

Olympus
BH2-BI30
Binocular Head
Repair Manual

BH2-BI

REPAIR MANUAL

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1. LIST OF REPAIR JIGS AND TEST EQUIPMENTS

1-1 JIG

B2KC0402 Jig for Bi/Tr tube prism alignment of BH2 series
B2KC0405 Positioning Jig for prism ZA070900 (P3, P4)
B2KC0406 Jig for interpupillary distance at 62mm of BH2-B1/TR
B2KC1401 Alignment Jig for prism P2 (B2KC0401)
B2KC1403 Alignment Jig for prism P2

1-2 TEST EQUIPMENT

KN0015 Centering objective for optical alignment of observation tube (160mm, Long Barrel)
(KN0005) Centering objective for optical alignment of observation tube (160mm, Short Barrel)
KN0016 Standard objective for optical length adjustment (160mm, Long Barrel)
(KN0007) Standard objective for optical length adjustment (160mm, Short Barrel)
KN0017 Centering objective for optical alignment of observation tube (200mm, Long Barrel)
(KN0014) Centering objective for optical alignment of observation tube (200mm, Short Barrel)
KN0025 Special focusing magnifier
(C-15) PM-FT, PM-FT36
KN0029 Special eyepiece for checking exit pupil of biological microscope (d=23.2mm)
KN0030 Special eyepiece with cross hairs (for Long Barrel)
(KN0028) Special eyepiece with cross hairs (for Short Barrel)
KN0031 Special eyepiece for optical tube length adjustment (for Long Barrel)
(KN0022) Special eyepiece for optical tube length adjustment (for Short Barrel)
KN0043 Standard Tube (tube length:160mm, d=23.2mm)

2. LIST OF ADHESIVE AND GREASE

2-1 ADHESIVE

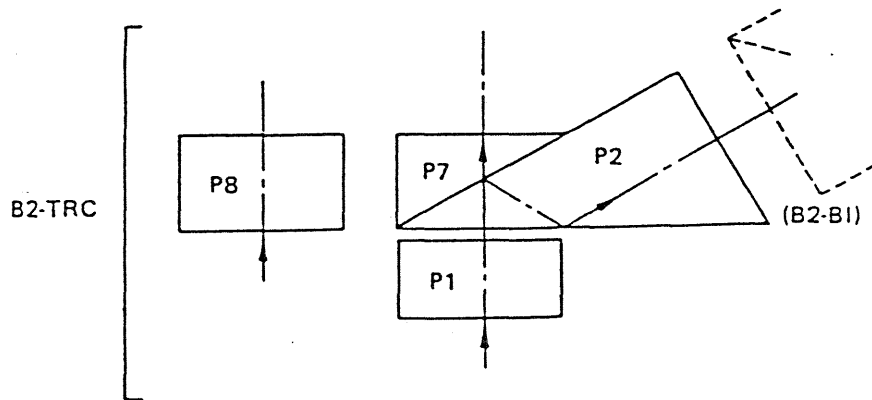
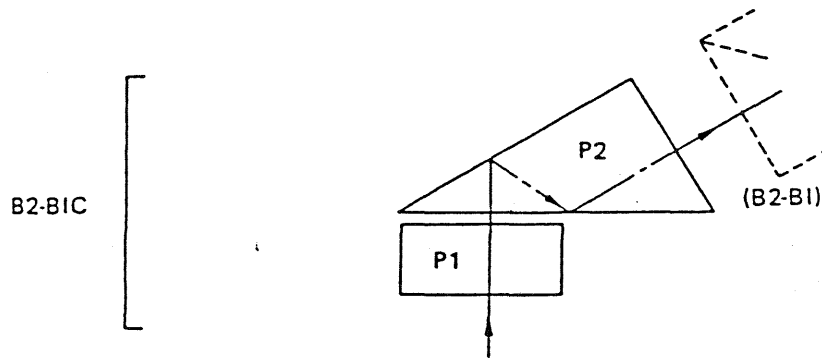
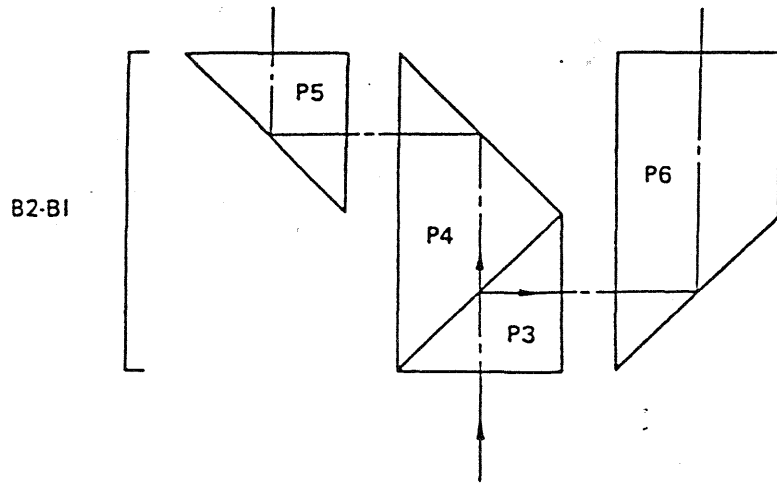
OT1027 Alon Alpha
OT1126 Perma Lock MM115
OT1131 Shellac
OT1315 Araldite Rapid

2-2 GREASE

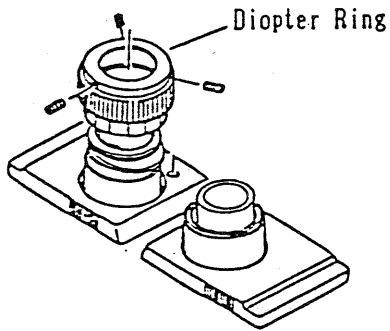
OT2008 50g (72515)

