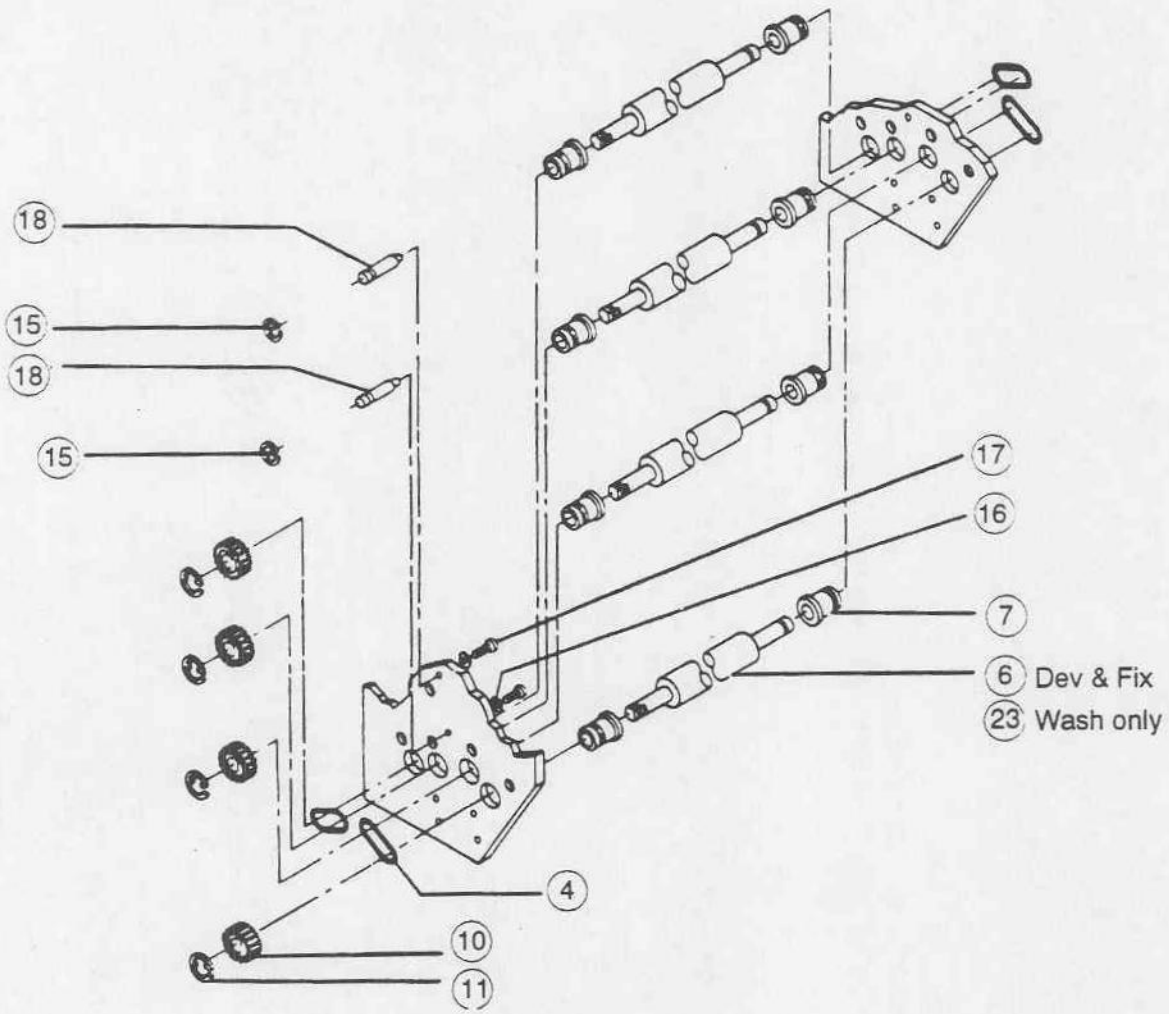


Figure 6-7, Wet Transports, Bottom Roller Group

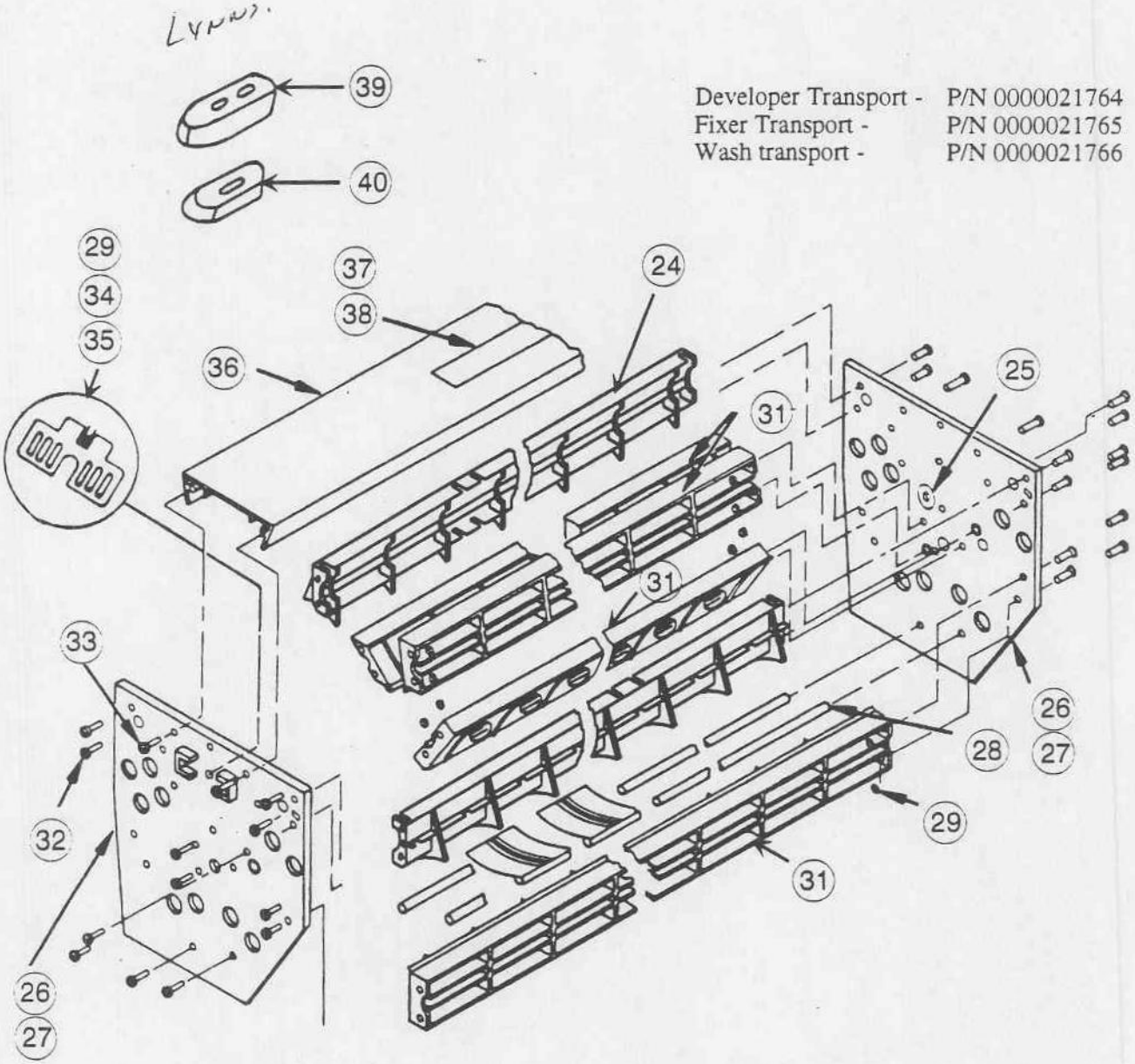


Figure 6-8, Wet Transports, Film Guide Group

Dryer Assembly, Front Exit, P/N 0000021767

Item	Part Number	Description	No. Used
1	0000020572	Bushing, Spring Groove, 3/8"	12
2	0000047802	Spring, Extension, Racks	6
3	568-007095	Spacer, Film Guide	4
4	0000021678	Block, Dryer Adjustment	2
5	0000021493-2	Guide, 1-Piece Film, Dryer	1
6	0000021175-1	Lamp Assy, I.R., 14", 275W, 115V	2
7	0000021684	Wire, Film Guide	12
8	0000021726	Reflector Assy	2
9	0000021728	Bracket, Air Knife	4
10	0000088981	Terminal Strip	2
