JVC

GR-AXM230U/SXM330U/SXM930U

No. 86595

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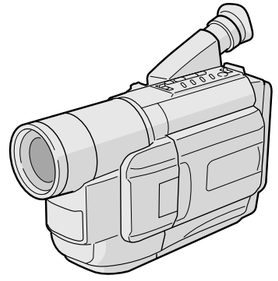
SERVICE MANUAL

COMPACT VHS CAMCORDER

GR-AXM230U/SXM330U/SXM930U



DIGITAL STILL CAMERA

S-VHS C

Super VHS

Super VHS ET

SPECIFICATIONS *(The specifications shown pertain specifically to the model GR-SXM930)*

Camcorder

General

Format	:	S-VHS/VHS NTSC standard
Power source	:	DC 11 V ⎓ (Using AC Adapter) DC 6 V ⎓ (Using battery pack)
Power consumption		
Viewfinder on	:	4.7 W
LCD monitor on	:	5.4 W
Video light	:	3.0 W
Signal system	:	NTSC-type
Video recording system		
Luminance	:	FM recording
Color	:	Converted sub-carrier direct recording Conforms to VHS standard
Cassette	:	S-VHS C / VHS C cassette
Tape speed		
SP	:	33.35 mm/sec. (1-5/16 ips)
EP	:	11.12 mm/sec. (7/16 ips)
Recording time (max.)		
SP	:	40 minutes
EP	:	120 minutes (with TC-40)
D.S.C. format		
Recording format	:	Digital data storage (based on JPEG)
Recording medium	:	Built-in flash memory, 2 Mbyte
Number of storable shots		
FINE mode	:	approx. 30 shots
STANDARD mode	:	approx. 60 shots
Image size	:	640 x 480 pixels (when captured on a PC)
Operating temperature	:	0°C to 40°C (32°F to 104°F)
Operating humidity	:	35% to 80%
Storage temperature	:	–20°C to 50°C (–4°F to 122°F)
Weight	:	Approx. 930 g (2.1 lbs)
Dimensions	:	206 mm x 112 mm x 118 mm (8-1/8" x 4-7/16" x 4-11/16") (with the LCD monitor closed and with the viewfinder fully tilted downward)
Pickup	:	1/4" format CCD
Lens	:	F1.6, f = 3.9 mm to 62.4 mm, 16:1 power zoom lens with auto iris and macro control, filter diameter 40.5 mm
Viewfinder	:	Electronic viewfinder with 0.55" color LCD
White balance adjustment	:	Auto/Manual adjustment
LCD monitor	:	3" diagonally measured, LCD panel/TFT active matrix system
Speaker	:	Monaural

Connectors

Video	:	1 V (p-p), 75 Ω unbalanced, analog output (via Video output connector)
Audio	:	300 mV (rms), 1 kΩ analog output (via Audio output connector)
Digital	:	ø2.5 mm, 4-pole, mini-head jack
S-Video	:	**Y** : 1 V (p-p), 75 Ω, analog output **C** : 0.29 V (p-p), 75 Ω, analog output

AC Adapter AP-V10U

Power requirement		
U.S.A. and Canada	:	AC 120 V~, 60 Hz
Other countries	:	AC 110 V to 240 V~, 50 Hz/60 Hz
Output	:	DC 11 V ⎓, 1 A
Dimensions (W x H x D)	:	59 mm x 31 mm x 69 mm (2-3/8" x 1-1/4" x 2-3/4")
Weight	:	Approx. 130 g (0.29 lbs)

Optional Accessories

- **Battery Packs BN-V12U, BN-V20U, BN-V400U**
- **A/V (Audio/Video) Cable**
- **S-Video Cable QAM0004-004**
- **Compact S-VHS (S-VHS C) Cassettes ST-C-40/30/20**
- **Compact VHS (VHS C) Cassettes TC-40/30/20**
- **Active Carrying Bag CB-V7U**

Some accessories are not available in some areas. Please consult your nearest JVC dealer for details on accessories and their availability.

Specifications shown are for SP mode unless otherwise indicated. E & O.E. Design and specifications subject to change without notice.

No. 86595
November 2000

TABLE OF CONTENTS

Section	Title	Page
	Important Safety Precautions	
	INSTRUCTIONS	
1.	**DISASSEMBLY**	
1.1	SERVICE CAUTIONS	1-1
1.1.1	Precautions	1-1
1.1.2	How to read the disassembly and assembly	1-1
1.1.3	Connection of the wires	1-1
1.2	TOOLS REQUIRED FOR ADJUSTMENTS	1-2
1.3	DISASSEMBLY/ASSEMBLY OF CABINET PARTS	1-3
1.3.1	Disassembly flow chart	1-3
1.3.2	Disassembly method	1-3
1.4	DISASSEMBLY/ASSEMBLY OF CAMERA SECTION AND DECK SECTION	1-9
1.4.1	Flowchart of disassembly	1-9
1.4.2	Disassembly method	1-9
1.5	REPLACEMENT OF CCD IMAGE SENSOR	1-12
1.5.1	Removal of CCD image sensor	1-12
1.5.2	Installation of new CCD image sensor	1-12
1.5.3	Replacement of CCD board assy	1-12
1.6	TAKE OUT CASSETTE TAPE	1-13
1.7	EMERGENCY DISPLAY	1-14
1.8	DEMONSTRATION MODE	1-14
1.9	SERVICE NOTE	1-16
2.	**MECHANISM ADJUSTMENT**	
2.1	SERVICE CAUTIONS	2-1
2.1.1	Precautions	2-1
2.1.2	How to read the disassembly and assembly (For Mechanism Parts)	2-1
2.1.3	Required adjustment tools	2-1
2.2	DISASSEMBLY/ASSEMBLY OF MECHANISM PARTS	2-2
2.3	CHECKUP AND ADJUSTMENT OF MECHANISM PHASE	2-6
2.4	TAPE TRANSPORT ADJUSTMENT	2-7
2.4.1	Back tension	2-7
2.4.2	Tape pattern	2-7
2.4.3	A/CTL head height & azimuth	2-8
2.4.4	Phase of control head (X value)	2-9
2.5	REMARKS	2-9
2.5.1	Cleaning	2-9
2.5.2	Applying oil and grease	2-9
2.5.3	Checkup	2-9
2.6	JIG CONNECTOR CABLE CONNECTION	2-10
3.	**ELECTRICAL ADJUSTMENT**	
3.1	ELECTRICAL ADJUSTMENT	3-1
3.1.1	PREPARATION	3-1
3.2	MONITOR ADJUSTMENT	3-3
3.2.1	V COM	3-3
3.3	ELECTRONIC VIEWFINDER (E. VF) ADJUSTMENT	3-4
3.3.1	Tilt	3-4
3.3.2	Centering	3-4
3.3.3	Vertical scanning	3-4
3.3.4	Brightness	3-4
3.3.5	Focus	3-4
4.	**CHARTS AND DIAGRAMS**	
	NOTES OF SCHEMATIC DIAGRAM	4-1
	CIRCUIT BOARD NOTES	4-2
4.1	BOARD INTERCONNECTIONS	4-3
4.2	CPU SCHEMATIC DIAGRAM	4-5
4.3	VTR ASP SCHEMATIC DIAGRAM	4-7
4.4	MECHA MDA SCHEMATIC DIAGRAM	4-9
4.5	VTR DSP SCHEMATIC DIAGRAM	4-11
4.6	DSP SCHEMATIC DIAGRAM	4-13
4.7	IRIS & AF/ZOOM SCHEMATIC DIAGRAM	4-15
4.8	VIDEO OUT SCHEMATIC DIAGRAM	4-17
4.9	REGULATOR SCHEMATIC DIAGRAM	4-19
4.10	LCD CTL SCHEMATIC DIAGRAM (FOR AXM230/SXM330)	4-21
4.11	LCD CTL SCHEMATIC DIAGRAM (FOR SXM930)	4-23
4.12	JACK AND CCD SCHEMATIC DIAGRAMS	4-25
4.13	SPEAKER AND MONITOR SCHEMATIC DIAGRAMS	4-27
4.14	C-VF BL SENSOR SCHEMATIC DIAGRAM	4-29
4.15	DSC SCHEMATIC DIAGRAM	4-31
4.16	TOP OPE UNIT, ZOOM UNIT, REAR UNIT AND SENSOR SCHEMATIC DIAGRAMS	4-33
4.17	ELECTRONIC VIEWFINDER SCHEMATIC DIAGRAM	4-35
4.18	MAIN CIRCUIT BOARD	4-37
4.19	CCD AND C-VF BL CIRCUIT BOARDS	4-43
4.20	MONITOR CIRCUIT BOARD	4-45
4.21	DSC CIRCUIT BOARD	4-47
4.22	ELECTRONIC VIEWFINDER CIRCUIT BOARD	4-49
4.23	POWER SYSTEM BLOCK DIAGRAM	4-51
4.24	CPU/MDA SYSTEM BLOCK DIAGRAM	4-53
4.25	CAMERA SYSTEM BLOCK DIAGRAM	4-55
4.26	Y/C SYSTEM BLOCK DIAGRAM	4-59
4.27	MONITOR SYSTEM BLOCK DIAGRAM	4-61
4.28	WAVEFORMS	4-63
4.29	VOLTAGE CHARTS	4-64
5.	**PARTS LIST**	
5.1	PACKING AND ACCESSORY ASSEMBLY <M1>	5-1
5.2	FINAL ASSEMBLY <M2>	5-3
5.3	MECHANISM ASSEMBLY <M3>	5-6
5.4	ELECTRONIC VIEWFINDER ASSEMBLY <M4> (SXM930U/UC)	5-8
5.4	ELECTRONIC VIEWFINDER ASSEMBLY <M4> (AXM230U/UC/SXM330U/UC)	5-9
5.5	MONITOR ASSEMBLY <M5>	5-10
5.6	ELECTRICAL PARTS LIST	5-11
	MAIN BOARD ASSEMBLY <01>	5-11
	CCD BOARD ASSEMBLY <02>	5-18
	C-VF BL BOARD ASSEMBLY <06> E,F	5-19
	MONITOR BOARD ASSEMBLY <07>	5-19
	DSC BOARD ASSEMBLY <08> E,F	5-19
	E. VF BOARD ASSEMBLY <50>	5-20

The following table lists the differing points between Models GR-AXM230U/UC, GR-SXM330U/UC and GR-SXM930U/UC in this series.

	GR-AXM230U	GR-SXM330U	GR-SXM930U
VIEW FINDER	B/W	B/W	COLOR
LCD MONITOR	2.5*	2.5*	3.0*
BODY COLOR	MOLD BLACK	METALLIC GRAY	SILVER
DIGITAL STILL CAMERA	NOT USED	NOT USED	USED
SHUTTER SOUND	NOT USED	NOT USED	USED
SNAP SHOT	NOT USED	USED (FULL ONLY)	USED (FULL & PIN-UP)
NIGHT ALIVE	NOT USED	USED	USED
5SEC REC SW	USED	NOT USED	NOT USED
S-VHS SW	NOT USED	USED	USED
S OUTPUT	NOT USED	USED	USED
PC TERMINAL	NOT USED	NOT USED	USED
RCU UNIT	NOT USED	RM-V715U	RM-V715U
PC CONNECTION CABLE	NOT USED	NOT USED	PROVIDE
CD-ROM	NOT USED	NOT USED	PROVIDE

SECTION 1
DISASSEMBLY

1.1 SERVICE CAUTIONS

1.1.1 Precautions

1. Before disassembling/re-assembling the set as well as soldering parts, make sure to disconnect the power cable.
2. When disconnecting/connecting connectors, pay enough attention to wiring not to damage it.
3. In general, chip parts such as resistor, shorting jumpers (0-ohm resistor), ceramic capacitors, diodes, etc. can not be reused after they were once removed.
4. When installing parts, be careful not to do with other parts as well as not to damage others.
5. When removing ICs, be careful not to damage circuit patterns.
6. Tighten screws properly during the procedures. Unless specified otherwise, tighten screws at torque of 0.196 N·m (2.0 kgf·cm).

1.1.2 How to read the disassembly and assembly

(For Cabinet Parts)

STEP /LOC NO.	PART	Fig. No.	REMOVAL
			*UNLOCK/RELEASE/ UNPLUG/UNCLAMP/ UNSOLDER
①	CASSETTE COVER ASSEMBLY	C1	2(S1)
②	UPPER CASE	C2	2(S2), (L2)
③	LOWER CASE ASSEMBLY(INCL. E. VF. ASSEMBLY)	C3	9(S3), (L3a), (L3b) *CN ③a ③b CAP (RCA jack)

(1) (2) (3) (4)

(1) Order of steps in Procedure
When reassembling, preform the step(s) in the reverse order. These numbers are also used as the identification (location) No. of parts Figures.
(2) Part to be removed or installed.
(3) Fig. No. showing Procedure or Part Location.