OPTICAL PATH DIAGRAMS OF BH2-BI AND BH2-TR

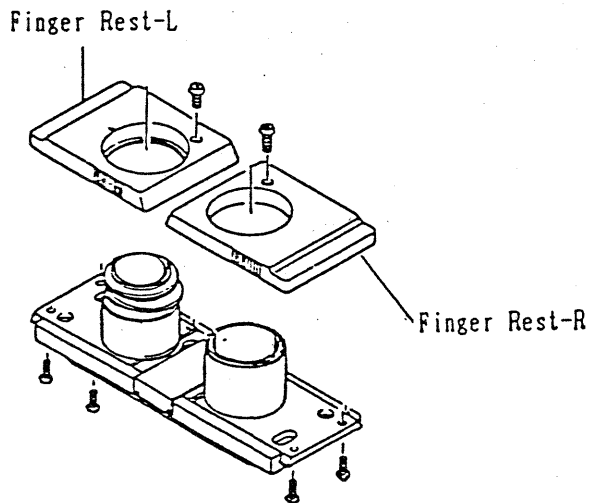
BH2-BI designates the combination of B2-BI unit and B2-BIC unit
BH2-TR designates the combination of B2-BI unit and B2-TRC unit



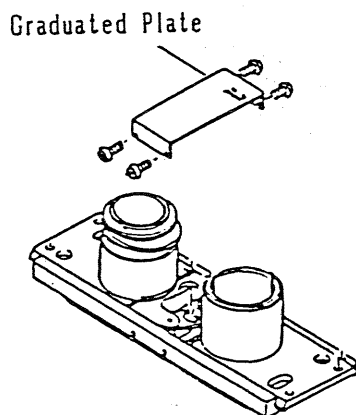
4. DISASSEMBLY PROCEDURE FOR B2-BI UNIT FROM B2-BIC UNIT



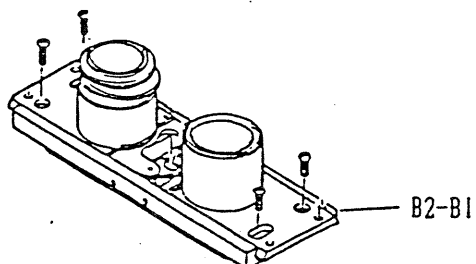
4-1 Remove Diopter Ring by removing three screws.



4-2 Disassemble Finger Rest-L and Finger Rest-R by removing six Screws.

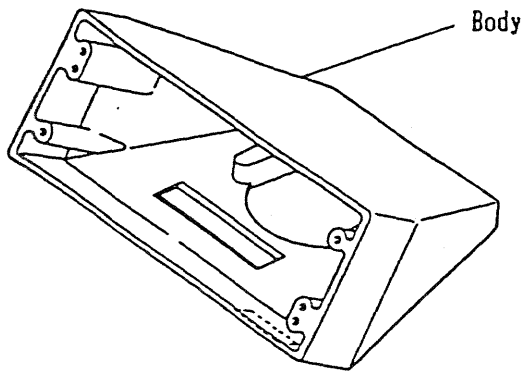


4-3 Remove Graduated Plate by removing four Screws.

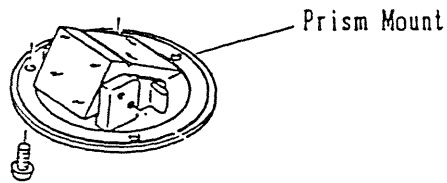


4-4 Dismount B2-BI unit from B2-BIC unit by removing four Screws

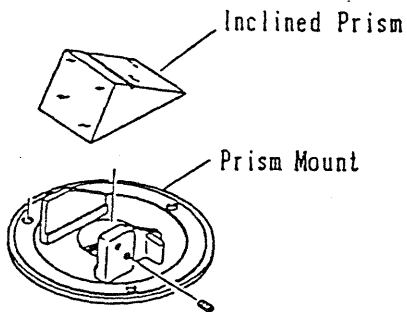
5. DISASSEMBLY PROCEDURE FOR B2-BIC UNIT



5-1 Disassemble Prism Mount from Body by removing three Screws.

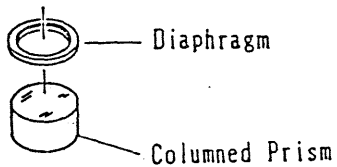


5-2 Dismount Prism from Prism Mount

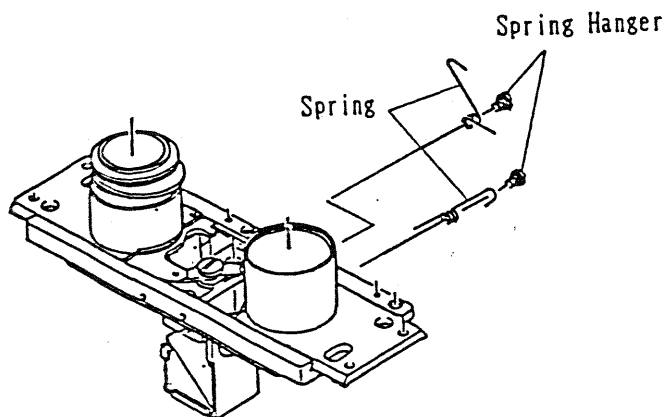


* The prism is bonded to the prism mount.
To remove adhesive, use the heated knife or
apply heat.

* Only Dismount the columned prism, when it is
damaged.



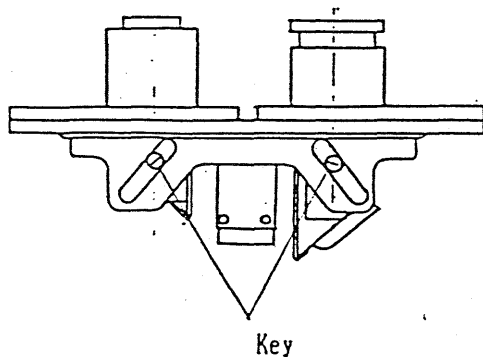
6. DISASSEMBLY PROCEDURE FOR B2-BI UNIT



6-1 Remove Springs from the constant tube length device.

