NOVEMBER 1958 NO. 735

Servicing the

KODAK RETINA REFLEX CAMERA

EASTMAN KODAK COMPANY
Apparatus Service Department
ROCHESTER 4, N.Y.

KODAK RETINA REFLEX CAMERA

TABLE OF CONTENTS

KODAK RETINA REFLEX

1. GENERAL INFORMATION

1.1 MECHANISM TYPES

Two distinct types of shutter release mechanisms will be found in the Retina Reflex Cameras. These are the "sequential" action (new type) and the "parallel" action (original type) mechanisms.

The basic difference between the sequential action and the parallel action mechanisms is the shutter release lever of the sequential type, which stops the shutter action after the initial closing of the blades. This prevents the shutter blades from opening and closing for the exposure until the opening action of the aperture cover trips the shutter release lever and allows the shutter action to continue for the exposure.

In the parallel action mechanism there is no provision for arresting the shutter action once it is started. Therefore, the mirror and aperture cover must clear the film aperture in the instant the shutter blades are initially closed and before they open and close for the exposure.

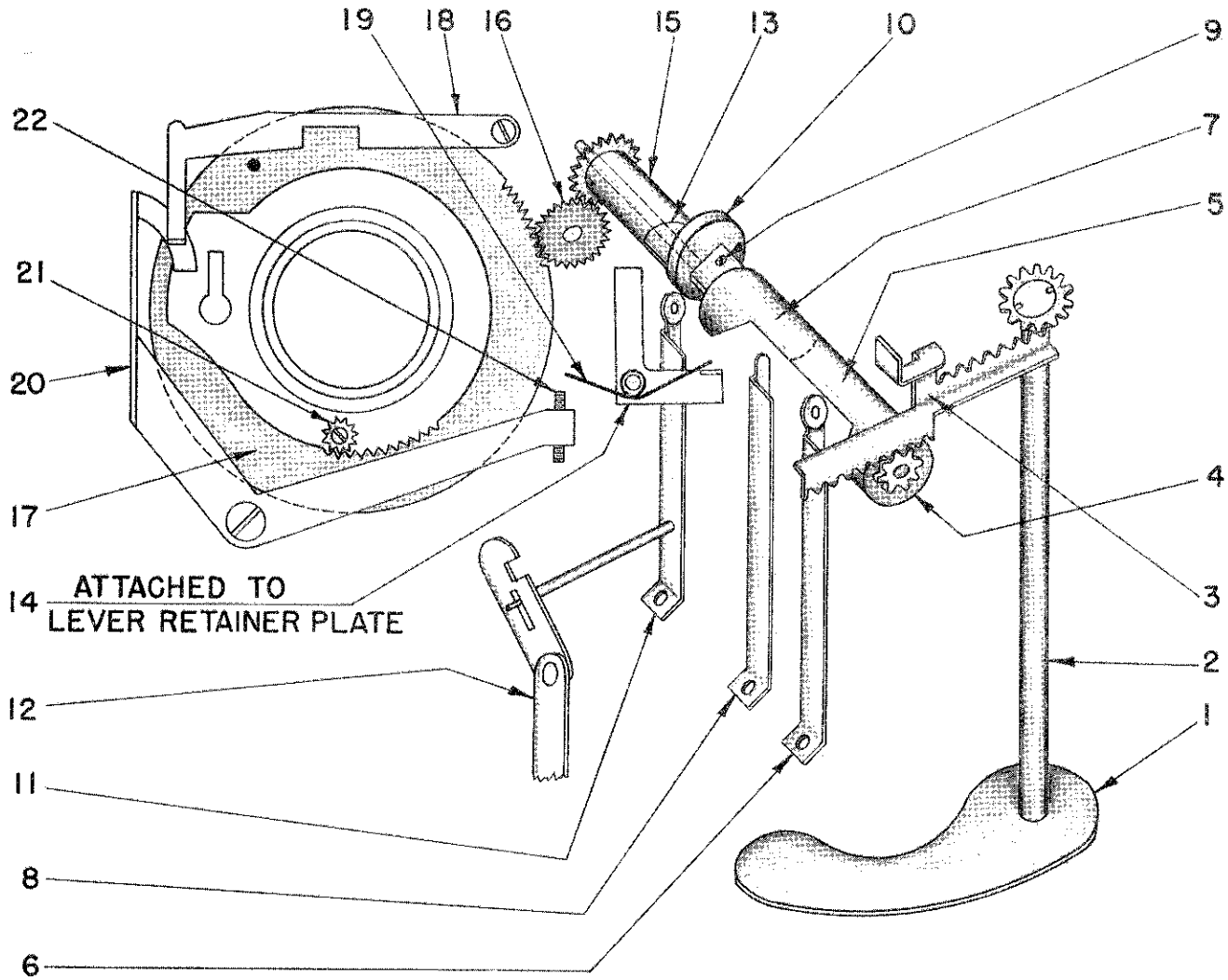
Note:

1. All Kodak imports are of the sequential type action and these instructions refer only to this type. However, basic disassembly and reassembly methods are similar on both types.

2. In the following instructions it should be understood that, unless otherwise specified, the right side referred to is the one to a serviceman's right when the camera or assembly is in picture-taking position.

3. Parts referred to in the text and identified by a number in parentheses can be located in Instruction 1.2 (Schematic of Setting Mechanism).

