OLYMPUS ZOOM STEREO MICROSCOPE

SZ3060/SZ4045/SZ4060

REPAIR MANUAL

OLYMPUS

CONTENTS

A. OUTLINE OF PRODUCT

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1. Outline of Merchandise

Name	Zoom stereo microscope
Model	SZ3060 (with 60° BI) SZ4045 (with 45° BI) SZ4060 (with 60° BI)

This is a binocular stereo microscope for the inspection in the field of industrial production, and used in conjunction with various auxiliary objective lenses.

2. Features

1) Use of the Glino optical system with inward angle of 10° provides an image with minimized color aberration free from swelling of an image.
2) Long 110mm working distance provides a wide working space.
3) Magnification is variable by moving the horizontal handles located on both sides. Selected magnification is displayed at an easy-to-see position permitting direct reading.

   Magnification variable range: 0.67 - 4X (zoom ratio 6)
4) Observation tube inclination angle is 45° in SZ4045, providing ease of observation. It is 60° in SZ4060 and SZ3060, and easy to observe when the unit is attached to an equipment.
5) Viewing width is adjustable with right and left interlocked, which is easy to operate.

3. Restrictive Conditions

1) Operating ambient temperature: 0 - 40°C (32 - 104°F)
2) Attachable eyepiece: G eyepiece series of stereo microscope
3) Attachable auxiliary objective lens:

110ALK0.3X	110AL0.62X
110ALK0.4X	110AL0.75X
110AL0.25X	110AL1.5X
110AL0.5X	110AL2X

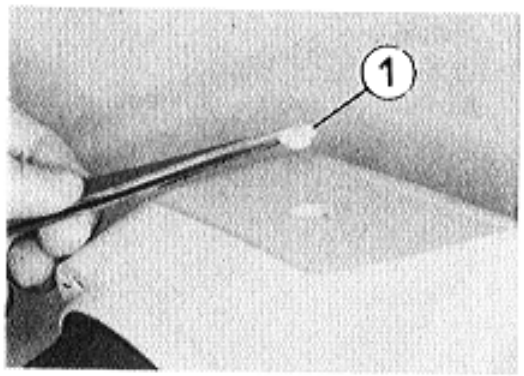
4. Specifications

Item		Specifications	Remarks
1	Tube inclination angle	SZ3060: 60°, SZ4045: 45°, SZ4060: 60°	
2	Viewing width adjustment	Right and left interlocked <Adjustable range> (at the position of GSWH10XEP) SZ3060: 51 ~ 76mm SZ4045: 50 ~ 76mm SZ4060: 51 ~ 76mm <Viewing width angle> SZ3060: 5° (Viewing width 51mm) ~ 11° (Viewing width 76mm) SZ4045: 4° (Viewing width 50mm) ~ 11° (Viewing width 76mm) SZ4060: 5° (Viewing width 51mm) ~ 11° (Viewing width 76mm)	
3	Eyepiece attaching part	Attaching inside diameter: ø30 +0.02 ~ +0.072 Eyepiece drop protective spring is provided.	
4	Magnification varying method	Zoom drive with the Glino horizontal handle with inward angle of 10° provided on both sides	
5	Zoom mangnification varying range	SZ3060: 0.9X ~ 4X (Zoom ratio 4.4) SZ4045/SZ4060: 0.67X ~ 4X (Zoom ratio 6)	
6	Diopter adjustment	Single lens diopter adjustment system (Left sleeve) Adjusting range -5 ~ 5 diopt	
7	Mounting on the stand	Fitting part outside diameter: ø76 -0.15 ~ -0.05	
8	Attachment of auxiliary objective lens	Screwing type M48X0.75	
9	Working distance	110mm	
10	Weight	Approx. 1.4kg	

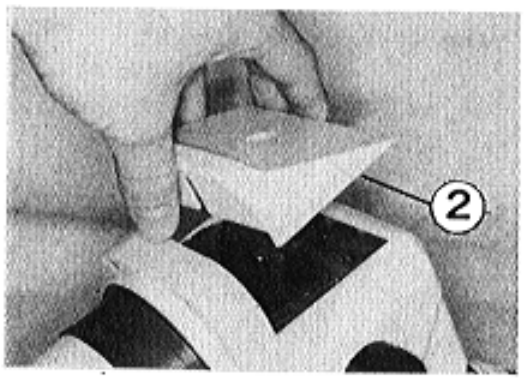
B. DISASSEMBLING PROCEDURE

CONTENTS

1. Disassembling the Observation Tube into Units

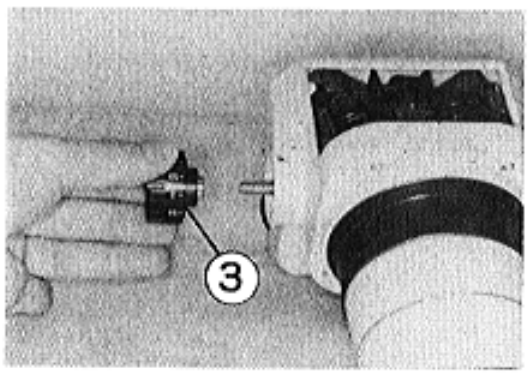


1-1 Remove the CAP ①. (Except SZ3060)



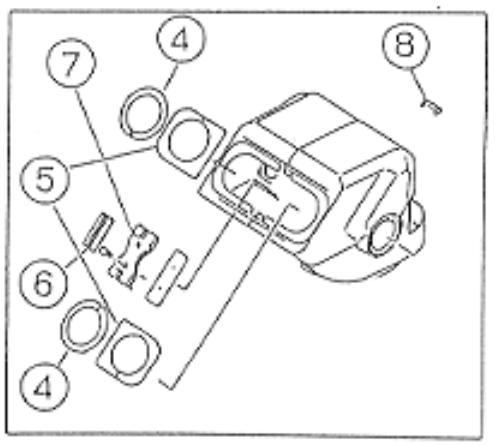
1-2 Remove the REAR COVER ②.
(Except SZ3060)

Screw CUK3x6SA 1 pc.



1-3 Remove the KNOB 2 ③ and the KNOB 1 (right side).

Screw ACU3x4SA 2 pcs. each

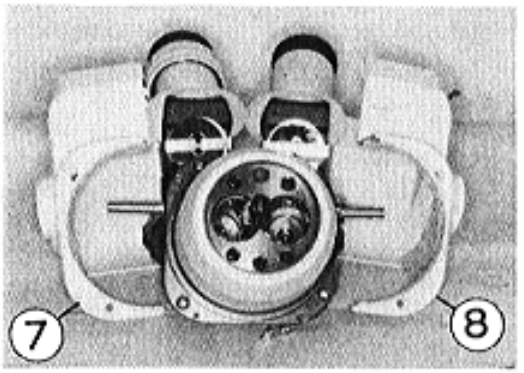


1-4 Strip the PLATE ⑥ after removing the WASHERS ④ and the SLIDE PLATEs ⑤.

1-5 Remove the COVER ⑦.

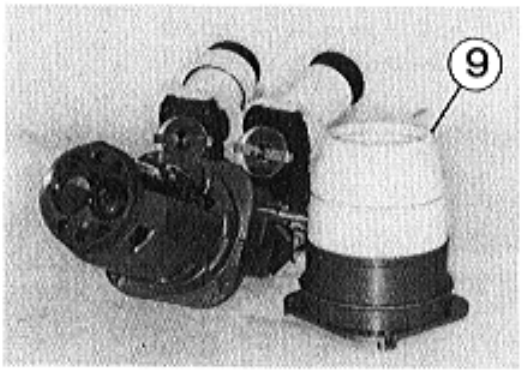
Screw PUK 2x8SA 2 pcs.

1-6 Remove the SPRING ⑧.



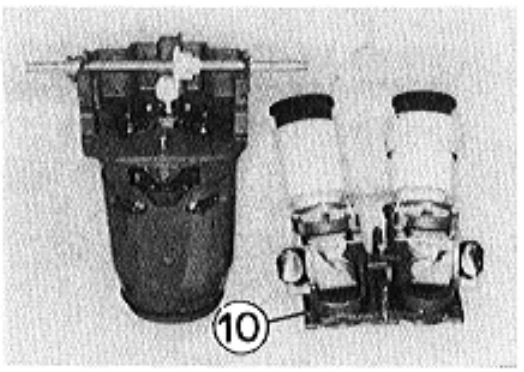
1-7 Remove the BI-COVER-L (7) and BI COVER-R (8).

Screw CUK3x6SA 2 pcs. each



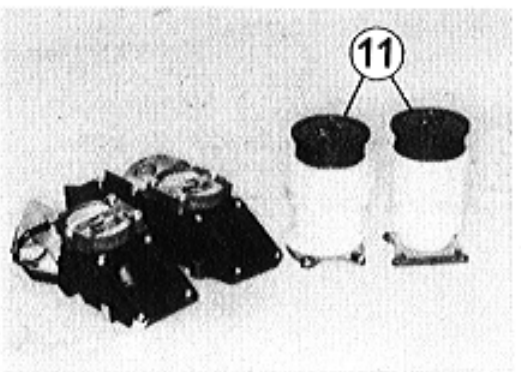
1-8 Remove the COVER (9).

Screw CUK3x6SA 4 pcs.



1-9 Remove the BI-SECTION (10).

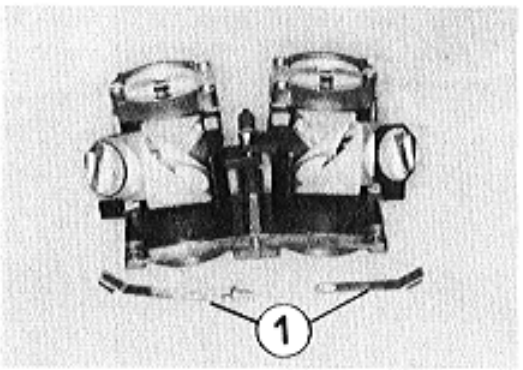
Screw AB3x8SA 4 pcs.



1-10 Remove the SLEEVE SECTION (11).

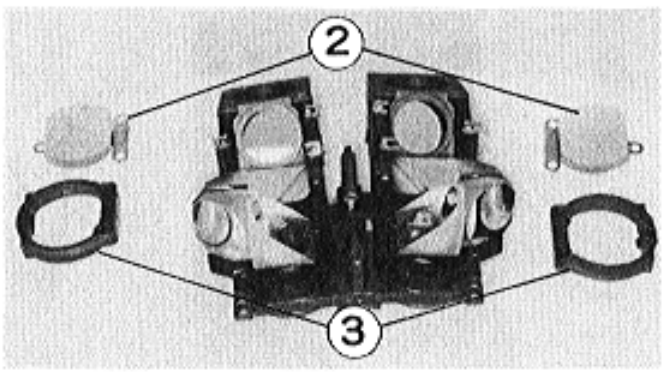
Screw AB3x8SA 4 pcs. each

2. Disassembling the BI Unit



2-1 Remove the SPRING-Ls (1).

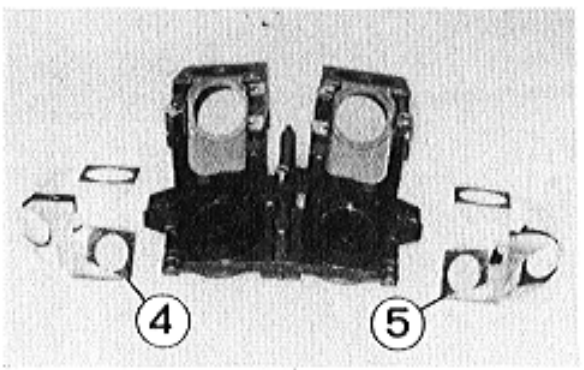
Screw CUK3x6SA 1 pc. each



2-2 Remove the MIRRORs (2) and MIRROR MOUNTs (3).

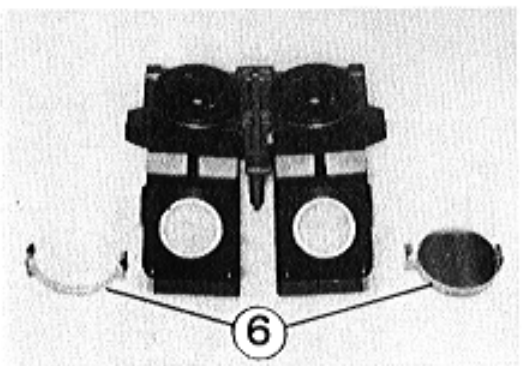
Screw CUK3x12SA 3 pcs. each

* Several spacers are used under the MIRROR MOUNT. Fasten them with a tape to prevent scattering.
* The spacers should be returned to the original position.

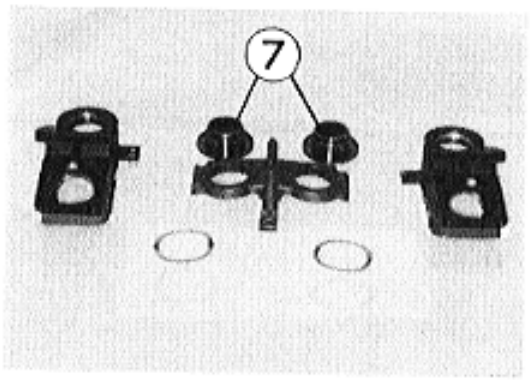


2-3 Remove the PRISM (4) and PRISM (5).

* The prisms have been bonded with a silicon adhesive.



2-4 Remove the MIRRORs (6).

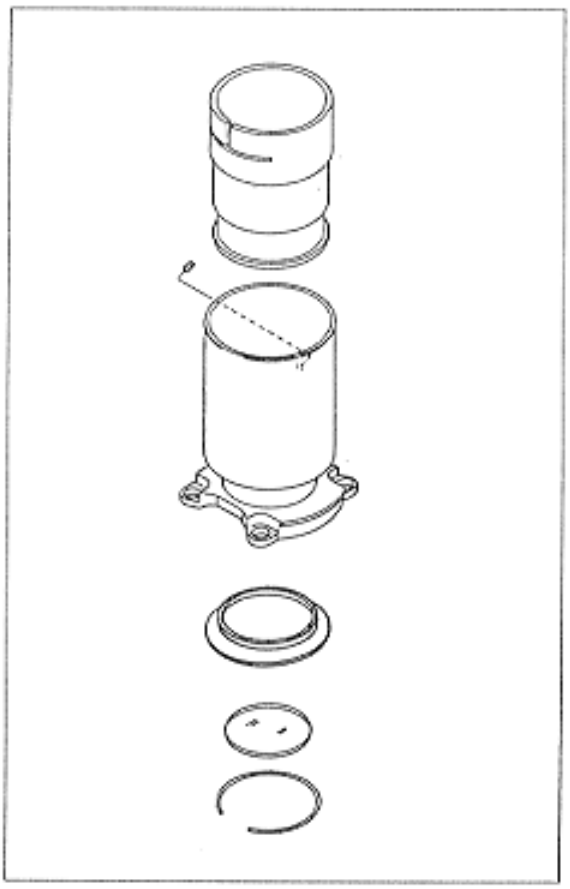


2-5 Remove the TUBE SHAFTs (7). The unit can be disassembled as shown in the drawing.

