PRODUCT NO.230-2

# ASAHI PENTAX S3


# SERVICE MANUAL

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# INTRODUCTION

This Service Manual is prepared for servicing Product # 230 2; however, since the following products have structures similar to 230 2. This Manual will also apply to these products:

| Product # | Model Description | Major Difference |
|---|---|---|
| 229-2 | S1. H1. S2. H2 | Semi-automatic diaphragm. |
| 230 | S3. H3 | Old-type fully automatic diaphragm. |
| 229-3 | S1. H1. S2. SB. SB2 | |
| 232 | SV. H3v | Self-timer, automatic re-setting film counter. |
| 230-3 | Sla. Hla, S2 | Automatic re-setting film counter. |

**SUMMARY OF STRUCTURE AND PERFORMANCE**

Upon cocking the rapid wind lever, the bounce stopper mechanism is first released, the shutter curtains are wound, and the mirror actuator lever, bottom (B19) tensions the mirror seat spring (B44) and the dia lever spring (B72).

When the shutter button is depressed, the bulb lever will be so positioned as to prevent rotation of the bottom selector gear (E44) which is connected with the 2nd curtain, and at the same time will contact the high speed cam (E85) which selects the high speed exposure timing. Further, the spill (E08) will come down, freeing the top idling gear (E17l, thus making the exposure ready to be made.

When the shutter button is depressed by 1.2mm to 1.7mm, the 2nd dia lever (B54) will be released and will start rotating rapidly, and the 1st dia lever (B53) which couples with the 2nd dia lever will press the automatic diaphragm release pin.

During the rotation of the 2nd dia lever, the reflex mirror is released and starts flipping upward. While the mirror is flipping up, the FP contact is switched in, and the curtain actuating lever is pressed up, starting the travel of the 1st curtain.

At the instant the 1st curtain passes the picture format, the X contact is switched in, and the bounce stopper functions and then stops.

The shutter exposure timing can be determined by turning the shutter speed dial. The shutter speed dial has a slot to be coupled with the Asahi Pentax clip-on exposure meter. As the shutter speed dial is turned, the centre slot of the high speed cam moves eccentrically, and added to the shape of the high speed cam, high speed exposure timing is determined (from 1/30 to 1/1000 sec). Slow speed exposure timing (from 1 to 1/15 sec.) is determined by the slow speed cam (F0l), which changes the operating time of the slow speed governor located underneath the mirror housing, as the shutter speed dial is turned within the slow speed range.

With the shutter speed dial set at "B" the high speed cam floats, and since the top bulb lever (E06A) does not contact the high speed cam, the 1st curtain starts travelling when the shutter button is depressed, however, the 2nd curtain stays without travel. The 2nd curtain will start travelling only after the shutter button is released.

With the shutter speed dial set at "T" the slow speed cam causes the time stopper (F03) to check the movement of the slow speed actuator lever (F06), and contrary to the "B" position, the 2nd curtain will not start travelling even after the shutter button is released, but will start its travel only after the shutter speed dial is turned either to the direction of "B" or 1/1000.

Just prior to the completion of travel of the 2nd curtain, the pin of the coupler gear (E18) rotates the pinion coupler lever (E10), and the bottom actuator lever spring (B47) causes the mirror actuator lever (B19) to return to its original position. As the 1st and 2nd levers are also placed back to the original position, the automatic diaphragm of the lens reopens again.

Actual time required from the start of the rotation of the 2nd diaphragm lever by depressing the shutter button to the completion of all these performance is not more than 40 ms. Needless to say, in the case of slow speed

exposure timing, the time required will be that much prolonged.

For facilitating better understanding of this Manual as well as for convenience of the reader when making requisition for interchangeable parts and/or tools, lists and diagrams are attached herewith as Attachments.

Explanations with respect to disassembly are given in the order of work to be performed, while those pertaining to assembly are described in the order opposite to the work of disassembly. No explanation is offered concerning easily understandable disassembly and, or assembly. In case of a partial disassembly or assembly, proceed with it on the basis of information contained in this Manual, making reference to such explanations as may be considered pertinent to such need.

**Classification of Part Numbers:**
Service part numbers are given always starting with 01, according to each mechanism, and mechanisms are classified in an alphabetical order as follows:

| | |
|---|---|
| A | Cover Plates, Back-Cover |
| B | Mirror Housing, Prism Seat |
| C | Film Winding Mechanism |
| D | Film Rewinding Mechanism |
| K | Shutter Mechanism |
| F | Shutter Slow-Speed Mechanism |
| G | Slow Speed Governor |
| AF | Optical Parts |

**Standard Parts:**
Service parts commonly used for all our products are called "Standard Parts" and the classification is as follows:

| | |
|---|---|
| W | Washer (except for those with special shape) |
| LW | Lock Washer |
| R | Rivets (except for those unavailable on the market) |
| Small Screws | (except for those other than the standard dimensions) |

Of the above, index numbers alone are quoted in the Manual to indicate standard small screws for the sake of brevity. However, the index numbers shown are those applicable only to this Manual for 230-2, and should therefore never be quoted, say, when making requisition for service parts or in technical communication.

Attachment 5 -- List of Service Parts -- may be modified or revised when alterations or improvement in some of the listed items are deemed necessary, or when assembled parts are altered for various other reasons.
Please note, however, when such alterations or modifications are initiated, a new complete List of Service Paris or a notice thereof will be mailed to you.

# CHAPTER I. DISASSEMBLY

NOTE: As red lacquered spots are the spots securely fixed after making necessary technical adjustment, do not unscrew such spots unnecessarily. When removing springs, care must be exercised so as not to give any deformation to the springs; also refrain from taking out springs with bare fingers.

**1. Disassembly of Cover Plates, Rapid Wind Lever and Rewind Knob.**

a. RAPID WIND LEVER (C03)
Take out the arrow ring retainer screw (C54). When the counter screw (C36) is removed, using special tool No. 225K-C36-A, the counter (C12) and counter spring (C60) can be taken out.

When the actuator lug screw (C53) for the advance lug actuator (C07) is taken out, 2 screws (C73) for (C03) can be removed. As (C03) is securely fixed with a binding agent to the upper surface of the wind-up lever seat (C35), dissolve the binding agent, using such solvent as Methyl-ethyl-ketone or Acetone, before attempting to remove the screw. Remember that in our current products a binding agent is used not on the surface of the wind-up lever seat (C35) but on the rapid wind lever retainer screw (C73).

b. SHUTTER SPEED DIAL (E23)
With the shutter dial set at " B," remove 3 small screws (23) and you will find it easier to perform disassembling.

c. REWIND KNOB (D06)
With a screw driver or a similar tool inserted into the fork of the rewind shaft (D05), which goes into one end of a film cassette, rotate the crank (D10) counter-clockwise more or less forcibly and unscrew it. If the flat nut (D09) is taken out, using special tool No. 225K-D09-A, the film type dial washer (D02) and film type dial (D08) will come out simultaneously.

d. TOP COVER PLATE (A03)
Take out 1 screw (18) on the upper side of the top cover plate (A03) and then 2 screws (19) on both sides of the finder eye-piece and push the plate strongly upward.

e. FRONT COVER PLATE (A05)
Remove 4 screws (19) and you will find the front cover adjust washer (A39) between the front cover plate (A05) and the body proper (A01); this is intended for the mechanical back to be 45.46mm. In the event (A05) is not replaced, fix the plate at time of reassembling to its original place, and correct dimensions can be maintained without making adjustment.

f. BOTTOM COVER (A04)
Remove 2 screws each (18) and (16).

**2. Disassembly of Mirror Housing and Optical Parts.**

a. PRISM SEAT (B01)
Take out 3 screws (13) by tightly holding the prism seat (B01) with fingers to protect it from floating by the elasticity of the ground glass holder (B79). The prism (AF17) should not be dismantled from the prism seat (B0l) as far as possible, but when it is to be removed, unscrew either one of the 2 adjustment screws (21).

b. MIRROR HOUSING (B02)
Unloose the screw (I) of the lug plate (B77) at X contact on the bottom part of the body proper (A0l), slowly correct the cord B (B73) with tweezers to make it straight, remove 2 screws (11) and 2 screws (B71) and take out the mirror housing (B02) slopewise frontward. While taking the mirror housing out, push it in the direction of B02 so as not to let the curtain actuator lever IB20I hook up the body proper (A01). Care must also be exercised not to let the cut opening of the mirror actuator lever, bottom (B19), hook up the edge of either the coupler gear (E18) or the coupler lever (C15).

c. MIRROR (AF12)
Press inward the front edge of the mirror (AF12), say, with the tip of tweezers, and 2 front claws of the mirror retainer plate (B12) will come off, thereby floating the mirror.

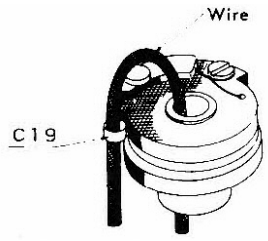
NOTE: Never touch the surface of the mirror with a fingertip or any kind of tool. If the mirror gets dusty, use a soft brush or a blower to dust it off.

**3. Disassembly of Top Transport Mechanism.**

a. WIND-UP LEVER SEAT (C35)
Press the edge of the spring (Cl9) with finger to prevent it from recoiling, and then take out (C35) from the wind-up lever shaft (C34), after which if (C19) is properly fixed to (C 35), using ɔ shape wire, the trouble of recoiling the spring can be dispensed with at time of reassembling. (Diagram 1)

NOTE: When recoiling (C19), do it with gloves on. If handled with bare fingers, the spring trends to be rusted.

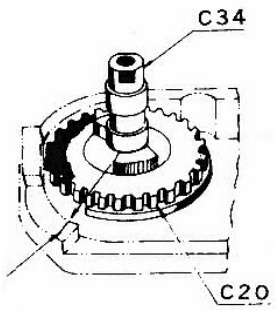
(Diagram 1)




b. LEVER STOPPER (Cl0)
Take out 2 screws (15) and 2 stopper washers (C68).

c. TOP FIRST GEAR (C20)
Prior to taking out the top 1st gear (C20), mark the body proper (A01) with a dot, indicating the spot extended from the corner of either one of the two projected points and an accurate angle can be easily determined when reassembling. (Diagram 2)

(Diagram 2)




d. WIND-UP LEVER SHAFT (C34) Unloose 3 screws (17).

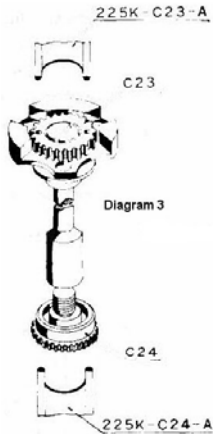
**4. Disassembly of Bottom Transport Mechanism.**

a. BOUNCE STOPPER ACTUATOR LEVER (E08)
Remove the bounce stopper lever screw (E103) and ease the bounce stopper actuator lever screw (E100) and take out; he bounce stopper lever (E99) and bounce stopper spring (E102) with particular attention to the washer W3—located beneath (E98).

NOTE: When (E98) is removed, (E99) must also be taken out, because once (E98) is dismantled, (E99) is invariably placed in a position where the bounce stopper mechanism is at work, and if, by any chance, the shutter is cocked, the 1st curtain will thereby very likely be damaged.

b. COUPLER LEVER (C15)
Remove the coupler lever retainer screw (C80).

c. "R" LEVER PARTS (C70)
As the "R" button is screwed in, remove it by turning it counter-clockwise forcibly with finger. When the "R" lever retainer screw (C52) is taken out, the "R" lever spring (C62), "R" lever (C70), W9 and bottom 1st gear (C25) will come out from the lower bottom 1st gear shaft (C46).




d. PIN ADJUST PLATE (C17) Remove the screw (14) and then unloose 2 screws (23).

e. WIND UP SHAFT PARTS
Press the top main gear (C23), using special tool No. 225K C23 A, and take out the bottom main gear (C24) by turning it counter-clockwise and thereby unscrewing it, using special tool 225K C24 A. (Diagram 3)

**NOTE:**
1. Do not turn (C23) counter-clockwise under any circumstances.

2. W17(s) located at the upper and lower parts of the spool brim are intended for adjusting the weight of load on the rotation of the spool, in view of which their number and location have to be remembered. The wind-up shaft bearing (C32) should be taken out along with the wind-up shaft (C 31) by loosening 3 screws (17), and then the top take-up spool brim (C13), the bottom take-up spool brim (C14) and the take-up spool shaft (C33) will come off.

**REFERENCE:**
The center diameter of (C31), in some cameras, is found narrower for it is intended to lighten the camera weight and should be considered as an improvement.

f. Sprocket Shaft (C30)
Take out the coupler lever seat (C16), sprocket seat spring (C63) located beneath the seat, and then the sprocket cover (A06). Unloose the sprocket screw (C56), and the bottom 3rd gear assembly (0C27) can be easily taken out from the body proper.

**5. Disassembly of Shutter Mechanism.**

**NOTE:** When disassembling the shutter mechanism, close attention must be paid to the coupling relations and locations of various gears.

a. SHUTTER GEAR MECHANISM

(1) Pinion Coupler Lever (E10)
Unloose the pinion coupler lever retainer screw (E52), and (E10) and the underneath washer (W2) can be taken out.

(2) Coupler Gear (E18)
Unloose the coupler gear retainer screw (E53), and (E18) can be taken out together with the underneath washer (W3)

(3) Coupler Pinion (E13)
Insert a driver through the cut-opening located at the back of the bottom part of the body, unloose the coupler pinion screw (E88), and forcibly pull it out from the 2nd curtain pinion shaft (E32).

**NOTE:** Care must be exercised not to press the driver too hard; otherwise (E32) might be bent.

(4) Shutter Rod (E29)
Remove the actuator rod (E30) by turning it counter-clockwise. Remove LW17 from the idling gear retainer screw (E50), and then (E30) can be taken out upward from the body proper.

**REFERENCE:**
In the event the idling gear parts alone are to be taken out for disassembling or washing purposes, do not go through the trouble of removing the mirror housing or the shutter rod (E29); just remove the release

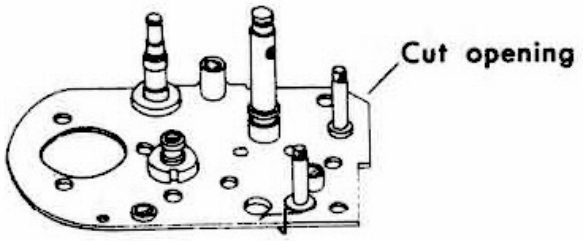
plate (E05) by loosening the release plate nut (E119), and the desired parts can be taken out.

(5) Slow Speed Rod (F12)
Ease the cam coupler plate nut (F11), using special tool No.225K-FII-A, remove the cam coupler plate (F02). Then remove LW13, intended to check up-and-down movement of the slow speed rod (F12), and the governor at the bottom of the body proper and its coupling parts can be taken out at the same time in one body from the bottom parts of the body proper.

(6) Speed Selector Disc (E68)
Take out the index ring (E24) from the speed gear shaft by unloosening 3 screws (23), and (E68) can be also removed.

(7) Unloose 2 screws (9) for the click spring (E83), and it can be taken out along with the light seal (C87).

**REFERENCE:**
The light seal (C87) began to be installed in 230 *2* at a later stage of production for the following reasons: For Product No 232 (with self-timer), a top mec. plate (C01) with a cut opening is used in view of its mechanical structure, and (C87) is accordingly installed for the purpose of insuring complete prevention of light leakage. As, however, a change was effected to make use of (COD for 230-2 for 232 as well. (C87) was added.
Consequently, in a case where (C0l) is devoid of any cut opening, (C87) is not required. (Diagram 4)



(Diagram 4)

(8) High Speed Cam Parts
Ease the selector shaft tube retainer screw (E117) and remove the selector collar (E25) from the selector gear shaft (E26), and the high speed cam (E85) parts, the cam shaft spring (E56) and the cam shaft spring receptacle (E79) can be taken out.
For disassembling the high speed cam parts, namely, (E85), cam shaft (E69) and cam shaft nut (E76), use special tools No. 230K - E69 A and No. 230K - E76A.

(9) Bulb Lever Paris
By easing the bulb lever nut (E48), the bulb lever parts can be taken out in a body from the bulb lever shaft (E27).

**NOTE:** Before attempting to remove the bulb lever parts, see to it that the bulb lever spring (E62) is dismantled from the bottom Bulb lever (E06B).

(10) Idling Gear Parts
When the idling gear retainer screw (E50) is removed, the idling gear parts located beneath it, viz., the spill receptacle plate (E09), top idling gear (E17), spill (E08) and bottom idling gear (E16) can be taken out. Make sure to remove the spill rest (E21) beneath (E16) and the spill spring (E58) at the same time as these are liable to be lost.

(11) Stopper (C11)
Ease 1 screw (12) and stopper nut (C92), and the stopper (C11) can be removed.

**NOTE:** Once the stopper (C11) is removed, the pinion rotates freely, thereby tending the shutter curtains to strip off the shaft. Consequently, before attempting to remove C11, see to it that the tension of the shutter curtain spring is weakened. (Refer to 5. b. 1.)