11	0000081993	Strip Marker, MS601-0	2
12	575-007028	Cover, Terminal Strip	2
13	0000037800	Thermostat, Dryer, High Limit	1
14	0000021781	Sensor, Dryer	1
15	0000021734	Bracket, Connector	1
16	0000032676	Harness, Dryer Rack	1
17	0000021690	Air Knife Assy, Rear	1
18	0000021675	Duct, Plenum	1
19	0000037760	Jumper	2
20	0000020260-2	Roller, Rubber	2
21	000-01108-AW-R	Screw, Thumb 1/4-20 X 1/2"	2
22	0000021463	Side Plate	2
23	0000021579	Pivot Stud, Dryer	2
24	0000020417-1	Bearing, Roller, 3/8"	4
25	0000021564	Gear, Driving	2
26	086-000228	Ring (Collar), Hub Tap, 8/32"	2
27	0000021563	Gear, Idler, 24P, 24T	1
28	0000021365	Gear, 24P, 60T	3
29	0000020575	Gear, Idler, 24P, 48T	1
30	0000020654	Stud, Idler	5
31	0000021086-3	Gear, 24P, 24T	6
32	0000021686	Air Knife Assy, Front	1
33	0000021730	Bracket, Blower Mount	1
34	0000021569	Dryer Fan Assy (2 Per Machine, 1 Per Dryer)	1
35	0000021582	Coupler, Rear Blower	1
36	0000021669	Vertical Duct	1
37	0000021231	Roller Assy	6
38	0000021679	Coupler Duct, Fan	1
39	0000021493-1	Guide, 1-Piece Film, Dryer	1
40	0000041550-B	Pin, Cotter, 1/16" X 1"	6
41	0000021464	Plate, I.R. Mounting	2
42	0000021467	Gear, Drive, 24P, 24T	1
43	000-00805-AQ-H	Screw, 8-32 X 5/16", Soc. Set	2
44	0000047701	Clip, Retaining, 5/16" Noryl	5

