

TM 8-6540-002-14&P

TECHNICAL MANUAL

**UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
MAINTENANCE MANUAL**

**(INCLUDING REPAIR PARTS AND
SPECIAL TOOLS LIST)**

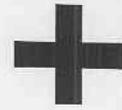
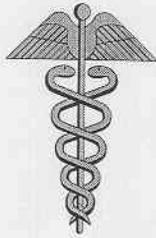
**LIGHT, SLIT, OPHTHALMIC
MODEL SL-6E**

6540-01-241-6965

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HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1999



SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

Do not try to pull or grab the individual.

If possible, turn off the electrical power.

If you cannot turn off the electrical power, pull, push, or lift the person to safety using a dry wooden pole or a dry rope, or some other insulating material.

Send for help as soon as possible.

After the injured person is free of contact with the source of electrical shock, move the person a short distance away and immediately start artificial resuscitation.

Throughout this manual are **WARNINGS**, **CAUTIONS**, and **NOTES**. Please take time to read these. They are there to protect you and the equipment.

WARNING

Procedures which must be observed to avoid personal injury, and even loss of life.

CAUTION

Procedures which must be observed to avoid damage to equipment, destruction of equipment, or long-term health hazards.

NOTE

Essential information that should be remembered.

ELECTRICAL AND ELECTRONIC HAZARDS

- » Severe injury or death can result when any part of your body comes in contact with live electrical circuits. Medical Equipment Repairers must be especially alert to the dangers of exposed circuits, terminals, power panels, and the like.

- » The electrical parameter that injures and kills is **CURRENT**; the force that caused current to flow is called **VOLTAGE**. Voltage ratings are normally assigned to live electrical circuits, power supplies, and transmission lines. You should consider all voltages of 30 or more to be hazardous.

- » The physiological effect of current flowing through the human body is related to the following factors:
 - The path of the current through the body.
 - The magnitude of the current.
 - The duration of the voltage shock or discharge that causes current flow.
 - The frequency of the voltage if alternating current.
 - The susceptibility of damage to your heart from the current and from repeated shocks.

- » Alternating current tends to concentrate near the body's surface because of the phenomenon of "skin effect." The higher the frequency of the alternating current voltage source, the more likely the current will tend to flow in or near the skin and away from internal body organs.

- » The effect of current becomes more severe with the length of time that it flows through the body; a prolonged current flow can cause severe internal burns, collapse, unconsciousness, or death.

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 WASHINGTON, DC 1 MARCH 1999

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 MAINTENANCE MANUAL
 (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
 LIGHT, SLIT, OPHTHALMIC
 6540-01-241-6965**

You can help improve this manual. If you find any mistakes or if you know a way to improve procedures, please let us know. Mail a memorandum to: U.S. Army Medical Materiel Agency, 1423 Sultan Drive, Suite 100, ATTN: MCMR-MMM, Fort Detrick, MD 21702-5001. A reply will be furnished directly to you.

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HOW TO USE THIS MANUAL

This manual provides all the information needed to understand the capabilities, functions, and characteristics of this equipment. It describes how to set up, operate, test, and repair the equipment. You must familiarize yourself with the entire manual before operating or beginning a maintenance task.

The manual is arranged by chapters, sections, and paragraphs followed by appendixes, a glossary, an index, and DA Forms 2028-2. Use the table of contents to help locate the chapter or section for the general subject area needed. The index will help locate more specific subjects.

Chapter 3 provides a systematic method of inspecting and servicing the equipment. In this way, small defects can be detected early before they become a major problem causing the equipment to fail. Make a habit of doing the checks and services in the same order each time and anything wrong will be detected quickly.

Only perform maintenance functions specified in the maintenance allocation chart for your level of maintenance. Maintenance functions specified for higher levels of maintenance frequently require additional training; test, measurement, and diagnostic equipment; or tools.

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. Overview.

This manual describes the slit lamp (fig 1-1); provides equipment technical data; and provides operational and maintenance functions, services, and actions. Additional information follows:

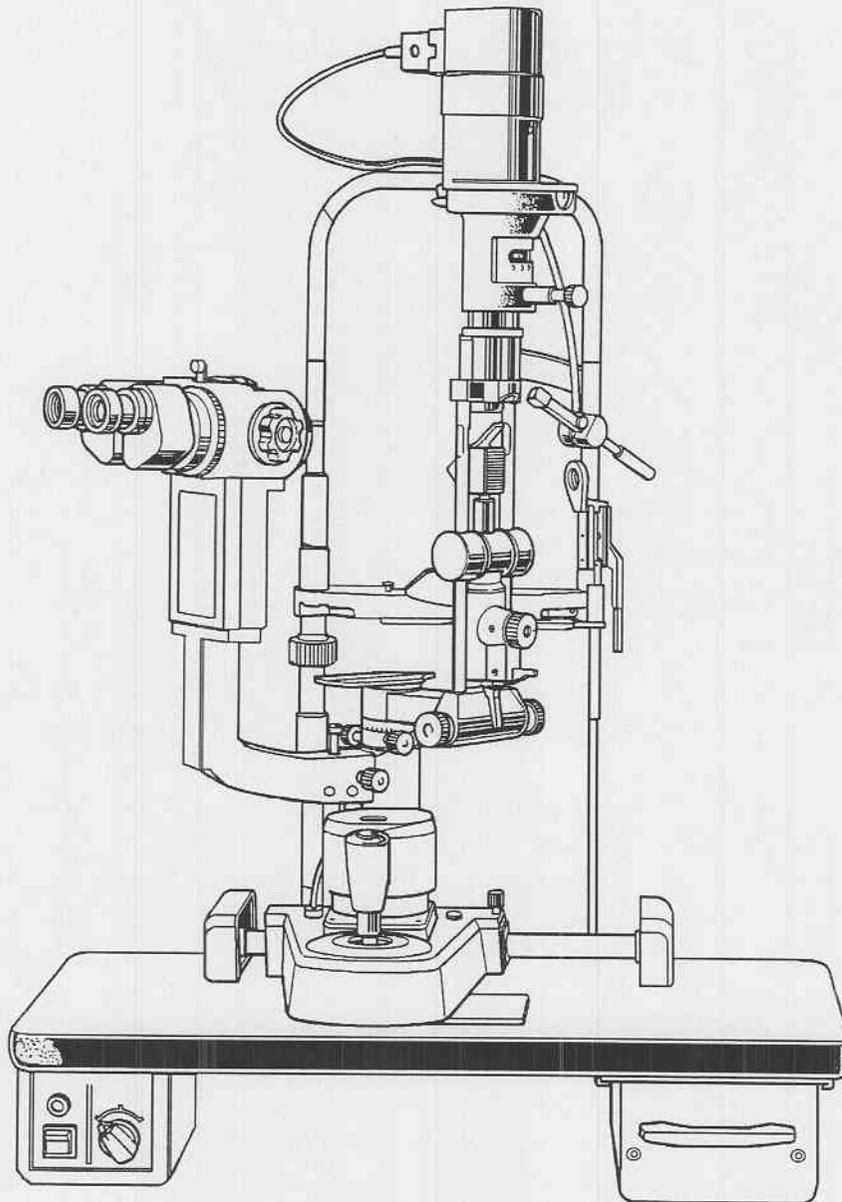


Figure 1-1. Ophthalmic slit light.

a. *Type of manual.* Unit, direct support (DS), and general support (GS) maintenance (including repair parts and special tools list).

b. *Model number and equipment name.* Model number SL-6E, Light, Slit, Ophthalmic.

c. *Purpose of equipment.* To provide a diaphragm controlled, narrow flat beam of intense light projected into an eye for the microscopic study of the conjunctiva, cornea, iris, lens, and vitreous.

1-2. Explanation of abbreviations and terms.

Special or unique abbreviations, acronyms, and terms used in this manual are explained in the glossary.

1-3. Maintenance forms, records, and reports.

TB 38-750-2 prescribes forms, records, reports, and procedures.

1-4. Destruction of Army materiel to prevent enemy use.

AR 40-61 contains instructions for destruction and disposal of Army medical materiel. Also, the SB 8-75 series provides periodic information and/or instructions on the destruction of medical materiel.

1-5. Administrative storage.

a. Place the slit lamp in administrative storage for only short periods of time when a shortage of maintenance effort exists. This equipment should be in mission readiness condition within 24 hours or within the time factors determined by the directing authority. During the storage period, keep appropriate maintenance records.

b. Perform preventive maintenance checks and services (PMCS) listed in tables 3-1 and 3-2 before placing Army equipment in administrative storage. When equipment is removed from storage, perform PMCS to ensure its operational readiness.

c. Inside storage is preferred for equipment selected for administrative storage.

1-6. Preparation for storage or shipment.

Procedures to prepare the slit lamp for storing or shipping are listed in chapter 3, section VII.

1-7. Quality control (QC).

TB 740-10/DLAM 4155.5/AFR 67-43 contains QC requirements and procedures.

1-8. Nomenclature cross-reference list.

Table 1-1 identifies official versus commonly used nomenclatures.

Table 1-1. Nomenclature cross-reference list.

<i>Common name</i>	<i>Official nomenclature</i>
Slit lamp	Light, slit, ophthalmic
Instrument stand	Mobile, instrument stand/instrument table
Brightness control dial	Illumination control switch
Joystick	Control lever
Slit centering knob	Slit centering control
Pilot lamp	Pilot light

1-9. Reporting and processing medical materiel complaints and/or quality improvement reports.

AR 40-61 prescribes procedures for submitting medical materiel complaints and/or quality improvement reports for the slit lamp.

1-10. Warranty information.

A warranty is not applicable.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-11. Equipment characteristics, capabilities, and features.

- a. The slit lamp (fig 1-1) provides five steps of magnification without changing the eyepiece and convergent binocular tubes for stereoscopic observation.
- b. A mobile instrument stand is provided to hold the slit lamp. The stand height is adjustable.
- c. The slit lamp operates from multiple voltages and frequencies.
- d. A built in power supply provides for switch selection of both input and output voltages.
- e. The slit lamp includes a reuseable case.

1-12. Component and accessory descriptions.

a. Major components.

(1) *Instrument stand.* The manually adjusted instrument stand provides a sturdy and stable support and incorporates four large rubber casters for smooth movement. Two casters have locks to prevent movement during patient diagnostic procedures. The instrument stand also incorporates an electrical outlet for the slit lamp.

(2) *Case.* The molded case holds the slit lamp, instrument stand, and all components and accessories for safe storage and unit movements.

(3) *Slit lamp.* Components of the slit lamp are provided in figure 1-2.

b. Accessories.

- (1) Long mirror, 1 each
- (2) Power cord, 1 each
- (3) Slit illumination lamps, 2 each
- (4) Test rods, 1 each
- (5) Chin rest pads, 1 pack
- (6) Fuse (spare), 1 each
- (7) Vinyl dust cover, 1 each
- (8) Cleaning brush, 1 each
- (9) Screwdrivers, 2 each
- (10) Spanner wrench, 1 each

1-13. Tabulated data, decals, and data plates.

The tabulated data provides miscellaneous characteristics, specifications, and other information for the slit lamp.

a. Miscellaneous characteristics and specifications. Tables 1-2 through 1-9 provide a broad range of miscellaneous characteristics and specifications for the microscope, slit illumination system, fixation targets, base, power unit, standard accessories, and dimensions and weight.

Table 1-2. Microscope characteristics.

Objective	f = 106.6 mm
Working distance	100.2 mm
Magnification changing system	Revolving drum, with 5 magnification changes
Total magnifications and field of view	6 X (33 mm \emptyset), 10 X (22.5 mm \emptyset), 16 X (14 mm \emptyset), 25 X (8.8 mm \emptyset) and 40 X (5.5 mm \emptyset)
Interpupillary distances	55 mm to 75 mm
Diopter adjustments.....	+3 D to -5 D

Table 1-3. Slit illumination system characteristics.

Projection magnification	2/3 X
Illuminated field	
Slit width	Continuously variable from 0 to 9 mm (field of view is round at 9 mm)
Slit length	Continuously variable from 1 mm to 8 mm
Aperture diameters	7 stops, 9, 8, 5, 3, 2, 1 and 0.2 mm \emptyset
Filters (4)	Blue, red-free, 13% neutral density, and heat absorbing filters built in
Lamp.....	6 V, 27 W, pre-centered tungsten filament lamp; brightness adjustable in 3 stages

Table 1-4. Fixation targets characteristics.

Annular type	Adjustable from -15 D to +10 D
Luminous type	Interchangeable with annular target
Lamp	6 V, 0.2 A

Table 1-5. Base characteristics.

Longitudinal movement	80 mm
Lateral movement	100 mm
Fine cross-slide adjustments	12 mm in both longitudinal and lateral directions
Vertical movement	30 mm
Chin-rest vertical range	80 mm

Table 1-6. Power unit characteristics.

Primary	100 VAC, 50/60 Hz or 120 VAC, 50/60 Hz or 220 VAC, 50/60 Hz or 240 VAC, 50/60 Hz
Secondary	4.5 VAC, 50/60 Hz or 6.3 VAC, 50/60 Hz or 7.5 VAC, 50/60 Hz
Power consumption	45 VAC

Table 1-7. Standard accessories characteristics.

Hruby lens	-58.7 D, for examinations of the vitreous body and fundus
Hruby lens guide plate	Also doubles as mount for Goldmann Applanation Tonometer

Table 1-8. Dimensions and weight characteristics.