C = Cabinet
CA = Camera
D = Deck

(4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered.

P = Spring
W = Washer
S = Screw
* = Unhook, unlock, release, unplug or unsolder.
2(S3) = 2 Screws (S3)
CN = Connector

(5) Adjustment information for installation.

1.1.3 Connection of the wires

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

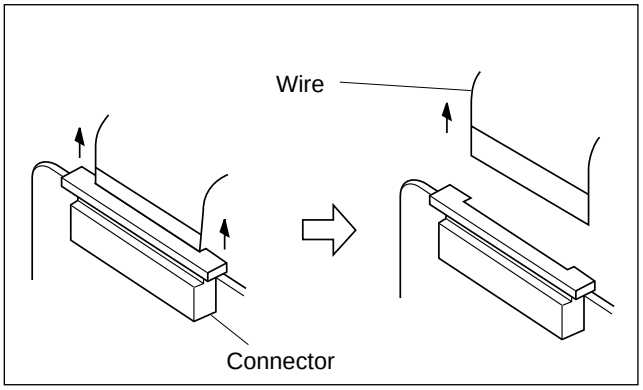
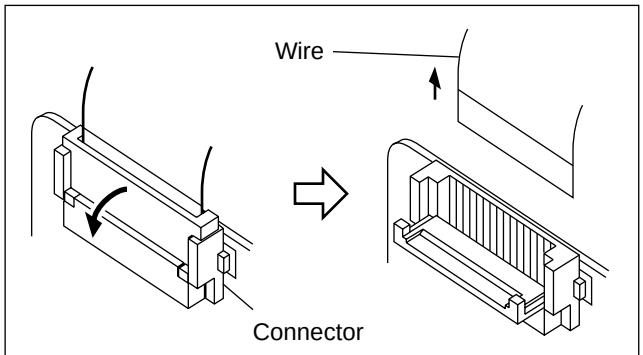


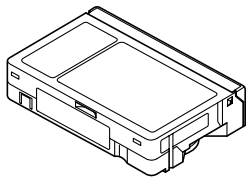
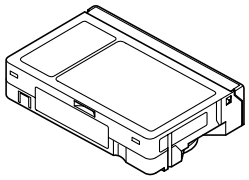
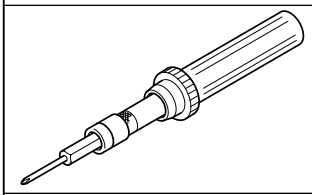
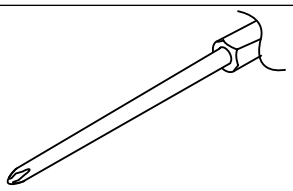
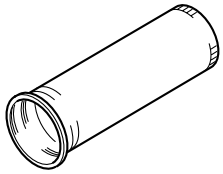
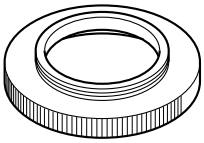
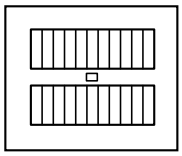
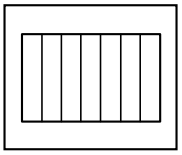
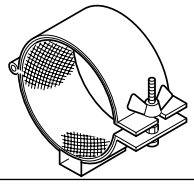
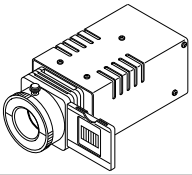
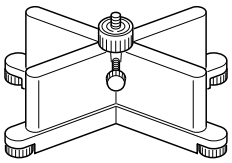
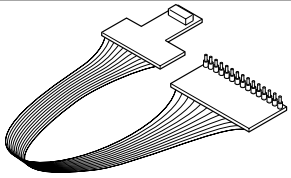
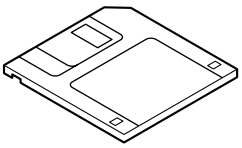
Fig. 1-1-1



NOTE: *After removing the wire, return the stopper to its original position, because it is apt to come off if it is left open.*

Fig. 1-1-2

1.2 TOOLS REQUIRED FOR ADJUSTMENTS

1 Alignment tape (for SP interchangeability) MHP-C	2 Alignment tape (for N. SP PB Y/C level) MHV-2C
	
3 Torque driver YTU94088	4 Bit YTU94088-003
	
5 INF adjustment lens YTU92001B	6 Conn. ring YTU92001-111
	
7 Gray Scale Chart YTU94133A	8 Color Bar Chart YTU94133C
	
9 INF lens holder YTU94087	10 Light box Assembly YTU93096A
	
11 Camera stand YTU93079	12 Extension connector YTU94145B-30
	
13 Jig connector cable YTU93106A	14 Service support system software YTU94057-51
	

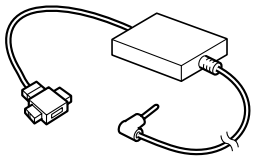
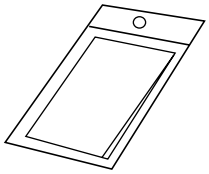
15 PC cable QAM0099-002	16 Cleaning cloth KSMM-01
	

Table 1-2-1

1,2. Alignment tape
To be used for check and adjustment of interchangeability of the mechanism.
(Video: Color bar signal, Audio: Non-signal)

3. Torque driver
Be sure to use to fastening the mechanism and exterior parts because those parts must strictly be controlled for tightening torque.

4. Bit
This bit is slightly longer than those set in conventional torque drivers.

5. INF adjustment lens
To be used for adjustment of the camera system.

6. Conn. ring
The connector ring to attach the INF. lens to the head of the OP lens.

7. Gray scale chart
To be used for adjustment of the camera system.

8. Color bar chart
To be used for adjustment of the camera system.

9. INF lens holder
To be used together with the camera stand (11) for operating the VideoMovie in the stripped-down condition such as the status without the exterior parts or for using commodities that are not yet conformable to the interchangeable ring.

10. Light box assembly
To be used for adjustment of the camera system.

11. Camera stand
To be used together with the INF adjustment lens holder.

12. Extention connector
To be used to JIG connector cable

13. JIG connector cable
Connected to CN25 of the main board and used for measuring error rates, etc.

14. Service support system software
To be used for adjustment with a personal computer.

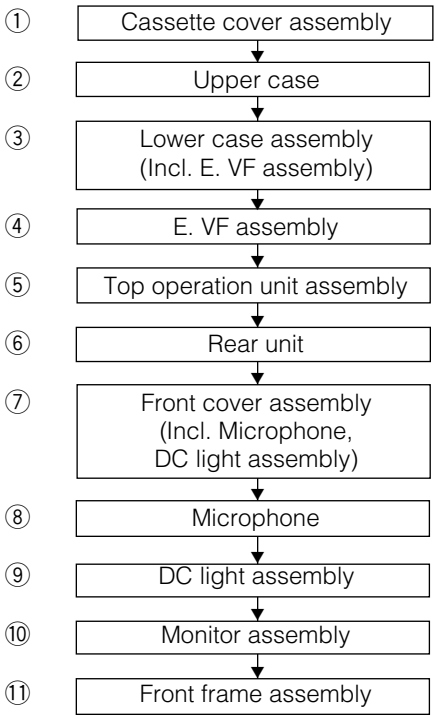
15. PC cable
To be used to connect the VideoMovie and a personal computer with each other when a personal computer is used for adjustment.

16. Cleaning cloth
Recommended cleaning cloth to wipe down the video heads, mechanism (tape transport system), optical lens surface.

1.3 DISASSEMBLY/ASSEMBLY OF CABINET PARTS

1.3.1 Disassembly flow chart

This flowchart indicates the disassembly step for the cabinet parts and board assembly in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally.



1.3.2 Disassembly method

STEP /LOC NO.	PART	Fig. No.	REMOVAL *UNLOCK/RELEASE/ UNPLUG/UNCLAMP/ UNSOLDER
①	CASSETTE COVER ASSEMBLY	C1	2(S1)
②	UPPER CASE	C2	2(S2), (L2)
③	LOWER CASE ASSEMBLY (INCL. E. VF ASSEMBLY)	C3	9(S3), (L3a), (L3b) *CN (3a) (3b) CAP (RCA jack)
④	E. VF ASSEMBLY	C4	3(S4)
⑤	TOP OPERATION UNIT ASSEMBLY	C5	2(S5), (L5a), (L5b), (L5c) *CN (5a)
⑥	REAR UNIT	C6	3(S6), (L6a), (L6b) *CN (6a)
⑦	FRONT COVER ASSEMBLY (INCL. MIC DC LIGHT ASSEMBLY)	C7	2(S7a), (S7b), (L7a), (L7b) *CN (7a)
⑧	MICROPHONE		(S7a)
⑨	DC LIGHT ASSEMBLY		2(L7c)
⑩	MONITOR ASSEMBLY	C8	2(S8a), (S8b) *CN (8a)
		C9	2(S9a), (S9b), (S9c)
		C10	2(S10a), 2(S10b), 2(S10c), (L10a), (L10b), (L10c)
		C11	(L11a), (L11b), (L11c) *CN (11a) , (11b) , (11c)
		C12	2(S12a), (S12b), 2(L12a)
⑪	FRONT FRAME ASSEMBLY	C13	2(S13)

List of Abbreviations:
2(S1)=2 screws (S1)
4(L1a)=4 Locking Tabs
CN=Connector

Reference Notes:
<NOTE 1>
Destination of connectors

Note: *Two kinds of double-arrows in connection tables respectively show kinds of connector/wires.*
⟺ : Flat wire
↔ : Wire

Connector	No. of Pins	Connector		
(3a)	2	SPEAKER	↔	MAIN CN27
(3b)	20	C-VF BL CN7551	⟺	MAIN CN11
	5	E. VF (B/W)	↔	MAIN CN12
(5a)	12	TOP OPERATION UNIT	⟺	MAIN CN18
(6a)	13	REAR UNIT	⟺	MAIN CN28
(7a)	2	MIC	↔	MAIN CN8
(8a)	33	MONITOR ASSEMBLY	⟺	MAIN CN16
(11a)	28	MONITOR CN7501	⟺	T. HINGE
(11b)	24	MONITOR CN7502	⟺	LCD MODULE
(11c)	2	MONITOR CN7503	↔	BACK LIGHT

<NOTE 2, 3>

(1) The FPC assembly should be winded around the hinge assembly by two and half turns so that the wire to be connected to the monitor board assembly is positioned inside.

(2) The upper and lower hinge covers should be mounted so carefully the any wire is not caught into either of the covers.

