Service Manual

AUTO ELECTRO FINDER (8219-200)

Minolta

FOREWORD

We have issued this service manual to assist you in carrying out complete repair service. It gives your thorough description of the services which are essential to this Minolta product, and thus enables you to be your own consultant in maintaining quality and precision.
This service manual consists or eight parts, viz., specifications, explanation of mechanism, parts list, disassembly instructions, reassembly instructions, adjustment instructions, check list, and special tools list. For easy reference, each subject has an index sheet.

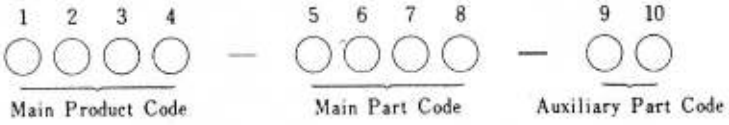
How to use the Service Manual

Specifications: This gives various product particulars item by item. It serves as technical reference material when inquiries are received from domestic and overseas customers.

Explanation of mechanism: Products which have new mecnanism are explained in detail.

Parts list:

1) This is composed of a table of contents, disassembled diagrams, parts numbers, parts names, and quantity of parts.
2) It is arranged with disassembled or exploded drawings on the left page and the parts numbers, parts names and quantity of parts on the right page.
3) On each page, the disassembled parts bear their respactive parts numbers.
4) Parts which are not supplied are indicated by "NO SUPPLY" in place of parts numbers in the disassembled diagrams.
5) "See Page·····" appearing in the disassembled diagrams incicates that the blocks concerned are shown disassembled on cited page(s).
6) Make-up of the Parts Code: The parts code is indicated by ten number spaces as illustrated below:



7) Indication of Parts Numbers:

A. Coupled Parts Numbers: A main part code with 0 in the fifth space indicates coupled parts.

Example: 5 6 7 8 — 9 10
0 2 2 2 — ○ ○

B. Simple Parts Numbers: A main part code with 1 to 9 in the fifth space indicates simple parts.

Example: 5 6 7 8 — 9 10
2 1 3 0 — ○ ○

C. Auxiliary Part Code Numbers: The 9 th and 10 th spases are for auxiliary code numbers indicating how often the parts have been altered.

Example: 5 6 7 8 — 9 10
○ ○ ○ ○ — 0 2

D. Coupled parts which can also be supplied as simple parts are indicated with light-face-type figures as shown below:

Example: **0201 − 01** (Coupled parts)
2207 − 02

E. Speciel care in observing the related footnote is necessary with reference to parts having a ★ Symbol in front of their numbers.

8) Revised pages will be issued indicating the number of times it has been revised by using the numbers 1, 2, 3 and so on following a hyphen after the page number, as shown in the following example.
When revision are made on page 1, the first revision will be indicated by 1-1 the second by 1-2, the by 1-3 and so on.

Disassembly instructions: This is an easy-to-understand guide that gives clear, step-by-step instructions so that even beginners can disassemble.

Reassembly instructions: This further an easy-to-understand guide gives similar clear, step-by-step instructions for reassembling this product.

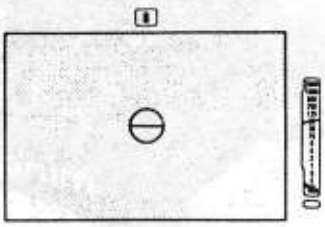
Adjustment instructions: This is a guide to the main points of adjustments to be accomplished after repair of this meter.

Check List: After repairing this camera, be sure to check that it conforms to all the contents of the check list.

Special Tools List: This is a list of the special tools required for repairing or adjusting this camera.

AUTO ELECTRO FINDER (AE. Finder)

(8219 - 200)



TYPE Eye-level pentaprism with Automatic electronic. Match-needle and Manual exposure control.

Magnification: 0.8 x with 50mm lens (∞)

Visibility: 98% of actural image on film

Diopter: - 1.0 diopters

Visible in finder: F-Number, shutter-speed scale, function scale, meter indicator needle, speed function bar, light-emitting diode exposure warning signal.

EXPOSURE MEASURING

Built-in Through-The-Lens, full-aperture CLC system with twin CdS cells, stop-down metering also possible.

Exposure control:

Aperture-priority type automatic, shutter-proirity-type match-needle, and manual.

Measuring range: EV 1 to EV 17 (e.g., 1 sec. at F1.4 to 1/2000 sec. at F8 with F1.4 lens) at ASA 100.

Circuits: IC memory circuits and others

Battery: Accepts two silver-oxide batteries both shutter and exposure-control system.

Finder power switch:

It auxiliary switch is used turn power ON or OFF when Auto-senswitch is not employed.

Film speed range:

ASA 12 to 6400

Shutter speed dial scale:

Auto, B,X,1, 1/2' 1/4' 1/8' 1/15, 1/30, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec.

Compensation scale:

- 0.5 EV to + 3.5 EV in halfstop graduation

Auto-Exposure override control:

- 2EV to + 2EV stepless manual control

Eye-piece shutter control:

Turning the eye-piece shutter control dial open or close the viewfinder shutter

SIZE

Dimention: 44(H) x 76(W) x 65(D)mm
1-3/4" x 3" x 2-5/8"

Weight: 230g (8.12 oz)

FEATURES

The Auto Electro Finder is technically the most sophisticated in that it offers three exposure control alternatives automatic, match-needle, plus of course, manual. A shutter speed scale, the aperture at which the lens is set, an exposure warning signal, and appropriate indicators are all visible.

While in automatic mode, an indicator needle points to the shutter speed that is being electrically selected. This same needle also doubles as the meter indicator in match-needle, manual mode. In this case it is made to align with the shutter speed bar by adjusting either speed or aperture.

In either mode, through-the-lens light measuring is by Minolta's unique Contrast Light Compensator twin CdS cell arrangement, a proven system that automatically provides more exposure under contrast lighting conditions.

Metering is accomplished either at the brightset lens opening, or stopped down to the shooting aperture. Meter sensitivity is accurate from EV1 to EV17.

Additional features in automatic mode.

Modifying automatic exposure is possible by manual adjustment of the Auto-Exposure Override Control.

As much as two stops under or overexposure are possible by using this variable control to alter shutter speed.

To guard against unintentional underexposure, a Light-Emitting Diode begins to puslate whenever aperture and shutter are set for an exposure under EV 1. The greater the degree of underexposure, the greater the rate of pulsation.

An Eyepiece Shutter is fitted to the Auto Electro Finder for situation that do not call for your eye's continuous attention at the viewfinder The shutter stops light from entering the eyepiece and affecting automatically determined exposure.

Sales Date: Apr. 1973

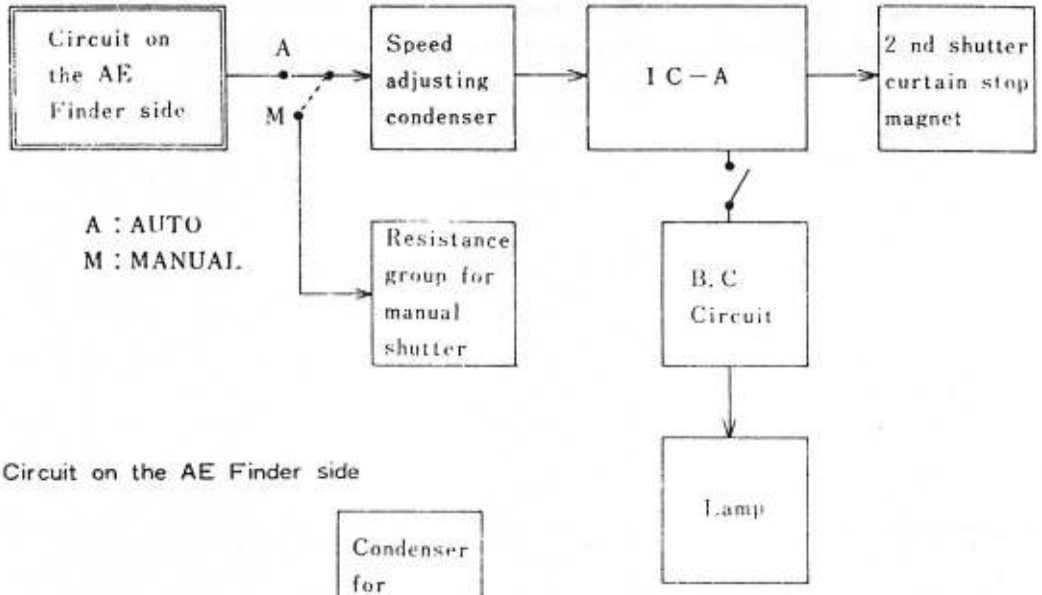
Explanatory Notes of the AE Finder

A. Explanation of the Electric control circuit 1
B. Explanation of the Override mechanism 3

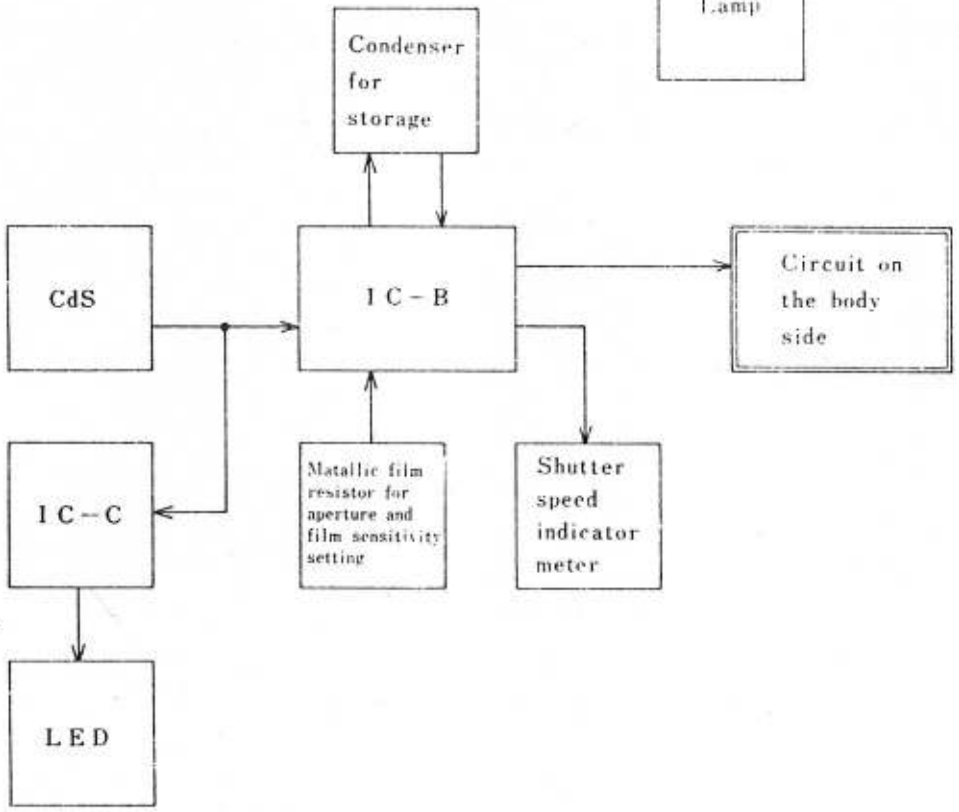
A. Explanation of the Electric Control Circuit

Circuit on the Body side

Fig. 1



Circuit on the AE Finder side



1. Explanation of the Circuit on the AE Finder Side

① The circuit receives the light reflected by CdS from an object coming in through the lens and determines the resistance of CdS which is based on the brightness of the object.

② Resistance is determined by the metallic film resistor according to the preset film sensitivity (ASA) and the preset aperture through the MC coupling.

③ The current transmitted by the resistance value determined in paragraphs 1 and a above is converted into voltage which is passed to the condenser for storage.

④ The shutter speed for that moment is indicated in the finder by the pointer of the meter.

⑤ When an object is very dark, the light in LED goes out under the action of the low luminescence limit warning circuit, IC-C.

⑥ On pressing the shutter button, the mirror rises to shield the CdS from incident light. Therefore, the memory switch is operated just before the mirror rises in order to store the signal described in paragraph ③ above in the condenser.

⑦ When the 1 st shutter curtain starts to run, interlocking with the exposure control switch, the signal stored in the condenser is converted by IC-B into the control signal for the shutter speed.

⑧ The control signal is then conducted to the circuit on the body side to control the magnet which keeps the 2 nd shutter curtain from running. Then the 2 nd shutter curtain begins to travel.

2. Explanation of the Circuit on the Body Side

(1) Automatic (A) Operation

① When the 1 st shutter curtain begins to run, interlocking with the exposure control switch, the circuit conducts the control signal from the circuit on the AE finder side to the speed adjusting condenser.

② The signal is then transmitted from the speed adjusting condenser to IC-A. When the signal reaches the specific size, another signal is produced from the IC-A.

③ The signal produced in paragraph ② above controls the magnet which prevents the running of the 2 nd shutter curtain, causing the 2 nd curtain to travel to control exposure time.

(2) Manual (M) Operation

① When the speed dial is set at any speed other than "AUTO" ranging from 1 to 1/2000 sec., the (A)-(M) changing switch is positioned at "M" and the shutter speed is determined by the resistance group for the manual shutter and the speed adjusting condenser.

The signal is transmitted to IC-A to control the magnet which prevents the 2 nd shutter curtain from running, thus controlling exposure time, as described in paragraph (1)-③ above.

② Even for long exposure (2 to 16 seconds), the shutter speed is determined by resistance value and the condenser.

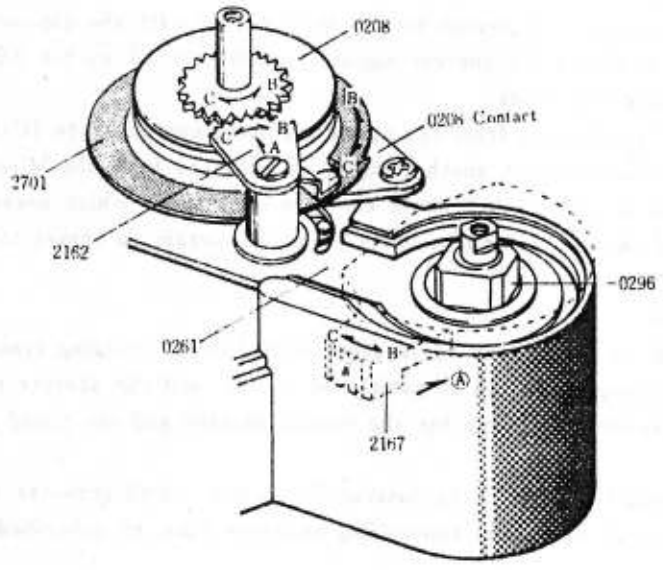
B. Explanation of the Override Mechanism

On pushing 2167, part (a) in the direction of arrow A, 2162 moves in the direction of arrow A via 0261. Then 2162 engages with 0208.
On rotating 2167, part (a) in the direction of arrow B or C, 0296 turns in the same direction, causing 2162 to rotate in the direction of arrow B or C via the lever of 0296. Then 0208 rotates in the direction of arrow B or C and the contact fastened to 0208 also moves in the direction of arrow B or C.
With the dial position preset by the ASA sensitivity dial remaining unmoved, only the contact of 0208 moves, making the correct exposure over or under about ± 2EV.

Caution:

- ○ Rotates in the direction of arrow B, making the correct exposure over.
- ○ Rotates in the direction of arrow C, making the correct exposure under.

Fig. 2



Rotates in the direction of arrow B, making the correct exposure over.

Rotates in the direction of arrow C, making the correct exposure under.

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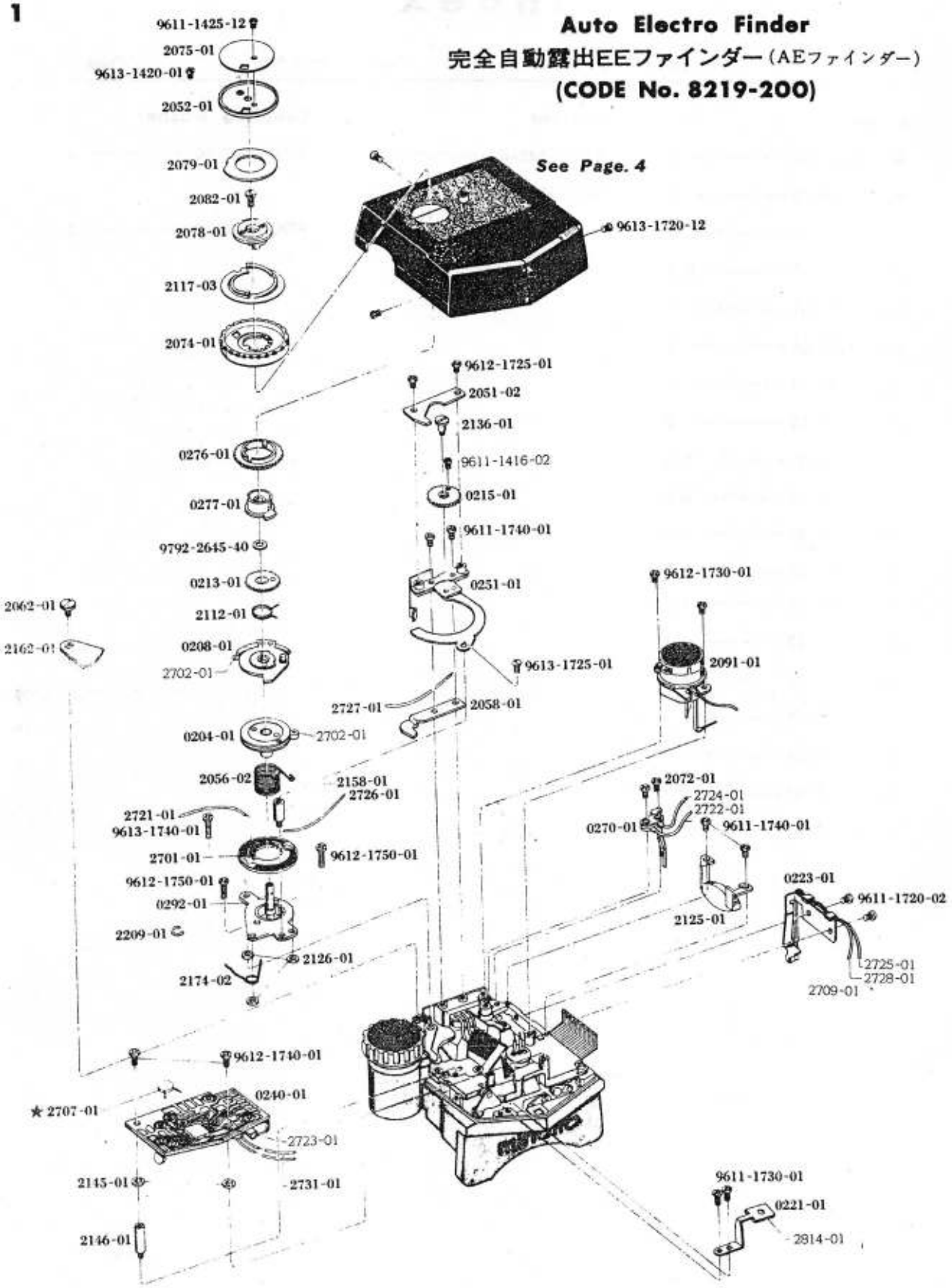
1