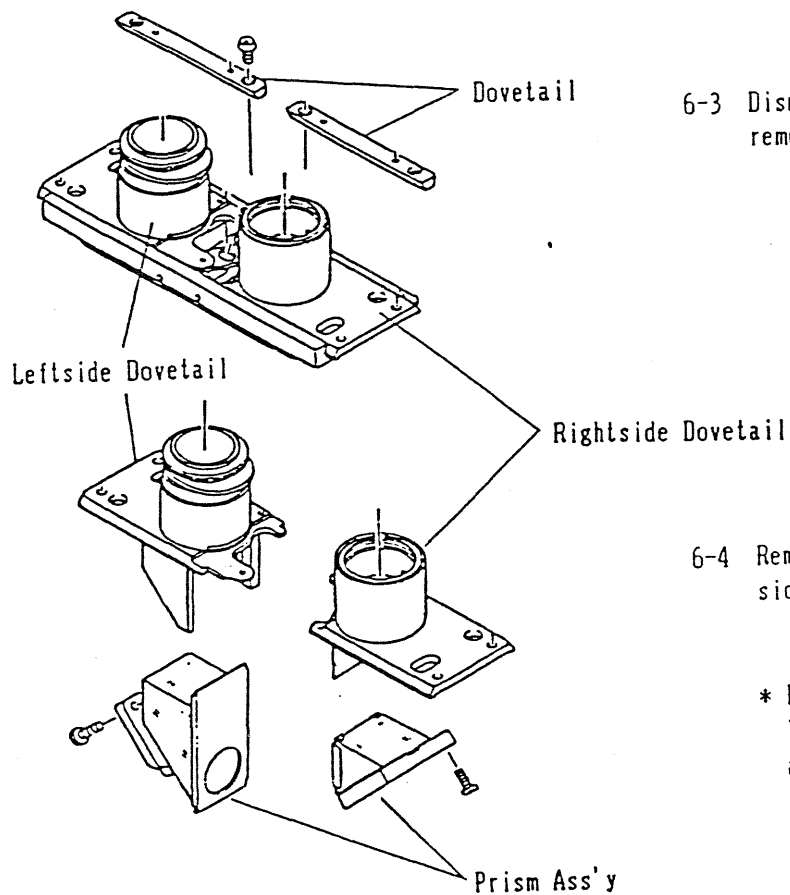
1) Remove Spring Hanger.

2) Remove Springs from each Keys.



6-2 Remove two Keys.

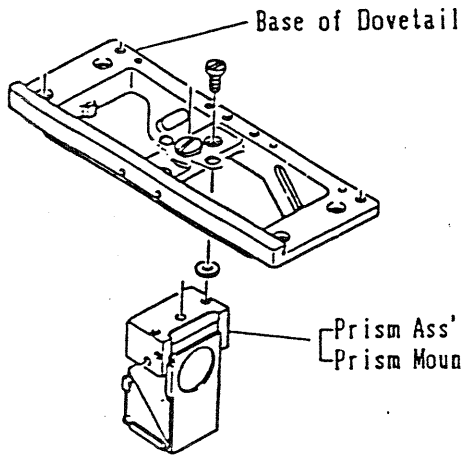
* The key is fixed with adhesive



6-3 Dismount left and right side Dovetails by removing four Screws.

6-4 Remove Prism Assemblies from left and right side Dovetail by removing two Screws.

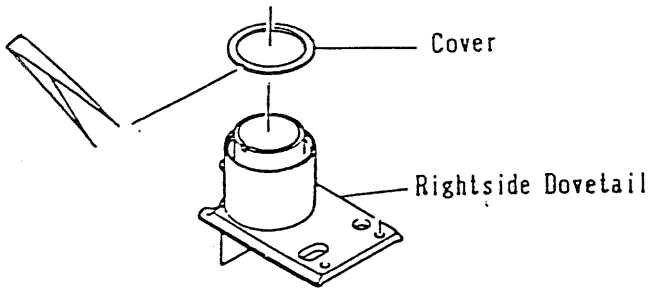
* Prism Mount is bonded with adhesive.
To remove adhesive, use the heated knife or apply heat.



6-5 Remove Prism Mount and Prism Assembly (P3, P4) from Base of Dovetail by removing two Screws.

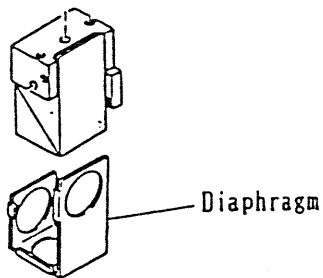
6-6 Remove Circular Cover from Right Side Dovetail.

* It can be detached by placing small amount of solvent through the notch and then forcibly extracting it with tweezers or a similar tool.



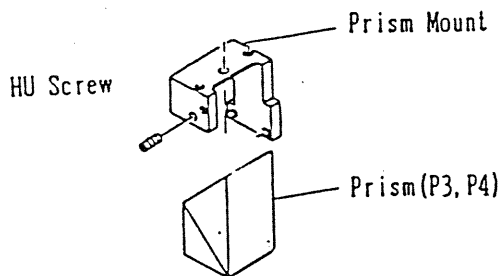
6-7 Remove Diaphragm from Prism

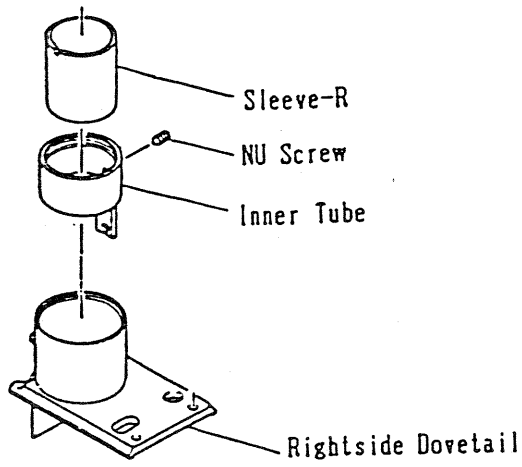
* The diaphragm is fixed with adhesive.



6-8 Dismount Prism from Prism Mount by removing two HU Screws.

* The Prism is bonded to the Prism Mount. To remove adhesive, use the heated knife or apply heat.



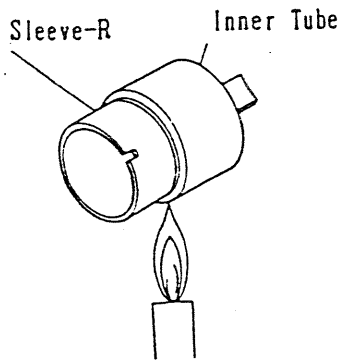


6-9 Extract Inner Tube

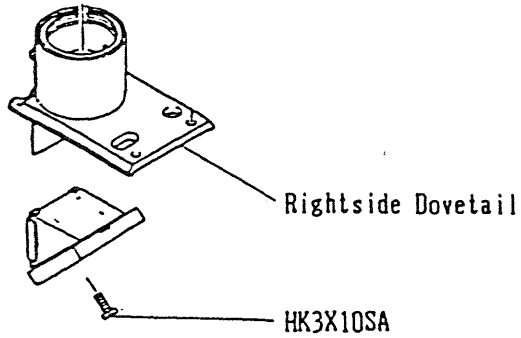
6-10 Remove Sleeve-R from Inner Tube as follows.

