SERVICE MANUAL

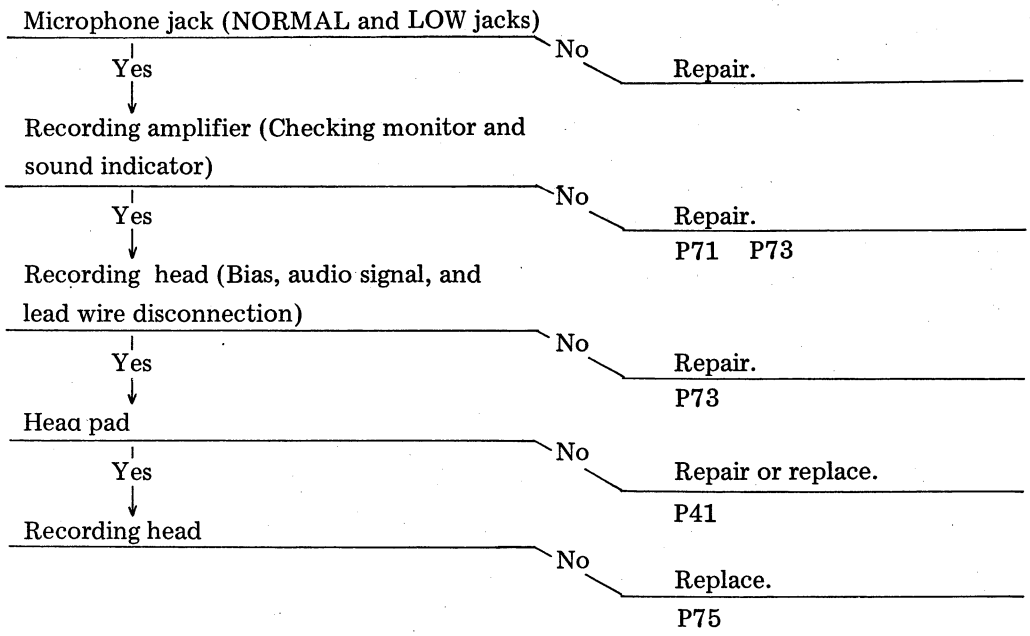
Fujica ZXM300 Single-8 Sound Movie Camera

CONTENTS

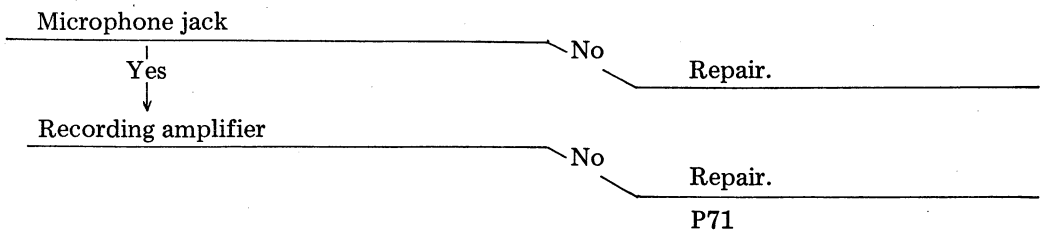
I TROUBLESHOOTING

1. SOUND RECORDING SYSTEM

1 — 1 Sound is not recorded.



1 — 2 Sound indicator does not light.



1 — 3 Monitoring cannot be made.

Sound indicator (Checking recording amplifier for condition)
- No → Repair. P71
- Yes ↓

Earphone jack
- No → Repair.

1 — 4 Wow-flutter is too high.

Film transporting system
- No → Repair.
- Yes ↓

Pinch roller
- No → Repair or replace. P81 P39
- Yes ↓

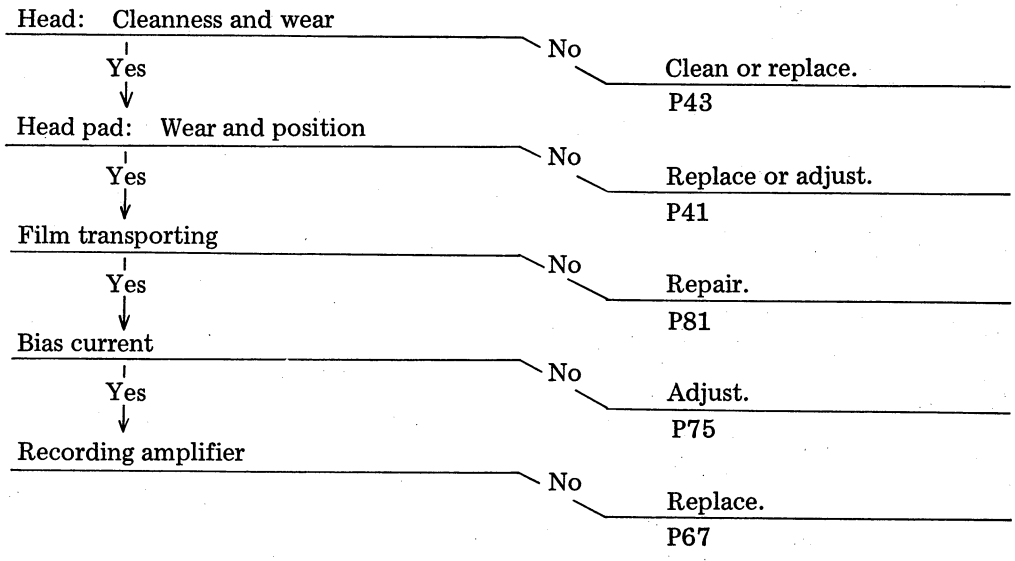
Film loop: Loop switch ON-OFF conditions
- No → Repair. P81 P41
- Yes ↓

Belt
- No → Replace. P81 P43
- Yes ↓

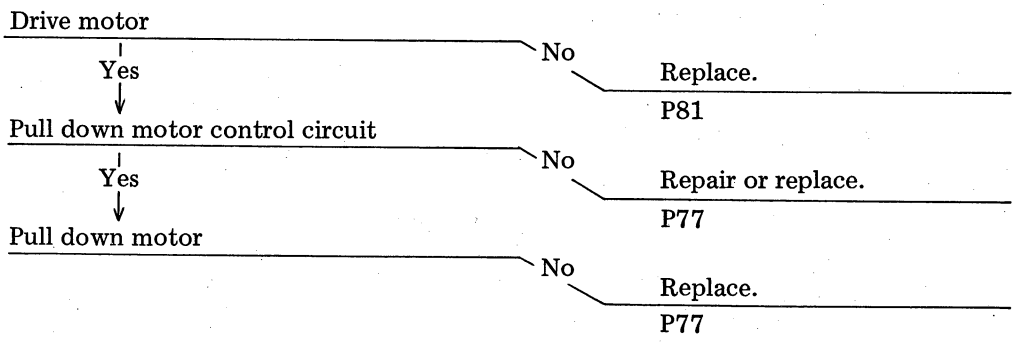
Capstan shaft holder: Balance and rotation of flywheel
- No → Replace. P81 P39
- Yes ↓

Drive motor (for recording mechanism)
- No → Replace. P81

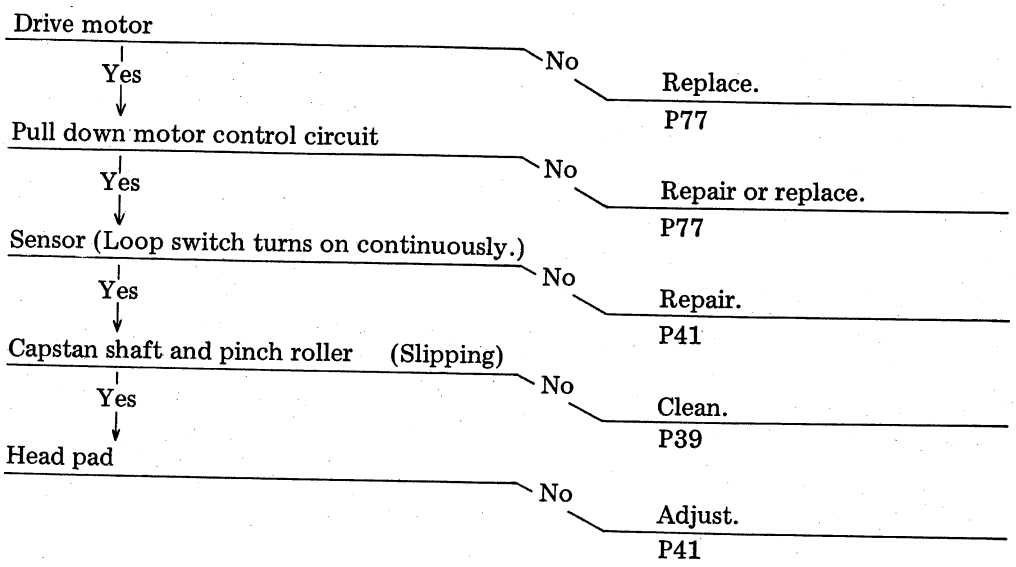
1 — 5 Frequency characteristics are low.



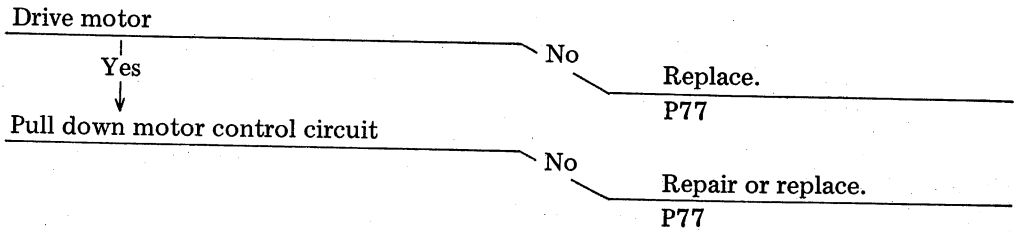
1 — 6 Recording speed (filming speed at head) is abnormal.



1 — 7 Film loop is too large

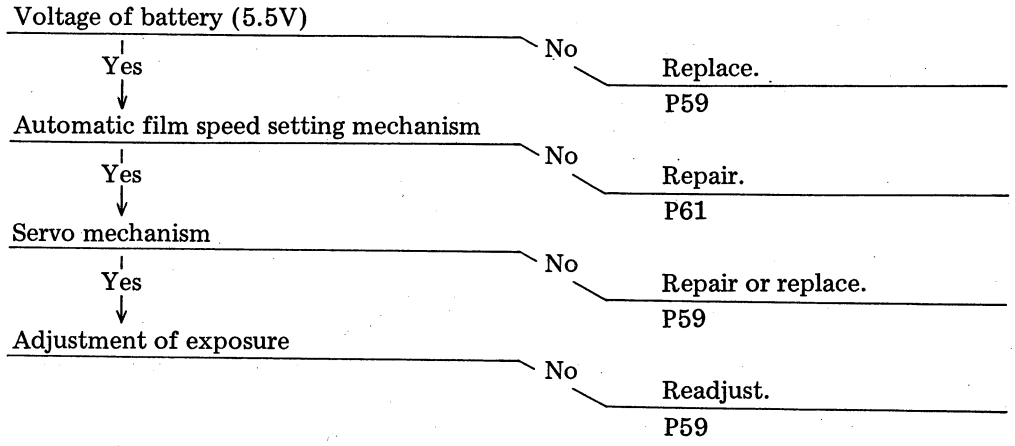


1 — 8 Film loop is too small

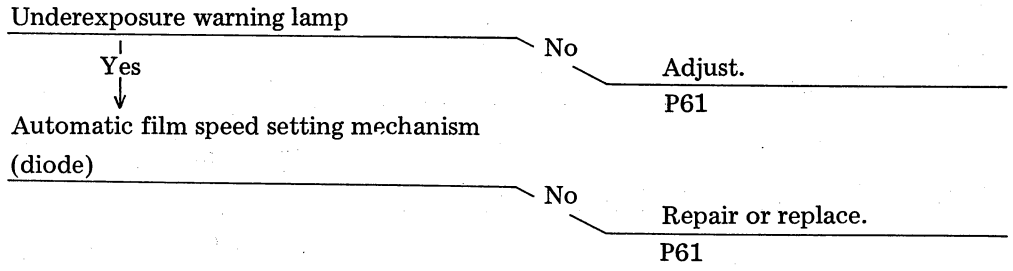


2. EXPOSURE METER

2 — 1 Under or over exposure

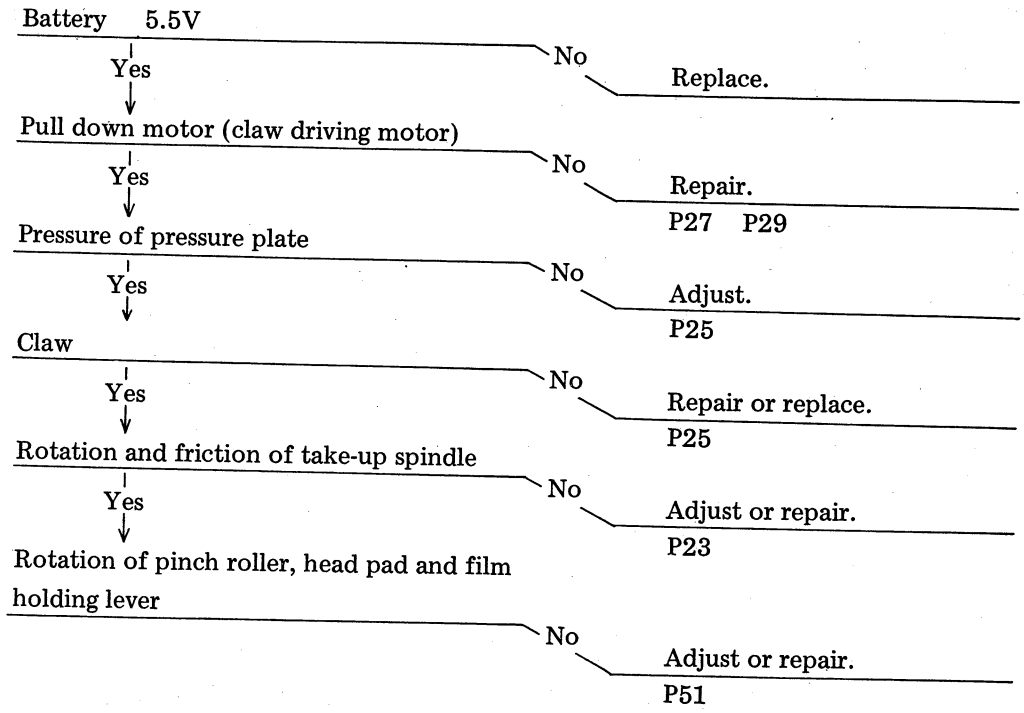


2 — 2 Underexposure warning lamp does not light correctly.

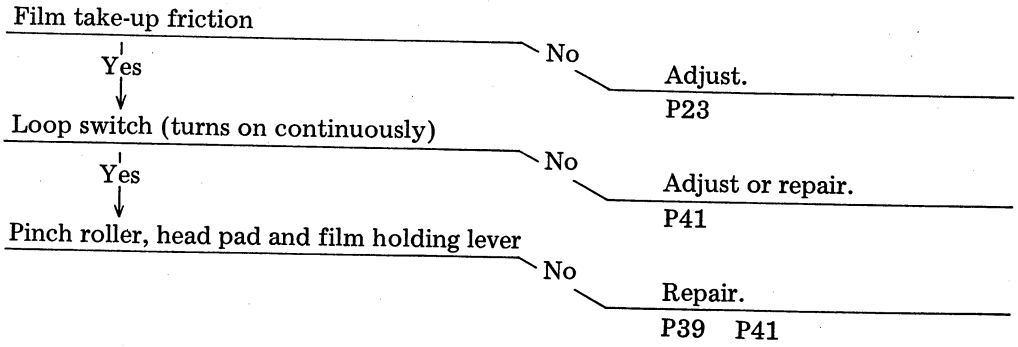


3. FILM IS NOT TRANSPORTED CORRECTLY.

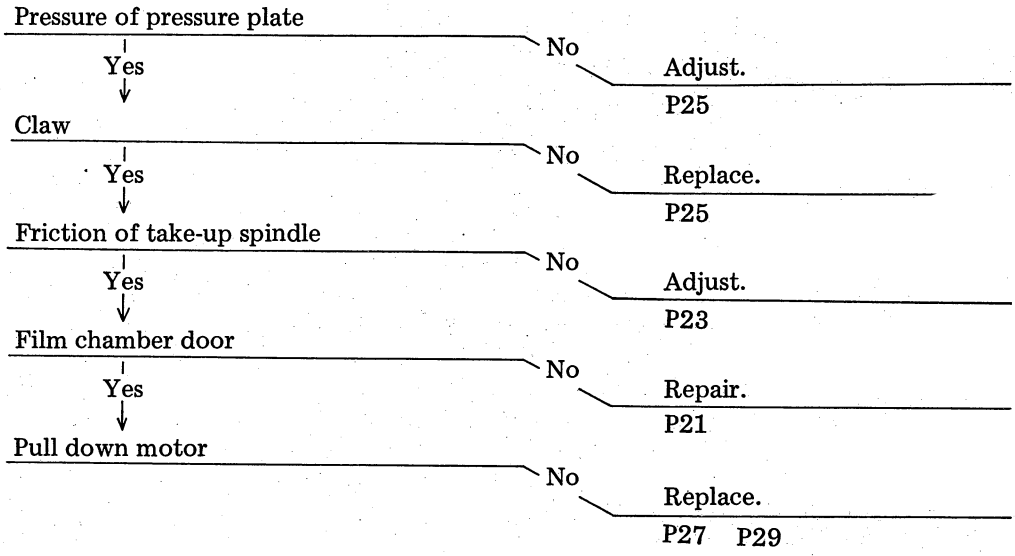
3 — 1 Film is not transported.



3 — 2 Film is jammed



3 — 3 Multiple exposure



Ⅱ DISASSEMBLY

1. UPPER FRONT COVER ASSEMBLY (1–4) AND LOWER FRONT COVER (1–7)

These front covers are lightly installed with Pliobond. Pull and remove them.

2. ACCESSORY SHOE (1–1)

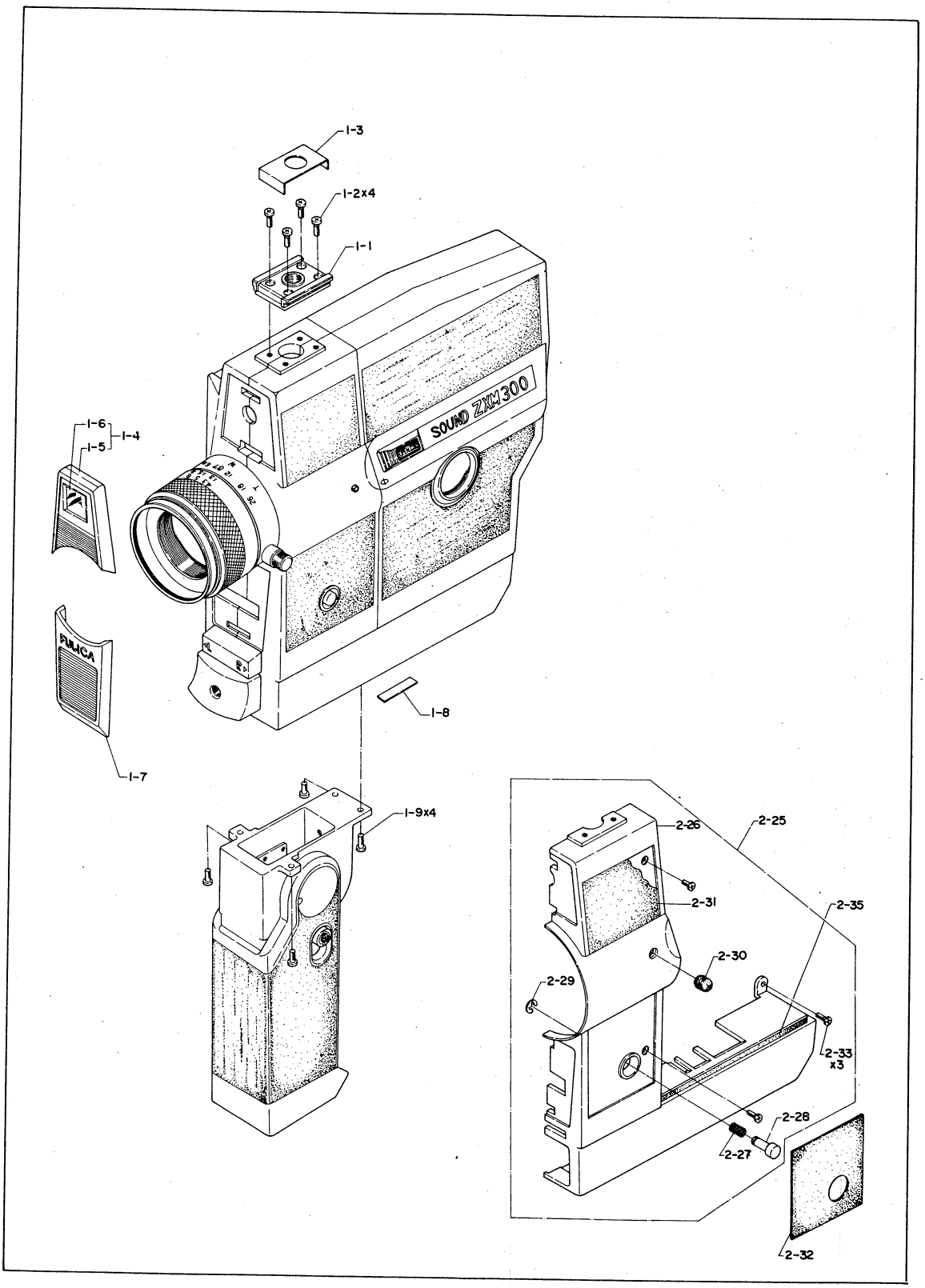
Remove the cover plate (1—3), and remove the accessory shoe after removing four screws (1—2).

3. SIDE COVER ASSEMBLY (2–25)

a. Remove leathers (2—31 and 2—32), and remove three screws (2—33).

b. Remove two screws (1—9). The side cover (2—26) can then be removed.

Fig. 1


1-3
1-2x4
1-1
1-6
1-5
1-4
SOUND ZXM300
FUJICA
1-8
1-7
1-9x4
2-26
2-25
2-31
2-35
2-30
2-29
2-33
x3
2-28
2-27
2-32

4. GRIP ASSEMBLY (9–1)

a. Disconnect two lead wires (W1 and W2) from the printed circuit board (7—59).

b. Remove two screws (1—9), and remove the grip assembly.

5. FILTER SELECTOR ASSEMBLY (3–29)

a. Remove the main name plate (3—42) after removing two screws (3—43).

b. Remove the leather (3—41).

c. Remove the base plate (3—37) after removing two screws (3—38).

d. Remove the filter selector assembly (3—29) carefully so as not to damage the click spring (3—36).

6. FILM CHAMBER PLATE ASSEMBLY (6–31)

a. Remove the cover (7—44) after removing the screw (7—45).

b. Remove three screws (6—42).

c. Remove the chamber plate assembly (6—31) carefully.

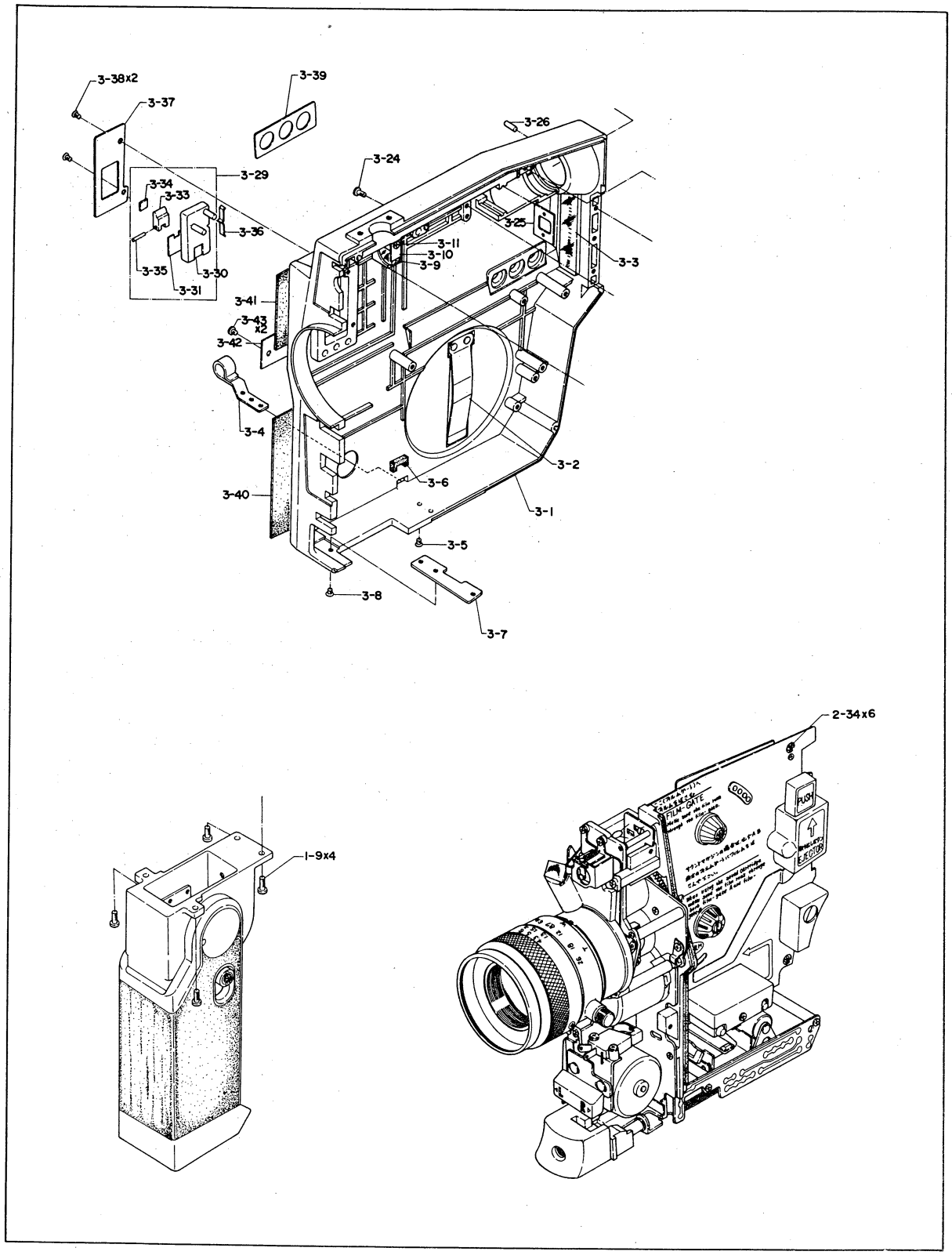
7. MECHANISM ASSEMBLY

a. Disconnect lead wires (W10, W11, W13, W14, W20, W21, W22 and W32).

b. Remove six screws (2—34). (One of the six screws is located beneath the EE lock lever (3—27).)

c. Pull out the mechanism assembly carefully and slowly from the side frame (3—1).

Fig. 2


3-38x2
3-37
3-39
3-26
3-24
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3-33
3-36
3-35
3-30
3-31
3-25
3-11
3-10
3-9
3-3
3-41
3-43
x2
3-42
3-4
3-6
3-2
3-40
3-1
3-5
3-8
3-7
2-34x6
1-9x4
FILM-GATE
PUSH

8. SOUND RECORDER MECHANISM ASSEMBLY (7—66)

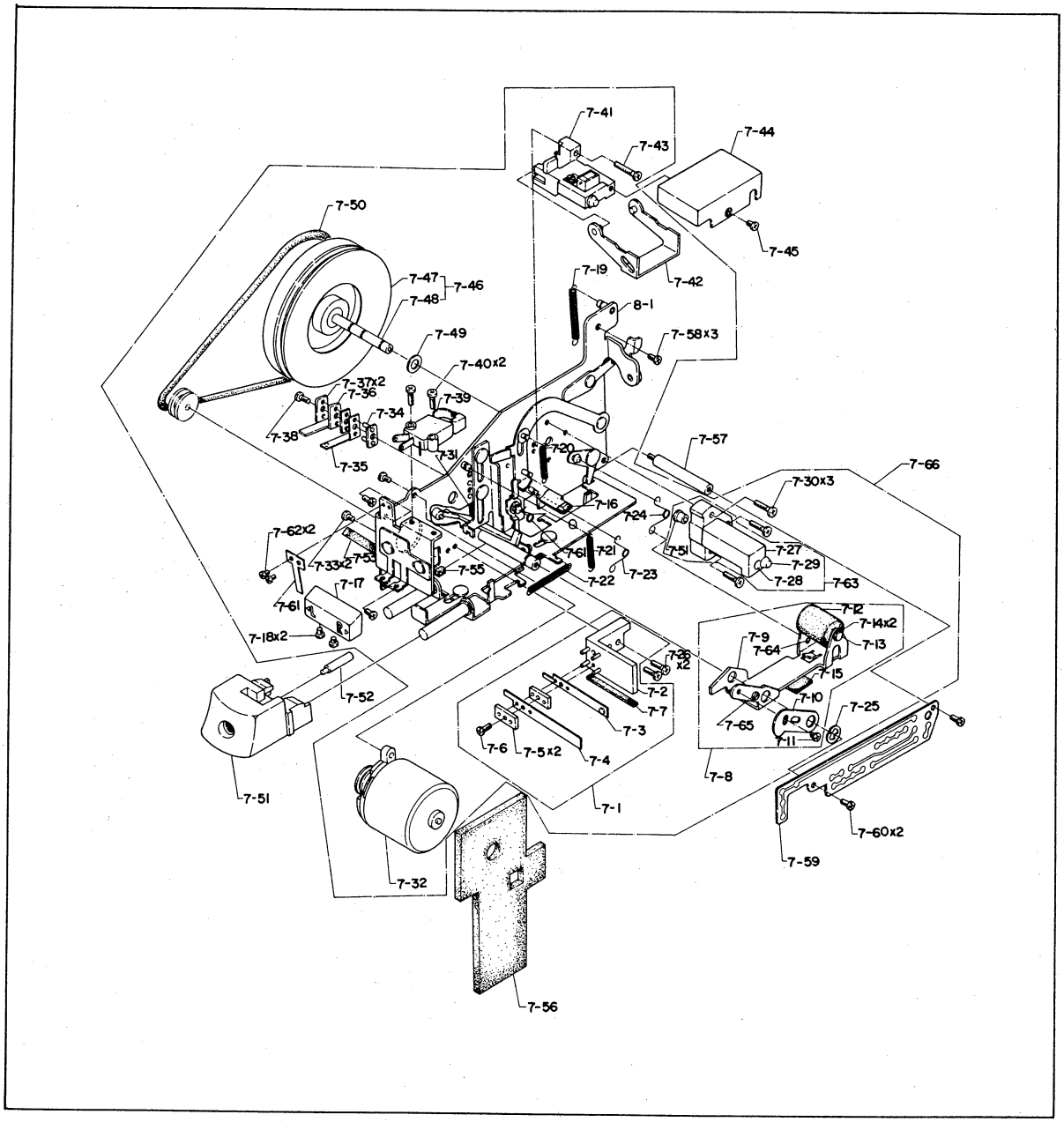
a. Remove the printed circuit board (7—59) after removing two screws (7—60).

b. Remove the column (7—57).

c. Remove three screws (7—58).

d. Pull out the sound recorder mechanism assembly (7—66) from the side frame (3—1) carefully so that the capstan shaft assembly (7—46) does not drop off.

Fig. 3


7-41
7-43
7-44
7-45
7-50
7-42
7-19
8-1
7-47
7-46
7-48
7-49
7-58x3
7-40x2
7-37x2
7-36
7-39
7-34
7-38
7-35
7-31
7-20
7-57
7-66
7-30x3
7-16
7-24
7-62x2
7-33x2
7-55
7-61
7-21
7-22
7-23
7-51
7-27
7-29
7-28
7-63
7-17
7-18x2
7-12
7-14x2
7-9
7-64
7-13
7-15
7-10
7-25
7-65
7-11
7-26 x2
7-2
7-7
7-3
7-6
7-5x2
7-4
7-52
7-51
7-1
7-8
7-60x2
7-59
7-32
7-56

9. ZOOM LENS ASSEMBLY (4–1) AND FOCUSING RING (4–3)

9 — 1 Focusing ring (4—3)

a. Remove the rubber ring (4—4).

b. Set the focusing ring (4—3) to "∞", and remove three screws (4—5).

c. Remove the focusing ring carefully so that the lens helicoid does not move.

d. Scribe lines (match marks) across the lens body and front lens hang by the use of a scriber.

