

COMPACT INVERTED
METALLURGICAL MICROSCOPE

CK40M FRAME

REPAIR MANUAL

OLYMPUS

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CONTENTS

A. OUTLINE OF PRODUCT

1.	Outline -----	A-1
2.	Features -----	A-1
3.	Using conditions -----	A-1
4.	Specifications -----	A-3
5.	Dimensions -----	A-4

B. DISASSEMBLY AND ASSEMBLY PROCEDURES

1.	CK40M frame (1) -----	B-1
2.	CK40M frame (2) -----	B-3
3.	CK40M frame (3) -----	B-5
4.	CK4M-REH -----	B-7
5.	CK4-J -----	B-9
6.	CK4M-MA -----	B-11

C. REPAIR PROCEDURE

1.	Adjustment procedure -----	C-1
2.	Preparation for adjustment -----	C-2
3.	Absolute optical axis adjustment -----	C-3
4.	Stage parallelism adjustment -----	C-7
5.	CK4M-MA illumination center adjustment -----	C-8
6.	MA-AS center adjustment -----	C-10
7.	Parfocality adjustment -----	C-12
8.	Exit pupil center check -----	C-14
9.	Fine focus sensitivity check -----	C-15

D. JIGS AND TOOLS

1.	List of jigs and tools -----	D-1
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E. LUBRICANTS AND CHEMICALS

1.	List of lubricants -----	E-1
2.	List of chemicals -----	E-1

1. Outline

Compact inverted metallurgical microscope, which is flexible to interchange observation tubes

(1) Target market, usage

Industrial inspection market (Sample observation and inspection, and abrasive inspection at plants and iron works)

(2) External standards acquired

- The product complies with UL and GS. The CE mark was self-declared. FCC is not applicable.
 - a) IEC1010-1
 - b) UL3101-1
 - c) EN55011 Group 1, class B
 - d) EN50082-2 (1995)
 - e) EN61326

(3) Service life

8 years

2. Features

- (1) It has only the minimum essential functions required for brightfield and simple polarized light.
- (2) It is easy to operate because it does not have many control parts.
- (3) It can be combined with TBI desirable from the ergonomics viewpoint. (Comfortable standing or seated posture)
- (4) It can be used in combination with DP series digital camera.

3. Using conditions

(1) Operating environment

Temperature: 0 - 40°C

Humidity: 30 - 90%

(2) Range of combinations

- When it is combined with CK40-TBI (tilting binocular tube), it is used for field number 18 only. (Flatness is lowered at field number 20.)

- When CK40-MVR (mechanical stage) is mounted on the right side (seen from the operation knob side) of the plane stage, CK40M-MS (stage mirror) cannot be mounted on there.
- When it is combined with CK40M-CP (stage plate), the observation range depends on the objective. In some cases, the CK40M-CP is pushed up by changing to a high magnification objective. (High magnification)

Combination with MDPlan80X:

The narrow part in the clip hole (shape: tear drop) of the stage plate cannot be observed. The part around $\phi 15$ mm in the clip hole of CK40M-CP is pushed up by changing to the objective.

Combination with MDPlan50X:

When the clip hole (shape: tear drop) of the stage plate is positioned in the non-breadthwise direction (when it is not combined with CK40M-MVR), the part around $\phi 15$ mm in the clip hole of CK40M-CP is pushed up in some cases by changing to the objective.

- When DP10 is combined with NFK2.5X, density may be uneven on one side of the field. This is a restriction of DP10.
- When it is combined with a TV camera including a photo element, a spot flare may occur on the TV monitor at a high-reflection mirror when the objective 50X or higher + NFK2.5X or 3X are used.

(This is caused by surface reflection of the CCD surface and the NFK lens.)

- When it is combined with a TV camera including a 2/3 inch or larger photo element and NFK1.67X, vignetting will occur at the four corners of the screen.
- When it is combined with CK40M-PO, the polarizer can be rotated more than 90° from the crossed Nicol (total extinction) position to the index side, but less than 90° in the opposite direction.

(3) This model can be combined with the following objectives:

MDAch10X
MDAch20X
MDAch50X

MDPlan5X
MDPlan10X
MDPlan20X
MDPlan40X
MDPlan50X
MDPlan80X

This model cannot be combined with the following objectives: LB (long barrel) objectives other than the above, SB (short barrel) objectives, and UIS objectives.

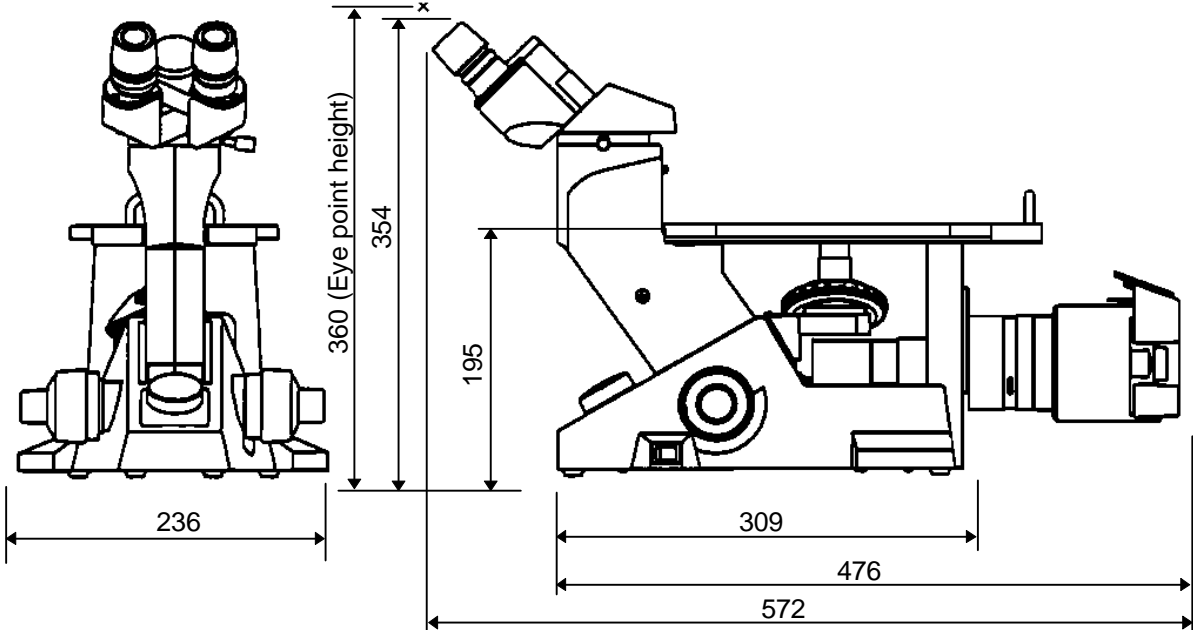
(4) This model can be combined with the following observation tubes:

CH3-BI, CH3-TR45, CK40-TBI

4. Specifications

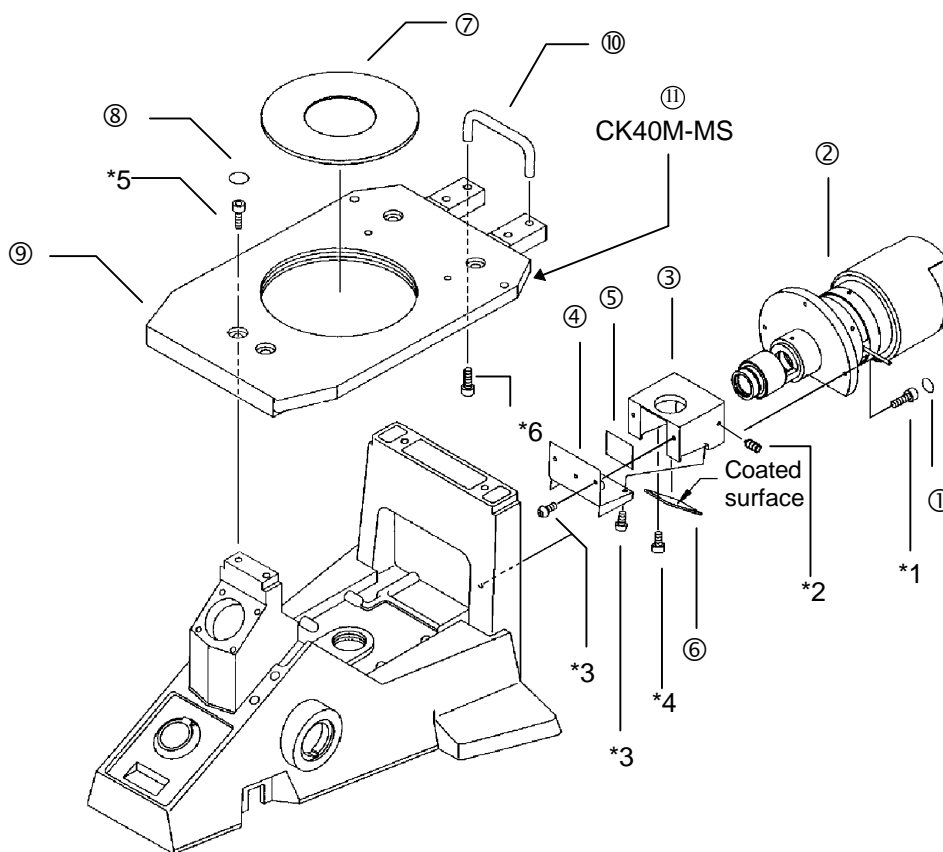
Item		Specifications	Remarks
1	Focus	<ul style="list-style-type: none"> • Revolving nosepiece vertical movement (Stage fixed type) • Coaxial coarse/fine adjustment knobs (Coarse adjustment with torque adjustment mechanism) • Roller guide type • Stroke: 9 mm from the focus position at 1 mm above stage top 7 mm upward and 2 mm downward • Stroke by 1 rotation of coarse adjustment knob: 36.8 mm • Stroke by 1 rotation of fine adjustment knob: 0.2 mm 	
2	Revolving nosepiece	Quadruple	
3	Stage	Plane stage 160 (L) × 250 (W) mm, stage insert plate provided (no accessory) A mechanical stage and stage clips can be mounted.	
	Illumination system	Light source 6 V 30 W halogen bulb (6 V 30 W HAL) Average service life of bulb: 100 hours U-LS30-3-4 lamp socket <ul style="list-style-type: none"> • Aperture diaphragm (AS) Lever control type Adjustable from $\phi 15$ mm (minimum) to $\phi 55$ mm (maximum) • Filter slot Drop-in type $\phi 25$ mm filter: Up to thickness of 25 mm • Polarizer slot Drop-in type • AS projection magnification (AS → Assumed objective exit pupil): 1.71X • Light source projection magnification (Filament → Assumed exit pupil): 3.11X 	Maker: Philips Model No. 5761 Cover provided (Filter/polarizer slot)
5	Power supply	Continuous light intensity control by variable resistance Rated output voltage: 6 V Built-in rated input voltage selector switch 100/110-120 V for F100 220/230-240 V for F200 Rated input frequency: 50 Hz, 60 Hz Built-in fuse Fuse rating: 0.6/0.3 A Rated load: 6 V 30 W halogen bulb (PHILIPS 5761) Power consumption: 72 VA (W)	
6	Weight	7.5 kg	

5. Dimensions



Unit: mm

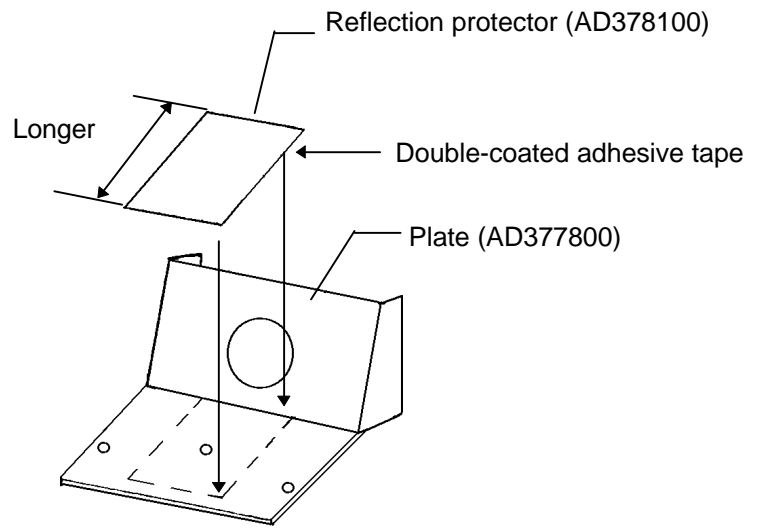
1. CK40M frame (1)



No.	Parts name	Screw	Grease	Adhesive	Remarks
①	SEAL (3 pcs.)				
②	CK4M-MA	AB4X12SA (*1) 3 pcs.			Adjustment (C-8, 9)
③	HALF MIRROR MOUNT	ANU3X4SA (*2) 2 pcs.			
④	PLATE	3PUK2X3SA (*3) 4 pcs. AB3X4SA (*4) 1 pc.			
⑤	REFLECTION PROTECTOR				For the reflection protector mounting position, refer to (1) on the next page.
⑥	HALF MIRROR			OT1873	For the half mirror mounting position, refer to (2) on the next page.
⑦	STAGE INSERT PLATE				
⑧	SEAL				
⑨	STAGE 40M	AB5X15SA (*5) 4 pcs.			
⑩	KNOB	AB5X12SA (*6) 2 pcs			
⑪	CK40M-MS				The mounting position of CK40M-MS depends on that of the X/Y knob of the stage.