Table surface	560 mm x 350 mm
Height from table surface	740 mm
Weight (body)	21 kg

Table 1-9. Specifications.

Microscope type	Galileo-type direct viewing binocular/stereoscopic microscope with erect image
Eyepieces	12.5 X
Slit angles	Consecutively variable from vertical to horizontal Horizontal scanning through 180° from 0° Slit projection inclination to 5°, 10°, 15°, and 20°
Electrical power	
Input	100 VAC, 120 VAC, 220 VAC, and 240 VAC, 50/60 Hz
Output	4.5 VAC, 6.3 VAC, and 7.5 VAC, 50/60 Hz

b. Identification, instruction, and warning plates, decals, or markings.

(1) The slit lamp manufacturer data plate (located on the right side of the base assembly) is depicted in figure 1-3.

(2) A decal (located on the back of the mobile instrument stand) is depicted in figure 1-4.

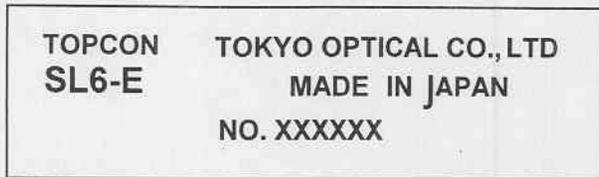


Figure 1-3. Slit lamp manufacturer data plate.

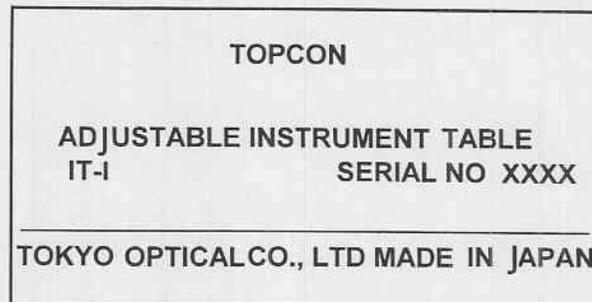


Figure 1-4. Instrument stand data plate.

(3) A manufacturer data plate (riveted to the bottom of the case) is depicted in figure 1-5.

(4) Caution labels (located on the top front and back of the case) are depicted in figure 1-6.

(5) An orientation decal (located on the front of the upper and lower sections of the case) is depicted in figure 1-7.

(6) An instructional decal (located near the pressure relief button) is depicted in figure 1-8.

1-14. Model differences.

Model differences are not applicable since this manual covers a single model.

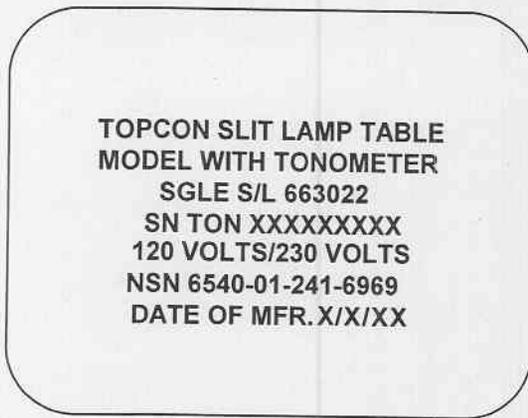


Figure 1-5. Manufacturer case data plate.



Figure 1-6. Caution label.



Figure 1-7. Orientation decal.

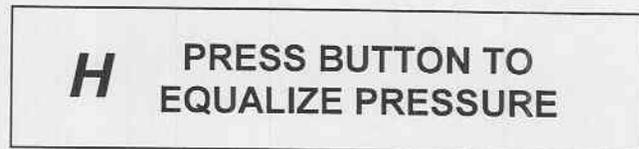


Figure 1-8. Instruction decal.

1-15. Safety, care, and handling.

a. Observe each WARNING, CAUTION, and NOTE in this manual.

b. Read the operating instructions in this manual before operating the unit. The slit lamp is intended for use by qualified medical personnel only. Refer servicing to qualified Medical Equipment Repairer personnel.

c. Verify that the input voltage selector switch (fig 1-9) matches the wall receptacle voltage.

d. Always turn the electrical power switch (fig 1-9) to off when connecting the electrical power cable of the slit lamp to the electrical wall receptacle.

e. DO NOT touch the surfaces of lenses and mirrors with your fingers or a hard object.

f. DO NOT switch the slit lamp on and off unnecessarily.

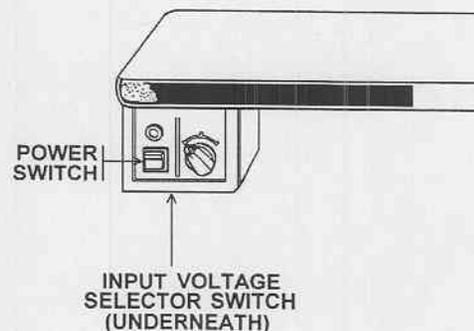


Figure 1-9. Power switches.

- g. DO NOT leave the slit lamp in a location which is too dusty, too humid, or exposed to direct sunlight.
- h. Always keep the slit lamp covered with the vinyl dust cover when not in use.

Section III. PRINCIPLES OF OPERATION

1-16. Basic operation.

a. The slit lamp consists of a specialized stereoscopic microscope, an illumination unit, and eyepiece unit to visualize the interior of an eye. The unit combines optical, light, and precision mechanical principles to provide ophthalmic patient care.

b. The slit lamp, when fitted with optional components or accessories, can provide a wider range of patient care.

1-17. Optical diagram.

The optical arrangement of the slit lamp is depicted in figure 1-10.

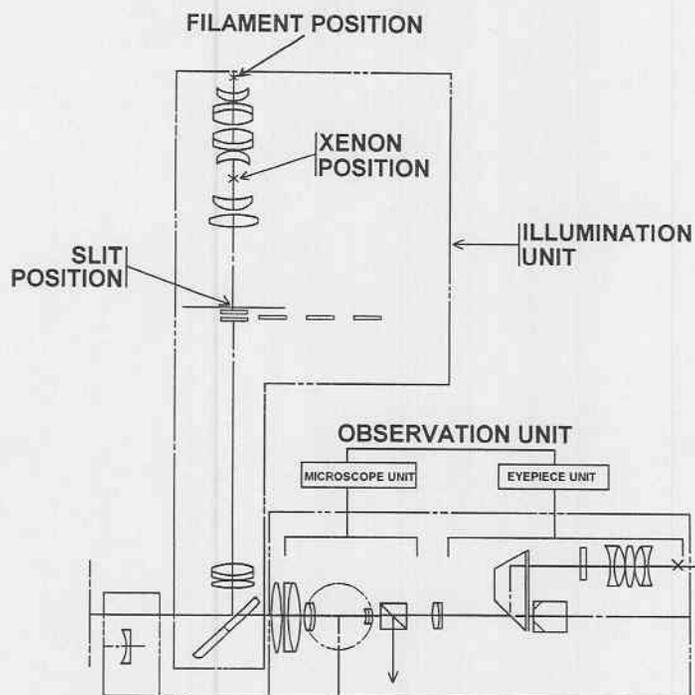


Figure 1-10. Optical arrangement.

CHAPTER 2

OPERATING INFORMATION AND INSTRUCTIONS

Section I. PREPARATION FOR OPERATION

2-1. Scope.

This manual is primarily intended to provide information, instructions, and procedures for the maintenance of the slit lamp. The operating information and instructions, while valid, do not provide sufficient information for use of the slit lamp on a patient. Only qualified medical personnel are trained in ophthalmic diagnostic procedures.

2-2. Service upon receipt of equipment.

a. Unpacking the slit lamp.

- (1) Depress the pressure release valve button of the case.
- (2) Open the latches and remove the top section of the case. Set it aside.
- (3) Remove the mobile instrument stand.
- (4) Install the two legs with casters to the base of the instrument stand.
- (5) Install the instrument stand working surface.
- (6) Remove the styrofoam box containing the slit lamp body and accessories from the case.
- (7) Remove the slit lamp body and set it on the instrument stand. Remove the components and accessories from their cutouts. Set the styrofoam box aside.
- (8) Verify receipt of the following items:
 - (a) Instrument stand with power unit and accessory drawer, 1 each
 - (b) Convergent binocular tubes, 1 each
 - (c) Base section, 1 each
 - (d) Illumination section and lamps, 1 each
 - (e) Chin rest and head rest section, 1 each
 - (f) Rail cover, 1 pair
 - (g) Hruby lens guide plate, 1 each
 - (h) Long mirror, 1 each
 - (i) Hruby lens, 1 each
 - (j) Power cord, 1 each
 - (k) Slit illumination lamp (spare), 2 each
 - (l) Test rods, 1 each
 - (m) Chin rest pads, 1 pack
 - (n) Luminous fixation target, 1 each
 - (o) Short mirror, 1 each
 - (p) Fuse (spare), 1 each
 - (q) Vinyl dust cover, 1 each
 - (r) Cleaning brush, 1 each
 - (s) Instruction manual, 1 each

- (t) Screwdrivers, 2 each
- (u) Spanner wrench, 1 each

b. Assembling the slit lamp.

- (1) Fasten the base of the slit lamp onto the mobile instrument stand using the four metric 8 x 20 mm mounting bolts and spring washers. You may have to elevate the instrument stand to install the bolts.
- (2) Remove the four screws fastening the chin rest attachment plate to the underside of the instrument stand. Set the screws aside.
- (3) Insert the electrical power cable in the space between the underside of the table and the chin rest attachment plate. Then replace the four screws to fasten it.
- (4) Connect the cords by the chin rest section and the electrical power cord to the power supply.
- (5) Determine if the connector on the electrical power cable matches the configuration of the electrical power outlet. If not, replace it with the correct connector.
- (6) Set the input voltage selector on the power supply to coincide with the voltage of the wall receptacle.

(7) Place the base section of the slit lamp onto the top of the table with the outrigger rollers (fig 2-1) aligned on top of the toothed rails. Then, insert the flange of each rail cover between the slight opening which exists between the rail and the surface of the table.

(8) Tighten the base fixing screw by turning it clockwise to prevent the base from moving.

(9) Loosen the microscope arm fixing screw (fig 2-2). Then, rotate the microscope arm 60 or 90 degrees to the right or left from its central position. Next, loosen the set screw that is protruding on the outside of the slit lamp arm on the attachment socket so that it no longer protrudes inside the socket. Finally, lower the slit lamp arm carefully into position while simultaneously aligning the two red dots. When properly aligned, tighten the set screw so the slit lamp arm cannot be detached.

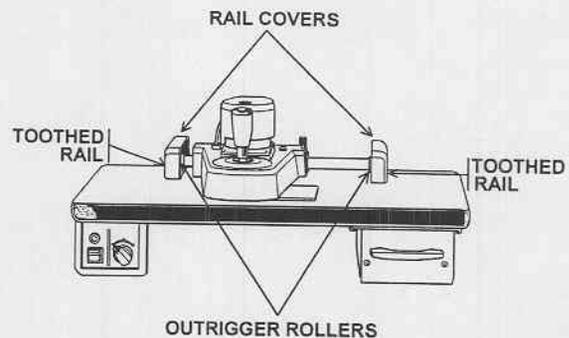


Figure 2-1. Base section.

(10) Push upward on the chin rest from the underside and then pull out the pad fixing pins from both sides of the chin rest holder. Place a suitable quantity of the disposable pads on top of the chin rest. Then, fix the pads in place by inserting the two pad fixing pins through the pad openings.

(11) Place the accessories in the drawer or store the accessories in the box furnished with the slit lamp.

Section II. OPERATING INFORMATION

2-3. Controls and indicators (fig 2-2).

a. Slit length adjustment knob. This mechanical handle rotates to provide 7 aperture changes of 9, 8, 5, 3, 2, 1, and 0.2 mm which is then followed by infinitely variable changes in the slit length from 1 to 8 mm, as indicated on the slit diameter/length scale. There are also click-stops at the 1 to 8 settings in the latter case. Swinging the handle in the horizontal plane will also rotate the slit image consecutively from the vertical to the horizontal in both directions.

b. Height level marker. This mechanical marker is used to indicate the proper height for the patient's eyes as adjusted by raising or lowering the chin rest.

c. Annular fixation target. This mechanical adjustment varies from -15 to +10 diopters to suit the patient's refractive power.

d. Slit centering knob. This knob permits movement of the slit image away from the center of the field of view. It is loosened by counterclockwise rotation.

e. *Inclination unit.* The plate provides for inclination of the slit illumination system up to 20 degrees in 5 degree increments.

f. *Slit width adjusting knob.* This mechanical knob is used to adjust the width of the slit illumination from 0 to 9 millimeters by rotating it in either direction.

g. *Shutter release button.* This mechanical switch is used for releasing the shutter when a camera accessory is used.

h. *Joystick.* This omni-directional control lever allows the base of the slit lamp to be guided freely in fine cross slide adjustment and allows vertical movement.

