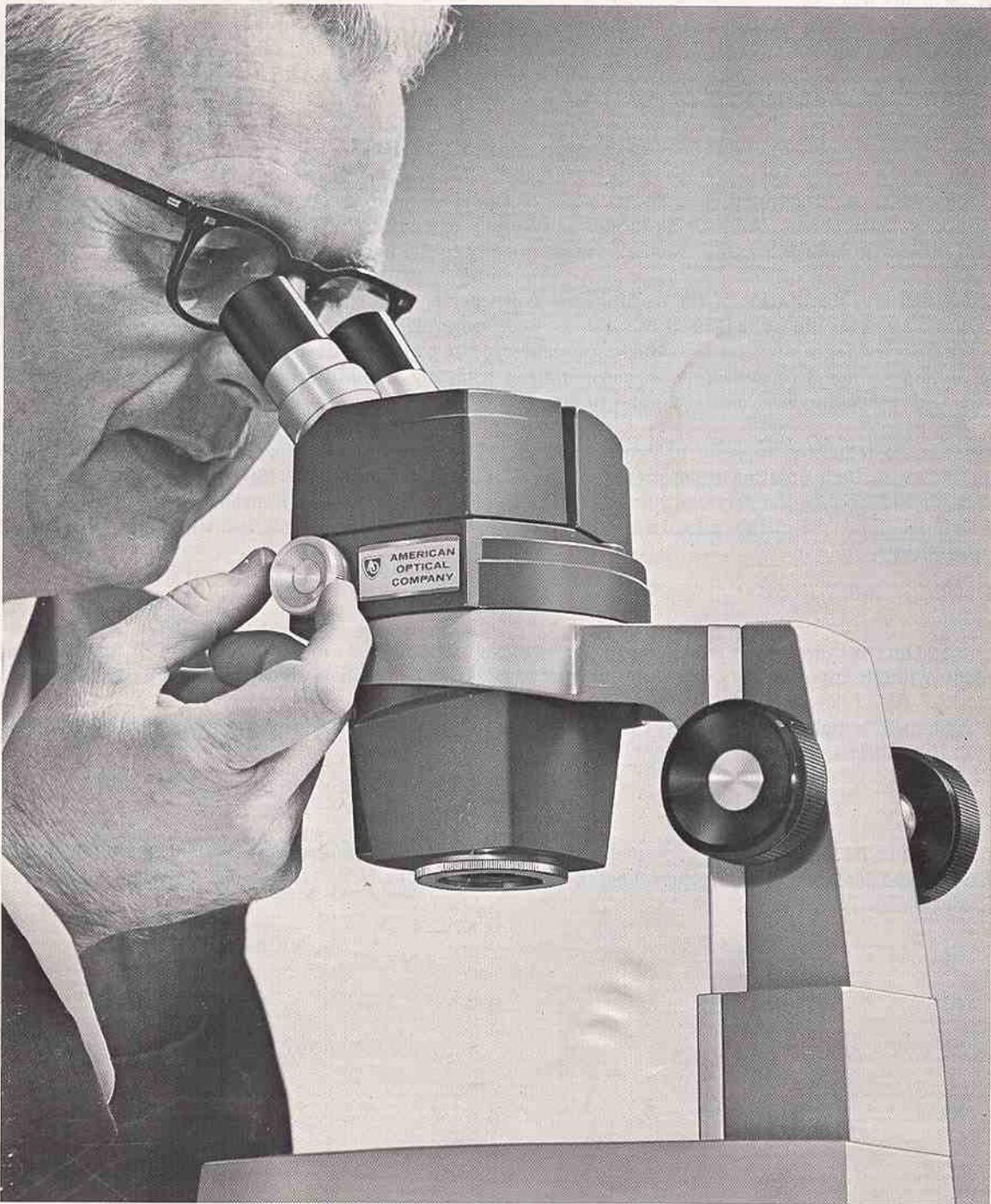


# AO® STEREOSTAR®/ZOOM Stereoscopic Microscope

## REFERENCE MANUAL



**AO** American Optical  
SCIENTIFIC INSTRUMENT DIVISION  
BUFFALO, NY 14215

Price \$1.00

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American Optical Corporation reserves the right to change designs or to make additions to or improvements in its products without imposing any obligations on itself to add such to products previously manufactured.

The equipment supplied may not agree in all details with our descriptions or illustrations because instruments are subject to modification and improvement.

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Repairs should be performed only by qualified service personnel. Complete repair facilities are available at many AO authorized dealers, and AO Technical Service Centers in Buffalo, N.Y., Chicago, Ill., Glendale, Calif., Springfield, N.J., and Dallas, Texas.

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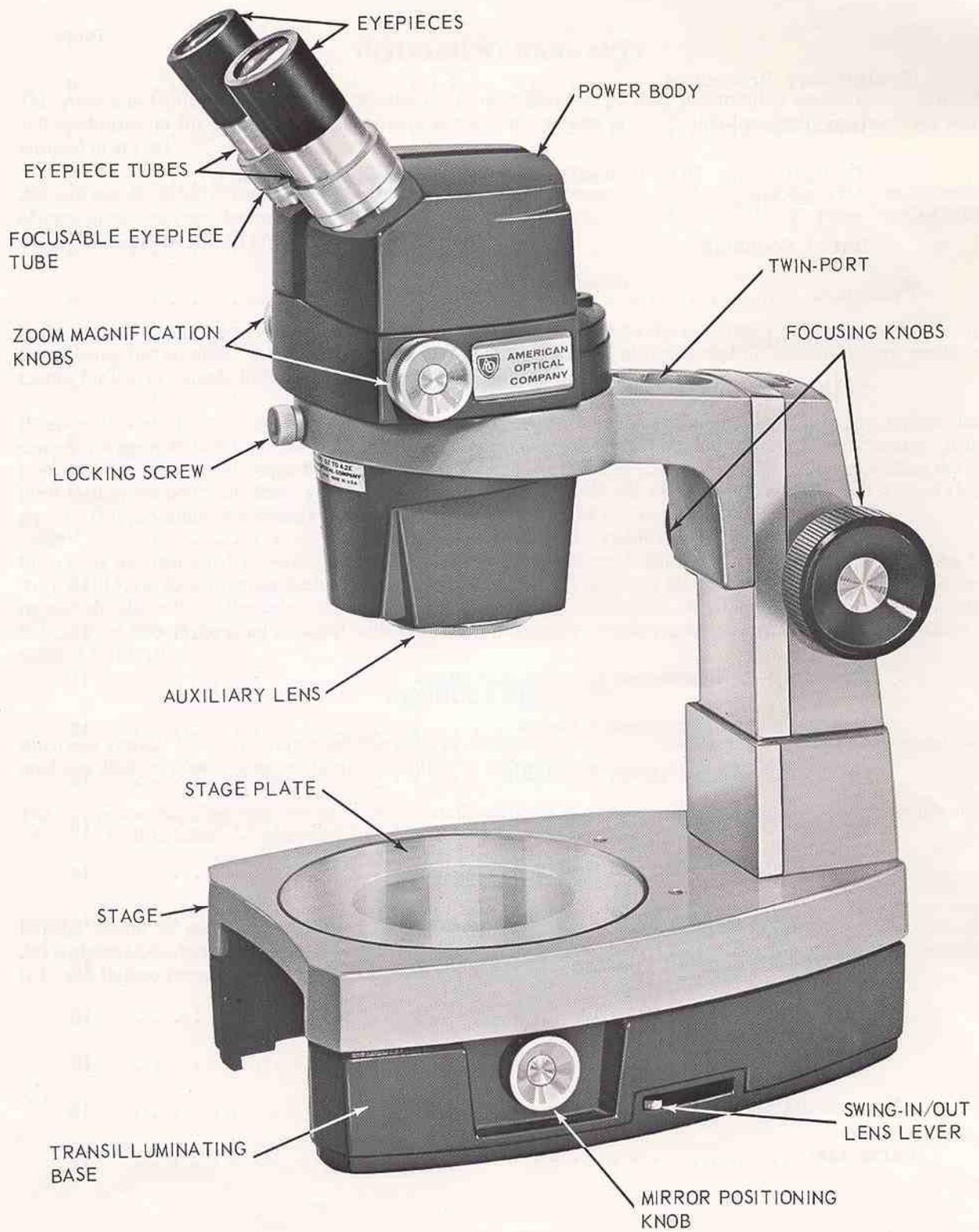
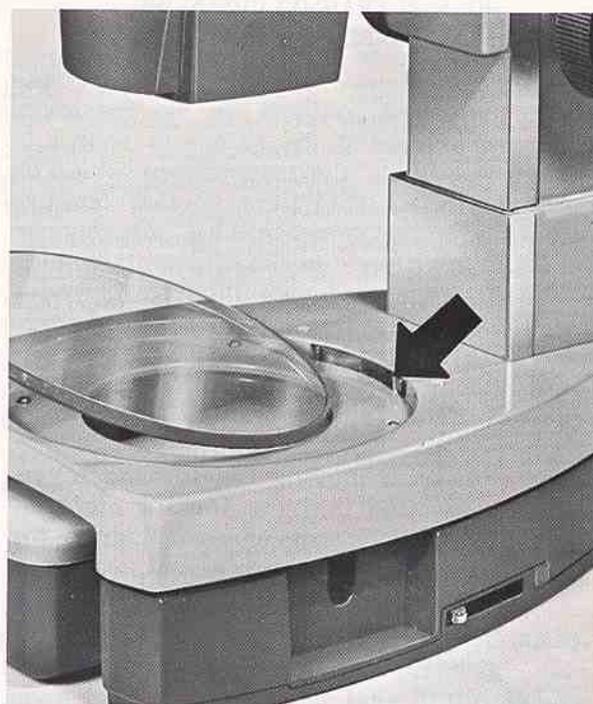


Figure A: AO Model No. 561C-H1

## PRELIMINARY PROCEDURE



**Figure B:** Check to see that locking screw has been turned out sufficiently before setting body in retaining ring.



**Figure C:** When inserting stage plate, press edge firmly against retaining spring. While maintaining tension, "seat" front edge into stage.

### INITIAL SET-UP

1. If using the No. 561S Transilluminating Substage Base, attach the base before proceeding. See instructions on page 4.
2. Set the power body in the retaining ring of the microscope arm. Rotate body until the eyepiece tubes face in the desired direction and tighten locking screw. (See Figure B.)
3. Insert eyepieces into eyepiece tubes.
4. Remove protective adhesive paper from faces of opaque plates if supplied. Insert plate into stage. As shown in Figure C, a retaining spring is provided to hold the stage plate securely in position. Four screws permit adjustment of stage plate height and leveling. (See page 14.)
5. Place a flat-surfaced specimen object in the center of the stage.
6. Illuminate the object. (For details on illumination, see page 6).
7. Using a focusing knob, raise the power body of the microscope above focus, if necessary, then lower the body to bring the object into sharp focus. This technique reduces the tendency of the eye to accommodate and minimizes eye fatigue.
8. Adjust the interpupillary distance of the eyepieces. Proper technique is to first move the gear-linked eyepiece tubes apart, then move together, as quickly as possible, until the two fields of view become one.

**NOTE:** If eyeglasses are worn, wear them while using the instrument.

**TO FASTEN  
NO. 561S TRANSILLUMINATING  
SUBSTAGE BASE TO THE MICROSCOPE**

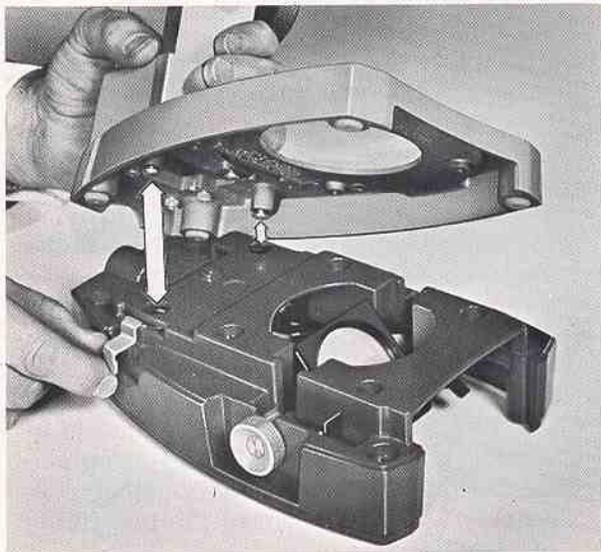
Set the locking lever of the substage base at the unlocked position by moving lever toward the rear of the base, as shown in Figure D. Place the microscope stand on the transilluminating base so that the two screws attached beneath the microscope base are positioned in the appropriate holes in the substage base (see Figure D). Move lever fully forward to lock. If the substage base is to be used permanently with the microscope, or attached for lengthy time periods, tighten the two slotted screws.

**NOTE:** If upon moving the locking lever, you find that the locking mechanism does not engage beneath the screw heads, turn screws counterclockwise slightly. If locking mechanism engages but does not hold securely, turn screws clockwise.

**INITIAL FOCUSING**

Zoom Power Bodies

1. Set the calibrated zoom magnification knob (to operator's right) to highest power; either 2.5X, 3X or 4.2X, depending upon the model being used.



**Figure D:** Locking lever in unlocked position.

2. With the left eye closed, look through the right eyepiece. Using a focusing knob, lower body of the microscope until the flat-surfaced object is in sharp focus.
3. Next set the magnification knob to the lowest power; either 0.7X or 1.0X, depending upon the model being used.
4. Without disturbing the focusing knob and using the left eye only, look through the left eyepiece. Turn the focusing sleeve of the left eyepiece tube counterclockwise until the object is out of focus. Still using the left eye only, turn sleeve clockwise until sharp focus is obtained.

**NOTE:** In performing this step, make certain that the eyepieces are seated against the eyepiece tubes.

5. The microscope should now be correctly adjusted for comfortable viewing with both eyes. The operator can set the instrument at any magnification within the range of the Zoom Power Body without having to refocus.

Fixed Power Bodies

1. With a flat-surfaced object centered on the stage and illuminated, and with the left eye closed, look through the right eyepiece. Using a focusing knob, lower body of the microscope until the object is in sharp focus.
2. Without disturbing the focusing knob and using the left eye only, look through the left eyepiece. Turn the focusing sleeve of the left eyepiece tube counterclockwise until the object is out of focus. Still using the left eye only, turn sleeve clockwise until sharp focus is obtained.

The microscope should now be correctly adjusted for comfortable binocular viewing.

# OPERATION

Center the object to be viewed on the stage, illuminate and bring into sharp focus using a focusing knob. In the event that several individuals are using the same microscope, the "Initial Focusing" procedure, previously outlined, should be performed before using the instrument.

Eyeshields are supplied which slip over the top of the Wide Field Eyepieces to reduce stray light. The Eyeshields should not be used if wearing glasses.

With AO Zoom Power Bodies, magnification knobs are conveniently located on each side of the body. Zoom magnification increments are engraved on the knob positioned on the right side. Using either knob, the operator can view the entire object at a lower power then increase magnification to concentrate on some detail of the object. As magnification is varied, the object is constantly in view and always in focus.

If more magnification is desired, 15X or 25X Eyepieces and/or Auxiliary Lenses may be used. All initial magnifications are engraved on the Auxiliary Lenses and Eyepieces and are indicated on Fixed Power Bodies. On Zoom Power Bodies, the magnification range is indicated on the right-hand magnification knob. Resultant, or total, magnification is the product of the initial magnification of the Auxiliary Lens X Body X Eyepiece. As shown in the Table, as magnification increases the field of view decreases. It should also be noted that increased magnification also reduces depth of focus.

