Service Manual

AUTO WINDER D (8731-100)
AUTO WINDER G (8731-200)

Minolta

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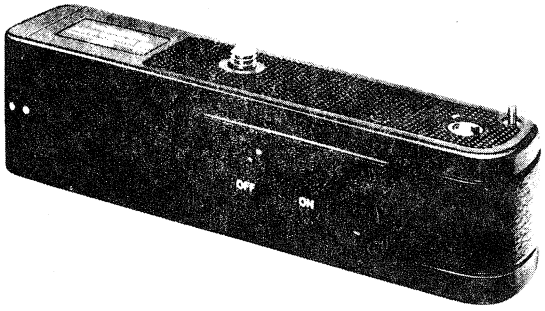
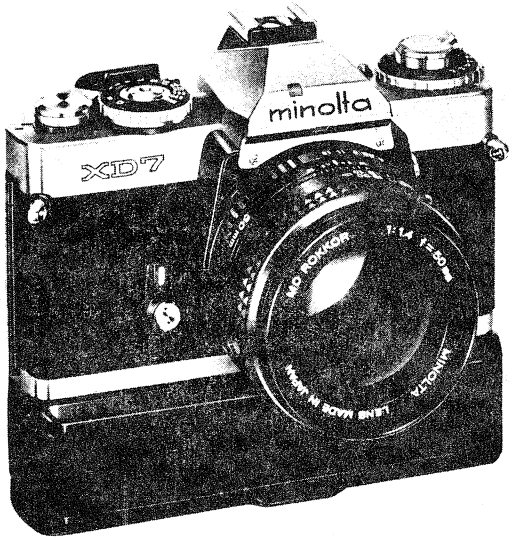
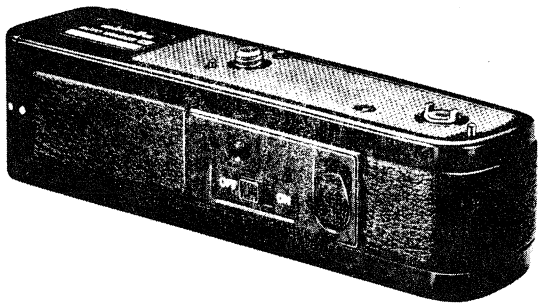
MINOLTA AUTO WINDER-D (8731-100)





Camera used	: MINOLTA XD, XD 7, XD 11 (2005)
Control mode	: Continuous photography (Single-frame photography possible by shutter button operation)
Frame speed	: About 2 frames per sec. max. in continuous photography.
Winding time	: About 0.4 sec.
Interlocking shutter speed	: All speeds (1 sec.~1/1000 sec. X. B. O.) (Single-frame photography at B and O)
Interlocking photography mode	: All modes
Operation system	: By camera's shutter button.
Power source	: 4 dry cells (UM-3) 6 V.
Battery capacity	: (36-frame film at normal temp.) Manganese battery ·····about 50 rolls Alkaline-manganese battery ·····about 70 rolls Ni-cd battery·····about 150 rolls
Film end detection	: Auto stop, LED indication (reset by power source switch).
Indication during operation	: LED indication during winding (used for auto stop indication).
Remote control	: Interlocked with remote control of camera.
Rewinding button	: Interlocked with rewind button of camera.
Size	: 136 (L) × 35 (H) × 37 (W) mm
Weight	: 205 g. (without battery)
Others	• Light-weight and compact using 4 dry cells (UM-3). • Equipped with a high efficiency coreless motor. • One-touch operation by cartridge type power source. • Simple controls. • Portable and easy to carry. • Inside components arranged in blocks.

MINOLTA AUTO WINDER-G (8731-200)



Camera used	: MINOLTA XG, XG 2, XGE (2006)
Control mode	: Continuous photography (single-frame photography possible by shutter button operation)
Frame speed	: About 2 frames per sec. max. in continuous photography.
Winding time	: About 0.4 sec.
Interlocking shutter speed	: All speed (1 sec.～1/1000 sec. Auto) (single-frame photography at B)
Interlocking photography mode	: All modes (M, Auto)
Operation system	: By camera's shutter button.
Power source	: 4 dry cells (UM-3) 6 V.
Battery capacity	: (36-frame film at normal temp.) Manganese battery ·····about 50 rolls Alkaline-manganese battery·····about 70 rolls Ni-cd battery·····about 150 rolls
Film end detection	: Auto stop, LED indication (reset by power source switch)
Indication during operation	: LED indication during winding (used for auto stop indication).
Remote control	: Interlocked with remote control of camera.
Rewinding button	: Interlocked with rewind button of camera.
Size	: 138 (L) × 35 (H) × 37 (W) mm
Weight	: 210 g (without battery)
Others	• Light-weight and compact using 4 dry cells (UM-3). • Equipped with a high efficiency coreless motor. • One-touch operation by cartridge type power source. • Simple controls. • Portable and easy carry. • Inside components arranged in blocks.

AUTO WINDER-D/G
Description of Mechanism

1. Winding Gear System and Operating Order

A. Reduction Gear System

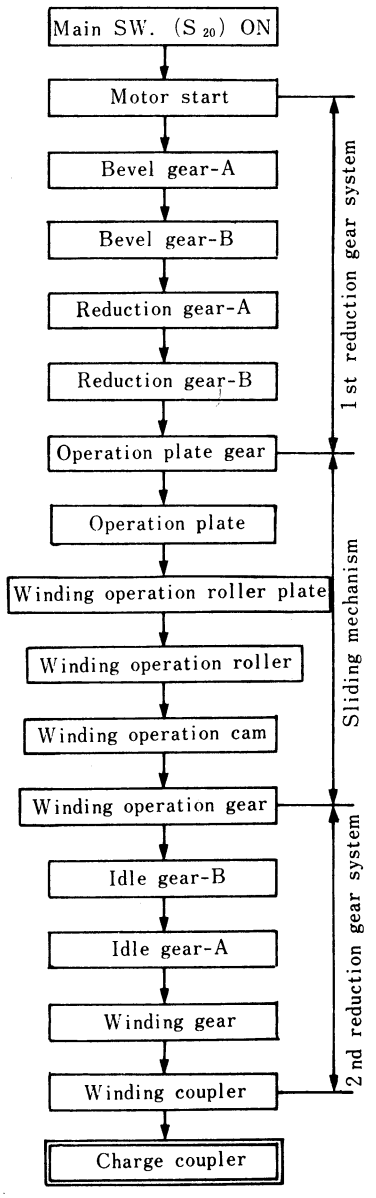
- The 1 st reduction gear system

  It ranges from the motor to the sliding mechanism, which serves to increase the motor power.

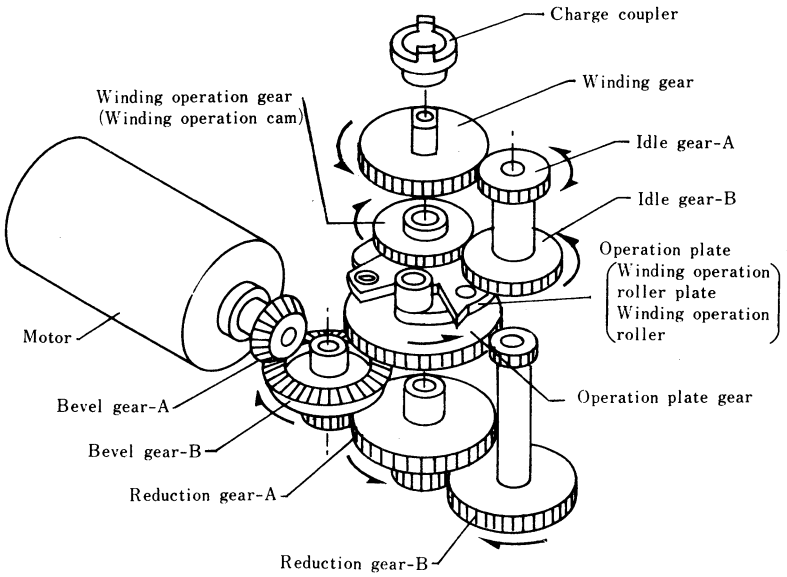
- The 2 nd reduction gear system

  It ranges from the sliding mechanism to the coupler, which serves to perform reciprocation at 130° at the coupler in accordance with the winding operation of the camera.

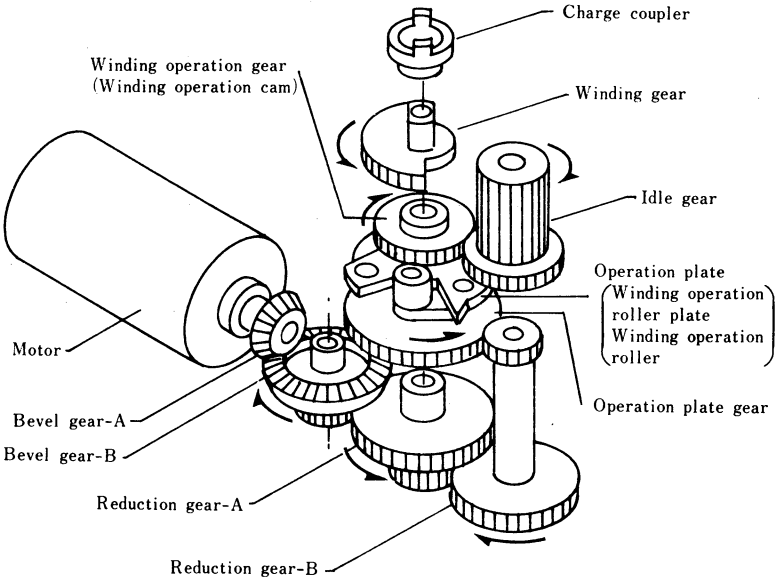
B. Operating Order and AUTO WINDER-D/G Winding Gear System



〈AUTO WINDER-D (8731-100)〉



〈AUTO WINDER-G (8731-200)〉

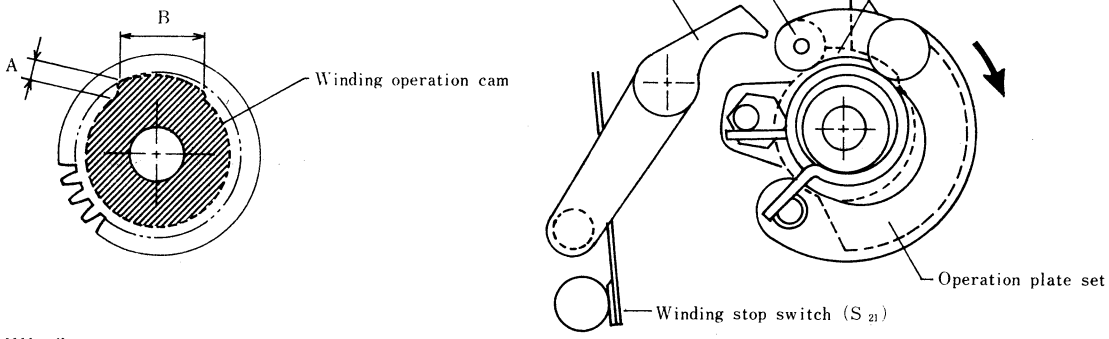


2. Sliding Mechanism

● Winding start

Winding coupler is engaged with charge coupler on the camera side. The winding mechanism is charged in the order of the 1st reduction gear system, sliding mechanism and 2nd reduction gear system as the motor is operated. The sliding mechanism with winding operation roller being in contact with face A of winding operation cam (Fig. 1) transmits the rotating power to the 2nd reduction gear system.

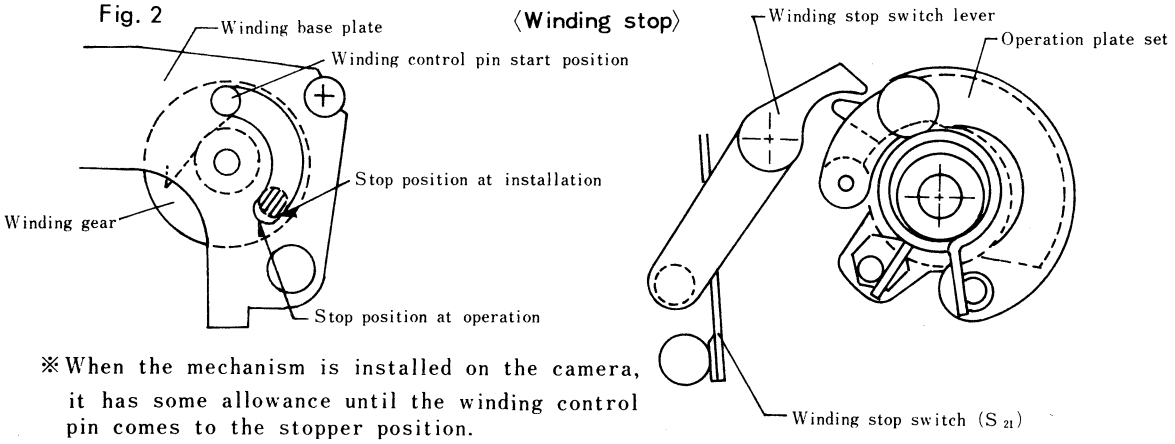
Fig. 1



● Winding stop

When winding has been completed, the winding gear stops at the stopper (camera side). Then the winding mechanism is completely charged on the camera side.
At that point, the charge coupler is not yet returned.

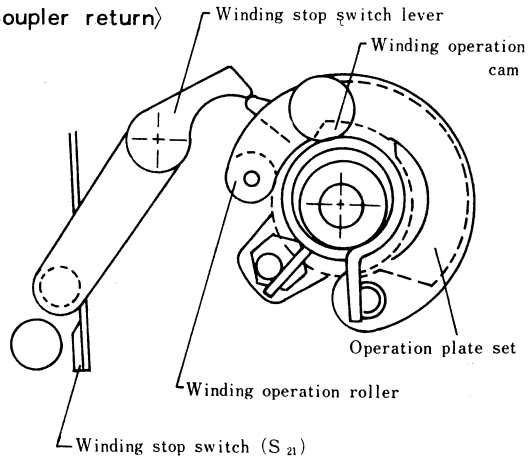
Fig. 2



※When the mechanism is installed on the camera, it has some allowance until the winding control pin comes to the stopper position.

● Coupler return

Winding gear stops but the motor is still operated rotating the operation plate gear. And the winding operation roller in the operation plate set goes over face A of winding operation cam and comes outo face B (Fig. 1). Then winding stop switch (S_{21}) is turned OFF for a moment by the function of winding stop switch lever, causing the motor to stop. At the time, when the operation plate roller reaches face B of winding operation com, the 2nd reduction gear system is freed and the winding control pin returns to the start position (Fig. 2) in the groove of winding base plate. At the same time, the charge coupler being engaged with the winding coupler also returns to the original position, getting reading for release operation.



3. AUTO WINDER-D Circuit Description

A. Operation of AUTO WINDER-D and Camera

When AUTO WINDER-D is mounted on camera (2005), one-frame photography is possible with the shutter speed dial set at B. O (dot), and continuous photography by shutter button operation with the dial set at X. 1～1/1000.

- Shutter release is mechanical at B. O, therefore, with shutter button depressed after releasing, winder switch (S_{14}) is kept OFF by the action of the exposure prevention lever, and then the winder is not operated because the exposure completion signal is not transmitted to the winder. Releasing the shutter button causes S_{14} to turn on to operate the winder. The operation is stopped by the mechanism in the winder to complete one-frame photography.
- Shutter release is magnetic at X. 1～1/1000, therefore, the exposure prevention lever does not act even with the shutter button depressed after releasing, and then the winder is operated with S_{14} ON to give the exposure completion signal. With winding completed (winding shaft completely returned), S_{14} is turned OFF and the winding completion signal is given to get ready for the operation of the next winding circuit and at the same time the exposure prevention switch (S_1) is turned ON for magnetic release operation. When the exposure completion signal is given, the next winding is started. After that, continuous operation is done by shutter button operation.
  The function of S_1 is to prevent exposure during magnetic release operation. It serves to suspend the magnetic release even with shutter button depressed unless winding is completed.

B. Description of Circuit

- **Winding preparation**

  C_1 is charged with power source voltage through R_3, and the circuit is ready for operation with S_{20} ON.

- **Winding start**

  When the exposure completion signal is given to the winder with S_{14} ON, the LED lights up and Tr_2 turns ON. Then the electric charge of C_1 flows through the circuit in the order of $C_1 \rightarrow Tr_2 \rightarrow R_4 \rightarrow R_5$ $(C_3) \rightarrow C_1$. Then trigger voltage is applied to the gate of SCR, thus operating the relay with both SCR and Tr_1 at ON, and the relay switch is set to M to operate the motor to start winding.

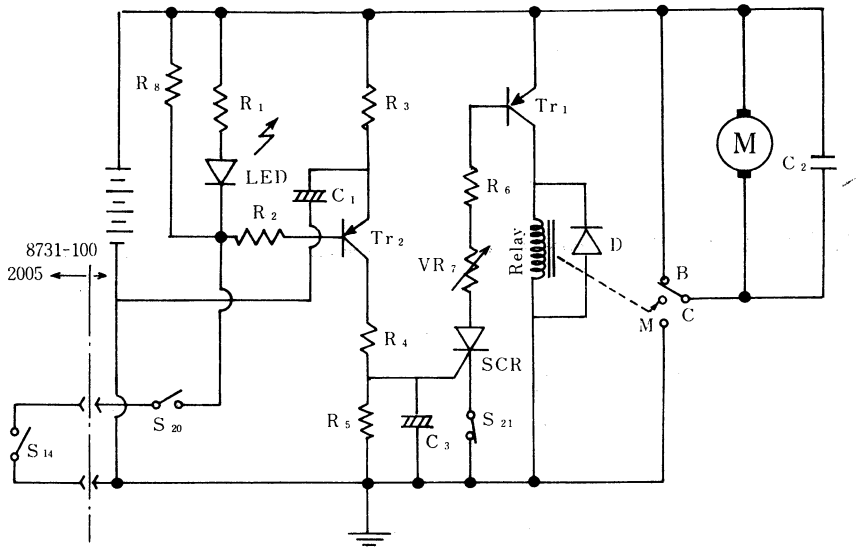
- **Winding stop**

  When the winder has completed winding, the sliding mechanism operates and the winding stop switch (S_{21}) is turned OFF for a moment and SCR is cut off.
  Then Tr_1 and relay are off and the relay switch is shifted to B to stop the motor.
  When the sliding mechanism operates, the winding coupler is returned to the start position by the function of spring, thus completing the winding on the camera side. Then S_{14} and Tr_2 are turned OFF, LED lighted and charging C_1 is started to get ready for the next winding.

- **Winding auto stop**

  If the film is ended during winding, the 1st reduction gear system is disengaged from the 2nd reduction gear system by the function of the sliding mechanism. Then only the 1st reduction gear system is rotated and S_{21} turns OFF for a moment to stop the motor. But because of winding operation on the camera side, S_{14} is ON, Tr_{20} ON and LED is lighted indicating the end of the film. In that case, set S_{20} to OFF and take out the film and again set S_{20} to ON, then the auto stop is released. (Even when manual winding is done without setting S_{20} to ON, auto stop is released because S_{14} is turned OFF, Tr_2 OFF, and C_1 charged.)

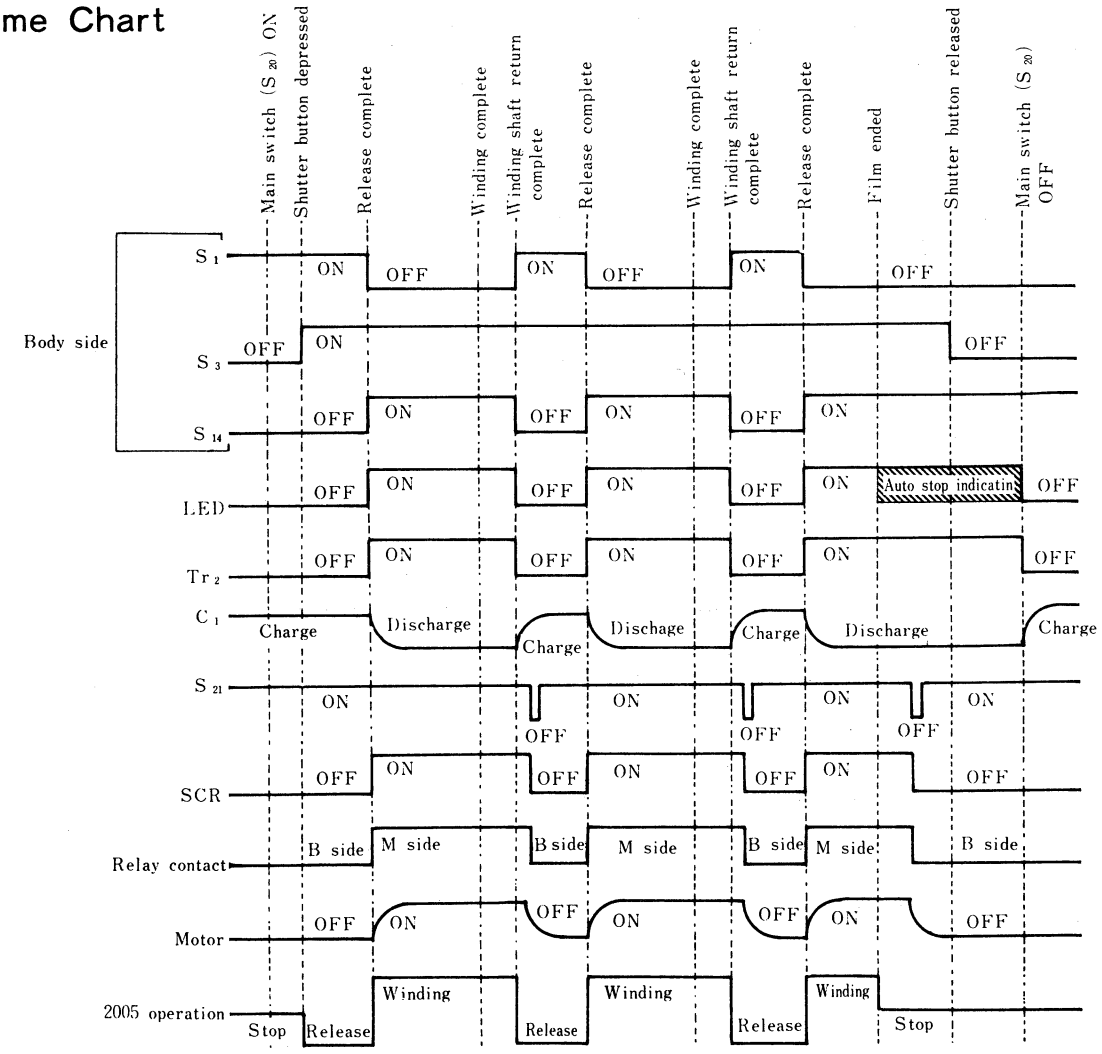
C. Circuit Diagram



D. Switches and Their Functions

Mark	Name	Functions
S_{14}	Winder switch	Transmits body-side signal to winder side to operate winder. ON with exposure completed and during winding; and OFF with winding completed.
S_{20}	Main switch	ON: preparation for circuit operation.
S_{21}	Winding stop switch	With winding completed on winder side, it turns OFF for a moment to cut off SCR.

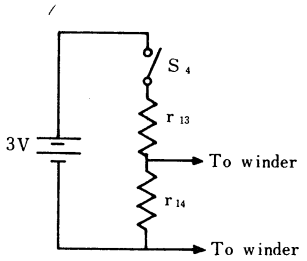
E. Time Chart



4. AUTO WINER-G Circuit Description

A. Operation of AUTO WINDER-G and Camera

Given from camera to winder are the winding signal and the exposure completion signal which are sent as change in voltage through the winder signal contact.
The signal is made by the reset switch (S_4) operation. When the switch is ON, the voltage is over 1 V, and when it is OFF, less than 0.2V.
The winder detects the signal on camera side through the winder signal contact, and does not start when the voltage is over 1V and starts when it changes from 1V to 0.2V. It is stopped by the mechanism in the Winder.



B. Description of Circuit

- **Winding preparation**

  C_1 is charged with power source voltage through R_3 irrespective of winder switch (S_{22}) and main switch (S_{20}). When winder is mounted on the body, winder switch (S_{22}) turns OFF, Tr_4 is ready for operation, and the circuit is ready for operation with main switch (S_{20}) set at ON.

- **Winding start**

  Reset switch (S_4) turns OFF on completion of exposure on camera side. When the voltage at winder signal contact is less than 0.2 V, Tr_3 turns ON followed by Tr_4, Tr_5, and LED is lighted. At the same time, Tr_2 turns ON, then the charge of C_1 flows through the circuit in the order of $C_1 \rightarrow Tr_2 \rightarrow R_4 \rightarrow R_5 \rightarrow C_1$.
  Then trigger voltage is applied to the gate of SCR for a moment, thus operating the relay with both SCR and Tr_1 at ON, and the relay switch is shifted to M to operate the motor to start winding.

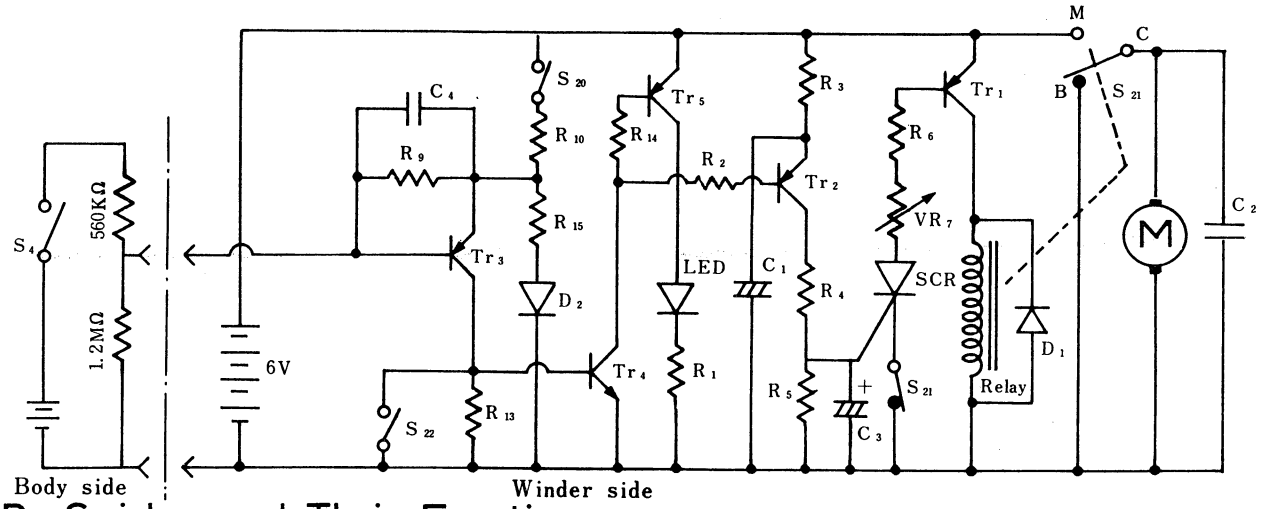
- **Winding stop**

  When the winder has completed winding, the sliding mechanism operates and winding stop switch (S_{21}) is turned OFF for a moment to cut off SCR, and relay switch is shifted to B with Tr_1 and relay at OFF, then the motor stops quickly. When the sliding mechanism operates, the winding coupler is returned to the start position by the function of spring to complete winding on camera side. Then reset switch (S_4) turns ON and the voltage at the winder signal contact becomes over 1 V, and Tr_3, Tr_4, Tr_5, and Tr_2 are turned OFF, LED OFF, C_1 charged, thus getting ready for the next winding.

- **Winding auto stop**

  If the film is ended during winding, the 1st reduction gear system is disengaged from the 2nd reduction gear system by the function of the sliding mechanism. Then only the 1st reduction gear system is rotated and winding stop switch (S_{21}) turns OFF for a moment to stop the motor.
  But because of winding operation on the camera side, reset switch (S_4) is OFF, Tr_3, Tr_4, Tr_5, and Tr_2 are ON, and LED is lighted indicating the end of the film. In that case, set S_{20} to OFF, take out the film and again set S_{20} to ON, then auto stop is released. (Even when manual is done without setting S_{20} to ON, auto stop is released.)