Auto Electro Finder
完全自動露出EEファインダー（AEファインダー）
(CODE No. 8219-200)



★Fixed resistor RP （固定抵抗RP）

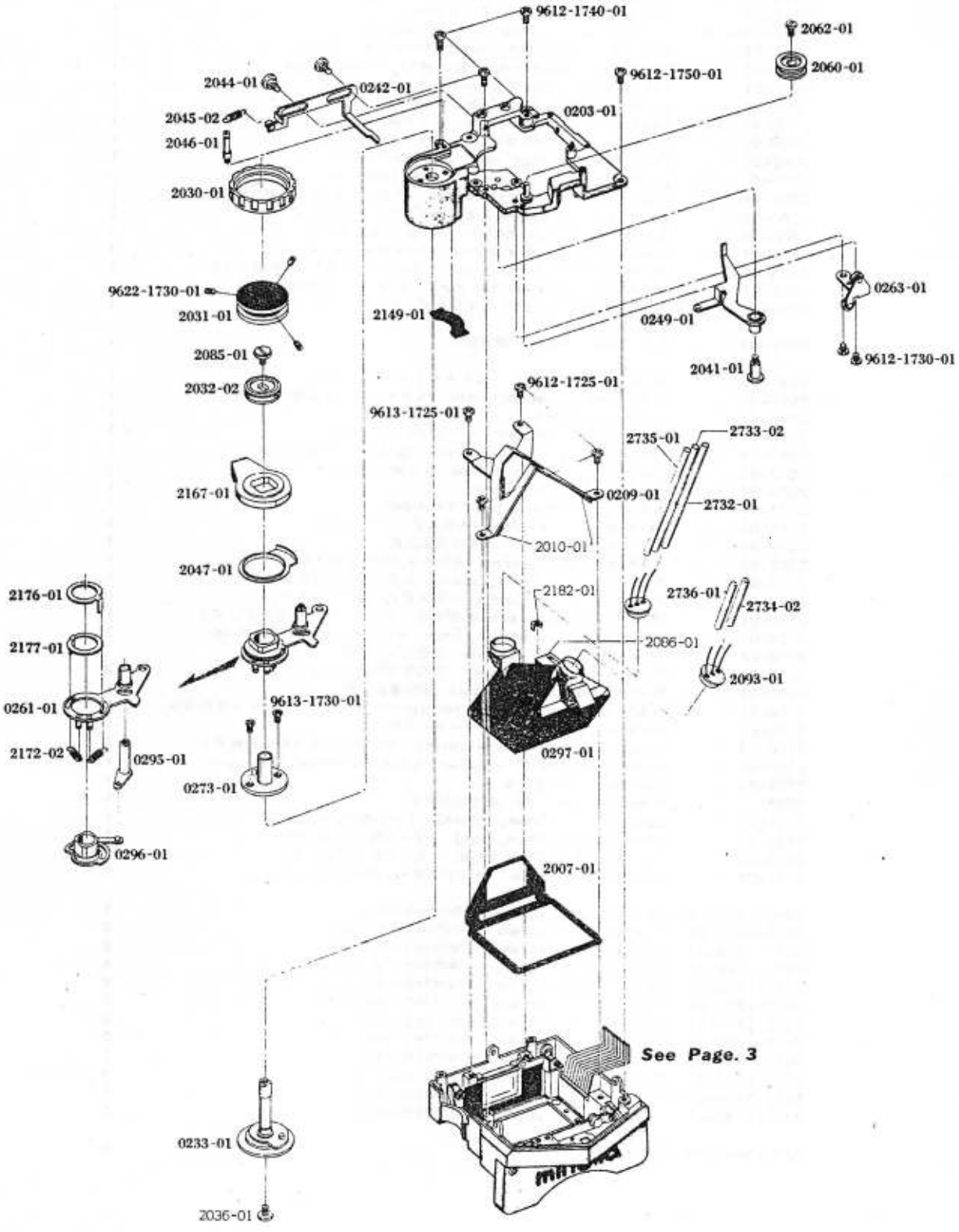
Auxiliary Part Code No. 部品補助コード	-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
KΩ	75KΩ	82KΩ	91KΩ	100KΩ	110KΩ	120KΩ	130KΩ	150KΩ	160KΩ	180KΩ

Part No. 部品番号	Part Name 部品名称	Unit 員数
0204-01	A.V pulley set　AVプーリーセット	1
2702-01	Brush　摺動ブラシ	1
0208-01	ASA brush holder plate set　ASAブラシホルダー取付板セット	1
2702-01	Brush　摺動ブラシ	1
0213-01	Transform gear-A　変換ギヤーA	1
0215-01	Transform gear-C　変換ギヤーC	1
9611-1416-02	Phillipstypype screw　十字穴付ナベ頭小ねじ	1
0221-01	Mirror holder set　絞りミラーホルダーセット	1
2814-01	Diaphragm-infinder mirror　絞りIn Fillder用平面鏡	1
0223-01	LED holder　警告素子ホルダーセット	1
2709-01	Light emission diode　発光ダイオード	1
2725-01	Lead wire (65mm, Green)　リード線 (65mm, 緑)	1
2728-01	Lead wire (65mm, White)　リード線 (65mm, 白)	1
0240-01	Printed base plate set　回路基板セット	1
2723-01	Lead wire (18mm, Red)　リード線 (18mm, 赤)	1
0251-01	ASA click spring plate set　ASAクリックばね取付台板セット	1
0270-01	Main switch contoct-A　メインスイッチ接片A	1
2722-01	Lead wire (55mm, Red)　リード線 (55mm, 赤)	1
2724-01	Lead wire (48mm, Yellow)　リード線 (48mm, 黄)	1
0276-01	ASA dial click plate set　ASAダイヤルクリック板セット	1
0277-01	Transform gear-D set ring　変換ギヤーD取付リング	1
0292-01	ASA dial axis set　ASAダイヤル軸セット	1
2091-01	Exposure meter　電流計	1
2051-02	ASA dial stopper　ASAダイヤルストッパー	1
2052-01	ASA dial receiver plate　ASAダイヤル銘板受	1
2056-02	Spring　駆動SP	1
2058-01	ASA brush stopper　ASAブラシストッパー	1
2062-01	Transform pulley set screw 変換プーリー押えビス	1
2072-01	Switch base plate screw　SW基板取付ビス	2
2074-01	ASA dial　ASAダイヤル	1
2075-01	ASA dial plate　ASAダイヤル銘板	1
2078-01	ASA dial base plate　ASAダイヤル取付台	1
2079-01	ASA helped plate　ASA補正銘板	1
2082-01	ASA dial axis screw　ASAダイヤル軸止メビス	1
2112-01	ASA brush coupling spring　ASAブラシ連結SP	1
2117-03	ASA dial ring spring　ASAダイヤルリングSP	1
2125-01	Needle infinder prism 指針インファインダー用集光プリズム	1
2126-01	ASA dial axis holder base　ASAダイヤル軸ホルダー座	3
2136-01	Transform gear-C axis　変換ギヤーC軸	1
2145-01	Printed base plate seat　回路基板取付シート	2
2146-01	Printed base setting axis　回路基板支柱	1
2158-01	ASA brush lead plate set screw　ASAブラシリード基板支柱	1
2162-01	Over-ride plate　オーバーライド取付板	1
2174-02	Over-ride base plate spring　オーバーライド取付台板SP	1
2209-01	ASA dial axis C washer　ASAダイヤル軸Cワッシャー	1
2701-01	Resistor　摺動抵抗体	1
★ 2707-	Fixed resistor RP　固定抵抗RP	1
2721-01	Lead wire (60mm, Brown)　リード線 (60mm, 茶)	1
2726-01	Lead wire (20mm, Blue)　リード線 (20mm, 青)	1
2727-01	Lead wire (20mm, Blue)　リード線 (20mm, 青)	1
2731-01	LED isolation tube　発光ダイオード絶縁チューブ	2
9611-1425-12	Phillips type screw　十字穴付なべ頭小ねじ	1
9611-1720-02	Phillips type screw　十字穴付なべ頭小ねじ	2
9611-1730-01	Phillips type screw　十字穴付なべ頭小ねじ	2
9611-1740-01	Phillips type screw　十字穴付なべ頭小ねじ	4
9612-1725-01	Phillips type screw　十字穴付なべ頭小ねじ	2
9612-1730-01	Phillips type screw　十字穴付なべ頭小ねじ	2
9612-1740-01	Phillips type screw　十字穴付なべ頭小ねじ	2
9612-1750-01	Phillips type screw　十字穴付なべ頭小ねじ	2
9613-1420-01	Phillips type screw　十字穴付皿小ねじ	1
9613-1720-12	Phillips type screw　十字穴付皿小ねじ	3
9613-1725-01	Phillips type screw　十字穴付皿小ねじ	1
9613-1740-01	Phillips type screw　十字穴付皿小ねじ	1
9792-2645-40	Washer　薄ワッシャー	1

Auto Electro Finder

完全自動露出EEファインダー（AEファインダー）

(CODE No. 8219-200)



Part No. 部品番号	Part Name 部品名称	Unit 員数
0203-01	Prism main base plate ペンタ土台セット	1
0209-01	Prism pressure ペンタ押え	1
2010-01	Prism pressure cushion ペンタ押えクッション	2
0233-01	Speed dial axis set スピードダイヤル軸セット	1
2036-01	Speed dial connection screw スピードダイヤル連動板止めビス	1
0242-01	Match needle lever set 追針レバーセット	1
0249-01	Match needle cam lever set 追針カムレバーセット	1
0261-01	Over-ride plate set オーバーライド取付板セット	1
0263-01	Middle pulley holder set 中間プーリーホルダーセット	1
0273-01	Speed dial axis receiver スピードダイヤル軸受	1
0295-01	Over-ride helped plate-A オーバーライド操作補助板A	1
0296-01	Over-ride helped plate-C オーバーライド操作補助板C	1
0297-01	Pentagon prism set ペンタプリズムセット	1
2086-01	Scale 指標板	1
2182-01	Signal mask 警告用ライトガイドマスク	1
2007-01	Eye-piece mask 視野接眼マスク	1
2030-01	Speed dial knurling スピードダイヤルローレット	1
2031-01	Speed dial スピードダイヤル	1
2032-02	Speed dial receiver スピードダイヤル受	1
2041-01	Cam lever axis 追針カムレバー軸	1
2044-01	Lever axis 追針レバー軸	2
2045-02	Lever spring 追針レバースプリング	1
2046-01	Lever spring hanger 追針レバースプリング掛け	1
2047-01	Cover-A 補助カバーA	1
2060-01	Pulley 変換プーリー	1
2062-01	Pulley screw 変換プーリー押えビス	1
2085-01	Speed dial axis screw スピードダイヤル軸止メビス	1
2093-01	CdS photocell CdS	1
2149-01	Cover-B 補助カバーB	1
2167-01	Over-ride dial オーバーライトダイヤル	1
2172-02	Over-ride spring オーバーライドダイヤル復帰スプリング	2
2176-01	Over-ride plate-A オーバーライド復帰補助板A	1
2177-01	Over-ride plate-B オーバーライド復帰補助板B	1
2732-01	CdS isolation tube-A (27mm, Red) CdS絶縁チューブA (27m, 赤)	1
2733-02	CdS isolation tube-B (27mm, Green or Black) CdS絶縁チューブB (27mm緑又は黒)	1
2734-02	CdS isolation tube-C (8mm, Green or Black) CdS絶縁チューブC (8mm緑又は黒)	1
2735-01	CdS isolation tube-D (27mm, Yellow) CdS絶縁チューブD (27m, 黄)	1
2736-01	CdS isolation tube-E (8mm, Yellow) CdS絶縁チューブE (8m, 黄)	1
9612-1725-01	Phillips type screw 十字穴付なべ小ねじ	3
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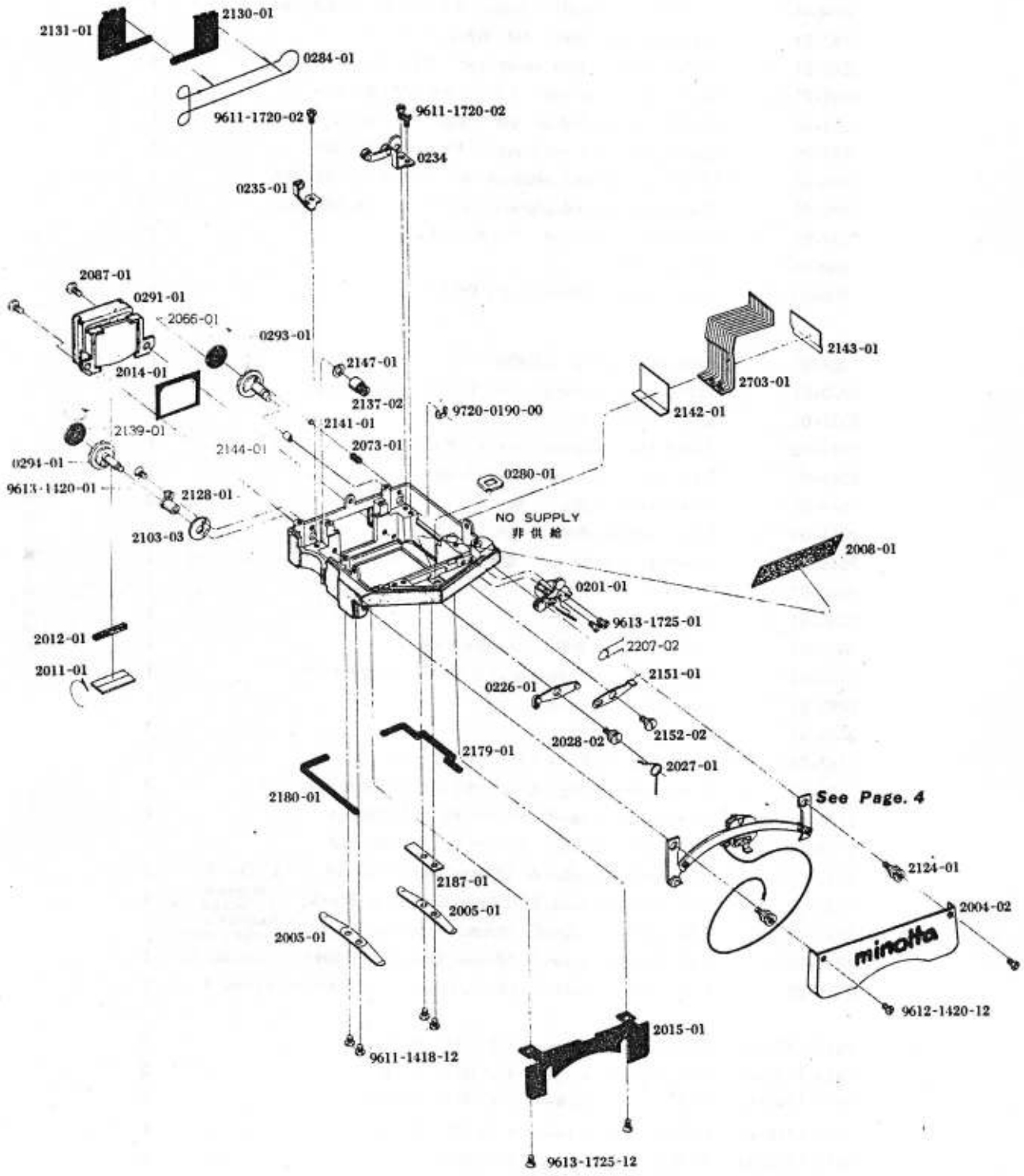
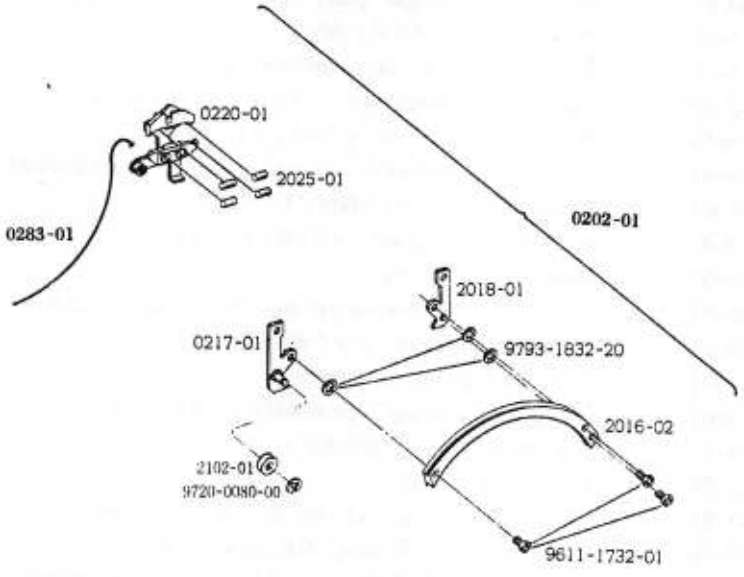
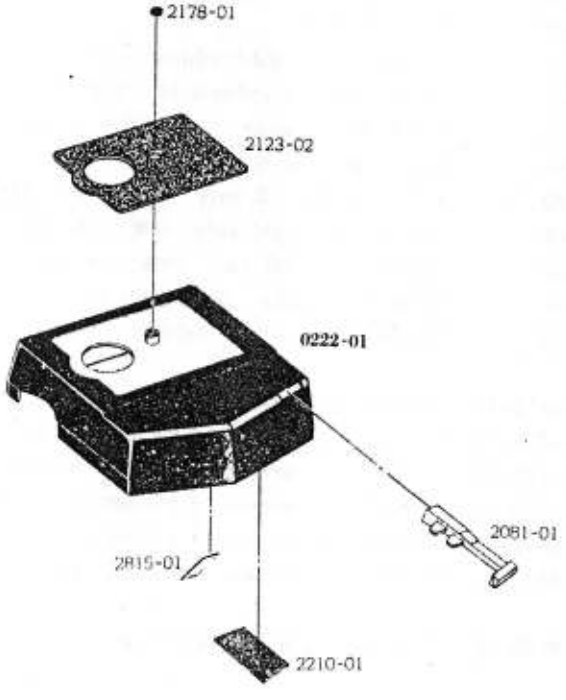
Auto Electro Finder
完全自動露出EEファインダー(AEファインダー)
(CODE No. 8219-200)