i) Remove NU Screw

2) Remove adhesive by heating it

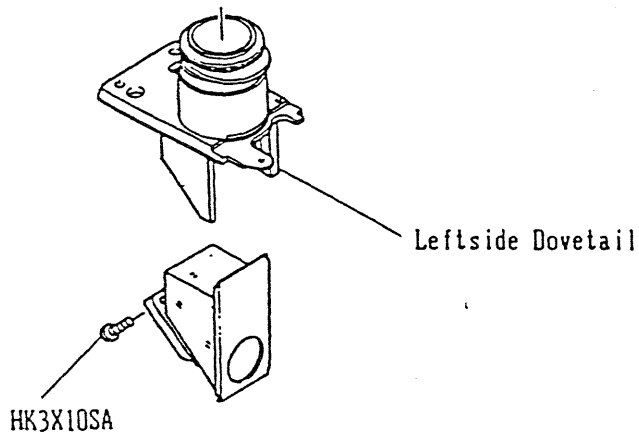


7. ASSEMBLY PROCEDURE FOR B2-BI UNIT



7-1 Assemble Prism with Right Side Dovetail.

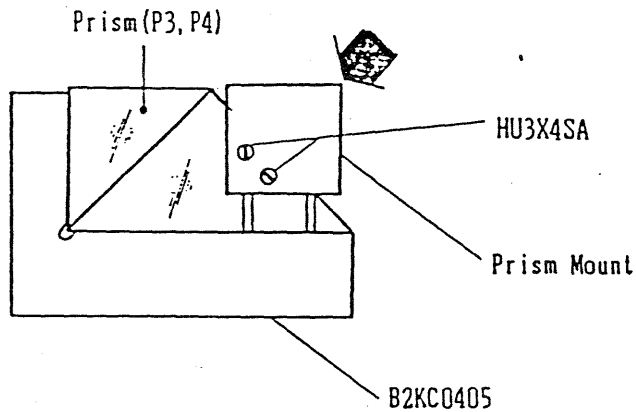
HK3X10SA 2 pcs.



7-2 Assemble Prism with Left Side Dovetail.

HK3X10SA 2 pcs.

7-3 Temporarily assemble Prism(P3, P4) with Prism Mount.



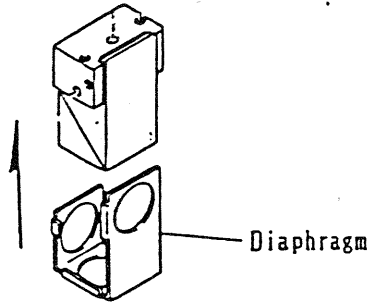
1) Position the Prism by using Positioning jig and then fix it by tightening Screws.

HU3X4SA 2 pcs.

Jig B2KC045

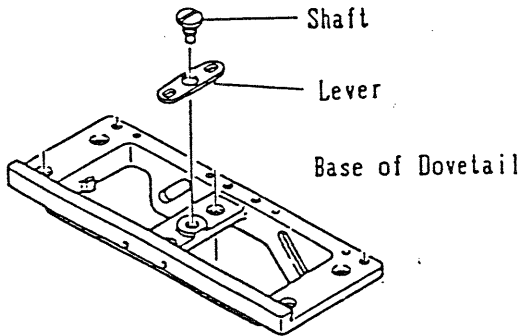
2) No gap should remain between the Prism Mount and Positioning jig as well as the Prism Mount and Prism.

* Butt the Prism Mount against the Prism and Positioning jig



7-4 Temporarily tape the Diaphragm to the Prism.

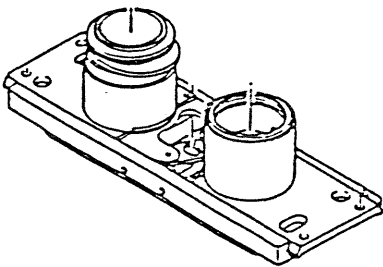
7-5 Assemble Lever and Shaft with Base of Dovetail.



* Apply Grease to the Lever and Shaft.

Grease OT2008

7-6 Assemble Left and Right side Dovetails in position respectively.



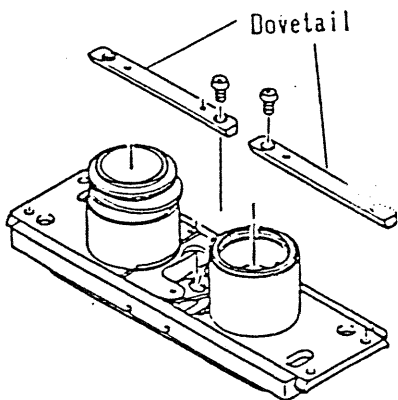
* Apply Grease to the sliding surfaces of the Dovetails.

Grease OT2008

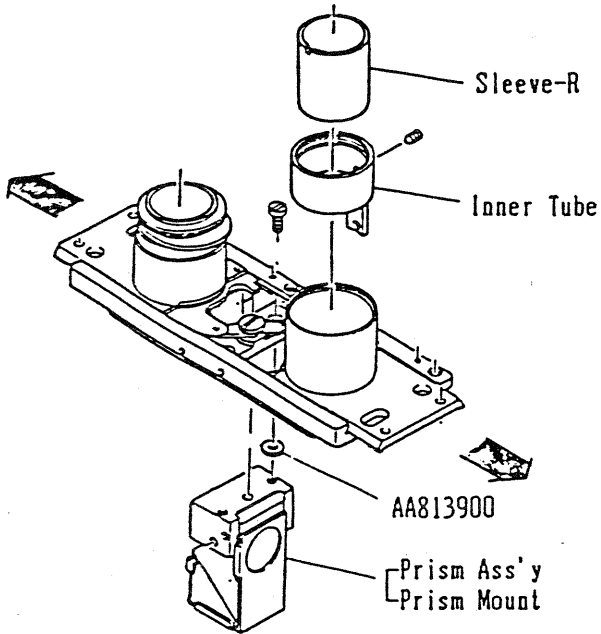
7-7 Assemble two Dovetails.

CUK2.6X5SA 4 pcs.

* Use the one used before disassembly.



7-8 Move the two dovetails and check for smooth operation



7-9 Temporarily clamp the Prism assembly with two Screws

HK 3X5SA 2 pcs.