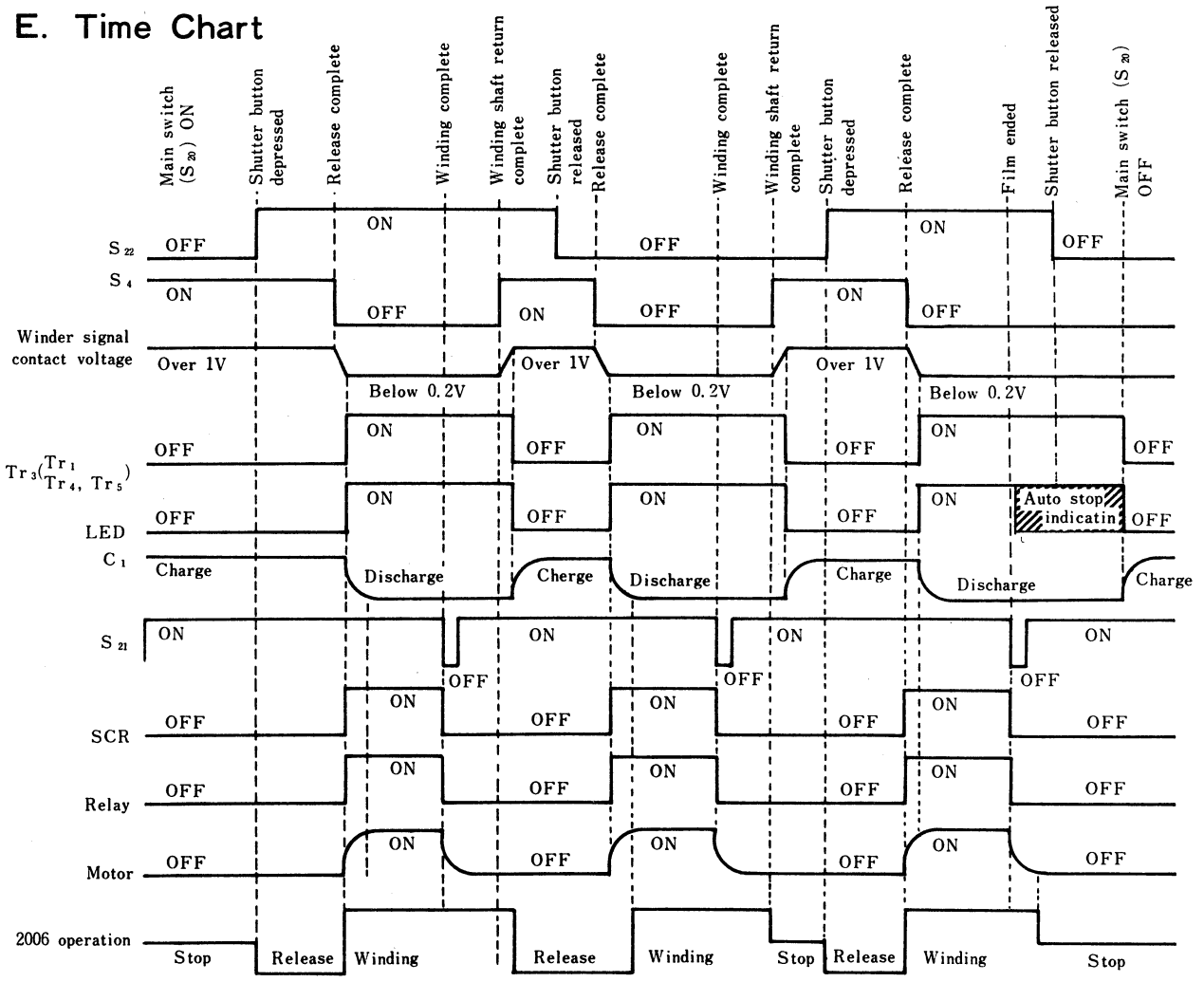
C. Circuit Diagram



D. Swiches and Their Functions

Mark	Name	Functions
S_4	Reset switch	ON with winding completed, and OFF with exposure completed.
S_{20}	Main switch	ON: preparation for circuit operation.
S_{21}	Winding stop switch	With winding completed on winder side, it turns OFF for a moment to cut off SCR.
S_{22}	Winder switch	OFF with winder mounted on camera, and ON with winder only, suspending Tr_4, even when winder terminals touched.

E. Time Chart



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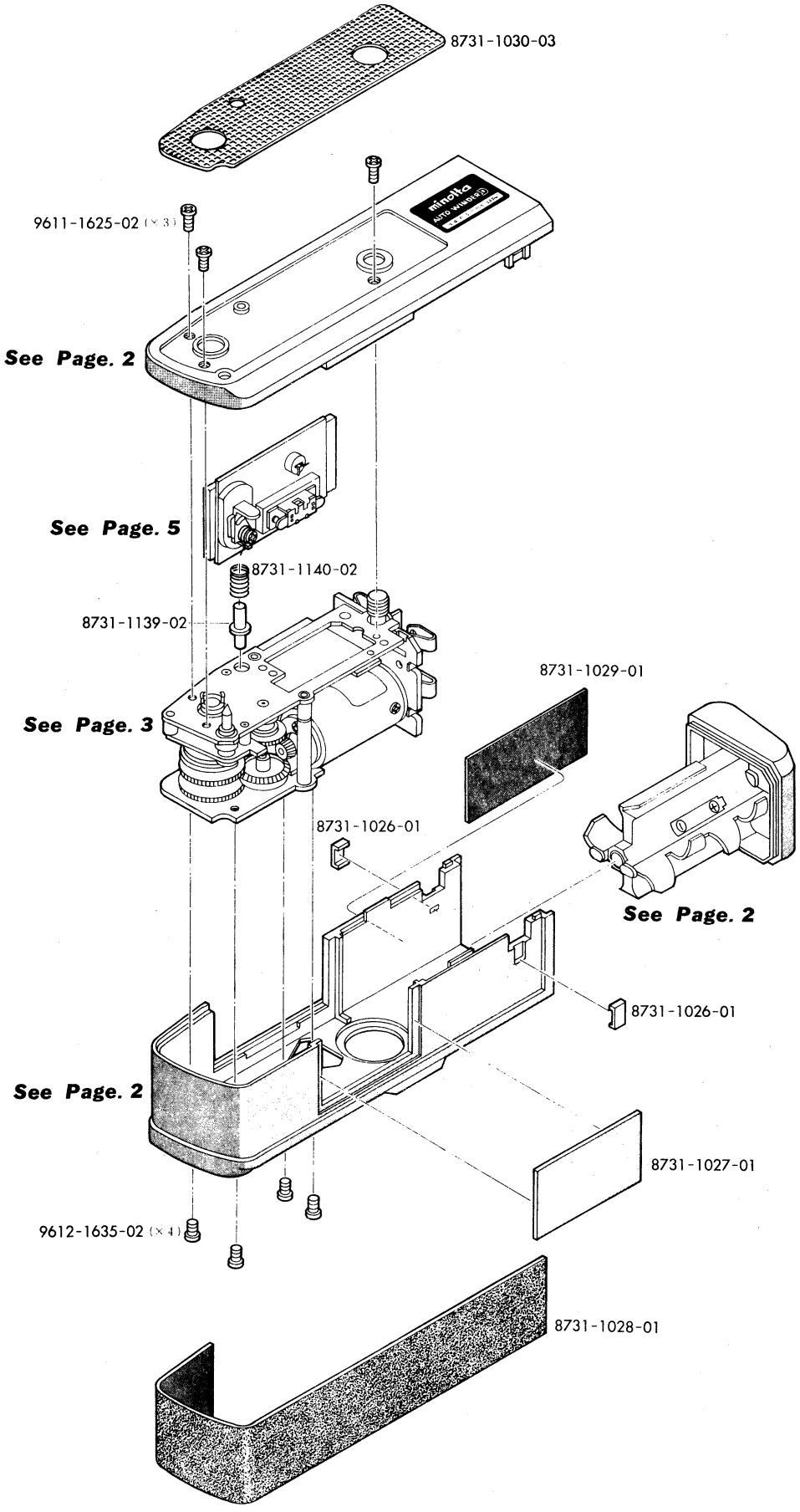
MINOLTA AUTO WINDER-D

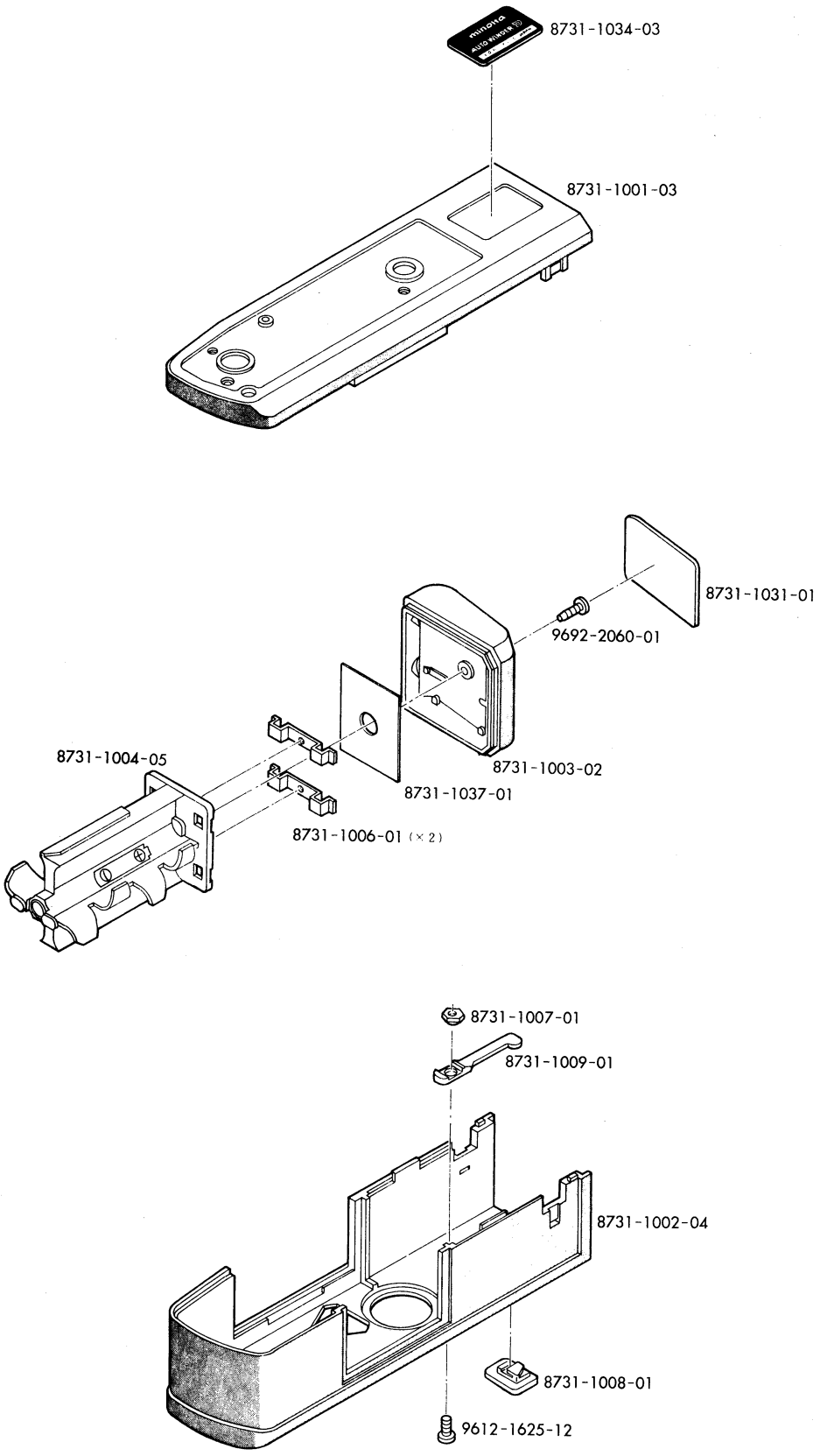
CODE No. 8731-100



Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-1026-01	Coupling plate 上下ケース継ぎ板	2
8731-1027-01	Motor cover モーターカバー	1
8731-1028-01	Leather-A 貼皮A	1
8731-1029-01	Leather-B 貼皮B	1
8731-1030-03	Leather-C 貼皮C	1
8731-1139-02	R-button axis R釦軸	1
8731-1140-02	R-button spring R釦スプリング	1
9611-1625-02	Phillips type screw 十字穴付なべ頭小ねじ	3
9612-1635-02	Phillips type screw 十字穴付なべ頭小ねじ	4

MINOLTA AUTO WINDER-D

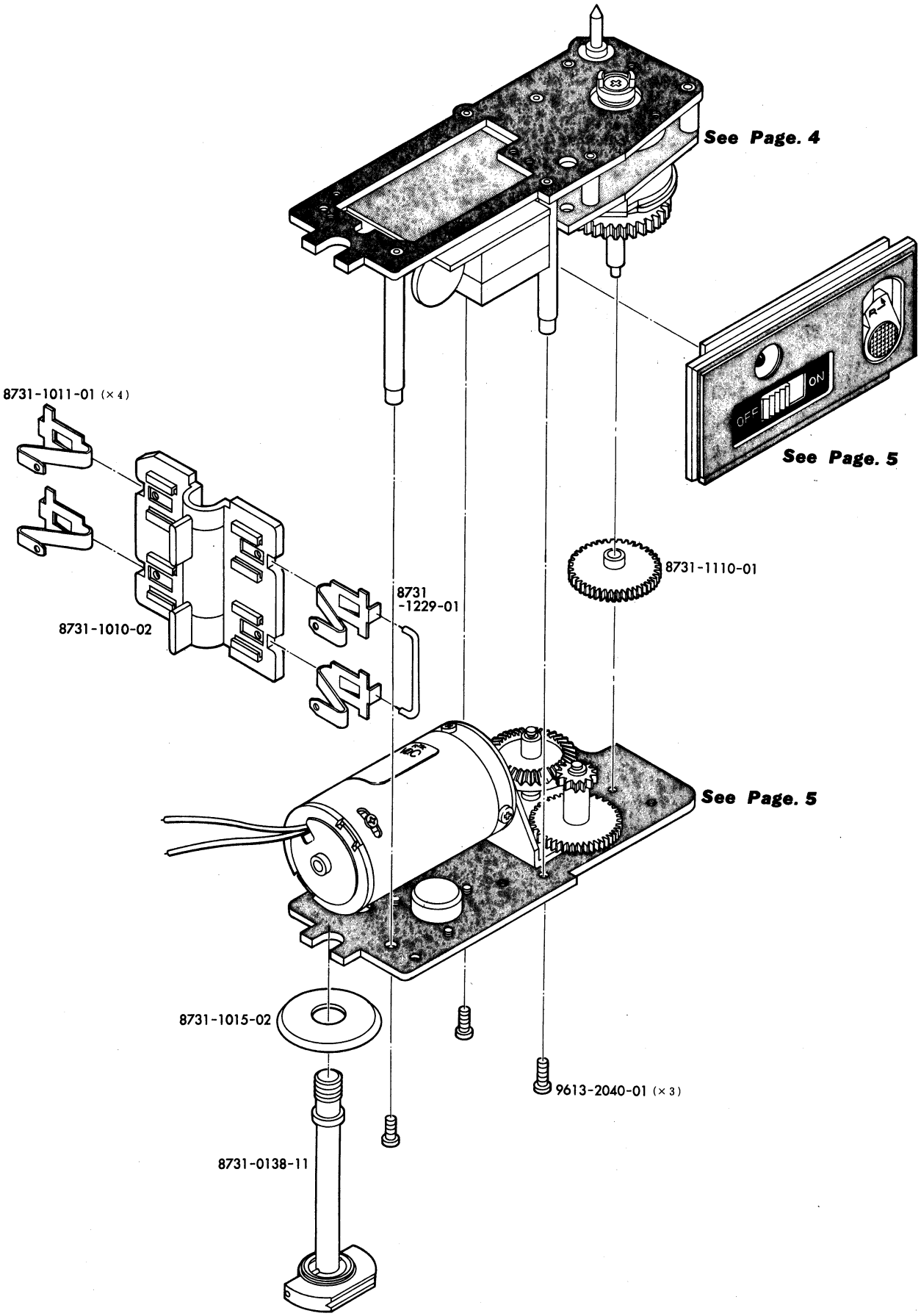
CODE No. 8731-100



Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-1001-03	Upper case 上ケース	1
8731-1002-04	Lower case 下ケース	1
8731-1003-02	Battery chamber cover 電池ケースぶた	1
8731-1004-05	Battery holder 電池ホルダー	1
8731-1006-01	Battery holder contact 電池ケース接片	2
8731-1007-01	Battery holder lock plate pressure 電池ロック板スプリング押え板	1
8731-1008-01	Battery holder lock plate 電池ロック板	1
8731-1009-01	Battery holder lock spring 電池ロックスプリング	1
8731-1031-01	Battery cover leather 電池蓋用貼皮	1
8731-1034-03	Name plate ワインダー銘板	1
8731-1037-01	Battery holder adjusting washer 電池ホルダー調整ワッシャー	1
9612-1625-12	Phillips type screw 十字穴付なべ頭小ねじ	1
9692-2060-01	Phillips type tapping screw 十字穴付タッピンねじ	1

MINOLTA AUTO WINDER-D

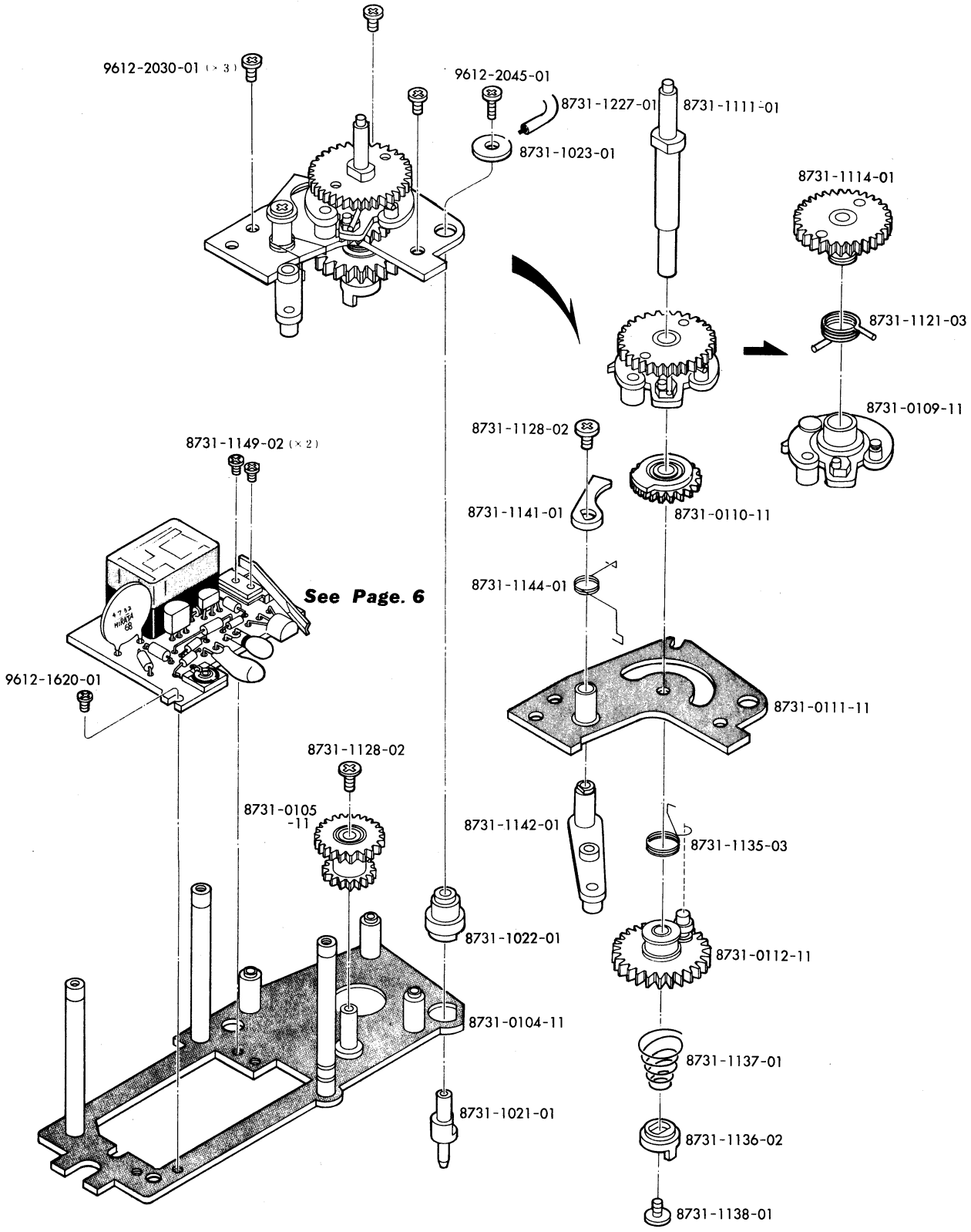
CODE No. 8731-100



Part No. 部品番号	Part Name 部 品 名 称	Qty 員数
8731-0138-11	Tripod screw set 三脚ねじセット	1
8731-1010-02	Battery contact set plate 電池接片取付板	1
8731-1011-01	Battery contact 電池接片	4
8731-1015-02	Tripod screw cover 三脚カバー	1
8731-1110-01	Reduction gear-A 減速ギヤーA	1
8731-1229-01	Lead wire I (Yellow, ℓ = 18mm, ϕ0.12/10wires: ϕ1) リード線（黄）	1
9613-2040-01	Phillips type screw 十字穴付皿頭小ねじ	3

MINOLTA AUTO WINDER-D

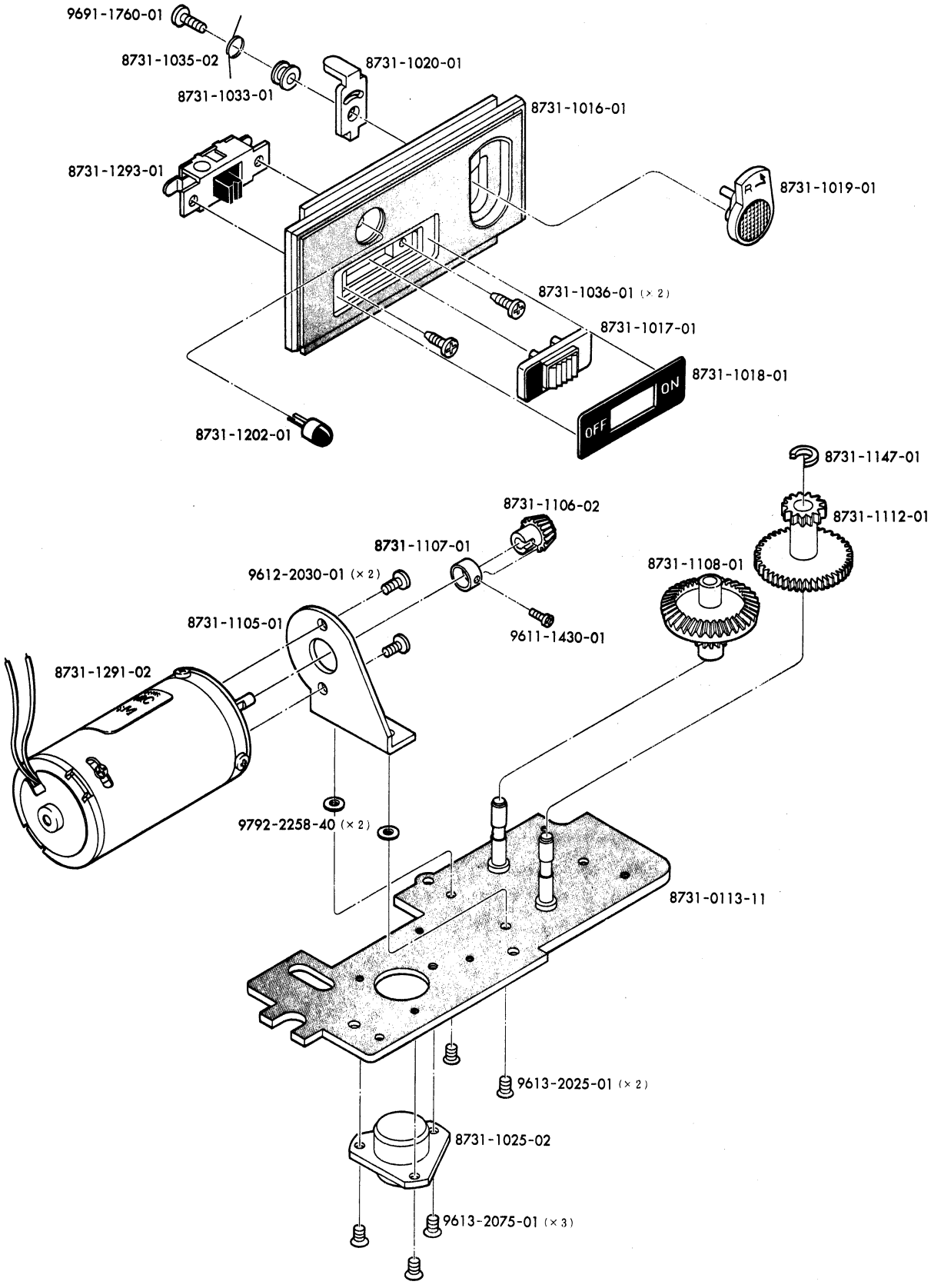
CODE No. 8731-100



Part No. 部品番号	Part Name 部 品 名 称	Qty 員数
8731-0104-11	Upper base plate set 上台板セット	1
8731-0105-11	Idle gear-A set アイドルギヤーAセット	1
8731-0109-11	Operation plate set 駆動板セット	1
8731-0110-11	Winding operation gear set 巻上伝達ギヤーセット	1
8731-0111-11	Winding base plate set 巻上台板セット	1
8731-0112-11	Winding gear set 巻上ギヤーセット	1
8731-1021-01	Position settlement pin 位置決めピン	1
8731-1022-01	Position settlement pin bush 位置決めピン取付ブッシュ	1
8731-1023-01	Position settlement pin washer 位置決めピン取付ワッシャー	1
8731-1111-01	Main shaft 主 軸	1
8731-1114-01	Operation plate gear 駆動板伝達ギヤー	1
8731-1121-03	Winding operation rollor spring 巻上伝達ローラースプリング	1
8731-1128-01	Idle gear set screw アイドルギヤー止めねじ	2
8731-1135-03	Winding coupler return spring 巻上カプラー戻しスプリング	1
8731-1136-02	Winding coupler 巻上カプラー	1
8731-1137-01	Winding coupler spring 巻上カプラースプリング	1
8731-1138-01	Winding coupler set screw 巻上カプラー止めねじ	1
8731-1141-01	Winding stop switch lever 巻止めスイッチ検出レバー	1
8731-1142-01	Winding stop switch change lever 巻止めスイッチ切替レバー	1
8731-1144-01	Winding stop switch lever bush 巻止めスイッチ検出レバーブッシュ	1
8731-1149-02	Winding stop switch contact set screw 巻止めスイッチ接片止めねじ	2
8731-1227-01	Lead wire G (White, ℓ=120mm, ϕ0.08/13 wires: ϕ0.8) リード線(白)	1
9612-1620-01	Phillips type screw 十字穴付なべ頭小ねじ	1
9612-2030-01	Phillips type screw 十字穴付なべ頭小ねじ	3
9612-2045-01	Phillips type screw 十字穴付なべ頭小ねじ	1

MINOLTA AUTO WINDER-D

CODE No. 8731-100

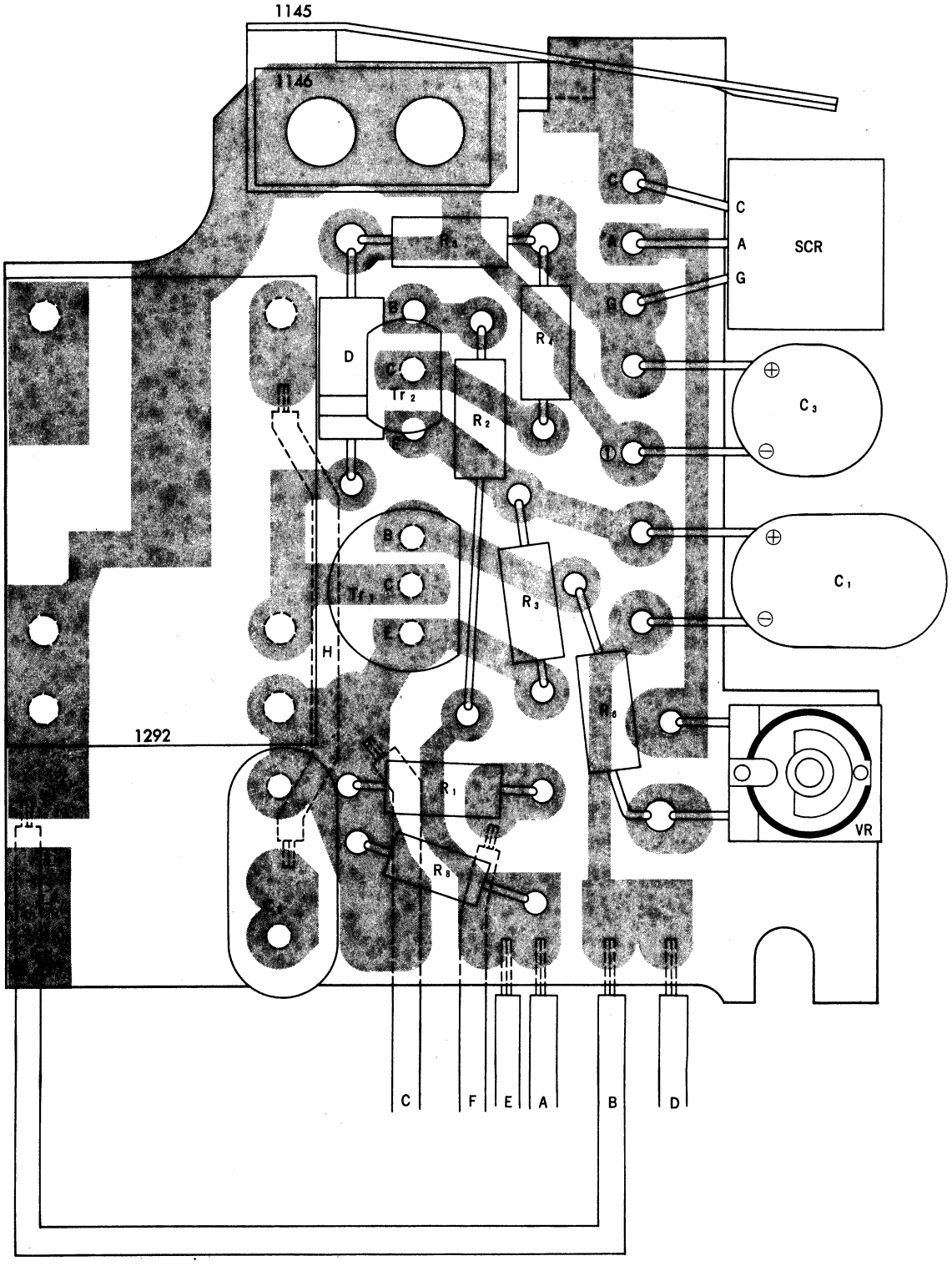


Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-0113-11	Lower base plate set 下台板セット	1
8731-1291-02	Motor モーター	1
8731-1016-01	Operation plate 操作板	1
8731-1017-01	Main switch operation button メインスイッチ操作釦	1
8731-1018-01	Main switch plate メインスイッチ釦板	1
8731-1019-01	R-button R釦	1
8731-1020-01	R-button slide lever R釦スライドレバー	1
8731-1025-02	Tripod socket 三脚めねじ	1
8731-1033-01	R-button spring-B collar R釦SPBカラー	1
8731-1035-02	R-button spring-B R釦SPB	1
8731-1036-01	Main switch set screw メインスイッチ止めねじ	2
8731-1105-01	Motor base plate モーター台板	1
8731-1106-02	Bevel gear-A ベベルギヤーA	1
8731-1107-01	Bevel gear-A set ring ベベルギヤーA止め輪	1
8731-1108-01	Bevel gear-B ベベルギヤーB	1
8731-1112-01	Reduction gear-B 減速ギヤーB	1
8731-1147-01	Reduction gear-B 減速ギヤーB止め輪	1
8731-1202-01	L.E.D LED	1
8731-1293-01	Main switch メインスイッチ	1
9611-1430-01	Phillips type screw 十字穴付なべ頭小ねじ	1
9612-2030-01	Phillips type screw 十字穴付なべ頭小ねじ	2
9613-2025-01	Phillips type screw 十字穴付皿頭小ねじ	2
9613-2075-01	Phillips type screw 十字穴付皿頭小ねじ	3
9691-1760-01	Phillips type tapping screw 十字穴付タッピンねじ	1
9792-2258-40	Washer 薄ワッシャー	2

