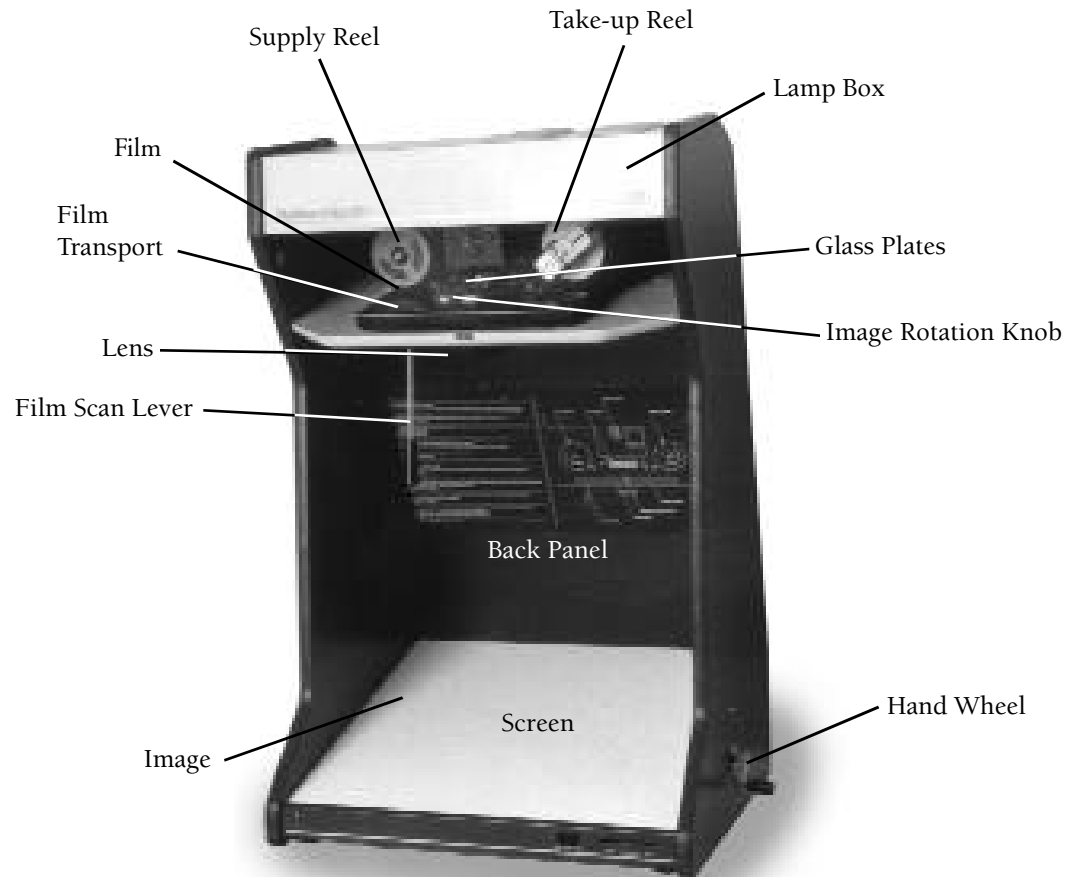


# Microfilm Reader-NMI 2020

## Clean and Repair

### Contents



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## Problems Chart

Problem	Cause	Try This
There is no light.	<ul style="list-style-type: none"> <li>• The power cord is not plugged in.</li> <li>• The lamp is not in the socket.</li> <li>• The lamp does not work.</li> <li>• The lamp socket does not work.</li> <li>• There is no power to the outlet or the building.</li> </ul>	<ul style="list-style-type: none"> <li>• Connect the power cord to an outlet.</li> <li>• Put the lamp in the socket (see page 4).</li> <li>• Replace the lamp (see page 4).</li> <li>• Replace the lamp socket (see page 8).</li> </ul>
The image is not clear.	<ul style="list-style-type: none"> <li>• The film is not in correctly.</li> <li>• The lower glass plate is not flat.</li> <li>• The image is not in focus.</li> <li>• The lens is not clean.</li> <li>• The glass plates are not clean.</li> </ul>	<ul style="list-style-type: none"> <li>• Put the film in correctly.</li> <li>• Adjust the lower glass plate until it is flat (see page 6).</li> <li>• Turn the focus ring on the lens until the image is in focus.</li> <li>• Clean the lens (see page 5).</li> <li>• Clean the glass plates (see page 6).</li> </ul>
The supply reel or take-up reel will not turn.	<ul style="list-style-type: none"> <li>• The upper drive belt or lower drive belt is loose or is broken.</li> <li>• The film is not in correctly.</li> <li>• A screw is loose on the universal joint or a pulley.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the upper drive belt or lower drive belt (see page 9-11).</li> <li>• Put the film in correctly.</li> <li>• Tighten the screws on pulleys and the universal joint. Connect the drive shaft if it has come out. (See page 10.)</li> </ul>
