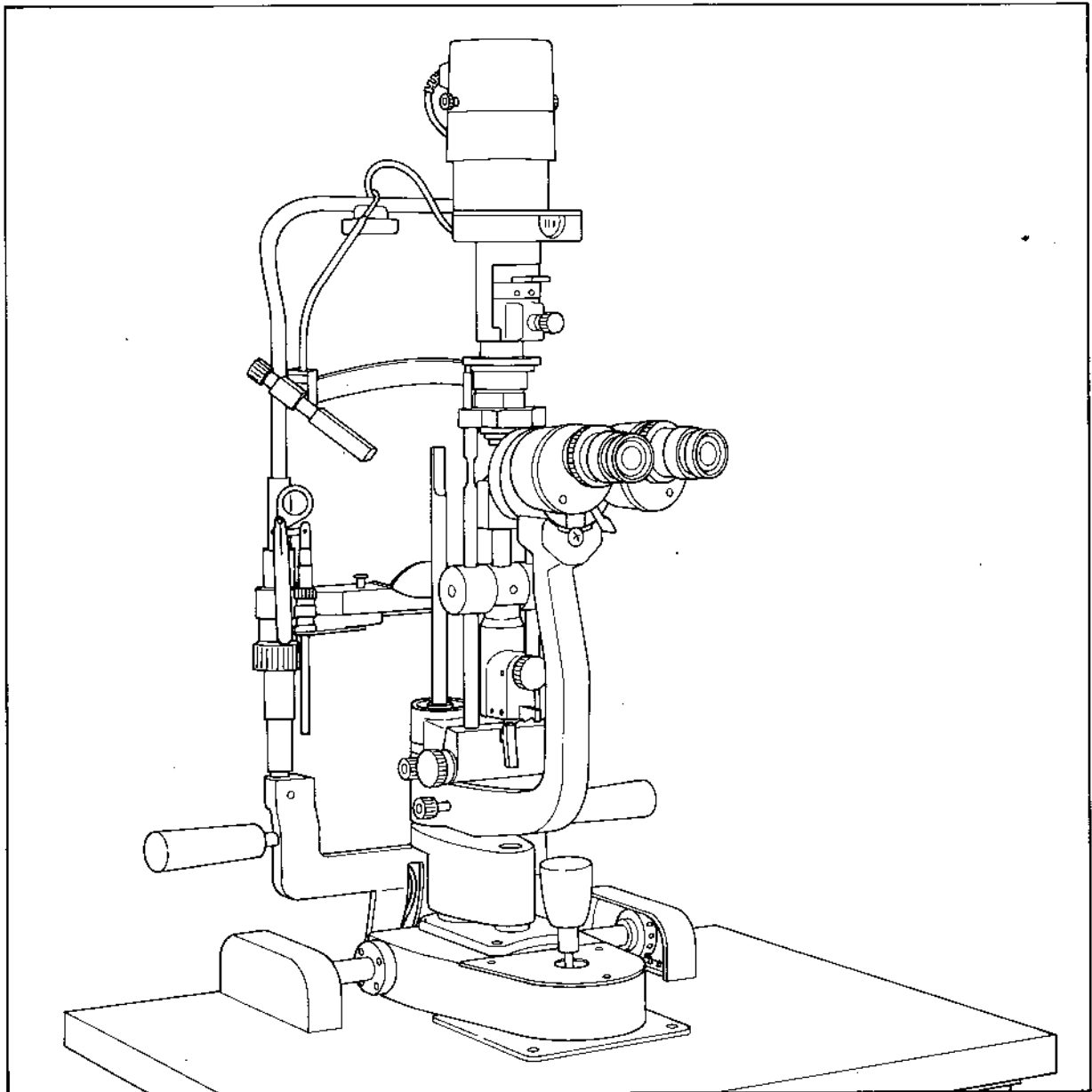


**Operation
Maintenance manual**



SLIT LAMP L-0185/L-0187



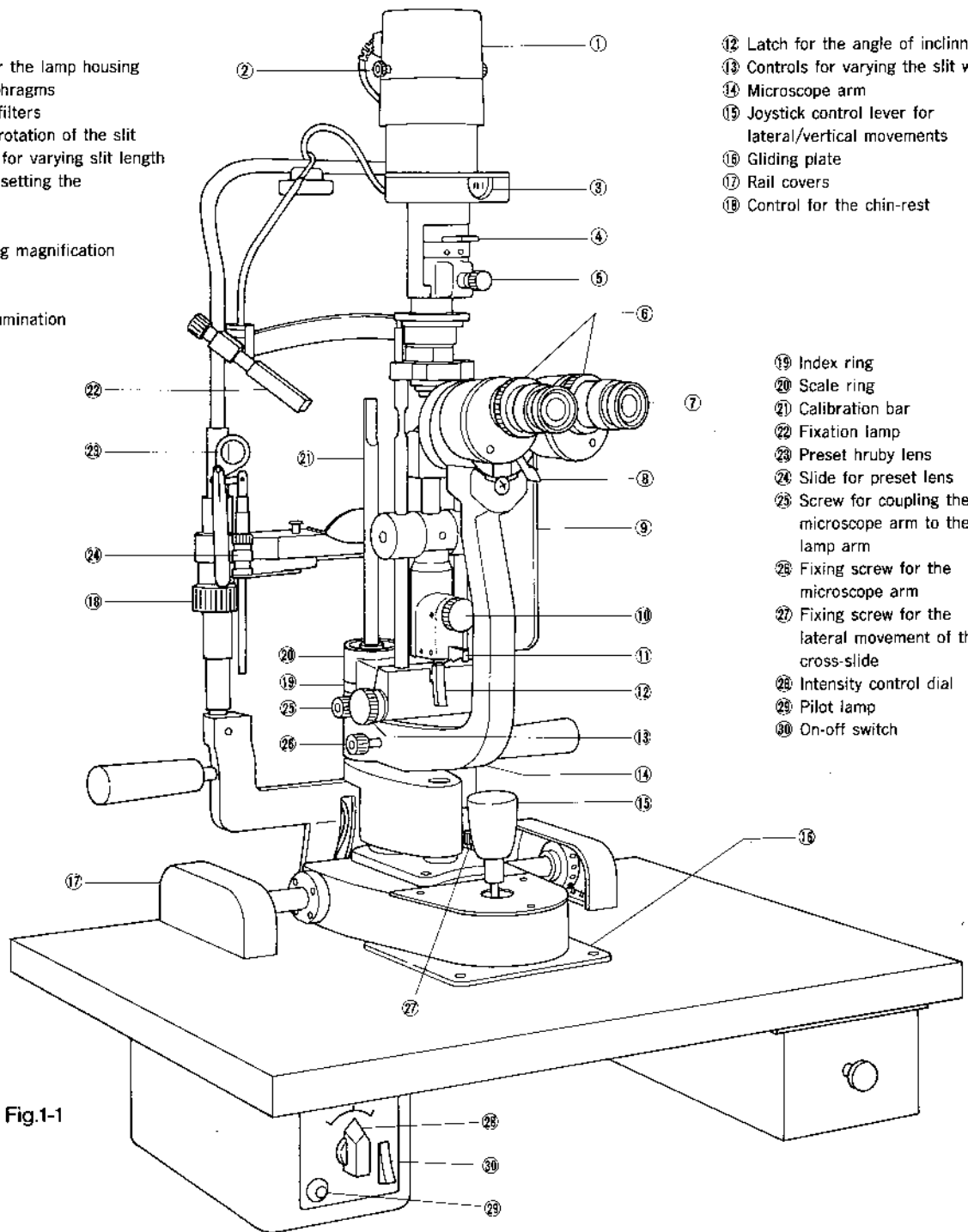
1. NOMENCLATURE OF L-0185 SLIT LAMP

The Latest of the top line 911 series, the New Slit Lamp Microscope, is now available in improved variations:

The Model L-0185 has been designed and built to INAMI traditionally high standards of quality.

- ① Lamp housing lid
- ② Clamping nuts for the lamp housing
- ③ Scale for slit diaphragms
- ④ Control lever for filters
- ⑤ Control lever for rotation of the slit and serrated dial for varying slit length
- ⑥ Knurled rings for setting the eyepieces
- ⑦ Eyepieces
- ⑧ Lever for changing magnification
- ⑨ Breath shield
- ⑩ Centering screw
- ⑪ 5° stops tilting illumination

- ⑫ Latch for the angle of inclination
- ⑬ Controls for varying the slit width
- ⑭ Microscope arm
- ⑮ Joystick control lever for lateral/vertical movements
- ⑯ Gliding plate
- ⑰ Rail covers
- ⑱ Control for the chin-rest



- ⑲ Index ring
- ⑳ Scale ring
- ㉑ Calibration bar
- ㉒ Fixation lamp
- ㉓ Preset hruby lens
- ㉔ Slide for preset lens