* The TUBE SHAFT SCREW THREAD has been bonded with SHELLAC. Use an exclusive tool for easy removal. It is recommended to apply alcohol to the screw thread before removing the shafts.

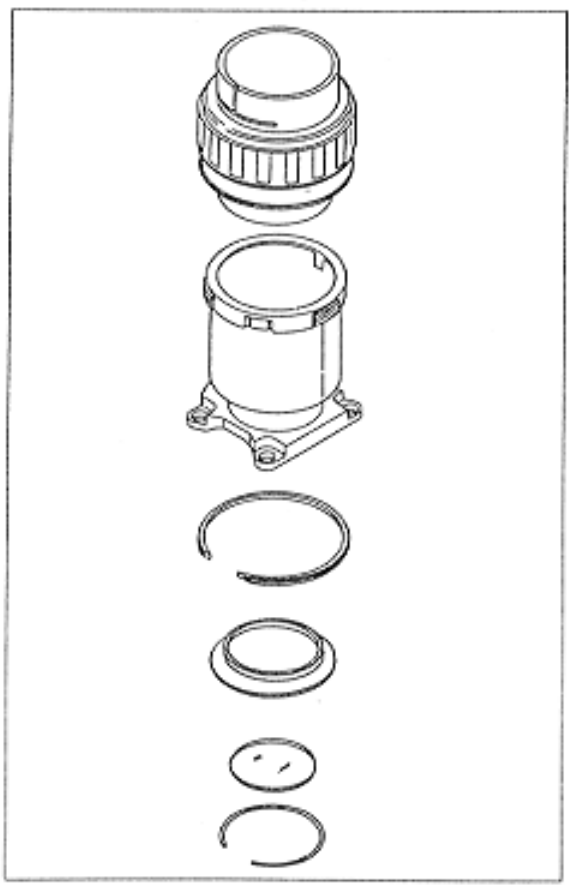
Tool KKAB6467

3. Disassembling the Sleeve Assembly



3-1 Disassembling the right side sleeve as shown in the drawing.

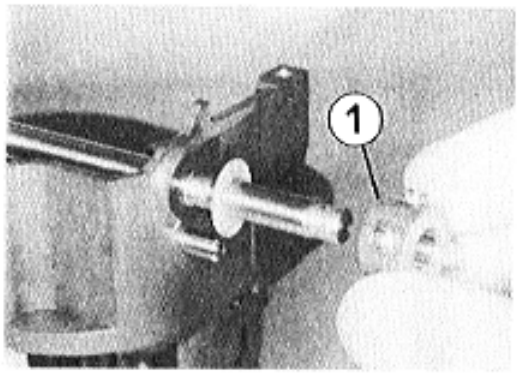
Screw ACU2x3UO 2 pcs.



3-2 Disassembling the left side sleeve as shown in the drawing.

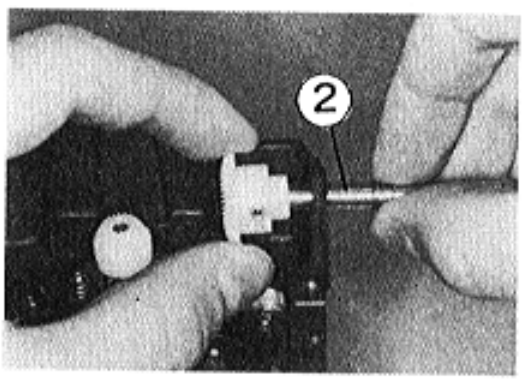
* When removing the helicoid of SLEEVE ASSEMBLY, mark the line so that the SLEEVE ASSEMBLY can be mounted to the original position.

4. Disassembling the ZB Unit



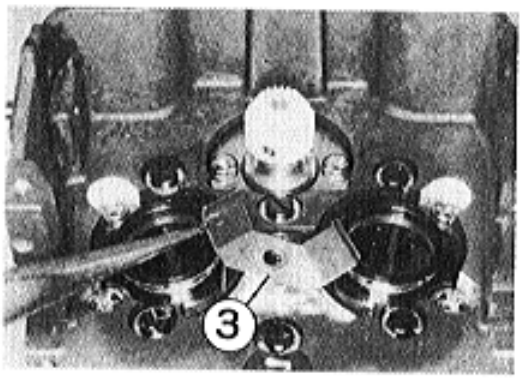
4-1 Remove the STOPPER ①.

Screw ACU3x4SA 2 pcs.



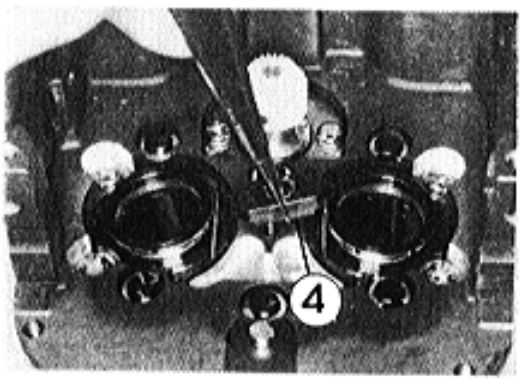
4-2 Remove the KNOB SHAFT ②.

Screw ACU3x4SA 2 pcs.



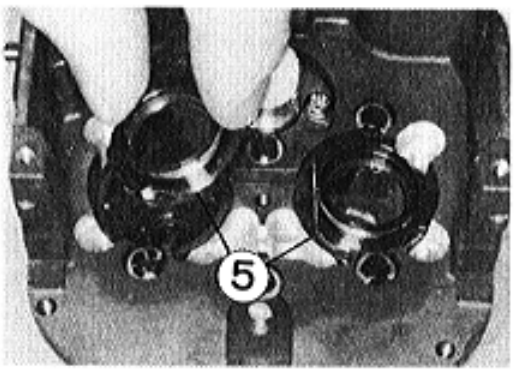
4-3 Remove the SPRING ③.

Screw CUK3x6SA 1 pc.



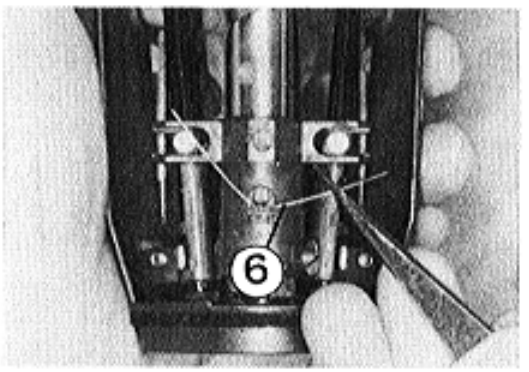
4-4 Remove the HOLDING BLOCK ④.

Screw CUK3x8SA 1 pc.

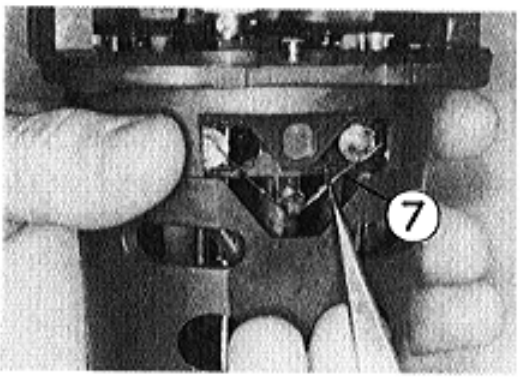


4-5 Remove the LENS ASSEMBLY ⑤.

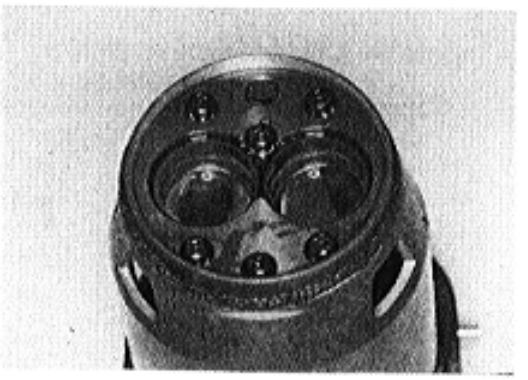
Screw CUK3x6SA 2 pcs. each



4-6 Remove the SPRING ⑥.



4-7 Remove the SPRING ⑦.



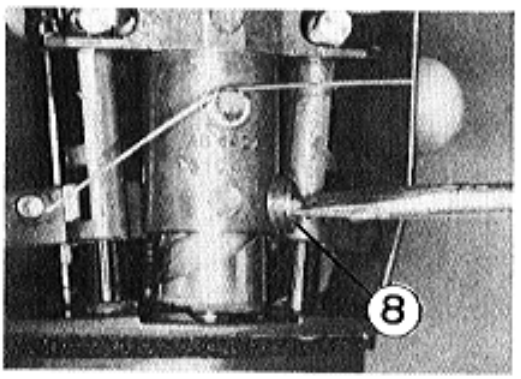
4-8 Loosen sufficiently the six screws fastening the bottom of the main unit.

Screw CUK3x6SA 6 pcs.

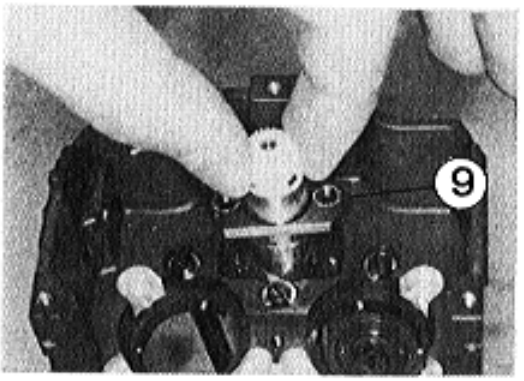
* The screws will not be removed simply by turning them. Fix the SHAFT on the opposite side with a screwdriver (-) before turning the screw.

4-9 After the six screws have been sufficiently loosened, push them with a screwdriver to make the SHAFTs easy to remove.

4-10 Remove all the six SHAFTs.

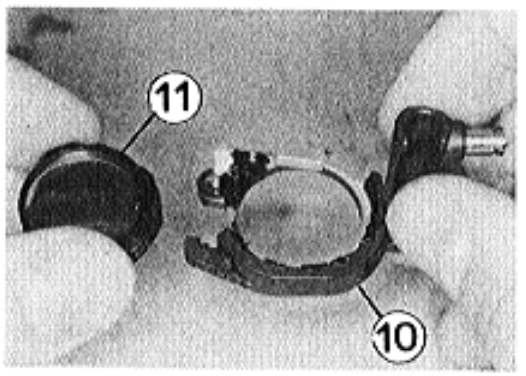


4-11 Remove the SCREW (8).



4-12 Remove the CAM ASSEMBLY (9).

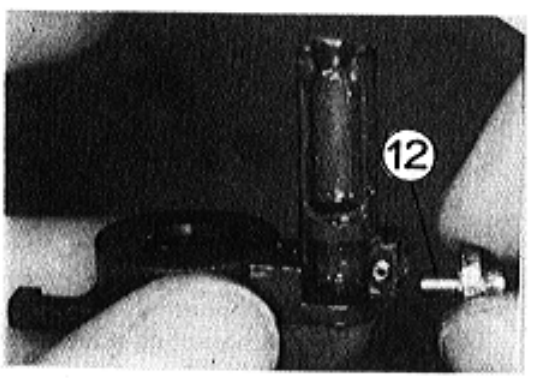
Screw CUK3x6SA 2 pcs.



4-13 Remove the LENS-ASSEMBLY (11) from the LENS-FRAME-L (10).

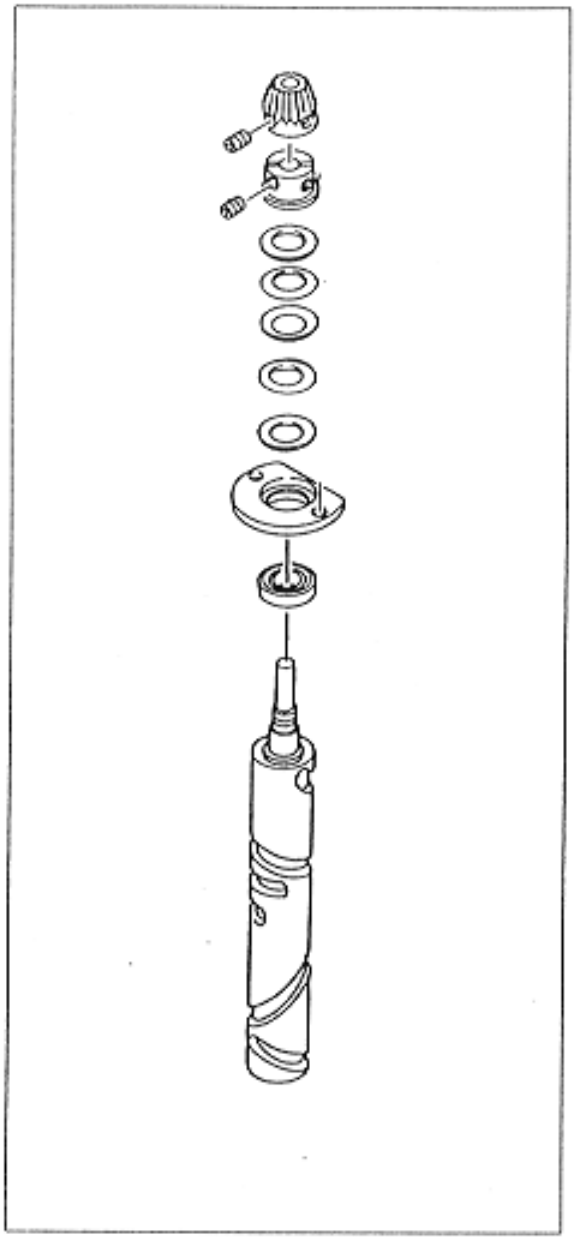
* The lens assembly has been bonded with the silicon and epoxy adhesive.

4-14 Remove the LENS-ASSEMBLY from the LENS-FRAME-R in the same manner.