**REFERENCE**:
When the shutter curtains, 2nd curtain pinions (Ell) (E12), bottom selector gear (E14) and top selector gear (E15) are not to be replaced with new ones, mark the exact coupling positions of the gears before removing (C11) for the purpose of facilitating reassembling. (Diagram 5)

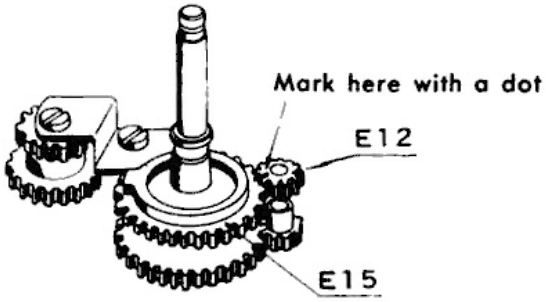



Diagram 5

b. SHUTTER CURTAIN PARTS

**NOTE:** When attempting to overhaul the shutter curtain parts, strict care must be exercised not to tear off the curtain from the pipes; not to make a hole in the curtain with such tool as tweezers; and not to stain them with oil.

(1) Curtain Spring Adjust Gear A (E92)
Put a driver into the slot of the curtain spring adjust gear A (E92i to prevent its rotation, take out the curtain spring adjust lug (E42) from the gear, and then turn the driver slowly clockwise, thereby placing the curtain spring back to its original position with no tension. For overhauling (E93), the same procedure may be followed.

**NOTE:** The curtain spring should never be placed back to its original position rapidly. Put a driver into the upper slot of the 1st curtain shaft (E33) to prevent its movement, and turn (E92) clockwise, unloosening the screw to take it out. The curtain spring adjust gear B (E93) should also be overhauled in exactly the same manner. Remember that (E92) and (E93) screw counter-clockwise.

(2) Sync. Gear (E104)
If LW13 is pulled out of the sync, gear column (E105), (E104) can be removed.

(3) Top Shaft Plate (E01)
When 2 pcs of LW13 and 2 pcs of screw (72) are removed, the curtain pipes and shutter curtains can be taken out in a body from the body proper.

(4) Top Mec Plate (C01)
Ease the 1st curtain checker arm stopper (E86) and stopper column (C42), and the 1st curtain pinion shaft (E31) and 2nd curtain pinion shaft (E32) can be taken out in a body from the body proper.

(5) Top Mec. Plate (C01) and Shutter Curtains
Ease 3 pcs of pinion shaft retainer screw (E55) and the 1st, and 2nd curtain pinion shafts (E31) (E32) can be pulled out of (C01).

**6. Disassembly of Mirror Housing Mechanism.**

**NOTE:** Overhauling of the mirror housing mechanism may be made from any parts you desire, but the following points must be borne in mind:

(a) Do not turn the red lacquer sealed 2nd dia. lever adjust screw (B59), because this screw is adjusted to cause the rotation of the 2nd dia. lever (B54) when the shutter bottom is depressed to 1.2 - 1.7 mm.

(b) Do not ease the mirror seat rest screw (B13) which retains the mirror seat rest (B14). The (B14) is properly adjusted to maintain the mirror at the correct 45° angle whenever it is down.

(c) Remember well the exact location of the washers located in between the mirror actuator lever, top (B18), mirror actuator, bottom (B19) and mirror actuator lever shaft (B35), as the washers are adjusted to prevent clearance of these parts.

# CHAPTER II. ASSEMBLY AND ADJUSTMENT

In this Chapter II, photographs are shown, besides diagrams, in the order of assembling, where considered helpful. For instance, photo No. 3 shown under 1. b, illustrates the assembled condition up to the stage of the stopper (C11).

**NOTE**:Disassembled parts, before assembling, need a careful washing and or dusting with either a piece of cloth or a blower. When servicing customers' cameras, discretion, of course, has to be exercised in this respect, taking into consideration such factors as the model, period of use, nature of defects, etc. However, the general rules are summarized below:

Parts equipped with rotating shafts and or shaft bearings have to be thoroughly washed with quality gasoline or benzene. Especially such parts as are to be lubricated with "L" lubricants need a careful washing and drying. However, pipes and governor parts containing curtains or springs should never be immersed in cleaning liquid for washing purposes.

Exposed plated and anodised parts should be thoroughly wiped either with a brush or with a clean piece of cloth. When stains are found, lightly wipe off the stained parts with a clean piece of cloth soaked with liquid composed of ether and alcohol at the ratio of *60%* and 40%.

Painted parts need only be lightly dusted with a brush. Stains on the outer surface of black cameras should be wiped either with silicon-cloth (similar to the one usually used for wiping glasses and is easily available on the market! or with the aforementioned liquid composed of 60% ether and 40% alcohol, very lightly so as not to erase the white letters engraved on the cameras.

For wiping optical parts, mixed liquid comprising 70% ether and 30% alcohol should be used. In this connection, a clean piece of cotton or hemp cloth, properly washed beforehand and entirely devoid of starch, or a piece of soil paper is recommended for use.

For wiping parts made of plastics (such as Fresnel and ground glass), use mixed liquid composed of 50% ether and 50% alcohol, which gives satisfactory results.

The mirror should never be wiped with a piece of cloth under any circumstances. If wiped with such material, it results in flaws. Dusts or dirts on the mirror need to be blown with a blower.

It is of utmost importance to abide by the instructions governing the right kind of lubricants, lubricating positions and lubricant quantity. Lubrication needs to be performed strictly in accordance with Attachment 2—List of Lube Oil —as wrong use of oil will invariably result in the deterioration in performance or functioning of various parts and may cause defects.

## 1. Assembly and Adjustment of Shutter and Transport Mechanism.

a. SHUTTER CURTAIN PARTS

(1) After the shutter curtain parts are assembled, slowly rotate 2 or 3 times the 1st curtain shaft (E33) and 2nd curtain shaft (E94) clockwise to tension the curtain springs. (Diagram 6) Final adjustment of the curtain spring tension should be made at the time of adjusting the curtain travel speed mentioned elsewhere.

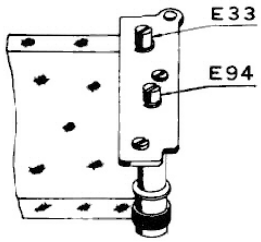



Diagram 6

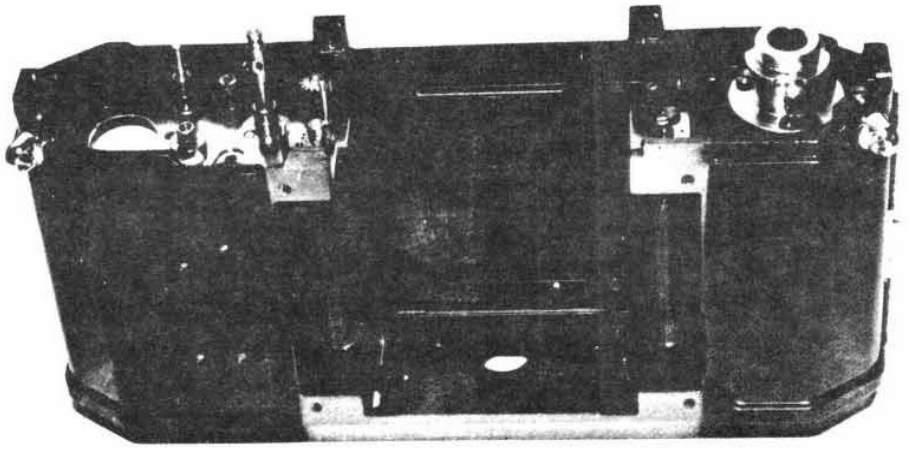
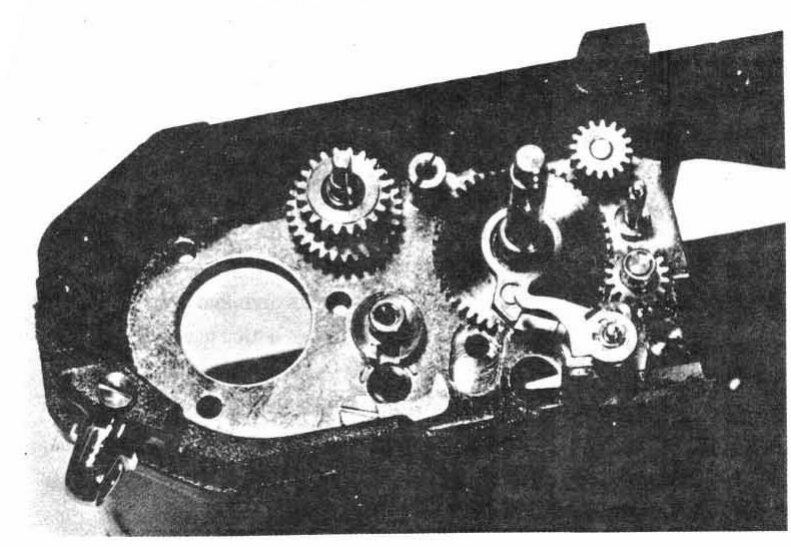


Photo 1

(2) Relative position of the shutter curtains and the bottom selector gear (E14), after assembling (E14) with bulb lever parts, should be determined by gearing (El4) with (Ell) in the wound-up condition of the shutter curtain as illustrated in Diagram 7. (E14) and the pinion shaft need oiling.



**NOTE:** When resetting the shutter curtains to the un-cocked condition, do it slowly. (Diagram 7)

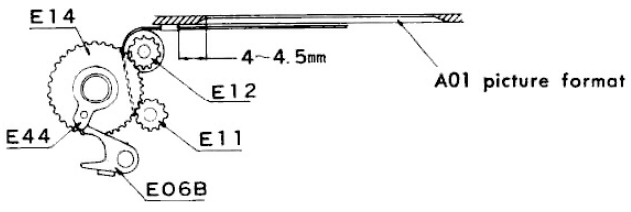
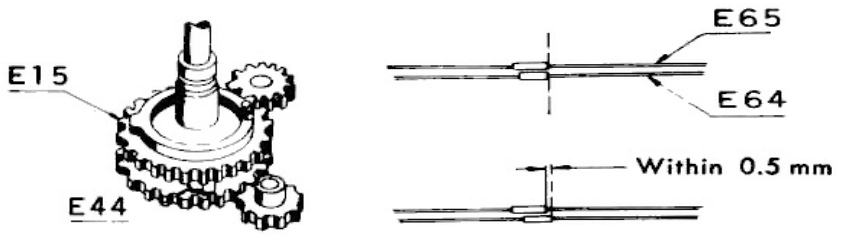



Diagram 7

(3) After the top selector gear (El5) is mounted, the location of the 1st and 2nd curtain edgers (E03, E04) should be adjusted as illustrated in Diagram 8. For winding the shutter curtains, use special tool No. 229K-E64, E65--A, and you will find the job easier.

Diagram 8

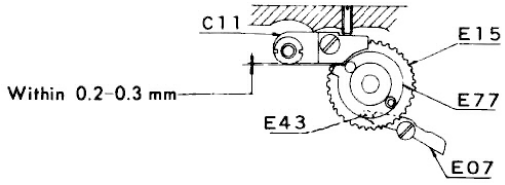



Location must be adjusted the tolerance of 0.5mm

b. STOPPER (C11)

After installing the 1st curtain checker arm (E07) and the stopper (C11), the gap between the projected point of the selector gear stopper (E77) and (C11) should be adjusted to be 0.2-0.3 mm in the cocked condition. This adjustment should be made by turning the screw (22) which is screwed in through the back of (A01). (Diagram 9)

Diagram 9



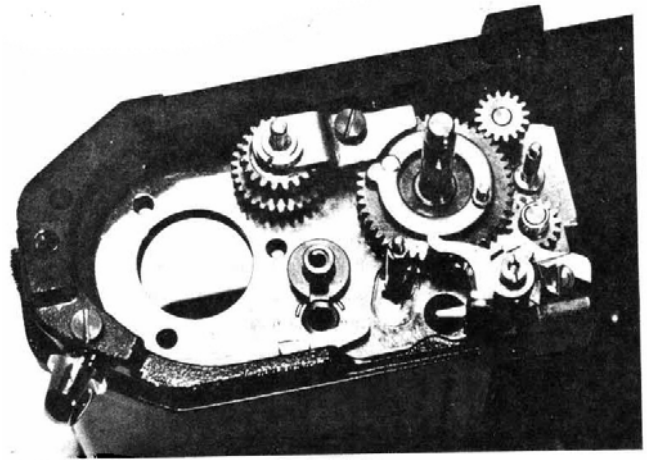



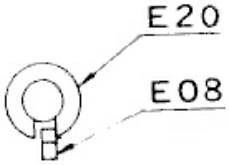
Photo 3

c. IDLING GEAR PARTS

**NOTE:** Read carefully the following instructions and utmost caution should be exercised when adjusting this part which is delicate in nature.

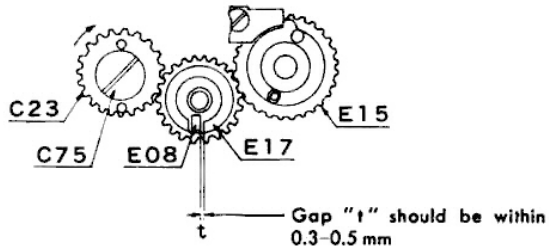
When installing the winding shaft parts, spill spring (E58), spill rest (E21), bottom idling gear (E16) and spill (E08), slowly rotate clock-wise the top main gear retainer screw (C75) first with a driver, while pressing downward (EOS) with the tip of tweezers. When the spill (E08) comes above the groove of the idling gear shaft (E20), it falls into the groove, pushed against the direction of the rotation of the various gears, preventing them from rotating. (Diagram 10)

Diagram 10



Ease the force of (C75) and also the pressure on (E08), and the top main gear (C23), (E16) (EOS) slightly turn backward with the tension of the wind-up shaft spring (C57); then the non-return arm (C04) springs into the groove underneath (E16) and then stops. While maintaining this position, fix the top idling gear (E17), paying careful attention to "t". (Diagram 11)

Diagram 11




Then putting on the spill receptacle plate (E09) and screw in with the idling gear retainer screw (E50).

**NOTE:** A tiny quantity of oil should be applied on (E20).

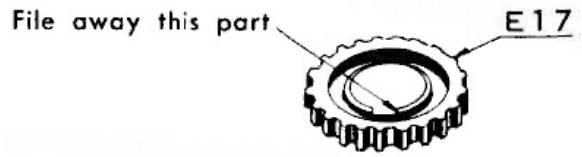
In a similar manner as described above, turn the top main gear retainer screw (C75) with a driver until the selector gear stopper (E77) collides against (C11), then relax the force of the driver. The idling gear part will then move backward slightly and stop in a manner as described above.

At the same time, the pin of the top selector gear (E15) comes to a stop, running against the tip of (E07). Then slowly press downward the spill (E08); and if (E08) smoothly goes up and down, proper adjustment has been completed.

If the gap "t" shown in Diagram 11 is too big, (E08) goes beyond the groove of (E20), if too small, it will not reach the proper position, colliding against the brink of the groove, or resulting in creak, when (E08) is pressed

In the event (E17) is replaced with a new one, if the groove of (E17) cannot be so properly positioned even though the engaging position of the gears is changed, the groove needs adjustment by filing with a fine file. (Diagram 12)

Diagram 12




**NOTE:** Before assembling (E17), oil or dirts in the hole, its surface and on the parts contacting (E09) must be thoroughly cleaned and removed. Otherwise, exposure time of the shutter is liable to remain unstable.

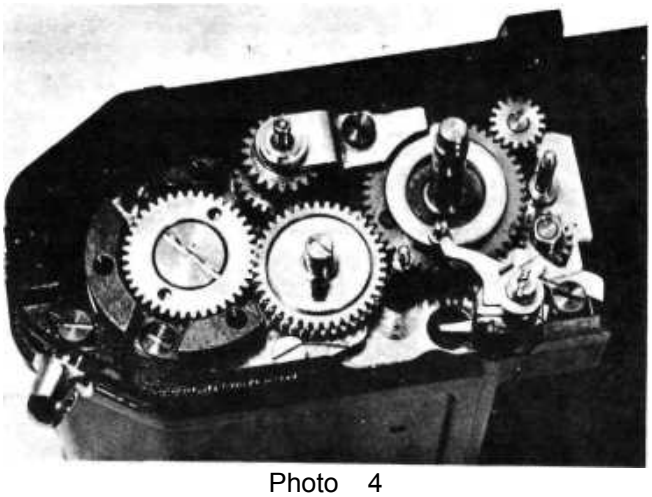
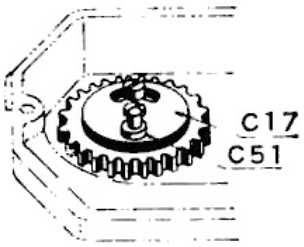


Photo 4

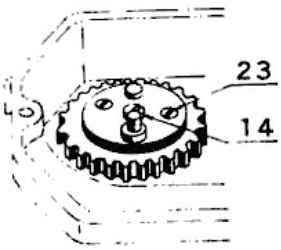
**REFERENCE:**

How to make adjustment if the pin adjust plate (C 17) is of the old type:
In the case of (C17) of the old type (prior to the introduction of the improved one), the range of adjusting the position of the coupler lever pin (C51), after completion of the adjustment of the idling gear, is slight; and accordingly, (E16) should be fixed along the groove of (E20), after correctly positioning (C51) by turning (C75). Needless to say, it is possible to make a slight adjustment of the position of (C51), even if (CI7) is of the old type.




