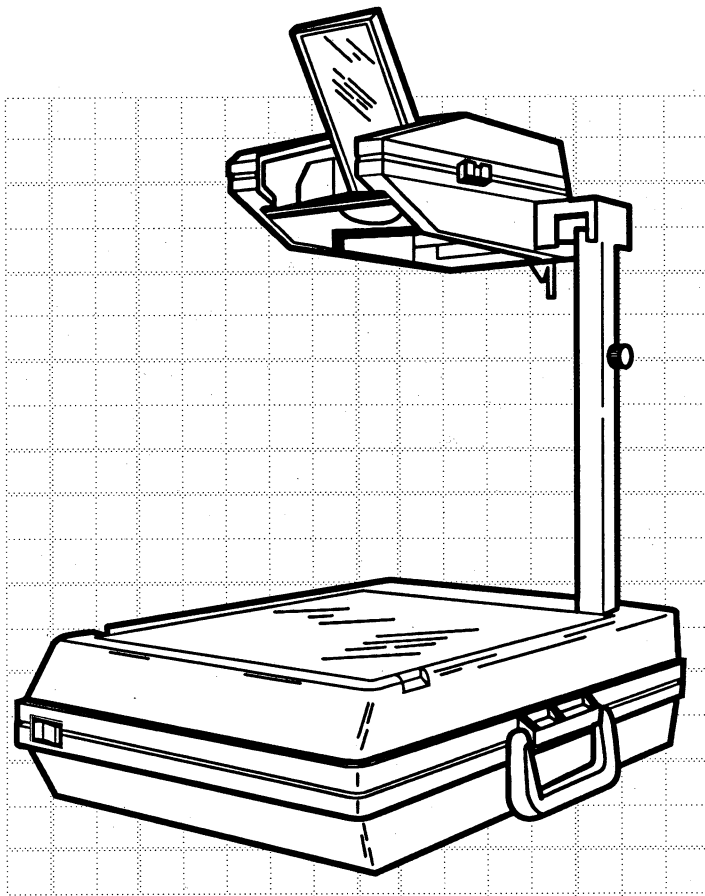


3M 2000 Overhead Projector



Service Manual

78-6970-1972-3 3/92

Visual Systems Division
3M Austin Center
Building A145-5N-01
Austin, TX 78769-2963

The 3M logo, consisting of the letters '3', 'M', and 'M' in a bold, sans-serif font, stacked vertically.

TABLE OF CONTENTS

| TITLE | PAGE NUMBER |
|---|-------------|
| Section 1 INTRODUCTION | |
| 1-1 Introduction | 1-1 |
| 1-2 Typical Specifications | 1-2 |
| Section 2 OPERATION AND MAINTENANCE | |
| 2-1 Set Up Procedure | 2-1 |
| 2-2 Fold Up Procedure | 2-2 |
| 2-3 Cleaning | 2-3 |
| 2-4 Lamp Replacement | 2-3 |
| Section 3 TROUBLESHOOTING | 3-1 |
| Section 4 ADJUSTMENTS | |
| 4-1 Projector Check-Out | 4-1 |
| 4-2 Post Perpendicularity Adjustment | 4-3 |
| 4-3 Side To Side Head Adjustment | 4-3 |
| 4-4 Head Parallel with Stage Alignment | 4-4 |
| 4-5 Front To Back Lens Alignment | 4-4 |
| 4-6 Focus Tension Adjustment | 4-5 |
| 4-7 Mirror Skewness Adjustment | 4-5 |
| Section 5 ELECTRICAL DIAGRAMS | |
| 5-1 100 Volt, (Japan) | 5-1 |
| 5-2 120 Volt, Model (USA, Canada, Saudi Arabia) | 5-2 |
| 5-3 230/240 Volt Models (European) | 5-3 |
| Section 6 DISASSEMBLY-REASSEMBLY | |
| 6-1 Base Top Removal | 6-1 |
| 6-2 Post Assembly Removal | 6-2 |
| 6-3 Bottom Head Cover Removal | 6-3 |
| 6-4 Projector Head Removal | 6-3 |
| 6-5 Top Head Cover Removal | 6-4 |
| 6-6 Lamp Socket Removal (EVW Type Lamp) | 6-4 |
| 6-7 Lamp Socket Removal (FSX/FSY Type Lamps) | 6-4 |
| 6-8 Slate Removal and Replacement | 6-5 |
| Section 7 ILLUSTRATED PARTS BREAKDOWN | |
| 7-1 Base & Arm Assembly | 7-2 |
| 7-2 Head Assembly for EVW Lamp Models | 7-4 |
| 7-3 Head Assembly for FSX/FSYLamps Models | 7-6 |

SECTION 1 - INTRODUCTION

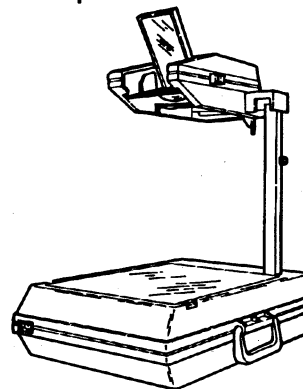
1-1 Introduction

This service manual contains servicing instructions, troubleshooting guide, adjustments, electrical diagrams, assembly/disassembly of parts and illustrated parts list.

The 3M 2000 is a highly portable and stylish overhead projector, designed to be used in the traveling presentation market. When transported, this projector offers the size and appearance of a brief case. When in use, its low profile provides minimal visual obstruction to the viewer and allows the presenter to work from a seated position.

The 3M 2000 offers the following features:

- Silent operating convection cooling - no fan.
- Easy operation and long life rocker On/Off switch.
- Easy and quick to set up, use and take down after presentations.
- Easy on/off switch - eliminates fumbling
- Full-size, hard-coat stage lens.
- Self-contained carrying case with handle.



The Model 2000 is available in the following versions:

| MODEL | VOLTS/HERTZ | MARKET AREA |
|-----------|-------------|------------------------------------|
| 2000 AAD | 127/60 | SAUDI ARABIA |
| 2000 AAM | 127/60 | MEXICO, SAUDI ARABIA |
| 2000 ABJ | 100/50 | JAPAN |
| 2000 ABJT | 100/50 | JAPAN |
| 2000 AG | 120/60 | USA, CANADA, MEXICO, LATIN AMERICA |
| 2000 AGT | 120/60 | USA, CANADA, MEXICO, LATIN AMERICA |
| 2000 AHA | 240/50 | AUSTRALIA |
| 2000 AHAT | 240/50 | AUSTRALIA |
| 2000 AHNT | 240/50 | NEW ZEALAND |
| 2000 AHNV | 240/50 | NEW ZEALAND |
| 200 AHR | 240/50 | SOUTH AFRICA |
| 2000 AHS | 230/50 | EUROPE* |
| 2000 AHST | 230/50 | GERMANY |
| 2000 AHSV | 230/50 | GERMANY |
| 2000 AHUT | 240/50 | U.K., MALAYSIA, SINGAPORE |
| 2000 AHUV | 240/50 | U.K., MALAYSIA, SINGAPORE |
| 2000 AHZ | 230/50 | SWITZERLAND |
| 2000 AHZT | 230/50 | SWITZERLAND |

*Europe includes Argentina, Austria, Belgium, Chili, Denmark, Finland, France, Germany, Hong Kong, Italy, Middle East, Netherlands, Norway, Philippines, South Africa, Spain, Sweden, Thailand

3M 2000 OVERHEAD PROJECTOR

1-2 Typical Specifications

| | 100 VOLT | 100 VOLT | 120 VOLT | 120 VOLT | 127 VOLT |
|------------------------|-------------------|-------------------|-----------------|-------------------|--|
| MODEL: | ABJ | ABJT | AG | AGT | AAD AAM |
| PHYSICAL: | | | | | |
| Width: | 13" (330mm) | 13" (330mm) | 13" (330mm) | 13" (330mm) | 13" (330mm) |
| Depth: | 19" (482mm) | 19" (482mm) | 19" (482mm) | 19" (482mm) | 19" (482mm) |
| Height - (Body) | 5" (127 mm) | 5" (127mm) | 5" (127mm) | 5" (127mm) | 5" (127mm) |
| (Max. top of head) | 21 1/2" (540mm) | 21 1/2" (540mm) | 21 1/2" (540mm) | 21 1/2" (540mm) | 21 1/2" (540mm) |
| Weight: | 16 lbs (7.3 kg) | 16.5 lbs (7.5 kg) | 14 lbs (6.4 kg) | 14.5 lbs (6.6 kg) | 14 lbs (6.4 kg) |
| ELECTRICAL: | | | | | |
| Voltage: | 100 VAC | 100 VAC | 120 VAC | 120 VAC | 127 VAC |
| Frequency: | 50/60 Hz | 50/60 Hz | 60 Hz | 60 Hz | 60 Hz |
| Current Rating: | 3.OA | 3.OA | 3.OA | 3.OA | 3.OA |
| Lamp Conversion | Transformer | Transformer | Diode | Diode | Diode |
| Power Cord: | 10'(3m) | 10'(3m) | 10'(3m) | 10'(3m) | 10' (3m) |
| Agency Approval: | MITI | MITI | UL/CSA | UL/CSA | |
| OPTICAL: | | | | | |
| Lamp: | EVW,82V,250W | EVW,82V,250W | EVW,82V,250W | EVW,82V,250W | EVW,82V,250W |
| Lamp Manufacturers | | | | | |
| Rated Lamp Life: | 50 Hrs. | 50 Hrs. | 50 Hrs. | 50 Hrs. | 50 Hrs. |
| Projection Lens: | 293mm Singlet | 317mm Triplet | 293mm Singlet | 317mm Triplet | 317mm Triplet - AAD 293mm Singlet - AAM |
| Typical Illumination: | 1700 Lumens | 1600 Lumens | 1600 Lumens | 1500 Lumens | 1500 Lumens |
| Stage: | A4, 11.2" x 11.2" | A4, 11.2" x 11.2" | 10.5" x 10.5" | 10.5" x 10.5" | 10.5" x 10.5" |
| (Reflective) | (285mm x 285mm) | (285mm x 285mm) | 267mm x 267mm) | 267mm x 267mm) | (267mm x 267mm) |
| MECHANICAL: | | | | | |
| Lamp Safety Interlock* | No | No | No | No | No |
| Screen Size Range | 45-100 inch | 40-90 inch | 45-100 inch | 40-90 inch | 45-100 inch |
| Resolution - (center) | 7 lines/mm | 8 lines/mm | 7 lines/mm | 8 lines/mm | 8 lines/mm |
| Projection Head Tilt: | 0°—25° | 0°—25° | 0°—25° | 0°—25° | 0°—25° |

*Open Lamp Access Door Will Shut OFF Lamp.