9 — 2 Zoom lens assembly (4—1)

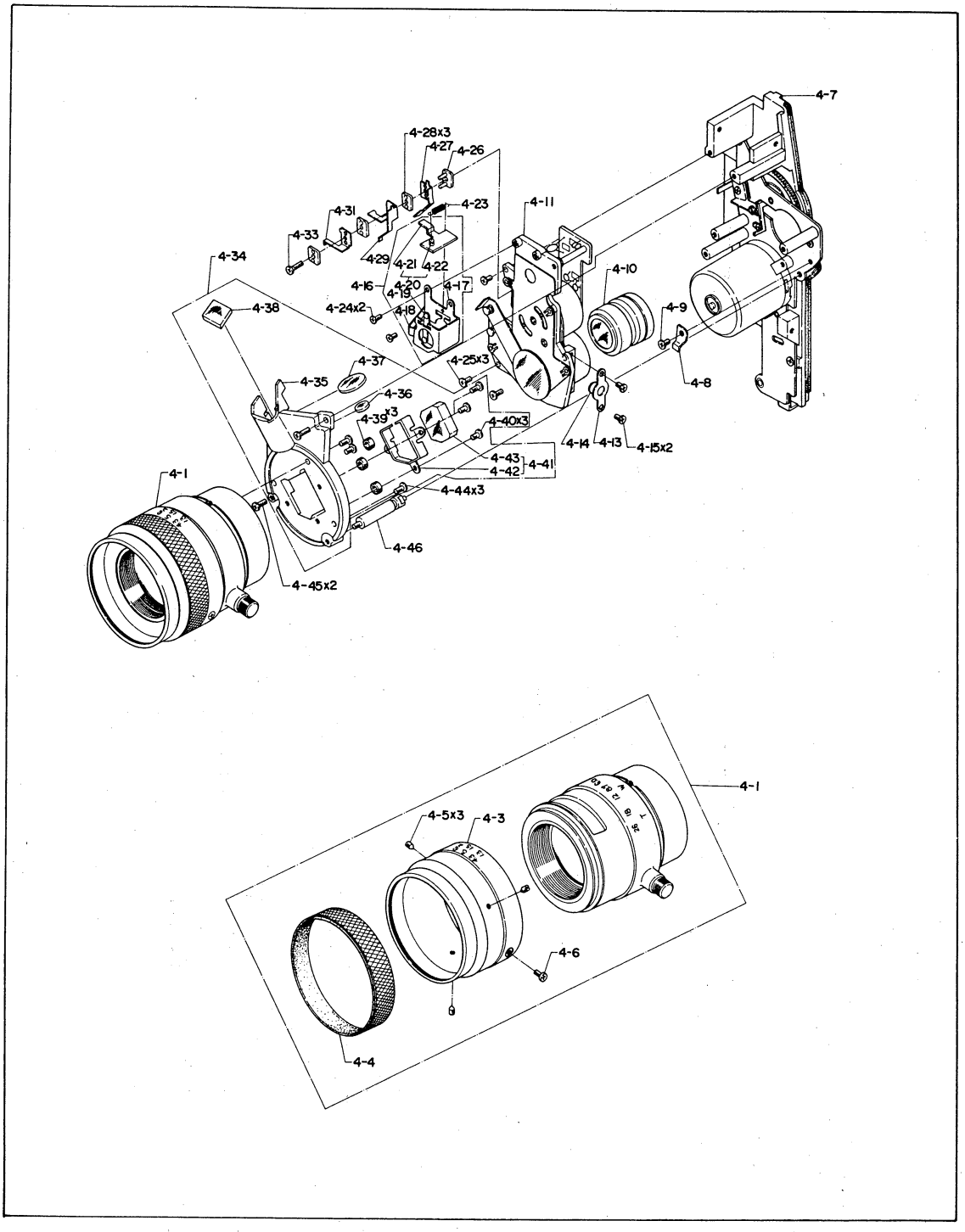
a. Remove two screws (4—45).

b. Remove the screw (4—9), and remove the holder (4—8).

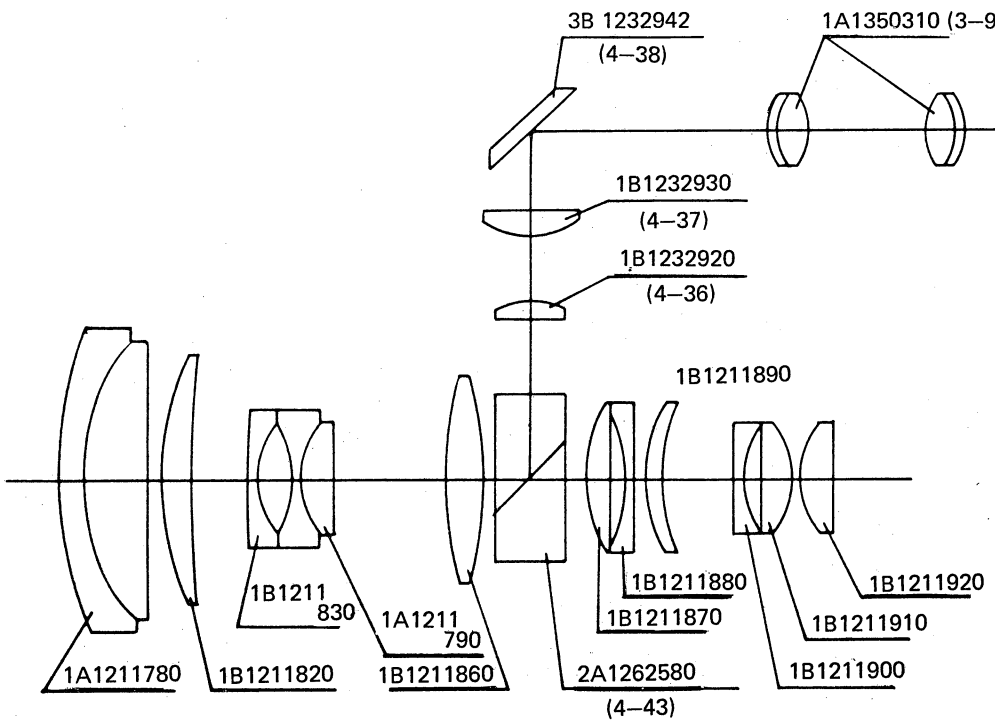
c. Separate the zoom lens assembly from the film transport mechanism assembly (4—7).

d. Remove three screws (4—44), and separate the viewfinder assembly (4—34) from the zoom lens assembly (4—1).

Fig. 4


4-7
4-28x3
4-27
4-26
4-23
4-11
4-31
4-33
4-34
4-29
4-21
4-22
4-10
4-16
4-20
4-17
4-19
4-24x2
4-18
4-9
4-38
4-25x3
4-8
4-37
4-35
4-36
4-39x3
4-40x3
4-14
4-13
4-15x2
4-43
4-42
4-41
4-1
4-44x3
4-46
4-45x2
4-1
4-5x3
4-3
4-6
4-4

Optical Parts Layout



Ⅲ REASSEMBLY AND ADJUSTMENT

1. SIDE FRAME

1 — 1 Leaf spring (3—2)

a. Make sure that the leaf spring is heat-caulked on the side frame (3—1) securely.

b. Make sure that the leaf spring functions correctly and smoothly.

1 — 2 Footage counter window (3—3)

a. Make sure that the scales and footage numbers are not scarred or blurred.

b. Check the window and see if it is securely installed on the side frame (3—1) securely with Pliobond.

1 — 3 Moquette (3—6)

After installing the strap ring bracket (3—4), install this morquette (3—6) with Pliobond on the side frame to shield light.

1 — 4 Lenses in the viewfinder system

The lenses must be directed correctly.

a. After installing the lens (3—9), lock it with Araldite so that it will not turn.

b. Apply Losoid grease (1160B) slightly to the sliding portions of the ring (3—16) and eyepiece assembly (3—12).

c. Move the ring (3—16) and make sure that the eyepiece assembly (3—12) moves back and forth smoothly. (Combine the projection on the side frame with the cam groove of the eyepiece assembly.)

d. Install the eyepiece barrel (3—17), and secure it with the screw (3—26) on the side frame. (Match the screw (3—26) with the screw hole on the eyepiece barrel.)

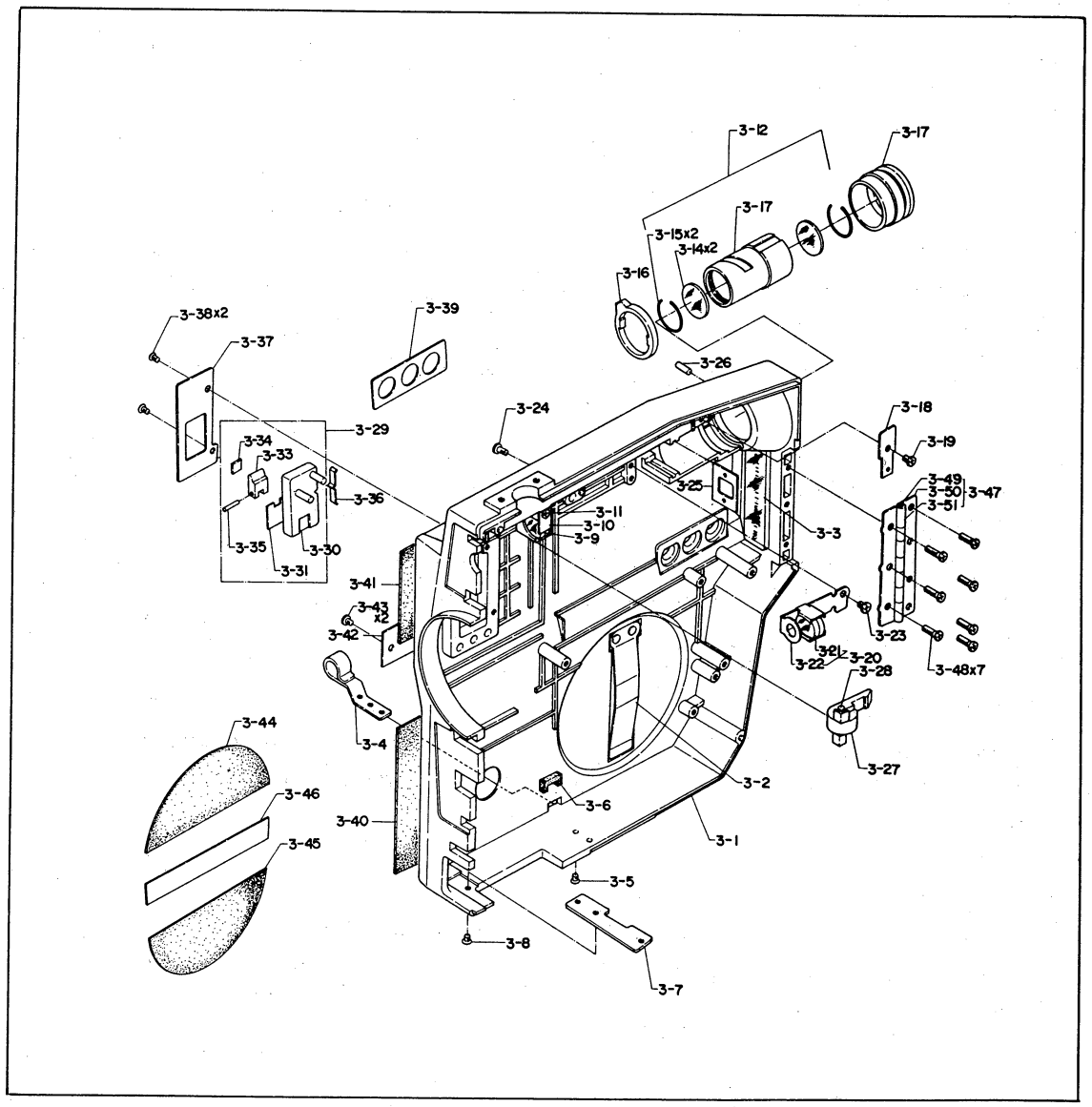
e. Lock the lens (3—21) of the lens frame assembly (3—20) with Araldite.

f. Make sure that the view finder frame (3—25) is installed on the side frame securely and correctly with Pliobond without tilting.

1 — 5 Adhered parts

Check the leathers (3—40, 3—41, 3—44 and(3—45), viewfinder frame (3—25), filter plate (3—31), name plates (3—39 and 3—46) and plate (3—34) to see that they are not floated but correctly installed with Pliobond.

Fig. 5


3-12
3-17
3-17
3-15x2
3-14x2
3-16
3-38x2
3-37
3-39
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3-24
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3-31
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3-43
x2
3-42
3-23
3-21
3-22
3-20
3-28
3-48x7
3-44
3-4
3-27
3-46
3-2
3-6
3-40
3-1
3-45
3-5
3-8
3-7

2. FILM CHAMBER DOOR ASSEMBLY

2 — 1 Pin (2—20)

a. Make sure that the pins (2—20) operate smoothly without any dragging.

b. Make sure that the spring (2—18) is weaker than spring (2—19).

c. Note that flicker of picture or multiple exposure occurs if the pins do not operate coreectly.

2 — 2 Open-close button (2—6)

a. Check the open-close button to insure that it is smoothly operated by the sprint (2—8).

b. Apply Squalol grease M4 to the sliding surface of the lock lever (2—9) slightly.

2 — 3 Leaf spring (2—11)

This leaf spring pushes the pressure plate of the film gate assembly (5—31). When shape of this leaf spring is incorrect, the pressure plate will not close with a catridge loaded, causing the film to be transported unsmoothly or resulting an incorrect focusing. Make sure that this leaf spring has the coreect shape so that the pressure plate closes correctly. (The leaf spring may be bent for shaping.)

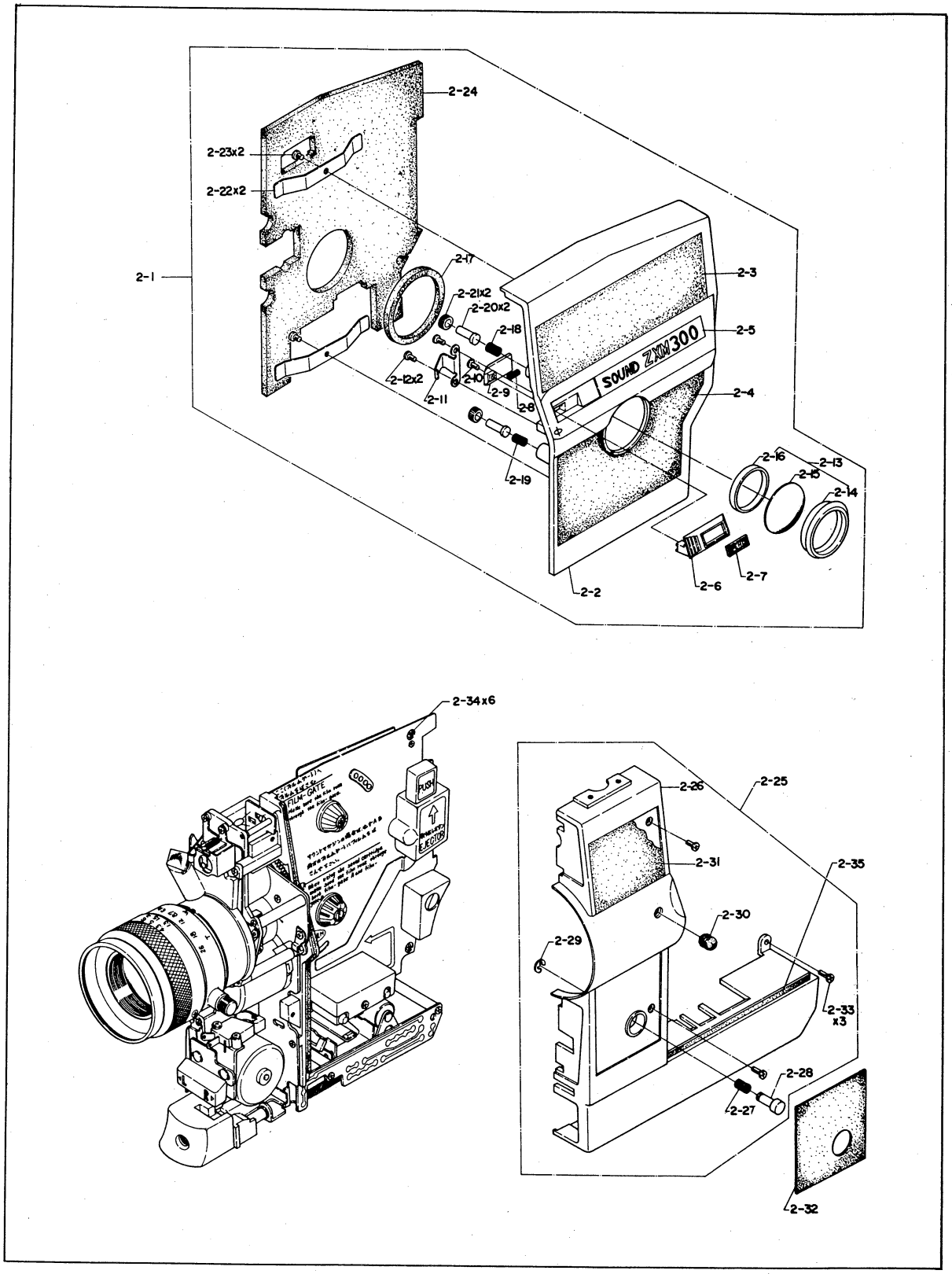
2 — 4 Leaf springs (2—22)

These two springs set cartridge stationarily. These springs must not be deformed. When a cartridge cannot be set stationarily, replace the leaf springs (2—22) with new ones.

2 — 5 Moquettes (2—17 and 2—24)

The moquette (2—17) is used to shield light and moquette (2—24) is for sound-proofing. Check them to insure that they are installed securely and correctly with Pliobond.

Fig. 6


2-24
2-23x2
2-22x2
2-1
2-17
2-21x2
2-20x2
2-18
2-3
2-5
SOUND ZXM300
2-12x2
2-11
2-10
2-9
2-8
2-4
2-19
2-16
2-15
2-13
2-14
2-6
2-7
2-2
2-34x6
2-26
2-25
2-31
2-35
2-30
2-29
2-33
x3
2-28
2-27
2-32

3. FOOTAGE COUNTER ASSEMBLY

3 — 1 Film take-up torque

The standard film take-up torque is 45±10 gr-cm. When film take-up torque is deviated from the standard value, replace the spring (6—10) with a proper one. Make sure that the shaft portion of the take-up gear (6—9) turns smoothly.

3 — 2 Lubrications

Lubricate the parts with the following greases slightly.

a. Squalol Grease M4: Gear teeth of the gear spindle (6—8).

b. Helicolube-Molycote mixed grease: Shaft holding portions of the plate (6—5), idler (6—7), gear spindle (6—8) and take-up gear (6—9).

3 — 3 Film end mark

a. Check the filter (6—15) to insure that it is installed on the lever (6—14) securely with Pliobond.

b. Make sure that the lever (6—14) operates smoothly.

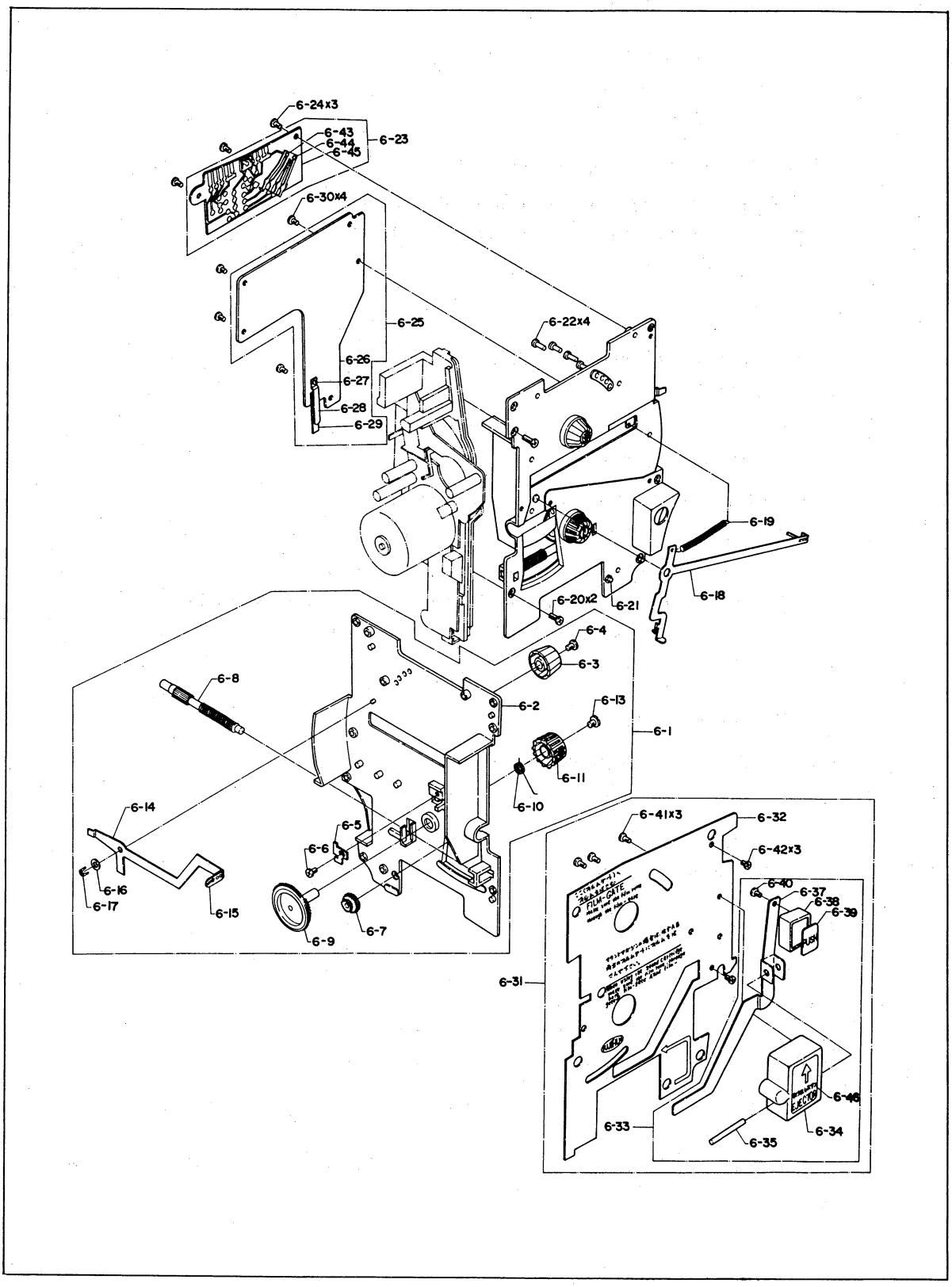
4. FILM CHAMBER PLATE ASSEMBLY (6—31)

a. Make sure that the film chamber plate (6—32) is not bent or warped.

b. Check the plate (6—39) to insure that it is installed on the button (6—38) securely with Pliobond.

c. Make sure that the lever (6—37) moves smoothly.

Fig. 7


6-24x3
6-43
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6-7
6-41x3
6-32
6-42x3
6-40
6-37
6-38
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6-31
6-46
6-33
6-34
6-35

5. FILM GATE ASSEMBLY (5–31)

5 – 1 Film pull down resistance

a. Adjust the screw (5—54) so that film pull down resistance is 65±5 gr.

b. When film pull down resistance cannot be adjusted with the screw (5—54), replace the spring (5—52) with a proper one.

c. When film pull down resistance is too high, film will not be transported smoothly or filming speed will be deviated. When it is too low, flicker of picture will occur.

5 – 2 Claw (5—39)

a. Open the pressure plate seat assembly (5—47) and make sure that the claw is not projected from the gate (5—33) plane.

b. Make sure that the claw is projected from the gate plane with the pressure plate seat assembly closed.

c. When the above conditions are not satisfactory, film will not be loaded or transported correctly. When adjustment is needed, adjust the claw releasing spring (5—49).

d. The standard projection and pressure of the claw are respectively 0.4±0.1mm from the gate plane and 10±2 gr. When projection or pressure is deviated from the standard value, replace the claw (5—39) and leaf spring (5—42) with new ones.

5 – 3 Lubrication

Apply Squalol oil to the sliding parts slightly.

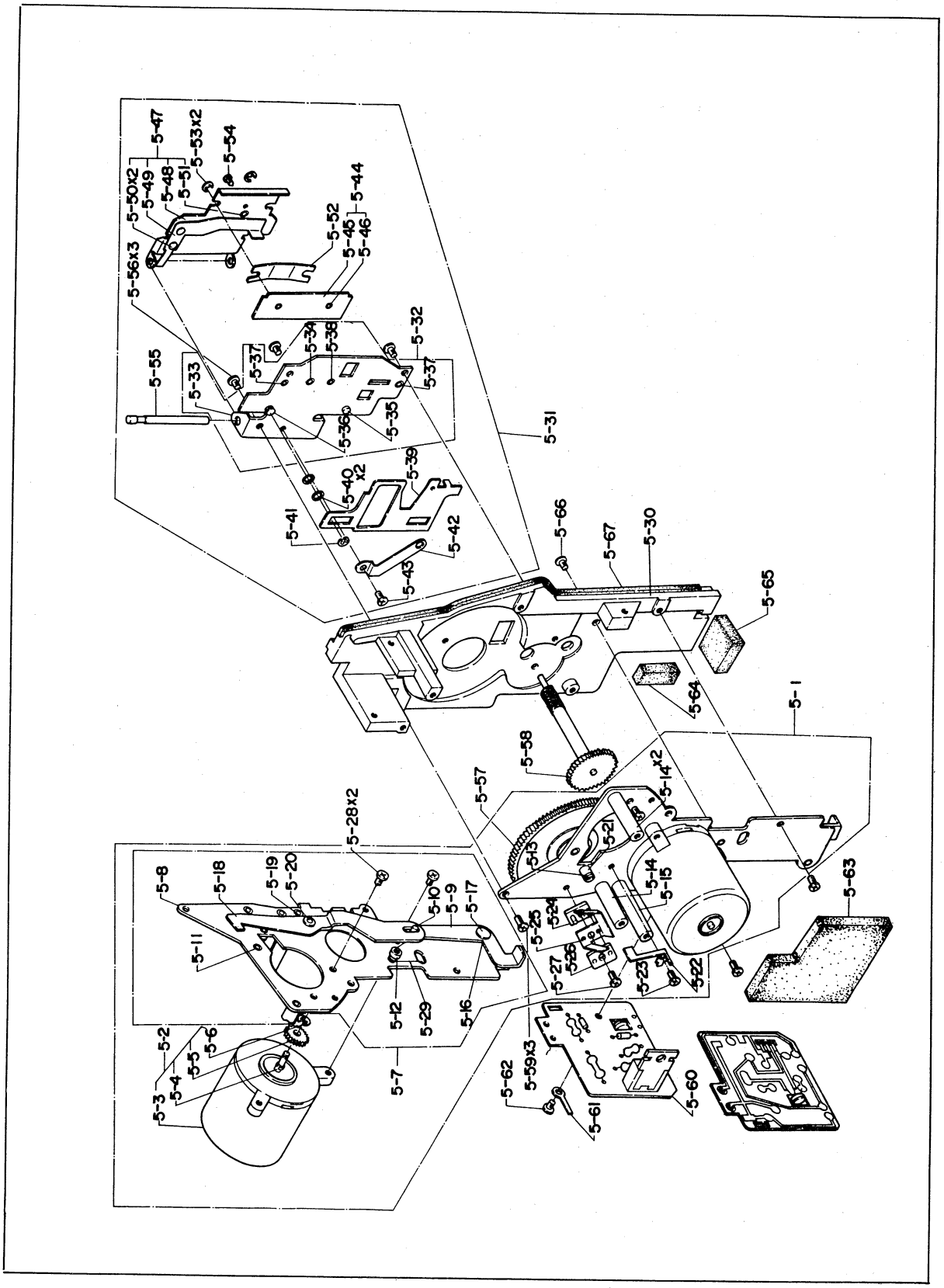
6. BASE PLATE ASSEMBLY (5–1)

a. The insulation tube (5—21) should be clean. When it is dirty with oil or other foreign matter, clean it with ether alcohol.

b. The contacts of the switch contact assembly (5—22) and contact assembly (5—25) should be clean. Clean them ether alcohol when needed.
When the contacts are dirty, the motor may not operate.

c. Check the levers (5—9 and 5—18) to insure that they are correctly reset by the spring (5—29).
When the levers do not reset correctly, the motor may not stop but turns continuously.

Fig. 8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5-3
5-7
5-62
5-59x3
5-61
5-60

7. REASSEMBLY AND ADJUSTMENT OF BASE PLATE ASSEMBLY (5–1), FRAME (5–30), FILM GATE ASSEMBLY (5–31) AND FOOTAGE COUNTER ASSEMBLY (6–1).

7 — 1 Reassembly

a. Install the film gate assembly (5—31) on the frame (5—30).

b. Apply Squalol oil L1 slightly to the shafts of the sectore gear assembly (5—57) and gear assembly (5—58). Slightly assply Squalol grease M4 to the portion of the sector gear assembly (5—57), to which the lever (5—18) comes into contact.

c. Place the trial angle cam of the sector gear assembly (5—57) into the square groove of the claw (5—39) of the film gate assembly.

d. Match the gear with the shaft holder of the base plate assembly (5—1) and assemble them.

e. Match the shaft of the gear assembly (5—58) to the shaft holder of the footage counter assembly (6—1), and install the footage counter assembly.

7 — 2 Adjusting switch

a. OFF

- The switch should be turned off when the lever (5—9) is in the reset position (condition prior to pushing the shutter release button).
- When the lever (5—9) is pushed once nad returned, the lever should engage with the sector gear assembly (5—57) first, and then the switch should be turned off.

b. ON

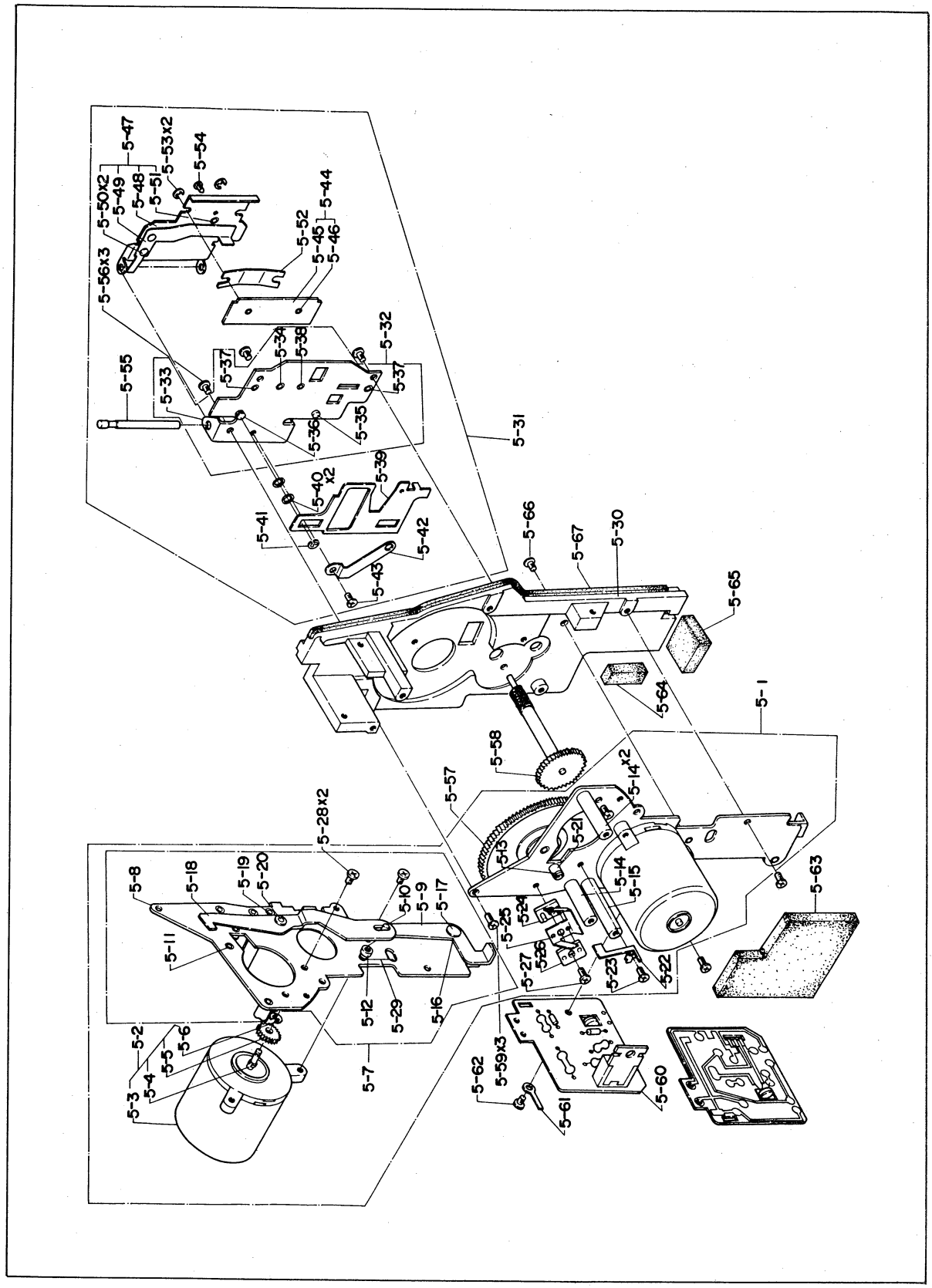
- When the lever (5—9) is pushed, the switch should be turned on before the lever runs away from the sector gear assembly (5—57).

c. Adjust the switch turning on and off timings with the eccentric pin (5—13).

d. Check the insulation tube (5—21) for its insulating function.
The insulation tube is of a heat-shrink type. Apply heated air to let it shrink.