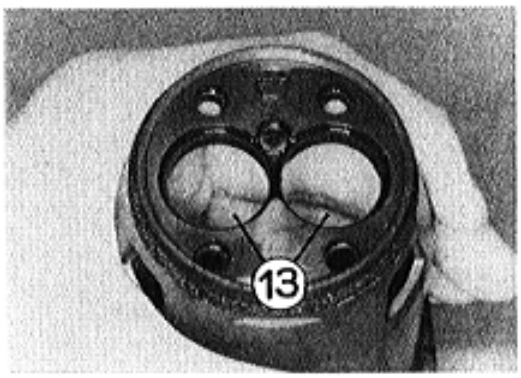


4-15 Remove the ECCENTRIC SHAFT (12).

Screw ACU2x4SA 1 pc. each



4-16 Disassemble the CAM ASSEMBLY as shown in the drawing.

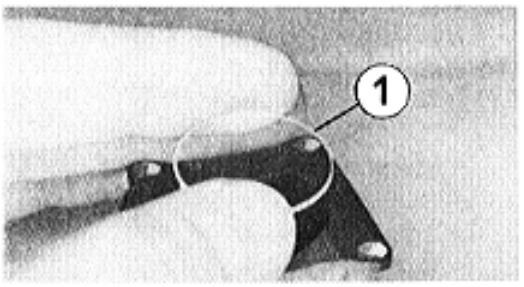


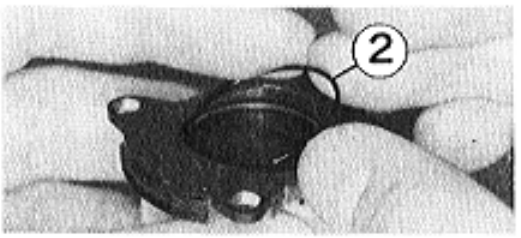
4-17 Remove the FILTERs (13) .

* The filter has been bonded with a silicon adhesive.

CONTENTS

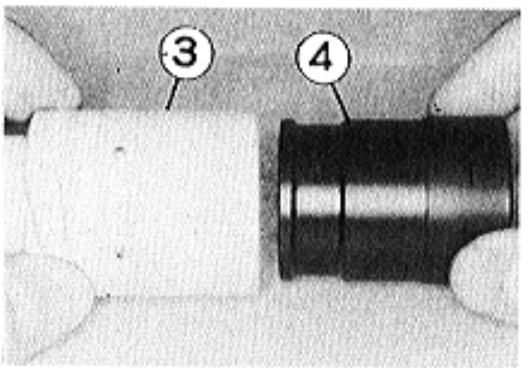
1. Reassembling the Sleeve Assembly





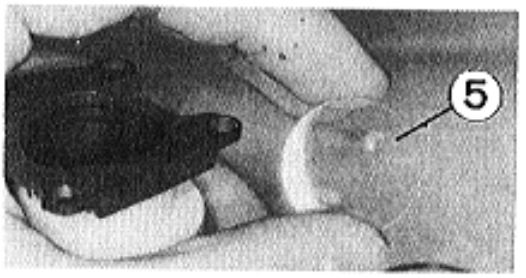
1-1 Reassembling the right side sleeve

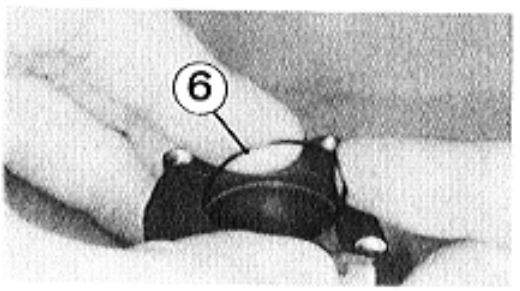
(1) Install the FILTER ① and fasten it with a SPRING ② .



(2) Fasten the SLEEVE-E ④ tentatively to the TUBE ③.

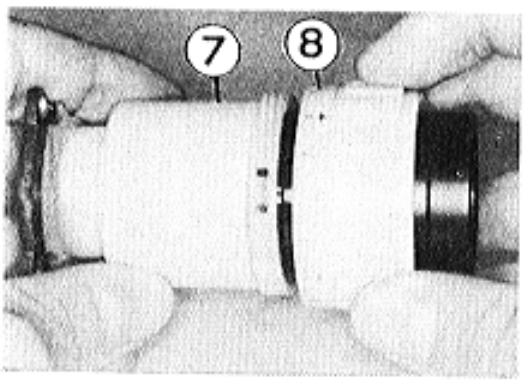
Screw ACU2x3UO 2 pcs.





1-2 Reassembling the left side sleeve

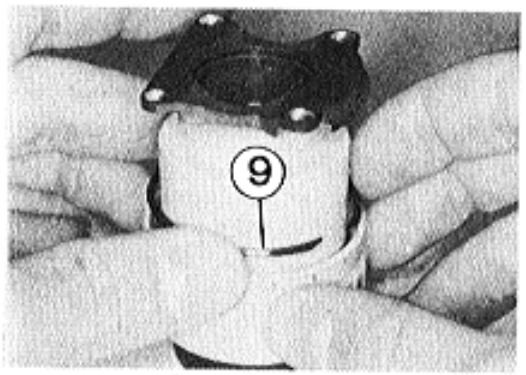
(1) Install the FILTER ⑤ and fasten it with a SPRING ⑥ .



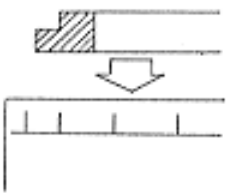
(2) Apply grease to the threads of the TUBE ASSEMBLY (7) and SLEEVE ASSEMBLY (8), and engage them.

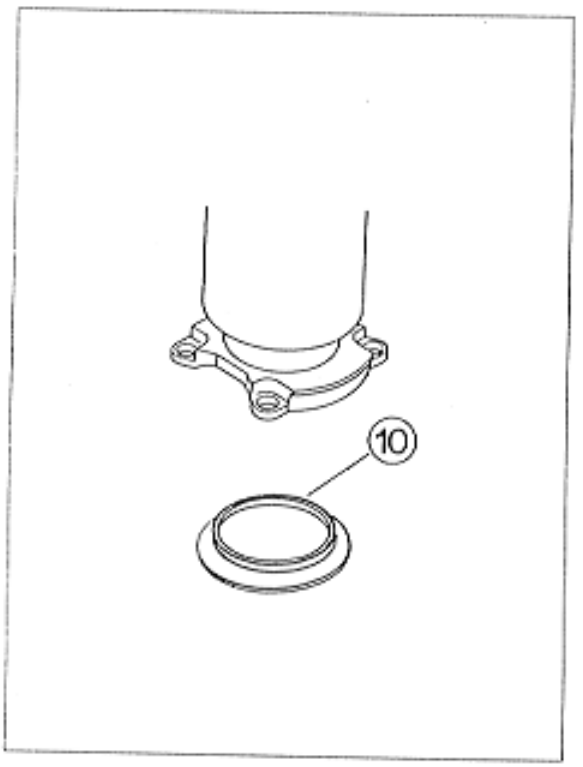
Grease Los 72515 (OT2008)

* Mount the helicoid of SLEEVE ASSEMBLY (8) at the original position marked the line when removing it.



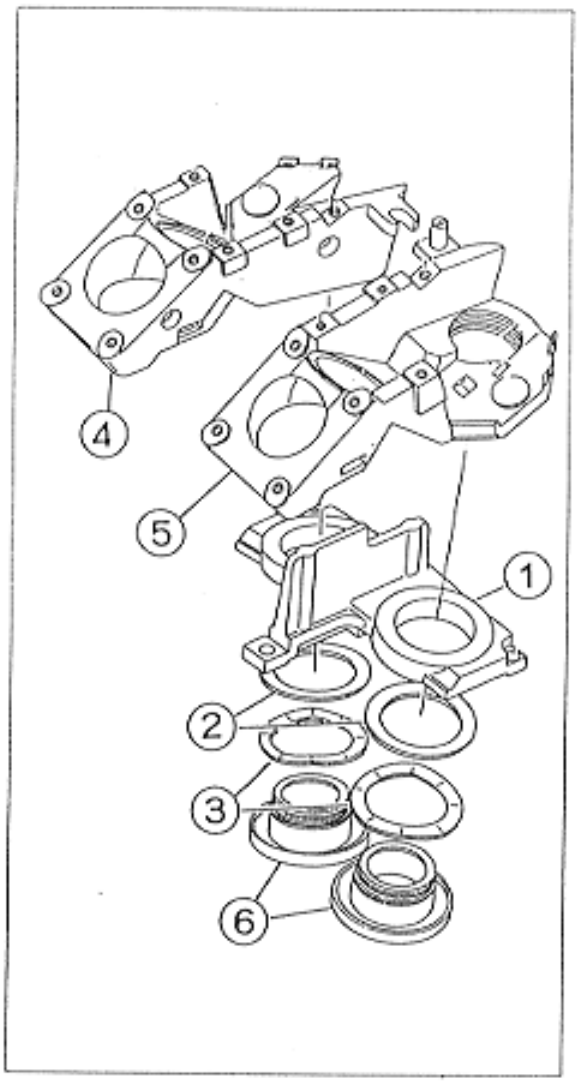
(3) Fit the H-RING (9).





1-3 Attach the RUBBER (10) to the finest part of the left and right sleeves.

2. Reassembling the BI Unit



2-1 Apply grease to both sides of the BI-FRAME (1) hole and the WASHERs(2) and SPRING WASHERs(3).

Grease Los 72515 (OT2008)

2-2 Mount the PRISM-MOUNT-L (4) and PRISM-MOUNT-R (5) on the BI-FRAME with the TUBE-SHAFTs(6).

* The WASHER and SPRING-WASHER tend to project.

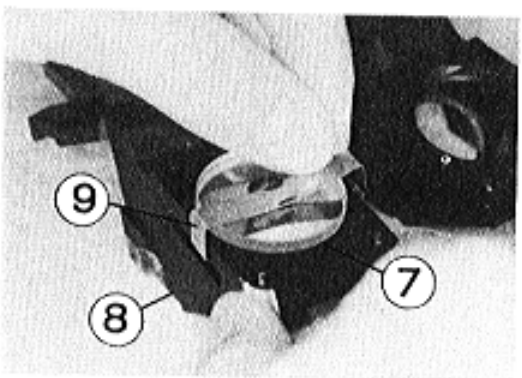
2-3 Push the ends of the PRISM-MOUNT-L and PRISM-MOUNT-R in the direction to narrow the viewing width, and check the working force.

Working force 2000 ± 500g

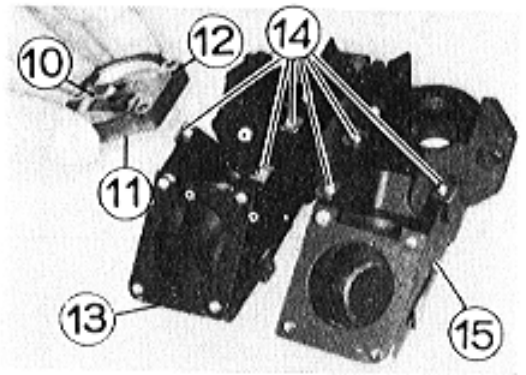
* Replace the SPRING-WASHER if the working force does not meet the standard. (Use a thicker spring washer if the force is too weak, and a thinner SPRING-WASHER if the force is too strong.)

2-4 Apply an adhesive to the TUBE SHAFT(6) screw threads.

Adhesive SHELLAC (OT1131)



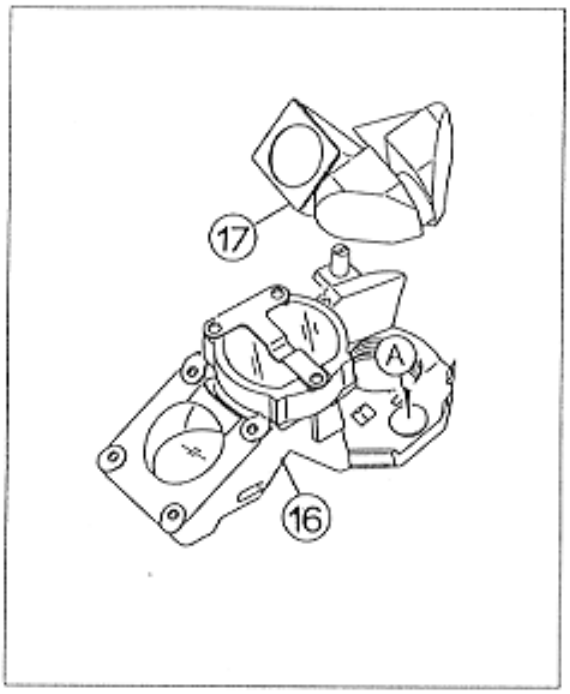
2-5 Fit the MIRROR (7) into the holes to set the PRISM-MOUNT-R (8) and PRISM-MOUNT-L, and fasten it with the SPRING-2 (9).



2-6 Fit the MIRROR (10) in the MIRROR-MOUNT (11), and hold it with the SPRING-1 (12) and fasten it to the PRISM-MOUNT-L (13).

SCREW CUK 3x12SA 3 pcs.

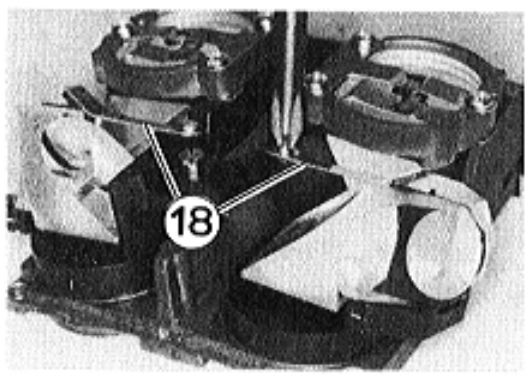
* Take care not to scatter the spacers (14) fastened to the PRISM-MOUNT-L (13) when peeling off the tape.
* Do the same for the PRISM-MOUNT-R (15).



2-7 Apply an adhesive to the part (A) of the PRISM-MOUNT-R (16), and set the PRISM (17) thereon.

Adhesive KE45 black (OT1017)

* Push the PRISM (17) in the arrow direction.
* Do the same for the PRISM-MOUNT-L.

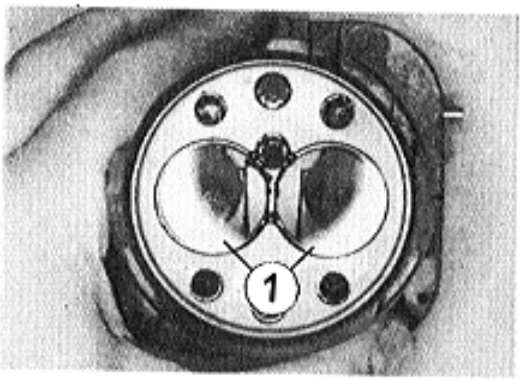


2-8 Assemble the T-SPRINGs (18).