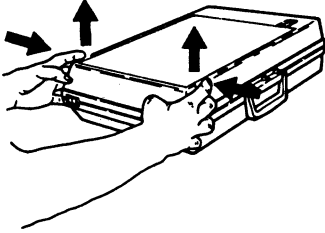
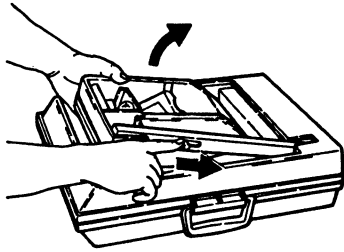
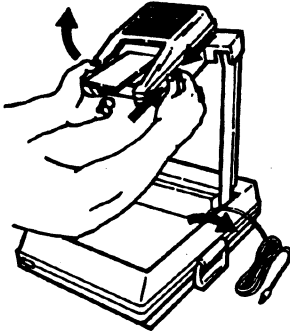
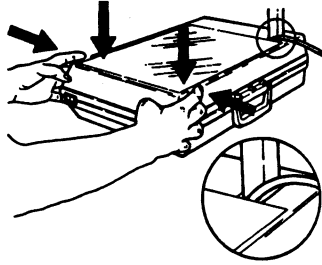
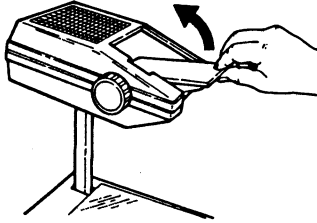
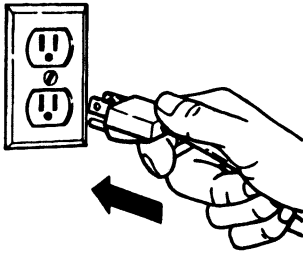
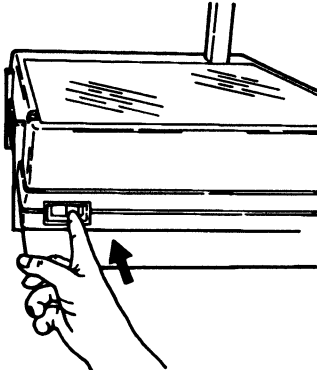
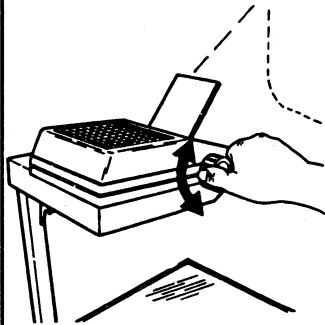
1-2 Typical Specifications

| | 230 VOLT | 230 VOLT | 240 VOLT | 240 VOLT |
|--------------------------|----------------------|-----------------------------|-------------------------------|--------------------------------------|
| MODEL: | AHST AHZT | AHS AHSV AHZ | AHUT AHNT AHAT | AHUV AHNV AHA AHR |
| PHYSICAL: | | | | |
| Width: | 13" (330mm) | 13" (330mm) | 13" (330mm) | 13" (330mm) |
| Depth: | 19" (482mm) | 19" (482mm) | 19" (482mm) | 19" (482mm) |
| Height - (Body) | 5" (127mm) | 5" (127mm) | 5" (127mm) | 5" (127mm) |
| - (Maximum, top of head) | 21 1/2" (540mm) | 21 1/2" (540mm) | 21 1/2" (540mm) | 21 1/2" (540mm) |
| Weight: | 15.5 lbs (7.0K9) | 15 lbs (7.0Kg) | 15.5 lbs (7.0Kg) | 15 lbs (7.0Kg) |
| ELECTRICAL: | | | | |
| Voltage: | 230 VAC | 230 VAC | 240 VAC | 240 VAC |
| Frequency: | 50 Hz | 50 Hz | 50 Hz | 50 Hz |
| Current Rating: | 2.5A | 2.5A | 2.5A | 2.5A |
| Power Cord: | 10'(3m) | 10'(3m) | 10'(3m) | 10'(3m) |
| Agency Approval: | IEC 380, TUV | IEC 380, TUV | IEC 380, TUV | IEC 380, TUV |
| OPTICAL: | | | | |
| Lamp: | FSX,230V,400W | FSX,230V,400W | FSY,240V,400W | FSY,240V,400W |
| Lamp Manufacturers Rated | | | | |
| Lamp Life: | 75 Hrs | 75 Hrs | 75 Hrs | 75 Hrs |
| Projection Lens: | 317 Triplet | 293mm Singlet | 317mm Triplet | 293 Singlet |
| Typical Illumination: | 1500 Lumens | 1600 Lumens | 1500 Lumens | 1600 Lumens |
| Stage: | A4, 11.2" x 11.2" | A4, 11.2" x 11.2" | A4, 11.2" x 11.2" | A4, 11.2" x 11.2" |
| (Reflective) | (285mm x 285mm) | (285mm x 285mm) | (285mm x 285mm) | (285mm x 285mm) |
| MECHANICAL: | | | | |
| Lamp Safety Interlock* | Yes | Yes | Yes | Yes |
| Screen Size Range | 45-80 inch | 45-100 inch | 45-80 inch | 45-100 inch |
| Resolution - (center) | 8 Lines/mm | 7 Lines/mm | 7 Lines/mm | 7 Lines/mm |
| Projection Head Tilt: | 0° — 30° | 0° — 25° | 0° — 30° | 0° — 25° |

*Open Lamp Access Door Will Shut OFF Lamp

SECTION 2 - OPERATION AND MAINTENANCE

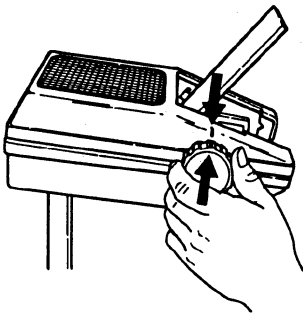
2-1 SET UP PROCEDURE

| | | | |
|--|---|--|--|
| <p>1</p>  <p>Push in and up on release buttons; remove cover</p> | <p>2</p>  <p>Push back post lock and erect post.</p> | <p>3</p>  <p>Squeeze projection head lock and erect head; remove power cord from storage.</p> | <p>4</p>  <p>Replace cover with power cord exiting as shown, projection surface up. Push in and down on release buttons to lock.</p> |
| <p>5</p>  <p>Elevate projection mirror.</p> | <p>6</p>  <p>Plug in power cord to electrical outlet.</p> | <p>7</p>  <p>Push on On/Off rocker switch.</p> | <p>8</p>  <p>Place transparency on projection surface and focus on screen or wall.</p> |

3M 2000 OVERHEAD PROJECTOR

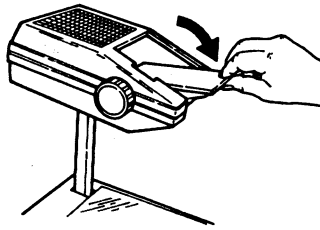
2-2 FOLD UP PROCEDURE

1



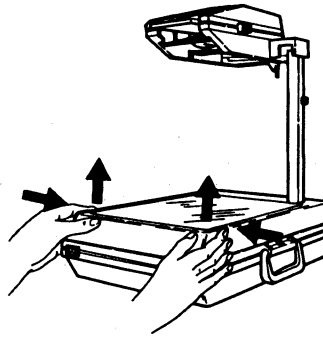
Turn focus knob so that the projection lens assembly is in the completely downward position.

2



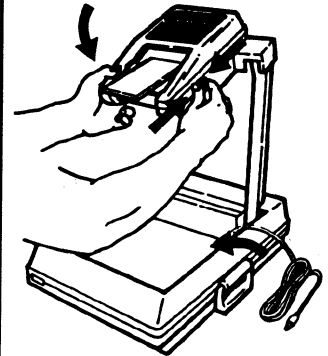
Lower projection mirror.

3



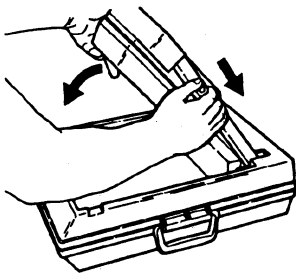
Push in and up on release buttons. Remove cover.

4



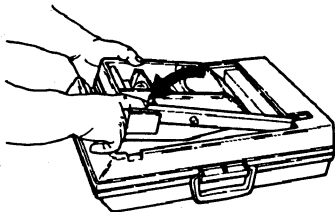
Squeeze projection head lock and lower head. Coil power cord and place in storage.

5



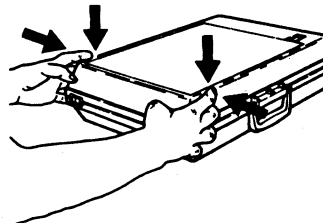
Push down post lock and lower post into case.

6



Insure post latches are in the down position.

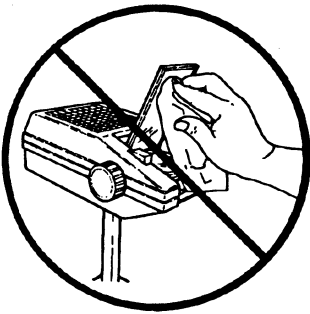
7



Replace cover, projection surface down. Push in and down on release buttons to lock.

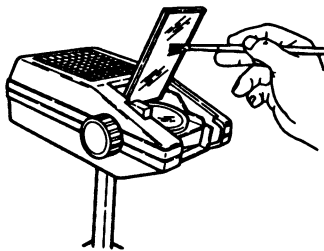
2-3 CLEANING

1



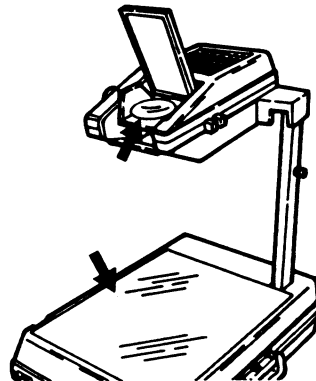
Mirror in the projection head is a front-surface mirror and must not be wiped clean.

2

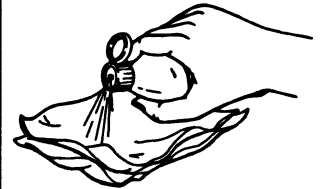


Remove any surface dirt with a camel hair brush to avoid scratching mirror.

3



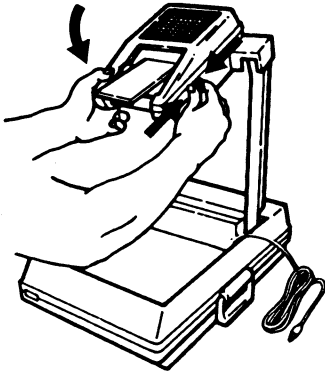
Clean projection lens and projection surface with cloth and 3M Lens Cleaner.



Use 3M Lens Cleaner PN 78-6969-7086-8. Clean with soft, lint-free cotton cloth.

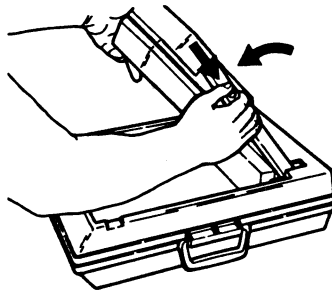
2-4 LAMP REPLACEMENT

1



Disconnect supply cord, squeeze projection head lock and lower head.

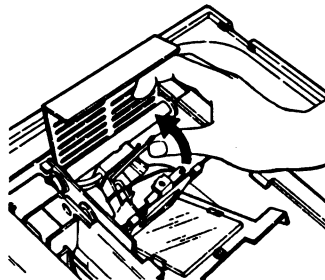
2



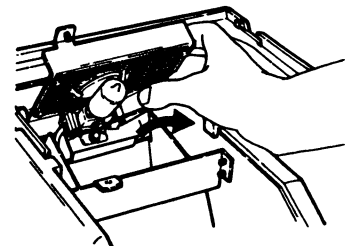
Push down post lock and lower post into case.

3

Warning! Lamp and adjacent metal parts are hot.



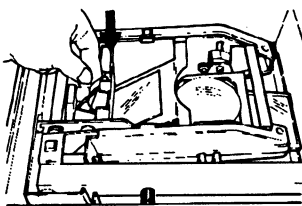
EVW Lamp



FSX or FSY Lamp

Open access door with coin or screwdriver. Pull back lamp ejector lever. Remove and discard old lamp.

4



Install new lamp. Push fully and squarely into socket. Close access door and lock with coin or screwdriver.

SECTION 3 - TROUBLESHOOTING

| PROBLEM | CHECK | SOLUTION(S) |
|---|--|--|
| Lamp does not energize | <ul style="list-style-type: none"> - Is power cord plugged in? - Is lamp burned out? - Is lamp properly seated in socket? - Is lamp defective? - Is lamp the proper type? - Is the interlock switch functional? - Is the Lampholder defective? - Is the Overhead plugged in? - Are interlock switches good? (if equipped) - Is there power at the outlet? - Is the fuse good? (if equipped) - Is the on/off switch working? - Are wires & connections good? - Is the Diode good? (if equipped) | <ul style="list-style-type: none"> - Plug in power cord - Replace lamp - Properly seat lamp - Replace lamp - Replace lamp with proper type - Engage, connect or replace - Replace Lampholder - Plug into an electrical outlet - Check function and replace if necessary - Try another outlet or check outlet with meter - Replace fuse with proper type - Check & replace if necessary - Repair wires and/or connectors (consult wiring diagram) - Replace Diode |
| Image is not of proper brightness | <ul style="list-style-type: none"> - Is the lamp of the proper type? - Is lamp properly seated in socket? - Is the line voltage adequate? - Are the optics damaged or not in proper alignment? - Is the lamp reflector damaged? | <ul style="list-style-type: none"> - Replace lamp with proper type - Properly seat lamp - Check line voltage - Repair and realign optics components - Replace lamp |
| Corners of image appear red (brown) or blue | <ul style="list-style-type: none"> - Is the lamp of the proper type? - Is lamp properly seated in socket? - Are the optics damaged or not in proper alignment? | <ul style="list-style-type: none"> - Replace lamp with proper type - Properly seat lamp - Repair and realign optics components |
| Top, bottom and sides of image are not in focus | <ul style="list-style-type: none"> - Are the optics damaged or not in proper alignment? - Is the lamp reflector or condenser lens damaged? - Is the Head slipping down? - Is the Mirror dirty or broken? - Is Fresnel Lens damaged? | <ul style="list-style-type: none"> - Repair and realign optics components - Replace lamp reflector or condenser lens - Realign head & tighten screw (See Section 4) - Clean or replace the Mirror - Replace Fresnel Lens |
| | | |

SECTION 4 - ADJUSTMENTS

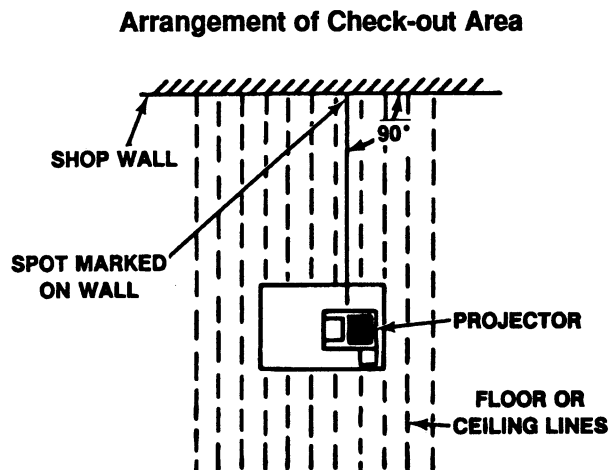
4-1 PROJECTOR CHECK-OUT

Reliable check-out and optical alignment of the overhead projectors can be accomplished only if proper facilities are available. (See Figure). This requires a permanent viewing screen and test stand in the dealer's shop, thus enabling high check-out standards to be established and maintained. Service personnel will also find that the use of permanent test facilities will assure a better check-out job in considerably less time than otherwise would be required.