(Old Type)

Diagram 13




(Improved Type)

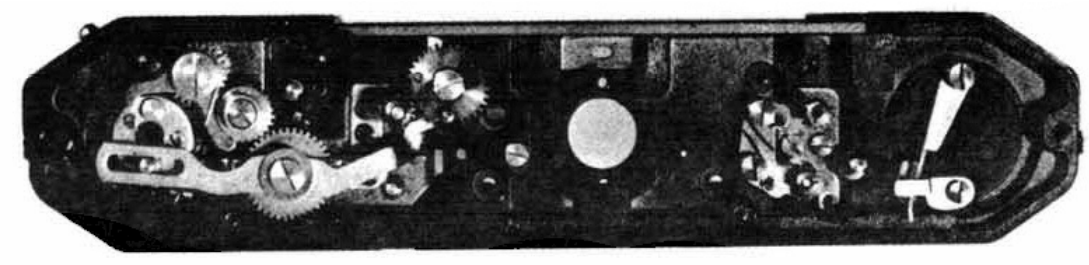
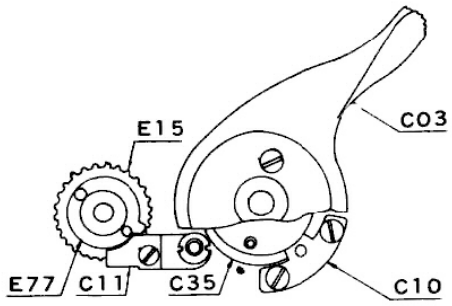


Photo 5

d. WIND-UP LEVER SEAT (C35) AND TOP FIRST GEAR (C20).
Tightly screw the wind-up lever shaft (C34) and affix (C20) to the shaft. (As explained in Chapter 1, 3 c, (C20) may be correctly positioned if matched to the mark properly made beforehand.) Fix the lever stopper (C10), (C35) and the rapid wind lever (C03), and cock the lever fC03) thoroughly. When (C03) is cocked completely, if the projected part of (E77) collide against (C11) and (C35) to the projected part of (C10) simultaneously, or else the latter has an opening to the extent of 0.2 mm, proper adjustment may be said to have been completed. (Diagram 14)

Diagram 14



In the event a wide gap has been created on either parts, lift the top 1st gear (C20) and change its engaging position with that of (C21). In the event any one of the gears on the upper part of the body proper has been replaced, proper adjustment of the aforementioned gap may sometimes be found impossible. In such a case as this where a delicate adjustment is called for, 5 kinds of the lever seat lug (C05), each different in length, are available.

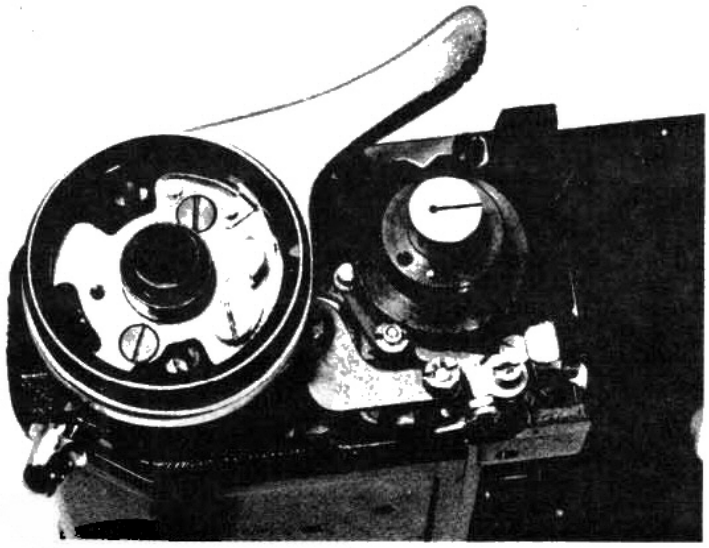
Diagram 14

C05-1 C05-2 C05-3 C05-4 C05-5

The Longest → The Shortest

**NOTE:** If (C10) and/or (C35) are filed off for the purpose of adjusting the gap, the rotating angle of (C03) changes, in consequence of which it sometimes becomes extremely difficult or impossible to adjust the counter assembly which is to be fixed on it.

Photo6

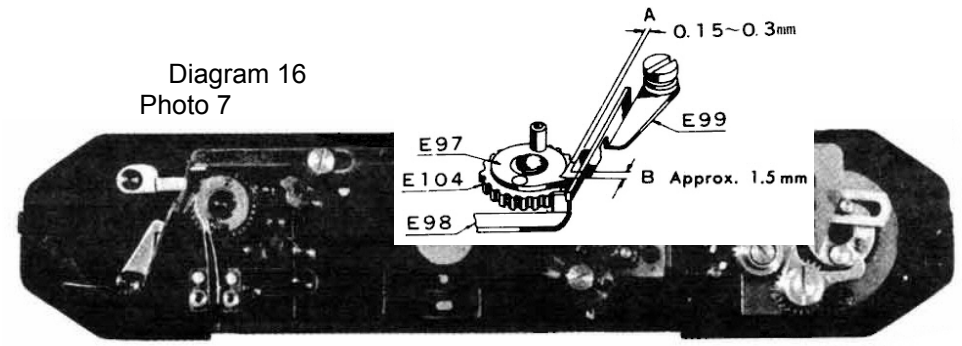


e. BOUNCE STOPPER MECHANISM

(1) When fixing the pin adjust plate (C17) to the bottom main gear (C24), determine the position of the coupler lever pin (C51) and fasten the screws (14) and (23). ((Refer to Diagram 13.)

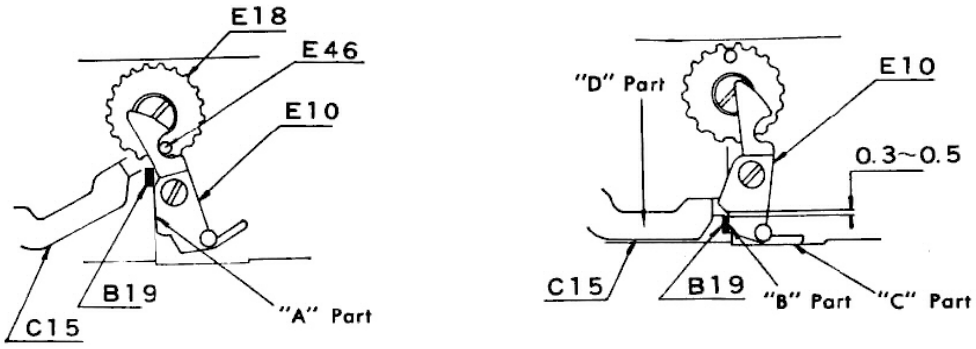
(2) The relative position of the bounce stopper lever (E99) to the sync gear (E104) is to be adjusted as per Diagram 16. Upon completion of the adjustment, cock the shutter to ensure that the bounce stopper (E97) will rotate smoothly without hooking up the bounce stopper lever (E99) at the initial stage of cocking.

Diagram 16
Photo 7



f. PINION COUPLER LEVER (E10) AND COUPLER LEVER (C15).
After fixing the mirror housing assembly (0B02) and (E10) to the body proper, the following adjustment has to be performed:

(1) Adjustment of (E10)
The "A" part of (E10), before shutter rocking, is supposed to be in parallel with the groove of the body proper checked by the coupler gear stud (E46) of the coupler gear (E18) as shown in Diagram 17-A; and the position of (E46) is to be determined by the half-moon shaped slow speed lever actuator stud (E45). (Refer to Diagram 19.) When the shutter is cocked, the "B" part of (E10) should be so positioned as to slightly pass the brink of the groove of the body proper. In the event this position is found unattainable, bend the "C" part of (E10) with pliers for necessary adjustment. (Diagram 17-B)




**A** Diagram 17 **B**

(2) Adjustment of (C15)
Before the shutter is wound, the tip of the mirror actuator lever, bottom (B19), is located close to (E18). In the course of winding the shutter, it slides along the groove of the body proper, forced by the tip of (C15). When (B19) is positioned closest to the back of the body proper, the gap between (B19) and (E10) should be adjusted to be within 0.3-0.5 mm. This adjustment is to be performed by bending the "D" part of (C15) with a pair of flat-nose pliers. (Diagram 17-B)

**NOTE:** In case (C15) is bent too much, (B19) will collide, during the course of winding, against the back of the body proper, resulting in heavy winding or failure in cocking.

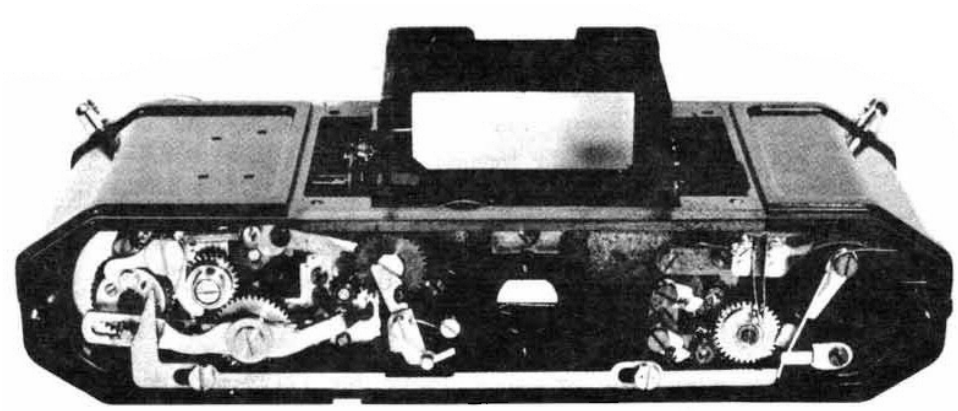


Photo 8

**2. Adjustment of Shutter Exposure Timing.**

After installing the speed dial (E23), the shutter exposure time is to be adjusted in the following order. However, covers such as (A03). (A04) and (A05) should be left unassembled.

(1) Adjustment of curtain travel speed.
(2) Adjustment of high speed exposure timing (l/1000 sec-1/30 sec.).
(3) Adjustment of slow speed exposure timing (1/15sec.- 1 sec.)

a. CURTAIN SPEED

The curtain travel speed is the time required for the shutter curtains to run through the picture format (36 mm). In this model, the speed is adjusted to be 16.5 +/- 0.3 ms under the ambient temperature of approx. 20° C.

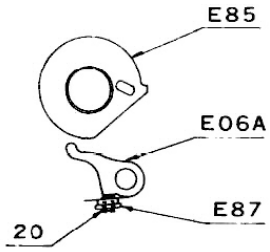
The adjustment has to be performed in the following order:
(1) Set the speed dial (23) at 1/1000.
(2) Disassemble the curtain spring adjust lug (E42) from the curtain spring adjust levers A and B (E92) (E93), and slowly put the curtain spring back to its original free-of-tension position (in the event it was wound 2 or 3 times when installing the curtain assembly).
(3) Tension the curtain spring by rotating (E92) 5 times, and (E93) 7 times.
(4) By adjusting the curtain spring, make necessary adjustment of the curtain travel speed so that it comes within the tolerance of the aforementioned value.

b. HIGH SPEED EXPOSURE TIMING

High speed exposure timing is to be adjusted by changing the width of the slit formed by the 1st and 2nd curtains. Ease the bulb lever adjust nut (E87) using special tool No. 225K E48-A, and if the screw (20) is turned clockwise, the exposure timing will be faster; if turned counter-clockwise, the exposure timing will be slower.

First, adjust the exposure timing for 1/125 sec. (8 ms) and 1/60 sec. (17.8 ms) to their rating or nearest to it. Then turn the speed dial to 1/1000 sec. (1 ms) and 1/500 (2 ms) for measuring purposes, and repeat this procedure until satisfactory exposure timing is obtained. Once the above mentioned exposure timing is determined, exposure timing for the other speeds may be determined automatically by dint of the high speed cam (E85). Lastly, (E85) should be sealed with red lacquer. (Diagram 18)

Diagram 18




In the event the shutter curtains, high speed cam and bulb lever parts are not replaced, correct exposure timing may be obtained merely by adjusting the curtain travel speed, without adjusting the screw (20).

c. IRREGULARITY OF EXPOSURE TIMING

If the exposure timing differs each time the shutter is released, it is called "irregularity of exposure timing." Strictly speaking, it is extremely difficult to maintain exposure timing entirely free of irregularity. However, major causes (or irregularity may be traced to the following:

(1) When the top idling gear is oiled or stained.

(2) When the high speed cam (E85) is dusted and or not properly oiled.

(3) When the bottom selector gear (E14) is not properly oiled.

(4) When the 1st, 2nd curtain pinion shafts (E31) (E32), and the shaft receptacle parts of both top and bottom mec plates (C01) (C02) are not properly oiled.

(5) When the curtain roller metal made of brass (E37) is not properly oiled.

**NOTE:** No oiling is required where plastic material is used.

d. SLOW SPEED EXPOSURE TIMING

Slow speed exposure timing can be determined by adjusting the exposure timing for 1/15 sec (6.7 ms), and the exposure timing for the rest (1/8-1 sec) may be determined automatically by dint of the slow speed cam (F01). Better stability of the exposure timing can be expected if the timing for 1/15 sec is adjusted so as to be very slightly prolonged, viz., 7-8 ms.

First, see to it that the contact between the slow speed lever (F07) and the slow speed lever actuator stud (E45) of the coupler gear (E18) is made closer to the entrance of the opening of the governor assembly (0G00). In other words, adjust and set the shutter exposure timing to be a little faster than 1/15 sec and then attempt to arrive at the correct exposure timing gradually by means of repeated measuring, and you will find this method easier for making necessary adjustment. The procedures are detailed below in the order of work: (Diagram 19)

(1) Slightly ease the adjust plate screw (F18) (left-handed screw) and the screw (5), and rotate the top adjust plate (F05) counter-clockwise until it reaches the lip of the screw (5).

(2) Slightly fasten the adjust plate screw (F18) to such an extent as to make (F05) rotate chafing against the bottom adjust plate (F04) when the screw (5) is turned.

(3) Turn the screw (5) clockwise slightly to give a push to (F05).

(4) Measure exposure timing.

(5) Repeat the procedure of 3 and 4.

(6) When the timing reaches the allowable tolerance of 7-8 ms, tightly screw in (F18).

(7) Make final measurement.

(8) Seal tightly the screw (5) with red lacquer.

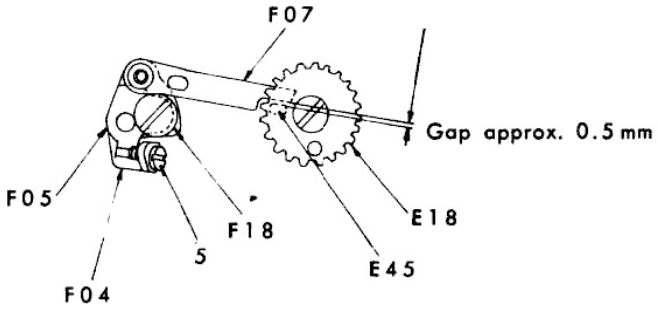



Diagram 19

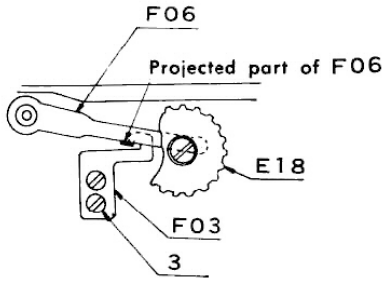
e. TIME EXPOSURE (Diagram 20)

When the shutter is released with the shutter speed dial set at "T," the 1st curtain completes its travel, but projected part of the slow speed actuator lever (F06) hooks with the time stopper (F03), thereby preventing the 2nd curtain from starting its travel.

When the shutter speed dial is turned to "B" or 1 1000, (F06) moves to the left by dint of the slow speed cam (F01), separating from the stopper (F03), causing the 2nd curtain to start its travel, thereby making time exposure complete.

During the time pace of 1.15 1 sec, (F06) actuates to the extreme right, when the speed dial is set at 1 sec. At this instant, the projected part of (F06) must actuate without contacting (F03). Bearing in mind what has been described above, it is essential to adjust (F03) by easing the screw (3).

Diagram 19




f. EXPOSURE TIMING AT VARIOUS POINTS ON THE PICTURE FORMAT.
In a camera with focal plane shutter, the slit formed by its shutter curtains travels right in front of the picture format, thereby providing exposure on the film successively. In view of this, it becomes necessary to measure the time of exposure at various points on the picture formal.

In this camera, the adjustment of the above exposure timing should be made at 1/1000 sec. If the travel time of the shutter curtains at 1/1000 sec. is consistent and the time of exposure at various points within the picture format is likewise satisfactory, it follows that exposure timing at the slower speeds is good as a matter of course.

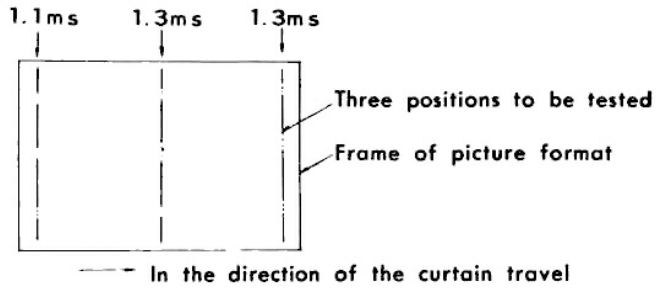
An ordinary shutter gauge indicates the time of exposure at 3 positions, viz., at starting end, at center and at finishing end of the picture format.