SCREW CUK 3x6SA 2 pcs.

* T-SPRING is not used in certain models.

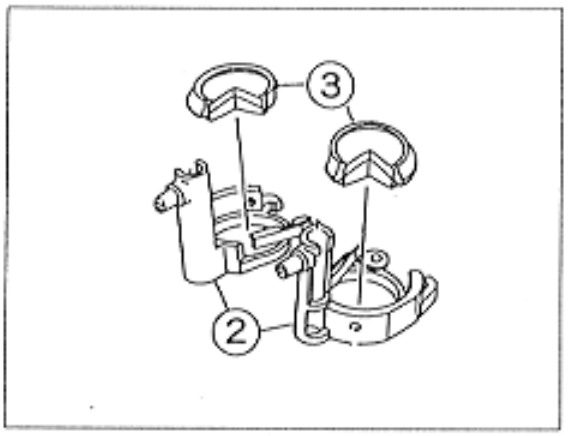
3. Reassembling the ZB Unit



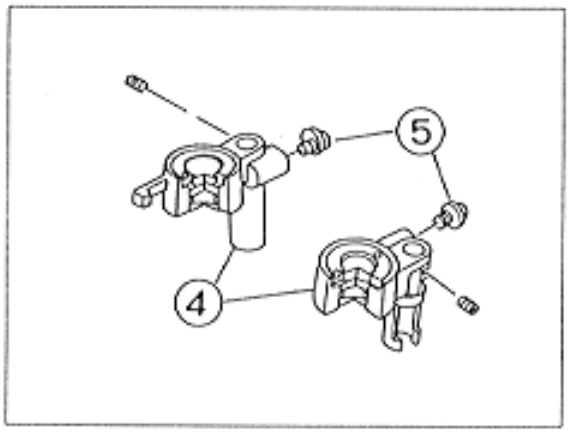
3-1 Bond the FILTERs ① to the main unit.

Adhesive KE3474 black (OTl393)

* Since it is used as a seal, take care to completely fill the space surrounding the glass diameter, but not to extrude it in lens effective diameter.

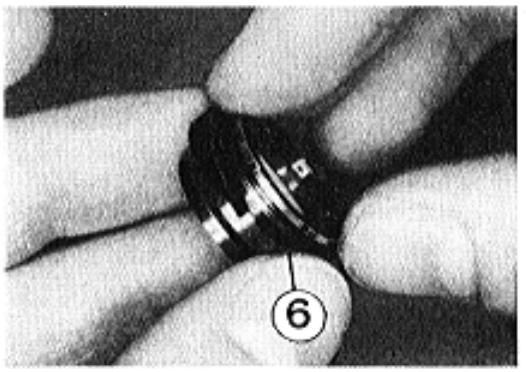


3-2 Assemble tentatively the LENS FRAME-1 ② and the LENS ASSEMBLY-1 ③.

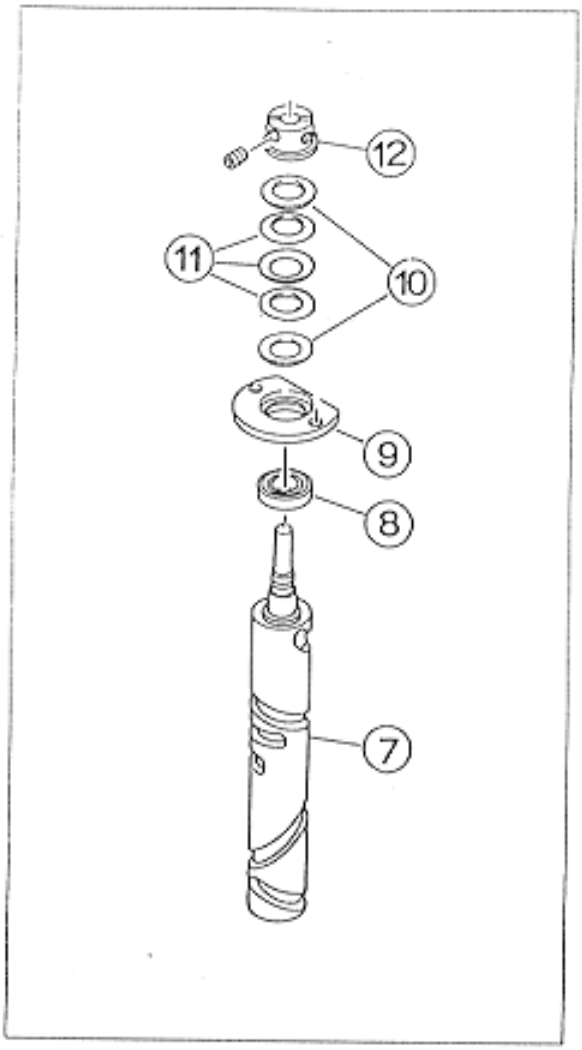


3-3 Assemble tentatively the ECCENTRIC SHAFTs ⑤ to the LENS ASSEMBLY-2 ④.

Screw ACU2x4SA 2 pcs. each



3-4 Clean the LENS ASSEMBLY ⑥ screw thread so that it can be turned smoothly.



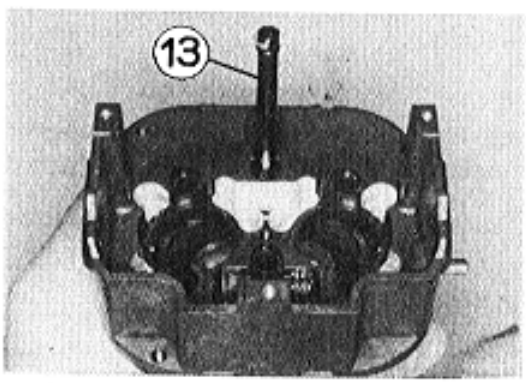
3-5 Assemble the BEARING (8) and the BEARING MOUNT (9) to the CAM SHAFT (7).

3-6 Apply grease to both sides of the WASHERs (10) and the SPRING WASHERs (11), and mount them on the BEARIBG MOUNT (9) with care taken to the direction.

Grease Los 72515 (OT2008)

3-7 Screw the B-NUT (12), and fasten it when the CAM SHAFT (7) rotating force against the BEARING MOUNT (9) meets the standard.

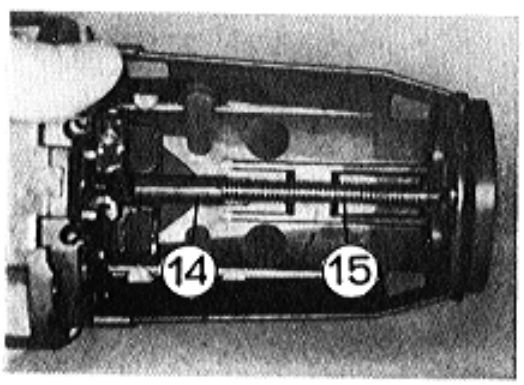
Rotating force 100 ~ 250g



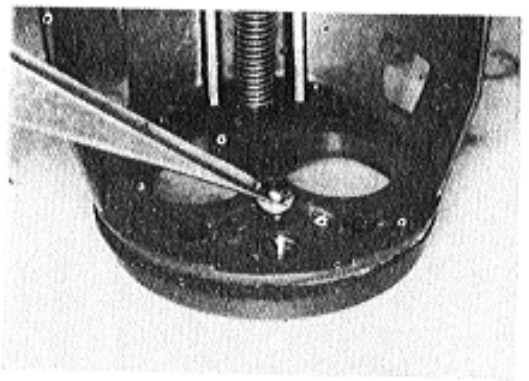
3-8 Insert the SHAFT (13) half into the main unit.

* Apply grease to the SHAFT beforehand.

Grease PHOTOLUB 017P (OT2142)

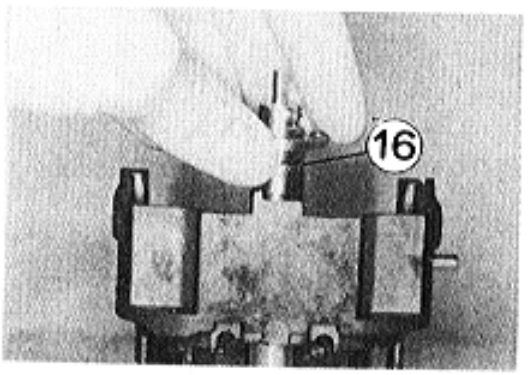


3-9 Insert the ARM-2R (14) and the SPRING (15) into the SHAFT (13), and then insert it completely into the main unit.



3-10 Apply grease to the concave of the main unit, and place the grease coated ball therein.

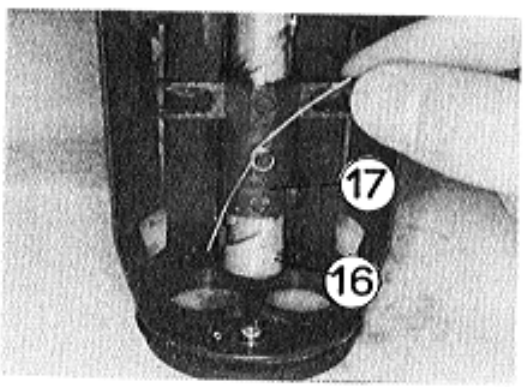
Grease Los 72515 (OT2008)



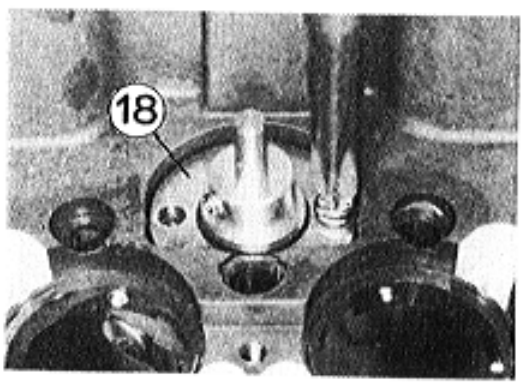
3-11 Insert the grease coated CAM SHAFT (16) half into the main unit.

* Apply Los 33 to the CAM SHAFT groove and periphery, and Los 72515 to the lower concave. Apply rather much amount of grease.

Grease Los 33 (OT2024) Los 72515 (OT2008)

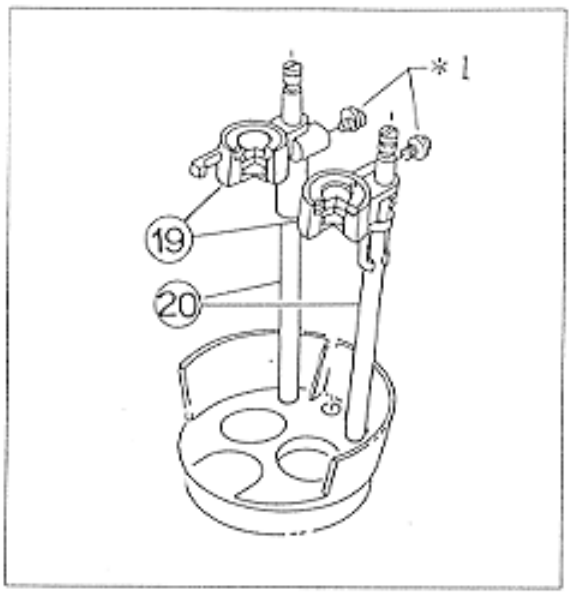


3-12 Pass the ARM-1F (17) through the CAM SHAFT (16) and fit the lower concave to the ball without play.

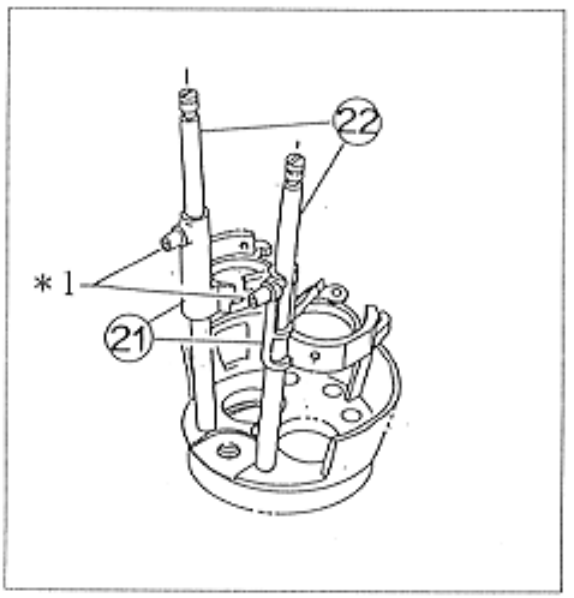


3-13 Fasten the BEARING MOUNT (18) to the main unit.

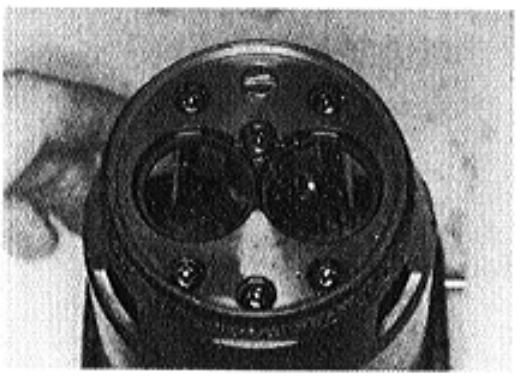
SCREW CUK 3x6SA 2 pcs.



3-14 Fit the pins *1 of the LENS ASSEMBLY-2 (19) into the ARM-2R (14) (No.C-6) and pass through the SHAFTs (20).

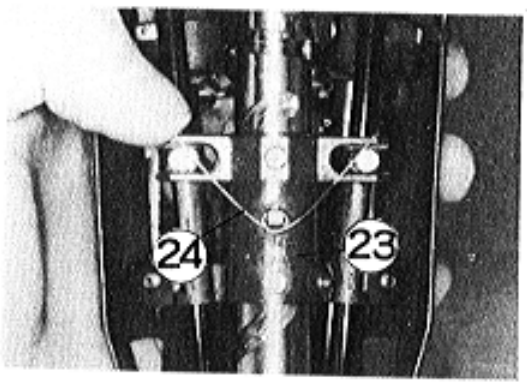


3-15 Fit the pins *1 of the LENS ASSEMBLY-1 (21) into the ARM-1F (17) (No.C-7) and pass through the SHAFTs (22).