MINOLTA AUTO WINDER-D

CODE No. 8731-100

8731-0134-11

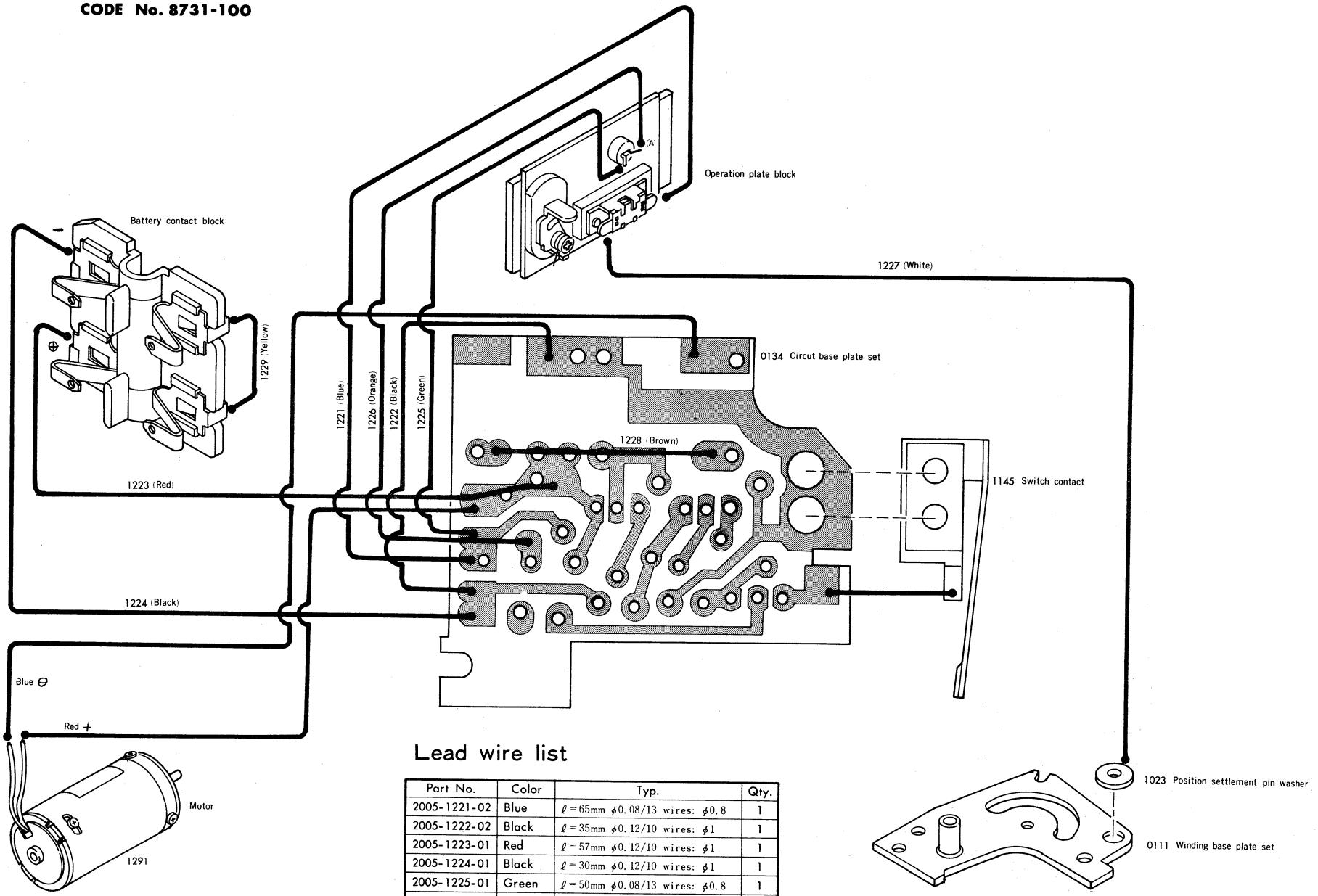


Assy. Part No. 8731-0134-11　　Assy. Part Name: Circuit base plate set 回路基板セット

Simbol	Part No.	Com.	Part Name	Typ.	Qty
R_5	9422-1026-32		Resistor	1 (KΩ) 1/8 (W)	1
R_2	9422-1046-32			100(KΩ) 1/8 (W)	1
R_6	9422-1516-32			150(Ω) 1/8 (W)	1
VR	9473-1529-61			1.5(KΩ)±30(%) RG 4 + 1 GS	1
R_4	9422-1626-32			1.6(KΩ) 1/8 (W)	1
R_8	9422-2226-32			2.2(KΩ) 1/8 (W)	1
R_1	9422-2416-32			240(Ω) 1/8 (W)	1
R_3	9422-3336-32			33(KΩ) 1/8 (W)	1
C_1	9534-1055-33		Condenser	CS15EIEOIOMIS	1
C_3	9535-4745-36			202	1
C_2	9565-4738-62			DD310-950BC473Z50VOB	1
Tr_1	9363-1761-01	02	Transistor	2 SA950-O, Y	1
Tr_2	9363-4761-02			2 SA728A	1
D	9361-1631-11		Diode	1 S953	1
SCR	8731-1209-01		Thiristor	SFOR 2 B41	1
A	8731-1221-01		Lead wire Blue	(ℓ=55mm, φ0.12/10wires: φ 1)	1
B	8731-1222-01		Blaack	(ℓ=35mm, φ0.12/10wires: φ 1)	1
C	8731-1223-01		Red	(ℓ=57mm, φ0.12/10wires: φ 1)	1
D	8731-1224-01		Black	(ℓ=30mm, φ0.12/10wires: φ 1)	1
E	8731-1225-01		Green	(ℓ=50mm, φ0.08/13wires: φ0.8)	1
F	8731-1226-01		Orange	(ℓ=55mm, φ0.08/13wires: φ0.8)	1
H	8731-1228-01		Brown	(ℓ=20mm, φ0.08/13wires: φ0.8)	1
	8731-1292-01		Relay	BR211ADOO 6 -M	1
	8731-1145-02		Switch contact 巻止めスイッチ接片		1
	8731-1146-02		Isolation bush 巻止めスイッチ絶縁ブッシュ		1

WIRING SCHEMATIC DIAGRAM

CODE No. 8731-100



Lead wire list

Part No.	Color	Typ.	Qty.
2005-1221-02	Blue	ℓ = 65mm ϕ0.08/13 wires: ϕ0.8	1
2005-1222-02	Black	ℓ = 35mm ϕ0.12/10 wires: ϕ1	1
2005-1223-01	Red	ℓ = 57mm ϕ0.12/10 wires: ϕ1	1
2005-1224-01	Black	ℓ = 30mm ϕ0.12/10 wires: ϕ1	1
2005-1225-01	Green	ℓ = 50mm ϕ0.08/13 wires: ϕ0.8	1
2005-1226-01	Orange	ℓ = 55mm ϕ0.08/13 wires: ϕ0.8	1
2005-1227-02	White	ℓ = 120mm ϕ0.08/13 wires: ϕ0.8	1
2005-1228-02	Brown	ℓ = 20mm ϕ0.08/13 wires: ϕ0.8	1
2005-1229-01	Yellow	ℓ = 18mm ϕ0.12/10 wires: ϕ1	1

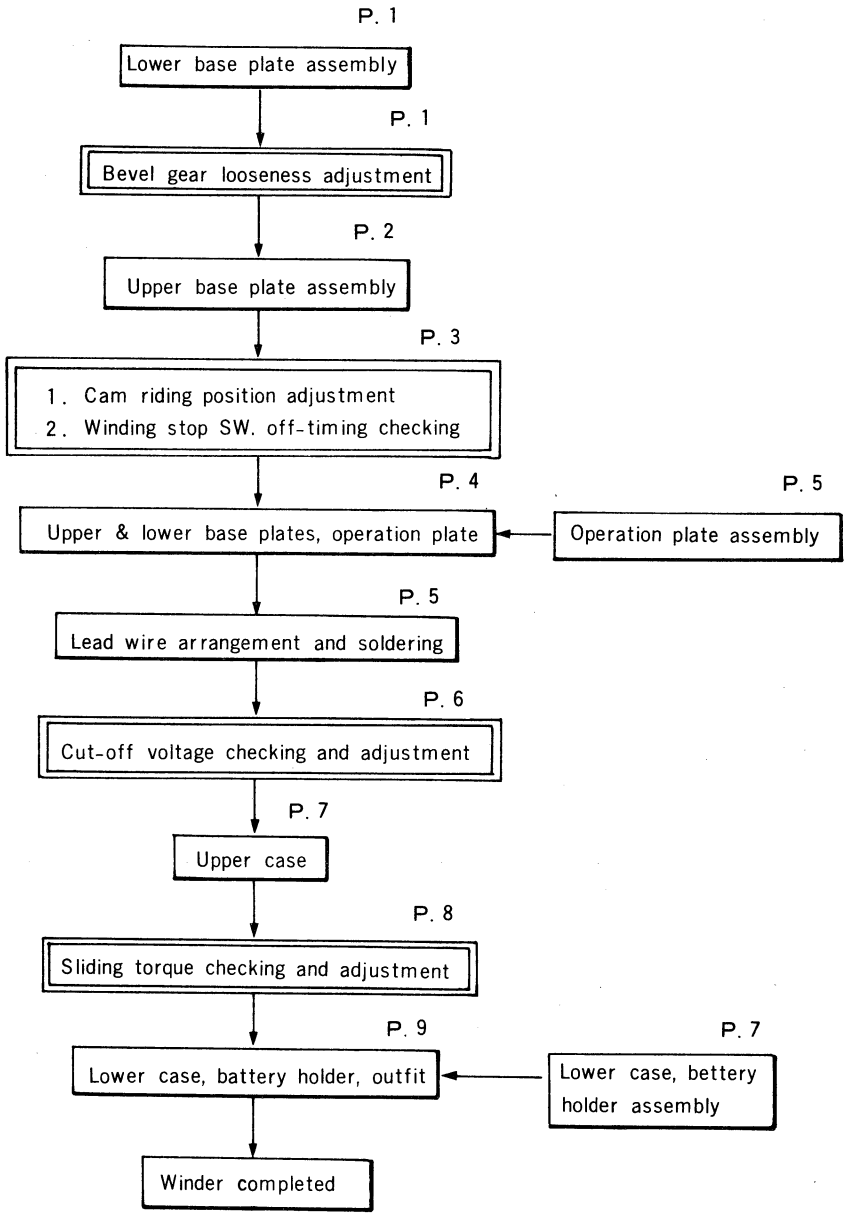
Disassembly, Assembly and Adjustment

■ The content of this manual includes the assembly and adjustment procedure in accordance with the assembly chart. For the disassembly procedure, refer to the pages in the reverse order.

— Description of marks —

✣ : Points for assembly and general cautions.
[G] : Grease used and applying portions.
[B] : Binding agent used and applying portions.
[O] : Oil used and applying portions.

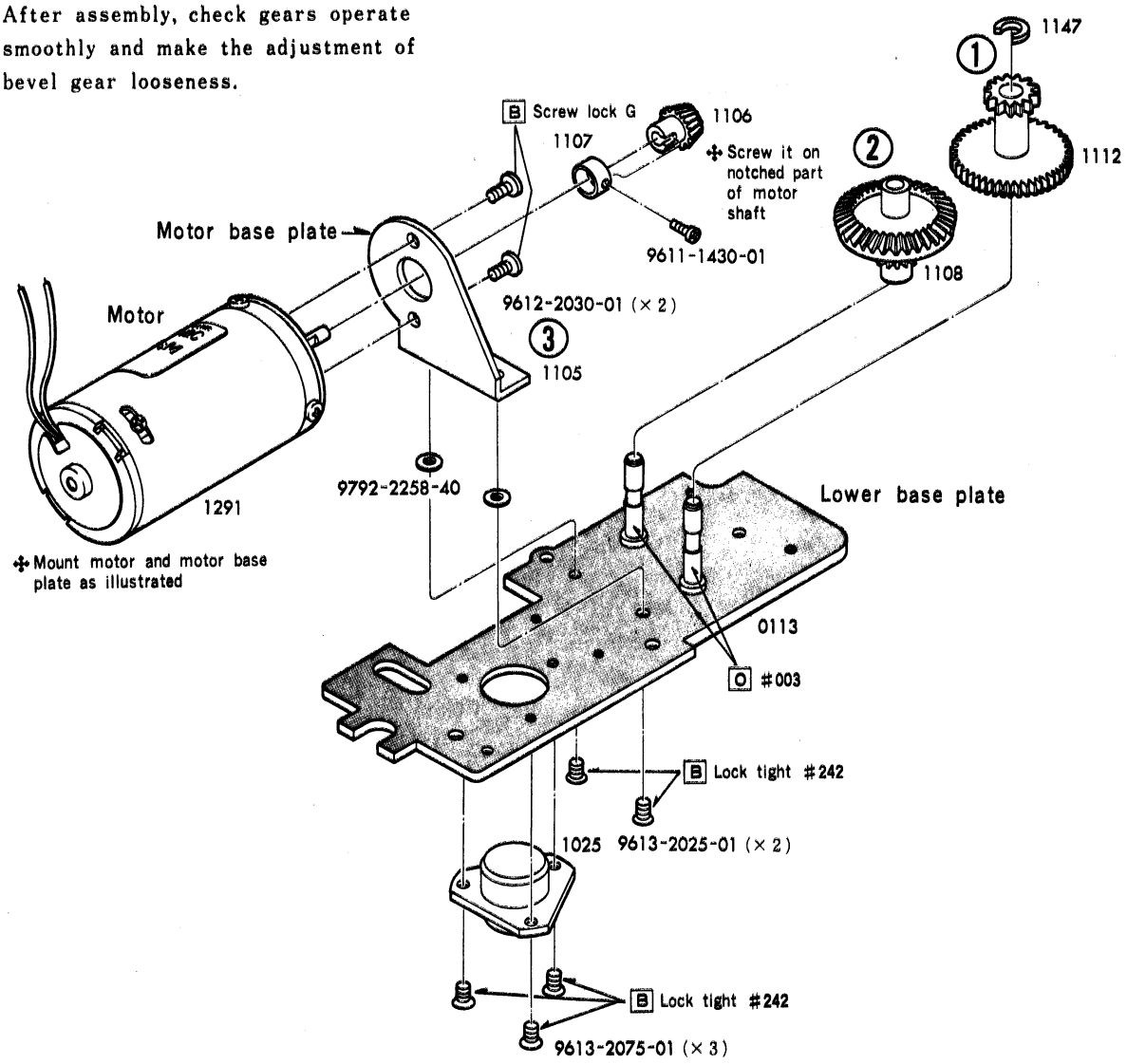
■ Assembly Procedure Chart



1 Lower base plate

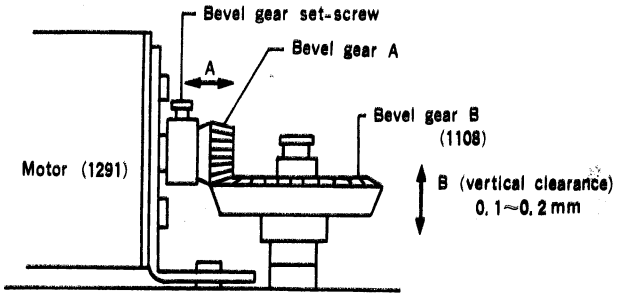
■Carry out the assembly in the order of 1~3.

■After assembly, check gears operate smoothly and make the adjustment of bevel gear looseness.



■ Bevel gear looseness adjustment

1. Loosen bevel gear set-screw (9611-1430-01).
2. Operate bevel gear A (1106) in the direction of arrow A and tighten bevel gear set-screw when the vertical clearance of bevel gear B (1108) is 0.1~0.2 mm.
3. Bevel gear B should move smoothly when rotated manually.
4. Apply screw lock G to bevel gear set-screw.

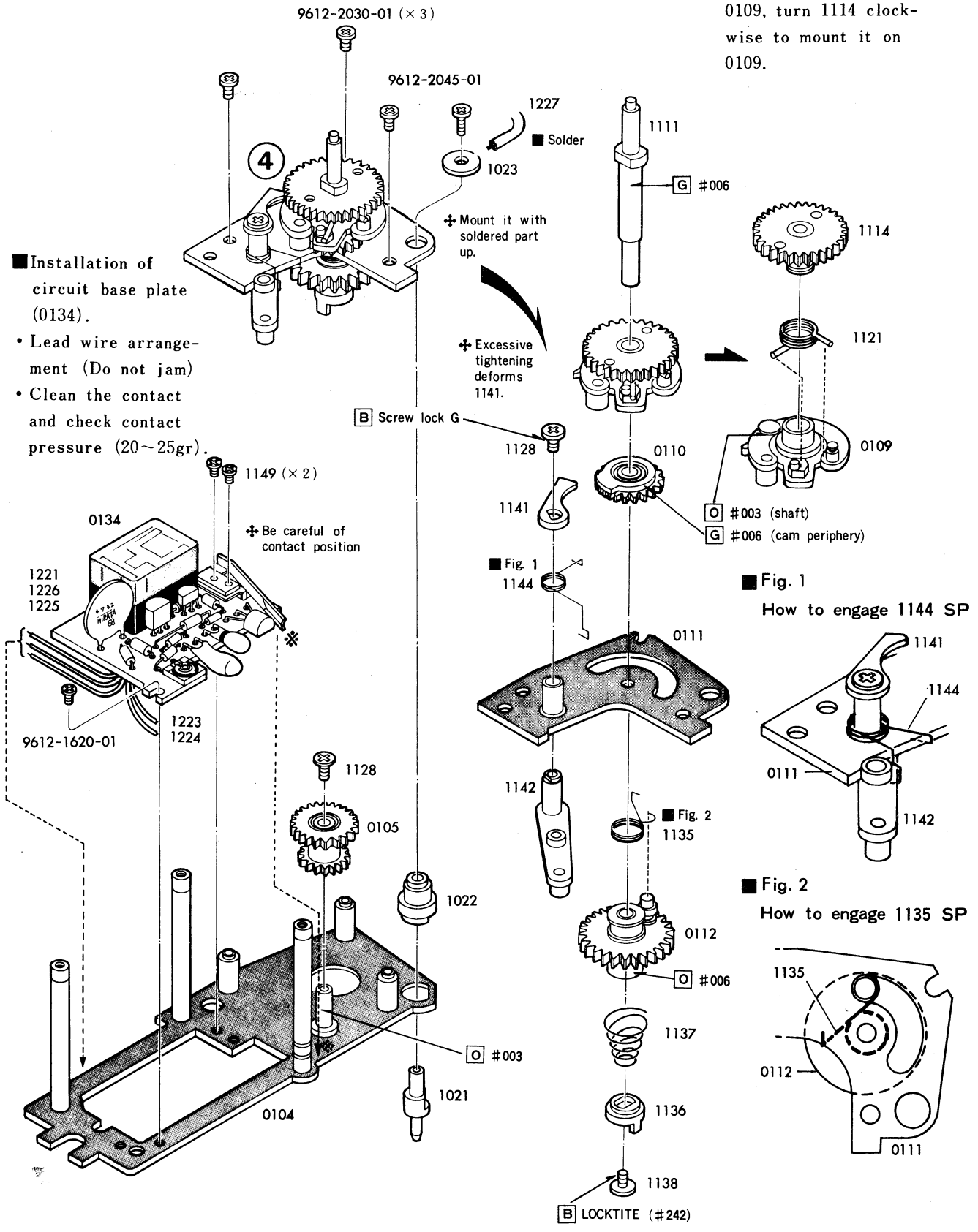


2 Upper base plate

■Carry out the assembly in the order of 1~4.

■To install 1114 and 0109, turn 1114 clockwise to mount it on 0109.

■Installation of circuit base plate (0134).
- Lead wire arrangement (Do not jam)
- Clean the contact and check contact pressure (20~25gr).



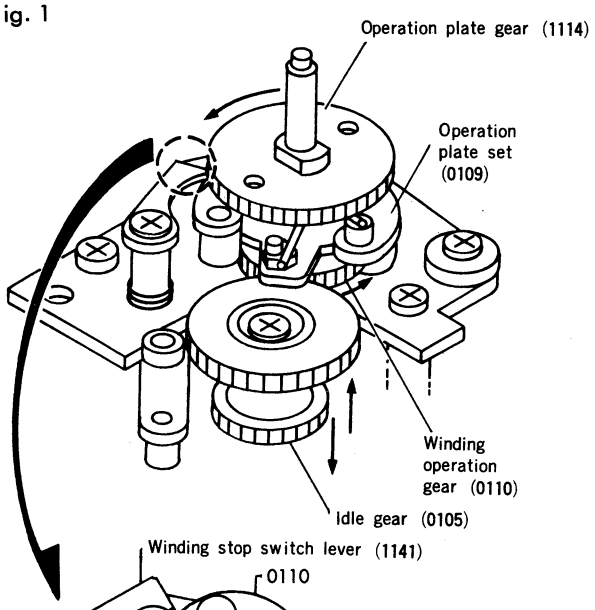
■Fig. 1
How to engage 1144 SP

■Fig. 2
How to engage 1135 SP

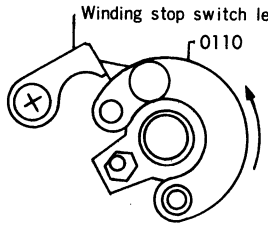
■After completion of the above assembly, carry out the adjustment of cam riding position and the checking of winding stop SW. off-timing on the next page.

■ Adjustment of cam riding position

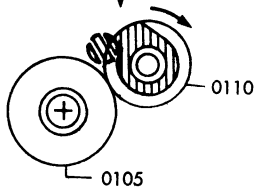
■ Fig. 1



■ Fig. 2



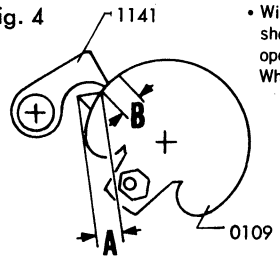
■ Fig. 3



1. Rotate operation plate gear (1114) in the direction of the arrow (counterclockwise) as in Fig. 1, and hold it when the operation plate claw in operation plate set (0109) comes in contact with winding stop switch lever (1141).
2. Loosen idle gear set-screw, and with idle gear (0105) disengaged from winding operation gear (0110), rotate 0110 in the direction of the arrow (counterclockwise) as in Fig. 1 until it stops.
3. With idle gear (0105) disengaged from winding operation gear (0110), move 0101 in the direction of the arrow (clockwise) as in Fig. 3 by 1 or 2 teeth from stop position so that 0105 is engaged with 0110.
4. Rotate operation plate gear (1114) in the direction opposite to the arrow in Fig. 1 (counterclockwise) until it stops (roller and cam touch each other.) Then, check the position is just as shown in Fig. 4 and tighten up idle gear set-screw.

※If the requirement in 4 is not satisfied, make the adjustment 1~3 again.

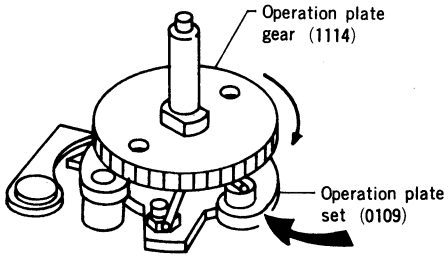
■ Fig. 4



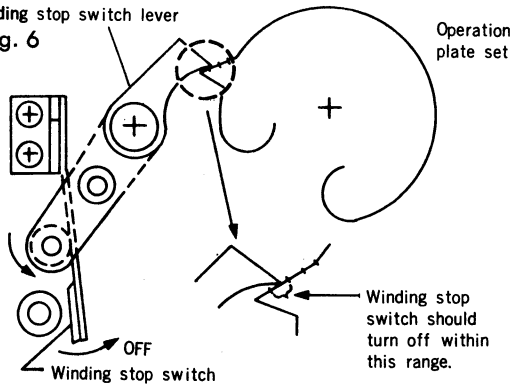
• Winding stop switch lever should be in range B of operation plate set. Where, A=B.

■ Checking of winding stop switch (SW. 21) off-timing

■ Fig. 5

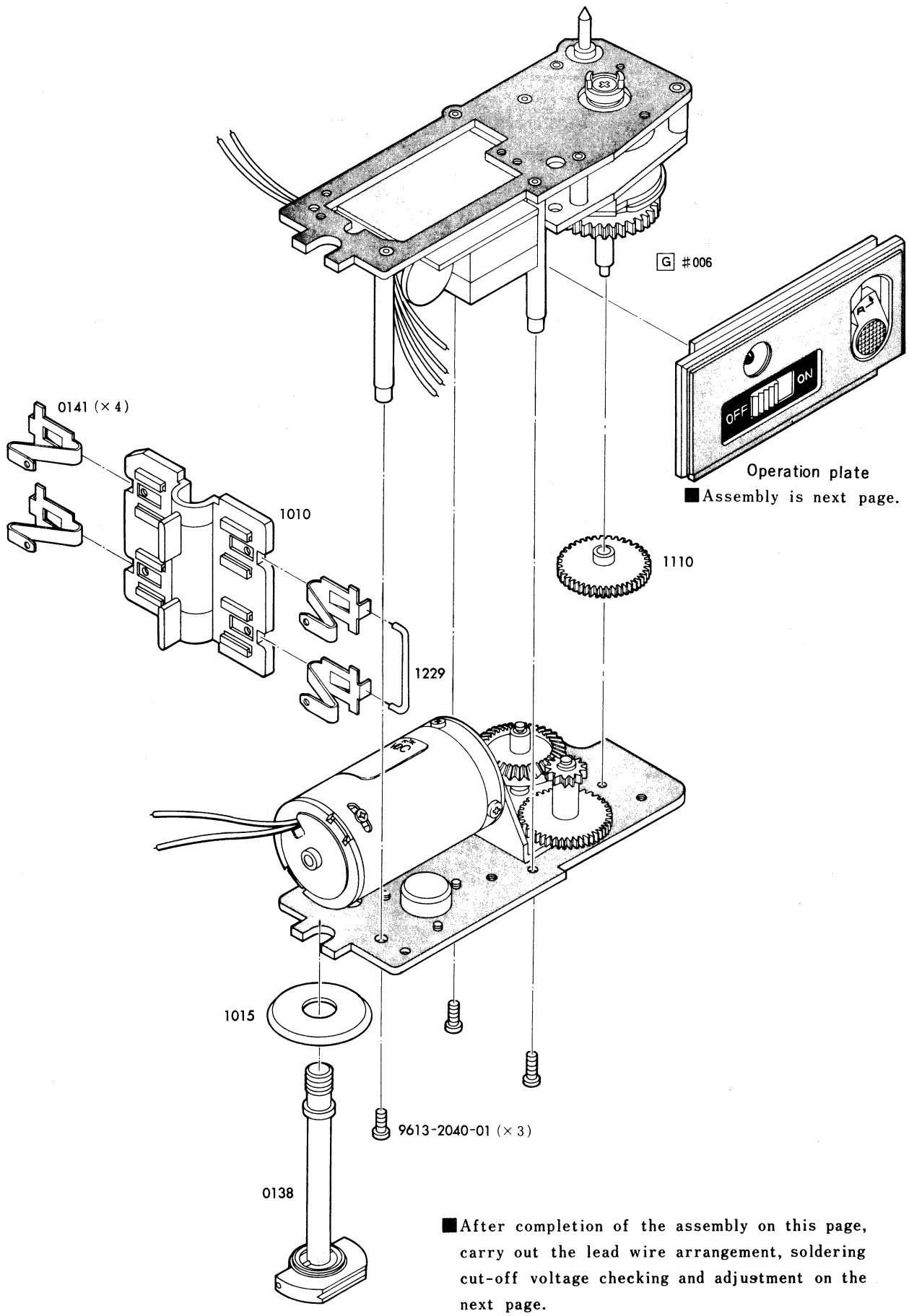


■ Fig. 6



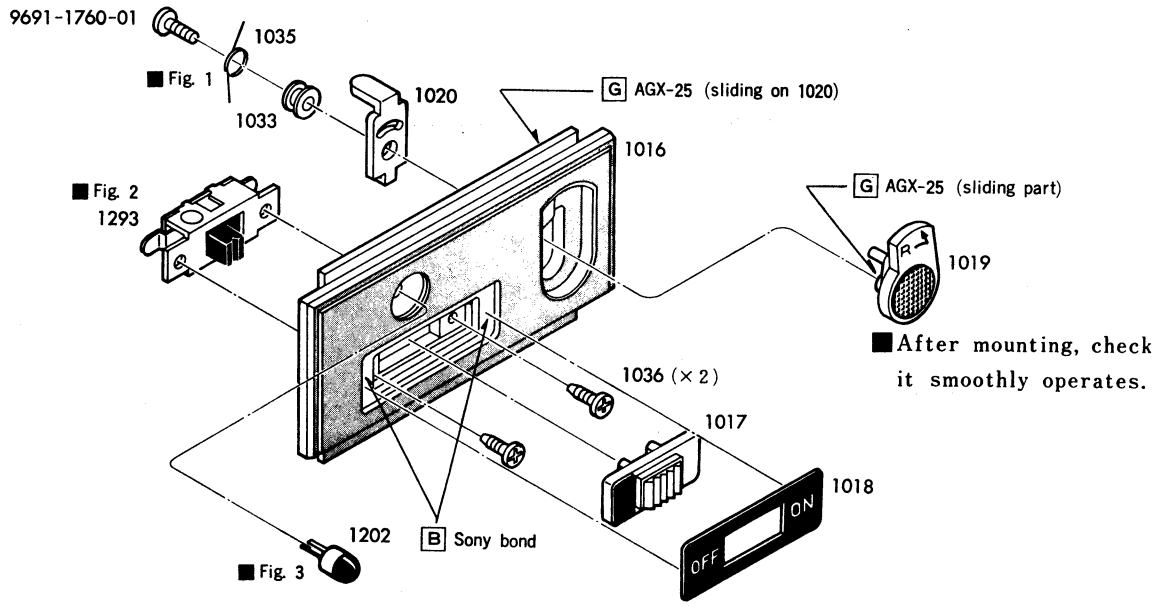
1. Rotate operation plate gear (1114) in the direction of the arrow as in Fig. 5 (clockwise) until it stops. Then push in part C by force so that winding operation gear (0110) is freed. (0110 rotates counterclockwise by the function of spring).
2. Slowly rotate operation plate gear (1114) clockwise and make sure winding stop switch (SW. 21) turns off with operation plate claw and winding stop switch lever (1141) are positioned as shown in Fig. 6.