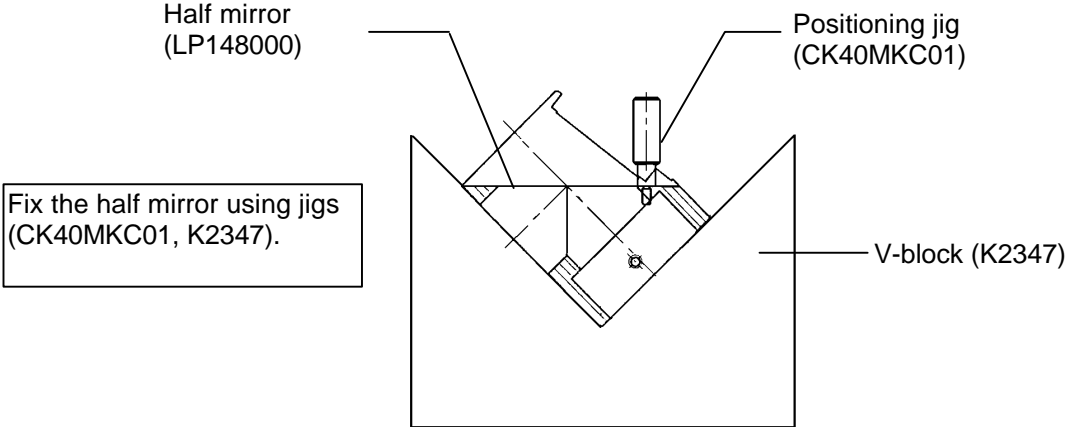
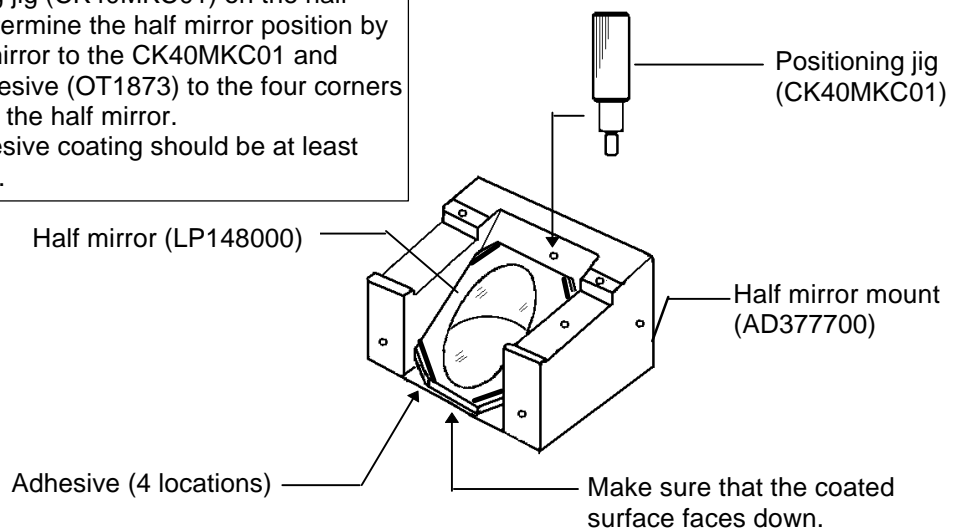
(1) Reflection protector (AD378100) mounting position

Place the reflection protector on the plate and stick it, aligning the right and left widths of reflection protector to the center hole.



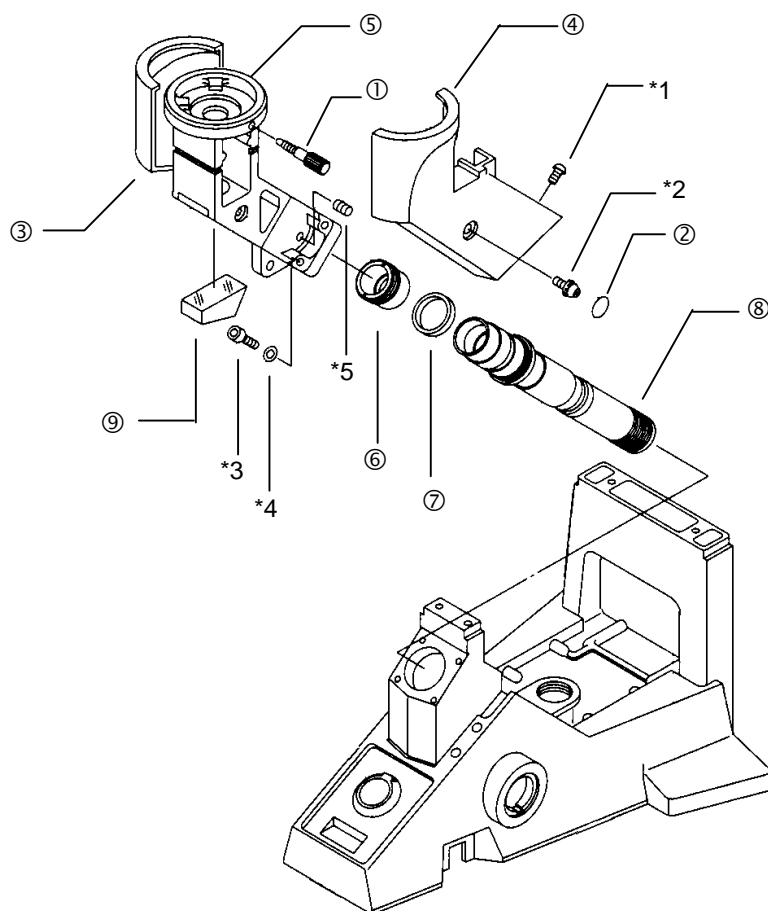
(2) Half mirror (LP148000) mounting position

Set the positioning jig (CK40MKC01) on the half mirror mount. Determine the half mirror position by pushing the half mirror to the CK40MKC01 and apply silicone adhesive (OT1873) to the four corners (bevelled parts) of the half mirror. The range of adhesive coating should be at least 7 mm per location.



Fix the half mirror using jigs (CK40MKC01, K2347).

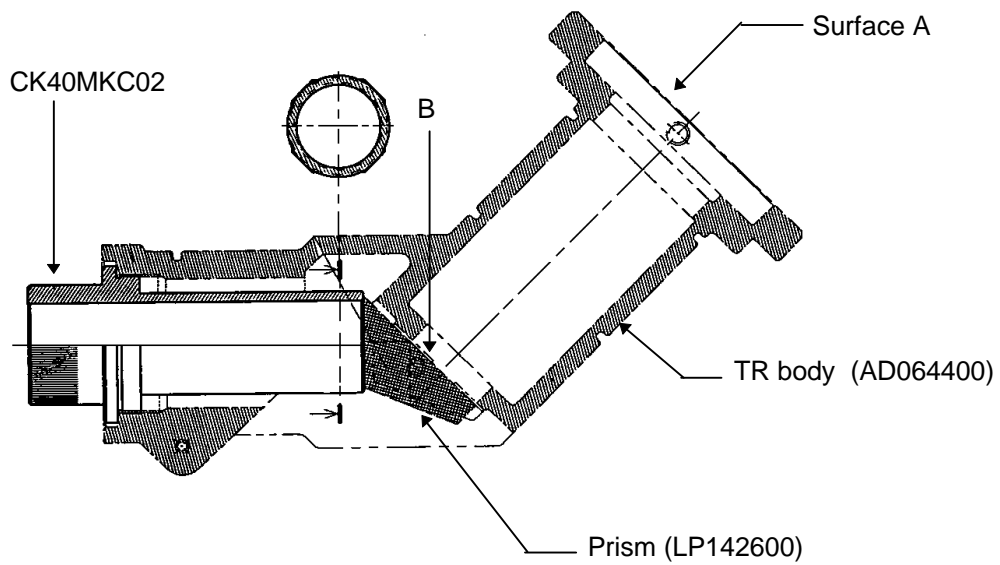
2. CK40M frame (2)



Note: Avoid disassembling parts ⑥, ⑦, and ⑧ unless necessary.
 When mounting the assembled parts of ⑥, ⑦, and ⑧ to TR body ⑤, screw this assembly in completely to the end (in case where these parts are disassembled).

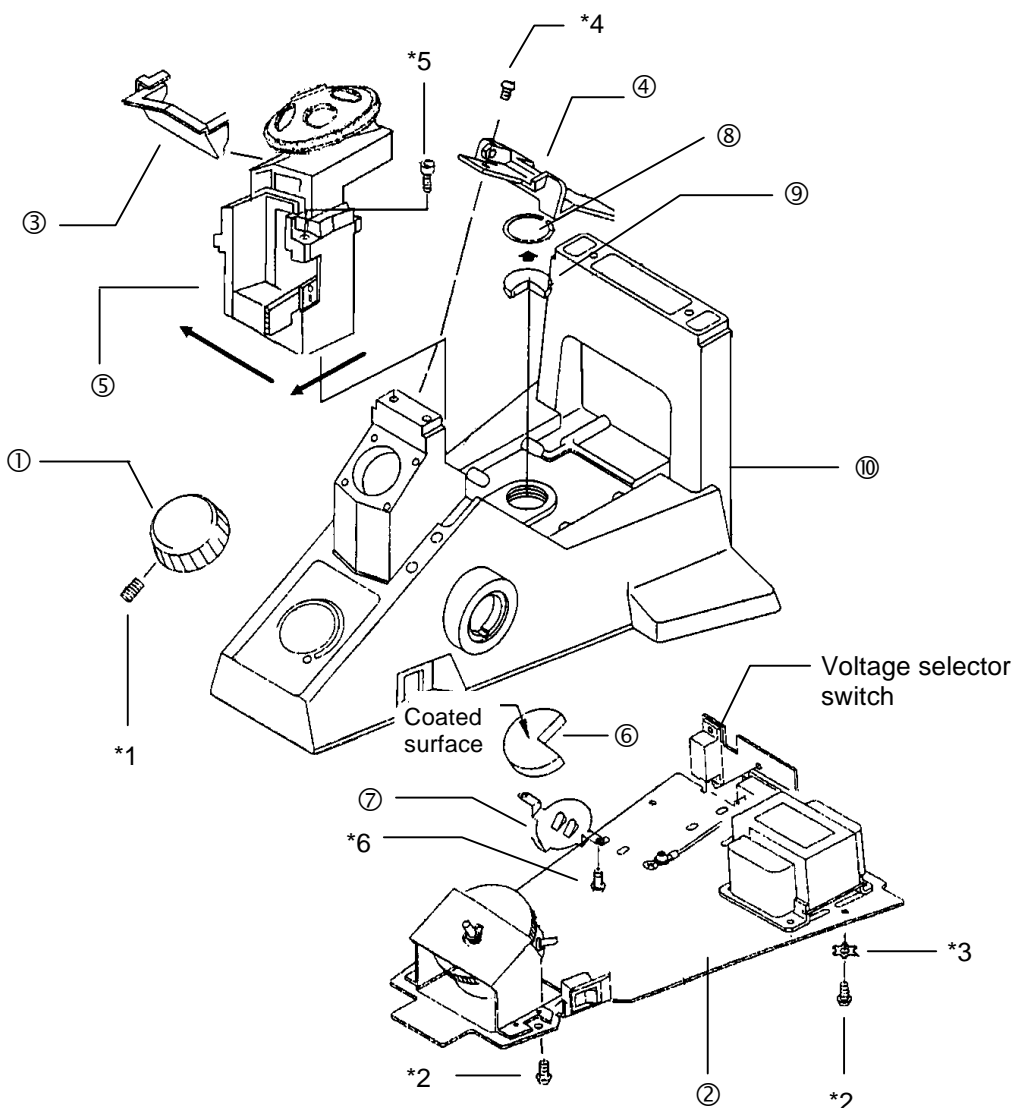
No.	Parts name	Screw	Grease	Adhesive	Remarks
①	KNOB		OT2008		
②	SEAL				
③	COVER-R	3PUTB2X4SA (*1) 1 pc.			Don't tighten the screw (*1) excessively because it is a tap screw.
④	COVER-L	CUKSK3X8SA (*2) 2 pcs.			
⑤	TR BODY	AB3X14SA (*3) 4 pcs. BNW3SA (*4) 4 pcs.			<ul style="list-style-type: none"> Refer to the procedure on "3. Absolute optical axis adjustment" (C-3).
⑥	LENS ASS'Y	ACU3X6SA (*5) 1 pc.	OT2144	OT1131	Apply grease to the screw thread of the lens ass'y ⑥. Apply adhesive to the screw (*5). <ul style="list-style-type: none"> Refer to the procedure on "7. Parfocality adjustment" (C-12).
⑦	SPACER				
⑧	LENS ASS'Y				
⑨	PRISM			OT1873	<ul style="list-style-type: none"> Refer to the procedure on "3. Absolute optical axis adjustment" (C-3). For the mounting position, refer to (3) on the next page.