- ㉕ Screw for coupling the microscope arm to the lamp arm
- ㉖ Fixing screw for the microscope arm
- ㉗ Fixing screw for the lateral movement of the cross-slide
- ㉘ Intensity control dial
- ㉙ Pilot lamp
- ㉚ On-off switch

Fig.1-1

Specifications:

• Binocular microscope

Eyepieces: 10X, and 16X **Objectives:** 1X, 1.6X **Total magnifications:** 10X, 16X and 25X **P.D.adjustment:** 52.90mm(w/10X eyepiece)

• Illumination unit

Slit image rotation: 0-180° **Tilting illumination:** 5, 10, 15, and 20° **Filter disc:** Cobalt filter, open aperture, and heat absorption, 50% ND and light-blue filters **Slit diaphragm disc:** 10, 6, 4, 3, 2, 1 and 0.2mm:wedge-shaped deaphragm for variable slit lengths

Up/down control: Coaxial with joystick operation **Lamp:** Pre-focused, Halogen 12V, 4.2A(L0160-H1)

• Optional accessories: Applanation tonometer

2. NOMENCLATURE OF L-0187 SLIT LAMP

The INAMI L-0187 Slit Lamp provides the practitioner with all the features required to perform a complete slit lamp examination. It has been designed and built to INAMI traditionally high standards of quality.