NOTE: When ON-OFF timings of the switch are incorrect, the sector will not fully open (half-open) or friction currecnt will flow continuously.

Fig. 9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5-53x2
5-54
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5-36
5-31
5-39
5-40 x2
5-41
5-42
5-43
5-66
5-67
5-30
5-65
5-64
5-1
5-58
5-57
5-14x2
5-28x2
5-21
5-13
5-8
5-18
5-19
5-20
5-10
5-9
5-17
5-14
5-15
5-63
5-24
5-25
5-11
5-26
5-27
5-23
5-22
5-12
5-29
5-16
5-2
5-6
5-5
5-4
5-3
5-7
5-62
5-59x3
5-61
5-60

7 — 3 Checking pull down motor driving current and operating sound

a. Adjust position of the plate (6—5), and set motor driving current to the minimum.

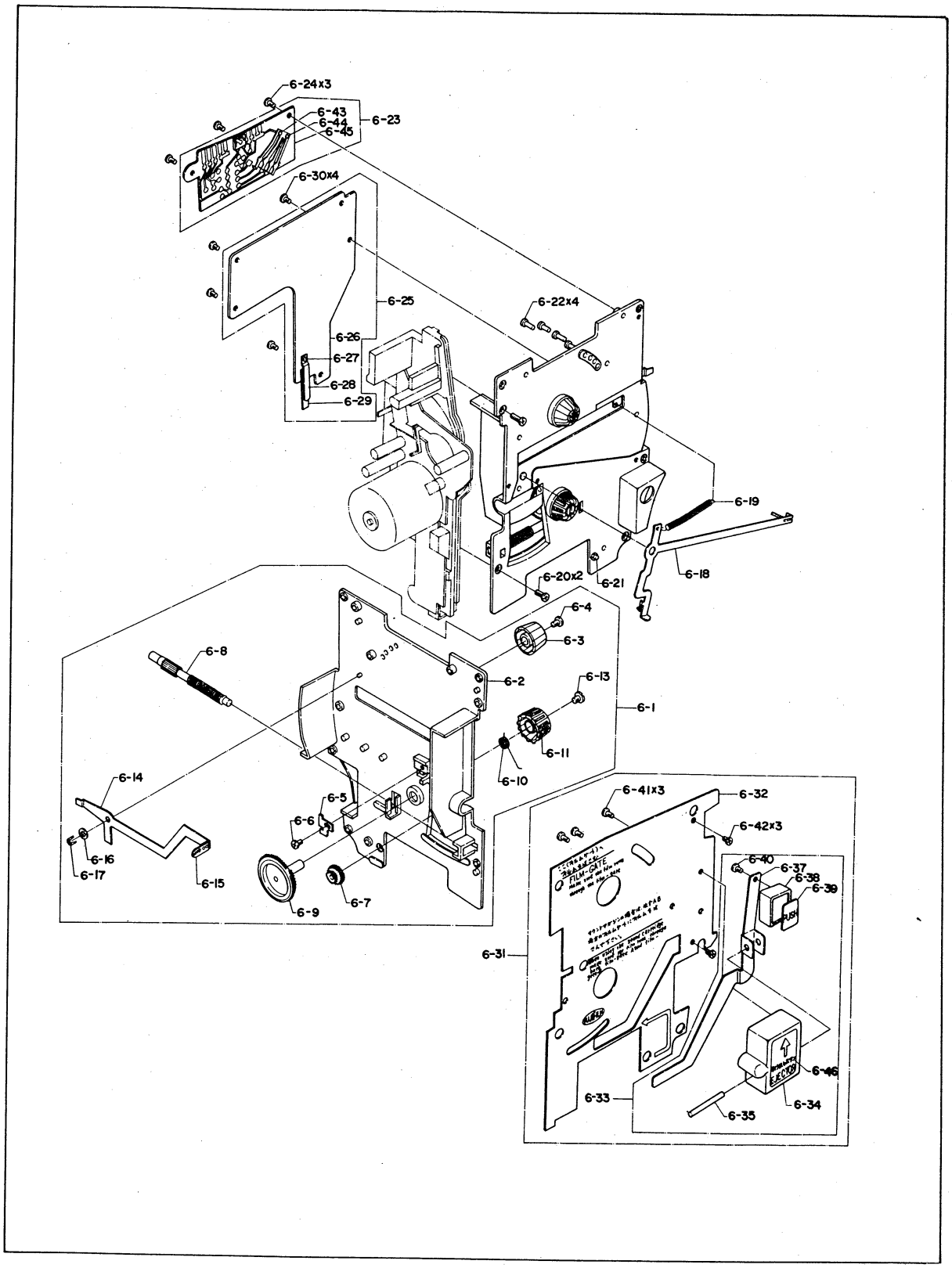
b. Check the shaft holding portion of the plate (6—5) for lubrication (with Squalol oil L1). When the shaft holding portion is properly lubricated and still abnormal operating sound occurs, clean the relative parts or replace them with new ones. Deformation of a part or existence of dust will cause abnormal operating sound.

7 — 4 Friction ring (5—4)

When spring force of this ring is too weak, correct filming speed will not be provided.

The standard filming speed: When transporting silent film: 19.5 to 21.0 FPS
When transporting sound film: 18±0.5 FPS

Fig. 10


6-24x3
6-43
6-44
6-45
6-23
6-30x4
6-25
6-22x4
6-26
6-27
6-28
6-29
6-19
6-18
6-20x2
6-21
6-4
6-3
6-8
6-2
6-13
6-1
6-11
6-10
6-14
6-5
6-6
6-16
6-17
6-15
6-9
6-7
6-41x3
6-32
6-42x3
6-40
6-37
6-38
6-39
6-31
6-46
6-33
6-34
6-35

8. SERVO MECHANISM

a. Check the contact pieces (4—27, 4—29 and 4—31) for cleanness.
These contact pieces should not be dirty.

b. Check the lock lever sssembly (4—20) to insure that it is moved by the spring (4—23).

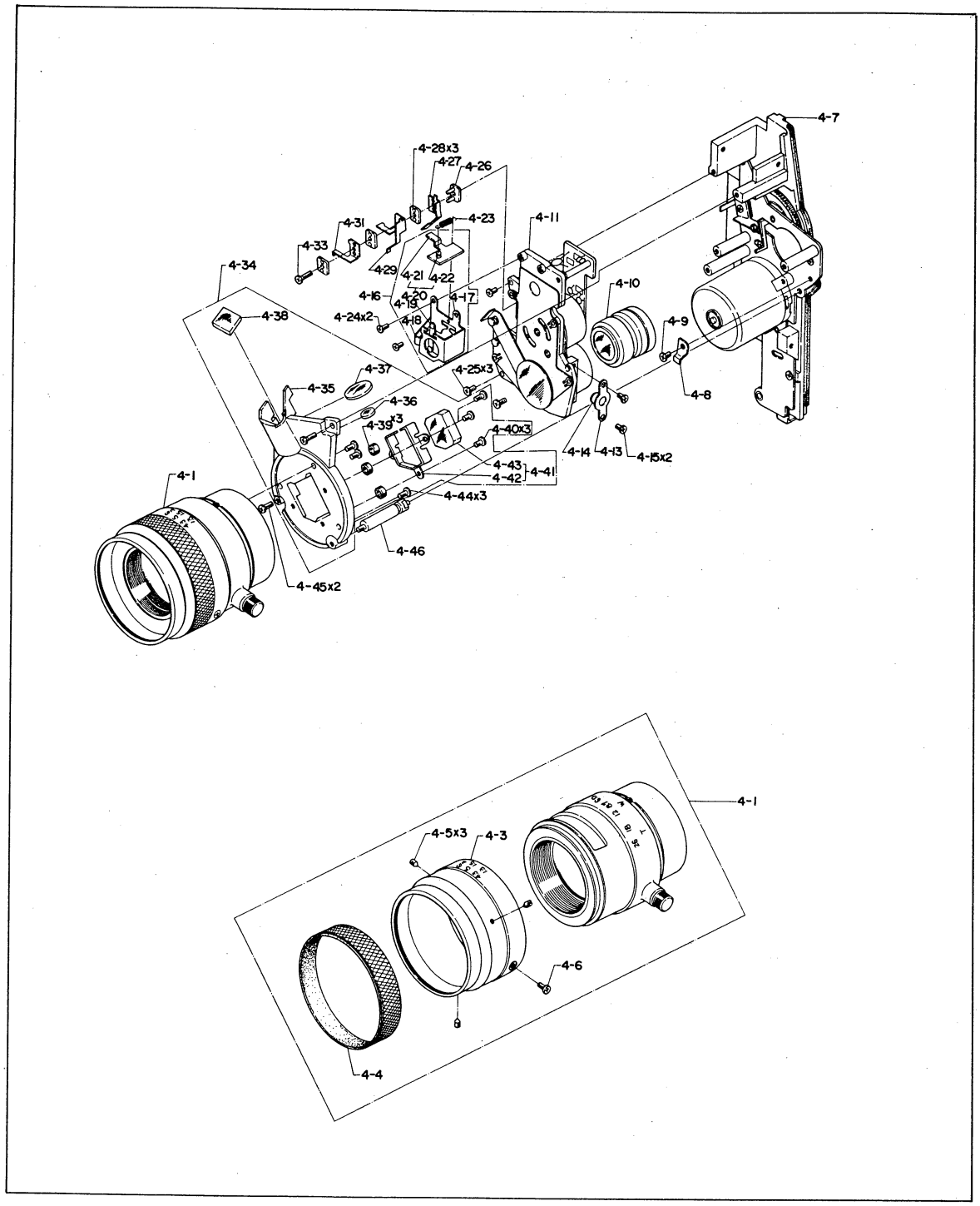
c. Match the sleeve (4—14) with the groove of the master lens assembly((4—10), and install the master lens assembly.

9. VIEWFINDER ASSEMBLY (4—34)

a. The half mirror assembly (4—41) has been so adjusted that the reflecting surface is correctly positioned against the optical axis. Do not touch the three screws (4—40).

b. Check the lenses (4—36 and 4—37) and mirror (4—38) to insure that they are securely installed with Araldite.

Fig. 11


4-7
4-28x3
4-27
4-26
4-31
4-23
4-11
4-33
4-34
4-29
4-21
4-22
4-10
4-16
4-20
4-17
4-19
4-9
4-24x2
4-18
4-38
4-25x3
4-37
4-35
4-8
4-36
4-39x3
4-40x3
4-14
4-13
4-15x2
4-43
4-41
4-42
4-1
4-44x3
4-46
4-45x2
4-1
4-5x3
4-3
4-6
4-4

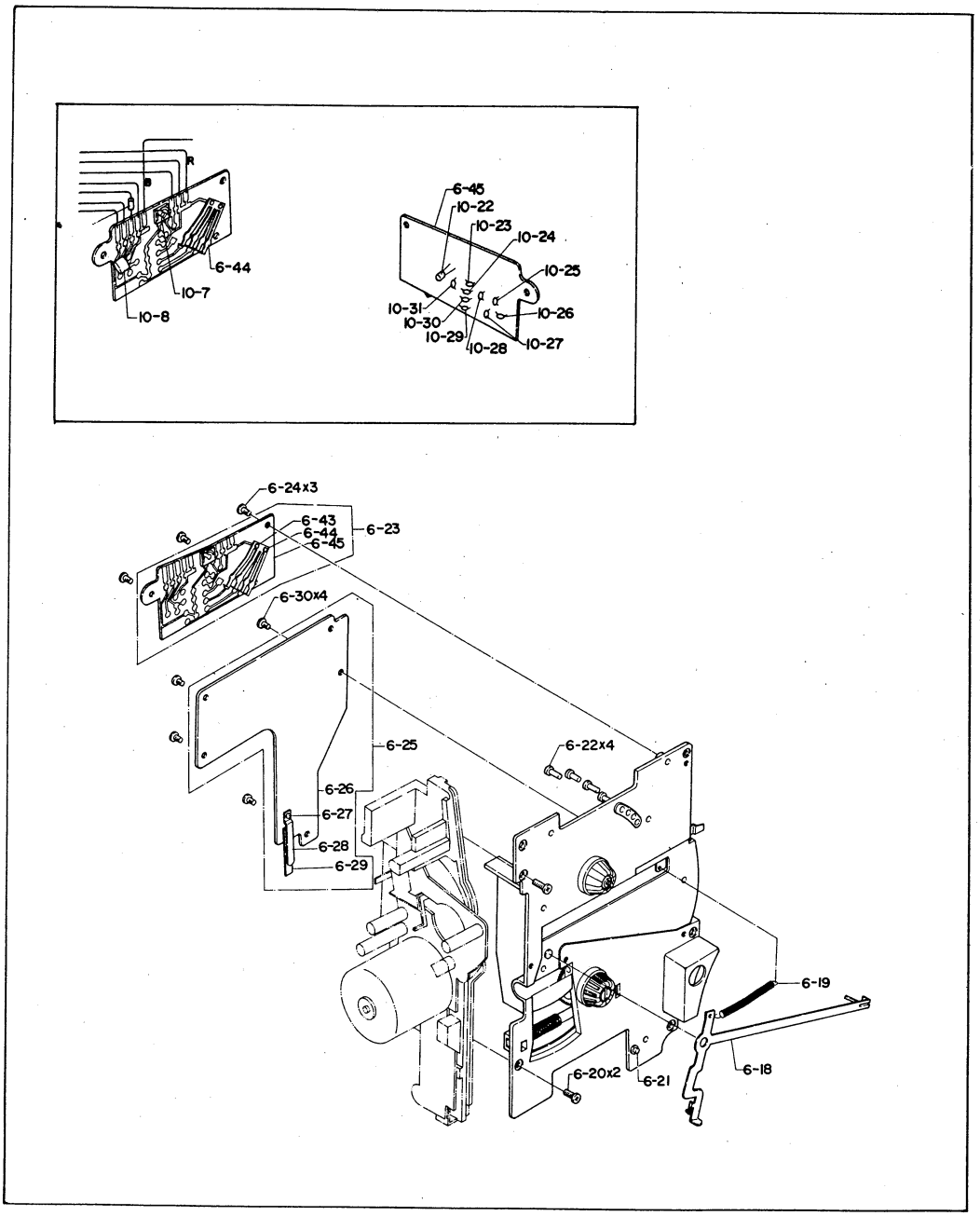
10. AUTOMATIC FILM SPEED SETTING CIRCUIT ASSEMBLY (6–23)

a. Make sure that the four film speed setting pins (6—22) reset correctly.

b. Push the film speed setting pins (6—22), and make sure that the switch turns on correctly.

c. Check that the contacts of the printed circuit board (6—45) and contact piece (6—44) are clean. (When they are dirty, clean them with ether alcohol.)

Fig. 12


6-44
10-7
10-8
6-45
10-22
10-23
10-24
10-25
10-26
10-27
10-28
10-29
10-30
10-31
6-24x3
6-43
6-44
6-45
6-23
6-30x4
6-25
6-26
6-27
6-28
6-29
6-22x4
6-19
6-18
6-21
6-20x2

11. AMPLIFIER CIRCUIT ASSEMBLY (6–25)

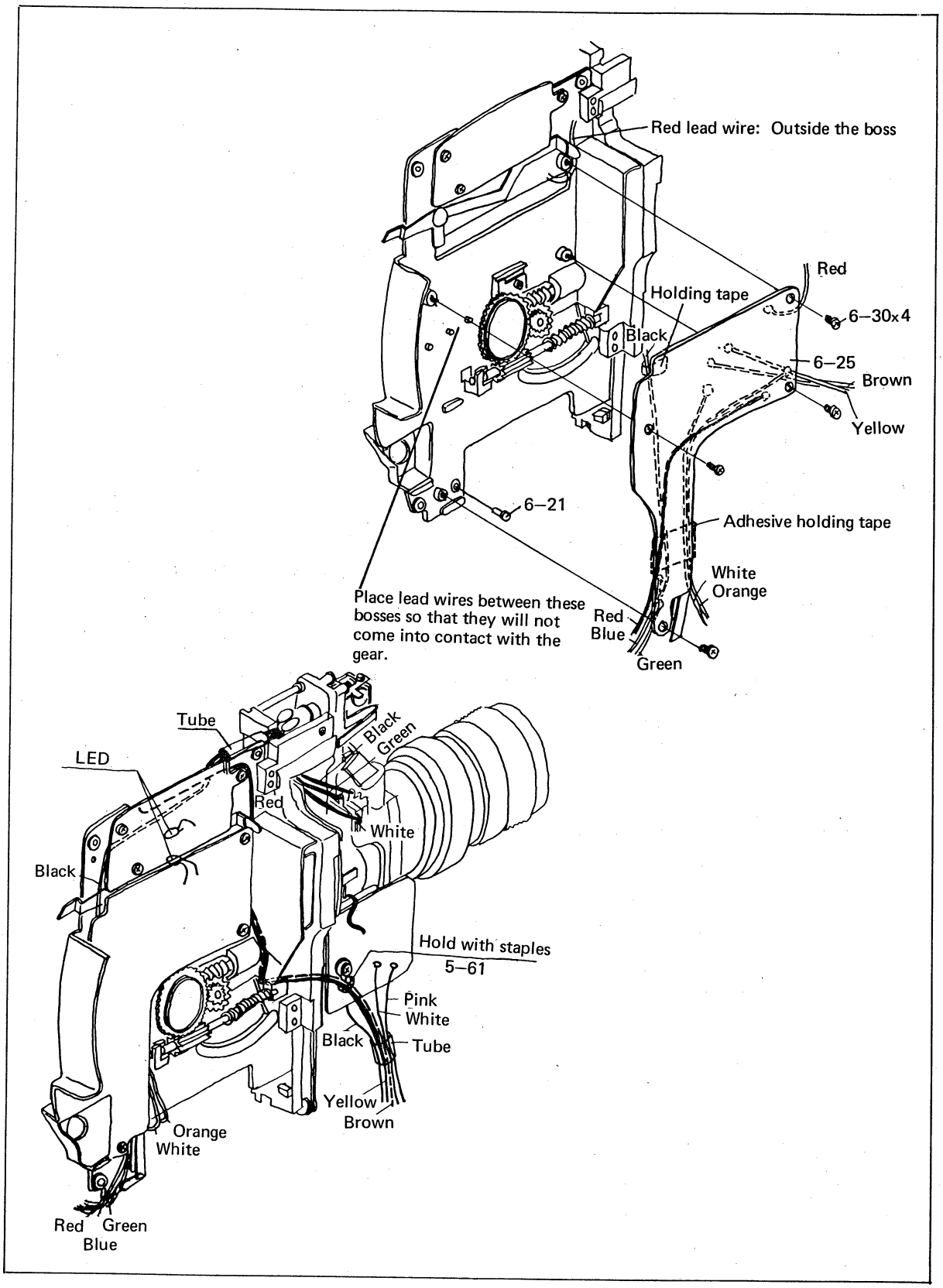
a. Align the lead wires as shown in Fig.13, apply pin (6—21), and install the amplifier circuit assembly.

b. Check the lever (6—14) to insure that it moves smoothly without any dragging.

c. Connect the lead wired and align them.

d. Push the pin (6—21) and make sure that the switch contacts (6—28 and 6—29) make. Check these switch contacts to insure that they break when the pin is free.

Fig. 13


Red lead wire: Outside the boss
Red
Holding tape
6–30x4
Black
6–25
Brown
Yellow
6–21
Adhesive holding tape
White
Orange
Red
Blue
Green
Place lead wires between these bosses so that they will not come into contact with the gear.
Tube
LED
Black
Green
Red
White
Black
Hold with staples
5–61
Pink
White
Black
Tube
Yellow
Brown
Orange
White
Red
Green
Blue

12. SOUND RECORDER MECHANISM ASSEMBLY (7–66)

12 – 1 Lubrication

a. The electrical parts of the recording head assembly, loop switch, recording switch, capstan shaft, pinch roller and flywheel driving belt in the sound recorder machanism assembly must be kept free from grease or oil sticking. Therefore, correct lubricant must be slightly applied to the correct parts.

b. Do not apply oil between the sensor (8—32) and shaft (8—33).

c. Slightly asppy Squalol grease M4 to the sliding portions of the parts other than the sensor, and make sure that they operate smoothly.

12 – 2 Operation

a. Push the lever (8—15) so that the lever (8—7) runs away.

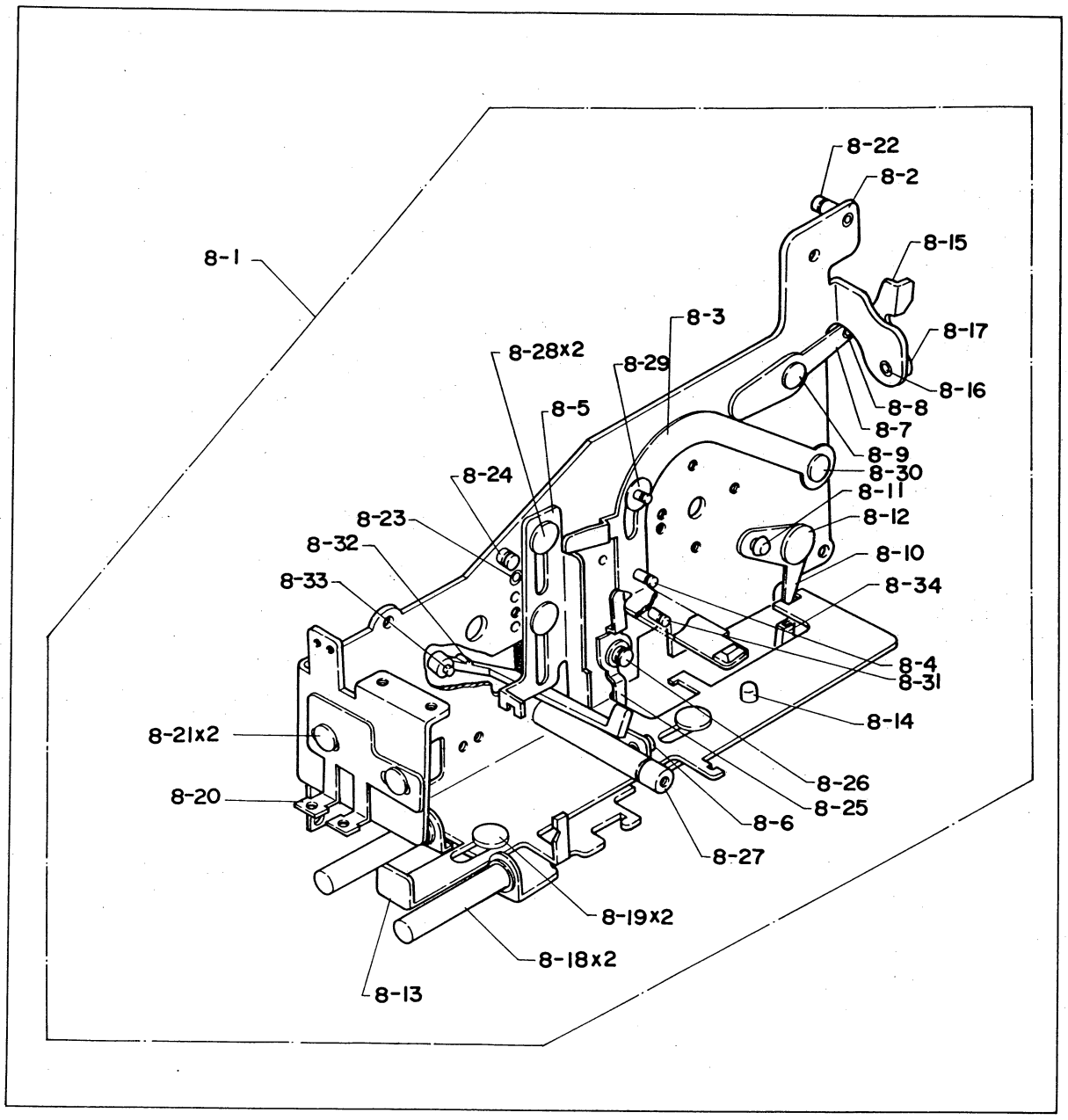
b. Push the shutter lever (8—13) and make sure that the lever (8—25) unhooks with the head pad lever (8—3) causing the film holder (7—42), head pad lever (8—3) and sensor (8—32) to move.

c. Push the lever (8—13) further, and make sure that the pinch roller lever assembly (7—8) moves and comes into contact with the capstan shaft (7—48).

d. Reset the shutter lever, and make sure that the pinch roller lever assembly resets.

d. Reset the lever (8—15), and make sure that the head pad lever, sensor and film holder resets causing the film passing channel to open.

Fig. 14


8-1
8-22
8-2
8-15
8-3
8-17
8-28x2
8-29
8-16
8-5
8-8
8-7
8-9
8-24
8-30
8-11
8-23
8-12
8-32
8-10
8-33
8-34
8-4
8-31
8-14
8-21x2
8-26
8-20
8-25
8-6
8-27
8-19x2
8-18x2
8-13

12 — 3 Flywheel (capstan shaft)

a. Make sure that the shaft is straight having no eccentricity.

b. Check the flywheel for dynamic balance. It should be 2 gr-cm or less.

c. Check the capstan shaft (7—48) to insure that it is held securely and tightly by the shaft holders (7—67 and 7—28) of the holder assembly (7—63), and that it turns smoothly.

d. The shaft holders of the holder assemblyare impregnated with oil. Do not wash them.

e. When the flywheel does not turn smoothly, replace the relative parts.

f. Check the groove to insure that no scar, cavity or other defective condition exists.

12 — 4 Pinch roller lever assembly

a. Check the pinch roller to insure that it contacts with the capstan shaft evenly.

b. Measure and insure that pressure of the pinch roller is 400 to 500 gr.

c. To adjust pressure of the pinch roller, the lever (7—9) may be bent.

d. Make sure that the pinch roller (7—12) is not scarred or deformed.

e. Do not make the pinch roller dirty with oil, grease or other foreign matter.

f. Make sure that the pinch roller turns smoothly having no eccentricity.

Fig. 15

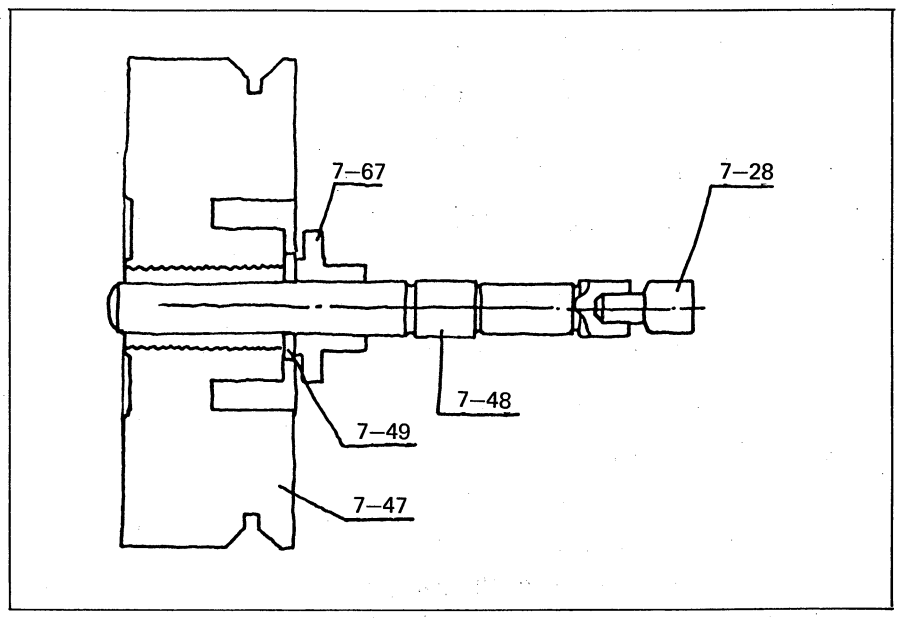
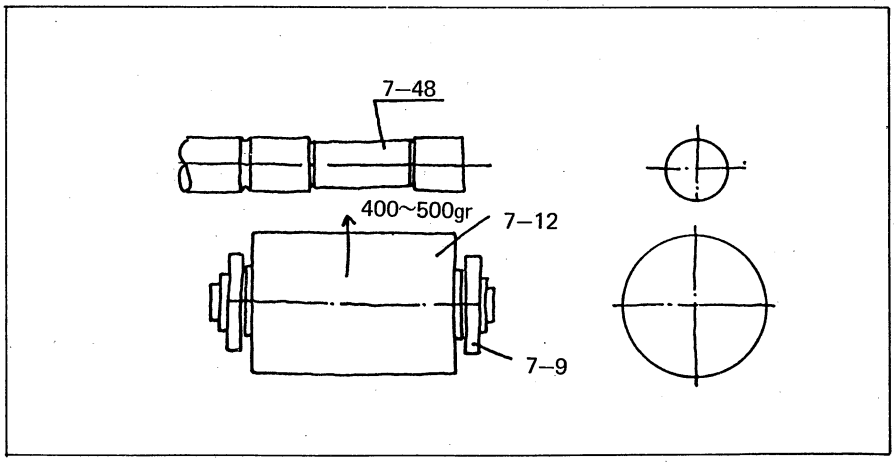


Fig. 16



12 — 5 Film holder (7—42)

a. Check the film holder to insure that it contacts with the head holder evenly.

b. Check the film transporting channel and insure that film is not cut or does not oscillate in the transporting channel. (The rated film transporting channel gap is 0.2mm.)

c. Make sure that film is held by the film holder with approximately 150 gram pressure.

d. The portion "A" (oblique-lined) of the film holder should be finished to be smooth by means of buffing.

12 — 6 Head pad (7—16)

a. Check the head pad to insure that it is pushed against the head in pressure of approximately 45 grams.

b. Check the head pad to insure that it comes into contact with the head evenly and it is centered correctly against the head. (One sided contact or deviation of the center are not permitted.)

c. Check the head pad (7—16) to insure that it is not damaged or deformed. When replacing the head pad, install it with Pliobond.

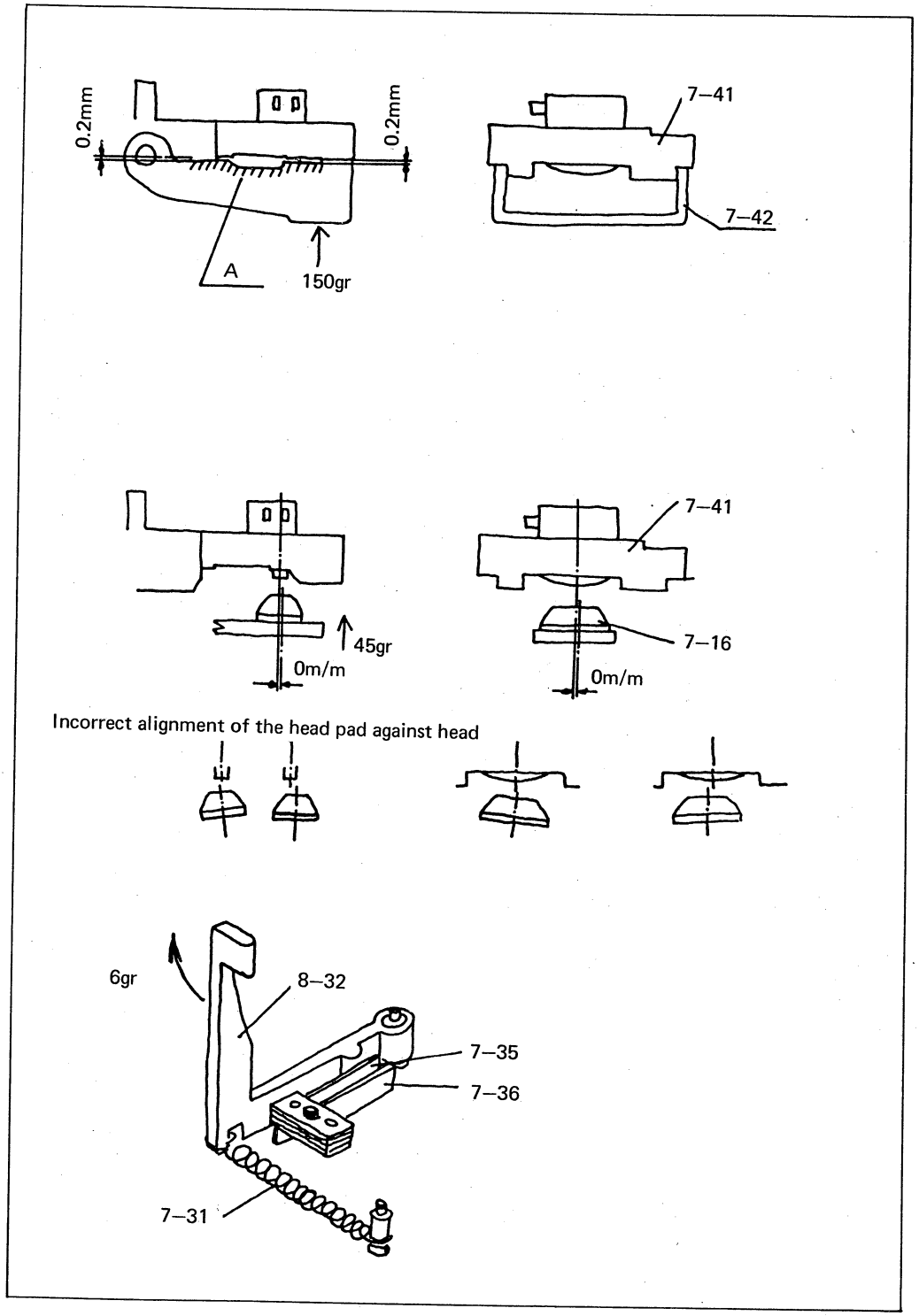
d. Check the head pad for cleanness.