Part No. 部品番号	Part Name 部品名称	Unit 員数
0201-01	MC lever plate set MC誤操作防止レバー台板セット	1
2207-02	MC lever-A spring MC誤操作防止レバーA用スプリング	1
0226-01	MC stop lever-A MC係止レバーA	1
0234-01	Pulley holder-A set アイピースマスクプーリーホルダーAセット	1
0235-01	Pulley holder-B set アイピースマスクプーリーホルダーBセット	1
0280-01	Diaphragm window glass set 絞り窓レンズセット	1
0284-01	String アイピースマスク操作紐	1
0291-01	Eye-piece frame set 接眼枠セット	1
0293-01	Main switch knob set メインスイッチノブセット	1
2065-01	Main switch mane plate メインスイッチ銘柄	1
2144-01	Main switch dial isolation tube メインスイッチダイヤル絶縁チューブ	1
0294-01	Mask dial set マスク操作ダイヤルセット	1
2139-01	Mask dial name plate マスク操作ダイヤル銘板	1
2004-02	Mane plate 銘 板	1
2005-01	Fresnel lens pressure spring 焦点板押えスプリング	2
2008-01	Prism front press ペンタ前面押え板	1
2011-01	Eye-piece cover 接眼枠補助カバー	1
2012-01	Eye-piece packing 接眼枠補助カバー遮光パッキン	1
2014-01	Eye-piece frame 接眼装飾マスク	1
2015-01	MC cover MCカバー	1
2027-01	MC stop lever spring MC係止レバースプリング	1
2028-02	MC stop lever A axis MC係止レバーA軸	1
2073-01	Main switch click spring メインスイッチクリックスプリング	1
2087-01	Eye-piece set screw 接眼枠取付けビス	2
2103-03	Click plate マスク操作ダイヤルクリック板	1
2124-01	Pole screw 前カバー支柱	2
2128-01	Mask dial axis マスク操作ダイヤル軸受	1
2130-01	Eye-piece mask-A アイピースマスクA	1
2131-01	Eye-piece mask-B アイピースマスクB	1
2137-02	Eye-piece musk pulley アイピースマスク操作プーリー	1
2141-01	Click ball クリックボール	1
2142-01	Stick-tape-A 連絡基板貼付テープA	1
2143-01	Stick-tape-B 連絡基板貼付テープB	1
2147-01	Mask dial washer マスク操作ダイヤルワッシャー	1
2151-01	MC stop lever-B MC係止レバーB	1
2152-02	MC stop lever-B axis MC係止レバーB軸	1
2179-01	Packing for right side 防塵パッキン右	1
2180-01	Packing for left side 防塵パッキン左	1
2187-01	Connecting plate 連絡基板押え板	1
2703-01	Flexible lead wire 接続基板	1
9611-1418-12	Phillips type screw 十字穴付なべ頭小ねじ	4
9611-1720-02	Phillips type screw 十字穴付なべ頭小ねじ	3
9612-1420-12	Phillips type screw 十字穴付なべ頭小ねじ	2
9613-1420-01	Phillips type screw 十字穴付皿小ねじ	1
9613-1725-01	Phillips type screw 十字穴付皿小ねじ	2
9613-1725-12	Phillips type screw 十字穴付皿小ねじ	2
9720-0190-00	Coupling washer 割ワッシャー	1

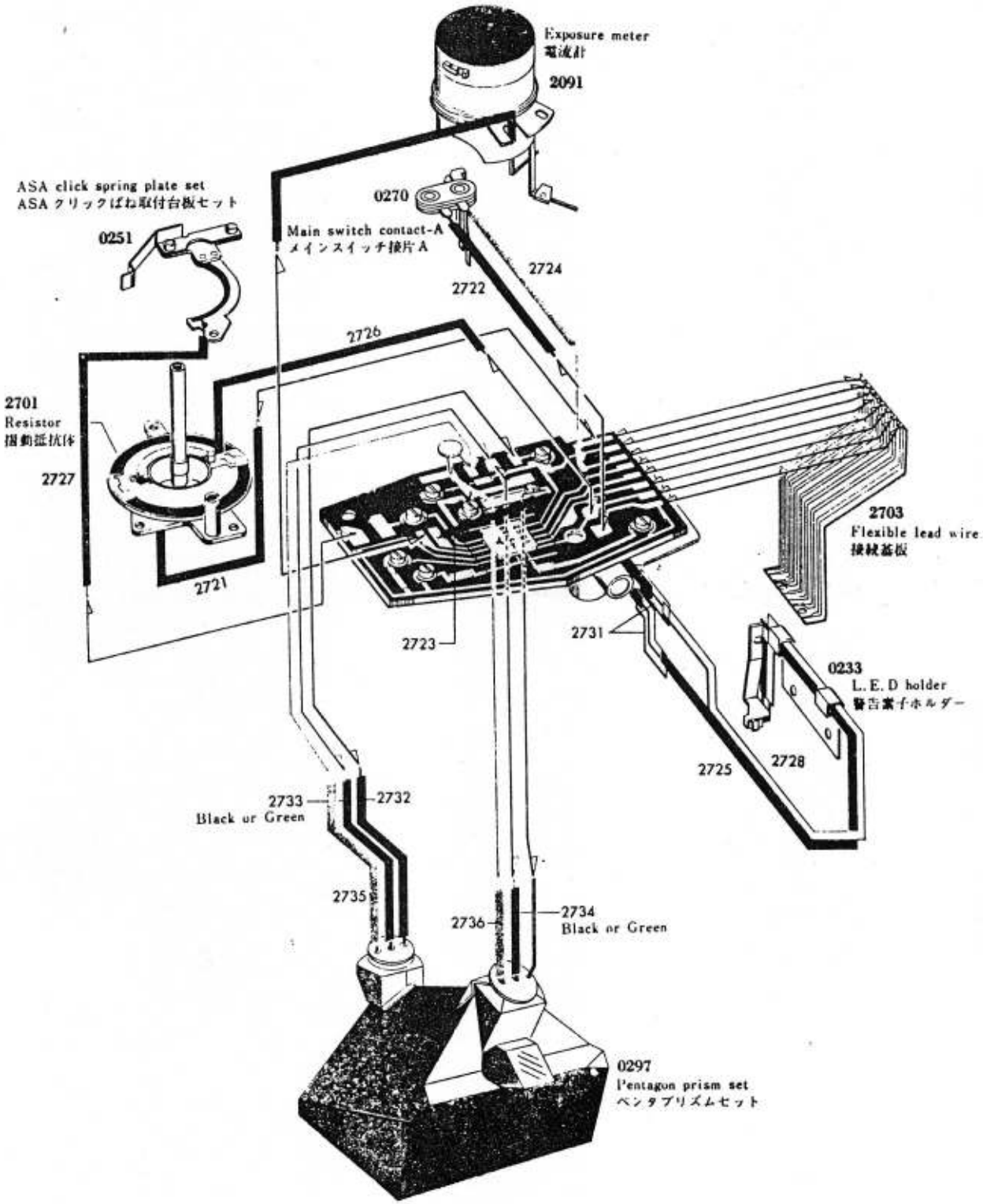
Auto Electro Finder
完全自動露出EEファインダー（AEファインダー）
(CODE No. 8219-200)





Part No. 部品番号	Part Name 部品名称	Unit 個数
0202-01	MC guide rail set MCガイドレールセット	1
0217-01	MC guide rail set plate A MCガイドレール取付板A	1
2102-01	Middle pulley 中間プーリー	1
9720-0080-00	Coupling washer 締ワッシャー	1
0220-01	MC guide B pin MC連動ガイドBピン	1
2016-02	MC guide rail MCガイドレール	1
2018-01	MC guide rail plate-B MCガイドレール取付板B	1
2025-01	MC guide slide MC連動スライド体	4
9611-1732-01	Phillips type screw 十字穴付ネジ頭小	3
9793-1832-20	Washer 薄ワッシャー	3
0222-01	Prism cover ペンタカバーセット	1
2081-01	Light window 採光窓	1
2123-02	Prism cover leather ペンタカバー革張	1
2178-01	ASA index mask ASA指標	1
2210-01	Light shield cover 採光遮光布	1
2815-01	Needle infinder mirror 指標インファインダー用反射鏡	1
0283-01	String 糸掛け紐	1

Auto Electro Finder 完全自動露出ファインダー
Wiring Schematic Diagram
立 体 配 線 図



DISASSEMBLY (8219-200)

分　解　編　(8219-200)

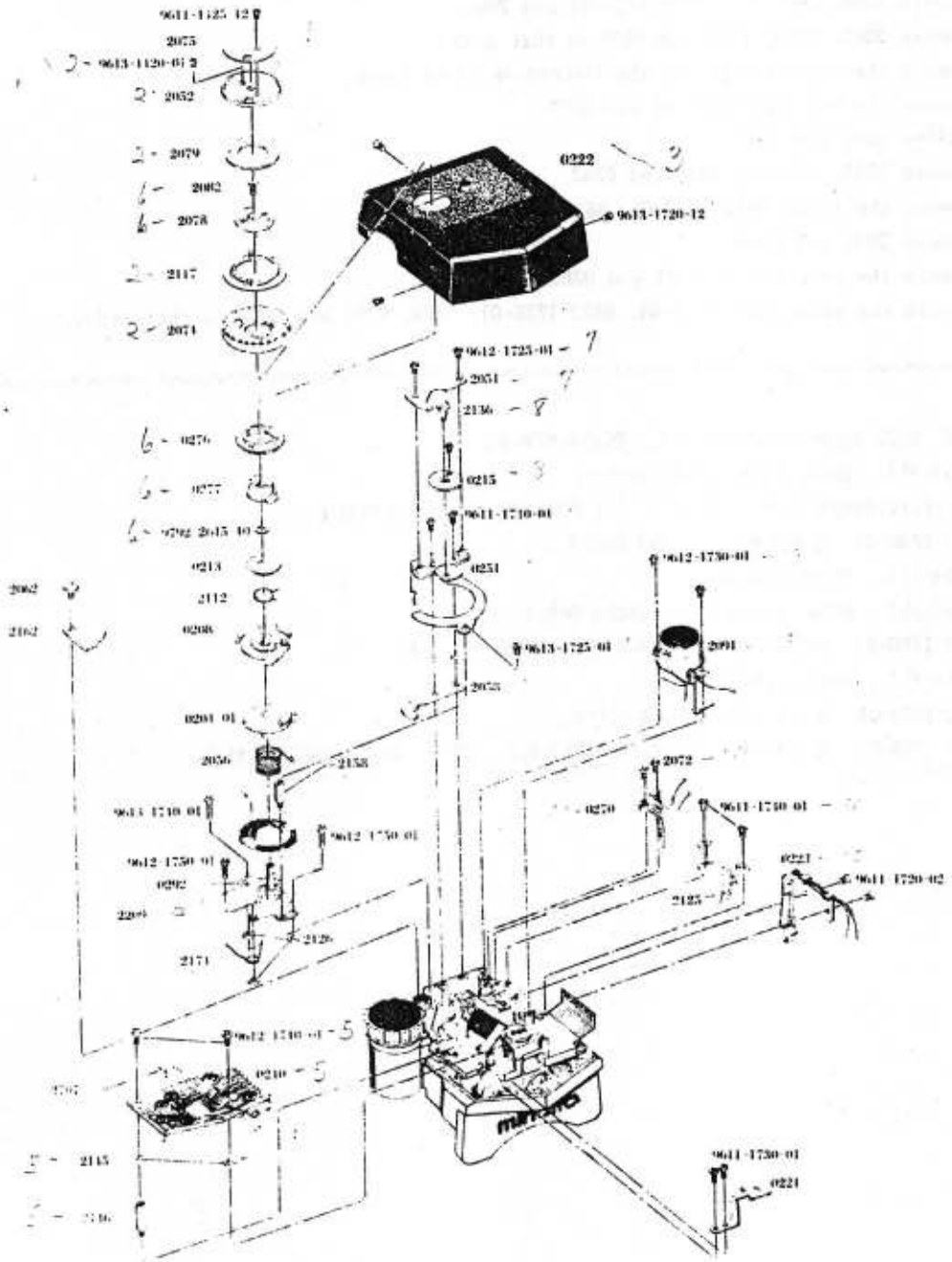
1

1. Remove 9611-1425-12 and 2075.
2. Remove 9613-1420-01, 2052, 2079, 2117 and 2074 in that order.
3. Remove the three 9613-1720-12 and 0222.
4. Unsolder the respective lead wires of the circuit base plate, CdS and flexible cord.
5. Remove the two 9612-1740-01, 0240, 2145 and remove 2146.
6. Remove 2082, take off 2078, 0276, 0277 and 9792-2645-40.
7. Remove the two 9612-1725-01 and 2051.
8. Remove 2136 and 0215, will now come off 0213 and 2112.
9. Remove the two 9611-1740-01 and 9613-1725-01, and take off 0251, and 2058.
10. Remove the two 2072 and 0270.
11. Remove the two 9611-1740-01 and 2125.
12. Remove the two 9611-1720-02 and 0223.
13. Remove the two 9612-1730-01 and 2091.
14. Remove 2062, 2162 and 0208.
15. Remove 2209, 0204 and 2056.
16. Remove the two 9612-1750-01, 9613-1740-01 and 0292, the two 2126 and 2174.
17. Remove 2158 from 029'
18. Remove the two 9611-1730-01 and 0221.

---

1. 9611-1425-12を外し，2075を取外す。
2. 9613-1420-01を外し，2052，2079，2117，2074を取外す。
3. 9613-1720-12　3本を外し，0222を取外す。
4. 回路基板のリード線，CdS，フレキシブルコードの各リード線半田付けを外す。
5. 9612-1740-01　2本を外し，0240，2145　2本を取外す。
6. 2082を外し，2078，0276，0277，9792-2645-40を取外す。
   そして，2146を外す。
7. 9612-1725-01　2本を外し，2051を取外す。
8. 2136を取外し0215，0213，2112を取外す。
9. 9611-1740-01　2本，9613-1725-01を外し，0251，2058を取外す。
10. 2072　2本を外し，0270を取外す。
11. 9611-1740-01　2本を外し，2125を取外す。
12. 9611-1720-02　2本を外し，0223を取外す。
13. 9612-1730-01　2本を外し，2091を取外す。
14. 2062を外し，2162，0208を取外す。
15. 2209を外し，0204，2056を取外す。
16. 9612-1750-01　2本，9613-1740-01を外し，0292，2126　3本，2174を取外す。
17. 0292より2158を取外す。
18. 9611-1730-01　2本を外し，0221を取外す。

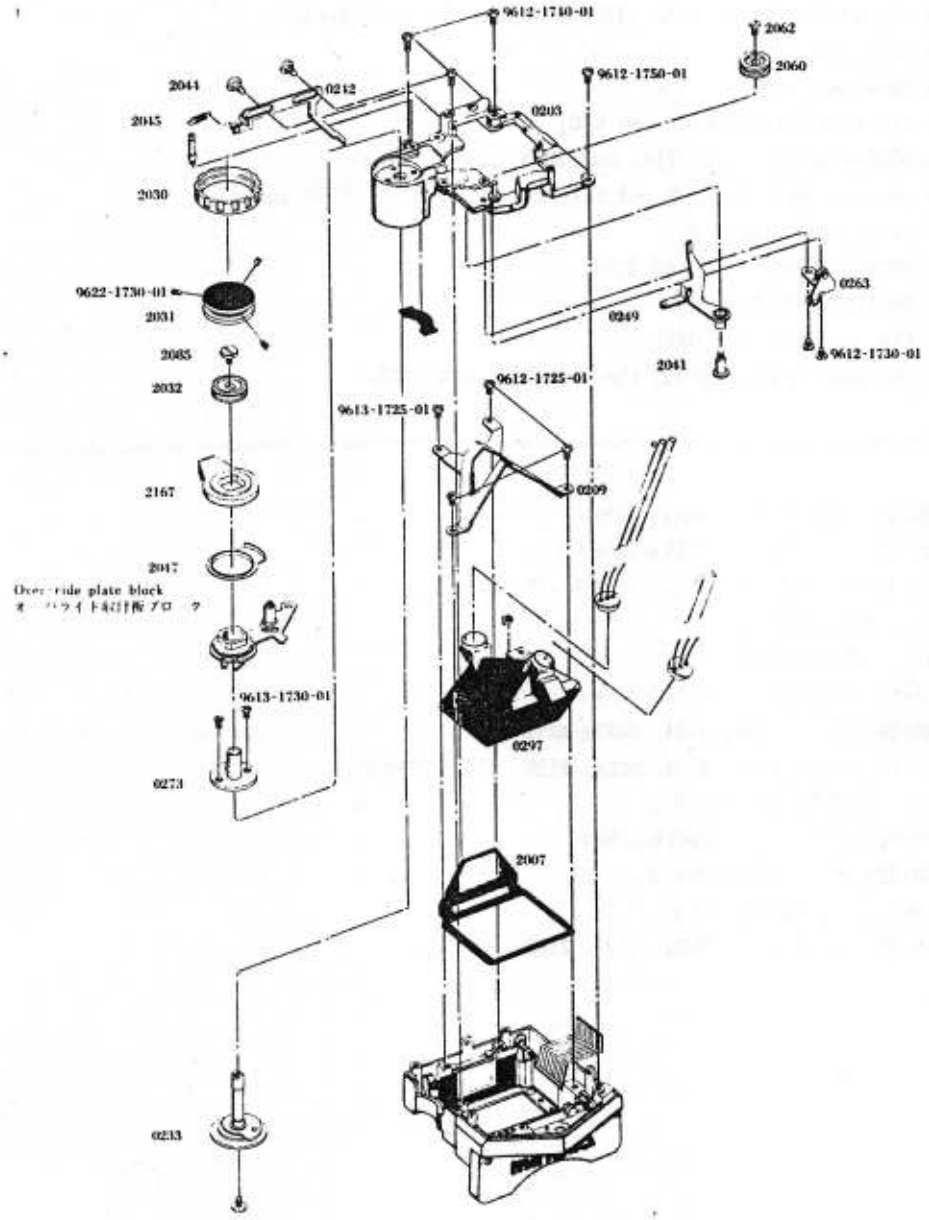
Fig. 1


0222
9613-1720-12
9612-1725-01
2051
2136
0215
9611-1710-01
0251
9612-1730-01
2091
9613-1725-01
2072
0270
9611-1730-01
0227
9611-1720-02
2125
2171
9612-1730-01
0210
2145
9611-1730-01
0221

19. Remove 2030, the three 9622-1730-01 and 2031.
20. Remove 2085, 2032, 2167 and 0233 in that order.
21. Remove the bonded 2047 and the Over-ride plate block.
22. Remove the two 9613-1730-01 and 0273.
23. Remove 2062 and 2060.
24. Remove 2045, the two 2044 and 0242.
25. Remove the three 9612-1740-01, 9612-1750-01 and 0203.
26. Remove 2041 and 0249.
27. Remove the two 9612-1730-01 and 0263.
28. Remove the three 9612-1725-01, 9613-1725-01, 0209, 0297 and 2007 in that order.