The image is not in the center of the screen.	<ul style="list-style-type: none"> <li>• The supply reel or take-up reel is not in correctly.</li> <li>• The film scan lever is not adjusted correctly.</li> </ul>	<ul style="list-style-type: none"> <li>• Push the supply reel or take-up reel back until it clicks in position.</li> <li>• Move the film scan lever until the image is in the center.</li> </ul>
The image is in upside-down or sideways.	<ul style="list-style-type: none"> <li>• The image is not turned.</li> </ul>	<ul style="list-style-type: none"> <li>• Use the image rotation knob to turn the film transport until the image shows correctly.</li> </ul>

## General Notes

1. To loosen screws, turn the wrench to the left (left loose). To tighten screws, turn the wrench to the right (right tight).
2. To loosen or tighten screws, use the hex (allen) wrench like this, . To remove or replace screws, use the hex (allen) wrench like this, .
3. To replace a part with more than one screw, put all the screws in (but not tight). Then tighten all the screws together to get equal pressure.

## Materials

Most tools come with new NMI 2020 machines. Other tools and supplies are available locally. If you cannot find a tool or supply, or if you need a new lamp or part, see one of the following:

- Your preventive maintenance supervisor
- Your stake physical facilities representative
- Your family history service center

(Lamps are available from Church Purchasing.)

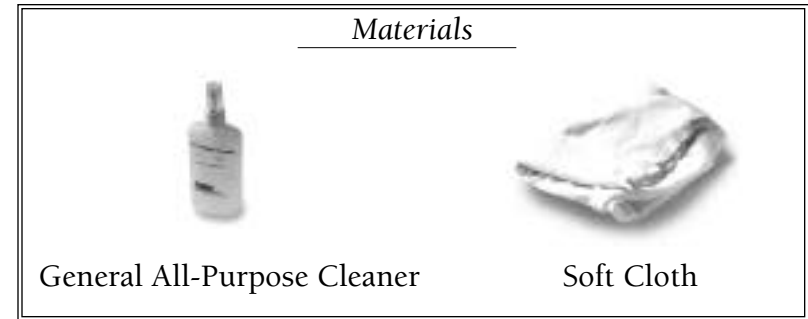
### Parts List

These parts are replaced frequently.

Part Number	Part Name
<b>All Models</b>	
---	DED Lamp (13.8 Volts 85 Watts)
0132220-201	Upper Belt
6625209-001	Lamp Socket
0164960-000	Upper Glass Assembly
0164950-000	Lower Glass Assembly
0132210-000	Lower Belt
0137790-000	Ball Bearing, Plastic Flanged
0132540-000	Rod, Scan Lever
0132230-000	Ball Bearing, Metal Flanged
<b>First Model      Serial Number G014D985 or Lower</b>	
0133450-000	Drive Cable “Black Casing”
0162360-000	Spring Clutch, Forward Drive
0162370-000	Spring Clutch, Reverse
<b>Second Model      Serial Number G015D000 to G019D000 (Two Speed Drive)</b>	
20124000	Timing Belt
0121076-700	Spring Pin “Gear Box”
01295101	Pad-O
20127001	Clutch Tensioner