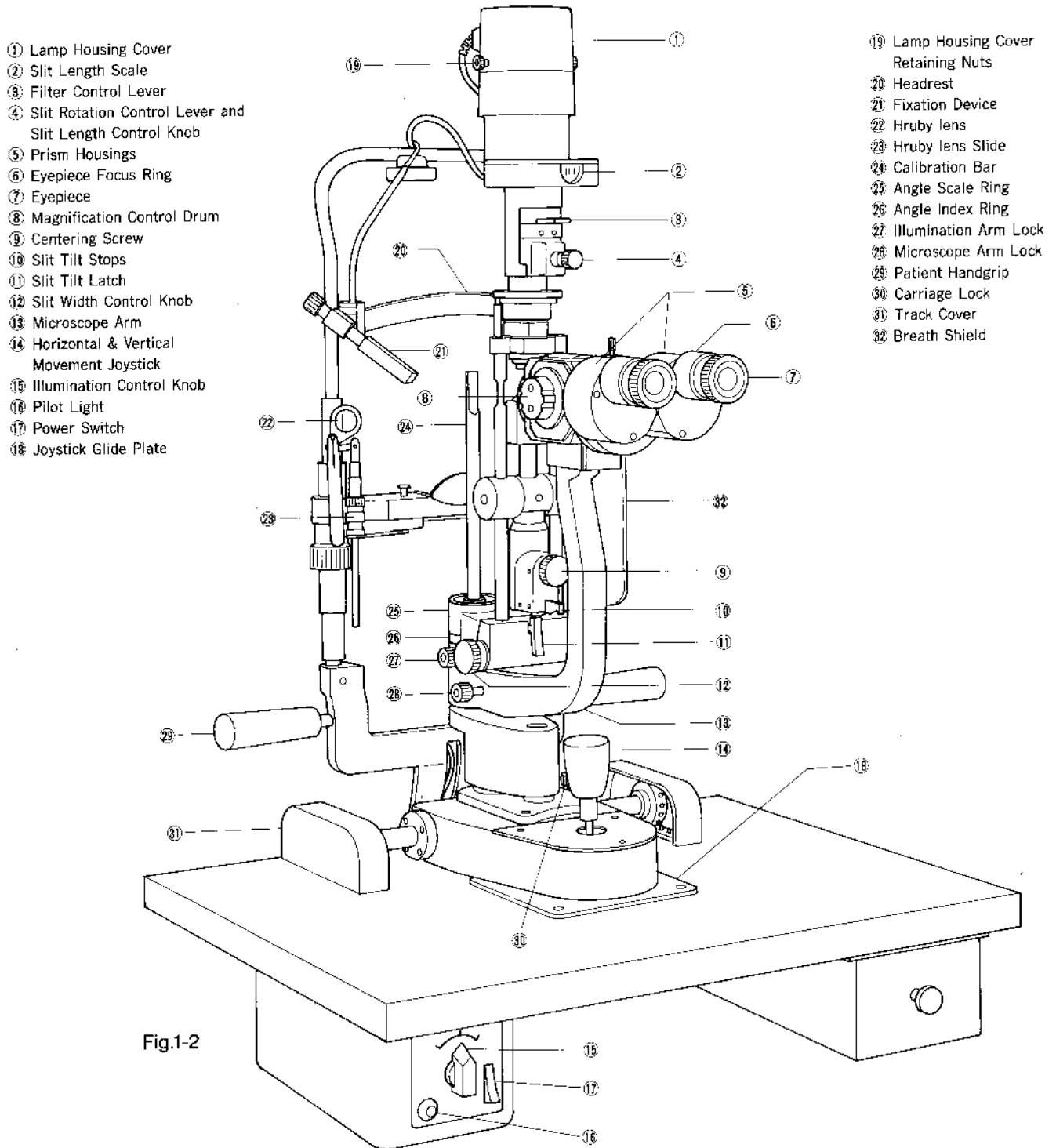


Fig.1-2

Specifications:

• Parallel tube stereomicroscope

Eyepieces: 15X **Variable magnification:** 10X, 16X and 25X **Working distance:** 98mm **Eyepiece focus adjustment:** + 6D to - 6D
P.D.adjustment: 48 - 78mm

• Illumination system

Slit length: 0.2, 1, 3, 4, 6, 10mm steps and continuously variable 0 - 10mm **Slit width:** Continuously variable from 0 - 10mm
Slit image rotation: 0 - 180° **Slit tilt:** 5, 10, 15, and 20° **Filter disc:** Open, cobalt blue, 50% neutral density, heat absorbing, red-free green **Lamp:** 12V, 50W halogen, prefocused

• **Optional accessories:** Applanation tonometer, Beam splitter module, Teaching tube with image rotation, 35mm camera adaptor, 35mm SLR camera body with automatic film advance, CCD TV Camera & adaptor

3. UNPACKING AND ASSEMBLY

INAMI Slit Lamp is packed for shipment in three stacking, molded polystyrene foam containers and covered with a sheet of foam material (Fig. 2). These containers are over-packed with a sturdy corrugated cardboard carton.

The upper container (Fig. 3) holds the headrest assembly and the fixation device.

The middle container (Fig. 4) holds the cross-slide instrument base with the microscope mounted on the supporting arm, the illumination unit with its supporting arm, the focusing rod and the three hexagonal wrenches required for assembly.

The lower container (Fig. 5) holds the tabletop with the attached transformer and accessory drawer.

The accessory drawer contains the following items:

- | | |
|------------------------|-------------------|
| Spare main lamp | Chinrest papers |
| Spare fixation lamp | Dust cover |
| Spare fuses | Patient handgrips |
| Spare mirror | Hand rest |
| Hruby lens | Breath shield |
| Hruby lens guide plate | |

Remove the tabletop from the lower container and remove the contents of the accessory drawer. Place the tabletop upside down on a table or other suitable work surface. The headrest side of the tabletop should be toward the assembler, with the top slightly overhanging the edge of the work surface.

Remove the two hex socket screws from the headrest mounting plate with one of the wrenches supplied (Fig. 6).

Remove the two thumb screws holding the plastic wire retaining plate (Fig. 7).