Only two low-cost items are required to provide proper check-out facilities: a test viewing screen, 60 by 60 inches, with a flat (non-reflective) white surface; and a bench or test stand permanently located about 6 1/2 feet from the screen.

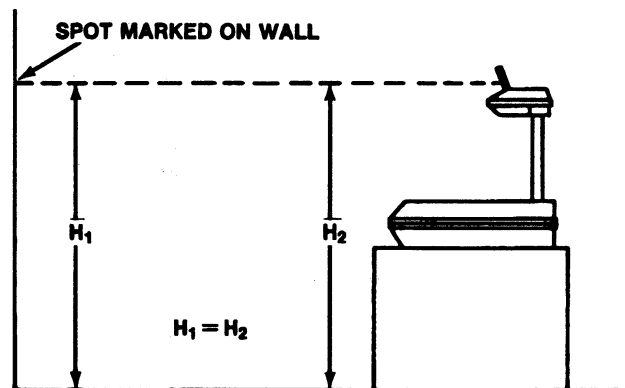
The screen should be vertical and can most easily be provided by applying a flat white paint to a 60 by 60 inch area of a smooth wall. If a smooth wall is not available, a piece of wallboard painted flat white, or a white window shade of the proper size can be mounted in the selected area.

The test stand should be high enough to provide easy access to all parts of the overhead projector when the projector is placed on the stand for check-out. An electrical outlet and a switch should be built into the test stand to facilitate making electrical connections to the projector.



The following steps provide a simple procedure for setting up the permanent test facilities. It is particularly important that the projector be perfectly square with the viewing screen in order to eliminate the possibility of vertical or horizontal keystoneing. Even the slightest keystoneing will result in unequal focusing of the projected image at the four corners, and will especially affect resolution readings. Therefore, several of the following steps involve squaring the projected light with the screen. Permanently locating the test stand and viewing screen will assure that the proper relationship, once established, does not change.

1. Select a 60 by 60 inch smooth area on one wall. Place a sturdy bench or test stand about 6 1/2 feet from this wall area. Position the overhead projector on the test stand so that it points toward the wall.
2. Measure the vertical distance from the floor to the center of the front projection mirror. Following a floor or ceiling line from the projector to the wall, make a mark on the wall the same distance from the floor (see Figure).



Locating Center of Projection Area

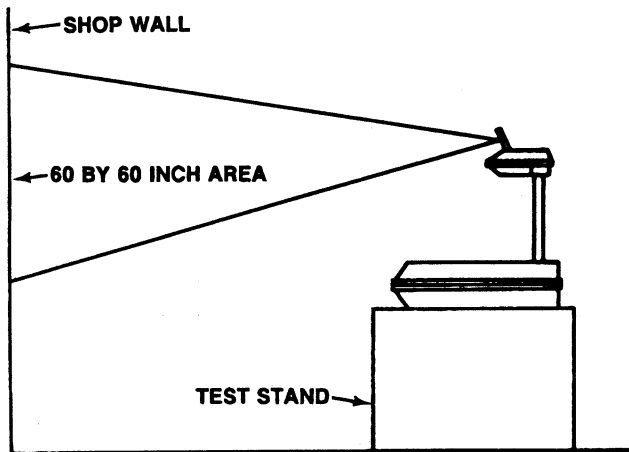
Note

If floor or ceiling lines are not available, stretch a cord or string from the projection lens to the wall, and use a carpenter's square or other square object to find the point at which the cord is perfectly perpendicular to the wall.

3. Mark the position of the stand on the floor, and the projector on the stand, so that the perpendicular relationship of the line from the projection lens to the wall is not lost while making subsequent adjustments.

3M 2000 OVERHEAD PROJECTOR

4. Using the mark on the wall as a base point, measure 30 inches up, down, to the left and to the right. Mark the edges of the resultant 60-inch square, and paint the enclosed area a flat white, or cover the area with a window shade, wallboard or other substitute viewing screen.
5. Turn the projector on and focus an image on the screen. Move the projector forward or backward, maintaining the image in focus at all times, until the projected light just fills the 60 by 60 inch screen. Be sure the image is in focus. (See Figure).
6. The axis of the projected image should be perfectly perpendicular to the center of the screen. If this condition is fulfilled, securely attach the test stand on the floor or mark its exact location so that it can be replaced in the same position for future check-out procedures. Also, mark the specific area on the test stand occupied by the projector.



Correct Position of Projector

4-2 POST PERPENDICULARITY ADJUSTMENT

Make this adjustment if the Post Assembly is not perpendicular to the Stage.

1. Remove Stage.
2. Loosen Screws A & B.
3. Replace Stage (with lens in down position to prevent damage) and use a square to adjust Post Assembly back or forth until it is perpendicular to the Stage (See figure 1).
4. Remove Stage and retighten Screws A & B.
5. Replace Stage and recheck alignment with the square. Repeat steps 2 to 4 if necessary (See Figure 2).

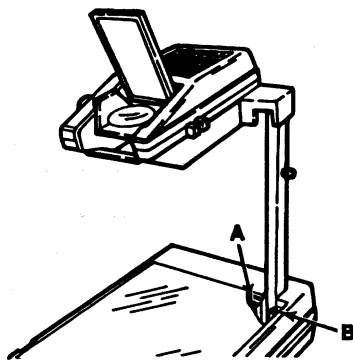


Figure 1

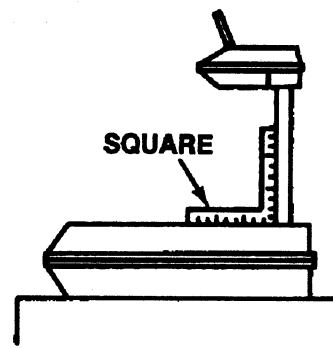
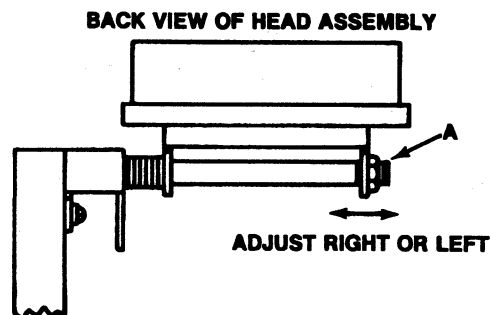


Figure 2

4-3 SIDE TO SIDE HEAD ADJUSTMENT

Make this adjustment if the Lamp filament is not centered from side to side in the projector lens.

1. Turn projector on and then off. Immediately look into the front mirror. The glow of the Lamp filament should be centered from side to side in the lens. If the filament is not centered, make the following adjustment.
2. Remove the Bottom Head Cover (See Section 6).
3. Adjust Nut A (See figure) until the filament is centered.
4. Tighten hex nut.
5. Replace the Bottom Head Cover.



3M 2000 OVERHEAD PROJECTOR

4-4 HEAD PARALLEL WITH STAGE ALIGNMENT

Make this adjustment if the Head Assembly is not parallel with the Stage (Fresnel Lens).

1. Loosen Screws A (See figure 1).
2. Adjust the Head Assembly until it is parallel with the Stage (See Figure 2).
3. Tighten Screws A.

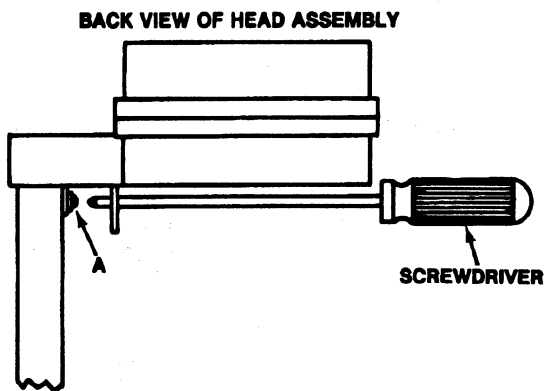


Figure 1

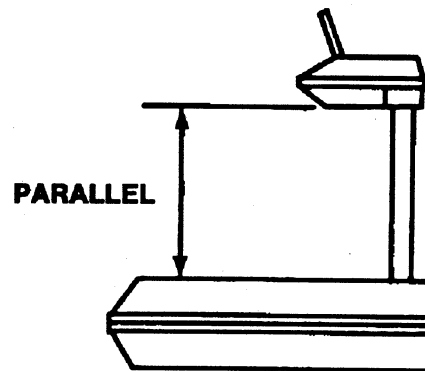


Figure 2

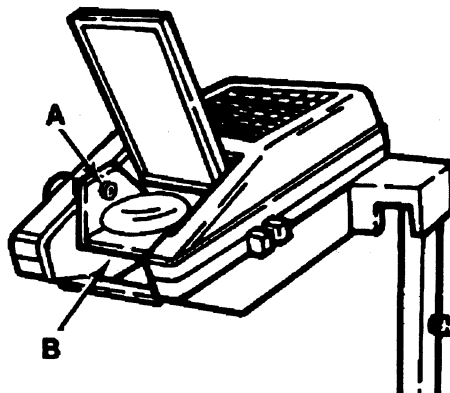
4-5 FRONT TO BACK LENS ALIGNMENT

Make this adjustment if the Lamp filament is not centered from front to back in the projection Lens.

1. Turn projector on and then off. Immediately look into the front mirror. The glow of the Lamp filament should be centered from front to back in the Lens. If the filament is not centered, make the following adjustment.
2. Loosen Screws A & B (See figure).
3. Adjust Lens back and forth until the filament is centered in the Lens.

NOTE: Make sure that the Lens stays parallel with the Stage.

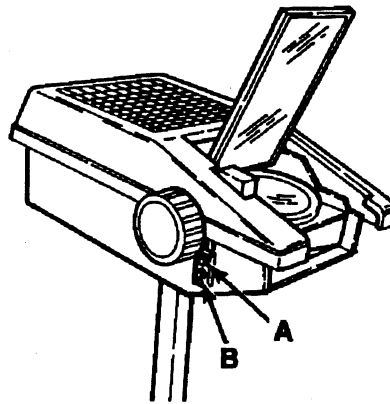
4. Retighten Screws A & B and recheck alignment.



4-6 FOCUS TENSION ADJUSTMENT

Make this adjustment if the focus adjustment Knob is too loose or too tight.

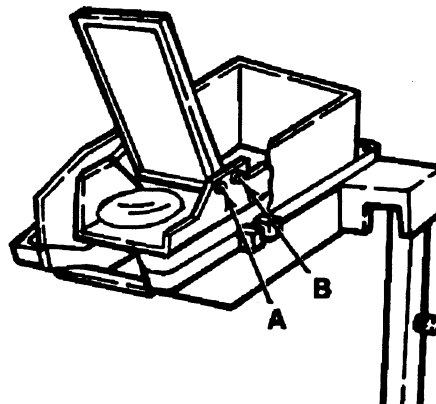
1. Remove the Bottom Cover of the Head Assembly (See Section 6).
2. Turn Focus Adjustment to the lowest position.
3.
 - a. Tighten Screws A & B (See figure) to tighten the Focus Control.
 - b. Loosen Screws A & B to loosen Focus Control.
4. Replace Bottom Cover of the Head Assembly.