1.2 SCHEMATIC OF SETTING MECHANISM



1. Film Advance Lever
2. Winding Shaft and Pinion
3. Setting Rack
4. Rear Transfer Shaft
5. Aperture Cover Cam
6. Aperture Cover Actuating Lever
7. Mirror Actuating Cam
8. Mirror Actuating Lever
9. Adjusting Screw on Transfer Shaft
10. Mirror Release Lever Cam
11. Mirror Release Lever
12. Mirror Latch Assembly
13. Latch Lug (on Front Transfer Shaft)
14. Latch Lever (for Front Transfer Shaft)
15. Front Transfer Shaft
16. Idler Pinion
17. Shutter Setting Ring
18. Shutter Release Lever
19. Latch Lever Spring
20. Body Release Bell Crank
21. Shutter Setting Pinion
22. Bell Crank Adjusting Screw

1.3 SEQUENCE OF ACTION - FILM ADVANCE LEVER

When the film advance lever is actuated, the aperture cover, the mirror, and the shutter are controlled in sequence by the cams and pinions on the two-section transfer shaft as follows:

a) In approximately the first half of the Film Advance Lever (1) actuation, the aperture cover (not shown in sketch) is brought down by the Aperture Cover Cam (5) acting on the Aperture Cover Actuating Lever (6) which also depresses the cover safety latch (not shown) below the lower right corner of the aperture opening. At the same time the Shutter Setting Ring (17) is rotated to a point where the stud in the ring is drawn up to the start of the cut-out section in the Shutter Release Lever (18).

b) In the second half of the film advance lever actuation, the mirror (not shown) is brought down into a latching position by the Mirror Actuating Cam (7) acting on the Mirror Actuating Lever (8). The movement of the mirror down into the latching position releases the aperture cover latch (not shown) on the left side and retains the cover in a closed position. Meanwhile, the shutter setting ring continues to rotate, setting the shutter and opening the blades and diaphragm.

c) As the film advance lever nears the end of its stroke, the Mirror Release Lever Cam (10) depress the Mirror Release Lever (11) which in turn depresses the Mirror Latch (12) and allows the mirror to pass the latch. At the end of the stroke the mirror release lever leaves the high point of the cam, thus releasing the mirror latch to hold the mirror down. At the same time the Latch Lug (13) passes the Latch Lever (14) and prevents any back rotation of the Front Transfer Shaft as the film advance lever is returned to its normal position.

d) On the return stroke of the film advance lever only the Rear Transfer Shaft (4) rotates. This releases both the Mirror Actuating Lever (8) and the Aperture Cover Actuating Lever (6). As the aperture cover actuating lever returns to the up position it releases the aperture cover safety latch (lower right), thereby locking the cover closed at both lower corners.

1.4 SEQUENCE OF ACTION - BODY RELEASE

The sequential action of the mechanism when the body release is depressed is as follows:

a) The body release plunger trips the film advance mechanism, then actuates the body release slide which in turn actuates the Body Release Bell Crank (20), which then unlocks the shutter. However, the shutter setting ring does not rotate at this time; it remains locked by the Idler Pinion (16) and the Front Transfer Shaft (15).

b) Simultaneously, the arm on the body release slide depresses the safety latch (not shown) for the aperture cover. At the instant this safety latch clears the cover, the small adjustment screw on the body release slide contacts the Mirror Latch (12) and releases the mirror.

c) When the mirror is approximately half closed it contacts the aperture cover latch on the left side and releases the aperture cover. The mirror continues to close and the stud on the right side of its frame strikes the Latch Lever (14) to unlock the front transfer shaft. This allows the shutter setting ring to rotate until its stud stops against the left side of the cut-out in the shutter release lever. During this limited rotation of the shutter setting ring the shutter blades close and the diaphragm contracts to the pre-selected setting. The shutter then "waits" for the aperture cover to complete its opening travel and strike the lug on the shutter release lever, when it then opens and closes normally to make the exposure.

1.5 RANGEFINDER OPERATION

The Retina Reflex rangefinder is an optically coupled split-field type using optical wedges in the pentaprism assembly with no moving parts other than the complete lens assembly.

In focusing on an object through the inner circular area, the rays of light from the right side of the lens are picked up by the lower wedge and those from the left side by the upper wedge in the pentaprism assembly. These rays are bent or deviated so that when an object is out of focus on the film plane, the images formed by the upper and lower wedges are not in alignment. Moving the lens assembly in or out changes the angle at which these rays are picked up by the wedges, thereby bringing the images into alignment in the circular area. When this occurs, the image of the object formed by the taking lens is correctly focused at the film plane.

1.6 FILM WIND MECHANISM

The film wind mechanism in the Retina Reflex Camera is basically the same as that used in the Retina Ib, iB, IIc, IIC, IIIc and IIIC Cameras.

1.7 SHUTTER

The shutter used in the Retina Reflex Camera is basically the same as that used in the Retina Ib, IB, IIc, IIC, IIIc and IIIC Cameras. However, it contains an added mechanism for fully opening the blades and diaphragm for viewing purposes.

2. DISASSEMBLY AND REASSEMBLY

2.1 METER SETTING RING FROM METER

a) Disassembly

1. To facilitate reassembly, set the film speed indicator dial to ASA 20 and then rotate the meter setting ring counter-clockwise to its limit and note the exact location of the index mark of the film speed indicator dial in relation to the #2 value on the meter setting ring.
2. Using Tool #971, remove the dial assembly retaining screw and lift off the dial assembly.

b) Reassembly

1. Replace the meter setting ring assembly, making certain the two studs on the meter cam are engaged in the two holes in the setting ring.
2. Rotate the setting ring counter-clockwise to its full extent.
3. Replace the dial tension washer and the film speed dial, locating the dial so that the white index mark on the outer circumference above the 1300 figure is near the #3 on the setting ring.
4. Replace the film speed indicator dial so that the exposure value index lines up with the #2 on the setting ring and the ASA index mark lines up with the #20 on the ASA scale.
5. Hold the dials in this position and replace the small tension washer and the retaining screw. Before tightening the screw securely, relocate the film speed indicator dial according to the original position as noted in Instruction 2.1 a) 1. above. (If the meter is replaced, set the ASA film speed dial to read exactly #20 when the outer ring indicates #2).

