Film-Tech

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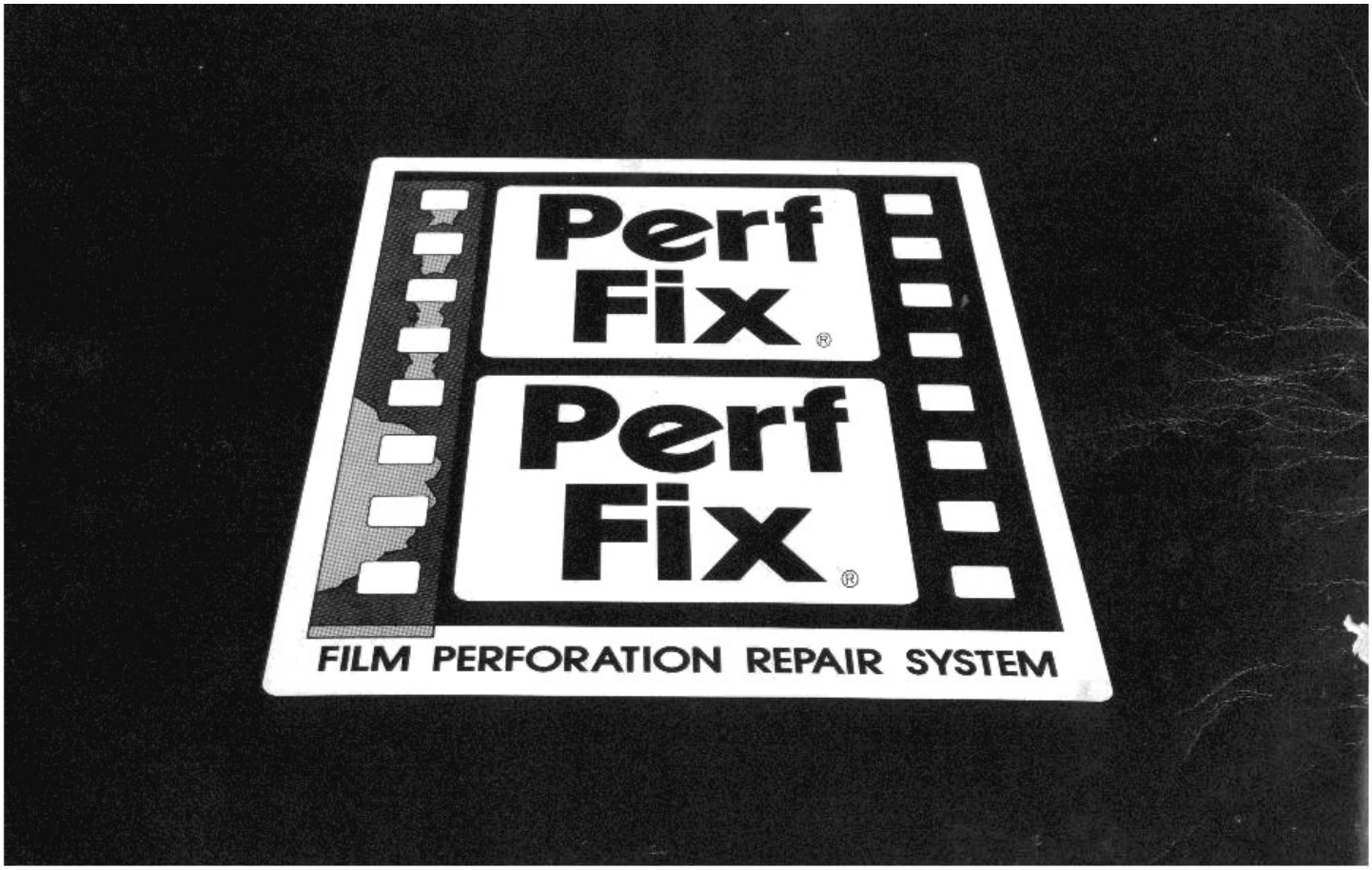
www.film-tech.com



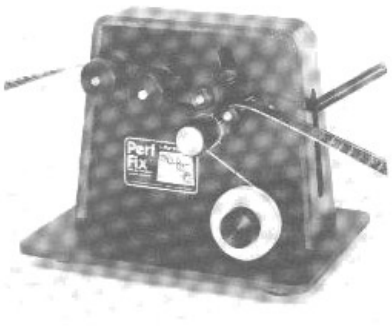
the Perf-Fix® system for film perforation repair instruction manual