4-7 MIRROR SKEWNESS ADJUSTMENT

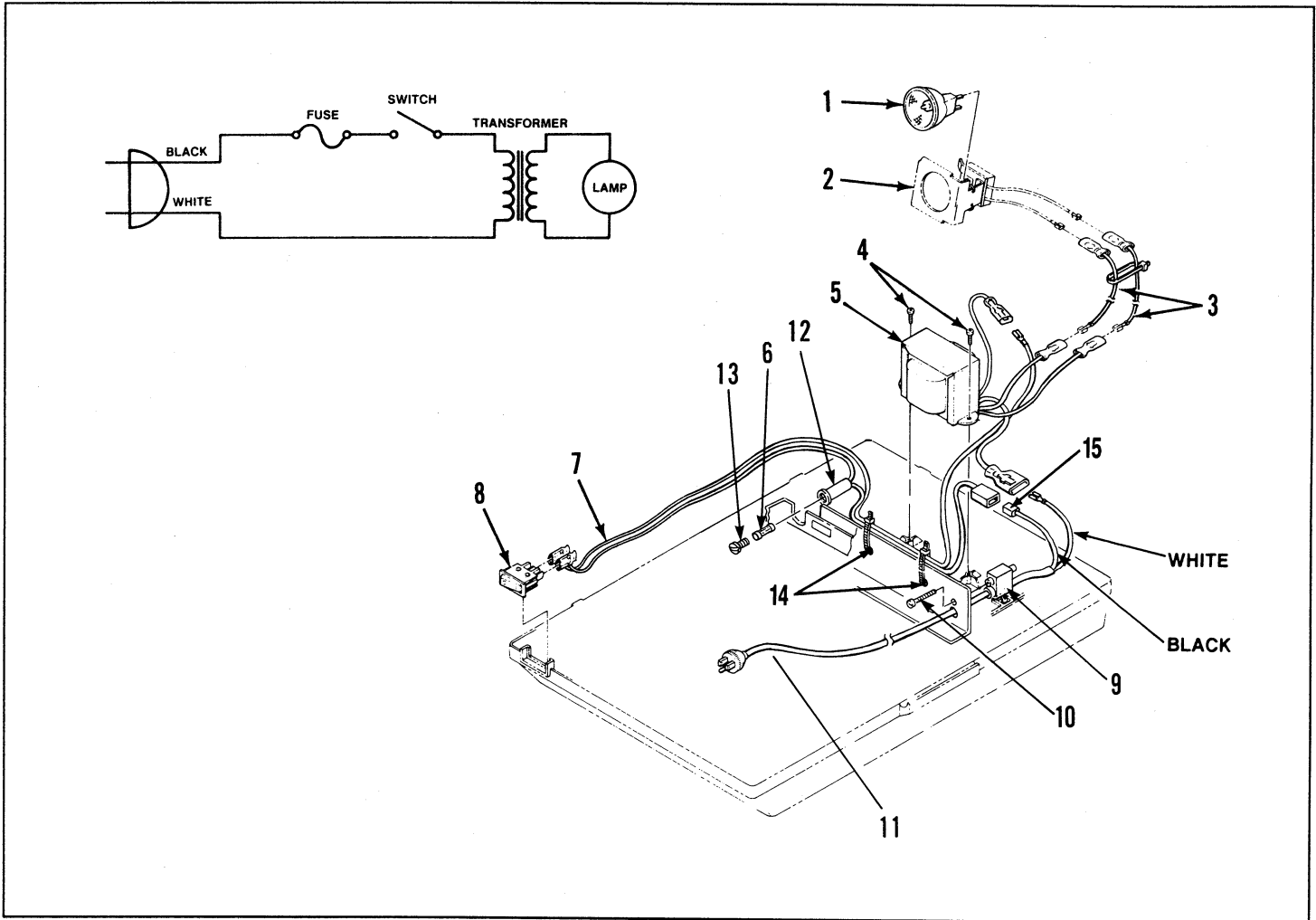
Make this adjustment if the image on the screen is skewed from side to side and cannot be adjusted by repositioning the projector.

1. Remove the Top Cover from the Head Assembly (See Section 6).
2. Loosen Screws A & B (See figure).
3. Adjust mirror for proper alignment on the screen.
4. Tighten Screws A & B.
5. Replace Top Head Cover.



SECTION 5 - ELECTRICAL DIAGRAMS

5-1 100 VOLT MODEL (JAPAN)

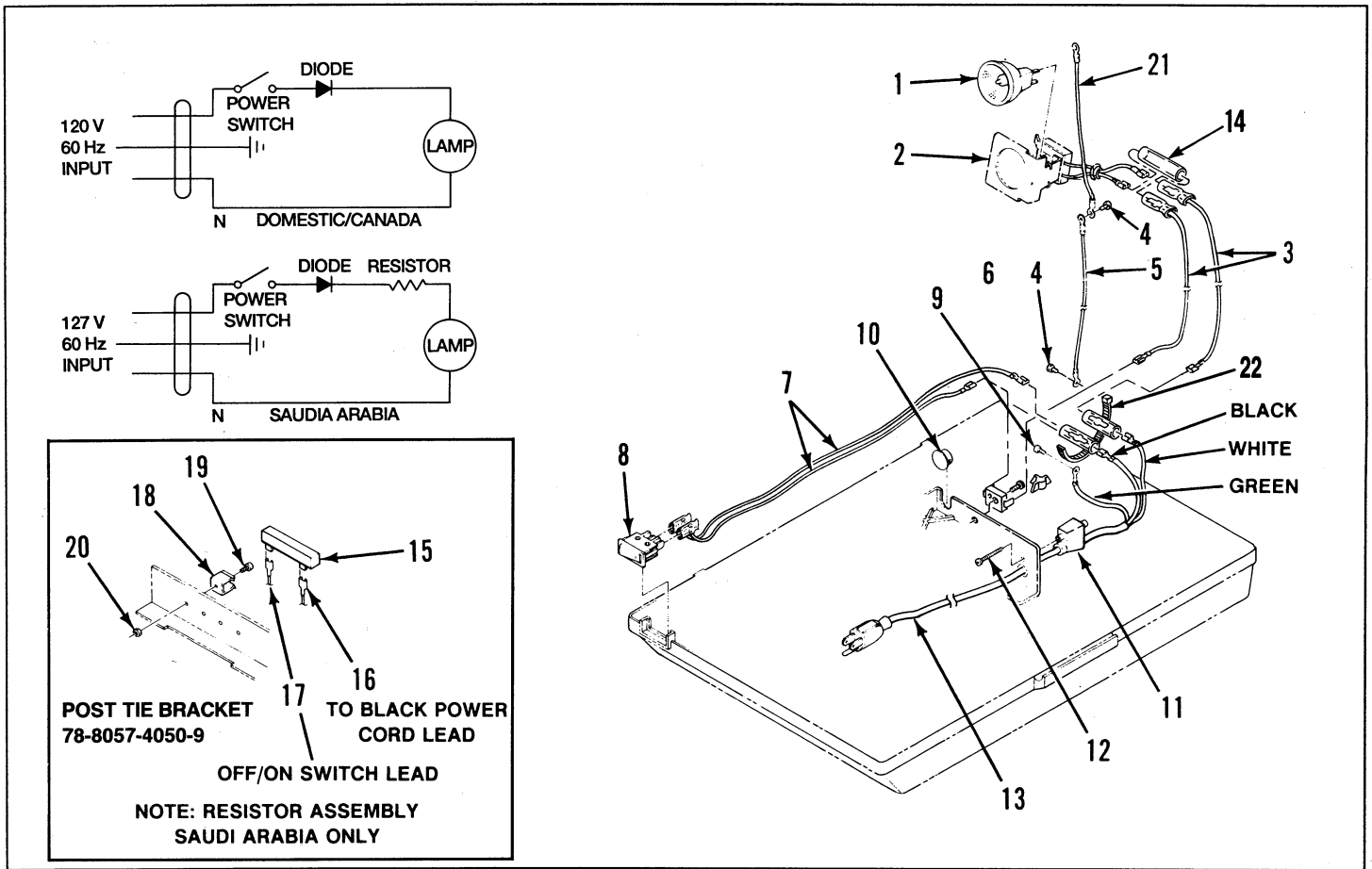


| Item Number | Part Number | Description |
|-------------|----------------|-----------------------------|
| 1 | 78-8014-6796-6 | LAMP, 82 Volt (EVW) |
| 2 | 78-8057-4081-4 | LAMP HOLDER |
| 3 | 78-8044-6810-2 | POST LEAD ASSEMBLY |
| 4 | 26-1002-4954-4 | SCREW, 8-16 X 5/8, Plastite |
| 5 | 78-8044-6919-1 | TRANSFORMER - 100 Volt |
| 6 | JJ-9960-0007-8 | FUSE, F-5A |
| 7 | 78-8057-4088-9 | SWITCH LEAD ASSEMBLY |
| 8 | 78-8057-4158-0 | SWITCH, Power |
| 9 | DY-1160-2020-6 | STRAIN RELIEF |
| 10 | 26-1003-3716-6 | SCREW, 6-19 x 1, Plastite |
| 11 | JY-6200-0002-8 | POWER CORD, JAPAN |
| 12 | 78-8057-4166-3 | FUSE HOLDER ASSEMBLY |
| 13 | 26-1001-6190-5 | CAP, Fuse holder |
| 14 | 78-8003-8335-4 | TIE WRAP |
| 15 | 26-1005-6802-6 | HOUSING, Receptacle |

3M 2000 OVERHEAD PROJECTOR

SECTION 5 - ELECTRICAL DIAGRAMS

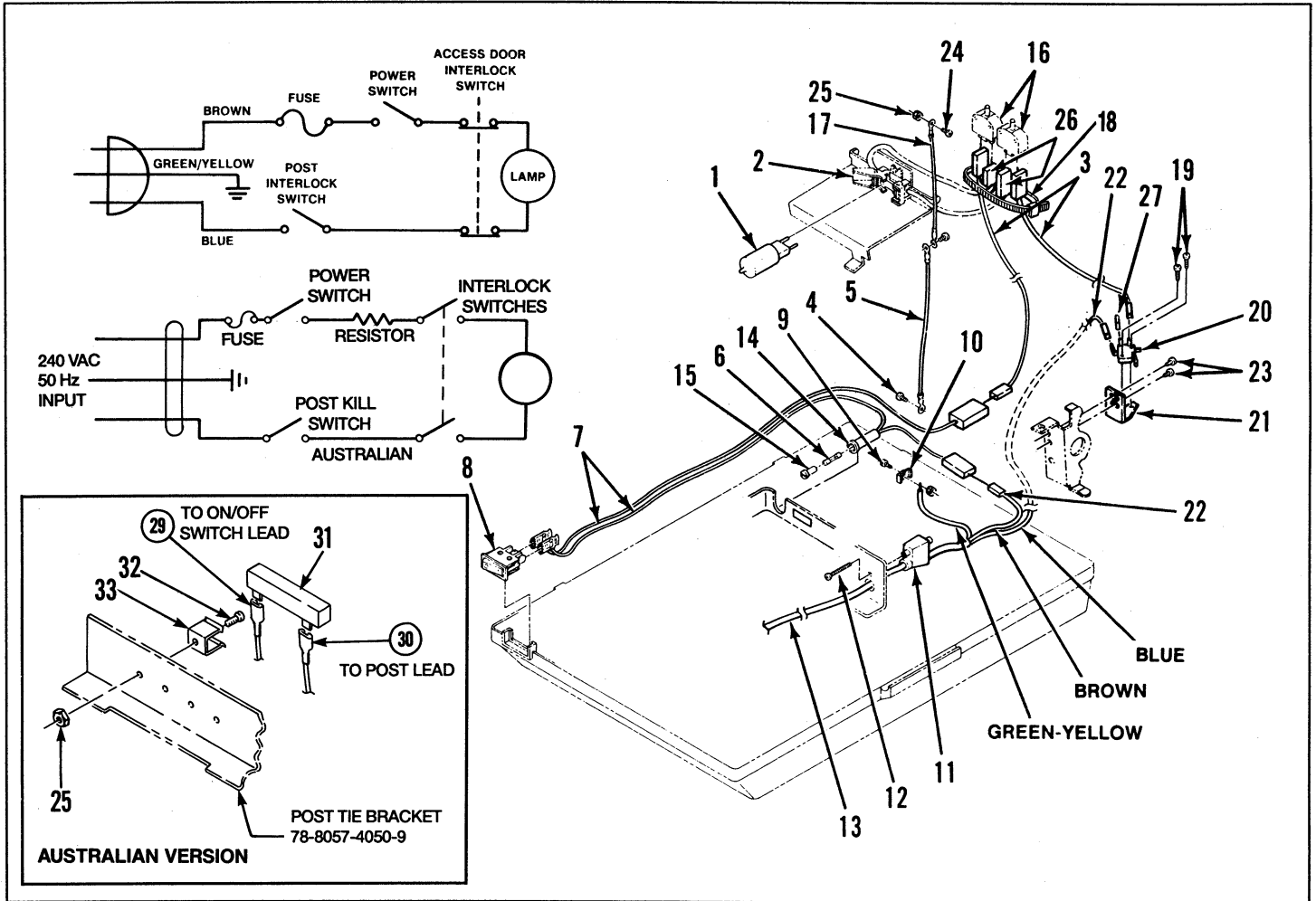
5-2 120 VOLT MODEL (USA, CANADA, SAUDI ARABIA)