2.2 TOP HOUSING FROM CASE

a) Disassembly

1. Remove meter setting ring (Instruction 2.1 a) and rewind knob (insert suitable tool in post slot and rotate knob counter-clockwise).
2. Remove cover retaining screws (one on right end, two on top left end) and cover support stud screw (top left end, using Tool #971), then lift top housing from case.

b) Reassembly

1. Reverse the order of disassembly.
2. Refer to Instruction 2.1 b) for reassembly of the meter setting ring.

2.3 PENTAPRISM FROM CASE

a) Disassembly

1. Disassemble as in Instructions 2.1 a) and 2.2 a).
2. Remove the three prism assembly retaining screws. These are the larger screws located at the right, left and rear of the prism assembly.
3. Remove the housing support stud at the left side of the prism and, using care, lift the assembly out of the case.

b) Reassembly

1. Reverse the order of disassembly.
2. Refer to Instructions 2.2 b) and 2.1 b) for reassembly of top housing and meter, respectively.

2.4 SHUTTER AND FOCUS RING

a) Disassembly

1. Trip the shutter mechanism.
2. Rotate the focus ring to the "Inf." position.
3. Remove the focus ring knob and the focus scale.
4. Lift out the focus scale retainer ring and remove the four clamping ring screws.
5. Carefully separate the complete assembly from the camera, paying particular attention to the flash contact plunger (spring loaded) and the shutter setting linkage (consisting of a brass ball-retainer sleeve and two small ball bearings).
6. Mark the orientation of the inner and outer focus barrel threaded sections to facilitate replacement and proper focusing.

b) Reassembly

1. Replace the brass ball-retainer sleeve on the shutter setting post with the longer section in and the open side toward the flash terminal.
2. Apply a slight amount of #7101 grease to the ball grooves in the shutter setting post and replace the bearings, one on the top side and one on the bottom.
3. Replace the flash contact spring and plunger in the insulated socket.
4. Align the orientation marks of the focus barrel assembly and rotate the focus ring on the shutter assembly to the "Inf." position and rotate the clamping ring so that the unthreaded hole is at the center between the top and bottom at the right side.
5. Hold the shutter assembly at a slight angle to the front of the case, engage the shutter trigger post in the trigger post socket, rotate the shutter assembly slightly to engage the shutter setting post and then press the assembly into position. (Use care, since the bearings can be dislodged easily).
6. With the focusing ring at the "Inf." position align the five holes of the inner clamping ring with those of the focus ring.
7. Replace the four clamping screws, the scale retainer ring (shoulder side up), and the focus scale.
8. Check the focus and readjust if required.

Note: No screw is used in the center location at the right side.

2.5 FOCUSING RING FROM SHUTTER ASSEMBLY

a) Disassembly

1. Disassemble as in Instruction 2.4 a).
2. Remove the four screws on the rear of the assembly and separate the ring from the shutter.

b) Reassembly

1. Reverse the order of disassembly.
2. Refer to Instruction 2.4 b) for reassembly of shutter and ring to camera.

2.6 FOCUS RING ASSEMBLY

a) Disassembly

1. Disassemble as in Instructions 2.4 a) and 2.5 a).
2. Indicate, by a light scratch-mark on the inner circumference, the orientation between the focus ring stop plate on the front and the spacer plate on the rear.
3. Remove the three flat head screws on the front side and carefully separate the assembly, noting the location of the shutter release extension bearing.

b) Reassembly

1. Reverse the order of disassembly.
2. Refer to Instruction 2.4 b) for reassembly of shutter and ring to camera.

2.7 FOCUS TUBE (INTERNALLY THREADED RING) FROM CASE

a) Disassembly

1. Disassemble as in Instruction 2.4 a).
2. Indicate, by a light mark, the "Inf." orientation of the outer ring of the focus barrel with the inner stationary mount.
3. Rotate the outer ring counter-clockwise until the ring just leaves the thread of the stationary mount. At this point indicate, by a light mark on the stationary mount, the starting thread for reassembly purposes.

b) Reassembly

1. Lubricate the threaded sections sparingly with #7101 grease.
2. Reverse the order of disassembly.
3. Replace the shutter and ring assembly (refer to Instruction 2.4 b).

2.8 SHUTTER COMPLETE (WITH FOCUS BARREL AND FRONT MOUNT) FROM CASE

a) Disassembly

1. Disassemble as in Instructions 2.2 a) and 2.3 a).
2. Remove the meter, the body release plunger assembly, and the film wind release button assembly.
3. Remove the high light plate retaining screws at the top front center and at the top left side of the prism cavity.
4. Carefully peel back the front covering, starting at the bottom center and working up and out toward both the latch and hinge ends until the front mount is fully exposed.
5. At this point it is advisable, for reassembly purposes, to indicate by a light scratch mark the orientation of the shutter setting ring and the transfer shaft assembly. The shutter setting ring can be marked in relation to the front mount at any convenient location. The transfer shaft assembly (front and rear sections) can be marked along the top right edge of the prism cavity in the case.
6. Remove the four screws, one at each corner of the front mount.
7. Lift the front of the high light plate to clear the top of the front mount and carefully (to avoid disengaging the rear pinion of the transfer shaft from the setting rack) withdraw the top of the front mount by pivoting it on the bottom high light plate and then lifting the assembly clear of the case.

b) Reassembly

1. The engagement of the rack with the pinion gear on the winding shaft should be such that the two end teeth of the rack are engaged when the film advance lever is at rest.
2. The rear pinion of the transfer shaft should be engaged in the Rack (3) in such a manner that the alignment mark (previously indicated) coincides with the edge of the prism cavity. If no mark is present, the shaft pinion should be located so that just prior to engagement with the rack teeth a slight counter-clockwise rotation (facing the mechanism) will start to depress the aperture cover.

   When the front mount is completely installed, this will position the straight edge of the camming section of the Rear Transfer Shaft (4) approximately 1/16" from the top of the lug on the Mirror Actuating Lever (8).
3. The Front Transfer Shaft (15) should be installed so that the cam contacts the roller on the Mirror Release Lever (11) and is rotated clockwise (facing mechanism) to its full limit of movement.