TABLE OF CONTENTS

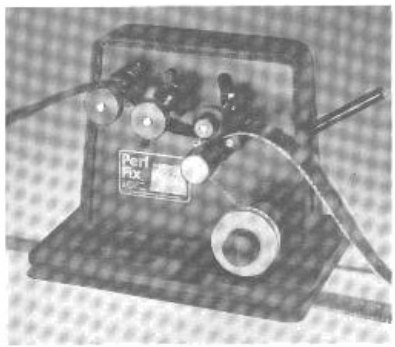
Features of the Perf-Fix® System

- Repairs perforation damage and replaces missing perforations in 16mm, 35mm, 65mm and 70mm film and 35mm filmstrips without affecting projected image.
- Repairs perforation shapes KS, BH and DH for 35mm films.
- Protects damage-prone regions on new prints and prevents further damage to repaired areas.
- Repairs perforation area only, using a perforated polyester tape with non-oozing, pressure-sensitive adhesive which is unaffected by cleaning and film inspection processes.
- Manually operated—repairs are made at the rate of 10 feet (3 meters) per minute.
- Uniquely designed sprockets and pressure rollers register repair tape and film with the exceptional precision required for sharp focus and smooth projection after repair.
- Automatically compensates during repair for film shrinkage—particularly important for the repair of films over three years old and films stored under less than ideal conditions.
- With the PF-16/35 machine, the sprocket/pressure roller sets are interchangeable and can be adjusted in minutes to change film size.
- The PF-70/65/35 can repair 35mm, 65mm or 70mm film with the same sprocket and pressure roller.
- The PF-35D machine permits simultaneous application of repair tape along both edges of 35mm film or filmstrips.

The Perf-Fix® Film Perforation Repair System is manufactured under U.S. Patent No.'s 3,959,048 and 4,026,756. Foreign Patents Pending.

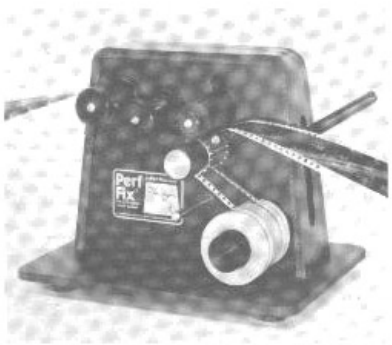


PF-16

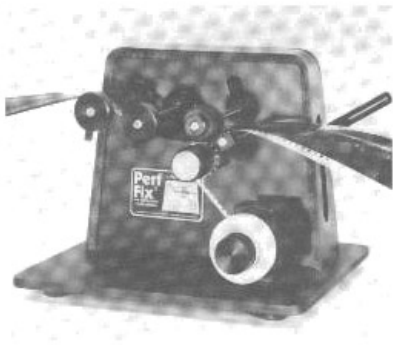


PF-35

PF-16/35

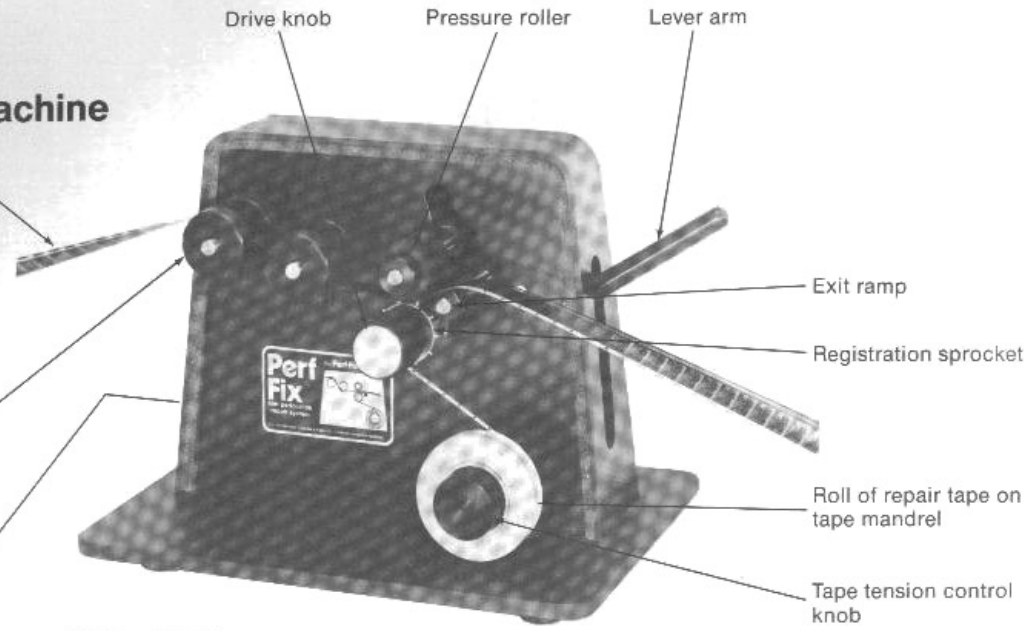


PF-35D



PF-70/65/35

Get to know the Perf-Fix machine



Not illustrated:
Allen wrenches
Scissors
Storage hole for scissors

16/35mm Model

DIMENSIONS:
length 9" (22.9cm), width 7" (17.8cm),
height 7" (17.8cm), weight 5 lbs. (2.27 kg)

Perf-Fix repair tape

The only perforated tape designed exclusively for protection and optimum repair of damaged perforations in motion picture film and filmstrips.