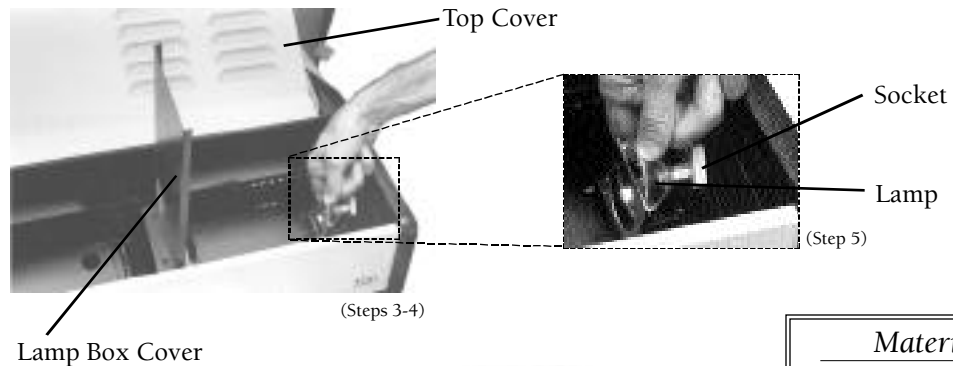
Part Number	Part Name
<b>Second Model (Con’t)</b>	
0137740-100	Pulley, Timing Belt 36T Rear
0137750-100	Pulley, Timing Belt 26T Front
0120136-000	Drive Shaft (order two)—replaces Drive Shaft 6475
0120135-999	Slide Coupling—replaces Slide Coupling 3765
0137780-000	Hand Wheel Crank
0137970-000	Knob, Hand Crank
<b>Third Model      Serial Number 1510002 and Higher (clear flex drive cable)</b>	
0121972-000	Drive Cable “Clear Casing”
20127001	Clutch Tensioner
01295101	Pad-O

## Clean Cabinet



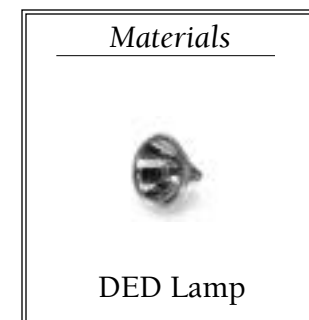
## Replace Lamp

1. Turn off the machine. Let the machine cool if the lamp was on.
2. Remove the power cord from the outlet.
3. Lift up the top cover on the machine.
4. Lift up the lamp box cover.
5. Lift the old lamp out. Remove it from the socket.
6. Put the new lamp in the socket. Move it back into position.



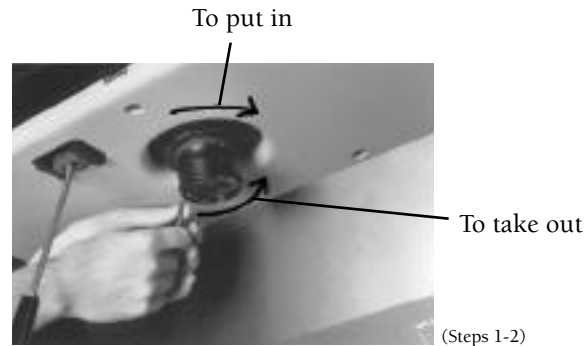
Caution: Do not touch the inside of the lamp. Oils on your skin can damage the lamp glass.

Note: If the lamp prongs look burned or broken, replace the lamp socket.



## Clean or Change Lens

1. Use the hex wrench to remove the three hex screws on the lens theft guard.
2. Remove the lens (turn counterclockwise).
3. Remove the lens theft guard.
4. Clean the lens. Use the lens cleaner and lens tissue or a soft brush.



