PENTAX AUTO 110

Batteries: 2 ea. S-76

Fig. 1—top cover removed

Fig. 2—bottom cover removed

Fig. 3—back view

Fig. 4—bottom view, lower mechanism assembly removed

Fig. 5—wind side, timing points

Fig. 6—mirror/shutter assembly, side view

Fig. 7—mirror/shutter assembly, bottom view

Fig. 8—shutter block

Fig. 9—mirror box, adjustment test

Fig. 10—mirror box, position for reassembly to shutter block

Fig. 11—upper mechanism assembly, bottom view

Fig. 12—upper mechanism assembly, top view

Fig. 13—ratchet lever, adjustment

Fig. 14—antireverse stopper, adjustment

Fig. 15—release-restriction plate, timing positions

Fig. 16—wiring pictorials and test points

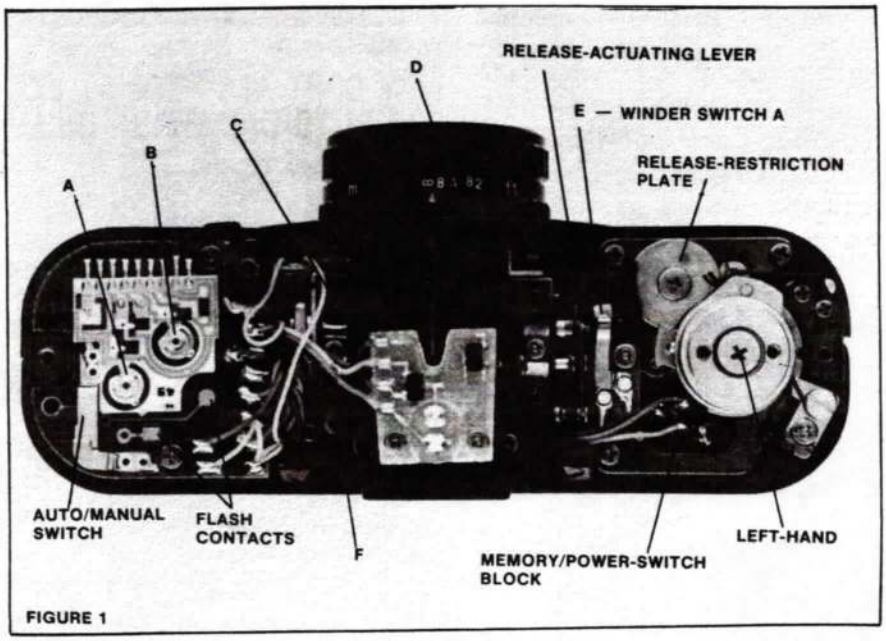


FIGURE 1

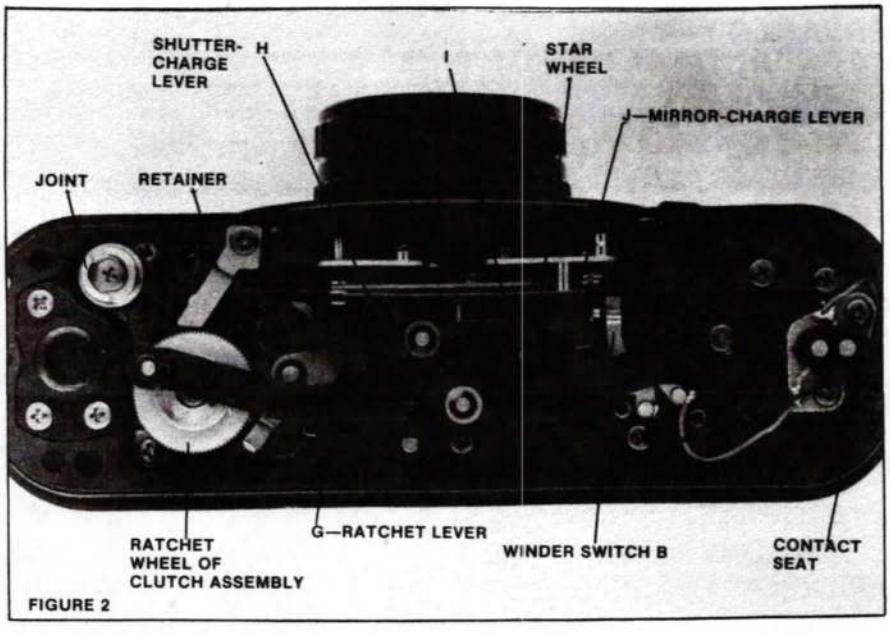


FIGURE 2

ADJUSTMENT LOCATIONS:

Auto exposure, low light	A
Auto exposure, high light	B
Viewfinder focus	C
Parallax	D
Winder switch A	E
LED position	F
Ratchet lever	G
Overtravel, shutter-charge lever	H
Film-spacing lever	I
Overtravel, mirror-charge lever	J
Antireverse stopper	K
Blade-opening lever	L

Note: After removing the front cover, you can also reach 2 adjustments on the shutter block — the timing-switch eccentric and the eccentric which controls the spring tension on the shutter ring. These adjustments for high-light levels should not be disturbed.

ADJUSTMENT AND TEST VALUES:

Flange-focal distance:	26.90 +0.04mm (flange to cartridge seat)

Battery test: The finder LEDs should not turn on with 2.2V applied to the battery terminals; they should turn on with 2.7V applied (no adjustment).

Film-speed settings:

a. ASA 80 with film-speed pin pushed in (for ASA 64, 100, and 125 films)

b. ASA 320 without pushing film-speed pin or no cartridge (for ASA 400 film)

Flash (manual) program with pin on

top cover pushed down:

a. ASA 80 — 1/30 at f/2.8
b. ASA 320 — 1/25 at f/5.6

Auto program: shutter blades program both f/stop and shutter speed. Fastest speed and smallest f/stop — 1/750 and f/13.6 (EV 17). The blades open fully at EV 8 for the largest f/stop (f/2.8). At lower light levels, the blades stay open longer.

LEDs: At EV 8 (ASA 80 setting), the yellow LED turns on to warn of camera shake; the green LED turns on at higher light levels. Note: If you push the release button far enough to open the memory switch (you'll hear a slight click), the LED indication will not change with a change in light level. It's then necessary to let up and redepress the release button. The LED indication will change if you push the release button just far enough to close the power switch.

Film-spacing lever: The film-spacing lever, Fig. 3, should not disengage when pushed from right to left a distance of 1mm (measured from the edge of the aperture); it should disengage when pushed a distance of 1.4mm.

Overtravel, shutter-charge lever: The star wheel, Fig. 2, should rotate an additional 3 to 6 teeth after the shutter latches in the cocked position.

Overtravel, mirror-charge lever: 0.2-0.4mm.

OPERATION NOTES:

1. With the lens removed, the shutter will not release.
2. It takes two wind-lever strokes to advance the film and cock the shutter. The second wind-lever stroke brings the cutout section of the release-restriction plate, Fig. 1, alongside the release-actuating lever. Without film, you can continue advancing the wind lever. Disengaging the film-spacing lever, Fig. 3, latches the wind mechanism.
3. To operate the camera with the lower mechanism plate removed, first charge the shutter by pushing the tab on the shutter-charge ring, Fig. 4, from left to right. Next charge the mirror by pushing the tab on the mirror-tensioning slide, Fig. 4, toward the front of the camera.