19. 2030, 9622-1730-01, 3本を外し，2031を取外す。
20. 2085を外し，2032, 2167, 0233を取外す。
21. のり付けの2047をはがし，オーバーライド取付板ブロックを取外す。
22. 9613-1730-01　2本を外し，0273を取外す。
23. 2062を外し，2060を取外す。
24. 2045を外し，2044　2本を外し，0242を取外す。
25. 9612-1750-01, 9612-1740-01　3本を外し，0203を取外す。
26. 2041を外し，0249を取外す。
27. 9612-1730-01　2本を外し，0263を取外す。
28. 9612-1725-01　3本を外し，9613-1725-01を外し，0209, 0297, 2007を取外す。

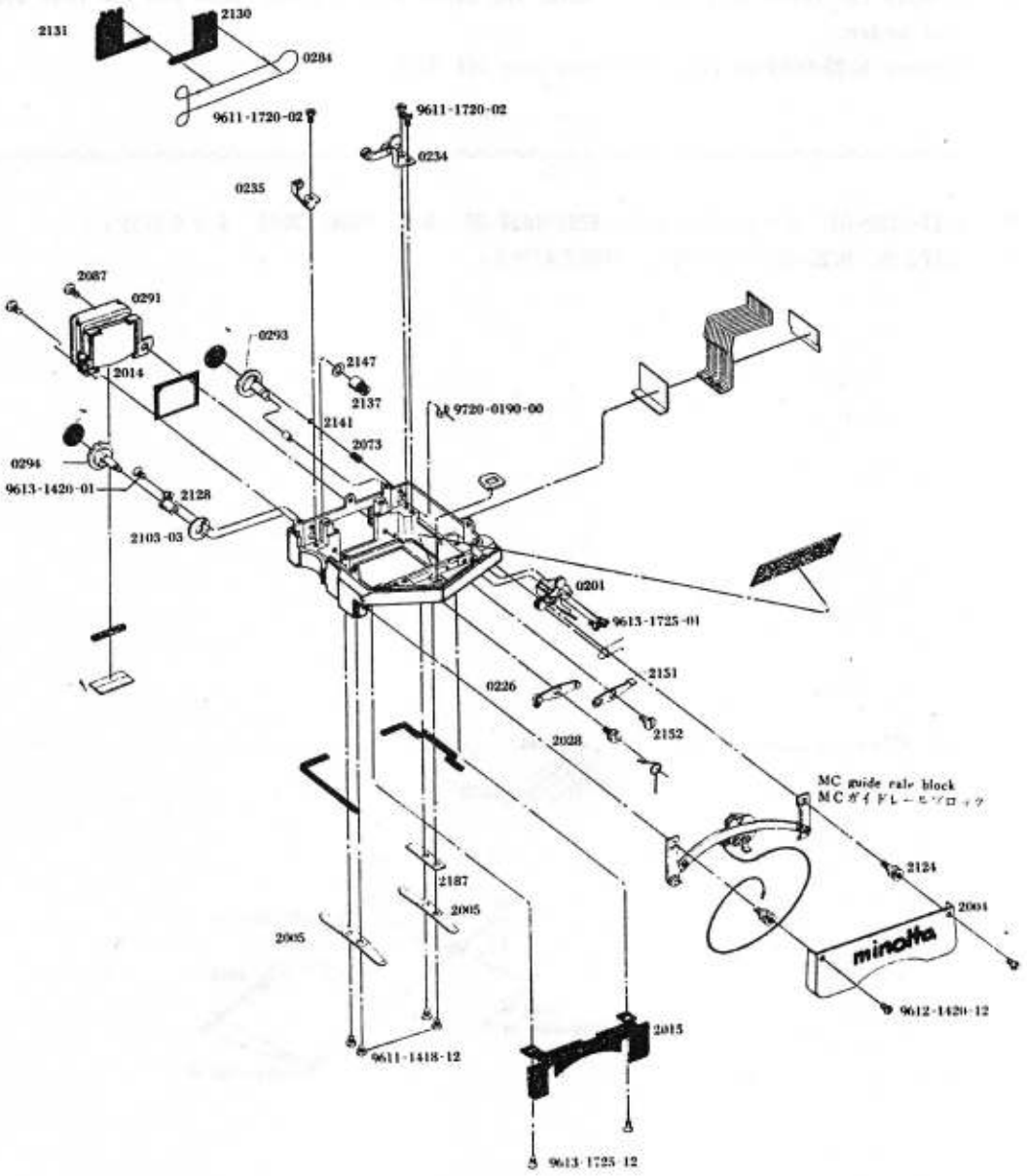
Fig. 2


9612-1740-01
2062
2060
9612-1750-01
2044
0242
0203
2045
2030
9622-1730-01
2031
0263
0249
2041
9612-1730-01
2035
2032
9612-1725-01
9613-1725-01
0209
2167
2047
Over ride plate block
9613-1730-01
0297
0273
2007
0233

29. Remove the two 9612-1420-12 and 2004.
30. Remove the two 9613-1725-12 and 2015.
31. Remove the two 2124 and take off the MC guide rail block.
32. Remove 2152 and 2151.
33. Remove 2028 and 0226.
34. Remove the two 9613-1725-01 and 0201.
35. Remove 9720-0190-00, 0293, 2141 and 2073 in that order.
36. Remove the two 9611-1720-02 and take off 0234, 0284, 2130 and 2131.
37. Remove 2137, 2147 and 0294.
38. Remove 9613-1420-01, 2128 and 2103.
39. Remove 9611-1720-02 and 0235.
40. Remove the two 2087 and 0291.
41. Remove the four 9611-1418-12, the two 2005 and 2187.

29. 9612-1420-12　2本を外し，2004を取外す。
30. 9613-1725-12　2本を外し，2015を取外す。
31. 2124　2本を外し，MCガードレールブロックを取外す。
32. 2152を外し，2151を取外す。
33. 2028を外し，0226を取外す。
34. 9613-1725-01　2本を外し，0201を取外す。
35. 9720-0190-00を外し，0293，2141，2073を取外す。
36. 9611-1720-02　2本を外し，0234，0284，2130，2131を取外す。
37. 2137を外し，2147，0294を取外す。
38. 9613-1420-01を外し，2128，2103を取外す。
39. 9611-1720-02を外し，0235を取外す。
40. 2087　2本を外し，0291を取外す。
41. 9611-1418-12　4本を外し，2005　2本，2187を取外す。

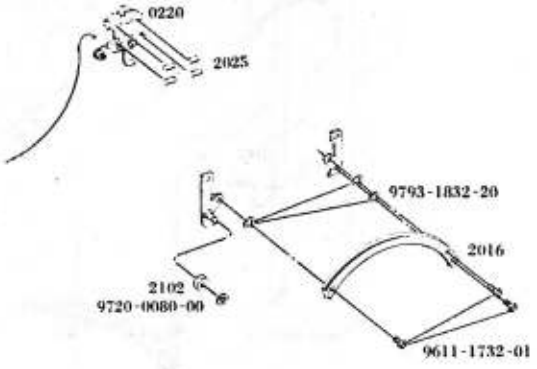
Fig. 3


2131
2130
0284
9611-1720-02
9611-1720-02
0234
0235
2087
0291
0293
2014
2147
2137
2141
9720-0190-00
2073
0294
9613-1420-01
2128
2103-03
0201
9613-1725-01
2151
0226
2152
2028
MC guide rail block
MCガイドレールブロック
2124
2004
minolta
9612-1420-12
2187
2005
2005
2015
9611-1418-12
9613-1725-12

42. Remove the three 9611-1732-01, 2016, the three 9793-1832-20, 0220 and the four 2025 in that order.
43. Remove 9720-0080-00 from 0217 and take off 2102.

42. 9611-1732-01　3本を外し、2016, 9793-1832-20　3本、0220, 2025　4本を取外す。
43. 0217より、9720-0080-00を外し、2102を取外す。

Fig. 4



REASSEMBLY (8219-200)

組 立 編 (8219-200)

Note: The attention ★ mark of the front parks number in contents a illustrated in the Figure, put into not assemble it page.

注：部品展開図の中で部品番号の前に★印があるものはそのページの組立行程では組込みをいたしませんので御注意下さい。

1

1. Fasten 0249 with 2041.
2. Fasten 0263 with 9612-1730-01.
3. Fasten 0273 with 9613-1730-01. Be sure that 0273 is positioned in the correct direction as shown in Fig. 2.
4. Fasten 2060 with 2062.
5. Fasten 2046.
6. Fasten 0242 with 2044, and mount 2045 as shown in Fig. 3.
7. Over-ride plate block reassembly.
   1) Insert 0296 from the bottom of 0261.
   2) While pressing 0296 to hold it in place, insert 2177 and 2176 from the top of 0261 in that order (Fig. 4) and hook 2172 from the bottom (Fig. 5). Be sure to distinguish 2177 from 2176.
   3) Insert 0295 into the above assembly, and fit the pin of 0296 into the hole of 0295 as indicated in Fig. 5.
8. Insert the Orer-ride plate block into 0203, and bond 2047 to the latter after applying adhesive to 0203.
9. Insert 0233 into 0203 from the bottom, set 2167 and 2032, and fasten them with 2085.
   Note: When mounting 0233, move 0249 in the direction of the arrow shown in Fig. 3.
   Operation Check: Be sure to check that 2032 operates correctly to interlock with 0242, which in turn functions properly.
10. Bond 2149 to 0203 by appling adhesive to the former.

---

1. 0249を2041で止める。
2. 0263を9612-1730-01で止める。
3. 0273を9613-1730-01で止める。方向に注意。Fig. 2 参照。
4. 2060を2062で止める。
5. 2046を止める。
6. 0242を2044で止め，2045をFig. 3 のようにセットする。
7. オーバーライド取付板ブロック組立
   1) 0261の下側より0296をはめ込む。
   2) 0296が脱落しないように押えながら0261の上側より2177，2176の順にはめ（Fig. 4 ）下側より2172を掛ける（Fig. 5 ）。2177，2176を間違えないこと。
   3) 0295をはめ，0296のピンを0295の穴にはめる。Fig. 5 参照。
8. オーバーライド取付板ブロックを0203にはめ込み，2047に接着材を塗り，0203に貼る。
9. 0233を0203の下側よりはめ込み，2167，2032をセットし，2085で止める。
   注) 0233をセットする際，0249をFig. 3 の矢印方向に押しておく。
   作動チェック：2032がスムーズに回転し，それに連動し，0242も作動することを確認する。
10. 2149に接着材を塗り，0203に貼る。

Fig. 1

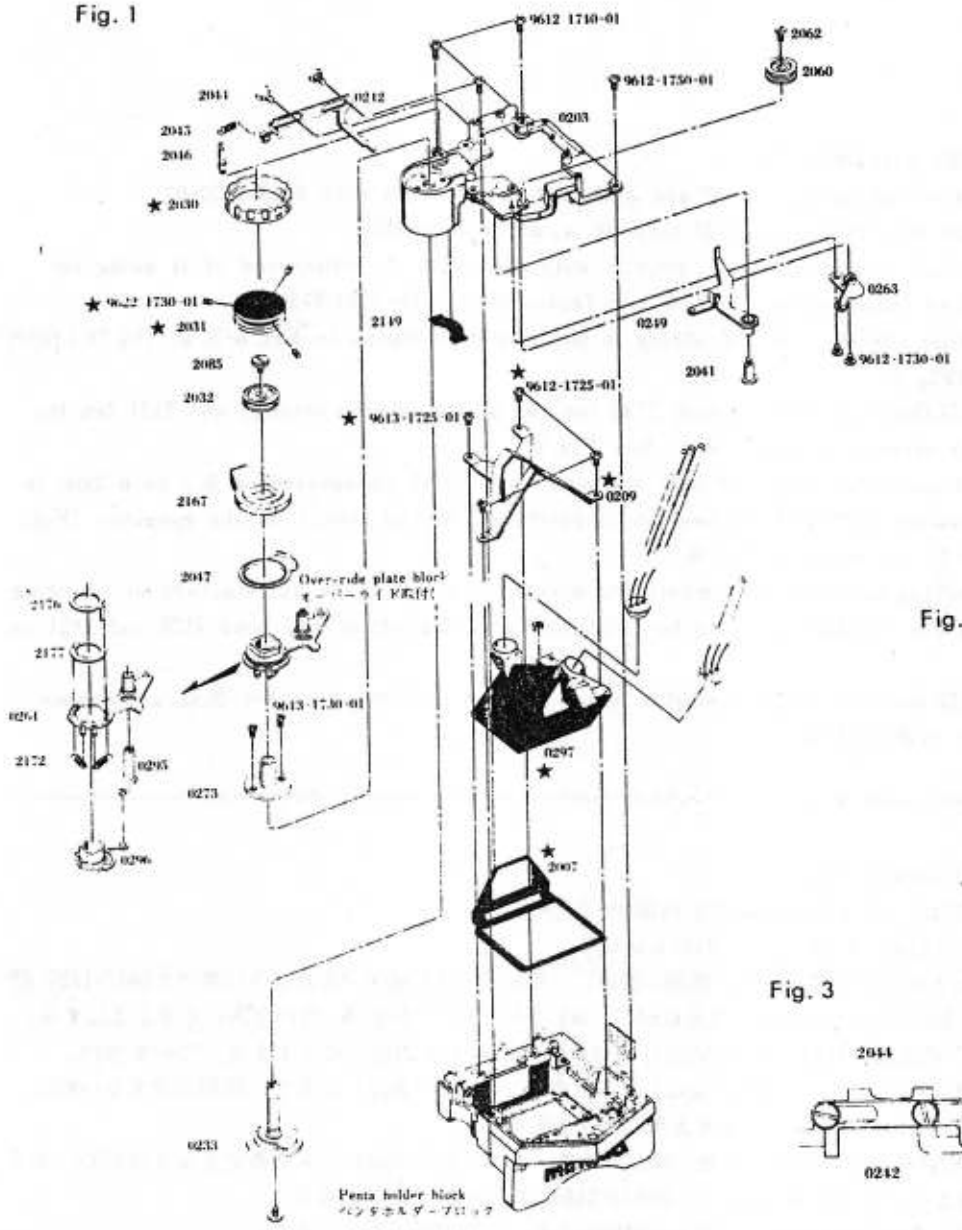


Fig. 2

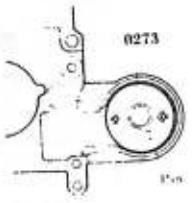


Fig. 3

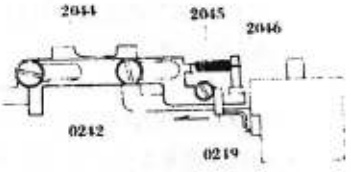


Fig. 4

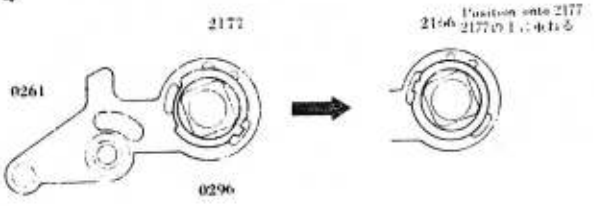
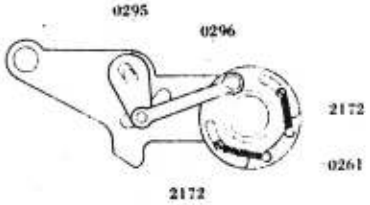


Fig. 5



11. Fasten 0235 with 9611-1720-02.
12. Match the screw holes of 2103 and 2108, and fasten them with 9613-1420-01.
13. Insert 0294 into 2128, pass 2147 through it, and fasten 2137.
14. Make a circle of 0284 (Fig. 7), hook it onto 0235 with the other end of it being set with 0234 as indicated in Fig. 8-A, and fasten 0234 with 9611-1720-02.
    Be sure that the knot of the string is positioned as shown in Fig. 8-B at the "CLOSE" position (Fig. 9).
15. At the "CLOSE" position, mount 2130 (on the bottom of the string) and 2131 (on the top of the string) in that order. See Fig. 9.
    Note: Be sure that 2130 and 2131 are overlapped with an opening of 0.2 to 0.3mm in between and that the overlap is positioned in the center of the eyepiece (Fig. 9-A) as shown in Fig. 9.
16. After checking that the abovementioned overlap conditions are satisfactory by changing 0294 from the "OPEN" position to "CLOSE" and vice versa, and bond 2130 and 2131 to 0284.
17. Insert 2073 into the above assembly, place 2141 on it, further insert 0293, and fasten them with 9720-0190-00.

11. 0235を9611-1720-02で止める。
12. 2103, 2108のねじ穴を合わせて9613-1420-01で止める。
13. 0294を2128にはめ, 2147を通して2137を締める。
14. 0284をFig. 7 のように輪を作り, 0235に掛け, 一端に0234をFig. 8 -Aのように掛けて9611-1720-02で止める。紐の結び目の位置は "CLOSE" の時 (Fig. 9) にFig. 8 -Bの位置にくるようにする。
15. "CLOSE" の位置で2130 (下側の紐に), 2131 (上側の紐に) の順にセットする。Fig. 9 参照。
    注) Fig. 9 のように重なり部分が接眼レンズの中心 (Fig. 9 -A 部) に来て, 隙間が見えない程度 (重なり量0.2~0.3mm) になるようにセットすること。
16. 0294をOPEN↔CLOSEと回転させ, 前記の条件 (重なり部が接眼レンズ中央で重なり量が0.2~0.3 mm) が満足していることを確認して, 0284と2130, 2131を接着材で止める。
17. 2073をはめ, その上に2141を置いてから0293を入れ, 9720-0190-00で止める。

Fig. 6

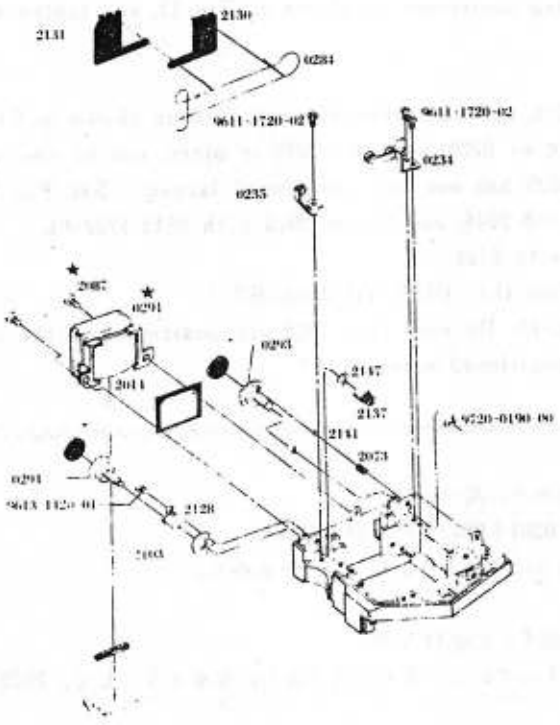


Fig. 7

Fig. 8

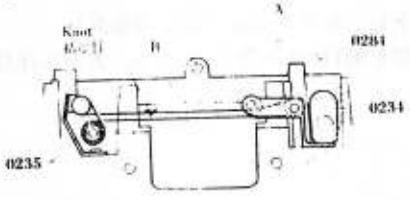
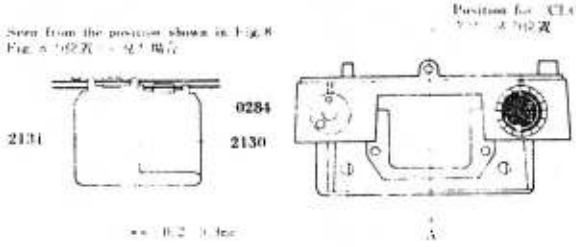


Fig. 9



18. Mount 0226, fasten it with 2028, and hook 2027 as shown in Fig. 11.
19. After hooking 2207 onto 0201 as shown in Fig. 12, fasten 0201 with 9613-1725-01.
20. Mount 2151 so that 0201 and 0226 are positioned as shown in Fig. 11, and fasten it with 2152.
21. MC guide rail reassembly.
    1) Insert the two 2025 into 0220, and pass them through 2016 as shown in Fig. 14.
    2) By turning the eccentric pin of 0220, push the 2025 in place, one by one, while making the opening where 2025 has not been positioned largest. See Fig. 14.
    3) Place 9793-1832-20 on 0217 and 2018, and fasten 2016 with 9611-1732-01.
22. Fasten 0202 reassembled as above with 2124.
23. MC guide rail mount adjustment (See the "HOW TO ADJUST")
24. Fasten 2005 and 2187 with 9611-1418-12. Be sure that 2005 are positioned in the correct directions (the straight lines are positioned outward).