| Item Number | Part Number | Description |
|-------------|----------------|-----------------------------------|
| 1 | 78-8014-6796-6 | LAMP, 82 Volt (EVW) |
| 2 | 78-8057-4081-4 | LAMP HOLDER |
| 3 | 78-8044-6810-2 | POST LEAD ASSEMBLY |
| 4 | 26-1004-5092-2 | SCREW, 6-32 x 3/8, Self tap |
| 5 | 78-8044-6805-2 | GROUND LEAD ASSEMBLY |
| 6 | 78-8073-6970-3 | DIODE ASSEMBLY |
| 7 | 78-8057-4088-9 | SWITCH LEAD ASSEMBLY |
| 8 | 78-8057-4158-0 | SWITCH, Power |
| 9 | 26-1002-5098-9 | SCREW, 8-32 x 3/8, Thread forming |
| 10 | 26-1002-4730-8 | PLUG, Hole |
| 11 | DY-1160-2020-6 | STRAIN RELIEF |
| 12 | 26-1003-3716-6 | SCREW, 6-19 x 1, Plastite |
| 13 | 78-8064-1536-6 | POWER CORD - 10 FT. |
| 14 | 80-1300-0275-3 | SCOTCHTITE 5/8" ID Tubing |
| 15 | 78-8011-1198-6 | RESISTOR |
| 16 | 78-8057-4201-8 | LEAD ASSY. RES. TO POWER CORD |
| 17 | 78-8057-4202-6 | LEAD ASSY. RES. TO POWER SW. |
| 18 | 78-8033-1666-6 | CLAMP, Resistor |
| 19 | 26-1002-5268-8 | SCREW, 6-32 x 3/8, Pan Head Phil. |
| 20 | 26-1001-7983-2 | NUT, 6-32 with lockwasher |
| 21 | 78-8065-8232-2 | GROUND LEAD ASSEMBLY |
| 22 | 78-8003-8335-4 | TIE WRAP |

SECTION 5 - ELECTRICAL DIAGRAMS

5-3 230/240 VOLT MODELS



| Item Number | Part Number | Description |
|-------------|----------------|-----------------------------------|
| 1 | 78-8057-4162-2 | LAMP, 230 Volt (FSX 400W) |
| | 78-8057-4163-0 | LAMP, 240 Volt (FSY 400W) |
| 2 | 78-8057-4237-2 | SOCKET, Lamp |
| 3 | 78-8057-4243-0 | POST LEAD ASSEMBLY |
| 4 | 26-1002-5092-2 | SCREW, 6-32 x 3/8, Self tap |
| 5 | 78-8044-6805-2 | GROUND LEAD ASSEMBLY |
| 6 | 26-1005-9599-5 | FUSE, F-5A |
| 7 | 78-8057-4187-9 | SWITCH LEAD ASSEMBLY |
| 8 | 78-8057-4158-0 | SWITCH, Power |
| 9 | 26-1002-5218-3 | SCREW, 6-32 x 1/2, Thread forming |
| 10 | 78-8010-0131-0 | CLAMP, ground |
| 11 | DY-1160-2020-6 | STRAIN RELIEF |
| 12 | 26-1003-3716-6 | SCREW, 6-19 x 1, Thread forming |
| 13 | 78-8057-4170-5 | POWER CORD (G.S.) |
| | 78-8057-4191-1 | POWER CORD ASSY. - U.K. |
| | 78-8057-4196-0 | POWER CORD - AUSTRALIAN |
| | 78-8057-4198-6 | POWER CORD ASSY. - NEW ZEALAND |
| | 78-8057-4199-4 | POWER CORD - SWITZERLAND |

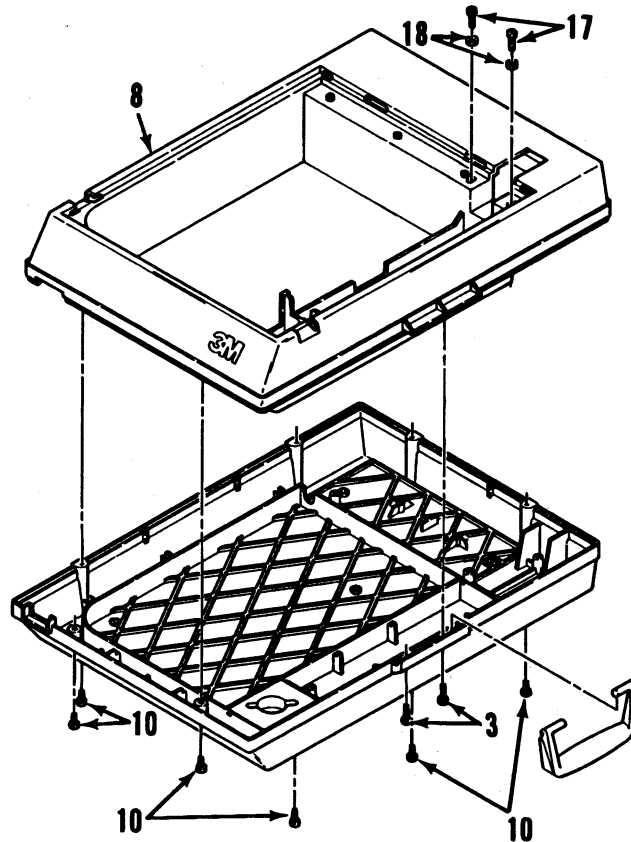
CONTINUED

3M 2000 OVERHEAD PROJECTOR

| Item Number | Part Number | Description |
|--------------------|--------------------|---|
| 13 (Cont.) | 78-8057-4204-2 | POWER CORD ASSY. SOUTH AFRICA |
| 14 | 78-8057-4166-3 | FUSE HOLDER ASSY. |
| 15 | 26-1001-6189-7 | CAP, Fuse holder |
| 16 | 78-8057-4102-8 | SWITCH, Access door interlock |
| 17 | 78-8065-8232-2 | GROUND WIRE |
| 18 | 78-8003-8335-4 | TIE WRAP |
| 19 | 78-1002-5042-7 | SCREW, 4-40 x 5/8 |
| 20 | 78-8057-4123-4 | SWITCH, Post interlock |
| 21 | 78-8057-4124-2 | BRACKET, Post interlock |
| 22 | 26-1005-6802-6 | HOUSING, 1 position receptacle |
| 23 | 26-1002-5098-9 | SCREW, 8-32 x 3/8 thread forming |
| 24 | 26-1002-5268-8 | SCREW, Machine, 6-32 x 3/8 pan head |
| 25 | 26-1001-7983-2 | NUT, 6-32, Ext. tooth lockwasher |
| 26 | 26-1005-6802-6 | HOUSING CONNECTOR, Amp |
| 27 | 26-1001-8819-7 | TERMINAL, Solderless receptacle |
| 28 | 26-1001-7983-2 | NUT, Keps 6-32 |
| 29 | 78-8057-4267-9 | LEAD ASSEMBLY - Resistor to On/Off Switch |
| 30 | 78-8057-4266-1 | LEAD ASSEMBLY - Resistor to Post Lead |
| 31 | 78-8054-1456-8 | RESISTOR - 230/240V |
| 32 | 26-1002-5268-8 | SCREW, 6-32 x 3/8 lg. |
| 33 | 78-8003-1666-6 | CLAMP, Resistor |

SECTION 6 - DISASSEMBLY/REASSEMBLY

6-1 BASE TOP REMOVAL



The Base Top Assembly needs to be removed to service the following:

On/Off Power Switch
 Power Cord
 Internal Wiring
 Diode, if equipped
 Fuse Holder, if equipped
 Transformer, if equipped
 Post Pivot Mechanism

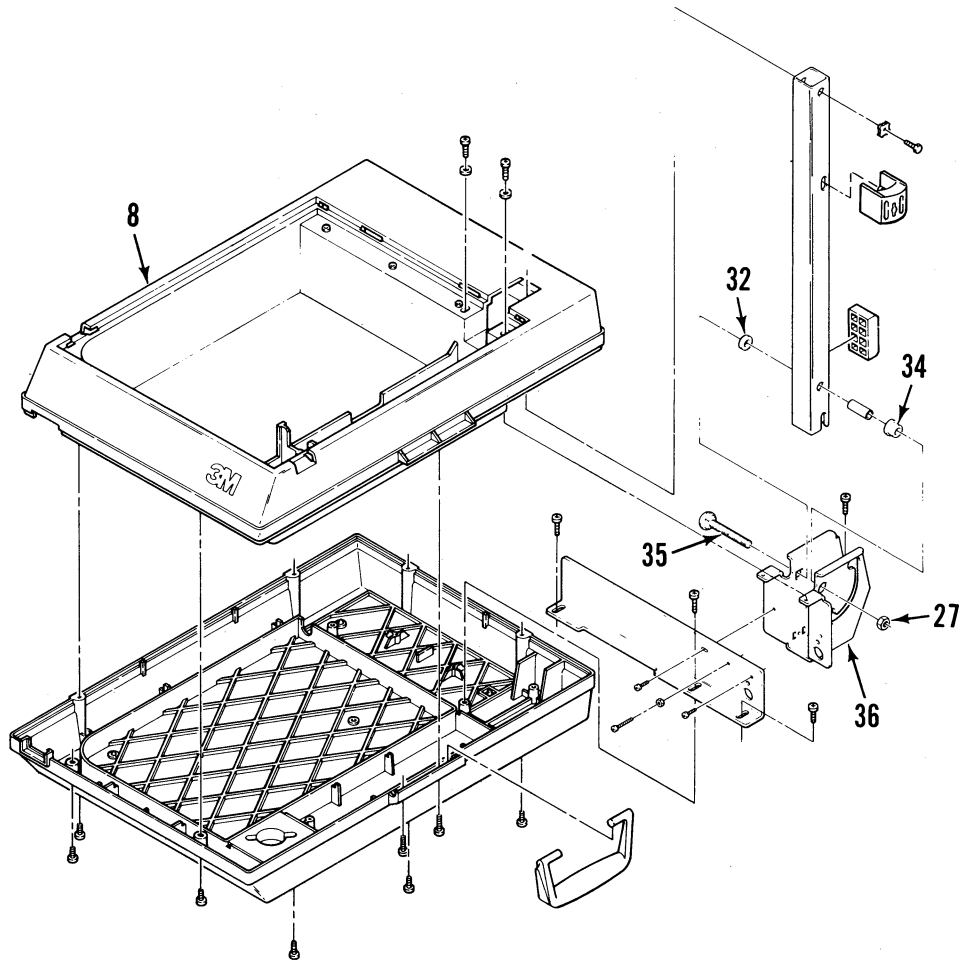
- 6-1-1 Remove two Screws (17) and washer (18) from the top of the Base near the Arm.
- 6-1-2 Remove six Screws (10) from the bottom of the Base Assembly.
- 6-1-3 Remove two Screws (3) from the bottom of the Base Assembly at the Handle.
- 6-1-4 Lift off the Top of the Base Assembly (8).

NOTE

The Top Assembly cannot be completely removed without removing the Post or Head Assembly. However, most service in this area can be performed without complete removal.