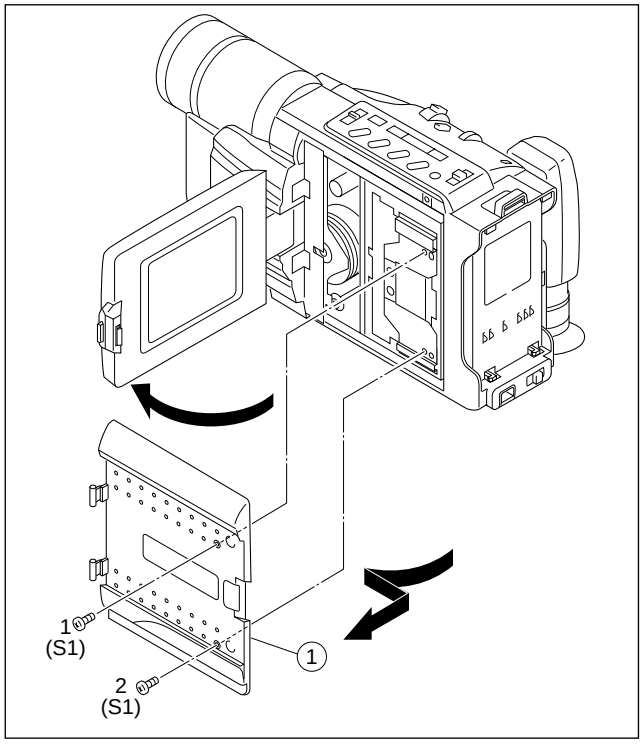


Fig. C1

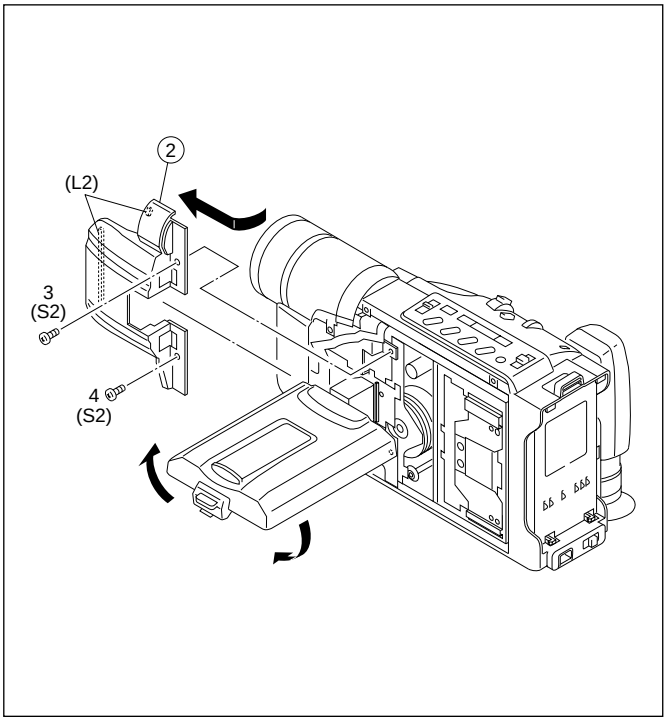


Fig. C2

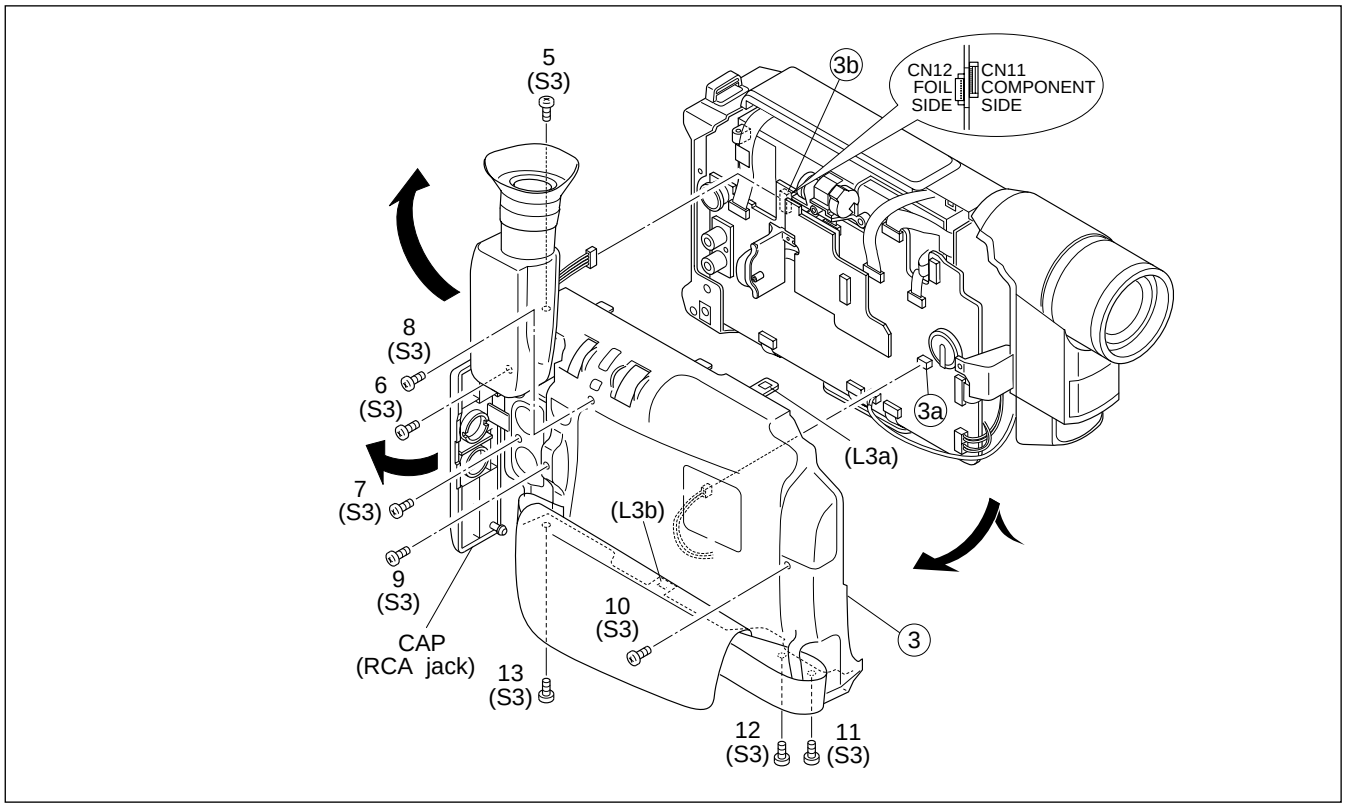


Fig. C3

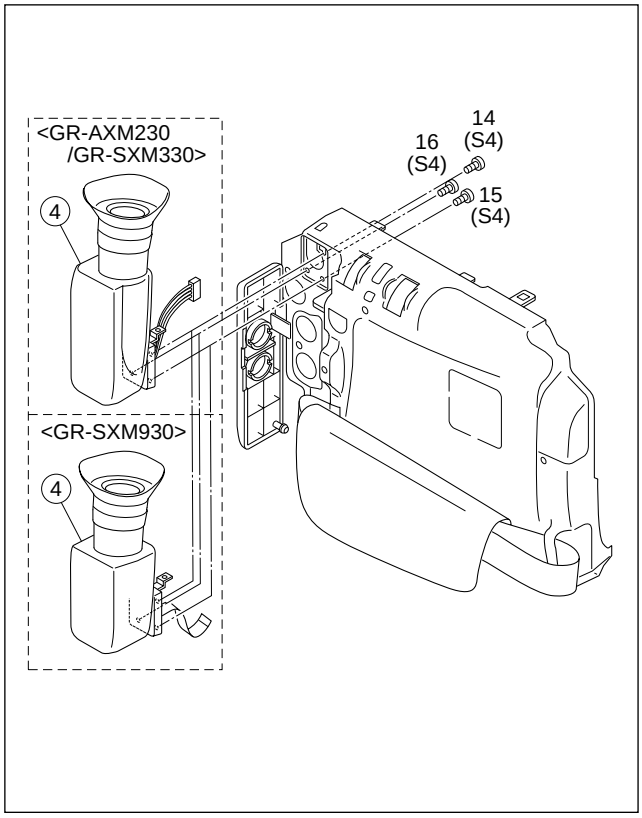


Fig. C4

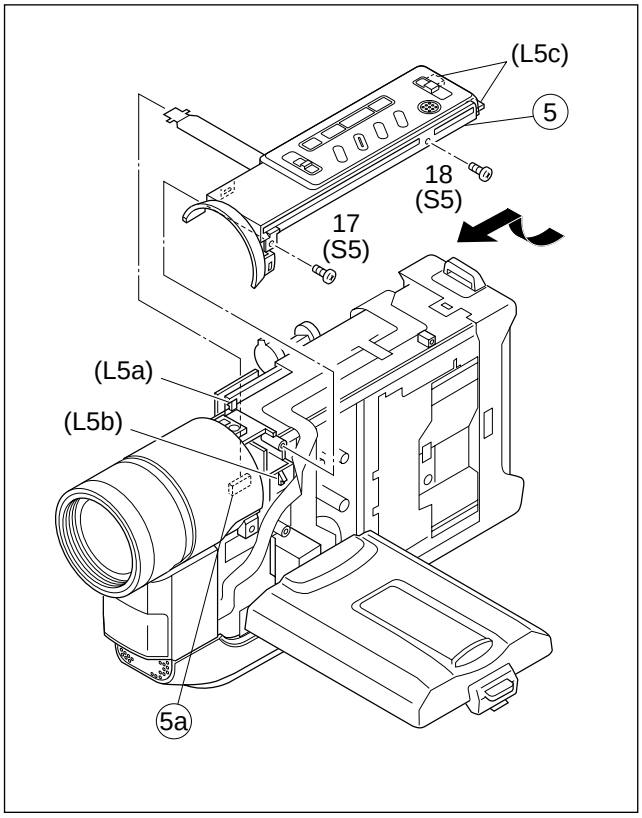