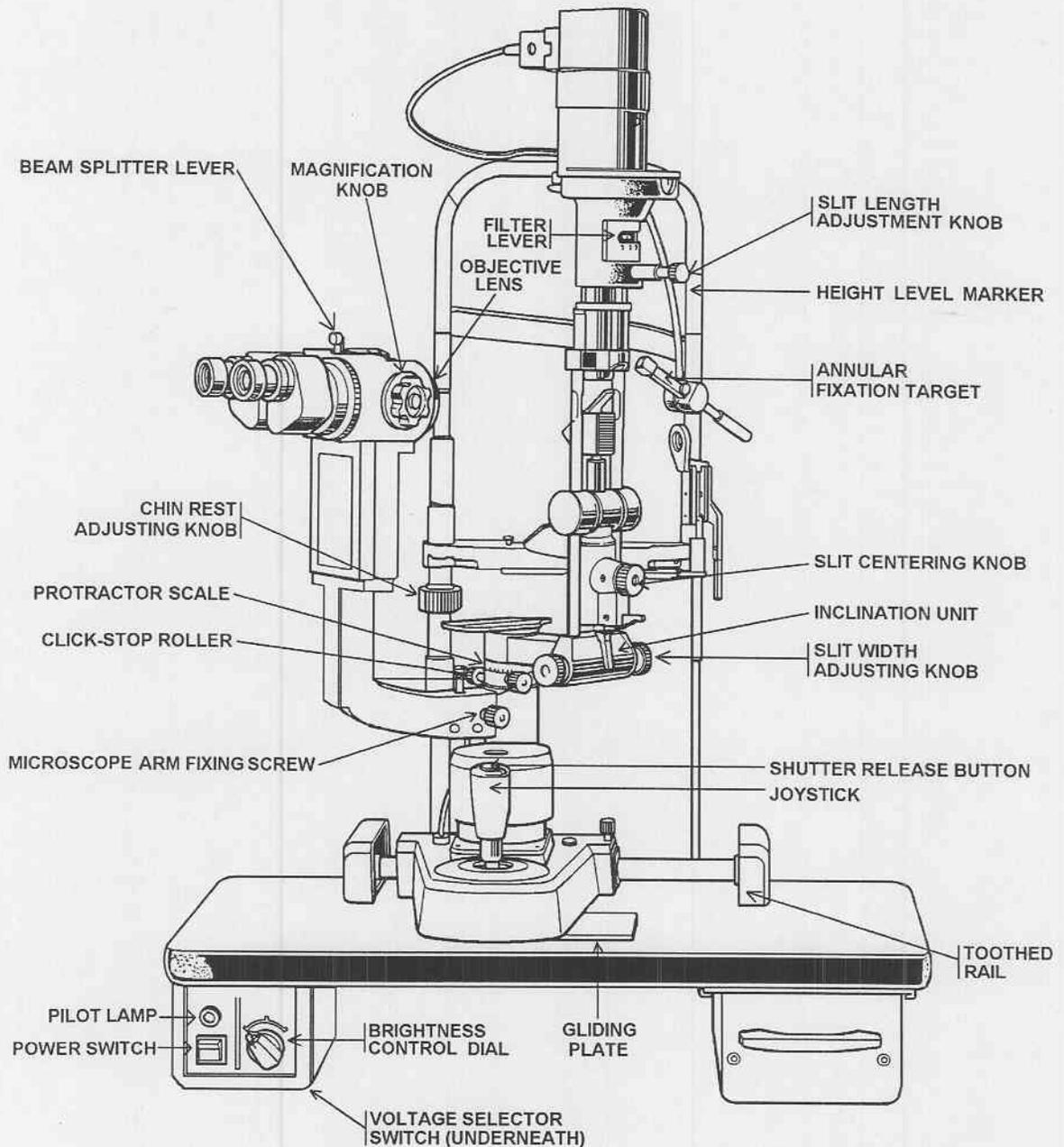


Figure 2-2. Controls and indicators.

i. *Toothed rails.* The toothed rails are provided for movement of the twin rollers of the base to provide longitudinal movement.

j. *Gliding plate.* This plate provides the cross-slide base with free movement in all directions.

k. *Voltage selector switch.* This rotary electrical switch is used to select the input voltage to match the available input voltage source.

l. *Brightness control dial.* This rotary electrical switch is used to control the secondary voltage of the power supply to provide low, medium, and high levels of brightness of the slit image.

m. *Power switch.* This rocker switch is used to provide electrical power to the variable transformer.

n. *Pilot lamp.* The pilot lamp is used to indicate the on or off electrical status of the slit lamp.

o. *Microscope arm fixing screw.* This mechanical knob permits rotation of the microscope arm or the slit lamp arm when loosened and couples the slit lamp arm and microscope arm when tightened.

p. *Click-stop roller.* The click-stop roller indicates when the slit lamp arm is at 0° (central position) or 10° to the right or left of the central position.

q. *Protractor scale.* This scale is used to read the angle between the microscope arm and the slit lamp arm.

r. *Chin rest adjusting knob.* This mechanical knob is used to adjust the height of the chin rest.

s. *Beam splitter lever.* This mechanical lever is normally pulled out and then pushed in for photography.

t. *Magnification knob.* This handle is rotated to select the five magnification levels.

u. *Filter lever.* This mechanical lever is used for the insertion of four filters (heat absorbing, 13 percent neutral density, red-free, and blue) as well as an open aperture at the beginning.

v. *Objective lens.* This lens focuses observed image and aligns it with optical axis.

2-4. Operational components and accessories.

a. *Mobile instrument stand.* The stand is provided for operation of the slit lamp.

b. *Accessory drawer (fig 2-3).* The drawer is provided for the storage of standard accessories.

c. *Power unit (fig 2-3).* The power unit with step-down transformer is provided to use multiple voltages for input power.

d. *Eyepiece lenses.* These 12.5 X lenses are sleeve insert type lenses.

e. *Mirrors.* Short and long reflection mirrors are provided for the slit illumination system. The long mirror can be exchanged with the short mirror when it obstructs the microscope's lines of sight.

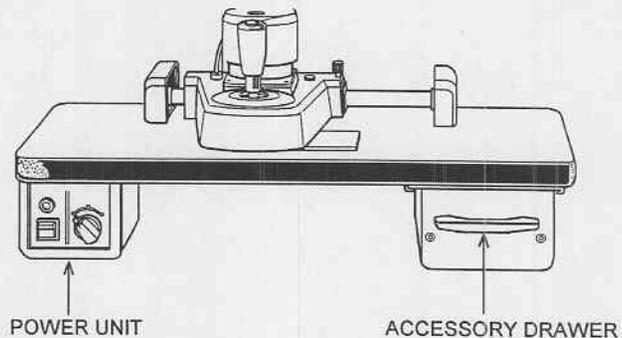


Figure 2-3. Operational components.

2-5. Start-up procedures.

a. Use the slit lamp in a darkened room.

b. Set the rotary input electrical power switch to match the electrical receptacle voltage. Connect the electrical power cable of the slit lamp to the nearest electrical receptacle.

CAUTION

The electrical power cable should not interfere with patient or medical personnel movement.

c. Set the beam splitter lever to its **OUT** position. The **IN** position is for photography.

- d. Insert the test rods into the opening on top of the post around which the microscope arm and slit lamp arm rotate.
- e. Depress the rocker type power switch to turn on the slit lamp.
- f. Check that both the slit illumination lamp and the fixation target lamp are energized.
- g. Project a suitable slit image on the test rod. First, revolve the slit width adjusting knob to adjust the width of the slit and then revolve the milled knob of the slit lamp plate handle around the axis of the handle to change the length of the slit.
- h. Dioptic adjustments.

NOTE

The cross-scales seen in the field of view of one of the eyepieces is used for adjusting the eyepieces to the clinician's eyesight. The cross-scales can be placed in the field of view of either eyepiece, as desired.

(1) Rotate the eyepiece adjusting ring to fully extend the eyepiece lens. The cross-scales should not appear blurred and indistinct.

(2) Slowly turn the eyepiece adjustment ring inward until the cross-scales are clear and distinct. If the eyepiece adjustment ring is turned inward beyond the point of clear focus, fully extend the eyepiece lens again and repeat the adjustment. If the clinician can remember his/her dioptic setting for each eyepiece, it will only be necessary to set the adjustment rings to their dioptic settings. Each eyepiece adjustment ring has a dioptic scale, in one diopter increments, engraved on it.

i. Adjust the pupillary distance between the binocular eyepieces by rotating the prism housings outward to increase the distance and inward to decrease the distance. The adjustment range is from 55 mm to 75 mm.

j. Observe the cross-scales and ensure that the left and right fields of view are merged together for the correct pupillary distance.

k. Check the slit image on the test rod as follows:

(1) Tighten the slit lamp arm fixing knob and rotate the slit lamp arm and microscope arm together around the upright post.

(2) Check that the slit image neither appears to move nor to become blurred.

(3) Loosen the slit lamp arm fixing knob, tighten the microscope arm fixing knob, and rotate the slit lamp arm only around the upright post.

2-6. Operating procedures.

- a. Seat the patient.
- b. Assist the patient in placing their chin on the chin rest and their forehead against the head rest.
- c. Rotate the chin rest adjusting knob so that the patient's eyes are approximately level with the level marker.
- d. Depress the power switch to the **ON** position.
- e. Rotate the illumination control switch to either the **L (low)**, **N (normal)**, or **H (high)** position to adjust the brightness. Use the illumination control at the lowest possible setting to conserve lamp service life.
- f. Adjust the fixation target for the eye that is not being examined by following the patient's response. The direction of the line of sight is changed by simply adjusting the position of the fixation target until suitable.
 - (1) Two types of fixation targets are available with the slit lamp. One is the annular fixation target with dioptic adjustments while the other is the luminous fixation target.
 - (2) The annular fixation target is adjusted for the patient's refractive power with the fixation target adjustment lever so that the target is located at the far point of the patient's eye. This action eliminates accommodation while fixating the target as well as convergence. The range of adjustment is from -15 through 0 to +10 diopters.

(3) The luminous fixation target is simple. Detach the end with the annular target and then attach the luminous fixation target in its place. The balance of the fixation target to include the lamp is left in place. Do not loosen the fixation knob too much during the exchange to prevent the knob from dropping off.

g. Focus the slit image on the iris of the patient's eye. This should be accomplished with the naked eye rather than the microscope. First, loosen the base fixing screw which will allow free movement of the base in the horizontal plane. The tip of this lever is tilted slightly in the required direction to make fine adjustments as well as to elevate or lower the slit lamp by rotating the lever. The slit image should be finely focused after adjusting the width and length of the slit image.

h. Adjust the slit width by rotating one of the two slit width adjusting knobs which will produce continuously variable changes in the width of the slit image from 0 to 9 millimeters. At 9 millimeters, however, the slit will simply become a circular patch of light.

i. Adjust the slit length by rotating the knurled knob of the slit diaphragm plate handle around the axis of the handle which will produce seven changes in the slit length. These are 9, 8, 5, 3, 2, 1, and 0.2 millimeters followed by infinitely variable changes from 1 to 8 millimeters. The 1 and 8 millimeter settings have click-stops. If the slit should be opened to its maximum width, the previous changes will produce circular beams of 9, 8, 5, 3, 2, 1 and 0.2 millimeters respectively. The changes in lengths (diameters) produced by the seven apertures, as well as the infinitely variable lengths produced by a wedge-shaped diaphragm, are indicated on the slit diameter/length scale over the slit diaphragm plate handle. The scale for the infinitely variable changes has a minimum division of 0.1 millimeter.

j. Rotating the slit diaphragm plate handle around the vertical axis of illumination in the horizontal plane will, on the other hand, rotate the slit image continuously through 90 degrees from the vertical to the horizontal with click-stops at the vertical, oblique, and horizontal positions. The oblique and horizontal positions are convenient for gonioscopy and fundus examinations in which oblique and horizontal optical sections are required.

k. The slit image can be swung across the eye by loosening the centering knob and rotating the slit illumination around its vertical axis. Displacing the slit image away from the center of field of view in this manner will produce indirect illumination, retro-illumination, scleral scatter, etc. The slit illumination will be returned to the center of the field of view when the centering knob is retightened. The centering knob should be tightened securely for normal operations.

l. Incline the slit illumination system by releasing the slit inclination latch and pulling the lamphouse end toward the operator, which will incline the slit illumination system up to 20 degrees of the vertical. The slit image will be introduced at an angle of 20 degrees below the horizontal and with the horizontally-located slit, will have the same effect as swinging the vertical slit image. Inclining the horizontal optical system is particularly valuable for gonioscopy and fundus examinations. The slit inclination stopper engages the slit inclination latch at 5 degree intervals for producing angles of inclination at 5, 10, 15, and 20 degrees.

m. Two types of reflection mirrors are available for use in deflecting the slit illumination toward the patient's eye. These are a long mirror with a tapered handle end and a short mirror which is a simple square. The long mirror is normally used with the vertical slit illumination for standard types of examinations. However, it may obstruct the line of sight of either objective when the slit lamp arm and microscope are used at angles of setting between approximately 3 to 10 degrees. The obstruction could vary from partially to completely obstructed. When using the short mirror, the slit illumination system can be inclined by 10 degrees for reflecting the complete illumination spot.

n. Four filters are inserted into the light path with the filter lever which is simply rotated horizontally to the left or right and set to the required symbol or setting. The symbols are a grey colored round index for the heat absorbing filter, a circular index for the 13% neutral density filter, a green-colored round index for the red-free filter, a blue-colored round index for the blue filter, and a plain circle which indicates the open aperture. The blue filter is used for applanation tonometry and examinations with fluorescein, the red-free filter is used for obtaining a green-colored field of greater contrast, the 13% neutral density filter is used for general observation over a wide field with the slit opened to the maximum aperture, and the heat absorbing filter is used with the overloaded lamp (maximum illumination) with the opened slit.

o. The magnifications of the observation can be changed by simply rotating the magnification changer handle to 6x, 10x, 16x, 25x, and 40x with 12.5x stand and eyepieces.