(AA813900 2 pcs.)

7-10 Locate the slit of Sleeve-R at the position of NU Screw.

7-11 Set the Positioning Screw.

NU 2X3SB 1pc.

7-12 Apply Grease to the sliding surface of slots.

Grease OT2008

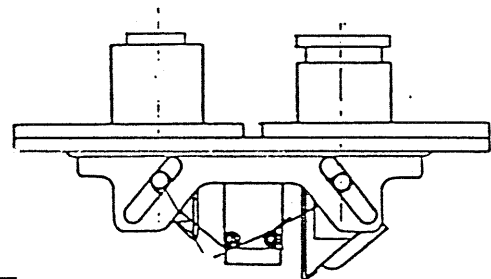
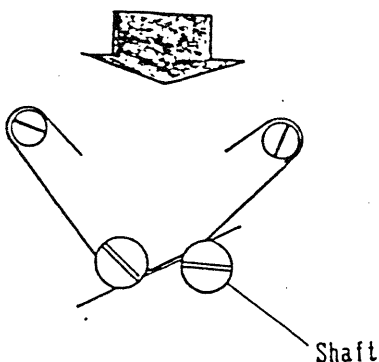
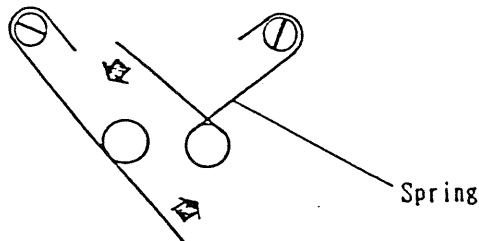
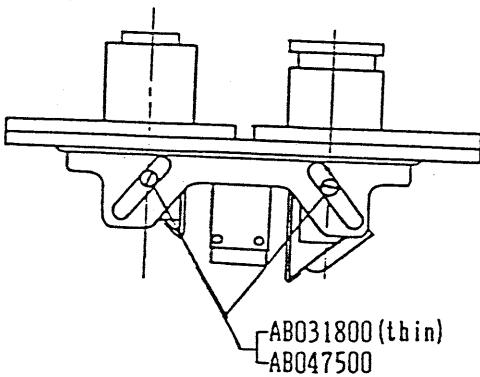
7-13 Assemble Key ABO31800 or ABO47500 in position.

Check movement of Keys in their slots for play or friction. Select smaller or larger diameter Keys to achieve smooth operation.

* Apply adhesive to the threaded part of Key.

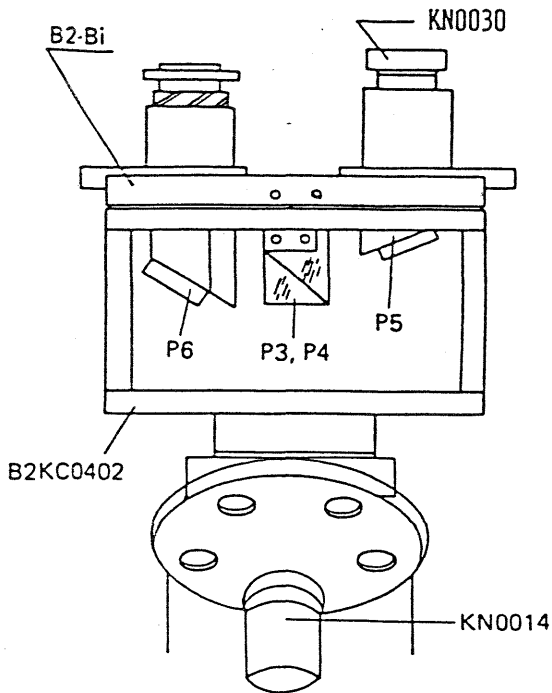
Adhesive OT1126

7-14 Assemble Springs and Spring Hangers in position.



8. OPTICAL ALIGNMENT OF B2-BI UNIT

8-1 Set the following Jigs, Test Equipments and B2-BI unit on the Microscope Stand.



Jig and Test Equipment

B2KC0402
 KN0017 (KN0014)
 KN0030 (KN0028)

8-2 Adjust position of the Prism Mount (P3, P4) taking Prism Assembly of P5 and P6 as standard, or adjust positions of these parts.

* If B2-BI unit can not be centered properly, fit Tin Foil or Washer between the Prism Assembly and Prism Mount.

STANDARD (image formation plane of objective)

① Deviation(s) of optical center(s) of right side sleeve and left side sleeve from optical axis

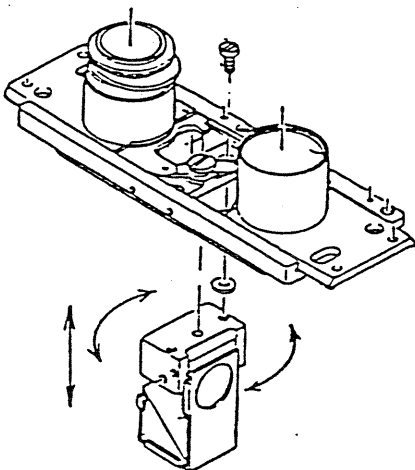
within 0.15mm

② Distance between optical center of right side sleeve and left side sleeve

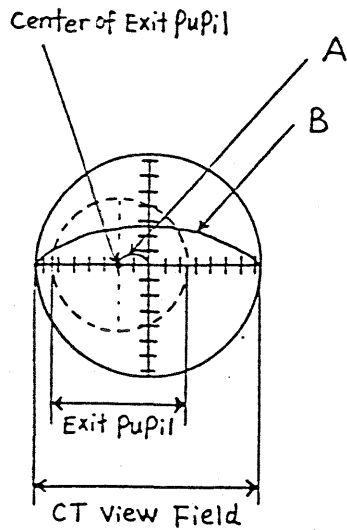
Y-direction	within 0.2mm
X-direction (outside direction)	within 0.2mm
X-direction (inner direction)	within 0.3mm

③ Deviation of center by interpupillary distance adjustment.

within 0.1mm



8-3 Eccentricity of exit pupil of objective



A/B: within 10% of view field diameter of CT

- 1) Put **KN0029** into the right eyepiece sleeve and place the objective **KN0017** in the optical path. Check the exit pupil of the objective for its eccentricity from the cross hair on **KN0029**.
- 2) Put **KN0029** into the left side eyepiece sleeve and check eccentricity in the identical manner.