Fig. C5

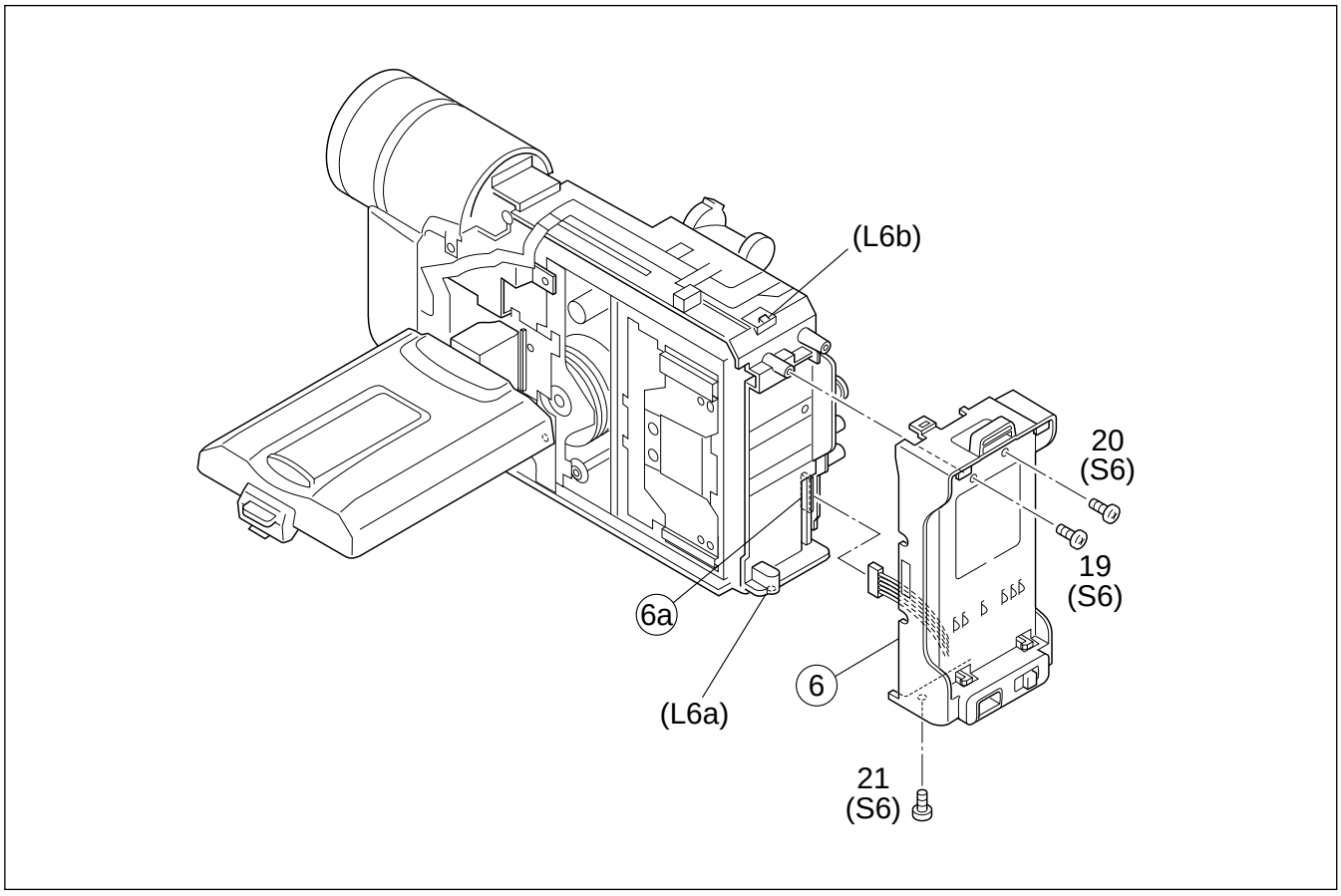


Fig. C6

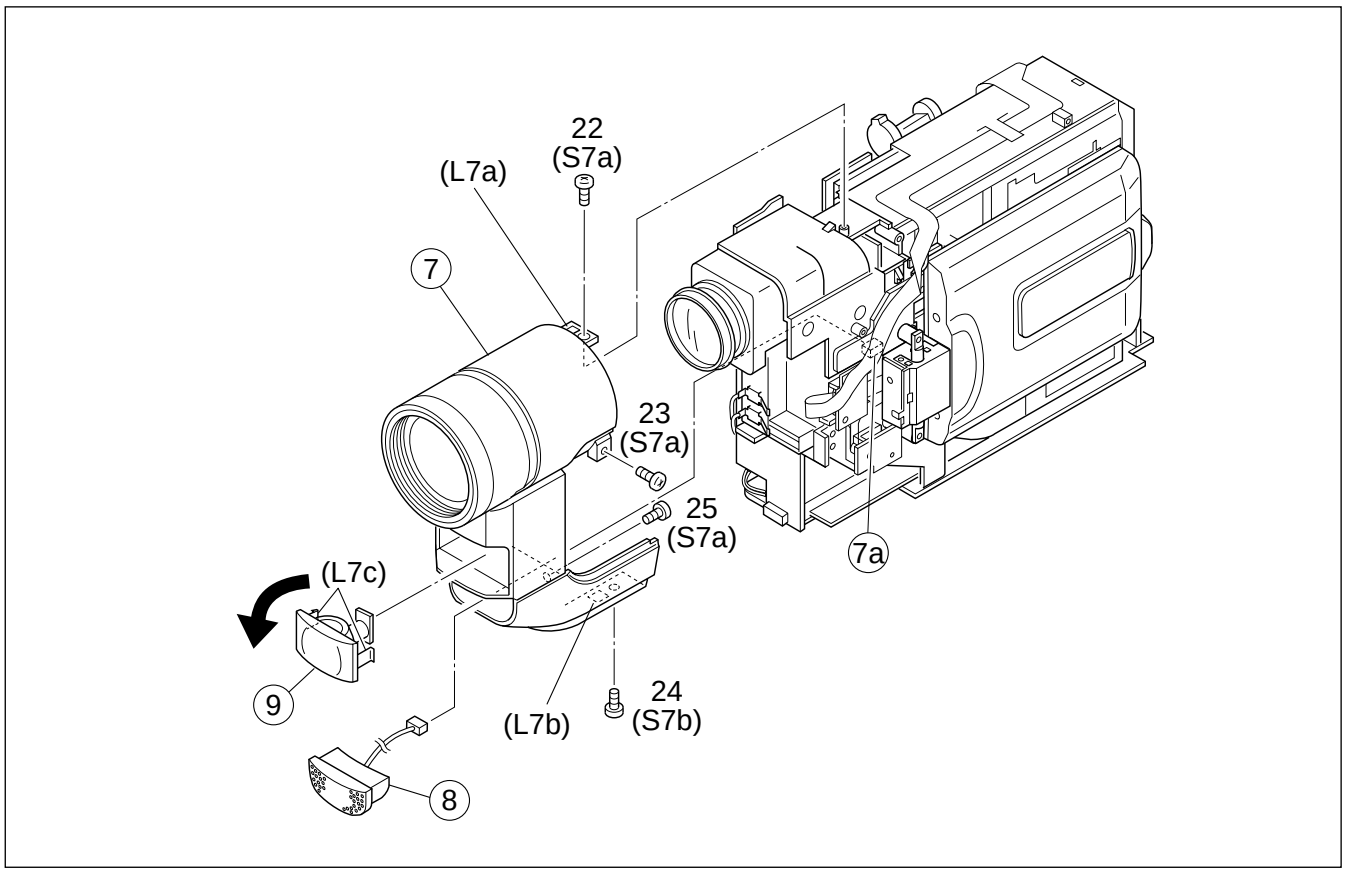

22
(S7a)
(L7a)
7
23
(S7a)
25
(S7a)
7a
(L7c)
9
(L7b)
24
(S7b)
8

Fig. C7

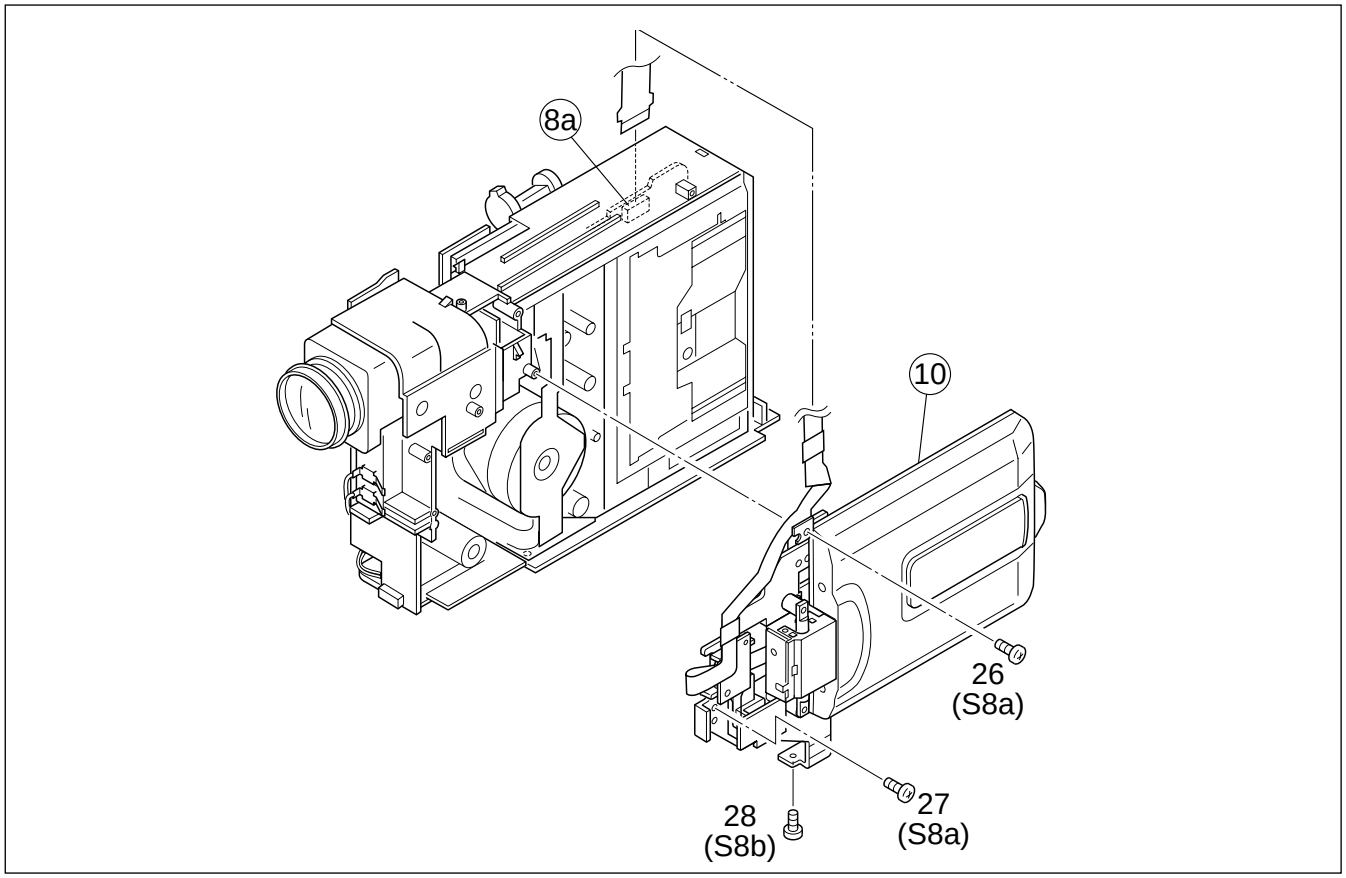

8a
10
26
(S8a)
27
(S8a)
28
(S8b)