2-7. Fundus examination.

a. Only the forward one-third portion of the vitreous body of the eye can be examined with the preceding patient examination procedures and settings. This limitation is caused since it is not possible to focus the slit image further into the vitreous body due to refraction by the cornea and crystalline lens. Therefore, the Hruby lens (preset to -58.7 diopters) is supplied for the examination of the fundus and the posterior part of the vitreous body.

b. The Hruby lens is used on the Hruby lens attachment mount coupled to the Hruby lens guide plate which should be fixed on the opening in the rotational axis of the slit lamp arm and microscope arm. When coupled in this manner, the Hruby lens follows all movements of the microscope while its distance to the patient's eye remains fixed, thus greatly facilitating examinations of the posterior segment of the eye with the slit lamp immediately after examining the anterior segment.

c. No special preparation is required of the patient if the pupil will stay open wide enough. If not, a few drops of mydriatic may have to be inserted into the patient's eye about 20 minutes prior to the examination in order to keep the pupil dilated sufficiently.

d. Place the Hruby lens guide plate in place on top of the rotational axis of the slit lamp and microscope arms.

e. Pull the lever of the Hruby lens attachment mount forward which will free the attachment mount and let it slide laterally below the chin rest. Then, locate the attachment mount over the Hruby lens guide plate and insert the shank of the Hruby lens into the attachment mount with the lower end of the shank engaging the groove of the guide plate. If necessary, loosen the locking ring to permit the shank to lower sufficiently for locking. Center the slit lamp arm and microscope arm approximately so that they face the patient's eye.

f. Depending upon whether the patient is myopic or hyperopic, move the Hruby lens forward or backward with the control lever, so that a slit image is focused on the fundus.

g. When observing the peripheral part of the fundus, it will be carried out through the guide of the eye by the fixation target or by rotating the microscope around the upright post.

h. The elimination of reflecting light will be carried out by changing the slit width, moving the inclination latch, and rotating the slit arm. When rotating the slit lamp arm, the observation will be prevented by the long mirror, therefore the short mirror will be used.

i. When the Hruby lens is not being used, simply pull the Hruby lens up so that the lower end of the shank no longer engages the coupling groove of the guide plate. Then, move the Hruby lens attachment mount to the right, as far as it will go, and revolve the lever to the right, too. The Hruby lens can be left in this position until it is used next.

j. To exchange the mirrors, first increase the angle between the microscope and the illumination system. Incline the illumination system about 10 degrees. Pull out the mirror. While the long mirror is easily pulled up, by gripping its tapered end, the short mirror must be pushed up slightly, with the sharp point of a pencil or similar tool before it can be pulled up. Do not touch the surfaces of the mirrors during exchange and place the unused mirror in its slot in the accessory drawer.

2-8. Shut-down procedures.

a. Adjust the fixation target out of the path of the patient's head.

b. Rotate the brightness control dial to the **L (low)** position.

c. Depress the power switch to the **OFF** position.

d. Assist the patient's movement out of the chin rest and away from the slit lamp.

e. Prepare the slit lamp for either the next procedure or for a nonuse period. Refer to section IV of this chapter for cleaning, disinfecting, and sterilizing procedures.

Section III. OPERATION OF AUXILIARY EQUIPMENT

2-9. Associated support items of equipment.

The slit lamp requires no associated support items of equipment other than an electrical power generator, which is shared with multiple items of equipment for electrical power.

Section IV. CLEANING, DISINFECTING, AND STERILIZING PROCEDURES

2-10. General.

a. The slit lamp and operating accessories should be clean at all times. Specific cleaning, disinfecting, and/or sterilizing procedures are provided in subsequent paragraphs.

b. Accessories identified as disposable should not be cleaned and reused. These accessories were designed and manufactured for one use only.

2-11. Lenses and mirrors.

a. *Cleaning.*

(1) Depress the power switch to the **OFF** position.

(2) Do not touch the lenses and mirrors, except when unavoidable.

(3) Brush the lenses and mirrors with the accessory cleaning brush.

(4) If the lenses and/or mirrors cannot be cleaned with brushing, wipe the lenses and/or mirror surfaces with a soft cotton or linen cloth dampened with a solution of 4 parts ether and 1 part alcohol. Apply a minimum of the solution to the lenses and mirrors.

b. *Disinfecting.* The slit lamp does not require disinfecting.

c. *Sterilizing.* The slit lamp cannot be sterilized.

2-12. Slit illumination condenser lens.

a. *Cleaning.*

(1) Depress the power switch to the **OFF** position.

(2) Check the lamp housing and ensure that it is not too hot to touch.

(3) Remove the lamp housing connector from the lamp housing.

(4) Remove the lamp housing cover by rotating it counterclockwise. Set it aside for subsequent reinstallation.

(5) Unscrew the four knurled knobs which are now exposed. Then, pull up the lamp housing. Set the knobs aside.

(6) Brush the lens with the accessory cleaning brush.

(7) If the lens is still not clean, follow the previous procedures to clean lenses and mirrors.

(8) Reassemble the slit illumination system.

b. *Disinfecting.* No disinfecting is required.

c. *Sterilizing.* No sterilizing is required.

2-13. Slit lamp plastic parts and guiding plates and rails.

a. Cleaning.

- (1) Depress the power switch to the **OFF** position.
- (2) Disconnect the electrical power connector from the wall receptacle.
- (3) Wipe with a silicon-impregnated cloth.
- (4) If further cleaning is required, wipe the plastic parts with a cloth soaked in a light detergent solution or soapy water. Then, wipe again with a clean, wet cloth to remove any residue. Finally, dry the plastic parts with a soft, dry cloth.

b. Disinfecting. Disinfecting is not required.

c. Sterilizing. Sterilizing is not required.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

2-14. Operating environments.

The slit lamp is a transportable device for operation within a field medical treatment facility. It can only be used in a controlled environment.

CHAPTER 3

UNIT LEVEL MAINTENANCE

Section I. GENERAL INFORMATION

3-1. Overview.

a. Unit level maintenance. This level of maintenance is the responsibility of and performed by a using unit on its assigned equipment. Responsibilities are stratified as follows:

(1) *Operator maintenance.* This segment of unit level maintenance is performed by operator/user personnel and consists of equipment operational functions; routine services like cleaning, dusting, washing, checking for frayed cables, and stowing items not in use; and checking for loose hardware, replacing operator accessories, and replacing operator repair parts. Replacing operator parts will not require extensive disassembly or assembly of the end item, critical adjustments after replacement, or the extensive use of tools.

(2) *Specialist maintenance.* This segment of unit level maintenance is performed only by trained Medical Equipment Repairers. The functions and services include:

(a) Scheduling and performing PMCS, electrical safety inspections and tests, and calibration/verification/certification (CVC) services.

(b) Performing unscheduled maintenance functions with emphasis on replacing assemblies, modules, and printed circuit boards (PCBs), when available.

(c) Operating a repair parts program to include Class VIII repair parts as well as other commodity class repair parts used on medical equipment.

(d) Maintaining a library of technical manuals (TMs), manufacturers' literature, repair parts information, and related materials.

(e) Conducting inspections on new or transferred equipment.

(f) Establishing administrative procedures for the control and administration of maintenance services in accordance with TB 38-750-2.

(g) Notifying support maintenance battalions of requirements and/or evacuating unserviceable equipment, assemblies, or modules.

b. Maintenance functions. Maintenance functions, both preventive and corrective, which are beyond the scope of the operator/user are assigned to unit level Maintenance Equipment Repairer personnel.

3-2. Tools and test equipment.

Common tools and test equipment required for unit level maintenance of the equipment are listed in appendix B, section III of this manual. Refer to your unit's modified table of organization and equipment (MTOE) for authorized items.

3-3. Components of end item and basic issue items.

Components of end item and basic issue items are listed in appendix C, sections II and III of this manual.

3-4. Expendable supplies.

Expendable and durable supplies and materials required for maintenance of the equipment are listed in appendix D, section II of this manual.

3-5. Repair parts.

Repair parts required for unit level maintenance are listed in appendix E, section II of this manual.

3-6. Special tools.

Special tools required for unit level maintenance of the equipment are listed in appendix E, section III of this manual.

Section II. LUBRICATION INSTRUCTIONS

3-7. Lubrication.

No lubrication of the slit lamp is required.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-8. General.

a. The slit lamp must be inspected and serviced systematically to ensure that it is ready for operation at all times. Inspection will allow defects to be discovered and corrected before they result in serious damage or failure.

b. Table 3-1 contains a list of items to be performed by unit level operator/user personnel. This PMCS table is also referred to as "-10 PMCS" requirements. Preventive maintenance by operator/user personnel is not limited to performing the checks and services in table 3-1. There are things operator/user personnel should do any time they need to be done, such as checking general cleanliness, observing for improper operational indicators, and maintaining the proper quantities of accessories.

c. Table 3-2 contains a list of items to be performed by unit level Medical Equipment Repairers. This PMCS table is also referred to as "-20 PMCS" requirements.

d. Some items to be inspected will be listed in both table 3-1 and table 3-2 to stress their importance, to provide a quality control check on multiple operator/user personnel, and to identify more comprehensive procedures to be accomplished by unit level Medical Equipment Repairers.

e. The following is a list of both PMCS table column headings with a description of the information found in each column:

(1) *Item No.* This column shows the sequence in which to do the PMCS, and is used to identify the equipment area on the Equipment Inspection and Maintenance Worksheet, DA Form 2404.

(2) *Interval.* This column shows when each PMCS item is to be serviced: B - Before Operation, D - During Operation, A - After Operation, Q - Quarterly, and S - Semiannually. B, D, and A should be performed with daily use of the equipment. The PMCS interval should be changed from semiannually to quarterly during long periods of sustained use.

NOTE

When the slit lamp must be kept in continuous operation, check and service only those items that will not disrupt operation. Perform the complete daily checks and services when the equipment can be shut down.

(3) *Item to be Inspected and Procedure.* This column identifies the general area or specific part to be checked or serviced.

(4) *Equipment is not Ready/Available If:* This column lists conditions that make the equipment unavailable or unusable.

Table 3-1. Operator preventive maintenance checks and services.

ITEM NO	INTERVAL					ITEM TO BE INSPECTED AND PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	Q	S		
1				X		Slit lamp. a. Inventory components and accessories.	Missing components or accessories prevent operation of the unit.
				X		b. Inspect the electrical power cable assembly for cuts, deterioration, fraying, or other physical damage.	The condition of the cable prevents operation of the unit or causes a safety hazard.
				X		c. Test the two lamps.	Either does not illuminate.
				X		d. Check the slit lamp for physical damage.	Physical damage to the unit prevents operation.
				X		e. Check the unit (clinician) for proper operation.	An operational control is defective or inoperable.
2				X		Instrument stand. a. Check the casters (2) for proper operation and ability to be locked.	Defective or unserviceable casters prevent proper operation of the unit.
				X		b. Ensure that the stand properly supports the slit lamp.	A defective stand precludes a stable base for operation of the unit.
				X		c. Check that the electrical switches operate properly.	A defective switch prevents operation of the unit.
3				X		Case. a. Check the case for an inoperable or damaged pressure relief valve.	An inoperable or damaged pressure relief valve would prevent safe deployment (movement).
				X		b. Check the case for inoperable or missing latches.	Inoperable or missing latches would prevent safe storage or movement of the item.
				X		c. Check the case for a faulty gasket, cracks, gouged holes, or other physical damage.	Case defects would prevent safe storage or movement of the unit.

Table 3-2. Repairer preventive maintenance checks and services.

ITEM NO	INTERVAL					ITEM TO BE INSPECTED AND PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	Q	S		
1				X		Slit lamp. a. Verify that components and accessories have been inventoried and shortages requisitioned by operator/user personnel.	Missing components or accessories prevent operation of the unit.
				X		b. Verify that the electrical power cable assembly is free of defects or deterioration.	The condition of the cable prevents operation of the unit or causes a safety hazard.
				X		c. Verify the absence of physical damage, loose/broken components, or other deficiencies.	Physical damage or other deficiencies prevent operation of the unit.
				X		d. Determine the result of the operator/user testing.	Reported defects prevent operation of the unit.
				X		e. Ensure that all lenses and condensers are clean and free of fingerprints.	Dirty lenses or condensers prevent quality results during operation.
2						Instrument stand.	
				X		a. Verify that the casters operate properly and that the two locking casters work properly.	Casters and locks impact upon operation of the unit.
3				X		b. Verify that the power unit, accessory drawer, and slit lamp base unit are firmly attached to the instrument stand.	Loose or defective components prevent operation of the unit.
						Case.	
				X		a. Verify that the pressure relief valve operates properly.	A defective or broken valve prevents safe movement of the unit.
			X		b. Verify the serviceability of the gasket.	An unserviceable gasket prevents safe storage of the slit lamp.	
			X		c. Verify that the case has no significant defects.	Defects prevent proper storage or movement of the slit lamp.	

3-9. Reporting deficiencies.