   When the front mount is completely installed this will position the Latch Lug (13) on the front transfer shaft so that approximately 1/32" to 1/16" of the lug is visible along the edge of the prism cavity.
4. Insert the lower edge of the front mount in the lower high-light plate and rotate the top edge back under the top high-light plate until the mirror prevents further movement.
5. Depress the mirror and aperture cover so as to clear the mirror shock absorber pad and the Shutter Release Lever (18) on the front casting. Then depress the complete transfer shaft so as to clear the casting and allow the top of the front mount to be pressed back until the complete transfer shaft is in position to engage the Idler Pinion (16).

   At this point rotate the Shutter Setting Ring (17) clockwise to align the positioning marks (previously indicated), then keep the front transfer shaft rotated counter-clockwise and engage the two by pressing the front mount back completely. If no alignment mark is present on the shutter setting ring and front mount, it will be necessary to locate the proper engagement by trial and error. Normally the setting ring will have to be advanced clockwise approximately

b) Reassembly (continued)

1/16" to 1/8" from its full counter-clockwise position before engaging the idler pinion.

When properly engaged the shutter will set, and remain fully open, slightly before the stud in the setting ring reaches the right side of the cut-out section in the shutter release lever when the film advance is fully actuated.

6. Check the action of the mirror and aperture cover by depressing the mirror with a suitable tool. If the action is blocked, the lug on the Shutter Release Lever (18) is below the aperture cover instead of above it.
7. Check the setting action of the shutter, mirror, and the aperture cover by actuating the film advance lever. DO NOT FORCE. Refer to Instruction 1.3 for sequence of action. If the aperture and/or the mirror does not remain latched or if the shutter does not open fully or if it closes on the return stroke of the advance lever, it is probable that the setting rack is improperly meshed with its mating pinions. If the advance lever does not travel its full stroke or does not return to its rest position and there is no binding, look for improper meshing between the setting rack and the winding shaft pinion.
8. Check the tripping action of the body release button. The mechanism should trip the film wind mechanism first, then the Body Release Bell Crank (20) adjustment screw should unlock the shutter just prior to, or at the same time as, the release of the mirror by the small adjusting screw on the body release slide (refer to Instruction 1.4 for sequence of action).

2.9 COMPLETE SHUTTER AND FOCUS BARREL FROM FRONT MOUNT

a) Disassembly

1. Disassemble as in Instruction 2.7 a).
2. Remove the three flat head screws on the rear of the assembly.
3. Carefully separate the complete shutter and focus barrel from the front mount, paying particular attention to the flash terminal plunger and the shutter setting linkage.
4. If further disassembly is required it is advisable to indicate the orientation between the inner teeth of the shutter setting ring and the setting ring pinion.

b) Reassembly

1. Replace the shutter setting linkage and the flash contact (refer to Instruction 2.4 b) 1 - 3).
2. Replace the shutter assembly by first engaging the setting linkage, then the shutter tripping post and then replace the screws.
3. Refer to Instruction 2.8 b) for reassembly of the complete front to the camera.

2.10 MIRROR AND APERTURE COVER ACTUATING LEVERS 6, 8, AND 12 FROM CASE

a) Disassembly

1. Disassemble as in Instruction 2.8 a).
2. Lift off the Front Transfer Shaft (15) and then depress the Aperture Cover Actuating Lever (6) and the Mirror Actuating Lever (8) to remove the Rear Transfer Shaft (4).
3. Remove the following parts to allow access to the lever retaining plate screws directly beneath the sprocket:
   a) Shoulder strap bracket (right side).
   b) Rack retainer plate and rack.
   c) Rewind release button, spring and washer.
   d) Sprocket drive screw, sprocket shaft and sprocket.

   Note: In some instances it may be necessary to loosen the bushing and gear assembly retaining screws slightly to allow the sprocket shaft to pass the small pinion gear on the bushing.
4. Remove the light guard at the bottom of the aperture.
5. Carefully disengage the Mirror Latch Assembly (12) from the stud in the Mirror Release Lever (11) by springing the latch assembly toward the latch end of the camera.
6. Remove the lever retainer plate screws and the plate.
7. Remove the levers and actuating springs.

b) Reassembly

1. Reverse the order of disassembly, making sure the stud on the mirror bracket is below the lug on the Latch Lever (14).
2. Refer to Instruction 2.8 b) for replacement of the shutter and front assembly to the case.

2.11 APERTURE COVER AND MIRROR PLATE FROM CASE

a) Disassembly

1. Disassemble as in Instruction 2.8 a).
2. Remove the light guard at the bottom and the plate directly above the hinge pin.

   Note: This plate retains one end of the mirror bracket spring at the left side of the mirror bracket.

3. With a suitable pin punch placed on the end of the hinge pin at the upper sprocket teeth, drive the pin toward the latch end of the camera sufficiently to grasp with pliers and carefully withdraw the pin until only the mirror bracket spring is retained.
4. Remove the mirror bracket, noting (1) the location of the spacer sleeve (short) between the mirror bracket and the aperture cover at the right side and (2) the anchorage of the long end of the mirror bracket spring under the aperture cover release ramp and the lug on the right side of the mirror bracket.
5. Withdraw the hinge pin sufficiently and remove the aperture cover, noting (1) the location of the spacer sleeve (long) between the aperture cover and the case at the right side and (2) the anchorage of the long end of the aperture cover spring on the stud attached to the left side of the cover.
6. Remove the aperture cover spring and hinge pin.

b) Reassembly

1. Insert the hinge pin from the latch end of the camera at the upper film rail sufficiently to retain the spring and replace the cover actuating spring with the longer end toward the top of the camera and adjacent to the cover.
2. Place the long spacer sleeve in alignment with the hinge pin hole at the right side of the camera.
3. Depress both the right and left cover latches, lock the cover in a closed position, and replace the longer end of the spring under the anchor stud on the left side of the cover.
4. Press the hinge pin in sufficiently to retain the mirror bracket spring, and replace the spring with the short end adjacent to the lip of the aperture cover and the longer end pointing toward the front of the camera.
5. Place the short spacer sleeve in alignment with the hinge pin hole at the right side of the aperture cover.
6. Insert the mirror bracket on the hinge pin, engaging the long end of the spring under the aperture cover release latch ramp and into the lug at the left side of the mirror bracket, then press the hinge pin into position making sure the sleeves and springs remain in their correct location.
7. Grasp the short end of the mirror bracket spring and rotate it up and around the pin and back to the case. At this point replace the top plate which retains the spring.
8. Replace the light guard bracket and reassemble the balance of camera (refer to Instruction 2.8 b).