12 — 7 Sensor (8—32)

a. Check the sensor to insure that it is caused to operate with a pressure of 6 grams, causing the loop switch to turn on and off.
When pressure of the sensor is incorrect, replace the spring (7—31) with a proper one.

b. Make sure that the surface of the sensor to which the film comes into contact is not scarred, dirty or deformed.

Fig. 17


0.2mm
0.2mm
A
150gr
7–41
7–42
45gr
0m/m
7–41
7–16
0m/m
Incorrect alignment of the head pad against head
6gr
8–32
7–35
7–36
7–31

12 — 8 Position of the recording head

a. Make sure that the recording head is positioned in the center of and in parallel to the sound track of film without any tilting.

b. Make sure that height of the film gate assembly is the same as film guide of the head assembly, and that film is transported straight in parallel to the head.

c. Make sure that the metal portion of the head is not scarred or damaged.

12 — 9 Belt (7—50)

a. Make sure that the belt is spplied to the V-grooves of the motor (7—32) pulley and flywheel (7—47) correctly, and that the belt is not twisted.

b. Make sure that width and height of the belt are even toward the entire belt loop, and that the belt is not damaged.

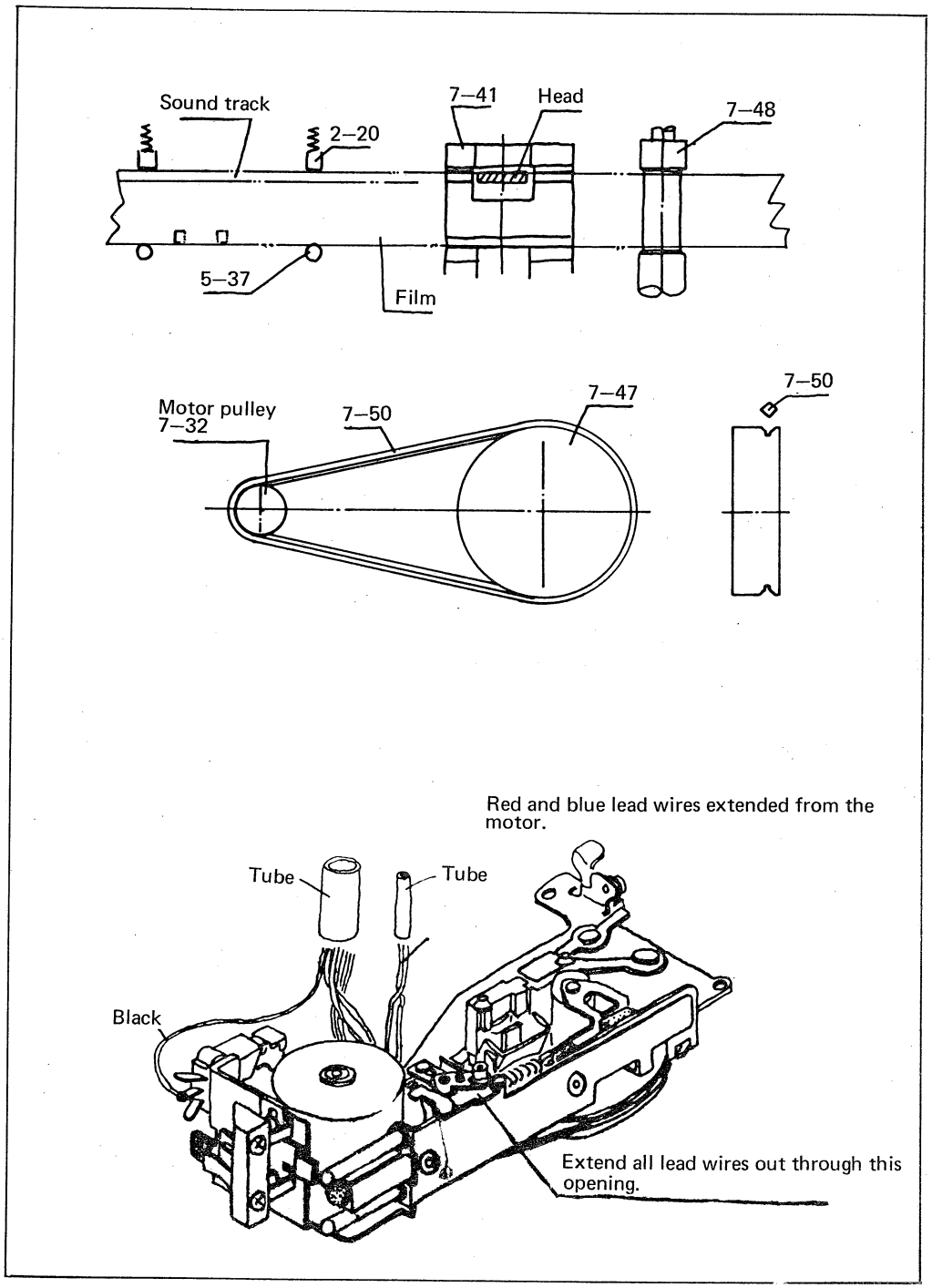
c. Be careful to keep the belt clean. Oil or grease should not stick on the belt.

12 — 10 Wiring and arrangement of lead wire

a. Check each lead wire terminal for soldering and insulation.

b. Align the lead wires as shown in Fig.18.

Fig. 18


Sound track
2–20
7–41
Head
7–48
5–37
Film
Motor pulley
7–32
7–50
7–47
7–50
Red and blue lead wires extended from the motor.
Tube
Tube
Black
Extend all lead wires out through this opening.

13. GRIP ASSEMBLY

13 — 1 Operation

a. Pull down the knob (9—7) and see if the grip can be folded.

b. Stretch the grip, and make sure that it clicks correctly.

c. When the grip does not click correctly, replace the lock pin(9—6), spring (9—5) or stopper (9—4).

13 — 2 Lubrication

a. Slightly apply Squalol grease M4 to the spring (9—5) and lock pin (9—6).

b. Slightly apply Squalol grease M4 to the O-ring (9—15).

13 — 3 Installing parts with adhesive

a. Install the name plate (9—13), moquette (9—14) and two plates (9—18) with Pliobond.

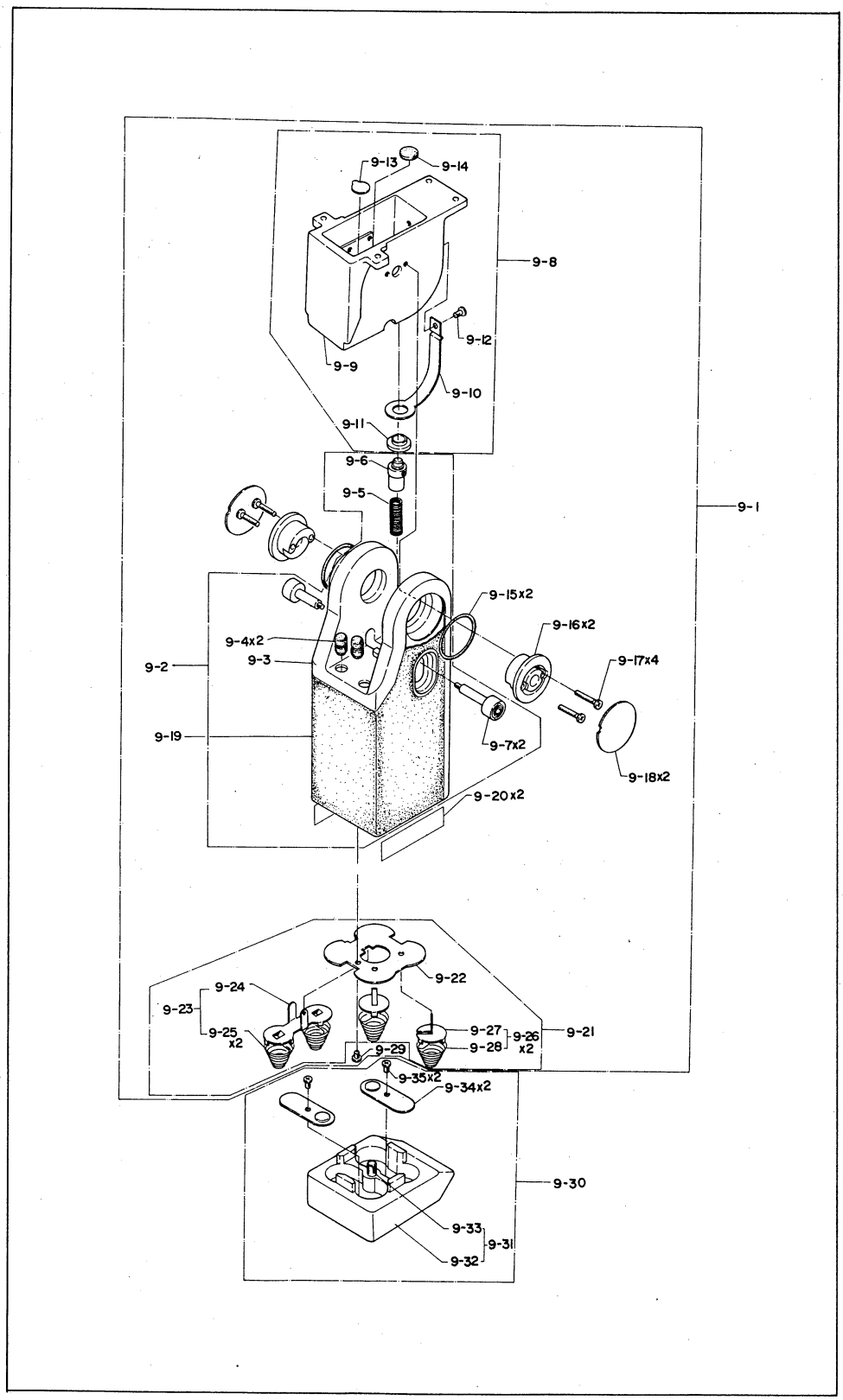
b. Install the leather (9—19) with Pliobond.

13 — 4 Battery contacts

a. Make sure that the contact assembly (9—23), two contact assemblies (9—26) and two contact pieces (9—34) are not corroded or dirty.

b. Make sure that the lead wired are soldered correctly and extended to the opposite terminals through the opening on the gip base (9—9).

Fig. 19


9-13
9-14
9-8
9-12
9-9
9-10
9-11
9-6
9-5
9-1
9-15x2
9-16x2
9-4x2
9-3
9-2
9-17x4
9-19
9-7x2
9-18x2
9-20x2
9-22
9-24
9-23
9-25 x2
9-27
9-26 x2
9-21
9-28
9-29
9-35x2
9-34x2
9-30
9-33
9-31
9-32

14. INSTALLING SOUND RECORDER MECHANISM ASSEMBLY

a. Apply Squalol grease M4 to the leaf spring (3—2).

b. Insert the shaft (7—52) into the shutter release button (7—51), and install the shutter release button on the sound recorder mechanism assembly (7—66).

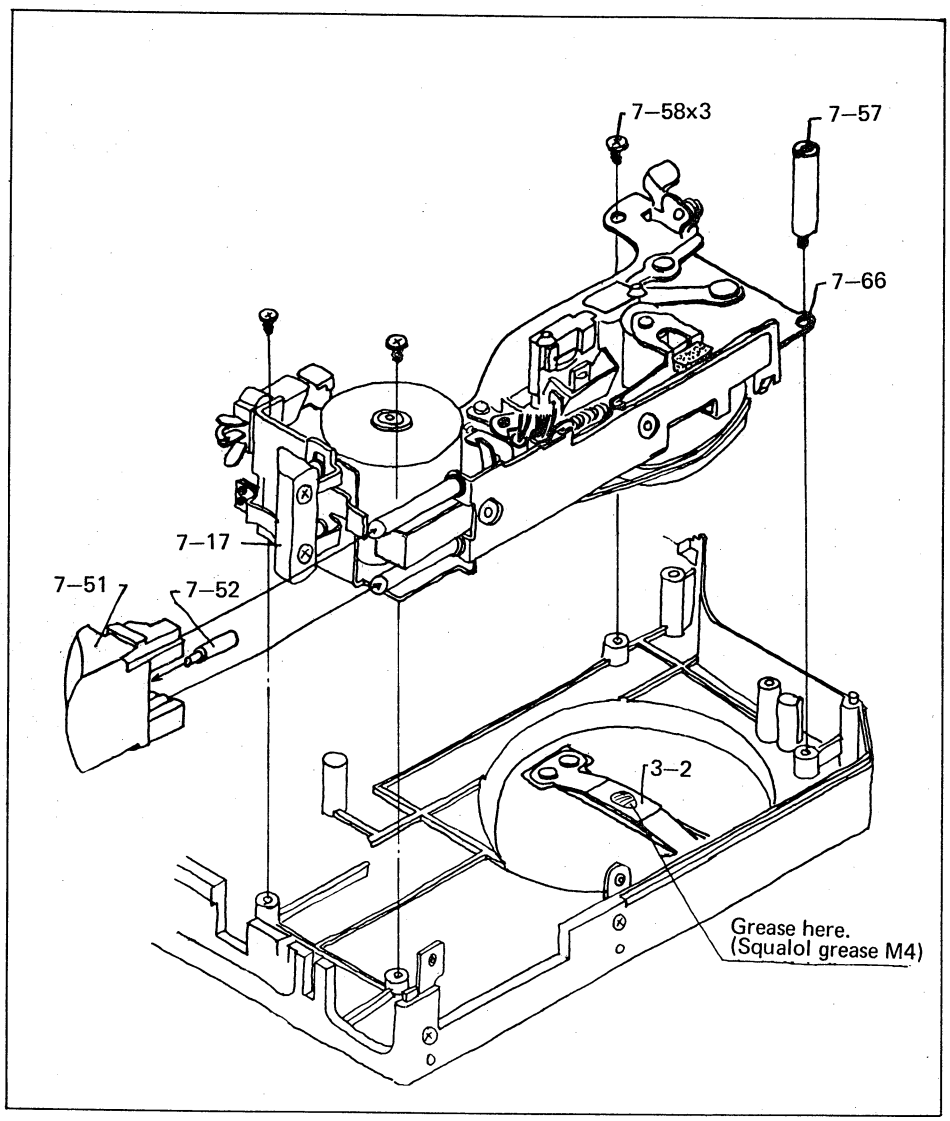
c. Install the sound recorder mechamism assembly on the side frame (3—1) with care exercised on the flywheel.

d. Secure the sound recorder mechanism assembly on the side frame with three screws (7—58) and column (7—57).

e. Push the shutter release button (7—51) and insure that it moves smoothly without dragging on the side frame.

f. Check the run-lock selector button (7—17) to insure that it moves smoothly without dragging on the side frame.

Fig. 20



15. INSTALLING FILM TRANSPORTING MECHANISM ASSEMBLY (BASE PLATE ASSEMBLY (5–1), FRAME (5–30), FILM GATE ASSEMBLY (5–31) AND FOOTAGE COUNTER ASSEMBLY (6–1))

a. Place this whole assembly into the side frame (3—1) carefully so that each lever does not come into contact with the side frame.

b. Fit the EE lock lever (3—27) into the groove on the side frame.

c. Secure the whole assembly with six screws (2—34).

NOTE: One of these six screws is to be tightened at the side of the opening for the EE lock lever (3—27).

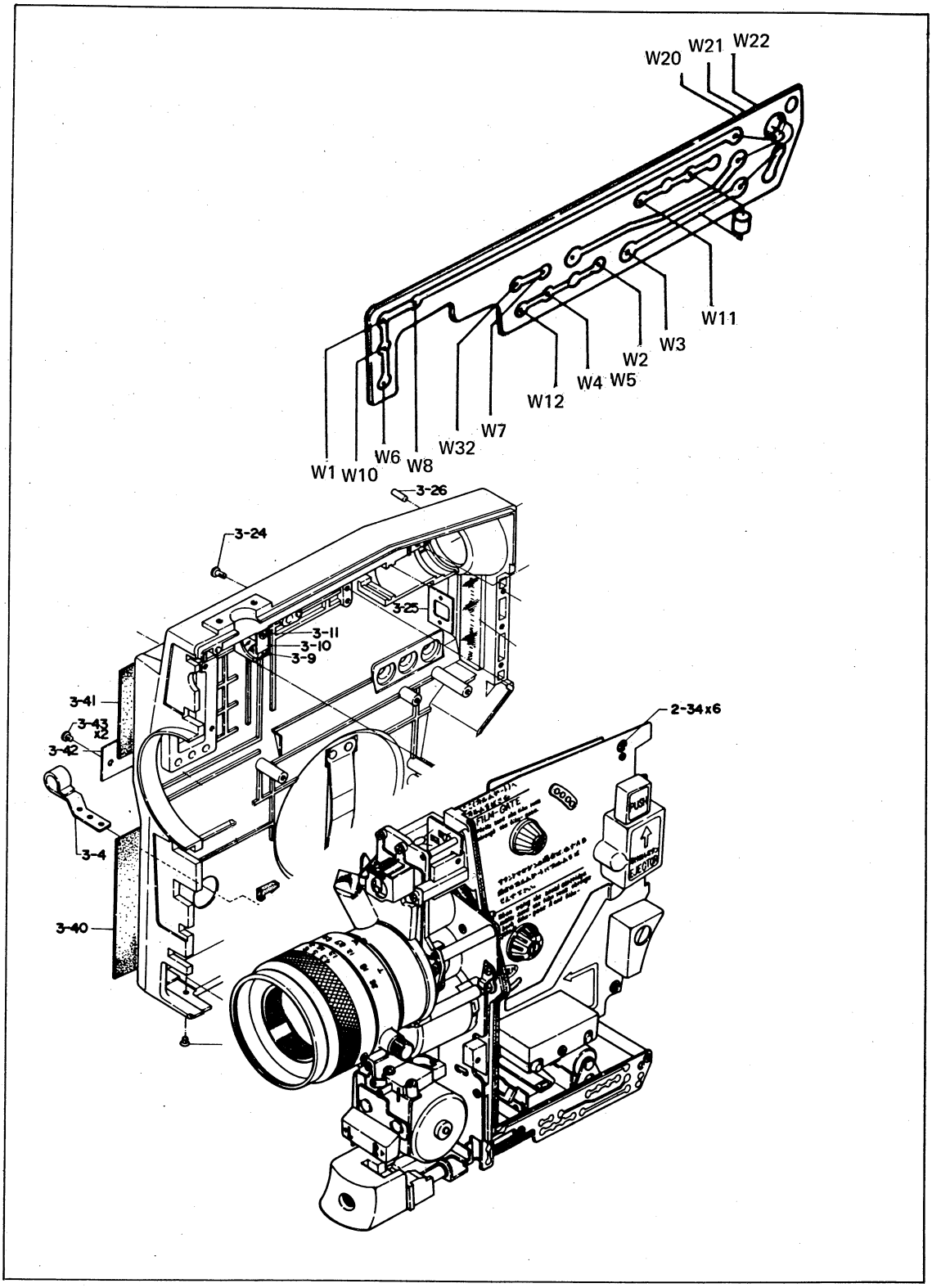
16. INSTALLATION AND WIRING OF PRINTED CIRCUIT BOARD (7–59)

a. Install the printed circuit board with two screws (7—60).

b. Connect the lead wires (W1, W10, W6, W8, W32, W7, W12, W14, W5, W2, W3, W11, W20, W21 and W22) correctly by soldering.

c. Extend the lead wires through the notched portion on the printed circuit board.

Fig. 21


W20
W21
W22
W11
W3
W2
W4
W5
W12
W7
W32
W6
W8
W1
W10
3-26
3-24
3-25
3-11
3-10
3-9
3-41
3-43
x2
3-42
3-4
3-40
2-34x6
PUSH

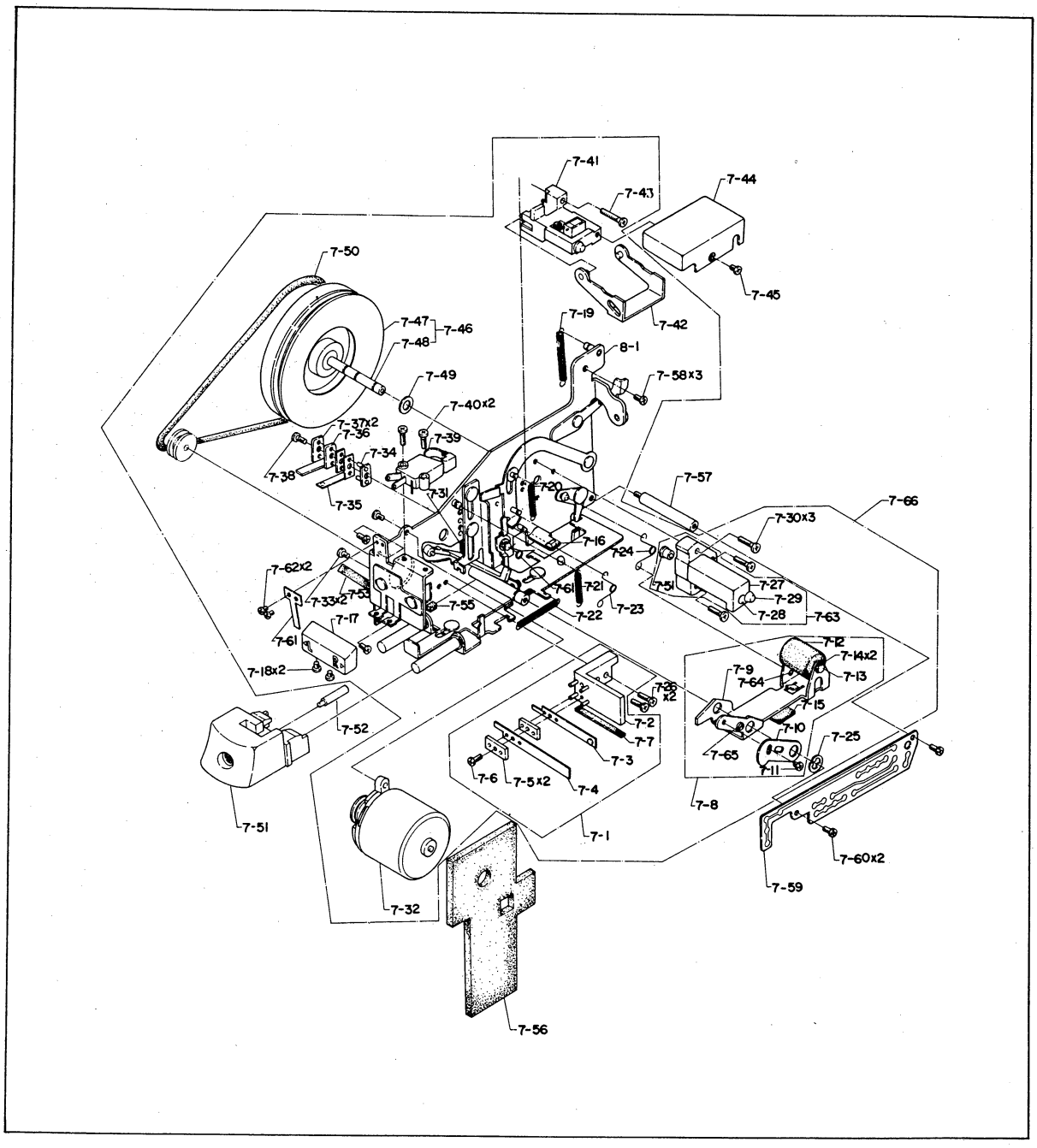
17. ADJUSTMENTS OF DRIVE MOTOR SWITCH, EE CIRCUIT SWITCH, PINCH ROLLER AND FILM PULL DOWN CLAW OPERATING TIMINGS.

a. Push the pin (6—21) first and then push the shutter release button (7—51). Check the aperture blade to see if it moves or not, and thus, insure that the EE circuit switch built in the switch assembly (7—1) has turned on.
Next, check the capstan shaft (7—48) to see if it turns or not, and thus, insure that the drive motor switch built in the switch assembly (7—1) has turned on causing the drive motor (7—32) to turn.
The operating timings are normal when the switch assembly (7—1) turns on sufficiently before the pinch roller (7—12) comes into contact with the capstan shaft (7—48).

b. Lock the run-lock button, depress the shutter release button, and make sure that the switch assembly (7—1) does not turn on.

c. Adjust the eccentric pin (7—65) so that the film claw operated as soon as the pinch roller (7—12) comes into contact with the capstan shaft (7—48).

Fig. 22


7-41
7-43
7-44
7-45
7-50
7-47
7-46
7-48
7-49
7-40x2
7-37x2
7-36
7-39
7-34
7-38
7-35
7-31
7-42
7-19
8-1
7-58x3
7-57
7-66
7-30x3
7-20
7-16
7-24
7-51
7-27
7-29
7-28
7-63
7-62x2
7-33x2
7-53
7-55
7-61
7-21
7-22
7-23
7-17
7-61
7-18x2
7-52
7-51
7-12
7-14x2
7-13
7-9
7-64
7-15
7-10
7-65
7-11
7-25
7-8
7-60x2
7-59
7-35 x2
7-2
7-7
7-3
7-6
7-5x2
7-4
7-1
7-32
7-56

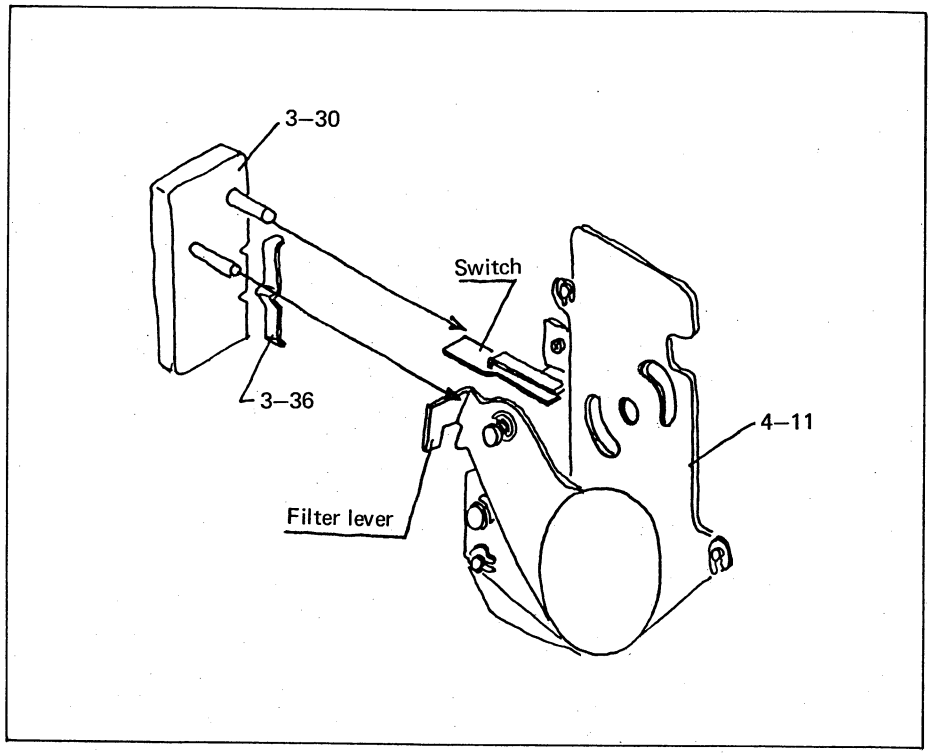
18. INSTALLING FILTER SELECTOR ASSEMBLY (3–29)

a. Match the filter lever and switch contact with the legs on the filter selector lever (3—30), and combine the filter selector lever with the servo mechanism assembly (4—11).

b. Make sure that:

- The click spring (3—36) effects correctly.
- The filter comes into the position in front of the aperture blade when the filter selector lever is moved to the side for application of the filter.
- The switch is separated from the leg on the filter selector lever and the switch turns on.

Fig. 23



19. ADJUSTMENT OF PARALLAX

a. Use a parallax adjuster.

b. Set the focusing ring to "1.3m", fully open the aperture (use EE lock), and set the zooming ring to "26mm".

c. Adjust a vertical deviation by moving the lens frame assembly (3—20) vertically.

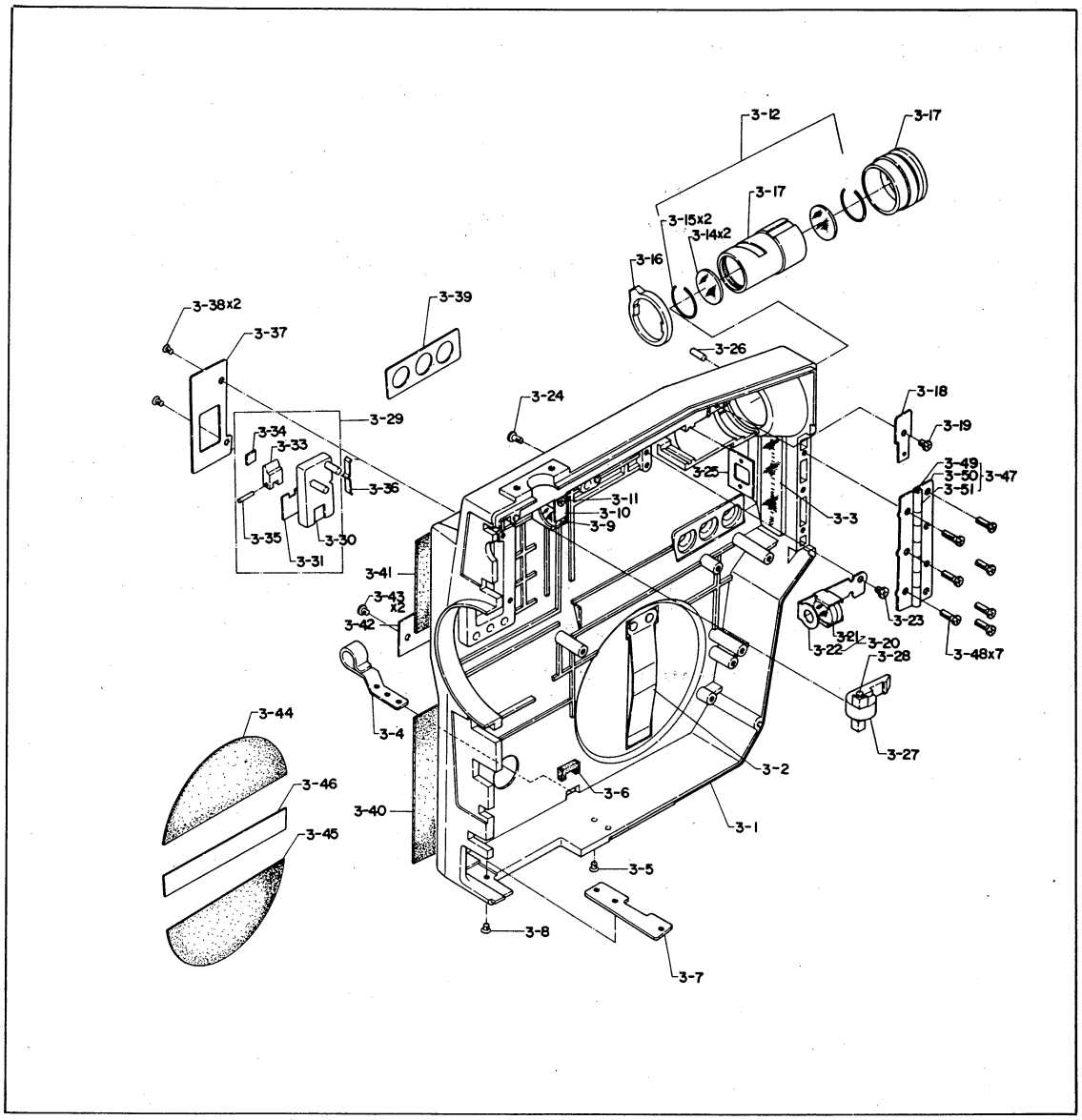
d. Adjust a horizontal deviation with the screw (3—24).