15X and 25X Eyepieces can be readily substituted for the 10X Eyepieces. As indicated in the Table, the substitution of eyepieces does not affect working distance. ("Working distance" is defined as the distance between the lower lens in the Power Body and the specimen object when the latter is in focus.)

**TABLE OF RESULTANT MAGNIFICATIONS, FIELD OF VIEW and WORKING DISTANCE**

Zoom Body	Auxiliary Lens Attachment	WIDE FIELD EYEPIECES						Working Distance	
		#1134 10X Magnification	10X Field of View	#1184 15X Magnification	15X Field of View	#1186 25X Magnification	25X Field of View		
#568 "A" 1.0X to 2.5X	none	10X to 25X	.79 to .32"	15X to 37.5X	.68 to .27"	25X to 62.5X	.36 to .14"	4"	
	#575 0.5X	5X to 12.5X	1.57 to .63"	7.5X to 18.8X	1.35 to .54"	12.5X to 31.3X	.71 to .28"	5.7"	
	#567 2.0X	20X to 50X	.39 to .16"	30X to 75X	.34 to .14"	50X to 125X	.18 to .07"	1.4"	
#569 "B" 0.7X to 3X	none	7X to 30X	1.12 to .26"	10.5X to 45X	.97 to .23"	17.5X to 75X	.51 to .12"	4"	
	#575 0.5X	3.5X to 15X	2.25 to .53"	5.3X to 22.5X	1.93 to .45"	8.8X to 37.5X	1.01 to .24"	5.7"	
	#567 2.0X	14X to 60X	.56 to .13"	20.6X to 90X	.48 to .11"	35X to 150X	.25 to .06"	1.4"	
		#1145 10X W.F. Eyepieces							
		Magnification	Field of View						
#570 H.R. "C" 0.7X to 4.2X	none	7X to 42X	1.13 to .19"	10.5X to 63X	.97 to .16"	17.5X to 105X	.51 to .09"	4"	
	#575 0.5X	3.5X to 21X	2.25 to .38"	5.3X to 31.5X	1.93 to .32"	8.8X to 52.5X	1.02 to .17"	5.7"	
	#576 1.25X	8.8X to 52.5X	.90 to .15"	13.1X to 78.8X	.77 to .13"	21.9X to 131X	.41 to .07"	2.8"	
	#574 1.5X	10.5X to 63X	.75 to .13"	15.8X to 94.5X	.65 to .11"	26.3X to 157.5X	.34 to .06"	2.4"	
		#577 2.0X	14X to 84X	.56 to .09"	21X to 126X	.48 to .08"	35X to 210X	.25 to .04"	1.3"
		#1134 10X		#1184 15X					
		Magnification	Field of View	Magnification	Field of View				
#571 "D" Fixed Power 1X	None	10X	.79"	15X	.68"	25X	.36"	4"	
#572 "E" Fixed Power 2X	None	20X	.39"	30X	.34"	50X	.18"	4"	

*To convert inch values to millimeters: multiply by 25.4*



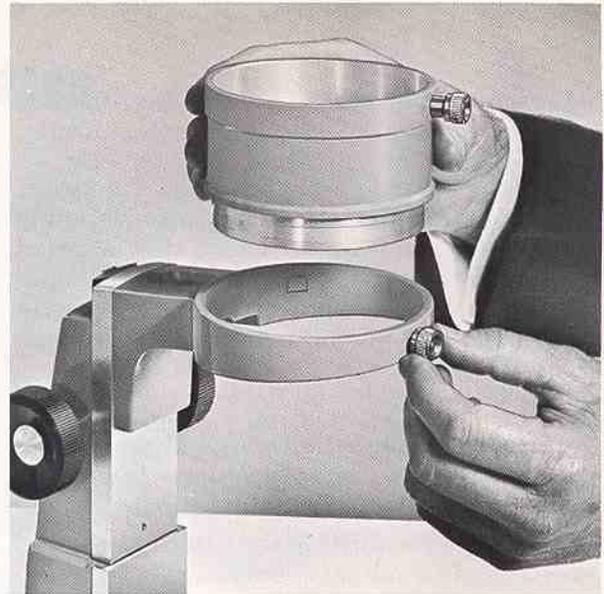
**Figure E:** Auxiliary Lenses quickly attach to body.

The 1.25X, 1.50X and 2.0X Auxiliary Lenses provide a preferred method of increasing magnification. As shown in Figure E, the lens in its threaded cell can be quickly screwed to the underside of the body. While the use of Auxiliary Lenses reduces working distance (see Table), these lenses increase resolution as well as magnification. As indicated in the Table, Auxiliary Lenses are available for Zoom Power Bodies only.

Should the operator require maximum magnification, both an Auxiliary Lens and either the 15X or 25X Eyepieces can be used.

When the application of the microscope is such that more working distance is required, use of the 0.5X Auxiliary Lens is suggested. As shown in the Table, the use of this lens will increase working distance from 4" to 5.7".

If very thick specimens are being used that exhaust all or most of the focusing travel of the rack and pinion, a 2" extension sleeve is available. Inserted between the arm and power body as shown in Figure F, the No. 556 2" Extension Sleeve will provide an additional 2" of working space for thick specimens.



**Figure F:** No. 556 2" Extension Sleeve

## ILLUMINATION

Only general rules can be given for illumination; the best methods are often found by trial. The nature of the specimen object and, in particular, its surface characteristics govern the choice of illuminator used.

Opaque specimens require top lighting, either oblique or vertical. While the specimen may be set on the glass stage plate, often either the black or white stage plate is used to provide a contrasting background. Again, the nature of the specimen object governs the choice of either the black or white stage plate for best contrast.

For transparent or semi-transparent specimens, the transilluminating base with an appropriate illuminator is recommended. On occasion, best illumination may be obtained thru the use of both top and in-base illumination, particularly in the case of semi-transparent specimen objects.

To acquaint the operator with the selection, and positioning versatility, of AO illuminators, each is described separately following the description of the transilluminating base.

## 561S TRANSILLUMINATING BASE

Easily attaches to Model 560 Stand as described on page 4. It accepts the STARLITE Illuminator thru "port" at rear of base or receives the Fluorescent Illuminator thru front of base. Can also be used with separate illuminator. A clear glass stage plate is provided with 561S Base.

Features include: Unique swing-in/out lens (#1, Figure G) for evenly balanced illumination over the entire viewing area of the glass stage plate. This lens is particularly useful in illuminating larger fields of

view subtended at lower magnifications. Mirror assembly (#2) with diffusing reflector on one side; plano mirror on opposite side. Recessed knob (#3) on both sides of the base for positioning of reflector or mirror. Two retaining clips (#4) to hold complete mirror assembly in position; and (#5), locking lever to secure 561S Base to 560 Stand.

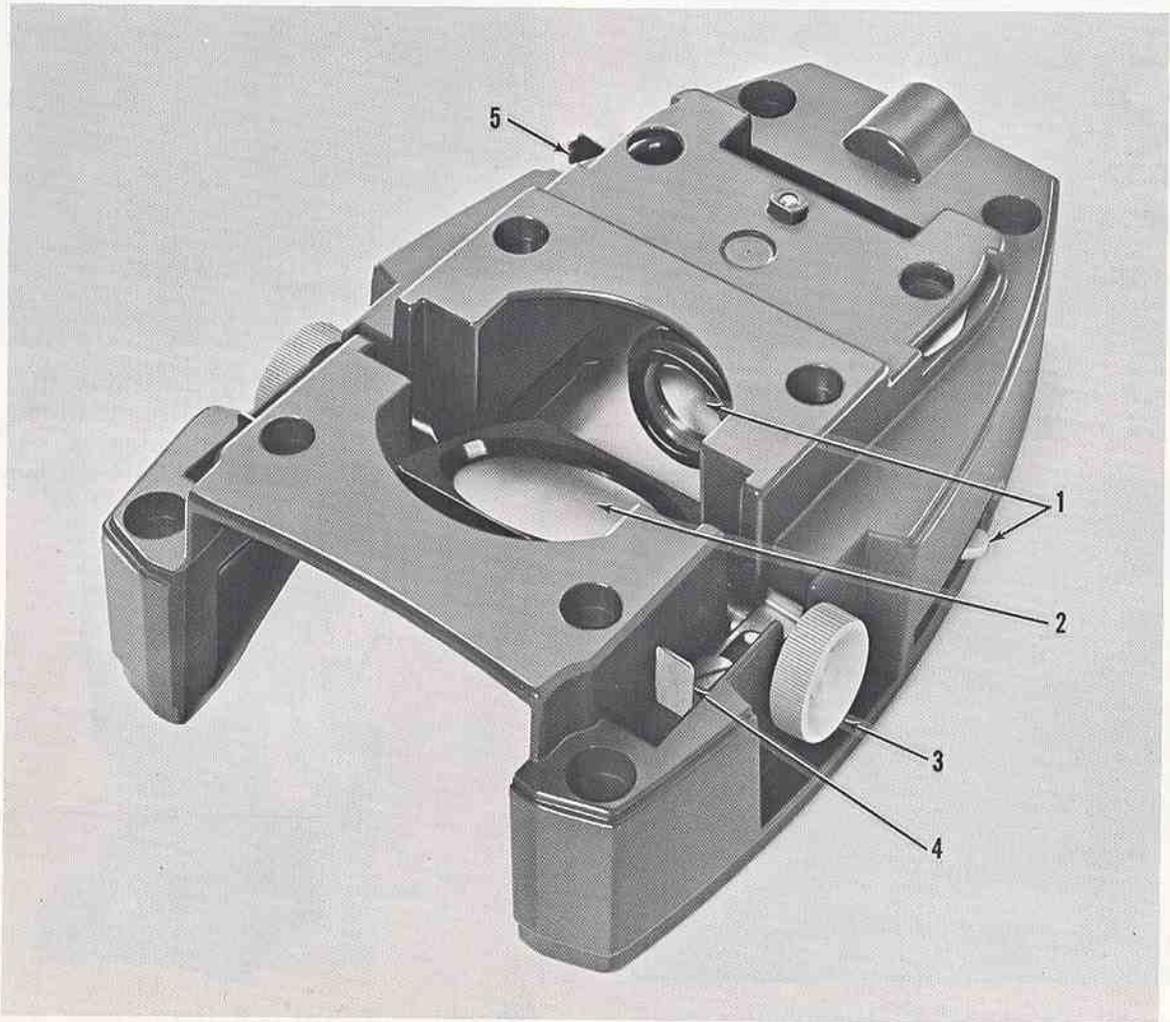


Figure G: No. 561S Transilluminating Base

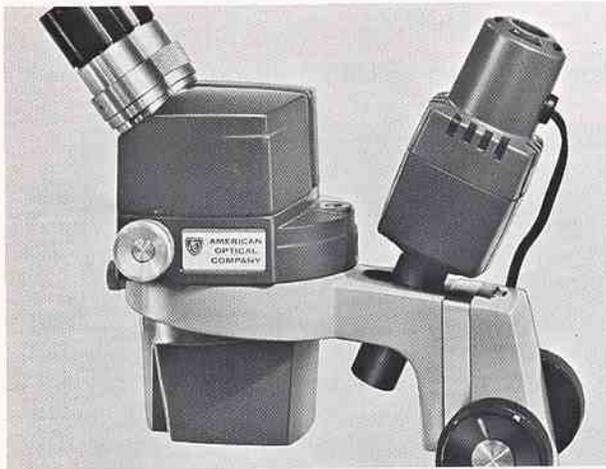
## STARLITE ILLUMINATOR

The No. 363V STARLITE Illuminator is supplied with three-link adjustable arm and No. 365 3-step Variable Transformer, 115V, 60C; the No. 363F with adjustable arm and No. 367 Fixed Transformer, 115V, 60C.

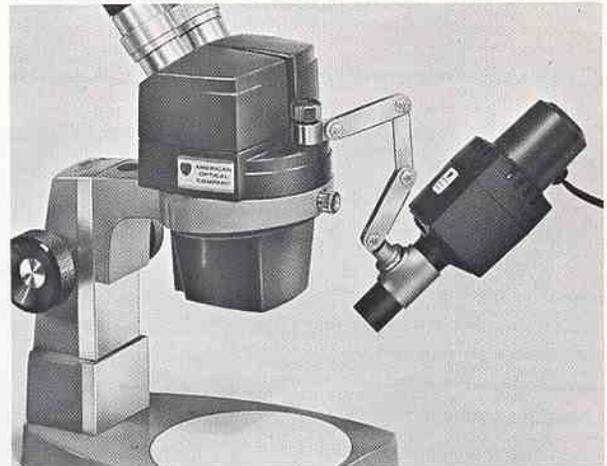
For top, oblique, spotlight-type illumination, the illuminator can be positioned in the twin-port of the microscope arm (see Figures H and I) or mounted on the power body, as shown in Figure J. Both methods of mounting keep the illumination centered

regardless of specimen thickness. The STARLITE Illuminator can also be mounted on its own transformer base when it is desirable to have a movable light source, as shown in Figure K.

For transmitted light, insert the illuminator into the circular opening at the back of the 561S Base as shown in Figure L. With the illuminator in this position, use of the diffusing reflector side of the mirror assembly is recommended. At lower magnifications, it may be desirable to use the swing-in/out lens to evenly illuminate larger fields of view.



*Figure H:* STARLITE Illuminator positioned in rear port.



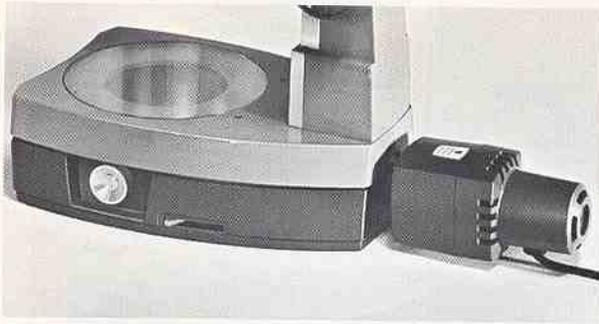
*Figure J:* Where it is desirable to vary incidence of illumination, the STARLITE Illuminator can be mounted on the power body.



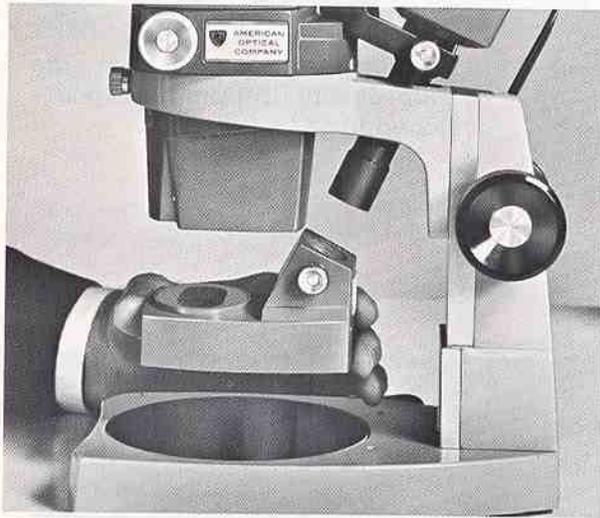
*Figure I:* STARLITE Illuminator positioned in front port for use with an Auxiliary Lens.