In view of the characteristics of this camera, it is desirable to adjust the exposure time so as to make it at the former end of the format slightly faster than at center, and to make it at the latter end as fast as, or slightly slower than, at center.

By carefully comparing the time of exposure at 3 different positions as indicated by a shutter speed tester, discretion has to be exercised whether to adjust the curtain speed or the bulb lever. The time of exposure at the former end has to be adjusted with the bulb lever, while that at the latter end with the curtain travel speed. However, since adjustment of either of the above parts changes the time of exposure at the 3 different positions, compare the exposure at the former and latter positions and repeat the above adjustment procedures until satisfactory results arc obtained. An example in this respect is shown in Diagram 21.

**REFERENCE:**
The time of exposure usually referred to means time of exposure at the center of the picture

Diagram 21




**3. Assembly and Adjustment of Exposure Counter.**

No adjustment is required when no parts are replaced. In the event some parts are replaced, assembly and adjustment have to be performed in the following order:

Fix the top cover plate (A03), and then the rapid wind lever (C03), followed by the cover ring (C39). The procedure up to this stage is mechanical.

Then the advance lug actuator (C07) has to be tightly secured with the actuator lug screw (C53). With (C03)

uncocked, (C07) should not idle in the direction of its rotation, checked by the cut-opening of (A03), and (C53). (Diagram 22, 23)

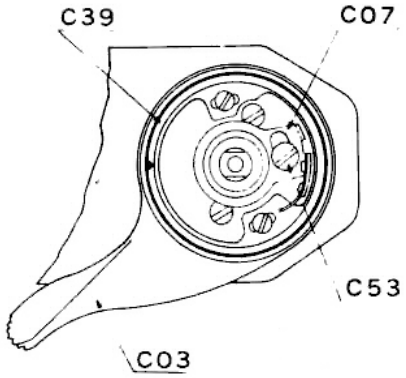



Diagram 22

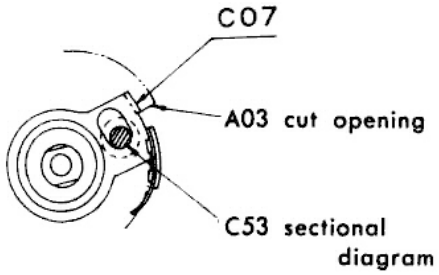
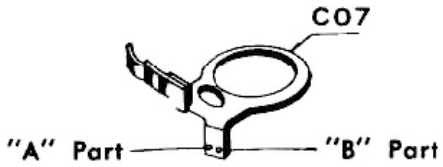



Diagram 23

If the gap of (C07) is considerable, it will invariably result in the counter dial travelling double scale space even by single cocking. In this event, it is necessary to minimize the gap by hammering out the "A" part of (C07). When (C53) can not be installed, file off !he "A" part. (Diagram 24)

Diagram 24




Then have only the transport gear (C28) ready, separated from (C12), install it and the counter retainer lug (C08). Check the interlocking of the counter advance lug (C06) with the teeth of (C28), to see that the gap between the tip of (C06) and the teeth should be of approx. 1/3 pitch in the direction of concentric circle, with the rapid wind lever uncocked. (Diagram 25)

If the gap is more than 1/3 pitch, (C07) must be bent inward, whereas if the gap is less than 1/3 pitch, (C07) must be bent outward. (Diagram 26)

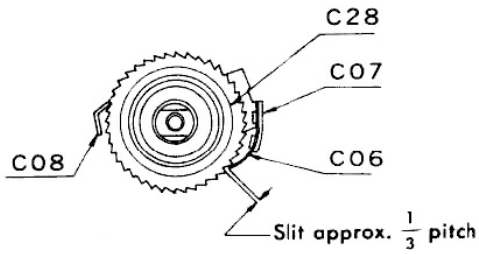



Diagram 26

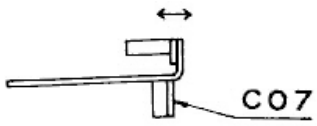



Diagram 26

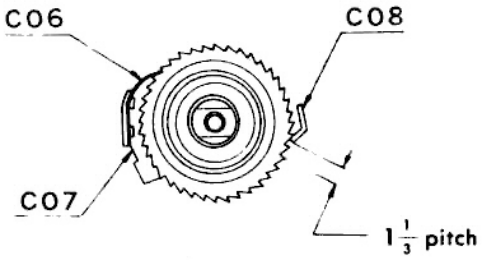
At this point, cock (C03) and let it return slowly. If (C06) travels smoothly over the tips of the teeth of (C28), the pressure of (C06) on (C28) may be considered proper. If (C06) comes to a stop at its tooth tip, it is because the pressure is too strong, in which event it is necessary to bend and stretch out, however, with utmost care not to deform or damage it.

**NOTE:** (C06) is annealed.
When (C03) is cocked, the transport gear (C28) must move by approx. 1 1/3 pitch by the counter retainer lug (C08). (Diagram 27)

If moved less than 1 1/3 pitch, the "B" part (as illustrated in Diagram 24) must be hammered out,

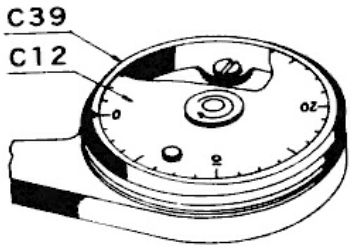
but if moved more than 1 1/3 pitch, the "B" part must be filed off properly.

Diagram 27




Lastly, install the counter plate (C12) joined with (C28), namely, (0C12) and then match the index mark of the covering ring (C39). The index mark should be matched before cocking. (Diagram 28)

Diagram 28



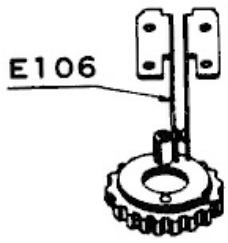

**4. Adjustment of X Contact.**

X contact should be so adjusted as to close at the moment the 1st shutter curtain has run through the picture format. As a matter of fact, however, once the shutter is released, it is difficult to let the 1st curtain travel slowly. Consequently, slowly cock the shutter, and if the X contact leaves its contact when the 2nd curtain edger (E04l begins to appear in the picture format, the X contact is properly adjusted.

(As the 1st curtain edger cannot be seen from the back of the body proper, and as the two edgers are completely overlapped, the 2nd curtain edger should be used as a substitute to make this check.)

Adjustment is to be made as follows:
When the shutter is released, let X contact (E106) makes its contact, and then, when the curtain edger (E04) appears on the picture format by cocking lever, bend X contact (E106) with tweezers so as to place it in a switched-off condition. (Diagram No.29.) (Refer to Diagrams No.8 and No.16.)

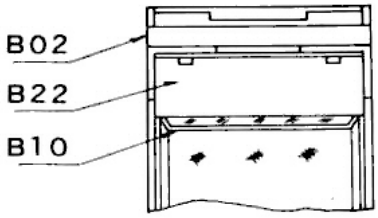
Diagram 29




**5. Adjustment of FP Contact.**

Slowly push up with a finger tip the mirror seat (B10) until its front upper part reaches the height of the light seal (B22), at which time the FP lever A (B23) should contact the FP lever B (B24I. If (B23) does not reach (B24) at this point, bend (B24) for proper adjustment. (Diagram 30)

Diagram 30




**6. Adjustment of Mechanical Hack.**

The distance from the film guide rails to the helicoid seat (A15) affixed to the front cover (A05) is referred to as " Mechanical Back," which should be adjusted to be 45.46 +/- 0.03 mm. Use the special gauges and tools illustrated in Attachment 1, viz., 230N-A01-A, dial gauge, dial comparator, 230N A15 A and 230N-A01-A2. First, on the dial comparator, place the special gauge 230N-A01-A to be followed by 230N A01 A2, and adjust the dial gauge to zero.

Then, remove 230N-A01-A2 and place the body to be tested as per the illustration of Diagram No. 31. Place 230N-A15-A on A15 and check the distance between the film guide rails and the gauge 230N-A15-A, at which the distance is to be adjusted to be 50.46± 0.03mm, using the front cover adjust washers (A39) with different thicknesses. (Diagram 32)

The front cover adjust washers are available with the following thickness:
0.05 mm 0.1 mm 0.15 mm 0.2 mm

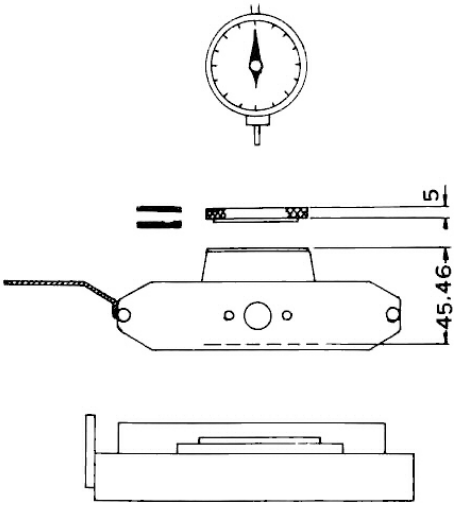



Diagram 31

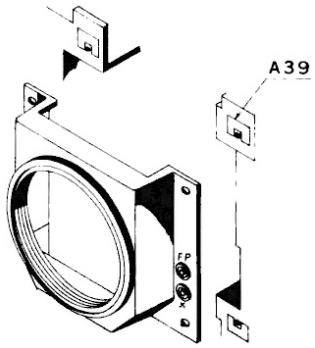



Diagram 32

**7. Adjustment of Viewfinder Focus.**

Whenever optical parts have been replaced, or when assembly of all parts has been completed, focussing of the viewfinder has to be checked and properly adjusted.
Usually a collimator is used for focus check. When a collimator is unavailable, however, use a distant thin stick-like subject, for example, a lightning arrester located 200 meters or more away, as an infinity target.

While viewing through the viewfinder, turn the distance scale ring of the lens mounted. When bright focussing at the infinity target is unattainable unless the lens is extended forward (as shown in Diagram 33), turn the 3 focus adjust screws (B63) to the right, using the special tool 230K-B63-A, and push upward the ground glass assembly. (Diagram 34)

On the other hand, when bright focussing at the infinity target is unattainable even if the lens distance scale is set at infinity, turn (B63) to the left, lowering the ground glass assembly.

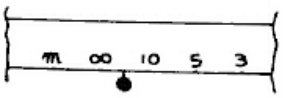



Diagram 33

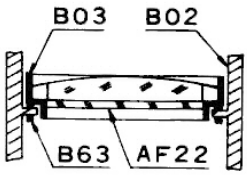



Diagram 34

Adjustment should be made so that the image at the center as well as at the four corners on the ground glass are equally in focus.

**NOTE:**

(1) Three pcs of screw (B63) have to be turned very slowly and alternatively.
(2) Upon completion of the adjustment, securely affix (B63) with binding agent.

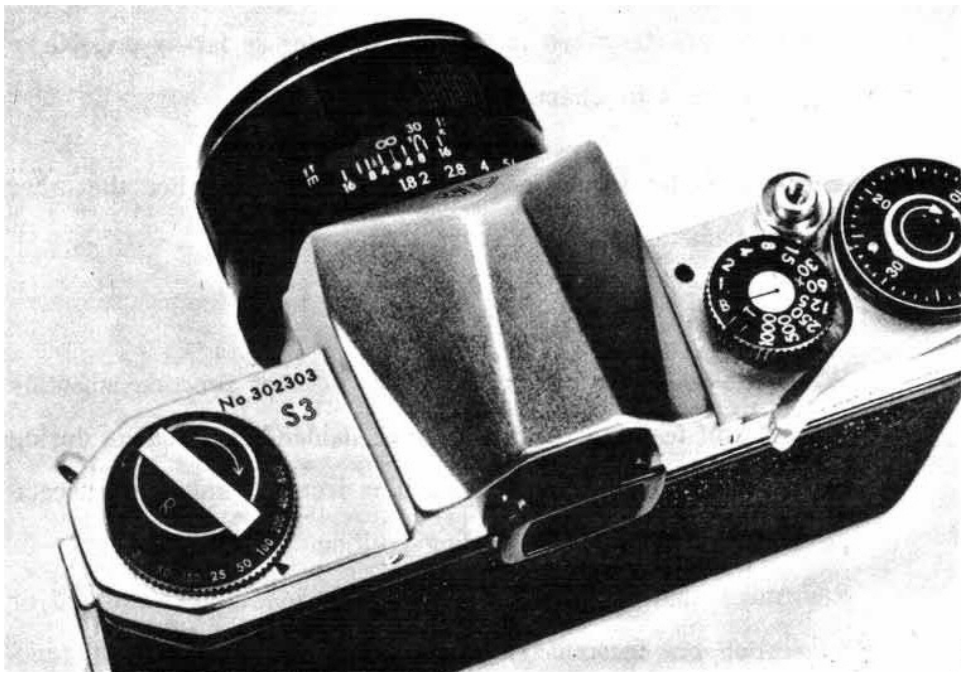



Photo 9

# CHAPTER III. FINAL TESTS

Upon completion of all assemblies, final tests should be performed. Needless to say, such strict, thoroughgoing tests as are performed at the time of manufacture are not only practicable but unnecessary.

However, final tests should be conducted according to the following procedures. Inasmuch as each of the following paragraphs has much to do with what are described in Chapter II, refer as far as possible to applicable paragraphs in Chapter II.

When checking finder focus, mount the standard lens. For the other parts, use the camera body only.

a. WIND-UP LEVER PERFORMANCE
When the rapid wind lever is cocked, it must function smoothly without stiff feeling, creaking noise or sudden heavy feeling during the course of cocking; and when it is freed, it must return completely to its original pre-winding position.
Remember that if the interior assembly and adjustment and/or lubrication are incomplete, they will invariably result in ill functioning of the lever.

b. FILM COUNTER PERFORMANCE
With the counter dial set at "0," watch the turn of the dial while cocking the rapid wind lever, say, 10 times, to check whether the dial completely travels one scale after another, or whether it travels 2 notches, with single cocking. Also determine if the indicator progresses accurately even when the wind lever is either slowly or rapidly cocked.

c. SHUTTER BUTTON PERFORMANCE
The shutter must function smoothly when the shutter button is depressed.
It must lift back to its original position the moment the depressing finger is off the button. After the mirror has flipped up and the shutter closed, the shutter button still must, have some clearance to be depressed slightly further.

After cocking the rapid wind lever, if the shutter button is released while lightly pushing the sprocket gear to the opposite direction, the shutter button must function smoothly.

d. Check whether the shutter speed dial and the index ring are correctly aligned. This checking is necessary because the speed dial couples with Asahi PENTAX clip-on meter. Also, check whether the speed dial turns smoothly and clicks properly at each calibration.

e. When the rapid wind lever is cocked, the red "cocked" indicator must appear, occupying more than 2/3 space of the window; and when the shutter is released, over 2/3 space of the window must be blacked out.

f. The rewind shaft, when pushed in, must correctly click, rotating smoothly.

g. The film type dial needs such friction as not to rotate too easily.

h. The "R" button, when pressed, must go in smoothly, and snap back to its original "out" position upon cocking the rapid wind lever.
As the "R" button rotates whenever the rapid wind lever is cocked, check carefully whether it is not in contact with the bottom cover.

i. Turn the spool brim to find out whether it has a proper friction.
In case of any doubt as to the extent of the friction, compare it with a new camera.

j. MIRROR PERFORMANCE
Determine if the flipping up of the mirror is smooth, thereby causing the curtain-actuating lever to function satisfactorily. Move the mirror seat up with your fingertip to find out whether the mirror will return smoothly to its original position, when the camera is not charged.

k. SHUTTER PERFORMANCE

Measure the time of exposure at 1/1000 sec, and check whether the exposure is consistent. Also find out if there is any even-lessness if viewed from the rear.

Then measure the time of exposure at 1/15 sec.

The best way of checking the shutter bounce is to carefully watch from the back side of the picture format, releasing the shutter at 1/60 sec. by holding and directing the camera toward a bright background, say, white walls or the sky.

Check the exposure time at 1 sec. Also find out if there is any irregularity in the sound of the governor.

Also check the "B" and "T" setting performance.

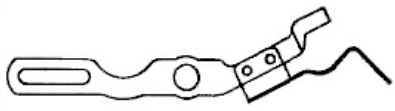
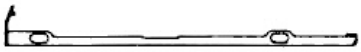
l. SYNC. CONTACT
With the speed dial set at "B" or " T," release the shutter to check the FP and X flash contact conductance, using a circuit tester usually available on the market.

m. MEASUREMENT OF MECHANICAL BACK
Place the camera body on the test board and measure the dimension of the mechanical back, with particular attention not to scratch the film guide rails, etc.

n. VIEW FINDER FOCUS
With a collimator, or by using a thin distant subject 200 meters or more away as a target, check the infinity focus of the camera. Find out if there are any dirts, dusts, piles or stains within the visional range of the finder.

Clearly visible dirts are usually found on the ground glass.