**Caution:** Put the lens cleaner on the lens tissue. Do not put lens cleaner directly on the lens.

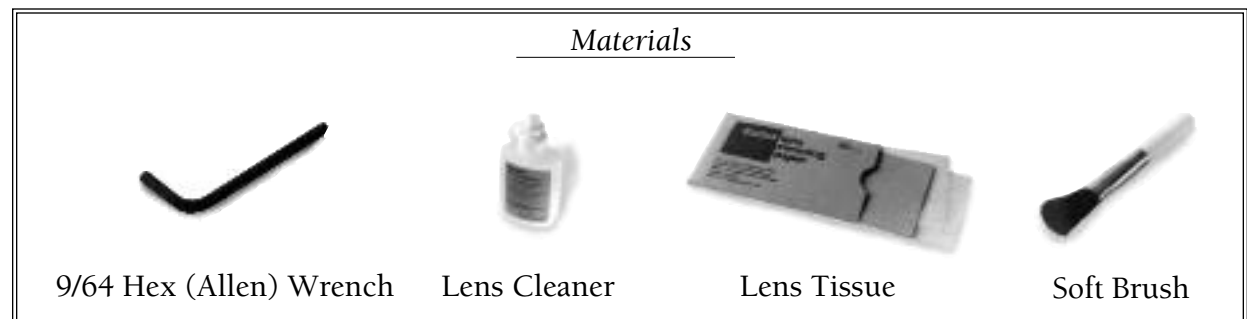
5. Replace the theft guard. (screw hole goes up)
  - On the zoom lens, the theft guard goes below the f-stop ring.
  - On the 42x lens, the theft guard goes in the groove.
  - On the 65x lens, the theft guard goes across one side.
6. Replace the lens (turn clockwise).



**Caution:** On the 65x lens, put in a microfilm and turn the lens until the image is in focus.

7. Replace the hex screws on the theft guard. (On the 65x lens, use the two screw holes near the back of the machine. On the zoom and 42x lens, the middle screw goes in the screw hole near the front of the machine.)

**Caution:** Put all of the screws in (but not tight). Then tighten them together to get equal pressure.



## Clean Glass Plates

1. Use the wrench to remove the front screw.
2. Remove the top glass plate.
3. Use the glass cleaner and soft cloth to clean the glass.
4. Replace the top glass plate. The glass dots or tape must face down (glass down).
5. Replace the screw. The screw head goes on top.
6. Use your fingers or a hook to push down and move the lower glass plate out.

*New machines have a metal tab you can push. Old machines have a small hole to put a hook in. You can make a hook from a paper clip.*

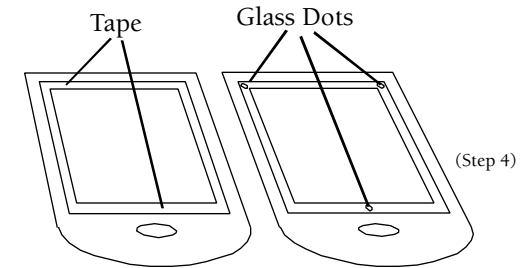
7. Clean the glass.
8. Replace the lower glass plate between the holding clips and the lower frame. The glass must face up.

**Caution:** The lower glass plate must be flat against the lower frame.

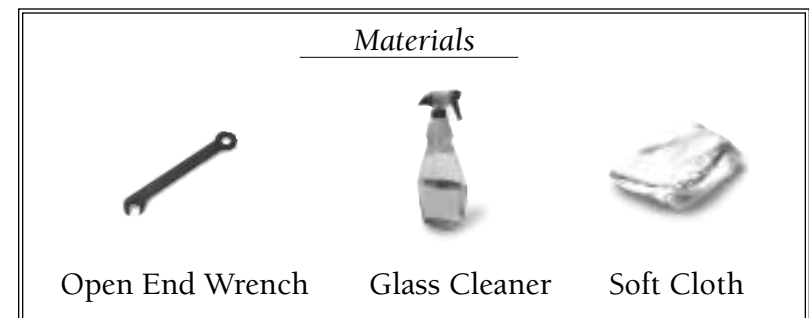
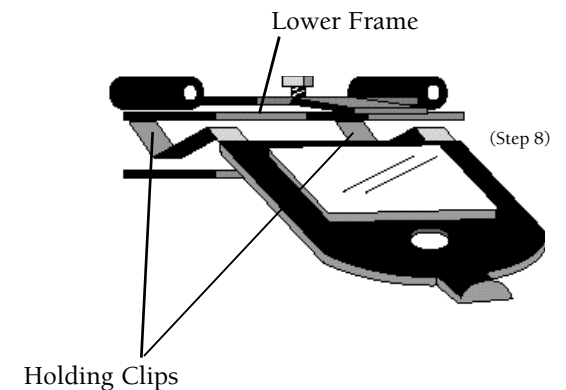


Front Screw

(Step 1)



(Step 3)



## Remove Panels

### New Model

#### To Remove the Back Panel

Hold the back panel and remove the two screws near the film transport. Carefully lift out the back panel.