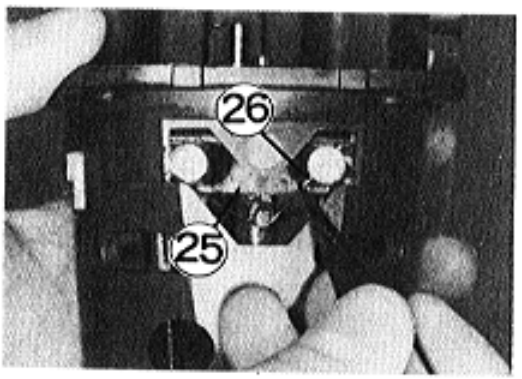


3-16 Fasten the SHAFTs.

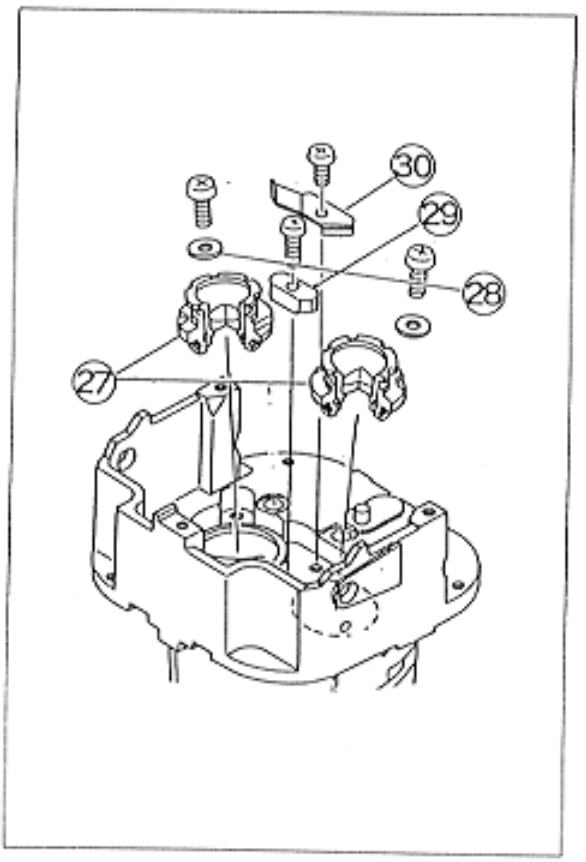
SCREW CUK 3x6SA 6 pcs.



3-17 Set the SPRING (24) between the ARM-1F (23) and two pins.



3-18 Set the SPRING (26) between the ARM-2R (25) and two ECCENTRIG SHAFTs.

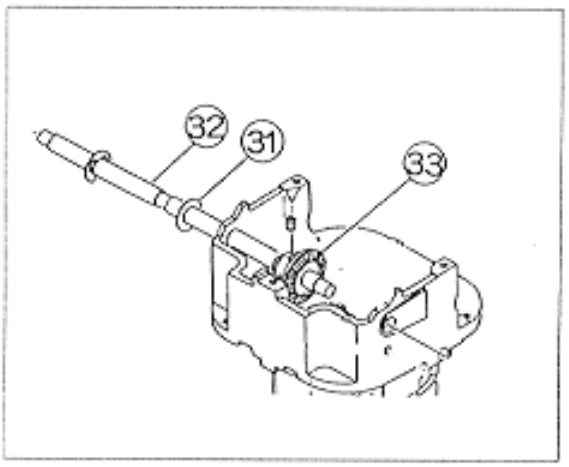


3-19 Attach the LENS ASSEMBLY (27) to the main unit, and fasten them tentatively with the WASHERs (28) and the HOLDING BLOCK (29).

SCREW CUK 3x6SA 4 pcs.
SCREW CUK 3x8SA 1 pc.

3-20 Attach the SPRING (30).

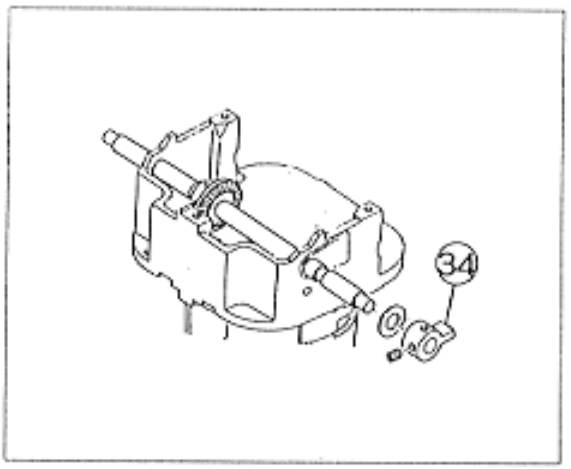
SCREW CUK 3x6SA 1 pc.



3-21 Insert the KNOB SHAFT (32) with the WASHER (31) attached into the main unit, and further insert it into the GEAR-2 (33) .

* Apply grease to the WASHER (31) beforehand.

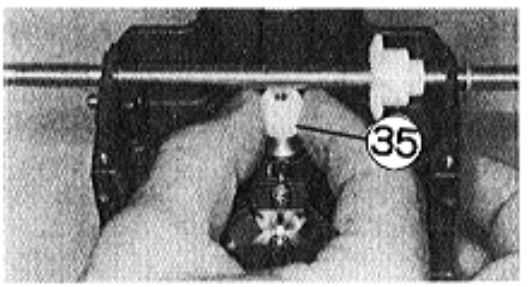
Grease Los 72515 (OT2008)



3-22 Project the KNOB SHAFT from the main unit, and pass it through the WASHER and the STOPPER (34) .

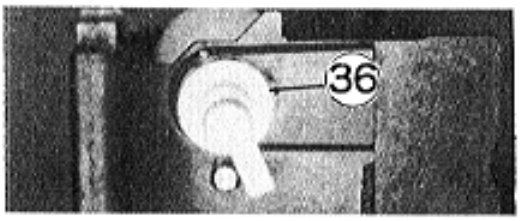
3-23 Fasten the STOPPER so that no side to side rattling is generated in the KNOB SHAFT.

SCREW ACU 3x4SA 2 pcs.

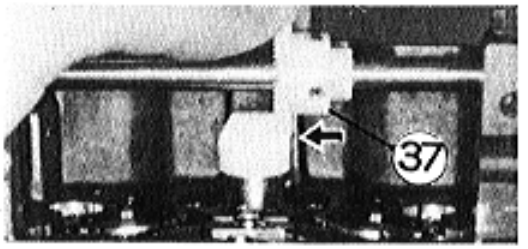


3-24 Turn the GEAR-1 (35) fully counter-clockwise, and then return it slightly.

(0.2 ~ 0.7mm in the gear circumference)



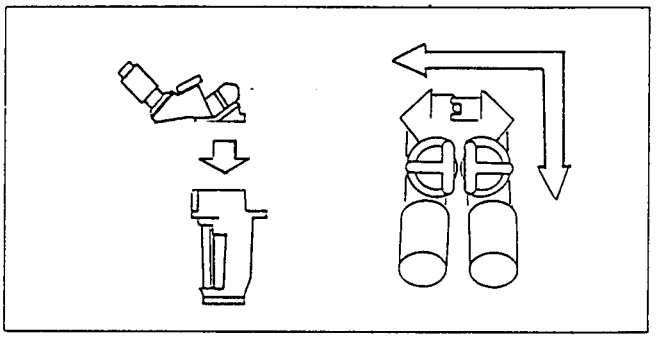
3-25 Push the STOPPER (36) to the stopper screw as shown in the drawing.



3-26 Push the GEAR-2 (37) slightly in the arrow direction and fasten it.

SCREW ACU 3x4SA 2 pcs.

4. Optical Adjustment



4-1 Prepare for the adjustment.

(1) Attach the BI unit to the ZB unit.

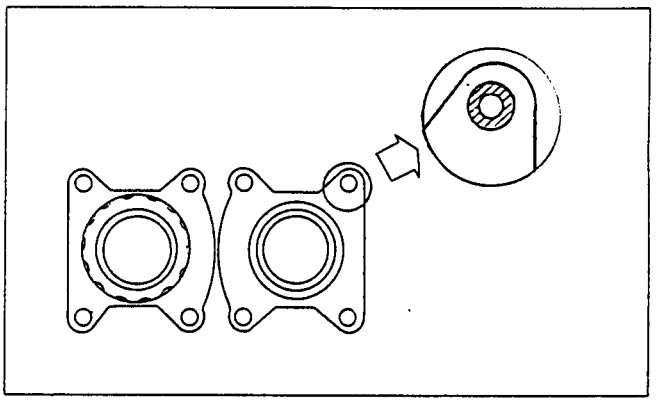
SCREW AB 3x8SA 3 pcs.

* Push the BI unit in the arrow direction and fasten it.

(2) Attach the sleeve to the BI unit.

SCREW AB 3x8SA 8 pcs.

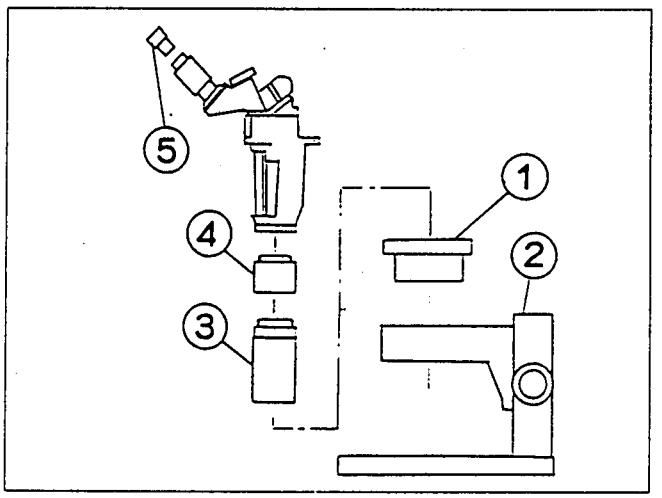
* The helicoid provided side should be the left side. It should be fastened securely at the middle position of tube play.



(3) Insert the adjusting ADAPTER ① into SZ-ST ② and fasten it.

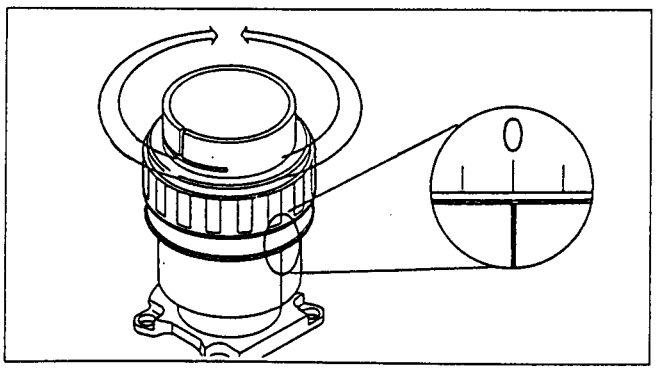
(4) Screw the longer ADAPTER ④ into the STANDARD OBJECTIVE ③, and screw it further into the BODY.

* The ADAPTER ④ is included in the STANDARD OBJECTIVE ③.



(5) Insert the BODY into the adjusting ADAPTER ①.

① Jig	Adjusting adapter (SZKC002)
③ ④ Jig	STANDARD OBJECTIVE (SZKC001)
⑤ Jig	STANDARD EYEPIECE (KN0024)



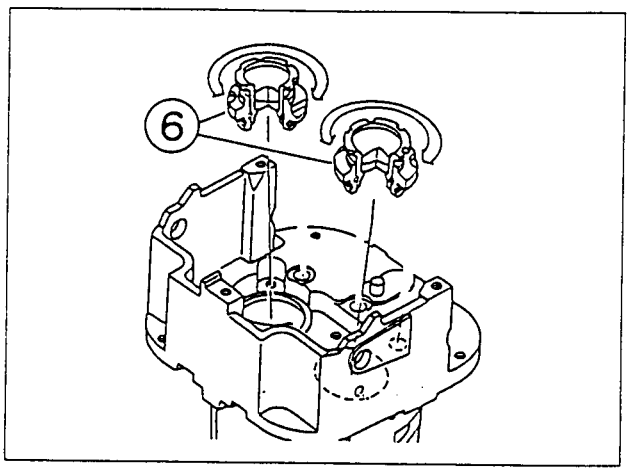
4-2 Adjust the parfocality.

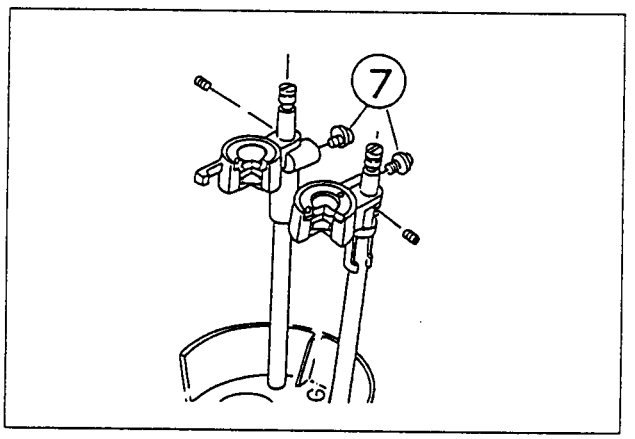
(1) Adjust the scale "0" of the LEFT SLEEVE ASSEMBLY to the index line of TUBE ASSEMBLY by rotating the helicoid ring and fasten it.

* It is recommendable to fasten it tentatively with a tape.

(2) Fasten the right sleeve at the position where it becomes the same level as the left sleeve.

SCREW ACU 2x3UO 2 pcs





(3) Insert the STANDARD EYEPIECE (5) (see the preceding page) into the right or left sleeve.

(4) Set zooming to the highest power, and adjust the focus on the specimen by rotating the top of the LENS ASSEMBLY (6).

* Adjust the STANDARD EYEPIECE diopter beforehand so that the CROSS of it can be clearly seen.