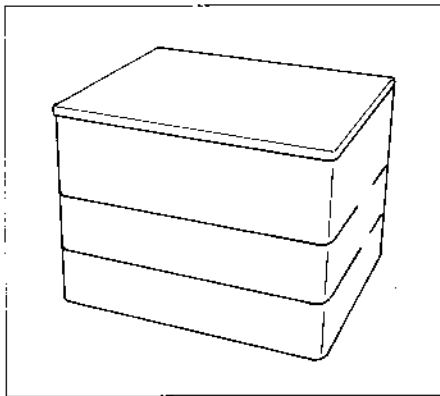


Fig. 2 Shipping Container

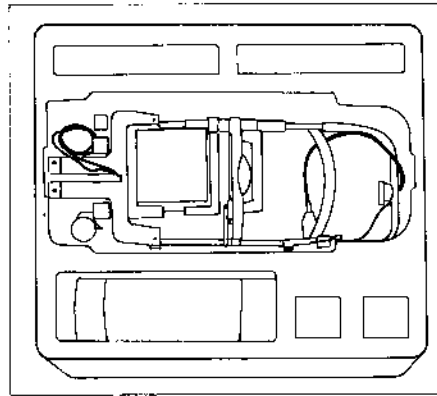


Fig. 3 Upper Container

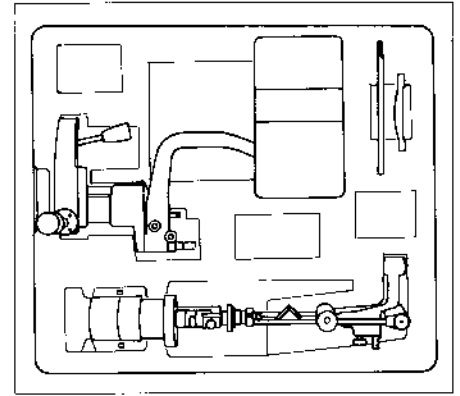


Fig. 4 Middle Container

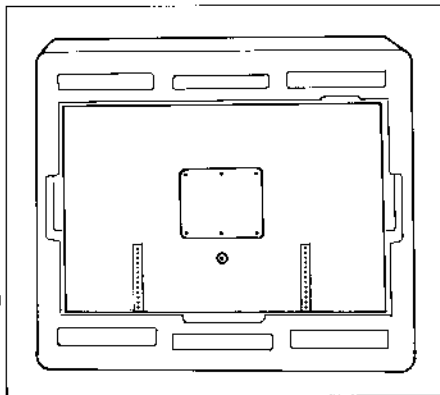


Fig. 5 Lower Container

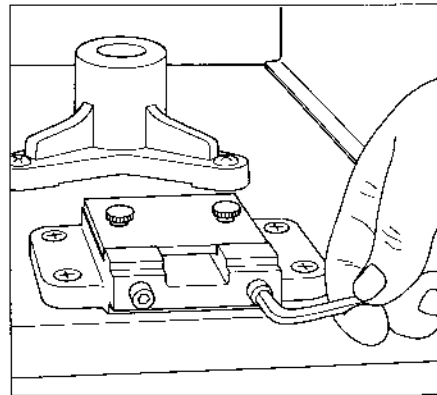


Fig. 6 Removing Headrest Mounting Plate Hex Screws

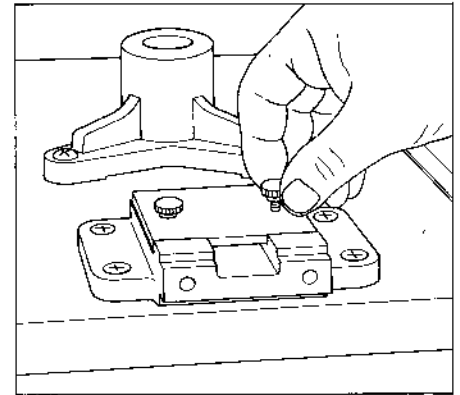


Fig. 7 Removing Thumbscrews from Plastic Wire Retaining Plate

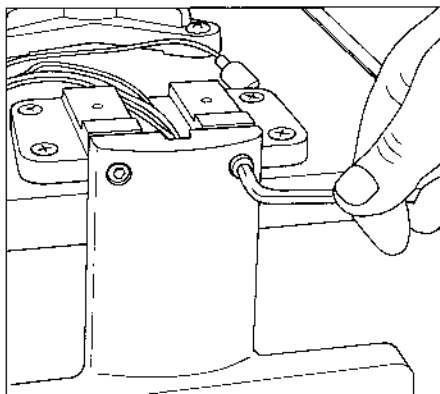


Fig. 8 Attaching the Headrest to the Mounting Plate

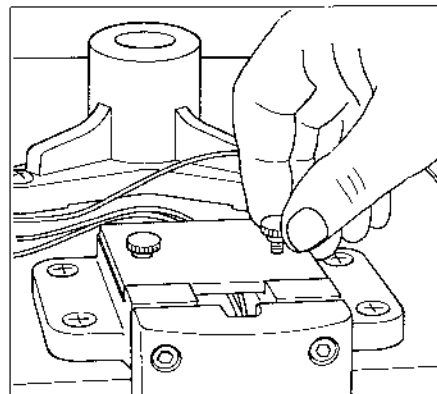


Fig. 9 Replacing the Wire Retaining Plate

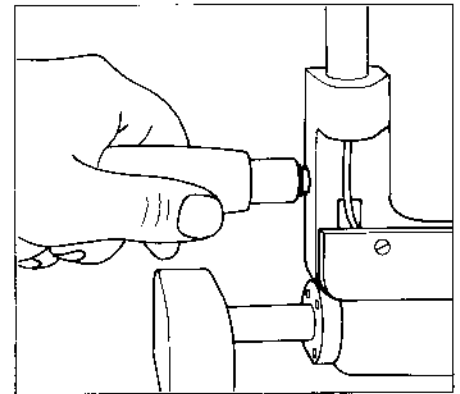


Fig. 10 Attaching the Handgrips

Assemble the headrest to the mounting plate. Be sure that the tongue of the plate engages the groove in the headrest. The wires should be located as shown in the grooves in the plate and headrest (Fig. 8). Tighten the two screws securely.

Replace the wire retaining plate and tighten the thumb screws as shown in Fig. 9.

Turn the tabletop and headrest assembly rightside up.

Remove the plug screws and screw the two patient hand grips into the sockets as shown in Fig. 10.

Place the cross-slide instrument base and microscope unit on the tabletop so that the perforated rollers engage the pinned tracks on the tabletop, and the joystick rests on the glide plate. The rollers should engage the same pins on each track. Test the action of the joystick and cross-slide by operating the assembly through its full forward/backward and left/right travels.

Connect the four-pin plug and receptacle as shown in Figs. 11 and 12.

Install the track covers 31 (Fig. 1-2) by sliding the cover

tabs under the track.

Install the illumination unit by sliding it carefully over the cross-slide assembly shaft as shown in Fig. 13. Tighten the retaining screw as shown in Fig. 14 with the hex wrench supplied.

Connect the two cable plugs to the receptacles at the back of the transformer case as shown in Fig. 15. Connect the main lamp plug to the three pins on the lamp housing cover.

Place the focusing rod in the hole provided in the cross-slide assembly shaft with the flat side of the rod facing the microscope as shown in Fig. 16. Set the illumination system and the microscope perpendicular to the flat surface as shown. Remove the eyepiece and objective lens caps. Turn the instrument on, and while observing a narrow slit image on the rod surface, check the instrument for proper focus and image centration.

Attach the breath shield 9 (Fig. 1-1) to the microscope arm.