(3) Prism (LP142600) mounting position



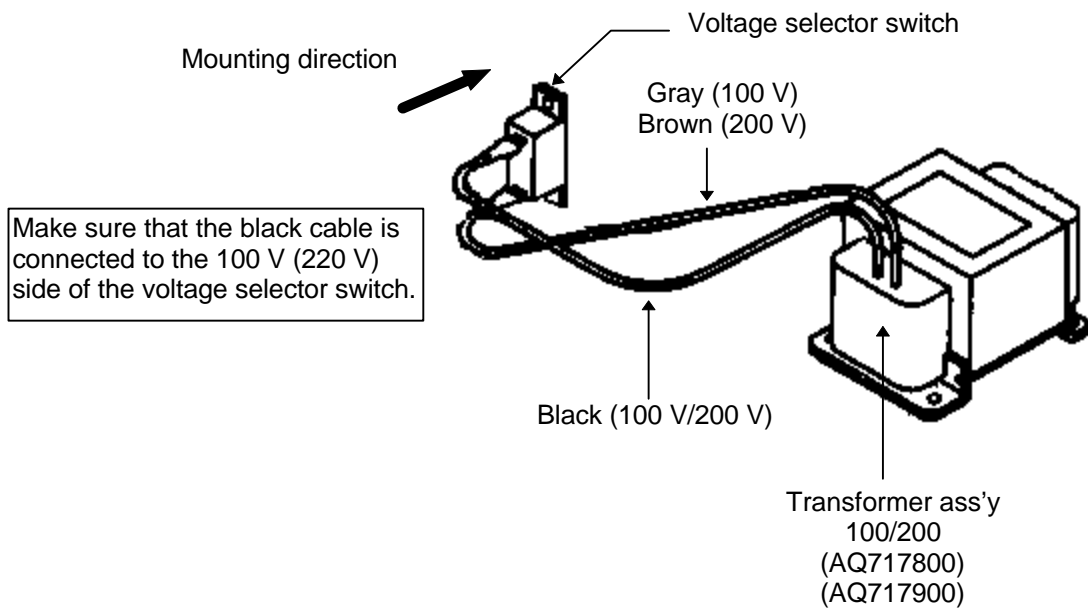
Mount the prism positioning jig (CK40MKC02) on the TR body (and tighten it firmly). Set the prism against the jig. Determining this as the prism fixing position, apply silicone adhesive (OT1873) at least 15 mm on the both sides of the prism. Positioning the surface A as the bottom, insert the M4 screw (AB453100) used for CK40 to location B shown in the above illustration to fix the prism while preventing its falling. It takes about 12 hours for OT1873 to go solid because it is silicone adhesive.

3. CK40M frame (3)

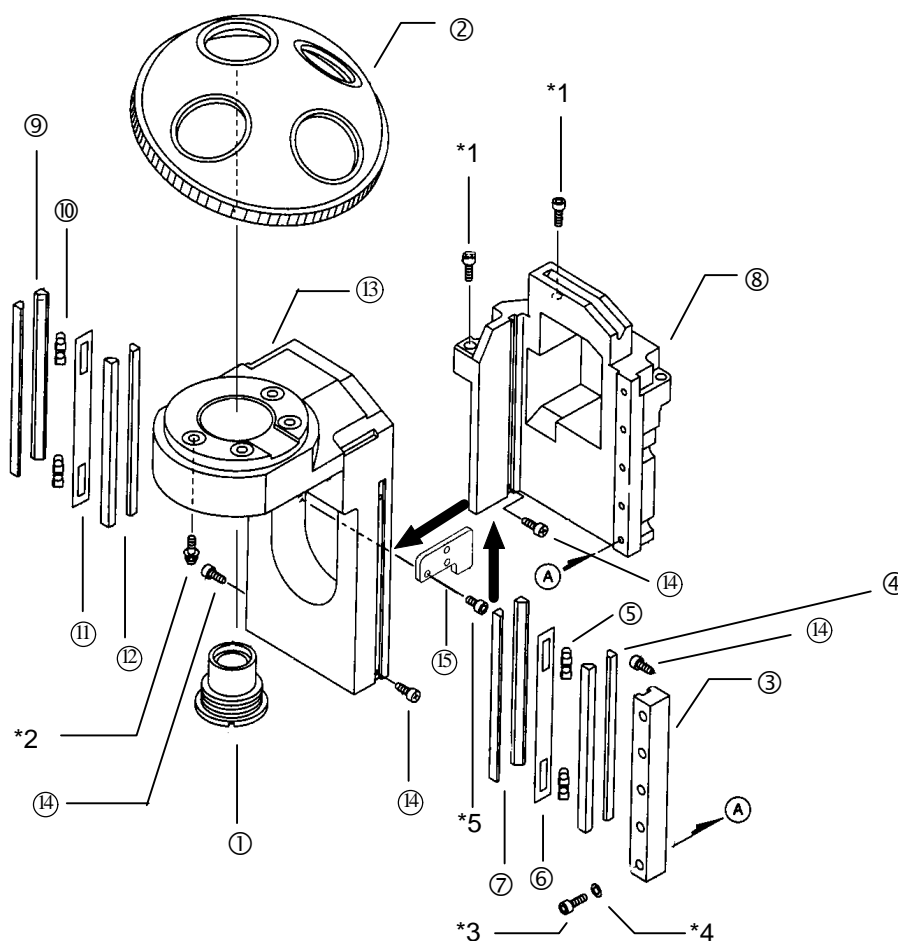


No.	Parts name	Screw	Grease	Adhesive	Remarks
①	KNOB	ACU3X12SA (*1) 1 pc.			
②	CK4-BD100or200	CUKS3X8SA (*2) 4 pcs. HWB3SA (*3) 1 pc.			For the mounting direction of the voltage selector switch, refer to (4) on the next page.
③	WATER-PROOF COVER				
④	COVER 2	CUKK3X6SA (*4) 1 pc.			
⑤	CK4-REH	AB4X14SA (*5) 3 pcs.			Pushing direction (refer to the above figure)
⑥	MIRROR				<ul style="list-style-type: none"> Refer to the procedure on "8. Exit pupil center check" (C-14).
⑦	MIRROR HOLDER	CUKSK3X6SA (*6) 2 pcs.		OT1131	
⑧	RING				Be careful because it easily flies out at disassembly.
⑨	LENS				
⑩	FRAME 40M				

(4) Mounting direction of voltage selector switch



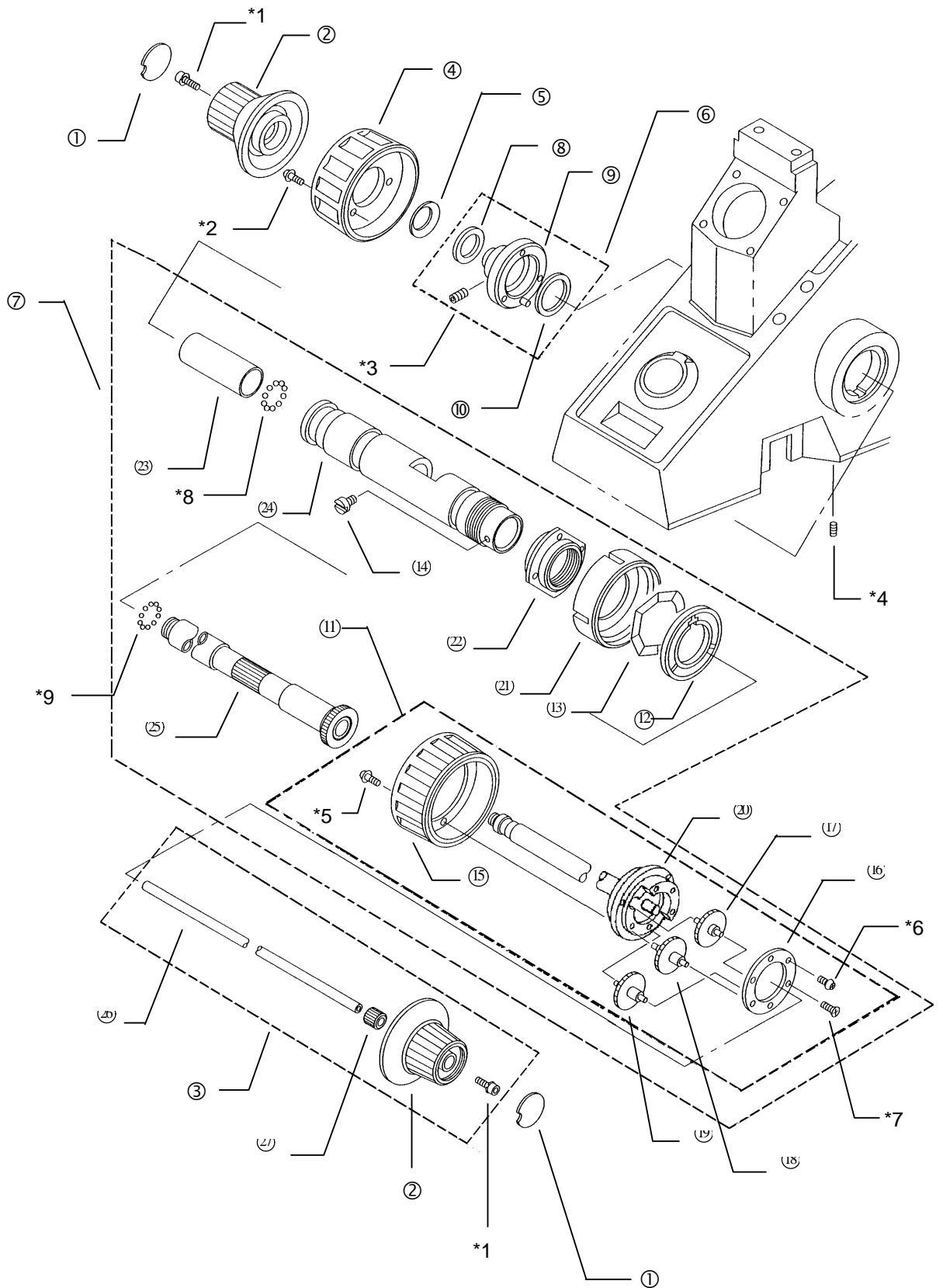
4. CK4M-REH



No.	Parts name	Screw	Grease	Adhesive	Remarks
①	TUBE				
②	NOSEPIECE	AB4X14SA (*1) 3 pcs. CUKSK2.6X6SA (*2) 4 pcs.		OT1131	Apply adhesive to the circumference of screw thread.
③	GUIDE	AB3X12SA (*3) 5 pcs. KNW3SA (*4) 5 pcs.	OT2010	OT1838	Apply grease in the groove to fit the wire. Apply adhesive to the screws (*3).
④	WIRE (2 pcs.)				
⑤	ROLLER BEARING (8 pcs.)		OT2010		
⑥	CASING				
⑦	WIRE (2 pcs.)				
⑧	GUIDE		OT2010		Apply grease in the groove to fit the wire.
⑨	WIRE (2 pcs.)				
⑩	ROLLER BEARING (8 pcs.)		OT2010		
⑪	CASING				