Operator personnel will report problems with the slit lamp discovered during their "-10 PMCS" that they are unable to correct. Refer to TB 38-750-2 and report the deficiency using the proper forms. Consult with your unit Medical Equipment Repairer if you need assistance.

Section IV. TROUBLESHOOTING

3-10. General.

a. Troubleshooting information for slit lamp operator/user personnel and for Medical Equipment Repairer personnel is provided in this section. Corrective maintenance beyond the capability or authority of operator/user personnel will be indicated by the phrase "Notify your unit's Medical Equipment Repairer."

b. This manual cannot list all possible malfunctions. If a malfunction is either not listed or is not determined by routine diagnostic procedures, notify your appropriate maintenance support unit.

3-11. Operator/user troubleshooting.

Operator/user troubleshooting procedures are provided in table 3-3. Each symptom is followed by possible causes and corrective maintenance.

Table 3-3. Operator/user troubleshooting.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE MAINTENANCE
1. PILOT LAMP DOES NOT ILLUMINATE.	Unit not connected to an electrical wall receptacle.	Connect the unit to a source of electrical power.
	Defective electrical power cable assembly.	Notify your unit's Medical Equipment Repairer.
	Defective electrical power unit.	Notify your unit's Medical Equipment Repairer.
2. SLIT ILLUMINATION SYSTEM INOPERABLE.	Burned out lamp.	Replace lamp.
	Defective electrical power unit.	Notify your unit's Medical Equipment Repairer.

3-12. Medical Equipment Repairer troubleshooting.

Medical Equipment Repairer troubleshooting procedures are provided in table 3-4. Each symptom is followed by possible causes and corrective maintenance.

Table 3-4. Medical Equipment Repairer troubleshooting.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE MAINTENANCE
1. ELECTRICAL POWER UNIT INOPERABLE.	Faulty 115-volt receptacle.	Notify appropriate power distribution personnel or correct the problem in an ISO shelter.

Table 3-4. Medical Equipment Repairer troubleshooting - continued.

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE MAINTENANCE
	Defective power cable.	Replace the defective connector or the entire power cable.
	Defective pilot lamp.	Replace lamp.
	Unserviceable brightness control.	Replace switch.
	Defective fuse.	Replace fuse.
	Unserviceable voltage selector switch.	Replace switch.
2. SLIT ILLUMINATION SYSTEM INOPERABLE.		
	Defective lamp.	Replace lamp.
	Unserviceable brightness control.	Replace switch.
	Defective transformer.	Replace transformer.
3. INSTRUMENT STAND INOPERABLE.		
	Defective brake.	Repair or replace brake (caster).
	Unserviceable gas spring.	Replace gas spring.
	Defective caster(s).	Replace caster(s).

Section V. CIRCUIT DESCRIPTION

3-13. Wiring diagram.

The wiring diagram (fig 3-1) for the slit lamp is provided to assist you when troubleshooting. Isolate the problem to a functional segment of the circuitry.

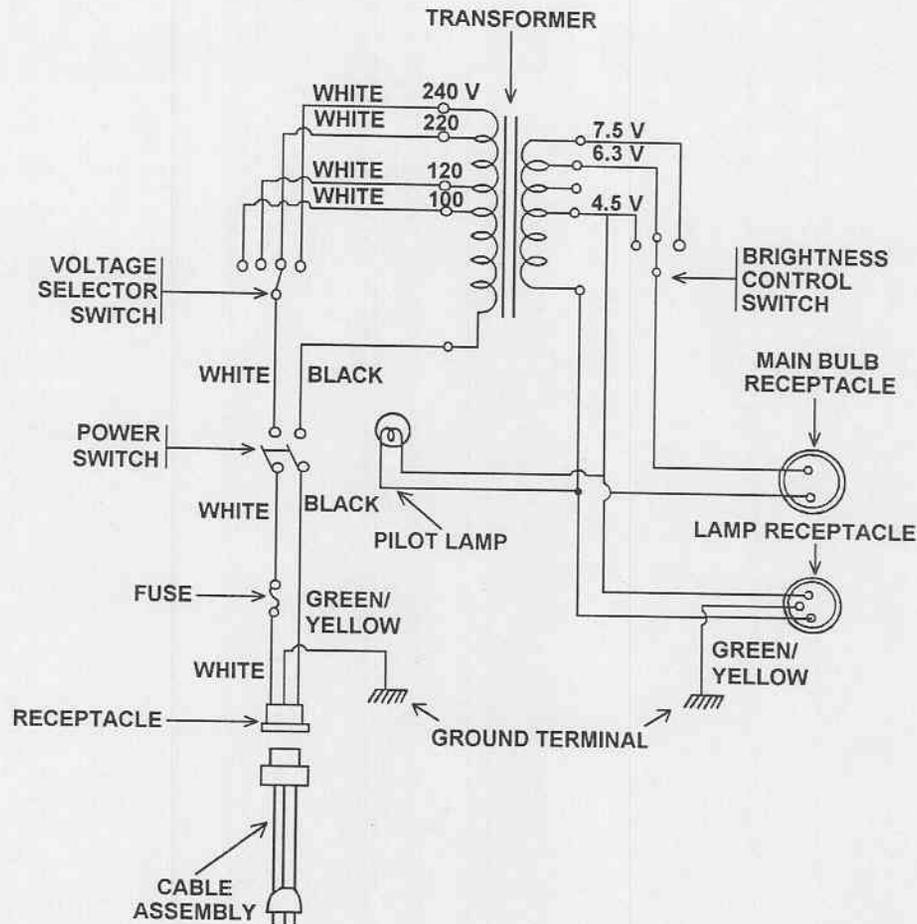


Figure 3-1. Wiring diagram.

3-14. Electrical circuitry.

- The electrical power unit consists of an electrical power receptacle, fuse, power switch, pilot lamp, and the input voltage selector switch.
- The voltage selector switch is used to match the slit lamp to the wall receptacle voltage.
- The brightness control dial is used to select the level of illumination (brightness).

Section VI. REPAIR PROCEDURES

3-15. Maintenance information.

- Procedures for disassembly, repair, or replacement of components, services, and reassembly are provided in this section of the manual.
- Repair procedures are continuous from the first disassembly step to the final reassembly step.

3-16. Slit illumination lamp replacement (user/operator) (fig 3-2).

- Depress the power switch to the **OFF** position.
- Disconnect the electrical power cable assembly from the wall receptacle.
- Check the lamp housing to ensure that it is not hot to touch.

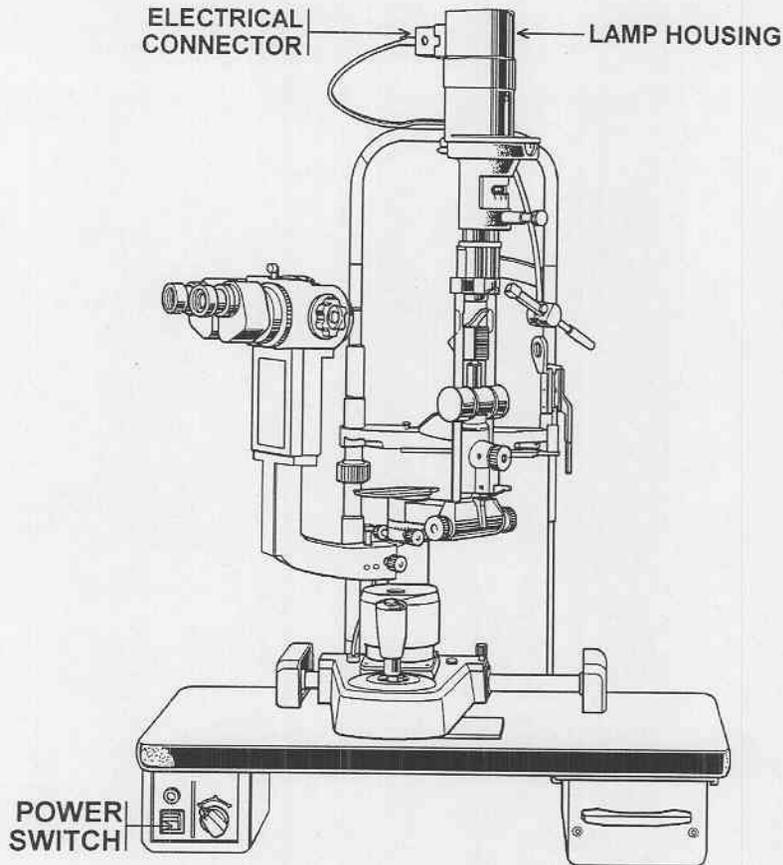


Figure 3-2. Lamp replacement.

- d. Remove the electrical connector from the lamp housing.
- e. Raise and remove the lamp housing by turning it counterclockwise. Set it aside.
- f. Remove the defective lamp. Set it aside.
- g. Insert the replacement lamp and ensure that it is seated tightly and the notch on the flange matches with the locating plate.
- h. Reinstall the lamp housing by turning it clockwise with a downward motion.
- i. Reinstall the electrical connector.
- j. Reconnect the electrical power cable assembly to a wall receptacle.
- k. Depress the power switch to the **ON** position and check that the lamp illuminates.

3-17. Fixation target lamp replacement (user/operator).

- a. Depress the power switch to the **OFF** position.
- b. Disconnect the electrical power cable assembly from the wall receptacle.
- c. Loosen the knurled knob of the fixation target slightly and detach the target end. Do not turn the knob too much or it will become detached.
- d. Grip the exposed lamp and pull outward until it is released. Set it aside.
- e. Reattach the target end and tighten the knurled knob.
- f. Reconnect the electrical power cable assembly to the wall receptacle.
- g. Depress the power switch to the **ON** position and check that the lamp illuminates.

3-18. Fuse replacement (MER).

- a. Depress the power switch to the **OFF** position.
- b. Disconnect the electrical power cable assembly from the wall receptacle.
- c. Turn the center of the fuse holder cap located on the back of the power supply with a slotted screwdriver. The fuse holder cap and fuse can now be removed from the fuse holder.
- d. Insert the replacement fuse into the fuse holder and reinstall the fuse holder cap.
- e. Reconnect the electrical power cable assembly.
- f. Depress the power switch to the **ON** position and check that the pilot lamp is on.

3-19. Instrument stand (MER).

a. An exploded version of the instrument stand (fig 3-3) is shown in the illustration. An exploded version of the main pillar assembly (fig 3-4) is also shown.

b. Detailed disassembly, parts replacement, and reassembly are not required in further detail and procedures for trained MERs.

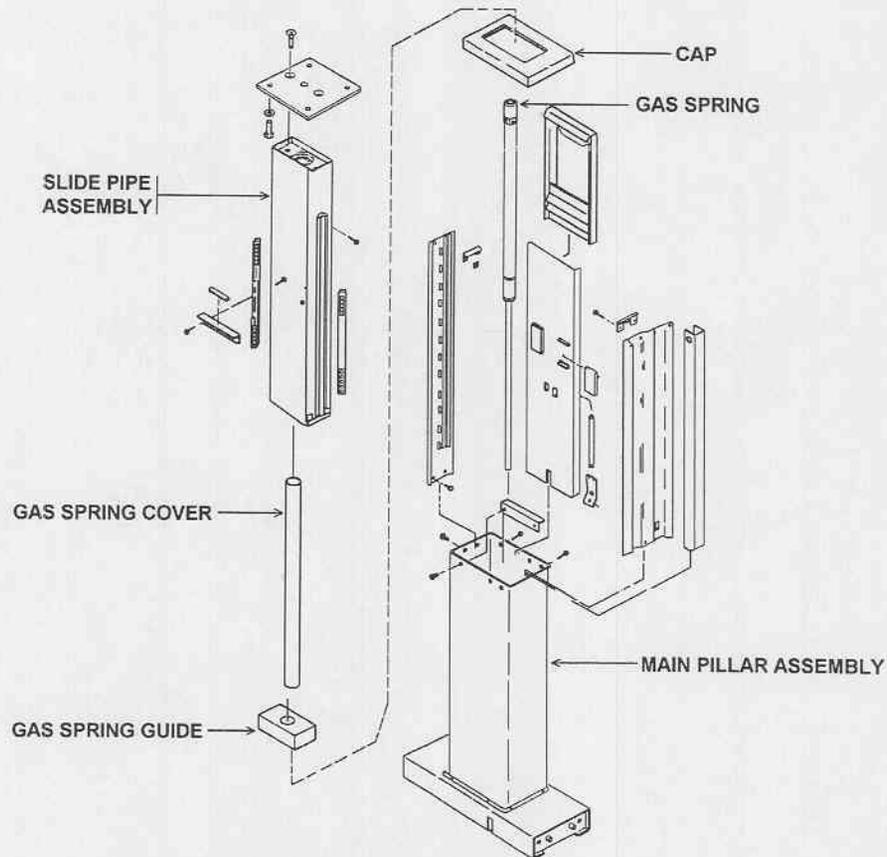


Figure 3-3. Instrument stand.