3 Upper base plate, lower base plate, and operation plate mounting

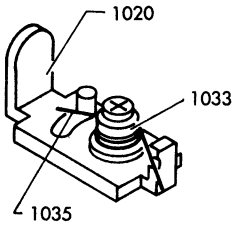


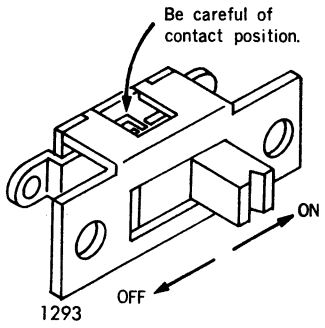
■After completion of the assembly on this page, carry out the lead wire arrangement, soldering cut-off voltage checking and adjustment on the next page.

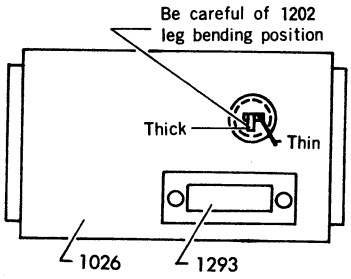
■ Operation plate assembly



■ Fig. 1 1035 spring setting ■ Fig. 2 Main switch (1293) position ■ Fig. 3 LED (1202) position

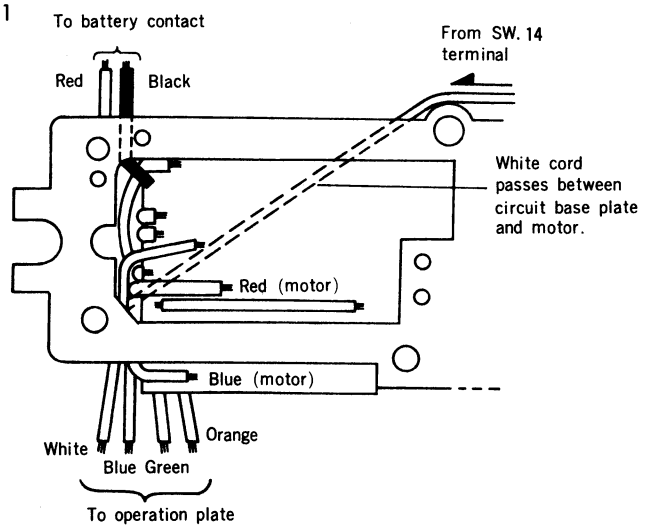






■ Lead wire arrangement and soldering

■ Fig. 1



- Arrange the lead wires as shown in Fig. 1.
- For lead wire soldering, refer to Wiring Diagram.

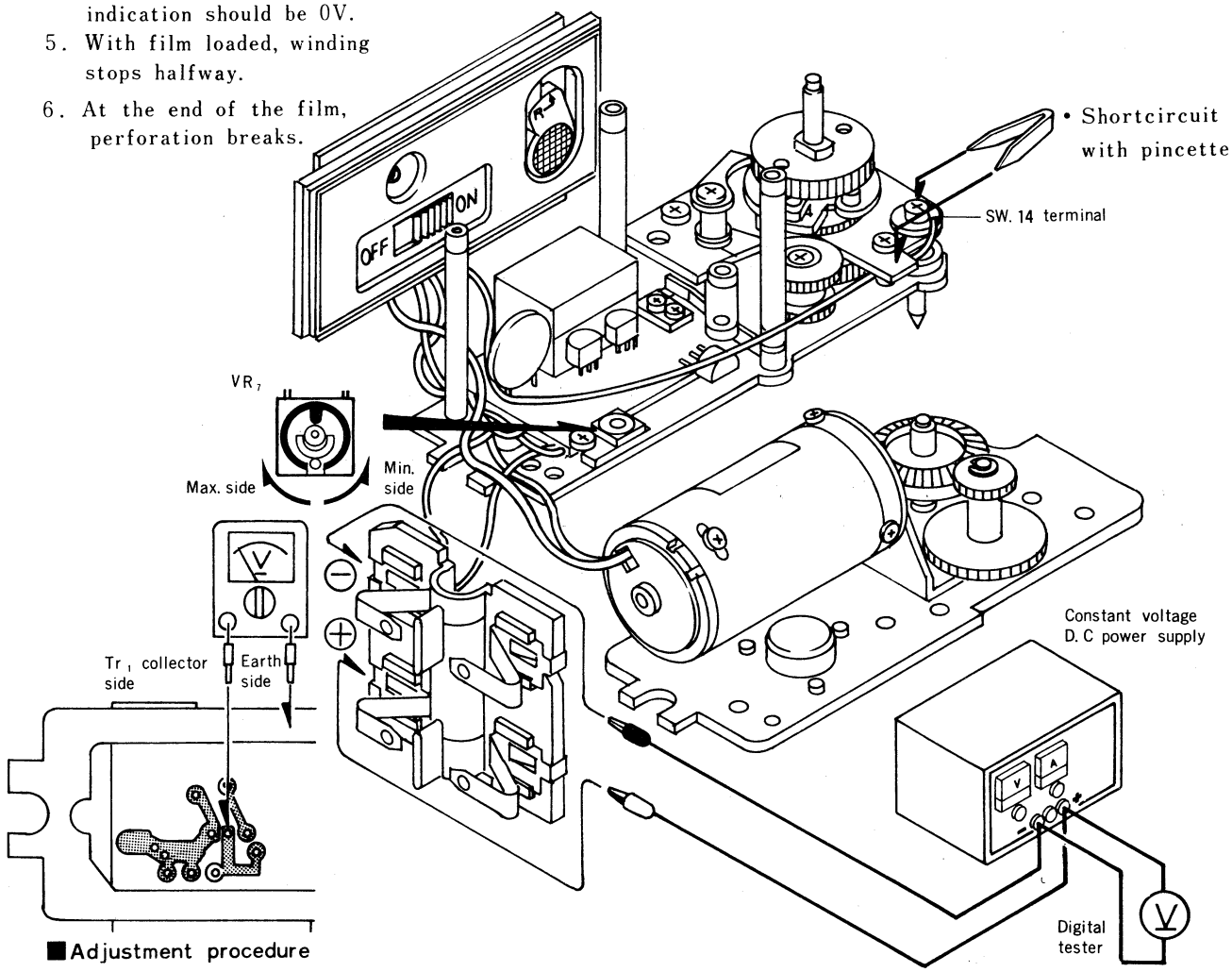
■ Cut-off voltage checking and adjustment

✣The checking and adjustment on this page can be omitted except when the element of circuit base plate is replaced or R_7 is shifted.

■Measuring Instruments: D.C power supply 〈E-1 or E-2〉
: Digital tester 〈Type 2507〉
: Luminescence adjusting driver C

■Checking items

1. As illustrated below, with wiring completed, separate upper base plate and lower base plate, and set main switch and SW.21 to ON.
2. Connect power source to battery contact and make the setting over 4.2V, 2A.
3. Operate the motor, shortcircuiting temporarily between SW.14 terminal and earth as illustrated. (Once SW.14 is turned on, the motor keeps rotating).
4. Next slowlylower the power source voltage while checking voltage (nearly equal to power source voltage) between Tr_1 collector and earth by means of circuit tester as illustrated. Thus, make sure that the motor stops within 2.0±0.1V. At that time, circuit test voltage indication should be 0V.
5. With film loaded, winding stops halfway.
6. At the end of the film, perforation breaks.



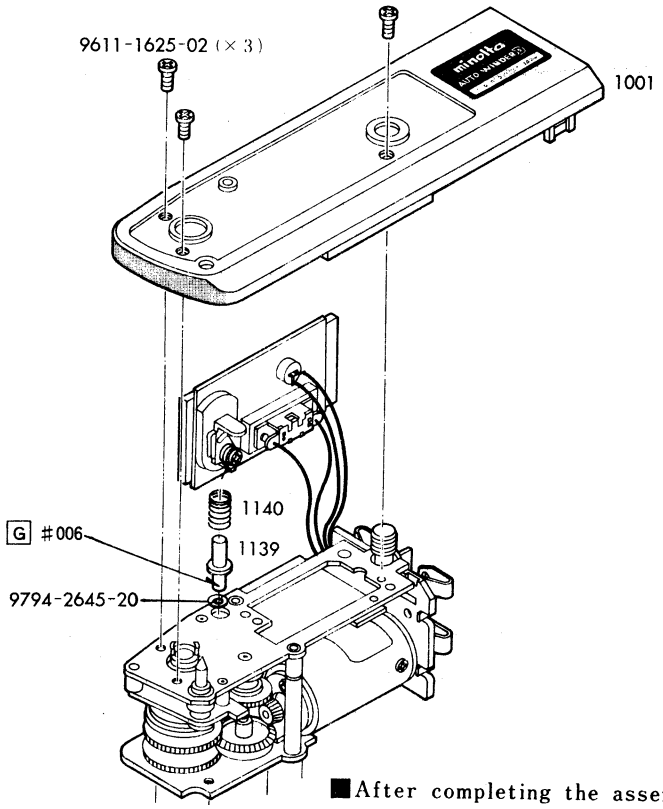
■Adjustment procedure

1. Fully turn VR to Min side as illustrated above.
2. Set the voltage to 4.2V 2A to operate the motor.
   Then lower the voltage to 2.0V. At that time, make sure that there is voltage between Tr_1 collector and earth by means of circuit tester.
3. Slowly turn VR to Max side and stop it when voltage between Tr_1 collector and earth is 0V.
4. Again set the voltage to 4.2V to operate the motor and then lower it slowly. Make sure that the motor stops at 2.0±0.1V and that the voltage between Tr_1 collector and earth is 0V.

NOTE: For motor operation, refer to "Checking procedure" 3.

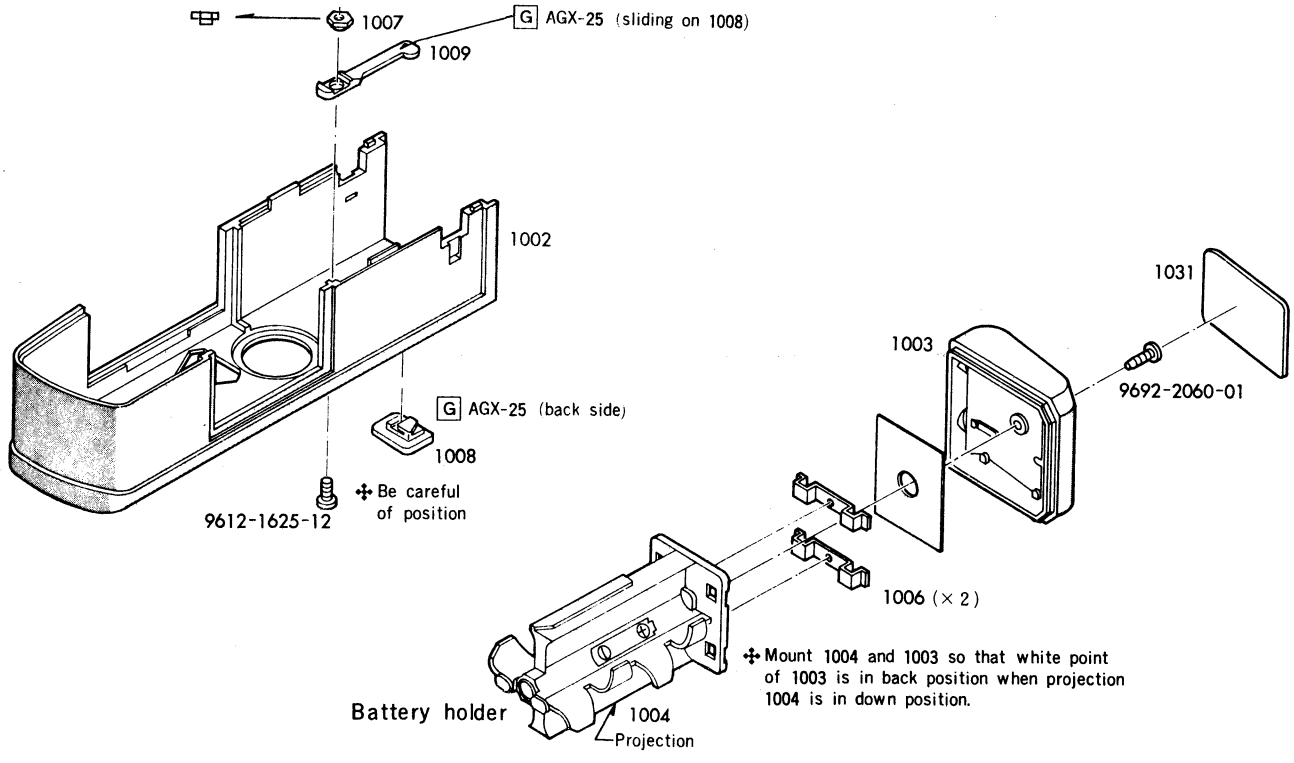
4 Upper case installation

■Sparingly apply ELECTROLUB to winding stop swith (SW. 21) contact.



■After completing the assembly, carry out the sliding torque adjustment on the next page.

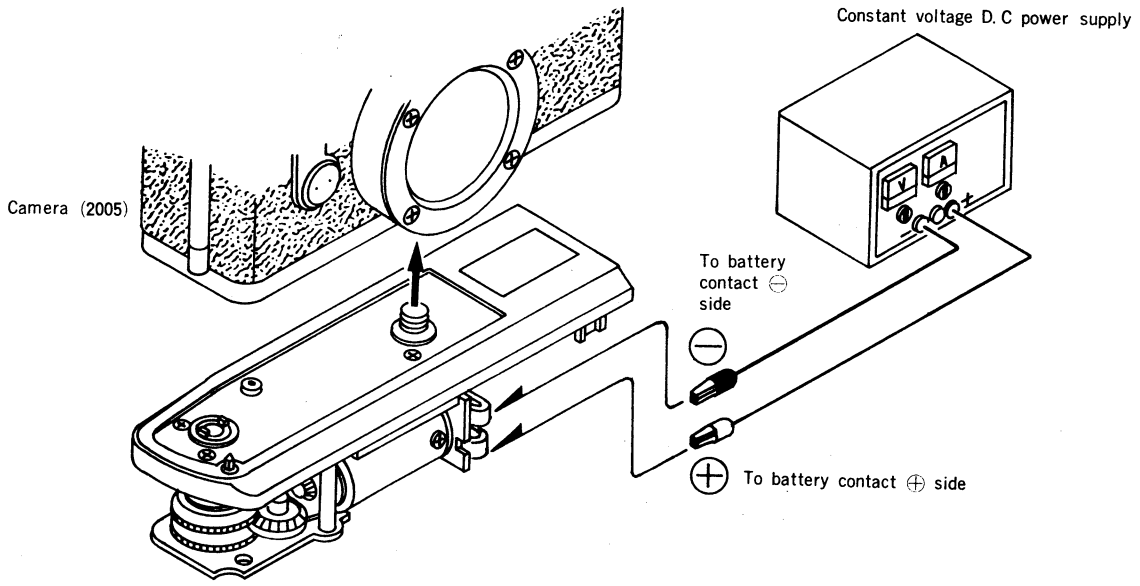
■ Lower case, battery holder assembly



■ Sliding torque checking and adjustment

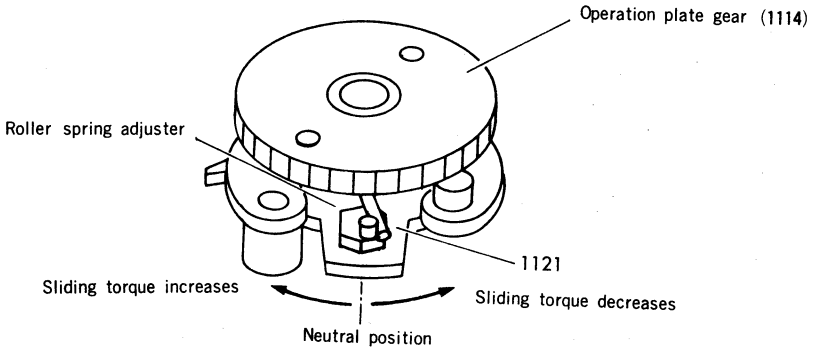
■Measuring Instruments: Constant voltage D.C power supply (E-1 or E-2)
: Film (NEOPAN SS 36 EXP.)

■Checking procedure



1. With upper case mounted on base plate set, secure it on camera (2005) with tripod screws.
2. Load the camera with film. (Winding should not be heavy.)
3. Set the power source voltage to over 6.5V, 2A and make the connections to battery contacts on the winder side as illustrated above.
4. Push the shutter button to operate the winder. At that time, the film should be completely taken up without slipping of the winder side mechanism. Also make sure that the automatic stop mechanism works properly.

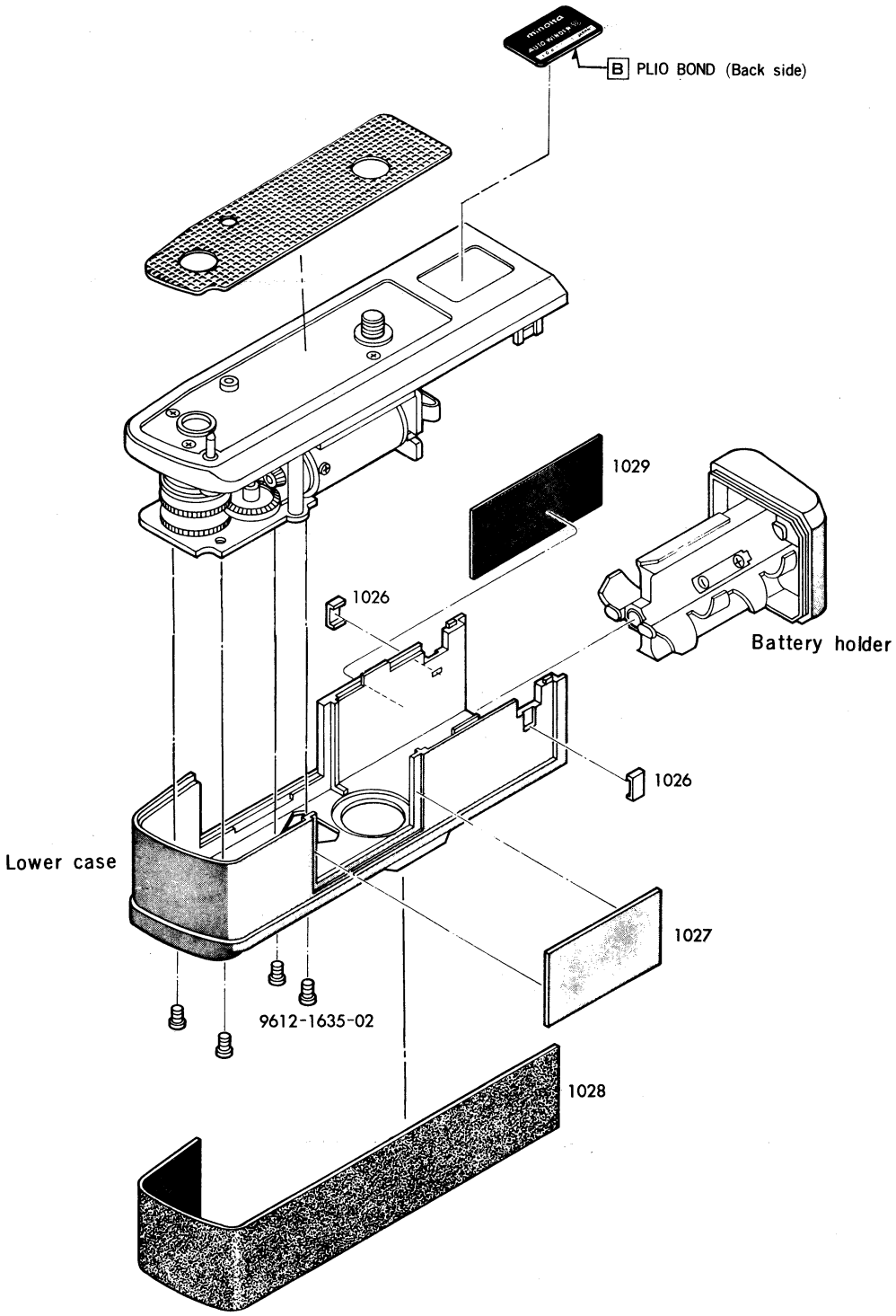
■Adjustment procedure



1. When sliding torque is low (Automatic stop at the end of film winding): As illustrated above, make the adjustment by turning roller spring adjuster to the right from neutral position by means of pliers.
2. When sliding torque is high (No automatic stop at the end of film winding): As illustrated above, make the adjustment by turning roller spring adjuster to the left from neutral position by means of pliers.

✣The adjustment of roller spring adjuster is difficult as operation plate gear rotates. So, make the adjustment while holding the operation plate gear by hand.

5 Lower case, outfit, battery holder (winder completed)



Trouble Shooting Chart

■ Content

1. This Touble Shooting Chart includes main troubles and possible causes. Carry out the checks proceeding in the directions of the arrows. When checking circuits, refer to the pattern diagram.
2. This chart only refers to winder troubles.

■ Items

A. No operation.

B. Winder stops halfway during film winding.

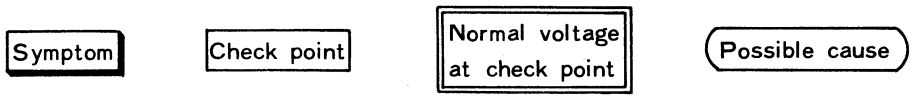
C. No automatic stop at the end of film.

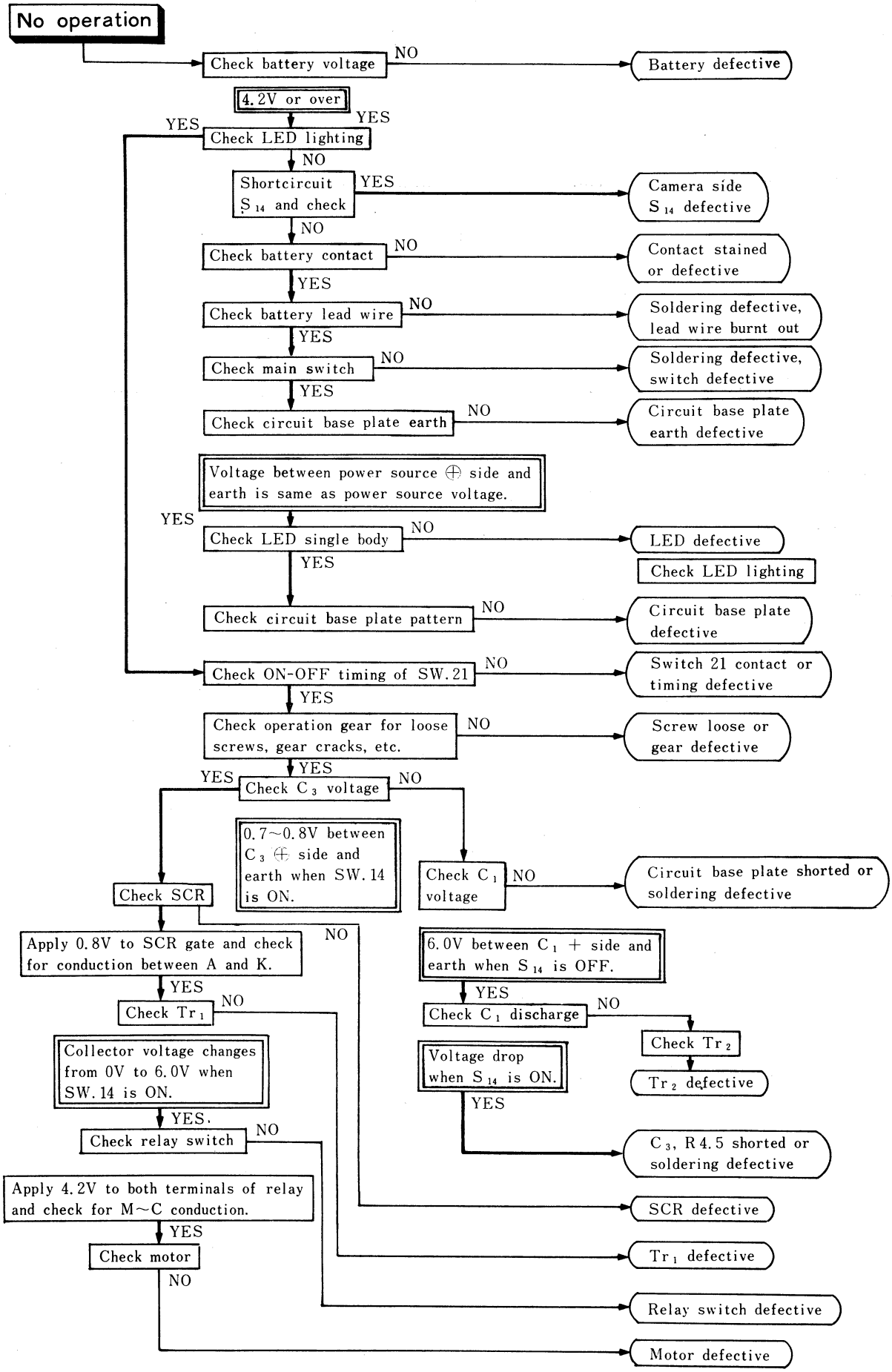
D. Film advance speed too slow.