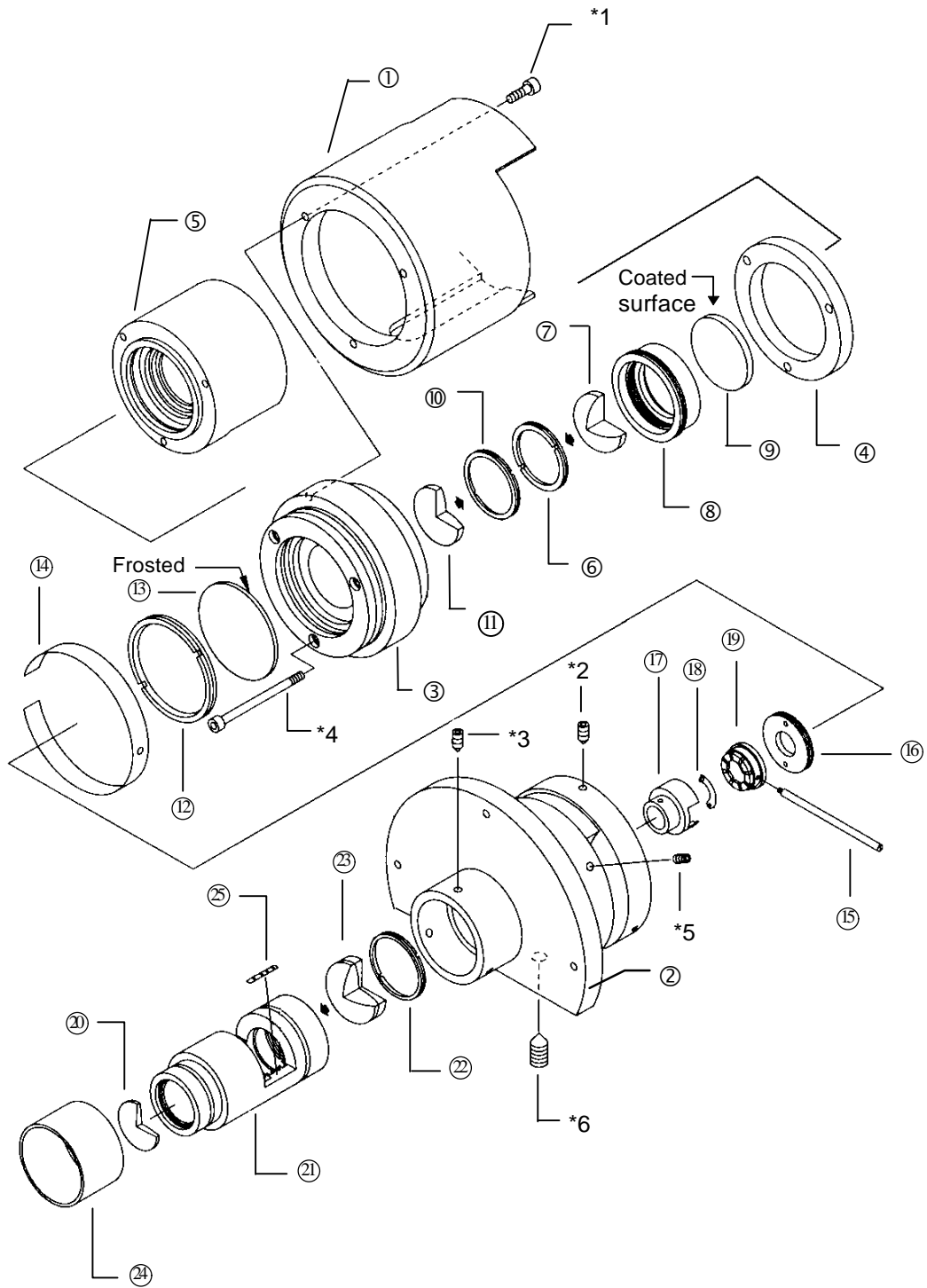
⑫	WIRE (2 pcs.)				
⑬	NOSEPIECE MOUNT		OT2010		Apply grease in the groove to fit the wire
⑭	SCREW				
⑮	RACK	AB3X8SA (*5) 3 pcs.		OT1838	Pushing direction (refer to the figure on previous page)

5. CK4-J



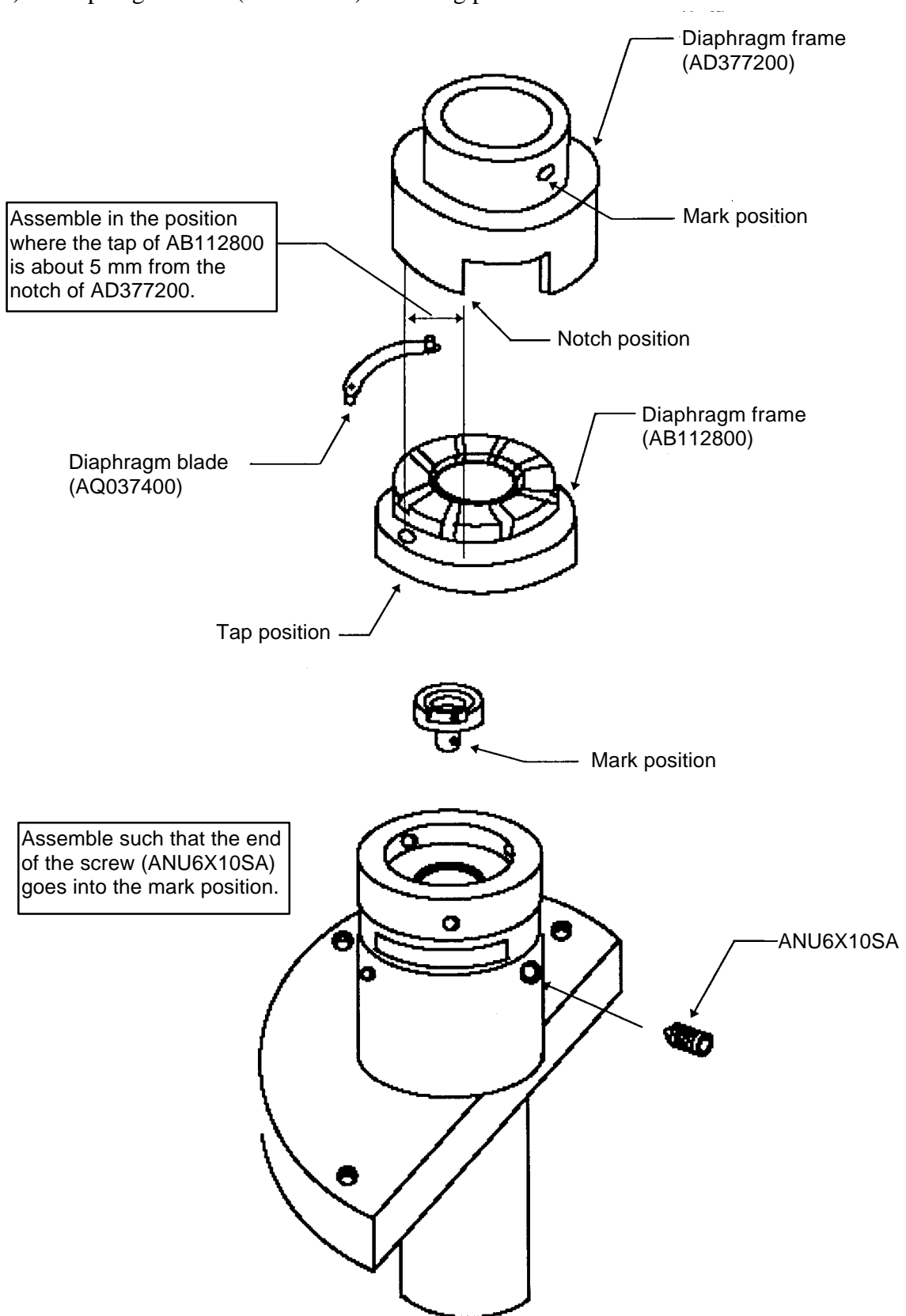
No.	Parts name	Screw	Grease	Adhesive	Remarks
①	PLATE (2 pcs.)				
②	FINE ADJ. KNOB	ABS3X8SA (*1) 2 pcs.		OT1131	Apply adhesive to the screw thread.
③	FINE ADJ. KNOB ASS'Y		OT2008		Apply grease to the shaft.
④	COARSE ADJ. KNOB	CWK3X6SA (*2) 3 pcs.			
⑤	SPRING WASHER		OT2008		Selective parts
⑥	FINE SHAFT MOUNT ASS'Y	ACU3X4SA (*3) 2 pcs.			Just loosen the screws.
⑦	COARSE ADJ. KNOB ASS'Y	ACU3X6SA (*4) 2 pcs.		OT1131	Apply adhesive to the screw thread.
⑧	WASHER		OT2008		
⑨	FINE SHAFT MOUNT		OT2008		Apply grease to the hole to insert the shaft.
⑩	WASHER		OT2008		
⑪	SHAFT MOUNT ASS'Y				
⑫	WASHER		OT2006		Apply grease to the groove and the entire circumference.
⑬	SPRING WASHER				
⑭	CD-SCREW			OT1983	
⑮	COARSE ADJ. KNOB	CWK2.6X6SA (*5) 3 pcs.			
⑯	PLATE	CUK2.6X5SA (*6) 1 pc. CSK2.6X6SA (*7) 2 pcs.			
⑰	GEAR		OT2012		
⑱	GEAR		OT2012		
⑲	GEAR		OT2012		
⑳	SHAFT MOUNT				
㉑	TENSION KNOB				
㉒	MOUNT				
㉓	NUT			OT3111	Apply adhesive to the screw thread.
㉔	PINION MOUNT	B1/16UO (*8) 30 pcs.	1. OT2012 2. OT2006		1. Apply grease to the surface on which the ball is arranged. 2. Apply grease to the screw thread.
㉕	PINION ASS'Y	B1/16UO (*9) 30 pcs.	OT2012		Apply grease to the surface on which the ball is arranged.
㉖	SHAFT			OT1131	Apply adhesive to the screw thread.
㉗	GEAR				Mount in the correct direction. (The bevelled part is on the shaft side.)