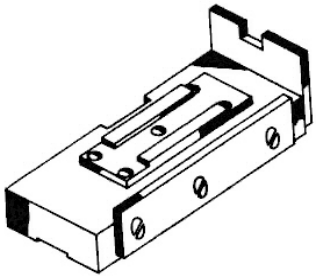
# CHAPTER IV.
# CAUSES OF DEFECTS AND SERVICING

| DEFECTS | CAUSES | SERVICING |
|---|---|---|
| Rapid wind lever stops while cocking, or does not return automatically. | Damaged spring (C19) | Replace (C19) |
| Shutter does not wind. | 1. When the shutter is released, the spill (E08) remains lowered.<br><br>**How to determine:**<br>Turn the sprocket hard in the rewinding direction. If the spill position is proper, the sprocket turns a little. If the spill remains lowered, the sprocket does not rotate at all.<br><br>a. Due either to the damaged wind-up shaft spring (C57) or to its slipping from the wind-up shaft (C31), the idling gear does not back up properly.<br><br>b. The bezel of the top idling gear (E17) is not properly positioned.<br><br>2. The bounce stopper lever (E99) does not slip off the bounce stopper (E97).<br><br>3. The pin adjust plate stud (C76) which is broken is sandwiched between the teeth of the gear.<br><br>**NOTE:**<br>This part was once temporarily used.<br>  <br><br>4. The shutter curtain especially the ribbon of the 1st curtain is torn and coiled around the 1st curtain wind shafts (E35) (E36). | a. Replace (C57). Also replace (C31) if it is worn<br><br>b. Properly reposition the bezel of (E17). (Refer to Chapter II, 1 c.)<br><br>2. Readjustment is necessary. (Refer to Chapter II, I, E, 2)<br><br>**REFERENCE:**<br>As the "A" part of the old type bounce stopper actuator lever (E98) as illustrated in the foil-lowing sketch is liable to bend, replace it with a new one.<br><br>"A" part<br>  <br><br>3. Take out the broken piece and cut off the erection point of (C76).<br><br>**NOTE:**<br>The wire-diameter of (E63) in cameras equipped with this part is 0.12 mm and is slightly narrower. Consequently, if movement of the pinion coupler lever (E10) is dull, replace it with an improved one with 0.15 mm in wire-diameter.<br><br>4. Replace the shutter curtain. |

| DEFECTS | CAUSES | SERVICING |
|---|---|---|
| Film counter dial does not move. | 1. The gap between the extreme point of the counter advance lug (C06) and the tooth of the transport gear (C28) is wider than the specified 1/3 pitch.<br>2. Damaged (C06). | 1. Adjust the engaging position of (C28). (Refer to Chapter II, 3.)<br>2. (0C07) is to be replaced. |
| Film counter dial indicator jumps 2 notches with single cocking: | This happens especially when the wind-up lever is returned too rapidly.<br>1. The gap between the extreme point of the counter advance lug (C06) and the tooth of the transport gear (C28) is wider than the specified 1/3 pitch.<br>2. The tension of the retainer lug spring (C09) is weak. | 1. Adjust the engaging position of (C28). (Refer to Chapter 11, 3.)<br>2. Bend inward (C09) to strengthen its tension. |
| Under-exposure at the latter part of the picture format at high shutter speed. | The travel speed of the 1st curtain is slow.<br>1. Dust or oil collected on the surface of the contact of the top idling gear (C17) with the spill receptacle plate (E09), and of (E17) with the idling gear collar (E19).<br>2. Lack of lubrication on the curtain roller bearing (E37).<br>3. Dust or lack of oil between the high-speed cam (E85), cam shaft nut (E76) and cam shaft (E69). | 1. Wash the parts involved.<br>2. Lubricate with L-4, or replace (E37) with a new (E37) plastic roller bearing.<br>3. Disassemble the parts and apply L-l slightly.<br>**NOTE:**<br>In case the curtain speed is still found slow after servicing as described in the foregoing 1, 2 and 3, strengthen the tension of the curtain spring. |
| Over-exposure at the latter part of the picture format at high shutter speed. | The travel speed of the 2nd curtain is slow.<br>Lack of lubrication on the pinion shaft (E32), coupler gear (E18) and curtain roller (E34). | Apply L-l.<br>**NOTE**: In case the curtain speed is still found slow after oiling with L-l, strength-en the tension of the curtain spring. |
| Shutter curtains travel without slit | 1. When the shutter is wound, the 1st curtain checker arm (E07) does not slip behind the stud of the top selector gear (E15).<br>2. The 1st curtain checker arm (E07) does not function be-cause of the damaged 1st curtain checker arm spring (E61). | 1. Adjust properly either the stopper (C11) or the lever stopper (E10) (Refer to Chapter II, 1 d.)<br>2. Replace (E61). |

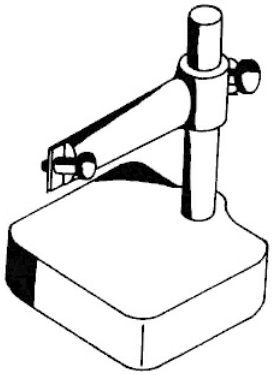
| DEFECTS | CAUSES | SERVICING |
|---|---|---|
| Shutter curtains do not start. | Though the mirror seat (B10) flips up, the 1st curtain checker arm (E07) does not slip off the stud of the top selector gear (E15). | Check if the mirror seat flipping mechanism is functioning smoothly. If found O.K., replace the mirror seat spring (B44) as it might have been weakened. |
| Slow speed shutter exposure timing is too fast. | Relative position of the slow speed lever (F07) to the stud of the coupler gear (F18) is not deep enough. | Make necessary adjustment. (Refer to Chapter II, 2 d.) |
| Slow speed shutter exposure timing is too slow. | 1. Relative position of the slow speed lever (F07) to the stud of the coupler gear (E18) is too deep.<br>2. The travel speed of the 2nd curtain is too slow. | 1. Make necessary adjustment (Refer to Chapter II. 2 d.)<br>2. Adjust the curtain travel speed. |
| High speed exposure at slow speed setting. | 1. Slow speed governor is not returned.<br>2. Slow speed lever (F07) does not hook the stud of (E18). | 1. Disassemble and wash the governor, or replace the complete governor.<br>2. Adjust the coupling of the stud of (E18) with (E07). (Refer to Chapter II, 2 d.) |
| The mirror does not flip up. | Mirror actuator lever, bottom (B19) does not properly hook the pinion coupler lever (E10). | Wash (E10) to make it function smoothly. f the pinion coupler lever spring (E63) is of the old type of 0.12 mm, replace it with a new one of 0.15 mm. |
| The mirror does not return. | Bottom actuator lever spring (B47) is either weakened or damaged. | Replace (B47). |

# LIST OF SPECIAL SERVICE TOOLS



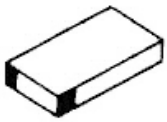
230N-A01-A Mechanical Back Gauge

Dial Gauge Mechanical Back Gauge



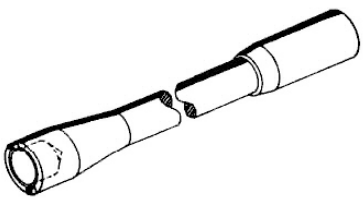
Dial Comparator Mechanical Back Gauge

230N-A15-A Mechanical Back Gauge

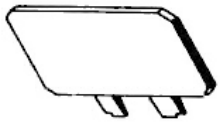


230N-A01-A2 Mechanical Back Gauge

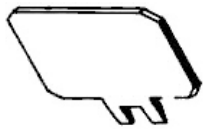
229K-E64 65-A Shutter Curtain Wind-Up Driver



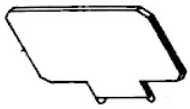
230K-E76 A E85 Driver



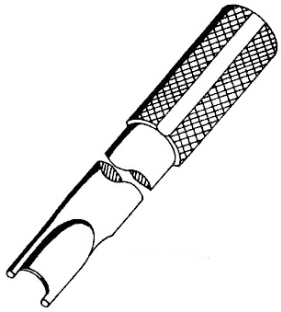
225K C36-A C36 Driver



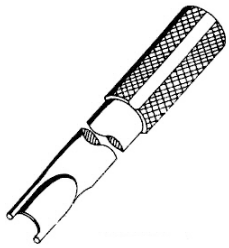
226K-D15-A D15 Driver



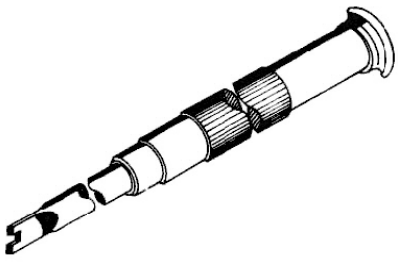
225K-D09-A D09 Driver



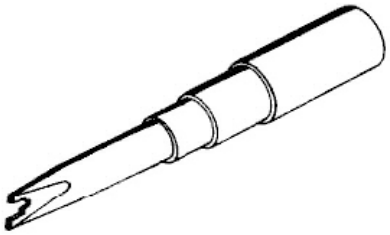
225-C23-A C24 Holder



225K-C24-A C24 Driver

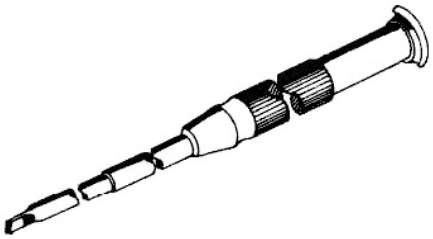


225K-E48-A E87 Adjust Driver

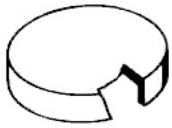


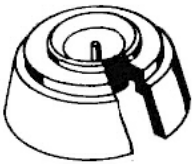
225K-F11-A F11 Driver

Watch Oiler



230K B63 A B63 Adjust Driver





Oil Cup

230K-E69-A E85 Holder

# LIST OF LUBE OIL

1. **“L” Lubrication.**
   The letter "L" stands for liquid lubrication oil.
   In the event a watch-oiler is used, "one droplet of oil" means such quantity of oil as is found on the extreme point of the watch-oiler when it is lined from the oil cup after soaking into oil at a 45$^{o}$ angle.

   When the extreme point of the oiler is placed on the contact point of the parts to be oiled, oil will be absorbed in the contact point because of the capillarity of oil. Watch carefully to assure that the oil from the extreme point of the oiler is completely absorbed. When the oil on a brand-new oiler can not be easily absorbed, grind the extreme point of the new oiler cither with a whetstone or a grinder to flatten its tip, which will facilitate absorption.

   "L" lubricant should never be exposed to the sunlight nor should it be stored under high temperature. Stale oil kept in the oil cup for a long time should never be used. Wash the oil cup from time to time.

2. **“G” Lubrication.**
   The letter "G" stands for grease.
   "G" is not so easily absorbed as " L." Consequently, before putting the parts together, grease them first and then assemble. Before assembling, put "G" mainly on shafts, which will make the job easier and ensure good lubrication.

   However, when greasing such parts as are not in a complete shaft bearing shape, for instance, slide surface, grease them after assembly, and the job will be easier and better results will be assured.

   Generally speaking, "G" has strong viscosity; and therefore, if by any chance, it is applied on parts where greasing is unnecessary, it will result in mal-functioning of the parts so smeared. Strict care must accordingly be exercised not to over-grease any parts.

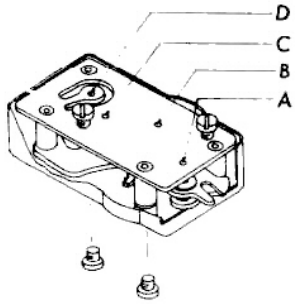
| **L-l Where To Apply.** | Quantity of Oil (Number indicates droplets of watch oiler) |
|---|---|
| Between (E31) (1st curtain pinion shaft) and shaft bearing of (C01) (top mec. plate). | 1 |
| Between ( E31) (1st curtain pinion shaft) and shaft bearing of (C02) (bottom mec. plate) | 1 |
| Between (E32) (2nd curtain pinion shaft) and shaft bearing of (C 01) (top mec. plate). | 1 |
| Between (E32) (2nd curtain pinion shaft) and shaft bearing of (C02) (bottom mec. plate). | 1 |
| Between (E18) (coupler gear) hole and (E53) (Coupler gear retainer screw). | 2 |
| Between (E26) (selector gear shaft) and (E14) (bottom selector gear) hole. | 1 |
| Between (E26) (selector gear shaft) and (E15) (top selector gear) hole. | 1 |
| Between (E34) (curtain roller, small) and shaft bearing of (E01) (top shaft plate). | 1 |
| Between (E34) (curtain roller, small) and bearing of (E89) (2nd curtain shaft plate). | 1 |
| Between (E85) (high speed cam) hole, (E69) (cam shaft) and (E76) (cam shaft nut). | 1 |
| Between (E104) (sync. gear) hole and (E105) (sync. gear column). | 2 |
| Between (F12) (slow speed rod) and (F13) (slow speed rod receptacle) hole. | 1 |

**L-2**

| | |
|---|---|
| Between (D05) (rewind shaft) and (D04) (shaft bearing). | Apply oil on a piece of glass or on a clean piece of tiny iron stick and give one vertical stroke with the side of it on (D05) and then put it into (D04). |

**L 3**

(0G00) Spots marked " A," "C," and "D" in the following sketch (both top and bottom). 1 or less




**NOTE:** When the governor has been disassembled, the spot marked "B" should not be oiled with watch oiler. Apply oil to the pivot only, and then, wipe it away lightly.

**L-4**

Between (E31) (1st curtain pinion shaft) and (E37) (curtain roller bearing), top and bottom. 2

**NOTE:** If (E37) is plastic, no oiling is required.

| | |
|---|---|
| **G 1** | |
| Between (B35) (mirror actuator lever shaft), (B18) (mirror actuator lever, top) and (B19) (mirror actuator lever, bottom) hole<br>Contact between (B42) (mirror seat lug stud) and (B83) (mirror checker spring). | Thin Japanese writing brush. |
| Between (C24) (bottom main gear) and shaft bearing of (C02) (bottom mec. plate). | Thin Japanese writing brush. |
| Between groove of (C24) (bottom main gear) and (C58) (take-up spool spring), (W17) and (C14) (bottom take-up spool brim). | " |
| Between bottom of (C31) (wind-up shaft) brim, (W17) (bakelite), and (C13) (top take-up spool brim). | " |
| Between (C34) (wind-up lever shaft) and hole and inside bottom of (C20) (top 1st gear). | " |
| Between (C34) (wind-up lever shaft) and hole of (C35) (wind-up lever seat). | " |
| Between (E20) (idling gear shafts and hole of (E19) (idling gear collar). | " (small quantity) |
| **G-2** | |
| Contact between (B16) (mirror checker lever) and (B51) (1st dia. lever pin). | " |
| Contact between (B27) (actuator lever, top) and (E30) (actuator lever rod). | " |
| Contact between (B28) (bottom actuator lever) and (B29) (2nd dia. lever checker plate). | " |
| Contact between (C15) (coupler lever) and (B19) (mirror actuator lever). | " |
| Between center hole of (C15) (coupler lever) and (C48) (coupler lever shaft). | " |
| Contact between long hole of (C15) (coupler lever) and (C51) (coupler lever pin). | " |
| Contact between the tip of (E06B) (bottom bulb lever) and (E44) (selector gear retainer ring). | " (small quantity) |
| Between projected part of (E68) (speed selector disc) and sliding part of (E69) (cam shaft) groove. | " (small quantity) |
| Between triangular groove of (E69) (cam shaft) and projected part of (E25) (selector collar). | " (small quantity) |
| **G 3** | |
| Between hole of (C25) (bottom 1st gear) and (C46) (bottom 1st gear shaft). | " (small quantity) |
| Between hole of (C26) (bottom 2nd gear) and (C45) (bottom 2nd gear shaft). | " (small quantity) |
| Contact between (C27) (bottom 3rd gear) and (C63) (sprocket seat spring). | " (small quantity) |

| | |
|---|---|
| Between narrow part of (C3D) (sprocket shaft) and hole of (A01) (body proper). | "<br>(small quantity) |
| Between (C30) (sprocket shaft), hole of (C02) (bottom mec. plate) and (W22). | "<br>(small quantity) |
| Between (C31) (wind up shaft) and (C57) (wind up shaft spring). | Thin Japanese writing brush. |
| Contact between (C32) (wind up shaft bearing; and (C23) (top main gear). | " |
| Between (C41) (top 2nd gear column) and hole of (C21) (top 2nd gear). | " |

# LIST OF BONDS

**NOTE:**

1. Immediately after use of binding agent, its container has to be capped tightly. Preferably it should be divided and kept in as smaller containers as possible. When not in use, the container has to be capped tightly.

2. Do not use stale binding agent that has been kept for a long time. The binding strength deteriorates if thinned from time to time with solvents.