This polyester repair tape is strong enough to make permanent film repairs, yet thin enough to pass through projectors without blurring the projected image or jumping within the projection gate. Repaired film is unaffected by cleaning, including sonic cleaning, and film inspection processes. The resulting repairs are the finest perforation repair possible. Both optically clear and white tape are available. You may prefer the white tape for quickly identifying repaired sections during subsequent film inspection.

Available in 16mm and 35mm—*Sold two rolls per core–65 feet (19.8 meters) per roll.* The 70mm is available in clear only—*Sold one roll per core.*

An optically clear "Laboratory Negative" tape is also available for the repair of original and internegative materials and is widely used in film laboratories. This tape has a narrower ligament width between the perforation and the picture frame. Available in 16mm, 35mm and 65mm—*Sold one roll per core–65 feet (19.8 meters) per roll.*

With the PF-35D machine, repair tape coded 35I is needed for use along the inner sprocket tooth position. This tape is also available in laboratory negative width.

A note about projection equipment

Inspect and service projection equipment regularly. Debris, dirt and small particles of adhesive residue should be periodically cleaned off sprockets and gate areas. With a toothpick, Q-tip, tweezers and a strong solvent like acetone or methyl ethyl ketone (MEK), the sprocket and gate can be cleaned quickly. Use these solvents sparingly and with caution. They will attack most plastics and paints and are very flammable.

Check projectors for worn or misaligned shuttle arms and sprocket drives as well as for excessive tension on take-up reels. This excessive tension typically causes perforation damage in the first and last 20 feet (6.1 meters) of a reel of film. You can help to resist damage in these head and tail sections by applying a one or two-sided lamination of Perf-Fix tape to new or used prints.

A note about automated film inspection, cleaning machines and film rejuvenation processes

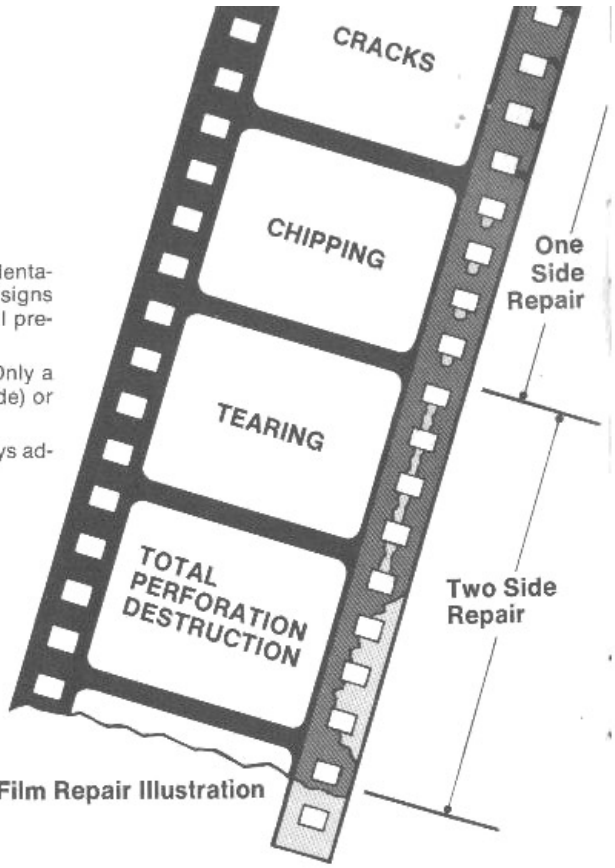
Perf-Fix System repairs are unaffected by cleaning (including sonic cleaning), film inspection and most rejuvenation processes. **Caution:** Please note that film cleaning processes which use liquid solvents do not generally affect Perf-Fix repairs because the solvent contacts the film for only a few seconds followed by rapid evaporation or drying action. However, improper cleaning whereby the film is soaked in a solvent for too long or the wetted film is rewound before drying may affect the adhesion of the Perf-Fix tape repair. In this situation the entrapped solvent will then slowly dissolve the adhesive along the bond-line and result in the loosening of the tape and the exuding of adhesive onto the film. If you experience this problem, your film can be salvaged and re-repaired after removing the affected tape and cleaning the adhesive residue from the film with a pad dampened with a film cleaner. **Caution:** Before using a rejuvenation process, we strongly advise trying the process with a length of repaired film. Wrap the treated film around itself on a reel and secure end. Re-examine the next day to verify that no dissolving or oozing occurred.