Fig. C8

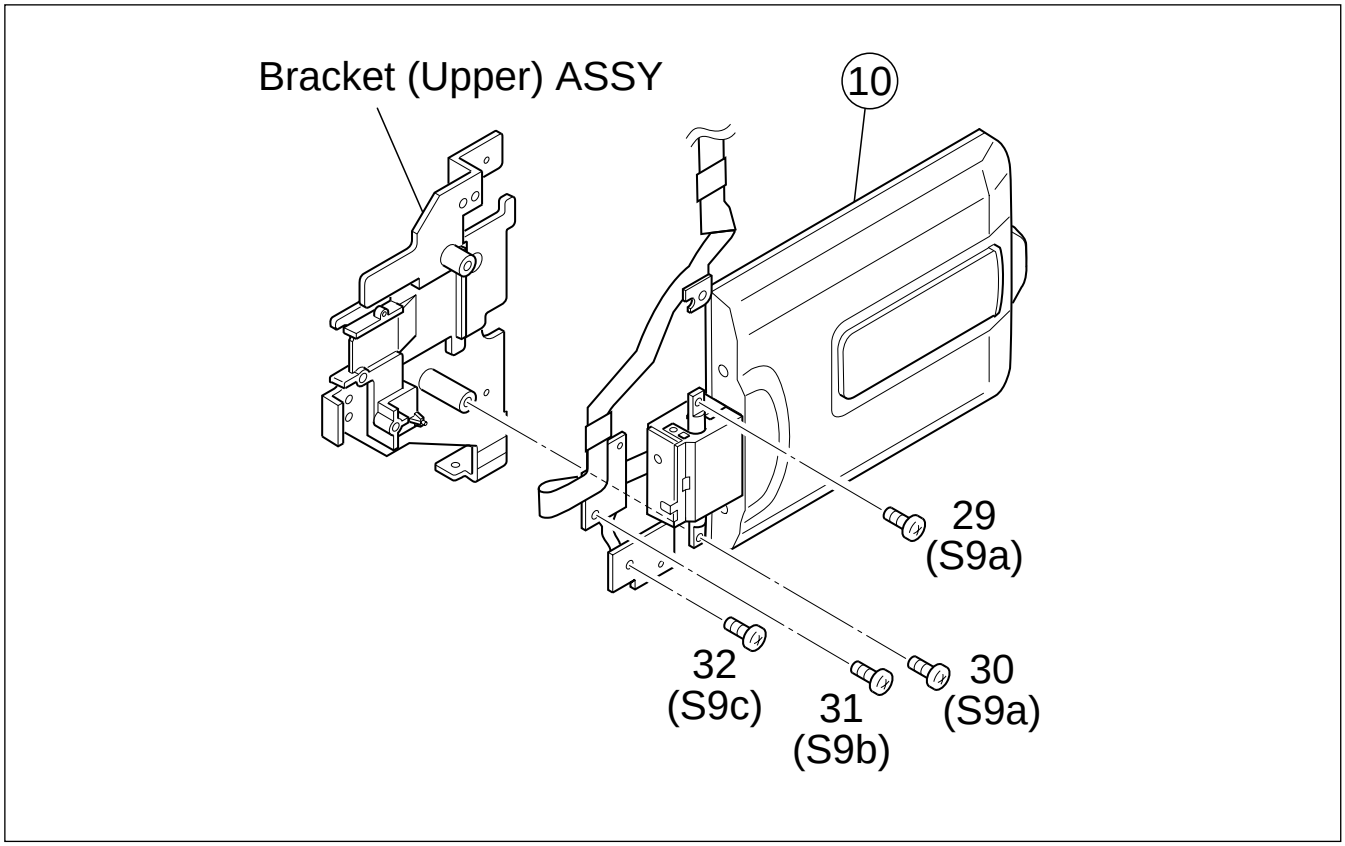


Fig. C9

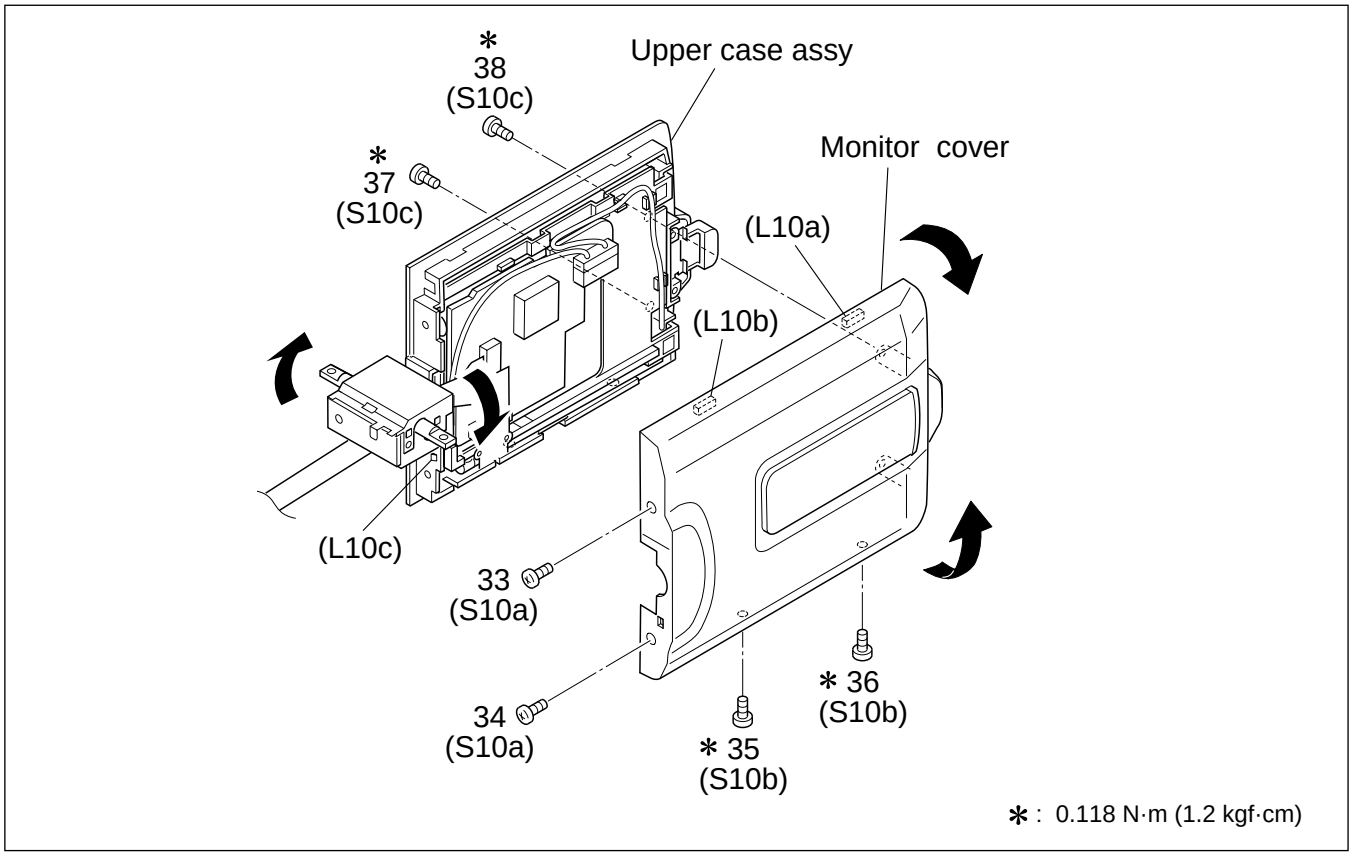


Fig. C10

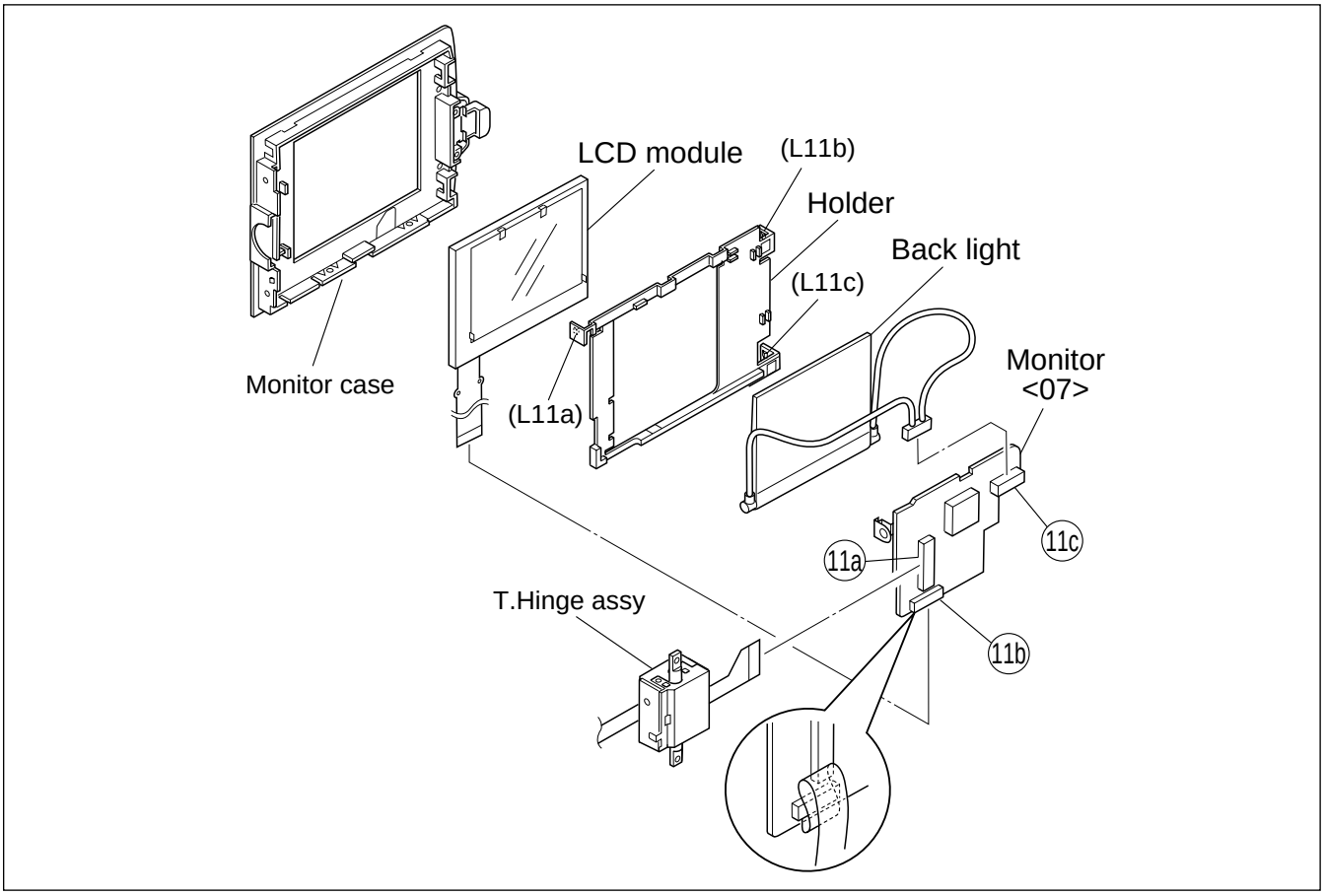


Fig. C11

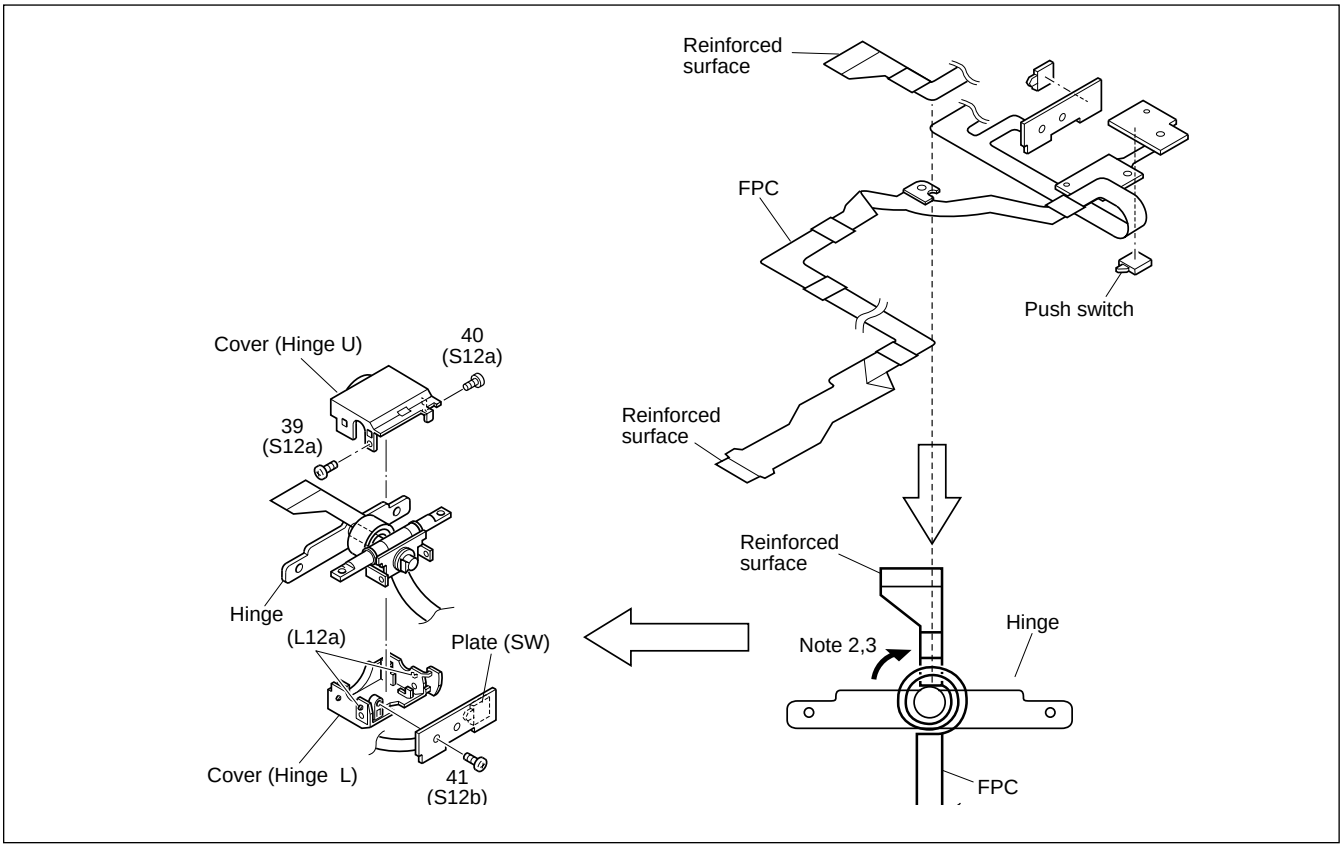


Fig. C12

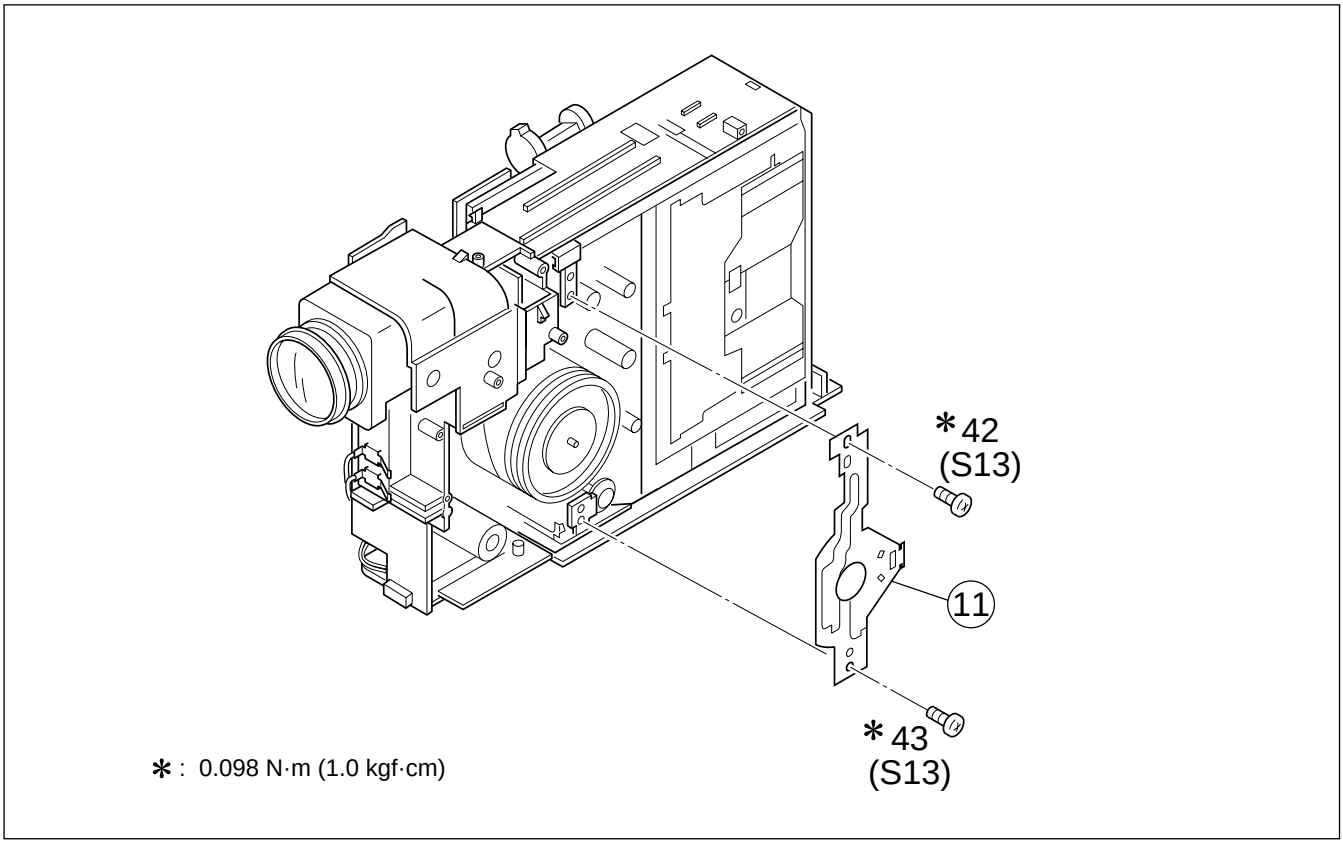


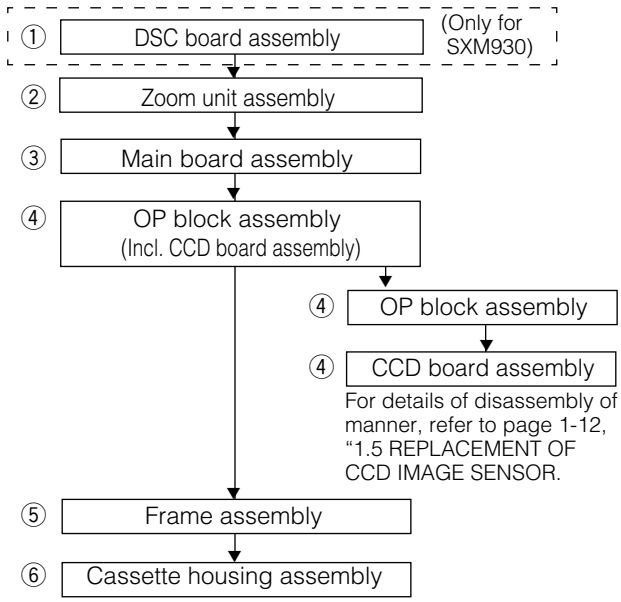
Fig. C13

1.4 DISASSEMBLY/ASSEMBLY OF CAMERA SECTION AND DECK SECTION

1.4.1 Flowchart of disassembly

The following flowchart shows the disassembly of the camera section and deck section. When assembly of the camera section and deck section, follow this flowchart in the reverse order.