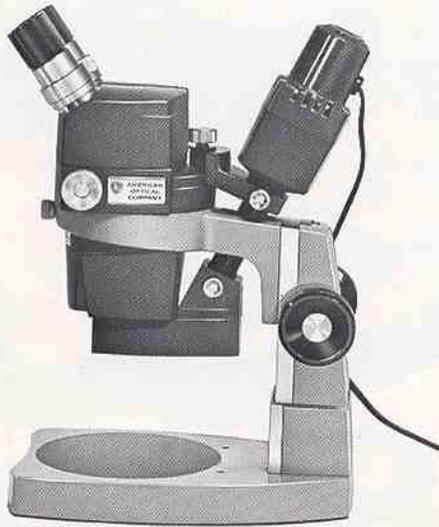
*Figure K:* STARLITE Illuminator mounted on No. 365 3-step Variable Transformer.



**Figure L:** For transmitted light, the STARLITE Illuminator is inserted into 561S Base.



**Figure M:** Attaching reflecting unit to body and front of illuminator.



**Figure N:** The Vertical Illuminator is designed for use without Auxiliary Lenses.

## VERTICAL ILLUMINATOR

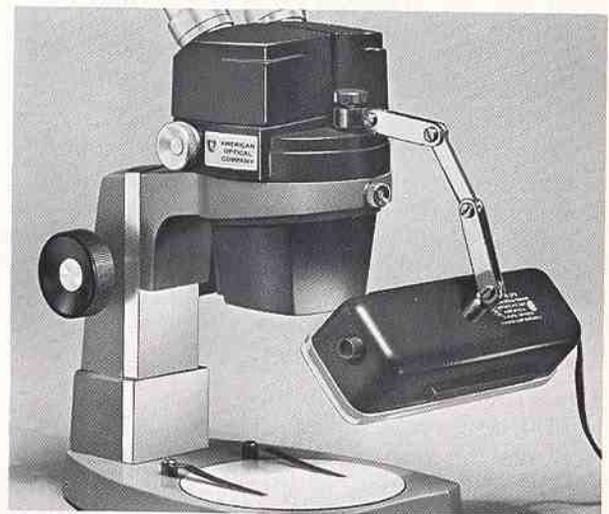
The No. 579 Vertical Illuminator with variable transformer provides straight top lighting for the examination of deep or narrow orifices which are difficult or impossible to examine with oblique illumination.

The illuminator includes a separate vertical reflecting unit, as shown in Figure M, which is positioned beneath the power body and is secured to the end of the illuminator as illustrated in Figure N.

## FLUORESCENCE ILLUMINATOR

The No. 578 Fluorescence Illuminator (115V, 60C), supplied complete with three-link adjustable arm and base, can be used for either oblique or transmitted illumination. The two daylight fluorescent tubes provide a flat, diffused, cool light that floods over the gross specimen to evenly illuminate surface detail regardless of specimen thickness variations.

For top lighting, the Fluorescence Illuminator can be attached directly to the power body in the same manner as the Starlite Illuminator (see Figure O) or can be used on its own base as shown in Figure P.



**Figure O:** For top lighting, the Fluorescence Illuminator can be attached to the power body.



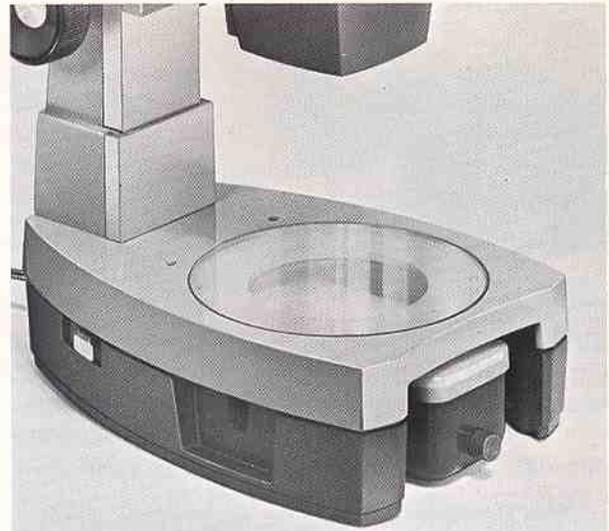
**Figure P:** Fluorescence Illuminator mounted on its own base.

For transmitted light, the illuminator is positioned in the Transilluminating Base as shown in Figure Q. To insert illuminator, the mirror assembly must be removed. Slide back the two retaining clips (#4, Figure G) and lift out mirror assembly. The two side "ribs" on the illuminator (see Figure R) fit above the slideway clips in the base. Insert in such a manner that the push button switch faces outward.

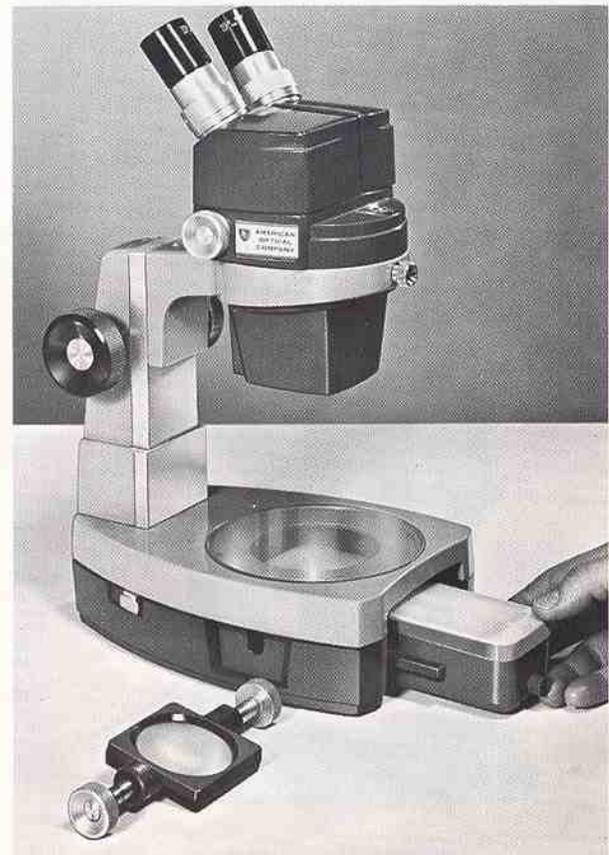
#### LAMP REPLACEMENT

Both the AO STARLITE and Vertical Illuminators use the 6.5V GE1460 Lamp (AO Cat. No. 1033). To replace lamp, loosen the two slotted, captive screws to separate the two sections of the illuminator housing. Push lamp in and turn counter-clockwise to remove. To install new lamp, properly position the lamp base plate on the three pins; push in and turn clockwise to secure. (New lamps, in most instances, can be purchased locally from your AO dealer.)

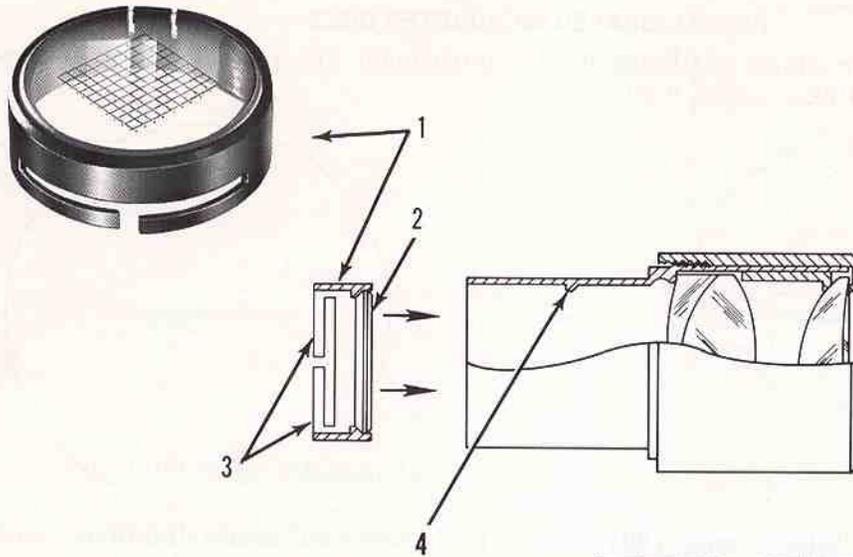
The Fluorescent Illuminator holds two day-light fluorescent tubes, Sylvania F4T5/D. Remove the plastic cover from the illuminator. Push tube to either side and lift out to remove; install new tube in similar manner. (Tubes are available locally.)



**Figure Q:** For transmitted light, the Fluorescent Illuminator is positioned in 561S Base.



**Figure R:** Slideway clips in base support "ribs" on illuminator.



### MEASURING

The AO STEREOSTAR/ZOOM Microscope can be used for measuring specimen objects by inserting a micrometer disc in an eyepiece. A wide selection of AO Micrometer discs are available for measuring; others are designed for work alignment and particle counting. A number of representative discs are illustrated on next page. All 20mm micrometer discs are mounted in cells and can be easily installed into 10X or 15X eyepieces. (Micrometer discs cannot be used in 25X eyepieces.)

### TO INSTALL CELL-MOUNTED MICROMETER DISCS

Insert the cell (#1, Figure S) into the end of the eyepiece in such a manner that the micrometer disc (#2, Figure S) faces toward the eyepiece lenses. Using a jeweler's screwdriver or rose stick, carefully press against the metal edge of the cell to "work" cell into eyepiece.

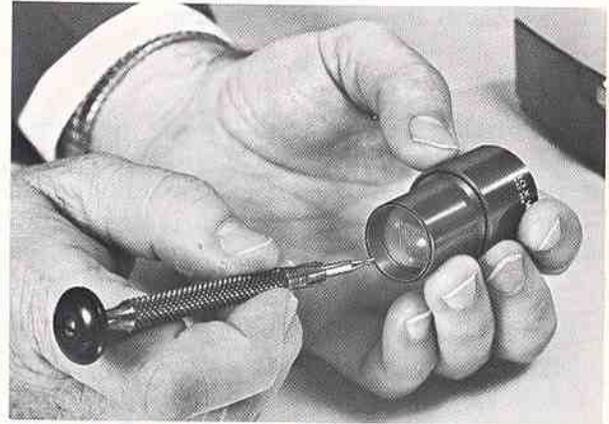


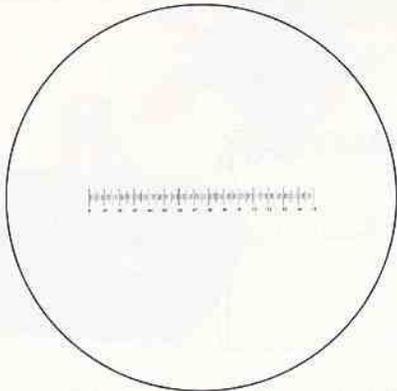
Figure S

As you press against the edge, move the screwdriver from one side of the cell to the other to keep sides of cell parallel to inside surfaces of eyepiece. Never press against the micrometer disc itself when inserting cell into eyepiece; also use care to keep disc clean. Should more friction be desired for a tighter fit, bend the two tabs #3, Figure S) outward slightly. The cell is in correct position when the micrometer disc is evenly seated against the field diaphragm (#4, Figure S) of the eyepiece.

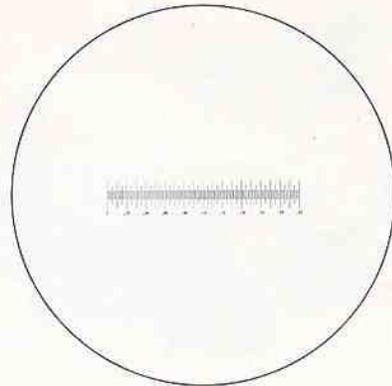
NOTE: The eyepiece with micrometer disc should always be inserted in the right (fixed) eyepiece tube of the power body.

### PRECALIBRATED MICROMETER DISCS

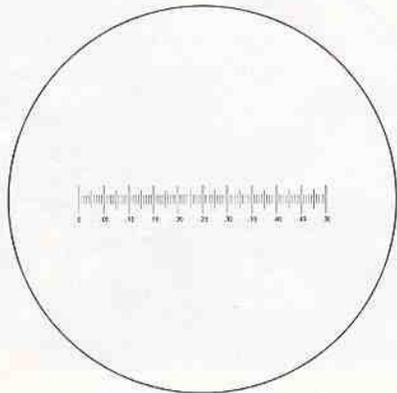
Four of the micrometer discs available (see illustrations) are precalibrated for use at a specific power body setting. These are:



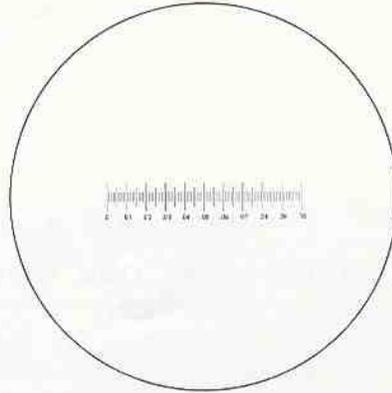
No. 1426 - 150 scale divisions, each  $.001''$  at 3X Zoom Power Body setting.



No. 1428 - 200 scale divisions, each  $.001''$  at 2X Zoom Power Body setting.



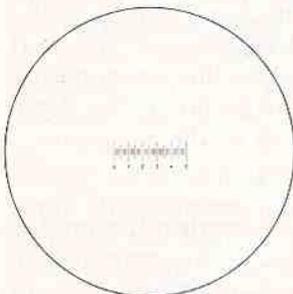
No. 1429 - 100 scale divisions, each  $.005''$  at 1X Zoom Power Body setting.



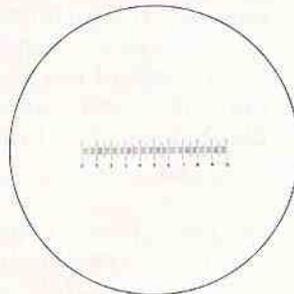
No. 1430 - 100 scale divisions, each  $.001''$  at 4X Zoom Power Body setting.

The four precalibrated micrometer discs are accurate for most routine measurements. When extreme accuracy is required, the discs can be precisely calibrated using the No. 1400 Stage Micrometer and by slightly rotating the zoom magnification knob. See next section.

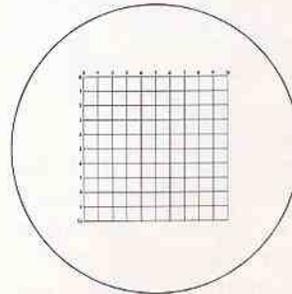
### OTHER MICROMETER DISCS AVAILABLE



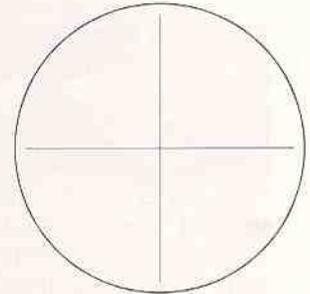
No. 1422 - Scale 5.0 mm ruled to 0.1mm.