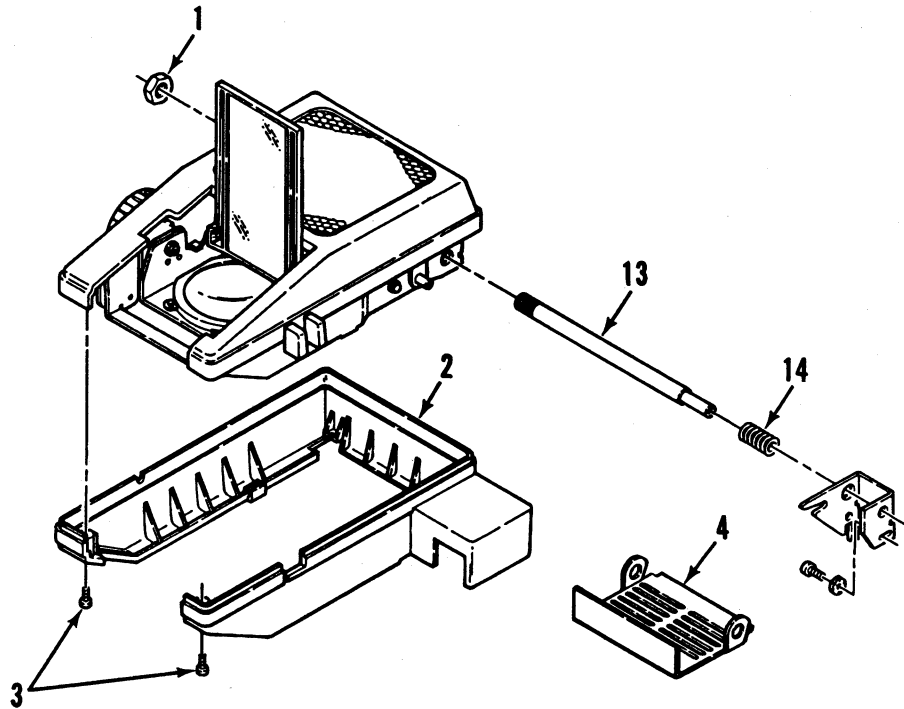
- 6-1-5 After servicing in this area, the Base Top Assembly should be reassembled in the reverse order. Care should be taken to prevent wires from being pinched and must be realigned (see Section 4).

3M 2000 OVERHEAD PROJECTOR



6-2 POST ASSEMBLY REMOVAL

- 6-2-1 Remove the Base Top Assembly (8) (see 6-1).
- 6-2-2 Disconnect the two lamp leads located at the bottom of the Post, from the power circuit.
- 6-2-3 Disconnect the green ground wire from the Post Mounting Bracket (36).
- 6-2-4 Remove Nut (27) from Bolt (35).
- 6-2-5 Remove Bolt (35) and Brass Bearings (32 & 34) from the Post Arm.
- 6-2-6 Lift up and turn Post Assembly to remove.
- 6-2-7 Reassemble in reverse order.



6-3 BOTTOM HEAD COVER REMOVAL

- 6-3-1 Remove two screws (3) from the bottom of the Head Cover (2).
- 6-3-2 Remove Bottom Head Cover (2).

6-4 PROJECTOR HEAD REMOVAL

- 6-4-1 Remove Bottom Head Cover (2) (see 6-3).
- 6-4-2 Disconnect Lamp Leads at top of Post Arm (or Interlock Switch, if equipped).
- 6-4-3 Disconnect Green Ground lead at back of Head.
- 6-4-4 Remove Nut (1) from Shaft (13).
- 6-4-5 Slide Head Assembly off of Shaft (13).

NOTE

Don't loosen Screw (15) or change the position of the Bracket (16) because it will change the head alignment set point.

NOTE

Lamp Access Door (4) and Spring (14) will also come loose at this time.

- 6-4-6 Reassemble in reverse order and realign head (see Section 4-3).

3M 2000 OVERHEAD PROJECTOR

6-5 TOP HEAD COVER REMOVAL

- 6-5-1 Remove Bottom Head Cover (Section 6-3).
- 6-5-2 Remove Green Ground wire and strap from back of the Head Assembly.
- 6-5-3 Remove two Screws from the back of the Head Cover.
- 6-5-4 Lift off Top Head Cover.
- 6-5-5 Reassemble in reverse order.

6-6 LAMP SOCKET REMOVAL (EVW TYPE LAMP)

- 6-6-1 Open Lamp Access Door and remove Lamp.
- 6-6-2 Remove Bottom Head Cover (see 6-3).
- 6-6-3 Remove Top Head Cover (see 6-5).
- 6-6-4 Disconnect Lamp Lead at top of Post.
- 6-6-5 Remove two Screws (see Figure 7-2) from Lamp Holder.

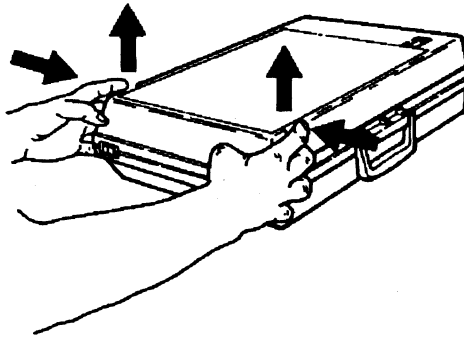
NOTE

Access to Screws through Lamp Access Door and opening in back of Head Assembly.

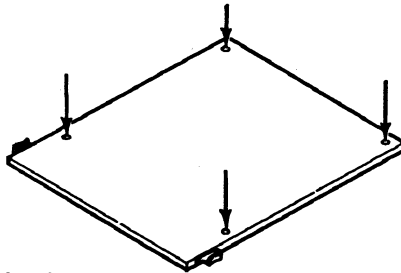
- 6-6-6 Lift out Lamp Socket.
 - 6-6-7 Reassemble in reverse order.
- ### **6-7 LAMP SOCKET REMOVAL (FSX/FSY TYPE LAMP)**
- 6-7-1 Remove Bottom Head Cover (see 6-3).
 - 6-7-2 Remove Top Head Cover (see 6-5).
 - 6-7-3 Disconnect Lamp Lead at top of Post (or Interlock, if equipped).
 - 6-7-4 Open Lamp Access Door and remove Lamp.
 - 6-7-5 Remove Lamp Access Door by removing "E" Ring from left side of Shaft (Figure 7-3, item 33). Slide out Shaft.
 - 6-7-6 Remove Screw (Figure 7-3, item 10) and Washer (Figure 7-3, item 35).
 - 6-7-7 Remove Screw (Figure 7-3, item 19) and Screw (Figure 7-3, item 10), Nut (Figure 7-3, item 34) and Washer (Figure 7-3, item 35).
 - 6-7-8 Lift out Lamp Socket.
 - 6-7-9 Reassemble in reverse order, making certain that the lamp socket is aligned over the condenser lens.

6-8 SLATE REMOVAL AND REPLACEMENT

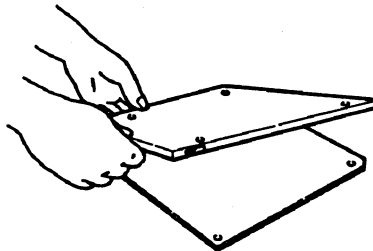
6-8-1 Push in and up on release buttons. Remove cover.



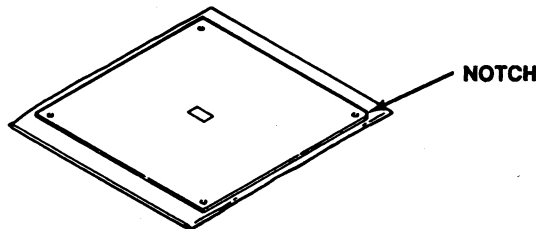
6-8-2 Set Cover with projection surface down and remove the four indicated Screws.



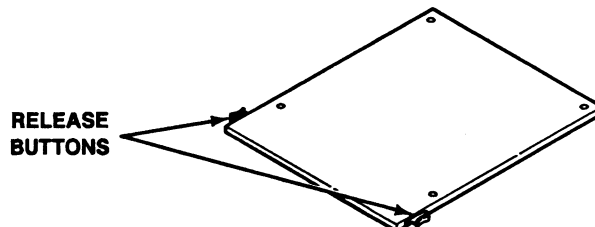
6-8-3 Lift the cover off the damaged projection slate.



6-8-4 Remove the replacement slate from the protective pouch and place on top of pouch with projection surface down. Note the notch location.

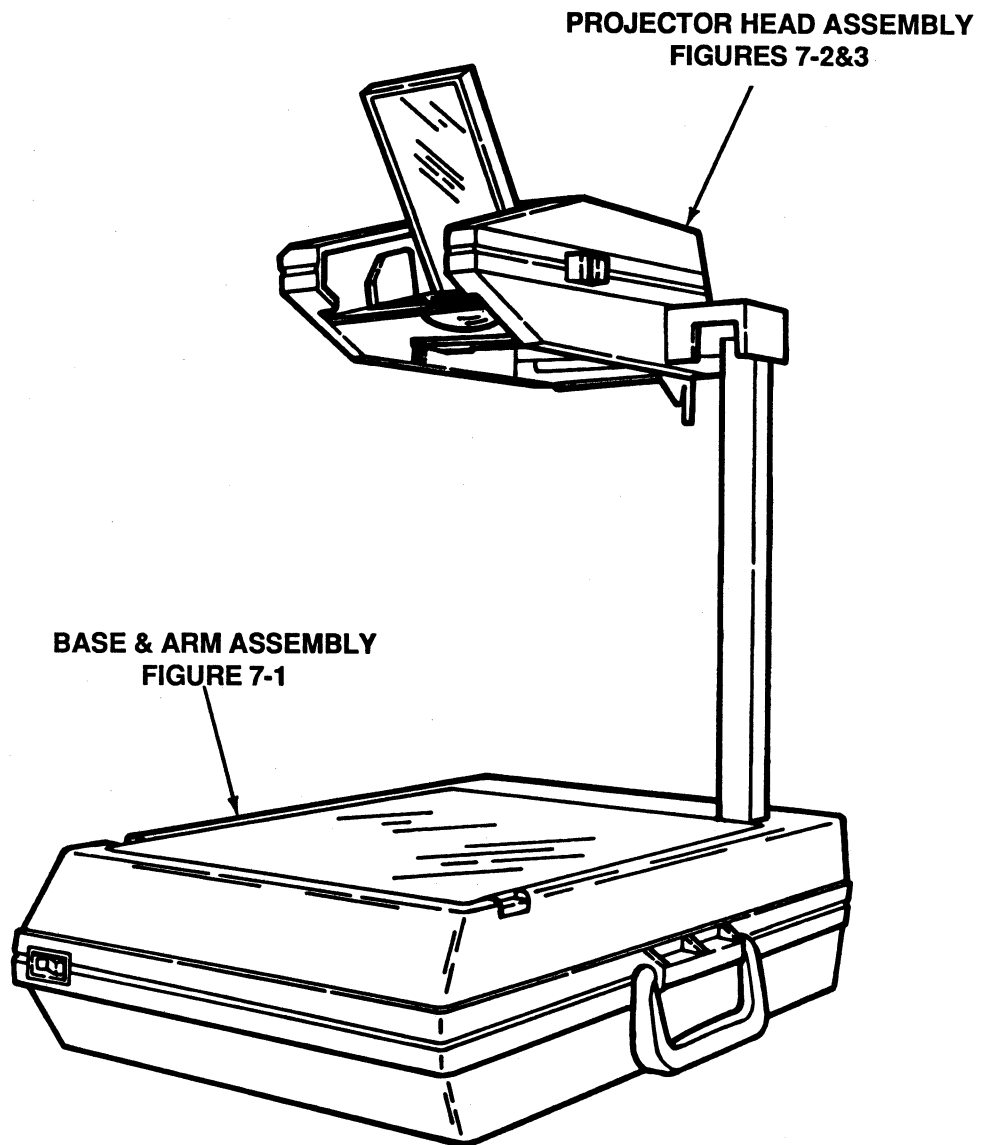


6-8-5 Set the cover over the replacement slate with the release buttons toward you. Replace and tighten the four Screws.



NOTE: The cover is meant to remain loose to allow the slate to "Float".

SECTION 7 - ILLUSTRATED PARTS BREAKDOWN



NOTE: FOR ELECTRICAL WIRING AND COMPONENTS SEE ELECTRICAL SECTION #5.