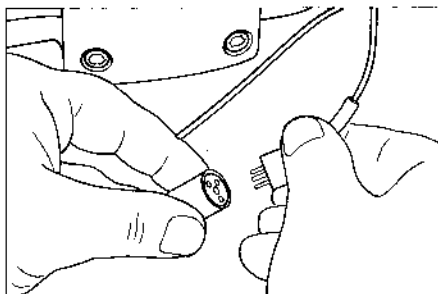


Fig. 11 Connecting the Four-Pin Plug and Receptacle

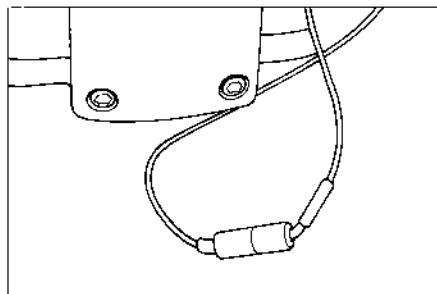


Fig. 12 Plug and Receptacle Connected

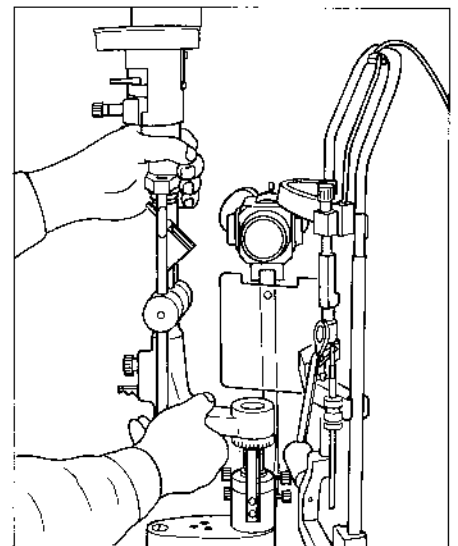


Fig. 13 Installing the Illumination Unit

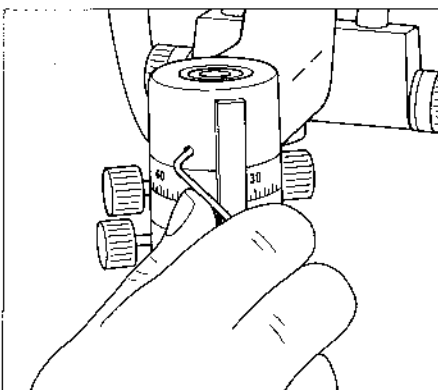


Fig. 14 Tightening the Illumination Unit Retaining Screw

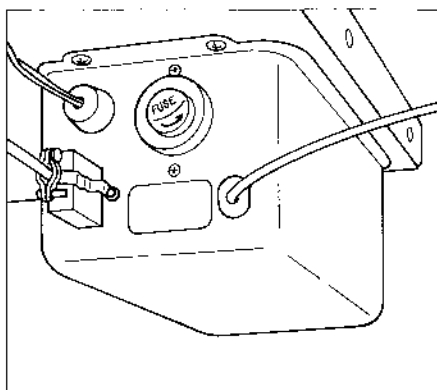


Fig. 15 Transformer Case-Rear View

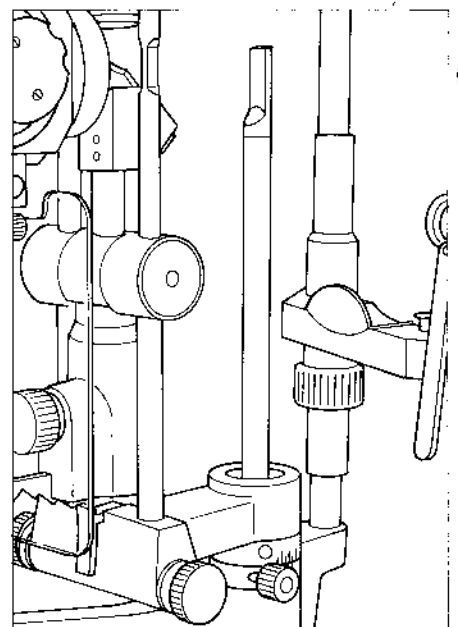


Fig. 16 The Focusing Rod in place

4. OPERATION

Adjust the microscope before beginning the examination. If the user is emmetropic, or is wearing a distance correction, focus the eyepieces at zero by rotating the focusing rings, 6 (Fig. 1-1), until the index marks coincide with the 0 on the adjacent scales. If the operator is ametropic and is not wearing a correction, set the distance spherical equivalent of the correction for each eye on the scale. If a significant amount of astigmatism is present, the user should wear the distance correction.

Adjust the interpupillary distance by grasping the prism housings, 5 (Fig. 1-2), and rotating them to the correct value according to the scale below the right eyepiece.

Seat the patient facing the headrest and adjust the instrument and/or the chair height so that the patient and the operator are seated comfortably. Have the patient lean forward, resting the forehead on the headrest. Adjust the chinrest using control, 18 (Fig. 1-1), so that the patient's eyes are aligned with the canthus mark.

Move the instrument approximately to the correct position by grasping the joystick, 27 (Fig. 1-1), and moving the lamp and microscope together in the required directions. Turn the slit lamp on with the main power switch, F (Fig. 17). The pilot light, E, indicates power is on. Regulate the brightness of the illumination with knob D. Adjust and focus the fixation lamp, 22 (Fig. 1-1), to obtain the desired direction of the patient's gaze.

Continue to refine the alignment until the slit image is properly positioned, and is approximately in focus to the unaided eye, by tilting the joystick and rotating for the vertical movement, 27 (Fig. 1-1). Obtain final alignment and focus by observation through the microscope.

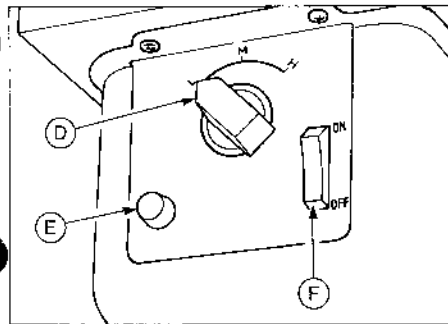


Fig. 17 Illumination Controls
D. Illumination Knob
E. Pilot Light
F. Main Power Switch

Rotate either of the slit width control knobs, 13 (Fig. 18), to vary the slit width. These knobs are also used as handles to rotate the illumination system to the left or right. The angle between the microscope and the illumination system can be adjusted from 0° to 90° on either side. This angle is indicated by a scale, 20 (Fig. 1-1). The scale on the left side slit width control indicates the width of the slit, 37 (Fig. 19).

The projected slit can be rotated about the optical axis continuously from vertical to horizontal by pushing the control, 4 (Fig. 20), to the left or right. Slit angles of 45° , 90° and 135° are indicated by click stops.

The illumination system can project an inclined slit image in 5° increments up to 20° below the horizontal. This is valuable in gonioscopy and fundus examination.