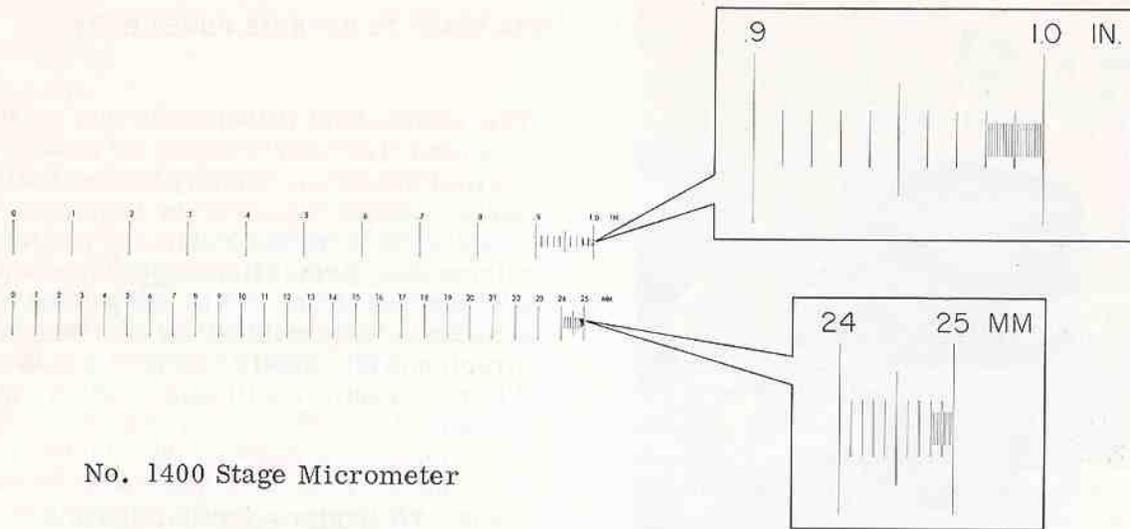
No. 1423 - Scale 10.0 mm ruled to 0.1mm.



No. 1424 - 10.0mm Square ruled to 1.0 mm sq.



No. 1425 - Crosshair



No. 1400 Stage Micrometer

### TO CALIBRATE MICROMETER DISCS

To calibrate, use the No. 1400 Stage Micrometer. The No. 1400 has two scales, English and Metric. The English scale is 1" long and subdivided into 0.1", 0.01" and 0.001" intervals. Metric scale is 25mm long with 1.0mm, 0.1mm and 0.02mm divisions. Focus on the stage micrometer and move it until one of the stage micrometer scale graduations corresponds exactly with one of the divisions of the micrometer disc scale (see Figure T). The greater the number of subtended lines, the greater is the unit accuracy.

The true distance (X) seen on the stage micrometer, which corresponds to the number of divisions (Y) of the eyepiece micrometer, is then read, and dividing this true distance by the number of divisions of the eyepiece micrometer ( $c = \frac{X}{Y}$ ), the distance each division subtends is determined. The number of divisions covered by the specimen object multiplied by the calibration constant (C) gives the length of the specimen.

With Zoom Power Bodies another method can be employed to take direct measurements. Align the scales of the stage micrometer and micrometer disc. Using the zoom magnification knob, increase or

decrease power until the graduations of both scales correspond exactly. If the stage micrometer scale is shorter than the micrometer disc scale, increase magnification. If the stage micrometer scale is longer, decrease magnification.

The projected values of scale graduations vary with the optical combination used and, therefore, must be calibrated before accurate measurements can be made at the desired magnification.

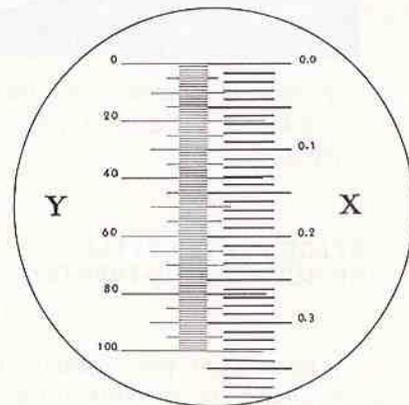
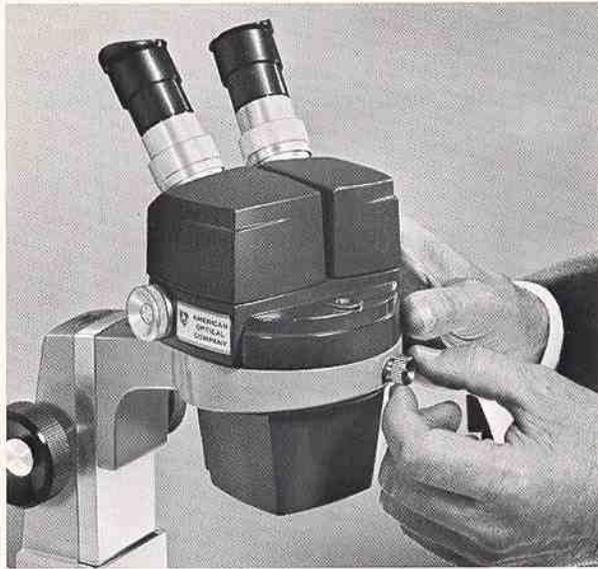
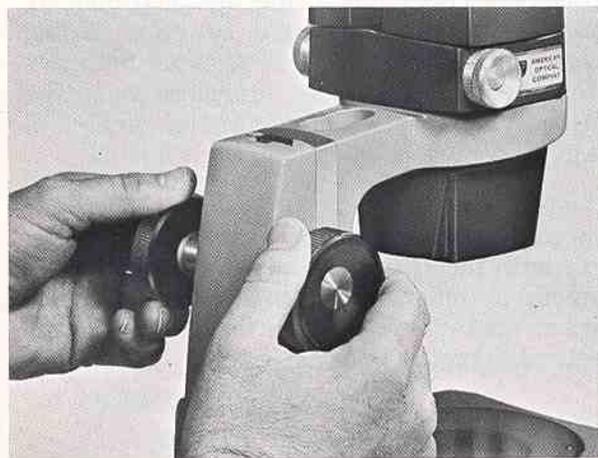


Figure T: Calibration of eyepiece disc against a known stage micrometer scale. Note coincidence of lines at "0" - "0.0" and "60" - "0.2" in the above schematic. In this case  $c = \frac{X}{Y} = \frac{0.2}{60} = .003$ .



**Figure U:** Loosen locking screw. Body rotatable 360°.



**Figure V:** Focusing tension can be easily adjusted to suit individual preference.

#### STAGE PLATE LEVELING AND HEIGHT ADJUSTMENTS

Four screws have been provided in the base of the microscope to permit leveling the stage plate or to change the height of the plate. Access holes to the screws are shown in Figure W. The top of the screws are visible in Figure C. If necessary, remove No. 561S Transilluminating Base to gain access to screw holes. Merely turn screw clockwise to raise plate; counterclockwise to lower.

#### TO REVERSE POWER BODY

The microscope power body can easily be reversed 180°, or rotated to face in any desired direction. Simply loosen the locking screw, as shown in Figure U, and rotate body in the retaining ring of the microscope arm. It is not necessary to lift body out of the retaining ring to reposition. Body will rotate 360° in either direction while safely "seated" within ring. When correctly positioned, tighten locking screw.

#### TO ADJUST FOCUSING TENSION

Tension on the focusing mechanism may be regulated to suit personal preference. To increase tension, hold one knob firmly and turn opposite knob clockwise, as shown in Figure V. An alternate method of increasing tension is to twist both knobs simultaneously in a clockwise direction. To reduce tension, turn counterclockwise.



**Figure W**

## CARE AND CLEANING

Always use the plastic dust cover provided when the microscope is not in use. Eyepieces should always be kept in the microscope to prevent dust from collecting within the eyepiece tubes of the binocular body. When cleaning, do not attempt to disassemble the power body. The lens systems within the body were carefully cleaned and aligned at the factory.

Dust on the eyepiece lenses is seen as specks which rotate when the eyepiece is turned while looking through it. If the field does not appear clear, carefully inspect the lower lenses of the power body. Subtle loss of contrast and definition due to dust or a slight smear on these lenses can be avoided with routine inspection and cleaning. If any optical surface becomes badly coated with dust or dirt, all such loose dust or dirt should be blown off with a syringe or dusted with a camel's hair

brush before attempting to wipe the surface clean.

Optical surfaces should be cleaned with a lint-free, soft, linen cloth, lens paper or a Q-tip moistened with distilled water, xylene or alcohol. It is very important to avoid the use of excessive solvent. The cloth, lens tissue, or Q-tip should be just moistened with solvent and not wet enough for the solvent to run down in around the lens with the resultant danger of loosening cement on interior surfaces. Always promptly wipe the surface dry, using a circular motion, before allowing it to air dry.

Glass surfaces should never be touched with the fingers because they will leave a greasy smear and, frequently, corrosive perspiration. Do not clean optical parts unnecessarily.

## LUBRICATION

The power bodies of AO STEREOSTAR/ZOOM Microscopes are permanently lubricated at the factory and do not require periodic lubrication.

Occasionally, the focusing slideway should

be wiped clean, using alcohol or xylene, and lightly relubricated. Do not apply lubrication to rack teeth or pinion gear. Use a small stiff brush to clean when required.

## ALTERNATE PARTS AND ACCESSORIES



**No. 1134:** 10X Wide Field Eyepiece (Pair) for use with 568, 569, 571, 572 Power Bodies.



**No. 1145:** 10X Wide Field Eyepiece (Pair) for use with 570 Zoom Power Body.



**No. 1184:** 15X Wide Field Eyepiece (Pair) for use with 568, 569, 570, 571, 572 Power Bodies.



**No. 1186:** 25X Wide Field Eyepiece (Pair) for use with 568, 569, 570, 571, 572 Power Bodies.



**No. 599:** Objective Protection Window for use with all Zoom Power Bodies.



**No. 567:** 2X Auxiliary Lens for use with 568, 569 Zoom Power Bodies.



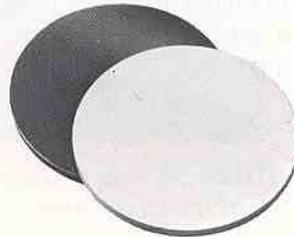
**No. 574:** 1.5X Auxiliary Lens for use with 570 Zoom Power Body.



**No. 575:** 0.5X Auxiliary Lens for use with 568, 569, 570 Zoom Power Bodies.



**No. 556:** 2" Extension Sleeve for use with Models 560, 562, etc.



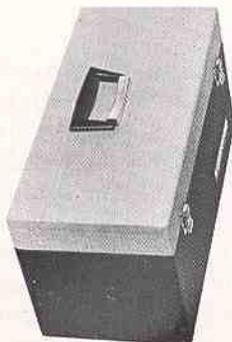
**No. 597:** Set of Opaque Black and White Stage Plates for Models 560, 563.



**No. 576:** 1.25X Auxiliary Lens for use with 570 Zoom Power Body.



**No. 577:** 2X Auxiliary Lens for use with 570 Zoom Power Body.

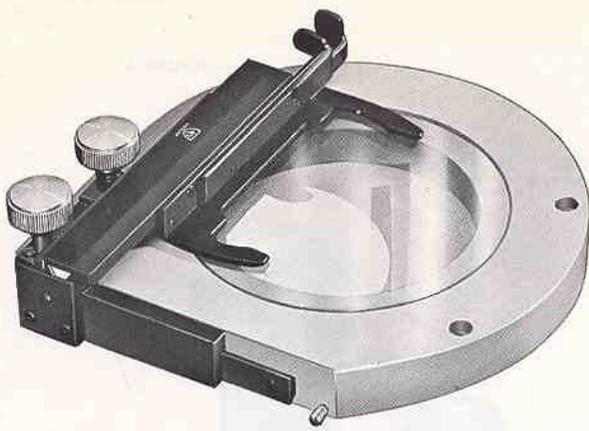


**No. 1692:** Carrying and Storage Case for STEREOSTAR Models 560, 561, 563, 563 with 561.

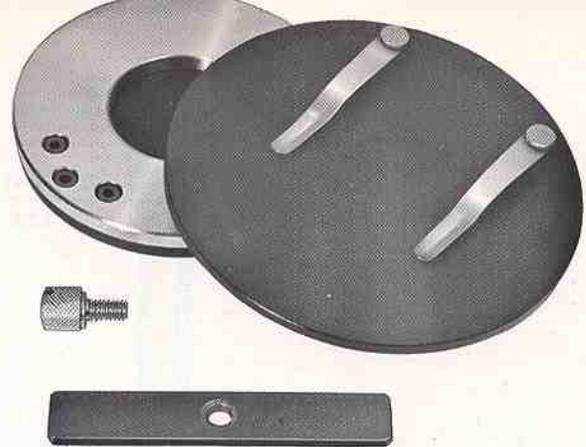


**No. 185:** Eyeshield (Single) for use with 1134, 1145 Eyepieces.

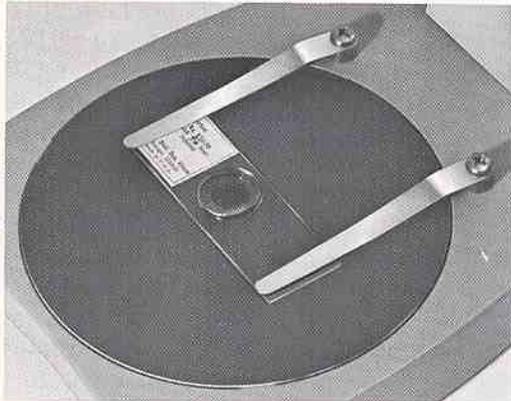
**No. 187:** Eyeshield (Single) for use with 1184, 1186 Eyepieces.



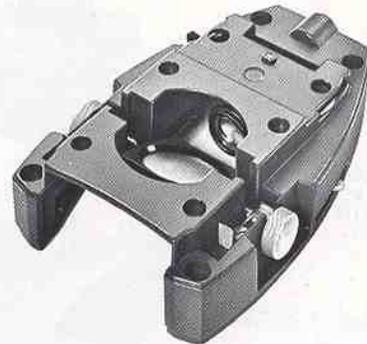
**No. 1556:** Ungraduated Mechanical Stage for use with Models 560, 561, 563.



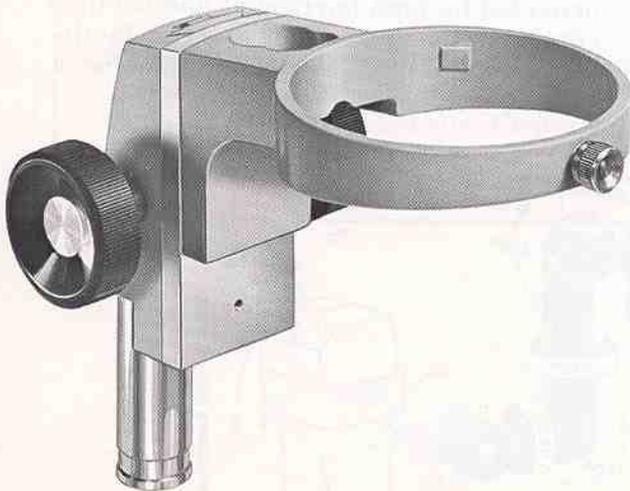
**No. 3012:** Micro-Glide Stage for use with Models 560, 561, 563.



**No. 595:** Stage Clip (Single) for Models 560, 563.



**No. 561S:** Transilluminating Substage Base for Models 560, 563 complete with Mirror Assembly, Swing-in/out Lens and Glass Stage Plate.