The Perf-Fix System has become an indispensable component of media libraries using Harwald, Paulmar, RTI and Winson film inspection machines. If stopping occurs on a film inspection machine due to increased film thickness of repaired areas, the operator can identify the repaired section and quickly pass the repair through manual override, then return to automatic inspection.

Repair advice

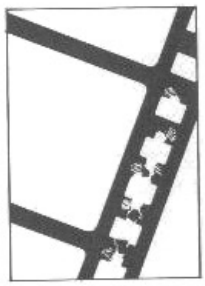
Before beginning repair, check your film for the following:

- Beginning perforation damage, such as corner cracks, small chips and indentations at edge of perforations. If you inspect film regularly to detect signs of beginning damage and repair immediately with Perf-Fix tape, you will prevent severe damage and prolong the life of your films.
- Minor "chipping" or "cracks" along the perforation edge of the film. Only a one-sided repair is usually required, and it may be on the base (shiny side) or emulsion side. **(See illustration.)**
- "Tearing" and "total perforation destruction." A two-sided repair is always advised in these cases.

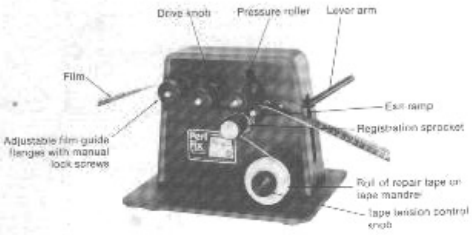


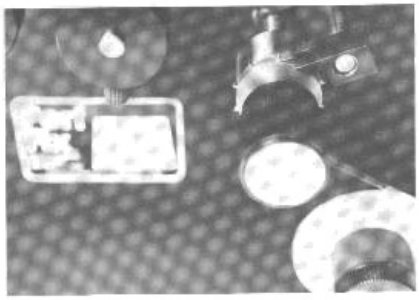
Film Repair Illustration

- Fragments of torn perforations that have remained on the film. **(See illustration.)** If repair tape is applied over these pieces, a "bump" occurs which may push the film out of the gate during projection. These fragments can be easily removed before repairing with a fingernail or scissors.
- Bad cement and/or tape splices. Poor splices often initiate perforation damage during projection. Resplice film if necessary before beginning perforation repair. **IMPORTANT:** We recommend that you stop and start Perf-Fix repairs on each side of a 16mm film splice to lessen the possibility of causing loss-of-loop during projection. With 35mm film, no projection problems have been reported when the Perf-Fix tape overlays a splice. In fact, some users intentionally reinforce tape splices with six-inch (15cm) strips of Perf-Fix tape.
- Film damage that extends beyond the perforation area into the picture frame. Although Perf-Fix tape can replace completely missing perforations, it cannot be used when there is damage to the picture area. We suggest a full-width tape splice to repair this type of damage.



FRAGMENTS





2. TAPE LOADING

How to use the Perf-Fix® System— *Loading and Operation*

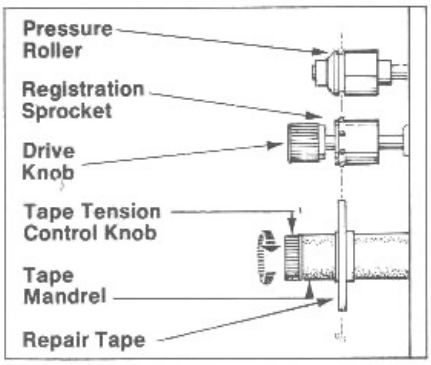
Step 1. Lower lever arm, thereby raising pressure roller.

Step 2. Bring repair tape from tape mandrel up and around registration sprocket to the 12 o'clock position, adhesive side facing up, away from sprocket. If you are using the PF-35D machine and do not want a double-edged repair, you can temporarily rest either tape on the horizontal post located parallel to the tape mandrel.

Step 3. Check to assure that repair tape unwinds from the tape roll to registration sprocket parallel to face of machine. Otherwise the feeding tape, if askew, may come off the sprocket teeth during repair. Check positioning occasionally.

Recommendation: To prevent the tape core from sliding laterally on the rubber mandrel, adjust the tape tension control knob to establish an easily rotatable, slip fit. The tape mandrel expands in size as the knob is turned to the right. However, on the PF-35D machine the tape mandrel has independent adjustment for inner and outer tape cores. Use only the metal knobs near the center of the tape mandrel to adjust tape tension.

Step 4. Thread damaged film in guide flanges. Flanges should be adjusted to guide the film in a straight line to the registration sprocket. The film should pass through the guide flanges without being bound against the sides. For optimum results we suggest threading the film so that the undamaged edge of the damaged perforations faces toward the exit ramp.