18. 0226を置き2028で止め，2027をFig.11のように掛ける。
19. 0201に2207をFig.12のように掛けてから0201を9613-1725-01で止める。
20. 2151を0201，0226との関係がFig.11のようになるように置き2152で止める。
21. MCガイドレール組立
    1) 0220に2025を2本入れて2016に通す。Fig.14 参照。
    2) 0220の偏心ピンを回し，2025が入っていない方の隙間が最大になるようにして，2025を片方ずつ押し込む。Fig.14 参照。
    3) 0217，2018に9793-1832-20を置き，2016を9611-1732-01で止める。
22. 上記で組立てた0202を2124で止める。
23. MCガイドレールガタ調整（調整編参照）
24. 2005，2187を9611-1418-12で止める。方向に注意（直線部が外側）。

Fig. 10

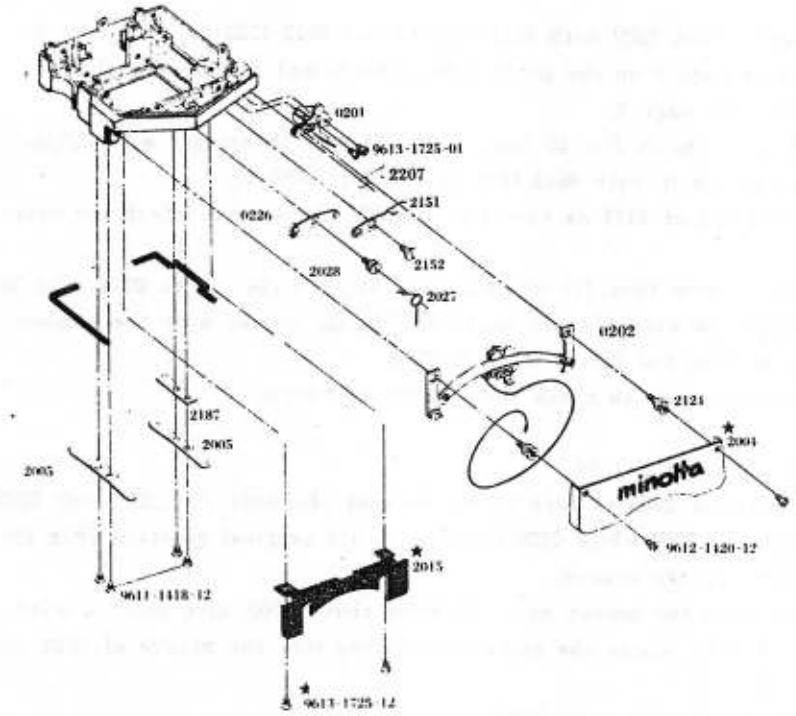


Fig. 11

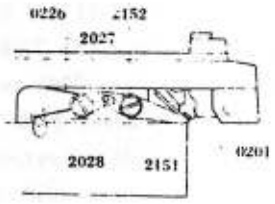


Fig. 12

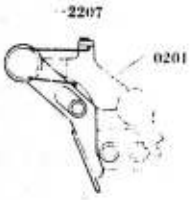


Fig. 13

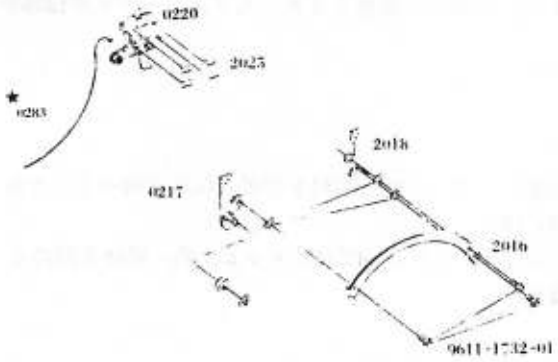
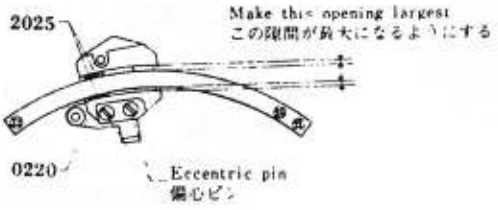


Fig. 14



25. Mount 2007 and 0297, and fasten 0209 with 9613-1725-01 and 9612-1725-01. See page. 2.
26. Place 0203 reassembled on page. 1 on the penta holder block, and fasten it with 9612-1740-01 and 9612-1750-01. See page. 2.
27. Position 2126 and 2174 as shown in Fig. 16 (one end of 2174 is in contact with 0261), place 0292 on them, and fasten it with 9613-1740-01 and 9612-1750-01.
28. Fasten 2146, and hook the end of 2174 as shown in Fig. 17. Be sure to check the over-ride operation.
29. Insert 2056 into the spring hole (Fig. 17) of 0292, hook it onto the pin of 0204 (Fig. 18), and turn 0204. Then stop 0204 when the pin shown in Fig. 18. climbs over the stopper pin (Fig. 17) in the third turn, and fasten it with 2209.
    Note: When setting 0204, be sure to check the contact pressure.
30. String Threading
    1) Thread 0283 as shown in Fig. 19.
    2) Position the groove of 2060 to turn to the back of the body (Fig. 20), pull 0283 to give 1.5 winds on 2060 while 0220 is reset to its original position (Fig. 19), and pass 0283 through the groove.
    3) Wind the string from the groove onto the drum above 2060, give about a wind onto the drum of 0204, insert the end of the string into the groove of 0204, and fasten it. See Fig. 20.
    4) Bond the string to the groove of 2060.

25. 2007, 0297を入れ, 0209を9613-1725-01, 9612-1725-01で止める (See page. 2)。
26. Page. 1で組立てたペンタ上台ブロック (0203) をペンタホルダーブロックに乗せ9612-1740-01, 9612-1750-01で止める (See page. 2)。
27. 2126, 2174をFig.16の状態に置き (2174の一端を0261に当てる) 0292を乗せて9613-1740-01, 9612-1750-01で止める。
28. 2146を止め, 2174の一端をFig.17のように掛ける。オーバーライド作動チェック。
29. 2056を0292のスプリング穴 (Fig.17参照) に入れ, 一端を0204のピン (Fig.18) に掛け, 0204を回転させ, Fig.18のピンが3回目にストッパーピン (Fig.17参照) を越えたところでストップさせ2209で止める。
    注) 0204セット時接片圧を確認すること。
30. 紐掛け要領
    1) 0283をFig.19のように通す。
    2) 2060の切溝が本体の真後を向くような状態にし (Fig.20) 0283を引張り0220が戻っている状態 (Fig.19) で2060に一周半巻き, 切溝に通す。
    3) 切溝より出ている紐を2060の上側のドラムに捲いてから, 0204のドラムに約一周巻き紐の先端を0204の切溝にはめて止める。Fig.20参照。
    4) 2060の切溝部の紐をのり付けする。

Fig. 15

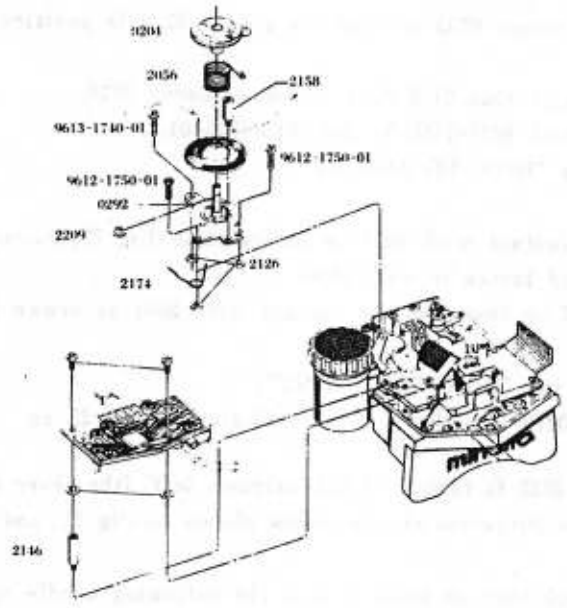


Fig. 16

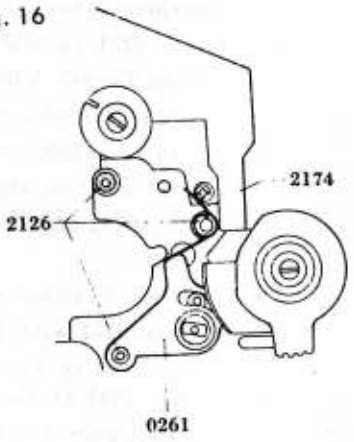


Fig. 17

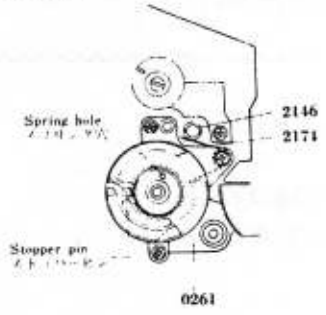


Fig. 18

It enters in the spring hole shown in Fig. 17

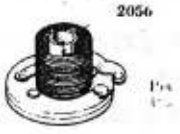
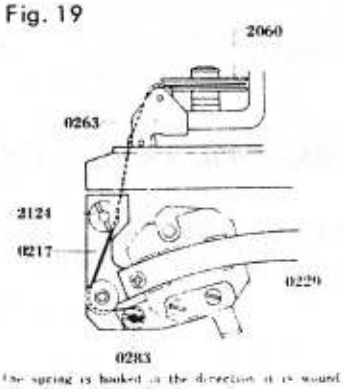


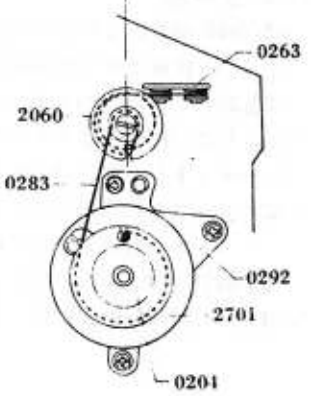
Fig. 19



The spring is hooked in the direction it is wound on 0229

Fig. 20

Be sure that the groove of 2060 is turned to the back



31. Mount 0208 so that the gear is positioned on the eyepiece side as shown in Fig. 22.
    Note: Be sure to check the contact pressure when mounting 0208.
32. Hook 2112 as shown in Fig. 22, and mount 0213 so that the pin of 0213 is positioned between 2112.
    Caution: When mounting 0213, be sure that 2112 does not move under 0213.
33. Place 0251 on 2058, and fasten it with 9611-1740-01 and 9613-1725-01.
34. String Length Adjustment (See the "HOW TO ADJUST")
35. Fasten 2051 with 9613-1725-01.
36. By turning 0208 until it comes in contact with 2058 as indicated in Fig. 23, mount 0215 on the position shown in Fig. 23, and fasten it with 2136.
37. Mount 9792-2645-40, and insert 0277 so that it is in contact with 2051 as shown in Fig. 37.
38. Stopper Position adjustment (See the "HOW TO ADJUST")
39. Fasten 2162 with 2062, and insert 0276 into the position indicated in Fig. 23 as illustrated in Fig. 24.
40. Mount 2091 at the position where 2032 is turned to the extreme left (the lever of 0242 is positioned at the left end in the direction of the arrow shown in Fig. 3), and fasten it with 9612-1730-01.
    Operation Check: Be sure to check that on turning 2032, the following needle operates properly. If not, check whether the pin of 2091 is positioned outside 0242.
41. Fasten 2125 with 9611-1740-01, and 0270 with 2072 respectively.
42. Fasten 0223 with 9611-1720-02, and 0221 with 9611-1730-01 respectively.

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31. 0208をFig.22のようにギヤーが接眼レンズ側に向くような方向に入れる。
    注) 0208取付時接片圧確認のこと。
32. 2112をFig.22のように掛け0213のピンが2112の間にくるように0213をはめる。
    注) 0213をセットする際、2112が0213の下にもぐり込まないように注意する。
33. 2058に0251を重ね、9611-1740-01、9613-1725-01で止める。
34. 糸長さ調整（調整編参照）
35. 2051を9612-1725-01で止める。
36. 0208を回転させ、Fig.23のように2058に当っている状態にしておき0215をFig.23の位置にセットし、2136で止める。
37. 9792-2645-40を入れ0277をFig.23のように2051に接触するようにはめ込む。
38. ストッパー位置調整（調整編参照）
39. 2162を2062で止め、Fig.23の状態で0276をFig.24の位置にはめる。
40. 2032を左に一杯回転させた位置（0242のレバーが左端に寄っている状態……Fig. 3矢印方向）にて2091をセットし、9612-1730-01で止める。
    作動チェック：2032を回転させるとそれにつれて2091の追針が作動することを確認する。
    追針が動かない場合は2091のピンが0242の外側になっていないかチェックする。
41. 2125を9611-1740-01、0270を2072で止める。
42. 0223を9611-1720-02、0221を9611-1730-01で止める。

Fig. 21

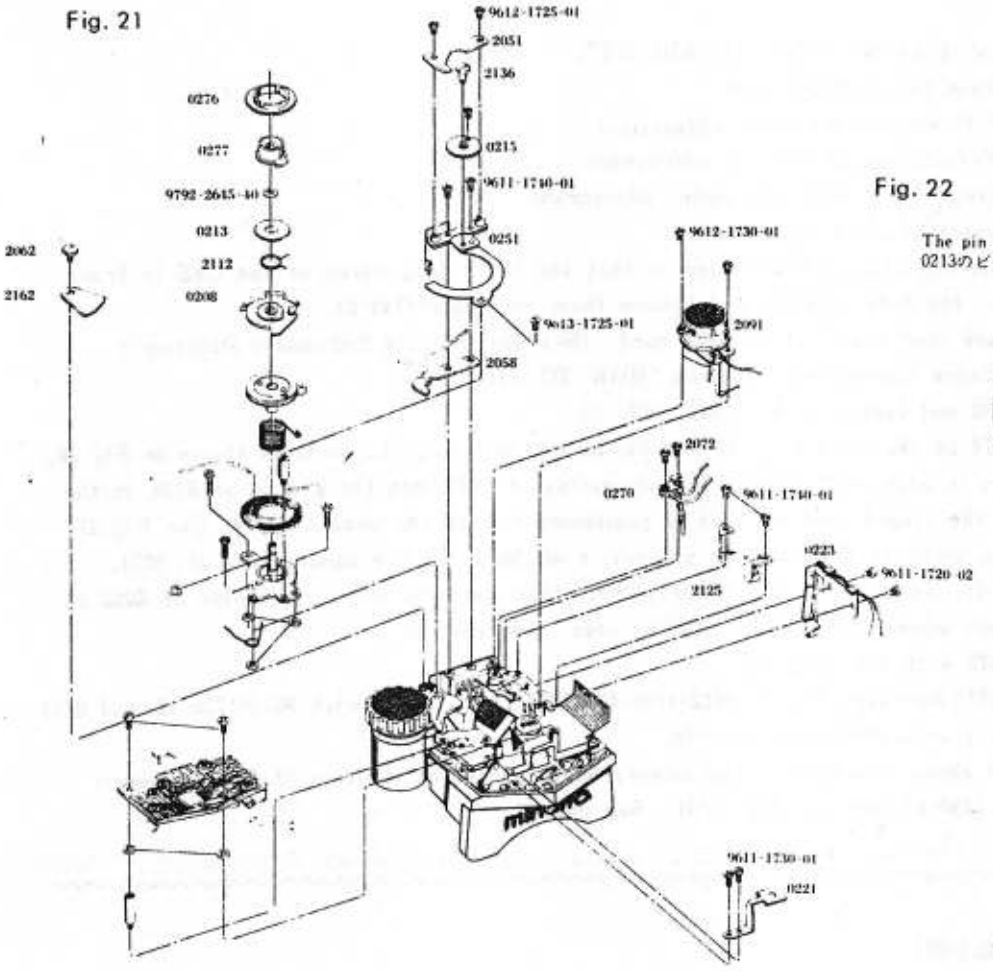


Fig. 22

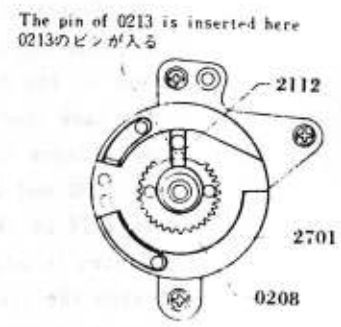
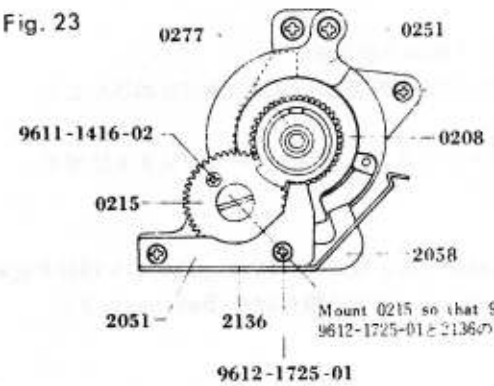
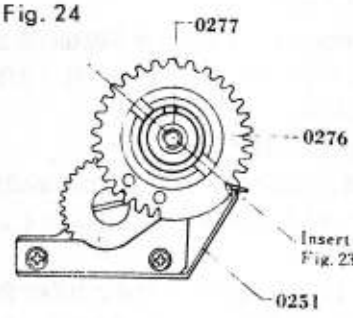


Fig. 23



Mount 0215 so that 9611-1416-02 falls on the center line between 9612-1725-01 and 2136
9612-1725-01と2136の中心線上に9611-1416-02がくるように0215を取付ける

Fig. 24



43. Adjustment (See the "HOW TO ADJUST")
    1) Main switch adjustment
    2) Following needle lever adjustment
    3) Warning signal position adjustment
    4) Visible in finder: F-number adjustment
    5) Indicater plate adjustment
44. Mount 2145 and 0240 in that order so that the three lead wires of the CdS in front are out of the hole of 0240, and fastem them with 9612-1740-01.
45. Solder each lead wire and flexible cord. (See the "Wiring Schematic Diagram")
46. Luminescenece Correction (See the "HOW TO ADJUST")
47. Mount 0222 and fasten it with 9613-1720-12.
48. Mount 2074 as shown in Figs. 23 and 24, insert 2078 into the position shown in Fig. 26, and fasten it with 2082. Insert the projection of 2078 into the groove of 0276. in the direction the staged part of 2078 is positioned toward the gear of 2074. See Fig. 27.
49. Insert the notch of 2117 and the projection of 2079 into the square hole of, 2074, respectively, fasten them with 9613-1420-01 after matching the screw holes of 2052 at the position where the mark of 2079 is seen. See Fig. 28.
50. Fasten 2075 with 9611-1425-12.
51. Fasten 2004 (See page. 6) with 9612-1420-12, 2015 (See page. 6) with 9613-1725-12, and 0291 (See page. 4) with 2087, respectively.
52. Mount the above assembly on the camera body, match the position of 2031, fasten it with 9622-1730-01, and fix 2030 to it. See page. 2.