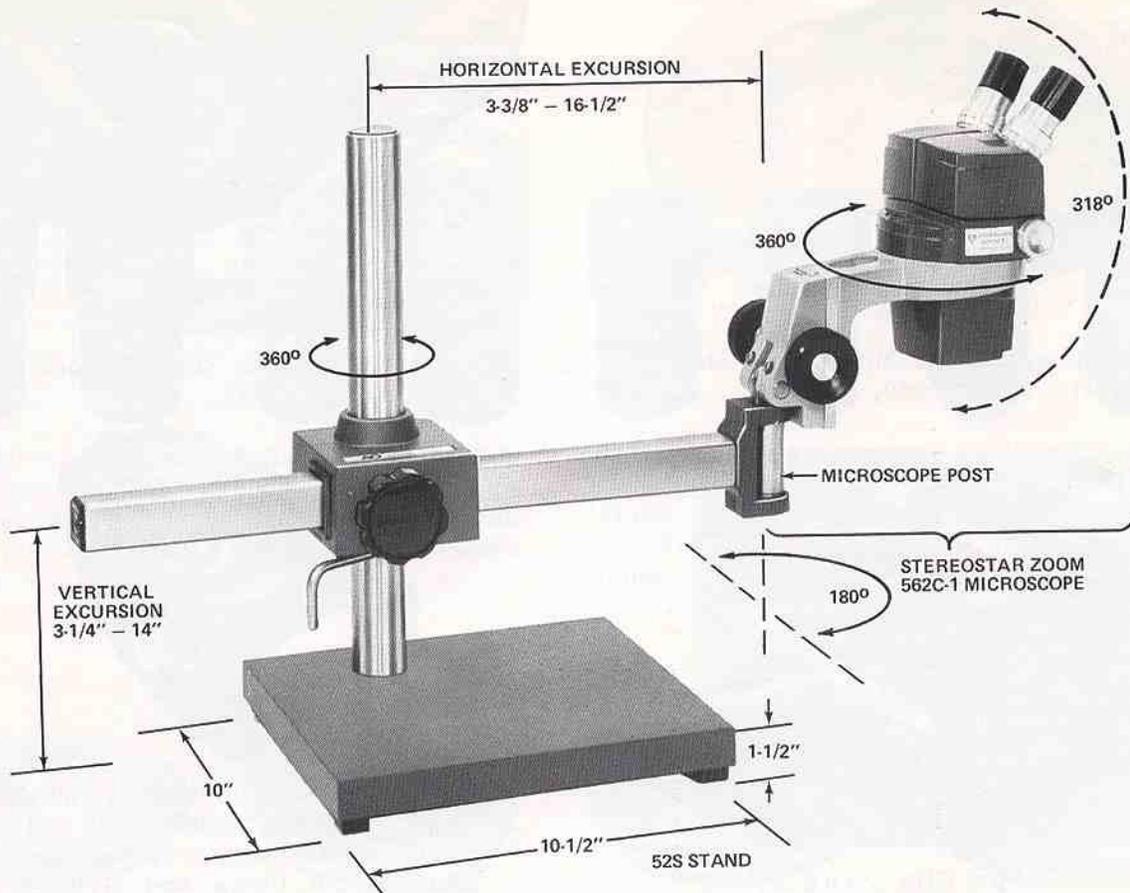


**No. 562S Stand** — Features a yoke and pillar unit for simple adaptation to machine tools, jigs and fixtures or other applications; heavy duty slideways and long excursion; wide durable rack and pinion focusing adjustment with adjustable tension.



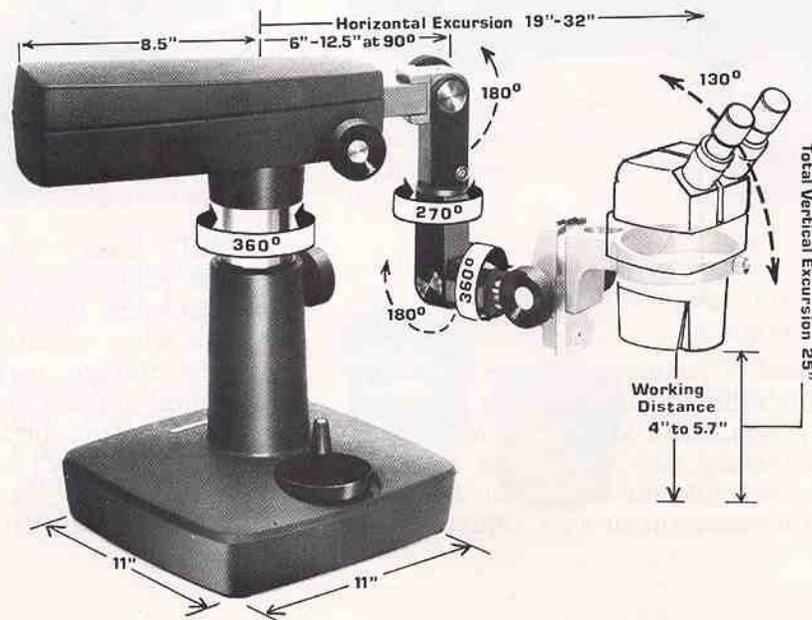
**No. 563S Stand** — For opaque specimens. Unique yoke and pillar vertical mount is detachable from stage base . . . allows a wide variety of possibilities in jig and fixture installations for many industrial and research applications. Inclination joint further extends adaptability to allow viewing objects from various angles. No. 561S may be added for transmitted light to view transparent specimens.

FIGURE 4



▲ **No. 525 Stand** — For opaque specimens. Provides horizontal excursion to 16-1/2 inches and vertical to 14 inches. Stand adjustments are made manually and secured by locking knobs. Supporting ring on the vertical post permits 360° rotation of arm.

▼ **No. 535 Stand** — For opaque specimens. Allows universal positioning in any direction for complete application flexibility. Rack and pinion adjustments are provided for both horizontal and vertical control. Counterbalanced arm facilitates easy, rapid instrument placement.



## PARTS LIST

This section contains a listing of parts and illustrations for the AO STEREOSTAR/ZOOM Microscope including: 560S Microscope Stand; 561S Transilluminating Base; Zoom and Fixed Power Bodies; and Illuminators.

The illustrations are used to identify and locate parts of the microscope, and are keyed to the parts lists by the use of index numbers. To order a part, identify and locate the part by using the illustrations. Note the index number for the part and cross-reference it to the parts list. The part number, description, and quantity required will be found opposite the index number.

In certain cases, it may be desirable to replace a complete assembly instead of overhauling or rebuilding with detail parts. Where complete assemblies are available, they are indicated by a note in the description column to show which parts they include. Detail parts of these assemblies are also available separately.

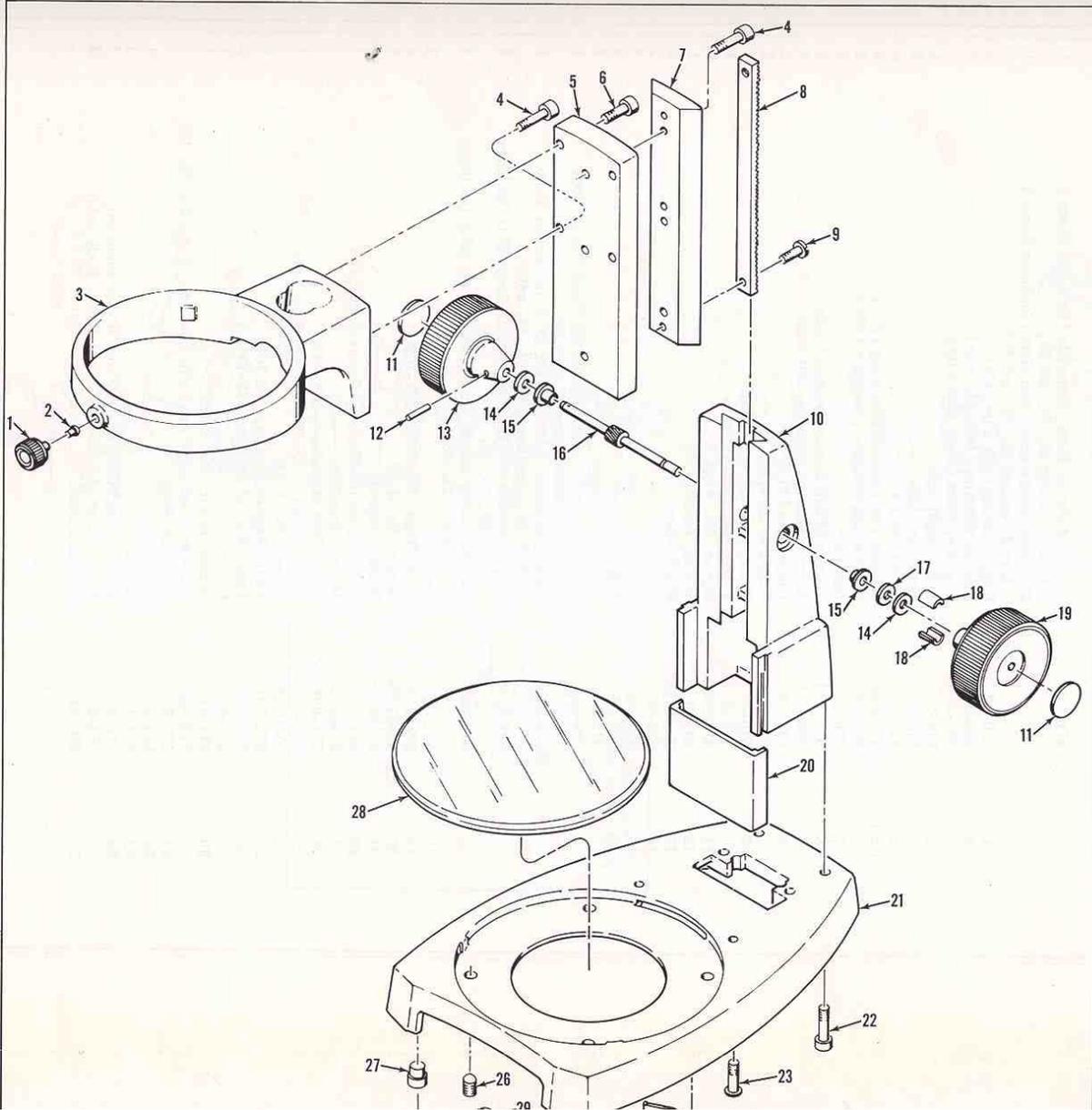
Parts or assemblies should be ordered directly from AO Instrument Division plant at Buffalo, N.Y., or from any of AO's authorized dealers. When ordering parts, be sure to include a complete description, part number, and correct quantity.

### SERVICE

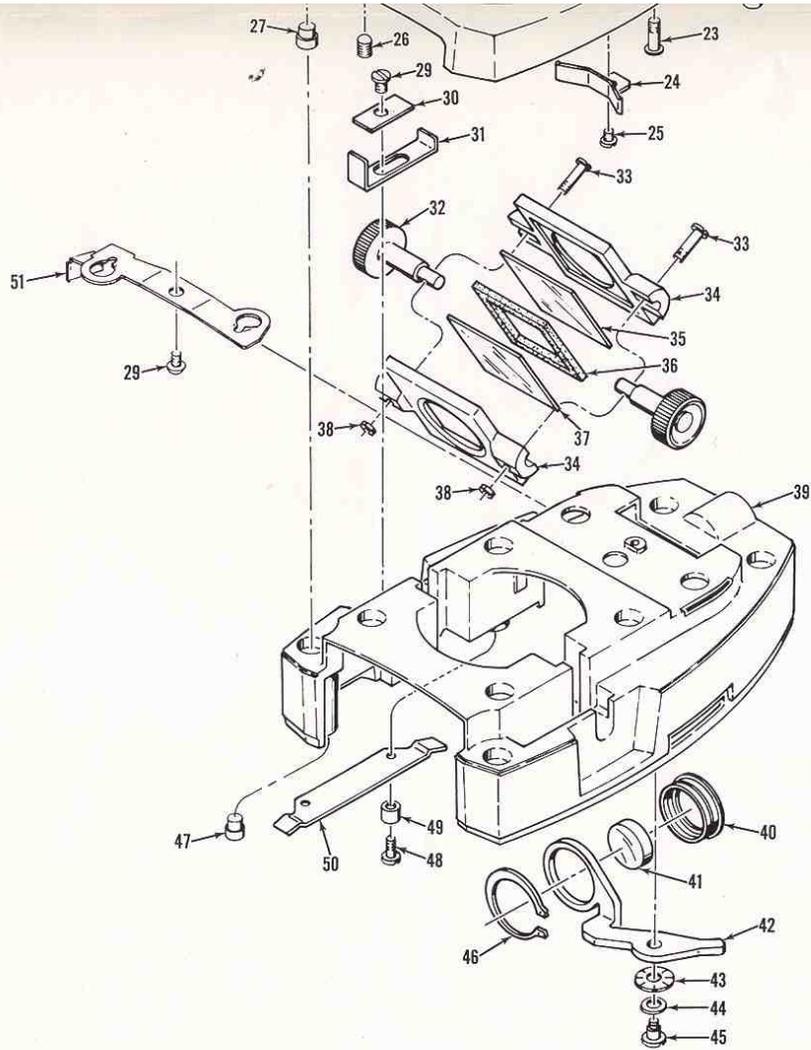
Complete repair facilities are available at many of AO's authorized dealers, the American Optical Corporation, Scientific Instrument Division plant, Buffalo, N. Y., and AO Technical Service Centers in Chicago, Ill., Glendale, Calif., Springfield, N. J., and Dallas, Texas.

STEREOSTAR Stand and Transilluminating Base Assembly

Index No.	Part Number	Description	Qty Per Assy
	560S	STEREOSTAR Stand (Includes items 1 thru 28)	
1 & 2	560-502	Screw with Nylon tip	1
3	560-27	Arm	1
4	X-19406	Screw, No. 8-32	5
5	560-24	Plate	1
6	X-19412	Screw, No. 8-32	2
7	560-25	Dovetail	1
8	560-9	Rack	1
9	42-51	Screw, No. 8-32	2
10	560-26	Upright	1
11	560-15	Disc, decorative	2
	560-851	Pinion & RH-Knob Assembly (Includes items 12 thru 16)	1
12	X-15086	Pin	1
13	560-14	Knob, fixed, right	1
14	01183-1	Washer	2
15	35-47	Bearing, Pinion	2
16	560-10	Pinion	1
17	01186-1	Washer	1
18	35-48	Bearing, tapered thrust (split)	2
19	560-12	Knob, focusing, with inside thread, left	1
20	560-17	Cover	1
21	560-2	Base	1
22	X-19466	Screw, No. 10-24	4
23	X-51667	Screw, locking, No. 8-32	2
24	560-19	Spring	1
25	X-30747	Screw, No. 8-32	1
26	X-36709	Screw, set, No. 8-32	4
27	42-52	Foot	4
28	597	Stage Plate Set, Includes: Stage Plate, opaque black Stage Plate, white	1 1 1
	561S	Transilluminating Base (Includes items 28 thru 51)	
28	596	Stage Glass, transparent	1
29	561-6	Screw, No. 8-32	3
30	561-14	Washer	2
31	561-8	Spring	2
	561-852	Mirror Assembly (Includes items 32 thru 38)	
32	561-4	Knob	2
33	X-762	Screw, No. 2-56	2
34	561-3	Holder, mirror	2
35	561-603	Mirror	1
36	561-9	Pad, mirror	1
37	561-602	Diffuser	1
38	X-8000-1	Nut, No. 2-56	2
39	561-2	Base	1
	561-851	Cell Assembly (Includes items 40 and 41)	
40	561-11	Cell	1
41	561-601	Lens	1
42	561-10	Adapter	1
43	01163	Spring	1
44	01293	Washer	1
45	561-13	Screw	1
46	X-51660	Ring	1
47	42-52	Foot pad	4
48	X-38843-2	Screw	4
49	561-12	Stop	1
50	561-5	Clip	2
51	561-7	Lever, lock	1