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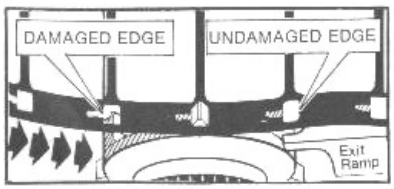


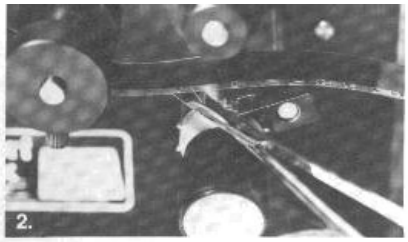
4. FILM THREADING

Step 5. Select an undamaged perforation 4 or 5 sprocket holes ahead of the damaged area. Quickly review damaged film for bent fragments and remove them. **(See page 9.)** Secure film to tape on sprocket by pressing the undamaged hole firmly down with two fingers on the sprocket tooth in the 12 o'clock position. If you do not firmly secure film onto the repair tape, the tape may rotate around the sprocket instead of adhering to the film.

Step 6. Raise lever arm, thereby lowering pressure roller.

Step 7. Turn drive knob in a steady fashion clockwise until the damaged section has been repaired. Do not pull film through the Perf-Fix machine by hand or with rewinds. The film must be slack while entering and leaving the sprocket for optimum precision registration of tape and film perforations.

Step 8. Examine the first foot of all long repairs for signs of misregistration. Good lighting and a low power magnifier may be of particular help to you for checking perforation repair of 16mm film. For the repair of most films, no tension is required in the feeding tape to achieve satisfactory registration. If, however, appreciable misregistration occurs, it can be reduced by adding slight tension to the feeding tape. **(See No. 5 in the Troubleshooting Section.)**



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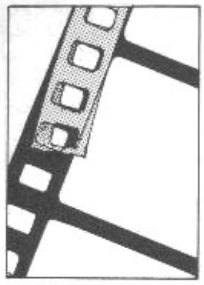

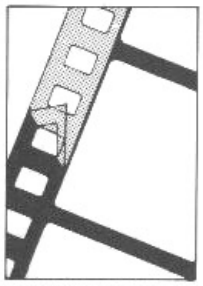

MISALIGNMENT FOLD-BACK

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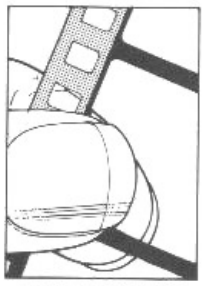


TAPE BONDING

Unloading and inspection

Step 1. Lower lever arm, thereby raising pressure roller.

Step 2. Lift film about one-half inch (13mm) off sprocket at the 12 o'clock position and cut tape using the scissors supplied with the Perf-Fix machine. If it is cut at this location, the repair tape will then remain on sprocket for the next repair. **Note:** If you are not planning to use the machine for another repair within a few hours, we suggest you rewind tape back onto roll as the exposed adhesive slowly loses its adhesion quality with prolonged exposure to air.

Step 3. Remove repaired film from the Perf-Fix machine.

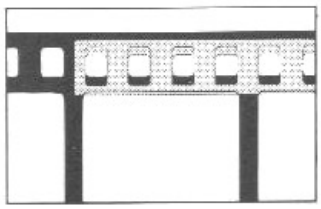
Step 4. Inspect beginning and end of repair for any misalignment. Tape should not run askew. Pinch tape to avoid tape fold-back at tape ends as well as to assure good adhesion throughout total repaired section.

Final inspection

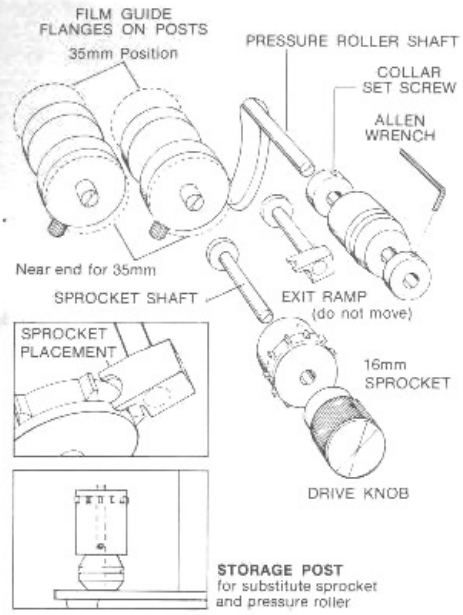
Step 1. After repair, check for any pieces of film fragments that were not removed before. These trapped fragments increase substantially the repaired film's thickness and can prevent smooth projection. Re-repair these regions.