**Pliobond**

| | Binding Places | Tool |
|---|---|---|
| A30 (body covering, left) | A01 (body proper) | Brush |
| A31 (body covering, right) | " | " |
| A41 (light seal) | " | Thin Japanese writing brush |
| A42 (light seal) | " | " |
| A33 (back cover covering) | A02 (back cover) | Brush |
| A40 (indicator window) | A03 (top cover plate) | Thin Japanese writing brush |
| A44 (prism scat) | " | Brush |
| A32 (key housing covering) | A13 (key housing) | " |
| B63 (focus adjust screw) | B02 (mirror housing) | Thin Japanese writing brush |
| B86 (mirror shock absorber) | " | " |
| Set screw, flat, 1.7x4 (prism adjustment) | B01 (prism seat) | " |
| B61 (light seal) | B02 (mirror housing) | " |

**Screw Lock No. 2**

| | | |
|---|---|---|
| A43 (strap hook screw) | A21 (strap hook) | Thin Japanese writing brush |
| B13 (mirror seat rest screw) | B02 (mirror housing) | " |
| C73 (rapid wind lever retainer screw) | C03 (rapid wind lever) | " |
| E105 (sync. gear column.) | A01 (body proper) | " |

**Shellac**

| | | |
|---|---|---|
| E03 (1st curtain edger) | E64 (1st curtain) | Spatula |
| E04 (2nd curtain edger) | E65 (2nd curtain) | " |
| W5 1.8x5 | A01 (body proper)<br>A05 (front cover plate) | Brush |

**Penguin No. 332 N**

| Binding Places | | Tool |
|---|---|---|
| B26 (sync. seat insulator) | B25 (sync. seat) | Spatula |
| E64 (1st curtain shutter) | E35 (1st curtain wind shaft, top) E64 | " |
| E64 " | E36 (1st curtain wind shaft, bottom) | " |
| E65 (2nd curtain shutter) | E 39 (2nd curtain pipe) | Brush |

**Penguin No. 251**

| | | |
|---|---|---|
| E115 (insulator tube) | E111 (X contact pin) | Thin Japanese writing brush |

**Red Lacquer**

| | | |
|---|---|---|
| E87 (bulb lever adjust nut) | E06R (bottom bulb lever), set screw, flat 1.4x2.5 | Thin stick |
| F19 (slow speed lever retainer screw) | F07 (slow speed lever) | " |
| F04 (bottom adjust plate) | Small screw, flat, medium, 1.7x3 | " |
| Set screw, flat 1.7x4 | A01 Back of (C11) of body proper | " |
| B59 (2nd lever adjust screw) | B27 (actuator lever, top) | " |

**Solvents and Additives of Bonds**

| Name of Bonds | Solvents and Additives |
|---|---|
| Pliobond No. 30 | Methyl-ethyl ketone |
| Penguin No. 332 N | Toluol |
| Penguin No. 251 | Toluol |
| Shellac | 40% shellac varnish |
| Screw lock No. 2 | Methyl ethyl ketone |
| Red Lacquer | Thinner |

# EXPLODED ILLUSTRATIONS

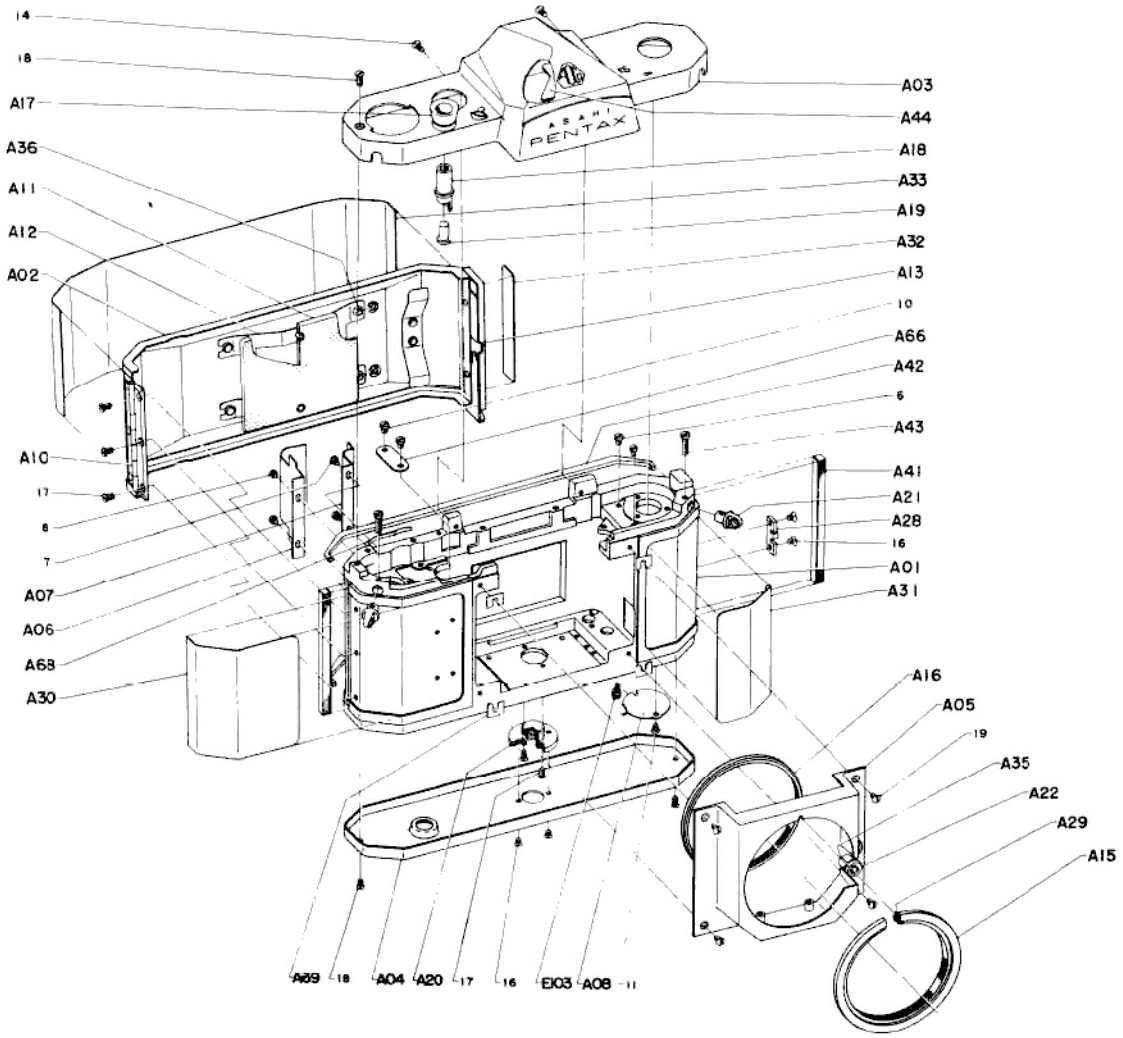



Fig.1

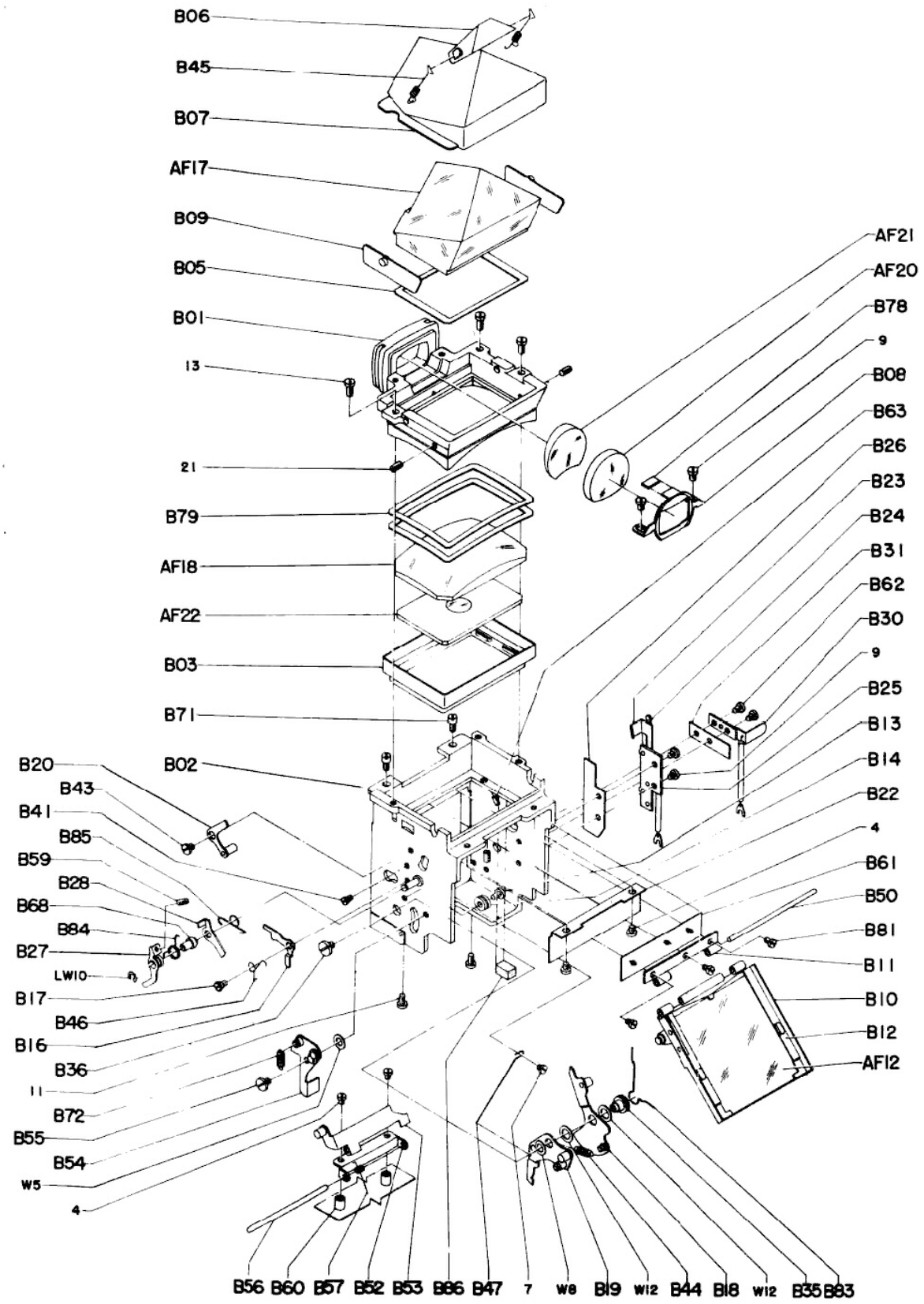

B06
B45
B07
AF17
B09
B05
B01
13
21
B79
AF18
AF22
B03
B71
B02
B20
B43
B41
B85
B59
B28
B68
B84
B27
LW10
B17
B46
B16
B36
11
B72
B55
B54
W5
4
AF21
AF20
B78
9
B08
B63
B26
B23
B24
B31
B62
B30
9
B25
B13
B14
B22
4
B61
B50
B81
B11
B10
B12
AF12
B56 B60 B57 B52 B53 B86 B47 7 W8 B19 W12 B44 B18 W12 B35 B83

Fig. 2

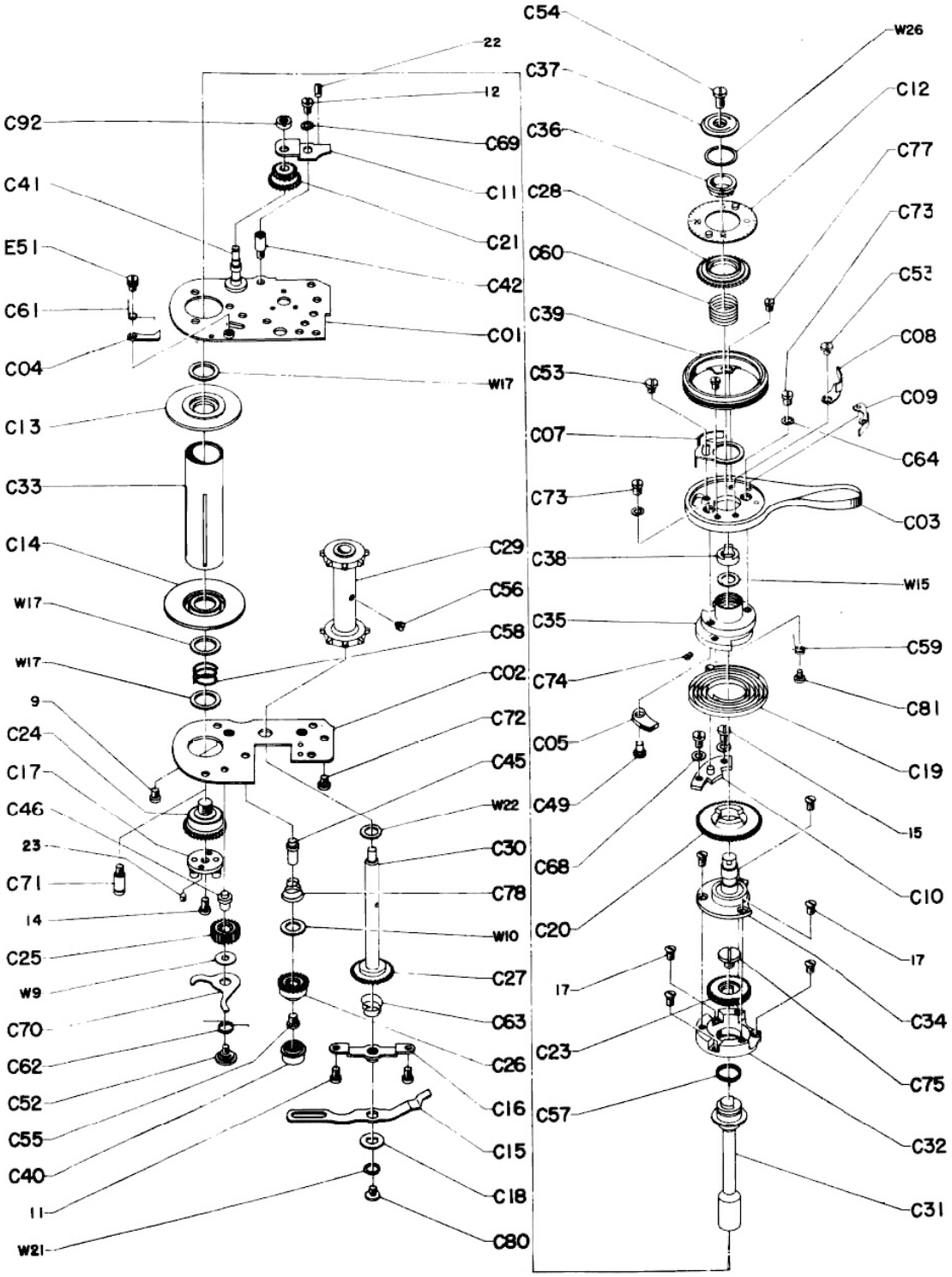

C54
22
C37
12
C92
C69
C36
C41
C11
C28
E51
C21
C60
C42
C61
C01
C39
C04
W17
C53
C13
C07
C33
C73
C14
C29
C38
C56
W17
C35
C58
W17
C74
C02
9
C72
C05
C24
C45
C49
C17
W22
C46
C30
C68
23
C78
C71
C20
14
W10
C25
C27
17
W9
C63
C70
C26
C23
C62
C16
C57
C52
C15
C55
C18
C40
C80
11
W21
W26
C12
C77
C73
C52
C08
C09
C64
C03
W15
C59
C81
C19
15
C10
17
C34
C75
C32
C31