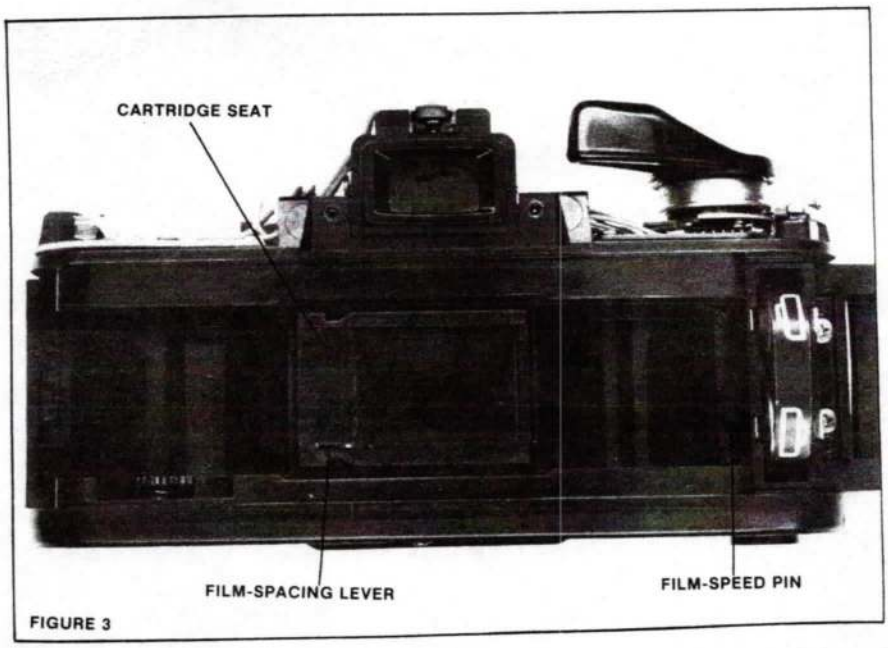


FIGURE 3

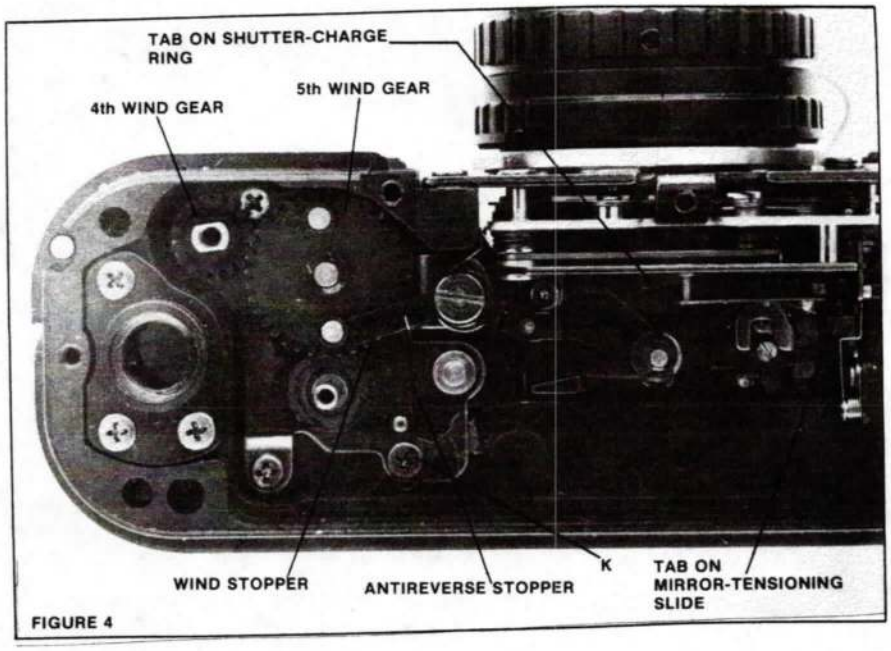


FIGURE 4

4. To operate the mirror/shutter assembly removed from the camera, first charge the shutter by pushing the tab on the shutter-charge ring, Fig. 7, from right to left. Next charge the mirror by pushing forward the mirror-tensioning slide, Fig. 6. Release the mirror by pushing down the mirror-release link, Fig. 7. With the mirror box removed from the shutter block, the mirror should remain up; return the mirror by pushing down the mirror-return lever, Fig. 9.

ADJUSTMENT PROCEDURES:

1. Auto exposure
   To shield the photocell from ambient light, use a dummy top cover (make from replacement top cover A300). Cut away the wind-lever end to clear the wind lever and cut a clearance slot for the variable resistors. Check the programmed exposure at two film-speed settings — ASA 320 (no cartridge) and ASA 80 (film-

speed pin pushed in). Make low-light adjustments with A (EV 6) and high-light adjustments with B (EV 12), Fig. 1. Although you don't have separate adjustments for the two film-speed settings, try for an exposure error of +0.3 EV at ASA 80 and -0.3 EV at ASA 320. These settings give optimum results for all film speeds as shown in the following charts:

Tester Setting	Exposure Error at/ Actual Film Speeds
ASA 80 +0.3 EV	ASA 64 — ±0 EV ASA 100 — +0.6 EV ASA 125 — +0.9 EV
ASA 320 - 0.3 EV	ASA 400 — ±0 EV

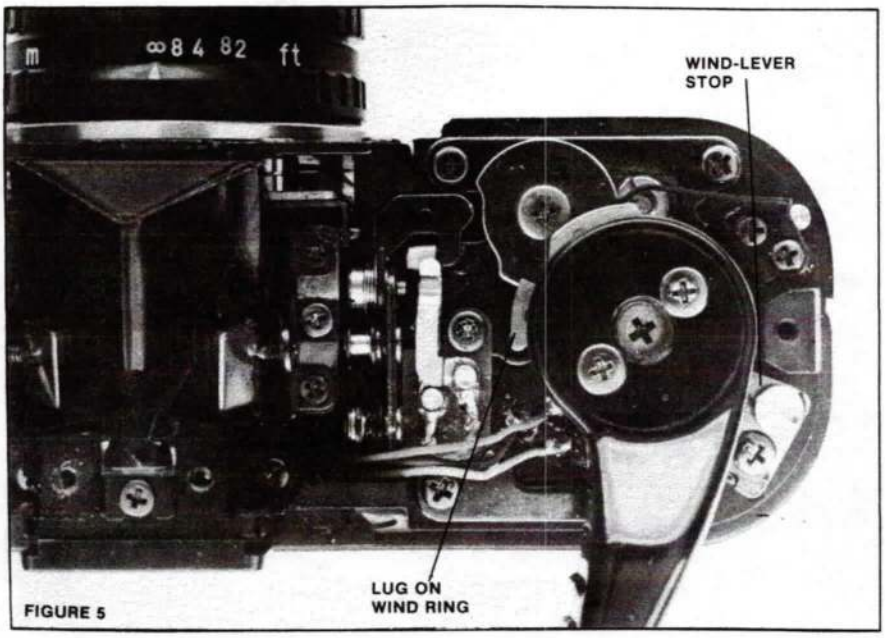


FIGURE 5

2. Focus
Measure the distance between the front of the flange and each of the four corners of the cartridge seat, Fig. 3. Adjust for 26.9 + 0.04mm by installing adjusting washers under the mount spring. Pentax supplies the following thicknesses:

A114-00A	0.4mm
00B	0.3mm
00C	0.2mm
00D	0.1mm
00E	0.05mm
00F	0.03mm

Note: Pentax uses fixtures and a dial gage to measure the back focus. However, you can hold open the shutter to check the focus with an autocollimator. One way is to slip a piece of paper between the contacts of the auto/manual switch, Fig. 1, to break contact. Then release the shutter. The shutter stays open until you restore contact or remove the batteries.