43. 調整（調整編参照）
    1）メインスイッチ調整
    2）追針レバー調整
    3）警告シグナル位置調整
    4）絞りイン・ファインダー調整
    5）数値板見え調整
44. 2145を置き，前側のCdSリード線3本が0240の穴より出るように0240を置き9612-1740-01で止める。
45. 各リード線及びフレキシブルコードハンダ付（立体配線図参照）
46. 輝度較正（調整編参照）
47. 0222をはめ，9613-1720-12で止める。
48. 2074をFig. 23，24の状態でFig. 26のようにはめ2078を入れて2082で止める。
    2078の段がついている方を2074のギヤー部に向くような方向で2078の突起を0276の溝にはめ込むこと。
    Fig. 27参照。
49. 2117の切欠き部，2079の突起部をそれぞれ2074の角穴に合わせて入れ，2079のマークが見える位置で2052のねじ穴を合わせて9613-1420-01で止める。Fig. 28参照。
50. 2075を9611-1425-12で止める。
51. 2004(See page. 6)を9612-1420-12，2015(See page. 6)を9613-1725-12，0291(See page. 4)を2087で止める。
52. カメラボデーに取付け，2031の位置を合わせて9622-1730-01で止め2030を取付ける(See page. 2)。

Fig. 25

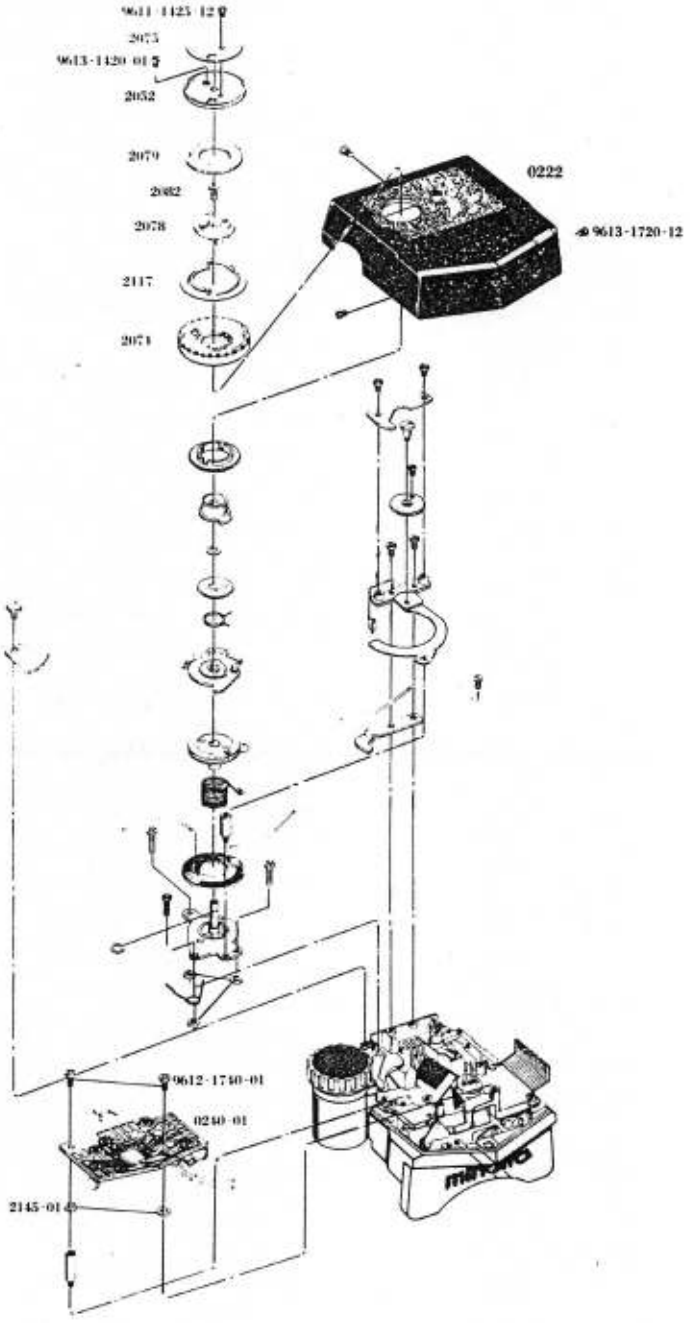


Fig. 26

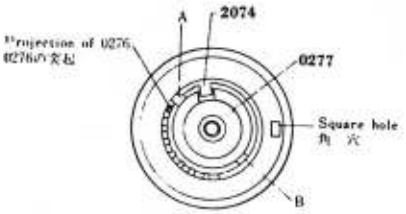


Fig. 27

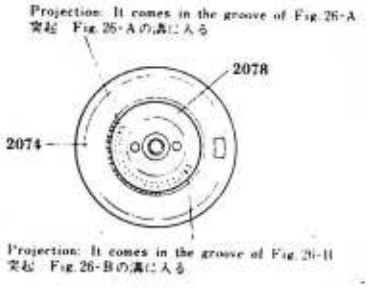
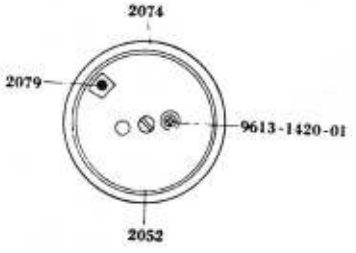


Fig. 28



HOW TO ADJUST (8219-200)

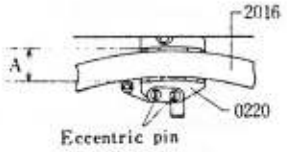
1. MC Guide rail adjustment 1
2. String length adjustment 1, 2
3. Stopper position adjustment 3
4. Main switch adjustment 3
5. Following needle lever adjustment 4
6. Warning signal position adjustment 4
7. Visible in-finder (F-Number) adjustment 5
8. Indicater plate adjustment 6
9. Luminescence correction
   - $R_{1'}$ adjustment 7, 8, 9, 10
   - R_1 adjustment (25μA adjustment) 11
   - R_2 adjustment (Diaphragm and ASA adjustment) 12
   - R_S and R_L adjustment (Luminescence correction linearity adjustment) 13, 14
   - R_4 adjustment (Luminescence correction parallelity adjustment) 15
   - Luminescence correction check 15, 16
   - R_3 adjustment (Meter needle adjustment) 16
   - $R_{02'}$ adjustment (Warning signal adjustment) 17

1

1. MC Guide Rail Adjustment

1) By turning the two eccentric pins, adjust the width of 0220, clipping 2016 as much as possible within the range where 0220 operates smoothly. See Fig. 1.
Caution: Be sure that both ends of 0220 are the same width.

Fig. 1

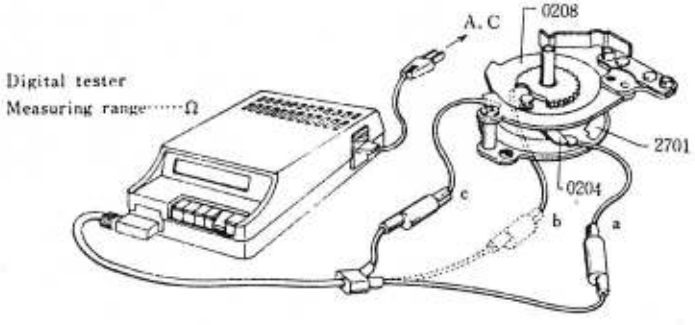


2) By moving 2016 vertically, check to see if it operates properly. Be sure that 0220 moves to the opposite side smoothly by its own weight. If it stops or catches halfway, readjust it as in paragraph 1) above.

2. String Length Adjustment

Measuring instrument: Digital tester (Model 2507)
How to use : See the operation manual of "Digital tester"
Pre-Adjustment Check: With the measuring range of the digital tester set to the "Ω" position, connect lead wires a and c shown in Fig. 2 with an connecting clip and by turning the ASA brush holder plate (0208) check whether the indication of resistance values changes smoothly. Then connect the digital tester lead wires b and c shown in Fig. 2 and by moving 0220 check whether the indication of resistance values changes smoothly. If the resistance value does not change smoothly, check for stains on the sliding surfaces of the resistor (2701) as well as the contact pressure of the 0204 and 0208.

Fig. 2

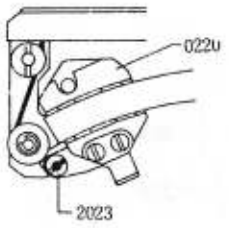


a	2726·····Blue
b	2721·····Brown
c	2727·····Blue

1) With 0208 set to any optional position, measure the resistance value between the lead wires a and c shown in Fig. 2.

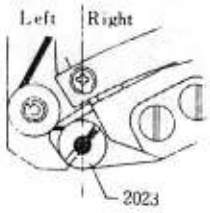
2) With 0208 remaining set to the same position as in paragraph 1) above, check if 0220 completely returns to its original position. Then adjust the resistance value between lead wires b and c by turning the eccentric pin (2023) of 0220 so that it is equal to that between lead wires a and c measured in paragraph 1) above. See Fig. 3.

Fig. 3



Caution: After adjusting, be sure that the groove into which the string from 2023 is to be inserted is positioned at the right of the perpendicular as shown in Fig. 4. If it is positioned at the left, check if the groove for the pulley (2060) (See the string threading, procedure 30 in the "REASSEMBLY") is positioned correctly or the length of string (0283) is adequate. (The correct string length is 184± 1 mm.)

Fig. 4



3. Stopper Position Adjustment

1) Turn transform gear-D (0277) from the ASA 12 position (Fig. 5) to the ASA 6400 position (Fig. 6). By unfastening 9612-1725-01 and changing the position of ASA dial stopper (2051), adjust the clearance A between the ASA brush holder plate (0208) and the ASA brush stopper (2058) so that it is identical at the both positions.

Fig. 5 (ASA 12)

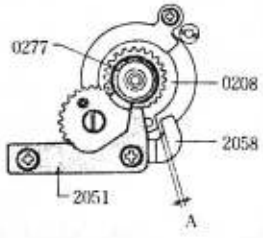
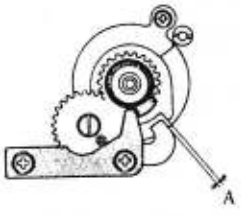
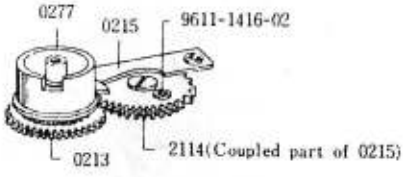


Fig. 6 (ASA 6400)



2) If the clearance between 0208 and 2058 cannot be adjusted at the position of 2051, adjust it by unfastening 9611-1416-02 and changing the engagement between 0213 and 2114. See Fig. 7.

Fig. 7



4. Main Switch Adjustment

1) Adjust the main switch by bending the main switch contact B (2068) so that it can be turned "ON" or "OFF" at the intermediate position of the rotary angle (90°) of the main switch knob (0293). The change of turning on or off can be checked by reading the movement of the needle in the tester. See Fig. 8 and Fig. 9.

Fig. 8

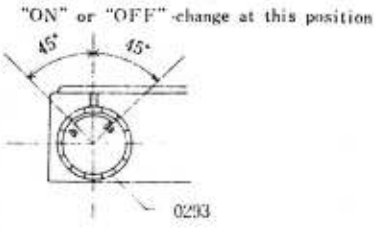
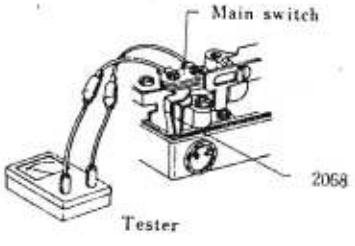


Fig. 9

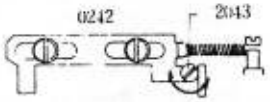


5. Following Needle Lever Adjustment

1) Mount the temporarily set shutter dial on the body and position the dial at "1/15".

2) Adjust the following needle by turning the eccentric pin (2093) of 0242 so that it points to "15" on the shutter speed scale. See Fig. 10.
Be sure to check by turning the shutter dial to "AUTO" through "2000" that the following needle stays within the shutter speed at any position of the dial.

Fig. 10

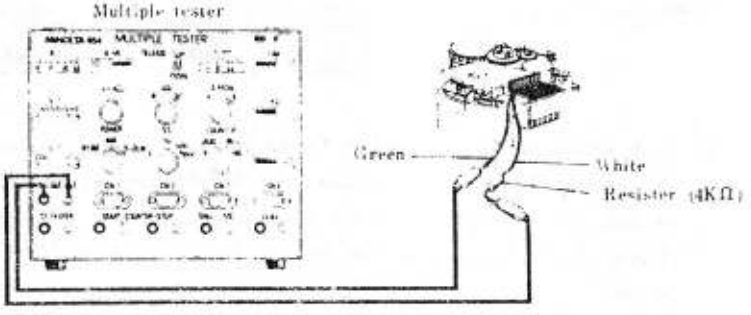


6. Warning Signal Position Adjustment

DC Power: Use the out put power of the Multiple tester (Voltage……V -- 1 - 3 V)

1) Connect the Multiple tester, Resister (4KΩ) and lead wires from the light emission diode (2709) as indicated in Fig. 11 and energize 2709 to adjust it by bending the LED holder (0223) with a pair of pincers so that the window (Fig. 12) on the lower part of the shutter speed scale glows evenly. See Fig. 13.

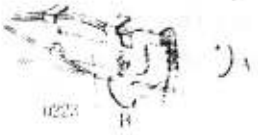
Fig. 11



Caution: Measurement with connect a fixed resister (4KΩ).

Fig. 12

Fig. 13



7. Visible In-Finder (F-Number) Adjustment

1) By bending the slant line shown in Fig. 14 horizontally or vertically with a pair of pincers, adjust the following so that the F-number can be seen in the center of the F-number frame:

F-Number Observed	Adjustment
Leaning upward (Fig. 15-①)	Bend in the direction of A – b
Leaning downward (Fig. 15-②)	Bend in the direction of A – a
Leaning left (Fig. 15-③)	Bend in the direction of B – b
Leaning right (Fig. 15-④)	Bend in the direction of B – a

Fig. 14-A

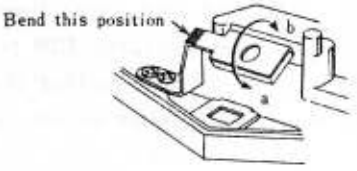


Fig. 14-B

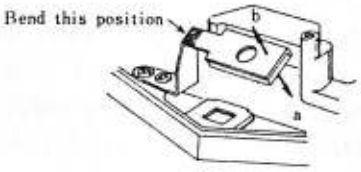
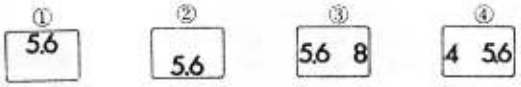
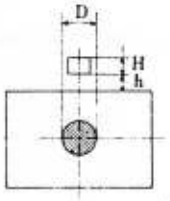


Fig. 15



2) In positioning the F-number frame with the eyepiece frame, the vertical deviation (h) should 0.5 to 1.5H against the height (H) of the F-number frame as indicated in Fig. 16. Moreover, for its horizontal position, the width (d) of the F-number frame should be within that of the focusing screen's micro-prism or the split image.

Fig. 16



3) When the horizontal position deviates greatly, check whether 0221 leans left or right as shown in Fig. 17.

Fig. 17

8. Indicater Plate Adjustment

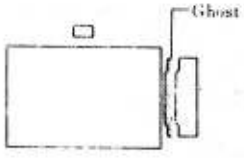
1) Adjust the shutter speed scale by slanting the reflector plate (2183) properly so that it glows uniformly from the top to the bottom. See Fig. 18.

Fig. 18

2) When the shutter speed scale is observed in the portion shown in Fig. 20, adjust it by twisting 2183. See Fig. 19.

Fig. 19

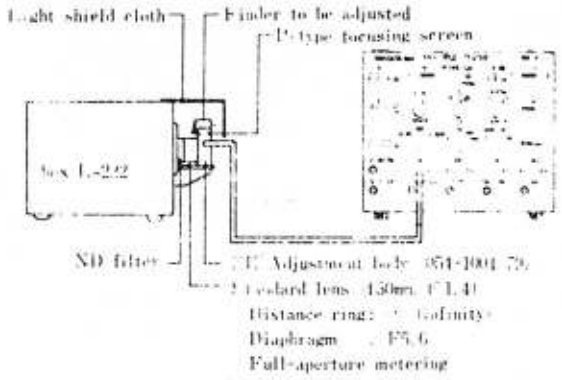
Fig. 20



9. Luminescence Crrection

1. Before making adjustments, care should be taken concerning the following points.
   1) Luminescence correction should be undertaken in a room with a constant temperature. When the Finder is placed in the luminescence box, be careful of rising temperature due to the heat from the box. In addition, set the luminescence box to a low luminescence to prevent a temperature increase when the luminescence box is not in use.
   2) Measurement by Full-aperture metering.
   3) Use a standard lens. 521 (f 50mm, F 1.4). The focus ring should be set on ∞ (infinity).
   4) Use a P-type focusing screen.
   5) The Eye-shutter of the finder should be closed to prevent effects of light passing through.
   6) Do not touch the variable resistors on the printed base plate, if it is not necessary for adjustment.
   7) Expose CdS cells to light (50 l.x) for about 15 minutes before adjusting.
   8) Keep CdS cells in a cool, dark place.
2. Measuring instruments and tools.
   1) Measuring instruments: Digital Tester (Model 2507)
      Luminescence Box (Model L-222)
      054 Multiple Tester (Model MT-1)
      Digital Time Counter (Model TC-1)
   2) Tools : EE Adjustment Body (054-1001-79)
      DC Supply Cord (054-4202-79) ····· When the AE Finder checking available for camera body of the user.
      Temporary Cover (8219-2002-79)
      ND Filter (Minolta ND 50% For Adjustment)
      Luminescence Adjustment Screw Driver
3. Rp Adjustment
   1) Prepare equipment and materials as shown in Fig. 21.