E. Battery exhaustion too early.

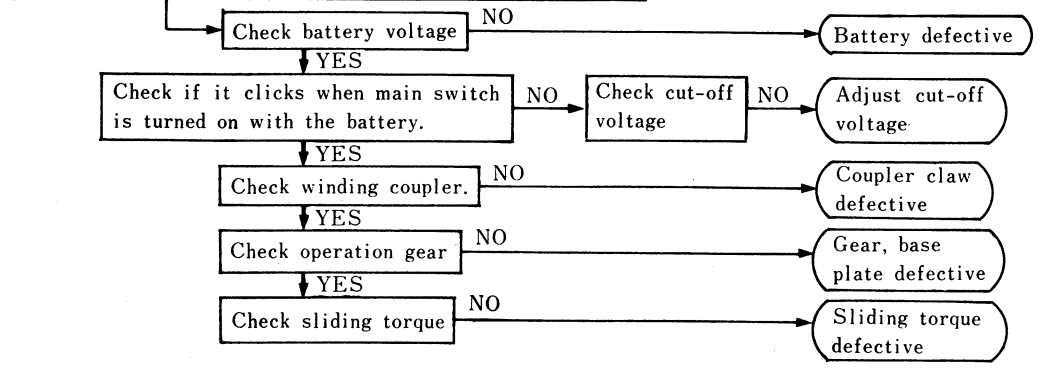
■ How to use Trouble Shooting Chart

1. Follow up the check points one by one after appearance of symptoms until finding of causes.
2. The marks in the Touble Shooting Chart are as follows:

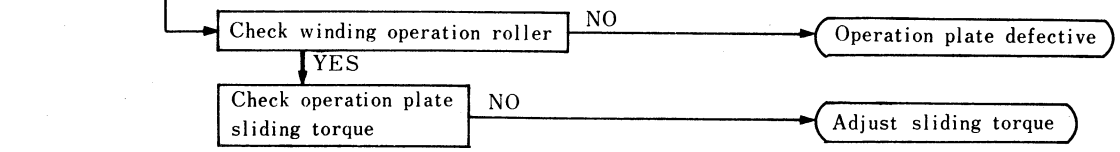



No operation
Check battery voltage
NO
Battery defective
4.2V or over
YES
YES
Check LED lighting
NO
Shortcircuit S14 and check
YES
Camera side S14 defective
NO
Check battery contact
NO
Contact stained or defective
YES
Check battery lead wire
NO
Soldering defective, lead wire burnt out
YES
Check main switch
NO
Soldering defective, switch defective
YES
Check circuit base plate earth
NO
Circuit base plate earth defective
Voltage between power source ⊕ side and earth is same as power source voltage.
YES
Check LED single body
NO
LED defective
YES
Check LED lighting
Check circuit base plate pattern
NO
Circuit base plate defective
Check ON-OFF timing of SW.21
NO
Switch 21 contact or timing defective
YES
Check operation gear for loose screws, gear cracks, etc.
NO
Screw loose or gear defective
YES
YES
Check C3 voltage
NO
0.7~0.8V between C3 ⊕ side and earth when SW.14 is ON.
Check C1 voltage
NO
Circuit base plate shorted or soldering defective
Check SCR
NO
Apply 0.8V to SCR gate and check for conduction between A and K.
YES
Check Tr1
NO
6.0V between C1 + side and earth when S14 is OFF.
YES
Check C1 discharge
NO
Check Tr2
Tr2 defective
Collector voltage changes from 0V to 6.0V when SW.14 is ON.
YES
Check relay switch
NO
Voltage drop when S14 is ON.
YES
C3, R4.5 shorted or soldering defective
Apply 4.2V to both terminals of relay and check for M~C conduction.
YES
Check motor
NO
SCR defective
Tr1 defective
Relay switch defective
Motor defective

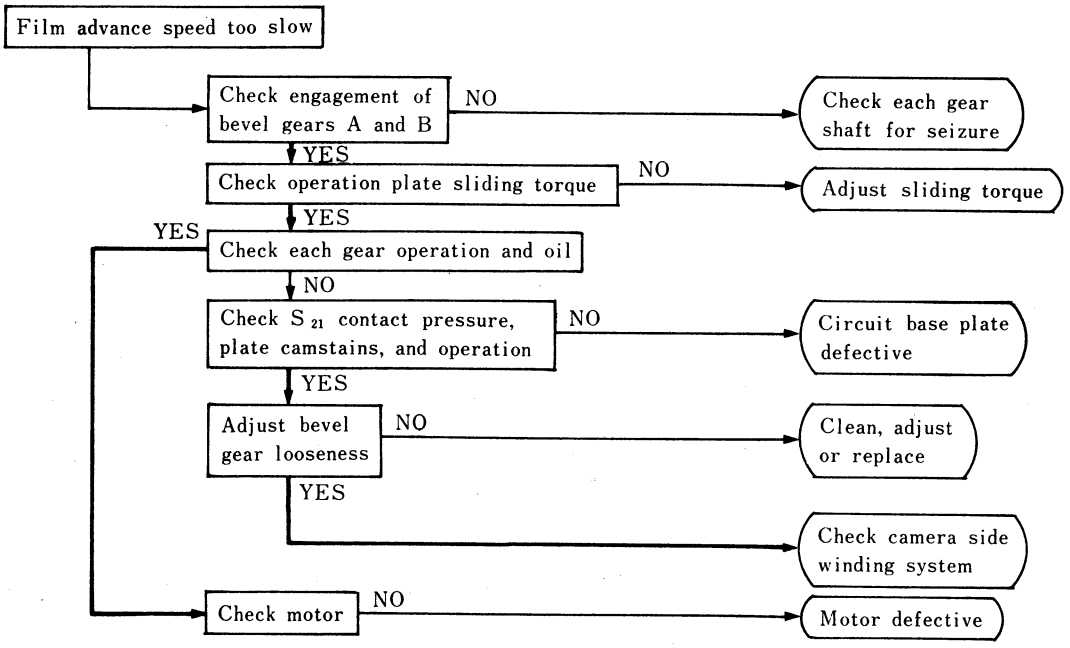
Winder stops halfway during film winding.



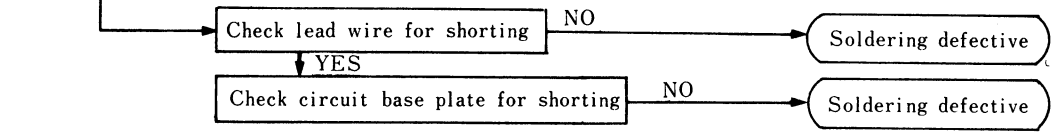
No automatic stop at the end of film

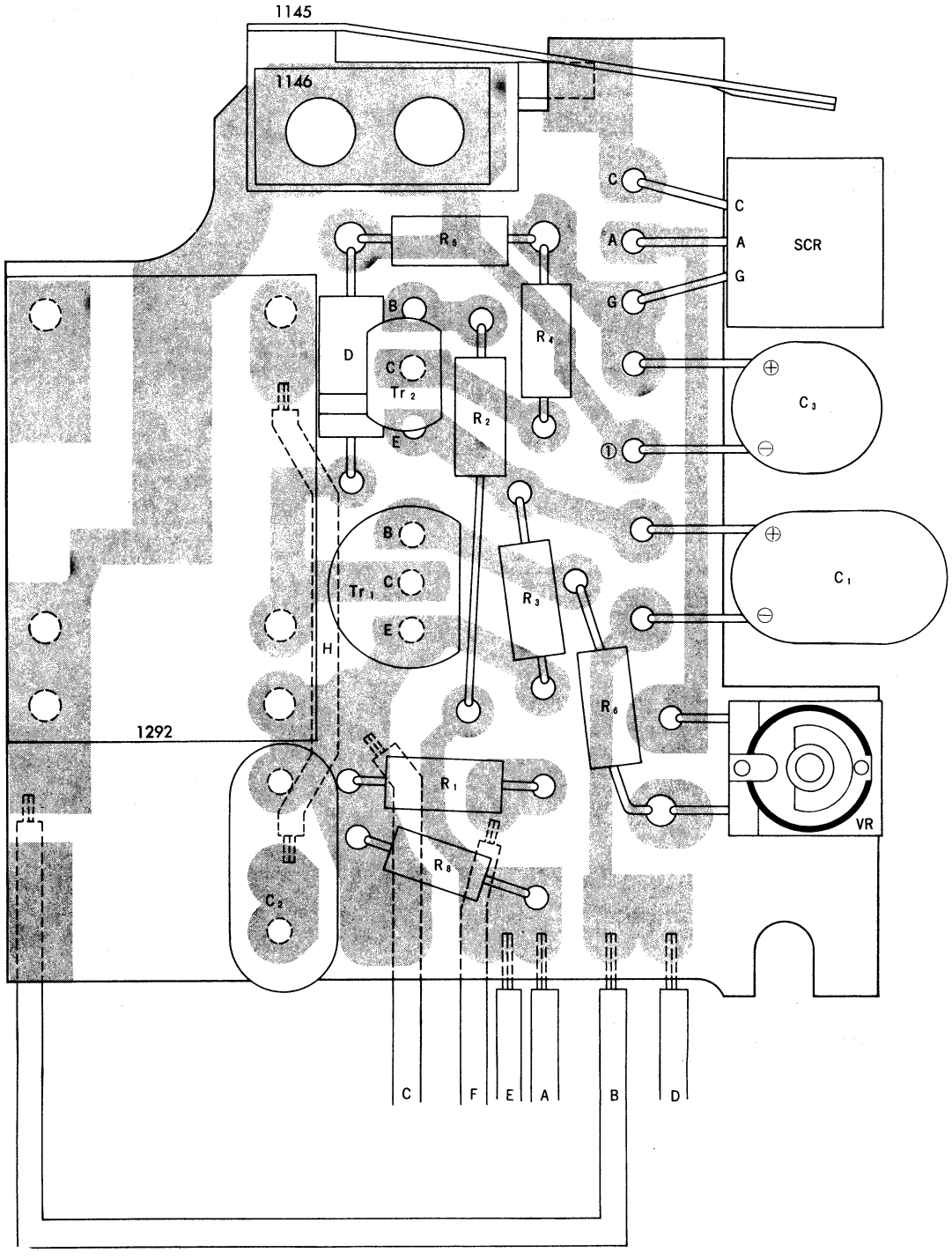


Film advance speed too slow

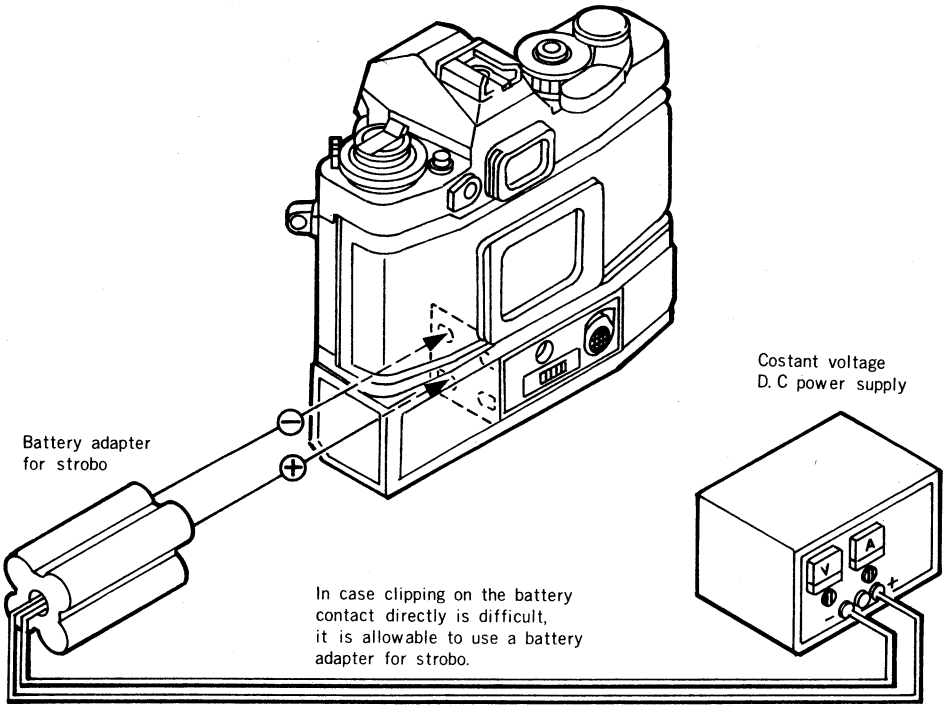


Too early exhaustion of battery




1145
1146
1292
SCR
C
A
G
R_5
R_4
R_2
R_3
R_6
R_1
R_8
C_3
C_1
C_2
VR
D
B
C
E
Tr_2
Tr_1
H
F
C
F
E
A
B
D

Inspection Specification
Auto-Winder D (8731-100)
(General performance and functions)

Check point	Contents
Frame speed Power consumption	Load the camera with NEOPAN SS (36 EXP.) and carry out the checks as follows.  Frame speed·····Set the power source voltage to 5.5V (2A), operate the winder for 10 sec., and then read the frame counter. The number of frame should be 16 at least. (Count the number from the 10 th frame on the counter.) Power consumption···Set the power source voltage to 5.5V, ampere to 1 A, and opelate the winder. then, the maximum deflection of the ammeter's indicator should be less than 900 mA up to the last flame of the film (36 EXP.).
Manual winding	Couple the winder with the camera and do the manual winding. There should be no significant difference in winding resistance between operations with and without film.
Winding coupler	The coupler is pushed up by winding coupler spring at all times. So, it returns to the original position when released. It should be possible to turn the coupler up to the contact position, and the coupler should return to the original position by the function of the spring.
Main switch	Check clicking, looseness, smoothness, etc.
R button	Check push-up, smoothness, return operation, etc.

■ Measuring Instruments

- ■ Constant voltage D. C power supply 〈Model E-1·E-2〉
- ■ Digital tester 〈Type 2507〉
- ■ Circuit tester
- ■ Luminescence adjusting driver C

■ Sub Materials

■ Grease

- Grease #006
- AGX-25
- ELECTROLUBE

■ Binding agent

- SONI-BOND SC-108
- PLIOBOND
- LOCKTITE #242
- SCREW LOCK G

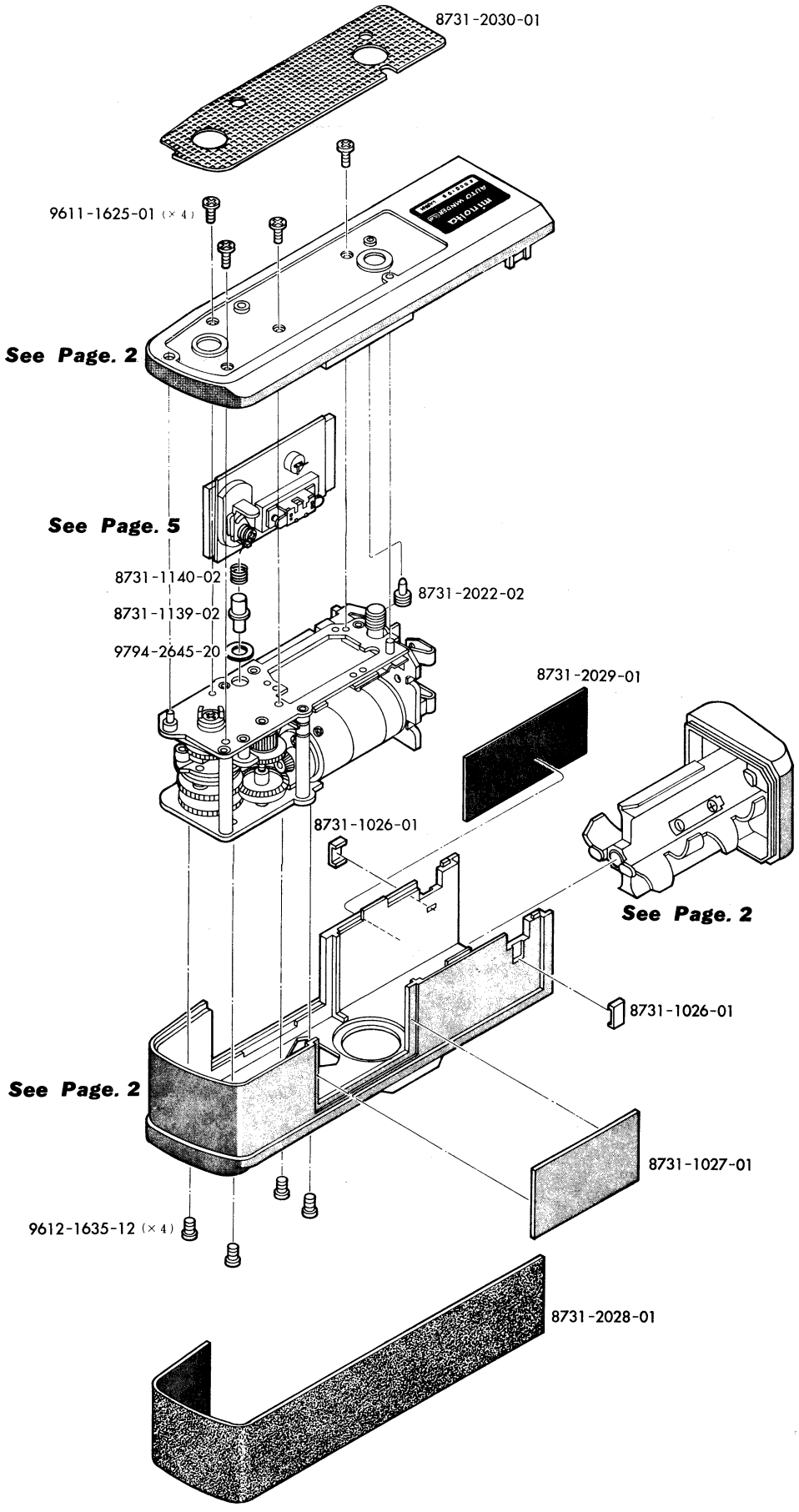
■ Cleaner

- FLONSOLVE

Index

MINOLTA AUTO WINDER-G

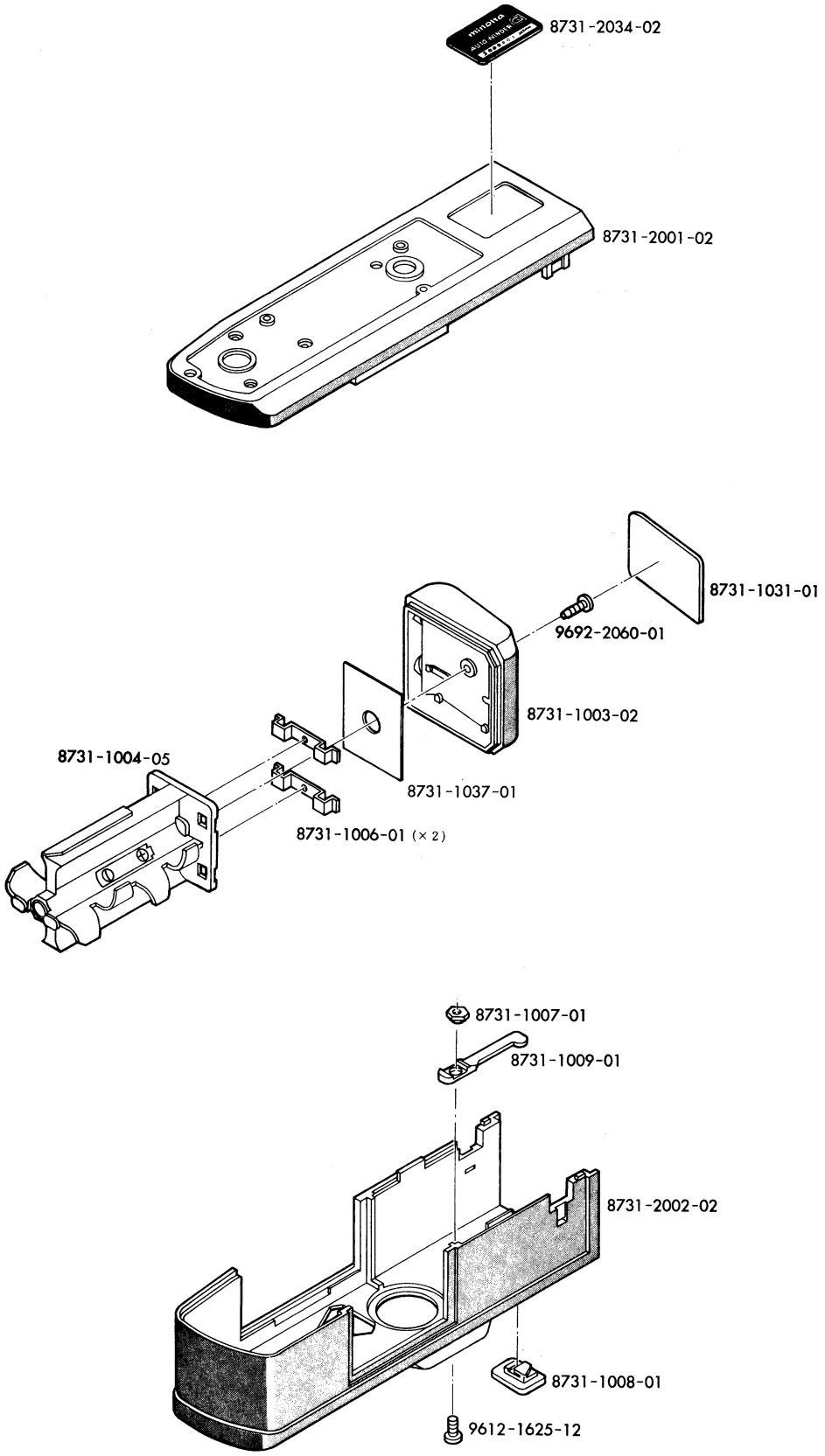
CODE No. 8731-200



Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-1026-01	Coupling plate 上下ケース継ぎ板	2
8731-1027-01	Motor cover モーターカバー	1
8731-1139-02	R-button axis R釦軸	1
8731-1140-02	R-button spring R釦スプリング	1
8731-2022-02	Winding contact カメラ接続接点	1
8731-2028-01	Leather-A 貼皮A	1
8731-2029-01	Leather-B 貼皮B	1
8731-2030-01	Leather-C 貼皮C	1
9611-1625-01	Phillips type screw 十字穴付なべ頭小ねじ	4
9612-1635-12	Phillips thpe screw 十字穴付なべ頭小ねじ	4
9794-2645-20	Washer 薄ワッシャー	1

MINOLTA AUTO WINDER-G

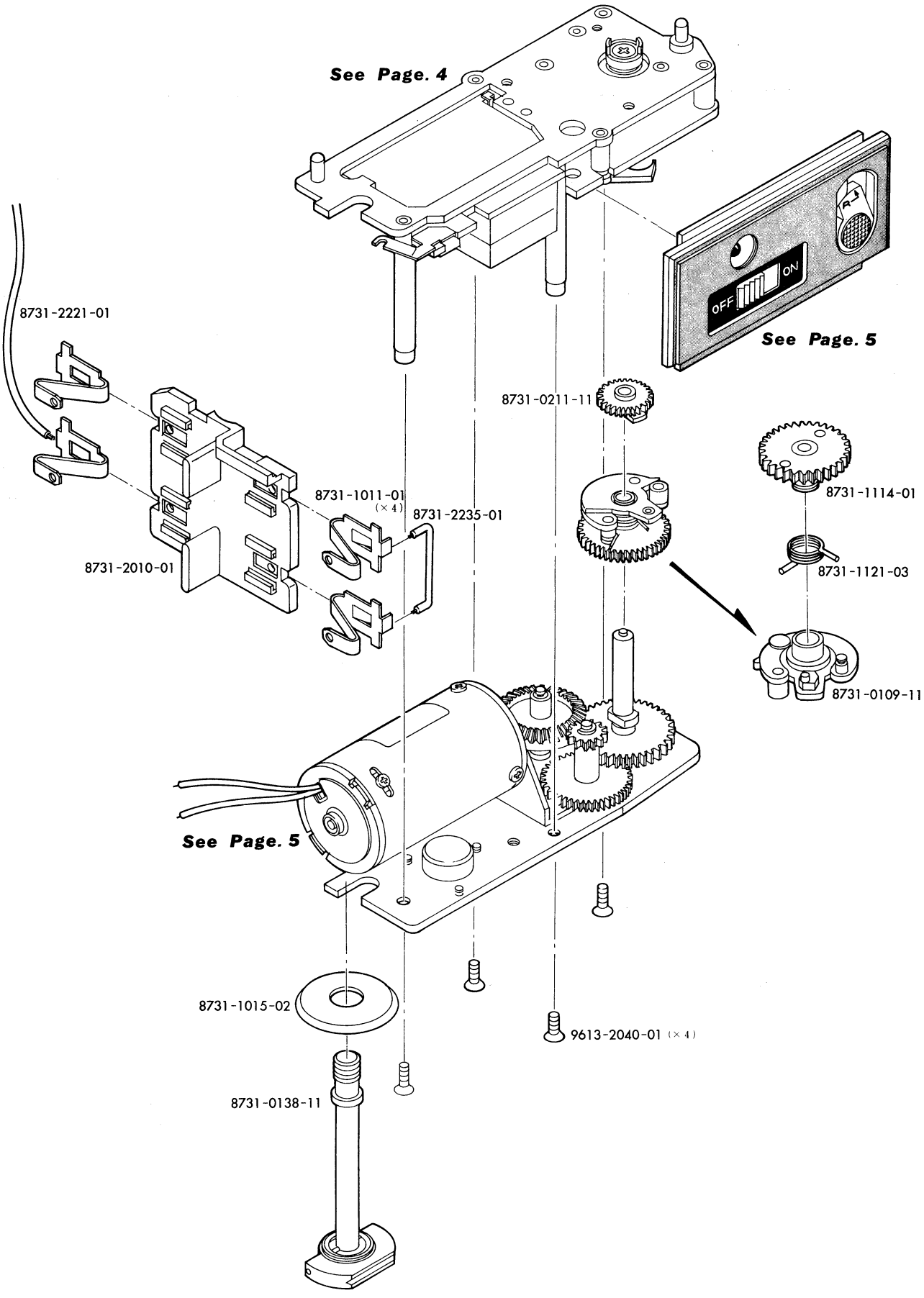
CODE No. 8731-200



Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-1003-02	Battery chamber cover 電池ケースぶた	1
8731-1004-05	Battery holder 電池ホルダー	1
8731-1006-01	Battery holder contact 電池ケース接片	2
8731-1007-01	Battery holder lock plate pressure 電池ロック板ＳＰ押え板	1
8731-1008-01	Battery holder lock plate 電池ロック板	1
8731-1009-01	Battery holder lock spring 電池ロック板スプリング	1
8731-1031-01	Battery cover leather 電池ぶた用貼皮	1
8731-1037-01	Battery holder adjusting washer 電池ホルダー調整ワッシャー	1
8731-2001-02	Upper case 上ケース	1
8731-2002-02	Lower case 下ケース	1
8731-2034-02	Name plate ワインダー銘板	1
9612-1625-12	Phillips type screw 十字穴付なべ頭小ねじ	1
9692-2060-01	Phillips type tapping screw 十字穴付タッピンねじ	1

MINOLTA AUTO WINDER-G

CODE No. 8731-200



Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-0109-11	Operation plate set 駆動板セット	1
8731-0138-11	Tripod screw set 三脚ねじセット	1
8731-0211-11	Winding operation gear set 巻上伝達ギヤーセット	1
8731-1011-01	Battery contact 電池接片	4
8731-1015-02	Tripod screw cover 三脚カバー	1
8731-1114-01	Operation plate gear 駆動板伝達ギヤー	1
8731-1121-03	Winding operation roller spring 巻上伝達ローラースプリング	1
8731-2010-01	Battery contact set screw 電池接片取付板	1
8731-2221-02	Lead wire-A (Blue, ϕ0.08/13wires: ℓ=85mm) コードA（青）	1
8731-2235-01	Leas wire-K (Yellow, ϕ0.12/10wires: ℓ18mm) コードK（黄）	1
9613-2040-01	Phillips type screw 十字穴付皿小ねじ	4