<Camera section/Deck section>



1.4.2 Disassembly method

STEP /LOC NO.	PART	Fig. No.	REMOVAL *UNLOCK/RELEASE/ UNPLUG/UNCLAMP/ UNSOLDER
①	DSC BOARD ASSEMBLY	D1	2(S1), (L1a), (L1b), (L1c) *CN (1a) , (1b) HOLDER (DSC)
②	ZOOM UNIT ASSEMBLY	D2	3(S2) *CN (2a) 4(S2) *CN (2a)
③	MAIN BOARD	D3	(S3), (L3a), (L3b) *CN (3a) ,(3b) ,(3c) , (3d) ,(3e) (3f) , (3g) ,(3h)
④	OP BLOCK ASSEMBLY	D4	2(S4) CUSHION (OP)
⑤	FRAME ASSEMBLY	D5	(S5a), 2(S5b), (S5c)
⑥	CASSETTE HOUSING ASSEMBLY	D6	4(S6)

List of Abbreviations:
2(S1) = 2 Screws (S1)
4(L1a)=4 Locking Tabs (L1a)
CN=Connector

Reference Notes:
<NOTE 1>
Destination of connectors

Note: *Two kinds of double-arrows in connection tables respectively show kinds of connector/wires.*

⟺ : Flat wire

↔ : Wire

Connector	No. of Pins	Connector		
⑴a	2	MAIN J4001/J4002	⟺	DSC JP8001/JP8002
⑴b	39	MAIN CN19	⟺	DSC CN8001
⑵a	14	MAIN CN13	⟺	ZOOM UNIT
⑶a	14	MAIN CN2	⟺	SENSOR
⑶b	11	MAIN CN5	⟺	VIDEO/FLY. E HEAD
⑶c	10	MAIN CN1	⟺	DRUM MOTOR
⑶d	6	MAIN CN4 (PIN 1,2) MAIN CN4 (PIN 5,6)	↔ ↔	LOADING MOTOR DC LIGHT (OPEN TWO PINS OF THE CENTER AND CONNECT)
⑶e	22	MAIN CN15	⟺	OP BLOCK
⑶f	18	MAIN CN3	⟺	CAPSTAN MOTOR
⑶g	11	MAIN CN7	⟺	A/C HEAD
⑶h	14	MAIN CN22	⟺	CCD

<NOTE 2>
Open two pins of the cennter and connect CN4 as shown in Fig.

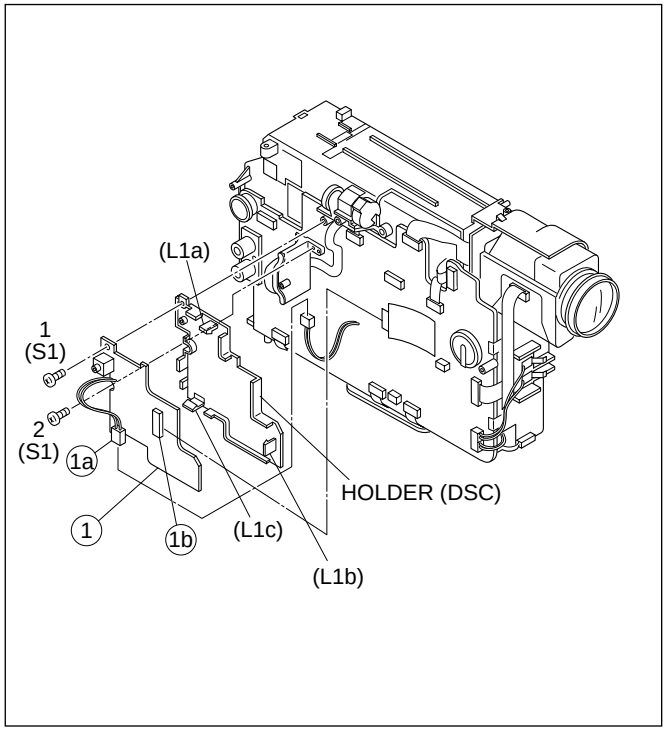
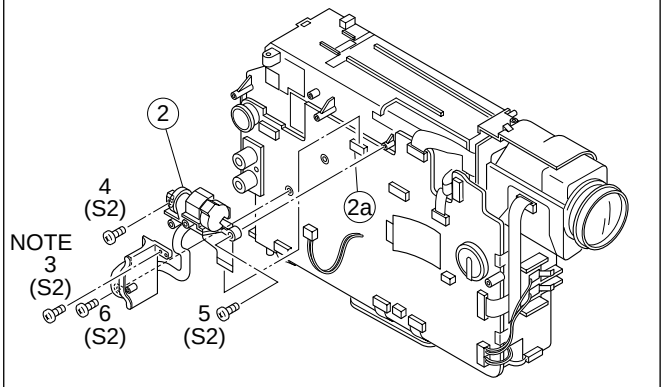


Fig. D1



Note: *Regarding the DSC model, the screw "3" has been removed together with the DSC board.*

Fig. D2

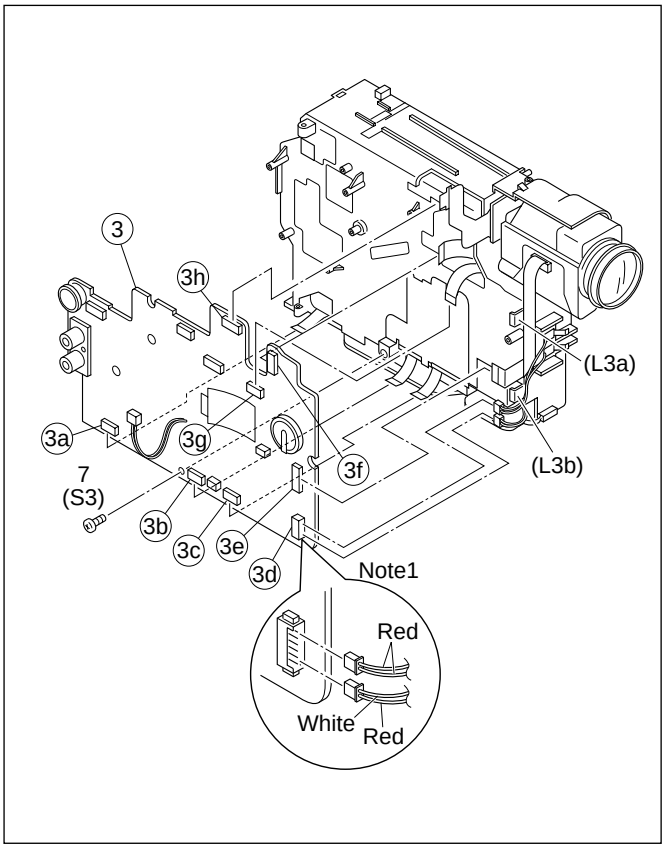


Fig. D3

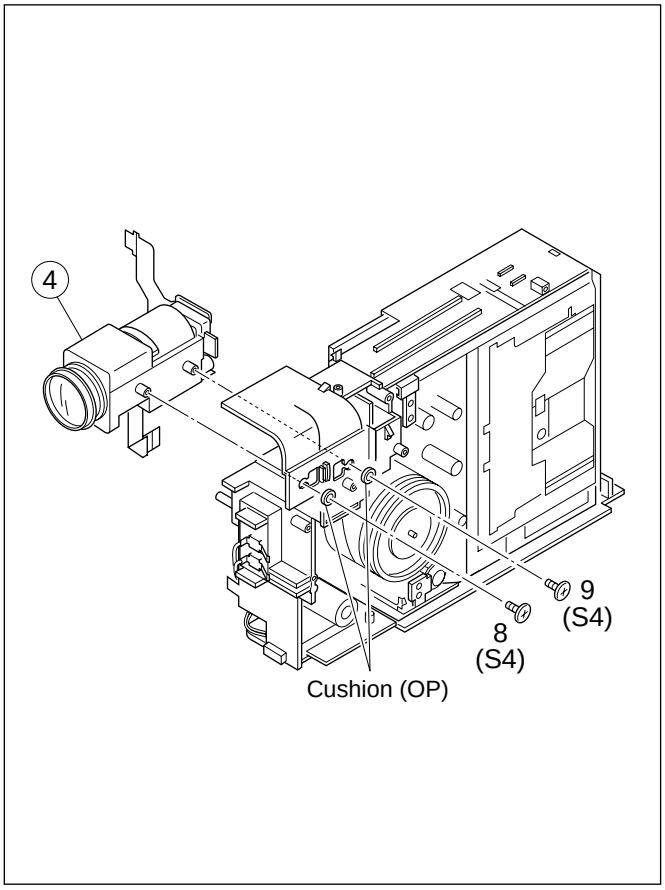


Fig. D4

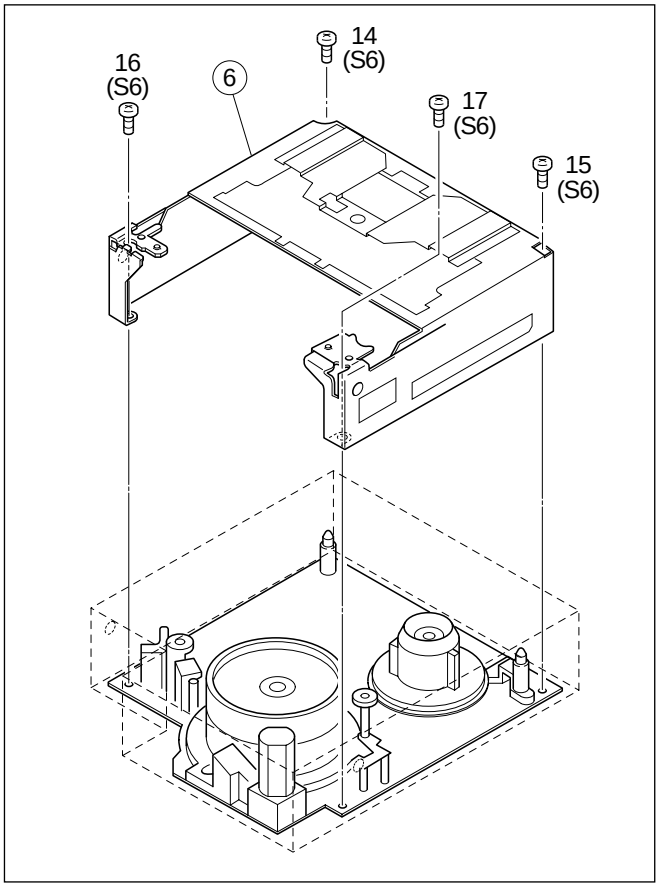


Fig. D6

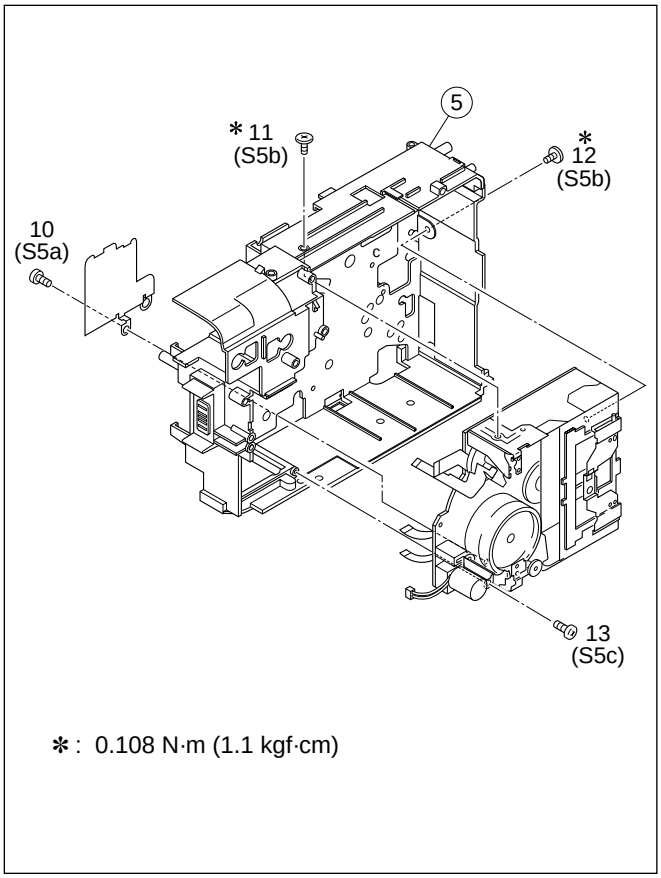


Fig. D5

1.5 REPLACEMENT OF CCD IMAGE SENSOR

Notes:

- *Pay the most careful attention to the transparent glass and optical LPF of the CCD image sensor so a not the soil and damage them. If something is soiled with finger-prints, etc., gently clean it with silicon-processed paper/cloth or chamois.*
- *When the CCD image sensor is shipped from the factory, there are protection seals applied onto the transparent glass. Leave the protector as it is, and take it off just before assembling the CCD image sensor to the OP block.*

1.5.1 Removal of CCD image sensor

1. Remove two screws (1, 2) securing the CCD base assy, and disassemble the CCD spacer, the optical LPF, spacer rubber.

1.5.2 Installation of new CCD image sensor

1. Remove the protection seal from a new CCD image sensor. Next, put the optical LPF, spacer rubber, CCD spacer on the CCD image sensor as they are piled up in this order. At that time, make sure of orientation of each item refering to the following table (see Fig. 1-5-1).

Part Name	Orientation
CCD image sensor	Mark is on the right viewed as indicated by the arrow ⓐ .
Spacer rubber	IC side is horizontal.
Optical LPF	Marks are on the left and bottom viewed as indicated by the arrow ⓐ .

2. Fix the CCD base assy to OP block with the two screws (1, 2) . At that time, be careful of the orientation.
3. After completion of all P.C. boards to the camera section, observe the monitor to confirm no vignetting caused by the bodytube, rings, lens hood, etc. If no vignetting is observed, it can be said that image's parallel, horizontality and centering are correct.

1.5.3 Replacement of CCD board assy

1. Remove one screw (3).
2. Unsolder at the fourteen points on the CCD board assy.

Note: *1. Remove the screw (3) only when the CCD board assy needs replacement.*
2. When installing a new CCD board assy, carry out the above-mentioned procedure in the reverse order.

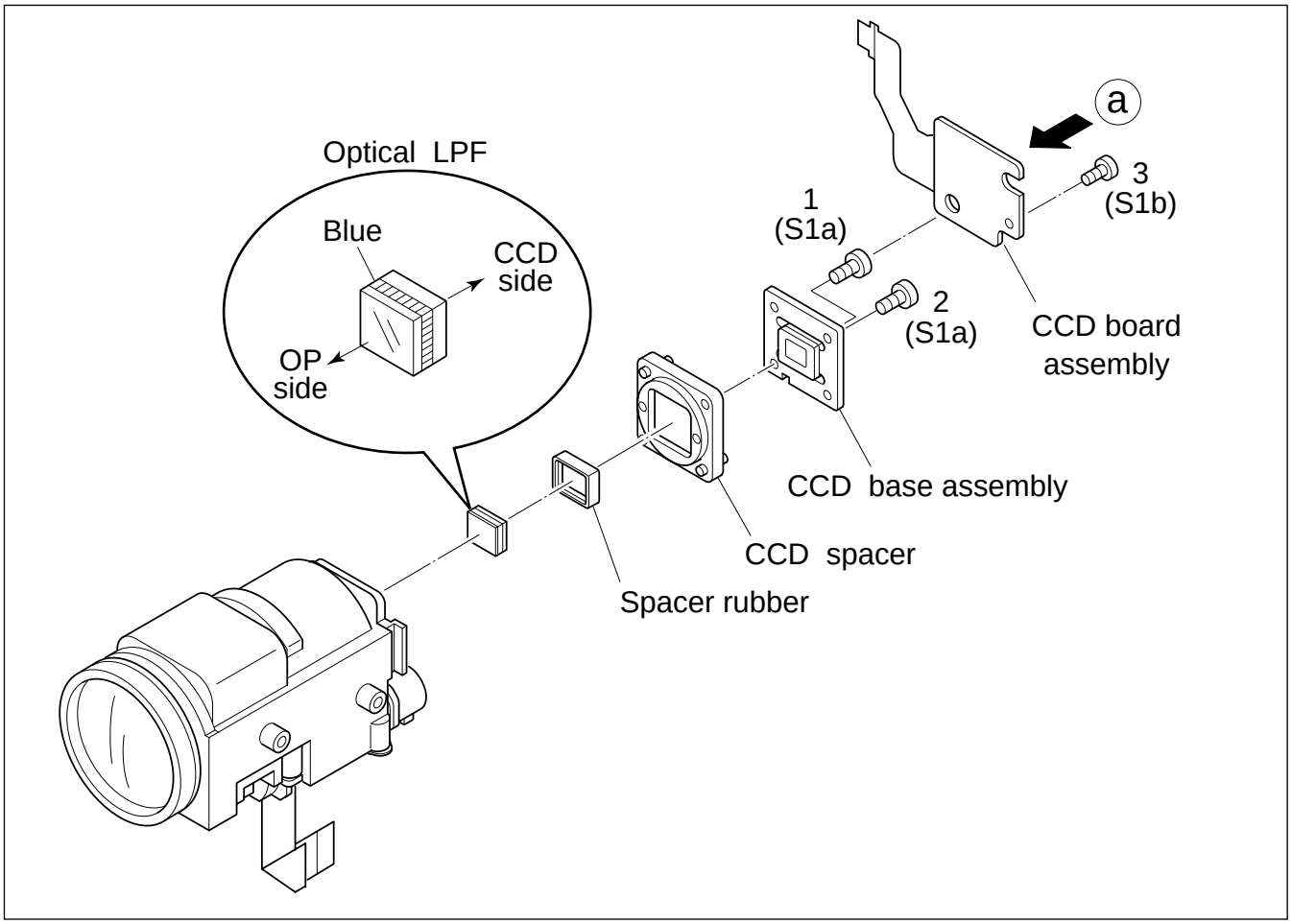


Fig. 1-5-1

1.6 TAKE OUT CASSETTE TAPE

In the event that the set enters the emergency mode as it is loaded with a cassette tape and the cassette tape cannot be ejected with the EJECT button, manually, take it out of the set according to the following procedure.

Note: *If the mechanism comes into the unloading mode as the cassette tape is not held by hand, it results in tape damage.*

1. Disconnect the set from the power source.
2. Remove the cassette cover assembly, Upper case, Lower case assembly, Top operation assembly, Monitor assembly (See Fig. C1, C2, C3, C5 and C8, Page 1-1 to 1-6).
3. Connect a jumper wire to each pole of the loading motor as shown by the magnified view ⓑ (Fig. 1-6-1)
4. While holding down the cassette housing by hand, connect the jumper wires to a battery to run the mechanism to the EJECT position four unloading. If this unloading operation is performed as the cassette housing is not held down by hand, the front lid of the cassette may damage the tape when it is ejected.
5. For taking in the slack of the tape, run the mechanism to the EJECT position as the front lid of the cassette is left open, and turn the take-up gear in the forward direction to wind up the tape. After confirming that the tape has completely been wound up and the supply reel is idling, take the cassette tape out of the cassette housing.

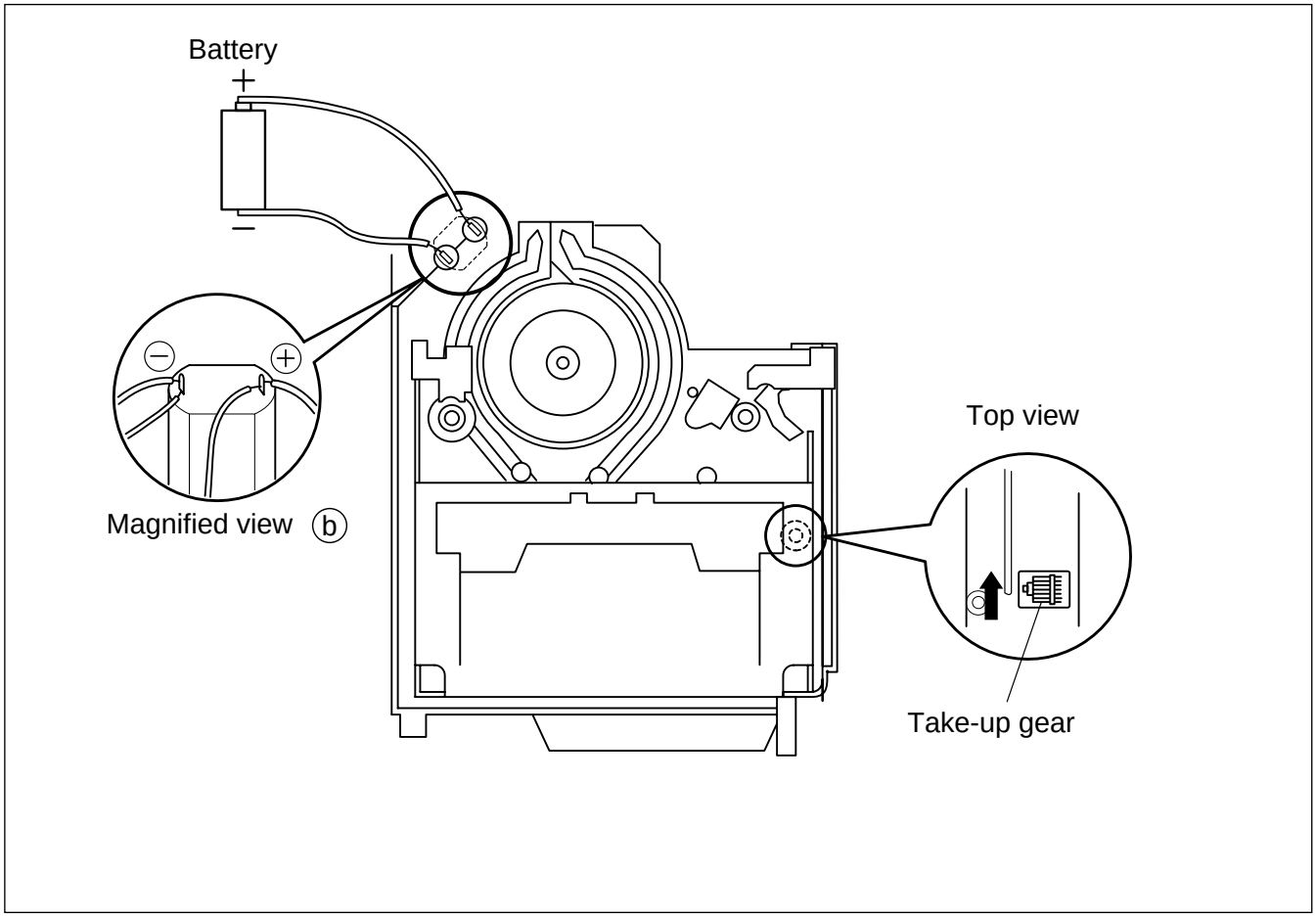


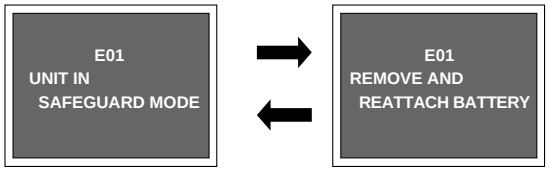
Fig. 1-6-1

1.7 EMERGENCY DISPLAY

Whenever some abnormal signal is input to the mechacon CPU, an error number (E01, as an example) is displayed in the electronic view finder.
In every error status, such the message as shown below alternately appear over and over.

- In an emergency mode, all operations except turning on/off the POWER switch are ineffectual.