- A. If necessary, trim (cut off) the plastic edge on each side of the machine to remove the back panel.
- B. If necessary, remove the four hex screws near the film scan lever. Remove the film scan lever.
- C. If necessary, remove the lens (see steps 1-2 on page 5).

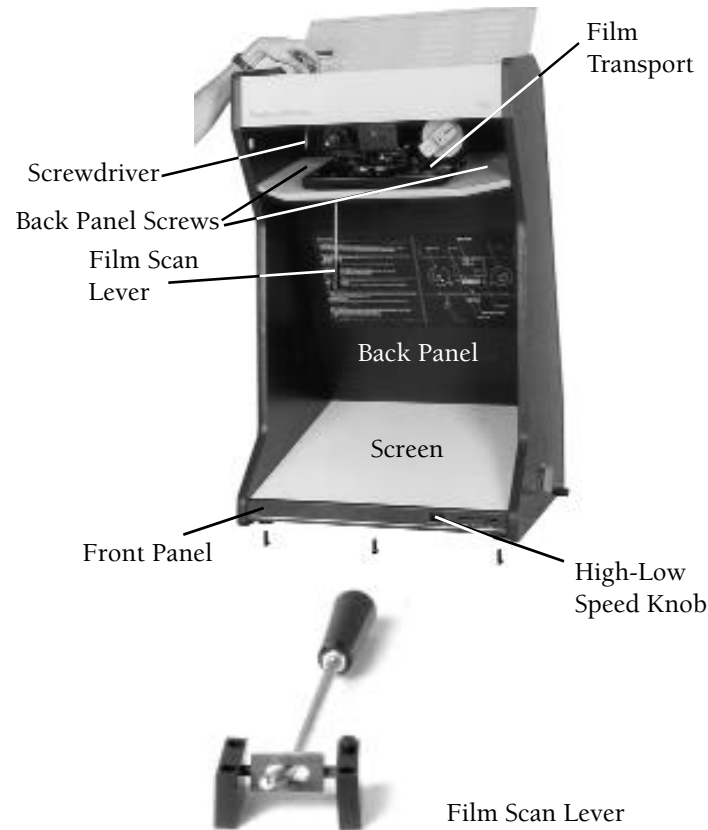
#### To Remove the Screen

1. Remove the high-low speed knob if one is on your machine. There is one screw below the knob.
2. Remove the three screws below the front panel. Move the front panel out.
3. Lift up the screen and remove it.

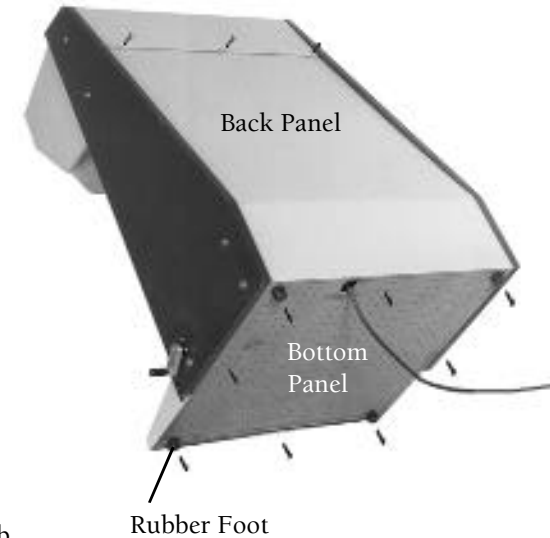
#### To Replace the Back Panel and Screen

1. Replace the screen in the back groove. Move it back into position.
2. Replace the front panel and high-low speed knob.
3. Replace the back panel in the top groove. Move it back into position. Replace the back panel screws near the film transport.
4. If necessary, replace the film scan lever. Put the three pieces back together. Then put the screws in. The lever must bend out.
5. If necessary, replace the lens.