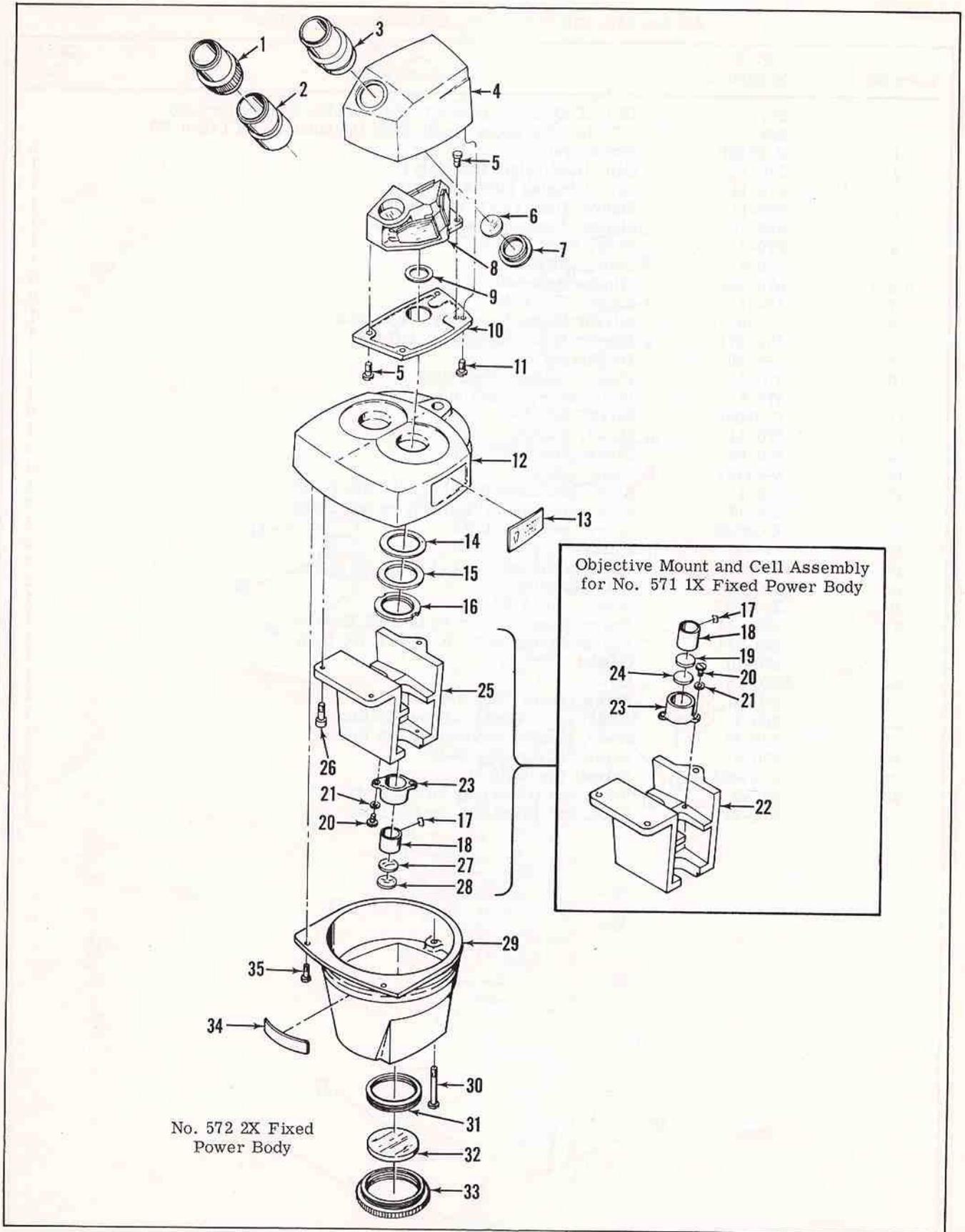


5608 STEREOSTAR Stand and 561S Transilluminating Base



AO No. 571, 572 Fixed Power Bodies

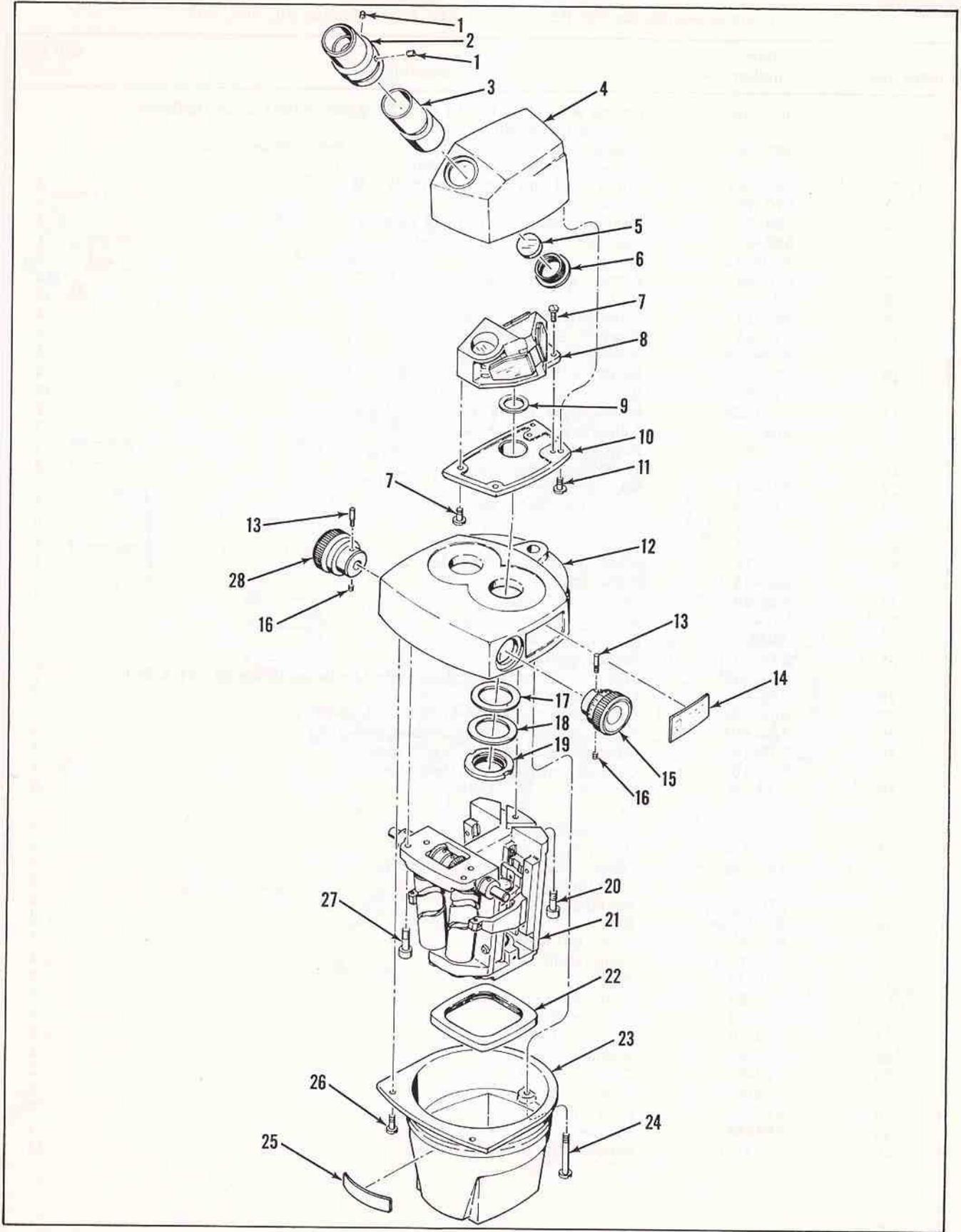
Index No.	Part Number	Description	Qty Per Assy
	571	1X Fixed Power Body, complete (Includes items 1 thru 35 except 25, 27, and 28)	1
	572	2X Fixed Power Body, complete (Includes items 1 thru 35 except 19, 22, and 24)	1
1	570-13	Cap, focusing (left side only)	1
2	569-10	Sleeve, focusing (left side only)	1
3	571-5	Eyeteube, fixed (right side only)	1
4	570-3	Body, right side	1
	570-4	Body, left side	1
5	42-31	Screw, No. 4-48	6
6 & 7	571-854	Window and retainer assembly (571)	2
	570-856	Window and retainer assembly (572)	2
7	570-11	Retainer	2
8	570-872	Mirror Mount Assembly, right side	1
	570-871	Mirror Mount Assembly, left side	1
9	571-10	Diaphragm (571)	2
	572-3	Diaphragm (572)	2
10	570-7	Plate, bearing, right side	1
	570-8	Plate, bearing, left side	1
11	X-38002	Screw, No. 4-40	6
12	571-6	Mount, bearing	1
13	X-51737	Plate, name	2
14	570-55	Washer	2
15	570-33	Washer, spring	2
16	570-34	Nut, retaining	2
17	571-7	Spring, objective	2
	571-852	Objective Mount Assembly for 1X Fixed Power Body (571) (Includes items 20 thru 23)	1
	572-852	Objective Mount Assembly for 2X Fixed Power Body (572) (Includes items 20, 21, 23, 25)	1
	571-851	Cell Assembly for 1X Fixed Power Body (571) (Includes items 18, 19, 24)	2
	572-851	Cell Assembly for 2X Fixed Power Body (572) (Includes items 18, 27, 28)	2
18	571-11	Cell	2
19	571-601	Lens (Part of doublet, 571-701)	2
20	42-31	Screw, No. 4-48	4
21	42-58	Washer, spring	4
22	571-4	Mount (Used on 1X Fixed Power Body only)	1
23	571-2	Mount, objective	2
24	571-602	Lens (Part of doublet, 571-701)	2
25	572-1	Mount (Used on 2X Fixed Power Body only)	1
26	X-19406	Screw, No. 8-32	3
27	572-601	Lens (Part of doublet, 572-701)	2
28	572-602	Lens (Part of doublet, 572-701)	2
29	570-65	Cover	1
30	570-67	Screw, cover, No. 8-32	1
	STK-599	Window Attachment Assembly (Includes items 31, 32, 33)	1
31	577-3	Retaining Ring	1
32	599-601	Window	1
33	599-1	Mount	1
34	571-8	Plate, name (Used on 1X Fixed Power Body only)	1
	572-2	Plate, name (Used on 2X Fixed Power Body only)	1
35	570-61	Screw, cover, No. 8-32	2



AO No. 571, 572 Fixed Power Bodies

## AO No. 568, 569 STEREOSTAR/ZOOM Power Bodies

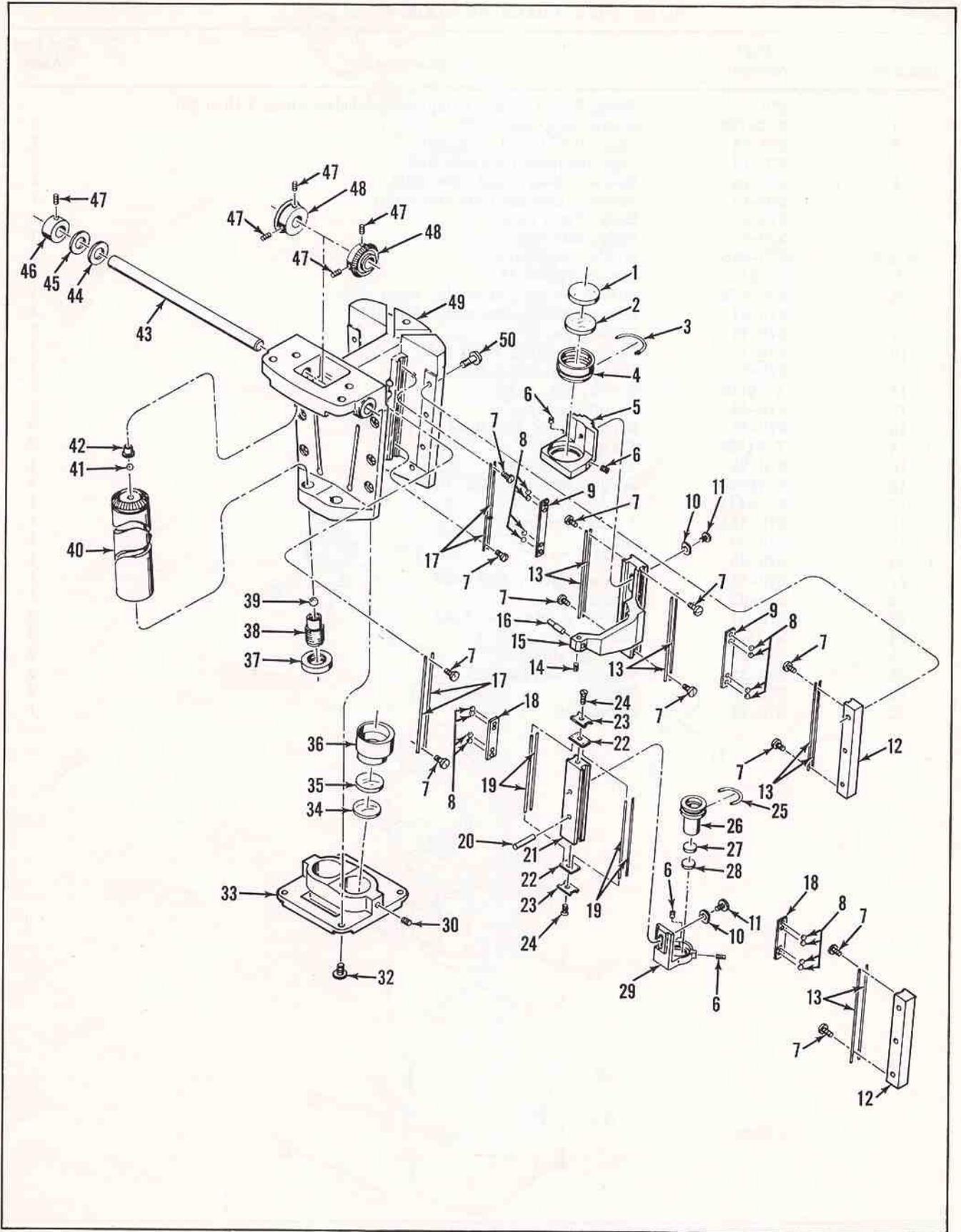
Index No.	Part Number	Description	Qty Per Assy
	568	1X to 2.5X Zoom Power Body (Includes items 1 thru 28)	
	569	0.7X to 3.0X Zoom Power Body (Includes items 1 thru 28)	
1	X-25750	Screw, set	2
2	570-15	Cap, fixed (right side only)	1
	570-13	Cap, focusing (left side only)	1
3	569-11	Sleeve, fixed (right side only)	1
	569-10	Sleeve, focusing (left side only)	1
4	570-3	Body, right side	1
	570-4	Body, left side	1
5 & 6	570-856	Window Assembly	2
7	42-31	Screw, No. 4-48	6
8	570-872	Mirror Mount Assembly, right side	1
	570-871	Mirror Mount Assembly, left side	1
9	569-20	Diaphragm	2
10	570-7	Plate, bearing, right side	1
	570-8	Plate, bearing, left side	1
11	X-38002	Screw, No. 4-40	6
12	570-44	Mount, bearing	1
13	570-69	Screw, stop, No. 2-56	2
14	X-51737	Plate, name	2
15	568-1	Knob, graduated (Used only on 568 Body)	1
	569-17	Knob, graduated (Used only on 569 Body)	1
16	X-20606	Screw, set, No. 6-32	2
17	570-55	Washer	2
18	570-33	Washer, spring	2
19	570-34	Nut, retaining	2
20	X-19412	Screw, No. 8-32	1
21	568-854	Frame Assembly for 1X to 2.5X Body	1
	569-854	Frame Assembly for 0.7X to 3.0X Body	1
22	570-70	Gasket	1
23	570-65	Cover	1
24	570-67	Screw, cover, No. 8-32	1
25	568-7	Plate, name (Used only on 568 Body)	1
	569-35	Plate, name (Used only on 569 Body)	1
26	570-61	Screw, cover, No. 8-32	2
27	X-19406	Screw, No. 8-32	2
28	568-2	Knob, left (Used only on 568 Body)	1
	570-24	Knob, left (Used only on 569 Body)	1