Step 2. Always inspect the entire length of repaired film for any misalignment that might have occurred due to incorrect repair procedures described in **"Loading and Operation."** If misalignment is found, remove tape in that locality and repair again.

Step 3. Lateral perforation misregistration should not occur and is an indication of either misalignment between the pressure roller groove and the sprocket teeth or askew guide flanges. See page 16 for realignment instructions.



3. LATERAL MISREGISTRATION



Interchanging the Perf-Fix 16/35mm machine

The Perf-Fix 16/35mm combination machine can be adjusted to repair 16mm or 35mm film through use of the interchangeable sets of registration sprockets/ pressure rollers.

Adjustment steps *for changing from 35mm to 16mm condition (example shown)*

1. Lower lever arm to raise pressure roller.
2. Using the allen wrenches* that came with the Perf-Fix repair system, loosen drive knob, pressure roller collars and registration sprocket, and remove from machine.
3. Remove substitute sprocket and pressure roller from storage post behind machine cover.
4. Slide new registration sprocket on sprocket shaft and center sprocket teeth between the opening in the exit ramp. Tighten set screw. (**Note:** the exit ramp location and angle are pre-set at the factory and should not be moved during the change operation.)
5. Replace drive knob and secure.

*#8-32 for drive knob and registration sprocket #6-32 for pressure roller collars

6. Slide collars and new pressure roller on pressure roller shaft. Align pressure roller with registration sprocket by raising lever arm so that groove in pressure roller and sprocket teeth mesh. Rotate drive knob several times to assure registration sprocket and pressure roller move freely and align together. Carefully secure collars on each side of roller and leave at least 1/64 inch (0.4mm) gap between each collar and pressure roller while securing the collars to allow loose rotation with some lateral clearance.
7. Adjust guide flanges by loosening lock screws with fingers and moving flanges to accommodate either 16mm or 35mm film. Flanges should be adjusted to guide the film in a straight line to the registration sprocket. The film should pass through the guide flanges without being bound against the sides.
8. Conduct a test repair to assure correct conversion. If lateral misregistration greater than about 15% of perforation width is present **(See figure, page 13),** repeat steps **6, 7** and **8** to realign pressure roller.
9. Take pressure roller and sprocket not in use and slip onto vertical storage post on platform in back and tighten set screw in sprocket to secure parts to post.

Troubleshooting—
Problems and Solutions

A few questions which new customers/users have asked occasionally are worthy of review, we think!

1-P Repaired film causes jumping in the projector gate:
S *Fragments of bent-over film are trapped between film and repair tape. Or, areas of perforation damage have been left unrepaired. Or, projector gate may be very dirty. Or, repair tape has been applied over splices (cement or tape type).*

2-P Repair tape does not feed onto sprocket teeth of Perf-Fix machine nor onto film without severe misregistration occurring between perforations in tape and film:
S *Tension in tape is too great. Tape has stretched measurably. Tape mandrel knob must be rotated counterclockwise to permit tape core to rotate more freely.*

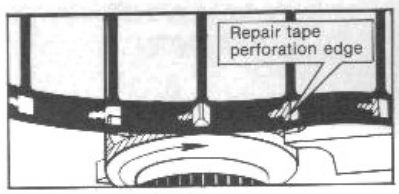
3-P Sprocket teeth won't pass smoothly through groove in pressure roller. And, lateral misregistration is pronounced between perforations in tape and film:
S *Pressure roller groove and sprocket teeth are misaligned laterally. Reset location of collars next to pressure roller to enable teeth to track freely in the groove. Or guide flanges are positioned incorrectly. Reset so that film is in a straight line between flanges and registration sprocket.*

4-P While making a repair, the tape suddenly comes off the sprocket and interrupts the repair:
S *The tape roll has been moved laterally. Position tape roll along mandrel so the tape feeds directly toward the sprocket teeth. Turn machine to side to check tape feeding alignment.*

5-P Misregistration (offsetting of perforations in the film with those in the tape) is 15% or more:
S *Introduce a slight amount of tension (turn tape mandrel knob) in the repair tape, between the tape roll and the sprocket. The tape roll should still remain rotatable without visible stretching occurring in the tape. This procedure will reduce the misregistration. However, too much tension in the tape will overstretch and deform the feeding tape and cause misregistration in the opposite direction and eventually total malfunction.*

6-P Misregistration is appreciable:
S *The exit ramp has been raised inadvertently. The tips of the exit ramp must be close to the sprocket surface; i.e., within 1/32 inch (0.8mm). Reset exit ramp using #6-32 allen wrench.*

Note: With time, small bits of adhesive and debris accumulate at the base of each sprocket tooth. Periodically clean off this matter. A fine-pointed tweezer works well. A tissue, cloth or Q-tip wetted with a solvent like acetone or even film cleaners will aid in the removal. Do not clean any other parts with acetone. However, any part of your Perf-Fix machine may be cleaned easily and effectively with a cloth dampened with isopropyl alcohol (rubbing alcohol).