Fig. 21



Multiple tester switches position

Switches	Position
V-1ADJ	V 1 - 3 V
POWER	MAIN
4337	IN
SS	Free
A-MSW	M
COUNTER	N
SWLPVSW	PV SW

2) Measuring CdS Cell Resistance

Connect the C terminals of forward and rear CdS cells to a digital tester as shown in Fig. 22 and measure the following resistances. Be sure to disconnect Rp using a soldering iron.

Fig. 22

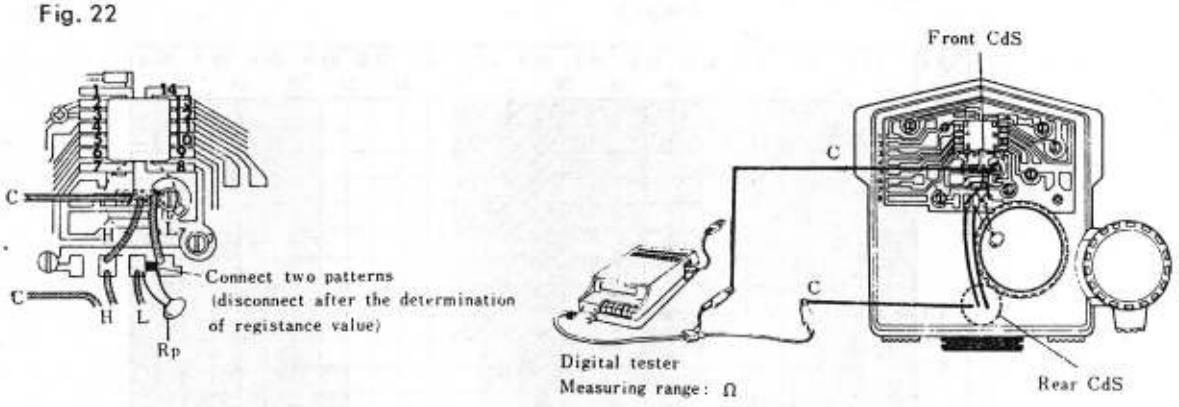


Table-1

Order of Measurements	Luminescence Box (L-222)	N.D Filter	Measured Luminescence	Terminal Connections between forward and rear CdS Cells	Measured Resistances
①	Ev5 (ASA100)	yes	Bv_{-1}	H-H, L-L	R_{HLBV-1}
②	Ev11 (ASA100)	yes	Bv_5	H-H, L-L	R_{HLBV5}
③	Ev11 (ASA100)	yes	Bv_5	H-H (L-L disconncted)	R_{HBV5}
④	Ev11 (ASA100)	yes	Bv_5	L-L (H-H disconnected)	R_{LBV5}

Note: 1. As the finder does not have a cover to protect it from outside light, cover it with a light shield cloth.

2. Double-check to make sure the Eye-Shutter is closed.

3. Take measurements as quickly as possible to compensate for rising CdS cell temperature due to luminescence box heat.

4. Do not expose CdS cells to strong light (more then 100Lx), either before or after taking measurements.

3) Determine Rp resistances

① How to calculate

$$\gamma = \frac{R_{HLBV-1}}{R_{HLBV5}} \cdots\cdots [1] \qquad \alpha = \frac{R_{HBV5}}{R_{LBV5}} \cdots\cdots [2]$$

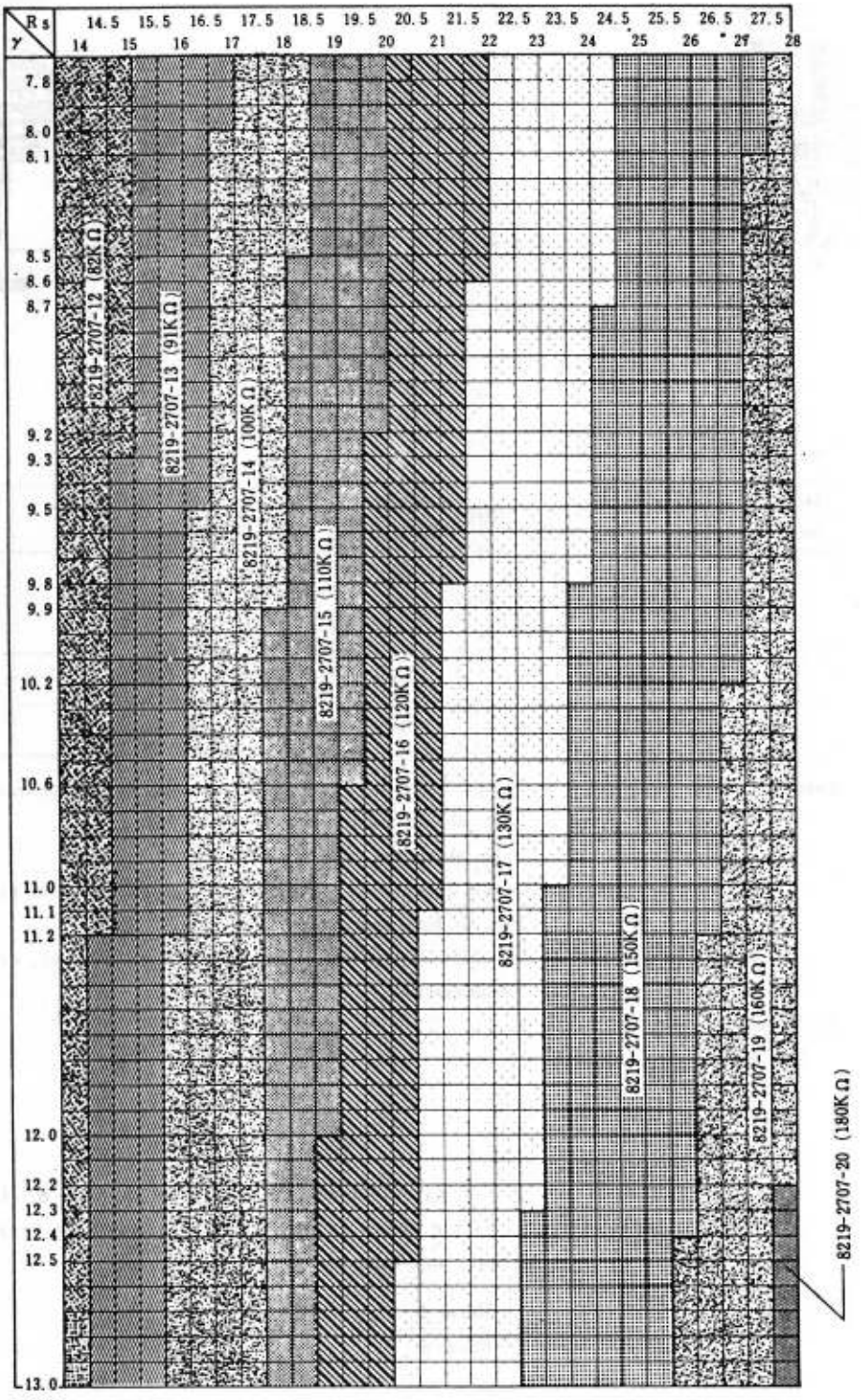
Check to see if results of calculations are: $\gamma = 7.8 \sim 13$, $\alpha = 8 \sim 12$

If the results are not within these ranges, change forward or rear CdS cell, or reverse their positions, and take measurements again.

$$Rp = R_{HLBV5}\left(0.1058 \times \frac{R_{HLBV-1}}{R_{HLBV5}} + 4.77\right) \cdots\cdots [3]$$

② How to determine of R_P value from table.

$$R_S = R_{HLBV\,5}, \quad \gamma = \frac{R_{HLBV\text{-}1}}{R_{HLBV\,5}}$$



③ Choose a resistor having the closest resistance to the values calculated in ① or ② above.

8219-2707-11	75KΩ
8219-2707-12	82KΩ
8219-2707-13	91KΩ
8219-2707-14	100KΩ
8219-2707-15	110KΩ
8219-2707-16	120KΩ
8219-2707-17	130KΩ
8219-2707-18	150KΩ
8219-2707-19	160KΩ
8219-2707-20	180KΩ

4) Solder all the CdS cell terminals, except the C terminal of the rear CdS cell, to the Printed base plate.

4. R_1 Adjustment (25μA adjustment)

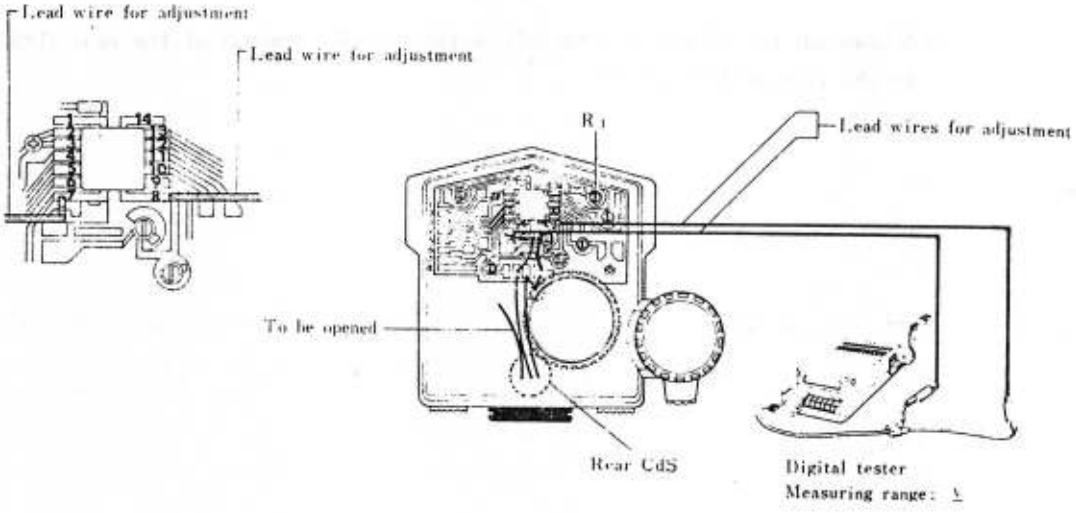
1) Affix 8219-2707 after calculating Rp resistance.

2) When the CdS cell circuit is opened (rear CdS cell C terminal disconnected from printed base plate), measure the voltage between IC terminals 7 and 8 with the digital tester when the finder is working, and adjust R_1 to give an Amv voltage. Use Amv of Table-2 to adjust voltage according to circumferential temperature.

Table-2

Temperature	10℃ ±2.5℃	15℃ ±2.5℃	20℃ ±2.5℃	25℃ ±2.5℃	30℃ ±2.5℃	35℃ ±2.5℃	40℃ ±2.5℃
Voltage A (mv)	368.0mv ± 2mv	374.5mv ± 2mv	381.0mv ± 2mv	387.5mv ± 2mv	394.0mv ± 2mv	400.5mv ± 2mv	407.0mv ± 2mv

Fig. 23



Note: 1. Connecting lead wires to IC terminals 7 and 8 simplifies taking voltage measurements. See Fig. 23.

2. As soldering raises the temperature, do not begin making adjustments immediately after soldering.

3. If Digital Tester Model 2507 is not available, use a high input resistance digital tester (higher than 10MΩ).

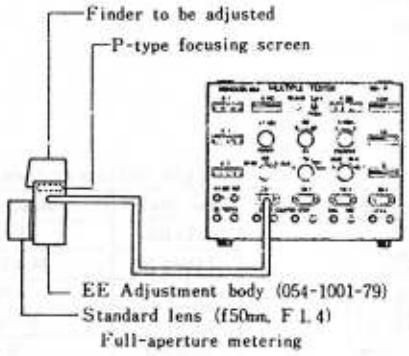
4. Maintain a constant room temperature.

5. R_2 Adjustment (Diaphragm and ASA Adjustment)

1) Prepare equipment and materials as shown in Fig. 24.

2) After setting up as shown in Figs. 24 and 25, turn diaphragm ring of standard lens 521 (F 1.4, f 50mm) and adjust by turning R_2 so that the voltage difference between each stop, from F 1.4 to F 16, is B mv, according to Table-3.

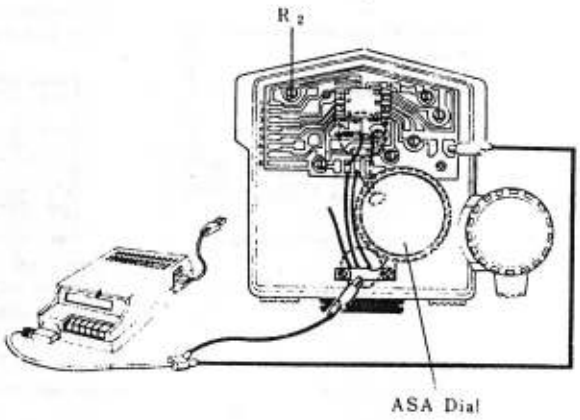
Fig. 24



Multiple tester switches position

Switches	Position
V-1ADJ	V − 1 = 3 V
POWER	MAIN
4337	IN
SS	Free
A-MSW	M
COUNTER	N
SW1PVSW	PV SW

Fig. 25



① Measure voltage with diaphragm ring at F 1.4.

② Measure voltage with diaphragm ring at F 16.

③ Adjust R_2 by turning so that voltage ① − ② = B (mv).

Use Table-3 to determine B mv depending on circumferential temperature.

Table-3

Temperature	10℃ ±2.5℃	15℃ ±2.5℃	20℃ ±2.5℃	25℃ ±2.5℃	30℃ ±2.5℃	35℃ ±2.5℃	40℃ ±2.5℃
Voltage C (mv)	106.0	107.9	109.7	111.6	113.5	115.3	117.2
Voltage B (mv)	17.1± 3	17.4± 3	17.7± 3	18.0± 3	18.3± 3	18.6± 3	18.9± 3

3) Setting equipment and materials as shown in Figs. 24 and 25, check by turning diaphragm ring to see if the voltage difference between each stop, from F 2.8 to F 16, equals C mv per 1 EV. Use Table-3 to determine C mv depending on circumferential temperature.

4) Setting equipment and materials as shown in Figs. 24 and 25, check by turning ASA dial to see if the voltage difference is equal to

$$\frac{\text{C mv} \times \text{ASA stop number} \pm 3\text{ mv}}{\text{ASA stop number}}$$

Use Table-3 to determine C mv depending on circumferential temperature.

If the measured voltage difference is not within the appropriate range, repeat the String Length Adjustment. Then check sections 5-2) and 5-3).

Note: 1. If it is difficult to take measurements under the conditions shown in Fig. you may connect the lead wires to connective contact No. 2 and the printed base plate.

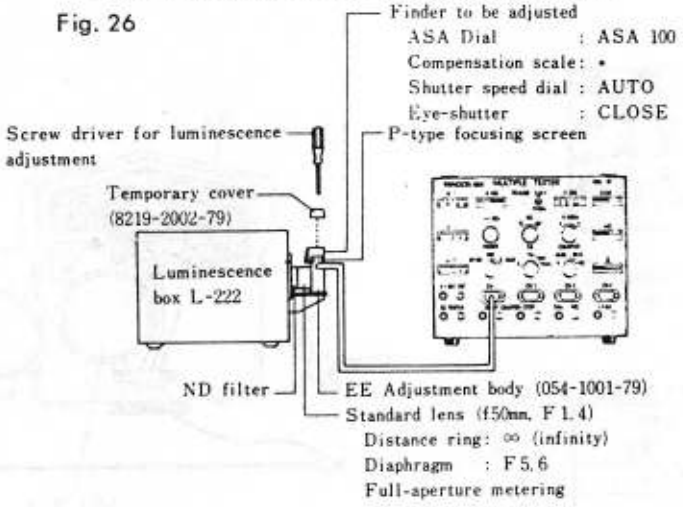
2. Maintain a constant circumferential temperature.

5) Re-affix by soldering all the CdS cell terminals (see WIRING SCHEMATIC DIAGRAM).

6. Rs and R_L Adjustment (Luminescence Correction Linearity Adjustment)

1) Prepare equipment and materials as shown in Fig. 26. Use ND filter only Rs adjustment, remove it when R_L adjustment.

Fig. 26



Multiple tester switches position

Switches	Position
V-1ADJ	V−1=3V
POWER	MAIN
4337	IN
SS	Free
A-MSW	A
COUNTER	N
SW1PVSW	PV SW

2) Rs Adjustment

Set the luminescence box to EV 5 (ASA 100). Adjust Rs to give the voltage between IC Terminals 7 and 8 a value of E_{BV-1}, after 75 seconds of exposure to luminescence box. (See Fig. 27.)

$$E_{BV\,5} = D\ \left(-8.08\frac{R_{HLBV-1}}{R_{HLBV\,5}} + 2.75 \times \frac{R_{HBV\,5}}{R_{LBV\,5}} - 124\right) \cdots\cdots [4]$$

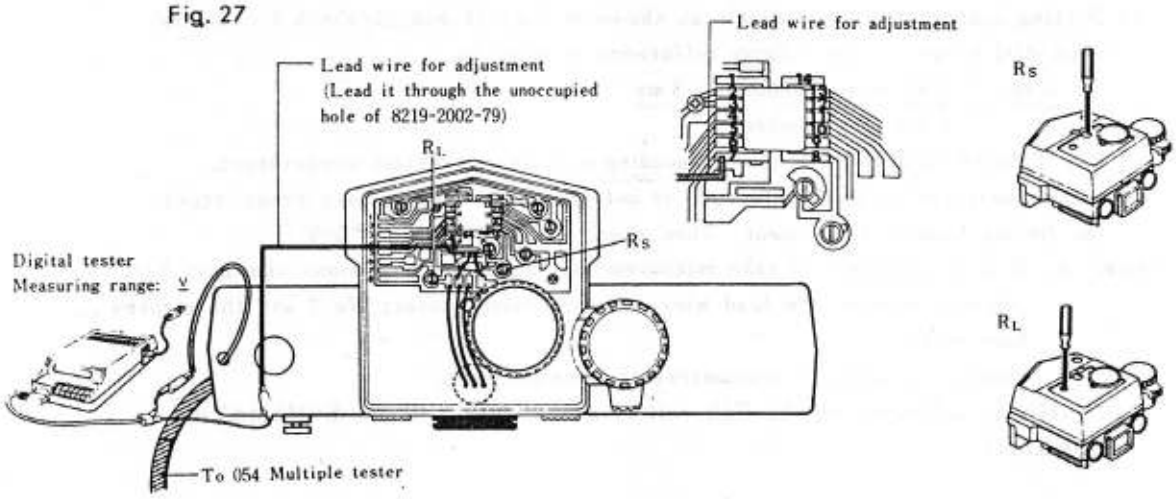
$$E_{BV-1} = E_{BV\,5} - F \cdots\cdots [5]$$

To determine R_{HLBV-1}, R_{HLBV-5}, $R_{HBV\,5}$, and $R_{LBV\,5}$, the resistances caloulated in 3-2) above should be used. Use Table-4 to determine D and F, according to circumferential temperature.