MINOLTA AUTO WINDER-G

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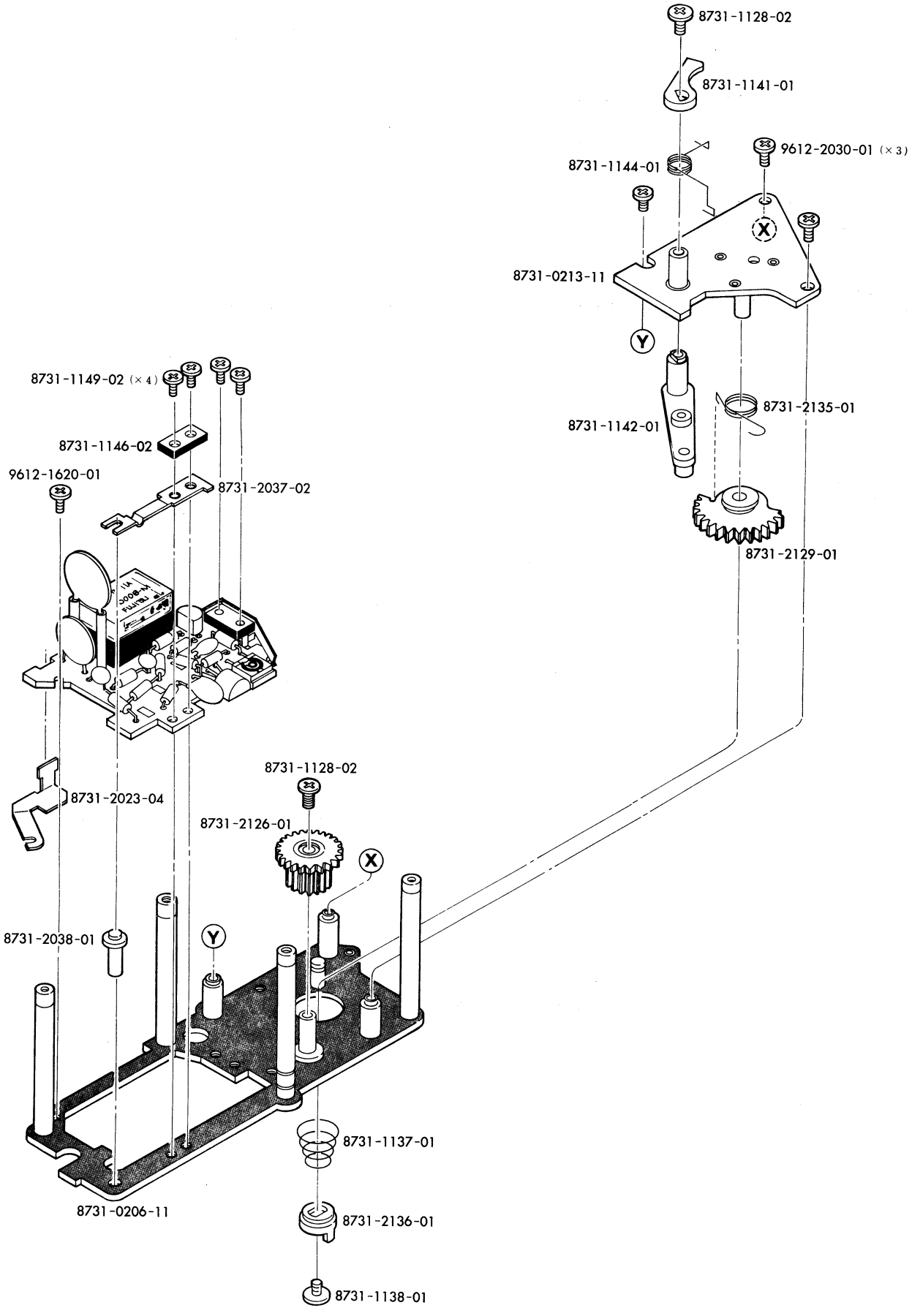
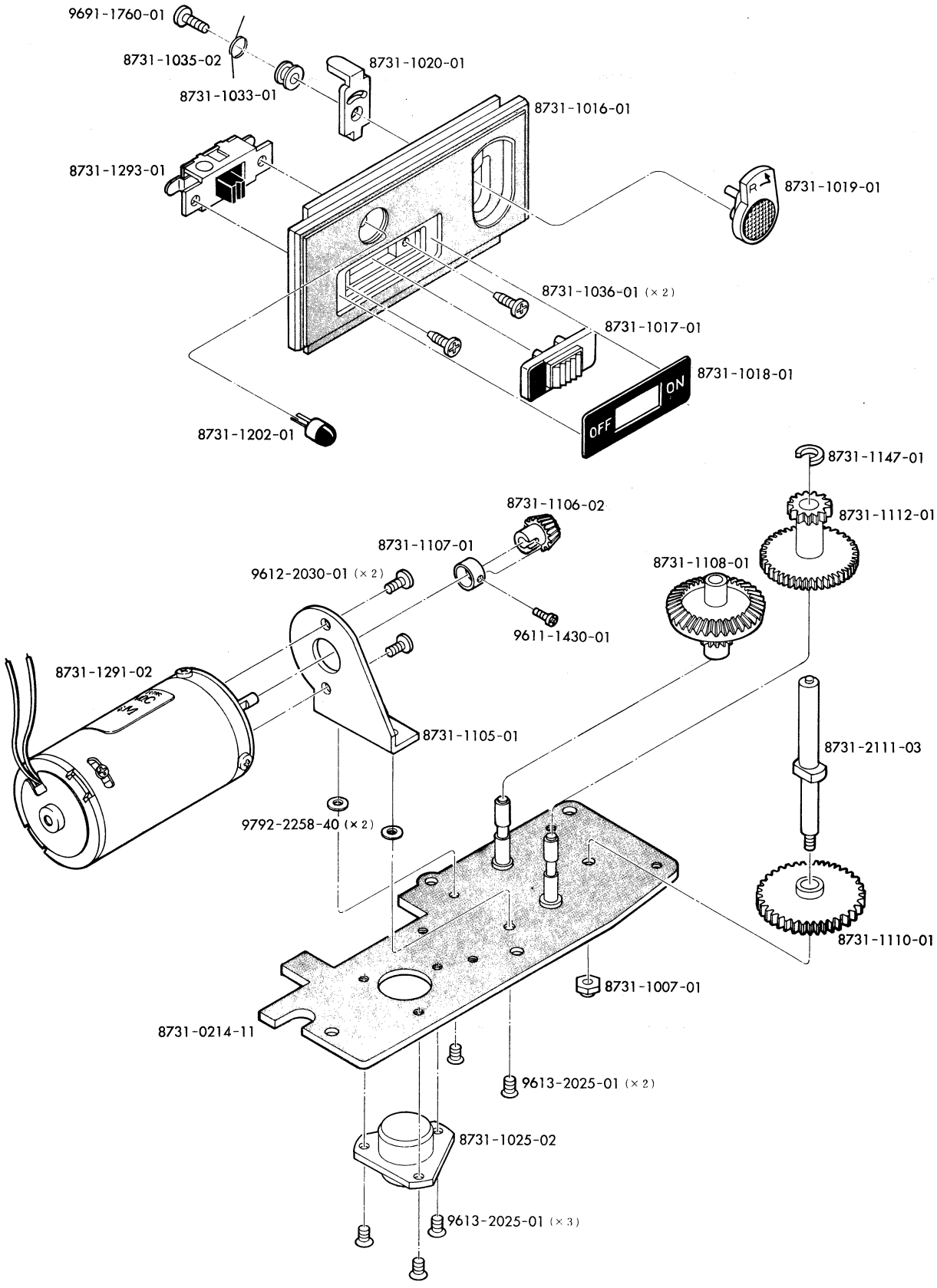


Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-0206-11	Upper base plate set 上台板セット	1
8731-0213-11	Winding base plate set 巻上台板セット	1
8731-1128-02	Idle gear set screw アイドルギヤー止めビス	2
8731-1137-01	Winding coupler spring 巻上カプラースプリング	1
8731-1138-01	Winding coupler set screw 巻上カプラー止めビス	1
8731-1141-01	Winding stop switch lever 巻止めSW検出レバー	1
8731-1142-01	Winding stop switch change lever 巻止めSW切換レバー	1
8731-1144-01	Winding stop switch lever spring 巻止めSWレバースプリング	1
8731-1146-02	Isolation bush 巻止めSW絶縁ブッシュ	1
8731-1149-02	Winding stop switch contact set screw 巻止めSW接片止めねじ	4
8731-2023-04	Winding contact plate カメラ接続接点SP板	1
8731-2037-02	Winder operation switch contact ワインダー作動SW接片	1
8731-2038-01	Winder operation switch button ワインダー作動SW釦	1
8731-2126-01	Idle gear アイドルギヤー	1
8731-2129-01	Winding gear 巻上ギヤー	1
8731-2135-01	Winding coupler return spring 巻上カプラー戻しスプリング	1
8731-2136-01	Winding coupler 巻上カプラー	1
9612-1620-01	Phillips type screw 十字穴付なべ頭小ねじ	1
9612-2030-01	Phillips type screw 十字穴付なべ頭小ねじ	3

MINOLTA AUTO WINDER-G

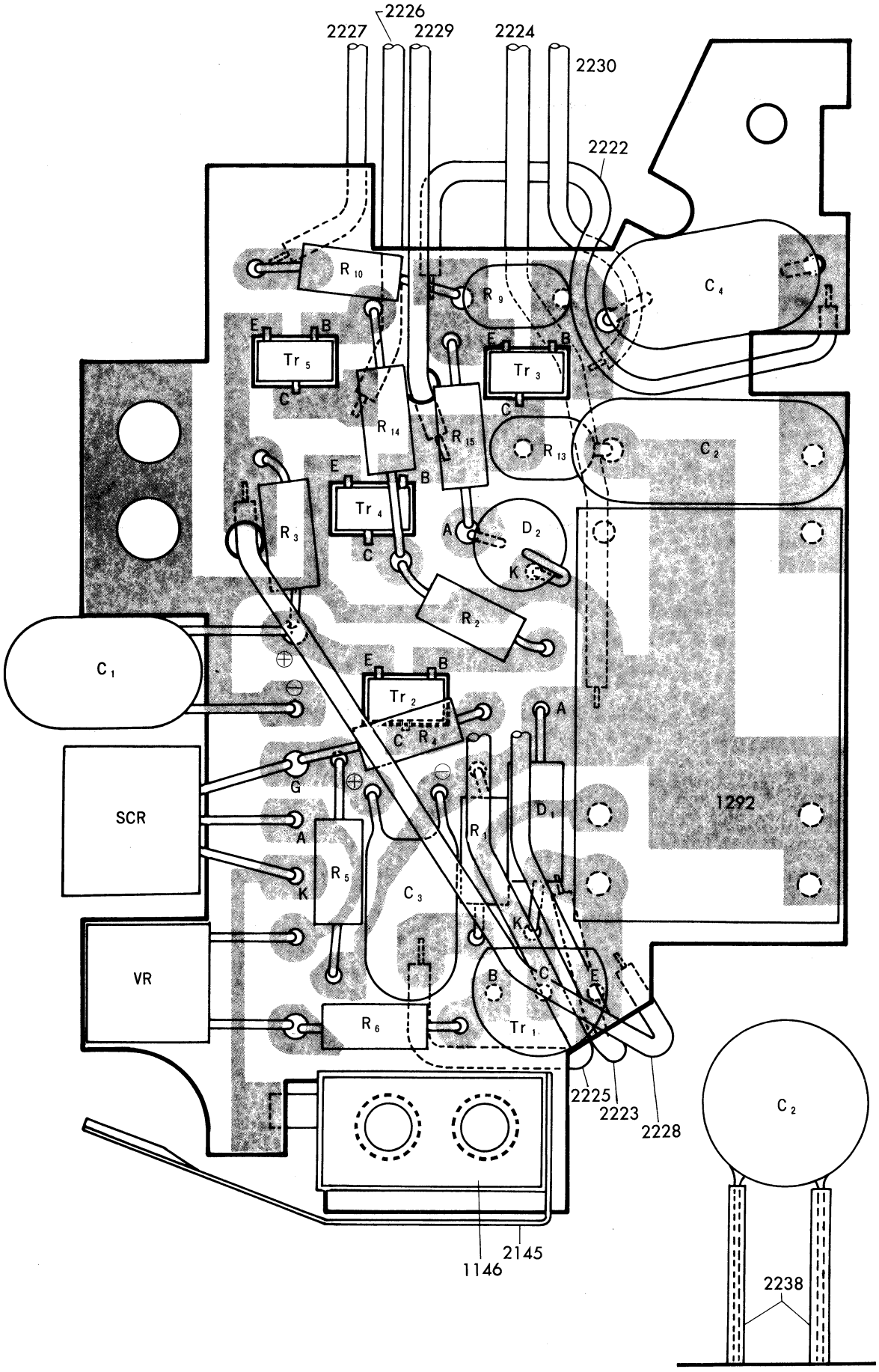
CODE No. 8731-200



Part No. 部品番号	Part Name 部品名称	Qty 員数
8731-0214-11	Lower base plate set 下台板セット	1
8731-1007-01	Pressure 押え板	1
8731-1016-01	Operation plate 操作板	1
8731-1017-01	Main switct operation button メインSW操作釦	1
8731-1018-01	Main switch plate メインSW銘板	1
8731-1019-01	R-button R釦	1
8731-1020-01	R-button slide lever R釦スライドレバー	1
8731-1025-02	Tripod socket 三脚めねじ	1
8731-1033-01	R-button spring-B collar R釦スプリングBカラー	1
8731-1035-02	R-button spring-B R釦スプリングB	1
8731-1036-01	Main switch set screw メインSW止めビス	2
8731-1105-01	Motor base plate モーター台板	1
8731-1106-02	Bevel gear-A ベベルギヤーA	1
8731-1107-01	Bevel gear-A set ring ベベルギヤー止め輪	1
8731-1108-01	Bevel gear-B ベベルギヤーB	1
8731-1110-01	Reduction gear-A 減速ギヤーA	1
8731-1112-01	Reduction gear-B 減速ギヤーB	1
8731-1147-01	Reduction gear set screw 減速ギヤー止め輪	1
8731-1202-01	Ligth emission diode L. E. D	
8731-1291-02	Motor モーター	1
8731-1293-01	Main switch メインSW	1
8731-2111-03	Min shaft 主軸	1
9611-1430-01	Phillips type screw 十字穴付なべ頭小ねじ	1
9612-2030-01	Phillips type screw 十字穴付なべ頭小ねじ	2
9613-2025-01	Phillips type screw 十字穴付皿小ねじ	5
9691-1760-01	Phillips type tapping screw 十字穴付タッピンねじ	1
9792-2258-40	Washer 薄ワッシャー	2

MINOLTA AUTO WINDER-G

CODE No. 8731-200



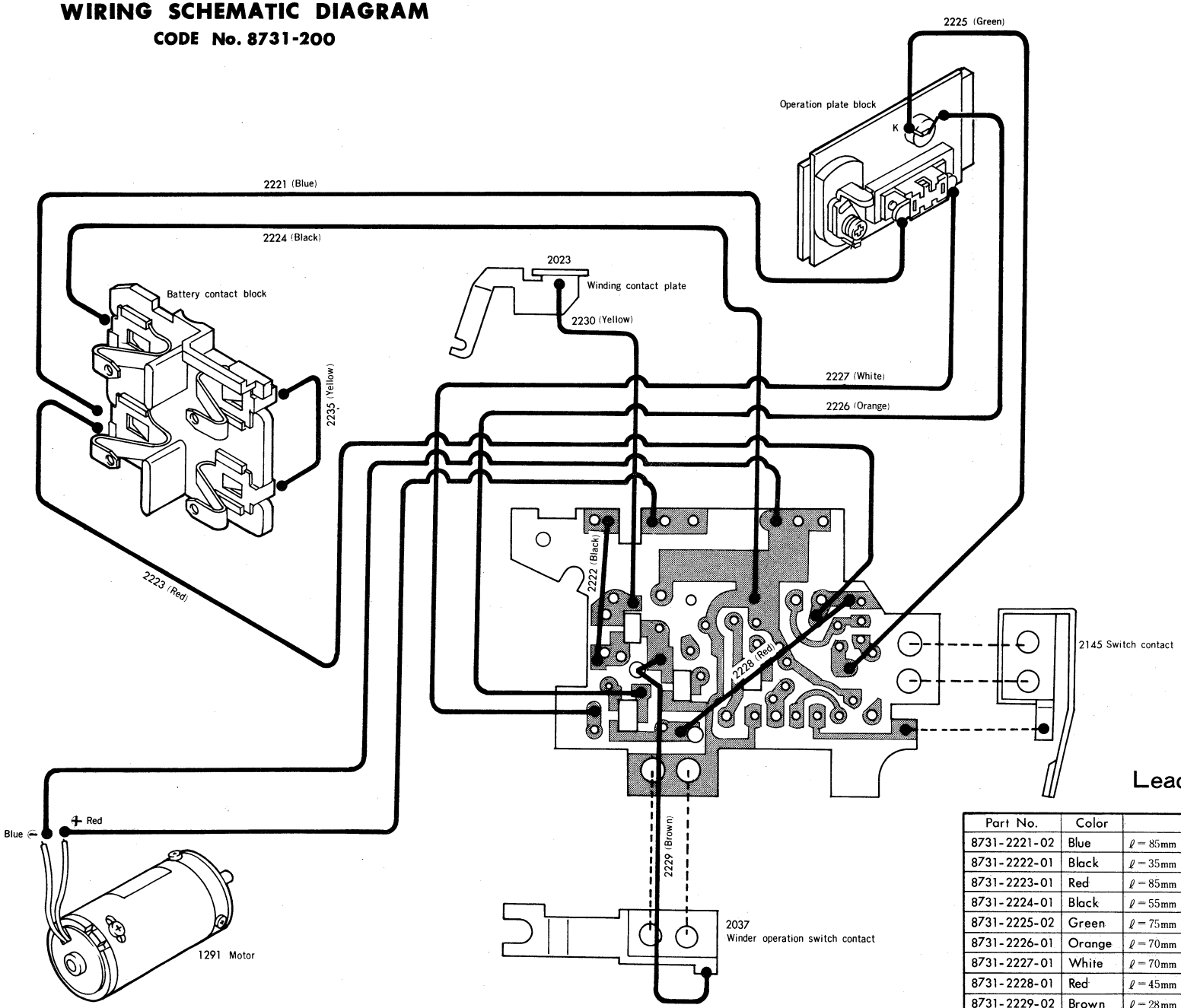
Assy. Part No. 8731-0234-11 Assy. Part Name: Circuit base plate set

回路基板セット

Simbol	Part No.	Com.	Part Name	Typ.	Qty.
Tr_1	9363-1761-01	02	Transistor	2SA950-	1
Tr_5 Tr_2	9363-1632-02	03, 04		2SA812(M5, M6, M7)	2
Tr_3	9363-1632-03	04		2SA812(M6, M7)	1
Tr_4	9362-1633-02	03, 04		2SC1623(L6, L7)	1
D_1	9361-1631-11		Diode	1S953	1
D_2	9361-5632-12			VD1211	1
SCR	8731-1209-01		Thyristor	5FOR2B41	1
C_1	9534-1055-33		Condenser	CS1SEIE010MIS 1μF	1
C_2	9565-4738-62			DD310-950BC473Z50V08, 0.047μF	1
C_3	9535-4745-36			TYPE202, 0.47μF	1
C_4	9563-3335-61			DD380-950BC333M16V08, 0.033μF	1
R_1	9422-2416-32		Fixed resistor	1/8W ERD10TJ 240Ω	1
R_2	9422-1046-32			1/8W ERD10TJ 100KΩ	1
R_3	9422-3336-32			1/8W ERD10TJ 33KΩ	1
R_4	9422-1626-32			1/8W ERD10TJ 1.6KΩ	1
R_5	9422-1026-32			1/8W ERD10TJ 1KΩ	2
R_6	9422-1516-32			1/8W ERD10TJ 150Ω	1
R_9	9431-6858-31			MR 1/16W 6.8MΩ	1
R_{10}	9422-5136-32			1/8W ERD10TJ 51KΩ	1
R_{13}	9431-5647-31			MR 1/16W 560KΩ	1
R_{14}	9422-2036-32			1/8W ERD-10TJ 20KΩ	1
R_{15}	9422-2226-32			1/8W ERD-10TJ 2.2KΩ	1
VR	9473-1529-61		Variable resistor	RG4-HAS 1.5KΩ	1
ℓ_B	8731-2222-01		Lead wire	Black ℓ=35mm ϕ0.08/13 wires	1
ℓ_C	8731-2223-01			Red ℓ=85mm ϕ0.12/10 wires	1
ℓ_D	8731-2224-01			Black ℓ=55mm ϕ0.12/10 wires	1
ℓ_E	8731-2225-02			Green ℓ=75mm ϕ0.08/13 wires	1
ℓ_F	8731-2226-01			Orange ℓ=70mm ϕ0.08/13 wires	1
ℓ_G	8731-2227-01			White ℓ=70mm ϕ0.08/13 wires	1
ℓ_H	8731-2228-01			Red ℓ=45mm ϕ0.08/13 wires	1
ℓ_I	8731-2229-02			Brown ℓ=28mm ϕ0.08/13 wires	1
ℓ_J	8731-2230-01			Yellow ℓ=22mm ϕ0.08/13 wires	1
①	8731-1292-01		Relay		1
②	8731-2145-01		Contact		1
③	8731-2238-01		Tube		2
④	8731-1146-02		Isolation bush		1

WIRING SCHEMATIC DIAGRAM

CODE No. 8731-200



Lead wire list

Part No.	Color	Typ.	Qty.
8731-2221-02	Blue	ℓ = 85mm ϕ0.08/13 wires: ϕ0.8	1
8731-2222-01	Black	ℓ = 35mm ϕ0.08/13 wires: ϕ0.8	1
8731-2223-01	Red	ℓ = 85mm ϕ0.12/10 wires: ϕ1	1
8731-2224-01	Black	ℓ = 55mm ϕ0.12/10 wires: ϕ1	1
8731-2225-02	Green	ℓ = 75mm ϕ0.08/13 wires: ϕ0.8	1
8731-2226-01	Orange	ℓ = 70mm ϕ0.08/13 wires: ϕ0.8	1
8731-2227-01	White	ℓ = 70mm ϕ0.08/13 wires: ϕ0.8	1
8731-2228-01	Red	ℓ = 45mm ϕ0.08/13 wires: ϕ0.8	1
8731-2229-02	Brown	ℓ = 28mm ϕ0.08/13 wires: ϕ0.8	1
8731-2230-01	Yellow	ℓ = 22mm ϕ0.08/13 wires: ϕ0.8	1
8731-2235-01	Yellow	ℓ = 18mm ϕ0.12/10 wires: ϕ1	1

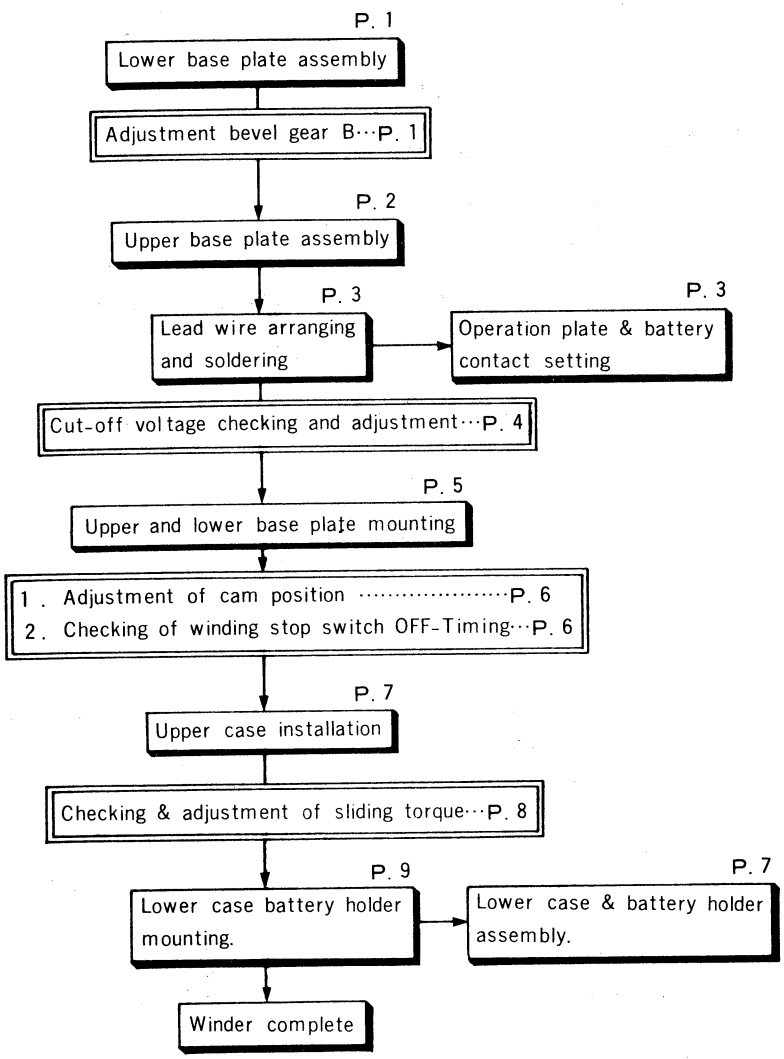
Disassembly, Assembly and Adjustment

■ The content of this manual includes the assembly and adjustment procedure in accordance with the assembly chart. For the disassembly procedure, refer to the pages in the reverse order.

— Description of marks —

✣ : Points for assembly and general cautions.
[G] : Grease used and applying portions.
[B] : Binding agent used and applying portions.
[O] : Oil used and applying portions.

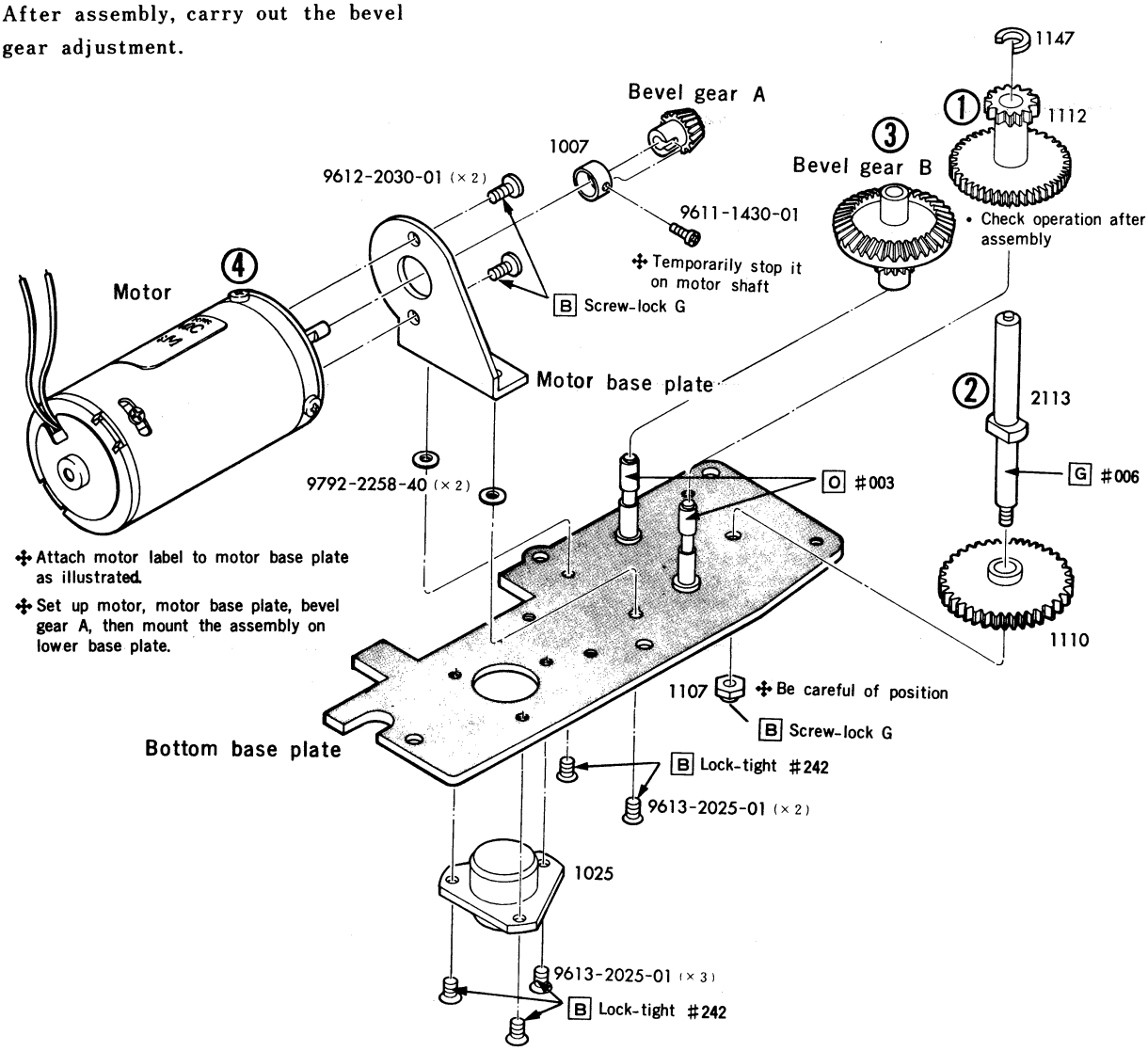
■ Assembly & Adjustment Procedure Chart



1 Lower base plate

■ Proceed in the order of ①~④.

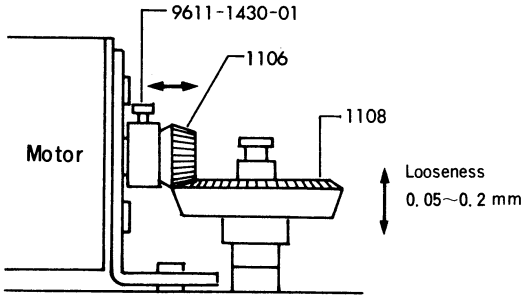
■ After assembly, carry out the bevel gear adjustment.



■ Adjustment of bevel gear B.

1. Loosen bevel gear set-screw (9611-1430-01).
2. Operate bevel gear A (1106) in the direction of the arrow and adjust the vertical looseness to 0.05~0.2 mm, then tighten the set-screw.
3. Rotate bevel gear B (1108) by hand and check to see that gear rotates smoothly.

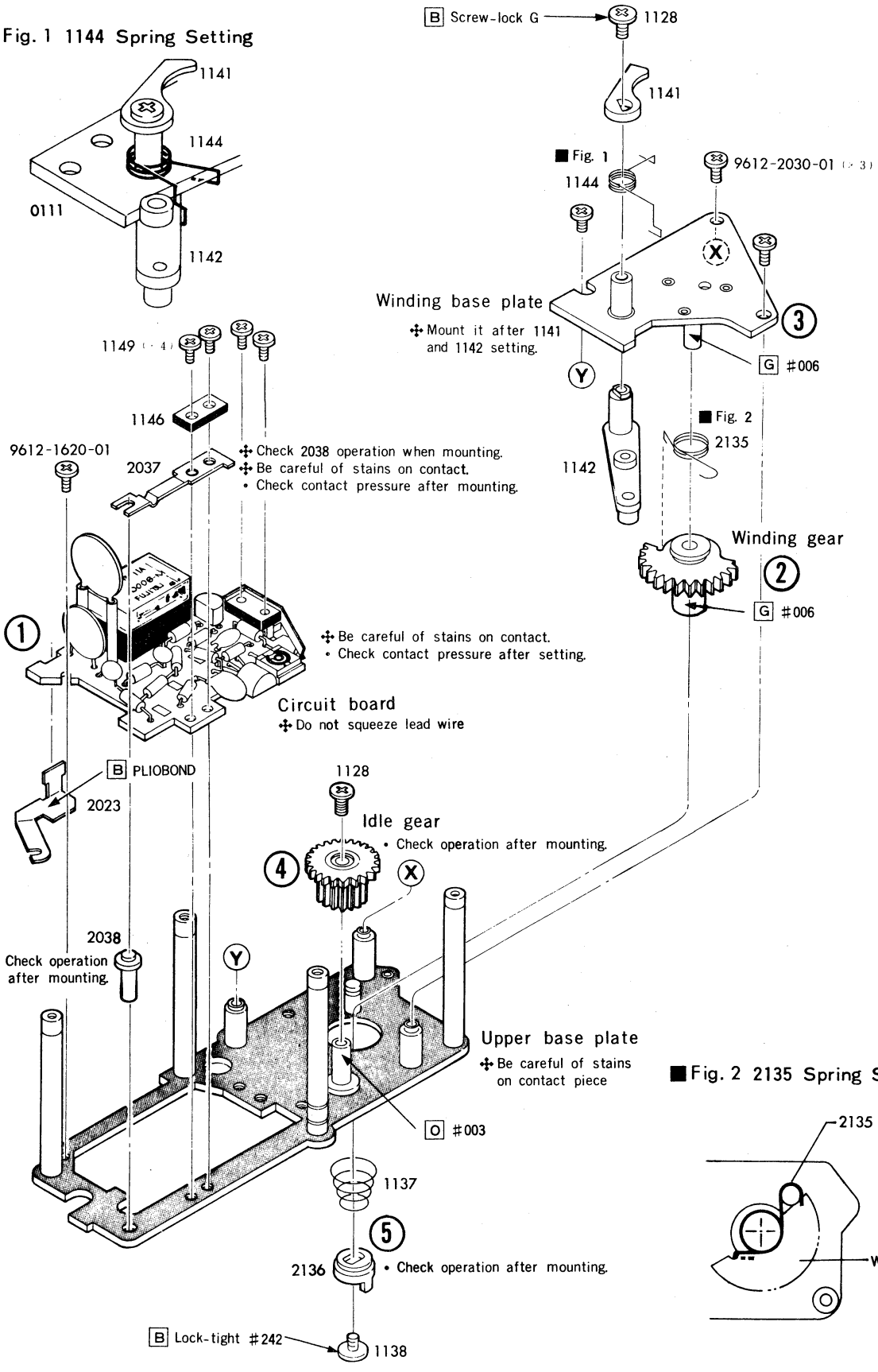
● After checking the operation, apply screw-lock G to bevel gear set-screw (9611-1430-01).