6. CK4M-MA

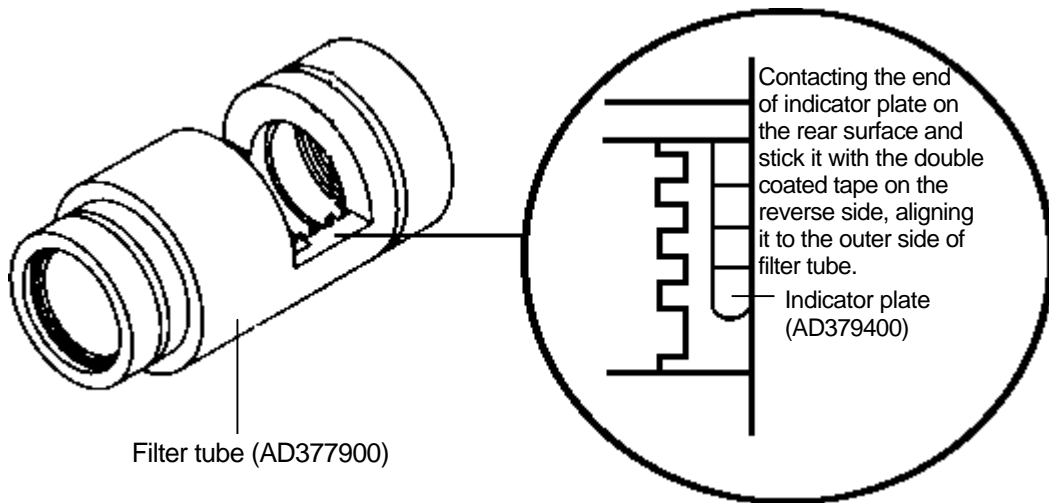


No.	Parts name	Screw	Grease	Adhesive	Remarks
①	COVER	AB3X14SA (*1) 3 pcs.			
②	MAIN TUBE	ANU4X6SA (*2) 3 pcs. ANU3X4SA (*3) 3 pcs.			
③	LENS TUBE	AB3X45SA (*4) 3 pcs.			
④	INSULATION TUBE				
⑤	SOCKET MOUNT				
⑥	RING			OT1131	Apply adhesive to 2 or 3 locations around the ring.
⑦	LENS				Insert the lens in the correct direction.
⑧	LENS TUBE				
⑨	HP GLASS				
⑩	RING			OT1131	Apply adhesive to 2 or 3 locations around the ring.
⑪	LENS				Insert the lens in the correct direction.
⑫	RING			OT1131	Apply adhesive to 2 or 3 locations around the ring.
⑬	FROSTED GLASS				
⑭	LEAF SPRING		OT2008		Apply grease thinly to the surface contacting the main tube.
⑮	SHAFT			OT1131	Apply a very small quantity of adhesive to the screw thread of the shaft.
⑯	RING				
⑰	DIAPHRAGM FRAME	ACU3X10SA (*5) 2 pcs. ANU6X10SA (*6) 1 pc.			
⑱	DIAPHRAGM BLADE				Don't damage the blade or contaminate it with grease. Demagnetization facilitates mounting.
⑲	DIAPHRAGM FRAME		OT2142		Apply a very small quantity of adhesive to the outer circumference. For the mounting position of the diaphragm frame, refer to (5) on the next page.
⑳	LENS			OT1870	
㉑	FILTER TUBE				
㉒	RING			OT1131	Apply adhesive to 2 or 3 locations around the ring.
㉓	LENS				Insert the lens in the correct direction.
㉔	COVER				
㉕	INDICATOR PLATE				For the mounting position of the indicator plate, refer to (6) on page B-14.

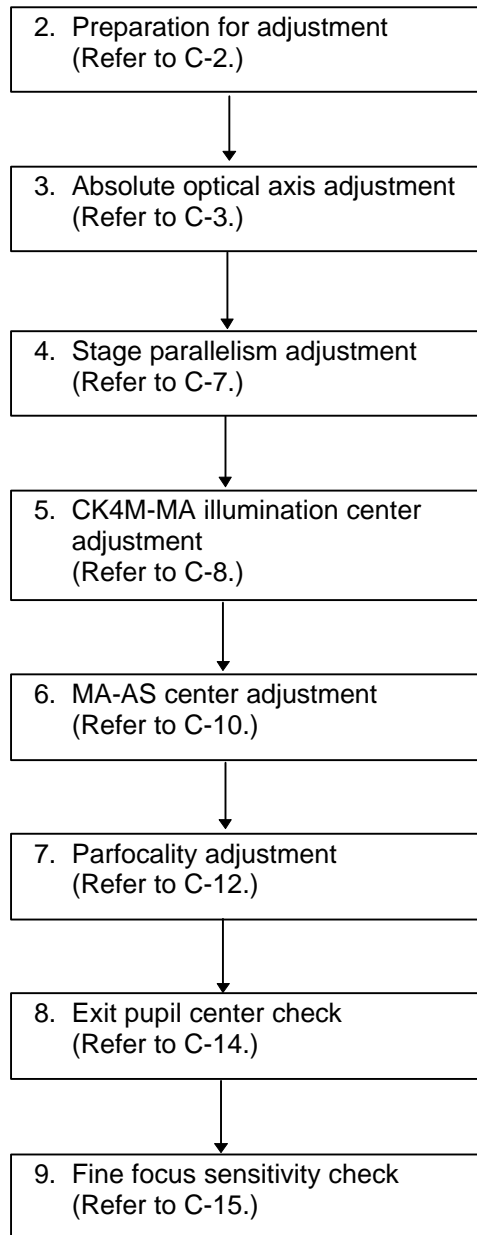
(5) Diaphragm frame (AD377200) mounting position



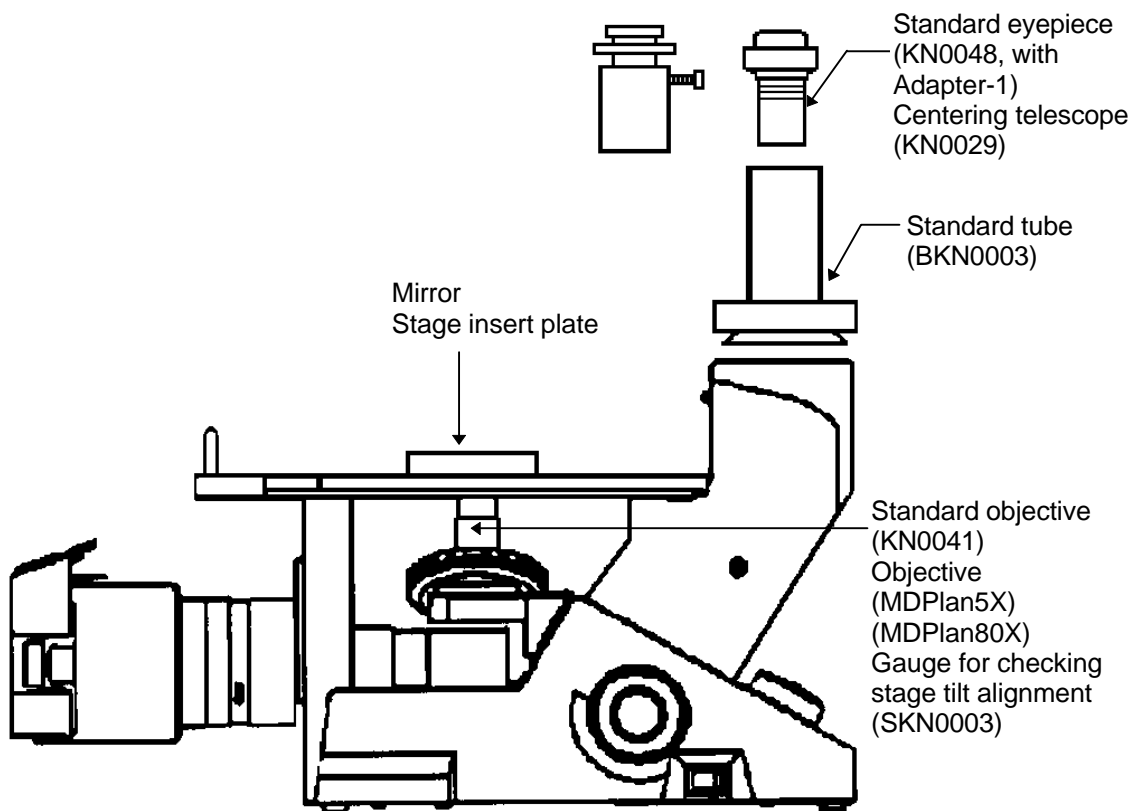
(6) Indicator plate (AD379400) mounting position



1. Adjustment procedure



2. Preparation for adjustment

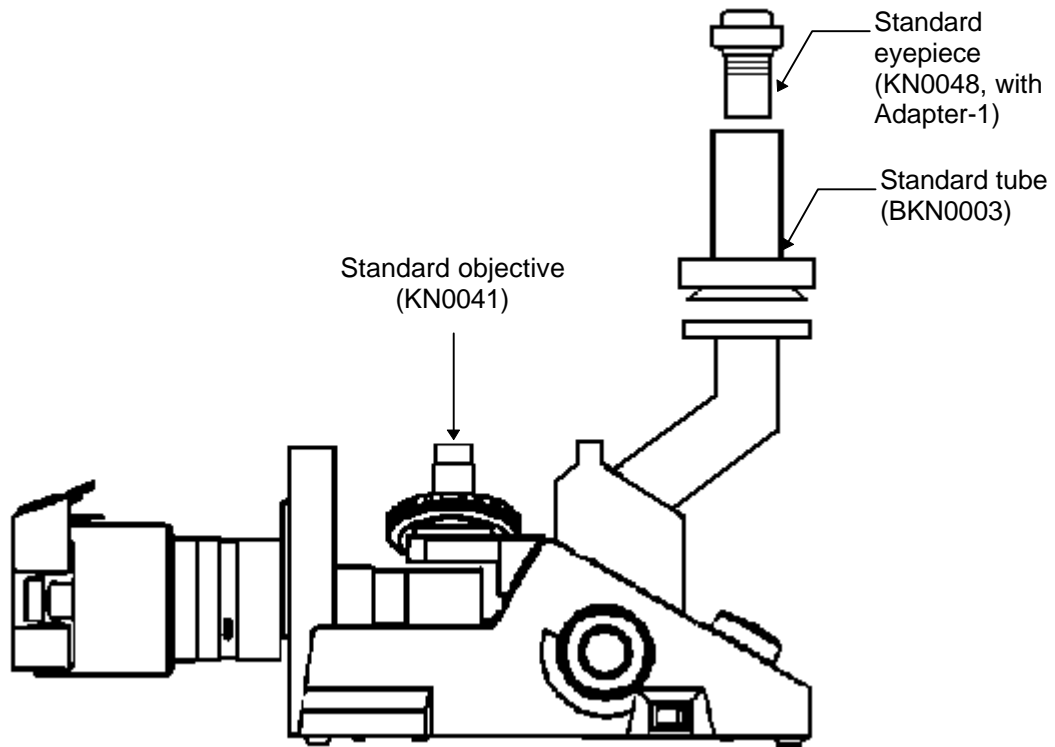


Adjustment item	Eyepiece (jig)	Objective (jig)	Jig and tool
Absolute optical axis	Standard eyepiece (KN0048, with Adapter-1)	Standard objective (KN0041)	Standard tube (BKN0003)
Stage parallelism		Gauge for checking stage tilt alignment (SKN0003)	Thickness gauge 0.07 mm (OT1949)
CK4M-MA illumination center	Centering telescope (KN0029)		Standard tube (BKN0003) Stage insert plate, mirror Slide glass
MA-AS center	Standard eyepiece (KN0048, with Adapter-1) Centering telescope (KN0029)	MDPlan80X objective	Standard tube (BKN0003) Stage insert plate, mirror
Parfocality	Standard eyepiece (KN0048, with Adapter-1) FT-36 or focusing telescope (-1) (KN0025)	Standard objective (KN0041)	Standard tube (BKN0003)
Exit pupil center	Centering telescope (KN0029)	MDPlan5X objective	Standard tube (BKN0003)
Fine focus sensitivity	Use WHK10X, WHK15X, NCWHK10X or GSWHK10X eyepiece.	Use MDPlan5X, 10X, 20X, 40X, 50X, 80X objective (optional) or MDAch10X, 20X, 50X objective	Use CH3-B145, CH3-TR45 or CH40-TBI observation tube.

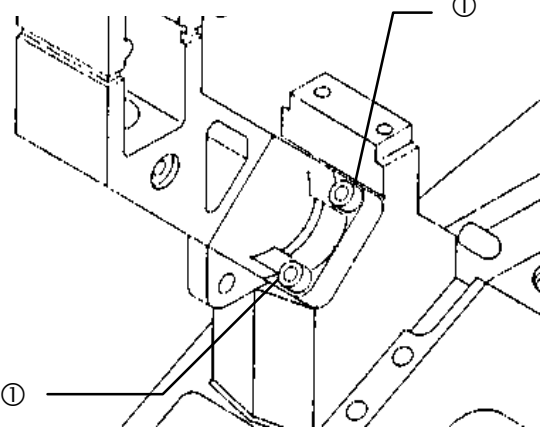
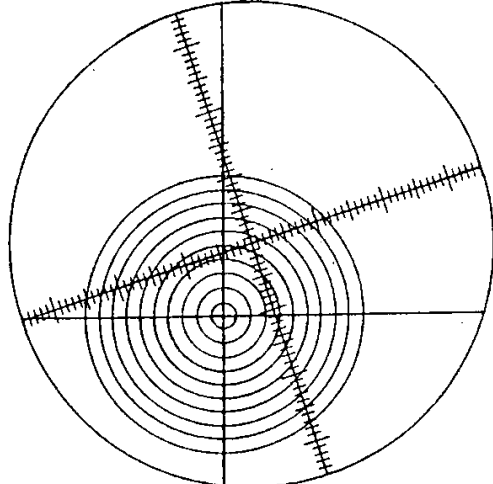
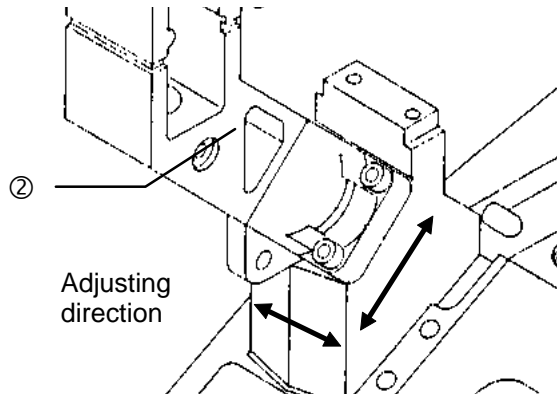
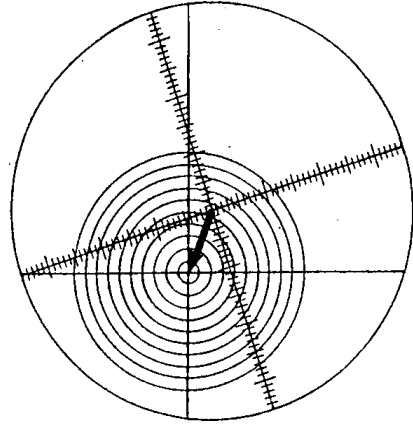
3. Absolute optical axis adjustment

3-1 Set the following jigs as illustrated below to adjust the absolute optical axis.