Test Equipment

KN0029
KN0017 (KN0014)

STANDARD

within 10% of view field diameter of CT

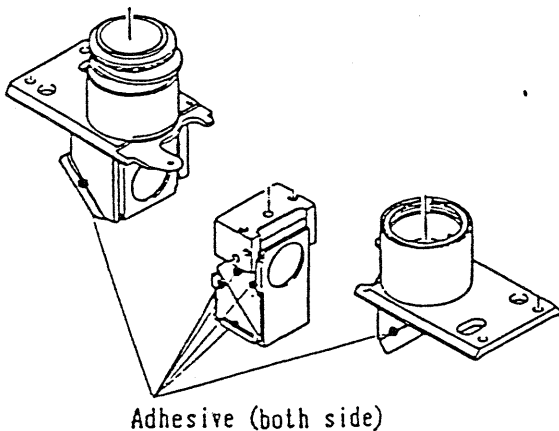
* If eccentricity exceeds 20%, repeat adjustment in step 8-2.

8-4 Apply adhesive to the each Screws.

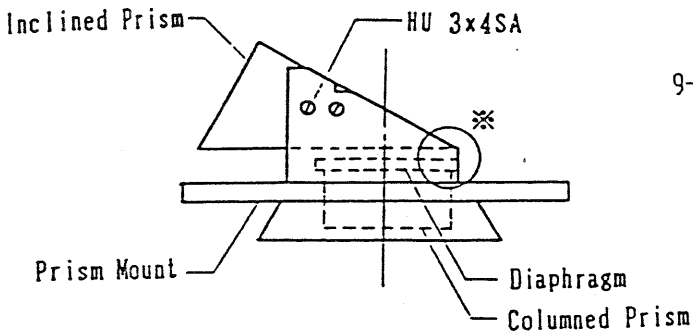
Adhesive **OT1131**

8-5 Bond the each Prisms and Diaphragms with adhesive.

Adhesive **OT1315**



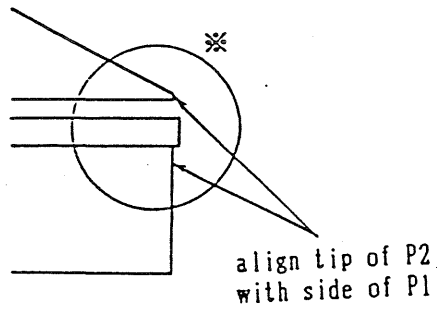
9. ASSEMBLY PROCEDURE FOR B2-BIC UNIT



9-1 Assemble Columned Prism(P1) with Prism Mount.

After inserting P1 into the Prism Mount, make sure that Prism has been inserted completely, then bond it at three points with adhesive.

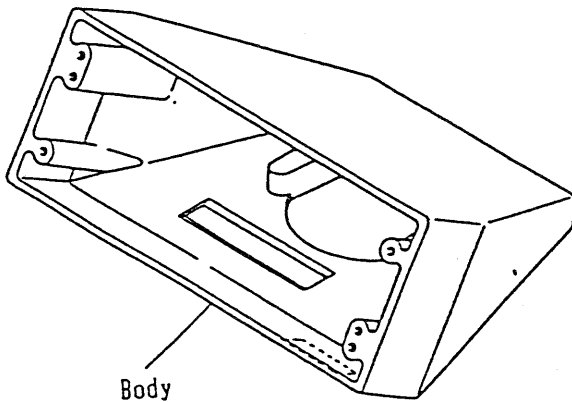
Adhesive OT1315



9-2 Assemble Diaphragm with Columned Prism(P1).

Press diaphragm evenly against P1 and bond it at three points with adhesive.

Adhesive OT1315

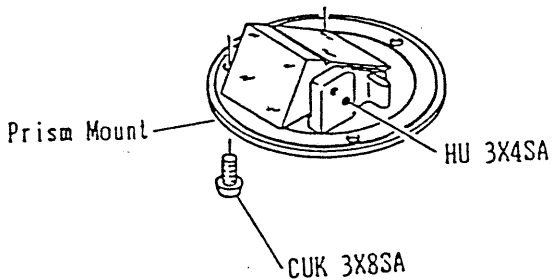


9-3 Assemble Inclined Prism(P2) with Prism Mount.

- 1) Align tip of P2 with side of P1.
- 2) After making sure that no gaps remain between P2 and Prism Mount.

Temporarily tighten two Screws.

HU 3X4SA 2 pcs.



9-4 Temporarily assemble Prism Mount on Body.

CUK 3X8SA 2 pcs.

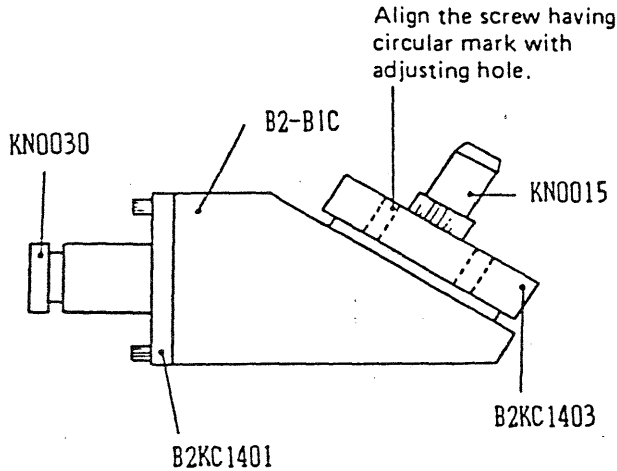
10. OPTICAL ALIGNMENT OF B2-BIC UNIT

10-1 Set the following Jigs and Test Equipments.

Jig and Test Equipment

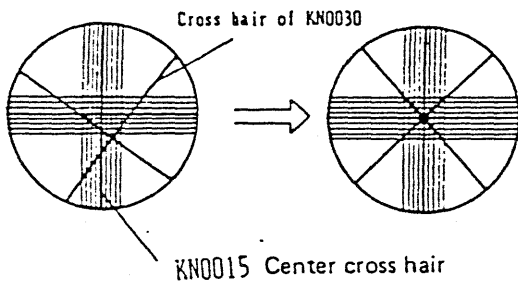
B2KC1401
 B2KC1403
 KN0015 (KN0005)
 KN0030 (KN0028)

* When alignment jig B2KC1403 is attached to B2-BIC, three adjusting holes in B2KC1403 should be aligned with three screws in prism mount of B2-BIC.