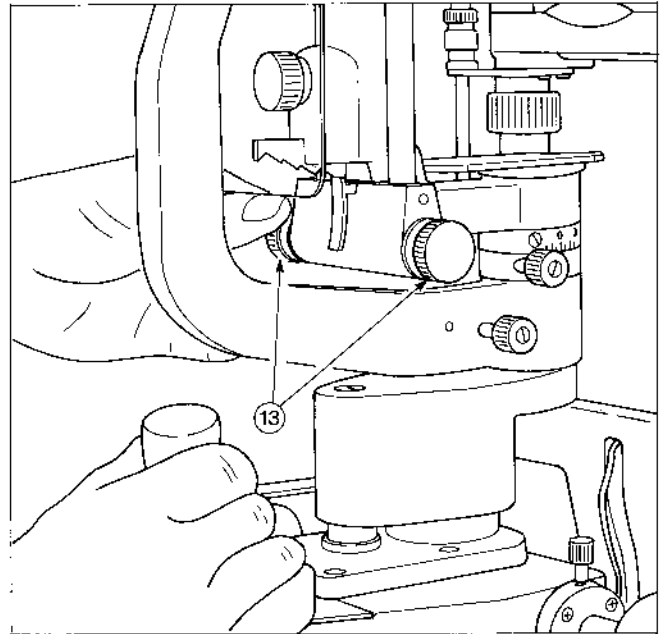


Fig. 18 Slit Width Control Knobs, 13

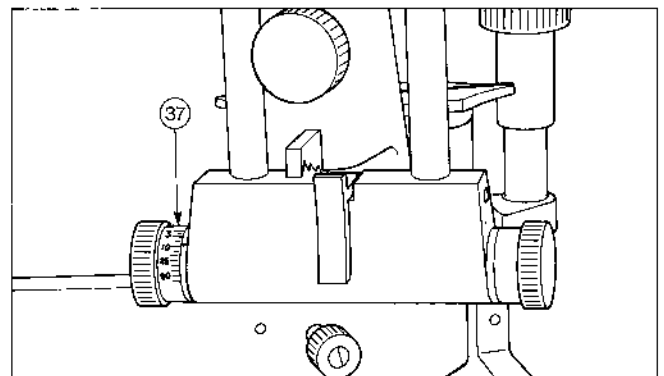


Fig. 19 Slit Width Control Scale, 37

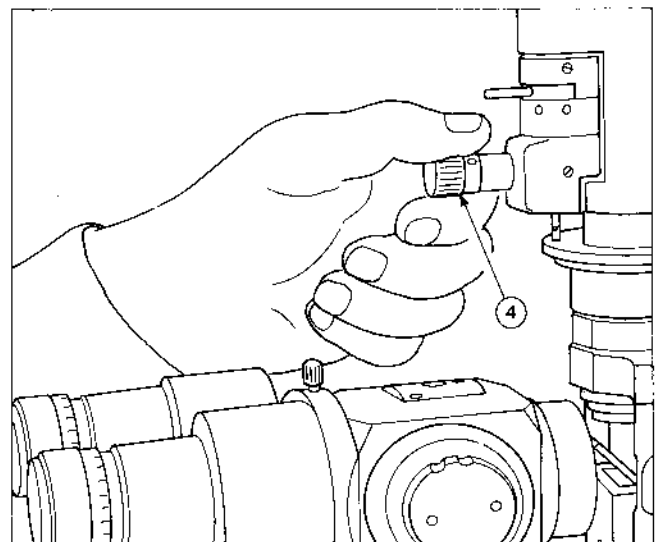


Fig. 20 Slit Orientation Control, 4

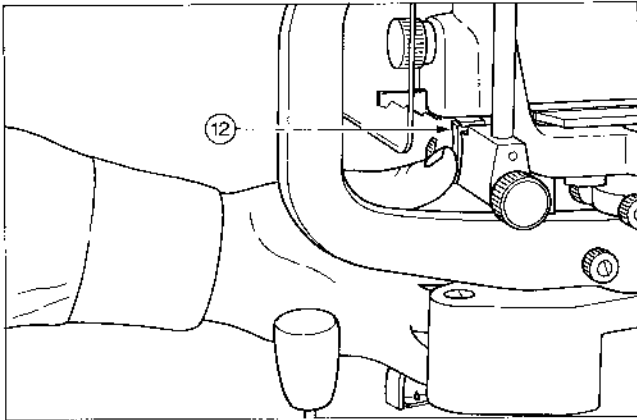


Fig. 21 Tilt Control Latch, 12

The system is tilted by depressing latch, 12 (Fig. 21), and pulling the base of the illumination system toward the operator, (Fig. 22). The latch is released to engage the desired tilt stop.

The illumination system also contains a filter disc and an aperture disc. The filter disc is controlled by lever 3, (Fig. 23). This disc contains filters in the following order: a cobalt blue filter (for fluorescein examinations), an open aperture, a heat absorbing filter, a 50% neutral density filter and a red free filter. The aperture disc is operated by turning the control knob, 4 (Fig. 23), to adjust the length of the projected slit. Fixed apertures are provided for 10, 6, 4, 3, 1 and 0.2mm. Continued rotation of control knob, 4, introduces a wedge-shaped diaphragm for producing continuously variable slit lengths in a range from 1 to 10mm. The length of the slit is indicated by scale, 2 (Fig. 24). Retrograde illumination, indirect illumination and lateral scanning of the slit can be accomplished by loosening the centering screw, 11 (Fig. 25), and rotating the illuminating system about its vertical axis. For normal use, the slit image is recentered automatically by tightening the screw.

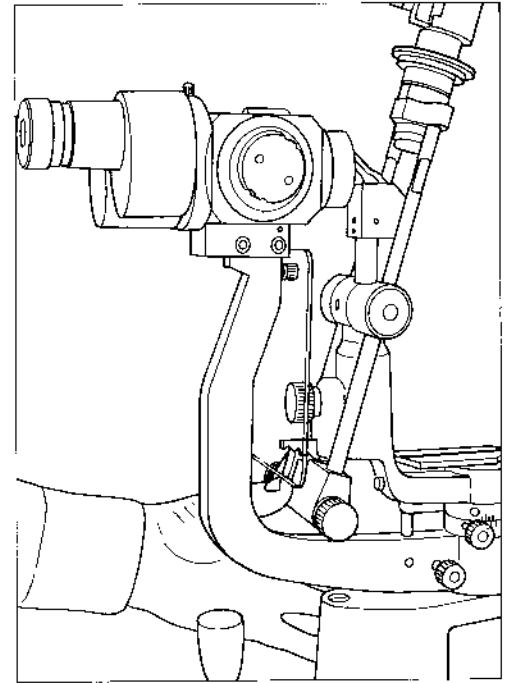


Fig. 22 Tilting the System

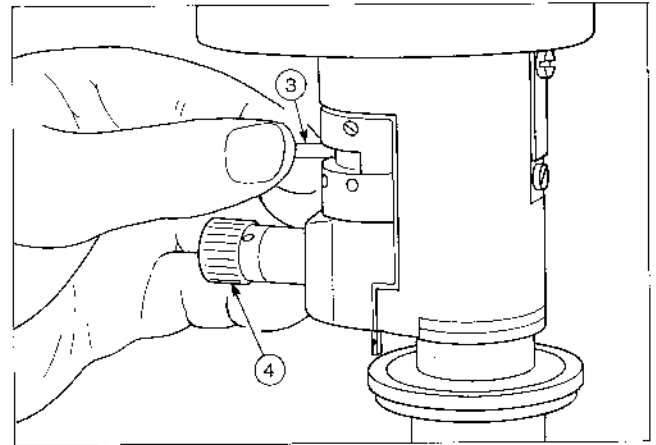


Fig. 23 Illumination System Controls
3. Filter Disc Lever
4. Aperture Disc Control Knob