NOTE: a. When the lenses (3—9 and 3—21) is floated or tilted, one side of the viewfinder will be blurred.
When these lenses are normal and yet one side of the viewfinder is blurred, replace the viewifnder assembly (4—34) with a new one.

b. Check the viewfinder frame (3—25) to insure that it is not floated or tilted.

e. When adjusting parallax, remove the main name plate (3—42), and use the repairing tool through the opening covered by the main name plate.

Fig. 24


3-12
3-17
3-17
3-15x2
3-14x2
3-16
3-38x2
3-39
3-37
3-26
3-24
3-18
3-19
3-29
3-34
3-33
3-25
3-49
3-50
3-51
3-47
3-36
3-11
3-10
3-9
3-3
3-35
3-30
3-31
3-41
3-43
x2
3-42
3-23
3-22
3-21
3-20
3-28
3-48x7
3-44
3-4
3-27
3-46
3-2
3-40
3-6
3-1
3-45
3-5
3-8
3-7

20. ADJUSTMENT OF FOCUS

a. Fully open the aperture and apply EE lock.

b. Set the focusing ring to "∞" and zooming ring to 26mm.

c. Use a collimater.

d. With the film being transported, move the master lens and adjust focus. Deviation of focus should be within ±0.015mm.

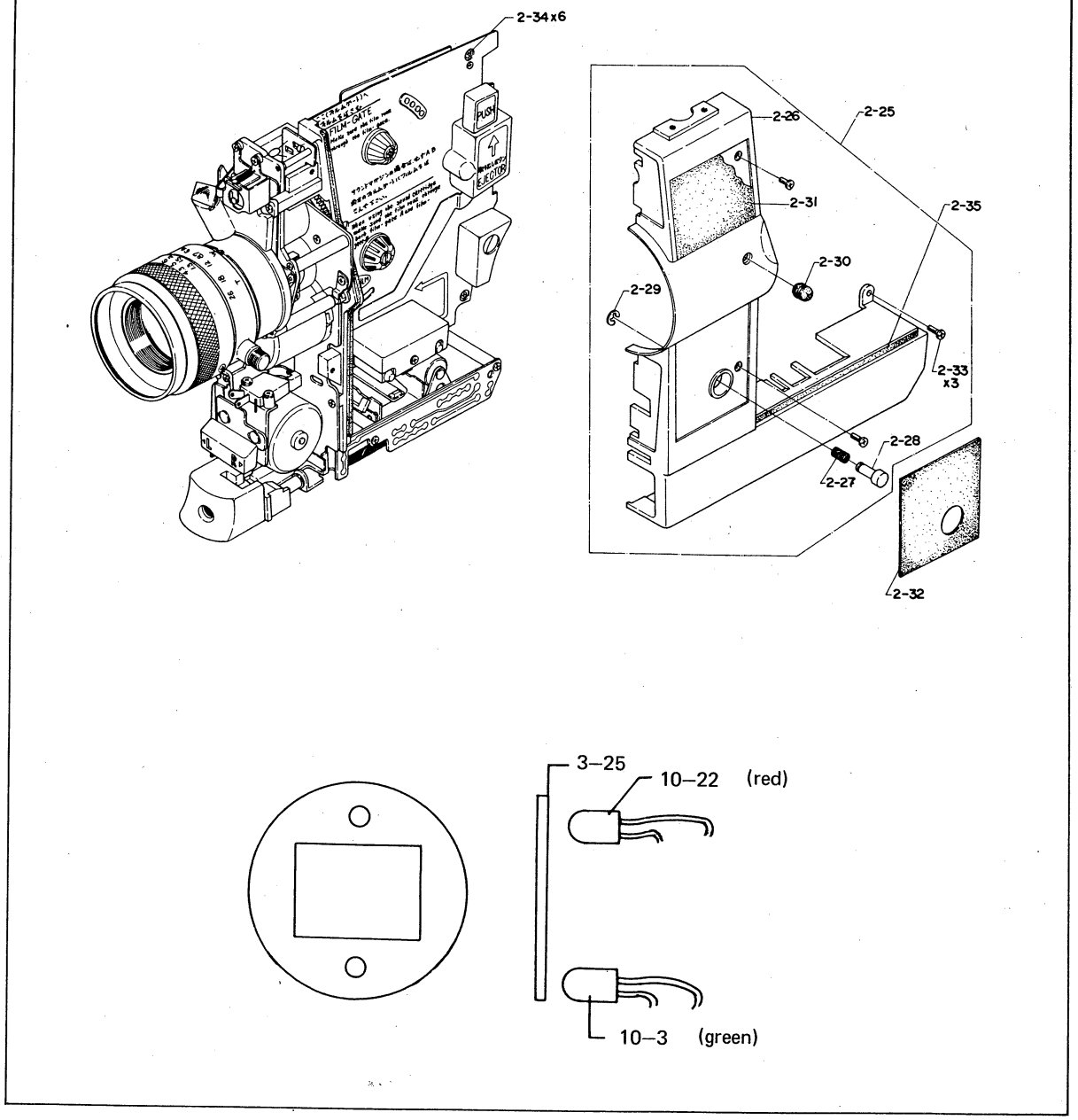
e. When adjustment is needed, use the repair tool through the opening after removing the plug (2—30).

21. ADJUSTMENTS OF LEDS FOR UNDEREXPOSURE WARNING AND RECORDING SIGNAL/BATTERY CHECKER

a. Properly bend the pin plugs (legs) of the LEDs (10—3 and 10—22) to adjust their positions against the small round windows seen in the viewfinder so that their red and green lights fully cover the small roung windows.

b. Perform these adjustments through the opening covered by the main name plete (3—42).

Fig. 25


2-34x6
2-26
2-25
2-31
2-35
2-30
2-29
2-33
x3
2-28
2-27
2-32
3–25
10–22 (red)
10–3 (green)

22. ADJUSTMENT OF EXPOSURE

Make sure that voltage of the battery is 5.5V or higher.

Set the filter selector so that no filter is applied.

Adjust the variable resistor (10—7) so that the values shown in the following table are satisfied.

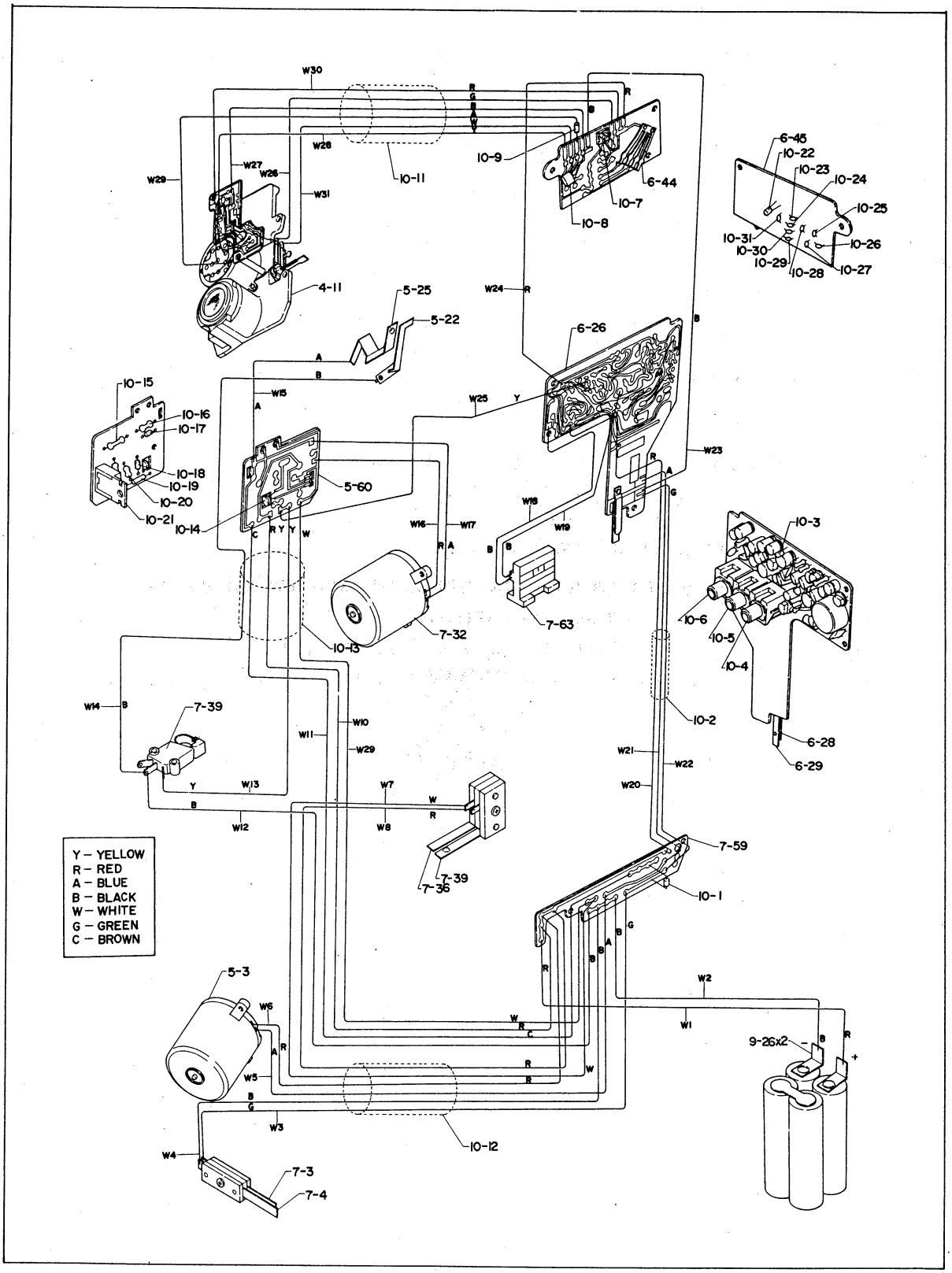
ASA	LIGHT SOURCE			RATED EXPOSURE	
25	Low luminosity	625rlx	(equivalent to F:2.8)	4.3lx to 10.8lx	±2/3
	Meduum luminosity	2,500rlx	(equivalent to F:5.6)	Same as above	±2/3
	High luminosity	10,000rlx	(equivalent to F:11)	Same as above	±2/3
200	Super low luminosity	78.1rlx	(equivalent to F:2.8)	0.54 to 1.35lx	±2/3
	Low luminosity	625rlx	(equivalent to F:8)	Same as above	±2/3
	Medium luminosity	2,500rlx	(equivalent to F:16)	0.54 to 1.35lx	±2/3
	High luminosity	10,000rlx	(equivalent to F:32)	0.43 to 1.70lx	±1

22 — 1 When exposure cannot be adjusted:

a. Check the servo mechanism assembly (4—11) to insure that it operates correctly. When the servo mechanism assembly does not operate, check the ASA printed circuit board and servo mechanism circuit. When these circuits are normal, replace the servo mechanism assembly with a new assembly.

b. When exposure cannot be adjusted through the method described in 22.1-a above, check ASA resistance and filter compensating resistance. When these resistances are normal, replace the servo mechanism assembly with a new one.

Fig. 26


Y – YELLOW
R – RED
A – BLUE
B – BLACK
W – WHITE
G – GREEN
C – BROWN
W30
W29
W28
W27
W26
W31
10-11
10-9
6-44
10-7
10-8
6-45
10-22
10-23
10-24
10-25
10-31
10-30
10-29
10-28
10-27
10-26
4-11
5-25
5-22
W24
6-26
10-15
10-16
10-17
10-18
10-19
10-20
10-21
10-14
W15
W25
5-60
W23
W16
W17
W18
W19
7-63
10-3
10-6
10-5
10-4
7-32
10-13
W14
7-39
W10
W11
W29
W13
W7
W8
W12
W21
W22
W20
6-28
6-29
10-2
7-59
10-1
7-39
7-36
5-3
W6
W5
W3
W4
7-3
7-4
10-12
W2
W1
9-26x2

22 — 2 Resistances for automatic film speed setign circuit assembly

Resistances across terminals (A) and (B) for the individual film speeds should be as indicated below:

ASA	Resistance
25	5.3 to 6.5kΩ
50	7.5 to 9.2kΩ
100	10.9 to 13.4kΩ
200	16.3 to 19.9kΩ
400	24.3 to 29.7kΩ

22 — 3 Filter compensating resistances

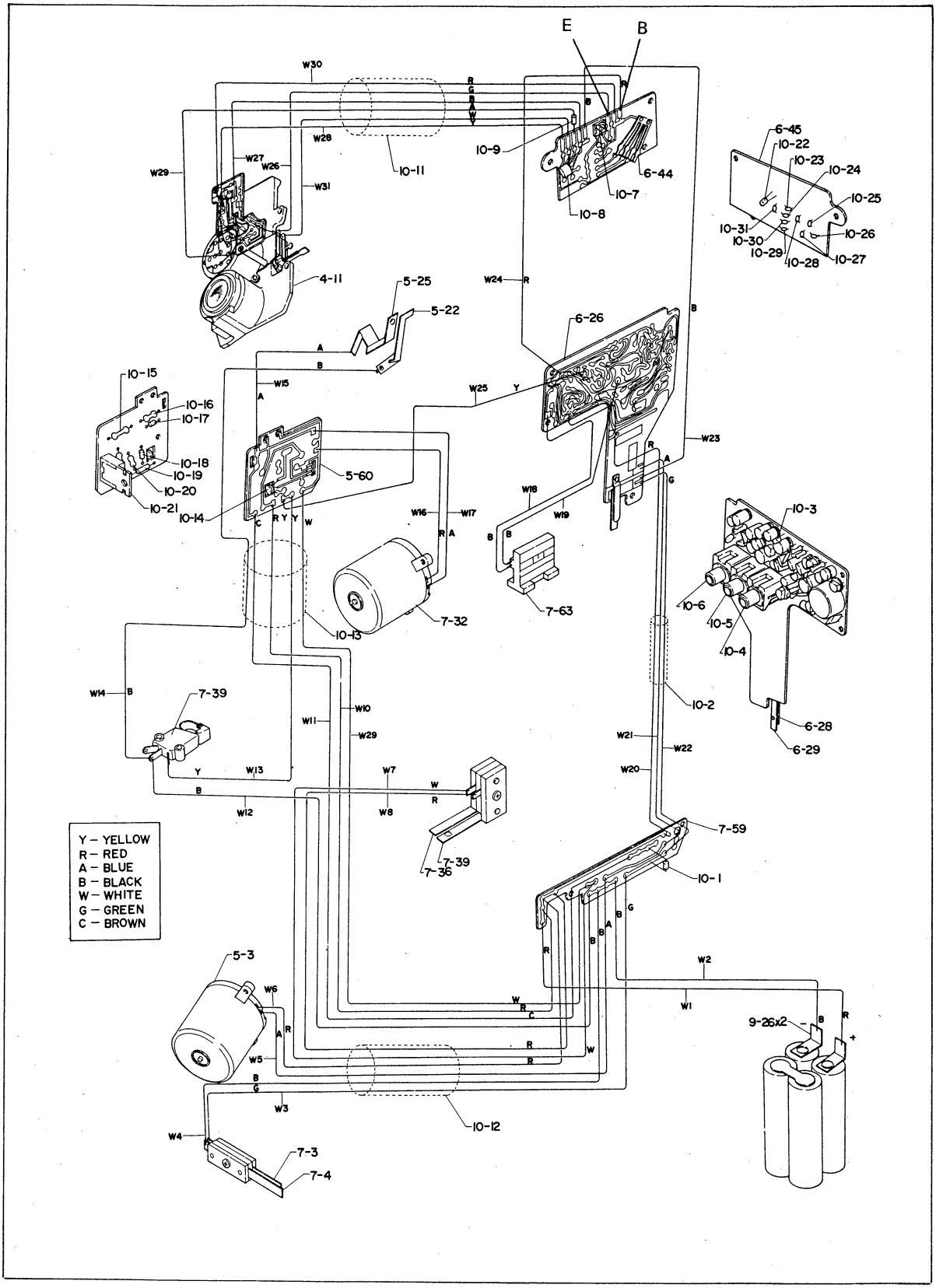
Resistances across terminals (C) and (D) should be as indicated below:

When filter is used:	6.2 to 7.4kΩ
When filter is not used:	4.5 to 5.5kΩ

22 — 4 LED (10—22) for underexposure warning

Shield light to the lens, and see if the LED lights in red. When the LED does not light, check the circuit across terminals (B) and (E).
When this circuit has a continuity, the LED (10—22) is defective.
When this circuit has no continuity, swtich contact of the servo mechanism assembly (4—11) is defective.

Fig. 27


E
B
W30
W28
W27
W26
W29
W31
10-11
10-9
6-44
10-7
10-8
6-45
10-22
10-23
10-24
10-25
10-31
10-30
10-29
10-28
10-27
10-26
4-11
5-25
5-22
W24
R
6-26
B
A
B
W15
A
W25
Y
10-15
10-16
10-17
10-18
10-19
10-20
10-21
10-14
5-60
C R Y W
W16
W17
R A
7-32
10-13
W18
W19
B
B
7-63
W23
R
A
G
10-3
10-6
10-5
10-4
10-2
6-28
6-29
W21
W22
W20
W14
B
7-39
W10
W11
W29
Y
W13
B
W12
W7
W
R
W8
7-39
7-36
7-59
10-1
Y – YELLOW
R – RED
A – BLUE
B – BLACK
W – WHITE
G – GREEN
C – BROWN
5-3
W6
A
R
W5
B
G
W3
W4
7-3
7-4
10-12
B
G
B
A
B
R
W2
W1
W
R
C
R
W
R
9-26x2
B
R
+
-

23. INSTALLATION AND ADJUSTMENT OF FOOTAGE COUNTER LEVER (6—18)

23 — 1 Installation

a. When the footage counter lever (6—18) is bent, do not use it. It will drag and correct footage display will not be made.

b. Check the needle portion of the lever which appears in the footage counter window to insure that this portion is painted in orange color.

c. Hook the spring (6—19) across the footage counter lever (6—18) and lever (6—14).

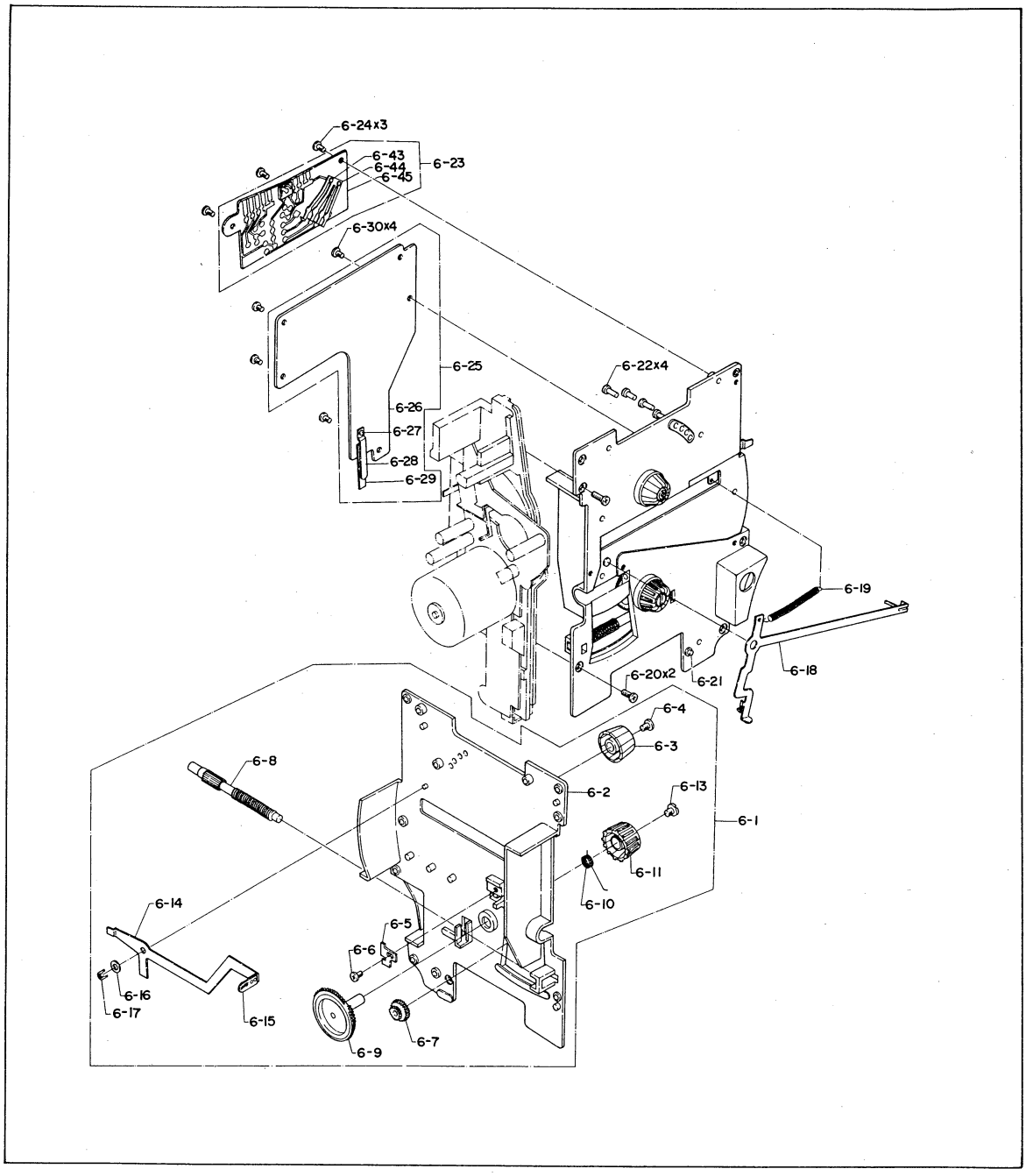
d. Check the needle portion of the lever (6—18) for its horizontality against the footage numbers.

23 — 2 Adjustment

a. Properly bend the footage counter lever (6—18) so that the orange colored needle indicates "S" when starting a film and also it moves beyond "15".

b. Adjust the portion having a slit on the footage counter lever (6—18) so that the viewfinder frame seen in the viewfinder appears to be entirely red (covered entirely by red filter (6—15)) when the orange colored needle reaches "15" of the footage scale.

Fig. 28

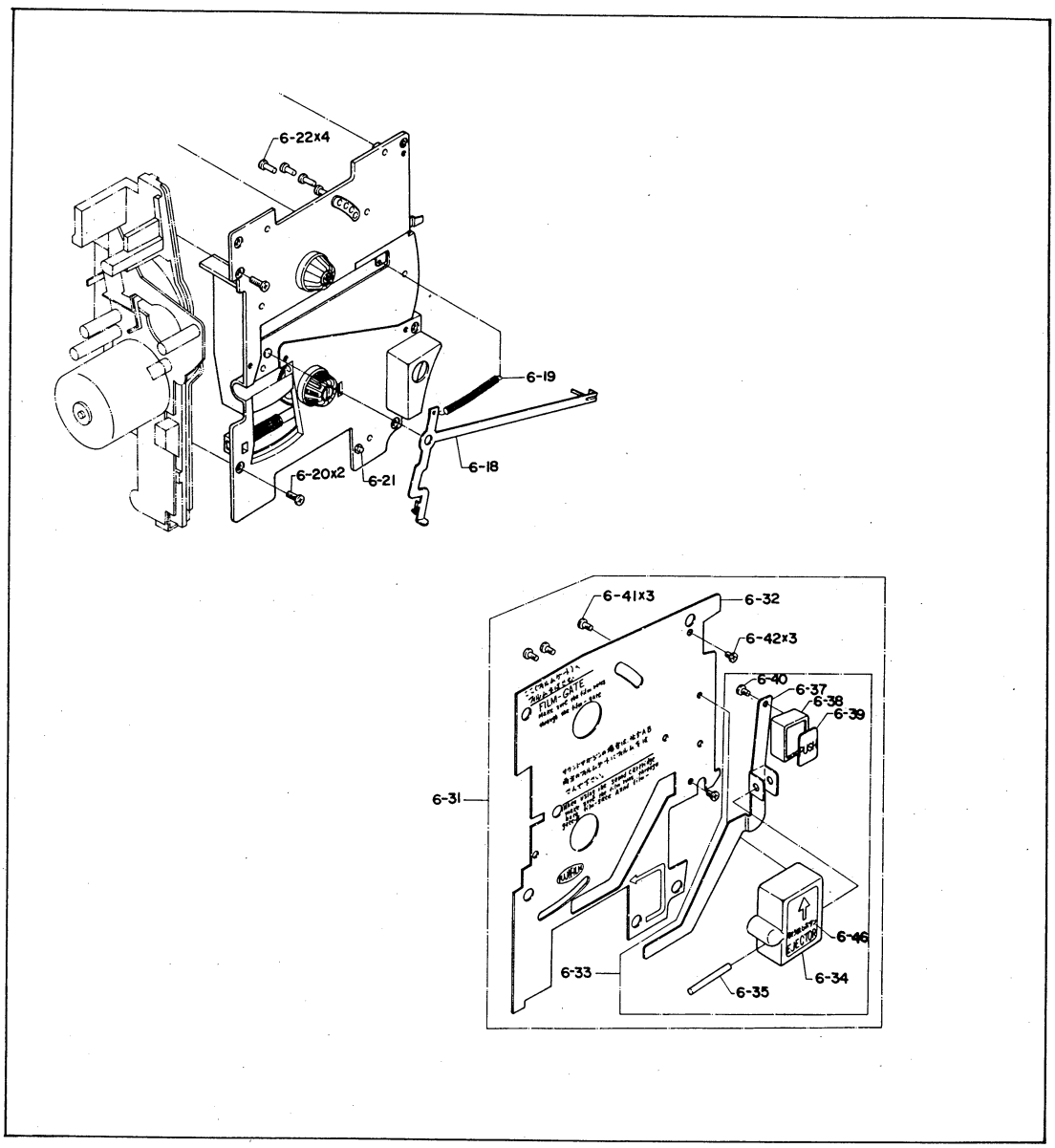

6-24x3
6-43
6-44
6-45
6-23
6-30x4
6-25
6-22x4
6-26
6-27
6-28
6-29
6-19
6-18
6-20x2
6-21
6-4
6-3
6-8
6-2
6-13
6-1
6-11
6-10
6-14
6-5
6-6
6-16
6-17
6-15
6-9
6-7

24. INSTALLING FILM CHAMBER PLATE ASSEMBLY (6–31)

a. Install the film chamber plate assembly (6—31) with three screws (6—42).

b. Make sure that the film chamber plate (6—32) does not flap.

Fig. 29


6-22x4
6-19
6-18
6-20x2
6-21
6-41x3
6-32
6-42x3
6-40
6-37
6-38
6-39
6-31
6-46
6-33
6-34
6-35

25. SOUND RECORDING SYSTEM

25—1 Ratings and method of inspection for sound recording system
The ratings shown below are at 22±2°C ambient temperature and with DC 5.5V applied to the camera.

ITEM	RATING	METHOD OF INSPECTION
Microphone input (standard)	-70 dBm at "NORMAL" microphone jack -60 dBm at "LOW" microphone jack	
Monitor output	-23 dBm or more	Apply 1KHz -70 dBm sine wave signal to the "NOEMAL" microphone jack and insure that monitor output level is -23 dBm or more.
LED monitor	(1) "NORMAL" microphone jack ..... Green LED should light at -(83±6) dBm. (2) "LOW microphone jack ..... Green LED should light at an input level 8 to 12 dBm higher than -(83±6) dBm (for "NORMAL" microphone jack).	Apply 1KHz sine wave signal to the "NORMAL" microphone jack and read out input level at the moment when the green LED begins to light or go out.
Frequency characteristics		Apply 100Hz to 5KHz -70 dBm sine wave signal to "NORMAL" microphone jack, let the sound recording system to record it on the film, reproduce the recorded sound by means of a projector or standard player, and insure that reproduced output level is within ±3 dB against that at 1KHz.
Distortion	6% or less	Apply 400Hz -70 dBm sine wave signal to "NORMAL" microphone jack to let the sound recording system to record it, reproduce it, and read out distortion.

ITEM	RATING	METHOD OF INSPECTION
S/N ratio	30 dBm or more through a wave filter	Compare output level produced from the portion recorded by applying 1KHz -64 dBm sine wave signal to "NORMAL" microphone jack with that produced from the portion recorded without applying signal to the microphone jack.
Wow-flutter	Less than 0.4%	Apply 3KHz -70 dBm sine wave signal to "NORMAL" microphone jack, let the sound recording system to record it on the film, play the film to reproduce the recorded signal, and read out wow-flutter of the reproduced signal.
Tolerance of filming speed	Within ±3%	Play the film recorded by applying 3KHz -70 dBm sine wave signal to "NORMAL" microphone jack, and read out filming speed at the time of reproduction.
Battery checker actuating voltage	The LED (battery checker) should go out at 4.1 to 4.8V.	Repeatedly turn on and off the battery check checker button with voltage applied to the camera being reduced gradually, and read out voltage when the LED (green) goes out.