AO No. 568, 569 STEREOSTAR/ZOOM Power Bodies

Frame Assembly for STEREOSTAR/ZOOM Power Bodies No. 568, 569

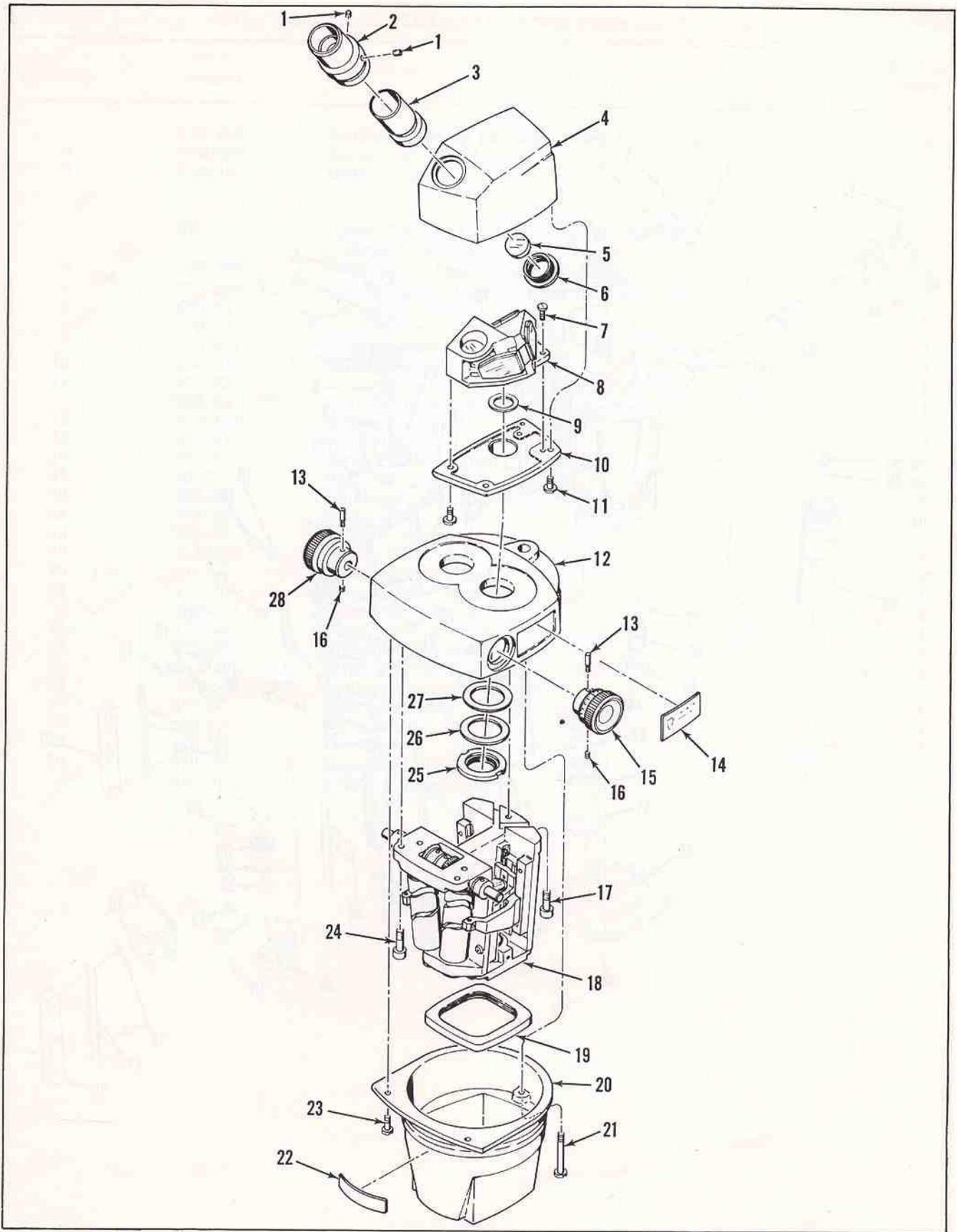
Index No.	Part Number	Description	Qty Per Assy
	568-854	Frame Assembly for 1X to 2.5X Zoom Power Body (Includes items 1 thru 50)	
	569-854	Frame Assembly for 0.7X to 3.0X Zoom Power Body (Includes items 1 thru 50)	
1, 2 & 4	569-853	Upper Cell and Lens Assembly	2
3	570-74	Spring, upper	2
5	569-8	Carrier, upper cell, right side	1
	569-9	Carrier, upper cell, left side	1
6	X-36843	Screw, set, No. 2-56	8
7	570-68	Screw, wire retainer, No. 1-72	24
8	10-6	Ball	32
9	569-13	Separator, ball, upper	4
10	570-66	Washer, spring	4
11	X-34596	Screw, No. 2-56	4
12	570-46	Guide, adjustable	4
13	570-58	Wire, long	16
14	X-30024	Screw, set, No. 3-48	2
15	569-3	Arm, driver, right side	1
	569-4	Arm, driver, left side	1
16	570-88	Follower, adjustable	2
17	570-81	Wire, frame	8
18	569-12	Separator, ball, mid.	4
19	570-57	Wire, short	8
20	570-89	Follower	2
21	569-15	Slide, middle, right side	1
	569-16	Slide, middle, left side	1
22	570-49	Plate, wire spacing	4
23	570-48	Plate, wire retaining	4
24	X-1390	Screw, No. 2-56	4
25	570-73	Spring, middle	2
	569-852	Middle Cell and Lens Assembly (Includes items 26, 27 & 28)	2
26	569-6	Cell, middle	2
27	569-604	Crown, middle (part of doublet 569-702)	2
28	569-603	Flint, middle (part of doublet 569-703)	2
29	570-18	Carrier, middle cell, right side	1
	570-40	Carrier, middle cell, left side	1
30	X-20591	Screw, set, No. 4-40	6
32	X-34580	Screw, No. 4-40	4
33	570-17	Plate, angle	1
34, 35 & 36	569-851	Lower Cell and Lens Assembly	2
37	570-29	Nut, lock	2
38	570-27	Bearing, cam	2
39	X-51645	Ball	2
40	569-2	Cam, left side	1
	569-1	Cam, right side	1
41	B35-14	Ball	2
42	570-23	Bushing, cam	2
43	570-26	Shaft, actuating	1
44	570-38	Washer, friction	2
45	X-50584	Washer, spring	1
46	570-28	Collar, thrust	2
47	X-20588	Screw, set, No. 4-40	6
48	570-19	Gear, bevel	2
49	569-25	Frame	1
50	X-51650	Screw, No. 6-32	12



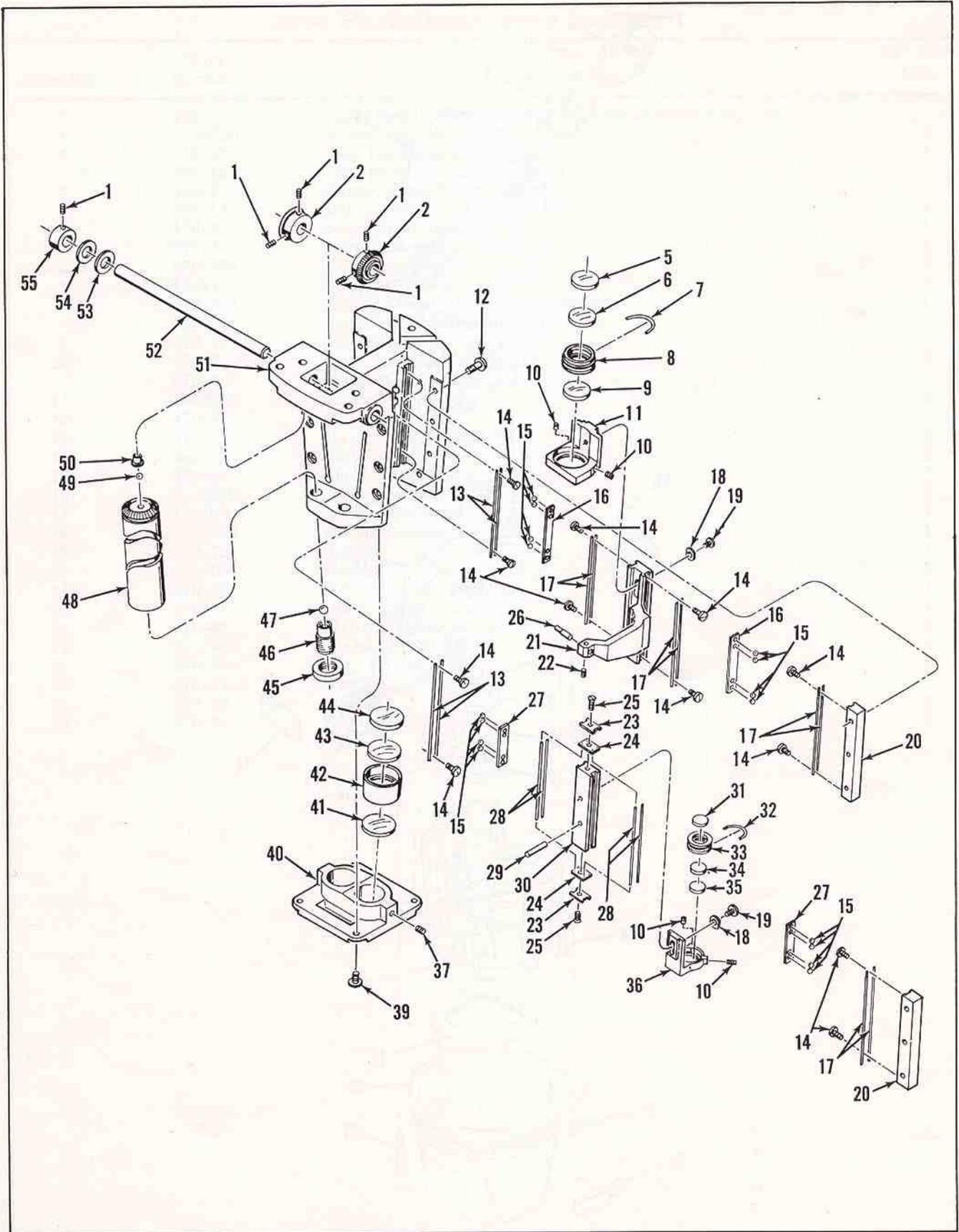
Frame Assembly for STEREOSTAR/ZOOM Power Bodies No. 568, 569

## AO No. 570 STEREOSTAR/ZOOM Power Body

Index No.	Part Number	Description	Qty Per Assy
	570	Zoom Power Body, complete (Includes items 1 thru 28)	
1	X-25750	Screw, set, No. 2-56	2
2	570-15	Cap, fixed (right side only)	1
	570-13	Cap, focusing (left side only)	1
3	570-14	Sleeve, fixed (right side only)	1
	570-12	Sleeve, focusing (left side only)	1
4	570-3	Body, right side	1
	570-4	Body, left side	1
5 & 6	570-856	Window Assembly	2
7	42-31	Screw, No. 4-48	6
8	570-872	Mirror Mount Assembly, right side	1
	570-871	Mirror Mount Assembly, left side	1
9	570-75	Diaphragm	2
10	570-7	Plate, bearing, right side	1
	570-8	Plate, bearing, left side	1
11	X-38002	Screw, No. 4-40	6
12	570-44	Mount, bearing	1
13	570-69	Screw, stop, No. 2-56	2
14	X-51737	Plate, name	2
15	570-25	Knob, graduated	1
16	X-20606	Screw, set, No. 6-32	2
17	X-19412	Screw, No. 8-32	1
18	570-854	Frame Assembly	1
19	570-70	Gasket	1
20	570-65	Cover	1
21	570-67	Screw, cover, No. 8-32	1
22	570-82	Plate, name	1
23	570-61	Screw, cover, No. 8-32	2
24	X-19406	Screw, No. 8-32	2
25	570-34	Nut, retaining	2
26	570-33	Washer, spring	2
27	570-55	Washer	2
28	570-24	Knob, left	1



AO No. 570 STEREOSTAR/ZOOM Power Body



Frame Assembly for STEREOSTAR/ZOOM Power Body No. 570

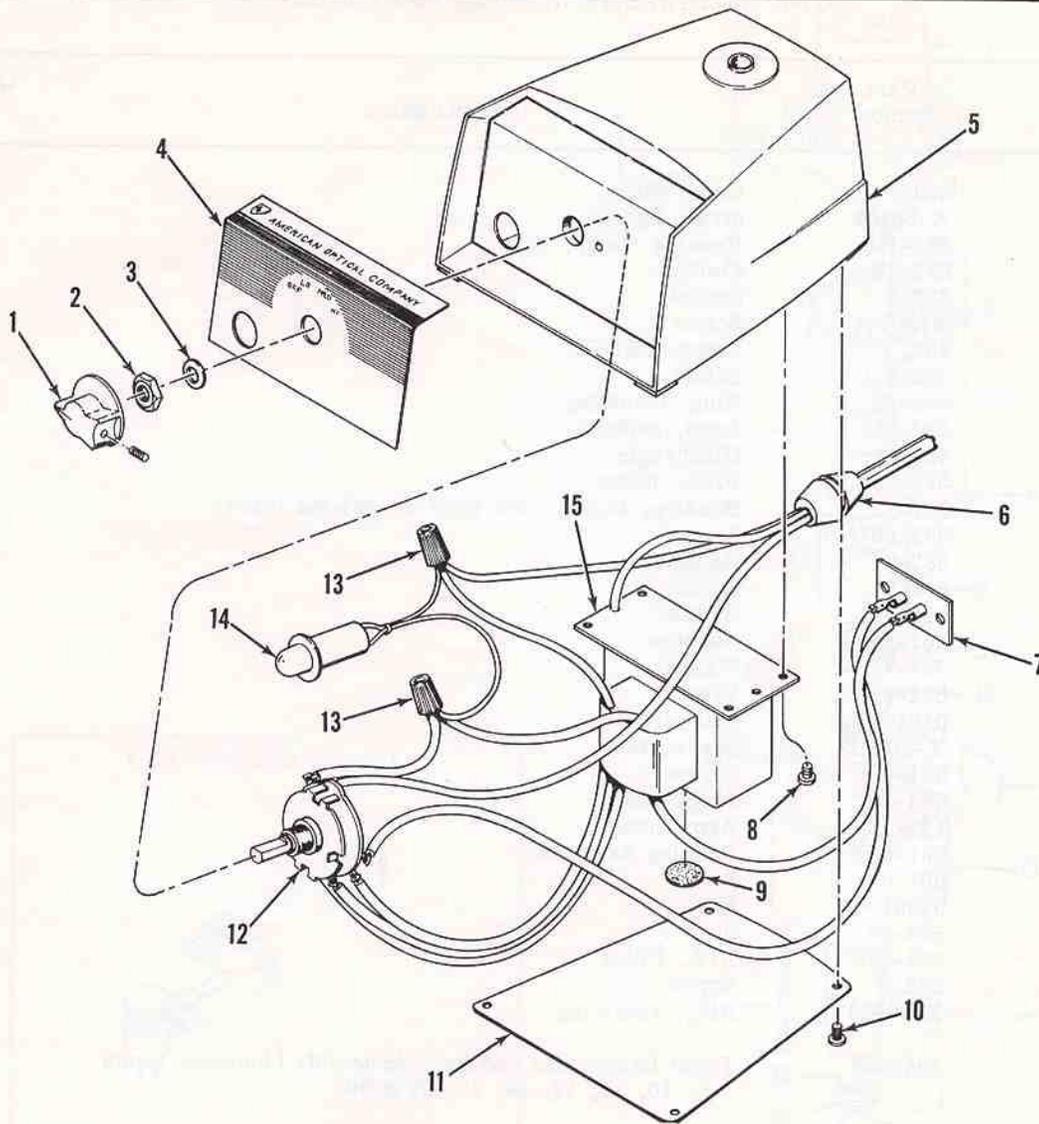
Frame Assembly for STEREOSTAR/ZOOM Power Body No. 570