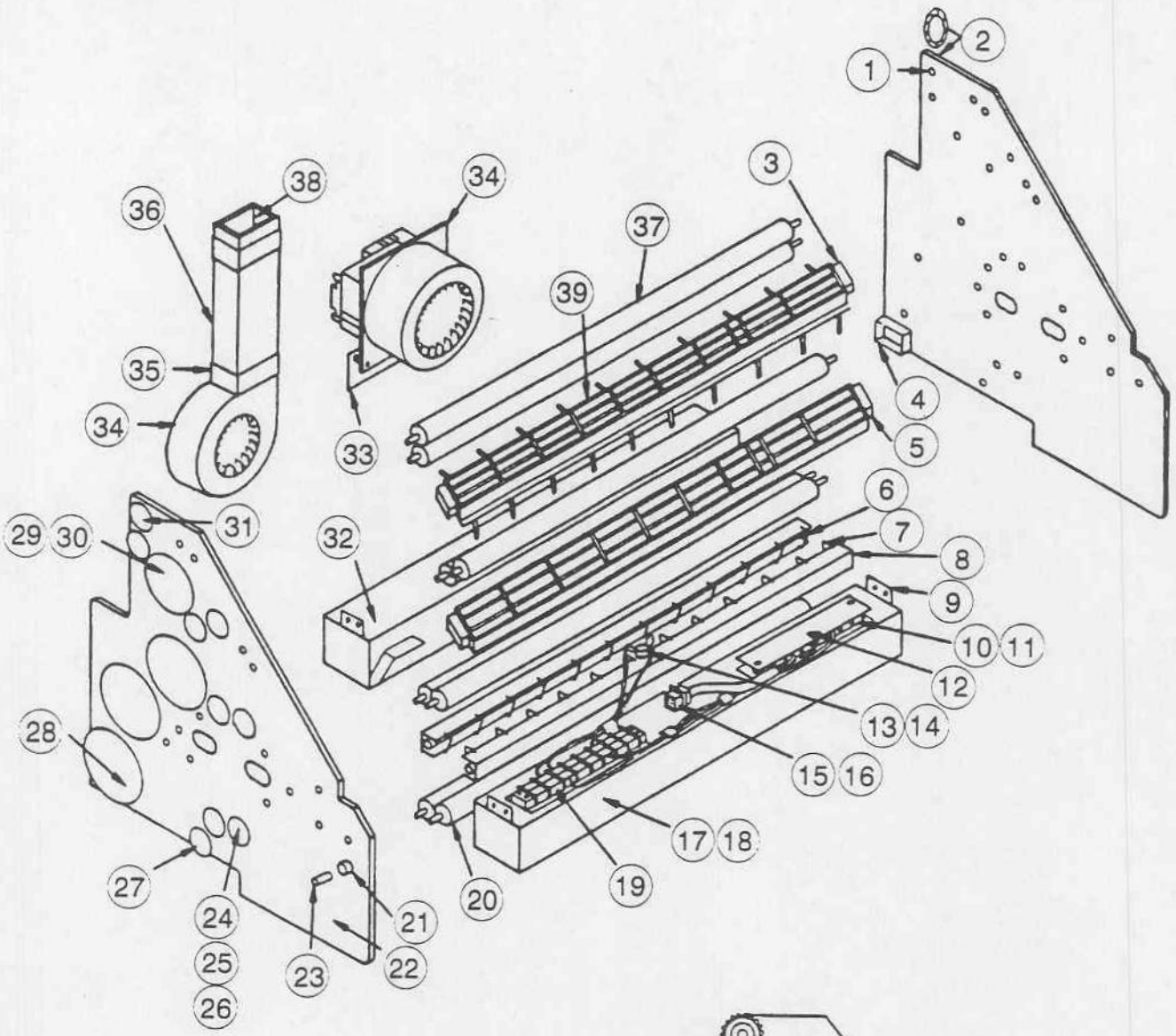


Figure 6-9, Dryer Assembly, Full View

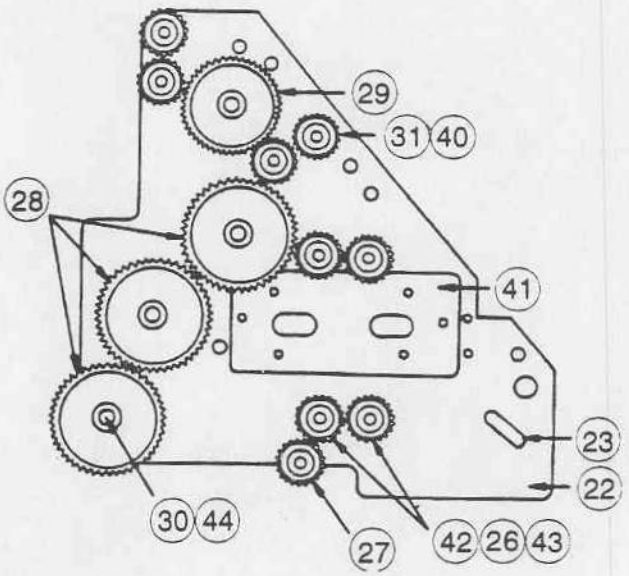
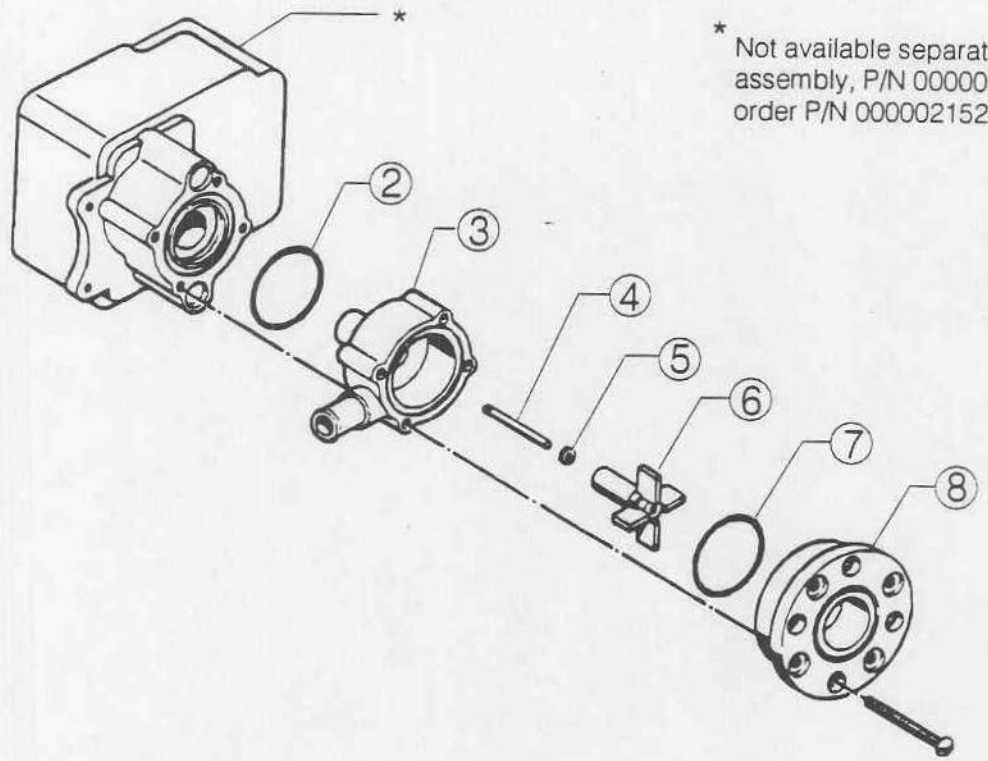


Figure 6-10, Dryer Assembly, Side View



* Not available separately. Order complete assembly, P/N 0000021145. (For 220VAC, order P/N 0000021525).

Figure 6-11, Recirculation Pump

Recirculation Pump P/N 0000021145

Item	Part Number	Description	No. Used
2	0000045830	"O" Ring, March Pump	1
3	0000091099	Housing, 1/2	1
4	0000091100	Shaft, Impellor	1
5	0000091101	Washer, Rear	1
6	0000091102	Impellor Magnet	1
7	0000045826	"O" Ring, Size 027 EP 70, Duro	1
8	0000091923	Cover Adapter	1

Plumbing Schematic, (Figure 6-12)

Item	Part Number	Description	No. Used
1	0000035316	P.C.B Assy, Main Harness	1
2	0000021483	Main Drive Motor	1
3	0000021145	Recirulation Pump	2
4	0000020995	Replenisher Pump	3
5	0000021436	Tee Fitting, Rubber	2
6	0000021904	Clamp, SNP 22	2
7	0000021569	Fan Assy, Lower	1
8	0000021903	Nipple, Heat Exchanger	2
9	0000041405	Clamp, Hose, Worm Gear	12
10	0000046251-C	Elbow, 1/2" Barb X 1/2" Barb	3
11	800-070391	Clamp, SNP 28	2
12	0000021880	Jacket, Heat Exchanger	1
13	0000021848-1	Heater, 500W, 110V	1
14	0000021869	Sensor Assy, Overtemp Safety	1
15	0000021851	Bracket, Heater Mounting	1
16	0000049004	Valve, Drain, Specialty FN (Not Shown)	3
17	0000046251-C	Elbow, 90Deg, 1/4 FPT X 1/4 FPT	3
18	0000046191-E	Nipple, 1/4 MPT X 3" PVC	3
19	0000046303-C	Spring, Replenisher Pump Mount	12
20	0000021051	Hanger, Replenisher Pump	6
21	0000021700	Drain Panel	1
22	0000041449	Clamp, SNP 12	9