25 — 2 Measuring Instruments

1) Sine wave signal generator
- Oscillation frequency: 5Hz~500KHz
- Wave-form: Sine wave
- Output impedance: 600Ω
- Distortion factor: 0.3% or less

2) AC voltmeter (dB meter)
- Measuring range: – 70~50dBm
- Indication method: Mean value
- Frequency characteristics: ±3% (20Hz~200KHz)

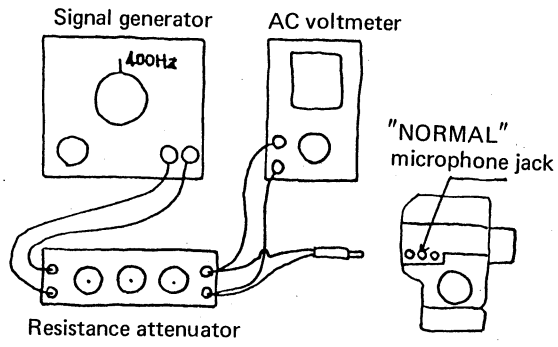
3) Resistance attenuator
- Type of connection: Unbalanced T-type
- Impedance: 600Ω
- Max. input: +30dBm or more
- Range of variation 100dB or more: 0.1dB step

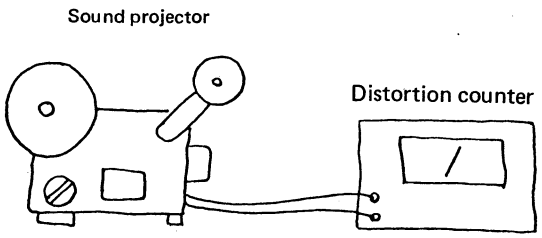
4) Wow-flutter meter
- Center frequency: Within 3000Hz±10%
- Input level: 5mV~10V
- Measuring range: 0.005%~1%
- Indication method: JIS — Actually effetive value
  NAB — Mean value
  CCIR — Peak value
- Tape speed indication
- Measuring range: 3000Hz±10%

5) Projector (SH-7M or other)
- Distortion factor measuring frequency range: 400Hz, 1KHz±10%
- Measuring range: 0.3~100%
- Input range: 50mV~50V
- Automatic colibration level range: 20dB or more

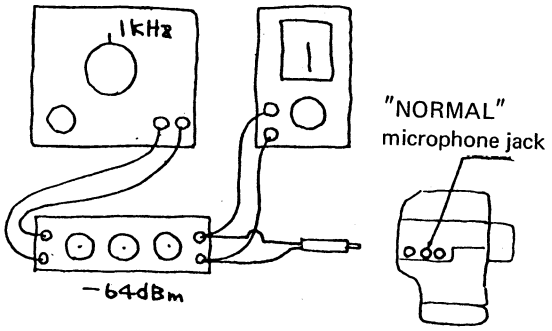
6) Oscilloscope
- Sensitivity: 10mV/DIV or more
- Frequency characteristics: DC~5MHz or more
- Input impedance: 1MΩ or more

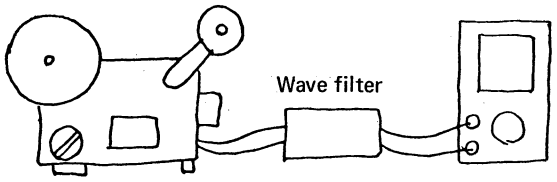
Distortion



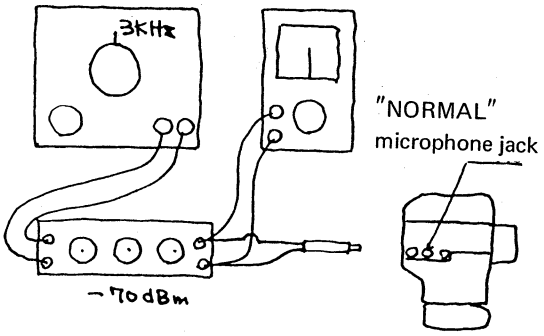


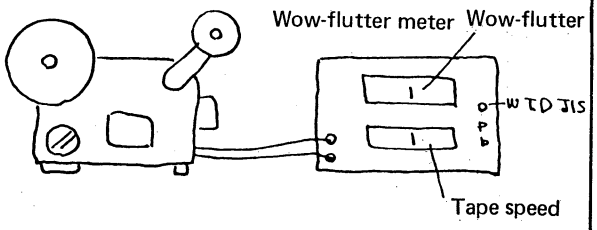
S/N ratio



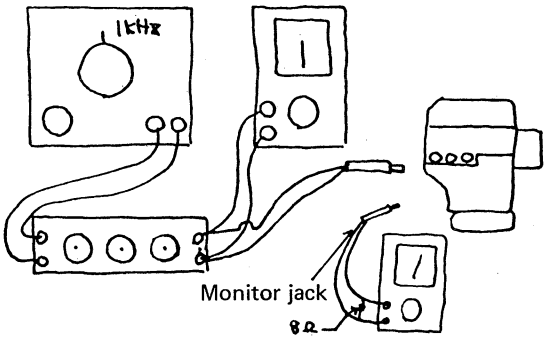


Wow-flutter, Filming speed tolerance





Monitor output, LED monitor

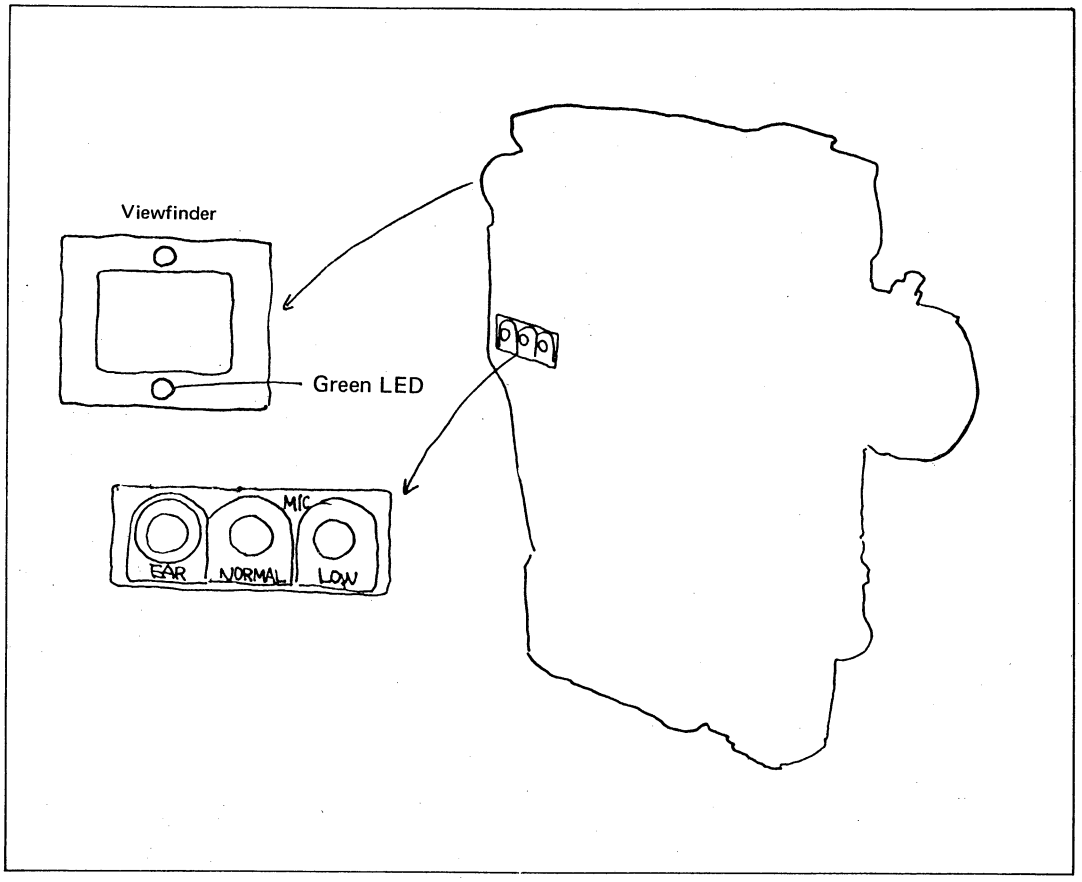


25 — 3 Sound recording system inspecting procedure

When the sound recording system is found to be defective, check it in the following sequence with DC 5.5V applied to the camera.

	Operation for inspection	Inspected item and result
a. Before disassembling the camera	(1) Connect a microphone to "N" or "L" microphone jack of the camera, apply audio signal, and let the sound recording system to record it.	(1) When the green LED lights, the amplifier is mormal. If not, the amplifier is defective or a broken wire exists in the circuit. (2) Connect an earphone to the monitoring jack of the camera, and listen the monitoring sound during the recording. When the recording sound can be heard, the amplifier is normal. If not, the amplifer is defective or a broken wire exists in the circuit.
	(2) Play the recorded film and listen the reproduced sound.	When no sound is recorded, the recording amplifier is defective or circuit surrounding the amplifier is defective (broken wire), or head coil is broken. ○ When sound is recorded but recording performance is too low. 1. Dirty head 2. Faulty contact of film on the head 3. Deviated wow-flutter 4. Defective recording amplifier 5, Fluctuation of filming speed
b. After disassembling the camera	(1) Remove the cover (7—44), and check the lead wires connected to the head (7—41) for soldering.	When the lead wire is disconnected, recording cannot be made.

Fig. 30



	Operation for inspection	Inspected item and result
	(2) Disconnect the two lead wires from the head (7—41), and measure bias current and bias oscillation waveform.	Bias current ... The recording amplifier is normal when bias current is 1.05 to 1.95mA. Bias oscillation waveform ... The recording amplifier is normal when distortion does not occur on sine wave signal (50KHz). When no bias current is generated: 1. Defective recording amplifier 2. Existence of broken wire on the surrounding circuit. Examples: a) Faulty contact of switch contacts (6—28 and 6—29) b) Broken lead wires (W20 and W21) c) Broken lead wires (W18 and W19)
	(3) Separate the recording amplifier from the camera. Apply +5.5V to the red lead wire (W20) and ground the blue lead wire (W21)	(1) Measure bias current. When no bias current is generated, the amplifier is defective. (2) Measure monitor oupput. When monitor output is incorrect, the amplifier is defective.

25 — 4 Ratings and method of inspection for sound recording system components

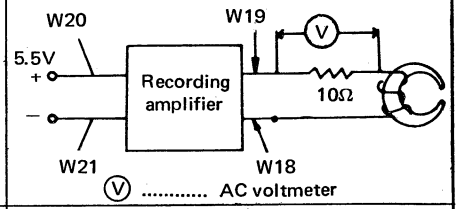
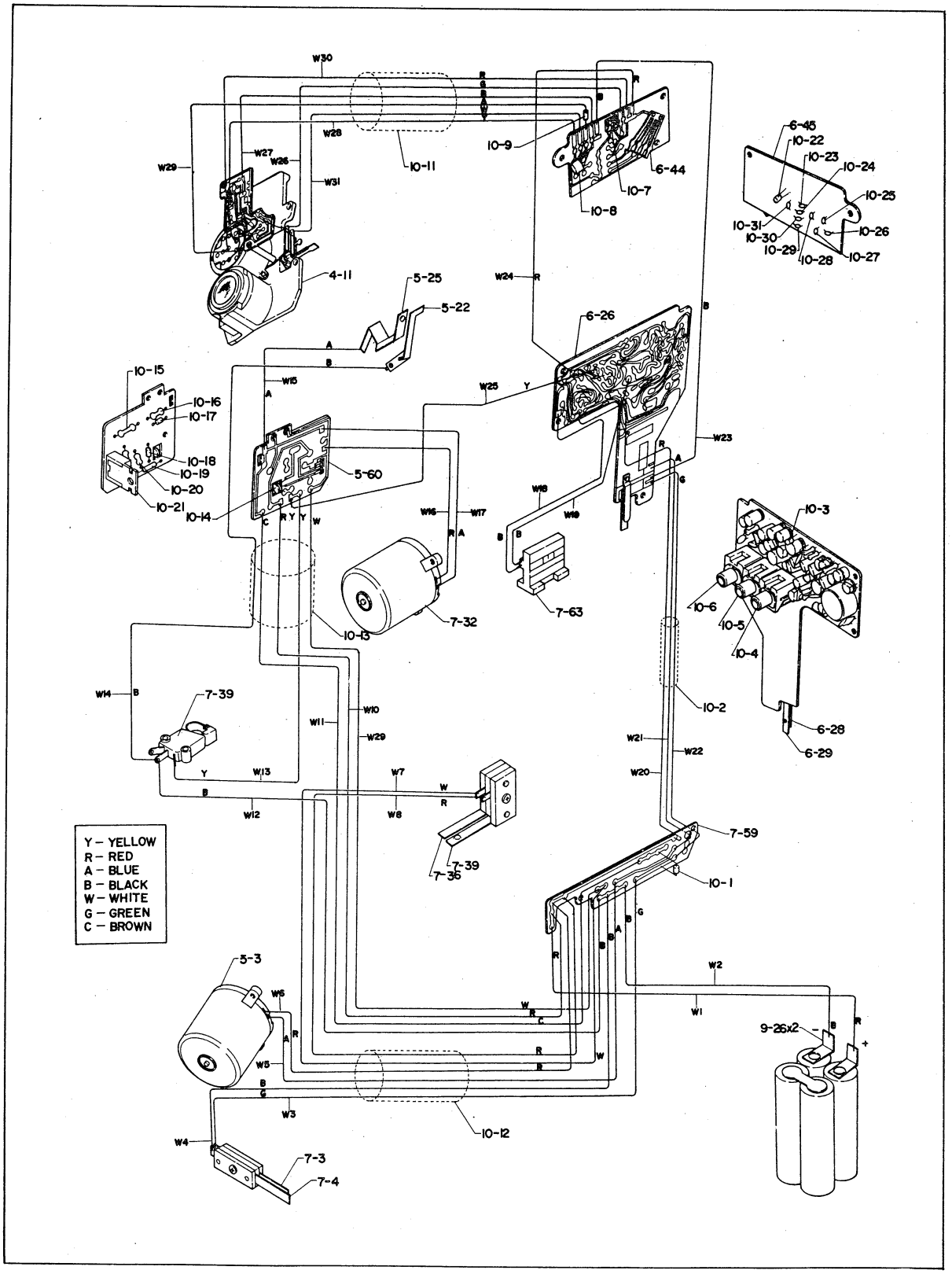
Name of component	Rating	Method of inspection
Head	Input impedance: 300Ω±30% at 1KHz	(1) Measure impedance with an impedance counter (2) Measure resistance with a tester (A simple method). The head is normal when resistance is approximately 70Ω.
Recording amplifier	Bias current: Should be within 1.5mA±30% at 5.5V.	When the recording amplifier is connected with a voltmeter as shown below, measured voltage should be 10.5 to 19.5mV. 
	Operation of battery checker (amplifier alone)	With +5.5V applied to lead wire W20 and with lead wire W21 grounded, ground yellow lead wire (W25), and see if the green LED lights or not. When the green LED lights, the battery checker is normal.

Fig. 31


W30
W28
W27
W26
W29
W31
10-11
10-9
6-44
10-7
10-8
6-45
10-22
10-23
10-24
10-25
10-26
10-27
10-28
10-29
10-30
10-31
4-11
5-25
5-22
W24
6-26
W25
W23
10-15
10-16
10-17
10-18
10-19
10-20
10-21
10-14
W15
5-60
W16
W17
W18
W19
7-63
10-3
10-6
10-5
10-4
10-13
7-32
10-2
6-28
6-29
W14
7-39
W11
W10
W29
W21
W22
W20
W13
W7
W12
W8
7-36
7-59
10-1
Y - YELLOW
R - RED
A - BLUE
B - BLACK
W - WHITE
G - GREEN
C - BROWN
5-3
W6
W5
W3
W4
10-12
7-3
7-4
W2
W1
9-26x2

25 — 5 Pull down control system

a) Operation of the pull down control system

Operation of camera	Condition of loop switch (consisting of contact assemblies (7—36) and (7—35))	Filming speed	Speed of pull down motor (5—3)
With or without loading silent film, colse the film chamber door and let the camera to operate.	ON	20 FPS	6400^{+130}_{-300} rpm
Without loading film, open the film chamber door and let the camera to operate.	OFF	14 to 17 FPS	4662~5128 rpm
With the camera loaded with a sound film, close the film chamber door, and let the camera to transport the film.	Turns on and off repeatedly once per frame.	18 FPS	

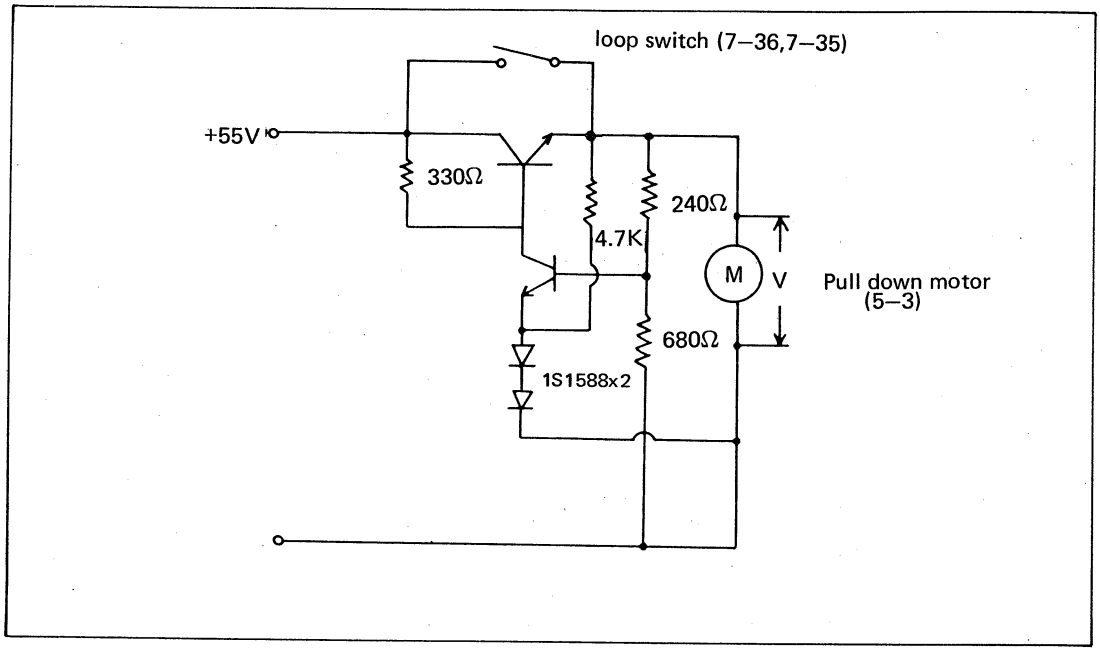
b) For checking pull down motor control circuit, measure voltage across the pull down motor terminals.

When measured voltage is approximately 5.5V with the loop switch turned on, or it is approximately 3.0V with the loop switch turned off, the pull down motor control circuit assembly (5—60) is normal.

c) When filming speed is abnormal (when filming speed fluctuates), check:

- ○ The pull down motor control circuit for the function.
- ○ The loop switch for faulty contact. (The standard loop switch pressure is 3 to 6 gr-cm.)
- ○ The pull down motor for friction.

Fig. 32


loop switch (7–36,7–35)
+55V
330Ω
4.7K
240Ω
M
V
Pull down motor
(5–3)
680Ω
1S1588x2

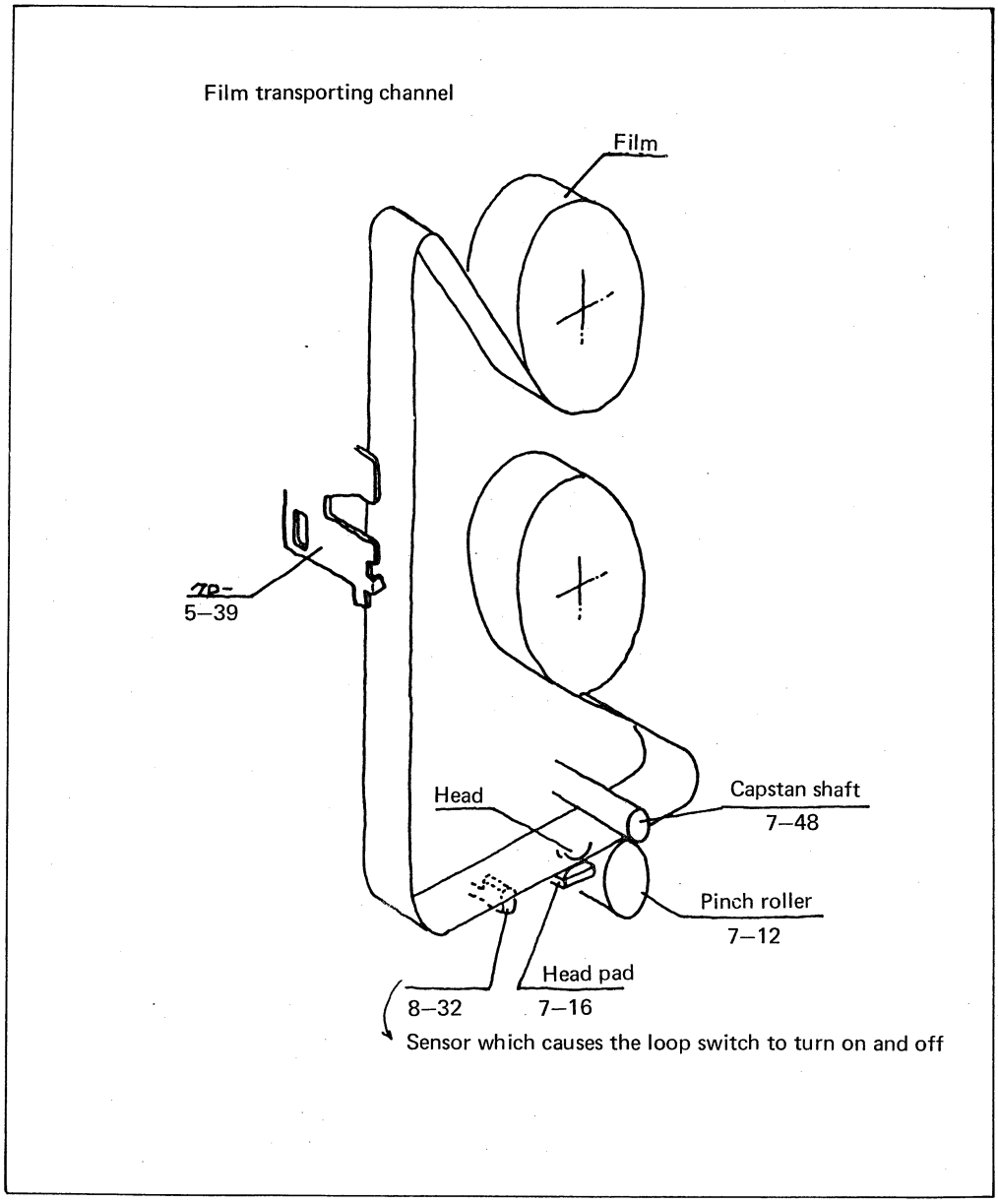
25 — 6 Gargle

When loop switch contact is poor, the pull down motor control circuit does not operate correctly. With this circuit operated incorrectly, correct voltage is not applied to the pull down motor terminals, causing motor speed to drop. With the motor speed dropped, film is not transported in the correct filming speed. Consequently, no film loop is formed.

When the film is pulled by the drive motor without having a proper film loop, the film does not come into contact with the recording head correctly and recording is skipped. This occurrence is called "Gargle".

Gargle occurs when the loop switch contacts are dirty or contact pressure is insufficient.

Fig. 33


Film transporting channel
Film
5–39
Head
Capstan shaft
7–48
Pinch roller
7–12
Head pad
8–32
7–16
Sensor which causes the loop switch to turn on and off

25 — 7 Rated current and filming speed

With the servo mechanism balanced and DC 5.5V applied, the rated current and filming speed should be as indicated below:

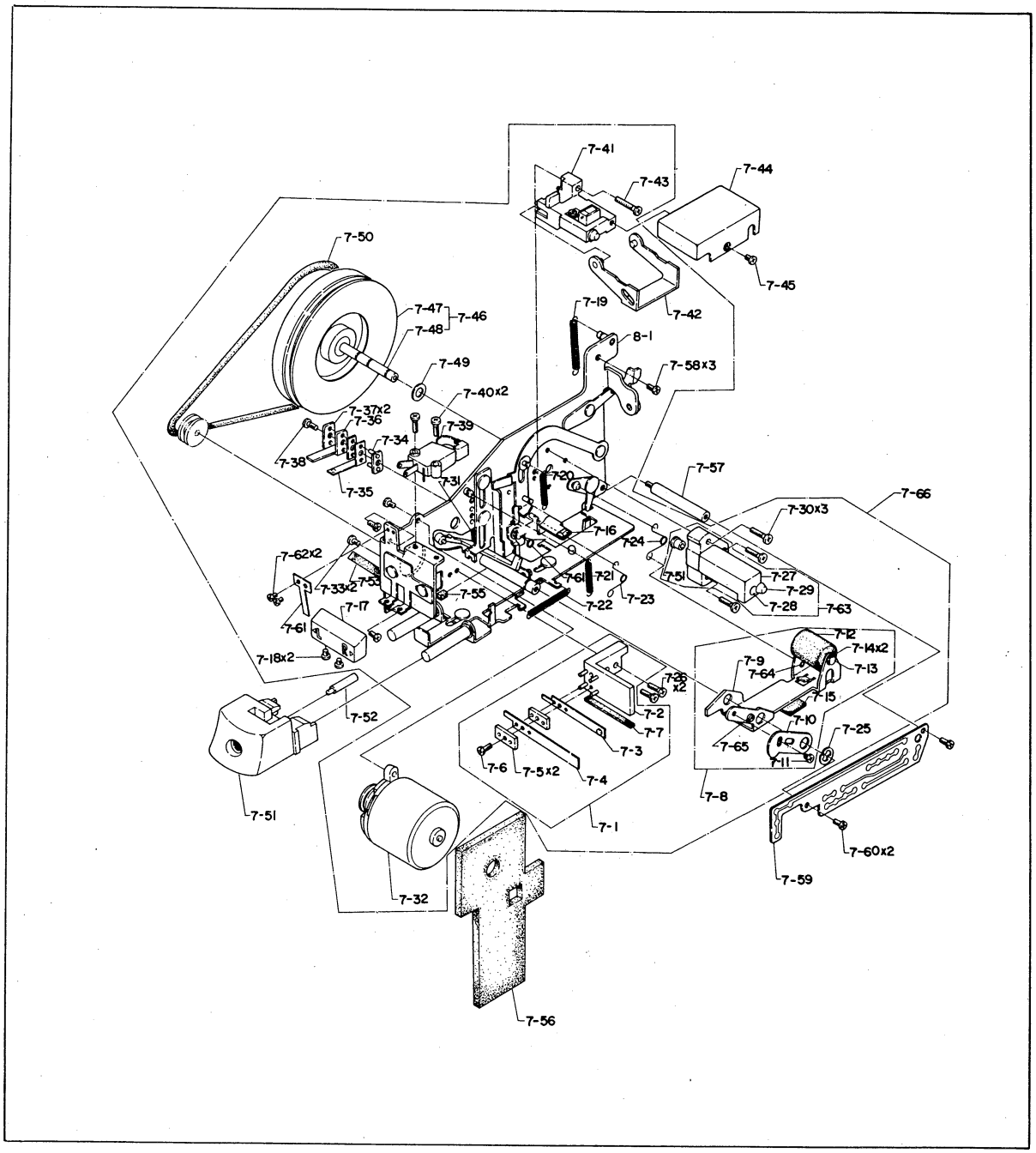
	Current	Filming speed
Without loading film	Less than 160mA	
With silent film transported	Less than 240mA	19.5 to 21.0 FPS
With sound film transported	Less than 400mA	18±0.5 FPS

25 — 8 Wow-flutter correcting method (Recording mechanism assembly)

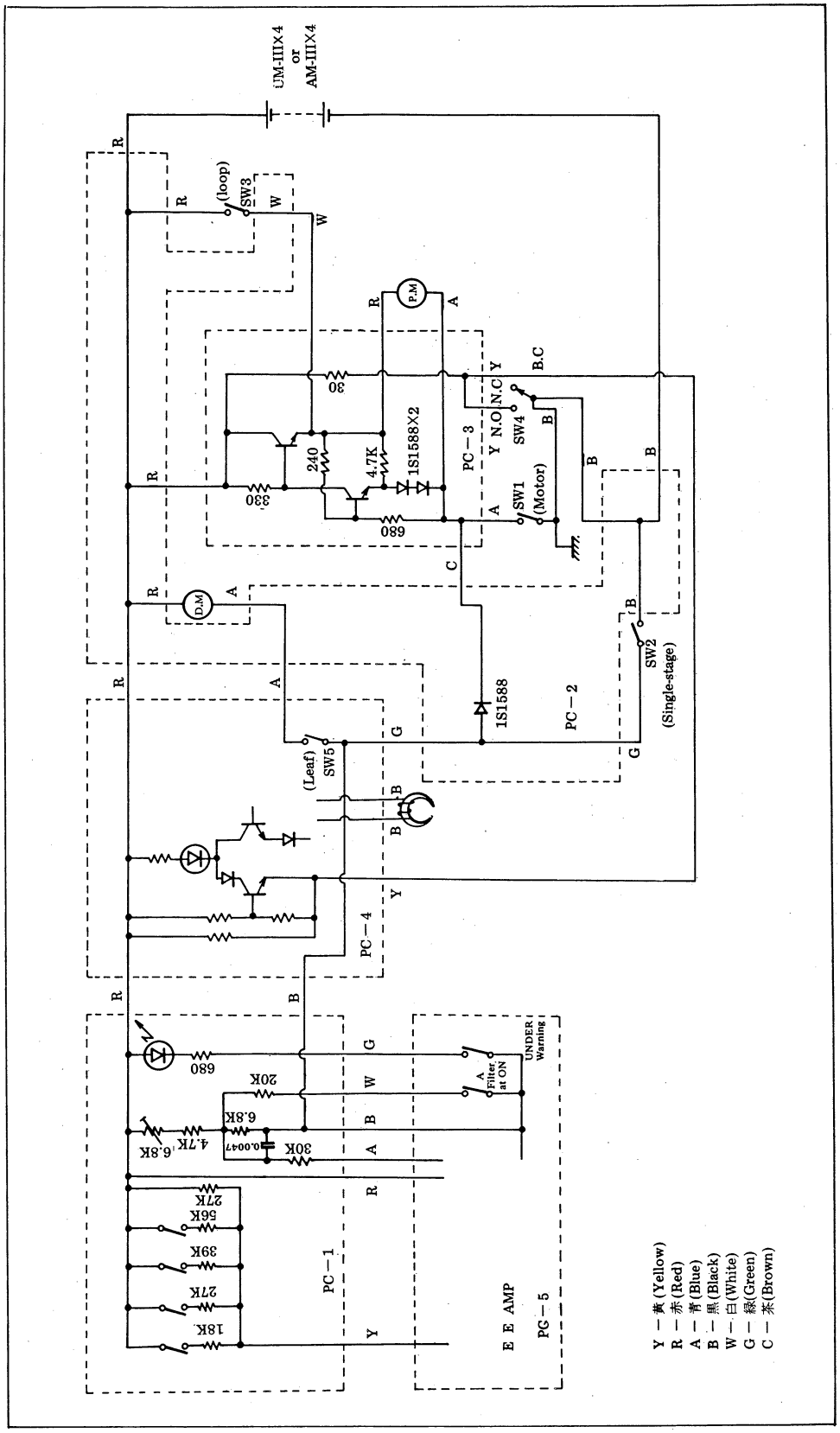
Rated wow-flutter: Less than 0.4%

Cause	Item to be inspected	Action to be taken
Fitting of the capstan shaft assembly (7—46) to the shaft holder (7—67)	When the flywheel (7—47) is turned without applying the belt, it should not stop as if it was braked. (Dirty parts cause this trouble.)	Clean or perform lapping.
Belt (7—50)	Existence of oil or dirt Deformation Belt oscillation during operation of recording mechanism assembly.	Clean. Replace. Replace.
Head pad (7—16)	Tape squeaking Floated head pad Dirty head pad Pressure of head pad (30 to 40 gr.)	Clean. Reinstall correctly. Replace. Adjust.
Pinch roller (7—12)	Smoothness of rotation Deformation (surface detrioration) Dirty pinch roller pressure of pinch roller (350 to 400 gr.)	Clean. Replace. Clean. Adjust.
Contact of leaf spring with capstan shaft	Wear of leaf spring surface	Replace.

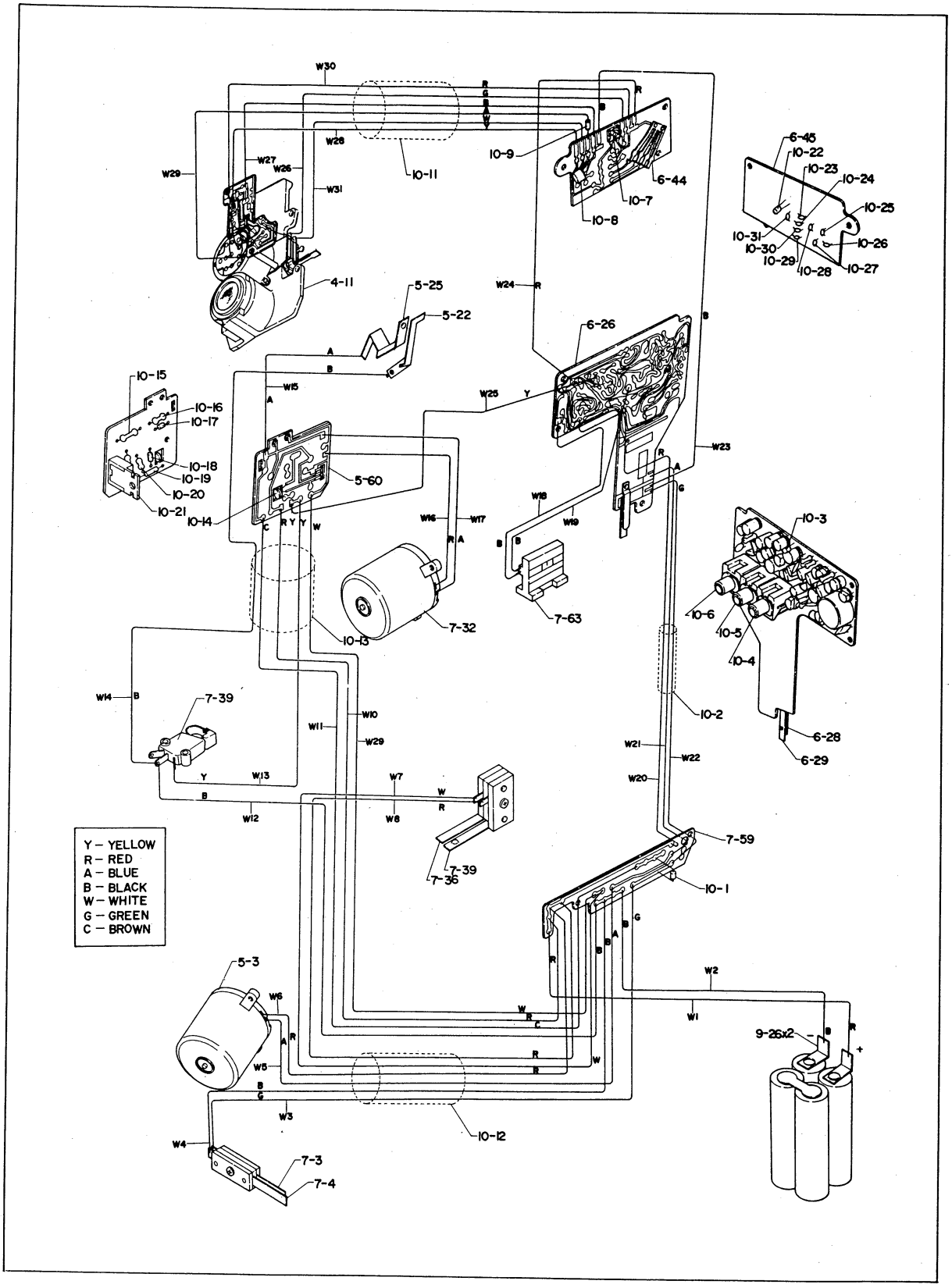
Fig. 34


7-41
7-43
7-44
7-45
7-50
7-47
7-46
7-48
7-49
7-40x2
7-37x2
7-36
7-39
7-34
7-38
7-35
7-31
7-19
8-1
7-58x3
7-42
7-57
7-66
7-30x3
7-20
7-16
7-24
7-62x2
7-33x2
7-55
7-61
7-21
7-22
7-23
7-51
7-27
7-29
7-28
7-63
7-17
7-61
7-18x2
7-52
7-51
7-12
7-14x2
7-9
7-64
7-13
7-15
7-10
7-65
7-11
7-25
7-8
7-60x2
7-59
7-39 x2
7-2
7-7
7-3
7-6
7-5x2
7-4
7-1
7-32
7-56

26. CIRCUIT DIAGRAM



27. WIRING DIAGRAM



Ⅳ INSPECTION

INSPECTION POINT	METHOD OF INSPECTION
1. Sound recording system	Load the camera with four 1.5V batteries (5.5V or higher) and a sound film.
1 — 1 Sound indicator	Connect a microphone to the "NORMAL" or "LOW" microphone jack, depress the shutter release button, and make sure that the LED (sound indicator lamp) seen in the viewfinder flashes in green.
1 — 2 Monitor output	Connect an earphone to the earphone jack, depress the shutter release button, and make sure that recording sound picked up by the microphone can be heard.
1 — 3 Recording.	Actually record sound on a film, reproduce the recorded sound by playing the film with a projector, and make sure that sound is recorded correctly. Recording on a film may be omitted because it takes a time to do so. In this case, however, trouble of the recording head cannot be checked out.
2. EE system	
2 — 1 Underexposure warning lamp	Cover the photocell to shield light, depress the shutter release button, and make sure that the LED (warning lamp) seen in the viewfinder lights in red. Further, make sure that this lamp does not light in a room having a normal brightness.
2 — 2 Filter selection	Move the filter selector lever, and make sure that it moves smoothly and it clicks correctly.
2 — 3 EE lock	After raising the EE lock lever in a room having mormal brightness, cover the photocell window to shield light, and make sure that the underexposure warning lamp does not light. With the EE lock lever turned down, shield light to the photocell and make sure that the warning lamp lights.