FIGURE 7-1 BASE AND ARM ASSEMBLY

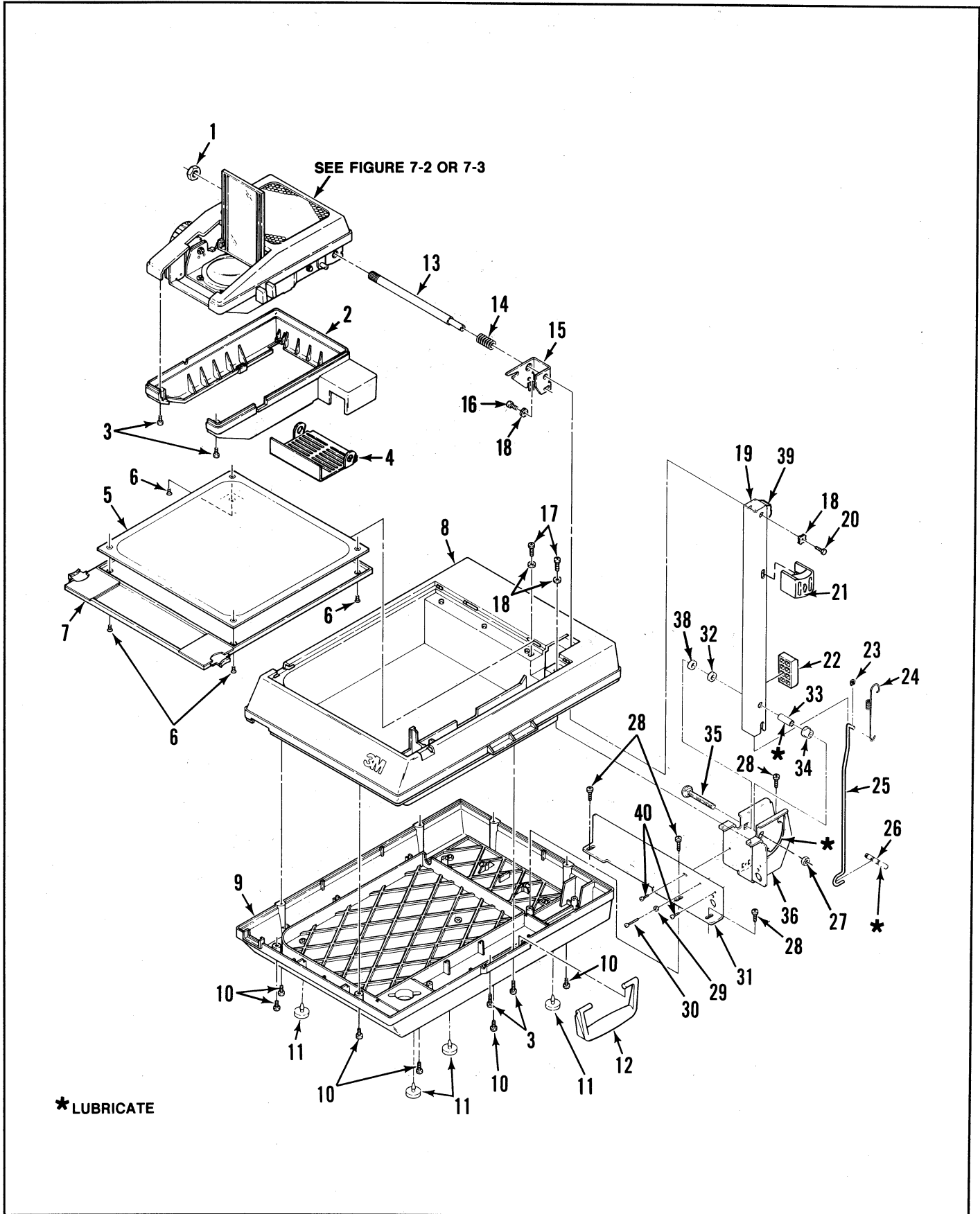


FIGURE 7-1 BASE AND ARM ASSEMBLY

| Item Number | Part Number | Description |
|-------------|----------------|---------------------------------------|
| 1 | 26-1006-5050-1 | NUT, Hex, Jam 1/2-13CS |
| 2 | 78-8057-4275-2 | COVER, Head bottom |
| 3 | 26-1007-5427-9 | SCREW, 6-19 x 3/8, Self tap |
| 4 | 78-8057-4036-8 | ACCESS DOOR ASSEMBLY |
| 5 | 78-8014-7442-6 | FRESNEL LENS (10 1/2 x 101/2) |
| | 78-8014-6798-2 | FRESNEL LENS (10 1/2 x 101/2) Triplet |
| | 78-8014-7443-4 | FRESNEL LENS A4(11.2 x 11.2) |
| | 78-8014-6799-0 | FRESNEL LENS A4(11.2 x 11.2) Triplet |
| 6 | 78-8014-7264-4 | SCREW, Fresnel lens |
| 7 | 78-8057-4282-8 | FRESNEL LENS HOLDER ASSEMBLY |
| 8 | 78-8057-4269-5 | BASE, Top |
| 9 | 78-8057-4280-2 | BASE ASSEMBLY |
| 10 | 26-1002-4971-8 | SCREW, 6-19 x 1/2, Plastite |
| 11 | 78-8054-1001-2 | FOOT |
| 12 | 26-1005-7653-2 | HANDLE |
| 13 | 78-8057-4040-0 | SHAFT, Head |
| 14 | 26-7994-4487-7 | SPRING, Head |
| 15 | 78-8057-4045-9 | BRACKET, Head lock |
| 16 | 26-1002-5092-2 | SCREW, 6-20 x 1/4, SEMS |
| 17 | 26-1002-5098-9 | SCREW, Thd form, 8-32 x 3/8 |
| 18 | 26-1004-1140-9 | WASHER, Dish, No. 8, shake proof |
| 19 | 78-8057-4041-8 | POST |
| 20 | 26-1005-8686-1 | SCREW, Mach 8-32 x 1/2 lg |
| 21 | 78-8062-1058-5 | KNOB, Slide, Post |
| 22 | 78-8057-4270-3 | PLATE, Post |
| 23 | 78-8656-5801-3 | RING, Retaining |
| 24 | 78-8062-1062-7 | SPRING, Post |
| 25 | 78-8057-4044-2 | WIRE FORM, Post |
| 26 | 78-8057-4043-4 | ROLLER, Post |
| 27 | 26-1005-8532-7 | NUT, Nylon, 5/16-18 |
| 28 | 26-1004-1139-1 | SCREW, Thread forming, 8-16 |
| 29 | 26-1005-7751-4 | NUT, 8-32, Regular hex |
| 30 | 26-1002-5063-3 | SCREW, 8-32 x 7/8, Taptite |
| 31 | 78-8057-4050-9 | BRACKET, Post tie |
| 32 | 78-8163-0108-5 | BEARING, Olite |
| 33 | 26-1005-4419-1 | BEARING, Olite |
| 34 | 78-8000-7134-8 | BEARING, Olite |
| 35 | 26-1000-0031-9 | BOLT, Carriage, 5/16 x 2 1/4 |
| 36 | 78-8057-4129-1 | BRACKET, Post Pivot |
| 37 | 78-8057-4189-5 | BRACKET, Post Pivot |
| 38 | 26-1006-1433-3 | WASHER, .437 I.D. |
| 39 | 70-0701-8296-3 | BUMPER, Black |
| 40 | 26-1008-3328-9 | WASHER, Plain |

3M 2000 OVERHEAD PROJECTOR

FIGURE 7-2 HEAD ASSEMBLY (FOR EVW LAMP MODELS)

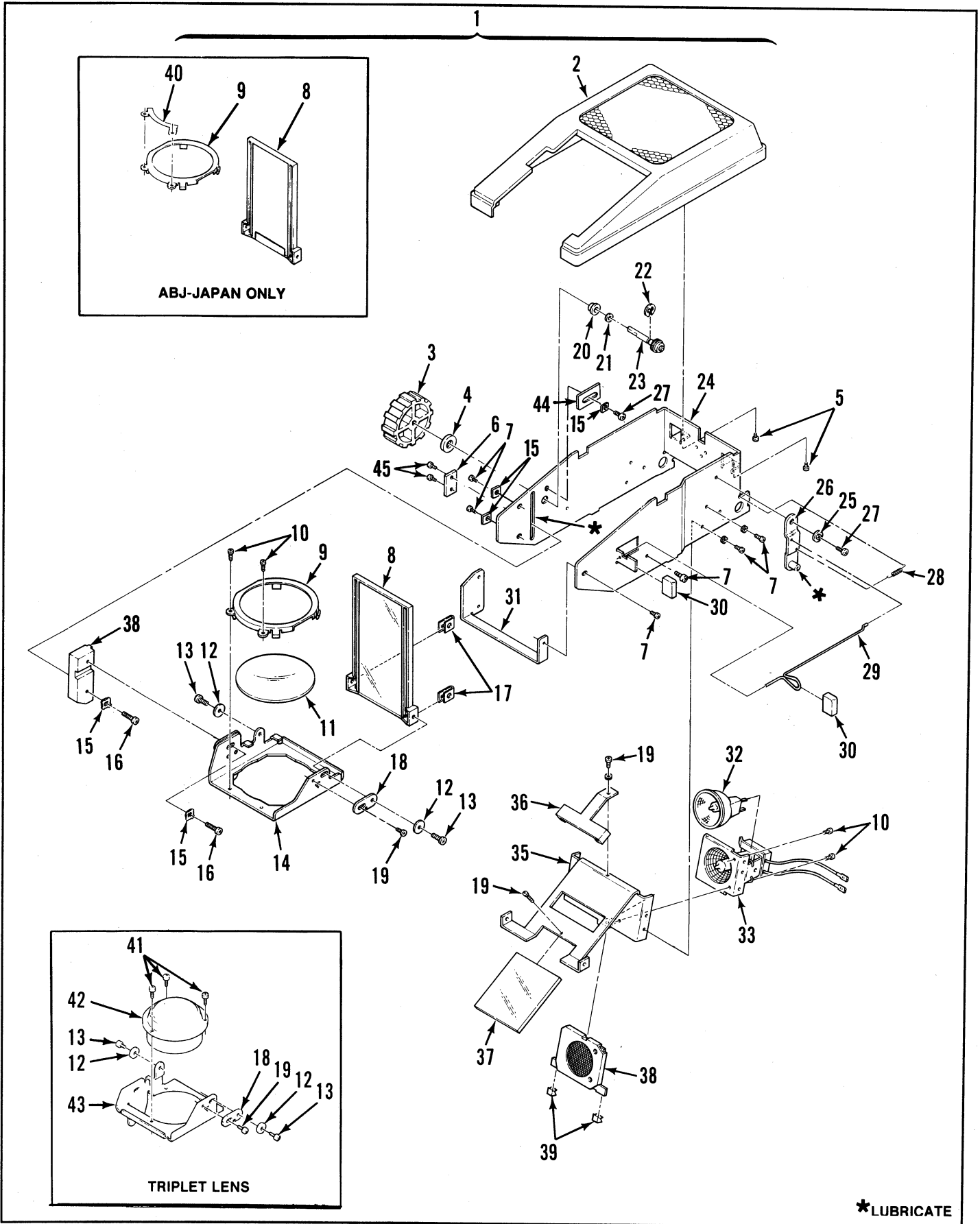


FIGURE 7-2 HEAD ASSEMBLY (FOR EVW LAMP MODELS)