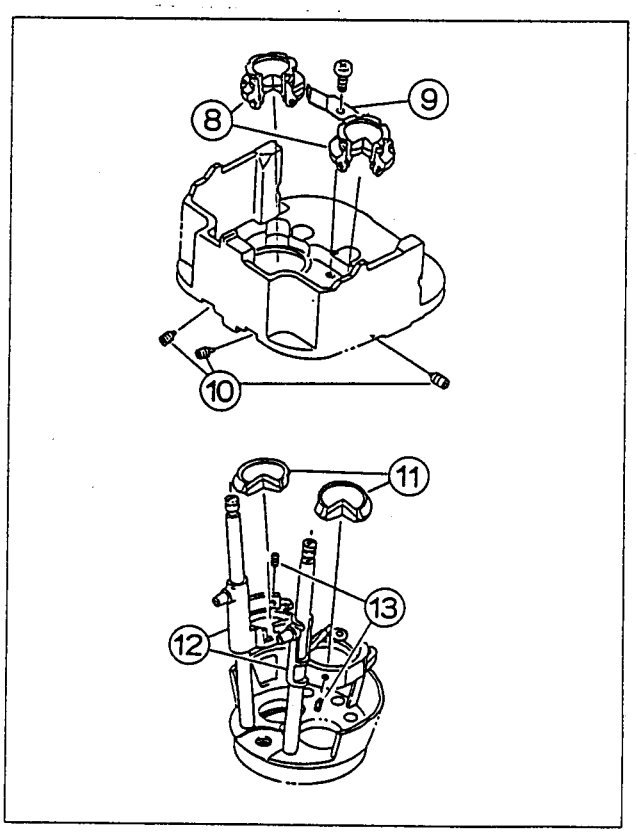
(5) Set the zooming to the lowest power, and adjust the focus on the specimen by turning the ECCENTRIC SHAFT (7) which can be seen from the rear of the main unit.

(6) Repeat the steps (4) and (5) several times, so that the focus is adjusted at all the magnifications from the lowest to highest power.

(7) After the focus has been adjusted, fasten each ECCENTRIC SHAFT (7) with a screw and apply adhesive to each SCREW THREAD of the LENS ASSEMBLY (6).

Adhesive SHELLAC (OT1131)

4-3 Adjust the optical axis.



(1) Loosen sufficiently the SCREWs (10) so that the SPRING (9) pushing the LENS ASSEMBLY (8) is enlarged.

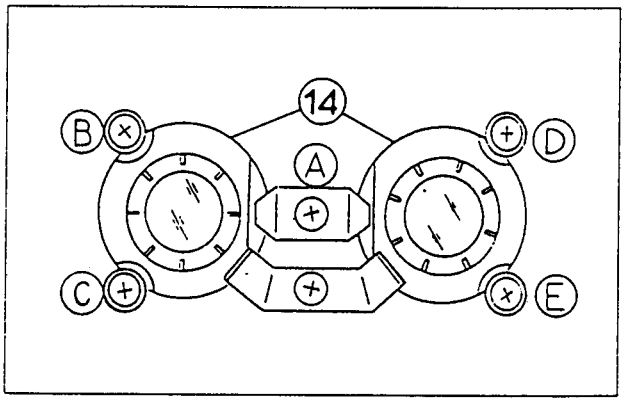
(2) Loosen sufficiently the SCREWs (13) so that the LENS ASSEMBLY (11) butts against the side wall of the LENS FRAME (12).

(3) Set the zooming to the lowest power, and coincide the standard eyepiece cross center with the specimen center by pushing the LENS ASSEMBLY (8) with the SCREWs (10).

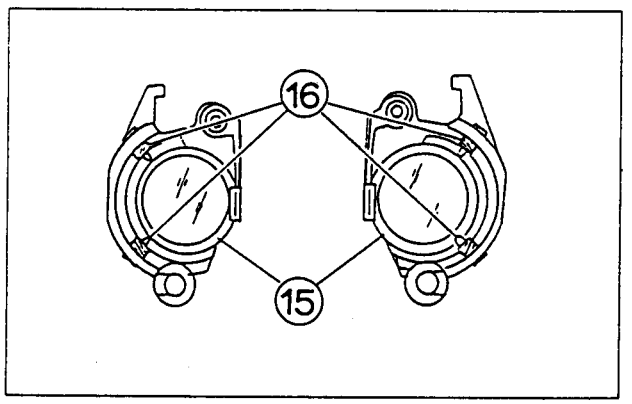
(4) Set the zooming to the highest power, and coincide the standard eyepiece cross center with the specimen center by pushing the LENS ASSEMBLY (11) with the SCREWs (13).

(5) Repeat the steps (3) and (4) several times, so that the STANDARD EYEPIECE cross center coincides with the specimen center at all the magnifications.

(6) Make the same adjustment for left and right optics.



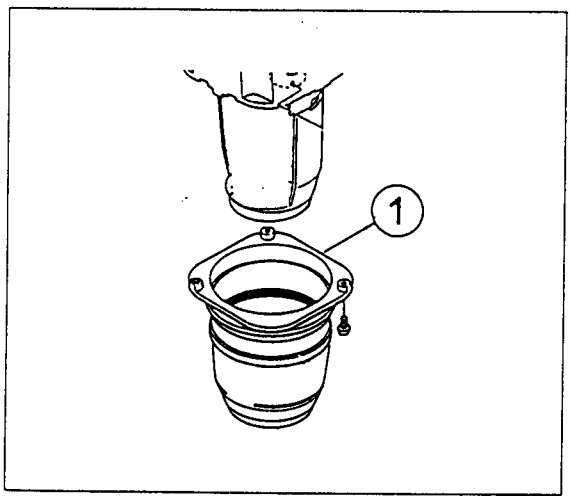
(7) After the optical axis has been adjusted, fasten the LENS ASSEMBLY (14) by fastening the screws in three times in the order of A ~ E in the drawing.



(8) Apply small amount of adhesive (ARALDITE RAPID) to the LENS ASSEMBLY (15) at the position near the projection of the SCREWs (16), and apply an adhesive (KE347) around the LENS ASSEMBLY.

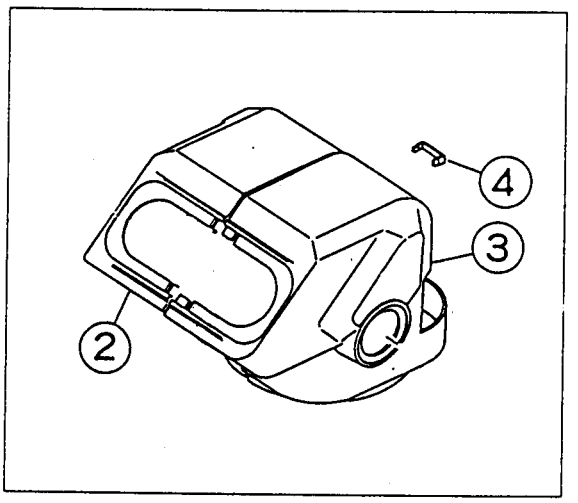
Adhesive	ARALDITE RAPID (OT1315) KE347 black (OT1391)

5. Reassembling the Covers



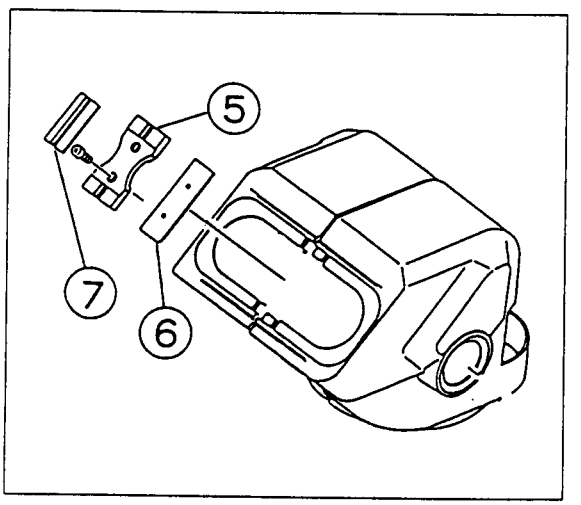
5-1 Attach the CONNECTING MOUNT (1) to the main unit.

SCREW CUK 3x6SA 3 pcs.



5-2 Cover the main unit with the BI-COVER-L (2) and BI-COVER-R (3), and fasten them with screws. Attach the SPRING (4).

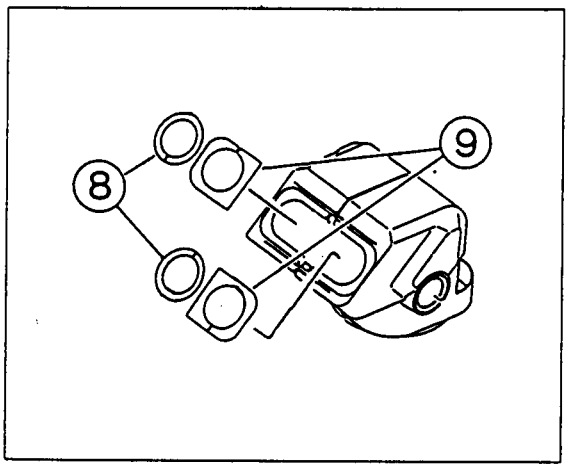
SCREW CUK 3x6SA 4 pcs.



5-3 Hold the joint between the BI-COVER-L (2) and BI-COVER-R (3) with the COVER (5) and the PLATE (6), and fasten them with screws.

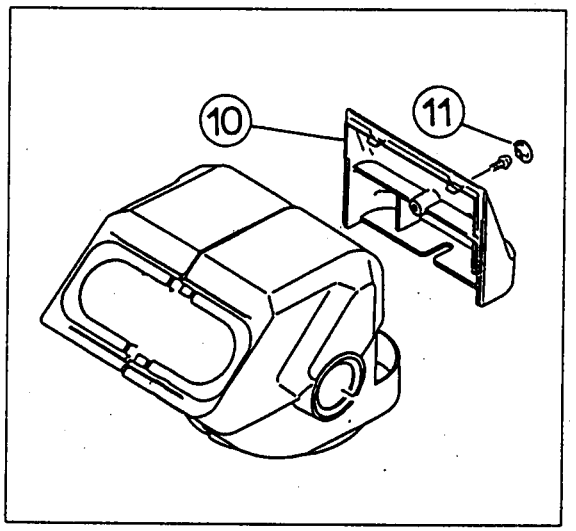
SCREW PUK2x8SA 2pcs.

5-4 Stick the PLATE (7).



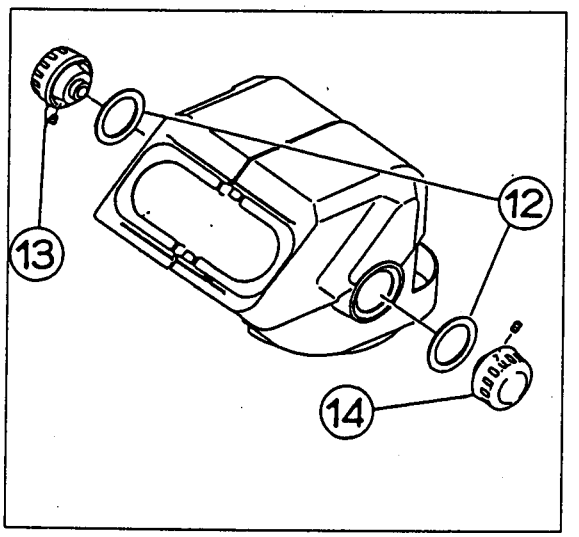
5-5 Attach the WASHERs (8) and the SLIDE PLATEs (9) just like winding them around the sleeve.

* Flatting surface of WASHER (8) and the SLIDE PLATE (9) should become upside.



5-6 Attach the COVER (10). Attach the CAP (11), too. (Except for SZ3060)

SCREW CUK 3x6SA 1 pc.



5-7 Attach two WASHERs (12), KNOB 1 (13) and KNOB 2 (14) to the main unit.

SCREW ACU 3x4SA 4 pcs.

5-8 Set the zooming to the highest power, and loosen the screws fastening the KNOB 2 (14). Adjust the scale of the KNOB 2 (14) to the position of the highest power, and fasten it with screws.

D. LUBRICANTS AND CHEMICALS

CONTENTS

1. LIST OF LUBRICANTS AND CHEMICALS

Classification	Name	Control No.	Remarks
Grease	Los 72515	OT 2008	
Grease	PHOTOLUB 017P	OT 2142	
Grease	Los 33	OT 2024	
Adhesive	SHELLAC	OT 1131	
Adhesive	KE45 black	OT 1017	
Adhesive	KE3474 black	OT 1393	
Adhesive	KE347 black	OT 1391	
Adhesive	ARALDITE RAPID	OT 1315	

E. JIGS AND TOOLS

CONTENTS

1. LIST OF JIGS AND TOOLS

Classification	Name	Control No.	Remarks
Tool	Pin face wrench	KKAB6467	For nut AB646700 of SZ
Jig	Adjusting adapter	SZKC002	
Jig	Standard objective	SZKC001	
Jig	Standard eyepiece	KN0024	

TRINOCULAR TUBE WITH PHOTO TUBE
SZ-TRU
REPAIR MANUAL

OLYMPUS

CONTENTS

1. Outline of Merchandise

This is the adapter for photography or TV camera optical path to be attached to the observation tube of the binocular stereo microscope SZ40/60/11 series designed for biological and industrial pruposes.

2. Features

(1) The right side optical path of the zoom body is taken out and used as an optical path for photography or TV camera.

(2) Combined with SZ-PT and SZ-CTV and used as a photographing unit and TV adapter.

(3) Can be attached later to the binocular type zoom body.

3. Using Conditions

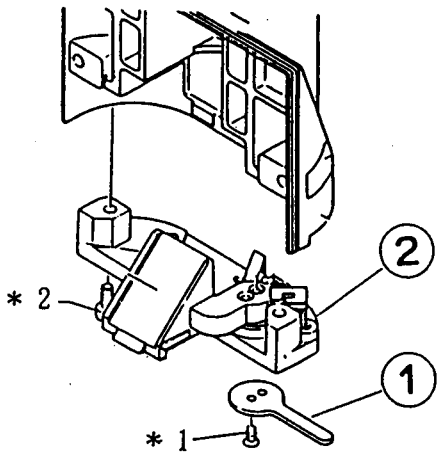
(1) Operating temperature: 0 ~ 40°C (32~104°F)

(2) When attached to the observation tube later, the optical axis and parfocality must be adjusted.

B. INSPECTION STANDARD

Item		Standard		Check method	
1	Mirror switching	1	No shading in the photography light path when the mirror is inserted.	1	Attach SZ-PT, and check at centering telescope (CT).
2	Parfocality	1	Parfocality difference from right side sleeve Lowest magnification ±0.2mm Highest magnification ±1mm	1	Attach SZ-PT and check at KN0048.
3	Optical axis	1	Decentration between right side sleeve and straight tube side. 0.35mm max.	1	Attach SZ-PT and check at KN0048.

1. MIRROR REPLACEMENT

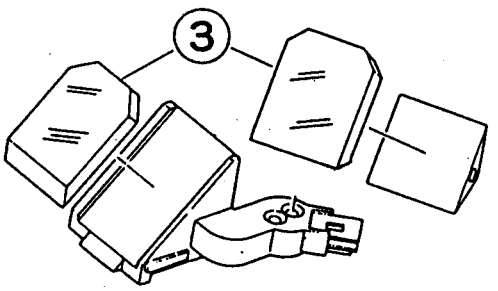


1-1 Remove the lever ①.