Table-4

Temperature	10℃±2.5℃	15℃±2.5℃	20℃±2.5℃	25℃±2.5℃	30℃±2.5℃	35℃±2.5℃	40℃±2.5℃
Coefficient D	0.950	0.966	0.983	1.000	1.017	1.034	1.050
Coefficient F	103.6	105.4	107.2	109.0	110.8	112.6	114.4

Fig. 27



3) R_L Adjustment

Change luminescence to EV 15 (ASA 100). Adjust R_L to give the voltage between IC Terminals 6 and 7 a value of $E_{BV\,10}$. (See Fig. 27.)

$$E_{BV\,10} = E_{BV\,5} + G \quad \cdots\cdots [6]$$

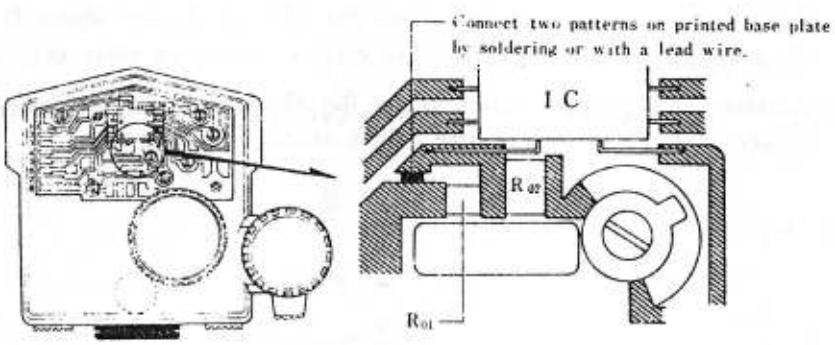
For $E_{BV\,5}$, use the value which was calculated using formula [4].
Use Table-5 to determine G, according to circumferential temperature.
Table-5

Temperature	10℃±2.5℃	15℃±2.5℃	20℃±2.5℃	25℃±2.5℃	30℃±2.5℃	35℃±2.5℃	40℃±2.5℃
Coefficient G	86.5	88.0	89.5	91.0	92.5	94.0	95.5

4) Recheck Rs adjustment 6-2) and readjust by turning if necessary. Recheck R_L adjustment 6-3) and readjust by turning if necessary. Continue readjusting until correct values are achieved for both.

5) If Rs and R_L are not adjustable by turning, short R_{01} and adjust, again following instructions 6-2)~4). (See Fig. 28.)

Fig. 28



Note: 1. Measuring values of Rs and R_L is simplified if a lead wire is connected to IC Terminal 7.

2. If Digital Tester Model 2507 is not availbale, use a high input resistance digital tester (higher than 10 MΩ).

3. If R_{01} is shorted, begin adjustments after it has been allowed to cool from the heat of soldering.

4. Maintain a constant circumferential temperature.

7. R_4 Adjustment (Luminescence correction parallelity adjustment)

1) Prepare equipment and materials as shown in Fig. 29.

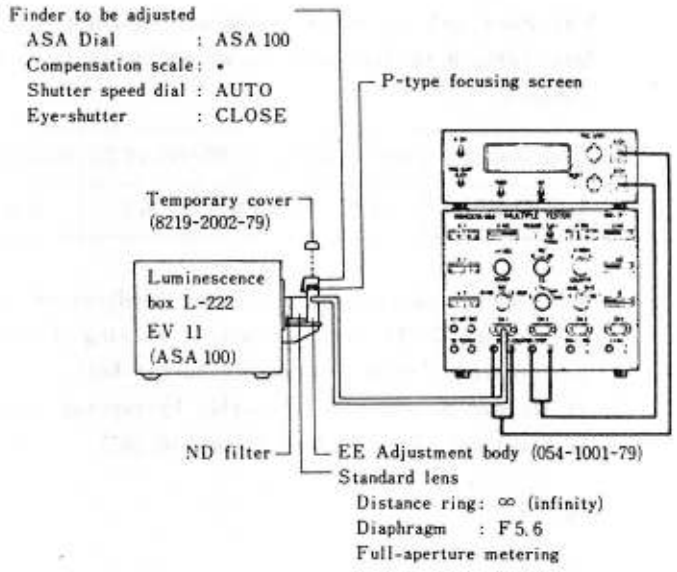
Fig. 29

Digital time counter switches and dial position

Switches & Dial	Position	
POWER	ON	
SEP-COM	SEP	
TRIG-LEVEL	A CH	B CH
	−0.5 — −1 (V)	−0.5 — −1 (V)
TRIG-SLOP	A CH	B CH
	⊖	⊕

Multiple tester switches position

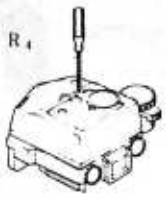
Switches	Position
V-1ADJ	V − 1 = 3 V
POWER	MAIN
4337	IN
SS	Free
A-MSW	A
COUNTER	N
SW1PVSW	PV SW



Refer to instruction manuals of the 054 Multiple Tester Model MT-I and the Digital Time Counter Model TC-I if more details concerning their usages are required.

2) Activate "RELEASE" switch of the 054 Multiple Tester and adjust R_4 by turning to give a 21.25 ± 2 ms. reading on the digital time counter.

Fig. 30



8. Luminescence correction check

1) Prepare equipment and materials as shown in Fig. 31.

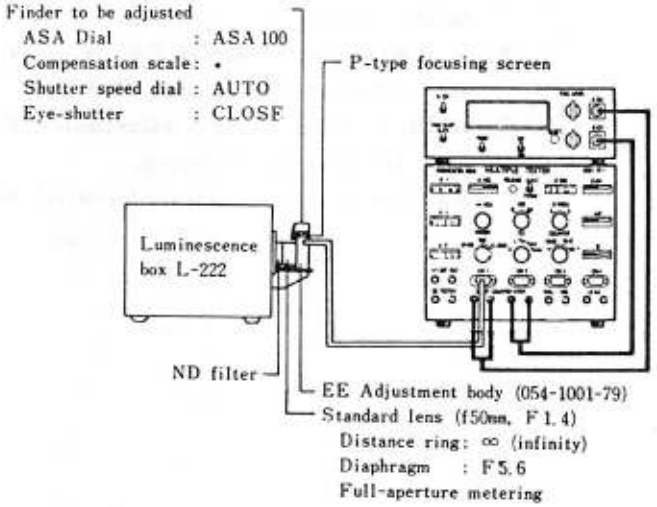
Fig. 31

Digital time counter switches and dial position

Switches & Dial	Position	
POWER	ON	
SEP-COM	SEP	
TRIG-LEVEL	A CH	B CH
	−0.5 — −1 (V)	−0.5 — −1 (V)
TRIG-SLOP	A CH	B CH
	⊖	⊕

Multiple tester switches position

Switches	Position
V-1ADJ	V − 1 = 3 V
POWER	MAIN
4337	IN
SS	Free
A-MSW	M
COUNTER	N
SW1PVSW	PV SW



2) Following the order in Table-6, check to see if time of shutter speed is in the 0.45 EV range. If shutter speed is not within the appropriate range, repeat luminescence correction.

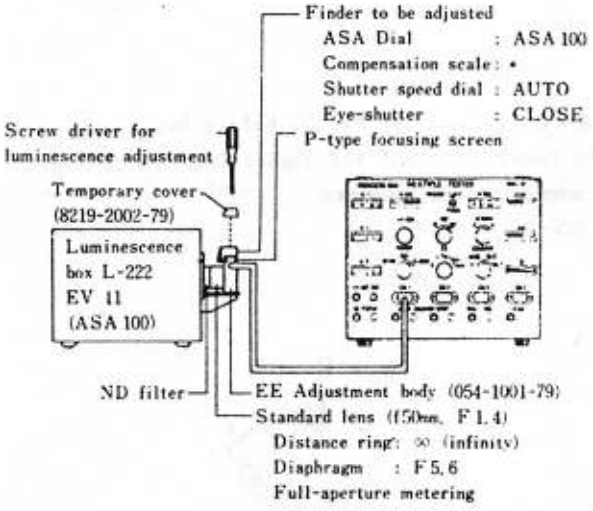
Table-6

Order of Measurements	Luminescence Box (L-222)	N.D filter	Measured Luminescence	Shutter speed shown on Digital Time Counter (m.sec.)		
				−0.45Ev	Basic time	+0.45Ev
①	Ev 5 (ASA 100)	Yes	Bv-1	1435	2000	2732
②	Ev 9 (ASA 100)	Yes	Bv 3	91.5	125	171
③	Ev 11 (ASA 100)	Yes	Bv 5	22.9	31.2	42.7
④	Ev 14 (ASA 100)	Yes	Bv 8	2.86	3.91	5.34
⑤	Ev 15 (ASA 100)	No	Bv 10	0.72	0.976	1.33

9. R_3 Adjustment (Meter Needle Adjustment)

1) Prepare equipment and materials as shown in Fig. 32.

Fig. 32



Multiple tester switches position

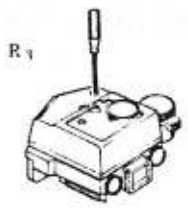
Switches	Position
V-1ADJ	V − 1 = 3 V
POWER	MAIN
4337	IN
SS	Free
A-MSW	A
COUNTER	N
SW1,PVSW	PV SW

2) Looking through viewfinder, adjust R_3 by turning so that needle points to 1/30 sec.

If needle does not point to 1/30sec as shown in Fig. 33, be sure adjustment well-balanced an error of the meter needle, for each shutter speed value by turning the R_3.

Fig. 33

Fig. 34

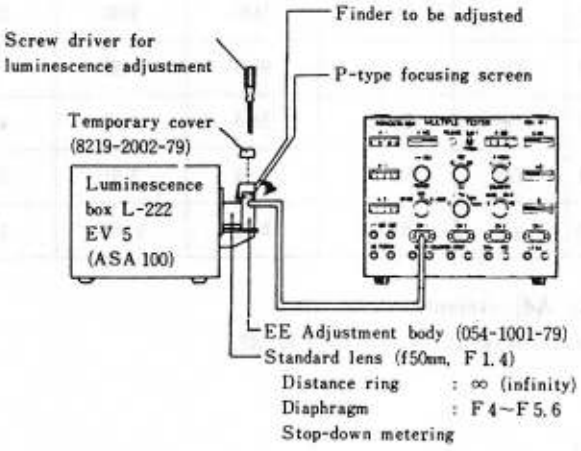


Caution: Care about the parallax when looking through the viewfinder.

10. R_{02} Adjustment (Warning Signal Adjustment)

1) Prepare equipment and materials as shown in Fig. 35.

Fig. 35



Multiple tester switches position

Switches	Position
V-1ADJ	V − 1 = 3 V
POWER	MAIN
4337	IN
SS	Free
A-MSW	M
COUNTER	N
SW1,PVSW	SW1

2) Wait more than 75sec. after setting up as shown in Fig. 35 before beginning. Using a standard lens, adjust R_{02} by turning so that the signal does not pulstate at F 4; between F4 and F 5.6, the signal should pulstate.

Basic value: LED pulsating at BV-3~−3.5

Fig. 36

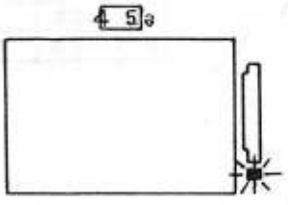


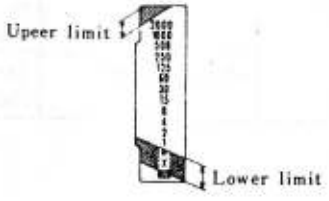
Fig. 37

Note: Because these measurements are taken using a low luminescence, take care to prevent exposure from outside light which might enter through the gap between the luminescence plane and the lens, through the counter light of the eyepiece, through unused holes of the Temporary cover, etc.

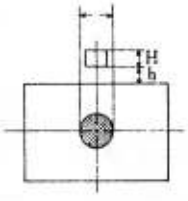
11. With full aperture metering, if shutter speed correctly corresponds to ASA sensitivity, diaphragm ring setting and luminescence.

CHECK LIST (8219-200)

Part	Item to be Checked	Checks and Corrective Measures (Standards or Specifications)
Mounting, dismounting & operation	Mounting & dismounting	Must be readily and accurately mounted or dismounted without any coupling play.
	Operation	With 8219-200 mounted on the camera body, release the shutter to check that it operates correctly both at the "AUTO" and "MANUAL" positions.
	Focusing screen pressing spring	The spring should be strong enough to hold the focusing screen securely in place.
Speed dial	Turning	When turning the speed dial with it mounted on the camera body, be sure there are no abnormal clicks or noises. Also, the dial should turn smoothly in either direction.
	Index matching	Each shutter speed value should be aligned with the center of the index.
ASA dial	Turning	Must turn smoothly in either direction without any abnormal clicks or noises. It should stop completely at ASA 12 and ASA 6400 and shold not go beyond them.
	Index matching	ASA dial and index……The ASA dial plate should be in the center of the red index. ASA helped plate and window……When the specified correction value is set, the set value should be within the window and the other values outside the window when viewed from top.
ASA helped plate	Operation	By pulling up the ASA dial and turning it, be certain that there are no hitches at heavy pull in either operation.
	Correction	For the values to be corrected, see the item, "Index Matching of ASA Dial".
Main switch	Operation	With the main switch mounted on the camera body, turn it on and off repeatedly to check that the needle operates correctly in both the on and off positions. Also, be sure that it turns smoothly.
	Changing angle	The main switch should be turned on or off at the center of the turning angle.

Part	Item to be Checked	Checks and Corrective Measures (Standards or Specifications)
Needle	Operation	Mount it on the camera body and check that it operates smoothly under any luminescence. Also, be certain that it changes correctly when turning the ASA dial or F-number ring.
	Balance	Turn off the switch to reset the needle of its original position. When inclining the camera back and forth and horizontally from the usual camera posture, be sure that the needle does not move noticeably.
	Friction	Apply a light source to the needle so that it reaches more than two-thirds the total length of the shutter speed scale in ordinary use. Gradually decrease the luminescence to zero until the needle comes to a standstill, tap the camera to check that there is no noticeable movement of the needle.
	Response time	Suddenly apply light to the needle so that it is positioned at about two-third of the shutter speed scale in ordinary use from its condition when light is cut off. At this time, be sure that the needle reaches the range of ±1/3Ev to the standstill point in less than 3 seconds. Also, apply light to the needle so that it points to the values of 2 to 4 in ordinary use. When the light is suddenly cut off after the needle has stopped, be certain that the needle is out of the range of the values 1 in less than 7 seconds.
	Stopper position	When the needle is positioned uppermost, it should be off the value of 2000 but within the field of view. When it returns to its original position (when the switch is turned off), it should be below B. See Fig. 1. Fig. 1 
	Adhesion	When the needle begins to move off the stop (either opper or lower limit), be sure that it moves smoothly under any luminescence without any adhesion to the stop.
	Matching with following needle	When the needle is positioned anywhere, it should be within the width of the following needle.
Following needle	Operation	By turning the speed dial from the "AUTO" position to "2000", check that the following needle moves smoothly without any hitch.
	Position	Be sure that the following needle is within the correct value at any position of "AUTO" to "2000".

<table>
<tr><th>Part</th><th>Item to be Checked</th><th>Checks and Corrective Measures (Standards or Specifications)</th></tr>
<tr><td>Auto exposure</td><td>Exposure time</td><td>Based on the procedures in the "Luminescence Correction Check" of Adjustment 9-8, check exposure time. The results must be within the permissible ranges shown in the following table.
<table>
<tr><th rowspan="2">Luminescence preset on luminescence box</th><th colspan="2">Time counter indication</th></tr>
<tr><th>Standard shutter speed (ms)</th><th>Permissible range (ms)</th></tr>
<tr><td>EV 5</td><td>2000</td><td>1435 ~ 2732 (±0.45EV)</td></tr>
<tr><td>EV 9</td><td>125</td><td>91.5 ~ 171 〃</td></tr>
<tr><td>EV 11</td><td>31.2</td><td>22.9 ~ 42.7 〃</td></tr>
<tr><td>EV 14</td><td>3.91</td><td>2.86 ~ 5.34 〃</td></tr>
<tr><td>EV 15</td><td>0.976</td><td>0.72 ~ 1.33 〃</td></tr>
</table>
Note: Measure the above except EV 15 using an ND filter.</td></tr>
<tr><td>Warning lamp</td><td>Lighting</td><td>Mount the warning lamp on the camera body (with a 50mm/1.4 attachment), set the lens range at infinity and the F-number at F 4. By stopping down the lens, give a luminescence of Ev 5 to the lamp from the luminous analyzer (L-222) and after 75 seconds, check the following:
The warning lamp does not light at F 4 but it should light in the intermediate between F 4 and F 5.6.</td></tr>
<tr><td></td><td>Lamp position</td><td>The lamp must be positioned to provide an even and adequate light to the window located under the shutter speed scale.</td></tr>
<tr><td>Override dial</td><td>Operation</td><td>With the depression of the lever, operate the over-ride dial to check that the dial operates smoothly without any jolt, creak at hitch.</td></tr>
<tr><td></td><td>Release</td><td>The lever should return to its original position wherever it is released during exposure correction. At this time, the needle position must remain unchanged from that prior to the lever release.</td></tr>
<tr><td></td><td>Correction amount</td><td>Put the override dial on the body and check the movement of the needle by operating the lever. Be sure the needle moves smoothly according to the lever operation and that the movement of the needle at the position where the lever stops is within $2^{+0.5}_{-0}$ (Ev) for the over and under sides.</td></tr>
</table>

Part	Item to be Checked	Checks and Corrective Measures (Standards or Specifications)
Meter coupler	Operation	Must operate in either direction for both going and returning smoothly without any hitch. Particularly when returning, it should be forced back to zero when the finger is released from it.
	Locking	Must be locked in accurately. When mounted on the body while it remains locked, the coupler is unlocked and returns to the position of a specific F-number.
Visible in-finder (F-number)	Window position	For the position of the F-number frame to the eyepiece frame, the vertical deviation (h) should be in the range of 0.5 to 1.5H to the height (H) of the F-number frame, as shown in Fig.2. For the horizontal position, the width of the F-number frame should be within that of the microprism or split-image on the focusing screen. See Fig. 2. Fig. 2 
	F-number observation	Must be mounted on the body (with the lens attached) and there should be no horizontal and vertical deviations in F-numbers.
Shutter speed scale	Appearance	Each value must be readily read and free of blur or unevenness in size (thick or thin).
	Position	The scale should be positioned correctly without any no image cutoff or tilt.
Eye-shutter	Operation	On operating the switch button, be sure that the shutter opens or closes smoothly without any hitch. When opened, it should not be seen from the eyepiece position. When closed, it must securely overlap the eyepiece.