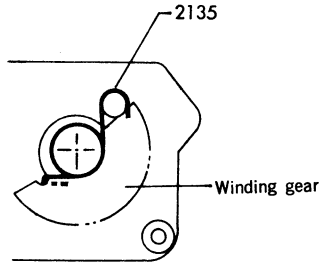
2 Upper base plate

■ Proceed in the order of ①~⑤.

■ Fig. 1 1144 Spring Setting

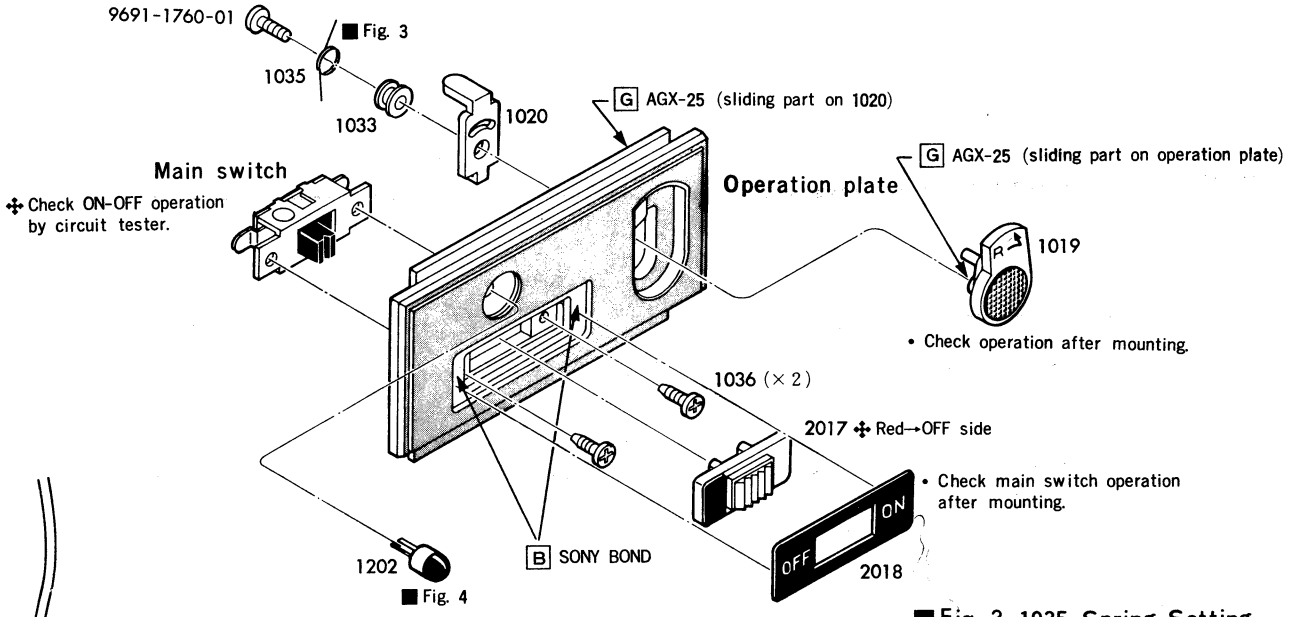


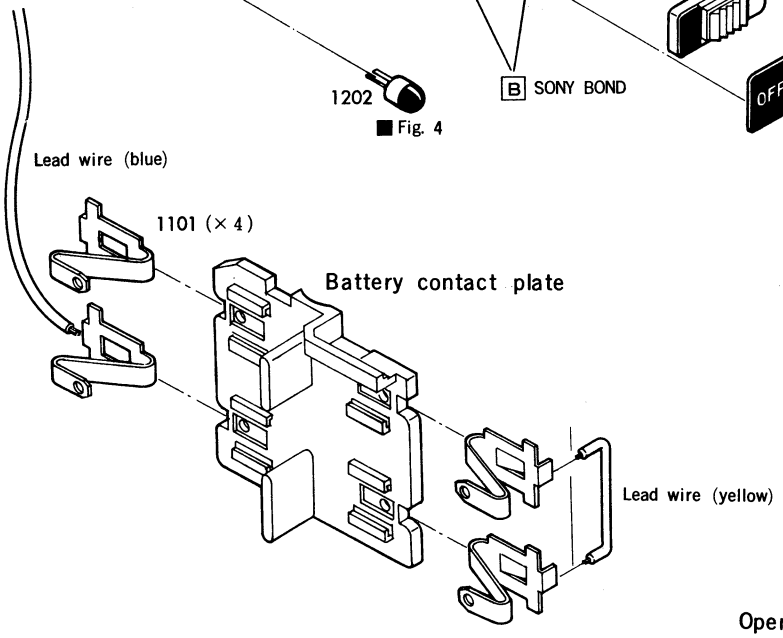
■ Fig. 2 2135 Spring Setting



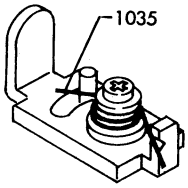
■ After the procedure on this page, arrange and solder each lead wire, check and adjust cut-off voltage on P. 4.

■ Operation plate and battery contact plate assembly



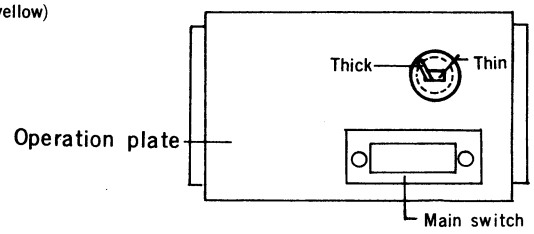


■ Fig. 3 1035 Spring Setting



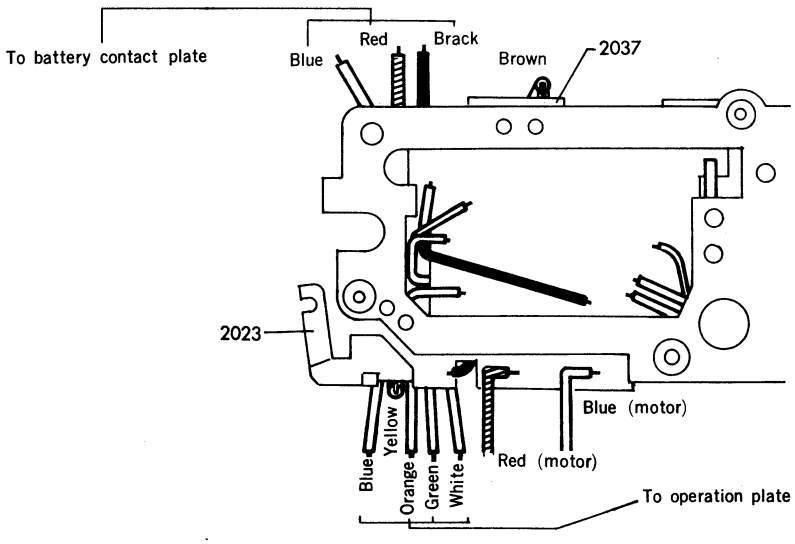
■ Fig. 4 LED (1202) Mounting

Be careful of 1202 leg position and bending direction.



■ Lead wire arrangement and soldering

Arrange lead wires as illustrated, then solder them according to the wiring diagram.



■ Checking and adjustment of cut-off voltage

■ Measuring instruments

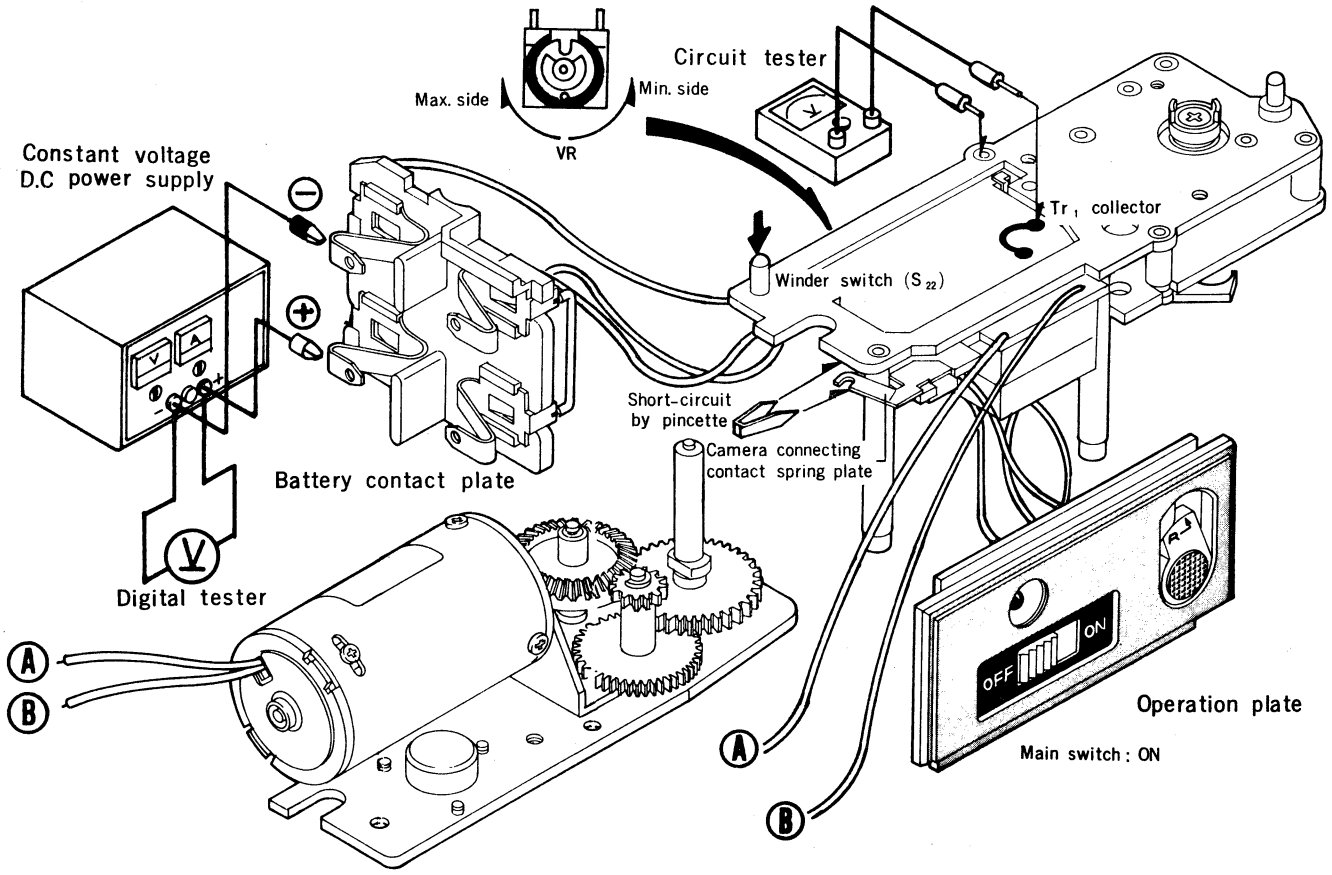
: Constant voltage D.C power supply (E-1 or E-2) : Circuit tester

: Digital tester (Type 2507) : Luminance adjusting driver C

■ Specification: Cut-off voltage 2.0±0.1V

■ Checking procedure

1. After wiring each lead wire, set main switch (S_{20}) and winding stop switch (S_{21}) to ON as illustrated.
2. Connect constant D.C voltage power supply to battery contact (1011) and set it to 4.2V, 2.0A.
3. Set winder switch (S_{22}) to OFF and temporarily short-circuit between camera connecting contact spring plate (2023) and earth as illustrated, then operate the motor. (After motor start, set winder switch to ON.)
4. Next, checking voltage between Tr_1 collector and earth (nearly equal to power source voltage) by circuit tester as illustrated, lower the power source voltage slowly. Check to see tat the motor stops within power source voltage of 2.0±0.1V. Also, make sure that the voltage indication of the circuit tester is 0V.

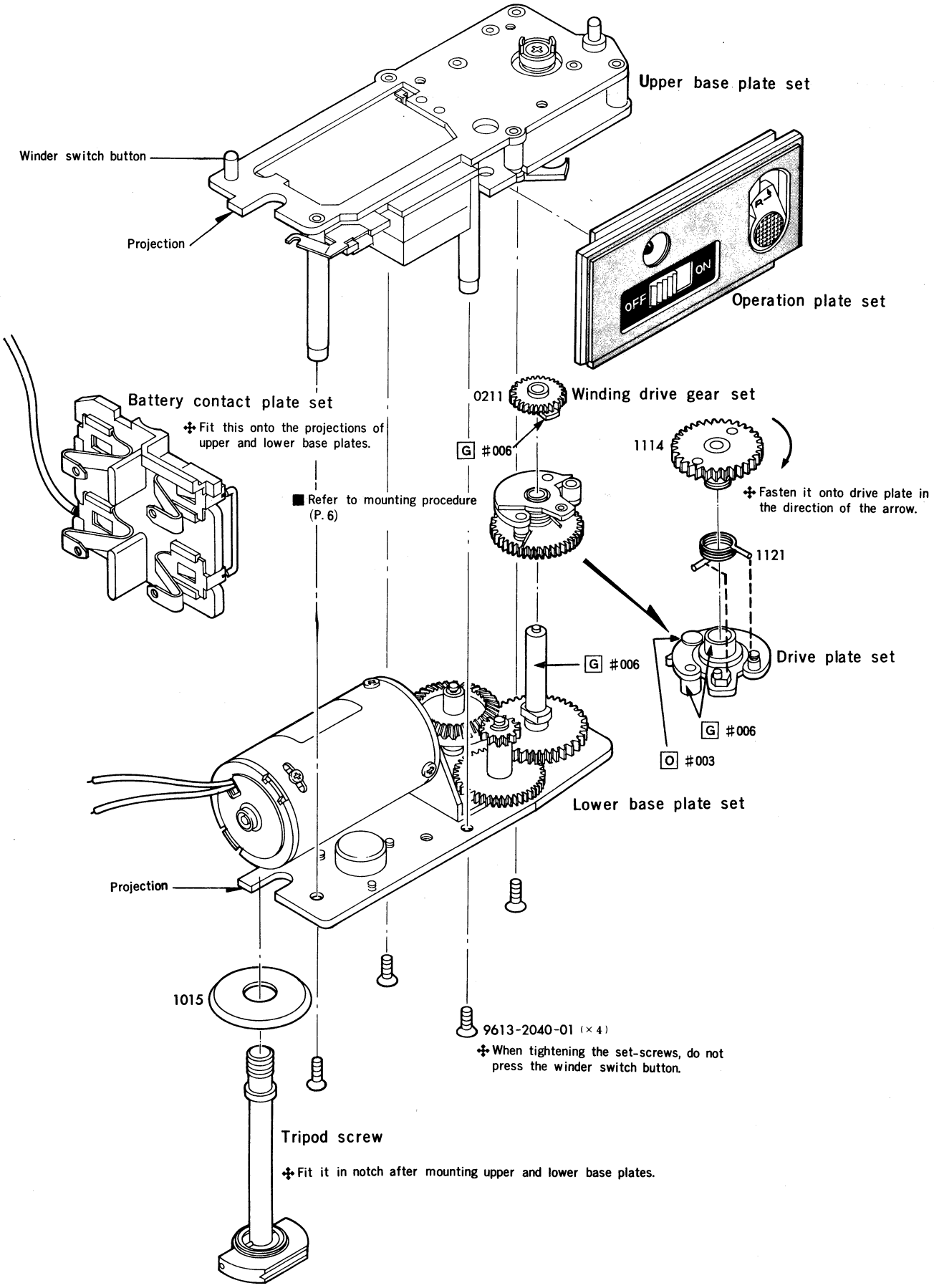


■ Adjustment procedure

1. Fully turn VR to Min side as illustrated above.
2. Operate the motor according to checking procedure 2) and 3), then slowly lower the power source voltage to 2.0V. At that time, make sure that voltage exists between Tr_1 collector and earth.
3. Slowly turn VR to Max side and stop it when the voltage between Tr_1 collector and earth is 0V.
4. Again set the power source voltage to 4.2V and operate the motor. (Refer to checking procedure 3.) Then slowly decrease the voltage and make sure that the motor stops at 2.0 ±0.1V and that the voltage between Tr_1 collector and earth is 0V.

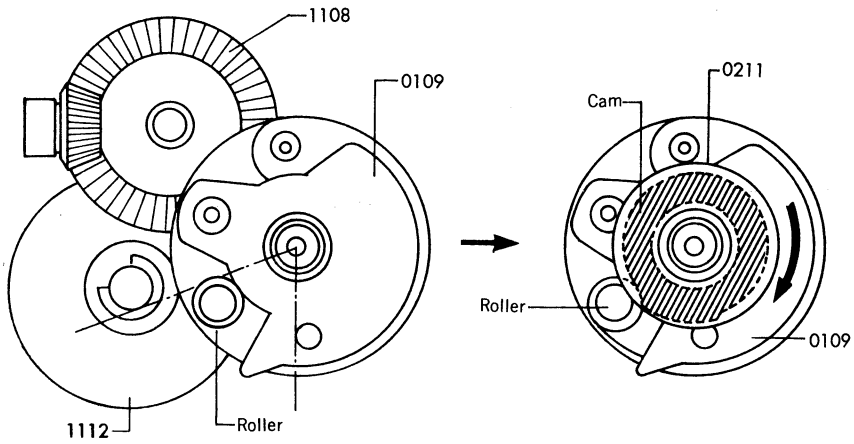
3 Upper and lower base plate mounting

■ After assembling, check the cam position and winding stop switch detection lever position and also check the winding switch (S_{21}) OFF-timing on Page. 6.



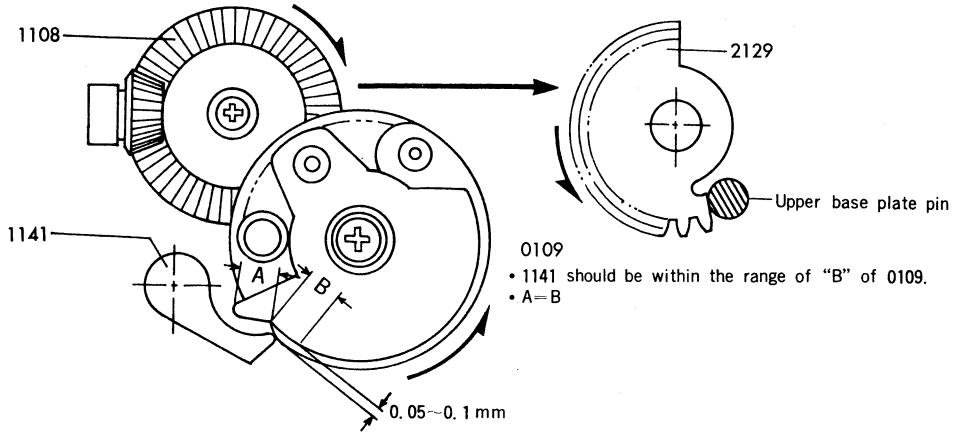
■ Drive plate set and winding drive gear set mounting

Mount the drive plate (0109) on the lower base plate. Turn the winding drive gear set (0211) in the direction of the arrow to set it in the position where the cam of (0211) is in contact with the roller of (0109). Then install the upper base plate, taking care not to allow the winding gear (0211) to shift.



■ Checking of cam position and winding stop switch detection lever position

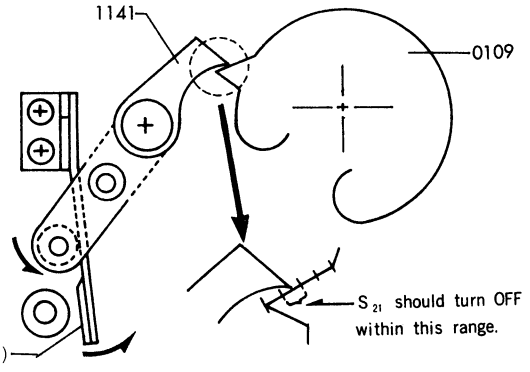
1. Rotate the bevel gear B (1108) in the direction of the arrow until winding gear (2129) comes in contact the pin of upper base plate. Then make sure that the winding stop switch detection lever (1141) is positioned within the range as specified in the figure.
   - If the position is not as specified, adjust the engagement between winding drive gear (0211) and idle gear (2126).
2. Make sure that the clearance between drive plate (0109) and winding stop switch detection lever (1141) is 0.05~0.1 mm.
   - If the clearance is not as specified, adjust the looseness of winding stop switch detection lever (1141).



■ Checking of winding stop switch (S_{21}) OFF-timing

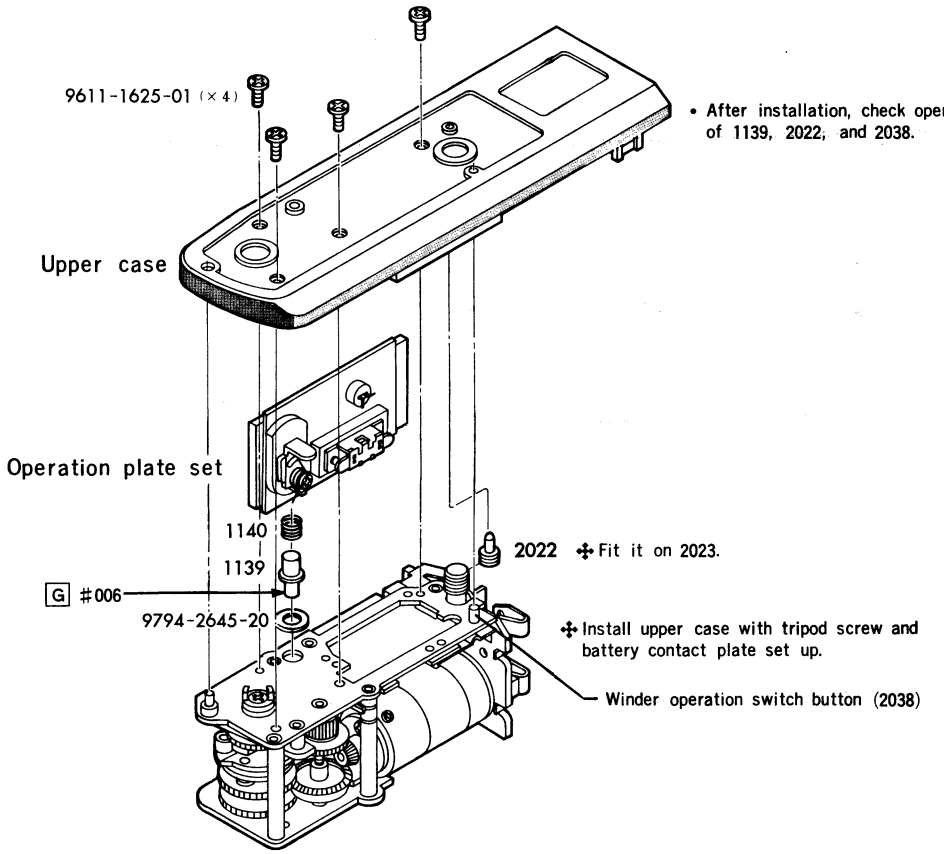
Slowly rotate bevel gear B (1108) in the direction of the arrow (see the above figure). Check to see that winding stop switch (S_{21}) turns off when the claw of drive plate set (0109) and winding stop switch detection lever (1141) are in the range as specified in the figure.

- If the OFF-timing is wrong, re-check the winding stop switch detection lever position.



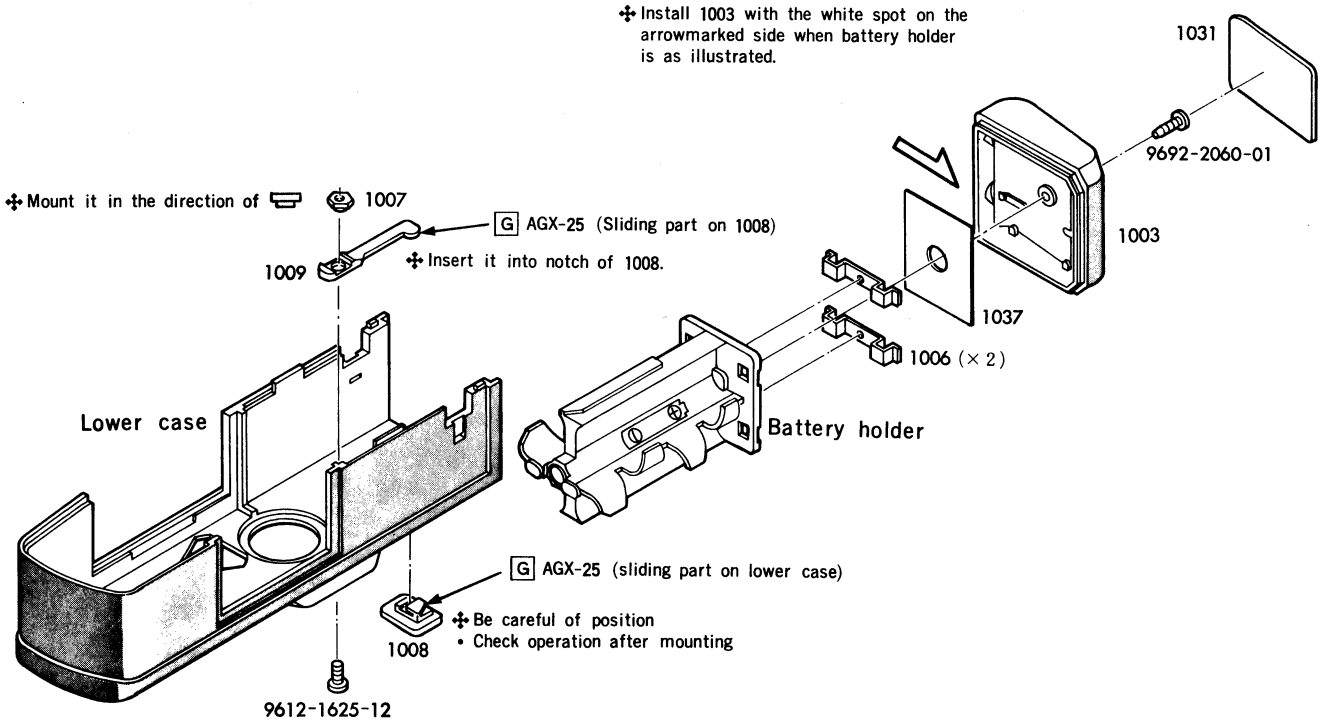
Upper case installation

■ Slightly apply Electrolube to the contact of winding stop screw (S_{21}) before installing the upper case.



• After completing the procedure on this page, carry out the checking and adjustment of sliding torgue on P. 8.

Assembly of lower case and battery holder



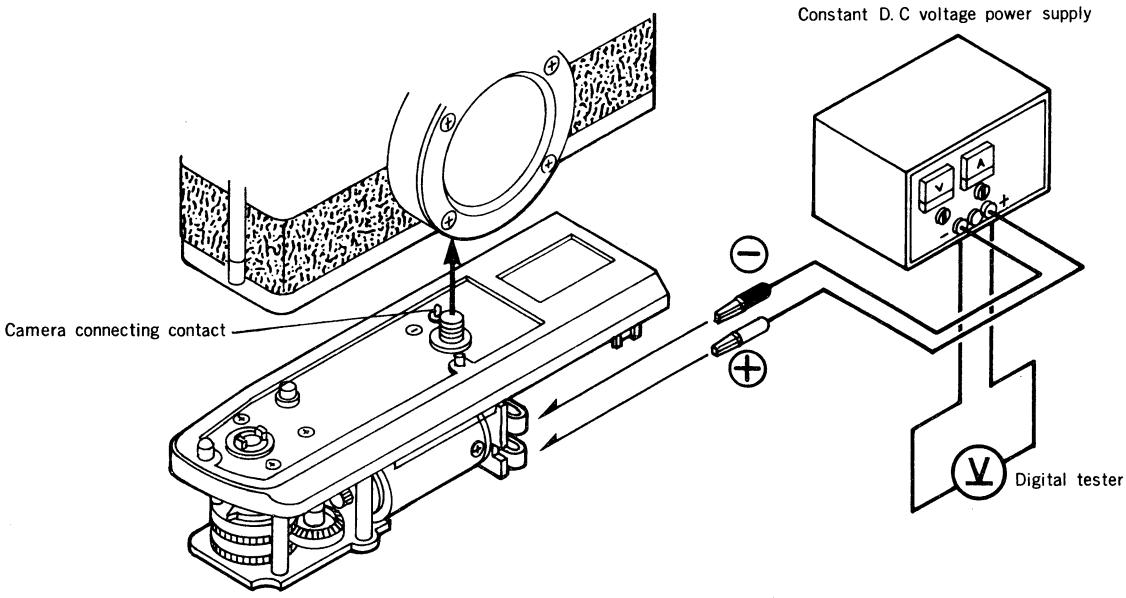
■ Sliding torque checking and adjustment

■ Measuring instruments

: Constant voltage D.C power supply (E-1 or E-2)
: Digital tester (Type 2507)
: Film (NEOPAN SS 36 EXP)

■ Checking procedure

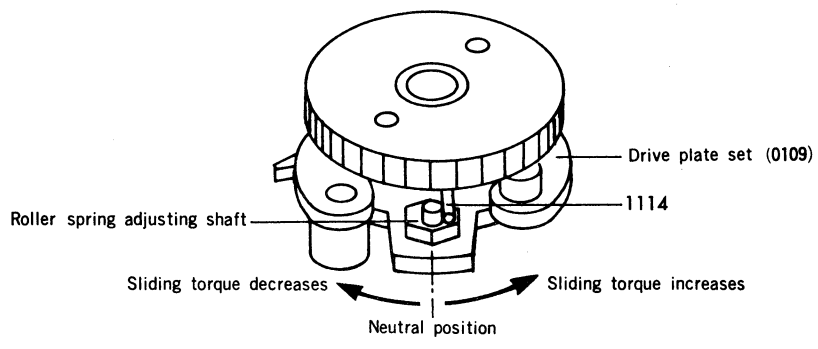
1. With the upper case mounted on the base plate set, set the power source voltage to 6.5V, 2A or oever. Connect it to battery contact (1011) as illustrated and shortcircuit between camera contacting contact (2022) and earth. Then check if the winder operates.
   If it operates, the contact of winder switch (S_{22}) is defective. It should be re-adjusted.
2. Load the camera (2006) with the film. The winding resistance should satisfy the specification.
3. Mount the winder on camera (2006) and set the power source voltage to 6.5V, 2.0A or over. Then connect it to battery contact (1011) as illustrated below.
4. Push the shutter button to operate the winder. At that time, make sure that the film is completely taken up without slipping of the winding mechanism and that the automatic stop completely works.