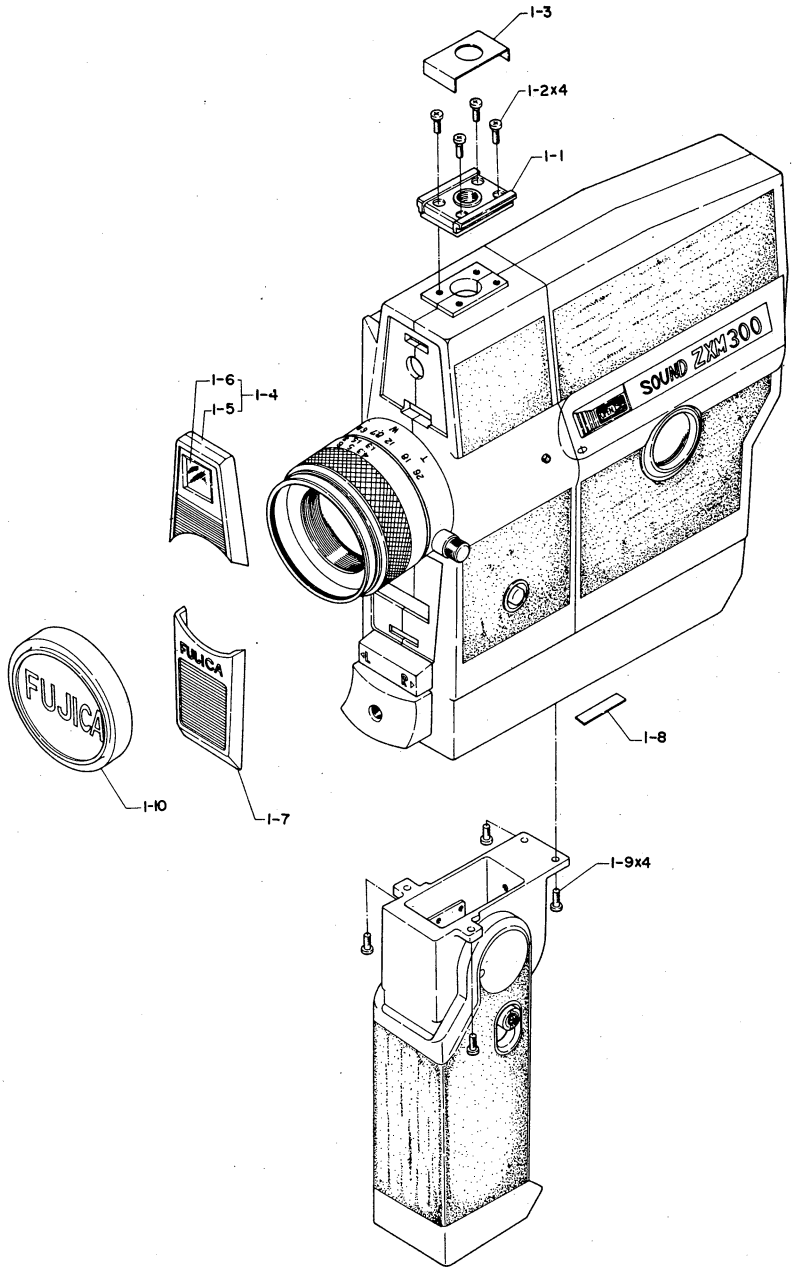
INSPECTION POINT	METHOD OF INSPECTION
3. Film transport system	
3 — 1 Pull down motor (Film transporting motor)	Depress the shutter release button, and make sure that the motor turns smoothly without generating any abnormal sound.
3 — 2 Drive motor (Motor for sound recording system)	With the shutter release button depressed, push the sound film identifying switch (pin), and make sure that the capstan shaft turns, causing the pinch roller to turn.
3 — 3 Film transporting	Load the camera with a cartridge, let the camera to transport the film, watch the film confirmation window to see if the film is transported correctly.
3 — 4 Run-lock functions	Set the run-lock button to "L" (Lock), depress the shutter release button, and make sure that the camera is locked.
4. Footage counter	With the camera loaded with a cartridge, let the camera to transport the film for approximately three meters (10 ft) and make sure that the footage counter displays footage correctly. Open the film chamber door, take out the cartridge, and make sure that the footage counter needle indicated "S".
5. Grip	Stretch the grip, and make sure that it clicks correctly. Further, make sure that the grip can be folded when the release button is depressed.
6. General operations	
6 — 1 Manual zooming	Make sure that manual zooming can be done smoothly from "T" to "W" or from "W" to "T". Pull the zoom lever, and make sure that it operates smoothly to the macro side.
6 — 2 Focusing	Check the focusing ring to insure that it moves smoothly from the close-up distance to infinity.
6 — 3 Shutter lock	Set the run-lock button to "L", and insure that the shutter release button cannot be depressed.
6 — 4 Adjustment of visibility	Check the visibility adjust ring on the eyepiece to insure that it moves smoothly.
6 — 5 Battery checker	Depress the battery checker button, and insure that the LED seen in the viewfinder lights in green.

INSPECTION POINT	METHOD OF INSPECTION
7. Appearnace	Check the camera body and insure that no scratch or dirt exists on the camera body. Look into the viewfinder, and insure that no dust or other foreign matter is seen in the viewfinder.
8. Setting parts of the camera after completing the inspection	1) Focusing ring: ∞ 2) Zooming ring: W 3) Filter selector lever: Turned down 4) Run-lock button: L 5) EE lock lever: Turned down 6) Footage counter: S 7) Grip: Folded

V

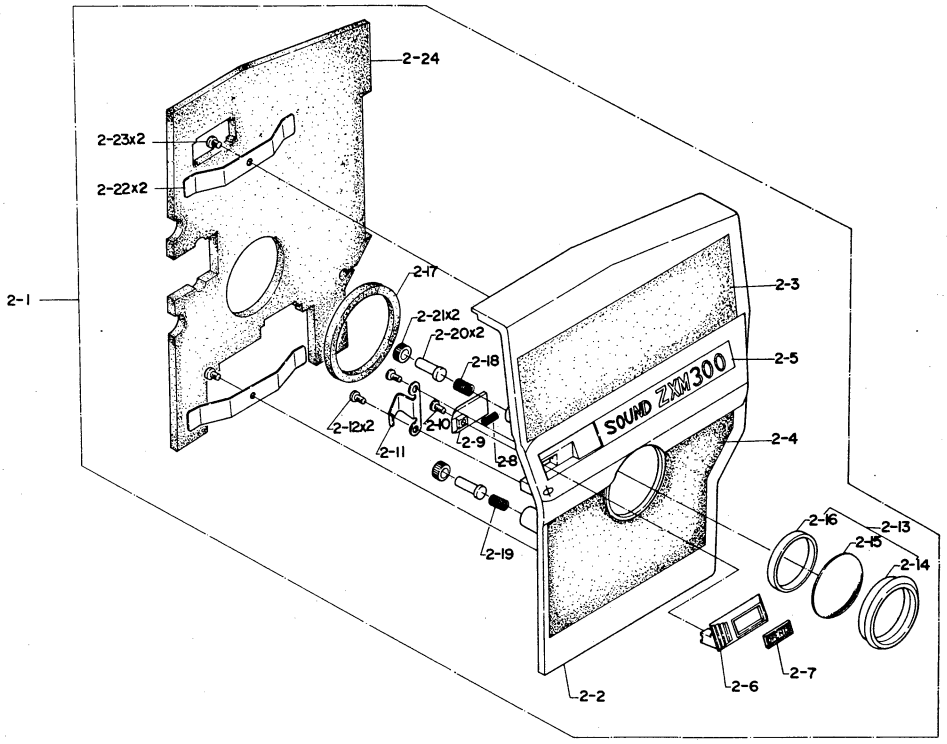
PART LIST

Fig. 1



Ref No.	Part No.	Part Name	Q'ty	Commonly used with
1— 1	41B 355830	Accessory shoe	1	ZC 1000
1— 2	113M 230401S	Screw	4	
1— 3	58B 355840	Cover plate	1	ZC 1000
1— 4	58A 1288240	Upper front cover assembly	1	
1— 5	58B 1288660	Upper front cover	1	
1— 6	4B 1288680	Glass	1	
1— 7	58B 1288670	Lower front cover	1	
1— 8	58B 14600	Number plate	1	Z 450
1— 9	110M 200603S	Screw	2	
1—10	57B 1288910	Lens cap	1	
1—11	110M 200503S	Screw	2	

Fig. 2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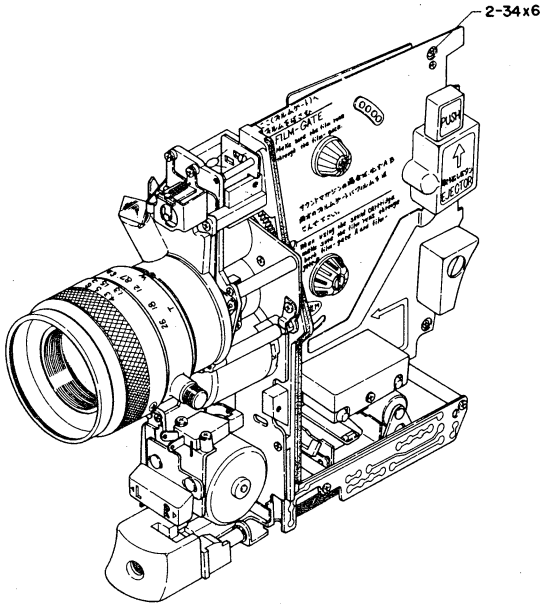
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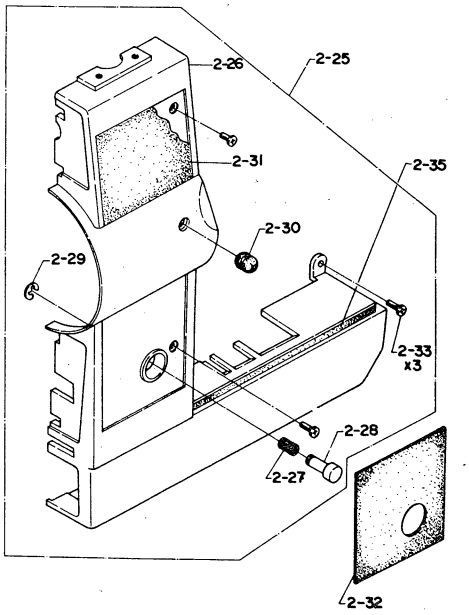
PUSH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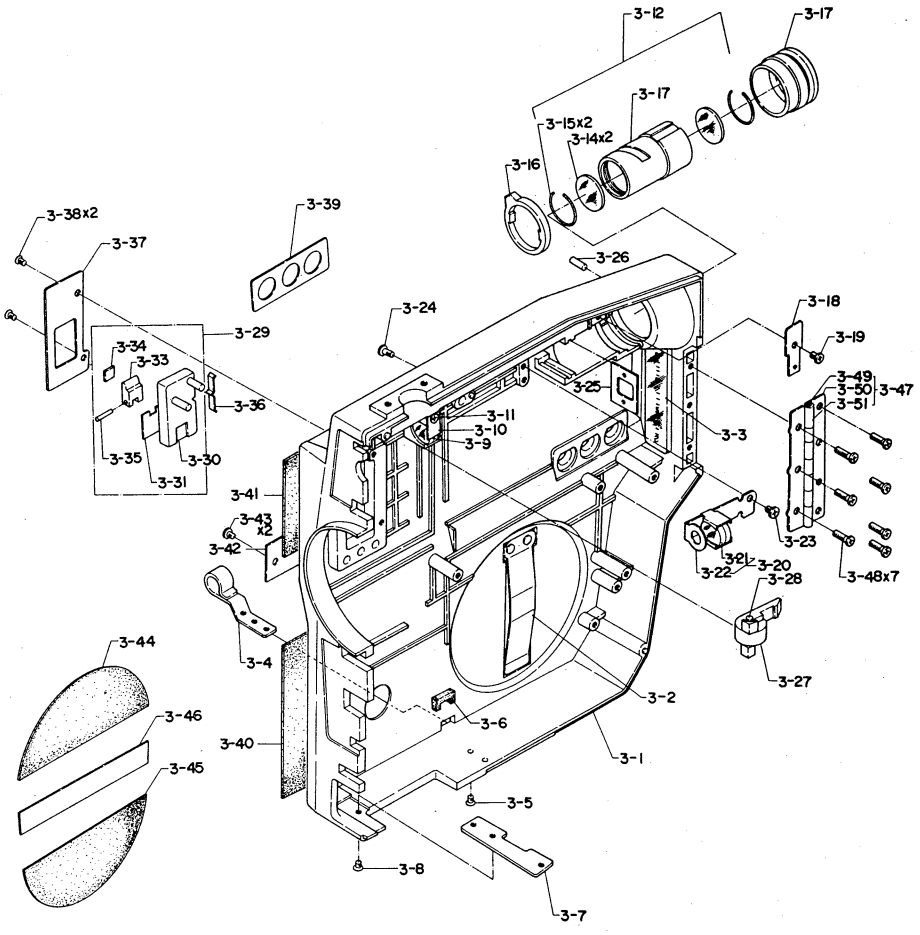
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
2— 1	11A 1294170	Film chamber door assembly	1	
2— 2	11B 1294470	Film chamber door	1	
2— 3	59B 1294510	Leather	1	
2— 4	59B 1294520	Leather	1	
2— 5	58B 1294490	Name plate	1	
2— 6	16B 1294480	Open-close button	1	
2— 7	58B 1294500	Cover plate	1	
2— 8	50B 1276060	Spring	1	PX 300
2— 9	47B 1276030	Lock lever	1	PX 300
2—10	113M 200501S	Screw	1	
2—11	50B 44730	Leaf spring	1	C 100
2—12	113M 200351S	Screw	2	
2—13	84A 9960	Film confirmation window	1	P 1
2—17	27B 1294550	Moquette assembly	1	
2—18	50B 654830	Spring	1	ZX 300
2—19	50B 654840	Spring	1	ZX 300
2—20	17B 1276091	Pin	2	PX 300
2—21	42B 654620	Bushing	2	ZX 300
2—22	50B 49370	Leaf spring	2	P 300
2—23	113M 200351S	Screw	2	
2—24	27B 1294540	Moquette	1	
2—25	10A 1292170	Side cover assembly	1	
2—26	10B 1292470	Side cover	1	
2—27	50B 654830	Spring	1	ZX 300
2—28	16B 1292480	Battery checker button	1	
2—29	191M 020T	E-clip	1	
2—30	57B 1275030	Plug	1	
2—31	59B 1288760	Leather	1	
2—32	59B 1288770	Leather	1	
2—33	113M 200703S	Screw	3	
2—34	113M 200703S	Screw	6	
2—35	27B 1302920	Moquette	1	

Fig. 3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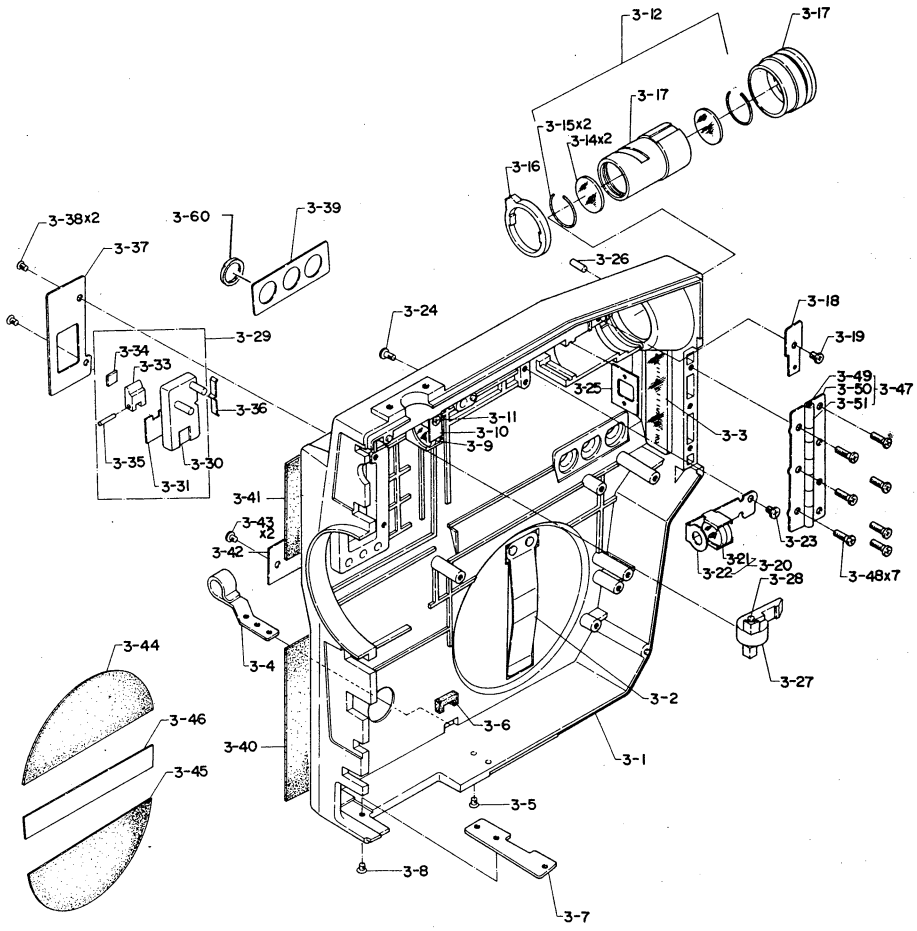
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
3— 1	10B 1290170	Side frame	1	
3— 2	50B 1290180	Leaf spring	1	
3— 3	6B 1290220	Footage counter window	1	
3— 4	41B 1288780	Strap ring bracket	1	
3— 5	111M 200401S	Screw	1	
3— 6	27B 1290280	Moquette	1	
3— 7	85B 1288850	Plate	1	
3— 8	111M 200281S	Screw	1	
3— 9	1A 1350310	Lens	1	
3—10	85B 1274220	Holder	1	PX 300
3—11	113M 200351S	Screw	1	
3—12	23A 1288170	Eyepiece assembly	1	
3—13	23B 1290190	Helicoid	1	
3—14	1B 1350340	Lens	2	
3—15	50B 1078410	Hold ring	2	ZX 500
3—16	23B 1290200	Ring	1	
3—17	23B 1290210	Eyepiece barrel	1	
3—18	85B 1274060	Holder	1	PX 300
3—19	113M 200351S	Screw	1	
3—20	20A 1288180	Lens frame assembly	1	
3—21	1A 1350310	Lens	1	
3—22	20B 1290230	Lens frame	1	
3—23	53B 1274210	Screw	1	PX 300
3—24	113M 200351S	Screw	1	
3—25	20B 1290240	View finder frame	1	
3—26	113M 200351S	Screw	1	
3—27	16E 1274100	EE lock lever	1	PX 300
3—28	32B 653230	Shaft	1	ZX 300
3—29	16A 1288210	Filter selector assembly	1	
3—30	16B 1290250	Filter selector lever	1	

Fig. 3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Ref No.	Part No.	Part Name	Q'ty	Commonly used with
3 — 31	58B 1274120	Filter plate	1	PX 300
3 — 33	16B 1274190	Knob	1	PX 300
3 — 34	58B 652340	Plate	1	ZX 300
3 — 35	32B 652240	Shaft	1	ZX 300
3 — 36	50B 69900	Click spring	1	ZX 300
3 — 37	46B 1290260	Base plate	1	
3 — 38	114M 200401S	Screw	2	
3 — 39	58B 1288720	Name plate	1	
3 — 40	59B 1288830	Leaheer	1	
3 — 41	59B 1288750	Leather	1	
3 — 42	58B 1288690	Main name plate	1	
3 — 43	113M 170401X	Screw	2	
3 — 44	59B 12288840	Leather	1	
3 — 45	59B 12288840	Leather	1	
3 — 46	58B 1288890	Name plate	1	
3 — 47	19A 359560	Hinge assembly	1	ZC 1000
3 — 48	113M 200601S	Screw	7	
3 — 49	19B 353590	Hinge shaft	1	ZC 1000
3 — 50	19B 353570	Hinge	1	ZC 1000
3 — 51	19B 353580	Hinge	1	ZC 1000
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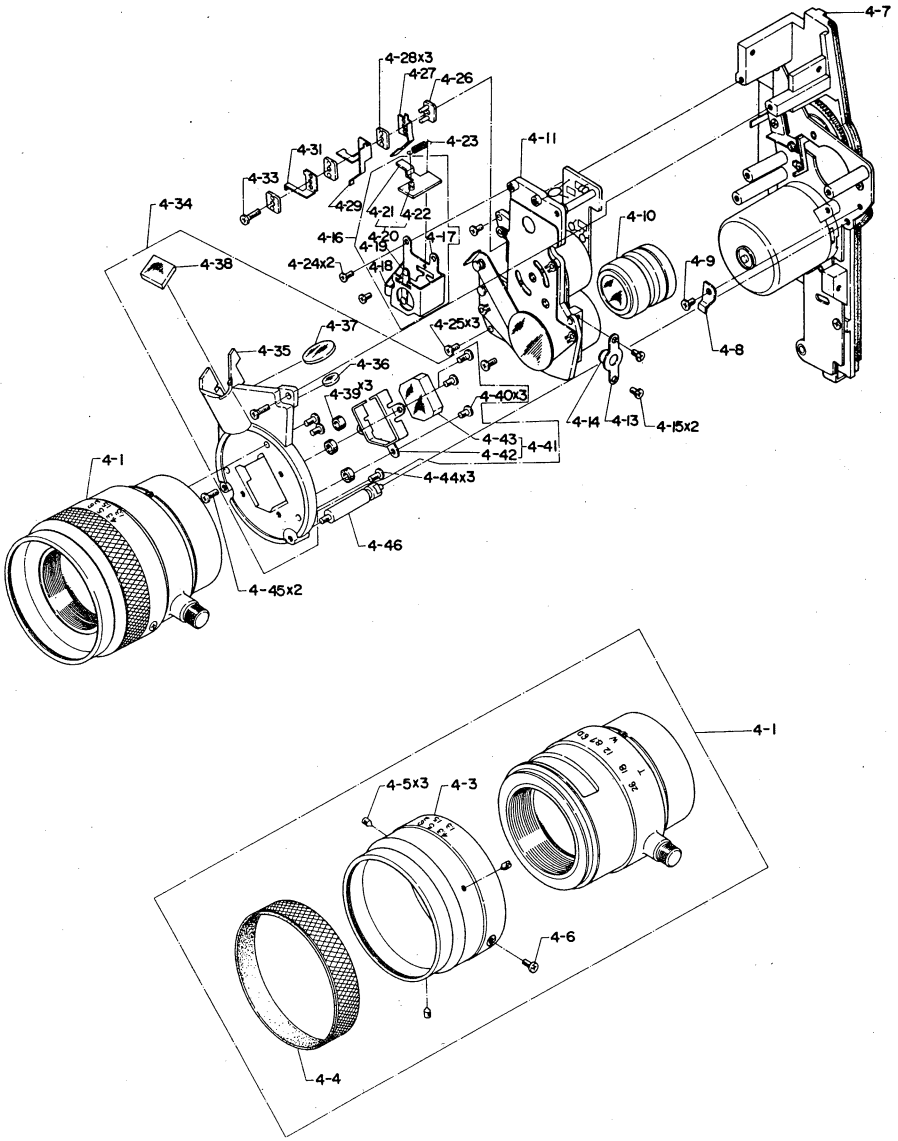
Fig. 4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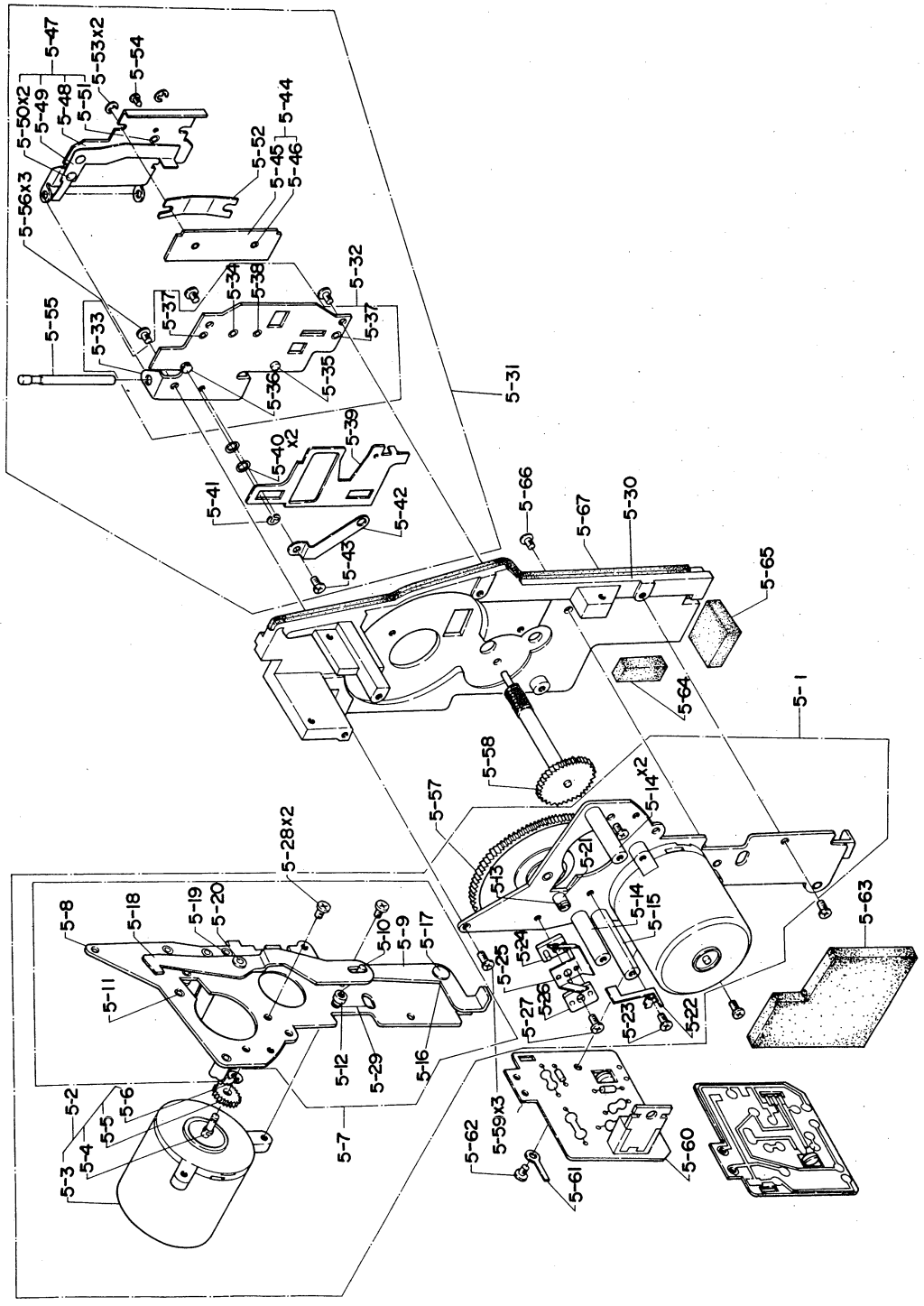
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
4— 1	324A 1219010	Zoom lens assembly	1	PX 300
4— 3	21B 1218720	Focusing ring	1	PX 300
4— 4	59B 1218760	Rubber ring	1	PX 300
4— 5	120M 230301S	Screw	3	PX 300
4— 6	53B 1218860	Screw	1	PX 300
4— 7	309A 1293200	Film transport mechanism assembly	1	PX 300
4— 8	85B 1275580	Holder	1	PX 300
4— 9	110M 200251S	Screw	1	PX 300
4—10	324A 1219020	Master lens assembly	1	PX 300
4—11	317A 1299870	Servo mechanism assembly	1	
4—13	50B 1278180	Leaf spring	1	PX 300
4—14	32B 1278190	Sleeve	1	PX 300
4—15	113M 200401S	Screw	2	
4—16	316A 1270110	Photocell assembly	1	PX 300
4—20	47A 1270360	Lock lever assembly	1	
4—23	50B 653040	Spring	1	ZX 300
4—24	113M 170451S	Screw	2	
4—25	113M 200601S	Screw	3	
4—26	115B 127030	Insulator	1	ST 801
4—27	109B 1278200	Contact piece	1	
4—28	115B 1278230	Insulator	3	PX 300
4—29	109B 1278210	Contact piece	1	PX 300
4—31	109B 1278220	Contact piece	1	PX 300
4—33	110M 140453S	Screw	1	
4—34	10A 1270370	Viewfinder assembly	1	PX 300
4—44	110M 200553S	Screw	3	
4—45	113M 200601S	Screw	2	
4—46	13B 1275570	Column	1	PX 300