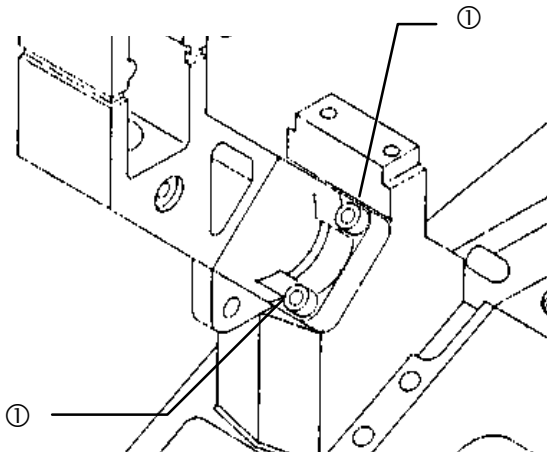
- Eyepiece----- KN0048: Standard eyepiece (with adapter-1)
- Objective ----- KN0041: Standard objective
- Other ----- BKN0003: Standard tube



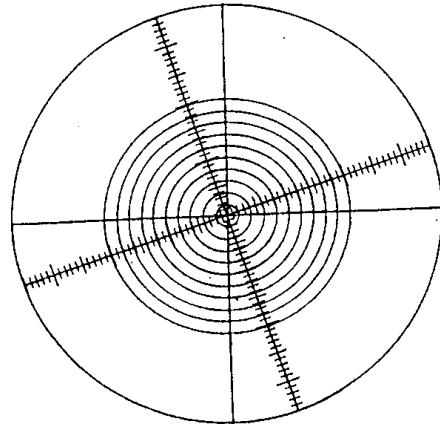
3-2 Adjusting the absolute optical axis

Work	Image seen through the standard eyepiece
<p>(1) Slightly loosen the four SCREWS ① fixing the TR body ass'y (to the extent that the unit does not become loose.)</p> 	<p>If the absolute optical axis is displaced, the cross hairs center of standard eyepiece is not located at the cross center of the specimen in the standard objective.</p> 
<p>(2) Looking though the standard eyepiece, align the cross hairs center of standard eyepiece with the cross center of specimen in the standard objective. (Make adjustment by changing the mounting position of the TR BODY ASS'Y ②. The range of adjustment should be within the range of screw play.)</p>  <p>Adjusting direction</p>	<p>Align the two centers.</p> 

(3) Firmly tighten the four SCREWS ① fixing the TR body ass'y.

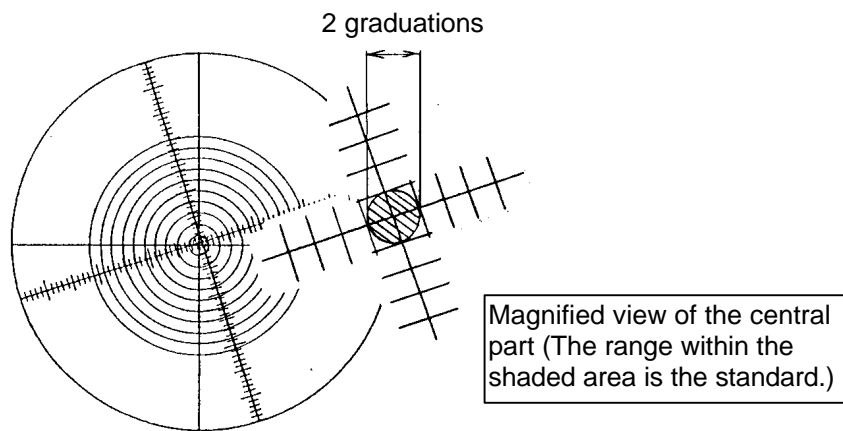


Make sure that the adjusted position may not be changed.



3-3 Checking the absolute optical axis

The cross center of specimen in the standard objective should be within the shaded range on the reticle scale of standard eyepiece.



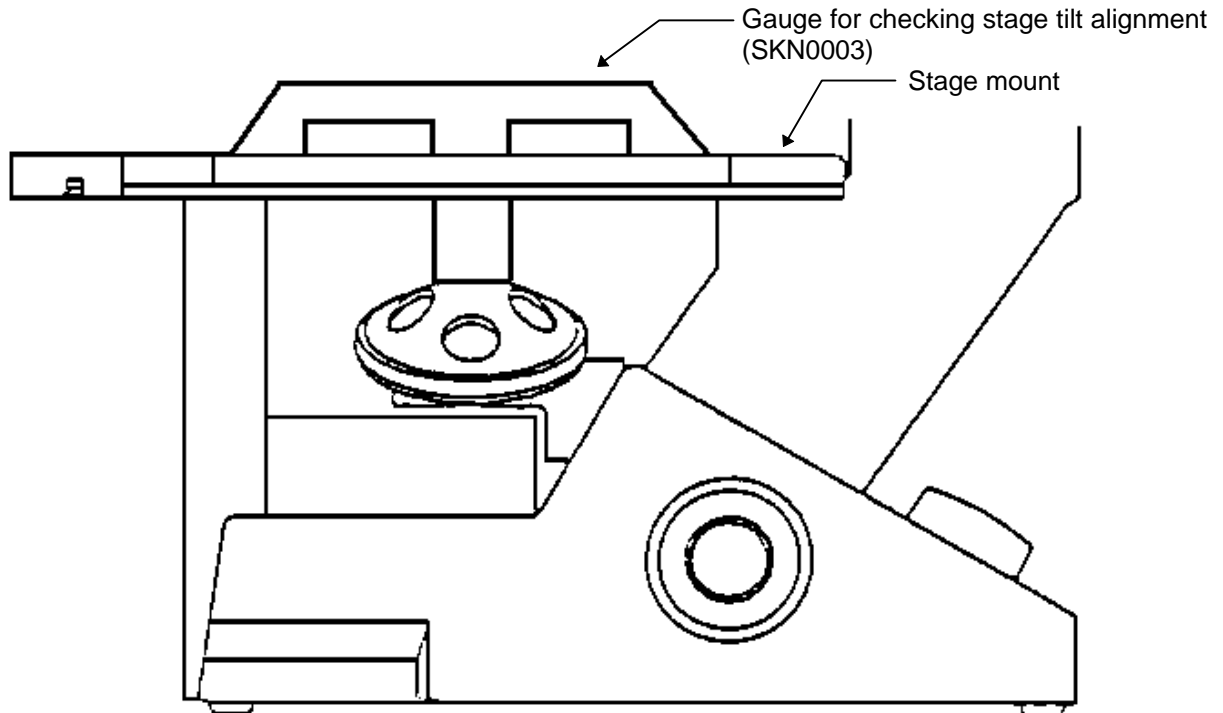
If the cross center of specimen in the standard objective is not within the above range, return to “3. Absolute optical axis adjustment” on page C-3 and work again.

Standard: Within 2 graduations on the reticle scale of standard eyepiece

4. Stage parallelism adjustment

4-1 Set the following jig as illustrated below to adjust the parallelism of the stage.

- Mount the gauge (SKN0003) on the revolving nosepiece.
- Use a 0.07 mm thickness gauge (OT1949).



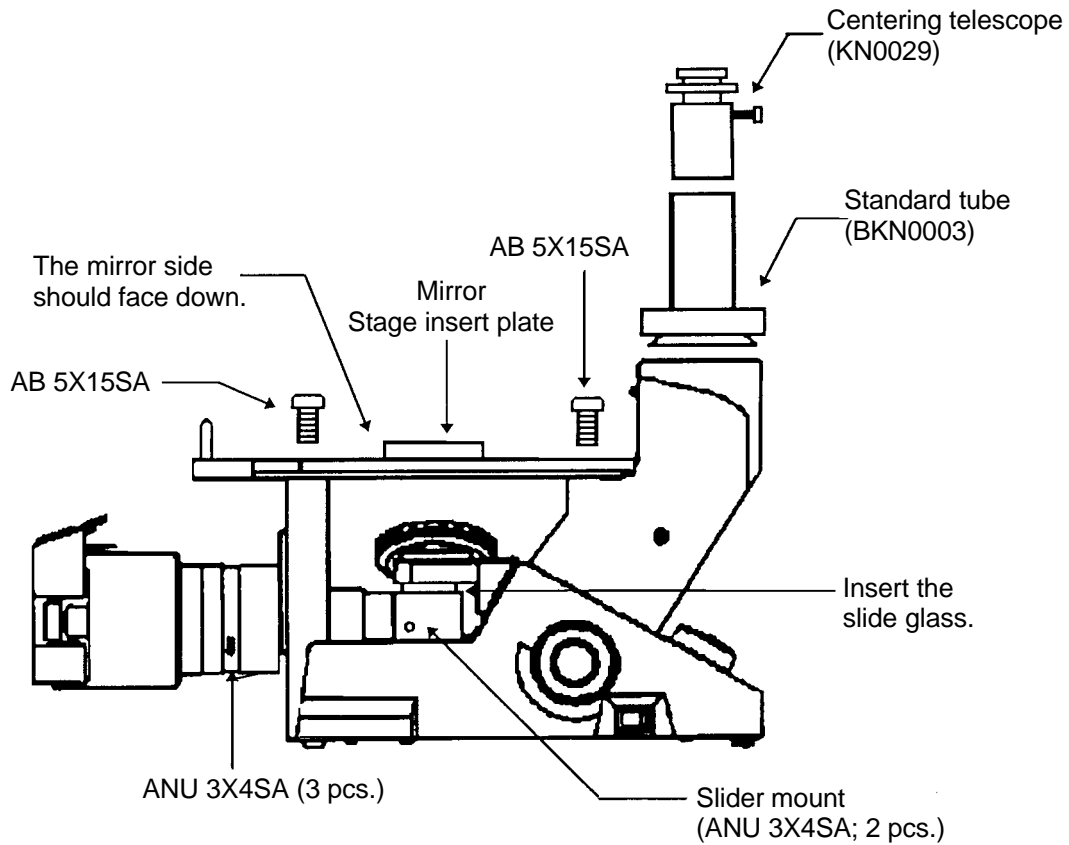
4-2 Checking method

- (1) Mount the gauge (SKN0003) on the revolving nosepiece.
- (2) Use the stage insert plate as the reference.
- (3) Using a 0.07 mm thickness gauge (OT1949), check the clearance between the gauge (SKN0003) and the stage mount.
- (4) The result is acceptable if the thickness gauge does not go through the clearance between the gauge and the stage mount.
- (5) Set the gauge in the front-rear and left-right directions.
- (6) If the result is not acceptable, insert tin foil between the stage mount and the frame until the specification is met.