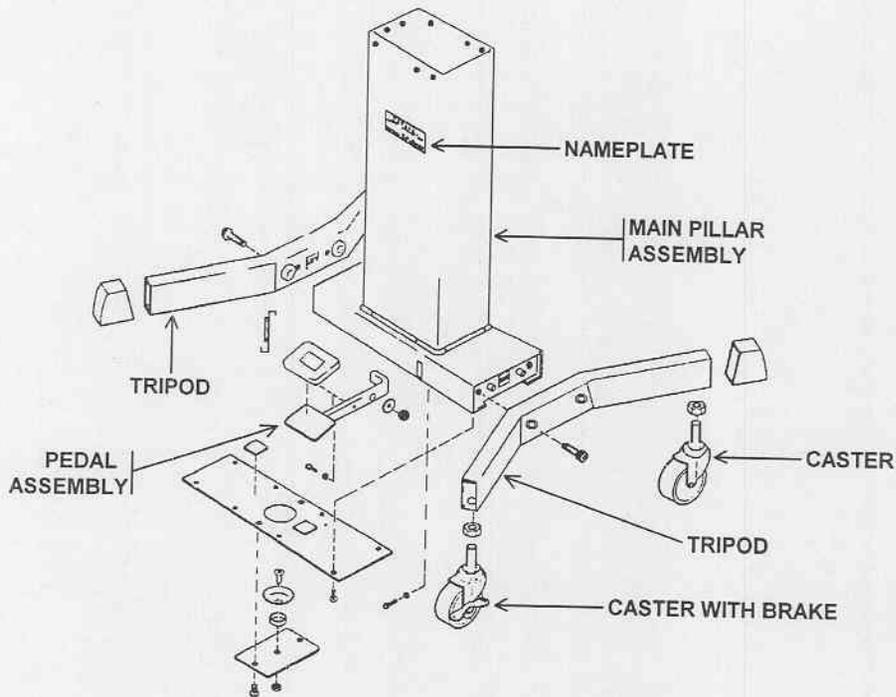


Figure 3-4. Main pillar assembly.

Section VII. STORING AND SHIPPING PROCEDURES

3-20. Preparation for storing.

- a. Locate the case and place it so that the slit lamp can be repacked into the case.
- b. Depress the pressure relief valve, open the latches, and remove the top section of the case.
- c. Remove all accessories and repack them into their styrofoam cutouts.
- d. Pull out the chin rest pad fixing pins and then remove the disposable pads. Place them into their storage space.
- e. Unfasten the chin rest by removing the four screws from the underside of the instrument stand.
- f. Disconnect the electrical cables.
- g. Remove the slit lamp body from the instrument base and pack it into its place in the case.
- h. Unfasten the base of the slit lamp and repack it into the case.
- i. Remove the accessory drawer. Pack it into the case.
- j. Remove the power unit. Pack it into the case.
- k. Remove the instrument stand working surface. Pack it into the case.
- l. Pack the remainder of the instrument stand into the case.
- m. Close and latch the case.

3-21. Preparation for shipping.

- a. The slit lamp, packed in the original shipping carton, is suitable for shipping.
- b. Notify your unit's transportation point.

CHAPTER 4

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

Section I. GENERAL INFORMATION

4-1. Overview.

This chapter provides for maintenance that is beyond the capability, capacity, and authorization for unit level maintenance personnel. The procedures in this chapter should not be attempted at the unit level.

4-2. Tools and test equipment.

Common tools and test equipment required for support maintenance of the equipment are listed in appendix B, section III. Refer to your unit's MTOE or installation table of distribution and allowances (TDA) for authorized items.

4-3. Components of end item and basic issue items.

Components of end item and basic issue items are listed in appendix C, sections II and III.

4-4. Expendable supplies.

Expendable and durable supplies and materials for support maintenance are listed in appendix D, section II.

4-5. Repair parts.

Repair parts required for support maintenance are listed in appendix E, section II.

4-6. Special tools.

Special tools required for support maintenance are listed in appendix E, section III.

Section II. MAINTENANCE PROCEDURES

4-7. General.

- a. There are no specific troubleshooting procedures for these levels of maintenance.
- b. Repair procedures beyond unit level are confined to depot level.

APPENDIX A

REFERENCES

A-1. Army regulations.

AR 40-61	Medical Logistics Policies and Procedures
AR 710-2	Supply Policy Below the Wholesale Level
AR 725-50	Requisitioning, Receipt, and Issue System
AR 750-1	Army Materiel Maintenance Policy and Retail Maintenance

A-2. Technical manual.

TM-8-DPSC-6500-RPL	Medical Materiel: Medical Repair Parts Reference List
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A-3. Technical bulletins.

TB MED 7	Maintenance Expenditure Limits for Medical Materiel
TB 8-6500-MPL	Mandatory Parts List for Medical Equipment
TB 38-750-2	Maintenance Management Procedures for Medical Equipment
TB 740-10/DLAM 4155.5/AFR 67-43	Quality Control, Depot Storage Standards, Appendix M, Medical Supplies

A-4. Field manual.

FM 21-11	First Aid for Soldiers
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A-5. Supply bulletin.

SB 8-75-()- series	Army Medical Department Supply Information
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A-6. Other publications.

(These publications may be obtained from U.S. Army Medical Materiel Agency, 1423 Sultan Drive, Suite 100, ATTN: MCMR-MMM, Fort Detrick, MD 21702-5001.)

Instruction Manual, TOPCON Photo Slit Lamp, Model SL-6E, Tokyo Optical Co., LTD, Japan
 Service Parts List, Adjustable Instrument Table, Model IT-1, Tokyo Optical Co., LTD, Japan
 Repair Manual, Slit Lamp, Model SL-6E, Tokyo Optical Co., LTD, Japan

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance levels.

c. Section III lists the tools and test equipment required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes required for a particular maintenance function.

B-2. Explanation of columns in MAC.

a. *Group Number, Column 1.* The assembly group number (Group No.) column is a numerical group assigned to each assembly. The applicable assembly groups are listed in the maintenance allocation chart (MAC) in disassembly sequence beginning with the first assembly removed in a top down disassembly sequence.

b. *Assembly Group, Column 2.* This column contains a brief description of the components of each assembly group.

c. *Maintenance Functions, Column 3.* This column lists the various maintenance functions (A through K) and indicates the lowest maintenance level authorized to perform these functions. The symbol designations for the various maintenance levels are as follows:

- C - Operator or crew
- O - Unit maintenance
- F - Direct support maintenance
- H - General support maintenance
- D - Depot maintenance

The maintenance functions are defined as follows:

A - Inspect. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

B - Test. To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

C - Service. To clean, to preserve, to charge, and to add lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

D - Adjust. To rectify to the extent necessary to bring into proper operating range.

E - Align. To adjust specified variable elements of an item to bring it to optimum performance.

F - Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

G - Install. To set for use in an operational environment such as tents or International Standards Organization shelters.

H - Replace. To replace unserviceable items with serviceable like items.

I - Repair. Those maintenance operations necessary to restore an item to serviceable condition through correction of material damage to a specific failure. Repair may be accomplished at each level of maintenance.

J - Overhaul. Normally the highest degree of maintenance performed by the Army in order to minimize time work in process consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by a maintenance standard in technical publications for each item of equipment. Overhaul normally does not return an item to like new condition.

K - Rebuild. The highest degree of material maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance level.

d. *Tools and Equipment, Column 4.* This column is provided for referencing by code, the tools and test equipment (sec III) required to perform the maintenance functions.

e. *Remarks, Column 5.* This column is provided for referencing by code, the remarks (sec IV) pertinent to the maintenance functions.

B-3. Explanation of columns in section III.

a. *Reference Code, Column 1.* This column correlates to section II, column 4.

b. *Maintenance Level, Column 2.* This column identifies the maintenance levels using the tools and test equipment.

c. *Nomenclature, Column 3.* This column identifies the tools and test equipment.

d. *National Stock Number, Column 4.* This column provides the national stock number of the specific tools or test equipment.

B-4. Explanation of columns in section IV.

a. *Reference Code, Column 1.* This column correlates to section II, column 5.

b. *Remarks, Column 2.* This column provides supplemental information or explanatory notes pertinent to the maintenance function in section II.

Section II. MAINTENANCE ALLOCATION CHART FOR SLIT LAMP

(1) GROUP NO.	(2) ASSEMBLY GROUP	(3) MAINTENANCE FUNCTIONS											(4) TOOLS AND EQUIPMENT	(5) REMARKS	
		A	B	C	D	E	F	G	H	I	J	K			
00	Slit Lamp	O 0.5		O 0.3	O 0.3	O 0.3				O 0.4	O 0.8	D 8.0	D 16.5	01,02,03, 04	A
01	Instrument Stand		O 0.3		O 0.3					O 0.4	O 0.8	D 8.0	D 16.5	01,02	A

**Section III. TOOLS AND TEST EQUIPMENT
FOR
SLIT LAMP**

(1) REFERENCE CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER
01	O,F,H,D	Tool Kit, Medical Equipment Maintenance and Repair: Repairmans	5180-00-611-7923
02	O,F,H,D	Tool Kit, Medical Equipment Maintenance and Repair: Organizational	5180-00-611-7924
03	O,F,H,D	Multimeter, AN/USM 486 or	6625-01-145-2430
04	O,F,H,D	Multimeter, AN/PSM 45A Tester, Current Leakage, TS 2514/P	6625-01-265-6000 6525-01-142-8233

**Section IV. REMARKS
FOR
SLIT LAMP**

(1) REFERENCE CODE	(2) REMARKS
A	Tools and test equipment are listed for each assembly group.

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. Scope.

This appendix lists components of end items and basic issue items for the equipment to help you inventory items required for safe and efficient operation.

C-2. General.

The Components of End Item and Basic Issue Items lists are divided into the following sections:

a. Section II. Components of End Item. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the equipment in operation, to operate it, and to perform emergency repairs. Basic issue items must be with the equipment during operation and whenever it is transferred between property accounts. This manual is your authority to request or requisition basic issue items, based on MTOE authorization of the end item.

C-3. Explanation of columns.

The following provides an explanation of columns found in both listings:

- a. Item Number, Column 1.* This column indicates the item number assigned to the item.
- b. National Stock Number, Column 2.* This column indicates the national stock number assigned to the item.
- c. Description, Column 3.* This column indicates the federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the commercial and government entity (CAGE) code in parentheses followed by the part number.
- d. Unit of Measure, Column 4.* This column indicates the unit of measure used in performing the actual operational or maintenance function. This measure is expressed by a two-character alphabetical abbreviation. These abbreviations are listed in the glossary.
- e. Quantity, Column 5.* This column indicates the quantity (QTY) of the item(s) provided with the equipment.

**Section II. COMPONENTS OF END ITEM
FOR
SLIT LAMP**

(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEASURE	(5) QTY
THERE ARE NO COMPONENTS APPLICABLE FOR THIS END ITEM.				

**Section III. BASIC ISSUE ITEMS
FOR
SLIT LAMP**

(1) ITEM NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEASURE	(5) QTY
1		Instruction Manual, TOPCON Photo Slit Lamp, Model SL-6E, Tokyo Optical Co., LTD, Japan (5S434) None	EA	2
2		Service Parts List, Adjustable Instrument Table, Model IT-1, Tokyo Optical Co., LTD, Japan (5S434) None	EA	2
3		Repair Manual, Slit Lamp, Model SL-6E, Tokyo Optical Co., LTD, Japan (5S434) None	EA	2
4		Instrument Table (5S434) IT-1	EA	1
5		Power Supply Transformer (5S434) None	EA	1
6		Accessory Drawer (5S434) None	EA	1

APPENDIX D

EXPENDABLE AND DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. Scope.

This appendix lists expendable and durable supplies and materials that are required to maintain the equipment. This listing is authorization to requisition and retain the items if not otherwise authorized.

D-2. Explanation of columns.

- a. *Item Number, Column 1.* The item number (Item No.) is sequentially assigned.
- b. *Level, Column 2.* This column identifies the lowest level of maintenance that requires the listed item. An explanation of the alphabetical character is provided in appendix B, section I of this manual.
- c. *National Stock Number, Column 3.* This column indicates the national stock number assigned to the item.
- d. *Description, Column 4.* This column indicates the federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the CAGE code in parentheses followed by the part number.
- e. *Unit of Measure, Column 5.* This column indicates the unit of measure used in performing the actual operational or maintenance function. This measure is expressed by an alphabetical abbreviation. These abbreviations are listed in the glossary.
- f. *Quantity, Column 6.* This column indicates the quantity (QTY) of the item(s) provided with the equipment.

**Section II. EXPENDABLE AND DURABLE SUPPLIES AND MATERIALS LIST
FOR
SLIT LAMP**

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) UNIT OF MEASURE	(6) QTY
1	O	7530-01-280-0613	Cloth, Cleaning (97327) Rymple Cloth 301	EA	1
2	O	5970-00-419-4290	Tape, Insulation, Electrical (81349) MIL-I-24391	RO	1
3	O		Pad, Chin Rest (5S434) 40310-40820	PK	1

APPENDIX E

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

E-1. Scope.

This manual lists spare and repair parts, special tools, special test equipment; and other special support equipment required for the performance of unit level, direct support, general support, and depot level maintenance. It authorizes the requisitioning and issue of spare and repair parts in consonance with the MAC (app B.)

E-2. General.

The Repair Parts and Special Tools List is divided into the following sections:

- a. Repair Parts, Section II.* A list of repair parts authorized for the performance of maintenance in figure number and item number sequence.
- b. Special Tools, Test, and Support Equipment, Section III.* A list of special tools, test, and support equipment authorized for the performance of maintenance.