2.12 FILM WIND MECHANISM

a) Disassembly

1. Disassemble as in Instruction 2.1 a), 2.2 a), and 2.3 a).
2. Remove the following parts: body release button, meter assembly, body release plunger and the film wind release button assembly.
3. At this point it is advisable for reassembly purposes to indicate, by a light scratch mark, the alignment of the Front (15) and Rear (4) Transfer Shaft in relation to the top right edge of the prism cavity and note the meshing between the setting rack and the winding shaft pinion.
4. Remove the following parts:
   a) Shoulder strap bracket (right side).
   b) Rack retainer plate and rack.
   c) Film advance lever and backlatch guard.
   d) Bottom covering.
   e) Bottom high light plate.

   Note: The bottom high light plate retains a small coil spring at the bottom rear approximately midway between the rewind release button and the mirror adjustment screws.

a) Disassembly (Continued)

5. Release the spring return tension on the film wind assembly by depressing the film lock assembly and the wind release assembly. (Assembly will rotate counter-clockwise approximately one full revolution).
6. Remove the following parts:
   a) Rewind release button, spring and washer.
   b) Sprocket shaft and sprocket.
   c) Drive pinion retainer screw on the wind shaft, bushing and gear retainer screws, and related parts.
   d) Rewind release dog spring.
   e) Shaft assembly retaining screws and the shaft assembly.

b) Reassembly

1. Assemble the shaft assembly to the case, and replace the bushing and gear assembly. In its free position (no tension) the larger cut-out section should engage the lock assembly lever.
2. Depress the release lever assembly and the lock assembly sufficiently to disengage them from cam assembly, then rotate the cam clockwise one complete revolution and allow the lock assembly to engage the larger cut-out of the cam.
3. Replace the sprocket, sprocket shaft, sprocket drive stud, rewind release dog spring, and the release button washer, spring and button.
4. Replace the aperture cover safety latch actuating spring (at the rear of bottom, midway between mirror adjusting screw and the rewind release button), bottom high-light plate, bottom covering, and the film advance lever.
5. Replace the drive gear and related parts on the top of the winding shaft.
6. Engage the rack (normally the two end teeth are engaged) in the pinion on the wind shaft and replace the rack alignment washer and the shoulder strap bracket.
7. Lift the left end of the rack slightly and align the transfer shaft alignment marks with the edge of the prism cavity and then engage the rack in the rear transfer shaft pinion.

   Note: If no alignment marks are visible, refer to Instruction 2.8 b) 2.

8. Replace the rack retainer bracket and the balance of the mechanism, referring to Instructions 2.3 b), 2.2 b), and 2.1 b).

3. SERVICE HINTS

3.1 TROUBLE-SHOOTING

BODY RELEASE trips mirror and aperture cover, and shutter closes, but does not open and close for the exposure.	Shutter release lever may bind on front mount to the extent that the aperture cover tension is not sufficient to lift lever and allow setting ring to rotate.
BODY RELEASE trips the mirror and aperture cover, but shutter remains fully open.	Shutter setting ring binding due to rust, corrosion or excessive lubrication.
BODY RELEASE, when depressed very slowly, trips mirror and aperture cover but shutter remains fully open until further actuation of the body release unlocks shutter and allows it to complete its normal cycle.	1. Bell crank may not unlock shutter at the instant mirror is released. (Readjust screw on bell crank). 2. Body release slide (Mirror release screw) may trip mirror in advance of shutter unlocking. (Readjust small screws on body release slide).
FILM ADVANCE LEVER latches mirror down and sets shutter but aperture cover fails to latch and returns to rest against mirror on return stroke of lever.	Aperture cover may not be depressed sufficiently by actuating lever to permit safety latch to retain cover. (Readjust spring finger on actuating lever).
FILM ADVANCE LEVER latches aperture cover down and sets shutter, but mirror fails to latch and returns to rest on return stroke of lever.	Front transfer shaft may not rotate far enough for mirror release lever to pass high point of cam on front transfer shaft. (Check for misalignment in setting mechanism, refer to Instruction 2.8 b). If alignment appears correct, readjust front transfer shaft Adjusting Screw (9) on rear transfer shaft. (An access hole is provided in case directly above the screw).
FILM ADVANCE LEVER can not be actuated.	Mirror and aperture cover hinge pin may have worked loose from case and interferes with rotation of sprocket.
FOCUS RING cannot be rotated to "Inf." position.	Set screw in pentaprism assembly may be lodged between sections of focus barrel assembly.
RANGEFINDER circles not concentric.	A shift in either the ground screen or the wedge disc plate in pentaprism may result in this condition. (Readjust small set screws at the bottom of the assembly and seal with an appropriate cement).
FLASH CIRCUIT open.	Corrosion or lacquer present where flash post assembly is staked to front mount. (Restake at several points around hub with a pin punch).
SHUTTER BLADES do not open fully when advance lever is actuated.	Incorrect timing between shutter setting ring and transfer shaft assembly. (Refer to Instruction 2.9 b) for correct alignment). In a few cases trouble may be traced to blade and diaphragm actuating plates in shutter.