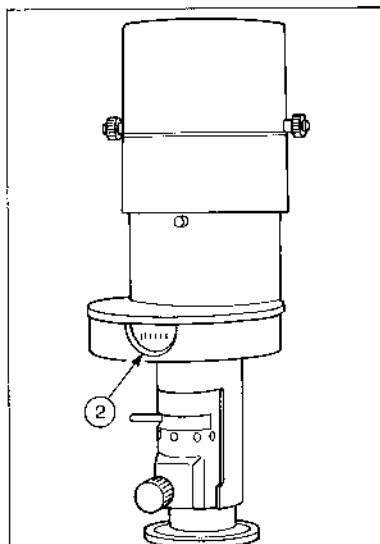


Fig. 24 Slit Length Scale, 2

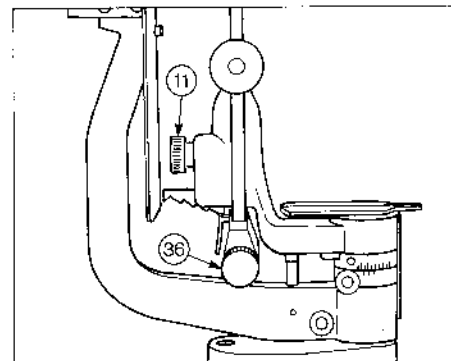
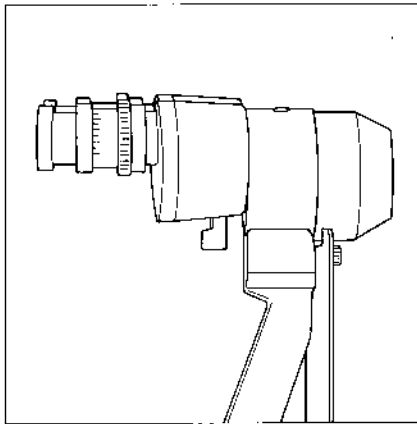
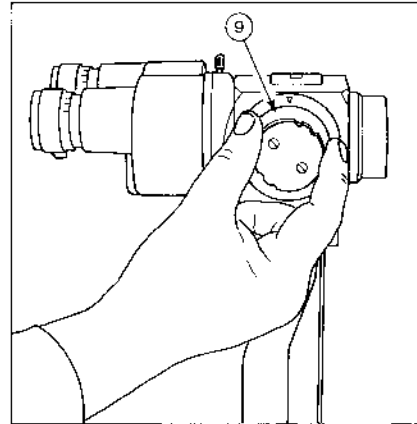


Fig. 25 11. Centering Screw
36. Friction Adjusting Screw



L-0185

By changing the eyepieces total magnifications up to 10X, 16X, and 25X.



L-0187

Fig. 26 Magnification Control Drum, 9

The microscope has objectives providing total magnifications of 10X, 16X, and 25X. The magnification is controlled by the drum, 9 (Fig. 26). The objectives are parfocal and the working distance is constant for any magnification. If the microscope is focused at a high magnification, all lower magnifications will also be in focus.

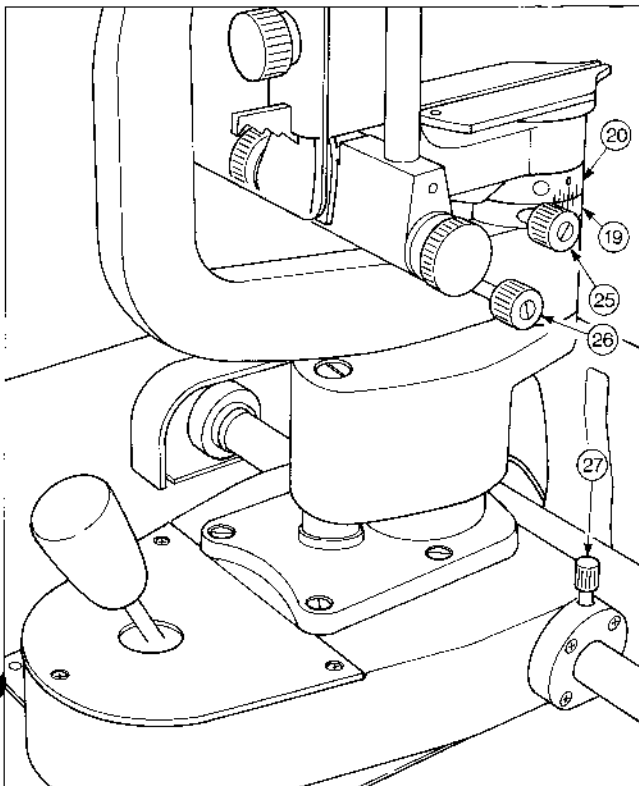


Fig. 27 Instrument Base
 20. Scale Ring
 19. Index Ring
 25. Illumination Arm Lock
 26. Microscope Arm Lock
 27. Horizontal Motion Lock

The lateral movement of the instrument base may be locked by tightening screw, 27 (Fig. 27). The microscope and illumination system can swing independently or together about the vertical pivot axis. The two units will move together with any fixed angle between them when knob 25, (Fig. 27), is tightened and knob 26, is loosened. The microscope rotation can be locked by tightening knob 26, and loosening knob 25 leaving the illumination system free to pivot around the axis. The index ring 19 and the scale ring 20 indicates the angle between the microscope and illumination systems. A detent is provided for the 0°, 10° right and