Fig. 5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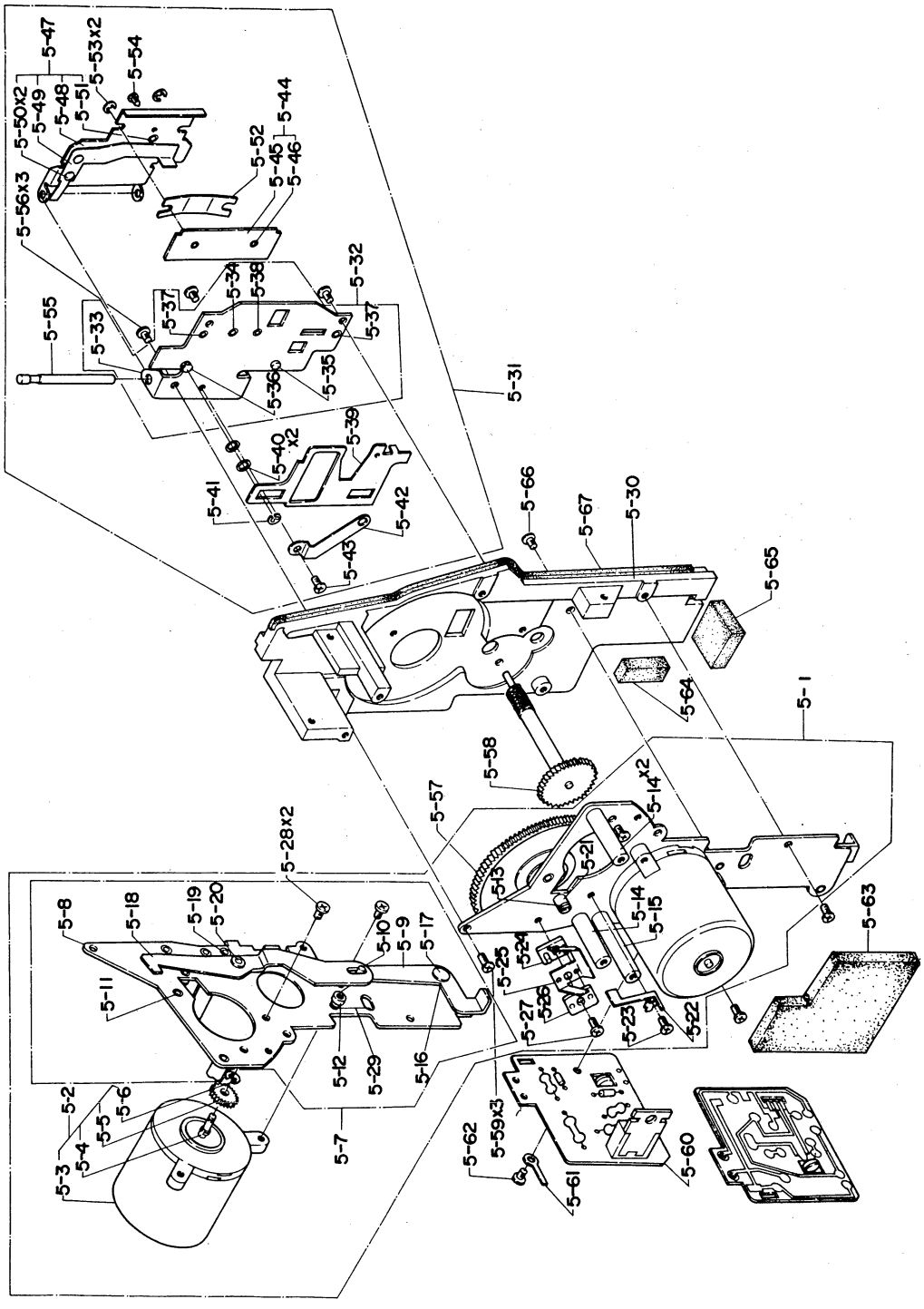
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
5— 1	46A 1293180	Base plate assembly	1	
5— 2	101A 1273170	Pull down motor assembly	1	
5— 3	101B 1293530	Pull down motor	1	
5— 4	50B 1275740	Friction ring	1	PX 300
5— 5	34B 1275730	Gear	1	PX 300
5— 6	191M 015T	E-clip	1	
5— 7	46A 1293650	Base plate assembly	1	
5—21	115B 1275790	Insulation tube	1	PX 300
5—22	109A 1270310	Switch contact assembly	1	PX 300
5—23	110M 170161S	Screw	1	
5—24	115B 127030	Insulation plate	1	ST 801
5—25	109A 1270320	Contact assembly	1	PX 300
5—26	115B 1278230	Insulation plate	1	PX 300
5—27	110M 140351S	Screw	1	
5—28	110M 200501S	Screw	2	
5—29	50B 1293510	Spring	1	
5—30	10B 1293470	Frame	1	
5—31	315A 1296680	Film gate assembly	1	
5—32	44A 1296710	Gate assembly	1	
5—39	45B 1296910	Claw	1	
5—40	55B 1296920	Washer	2	
5—41	191M 012T	E-clip	1	
5—42	50B 1296880	Leaf spring	1	
5—43	110M 200203N	Screw	1	
5—44	44A 1296720	Pressure plate assembly	1	
5—47	44A 1270250	Pressure plate seat assembly (1)	1	PX 300
5—52	50B 656071	Leaf spring	1	ZX 300
5—53	191M 015T	E-clip	2	
5—54	120M 200223S	Screw	1	
5—55	32B 1277020	Shaft	1	PX 300
5—56	113M 200501S	Screw	3	
5—57	34A 1270060	Sector gear ssembly	1	PX 300

Fig. 5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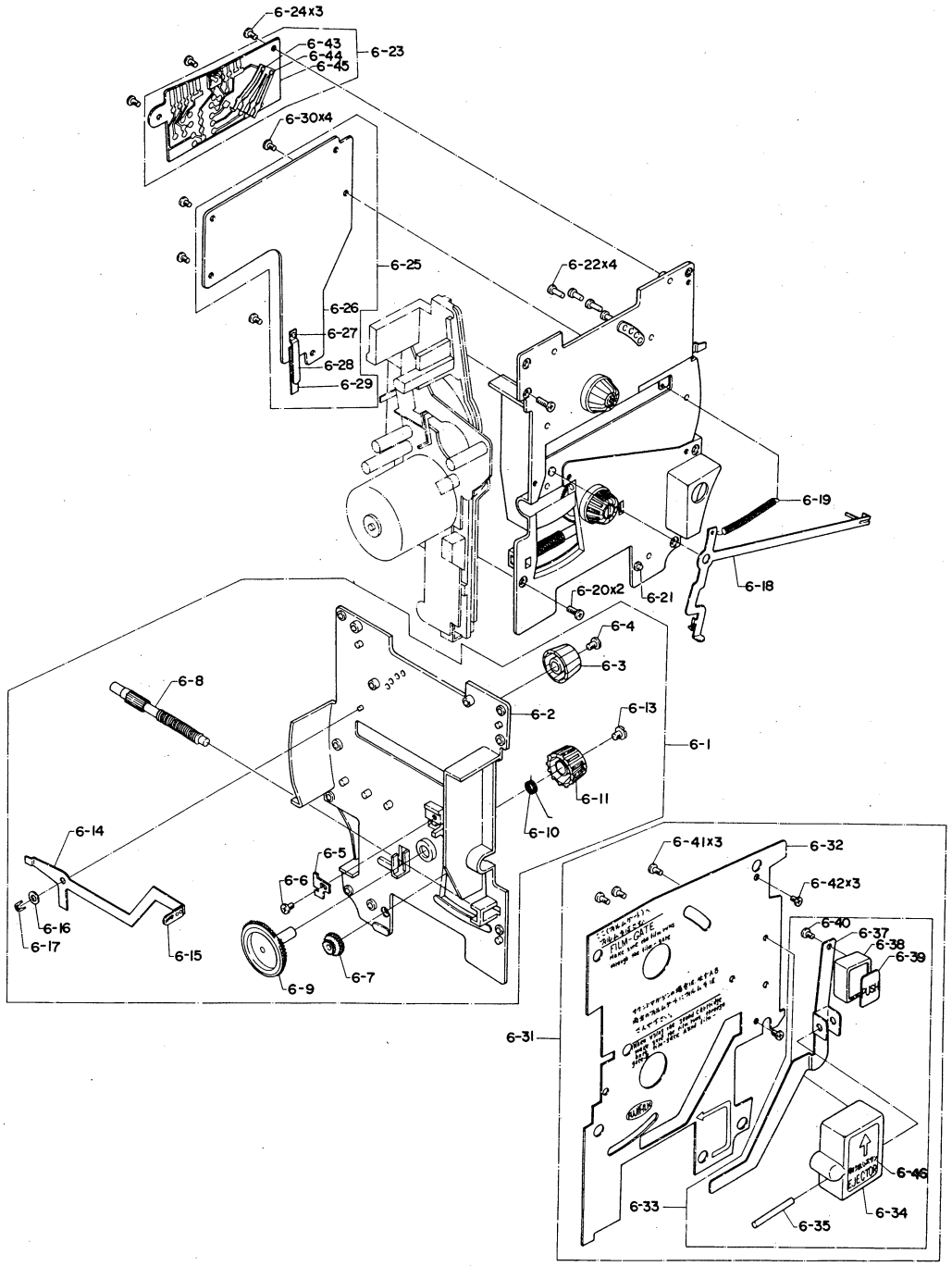
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
5 — 58	34A 1270070	Gear assembly	1	PX 300
5 — 59	113M 200501S	Screw	3	
5 — 60	110A 1293190	Motor control circuit assembly	1	
5 — 61	111B 72560	Lug	1	Z 600
5 — 62	110M 2002GIS	Screw	1	
5 — 63	27B 1288860	Moquette	1	
5 — 64	95B 1302980	Moquette	1	
5 — 65	27B 1288880	Moquette	1	
5 — 66	111M 170301S	Screw	1	
5 — 67	27B 1302920	Moquette	1	

Fig. 6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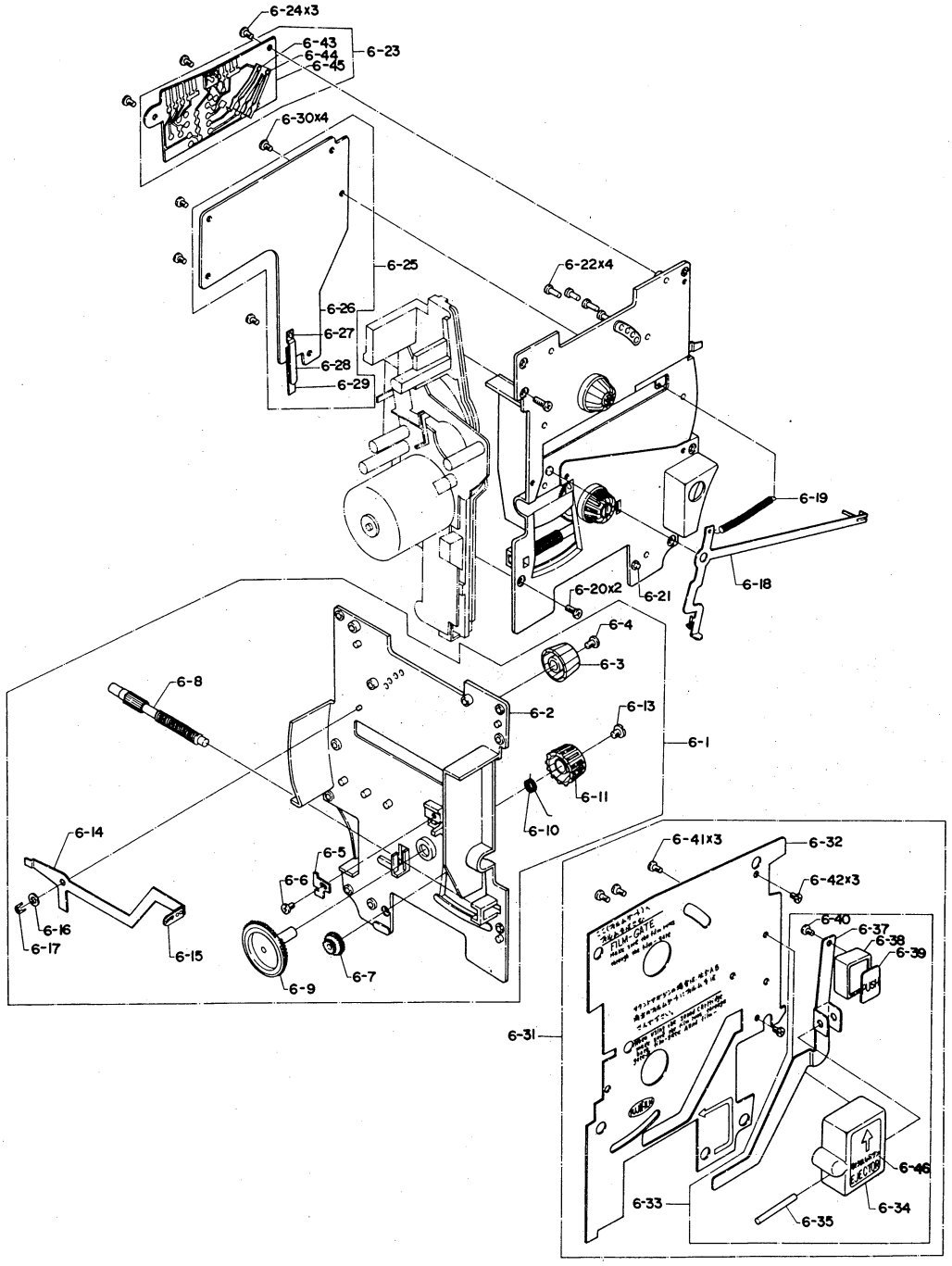
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
6 — 1	322A 1295170	Footage counter assembly	1	
6 — 2	46B 1295670	Base plate	1	
6 — 3	32B 1295810	Film feed spindle	1	
6 — 4	53B 70390	Screw	1	Z 600
6 — 5	31B 1276590	Plate	1	PX 300
6 — 6	113M 200351S	Screw	1	
6 — 7	34B 1276540	Idler	1	PX 300
6 — 8	34B 1276560	Gear spindle	1	PX 300
6 — 9	34B 1276550	Take-up gear	1	PX 300
6 — 10	50B 655110	Spring	1	ZX 300
6 — 11	37B 1295790	Film take-up spindle	1	
6 — 13	53B 1295800	Screw	1	
6 — 14	47B 1295690	Lever	1	
6 — 15	4B 1295770	Filter	1	
6 — 16	55B 11820	Washer	1	Z 800
6 — 17	25K 249010	Clip	1	
6 — 18	50B 1295680	Footage counter lever	1	
6 — 19	50B 1295780	Spring	1	
6 — 20	113M 200501S	Screw	2	
6 — 21	17B 1277530	Pin	1	PX 300
6 — 22	17B 1277530	Film speed setting pin	4	PX 300
6 — 23	318A 1297170	Automatic film speed setting	1	
6 — 24	113M 200351S	Screws circuit assembly	3	
6 — 25	328A 1297370	Amplifier circuit assembly	1	
6 — 30	113M 200351S	Screw	4	
6 — 31	58A 1288230	Film chamber plate assembly	1	
6 — 32	58B 1288730	Film chamber plate	1	
6 — 33	11A 1288220	Cover assembly	1	
6 — 34	11B 1288790	Cover	1	
6 — 35	32B 1288820	Rod	1	
6 — 37	47B 1288810	Lever	1	

Fig. 6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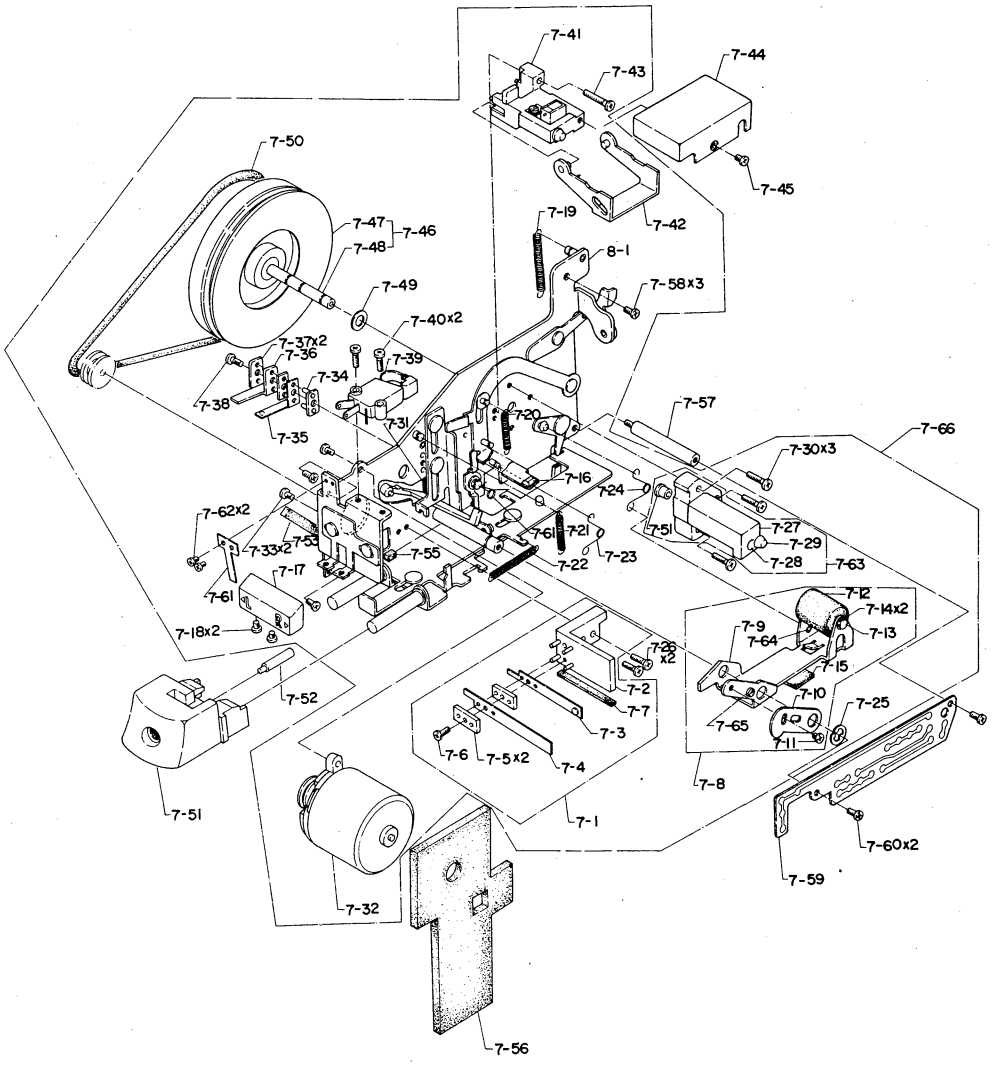
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
6 — 38	16B 1288800	Button	1	
6 — 39	58B 1288710	Plate	1	
6 — 40	114M 200501S	Screw	1	
6 — 41	114M 200501S	Screw	3	
6 — 42	113M 170301S	Screw	3	

Fig. 7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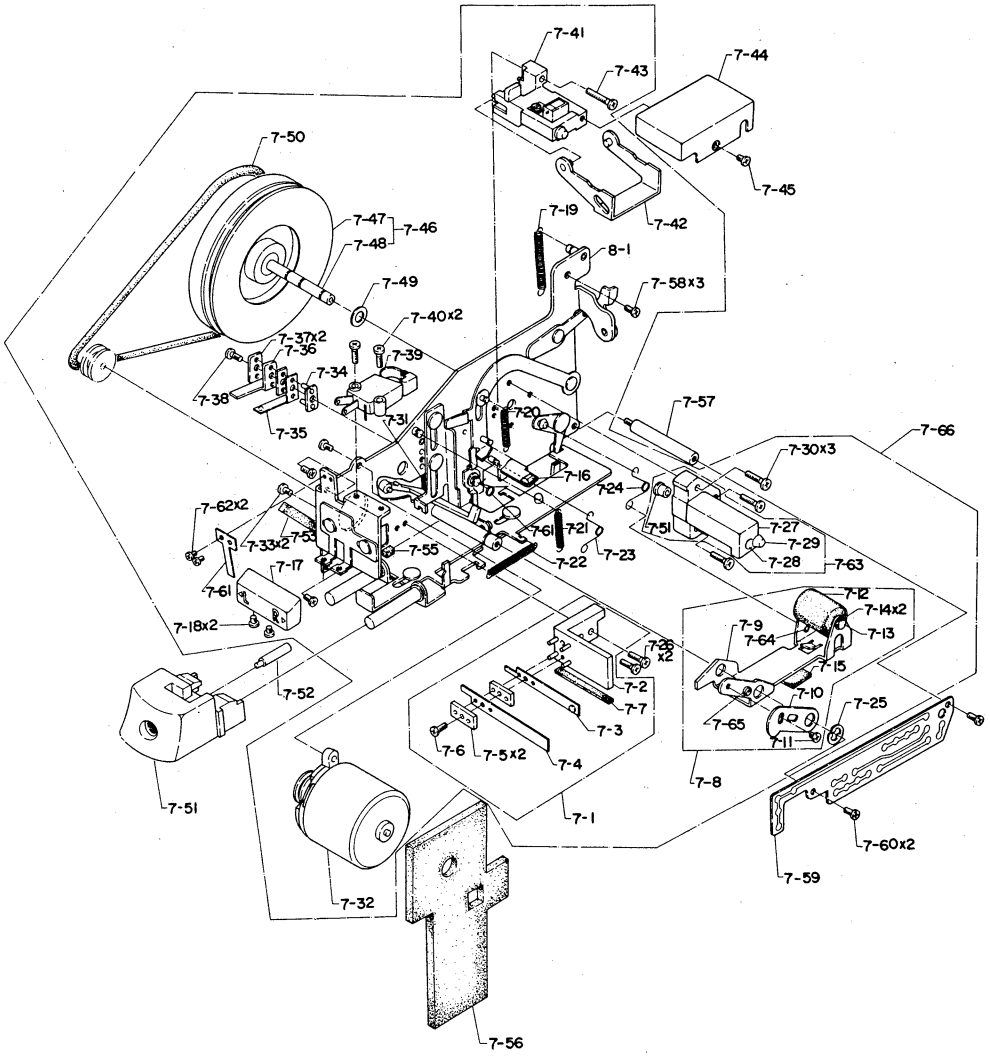
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
7— 1	121A 1298250	Switch assembly	1	
7— 2	82B 1298970	Base plate	1	
7— 3	109B 1298990	Contact piece	1	
7— 4	109B 1298980	Contact piece	1	
7— 5	115B 127050	Insulation plate	2	ST 801
7— 6	113M 140403S	Screw	1	
7— 7	95B 1302900	Moquette	1	
7— 8	47A 1298310	Pinch roller lever assembly	1	
7— 9	47B 1298860	Lever	1	
7—10	47B 1298890	Lever	1	
7—11	110M 200253S	Screw	1	
7—12	36B 1298870	Pinch roller	1	
7—13	32B 1298880	Shaft	1	
7—14	191M 020T	E-clip	2	
7—15	95B 1303030	Moquette	1	
7—16	51B 1298710	Head pad	1	
7—17	16B 1299050	Run-lock selector button	1	
7—18	111M 200551S	Screw	2	
7—19	50B 1299250	Spring	1	
7—20	50B 1299090	Spring	1	
7—21	50B 1299080	Spring	1	
7—22	27B 1299250	Srping	1	
7—23	50B 1298830	Spring	1	
7—24	50B 1298960	Spring	1	
7—25	191M 030T	E-clip	1	
7—26	110M 200551S	Screw	2	
7—30	110M 200551S	Screw	3	
7—31	50B 1299190	Spring	1	
7—32	101A 1298200	Drive motor assembly	1	
7—33	110M 200551S	Screw	2	
7—34	115B 127030	Insulation plate	1	ST 801

Fig. 7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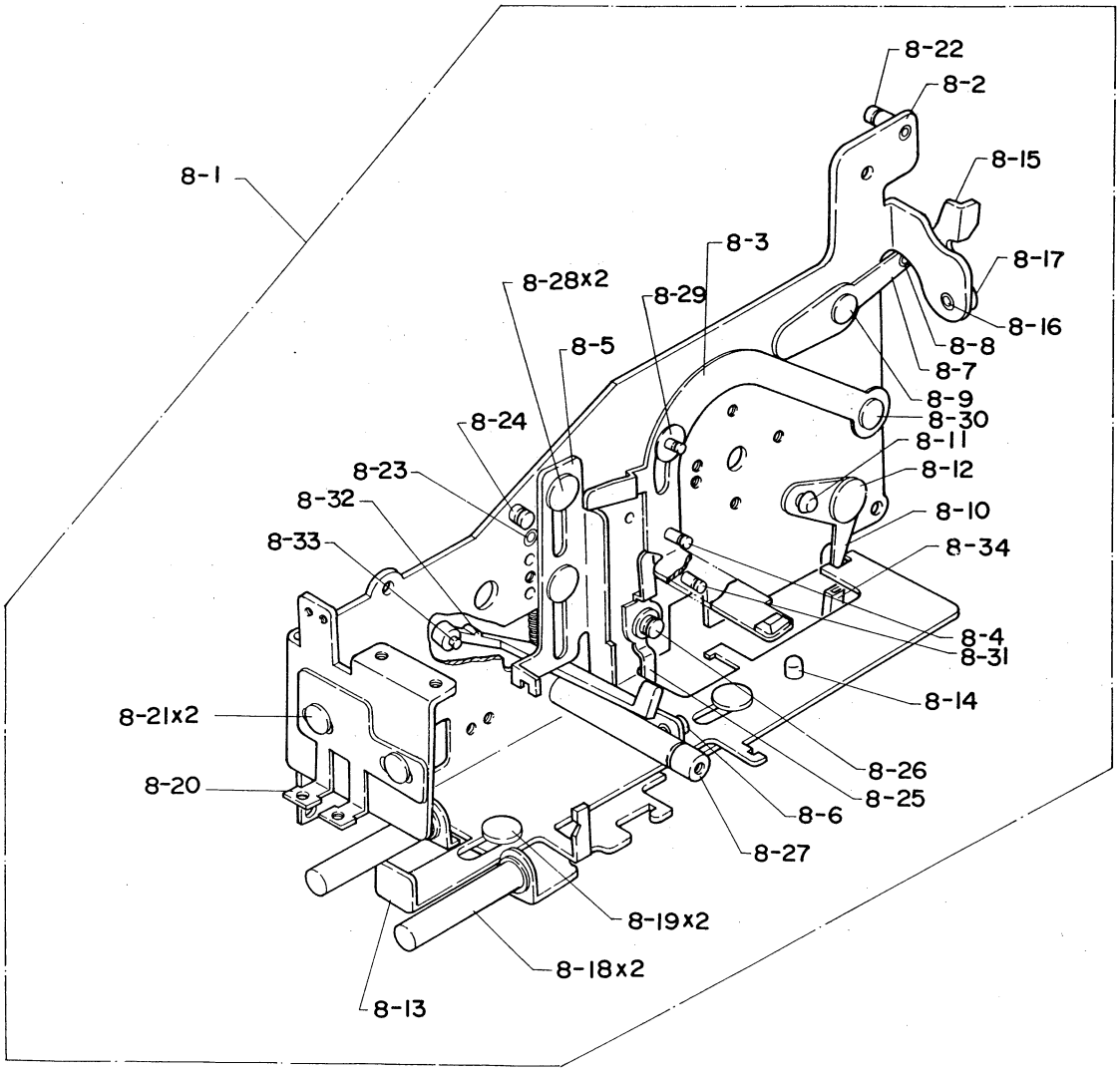
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
7 — 35	109A 1298240	Contact assembly	1	
7 — 36	109A 1298220	Contact assembly	1	
7 — 37	115B 1278230	Insulation plate	2	PX 300
7 — 38	110M 140351S	Screw	1	
7 — 39	121K 252720	Skelton switch	1	
7 — 40	110M 200701S	Screw	2	
7 — 41	10A 1298190	Head holder aseembly	1	
7 — 42	44B 1298690	Film holder	1	
7 — 43	110M 200653S	Screw	1	
7 — 44	11B 1298730	Cover	1	
7 — 45	110M 200351S	Screw	1	
7 — 46	32A 1298180	Capstan shaft assembly	1	
7 — 49	55K 252710	Washer	1	
7 — 50	56B 1298750	Belt	1	
7 — 51	16A 1288190	Shutter release button	1	
7 — 52	32B 1299000	Shaft	1	
7 — 53	95B 1302970	Moquette	1	
7 — 55	95B 1302950	Moquette	1	
7 — 56	27B 1288870	Moquette	1	
7 — 57	13B 1298910	Column	1	
7 — 58	113M 200703S	Screw	3	
7 — 59	110B 1298930	Printed circuit board	1	
7 — 60	110M 200351S	Screw	2	
7 — 61	50B 1299320	Click spring	1	
7 — 62	110M 170201S	Screw	2	
7 — 63	10A 1298300	Holder assembly	1	
7 — 64	17B 1298900	Pin	1	
7 — 66	347A 1298170	Sound recorder mechanism assembly	1	

Fig. 8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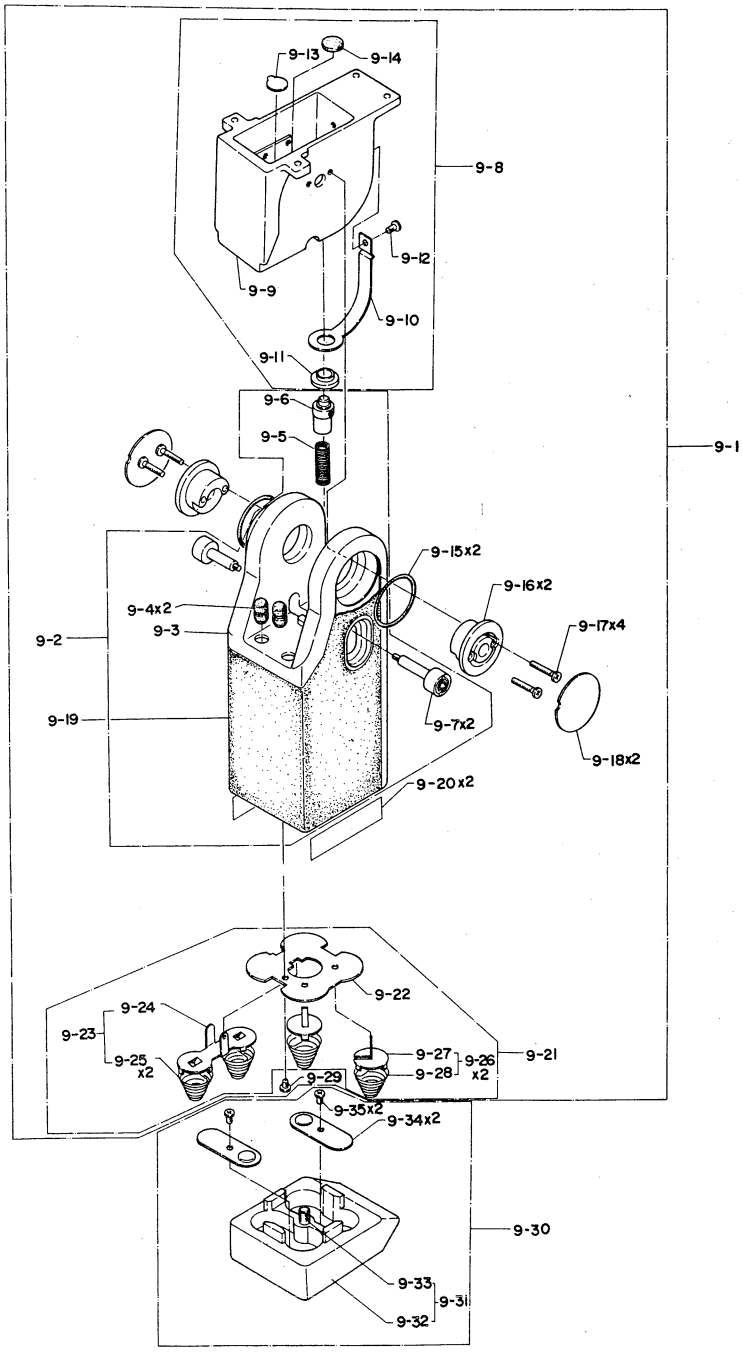
Ref No.	Part No.	Part Name	Q'ty	Commonly used with
8— 1	46A 1298400	Recorder base plate assembly	1	
8—34	115B 1299330	Tube	1	

Fig. 9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Ref No.	Part No.	Part Name	Q'ty	Commonly used with
9— 1	321A 1300670	Grip assembly	1	
9— 2	41A 1300690	Grip assembly	1	
9— 3	41A 1300730	Grip	1	
9— 4	87B 330662	Stopper	2	Z 800
9— 5	50B 1301320	Spring	1	
9— 6	17B 1301250	Lock pin	1	
9— 7	16B 1301260	Knob	2	
9— 8	10A 1300740	Grip base assembly	1	
9—12	110M 200251N	Screw	1	
9—13	58B 1301350	Name plate	1	
9—14	27B 93890	Moquette	1	ST 701
9—15	60K 252700	O-ring	2	Z 800
9—16	32B 1301230	Seat	2	
9—17	110M 200901S	Screw	4	
9—18	58B 1301310	Plate	2	
9—19	59B 1301330	Leather	1	
9—20	58B 26771	Label	2	Z 450
9—21	109A 1300700	Contact base assembly	1	
9—22	115B 330992	Insulation plate	1	Z 800
9—23	109A 23150	Contact assembly	1	Z 800
9—24	109B 26660	Contact piece	1	Z 800
9—25	109B 24460	Spring	2	Z 800
9—26	109A 23140	Contact assembly	2	Z 800
9—27	109B 26650	Contact piece	2	Z 800
9—28	109B 24460	Spring	2	Z 800
9—29	113M 200401S	Screw	1	
9—30	57A 1300750	Battery chamber cover assembly	1	
9—31	57B 1300750	Cover assembly	1	
9—32	57B 1301190	Cover	1	
9—33	53B 331000	Screw	1	Z 800
9—34	109B 14550	Contact piece	2	
9—35	113M 170301S	Screw	2	