MISREGISTRATION

FIVE YEAR WARRANTY
NOW IN EFFECT

The Perf-Fix® repair system limited warranty service agreement

The Perf-Fix System is warranted against factory defects in material and workmanship for a period of one year from date of purchase. We will elect to either repair the product or replace it with a new or factory service unit, in one day's time, at no cost to you for labor, materials or return transportation.

Repairs required after one year will be gladly reviewed and performed for a nominal fee.

Customers with warranty claims or in need of repair advice or service should contact the Perf-Fix Company or forward the machine prepaid with a letter explaining the problem to:

The Perf-Fix Company
Manufacturing Division
11568 Sorrento Valley Road, Suite 12
San Diego, CA 92121

or contact the marketing division at: (213) 820-5827

If you need advice concerning film repair, please call the manufacturing division at (714) 453-8316.

For further information about the Perf-Fix film perforation repair machine and repair tape, call or write:

The Perf-Fix Company
12381 Wilshire Blvd., Suite 203
Los Angeles, California 90025
(213) 820-5827

or

P.O. Box 3524
Santa Monica, California 90403

The Perf-Fix Company... Memo

To:

Date

From: MARY GIBSON

FOR THE PERF-FIX 2[illegible] D MACHINE- AN IMPORTANT REMINDER

The diameters of each half of the Tape Mandrel can be adjusted by rotating the silver colored, steel knobs at the midway location. DO NOT attempt to turn the black knob at the end of the Tape Mandrel. This knob remains stationary.

Thank you.

Perf Fix
Perf Fix
FILM PERFORATION REPAIR

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12381 W[illegible]
Manufa[illegible]
11568 [illegible]

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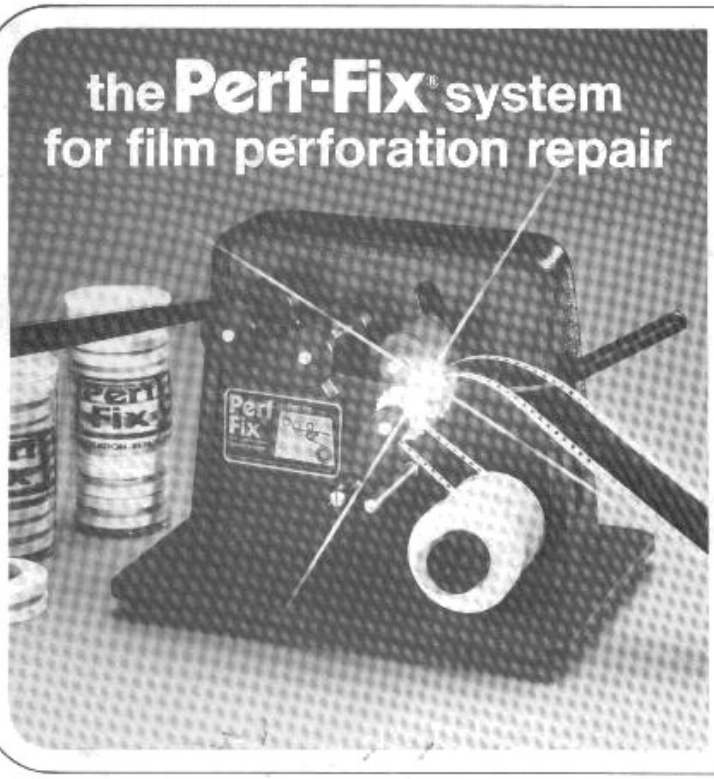
Divis.on:
[illegible], San Diego CA 92121 • 714) 453-[illegible]



Additions

the Perf-Fix instruction manual

- ***New Features***
- ***Filmstrip Repair***
- ***PF-35D***

Instructions for Perf-Fix Machine Models PF-35D and PF-16/35D

The 35D model enables:

Simultaneous application of repair tape along both edges of 35mm film/filmstrips; lengthwise, full-frame repair of filmstrips damaged in the image area.

Special features on this machine model are:

A Horizontal Post adjacent to the tape mandrel: When you want to apply tape along one row of perforations, lift the other segment of tape from the sprocket, and lay it back temporarily against the horizontal post.

A Tape Mandrel with independent adjustment for both the outer and inner tape core locations: Turn the metal knobs near the center of the tape mandrel to adjust the slippage of the cores. The outer black knob should remain fixed.

Tweezers: A fine point tweezers is included to facilitate tape threading and removal from the inner sprocket tooth position.