New Model (one-piece cabinet, brown)



Old Model (two-piece cabinet, grey)



### Old Model

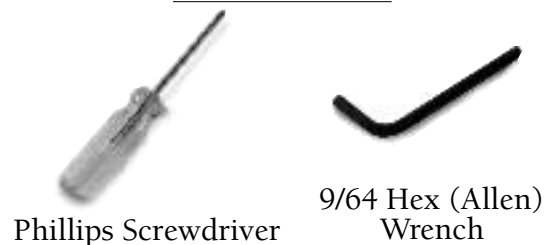
#### To Remove the Back and Bottom Panels

1. Remove the screws inside the four rubber feet and on the bottom panel. Remove the bottom panel.
2. Remove the three screws on the back panel. Move the top of the back panel out; then lift the back panel out of the groove.

#### To Replace the Panels

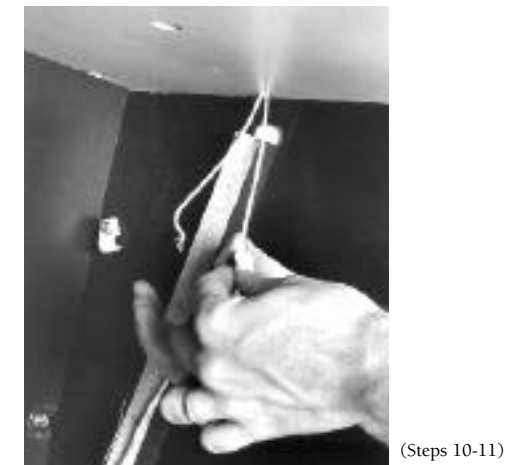
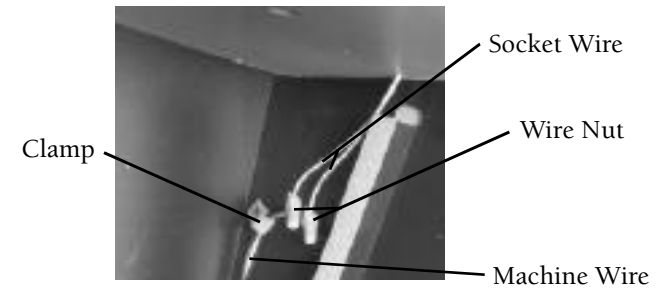
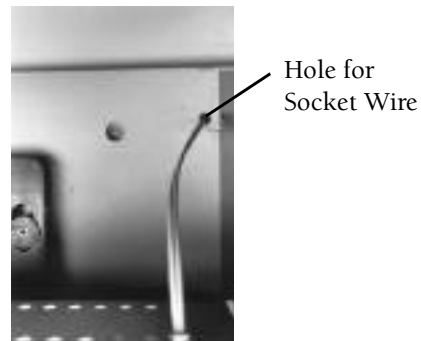
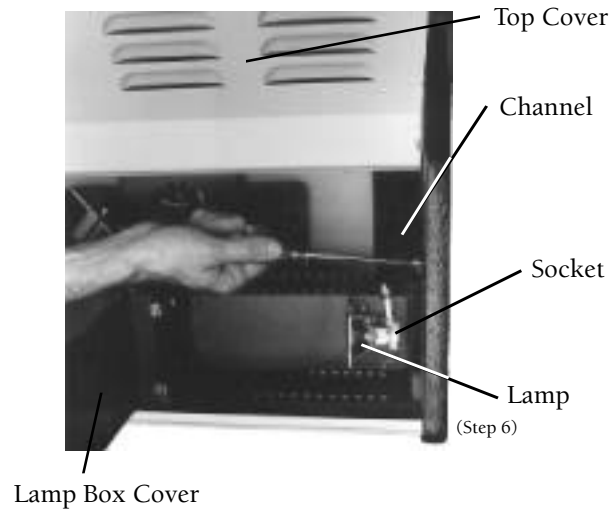
1. Replace the back panel in the lower groove. Move it back into position. Replace the screws.
2. Replace the bottom panel and screws.