SCREW → 2 pcs. (*1)

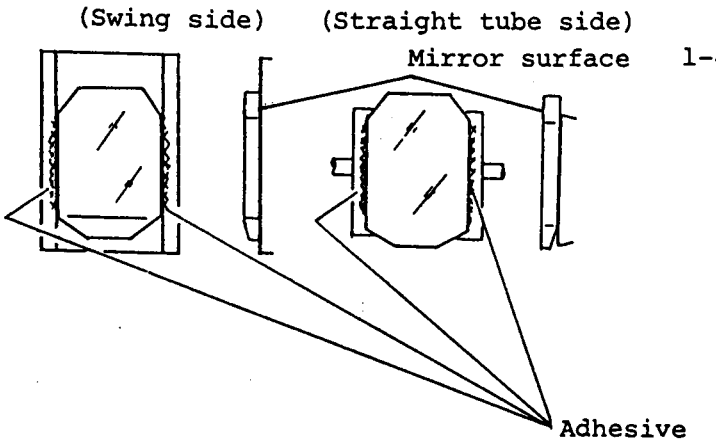
1-2 Remove the BASE ②.

SCREW → 2 pcs. (*2)



1-3 Remove two mirrors ③.

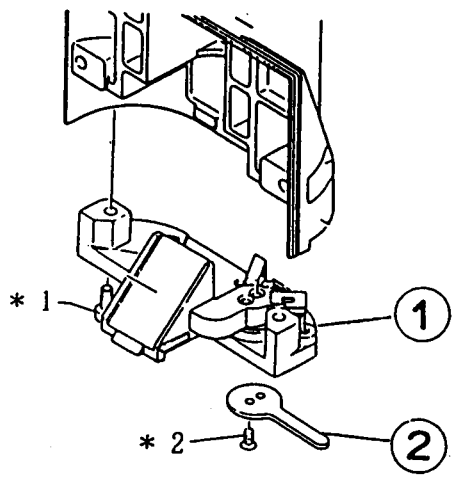
* Bonded with silicon KE45 (black).



1-4 Attach the mirror.

* The direction of mirror surface is different in the straight tube side and the swinging side.
* Apply an adhesive to both sides of the mirror.

Adhesive Silicon KE45 (black)



1-5 Mount the BASE ①.

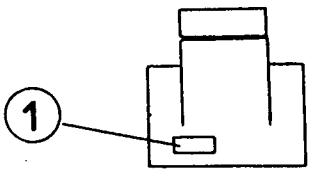
SCREW → AB 3x6SA 2 pcs. (*1)

1-6 Attach the lever ②.

SCREW → PSK 2x4SA 2 pcs. (*2)

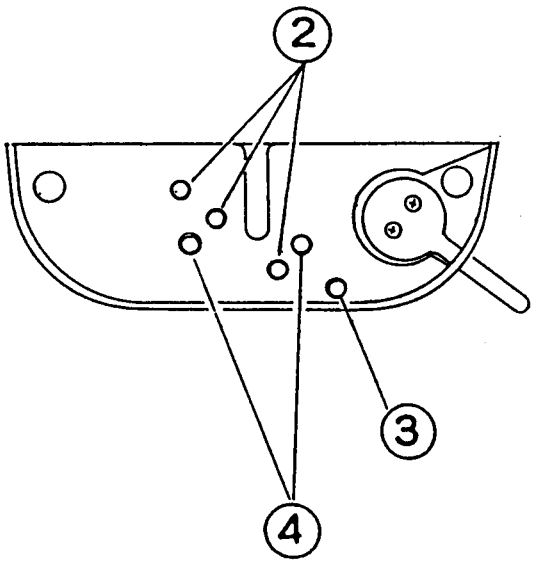
1-7 Make the optical check.
(Refer to 2. Optical Adjustment.)

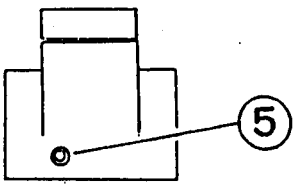
2. OPTICAL ADJUSTMENT



2-1 Adjust the MIRROR.

(1) Remove the NAME PLATE ①.





(2) Locations of the adjustment screw and fixing screw

② .. Screw fixing the mirror of the straight tube side

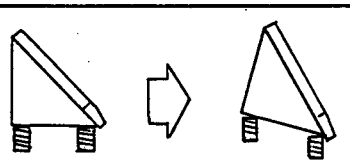
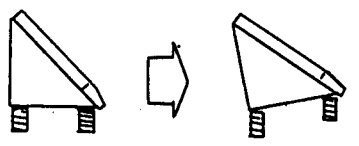
③ .. Adjustment screw to turn the eccentric shaft that determines the swing mirror stop position

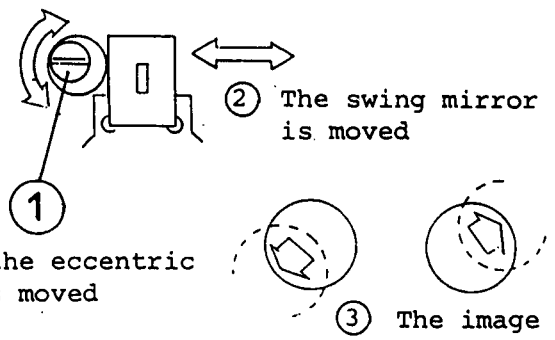
④ .. Adjustment screw to incline the mirror of the straight tube side

⑤ .. Screw fixing the eccentric shaft that determines the swing mirror stop position

(3) Adjustment screw functions

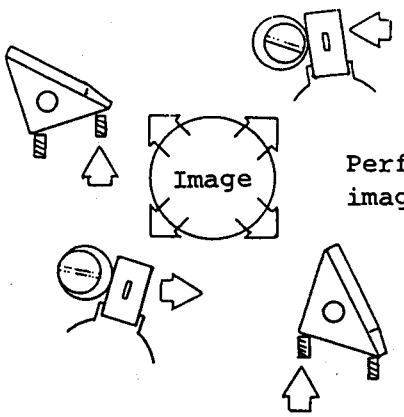
(a) Adjust (incline) the mirror of the straight tube side.

Adjustment (inclination) of the mirror of the straight tube side	Image movement
	 Move lower right. (Visual field is shading.) Image
	 Move upper left. (Visual field is shading.)



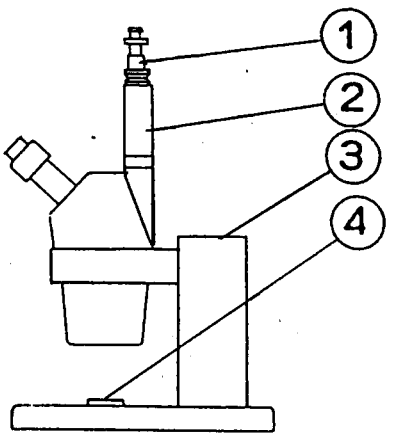
(b) Eccentric pin ① to determine the swing mirror stop position

(c) Summary



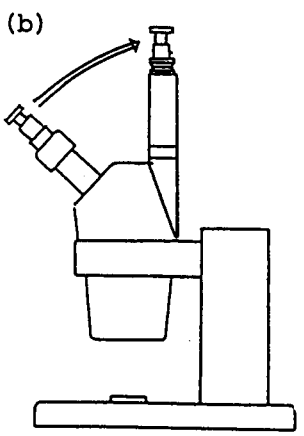
Perform as follows to move the image in the arrow direction.

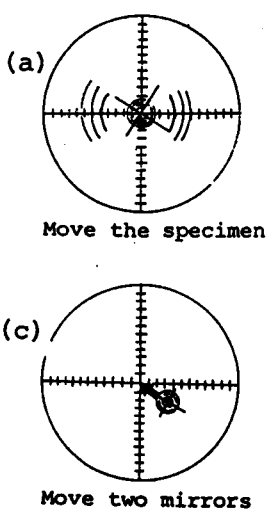
(4) Set the jigs as shown in the drawing on the left.



① .. Universal standard eyepiece .. KN0048
② .. Straight tube ..... SZ-PT
③ .. Stand ..... SZ-ST
④ .. Specimen (Concentric circles etc.)

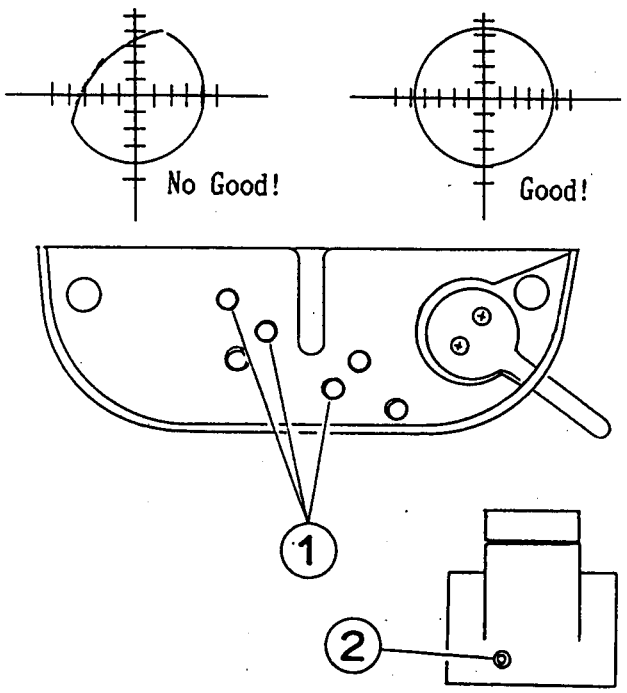
(5) Adjust the mirror position.





(a) Set KN0048 in the right sleeve, and move the specimen so that the center (or optional point) of the specimen coincides with the center of the cross hairs of KN0048.
(b) When the centers coincide, shift KN0048 (except for adapter:AD2) to straight tube (SZ-PT).
(c) Move two mirrors so that the center (or optional point) of the specimen coincides with the center of the cross hairs of KN0048.

* The pupil mentioned here is the iris part that is seen the smallest when the CT INNER TUBE is inserted or pulled out.



(6) After adjustment, replace KN0048 with KN0029. Check that the pupil is no shading and uniform brightness is obtained.

> * When optical axis is adjusted, the pupil should be no shading, but if the pupil is shading, check the mounting condition of TRU.

(7) When the centers of specimen and the cross hairs of KN0048 coincide, tighten the screws ① to fix the mirror of the fixing side and screw ② to fix the eccentric pin that determines the swing mirror stop position.

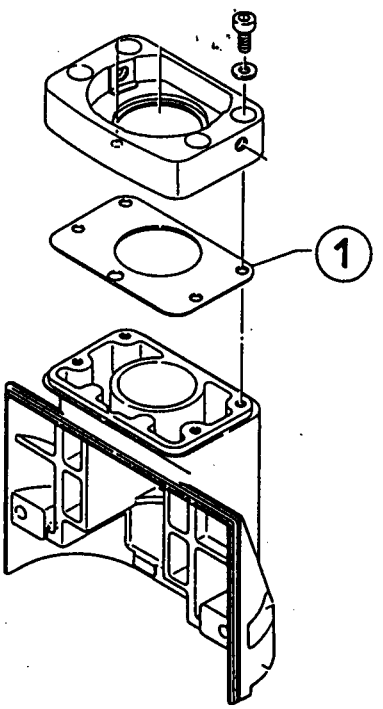
(8) Apply an adhesive to each screw.

Adhesive Shellac (OT1131)

2-2 Adjust the parfocality. (Adjust the parfocality difference from the right side sleeve to 0.2mm max. in the lowest magnification side.)

(1) Set the KN0048 in the right sleeve, and place FT36 (at focal position adjusted to 1m) on KN0048. Adjust the focus at the specimen (easy to adjust the focus) by changing the working distance (WD) while peeping into the KN0048.

> * If the right side sleeve has a helicoid ring, set the diopter adjustment ring to "0".

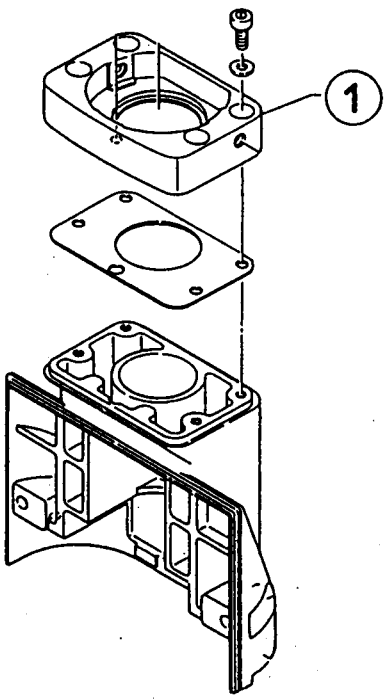


(2) After adjusting the focus, shift the KN0048 (except for adapter: AD2) to SZ-PT.

(3) Adjust the focus at the specimen by turning the graduated tube of KN0048. At this time, read the parfocality difference in moving amount of graduated tube (1 division: 0.1mm).

(4) Increase or decrease the washer ① thickness by the extent of parfocality difference.

(5) After selecting the washer, repeat (2) ~ (5) so that the parfocality difference between the right side sleeve and the straight tube side (SZ-PT) becomes 0.2mm max.



2-3 Adjust the optical axis

(1) Set KN0048 in the right side sleeve, and move the specimen so that the center (or optional point) of the specimen coincides with the center of the cross hairs of KN0048.

(2) When the centers coincide, shift the KN0048 (except for adapter: AD2) to the straight tube (SZ-PT).

(3) Move the mounting base (1) in the screw rattling range, and tighten the screws fixing the mounting base when the centers of the specimen and the cross hairs of KN0048 coincide.

1. Special Tools

Classification	Name	Control No.	Remarks
Tester	Universal standard eyepiece	KN0048	Included adapter: AD2 ø23.2 → ø30 (for stereo microscope)
Jig	CT adapter	KC2048	
Tester	Centering telescope (CT)	KN0029	

2. Adhesives

Classification	Name	Control No.	Remarks
Adhesive	Shellac	OT1131	
Adhesive	Silicon KE45 (black)	OT1017	

COAXIAL VERTICAL ILLUMINATOR
SZ-CHI
REPAIR MANUAL

OLYMPUS

CONTENTS

A. OUTLINE OF PRODUCT

1. Outline of Merchandise

This is attached to a tube body for observing a flaw, pattern, interference color, etc. which can not be seen with ordinary illumination. It is used in the semiconductor and metal industry fields.