Fig. 3

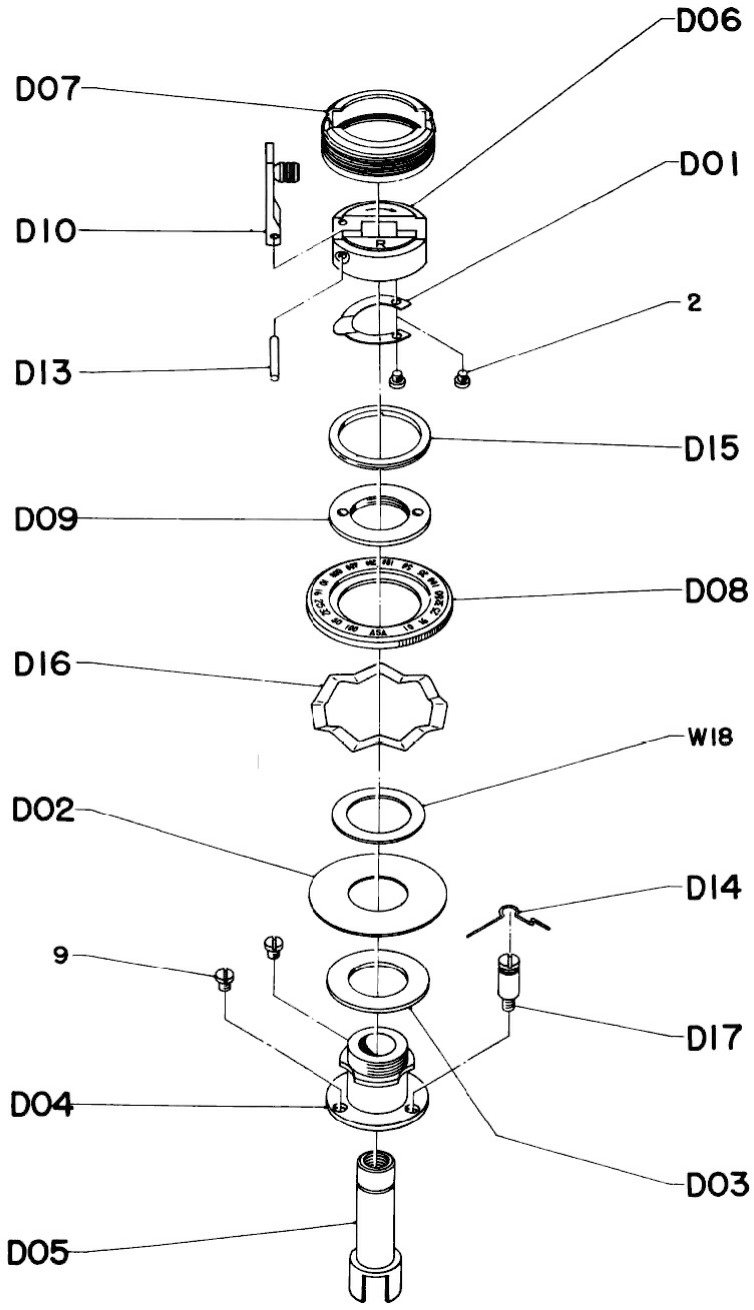

D06
D07
D01
D10
2
D13
D15
D09
D08
D16
W18
D02
D14
9
D17
D04
D03
D05

Fig.4

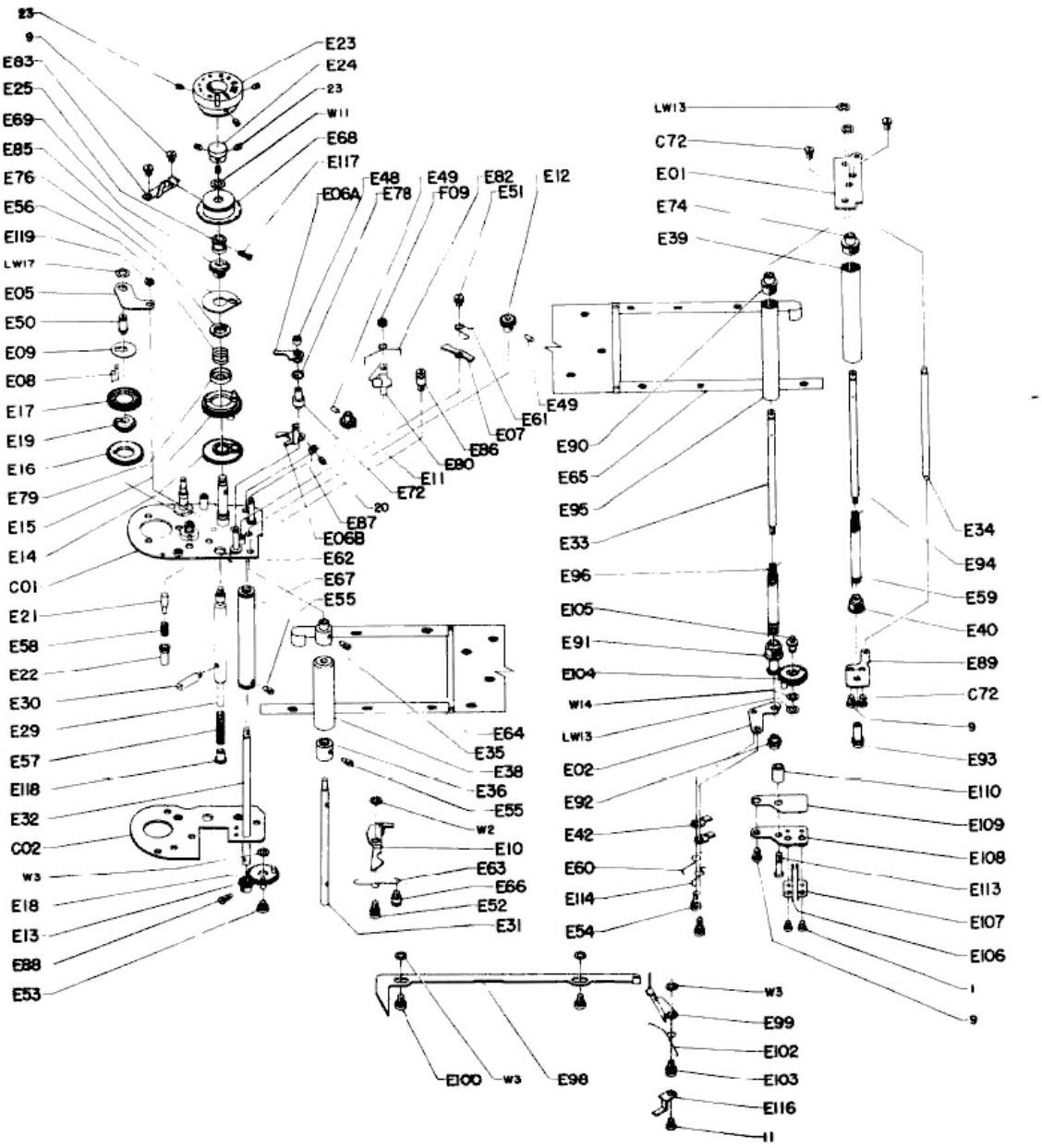

23
9
E83
E25
E69
E85
E76
E56
E119
LW17
E05
E50
E09
E08
E17
E19
E16
E79
E15
E14
C01
E21
E58
E22
E30
E29
E57
E118
E32
C02
W3
E18
E13
E88
E53
E23
E24
23
W11
E68
E117
E48
E06A
E78
E49
F09
E82
E51
E12
E49
E61
E07
E86
E80
E11
E72
20
E87
E06B
E62
E67
E55
E64
E35
E38
E36
E55
W2
E10
E63
E66
E52
E31
E100
W3
E98
LW13
C72
E01
E74
E39
E90
E65
E95
E33
E96
E105
E91
E104
W14
LW13
E02
E92
E42
E60
E114
E54
W3
E99
E102
E103
E116
11
E34
E94
E59
E40
E89
C72
9
E93
E110
E109
E108
E113
E107
E106
1
9

Fig. 5

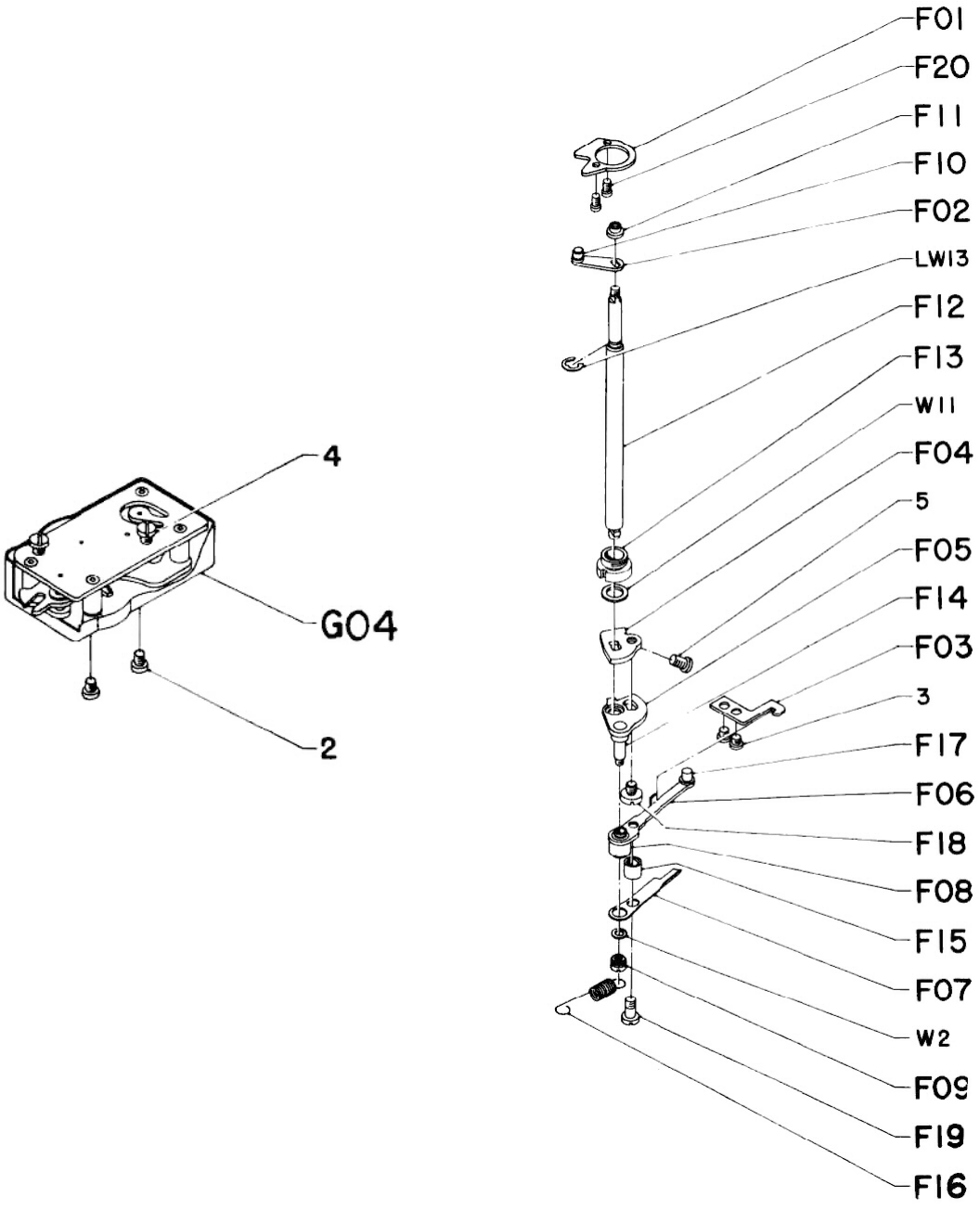

F01
F20
F11
F10
F02
LW13
F12
F13
W11
F04
5
F05
F14
F03
3
F17
F06
F18
F08
F15
F07
W2
F09
F19
F16
4
G04
2

Fig. 6

# LIST OF SERVICE PARTS

**Product No. 230-2**

**ASAHI PENTAX S3**

Note: The parts with numbers starting with ' 0' are assembled parts, and the *marked parts are included in the ' 0 '-starting assembled parts.

| PART NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 0A01 | Body proper assembly (A01, E118) | 1 |
| 0A02 | Back cover assembly (A02, A09, A10, A13, AI4, A25, A27, A32. A33, A34, A36, A37) | 1 |
| 0A03 | Top cover assembly (A03, A17, A40) | 1 |
| A04 | Bottom cover | 1 |
| 0A05 | Front cover assembly (A05, A15, A16, A22, A23, A24, A29, A35, B51, B52, B53, B56, B57, B60, small screw FM 1.4x2) | 1 |
| A06 | Sprocket cover | 1 |
| A07 | Light seal | 1 |
| A08 | Cassette receptacle | 1 |
| A09 * | Cassette holder | 1 |
| A10 * | Hinge | 1 |
| 0A11 | Pressure plate assembly (All, A12, A26) | 1 |
| A12 * | Pressure plate spring | 1 |
| A13 * | Key housing | 1 |
| A14 * | Back cover key | 1 |
| A15 * | Helicoid seat | 1 |
| A16 * | Helicoid seat retainer screw | 1 |
| A17 * | Shutter button seat | 1 |
| A18 | Shutter button | 1 |
| A19 | Shutter button shaft | 1 |
| A20 | Tripod socket | 1 |
| A21 | Strap hook | 1 |
| A22 * | Plug seat | 1 |
| A23 * | Outer pole | 1 |
| A24 * | Inner pole | 1 |
| A25 * | Pressure plate retainer stud A | 2 |
| A26 * | Pressure plate rivet | 2 |
| A27 * | Key housing column | 2 |
| A28 | Key housing retainer plate | 1 |
| A29 * | Helicoid seat stopper | 1 |
| A30 | Body covering, left | 1 |
| A31 | Body covering, right | 1 |
| A32 * | Key housing covering | 1 |

| | | |
|---|---|---|
| A33 * | Back cover covering | 1 |
| A34 * | Cassette holder rivet | 2 |
| A35 * | Earth | 1 |
| A36 * | Pressure plate retainer stud B | 2 |
| A37 * | Hinge rivet | 3 |
| A39 | Front cover adjust washer | 4 |
| A40 * | Indicator window | 1 |
| A41 | Light seal | 2 |
| A42 | Light seal | 2 |
| A43 | Strap hook screw | 2 |
| | | |
| B01 | Prism seat | 1 |
| 0B02 | Mirror housing assembly (B02, B21, B76, R304) | 1 |
| B03 | Ground glass frame | 1 |
| B05 | Ground glass mask | 1 |
| B06 | Prism retainer plate | 1 |
| B07 | Prism cover | 1 |
| 0B08 | Magnifier retainer assembly (B08, B78) | 1 |
| 0B09 | Prism side protector assembly (B09, B33) | 2 |
| 0B10 | Mirror seat assembly (B10, B11, B12, B15, B42, B48, B49, B50) | 1 |
| B11 * | Mirror Hinge | 1 |
| B12* | Mirror retainer plate | 1 |
| B13 | Mirror seat rest screw | 1 |
| B14 | Mirror seat rest | 1 |
| B15 * | Mirror seat lug | 1 |
| B16 | Mirror check lever | 1 |
| B17 | Mirror check lever screw | 1 |
| 0B18 | Mirror actuator lever, top assembly (B18, B39, B51) | 1 |
| 0B19 | Mirror actuator lever, top assembly (B19, B38, B58, B70) | 1 |
| 0B20 | Curtain actuator lever assembly (B20, B40) | 1 |
| B21 * | Light seal | 1 |
| B22 | Light seal | 1 |
| B23 * | FP lever A | 1 |
| B24 * | FP lever B | 1 |
| 0B25 | Sync seat assembly (B25, B23, B24, B26, B64, B65, B66, B73, B74, B77) | 1 |
| B26 * | Sync seat insulator | 1 |
| 0B27 | Actuator lever assembly (B27, B28, B59, B67, B68, B84) | 1 |
| B28 * | Bottom actuator lever | 1 |
| B29 * | 2nd dia lever checker plate | 1 |
| 0B30 | X lever assembly (B30, B32, B73, B75, B77, B80) | 1 |
| B31 | X lever insulator | 1 |

| | | |
|---|---|---|
| B32 * | X lever retainer plate | 1 |
| B33 * | Protector plate pin | 2 |
| B35 | Mirror actuator lever shaft | 1 |
| B36 | Mirror actuator lever retainer screw | 1 |
| B37 * | 2nd dia lever checker plate rivet | 2 |
| B38 * | Mirror actuator lever spring hanger A | 1 |
| B39 * | Mirror actuator lever spring hanger B | 1 |
| B10 * | Curtain actuator lever stay | 1 |
| B41 | Actuator lever spring hanger | 1 |
| B42 * | Mirror seat lug stud | 1 |
| B43 | Curtain actuator lever retainer screw | 1 |
| B44 | Mirror seat spring | 1 |
| B45 | Prism retainer spring | 2 |
| B46 | Mirror check lever spring | 1 |
| 847 | Bottom actuator fever spring | 1 |
| B48 * | Mirror scat lug rivet | 2 |
| B49 * | Mirror retainer plate rivet | 2 |
| B50 * | Mirror hinge shaft | 1 |
| B51 * | 1st dia lever pin | 2 |
| B52 * | Dia lever support | 1 |
| B53 * | 1st dia lever | 1 |
| 0B54 | 2nd dia lever assembly (B54, B29, B37, B69) | 1 |
| B55 | 2nd dia lever retainer screw | 1 |
| B56 * | 1st dia lever shaft | 1 |
| B57 * | 1st dia lever spring | 1 |
| B58 * | Mirror actuator lever, bottom, stud | 1 |
| B59 * | 2nd dia lever adjust screw | 1 |
| B60 * | Supporter column | 2 |
| B61 | Light seal | 1 |
| B62 | X lever retainer plate screw | 2 |
| B63 | Focus adjust screw | 3 |
| B64 * | Contact A | 2 |
| B65 * | Contact B | 2 |
| B66 * | Sync lever rivet | 6 |
| B67 * | Actuator lever collar | 1 |
| B68 * | Actuator lever shaft | 1 |
| B69 * | Dia lever spring hanger A | 1 |
| B70 * | Dia lever spring hanger B | 1 |
| B71 | Mirror housing retainer screw | 2 |
| B72 | Dia lever spring | 1 |
| B73 * | Cord B | 2 |

| | | |
|---|---|---|
| B74 • | Tube A | 1 |
| B75 * | Tube B | 1 |
| B76 * | Actuator lever column | 1 |
| B77 * | Lug plate | 2 |
| B78 * | Magnifier cushion | 1 |
| B79 | Ground glass holder | 2 |
| B80 * | X lever rivet | 1 |
| B81 | Mirror hinge screw | 3 |
| B83 | Mirror checker spring | 1 |
| B84 * | Actuator lever coupler spring | 1 |
| B85 | Actuator lever spring | 1 |
| B86 | Mirror shock absorber | 1 |
| | | |
| 0C01 | Top mec plate assembly (C01, C41, C43, C79, E20, E22, E26, E27, E28, E81, E120) | 1 |
| 0C02 | Bottom mec plate assembly (C02, C45, C46, C47I | 1 |
| 0C03 | Rapid wind lever assembly (C03, C09, E120) | 1 |
| C04 | Non-return arm | 1 |
| C05 * | Lever seat lug | 1 |
| C06 * | Counter advance lug | 1 |
| 0C07 | Advance lug actuator assembly (C07, C06, C66) | 1 |
| C08 | Counter retainer lug | 1 |
| C09 * | Retainer lug spring | 1 |
| 0C10 | Lever stopper assembly (C10, C44) | 1 |
| C11 | Stopper | 1 |
| 0C12 | Counter assembly (C12, C28, C50) | 1 |
| C13 | Top take-up spool brim | 1 |
| C14 | Bottom take-up spool brim | 1 |
| C15 | Coupler lever | 1 |
| 0C16 | Coupler lever seat assembly (C16, C48) | 1 |
| 0C17 | Pin adjust plate assembly (C17, C51. C76, set screw tapered 1.7x2) | 1 |
| C18 | Half moon washer | 1 |
| C19 * | Spring | 1 |
| C20 | Top 1st gear | 1 |
| 0C21 | Top 2nd gear assembly (C21, C22) | 1 |
| C22 • | Top 3rd gear | 1 |
| C23 * | Top main gear | 1 |
| C24 | Bottom main gear | 1 |
| C25 | Bottom 1st gear | 1 |
| C26 | Bottom 2nd gear | 1 |
| 0C27 | Bottom 3rd gear assembly (C27, C30) | 1 |
| C28 * | Transport gear | 1 |