### Materials

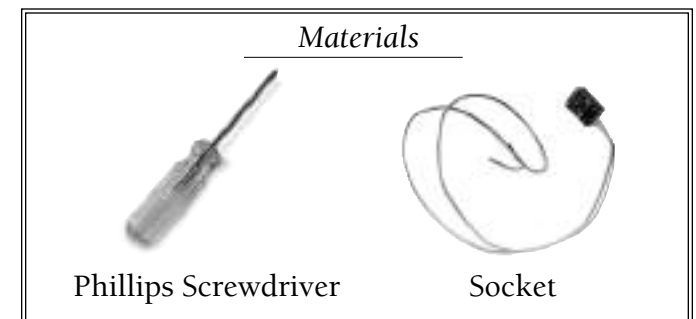


## Replace Lamp Socket

1. Turn off the machine. Let the machine cool if the lamp was on.
2. Remove the power cord from the outlet.
3. Lift up the top cover on the machine.
4. Lift up the lamp box cover.
5. Lift the old lamp out. Remove it from the socket.
6. Remove the two screws in the channel. Lift the channel out.
7. Remove the back panel (see page 7).
8. Twist the wire nut off. Disconnect the wires. Remove the old socket. If necessary, remove the clamp.
9. Some wire must show to connect it. If no wire shows on the new socket, use a wire stripper or knife to remove  $\frac{1}{2}$  inch (one centimeter) of the insulation on each new wire.
10. Put the socket wires through the hole and twist each one to a machine wire. (It is not important which socket wire connects to which machine wire.)
11. Twist the wire nut on. Replace the clamp if you removed it.



12. Replace the channel.
13. Replace the lamp in the new socket. Move it back into position.
14. Replace the back panel, film scan lever (if removed), and lens (if removed).





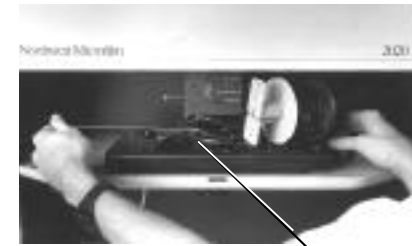
## Replace Upper Drive Belt

1. Remove the lower glass plate (see step 6 on page 6).
2. Turn the film carrier to the back.
3. Use the screwdriver to remove the screws. Remove the back cover.
4. Carefully pull the old belt forward to remove it. (Do not catch the belt on the holding clips near the lower glass plate.)
5. Turn the film carrier to the side.
6. Hold the new belt near the back of the film carrier. Move the spring hook under the lower glass plate frame retainer, hook the belt, and pull it forward.
7. Put the belt around the lower pulley.
8. Hold the belt tight. Turn the film carrier to the back again.
9. Put the belt between the two idler pulleys.
10. Put the belt around the upper pulleys.
11. Replace the back cover.
12. Replace the lower glass plate.

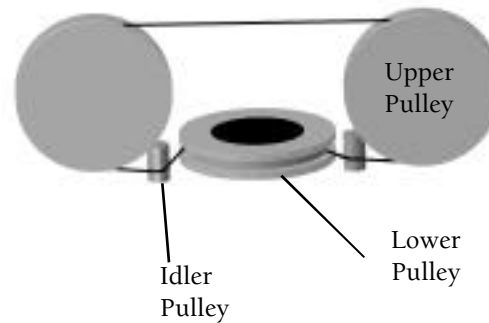
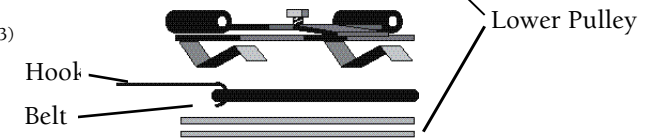


Film Carrier

(Step 3)



(Step 6)



(Step 9)

Upper Pulley



(Step 10)