2. Features

(1) Polarizing plate and quarter wave plate are provided to illuminate a specimen along the observation optical axis. This enables observation of a flow on metal surface, IC chip circuit, liquid crystal pattern, etc. which can not be observed before.

(2) Interference color is created on a thin film like a metal microscope, and the IC circuit pattern structure can be observed with sharp contrast.

(3) Specimen such as an ore which has polarization can be observed easily with a vertical polarizing light.

(4) Incident polarizing state is the same in left and right, the brightness and color differences are minimum in the left and right optics.

(5) The illuminator is mounted compact on a tube body, and not obstructive when attached to various industrial equipments.

3. Using Conditions

(1) Operating temperature: 0 ~ 40°C (32~104°F)

(2) When using an auxiliary objective lens, attach the quarter waver plate to its bottom end.

(3) Usable auxiliary objective lenses and zoom magnifications are as shown in the table below.

	SZ30, 40			SZ60		SZ11	
	10×	20×	30×	10×	20×	10×	20×
Microscope only	△	△	△	○	○	○	○
0.25 ×	×	×	△				
0.3 ×	×	△	△				
0.4 ×	×	△	△				
0.5 ×	×	△	△	△	△	△	△
0.62 ×	△	△	△				
0.75 ×	△	△	△				
1.5 ×	△	△	○	△	○	△	○
2 ×	○	○	○	△	△	△	○

○ ... Visual field is met in all the zoom range.

△ ... Visual field is met with high zoom magnification.

× ... Visual field is not met in all the zoom range.

(4) Be sure to attach the diopter adjustment ring to the eyepiece sleeve.

(5) Use TL2 transformer.

(6) When observing a specimen with low reflectivity, a ghost may appear in the visual field with a low magnification.

(7) When room temperature (or storing temperature) rises over 50°C, the polarizing performance is degraded and not restored.

(8) The quarter wave plate compatibility is not guaranteed. Therefore, do not change the combination at shipment.

(9) The optical axis and parfocality need adjustment after the illuminator is attached to the microscope. If they are not adjusted, the quality will be as follows:

Centration of left and right tubes
... 0.3 max. in the up/down/outward direction and 0.4 inward

Decentration of image by interpupillary distance adjustment
... 0.25mm max. on image surface

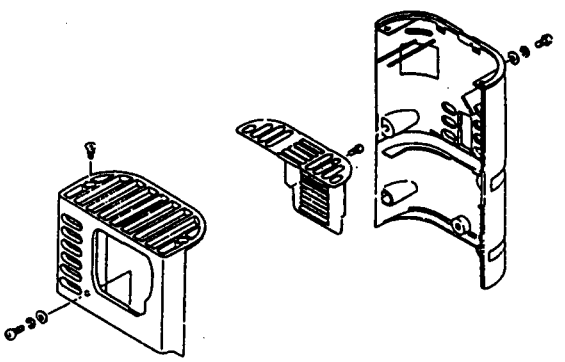
Decentration of image when zooming ... 0.7mm max. on image surface

Parfocality between left and right tubes
... ±2 diop at low magnification, ±3 diop at high magnification

B. INSPECTION STANDARD

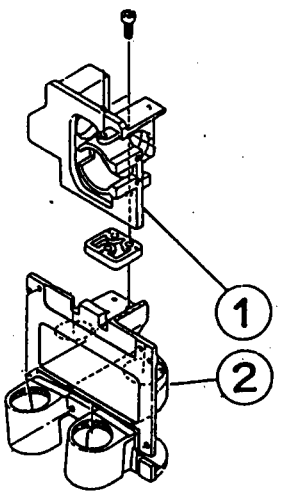
Item		Standard	
1	Illumination performance	1	No extreme uneven illumination SZ40 Zoom magnification 2X or more SZ60 Zoom magnification 1X or more SZ11 Zoom magnification 1.8X or more
		2	No extreme eccentricity in illumination field. SZ40 1mm max. (When illumination field is Ø20)

1. OPTICAL ADJUSTMENT

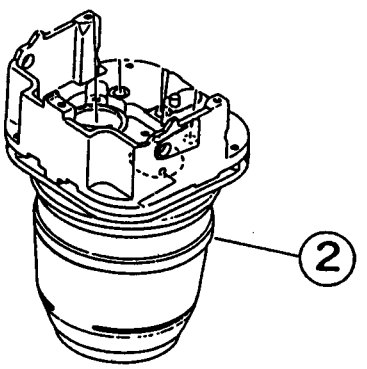


1-1 Adjusting the analyzer

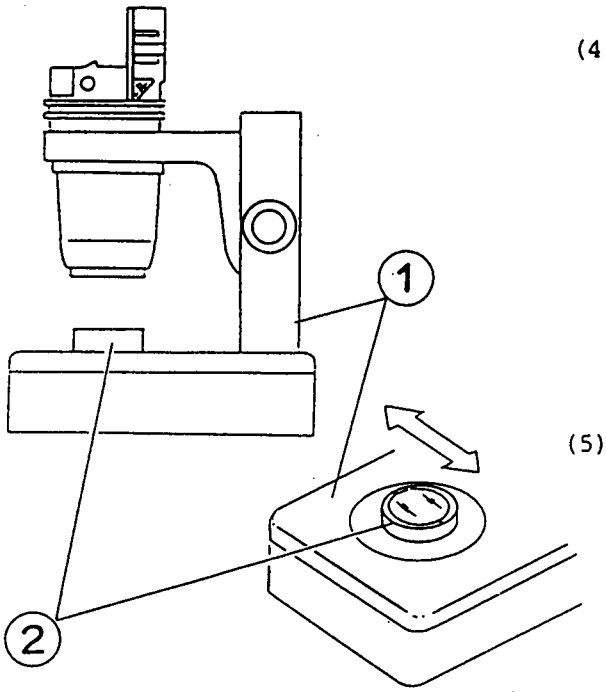
(1) Remove the three types of covers.



(2) Disassemble the SZ-CHI into the upper part ① and the lower part ②.



(3) Disassemble the SZ microscope into the ZB part ② only.
(For the disassembling method and procedure, refer to the SZ3060 repair manual.)



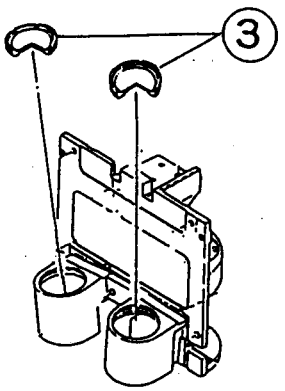
(4) Set the jig

① Stand･･･SZ-ST + SZ-ILA

② Polarizing plate...(A-PO, etc.)

* Adjust and fix the SZ microscope direction by visual inspection so that the polarizing plate vibration direction and the SZ microscope are not inclined.

(5) Adjust the polarizing plate vibration to the arrow direction in the drowing on the left.

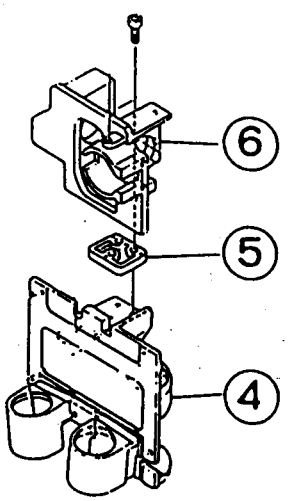


(6) The analyzer ③ is fixed with Shellac. Apply the mixture on it to make the analyzer rotatable freely.

(7) Rotate the analyzer while monitoring the polarizing plate through the analyzer, and fix it when the polarizing plate is seen most dark.

Adhesive SHELLAC (OT1131)

1-2 Adjusting the polarizer

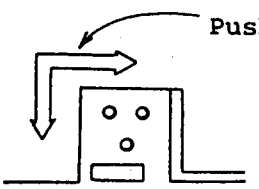


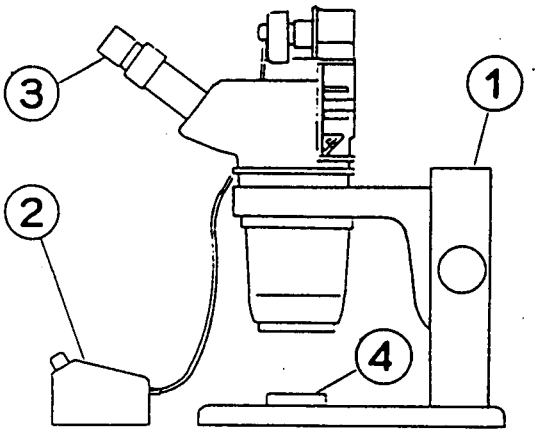
(1) Reassemble the SZ microscope. (For the disassembling method and procedure, refer to the SZ3060 repair manual.)

* Do not remove the SZ-CH1 until the adjustment is finished.

(2) Attach the upper part ⑥ of SZ-CHI to the lower part ④ of it with the insulated plate ⑤ interposed therebetween.

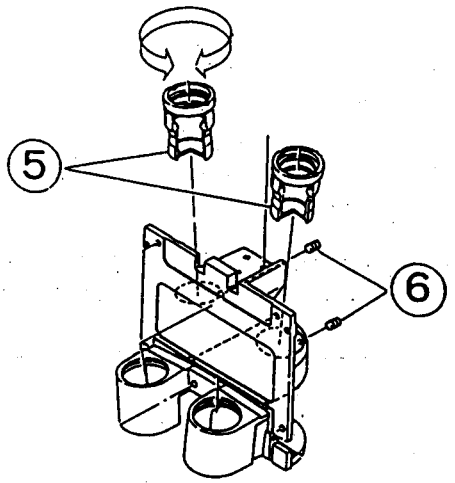
Screw → AB 3X12SA 3 pcs.





(3) Set the jig.
- ① Standard stand .. SZ-ST
- ② Transformer TL2
- ③ Eyepiece ..... G series eyepiece
- ④ Mirror of ø20 or more

(4) Light the halogen lamp of SZ-CHI.

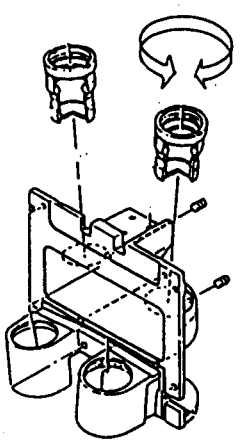


(5) Loosen the screws ⑥ fixing the left and right polarizer ⑤.

(6) Adjust focus on the mirror surface.

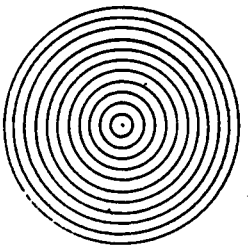
(7) Turn the left side polarizer while monitoring through the right side eyepiece, and tighten the screw to fix the polarizer at the position where the view becomes most dark.

(8) Attach the quarter wave plate to the SZ microscope bottom end, turn it gradually while monitoring through the right side eyepiece, and stop it at the position where the view becomes most dark.



(9) Turn the right side polarizer while monitoring through the left side eyepiece, and tighten the screw to fix the polarizer at the position where the view becomes most dark.

(10) Observe the mirror surface by viewing the left and right side eyepieces simultaneously. Turn the quarter wave plate and check if the cross nicol and open nicol appear simultaneously in the left and right visual fields. If any defect occurs, repeat the adjustment from (8).

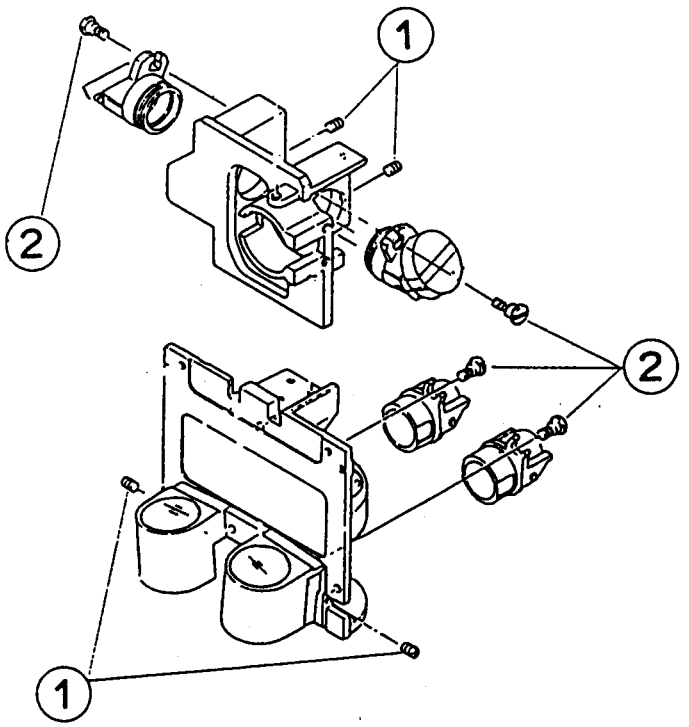


1-3 Adjusting the illumination field

(1) Remove the mirror set on the stage.

(2) Insert the universal standard eyepiece into the SZ microscope sleeve, and place the copy of the chart shown on the left on the stage of the stand as a specimen.

Universal standard eyepiece (KN0048)

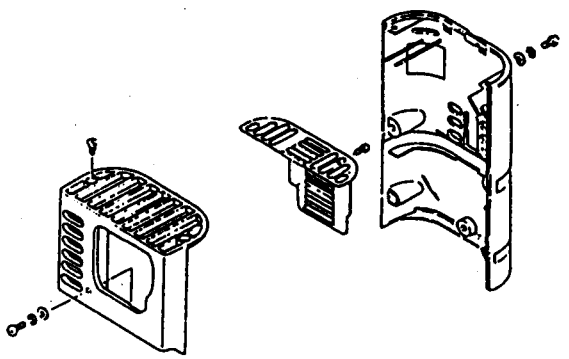


(3) Adjust focus on the specimen (so that the focus is adjusted in all the zoom range to ensure exact WD) and coincide the center of the standard eyepiece with the center of the specimen by moving the specimen.

(4) Loosen the screws (1) securing the mirrors, and adjust the left and right illumination fields by turning the eccentric pins (2) so that the concentric circle of the illumination field and specimen does not deviate.

(5) Apply an adhesive to all the fixing screws.

Adhesive SHELLAC (OT1131)



(6) Mount the covers.

1. Special Tools

Classification	Name	Control No.	Remarks
Jig	Universal standard eyepiece	KN0048	
Others	Mirror	—	ø20 or more
Others	Poralizing plate	—	A-PO, etc.

2. Adhesives

Classification	Name	Control No.	Remarks
Adhesive	Shellac	OT1131	
Adhesive	Silicon KE45 Black	OT1017	