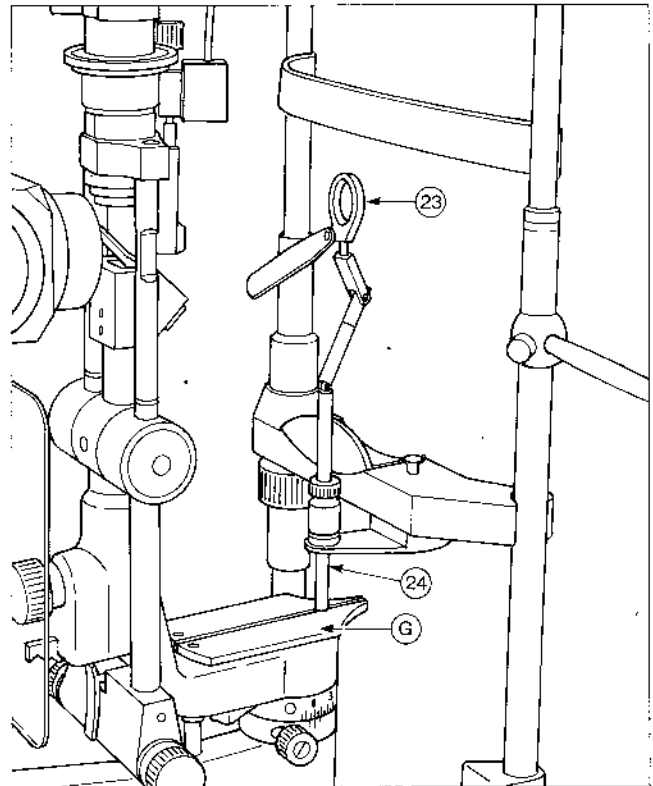


Fig. 28 Positioning the Hruby Lens
 23. Hruby Lens
 24. Slide
 G. Guide Plate

10° left positions.

Examination of the posterior vitreous and the fundus can be made either with the fundus contact lens or with the Hruby Lens. For initial orientation use a relatively low magnification and low illumination. When the Hruby Lens, 23, the slide, 24, and the guide plate are arranged as shown in Fig. 28, the lens will follow every movement of the slit lamp. Minimal adjustment of the lens is then required during the examination.

Normally, the settings of the illumination control will provide suitable slit illumination for the examination.

5. MAINTENANCE

Main Lamp Replacement

The main lamp is a halogen lamp which operates for long periods without blackening of the glass envelope. When it is eventually necessary to replace the lamp, it can be done quickly and easily by using the following procedure.

CAUTION

Allow sufficient time for the lamp to cool before replacement. Metal and glass parts of the lamp can be hot enough to burn the fingers even if the instrument has been in use for only a short time.

Loosen the two lamp housing cover retaining nuts 2, (Fig. 29). Remove the cover as shown in Fig. 30. Remove the old lamp as shown in Fig. 31 and replace it with a new one. The lamps are pre-focused and aligned so it is only necessary to be certain that the notch in the lamp base engages the tab on the lamp housing 35, (Fig. 32).

Replace the lamp housing cover and press down against the spring force while tightening the two retaining nuts.

Fixation Lamp Replacement

Remove the front portion of the fixation device by rotating it counterclockwise and pulling it off. Unscrew the old lamp and replace it with a new one. Reassemble the front portion by pushing it on and turning it clockwise.

Mirror Replacement

Tilt the illumination system by releasing the latch 12, (Fig. 21). Grasp the narrow shank of the mirror by its edges and pull upward as shown in Fig. 33.

Mirror Cleaning

Remove dust accumulation with a camel's hair brush. After brushing, finger marks can be removed, if necessary, with isopropyl alcohol and a cotton swab. Dry with a facial tissue.

Eyepiece Lens Cleaning

Finger marks can be removed by the same method used for the mirror. A minimum of alcohol should be used in this case.

Exterior Surface Cleaning

Clean the exterior surfaces, especially the joystick glide plate, by wiping with a soft, dry cloth. Do not use commercial or household cleaners.

Slit Width Control Adjustment

The friction applied to the slit width control can be adjusted for the user's preference. Loosen or tighten the small screw 36, (Fig. 25) at the center of the control to change the amount of force required to turn the knob. The screw should be tight enough to insure that the slit does not close spontaneously.

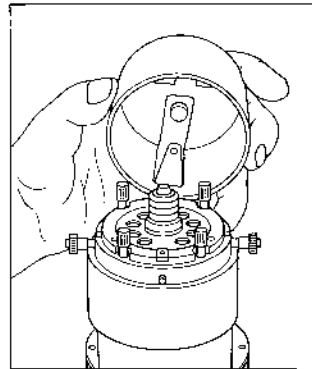


Fig. 30 Lamp Housing Cover Removal

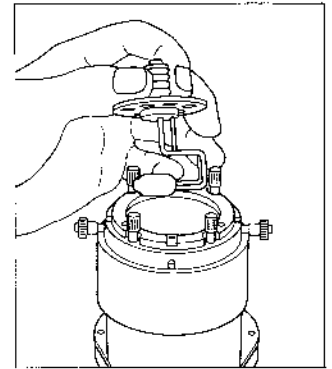


Fig. 31 Lamp Removal

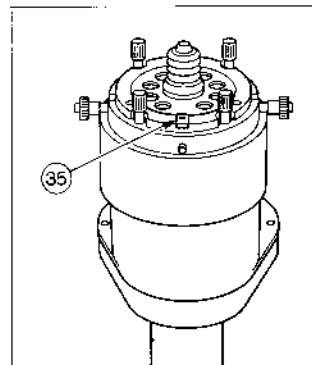


Fig. 32 Lamp Alignment Tab, 35

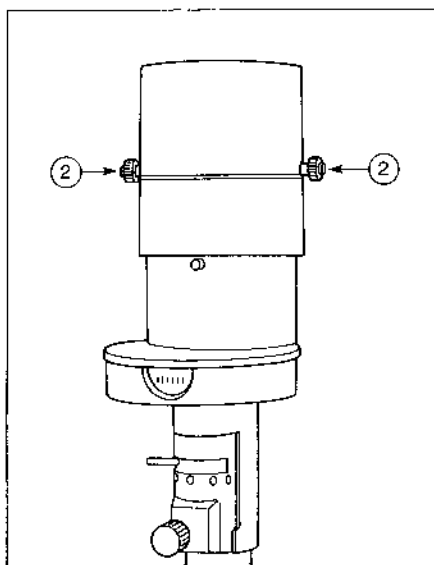


Fig. 29 Lamp Housing Cover Retaining Nuts, 2

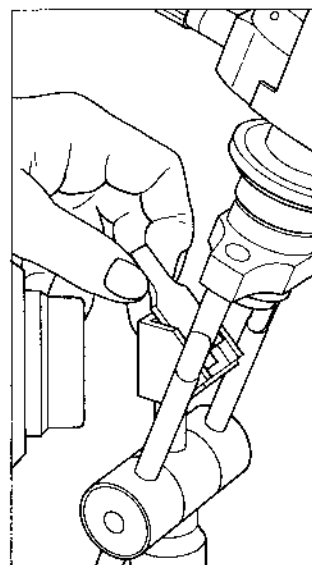


Fig. 33 Mirror Replacement

6. WIRING