Bubble Card: Use this card to smooth out entrapped bubbles between film and tape after full-frame tape has been applied to torn filmstrips. Push edge of card along top of tape.

Repair tapes:

Remember to order "35-I" type repair tape (clear or white) for use at the Inner sprocket tooth position on this machine. You can identify this tape by the "I" printed on the inside surface of the tape core. Full-frame, perforated tape is also available for lengthwise repair of filmstrips torn within the image area.

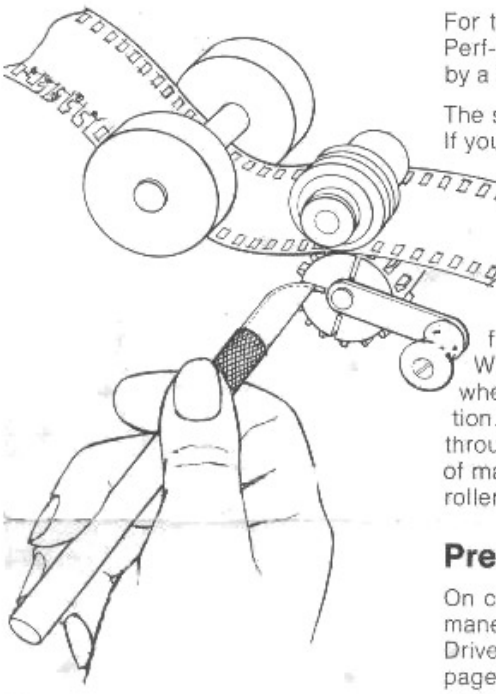
The Perf-Fix Company
12381 Wilshire Boulevard, Suite 203
Los Angeles, California 90025
(213) 820-5827

New Features

The Drive Crank

To make repairs on damaged film, turn the new drive crank at a rate slow enough to allow visual inspection of the damaged regions. However, when applying tape to protect head and tail sections of new or undamaged prints, rapid tape application is easily accomplished at a rate of 8 feet in 10 seconds if desired.

Multiple-slotted Sprocket



For total versatility in both trimming torn film fragments and cutting tape, the Perf-Fix machine now features a multiple-slotted sprocket and is accompanied by a blade cutter and fine-tip scissors.

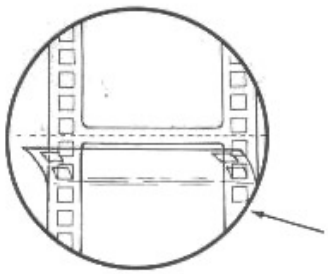
The scissors or blade cutter can be used to cut tape when repair is completed. If you use the blade cutter, the availability of three slots on the sprocket enables cutting close to the end of a repair, thereby eliminating tape waste. The blade cutter is especially effective when cutting full frame 35mm tape, and any slot can be used to insure ending tape application along the frame line of a filmstrip image (see filmstrip repair directions).

For smooth projection of your films, uniform, non-bumpy lamination of repair tape is necessary. Use the fine-tip scissors to clip off small, bent fragments often present at the damaged film perforations. TO CUT TAPE WITH BLADE CUTTER: After repairing damage, stop turning of drive crank when any one of the three sprocket slots is between the 9 and 10 o'clock position. Slide blade cutter with sharp edge facing outward into slot to cleanly slice through the repair tape. Retract blade cutter and return to storage hole on side of machine. Turn crank to bring tape cut to 12 o'clock position. Raise pressure roller and remove repaired film.

Pressure Roller

On combination machines, 16/35 and 16/35D, the pressure roller remains permanent. When changing repair capability from 35mm to 16mm, remove only the Drive Crank and Sprocket. Slide the 16mm sprocket onto the shaft as shown on page 14 of the instruction manual. Center the sprocket teeth between the forked opening on the outer exit ramp. Secure sprocket to shaft. Replace drive crank, making sure the crank points opposite the center sprocket slot. Readjust guide flanges (step 7, p. 15).

Repairing Filmstrips



1. If the filmstrip is torn into the image area, first apply perforation repair tape along film edges beginning about 10 sprocket holes away from the perforation damage.

2. The two pieces of the broken perforation which begin the tear should register together as tape is applied. End application of tape 5-6 sprocket holes beyond repair.

3. Remove the partially repaired filmstrip from the machine. Then thread the full-frame tape on sprocket lining up cut end of tape with one of the slots. Tape should be moved up to 12 o'clock position to begin repair.

4. Turn filmstrip over. Return to the machine, lining up frame edge with slot in sprocket. This insures that tape will begin and end along frame lines.

5. To cut tape, bring a sprocket slot to between the 9 and 10 o'clock position. Slide blade cutter with sharp edge facing outward (as illustrated) into slot to cleanly slice through the repair tape. Then move slot to 12 o'clock position, raise pressure roller and remove film.