5. CK4M-MA illumination center adjustment

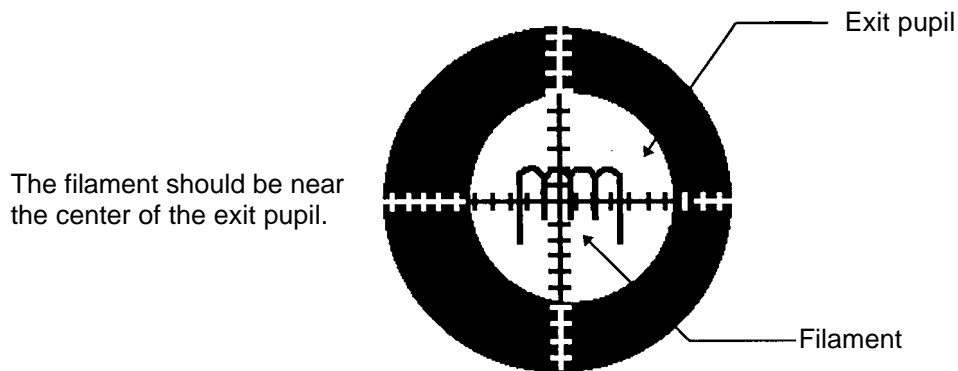
5-1 Set the following jigs as illustrated below to adjust the CK4M-MA illumination center.

- Eyepiece-----KN0029: Centering telescope
- Other -----BKN0003: Standard tube, stage insert plate, mirror



5-2 Adjusting CK4M-MA illumination center

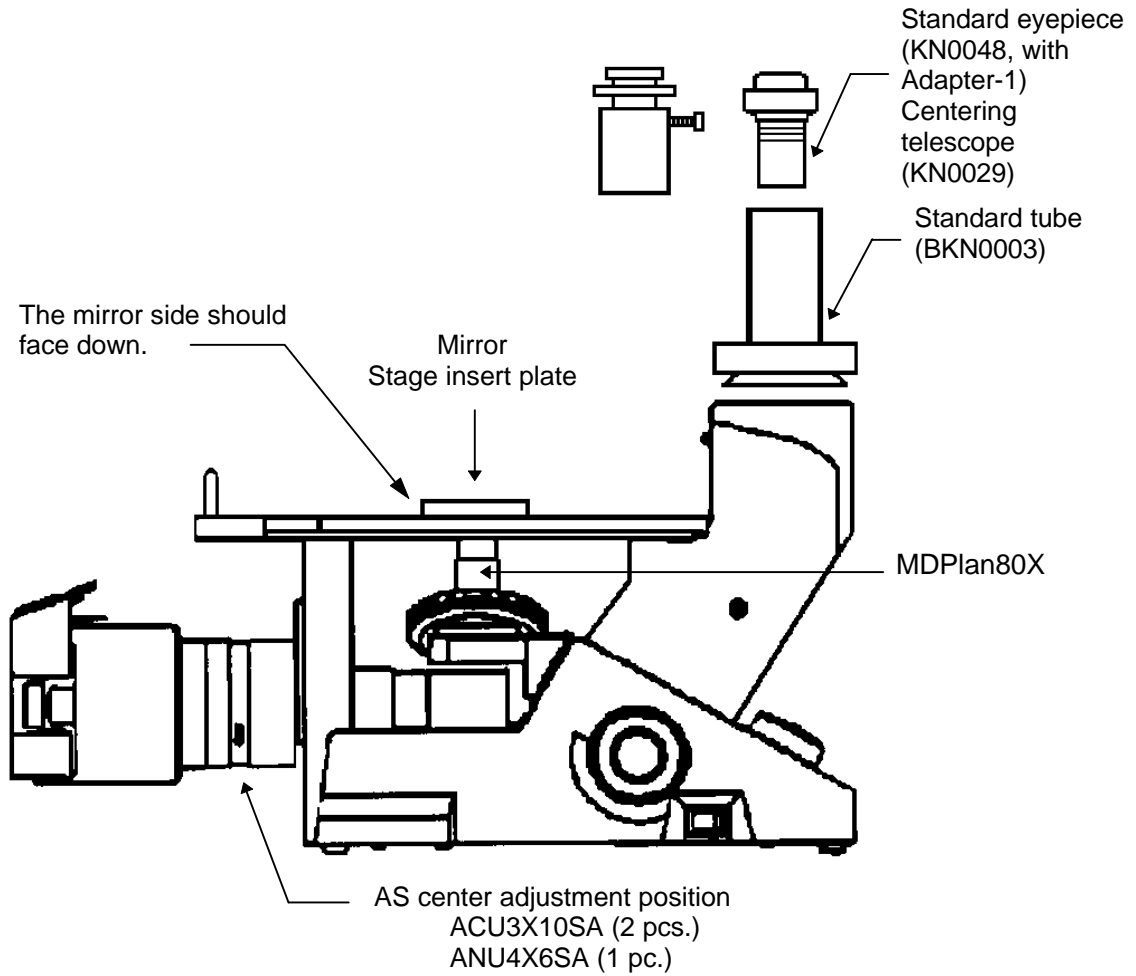
- 1) Temporarily fix the stage. (Screw: AB5X15SA 4 pcs.)
- 2) Loosen the screws (ANU3X4SA 2pcs.) fixing the slider mount.
- 3) Insert slide glass between the slider mount and the revolving nosepiece and fix the slider mount where it becomes flat.
- 4) To look at the bulb filament, remove the frosted glass from the illuminator. (Remove the screws: ANU 3X4SA 3pcs.)
- 5) Using the centering telescope, focus on the filament.
- 6) The positional relationship between the filament and the exit pupil should be as shown below.
- 7) Don't forget to mount the frosted glass on the illuminator.



6. MA-AS center adjustment

6-1 Set the following jigs as illustrated below to adjust the MA-AS center.

- Eyepiece -----KN0048: Standard eyepiece (with adapter-1)
 KN0029: Centering telescope
- Objective-----MDPlan80X
- Other -----BKN0003: Standard tube, stage insert plate, mirror

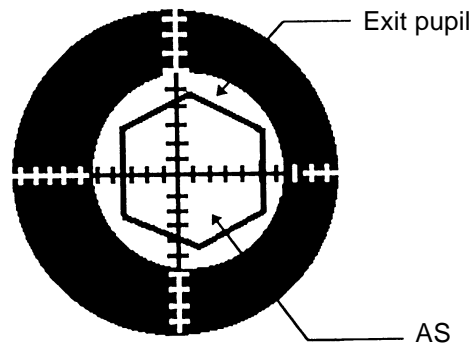


6-2 Adjusting AS center

- 1) Fully open the aperture diaphragm (AS).
- 2) Set the standard eyepiece and focus on the mirror surface.
- 3) Take out the standard eyepiece and set the centering telescope.
- 4) Look at the exit pupil of the objective through the centering telescope. At this time, the AS image may be slightly out of focus (it is acceptable in this adjustment).
- 5) Stop down the AS by about 30% using the AS knob.
- 6) Using the three-direction screws fixing the AS, align the AS image to the exit pupil center of the objective.
- 7) Make sure that the displacement of the AS image center from the center of the MDPlan80X exit pupil is within 1 graduation on the centering telescope scale.

Standard:

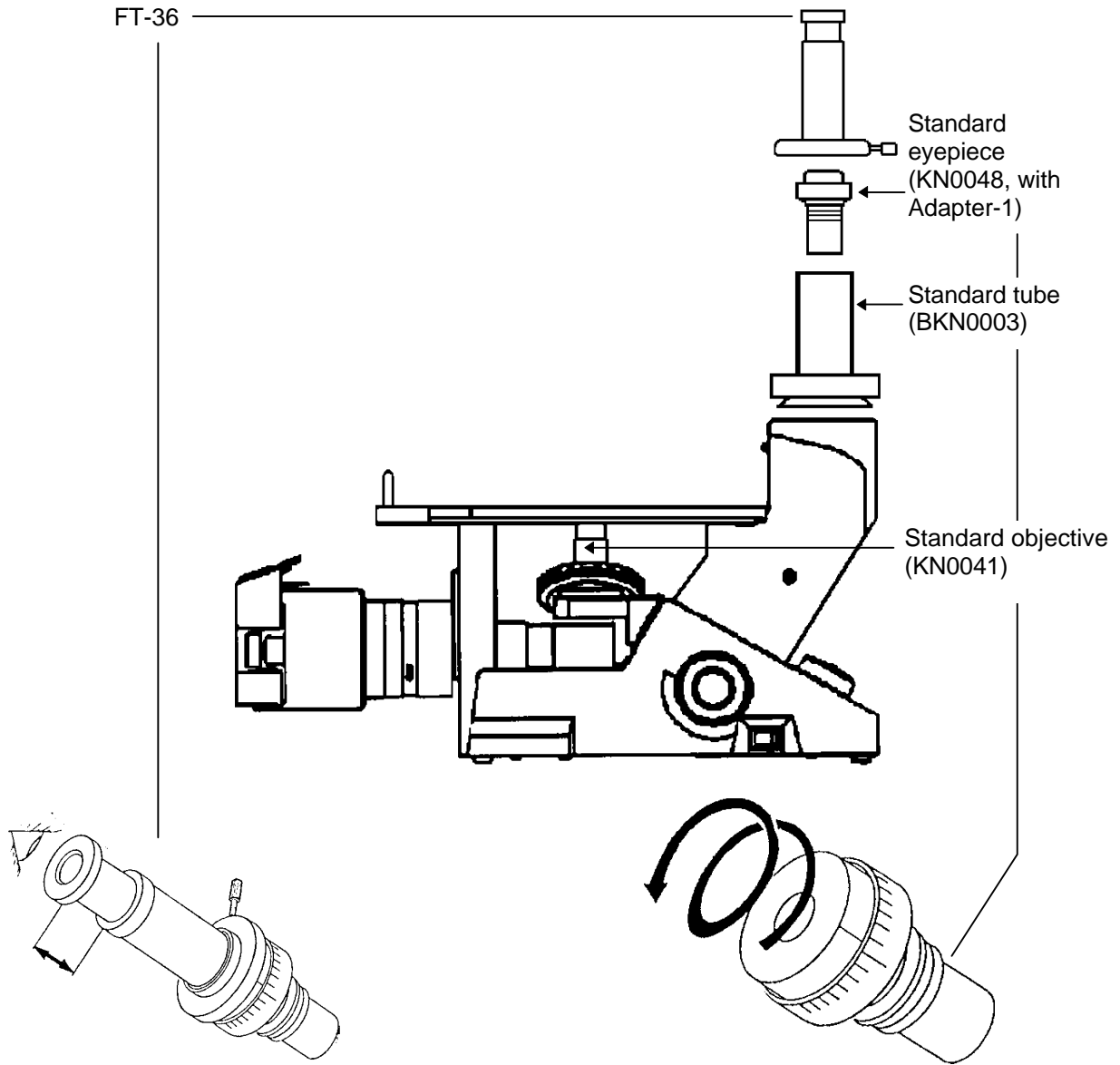
The displacement in the vertical and horizontal directions from the exit pupil center should be within 1 graduation on the centering telescope scale.



7. Parfocality adjustment

7-1 Set the following jigs as illustrated below to adjust the parfocality.

- Eyepiece----- KN0048: Standard eyepiece (with adapter-1)
- Objective ----- KN0041: Standard objective
- Other ----- FT-36 or KN0025: focusing telescope (-1), BKN0003: Standard tube

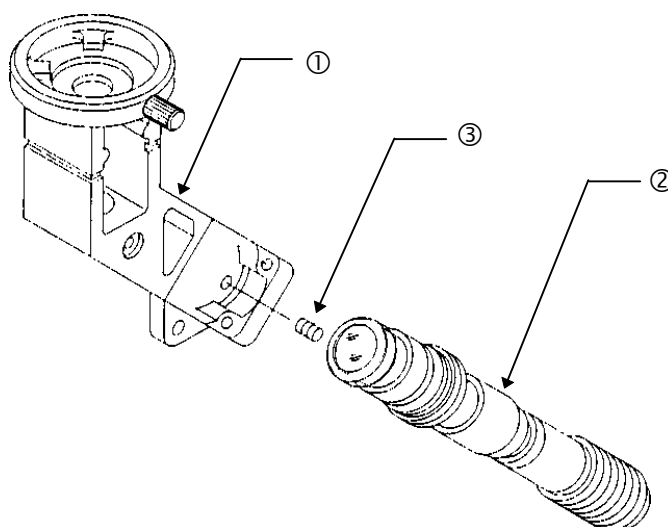


Stop where the cross hairs in the KN0048 can be seen clearly.

Screw in fully and return back by two turns.