Index No.	Part Number	Description	Qty Per Assy
	570-854	Frame Assembly (Includes items 1 thru 55)	1
1	X-20588	Screw, set, No. 4-40	6
2	570-19	Gear, bevel	2
	570-853	Upper Cell and Lens Assembly (Includes items 5, 6, 8 & 9)	2
5	570-609	Flint, upper (part of upper doublet)	2
6	570-608	Crown, upper (part of upper doublet)	2
7	570-74	Spring, upper	2
8	570-32	Cell, upper	2
9	570-607	Single, upper	2
10	X-36843	Screw, set, No. 2-56	8
11	570-52	Carrier, upper cell, right side	1
	570-54	Carrier, upper cell, left side	1
12	X-51650	Screw, No. 6-32	12
13	570-81	Wire, frame	8
14	570-68	Screw, wire retainer, No. 1-72	24
15	10-6	Ball	32
16	570-39	Separator, ball, upper	4
17	570-58	Wire, long	16
18	570-66	Washer, spring	4
19	X-34596	Screw, No. 2-56	4
20	570-46	Guide, adjustable	4
21	570-60	Arm, driver, right side	1
22	X-30024	Screw, set, No. 3-48	2
23	570-48	Plate, wire retaining	4
24	570-49	Plate, wire spacing	4
25	X-1390	Screw, No. 2-56	4
26	570-56	Follower, adjustable	2
27	570-37	Separator, ball, mid	4
28	570-57	Wire, short	8
29	570-63	Follower	2
30	570-36	Slide, mid, right side	1
	570-47	Slide, mid, left side	2

(Continued on next page)

Frame Assembly for STEROESTAR/ZOOM Power Body No. 570 (Cont.)

Index No.	Part Number	Description	Qty Per Assy
	570-852	Mid Cell and Lens Assembly (Includes items 31, 33, 34 & 35)	2
31	570-606	Single, middle	2
32	570-73	Spring, middle	2
33	570-22	Cell, middle	2
34	570-604	Crown, middle (part of middle doublet)	} Order Assembly #570-852
35	570-605	Flint, middle (part of middle doublet)	
36	570-18	Carrier, middle cell, right hand	1
	570-40	Carrier, middle cell, left hand	1
37	X-20591	Screw, set, No. 4-40	2
39	X-34580	Screw, No. 4-40	4
40	570-17	Plate, angle	1
	570-851	Lower Cell and Lens Assembly (Includes items 41, 42, 43, 44, and Assembly 570-701.)	2
41	570-601	Single, lower	2
42	570-107	Cell, lower	2
43	570-602	Crown, lower (part of lower doublet)	} Order Assembly #570-851
44	570-603	Flint, lower (part of lower doublet)	
45	570-29	Nut, lock	2
46	570-27	Bearing, cam	2
47	X-51645	Ball	2
48	570-21	Cam, left hand	1
	570-50	Cam, right hand	1
49	B35-14	Ball	2
50	570-23	Bushing, cam	2
51	570-43	Frame	1
52	570-26	Shaft, actuating	1
53	570-38	Washer, friction	2
54	X-50584	Washer, spring	1
55	570-28	Collar, thrust	2

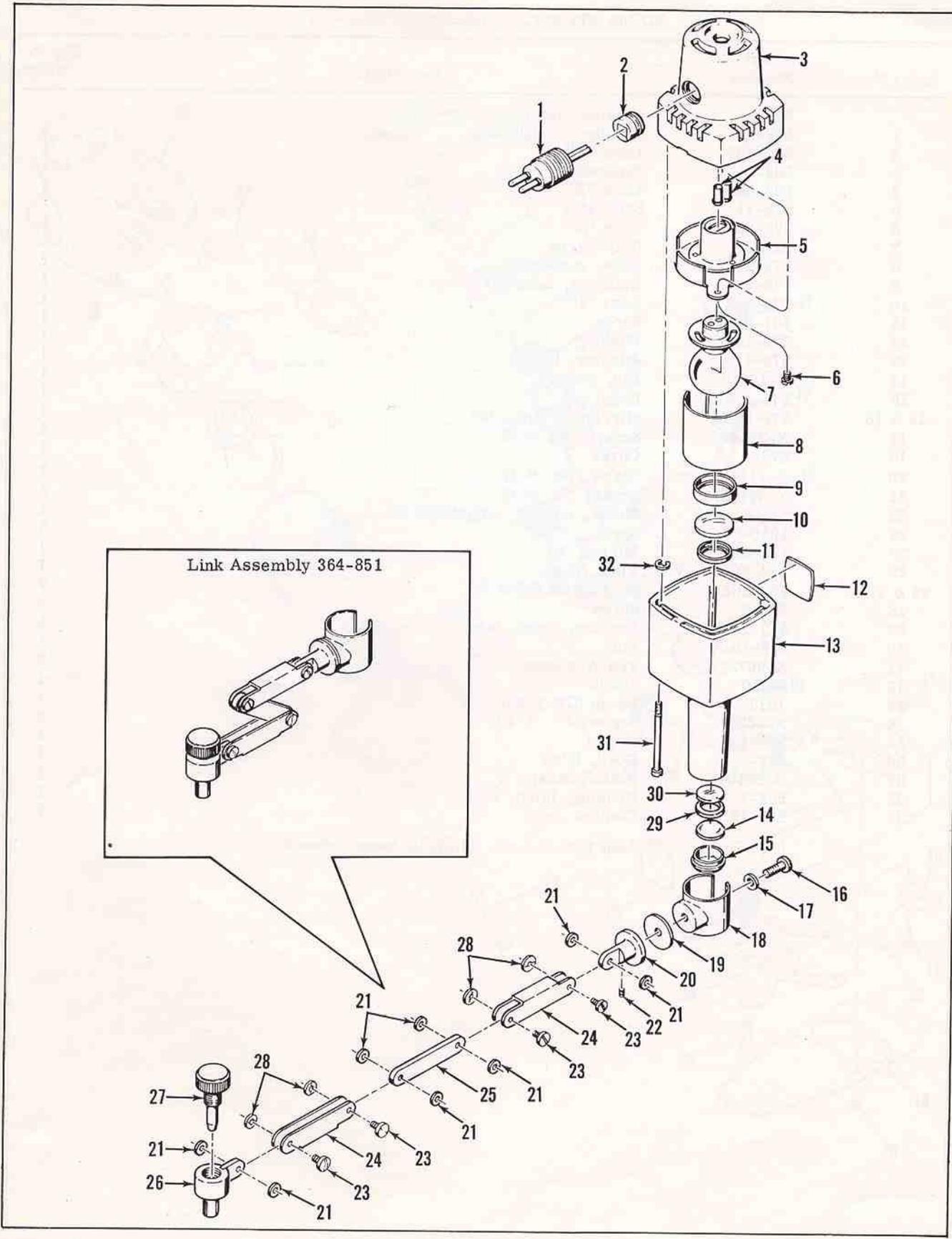


AO No. 365 Variable Voltage Transformer (Part of 363V)

Index No.	Part Number	Description	Qty Per Assy
1	X-51376	Knob and Screw Assembly	1
2		Nut (Part of item 12)	1
3		Washer (Part of item 12)	1
4	365-14	Plate, name	1
5	365-7	Case Assembly	1
6	651-8	Cord, 3 wire	1
7	651-5	Receptacle	1
8	X-9548	Screw	4
9	11201-77	Pad, base	1
10	X-9542	Screw	4
11	365-10	Plate, bottom	1
12	651-16	Switch	1
13	X-50282	Nut, wire	2
14	11144-7	Light, pilot	1
15	365-1	Transformer	1

AO No. 364 STARLITE Illuminator (Part of 363V)

Index No.	Part Number	Description	Qty Per Assy
1	652-9	Cord, lamp	1
2	X-50109	Strain relief	1
3	582-1	Housing, lamp, rear	1
4	582-17	Contact	2
5	582-4	Socket	1
6	X-30734	Screw	2
7	1033	Lamp (GE1460)	1
8	582-9	Shield	1
9	582-23	Ring, retaining	1
10	582-609	Lens, aspheric	1
11	582-13	Diaphragm	1
12	582-20	Plate, name	1
13	582-12	Housing, lamp, front (also see 364-852 below)	1
14	582-607	Lens	1
15	582-8	Retainer	1
16	581-5	Screw	1
17	01229-1	Washer	1
18	581-15	Adapter	1
19	581-7	Washer	1
20	581-6	Pivot	1
21	01016-2	Washer	8
22	X-20591	Screw, set	1
23	581-18	Screw	4
24	581-20	Arm, outer	2
25	581-19	Arm, inner	1
26	581-502	Bushing Assembly	1
27	581-9	Screw	1
28	02091-4	Nut	4
29	582-25	Spacer	1
30	582-608	H. A. Filter	1
31	582-6	Screw	2
32	X-50733	Ring, retaining	2
	364-852	Front Lamphouse and Lens Assembly (Includes items 9, 10, 11, 13, 14, 15, 29 & 30)	

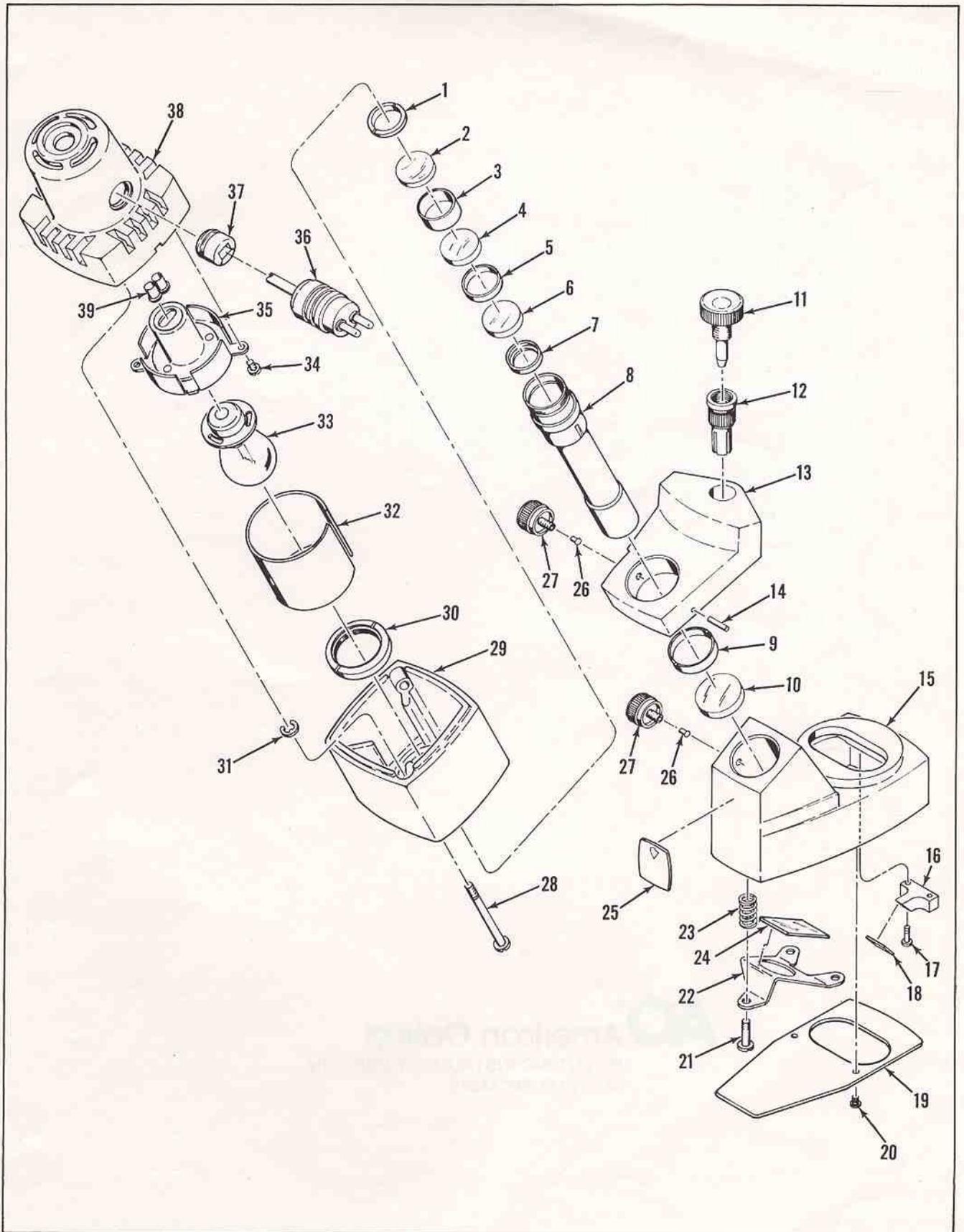


Link Assembly 364-851

AO No. 364 STARLITE Illuminator

## AO No. 579 Vertical Illuminator Assembly

Index No.	Part Number	Description	Qty Per Assy
	579	Vertical Illuminator Assembly	
1	579-12	Retainer, condenser	1
2	582-604	Lens "A"	1
3	582-14	Separator	1
4	582-605	Lens "B"	1
5	579-11	Separator	1
6	579-601	Lens "A"	1
7	579-15	Diaphragm	1
8	579-9	Tube, condenser	1
9	579-7	Retainer, Lens "B"	1
10	579-602	Lens "B"	1
11	581-9	Screw	1
12	579-14	Bushing	1
13	579-4	Adapter, lamp	1
14	X-14410	Pin, roll	1
15	579-2	Housing	1
16 & 18	579-853	Mirror "B" mounted	1
17	X-34143	Screw, No. 6-32	2
19	579-8	Cover	1
20	X-34140	Screw, No. 6-32	2
21	X-34145	Screw, No. 6-32	3
22	579-6	Mount, mirror, adjustable	1
23	1036-16	Spring	3
24	579-603	Mirror "A"	1
25	582-20	Plate, name	1
26 & 27	560-502	Screw with Nylon tip	2
28	582-6	Screw	2
29	579-13	Housing, front, lamp	1
30	579-10	Nut	1
31	X-50733	Tru-Arc Ring	2
32	582-9	Shield	1
33	1033	Lamp (GE 1460)	1
34	X-30734	Screw, No. 4-40	2
35	582-4	Socket	1
36	652-9	Cord, lamp	1
37	X-50109	Relief, strain	1
38	582-1	Housing, lamp, rear	1
39	582-17	Contact	2
	579-851	Lens tube assembly (Includes items 1 thru 8)	1



AO No. 579 Vertical Illuminator Assembly

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