| | | |
|---|---|---|
| C29 | Sprocket | 1 |
| C30 * | Sprocket shaft | 1 |
| 0C31 | Wind-up shaft assembly (C31, C23, C32, C57,C75) | 1 |
| C32 * | Wind-up shaft bearing | 1 |
| C33 | Take-up spool shaft | 1 |
| C34 | Wind-up lever shaft | 1 |
| 0C35 | Wind-up lever seat assembly (C35, C05, C19, | 1 |
| C36 | Counter screw | 1 |
| C37 | Arrow ring | 1 |
| C38 | Lever seat collar | 1 |
| C39 | Covering ring | 1 |
| C40 | R button | 1 |
| C41 * | Top 1st gear column | 1 |
| C42 | Stopper column | 1 |
| C43 * | Non-return arm seat | 1 |
| C44 * | Spring hanger column | 1 |
| C45 * | Bottom 2nd gear shaft | 1 |
| C46 * | Bottom 1st gear shaft | 1 |
| C47 * | Coupler lever collar | 2 |
| C48 * | Coupler lever shaft | 1 |
| C49 * | Lever seat rivet | 1 |
| C50 * | Counter stud | 2 |
| C51 * | Coupler lever pin | 1 |
| C52 | R lever retainer screw | 1 |
| C53 | Actuator lug screw | 2 |
| C54 | Arrow ring retainer screw | 1 |
| C55 | Bottom 2nd gear screw | 1 |
| C56 | Sprocket screw | 1 |
| C57 * | Wind-up shaft spring | 1 |
| C58 | Take-up spool spring | 1 |
| C59 | Lever seat lug spring | 1 |
| C60 | Counter spring | 1 |
| C61 | Non-return arm spring | 1 |
| C62 | R lever spring | 1 |
| C63 | Sprocket seat spring | 1 |
| C64 | Spring washer | 2 |
| C66 * | Advance lug rivet | 2 |
| C68 | Stopper washer A | 2 |
| C69 | Stopper washer B | 1 |
| C70 | R lever | 1 |
| C71 | Slow speed spring hanger | 1 |

| | | |
|---|---|---|
| C72 | Bottom mec plate retainer screw | 4 |
| C73 | Rapid wind lever retainer screw | 2 |
| C74 * | Spring Retainer screw | 1 |
| C75 * | Top main gear retainer screw | 1 |
| C76 * | Pin adjust plate stud | 1 |
| C77 | Cover ring retainer screw | 2 |
| C78 | Bottom 2nd gear spring | 1 |
| C79 • | Gear column pin | 1 |
| C80 | Coupler lever retainer screw | 1 |
| C81 * | Lug spring retainer screw | 1 |
| C87 | Light seal | 1 |
| C92 | Stopper nut | 1 |
| D01 * | Hoof spring | 1 |
| D02 | Film type dial washer | 1 |
| D03 | Shaft bearing washer | 1 |
| D04 | Shaft bearing | 1 |
| D05 | Rewind shaft | 1 |
| 0D06 | Rewind knob assembly (D06, D07, D10, D11, D12, D13, D15) | 1 |
| D07 * | Rewind cover ring | 1 |
| D08 | Film type dial | 1 |
| D09 | Flat nut | 1 |
| D10 * | Crank | 1 |
| D11 * | Nipple | 1 |
| D12 • | Crank shaft | 1 |
| D13 * | Crank pin | 1 |
| D14 | Shaft spring | 1 |
| D15 * | Retainer ring | 1 |
| D16 | Dial seat spring | 1 |
| D17 | Shaft spring retainer screw | 1 |
| E01 | Top shaft plate | 1 |
| E02 | 1st curtain shaft, plate | 1 |
| E03 * | 1st curtain edger | 1 |
| E04 * | 2nd curtain edger | 1 |
| E05 | Release plate | 1 |
| 0E06 | Bulb lever assembly (E06A, E06B, E71, E72, B78, E87, set screw flat 1.4 x 2.5) | 1 |
| E06A * | Top bulb lever | 1 |
| E06B * | Bottom bulb lever | 1 |
| E07 | 1st curtain checker arm | 1 |

| | | |
|---|---|---|
| E08 | Spill | 1 |
| E09 | Spill receptacle plate | 1 |
| 0E10 | Pinion coupler lever assembly (E10, E75) | 1 |
| 0E11 | 2nd curtain pinion assembly (Ell, E32, E49) | 1 |
| E12 * | 1st curtain pinion | 1 |
| E13 | Coupler pinion | 1 |
| 0E14 | Bottom selector gear assembly (E14, E44, E73) | 1 |
| 0E15 | Top selector gear assembly (E15, E43, E70, E77, E84) | 1 |
| 0E16 | Bottom idling gear assembly (E16, E19I | 1 |
| E17 | Top idling gear | 1 |
| 0E18 | Coupler gear assembly (E18, E45, E46) | 1 |
| El9 * | Idling gear collar | 1 |
| E20 * | Idling gear shaft | 1 |
| E21 | Spill rest | 1 |
| E22 * | Spill rest collar | 1 |
| E23 | Speed dial | 1 |
| E24 | Index ring | 1 |
| E25 | Selector collar | 1 |
| E26 * | Selector gear shaft | 1 |
| E27 * | Bull) lever shaft | 1 |
| E28 * | 1st curtain checker arm seat | 1 |
| E29 | Shutter rod | 1 |
| E30 | Actuator rod | 1 |
| E31 * | 1st curtain pinion shaft | 1 |
| E32 * | 2nd curtain pinion shaft | 1 |
| E33 * | 1st curtain shaft | 1 |
| E34 | Curtain roller, small | 1 |
| E35 * | 1st curtain wind shaft, top | 1 |
| E36 * | 1st curtain wind shaft, bottom | 1 |
| E37 * | Curtain roller bearing | 2 |
| 0E38 | Curtain roller, large, assembly (E38, E37) | I |
| E39 * | 2nd curtain pipe | 1 |
| E40 • | 2nd curtain wind shaft bearing, bottom | 1 |
| E41 • | Wind shaft bearing | 2 |
| E42 | Curtain spring adjust lug | 2 |
| E43 * | Top selector gear stud | 1 |
| E44 * | Selector gear retainer ring | 1 |
| E45 * | Slow speed lever actuator stud | 1 |
| E46 * | Coupler gear stud | 1 |
| E47 * | Edger rivet | 4 |
| E48 | Bulb lever nut | 1 |

| | | |
|---|---|---|
| E49 * | Pinion retainer pin | 2 |
| E50 | Idling gear retainer screw | 1 |
| E51 | lst curtain checker arm retainer screw | 2 |
| E52 | Pinion coupler lever retainer screw | 1 |
| E53 | Coupler gear retainer screw | 1 |
| E54 | Adjust lug screw | 2 |
| E55 * | Pinion shaft retainer screw (Only 2 supplied with 0E64) | 3 |
| E56 | Cam shaft spring | 1 |
| E57 | Shutter rod spring | 1 |
| E58 | Spill spring | 1 |
| E59 * | 2nd curtain spring | 1 |
| E60 | Adjust lug spring A | 1 |
| E61 | 1st curtain checker arm spring | 1 |
| E62 | Bulb lever spring | 1 |
| E63 | Pinion coupler lever spring | 1 |
| 0E64 | 1st curtain assembly (E64, E03, E12, E31, E33, E35, E36, E47, E49, E55, E90, E91, E95, E96) | 1 |
| 0E65 | 2nd curtain assembly (E65, E04, E39, E40, E41, E47, E59, E67, E74, E94) | 1 |
| E66 | Coupler lever spring hanger | 1 |
| E67 * | Curtain pipe | 1 |
| E68 | Speed selector disc | 1 |
| E69 * | Cam shaft | 1 |
| E70 * | Speed selector pin | 1 |
| E71 * | Bulb lever collar, top | 1 |
| E72 * | Bulb lever collar, bottom | 1 |
| E73 | Retainer ring rivet | 1 |
| E74 * | 2nd curtain wind shaft metal, top | 1 |
| E75 * | Pinion coupler lever pin | 1 |
| E76 * | Cam shaft nut | 1 |
| E77 * | Selector gear stopper | 1 |
| E78 * | Bulb coupler spring | 1 |
| E79 | Cam shaft spring receptacle | 1 |
| E80 | ' Cocked' indicator | 1 |
| E81 * | ' Cocked ' indicator shaft | 1 |
| E82 | ' Cocked ' indicator spring | 1 |
| E83 | Click spring | 1 |
| E84 * | Selector gear stopper rivet | 1 |
| 0E85 | High speed cam assembly (E85, E69, E76) | 1 |
| E86 | 1st curtain checker arm stopper | 1 |
| E87 * | Bulb lever adjust nut | 1 |
| E88 | Coupler pinion screw | 1 |

| | | |
|---|---|---|
| E89 | 2nd curtain shaft plate | 1 |
| E90 * | 1st curtain wind shaft bearing, lop | 1 |
| E91 * | 1st curtain wind shaft bearing, bottom | 1 |
| E92 | Curtain spring adjust gear A | 1 |
| E93 | Curtain spring adjust gear B | 1 |
| E94 * | 2nd curtain shaft | 1 |
| E95 * | 1st curtain pipe | 1 |
| E96 * | 1st curtain spring | 1 |
| E97 * | Bounce stopper | 1 |
| E98 | Bounce stopper actuator lever | 1 |
| E99 | Bounce stopper lever | 1 |
| El00 | Bounce stopper actuator lever screw | 2 |
| E101 * | Bounce stopper rivet | 1 |
| E102 | Bounce stopper spring | 1 |
| E103 | Bounce stopper lever screw | 1 |
| 0E104 | Sync gear assembly (E104, E97, E101, E111, E115) | 1 |
| E105 | Sync gear column | 1 |
| E106 * | X contact A | 1 |
| 0E107 | X contact B assembly (E107, B64, B65, B66, E106, E108, E109, E112) | 1 |
| E108 * | X contact seat | 1 |
| E109 * | X insulator | 1 |
| E110 | X contact support | 1 |
| E111 * | X contact pin | 1 |
| E112 * | X contact column | 2 |
| E113 | X contact retainer screw | 1 |
| El14 | Adjust lug spring B | 1 |
| E115 * | Insulator tube | 1 |
| EI16 E117 | Bounce stopper lever retainer | 1 |
| E118 * | Shutter rod receptacle | 1 |
| E119 | Release plate nut | 1 |
| E120 * | Gear shaft rivet | 5 |

| | | |
|---|---|---|
| F01 | Slow speed cam | 1 |
| 0F02 | Cam coupler plate assembly (F02, F10) | 1 |
| F03 | Time stopper | 1 |
| 0F04 | Bottom adjust plate assembly (F04, F12I | 1 |
| 0F05 | Top adjust plate assembly (F05, F06, F07, F08, F09, F14, FI5, F17, F19, W2) | 1 |
| F06 * | Slow speed actuator lever | 1 |
| F07 * | Slow speed lever | 1 |
| F08 * | Slow speed lever collar | 1 |

| | | |
|---|---|---|
| F09 * | Lever support nut (Only 1 supplied with 0F05) | 2 |
| F10 * | Cam coupler plate stud | 1 |
| F11 | Cam coupler plate nut | 1 |
| F12 * | Slow speed rod | 1 |
| F13 | Slow speed rod receptacle | 1 |
| F14 * | Lever support | 1 |
| F15 * | Slow speed lever seat | 1 |
| F16 | Slow speed spring | 1 |
| F17 * | Slow speed actuator lever stud | 1 |
| F18 | Adjust plate screw | 1 |
| F19 * | Slow speed lever retainer screw | 1 |
| F20 | Slow speed cam retainer screw | 2 |
| 0G00 | Slow speed governor assembly (G01 -G19) | 1 |

| | | |
|---|---|---|
| AF12 | Mirror | 1 |
| AF17 | Pentaprism | 1 |
| AF18 | Ground glass | 1 |
| 0AF20 | Magnifier front element assembly (AF20, AF21) | 1 |
| AF21 * | Magnifier rear element | 1 |
| AF22 | Fresnel lens | 1 |

# LIST OF STANDARD PARTS

**Product No. 230-2**

## ASAHI PENTAX S3

**Standard Small Screws**

| Index No. | Name | | Surface Treatment | Place of Use | Quantity |
|---|---|---|---|---|---|
| 1 | Small screw, flat, medium | 1.2x1.6 | Nickel | G02, G13 | 2 |
| | | | Black | E112, B77 | 2 |
| | | | | G04, G14 | 2 |
| 2 | " | 1.4x1.2 | Black | D01, D06 | 2 |
| 3 | " | 1.4x1.4 | Black | E03, C02 | 2 |
| 4 | | 1.4x2 | Black | A01, G01 | 2 |
| | | | | B52, B60 | 2 |
| | | | | B02, B22 | 2 |
| 5 | | 1.4x3 | Black | F04, F05 | 1 |
| 6 | | 1.7x1.4 | Black | A01 | 2 |
| 7 | | 1.7x1.8 | Black | B02, B47 | 1 |
| | | | | A01, A07 | 2 |
| 8 | | 1.7x2 | Black | A01, A06 | 2 |
| 9 | | 1.7x2.5 | Black | A01, E89 | 1 |
| | | | | A01, E108 | 1 |
| | | | | A01, E83 | 2 |
| | | | | A01, D04 | 2 |
| | | | | A01, C02 | 1 |
| | | | | B02, B25 | 2 |
| | | | | B01, B08 | 2 |
| 10 | | 1.7x2.8 | Black | A01, A66 | 2 |
| 11 | | 1.7x3 | Black | A01, B02 | 2 |
| | | | | A01, A08 | 1 |
| | | | | C16, C47 | 2 |
| 12 | | 1.7x3.5 | Black | C11, C42 | 1 |
| 13 | | 1.7x5 | Black | B01, B02 | 3 |
| 14 | | 2x3 | Black | C17, C24 | 1 |
| 15 | | 2x4.5 | Black | A01, C10 | 2 |
| 16 | Small screw, saucer, medium | 1.7x2.2 | Chrome plated | A04, A20 | 2 |
| | | | | A01, A28 | 2 |
| 17 | | 1.7x3.5 | Black | A01, C32 | 3 |
| | | | | A01, A20 | 2 |
| | | | | A01, A10 | 3 |
| | | | | C32, C34 | 3 |
| 18 | | 2x3.5 | Chrome plated | A01, A03 | 1 |
| | | | | A01, A04 | 2 |
| 19 | Small screw, round, saucer, medium | 1.7x3 | Chrome plated | A01, A03 | 2 |
| | | | | A01, A05 | 4 |
| 20 | | 1.4x2.5 | Nickel plated | E06A, E06B | 1 |
| 21 | Set screw, flat | 1.7x4 | | B01, B09, AF17 | 2 |

| | | | | |
|---|---|---|---|---|
| 22 | Set screw, flat | 1.7x4.5 | A01, C11 | 1 |
| 23 | Set screw, tapered | 1.7x2 | C17, C24 | 2 |
| | | | E24, E26 | 3 |
| | | | E23. E68 | 3 |

### Lock Washer

| Code | Material | Thickness (mm) | Place of Use | Quantity |
|---|---|---|---|---|
| LW10 | | 0.2 | B76 | 1 |
| LW13 | | 0.3 | F12 | 1 |
| | | | E33 | 1 |
| | | | E94 | 1 |
| | | | E105 | 1 |
| LW17 | | 0.4 | E50 | 1 |

### Washers

(**NOTE:** Asterisk " denotes quantity which is subject to change.)

| | | | | |
|---|---|---|---|---|
| W2 | Steel | 0.03, 0.05, 0.1 | E09, F14 | 1* |
| | Brass | 0.4 | E10 | 1 |
| W3 | Steel | 0.1 | E18 | 1 |
| | | | E99 | 1 |
| | Phosphorus bronze | 0.2 | E98 | 2 |
| W5 | Steel | 0.05, 0.1, 0.2 | B02, B54, B55 | 1 |
| | | | A01, A05 | 4* |
| W8 | Phos. bronze | 0.1 | B02, B35 | 1 |
| W9 | Brass | 0.4 | C70 | 1 |
| W10 | Steel | 0.05 | C26 | 1 |
| Wll | Phos. bronze | 0.1, 0.15, 0.2, 0.5 | A27 | 2* |
| | | | F12 | 1* |
| | | | E26 | 1* |
| W12 | | 0.05, 0.07, 0.1 | B18, B35 | 1* |
| | | | B19, B35 | 1* |
| W13 | Steel | 0.3 | A27 | 2 |
| W14 | Phos. bronze | 0.1 | E105 | 1 |
| W15 | Steel | 0.05, 0.1 | C34 | 1 |
| W17 | Bakelite | 0.4 | C13, C31 | 1 |
| | Steel | 0.2 | C14, C24 | 3* |
| W18 | Steel | 0.1 | D02, D09 | 1* |
| W21 | Steel | 0.05, 0.1 | C48 | 1* |
| W22 | Phos. bronze | 0.7, 0.8 | C30 | 1 |
| W26 | | 0.1. 0.15 | C12, C36 | 1* |