| Item Number | Part Number | Description |
|-------------|----------------|---|
| 1 | 78-8057-4287-7 | COMPLETE HEAD ASSEMBLY (EVW, Singlet) |
| | 78-8057-4288-5 | COMPLETE HEAD ASSEMBLY (Japan-ABJ, Singlet) |
| | 78-8057-4278-6 | COMPLETE HEAD ASSEMBLY (EVW - Triplet) |
| 2 | 78-8057-4285-1 | TOP SHROUD ASSEMBLY (EVW, singlet) |
| | 78-8057-4271-1 | TOP SHROUD ASSEMBLY (EVW, triplet) |
| 3 | 78-8057-4137-4 | KNOB, Focus |
| 4 | 78-8003-9177-9 | BEARING, Olite |
| 5 | 26-1002-4969-2 | SCREW, 2-19 x 3/8, Self tap |
| 6 | 78-8057-4053-3 | SLIDE, Focus rack |
| 7 | 26-1002-5092-2 | SCREW, 6-32 x 3/8, Self tap |
| 8 | 78-8057-4231-5 | MIRROR HOUSING ASSEMBLY |
| | 78-8057-4226-5 | MIRROR HOUSING ASSEMBLY (Japan-ABJ) |
| 9 | 78-8014-7477-2 | RETAINER, Lens |
| 10 | 26-1004-0997-3 | SCREW, 4-4 x 5/16, TT Pan head |
| 11 | 78-8014-8951-5 | SINGLET LENS (293mm) |
| 12 | 26-1004-0460-2 | WASHER, Nylon .172 I.D. |
| 13 | 26-1005-9570-6 | SCREW, 8-32 x 7/16, Pan head |
| 14 | 78-8057-4160-6 | LENS HOLDER (singlet) |
| 15 | 26-1004-1140-9 | WASHER, Dish, no. 8 shakeproof |
| 16 | 26-1004-1139-1 | SCREW, 8-16. Thread forming |
| 17 | 78-8003-9762-8 | CLIP, Tinnerman |
| 18 | 78-8052-8132-2 | CLIP, Mirror adjust |
| 19 | 26-1002-5091-4 | SCREW, 6-32 x 1/4, |
| 20 | 78-8003-7798-4 | BEARING, Plain flanged |
| 21 | 78-8659-3873-8 | WASHER, U Bend .257 I.D. |
| 22 | 78-8656-4002-9 | RING, Retaining |
| 23 | 78-8057-4093-9 | FOCUS ADJUST SHAFT |
| 24 | 78-8057-4049-1 | BRACKET, HEAD |
| 25 | 78-8014-7453-3 | BUSHING |
| 26 | 78-8057-4046-7 | ARM, Head lock |
| 27 | 26-1002-5098-9 | SCREW, 8-32 x 3/8, Thread forming |
| 28 | 78-8014-7485-5 | SPRING |
| 29 | 78-8057-4047-5 | WIRE FORM, Head lock |
| 30 | 78-8014-6947-5 | BUTTON RELEASE |
| 31 | 78-8057-4052-5 | BRACKET, Tie head |
| 32 | 78-8014-6796-6 | LAMP (EVW) |
| 33 | 78-8057-4081-4 | LAMP HOLDER, Rim mount |
| 34 | 78-8057-4051-7 | FOCUS RACK |
| 35 | 78-8057-4054-1 | BRACKET, Lamp |
| 36 | 78-8014-6804-8 | HOLDER, Mirror |
| 37 | 78-8014-6899-8 | IMAGE MIRROR ASSEMBLY |
| 38 | 78-8044-6933-2 | LAMP SHIELD ASSEMBLY |
| 39 | 26-1007-5430-3 | CLIP, No. 6 speed nut |
| 40 | 78-8057-4164-8 | SHIELD, Lens retainer (Japan-ABJ) |
| 41 | 26-1002-5085-6 | SCREW, 4-40 x 1/4 TT pan |
| 42 | 78-8014-8916-8 | TRIPLET LENS, 317mm |
| 43 | 78-8057-4182-0 | LENS HOLDER ASSEMBLY |
| 44 | 78-8057-4118-4 | SLIDE RACK |
| 45 | 78-1007-5427-9 | SCREW, Thd form 6-19 x 3/8 lg, Pan Hd Phil |

FIGURE 7-3 HEAD ASSEMBLY (FOR FSX/FSY LAMP MODELS)

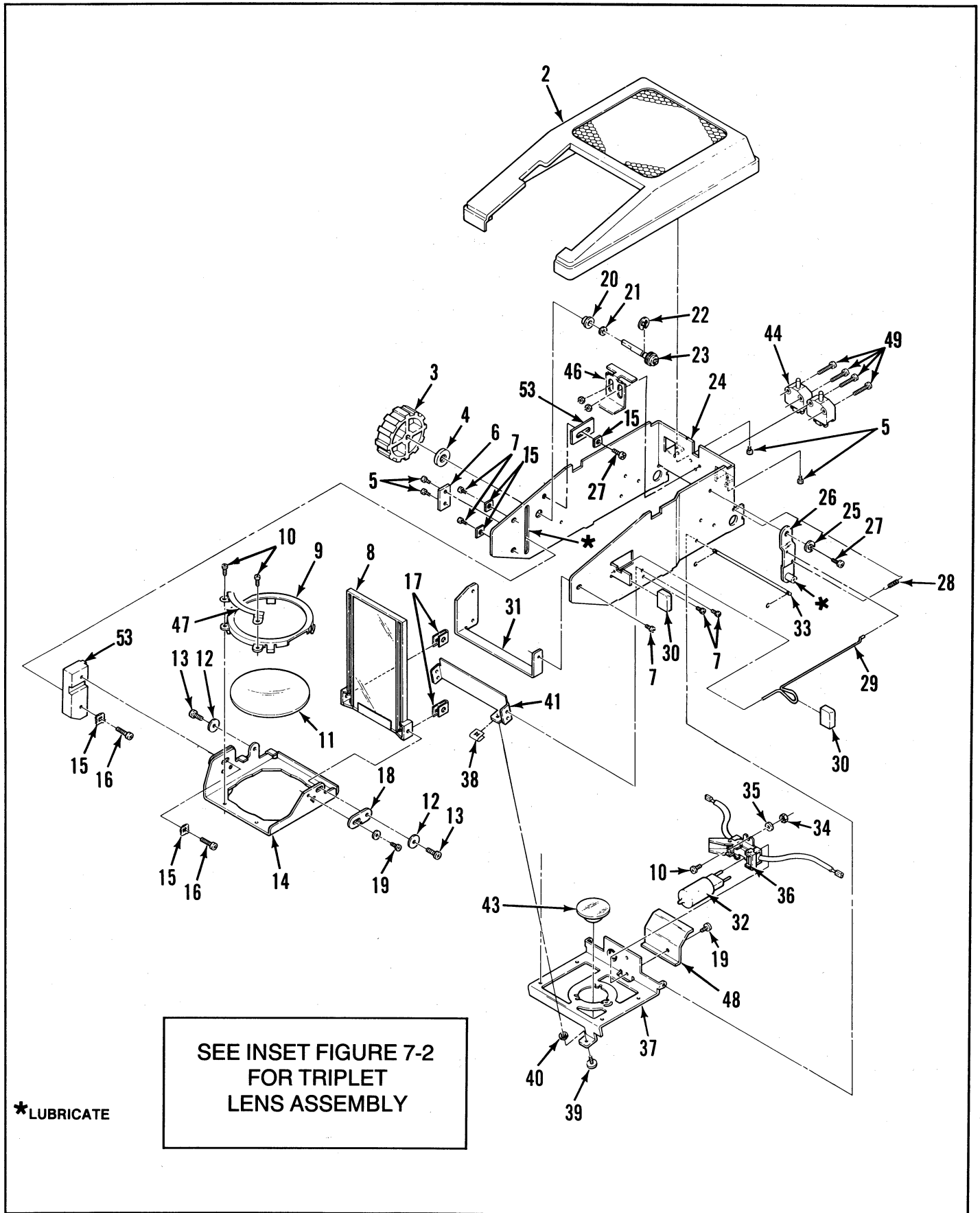


FIGURE 7-3 HEAD ASSEMBLY (FOR FSX/FSY LAMP MODELS)

| Item Number | Part Number | Description |
|-------------|----------------|--|
| 1 | 78-8057-4290-1 | COMPLETE HEAD ASSEMBLY European, Singlet) |
| | 78-8057-4291-9 | COMPLETE HEAD ASSEMBLY(Australia, Singlet) |
| | 78-8057-4281-0 | COMPLETE HEAD ASSEMBLY(Australia, Triplet) |
| 2 | 78-8057-4279-4 | COMPLETE HEAD ASSEMBLY(European, Triplet) |
| | 78-8057-4286-9 | TOP SHROUD ASSEMBLY (European, Singlet) |
| | 78-8057-4277-8 | TOP SHROUD ASSEMBLY (European, triplet) |
| 3 | 78-8057-4137-4 | KNOB, Focus |
| 4 | 78-8003-9177-9 | BEARING, Olite |
| 5 | 26-1002-4969-2 | SCREW, 2-19 x 3/8, Self tap |
| 6 | 78-8057-4053-3 | SLIDE, Focus rack |
| 7 | 26-1002-5092-2 | SCREW, 6-32 x 3/8, Self tap |
| 8 | 78-8057-4226-5 | MIRROR HOUSING ASSEMBLY |
| 9 | 78-8014-7477-2 | RETAINER, Lens |
| 10 | 26-1004-0997-3 | SCREW, 4-4- x 5/16, TT Pan head |
| 11 | 78-8014-8951-5 | SINGLET LENS (293mm) |
| 12 | 26-1004-0460-2 | WASHER, Nylon, .172 I.D. |
| 13 | 26-1005-9570-6 | SCREW, 8-32, x 7/16 Pan head |
| 14 | 78-8057-4160-6 | LENS HOLDER ASSEMBLY |
| 15 | 26-1004-1140-9 | WASHER, Dish, No. 8 shakeproof |
| 16 | 26-1004-1139-1 | SCREW, 8-16, Thread forming |
| 17 | 78-8003-9762-8 | CLIP, Tinnerman |
| 18 | 78-8052-8132-2 | CLIP, Mirror adjust |
| 19 | 26-1002-5091-4 | SCREW, 6-32 x 1/4, SEMS |
| 20 | 78-8003-7798-4 | BEARING, Plain flanged |
| 21 | 78-8659-3873-8 | WASHER, U Bend, .257 I.D. |
| 22 | 78-8005-0558-4 | RING, Retaining |
| 23 | 78-8057-4093-9 | FOCUS ADJUST SHAFT |
| 24 | 78-8057-4049-1 | BRACKET, Head |
| 25 | 78-8014-7453-3 | BUSHING |
| 26 | 78-8057-4046-7 | ARM, Head lock |
| 27 | 26-1002-5098-9 | SCREW, 8-32 x 3/8, Thread forming |
| 28 | 78-8014-7485-5 | SPRING |
| 29 | 78-8057-4047-5 | WIRE FORM, Head lock |
| 30 | 78-8014-6947-5 | BUTTON RELEASE |
| 31 | 78-8057-4052-5 | BRACKET, Tie head |
| 32 | 78-8057-4162-2 | LAMP, Projector 230V, 400W (FSX) |
| | 78-8057-4163-0 | LAMP, Projector 240V, 400W (FSY) |
| | 78-8057-4021-0 | LAMP, Projector 240V, 500W (FPG) (Jan, 90 - Australia) |
| 33 | 78-8057-4056-6 | SHAFT, Lamp holder |
| 34 | 26-1003-4029-3 | NUT, 4-40, KEPS |
| 35 | 12-7991-1735-8 | WASHER, Plain, no. 4 |
| 36 | 78-8057-4237-2 | SOCKET, Lamp |
| 37 | 78-8057-4225-7 | BRACKET ASSY, Lamp (Includes screen) |
| 38 | 26-1007-5430-3 | CLIP, No. 6, speed nut |
| 39 | 78-8057-4091-3 | SCREW, Access |
| 40 | 78-8003-8593-8 | RING, Retaining - TRUARC |
| 41 | 78-8057-4094-7 | BRACKET, Tie |
| 42 | 26-1006-0998-6 | SCREW, Thd Form, 6-32 x 7/8 lg, Pan Hd Phil |
| 43 | 78-8012-7827-2 | LENS, Condenser |
| 44 | 78-8057-4102-8 | SWITCH, Access door interlock |
| 45 | 78-8057-4113-5 | SCREW, 6-32 x 7/8, Self tap |

3M 2000 OVERHEAD PROJECTOR**FIGURE 7-3 HEAD ASSEMBLY (FOR FSX/FSY LAMP MODELS)**

| Item Number | Part Number | Description |
|--------------------|--------------------|--------------------------------------|
| 46 | 78-8057-4111-9 | ACTUATOR, Interlock switch |
| 47 | 78-8057-4164-8 | SHIELD, Lens retainer |
| 48 | 78-8057-4171-3 | LEVER-ACTUATOR |
| | 78-8057-4264-6 | LABEL, Lamp replacement (not shown) |
| 49 | 78-8658-4004-5 | E-RING, Retaining |
| 50 | 18-9851-0616-2 | WASHER, Lock #6 (Australian version) |
| 51 | 26-1007-5427-9 | SCREW, Thd Form, 6-19 x 3/8 Pan Hd |
| 52 | 78-8057-4051-7 | RACK, Focus |
| 53 | 78-8057-4118-4 | SLIDE RACK |