E-3. Explanation of columns in section II.

a. Illustration, Column 1.

(1) *Figure Number.* This column indicates the figure number (FIG NO.) of the illustration on which the item is shown.

(2) *Item Number.* This column indicates the item number (ITEM NO.) used to identify each item on the illustration.

b. National Stock Number, Column 2. This column indicates the national stock number assigned to the item.

c. Description, Column 3. This column indicates the federal item name of the item. The last line for each item indicates the CAGE code in parentheses followed by the part number.

d. Unit of Measure, Column 4. This column indicates the unit of measure used in performing the actual operational or maintenance function. This measure is expressed by a two-character alphabetical abbreviation.

e. Quantity, Column 5. This column indicates the quantity (QTY) of the item(s) to be used with or on the illustrated component, assembly, module, or end item.

E-4. Explanation of columns in section III.

a. Item Number, Column 1. This number is sequentially assigned.

b. Level, Column 2. This column identifies the lowest level of maintenance that requires the listed item. An explanation of the alphabetical character is provided in appendix B, section I of this manual.

c. National Stock Number, Column 3. This column indicates the national stock number assigned to the item.

d. Description, Column 4. This column indicates the federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the CAGE code in parentheses followed by the part number.

e. Unit of Measure, Column 5. This column indicates the unit of measure used in performing the actual operational or maintenance function. This measure is expressed by a two-character alphabetical abbreviation.

f. Quantity, Column 6. This column indicates the quantity (QTY) of the items(s) to be used with or on the illustrated component, assembly, module, or end item.

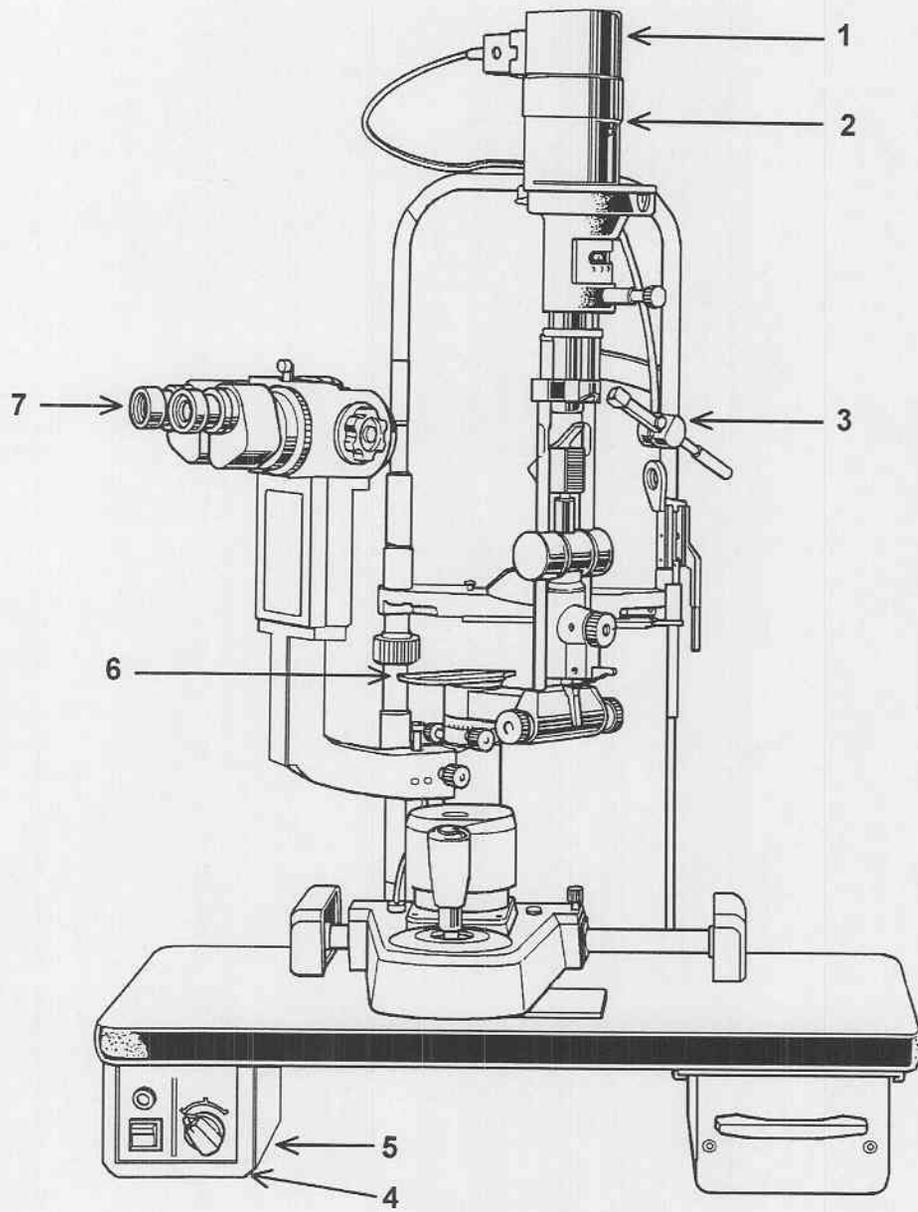


Figure E-1. Slit lamp.

Section II. REPAIR PARTS LIST FOR SLIT LAMP

(1) ILLUSTRATION		(2)	(3)	(4)	(5)
FIG NO.	ITEM NO.	NATIONAL STOCK NUMBER	DESCRIPTION	UNIT OF MEASURE	QTY
E-1	1	6240-01-246-8260	Cover, Lamp (5S434) 40320-25570	EA	1
E-1	2	6540-01-247-8221	Housing, Lamp (5S434) 40320-25561	EA	1
E-1	3	6540-01-247-1272	Target, Ophthalmic (5S434) 40310-43000	EA	1
		6540-01-247-1273	or Target, Ophthalmic (5S434) 40340-43000	EA	1
E-1	4	6540-01-246-3780	Selector, Voltage (5S434) 40341-60080	EA	1
E-1	5	6120-01-246-0100	Transformer, Power (5S434) 44630-60200	EA	1
E-1	6	6540-01-247-1271	Chin Rest (5S434) 40310-40150	EA	1
E-1	7	6650-01-246-8262	Eyepiece Assembly (5S434) 40350-16000	EA	1
E-1	*		Switch, Voltage Selector (5S434) 40341-6008	EA	1
E-1	*		Power Switch (5S434) 40341-6006	EA	1
E-1	*	5920-01-246-0091	Fuse, 1-AMP (5S434) PNWRS10-93	EA	1
E-1	*		Socket, Electrical (5S434) 6005	EA	1
E-1	*		Cable, Input (5S434) 40314-6006	EA	1
E-1	*		Terminal, Ground (5S434) 40340-6008	EA	2
E-1	*		Receptacle, Lamp (5S434) 40420-5533	EA	1
E-1	*		Receptacle, Bulb (5S434) 40314-6003	EA	1
E-1	*	5930-01-246-0096	Switch, Rotary (5S434) 40350-6004	EA	1

**Section II. REPAIR PARTS LIST
FOR
SLIT LAMP**

(1) ILLUSTRATION		(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEASURE	(5) QTY
FIG NO.	ITEM NO.				
E-1	*		Transformer (5S434) 6002	EA	1
E-1	*		Pads, Chin Rest (5S434) 40310-40820	PK	1
E-1	*	6650-01-246-0213	Scale, Diopter (5S434) RT-3	EA	1
E-1	*	6540-01-246-3801	Telescope, Diopter (5S434) RT-1	EA	1
E-1	*	6540-01-246-3745	Weight, Control, Slit (5S434) 0900-2270	EA	1
E-1	*	6540-01-247-8220	Lens, Assembly, Slit (5S434) 44660-10200	EA	1
E-1	*	6540-01-247-1279	Rod, Test, Ophthalmic (5S434) 40310-25542	EA	1
E-1	*	5355-01-246-8304	Knob (5S434) 40320-25550	EA	1
E-1	*	6540-01-247-1280	Plate, Guiding (5S434) 40524-41050	EA	1
E-1	*	5340-01-246-8209	Cover, Access (5S434) 40310-80481	EA	1
E-1	*	6540-01-247-8222	Gear (5S434) 40310-80360	EA	1
E-1	*	6240-01-246-1896	Lamp, Incandescent (5S434) STCSL-1611	EA	1
E-1	*	6240-01-246-8211	Lamp, Incandescent (5S434) STCSL-1610	EA	1
E-1	*	6240-01-246-0102	Lamp, Incandescent (5S434) 41107-60490	EA	1
E-1	*	5930-01-245-4346	Switch, Push (5S434) 40350-60030	EA	1
E-1	*		Pin, Straight Head (5S434)	EA	1
E-1	*	5315-01-246-4117	Pin, Straight Head (5S434) STCSL00-401	EA	1

Section II. REPAIR PARTS LIST FOR SLIT LAMP

(1) ILLUSTRATION		(2)	(3)	(4)	(5)
FIG NO.	ITEM NO.	NATIONAL STOCK NUMBER	DESCRIPTION	UNIT OF MEASURE	QTY
E-1	*	6540-01-246-3744	Spring (5S434) STCTA12-80	EA	1
E-1	*	5930-01-246-0098	Switch, Toggle (5S434) 40350-34040	EA	1
E-1	*	5920-01-246-0092	Fuse, Cartridge (5S434) 44630-60070	EA	1
E-1	*	5360-01-251-3700	Spring, Flat (5S434) 40310-20771	EA	1
E-1	*	5920-01-246-0092	Fuse, Cartridge (5S434) 44630-60070	EA	1
E-1	*	6540-01-247-1274	Switch (5S434) 40350-10441	EA	1
E-1	*	5930-01-246-0098	Switch, Toggle (5S434) 40350-34040	EA	1

* Indicates parts not illustrated.

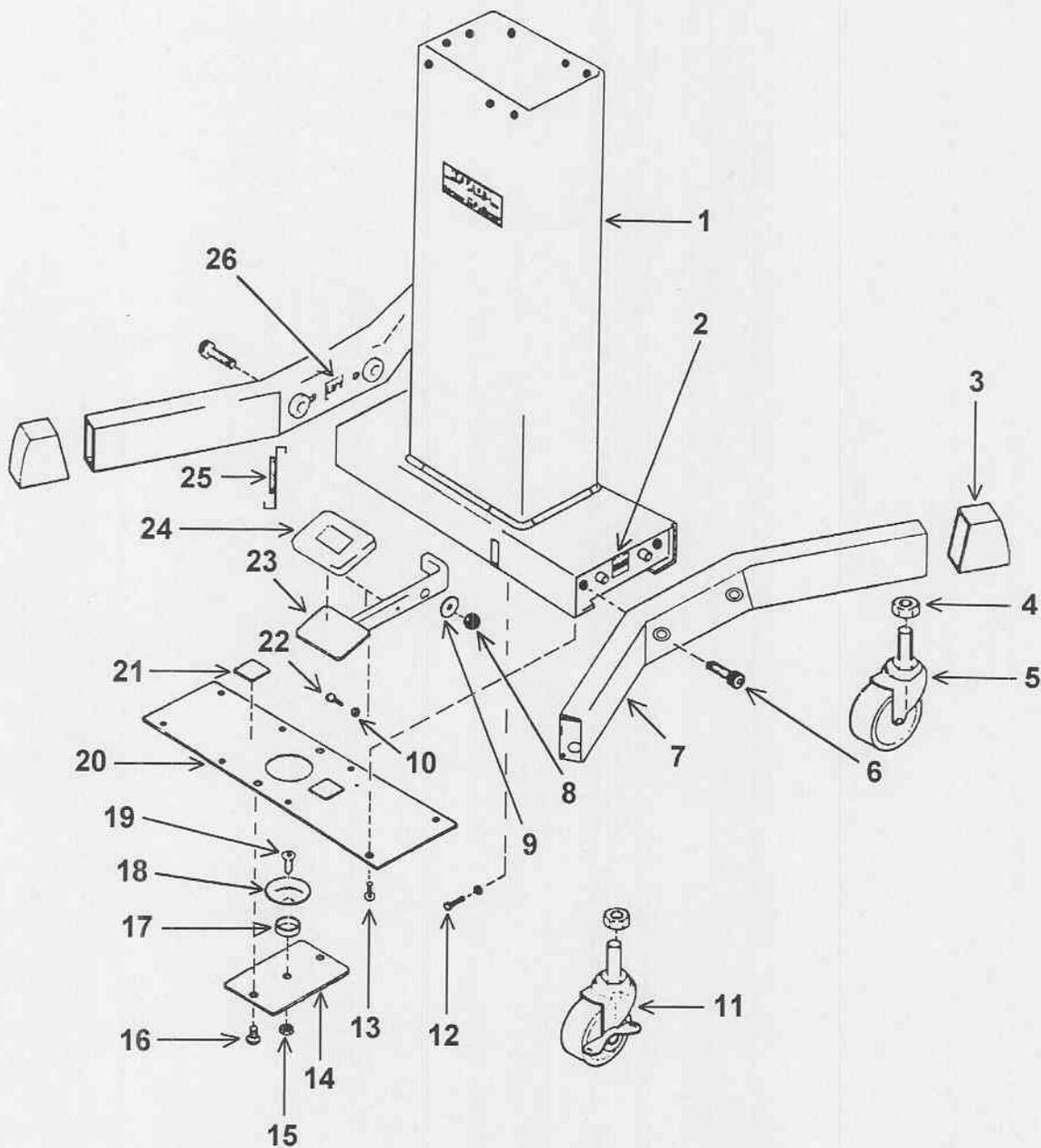


Figure E-2. Main pillar components.