3. Finder focus
After adjusting the back focus, install the 50mm lens and adjust the finder focus with the four focusing-screen screws, Fig. 1.

4. Power switch
Temporarily solder wires to the power-switch contacts at the top of the memory/power-switch block, Fig. 16. Connect an ohmmeter between the two wires. Slowly depress the release-actuating lever until its top surface is even with the top surface of the release-restriction plate; the power switch should now close. Adjust by bending the shorter contact of the power switch, Fig. 11.

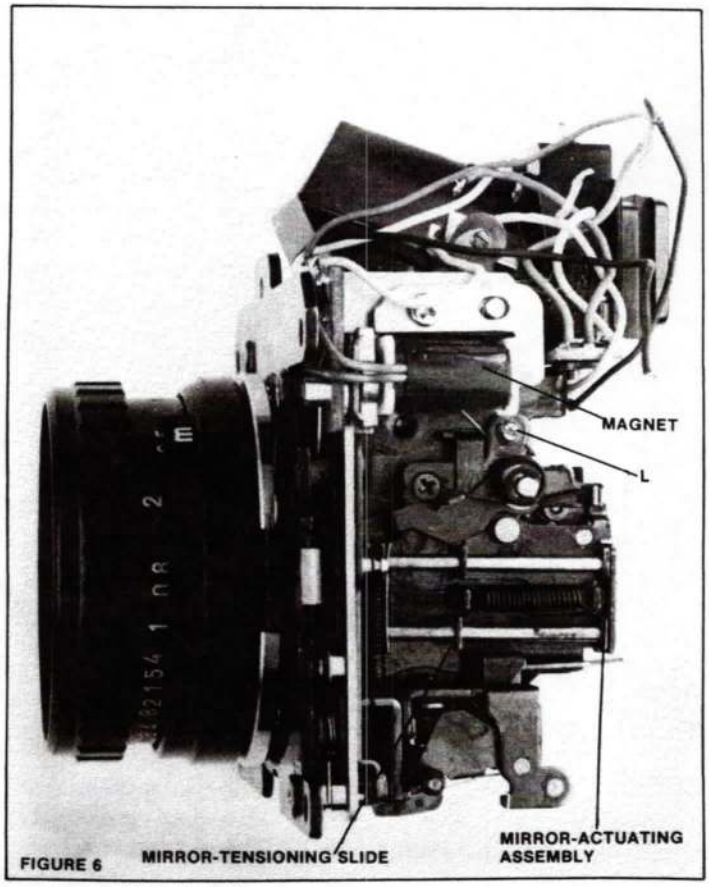


FIGURE 6

5. Memory switch
Temporarily solder wires to the memory-switch contacts at the top of the memory/power-switch block, Fig. 16. Connect an ohmmeter between the two wires. Slowly depress the release-actuating lever until it disengages from the hook lever, Fig. 11; the memory switch should open at the same moment that the hook lever disengages.

Adjust by bending the longer contact of the memory switch, Fig. 11.

6. Blade-opening lever
Charge the mirror box. Then pull the mirror-lifting slide as far as it will go to the right as shown in Fig. 9. Space gap #2 (between the post on the mirror-lifting slide and the edge of the blade-opening lever) should now be larger than gap #1 (between the mirror-lifting slide and the mirror-release lever). When you allow the mirror-lifting slide to return, the blade-opening lever should not move. Adjust with eccentric L, Fig. 9.
7. Sync-safety switch
Check for proper contact tension by pushing down the lower contact, Fig. 7; you should see the upper contact move, indicating firm contact pressure.
8. Antireverse stopper
Adjust the position as shown in Fig. 15. The antireverse stopper should maintain light pressure against the wind gear. Excessive pressure results in a loud clicking noise during winding; the clicking sound should be very light. Hold the antireverse stopper in position as you tighten the screw (tightening the screw tends to shift the antireverse stopper away from the gear). Or adjust the antireverse stopper for excessive pressure against the gear; tightening the screw then reduces the pressure. Lock the screw after adjustment.
9. Ratchet lever
Adjust the eccentric (G in Fig. 2) for a 0.2mm space gap between the pawl end of the ratchet lever and the ratchet wheel. But make sure the eccentric pin is on the side shown in Fig. 13. If the eccentric pin is on the opposite side, it can interfere with the spring on the adjacent lever. Then disengage the film-spacing lever and make sure the ratchet lever firmly latches the ratchet wheel.
10. Overtravel, shutter-charge lever
Cock the shutter while watching the shutter-charge lever, Fig. 2. After the shutter latches in the cocked position, the shutter-charge lever should continue pushing the tab on the shutter-charge ring a slight distance. To check, watch the star wheel, Fig. 2; after the shutter reaches the cocked position, the star wheel should continue to rotate an additional 3 to 6 teeth. To adjust, remove the lower mechanism assembly and bend the end of the shutter-charge lever.
11. Overtravel, mirror-charge lever
Cock the shutter while watching the tab on the mirror-tensioning slide, Fig. 4. The tab should move 0.2 to 0.4mm beyond the mirror latch before dropping back to the latched position. To adjust, remove the lower mechanism