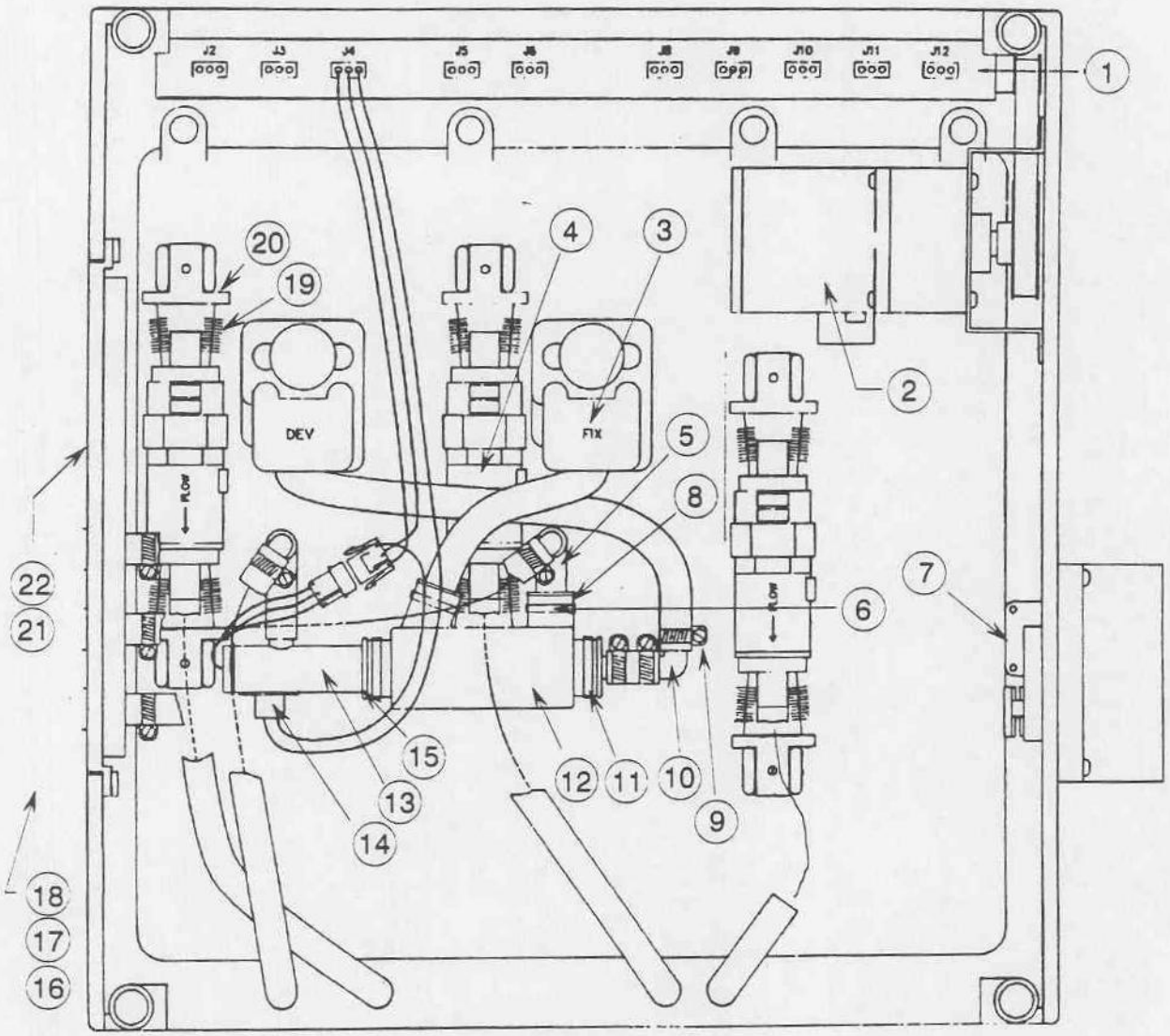


Figure 6-12, Plumbing Schematic

Notes:

WARNING: Never attempt to perform any electrical troubleshooting, adjustment or service unless you are a qualified electrician, electronics technician or factory trained service technician.