### Materials



Phillips Screwdriver



Upper Drive Belt



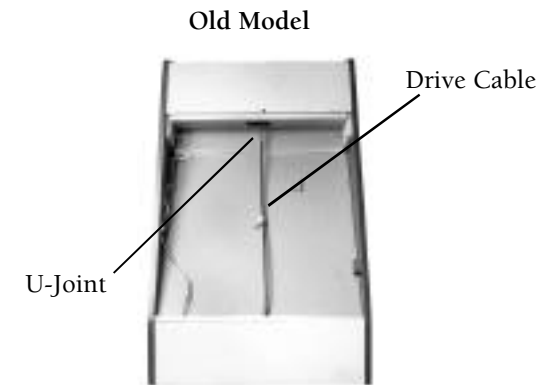
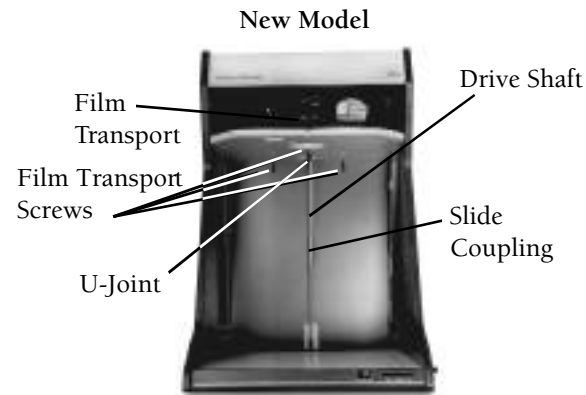
Spring Hook

## Replace Lower Drive Belt

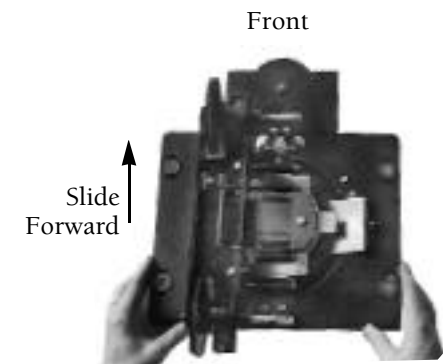
1. Remove the back panel (see page 7).
2. Loosen the hex screws on the top of the drive shaft or drive cable. (Do not remove the screws.) Remove the U-joint (or coupling) at the top.

*If the drive shaft has a slide coupling in the middle, slide it down before you remove the U-joint at the top. (Mark where the slide coupling is on the drive shaft. Remove the nuts and hex screws on the coupling. Slide the coupling down.)*

3. Remove the three screws holding the film transport. Lift the film transport and carefully set the drive shaft down.
4. Remove the film transport.
5. Move the top of the film transport forward.



(Step 2)



(Step 5)

### Materials



Phillips Screwdriver



Lower Drive Belt



9/64 Hex (Allen) Wrench



3/32 Hex (Allen) Wrench  
for Drive Cable



1/16 Hex (Allen) Wrench  
for Drive Shaft

6. Remove the old belt. (Set the film transport on the back edge. Tilt the film transport forward to help the old belt come off the lower pulley.)

7. Put the new belt around the lower pulley. (Set the film transport on the back edge. Tilt the film transport forward to help get the belt in. Tilt it back to have gravity help the belt go around the lower pulley.)



Tilt forward



(Step 7)

Tilt back

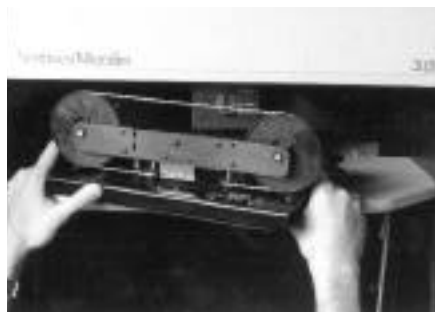
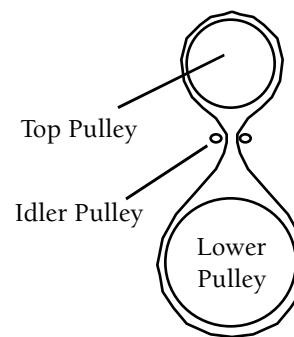
8. Put the belt between the two idler pulleys.

9. Put the belt around the top pulley.

10. Replace the film transport. To get the film transport back in, move the film carrier to the front. If necessary, remove the back cover (see step 3 on page 9).

11. Replace the drive shaft or drive cable and back panel. Turn the hand wheel to make sure the supply reel and take-up reel also turn.

12. If removed, replace the film scan lever and lens (see page 7).



(Step 10)