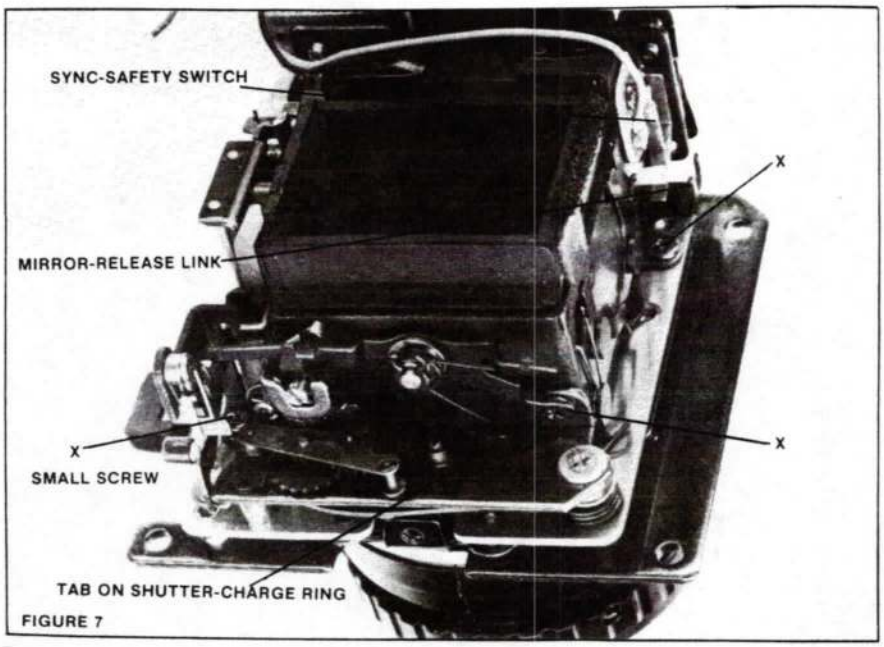


FIGURE 7

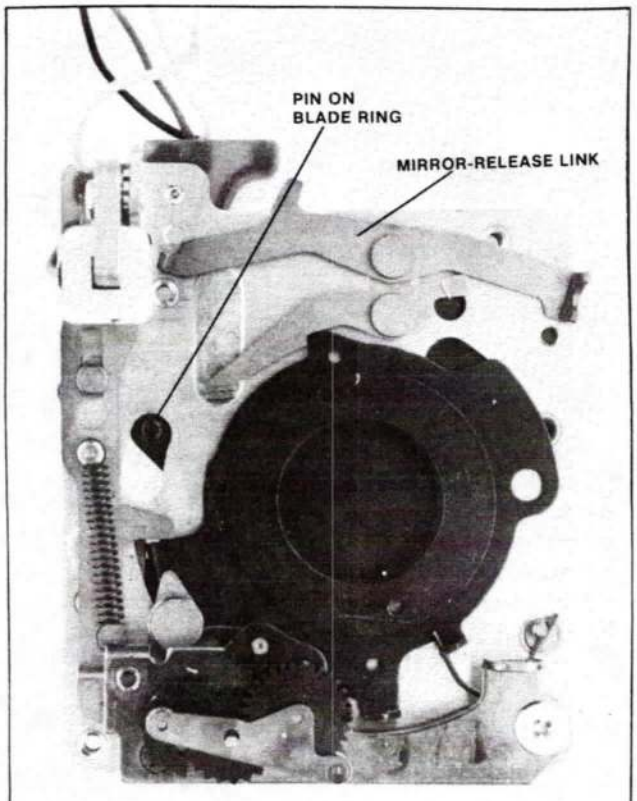


FIGURE 8

assembly and bend the tip of the mirror-charge lever.

12. LED positioning
When the green LED turns on, it should be at the right-hand end of the viewfinder oval; the green light should fill the oval. When the yellow LED turns on, it should be at the left-hand end of the oval; the yellow light should fill the oval. Adjust by loosening the screw (F in Fig. 1) and shifting the LED display.
13. Winder switch A
Advance the wind lever one time so that the release-restriction plate blocks the release-actuating lever. Slowly depress the release-actuating lever while watching winder switch A, Fig. 1. The switch should open just as the release-actuating lever touches the release-restriction plate. Adjust by bending the tip of the contact that rides against the insulator.
14. Film-spacing lever
Push the film-spacing lever from left to right to see when it disengages. Pentax uses special gage 24100N-A01-A to measure the distance. However, you can use a vernier to push the film-spacing lever. At a distance of 1mm (measured from the edge of the aperture, Fig. 3), the film-spacing lever should not disengage. The film-spacing lever should disengage when pushed a distance of 1.4mm. Adjust with eccentric I, Fig. 2.
15. Auto/manual switch
With the top cover installed, depress the auto/manual (flash) pin 1mm; the auto/manual switch should then select the flash speed. Check with Pentax gage 24100N-A314-A-1, a depth micrometer, or the flash unit.
16. Parallax
View a vertical line simultaneously through the finder and alongside the finder. The line should appear continuous. Adjust by shifting the pentaprism with the setscrews (D in Fig. 1). Shift the pentaprism in the same direction as you want the line seen through the finder to move.

TIMING PROCEDURES:

1. 2nd wind gear (necessary if you remove the 2nd wind gear, the gear under the release-restriction plate)

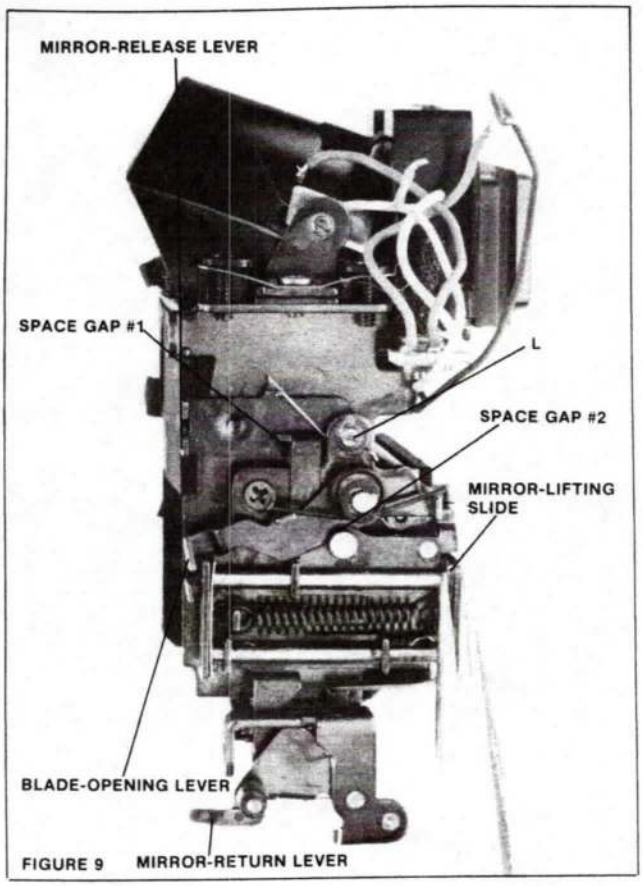


FIGURE 9

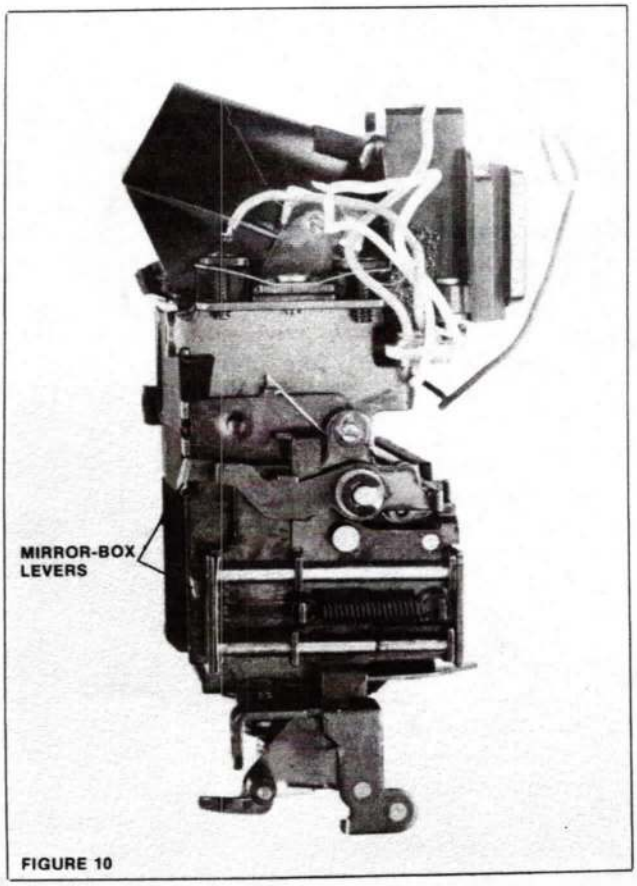


FIGURE 10

a. Reassemble the upper mechanism assembly except for the 2nd wind gear and the release-restriction plate.
b. Rotate the wind-restriction plate to position its lug as shown in Fig. 11.
c. Rotate the 1st wind gear, Fig. 12, fully clockwise (as seen from the top) until it stops.
d. Engage the 2nd wind gear with the 1st wind gear and replace the release-restriction plate. At this point, the cutout in the release-restriction plate should be slightly counterclockwise of the release-actuating lever.
e. Put light finger pressure on the release-restriction plate and advance the wind lever twice. The cutout of the release-restriction plate should now center on the release-actuating lever, Fig. 12. If the release-restriction plate does not center, retime using a different position of the 2nd wind gear (turn the gear 180 degrees, turn over the gear and try the two positions). If the release-restriction plate still won't center, you can change the 2nd wind gear. Pentax supplies the 2nd wind gear in 3 slightly different versions for timing purposes — C21-00A, C21-00B, C21-00C.