3.2 CLEANING SHUTTER SETTING RING

a) Disassemble as in Instruction 2.8 a).
b) Remove the Shutter Release Lever (18).
c) Remove the Body Release Bell Crank (20).
d) Remove the shutter setting return spring.
e) Indicate the alignment of the Shutter Setting Pinion (21) and the inner teeth of the Setting Ring (17). The alignment of the Idler Pinion (16) with the external teeth of the setting ring does not require marking.
f) Remove the two setting ring retainer screws and the anchor stud for the return spring.
g) Using care to avoid damaging or disconnecting the flash contact lead, lift the setting ring from the front section and thoroughly clean all bearing surfaces of the steel ring and the casting. The use of an erasure stick will facilitate the cleaning operation.

Note: Do not remove the black finish on the brass ring used on the late models.

h) Lubricate all bearing surfaces of the ring and the front section with dry graphite rubbed thoroughly into the surface with hard felt. Remove all excess lubrication.
i) Reassemble the ring to the front section, being careful to maintain the correct alignment between the shutter setting pinion and the inner teeth of the ring. Replace shutter release lever (if fitted) and the body release bell crank.
j) Check the setting action of the shutter by inserting a screwdriver in the retaining screw for the shutter setting pinion at the bottom and rotating it clockwise. The shutter should set slightly before the stud in the setting ring reaches the right side of the cut-out section in the shutter release lever, and the blades should then remain fully open.
k) Check the tripping action of the shutter by depressing the body release slide at the right side of the assembly. The stud in the ring should move from the right to the left side of the cut-out section of the shutter release lever, the shutter blades should close, and the diaphragm should close to any preset value. At this point in a fully assembled camera the aperture cover strikes the shutter release lever and pushes it out of contact with the stud in the setting ring. The ring then rotates counter-clockwise, and the shutter opens and closes for the exposure. Push the release lever up and observe the action. Any binds or hesitation of the ring in its movement may prevent the shutter from operating normally.

On the early models without the shutter release lever, the action of the shutter setting ring must be completely free since, in the initial movement of the ring, the mirror and aperture cover must clear the film aperture before the shutter opens and closes for the exposure.

l) Reassemble as in Instruction 2.8 b).

3.3 LENS FOCUS

The lens focus should be checked on a focus analyzer or ground glass at an accurately measured distance (preferably 15 feet) from the film plane (the rear of the top housing). Since the basic front lens combination is the 50mm component, any adjustment or checking should be done with this lens. If a correction is required, remove the focus scale and the scale retainer ring, then loosen the four clamping ring screws and carefully rotate the focus ring the required amount and tighten the screws. Reassemble the scale to the ring and recheck the lens focus.

3.4 RANGEFINDER ADJUSTMENTS

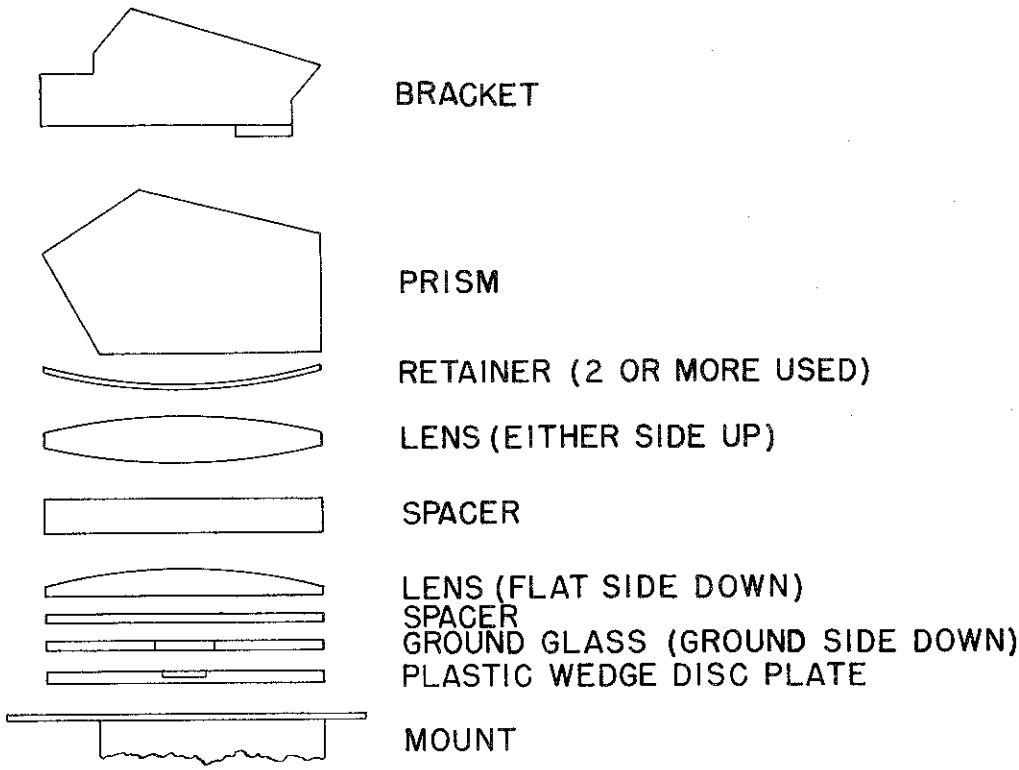
Before attempting an adjustment of the rangefinder, the lens focus should be checked (see Instruction 3.3). Only one adjustment of the rangefinder is possible; this is in the mirror latching assembly, which to a certain degree can affect the finder pointing. Minor corrections can be made by carefully skiving the bottom covering from the rear edge of the bottom high-light plate toward the front at a point approximately 1/8" to the right of the accessary locating socket. Turning back the covering will then allow access to the mirror latch adjustment screw.