Section II. REPAIR PARTS LIST FOR SLIT LAMP

(1) ILLUSTRATION		(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEASURE	(5) QTY
FIG NO.	ITEM NO.				
E-2	1		Main Pillar Assembly (5S434) GST-101	EA	1
E-2	2		Name Plate, Right Side (5S434) GST-302	EA	2
E-2	3		Cap, Tripod (5S434) Z-08-1	EA	4
E-2	4		Nut (5S434) 3N12S XZN	EA	4
E-2	5		Caster (5S434) KOS3T-108	EA	2
E-2	6		Bolt (5S434) 6S8X30S	EA	4
E-2	7		Tripod (5S434) GST-104	EA	2
E-2	8		Nut (5S434) 1N6S XZN	EA	1
E-2	9		Washer (5S434) FW6S XZN	EA	1
E-2	10		Nut (5S434) 1N4S XZN	EA	1
E-2	11		Caster with Brake (5S434) KOS3T-107	EA	2
E-2	12		Bolt (5S434) 6B4X12S XZN	EA	1
E-2	13		Screw (5S434) CD4X6S XZN	EA	8
E-2	14		Plate (5S434) GST-107	EA	1
E-2	15		Nut (5S434) 3N6S XZN	EA	1
E-2	16		Screw (5S434) CB6X8S XZN	EA	2
E-2	17		Collar (5S434) GST-108	EA	1

Section II. REPAIR PARTS LIST FOR SLIT LAMP

(1) ILLUSTRATION		(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEASURE	(5) QTY
FIG NO.	ITEM NO.				
E-2	18		Supporter, Gas Spring (5S434) TF-20-202	EA	1
E-2	19		Screw (5S434) CQ6X10S XZN	EA	1
E-2	20		Cover (5S434) GST-106	EA	1
E-2	21		Cushion, Rubber (5S434) TF-10-09	EA	2
E-2	22		Bolt (5S434) 6B4X12S XZN	EA	1
E-2	23		Pedal Assembly (5S434) GST-203	EA	1
E-2	24		Pedal Rubber (5S434) GST-205	EA	1
E-2	25		Spring (5S434) TF-10-18A	EA	1
E-2	26		Name Plate (Left Side) (5S434) GST-303	EA	2

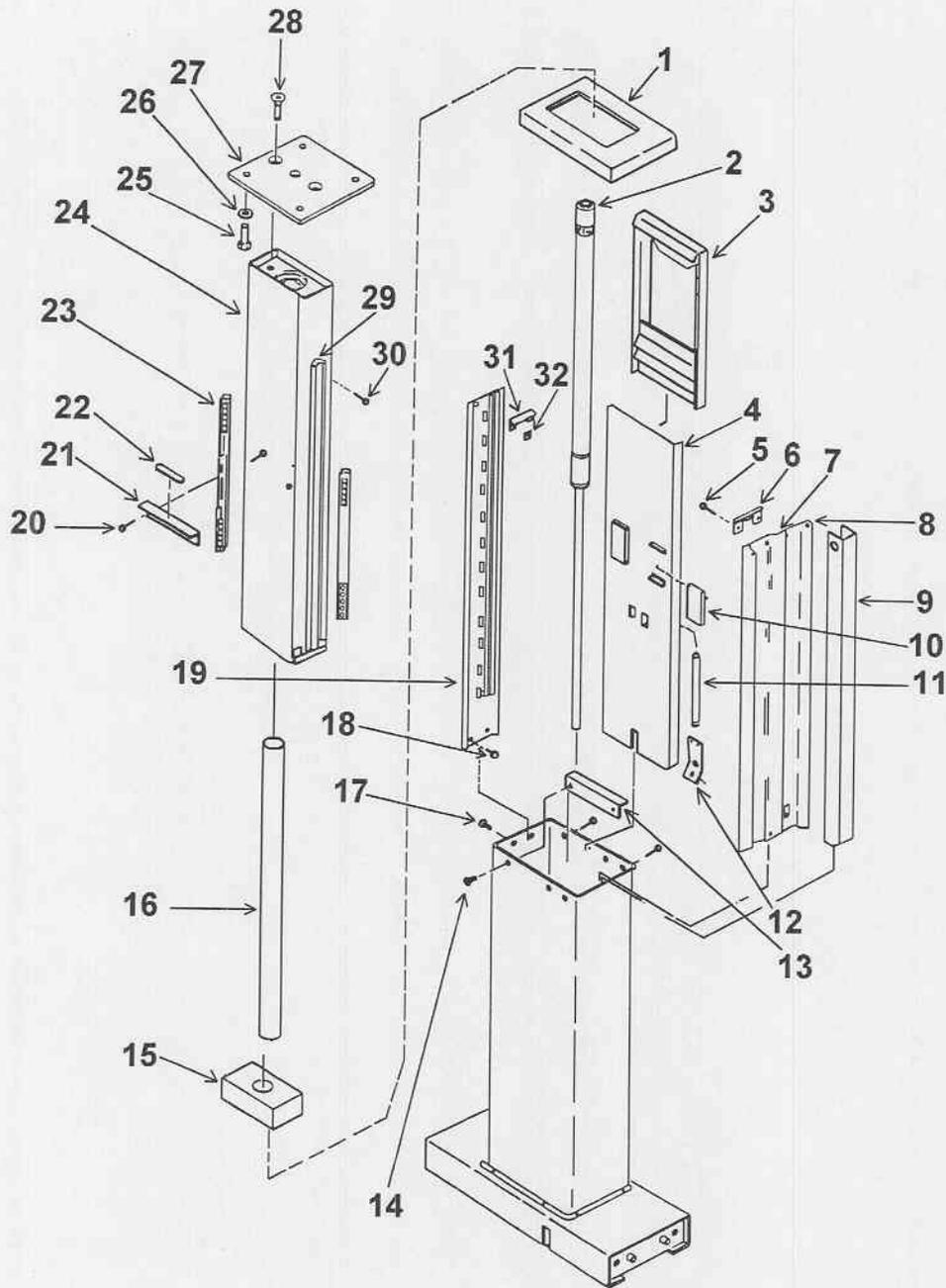


Figure E-3. Instrument stand components.

Section II. REPAIR PARTS LIST FOR SLIT LAMP

(1) ILLUSTRATION		(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEASURE	(5) QTY
FIG NO.	ITEM NO.				
E-3	1		Cap (5S434) TF-10-44	EA	1
E-3	2		Gas Spring (21 kg) (5S434) STCTA12-80	EA	1
E-3	3		Supporter Assembly (5S434) TF-10-39-1	EA	1
E-3	4		Brake Plate (5S434) GST-209	EA	1
E-3	5		Screw (5S434) CRC1 4X8S XZN	EA	2
E-3	6		Rail Retainer (Right) (5S434) TF-10-28	EA	1
E-3	7		Rail (Out) (5S434) TF-10-24	EA	4
E-3	8		Rail Supporter (Right) (5S434) GST-207	EA	1
E-3	9		Liner (5S434) K0SFT-209	EA	1
E-3	10		Brake Rubber (5S434) TF-10-35	EA	2
E-3	11		Spring (5S434) TF-10-37	EA	2
E-3	12		Spring Hook (5S434) GST-210	EA	1
E-3	13		Stopper (B) (5S434) TF-10-43	EA	1
E-3	14		Screw (5S434) CD4X8S XZN	EA	2
E-3	15		Gas Spring Guide (5S434) GST-214	EA	1
E-3	16		Gas Spring Guide (5S434) TZ-50-34-1	EA	1
E-3	17		Screw (5S434) CD4X10S XZN	EA	2
E-3	18		Screw (5S434) CD4X6S XZN	EA	2

Section II. REPAIR PARTS LIST FOR SLIT LAMP

(1) ILLUSTRATION		(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) UNIT OF MEASURE	(5) QTY
FIG NO.	ITEM NO.				
E-3	19		Rail Supporter (Left) (5S434) GST-206	EA	1
E-3	20		Screw (5S434) TCD4X8S XZN	EA	2
E-3	21		Stopper (A) (5S434) TF-10-42	EA	1
E-3	22		Stopper Rubber (5S434) TF-20-218	EA	1
E-3	23		Lightener Assembly (5S434) TZ-50-29-2	EA	2
E-3	24		Slide Pipe Assembly (5S434) GST-208	EA	1
E-3	25		Bolt (5S434) 6B8X20S XZN	EA	4
E-3	26		Washer (5S434) SW8S XZN	EA	4
E-3	27		Plate (5S434) K0S3T-203	EA	1
E-3	28		Screw (5S434) 6Q8X25S XZN	EA	2
E-3	29		Rail (In) (5S434) TF-10-31	EA	4
E-3	30		Screw (5S434) TCQ4X10S XZN	EA	2
E-3	31		Rail Retainer (Left) (5S434) TF-10-25	EA	1
E-3	32		Nut (5S434) SN4S XZN	EA	2
E-3	*		Gas Spring (17kg) (5S434) Optional	EA	1
E-3	*		Gas Spring (27kg) (5S434) Optional	EA	1

* Indicates parts not illustrated.

**Section III. SPECIAL TOOLS, TEST, AND SUPPORT EQUIPMENT
FOR
SLIT LAMP**

(1) ILLUSTRATION		(2)	(3)	(4)	(5)
FIG NO.	ITEM NO.	NATIONAL STOCK NUMBER	DESCRIPTION	UNIT OF MEASURE	QTY
<p>THERE ARE NO SPECIAL TOOLS, TEST, OR SUPPORT EQUIPMENT APPLICABLE FOR THIS END ITEM.</p>					

GLOSSARY

A (amp)	Ampere(s)
AC	Alternating current
AFR	Air Force regulation
AR	Army regulation
C	Operator or crew
CAGE	Commercial and government entity
cm	Centimeter
cm ³	Cubic centimeter
CN	Can
CTA	Common table of allowances
CVC	Calibration/verification/certification
D	Depot level maintenance
D	Diode
D	Diopter
DA	Department of the Army
DC	Direct current
DLA	Defense Logistics Agency
DLAM	Defense Logistics Agency manual
DPSC	Defense Personnel Support Center
DS	Direct support
EA	Each
F	Direct support maintenance
FM	Field manual
FSC	Federal supply class
FSCM	Federal supply code for manufacturers. This is an obsolete term. CAGE (commercial and government entity) is the correct acronym.
ft	Foot (feet)
GS	General support
H	General support maintenance
HV	High voltage
Hz	Hertz
in	Inch
ISO	International Standards Organization
JTA	Joint table of allowances
kg	Kilogram
lbs	Pounds

m	Meter
MAC	Maintenance allocation chart
MAN	Manual
MER	Medical Equipment Repairer
MFD	Manufactured
MFR	Manufacturer
mm	Millimeter
mmø	An optical measurement
MPL	Mandatory parts list
MTOE	Modified table of organization and equipment
N/A	Not applicable
NO. (No.)	Number
NSN	National stock number
O	Unit maintenance
PCB	Printed circuit board
PMCS	Preventive maintenance checks and services
QC	Quality control
QTY	Quantity
RO	Roll
RPL	Repair parts list
SB	Supply bulletin
SER.	Serial
TB	Technical bulletin
TDA	Table of distribution and allowances
TM	Technical manual
VA	Volt amperes
VAC	Volts alternating current
VDC	Volts direct current
W	Watts
°C	Degrees Celsius
°F	Degrees Fahrenheit

INDEX

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METRIC SYSTEM CONVERSIONS

<i>CHANGE</i>	<i>TO</i>	<i>MULTIPLY</i>	<i>CHANGE</i>	<i>TO</i>	<i>MULTIPLY</i>
inches	centimeters	2.540	centimeters	inches	.394
feet	meters	.305	meters	feet	3.280
yards	meters	.914	meters	yards	1.094
sq inches	sq centimeters	6.451	sq centimeters	sq inches	.155
sq feet	sq meters	.093	sq meters	sq feet	10.764
cubic feet	cubic meters	.028	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	milliliters	fluid ounces	.034
pints	liters	.473	liters	pints	2.113
quarts	liters	.946	liters	quarts	1.057
gallons	liters	3.785	liters	gallons	.264
ounces	grams	28.349	grams	ounces	.035
pounds	kilograms	.454	kilograms	pounds	2.205

TEMPERATURE CONVERSION

Degrees Fahrenheit to Degrees Celsius: $(^{\circ}\text{F} - 32) \times .5555 = ^{\circ}\text{C}$

Degrees Celsius to Degrees Fahrenheit: $(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$

WEIGHTS

1 gram = 10 decigrams = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds

CUBIC MEASURE

1 cu centimeter = 1000 cu millimeters = .06 cu inch
 1 cu decimeter = 1000 cu centimeters = 61.02 cu inches
 1 cu meter = 1000 cu decimeters = 35.31 cu feet

LINEAR MEASURE

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches

LIQUID MEASURE

1 centiliter = 10 milliliters = .34 fluid ounce
 1 deciliter = 10 centiliters = 3.38 fluid ounces
 1 liter = 10 deciliters = 33.81 fluid ounces