2. 4th wind gear (necessary if you remove the upper mechanism assembly or the 4th wind gear, Fig. 4)

a. Time after replacing the upper mechanism assembly and the mirror/shutter assembly. Install the 5th wind gear, Fig. 4, but do not as yet replace the 4th wind gear. Also install the wind stopper, Fig. 4.
b. Charge the shutter and the mirror. Disengage the film-spacing lever so that the wind stopper moves above the 5th wind gear, Fig. 4.
c. Turn the 5th wind gear until one of its pins comes against the wind stopper.
d. Rotate the release-restriction plate slightly off-center — the position shown in Fig. 5.
e. Install the 4th wind gear, Fig. 4.
f. Disengage the wind stopper and advance the wind lever twice — hold the wind lever in the fully advanced position after the second wind stroke. The other pin on the 5th wind gear should now be against the wind stopper.
g. While holding the wind lever fully advanced, check the space gap between the lug on the wind ring and the wind-lever stop, Fig. 5; there should be a 0.5mm gap. If there's no gap, the wind ring is coming against the wind-lever stop before the pin on the 5th wind gear comes against the wind stopper. To adjust, try a different position of the 4th wind gear (reverse 180 degrees, try two positions upside down). If necessary, you can change the 4th wind gear to adjust. Pentax supplies 3 slightly different versions — C112-00A, C112-00B, C112-00C.
h. Check the timed position of the release-restriction plate. The release-restriction plate should be no further counterclockwise than shown in Fig. 14B. Now release the shutter and hold down the release-actuating lever. Advance the wind lever until the wind-restriction plate, Fig. 11, is stopped by the wind-restriction lever. The release-restriction plate should then be positioned as shown in Fig. 14C. Continue to hold the wind lever fully advanced and let up the release-actuating lever. The release-actuating lever should return to its rest position without catching on the release-restriction plate.

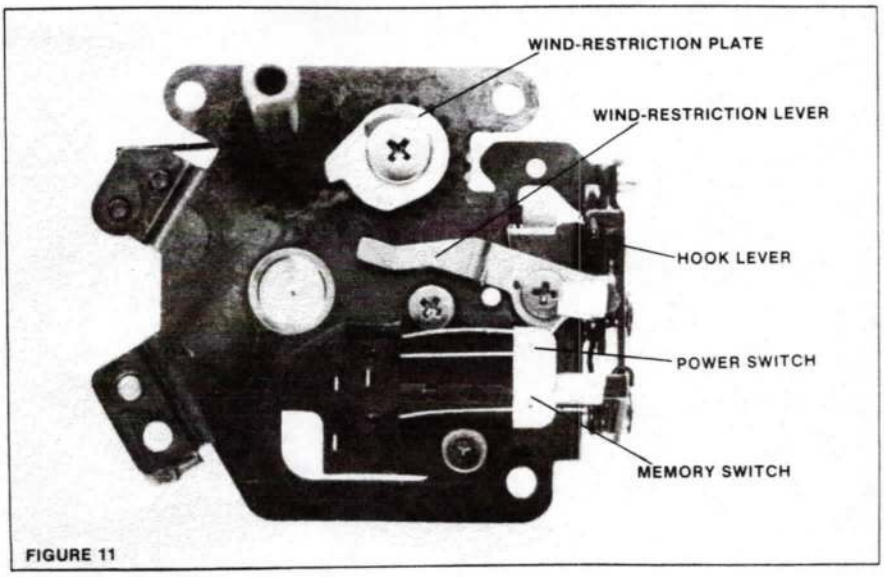


FIGURE 11

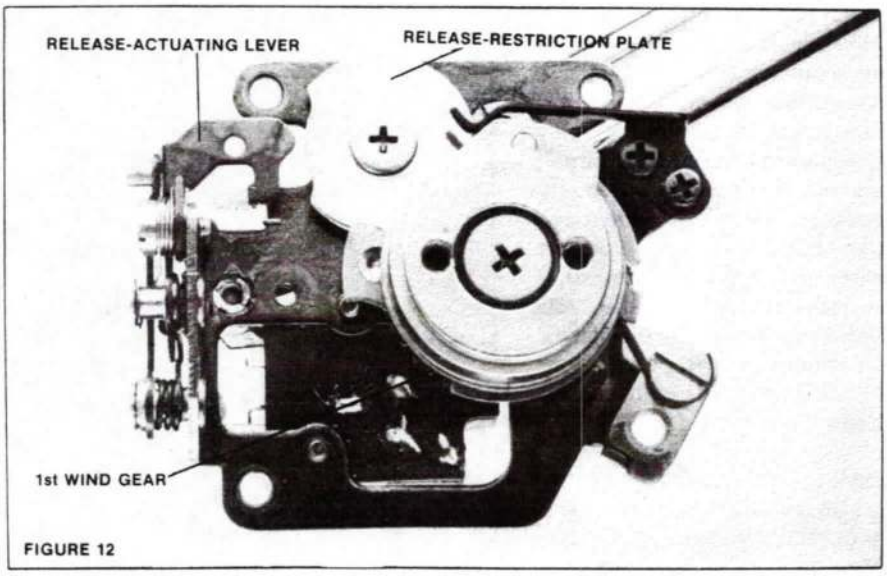


FIGURE 12

DISASSEMBLY HIGHLIGHTS:
Locations of left-hand threads: screw holding wind-lever seat, Fig. 1
Precautions:
1. Since the camera body is plastic,

be careful to avoid stripping plastic threads; the body isn't available as a replacement part. Replace the top-cover and bottom-cover screws in the same positions from which they were removed.

2. Do not use alcohol or commercial lens cleaners to clean the focusing screen (the focusing screen may turn white). To be safe, use only 100% ether as a cleaner.
3. Avoid touching the top of the memory-switch/power switch block, Fig. 1, with a soldering iron; the switch block is plastic. Touch only the solder connections. Also be careful to avoid touching the soldering iron to the plastic wind lever and camera body.
4. Do not put pressure on the sides of the mirror box, Fig. 7. Pressure can distort the mirror box and prevent free mirror movement.
5. In the new style, the LED display is separate from the circuit board. It's not normally necessary to remove the new-style LED display (the old style comes with the circuit board). If you have to replace the LED display, first remove the mirror box; otherwise, there's a danger of scratching the focusing screen.