Loosen the small set screw locking the large adjustment screw. Carefully rotate the larger screw until the images formed in the finder are in alignment at an accurately measured distance from the film plane. When the alignment is correct, tighten the set screw and trip and set the mechanism several times to be sure the adjustment remains constant; if satisfactory, recement the covering. If the adjustment will not remain stable, it may be caused by a mirror latch adjusting screw, which is not properly staked to the latch assembly. If excessive adjustment is required, look for a bent mirror bracket or incorrect assembly of the pentaprism assembly.

3.5 CLEANING PENTAPRISM ASSEMBLY

Due to the extreme magnification in the pentaprism assembly the removal of minor dust is very difficult without the aid of some type of suction apparatus in a dust free area.

If it is necessary to disassemble the unit, the following diagram may be helpful in replacing the components in their proper order. Care must be used in cleaning the plastic wedge disc plate since cleaners other than Kodak Lens Cleaner or plain water may affect the surface of the plastic plate.



3.6 EXPOSURE METER

The exposure meter is basically the same unit as used on the late Model IIIc and the IIIC. However, three different methods have been used to retain the meter on the camera case. These are:

a) Fastened securely with a standard fillister head screw.
b) Fastened loosely with a shoulder screw and retained at the other end by a pad in the top housing.
c) Located by a stud in place of the screw and retained at the other end by a pad in the housing.

When replacing a meter of the first type, do not tighten the retaining screw too much, or the meter housing lug may be damaged.

Excessive lubrication on the body release plunger should be avoided since some types of grease or oil will affect the plastic meter case.

Inoperative or erratic meters should be exchanged; repairs should not be attempted. Zero adjustment of the meter can be made in the following manner:

a) Remove the meter setting dial assembly and the top housing.
b) Cover the front glass of the meter to prevent any stray light from striking the meter.
c) Turn the cam on the top of the meter counter-clockwise as far as possible.
d) Hold the meter in a horizontal position and adjust by rotating the eccentric adjustment stud at the right side to align the "white" needle with the "yellow" pointer.

3.7 SERVICING THE SHUTTER

Several repairs or adjustments to the shutter mechanism can be performed without removal of the shutter assembly from the camera. The shutter must be removed from the camera only when diaphragm or shutter blade repairs are necessary. (See Instruction 3.7 e).

a) Disassembly - Front of Shutter

1. Remove the front lens combination.
2. Remove the three nameplate screws and loosen the number block set screw.
3. Lift the shutter nameplate approximately 1/4" opposite the lens lock lever, then lift the speed ring and at the same time slide it slightly toward the lens lock lever. Then remove the nameplate and the speed ring by lifting the nameplate to release it from the lens lock lever.
4. Remove the speed and diaphragm index scale and the diaphragm setting ring.
5. Remove the bayonet mount and hub assembly by removing the four screws at the base of the hub.

   Note: It is not necessary to remove the four bayonet mount screws at the top of the hub.

6. Remove the black dust plate, the speed plate retainer ring, and the speed plate.

Disassembly of the balance of the mechanism on the front of the plate is similar to that of the Retina IIIc shutters, but the following parts and spring anchorages contain major changes:

Synchro plate assembly.
Cocking ring and cocking ring pinion.
Cocking ring latch (new part) and trigger.
Anchorage of cocking ring spring to a special retainer stud for the bulb lever.
Anchorage of the bulb lever spring to the stud on the time release lever.
Main drive assembly.

b) Sequence of Action - Setting the Shutter

As the shutter mechanism is set by the Shutter Setting Ring (17) through the Shutter Setting Pinion (21), the long lug on the cocking ring performs two functions: (1) it contacts the diaphragm-opening lever to open the diaphragm fully, and (2) it contacts the blade-opening spring tip at the lower left (facing the shutter) to open the blades fully. It is then held in this full-rotated position by the latch at the upper right; the shutter setting ring, meanwhile, is locked by the Front Transfer Shaft (15). (Refer to Instruction 1.3 for complete sequence of setting action).

c) Sequence of Action - Tripping the Shutter

When the shutter is tripped, the Body Release Bell Crank (20) actuates the cocking ring latch in the shutter and unlocks the cocking ring. (Blades and diaphragm may close slightly but the shutter setting ring remains locked by the front transfer shaft). The body release action then trips the mirror which in moving upward strikes the Latch Lever (14) which releases the Front Transfer Shaft (15), thus allowing the shutter setting ring and cocking ring to rotate until blocked by the Shutter Release Lever (18). During this limited rotation, the shutter blades close and the diaphragm contracts to the predetermined setting. The shutter then "waits" for the aperture cover to complete its opening travel before making the exposure. When the aperture cover strikes the lug on the shutter release lever, the shutter setting ring and the cocking ring rotate. The cocking ring then releases the main drive latch on the synchro plate assembly, thus tripping the shutter for the exposure. (Refer to Instruction 1.4 for complete sequence of tripping action).

d) Slow Shutter Speeds and Blades Failing To Close

Generally, slow shutter speeds are caused by a sticking retard gear assembly. In most cases a thorough cleaning of the retard assembly and the limited use of graphite to lubricate the assembly will correct the trouble. Occasionally, a weak main drive spring may be the cause of the trouble.

In a few instances in which the camera has been dropped or damaged the carrier plate for the shutter blades may bind and cause a similar condition. If this condition is encountered, it will be necessary to remove the shutter assembly from the camera for further disassembly.