10-2 Insert Test Eyepiece KN0030 into the eyepiece sleeve of alignment jig B2KC1403.

10-3 By using the adjusting holes of the alignment jig adjust position of the prism mount until the cross hairs of KN0030 intersects with the cross hairs of the centering objective KN0015.

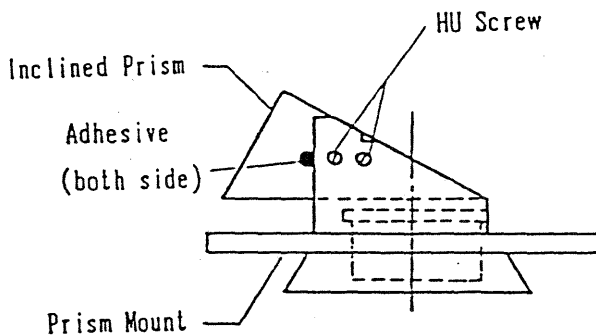


* If centralization is impossible by adjusting position of the prism mount, check P2 for its assembly.

STANDARD (image formation plane of objective)

within 0.15mm

* Tighten three fixing screws of prism mount.



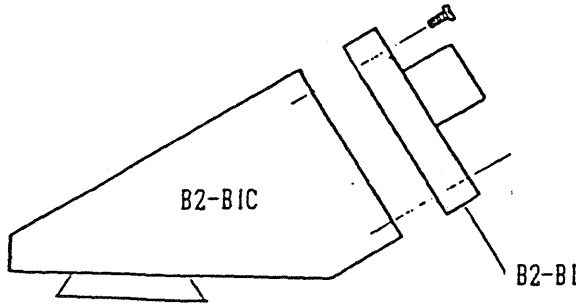
10-4 Bond the Inclined Prism(P2) with adhesive.

Adhesive OT1315

10-5 Apply adhesive to the HU Screws.

Adhesive OT1131

11. OVERALL ASSEMBLY AND ADJUSTMENT

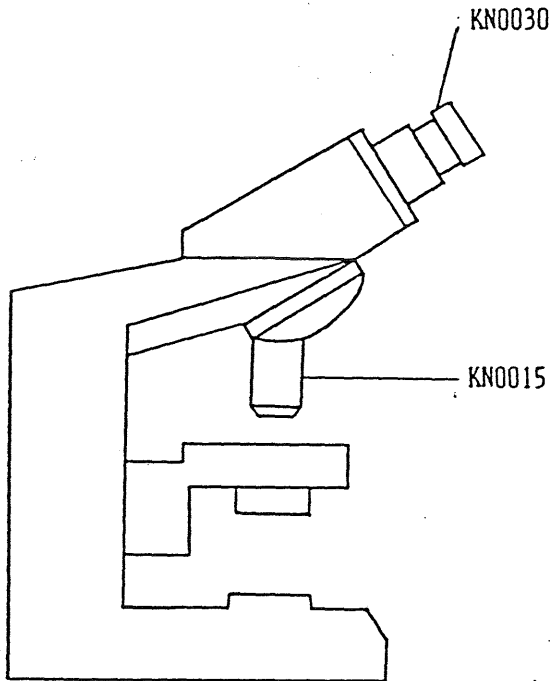


11-1 Temporarily assemble B2-B1 unit to B2-BIC unit with four Screws.

CUK 3X6SA 4 pcs.

11-2 Set the following Test Equipments and BH2-B1 unit (step 11-1) on the Microscope Stand.

Test Equipment KNO015 (KNO005)
KNO030 (KNO028)



11-3 Bring center of KNO015 to center of KNO030 by adjusting position of the B2-B1 unit.

(STANDARD ! refer to step 8-2)

11-4 Check eccentricity of exit pupil of objective.

Test Equipment KNO029

STANDARD
within 10% of view field diameter of CI

11-5 Tighten four fixing Screws firmly.

CUK 3X6SA 4 pcs.

11-6 Apply adhesive to the CUK screws.

Adhesive OT1131

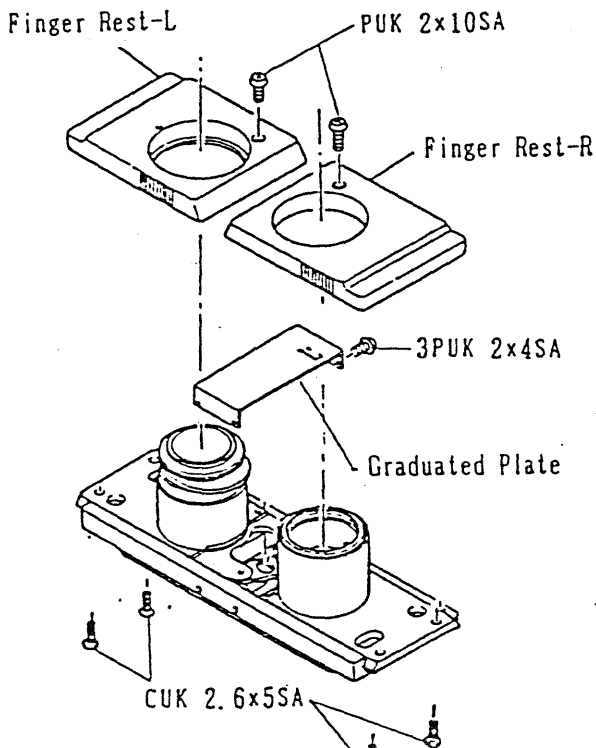
11-7 Assemble Graduated Plate in position.

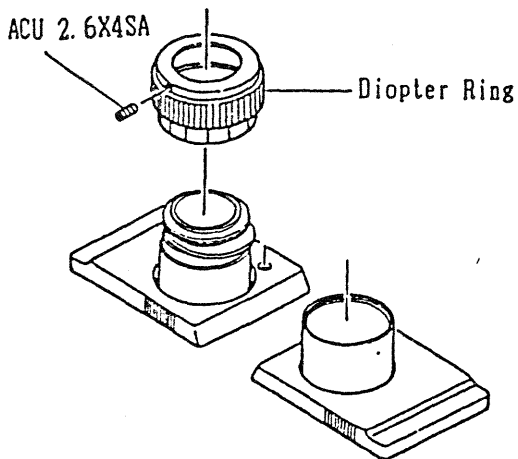
3PUK 2X4SA 4 pcs.