Sequence:

1. top cover and bottom cover (longer screw goes in center) Note: Watch for adjustment washers under the wind lever; one or more may be used to prevent the wind lever from dragging on the top cover. The contact seat, Fig. 2, will be loose when you remove the bottom cover.
2. front cover (1 screw)
3. batteries
4. unsolder all 11 wires from top of circuit board, Fig. 16
5. 2 screws holding circuit board and 2 screws holding photocell board
6. lift out circuit-board assembly. Note: In the earlier style, the circuit board plugs into a connector. To remove, take out 3 screws (1 holds the LED display) and unplug the board.
7. unsolder the following wires from relay P.C. board T211,

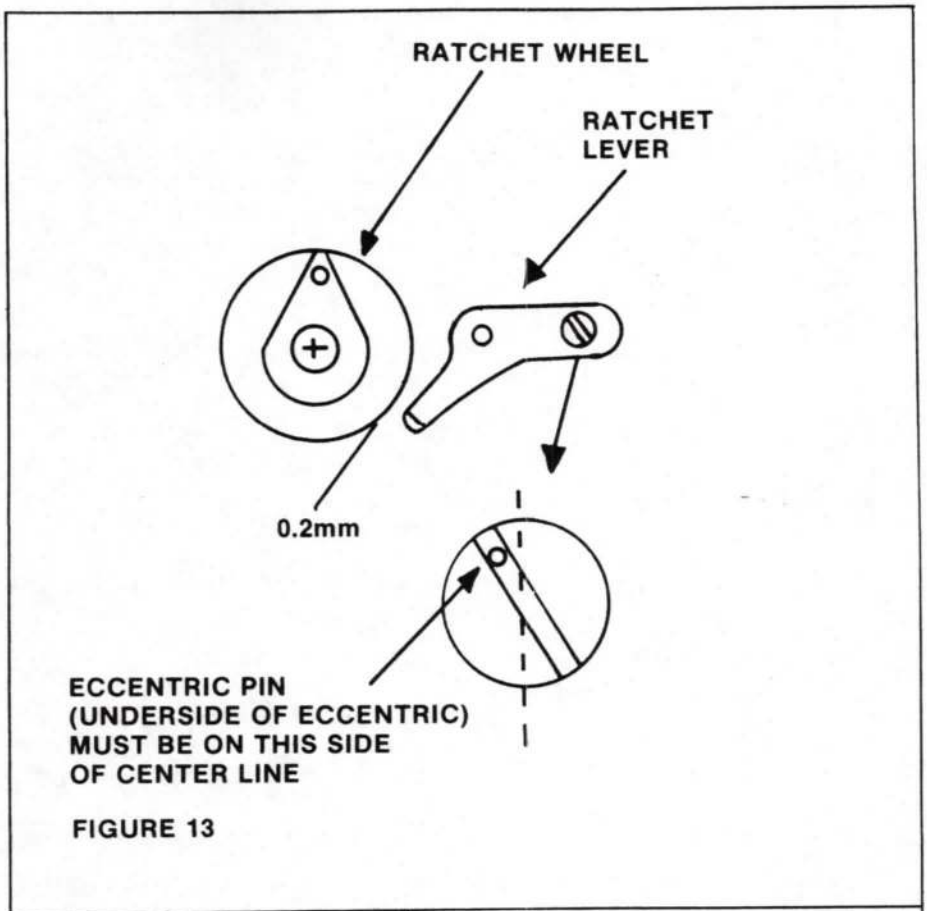


FIGURE 13

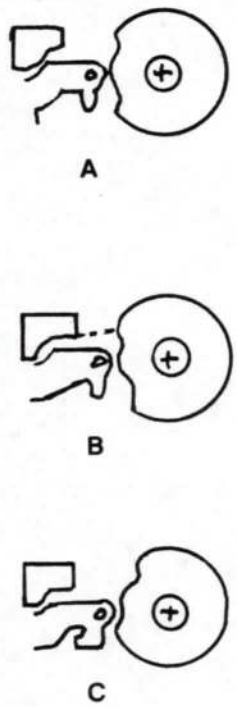


FIGURE 14

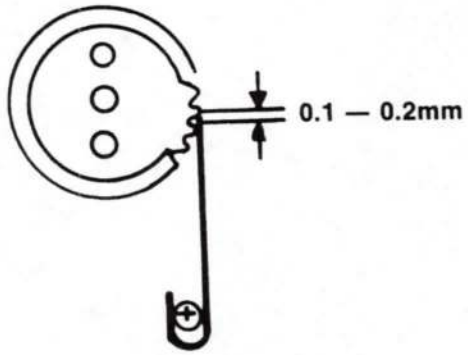
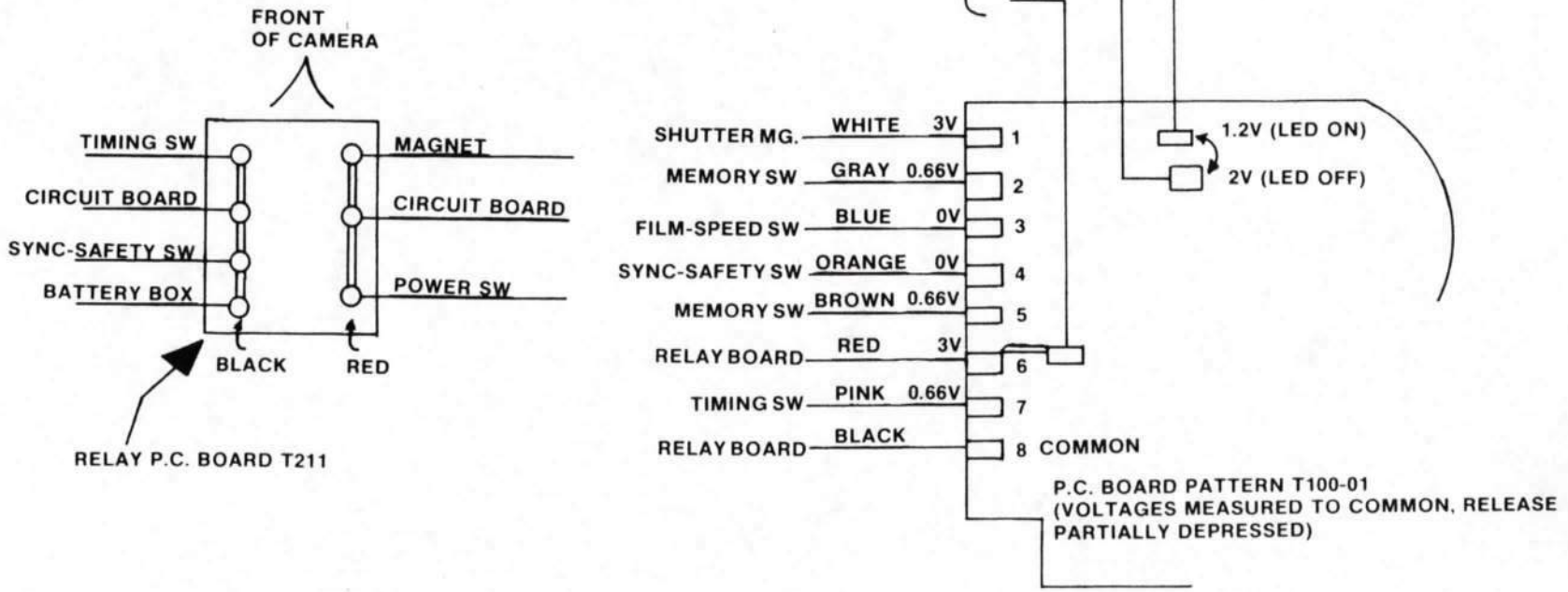