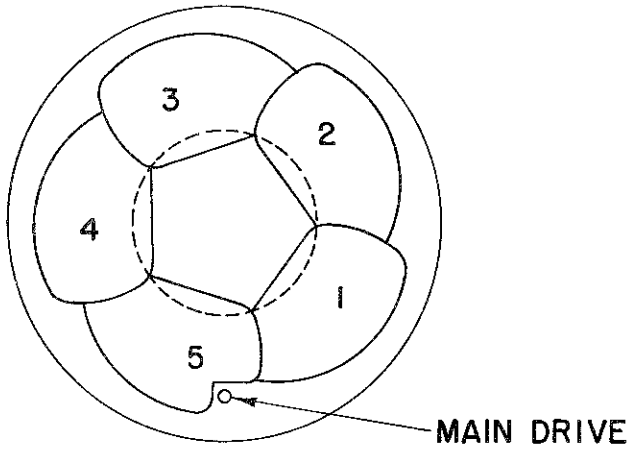
e) Disassembly - Rear of Shutter for Blade Repairs

1. Remove the shutter and focus ring (Instruction 2.4 a).

2. Remove the focusing ring from shutter assembly (Instruction 2.5 a).
3. Remove the shutter setting post, the rear lens and the retainer collar and the rear shroud from the shutter.
4. Remove the blade and diaphragm closing springs on the rear of the shutter case.
5. Remove the diaphragm control ring retainer screws (note the location of the one screw stud which serves as an anchorage point for the diaphragm closing spring), and control ring, then the synchro selector ring.
6. Remove the three case-to-mechanism plate screws and separate the case from the plate.
7. Remove the five blades, noting the position of the one cut-out blade, and the carrier plate.

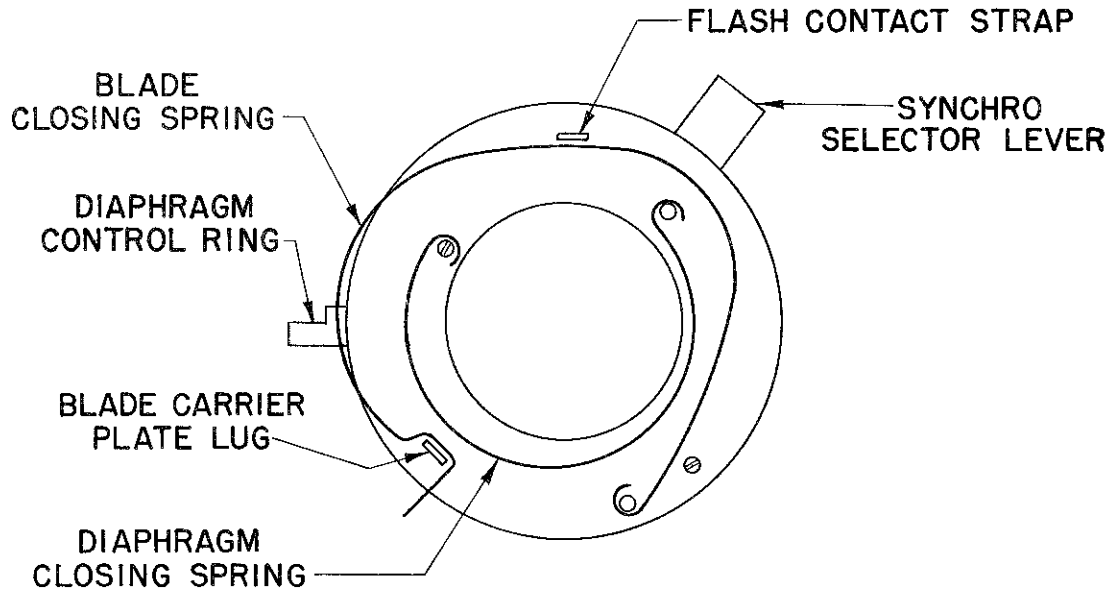
f) Reassembly - Rear of Shutter

Clean all bearing surfaces of the blade carrier plate and the case, and lubricate sparingly with dry graphite. The blades should be replaced starting with one of the four similar blades at the right of the main drive bearing and working counter-clockwise. The one cut-out blade should be the last blade replaced. (See Sketch).



REAR OF MECHANISM PLATE
BLADE LOCATION

The following sketch shows the proper anchorage points for the blade and diaphragm closing springs.

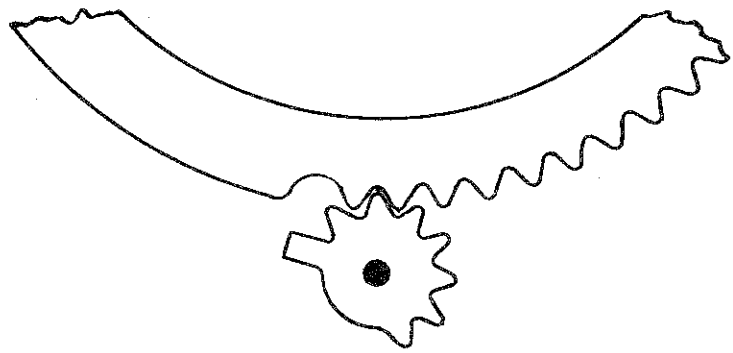


REAR VIEW

f) Reassembly - Rear of Shutter (continued)

When replacing the rear shroud on the shutter case be sure the synchro selector lock lever is depressed to allow the shutter case to seat properly in the shroud before securely tightening the retaining collar.

In replacing the balance of the shutter mechanism the engagement of the cocking ring pinion gear (with the cocking ring rotated completely counter-clockwise) the first tooth of the ring should be between the first and second teeth near the setting lug on the pinion. (See Sketch)



g) Flash Synchronization

X - Contact when blades are fully open.
M - 15 to 17 milliseconds from electrical contact to full-open shutter.

Adjustment of the M synchronization is made by increasing or decreasing the spring tension on the synchro sector spring anchor.

h) Shutter Speeds

Shutter speeds should be within the following tolerances:

Total Time

1 second	-	800 to 1200	milliseconds
1/2 "	-	400 to 600	"
1/4 "	-	200 to 300	"
1/8 "	-	100 to 150	"
1/15 "	-	55 to 82	"
1/30 "	-	28 to 42	"
1/60 "	-	16 to 24	"
1/125 "	-	8.0 to 14	"
1/250 "	-	4.5 to 8.0	"
1/500 "	-	2.5 to 5.0	"

Equivalent Exposure

1 second through	1/60	- ± 20%
1/125 " "	1/500	- ± 30%