11-8 Assemble Finger Rest-L and Finger Rest-R in position

PUK 2X10SA 2 pcs.

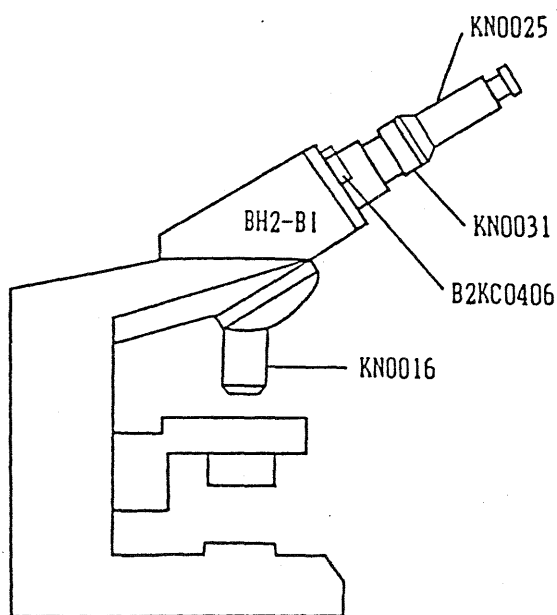
CUK 2.6X5SA 4 pcs.





11-9 Temporarily clamp Diopter Ring by three Screws.

ACU 2. 6X4SA 3 pcs.



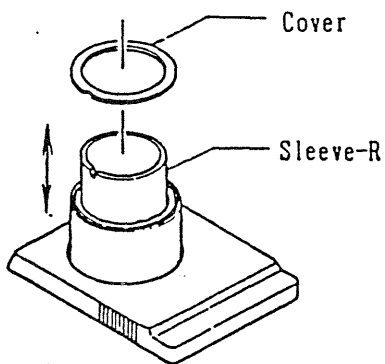
11-10 Adjust mechanical tube length of the Right side Eye piece Sleeve.

- 1) Set the following Jig, Test Equipments and BH2-B1 on the Microscope Stand.

Jig and Test Equipment

- B2KC0406
- KNO016 (KNO007)
- KNO031 (KNO022)
- KNO025 (C-15)
- KNO043

- 2) Looking through the KNO025, bring the specimen of KNO016 into focus by adjusting longitudinal position of Sleeve-R.



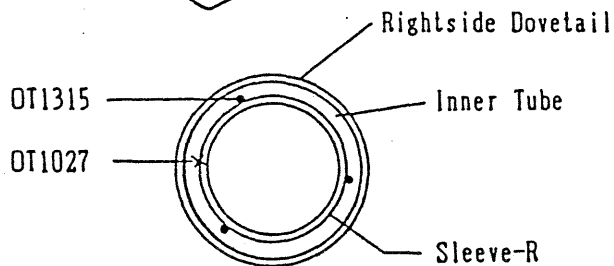
- 3) With the specimen in focus fix Sleeve-R and Inner-Tube.

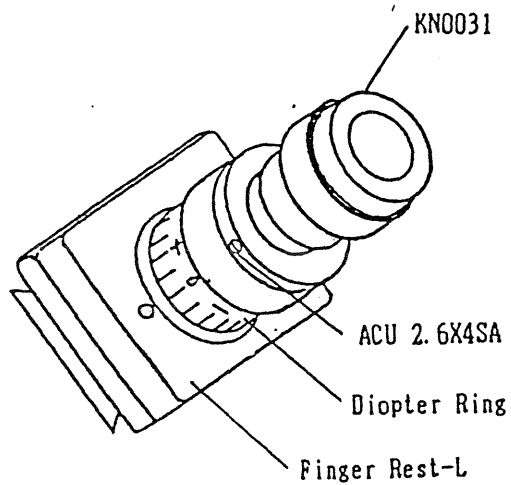
a) Bond with Adhesive at one point. **OT1027**

b) Bond with Adhesive at three points. **OT1315**

- 4) Assemble Circular Cover in position.

Bond with Adhesive at two or three points **OT1315**





11-11 Adjust Left Side tube length.

- 1) After focusing on the right side (step 11-10-2)), put KNO031 and KNO025 into the Left Side Sleeve.
- 2) Taking tube length on the right side as standard, turn the Diopter Ring in either direction to bring the specimen into focus.
- 3) Loosen Set Screws ACU 2.6X4SA on Diopter Ring, turn the Diopter Ring only until the index of the Finger Rest-L indicates "0" on the Diopter Ring. Then fix the Diopter Ring by tightening Set Screws

ACU 2.6X4SA 3 pcs.

12. OVERALL CHECK

- 12-1 Deviation(s) of optical center(s) of right side sleeve and left side sleeve from optical axis.

STANDARD within 0.15mm

- 12-2 Distance between optical center of right side sleeve and left side sleeve.

STANDARD

Y-direction	within 0.2mm
X-direction (outside direction)	within 0.2mm
X-direction (inner direction)	within 0.3mm

- 12-3 Deviation of center by interpupillary distance adjustment.

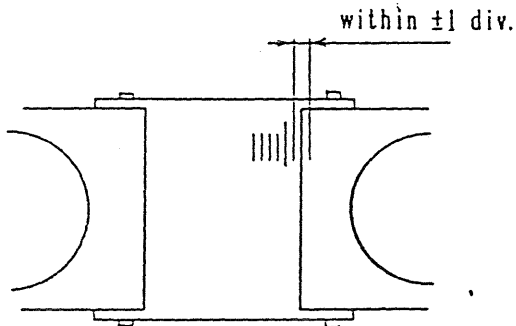
STANDARD within 0.1mm

- 12-4 Eccentricity of exit pupil of objective.

STANDARD

within 10% of view field diameter of CT

- 12-5 Position for interpupillary distance of 62mm.



- 1) By using Jig B2KC0406, read left side position of Finger Rest-R on the Graduated Plate.

STANDARD 62 ±1mm

- 2) If the STANDARD is not met, adjust position of Finger Rest-R and Graduated Plate.

- 12-6 Adjustable range of interpupillary distance.

STANDARD at least 55mm ~ 75mm

- * The Finger Rest R and L must not be brought into contact with each other when the interpupillary distance is set at minimum separation.

- 12-7 Difference of height between right side and left side sleeve.

STANDARD within 1.0mm

- * The index of the Finger Rest-L should be indicate "0" on the Diopter Ring.