FIGURE 15


FRONT
OF CAMERA
TIMING SW
CIRCUIT BOARD
SYNC-SAFETY SW
BATTERY BOX
MAGNET
CIRCUIT BOARD
POWER SW
BLACK
RED
RELAY P.C. BOARD T211
LED DISPLAY
YELLOW
GREEN
RED
1.2V (LED ON)
2V (LED OFF)
SHUTTER MG. WHITE 3V 1
MEMORY SW GRAY 0.66V 2
FILM-SPEED SW BLUE 0V 3
SYNC-SAFETY SW ORANGE 0V 4
MEMORY SW BROWN 0.66V 5
RELAY BOARD RED 3V 6
TIMING SW PINK 0.66V 7
RELAY BOARD BLACK 8 COMMON
P.C. BOARD PATTERN T100-01
(VOLTAGES MEASURED TO COMMON, RELEASE
PARTIALLY DEPRESSED)

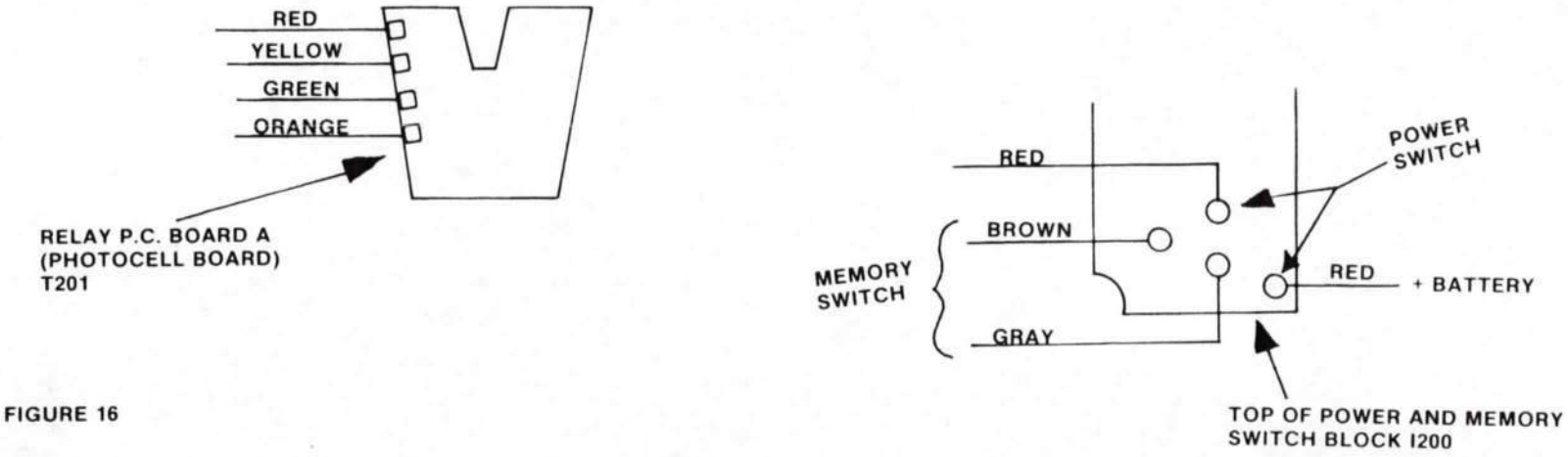

RED
YELLOW
GREEN
ORANGE
RELAY P.C. BOARD A
(PHOTOCELL BOARD)
T201
POWER
SWITCH
RED
BROWN
MEMORY
SWITCH
RED
+ BATTERY
GRAY
TOP OF POWER AND MEMORY
SWITCH BLOCK I200

FIGURE 16

Fig. 16:
—red that goes to shutter block
—black that goes to shutter block
—black that goes to sync-safety switch

8. unsolder black wire and violet wire from winder switch B, Fig. 2
9. remove gripping ring (snap ring) from mirror-charge lever, Fig. 2
   Note: Be careful to avoid spreading the gripping ring. Pentax recommends replacing the gripping ring (GS-1.5) any time it's removed. Check after replacing to see if you can rotate the gripping ring; if the gripping ring will turn on its post, it's too loose.
10. retainer from mirror-charge lever, Fig. 2 (1 screw)
11. lower mechanism assembly (3 screws)
12. ratchet lever, Fig. 2, and spring (watch for adjustment washer under ratchet lever)
13. wind stopper, Fig. 4, and spring (spacer under wind stopper)
14. 4 screws at front (corners) holding shutter/mirror assembly
15. shutter/mirror assembly — pull straight out from body

Reassembly highlights:

1. Install the shutter/mirror assembly straight into the camera body — watch from the back to make sure the film-spacing lever passes through the camera-body slot. Also make sure the forked end of the mirror-release link, Fig. 7, passes over the pin on the release mechanism.
2. Charge the shutter and the mirror before replacing the lower mechanism assembly.
3. When you replace the gripping ring, make sure its closed end faces the outside of the ratchet wheel, Fig. 2. If the open end faces out, the gripping ring may catch on the bottom cover.
4. After you replace the circuit board and reconnect the wires, install the batteries. Check to see that the LEDs turn on when you depress the release-actuating lever part way. If not, remove the batteries and recheck the wiring.
5. Check the following adjustments:
   —overtravel of mirror-charge lever
   —overtravel of shutter-charge lever
   —film-spacing lever
   —ratchet lever
   —focus
   —auto exposure
   —auto/manual switch

Sequence to disassemble mirror/shutter assembly:

1. plate at front of assembly (4 screws)
   Note: With the plate removed, the shutter will release without a lens installed.
2. 4 screws holding the mirror box to shutter block (small screw goes by mirror-return lever)
   Note: Fig. 7 points out the positions of 3 of the screws (X). To reach the fourth screw, insert a small screwdriver between the magnet and the mirror box; be careful to avoid damaging the magnet.
3. separate mirror box from shutter block
4. mirror-actuating assembly, Fig. 6 (2 screws — charge and release the mirror mechanism to reach 1 screw, return the mirror to reach the other screw) — the rollers on the mirror-lifting lever (side of mirror box) will be loose

Reassembly sequence:

1. Replace the mirror-actuating assembly.
2. Check the adjustment on the sync-safety switch.
3. Check the adjustment on the blade-opening lever.
4. Remove the spring from the blade-opening lever, Fig. 9. Position the mirror-box levers as shown in Fig. 10; these levers must straddle the pin on the blade ring, Fig. 8.
5. Seat the mirror box. Make sure that the mirror-box levers straddle the pin on the blade ring and that the fork on the mirror-release lever straddles the tab on the mirror-release link, Fig. 8. Also make sure that the mirror-return lever is under the lower end of the magnet armature.
6. Lock the threads of the 4 mirror-box screws with Loctite.
7. Replace the spring on the blade-opening lever.

Sequence to disassemble wind mechanism:

1. mirror box
2. unsolder 4 wires from top of memory/magnet-switch block, Fig. 16 (as a precaution, remove the wind lever before unsoldering)
3. unsolder black wire and violet wire from winder switch A, Fig. 1
4. winder switch A (1 screw)
5. power-winder joint, Fig. 2 (1 screw)
6. 4th wind gear, Fig. 4
7. clutch assembly — screw (may be adjustment washer under screw), link seat, ratchet wheel, antireverse spring, 6th wind gear (washer under assembly)
8. upper mechanism assembly (4 screws — 1 also holds stop for wind lever)
9. antireverse stopper, Fig. 4
10. lower mechanism plate
    Note: You can now remove any of the parts from the upper mechanism assembly, Fig. 11, as needed. All these parts are supplied individually, not as a unit.