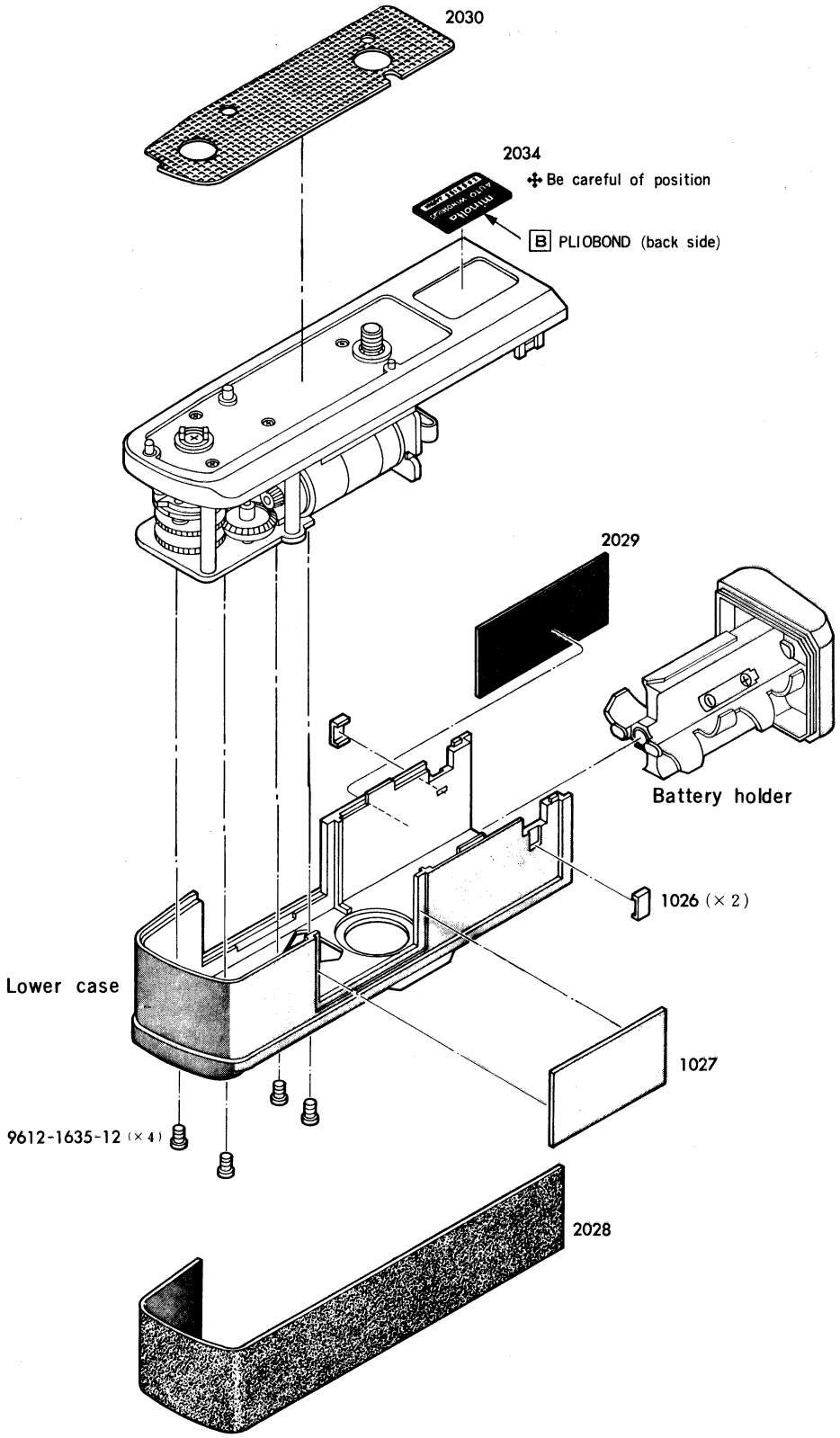
■ Adjustment procedure

1. Sliding torque is insufficient (stops halfway when loaded with film)
   • Turn the roller spring adjusting shaft to the right by means of pincers.
2. Sliding torque is excessive (perforation breaks at the end of film)
   • Turn the roller spring adjusting shaft to the left by means of pincers.

✣ When turning roller spring adjusting shaft, hold the drive plate gear (1114) with hand.



5 Lower case & battery holder mounting



Trouble Shooting Chart

■ Contents

1. This Trouble Shooting Chart includes main troubles and possible causes. Carry out the checks proceeding in the directions of the arrows. When checking circuits, refer to the pattern diagram.
2. This chart only refers to winder troubles.

■ Items

A. No operation.

B. No indication of LED.

C. Operates when camera contact and tripod screw are touched by finger (winder unit).

D. Winder stops halfway during film winding.

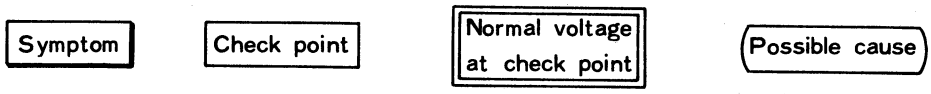
E. No automatic stop at the end of film.

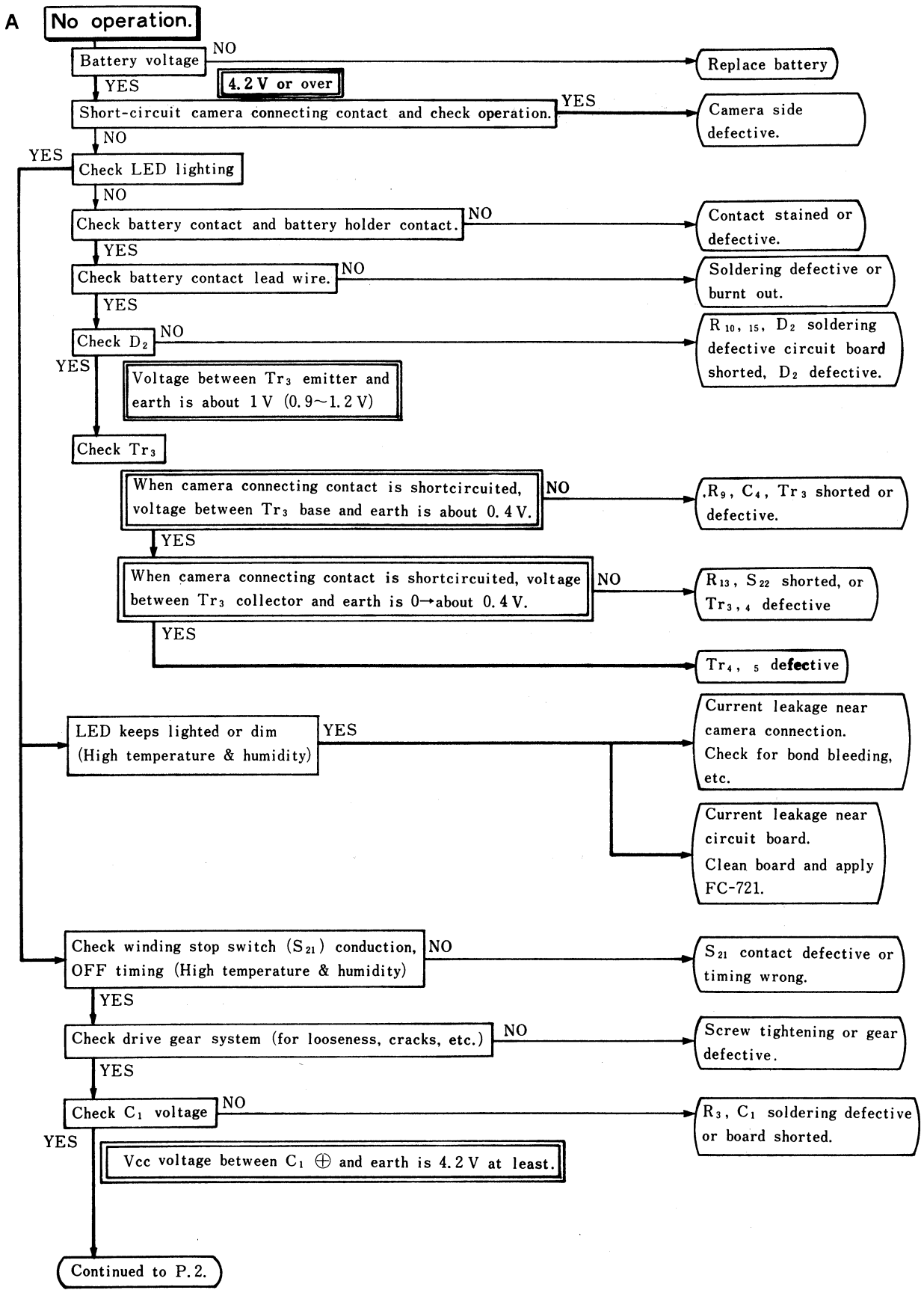
F. Film advance speed too slow.

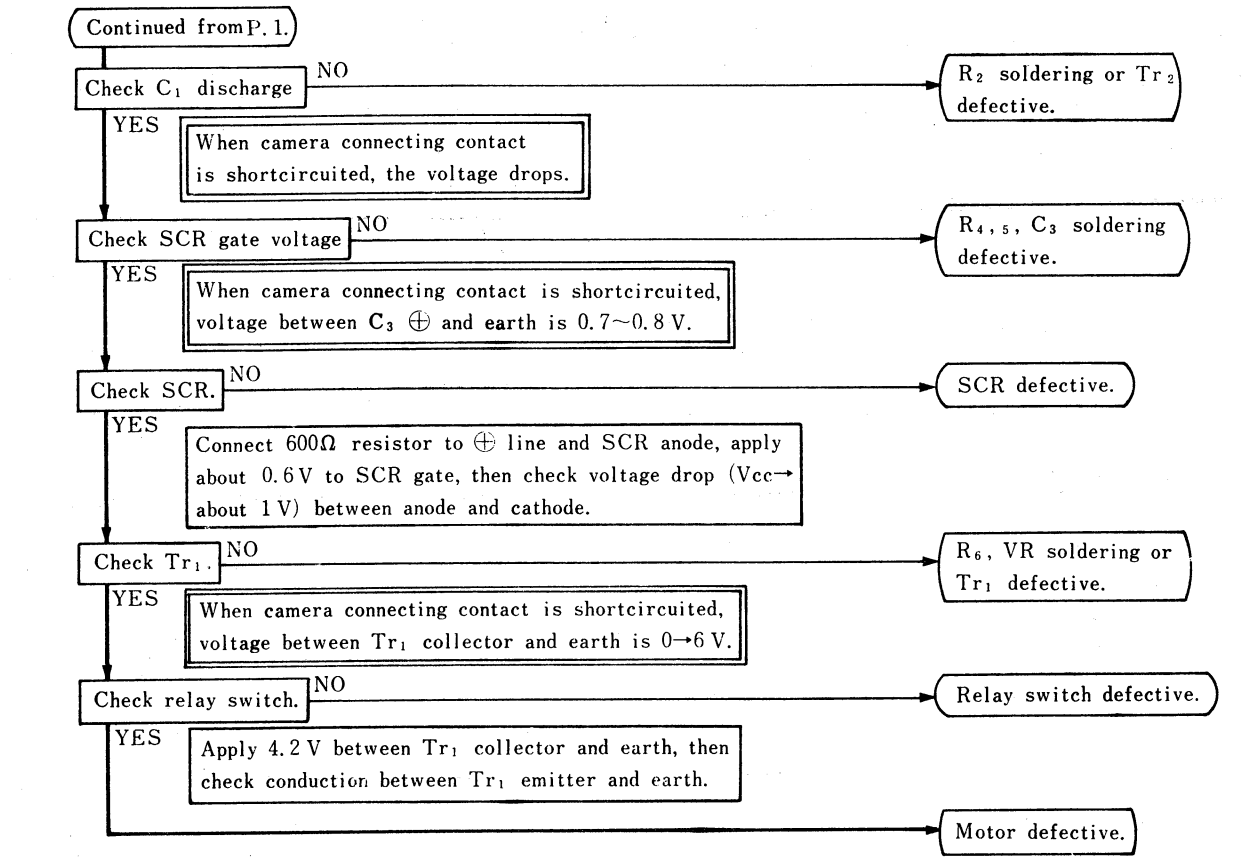
G. Battery exhaustion too early.

■ How to use Trouble Shooting Chart

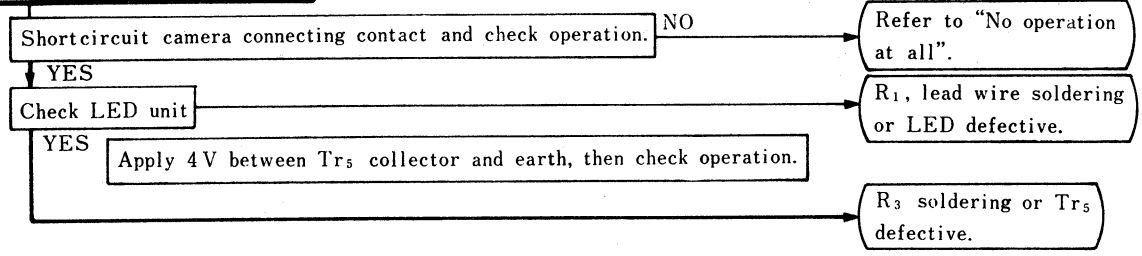
1. Follow up the check points one by one after appearance of symptoms until finding of causes.
2. The marks in the Trouble Shooting Chart are as follows:



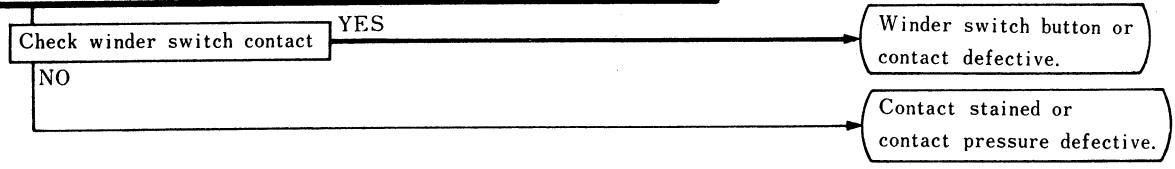

A
No operation.
Battery voltage
NO
Replace battery
YES
4.2 V or over
Short-circuit camera connecting contact and check operation.
YES
Camera side defective.
NO
YES
Check LED lighting
NO
Check battery contact and battery holder contact.
NO
Contact stained or defective.
YES
Check battery contact lead wire.
NO
Soldering defective or burnt out.
YES
Check D2
NO
R10, 15, D2 soldering defective circuit board shorted, D2 defective.
YES
Voltage between Tr3 emitter and earth is about 1 V (0.9~1.2 V)
Check Tr3
When camera connecting contact is shortcircuited, voltage between Tr3 base and earth is about 0.4 V.
NO
R9, C4, Tr3 shorted or defective.
YES
When camera connecting contact is shortcircuited, voltage between Tr3 collector and earth is 0→about 0.4 V.
NO
R13, S22 shorted, or Tr3, 4 defective
YES
Tr4, 5 defective
LED keeps lighted or dim (High temperature & humidity)
YES
Current leakage near camera connection. Check for bond bleeding, etc.
Current leakage near circuit board. Clean board and apply FC-721.
Check winding stop switch (S21) conduction, OFF timing (High temperature & humidity)
NO
S21 contact defective or timing wrong.
YES
Check drive gear system (for looseness, cracks, etc.)
NO
Screw tightening or gear defective.
YES
Check C1 voltage
NO
R3, C1 soldering defective or board shorted.
YES
Vcc voltage between C1 ⊕ and earth is 4.2 V at least.
Continued to P.2.



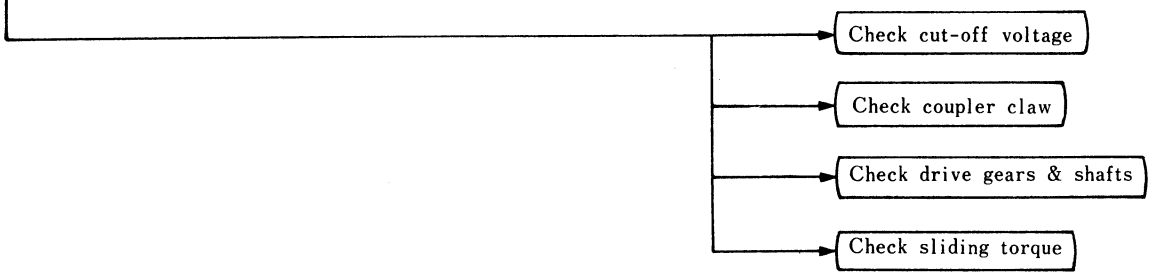
B No indication of LED



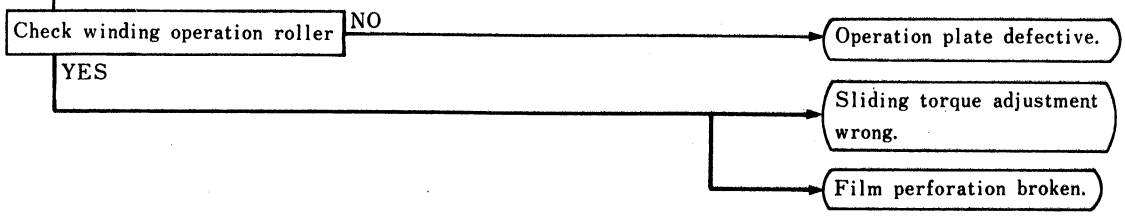
C Operates when camera contact and tripod screw are touched by finger (winder unit)



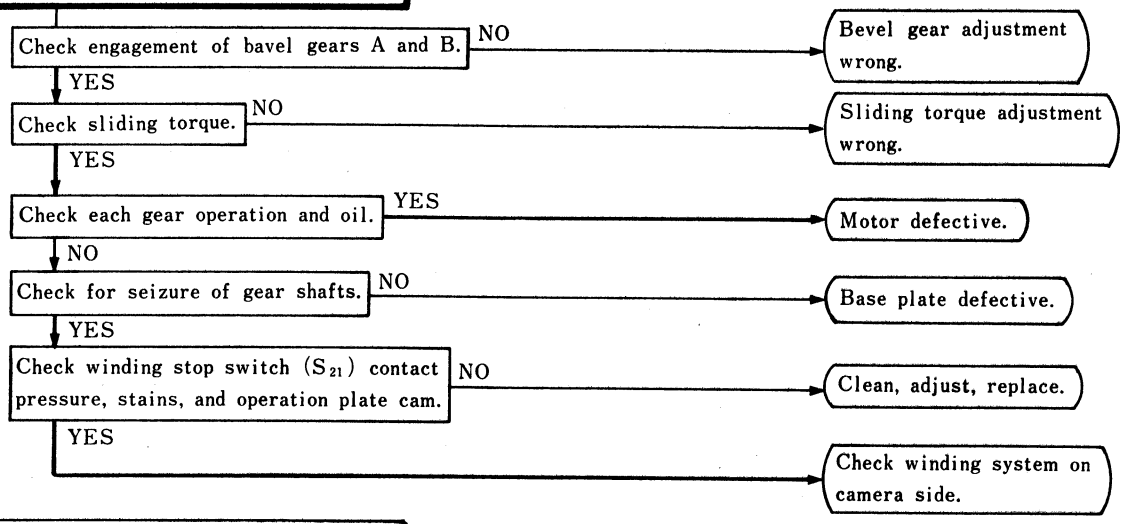
D Winder stops halfway during film winding



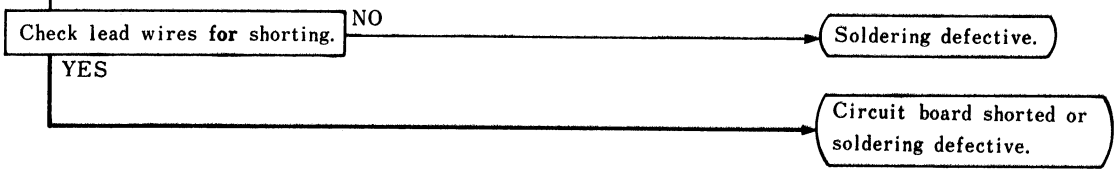
E No automatic stop at the end of film.



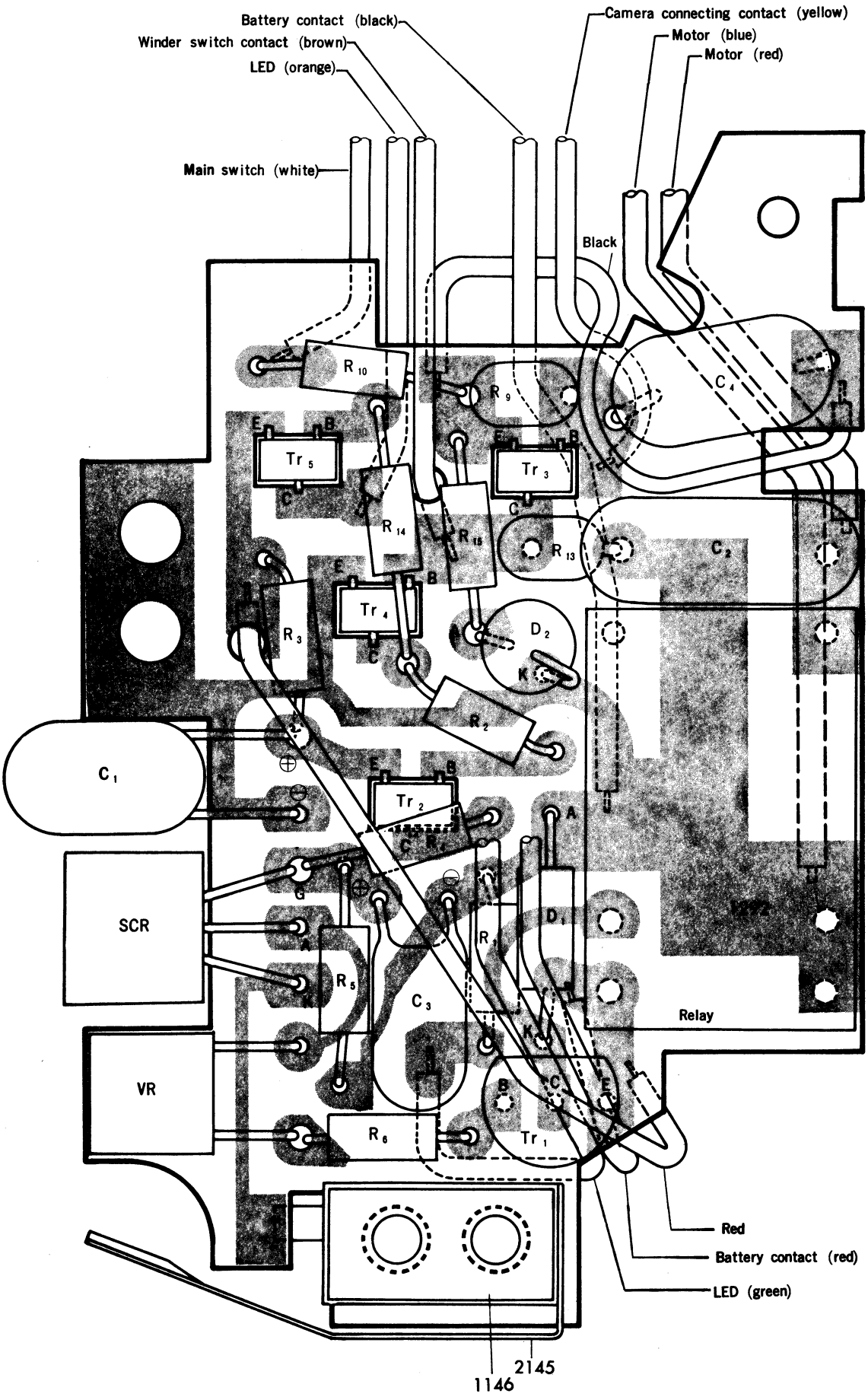
F Film advance speed too slow.



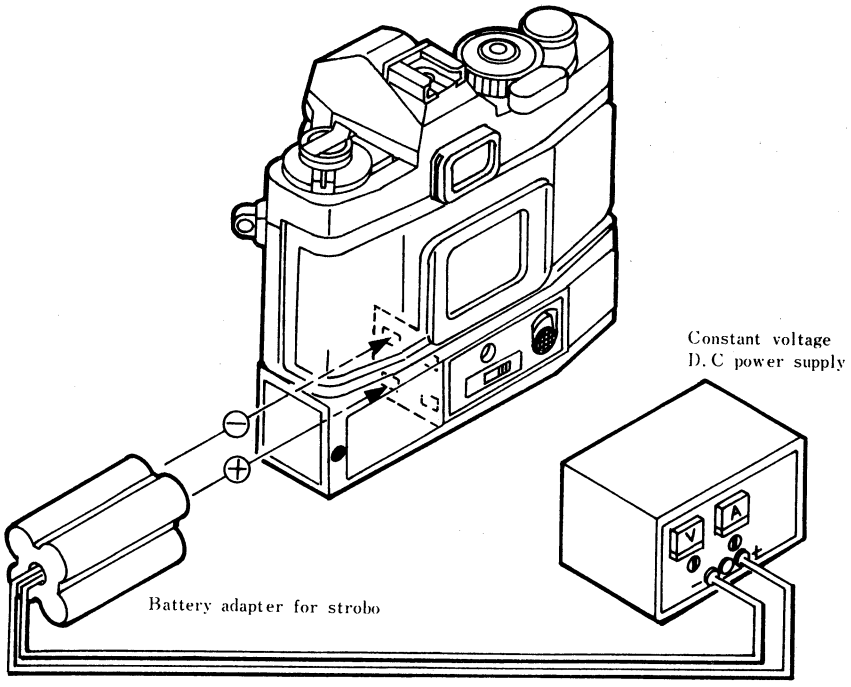
G Battery exhaustion too early.



8731-200 Pattern Diagram



Inspection Specification
Auto-Winder G (8731-200)
(General performance and functions)

Item	Check point	Contents
Switch	Main switch	Operation···Clicking, looseness, squeaking.
	Winder switch	Operation···Catching, gritty, returning, looseness. Usually auto winding impossible with SW. ON and possible with SW. OFF.
	Camera contact	Operation···Catching, gritty, returning, looseness.
Winding rewinding	Winding coupler	Operation···When pushed and released, it should smoothly return to original position by spring strength. When turned to the left up to contact, it should return to original position by spring strength.
	Auto winding	When shutter released with main switch ON, LED lights up immediately after completion of exposure, and then auto-winding should be performed.
	Manual winding	When manual winding is done with main switch ON, winding resistance should not be remarkably different from that with camera only.
	R button	Operation···Catching, gritty, returning.
General performance	Frame speed & current consumption	Load the camera with NEOPAN SS (36 EXP) and do the check by connecting the measuring instrument as illustrated below.  Frame speed···Set the power source voltage to 5.5 V, 2.0 V or over and operate the winder for 10 sec. Then the number of frames read on the film counter should be 16 or over. (It should be counted from the 10 th frame on.) Current consumption···Set the power source voltage to 5.5 V, 1.0 A. Then the maximum indication of ammeter should be less than 900 mA until the end of the film (36 EXP).

■ Measuring Instruments

■ Constant voltage D. C power supply 〈Model E-1·E-2〉
■ Digital tester 〈Type 2507〉
■ Circuit tester
■ Luminescence adjusting driver-C

■ Sub Materials

■ Grease

- Grease #006
- AGX-25
- ELECTROLUBE

■ Oil

- Oil #003

■ Binding agent

- SONI-BOND SC-108
- PLIOBOND
- LOCKTITE #242
- SCREW LOCK G

■ Cleaner

- FLONSOLVE

■ Board coating agent

- FC-721
- FC-77 (Diluting solution)

NOTE: Dilute by FC-721 (1): FC-77 (10)