7-2 Checking parfocality

- 1) Align the white scale with the red scale on KN0048.
 - 2) Using the focusing telescope, focus on the cross hairs in the KN0048.
 - 3) Turning the helicoid ring of the standard eyepiece, focus on the wave pattern of the specimen in the standard objective.
 - 4) If the movement amount from the scale position of 2) is within 12 graduations in the clockwise and counterclockwise directions, the parfocality check is completed.
- If the result of parfocality checking is not acceptable, loosen the SCREW ③ and check whether the LENS ASS'Y ② is screwed to the contact surface of the TR BODY ASS'Y ①.



If no problem is found as a result of the above checking, select a spacer (for parfocality) to insert it. (Thickness $t=1.5, 1.8, 2.0, 2.2, 2.5$)

Spacer selection method

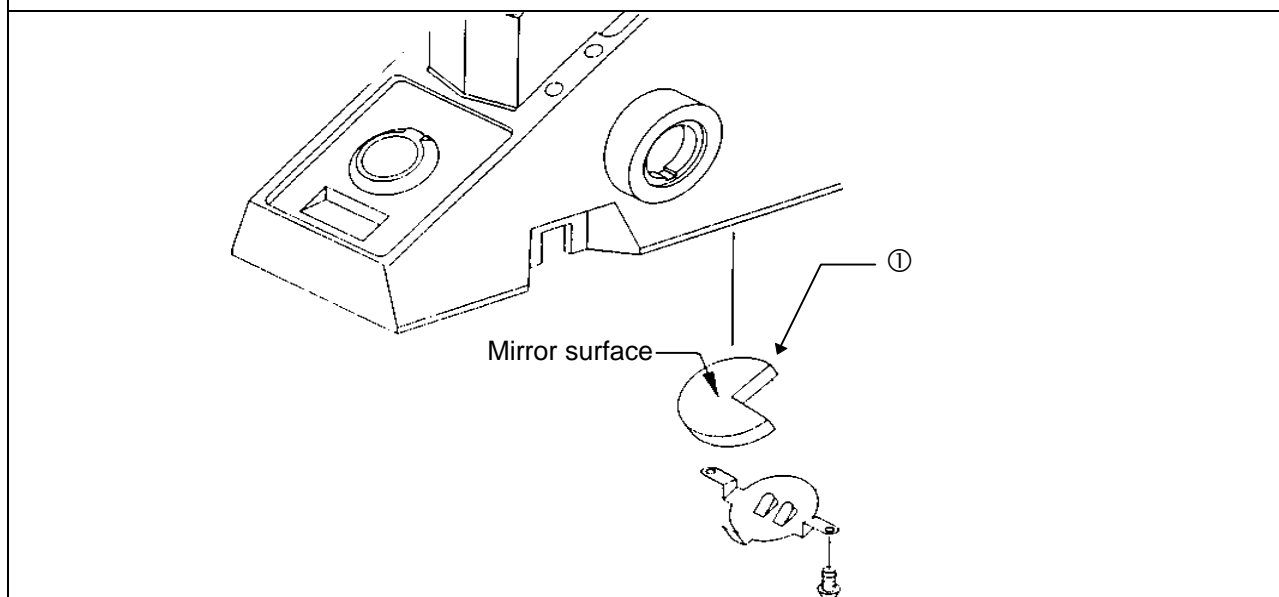
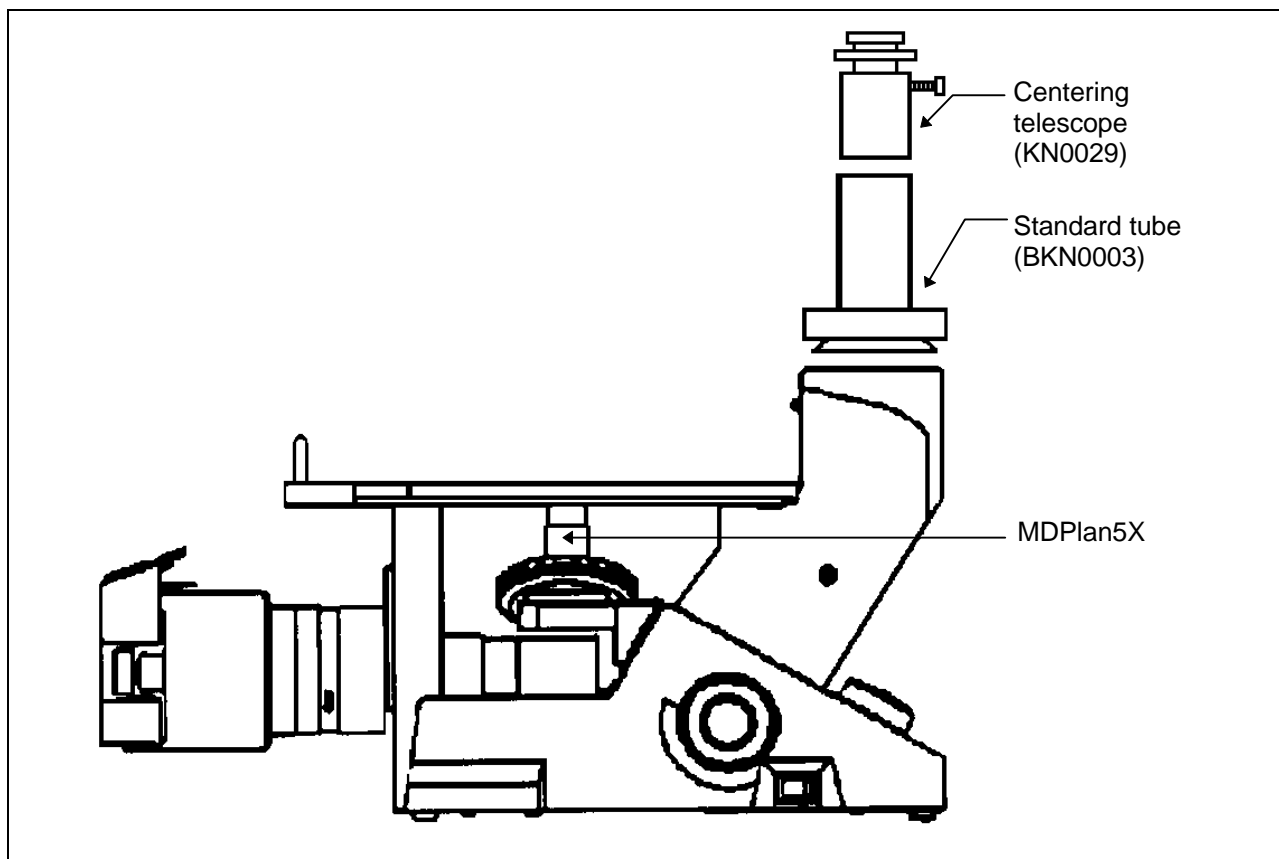
1. Assemble the TR body ass'y temporarily using a 2.0 mm thick spacer.
2. Check the parfocality by the procedure explained in the previous page. If the parfocality position is 14 and 17 graduations in the plus direction, use a 2.2 mm spacer and a 2.5 mm spacer, respectively. If it is 14 graduations and 17 graduation in the minus direction, use a 1.8 mm spacer and a 1.5 mm spacer, respectively.
3. One graduation on the helicoid scale of standard eyepiece is 0.1 mm.

Standard: Within ± 12 graduations on the helicoid scale of standard eyepiece

8. Exit pupil center check

8-1 Set the following jigs as illustrated below to check the exit pupil center.

- Eyepiece----- KN0029: Centering telescope
- Objective ----- MDPlan5X
- Other ----- BKN0003: Standard tube

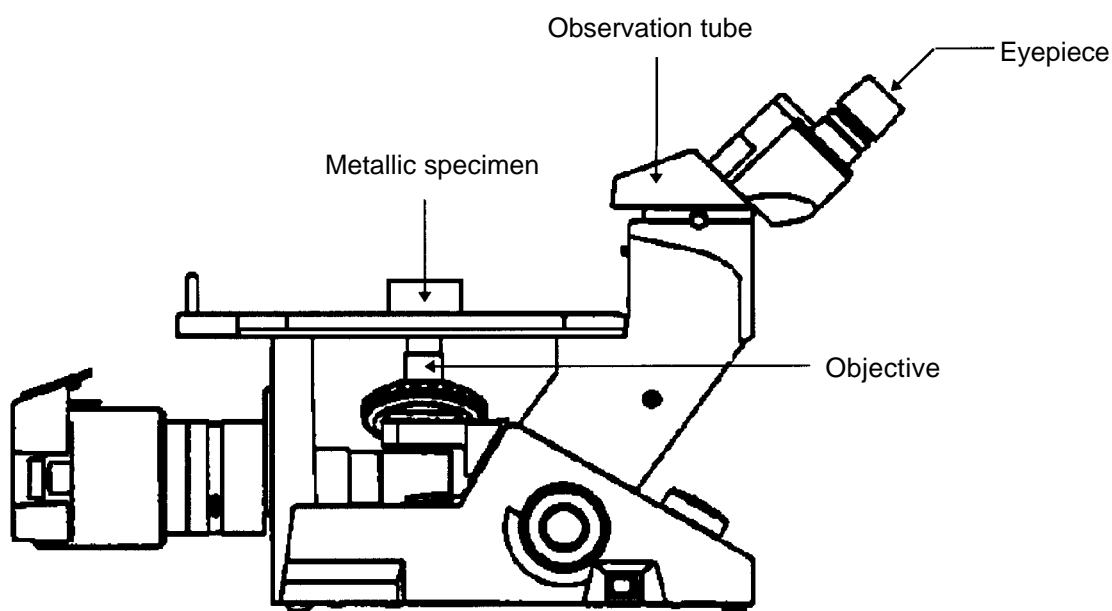


Make sure that the displacement between the center of the objective's exit pupil diameter and the cross hairs center of centering telescope is within 15% of the objective's exit pupil diameter. If the above requirement is not met, the MIRROR ① is tilted (failure in installation) or defective.

9. Fine focus sensitivity check

9-1 Set one of following products as illustrated below to check the fine focus sensitivity.

- Eyepiece----- WHK10X, WHK15X, NCWHK10X, GSWHK10X
- Objective ----- MDPlan5X, MDPlan10X, MDPlan20X, MDPlan40X,
MDPlan50X, MDPlan80X
MDAch10X, MDAch20X, MDAch50X
- Observation tube ----- CH3-BI45, CH3-TR45, CK40-TBI
(CH3-BI45 is mounted in the following illustration.)
- Specimen----- Metallic specimen



9-2 Checking fine focus sensitivity

- 1) Focus on the metallic specimen.
- 2) Remember the position of the scale on the fine adjustment knob at the focused position.
- 3) Turning the fine adjustment knob, set the specimen out of focus (in the both directions), and then focus on the specimen again.
- 4) If the position of the scale on the fine adjustment knob is within 2 graduations from the position in 2), the result is acceptable.
- 5) If the displacement exceeds 2 graduations, the focusing unit must be assembled again.

Standard: Within 2 graduations from the previous focus position

1. List of jigs and tools

No.	Description	Page
BKN0003	Standard tube	C-3, 8, 10, 12, 14
CK40MKC01	Half mirror positioning jig	B-2
CK40MKC02	Prism positioning jig	B-4
(FT-36)	Focusing telescope	C-12
K2347	V-block	B-2
KN0025	Focusing telescope (-1)	C-12
KN0029	Centering telescope	C-8, 10, 14
KN0041	Standard objective for infinity correction series	C-3, 12
KN0048	Universal standard eyepiece with cross hairs	C-3, 10, 12, 13
OT1949	Thickness gauge	C-7
SKN0003	Gauge for checking stage tilt alignment	C-7

1. List of lubricants

No.	Description	Page
OT2006	Grease (heavy)	B-10
OT2008	Grease (medium)	B-3, 10, 12
OT2010	Grease (light)	B-7, 8
OT2012	Molykote grease	B-10
OT2142	Grease (light)	B-12
OT2144	Grease (light)	B-3

2. List of chemicals

No.	Description	Page
OT1131	Shellac	B-3, 5, 7, 10, 12
OT3111	Cyanoacrylate adhesive	B-10
OT1838	Cyanoacrylate adhesive	B-7, 8
OT1870	Silicone adhesive	B-12
OT1873	Silicone adhesive (black)	B-1, 2, 3, 4
OT1983	Solvent-based adhesive (red)	B-10