Reassembly sequence:

1. lower mechanism plate
2. If you disassembled the upper mechanism assembly, time the 2nd wind gear.
3. Check the memory-switch adjustment and the power-switch adjustment.
4. Seat the upper mechanism assembly and replace the screws.
5. Replace the mirror/shutter assembly.
6. Replace the antireverse stopper and the wind stopper, Fig. 4.
7. Adjust the timing of the 4th wind gear.
8. Replace the power-winder joint.
9. Adjust the antireverse stopper and apply locking agent to the screw.
10. Replace the clutch assembly and the ratchet lever.
11. Check the ratchet-lever adjustment.
12. Replace winder switch A and check its adjustment.
13. If you removed the detent for the wind lever, check its position. Move the wind lever to the flush position; there should now be no free play in the wind lever. To adjust, shift the detent position until you eliminate the free play.

TROUBLESHOOTING:

Behavior without batteries: blades don't open, flash won't fire, no LEDs

Behavior without lens: shutter won't release

Current draw (3V supplied):

—LED on — 4ma

—shutter open — 11ma

Testing procedures for switches:

1. Power-winder switches —

a. Winder switch A (at top of release assembly, Fig. 1). Opens as release-actuator lever moves down.

b. Winder switch B (bottom of camera, Fig. 2). Open with shutter cocked, closed with shutter released.

To check, test the continuity across the power-winder pins at the bottom of the camera. You should get direct contact with the shutter released, no contact with the shutter cocked. Then, with the shutter released, advance the wind lever one time. Push down the release-actuator lever until it's blocked by the release-restriction plate. Winder switch A should open, breaking the contact between the power-winder pins.

2. Film-speed switch (at front of battery box)

Test the continuity between the blue wire and the black wire at the circuit board, Fig. 16. You should get direct contact (ASA 320). Then push in the film-speed pin; you should get no contact. To reach the switch, take out the 2 screws inside the battery box and the 2 screws on the back hinge. Slide out the battery box to the back of the camera.

3. Power switch (bottom of memory/power-switch block — closes as you push the release button part way to provide power to the circuit)

Check the continuity between the two red wires at the top of the memory/magnet-switch block, Fig. 16. You should get direct contact. Then push down the release-actuator lever until it's level with the release-restriction plate; you should get no contact.

4. Memory switch (bottom of memory/power-switch block — opens when release-actuator lever moves down far enough to disengage from hook lever)

Check the continuity between the brown wire and the gray wire at the top of the memory/power-switch block, Fig. 16. You should get no continuity. Then, with the shutter released, push down the release-actuator lever until you hear it click; you should now get direct contact.

5. Sync-safety switch (on side of mirror box, Fig. 7 — opens as mirror moves to up position)

Disconnect the orange wire at the circuit board, Fig. 16. Then measure the continuity between the orange wire and the black wire (common). You should get direct contact. Then release the shutter; you should see the contact break momentarily.

Note: There are no sync contacts in the shutter. A voltage (around 0.9V) normally appears across the flash contacts on the circuit board, Fig. 1. As the shutter starts to close, the voltage across the flash contacts drops to around 0.3V to fire the flash. The current through the shutter magnet controls the voltage across the flash contacts. The normally closed sync-safety switch prevents a drop in voltage across the flash contacts when the power switch closes.

Tips for troubleshooting without disassembly:

If the shutter hangs open until you remove the batteries, try pushing down the auto/manual switch pin on the top cover. If the shutter then closes, the problem is poor contact in the auto/manual switch, Fig. 1.

Troubleshooting steps for specific problems:

1. Overlapping of film frames, or picture area extending into pre-exposed stripes

Antireverse spring C107

Disassemble the clutch assembly, Fig. 2, to check the antireverse spring.

Film-spacing lever, adjustment incorrect

2. Wind lever advances continuously without transporting film or cocking shutter

Antireverse stopper C118, Fig. 4 — bent or improperly adjusted

3. Blades don't open, no LEDs

Battery power to board

Check for 3V between the red battery-box wire, Fig. 16, and the black wire (common) at the circuit board. No voltage — battery box or wiring.

Power switch

Check by shorting together the two red-wire connections on the memory-switch/power-switch block, Fig. 16. If the LEDs then turn on, remove the upper mechanism assembly to clean and/or adjust the power switch.

4. Blades don't open, LEDs work

Electromagnet

Disconnect either the red wire or the white wire at the circuit board, Fig. 16. Then measure the resistance between the two wires. You should measure around 300-350 ohms, the resistance of the coil. Alternately, measure the voltage to the white wire at the circuit board, Fig. 16. You should measure 3V when you push the release-actuating lever part way. If you measure 3V at the red wire and 0V at the white wire, the coil is open. Replace the complete shutter block E000.

5. One or both LEDs won't turn on, shutter o.k.

LED display

Disconnect the red wire at the circuit board that goes to the LED display, Fig. 16. Also disconnect the yellow wire (if the orange LED won't turn on) or the green wire (if the green LED won't turn on). Apply 1.75V between the red wire (+) and the other disconnected wire. If you've connected the power supply to the green wire, the green LED should turn on; if you've connected the power supply to the yellow wire, the orange LED should turn on. If not, replace the LED display T300.

6. Blades stay open

Memory switch, poor contact

Auto/manual switch, poor contact

Timing switch, constantly closed

7. Blades won't open fully to f/2.8

Blade-opening lever, timing incorrect

8. Power winder continues running with film-spacing lever disengaged
   Release-actuator lever, shorting to winder switch A
   Check to see if the insulator is missing from the release-actuator lever. The insulator sits under the lower contact of winder switch A, Fig. 1.
9. Power winder doesn't run when mounted to camera
   Winder switch A, poor contact or adjustment
   Winder switch B, poor contact or adjustment
   Note: To check the power winder, turn it on and short between the two contact pins that come against the camera power-winder contacts; the motor should run.
10. Three wind-lever strokes required to full charge
    Timing of 4th wind gear incorrect
11. Underexposure at ASA 80, no change in exposure when you push in the film-speed pin
    Film-speed switch, poor contact
12. Flash fires when you depress release button part way (to close power switch)
    Sync-safety switch, poor contact
13. Flash does not fire
    Poor contact between top-cover contacts and board
    Sync-safety switch, constantly closed
    Circuit board T100
    Note: To check the flash unit, short between the two contacts that connect to the camera; the flash should fire. Also check to see if the shutter blades are opening. If not, refer to items #3 and #4 in troubleshooting steps.

OTHER COMMENTS:

1. Product number for parts orders is 24100.
2. If you order a replacement circuit board, specify PC board pattern T100 (old style with plug-in connector) or PC board pattern T100-01 (new style with wires to board). If you can only get the new style, you can install the board in an older camera. Remove the plug-in connector 1800 from the camera. Then solder the wires that were going to the connector directly to the new-style board. The following chart shows the connections at the new-style board for the wires in an earlier camera (connection numbers refer to Fig. 16):

Wire color in in old style	Connections to new-style board
Brown	terminal 5
Gray	terminal 2
Blue	terminal 3
Green	terminal 4
Black	terminal 1
White	terminal 6
Red	terminal 7
Pink	

3. For stripped body threads, you can use oversize screws inside the camera; just make sure you use the same head design. If a thread for a T-CNM 1.7x2.0 screw is stripped, use a T-CNM 1.7x3.0 ("T" means self-tapping). If the screw still won't hold, use a T-CNM 2.0x3.0 or CNM 2.0x3.0 (not self-tapping). For external screws, however, you won't be able to match the head design.
4. Shutter block E000 is available only as a complete unit, Fig. 8.