Example (in case of the error number E01):



E. VF/LCD	Symptom	Mode when observed	Resulting mode
E07	Short circuit of capstan MDA	Power ON	Power OFF
E06	CAPSTAN FG input absent	EDIT	Power OFF
E04	DRUM FF input absent	DRUM rotation	Power OFF
E03	SUPPLY REEL FG input absent	REC, PLAY, SEARCH, FF	UNLOADING →Power OFF
E02	Mode control motor rotates for more than 10 sec without shift to next mode.	UNLOADING	Power OFF
E01	Mode control motor rotates for more than 10 sec without shift to next mode.	LOADING	Power OFF
E00	Overtime the programming transaction	REC, PLAY	Power OFF

1.8 DEMONSTRATION MODE

This model has the DEMONSTRATION mode.

1) How to set the DEMONSTRATION mode.
The camera can be entered into the DEMONSTRATION mode by setting on the DISPLAY screen appearing in the viewfinder.

When entering the camera into the DEMONSTRATION mode, pay heed to the following matters.

No cassette is set in the camcorder or a cassette is set in the camcorder but it is protected from recording.

Note 1) *The indications of the DISPLAY page very depending on the setting.*

2) How to cancel the DEMONSTRATION mode.
To cancel the DEMONSTRATION mode, turn the POWER switch off (“POWER OFF”).

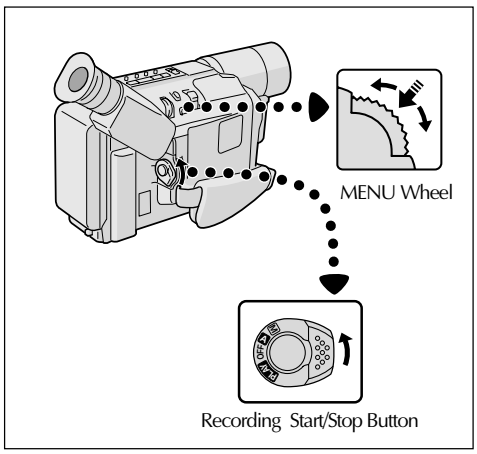
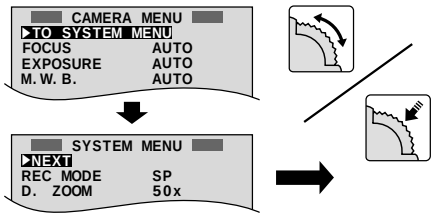


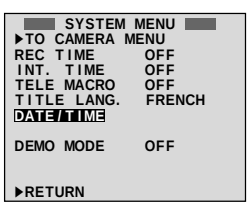
Fig. 1-8-1

1. Set the POWER switch to turn on the "M".
   Press the MENU WHEEL once. The first page of the DISPLAY appears on the LCD monitor (or in the viewfinder).



Display 1

2. Turn the MENU WHEEL in the direction of the arrow to set the cursor at “NEXT”.
   Press the MENU WHEEL once. The second page of the DISPLAY appears on the LCD monitor (or in the viewfinder).



See to next page

Display 2

Note 2) *As the "DEMO MODE" is executed, the camcoder enters the DEMONSTRATION mode after the title screen of "TITLE CALL" and "FUTURE" appear in this order.*

<Flow chart>

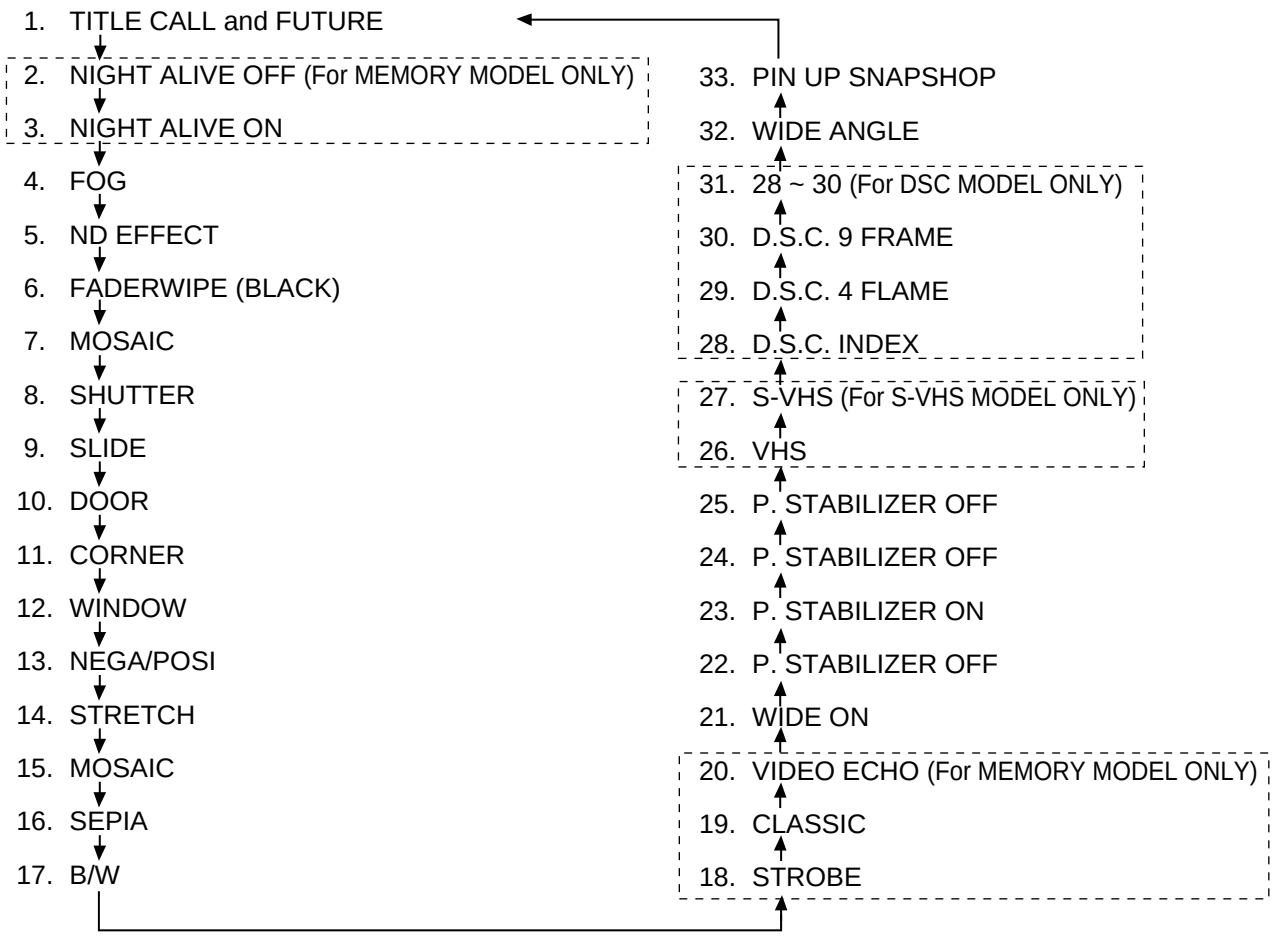
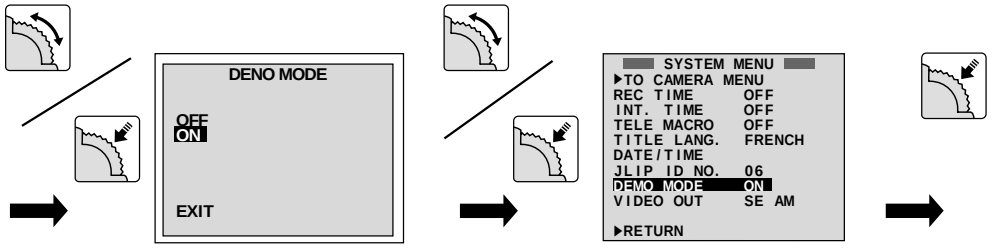


Fig. 1-8-2

3. Turn the MENU WHEEL in the direction of the arrow to set the cursor at "DEMO MODE". Then, press the MENU WHEEL once. The third page of the DEMO MODE appears on the LCD monitor (or in the viewfinder).

4. Turn the MENU WHEEL in the direction of the arrow to set the cursor at "ON". Then, press the MENU WHEEL once.
The fourth page of the DISPLAY appears on the LCD monitor (or in the viewfinder).
("DEMO MODE" is switched "ON" from "OFF" status.)

5. Press the MENU WHEEL once. The camcorder automatically enters the DEMONSTRATION mode and it repeats demonstration operation.
While the camcorder is performing demonstration, all operations except turning on/off the POWER switch are ineffectual.



Display 3

Display 4

MAIN ASS'Y

Symbol No. →	①		②		③									④			⑤		⑥			⑦ (⑧ , ⑨)			
Removing order of screw →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Place to stick screw →																									
Reference drawing →	Fig. C1		Fig. C2		Fig. C3									Fig. C4			Fig. C5		Fig. C6			Fig. C7			
Screw tightening torque →	I																								

Symbol No. →	⑩															⑪		
Removing order of screw →	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Place to stick screw →																		
Reference drawing →	Fig. C8			Fig. C9				Fig. C10						Fig. C12			Fig. C13	
Screw tightening torque →	II													III			IV	

DECK ASS'Y

Symbol No. →	①		②				③	④		⑤				⑥			
Removing order of screw →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Place to stick screw →																	
Reference drawing →	Fig. D1		Fig. D2				Fig. D3	Fig. D4		Fig. D5				Fig. D6			
Screw tightening torque →	I									V	VI		I	VII			

OP B LOCK ASS'Y

Symbol No. →	
Removing order of screw →	1 2 3
Place to stick screw →	
Reference drawing →	Fig. 1-5-1
Screw tightening torque →	IV

< NOTE >

- Pay careful attention to tightening torque for each screw.

I : 0.196 ± 0.019N·m II : 0.098 ± 0.009N·m III : 0.069 ± 0.009N·m
IV : 0.118 ± 0.019N·m V : 0.127 ± 0.012N·m VI : 0.069 ± 0.010N·m
VII : 0.186 ± 0.019N·m

Table 1-9-1

SECTION 2
MECHANISM ADJUSTMENT

2.1 SERVICE CAUTIONS

2.1.1 Precautions

1. Before disassembling/re-assembling the set as well as soldering parts, make sure to disconnect the power cable.
2. When disconnecting/connecting connectors, pay enough attention to wiring not to damage it.
3. When installing parts, be careful not to do with other parts as well as not to damage others. (Pay the most careful attention to the upper drum assy and tape transport mechanism.)

2.1.2 How to read the disassembly and assembly (For Mechanism Parts)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) No. of parts Figures.

(2) Part to be removed or installed.

(3) Location of part.
T = Top
B = Bottom

(4) Fig. No. showing Procedure or Part Location.
M = Mechanism

(5) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered.
P = Spring
W = Washer
S = Screw
* = Unhook, unlock, release, unplug or unsolder.

(6) Adjustment information for installation.
(+) = Refer to Exploded Views for Lubrication information.

2.1.3 Required adjustment tools

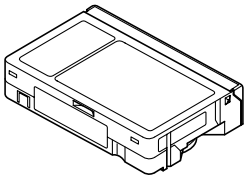
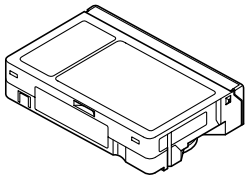
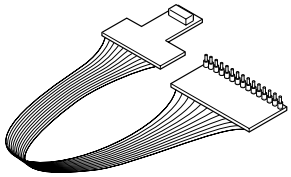
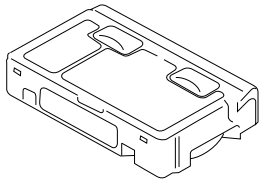
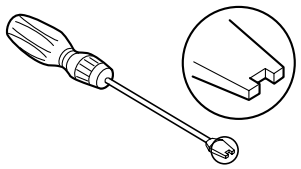
Alignment tape MHP-C	Alignment tape MHP-LC
	
Jig connector cable YTU93106A	Extension connector YTU94145B-30
	
Cassette torque meter PUJ50431-2	Roller Driver PTU94002-2
	

Table 2-1-1

(For Mechanism Parts)

STEP/LOC. No.	PART		Fig. No.	REMOVAL *UNHOOK/UNLOCK /RELEASE/UNPLUG /UNSOLDER	INSTALLATION ADJUSTMENT CONDITION NOTE
①	ROLLER BASE ASSEMBLY	T	M1	(S1)	–
②	TENSION ARM ASSEMBLY	T	M1	(P1), (W1a)	–
③	REEL DISC (SUP)	T	M1	(W1a), (W1b)	_
④	SLANT ARM ASSEMBLY	T	M1	(W1a)	–
⑤	CANCEL LEVER ASSEMBLY	T	M2	(W2)	_
⑥	EJECT LEVER ASSEMBLY	T	M2	(W2)	–
⑦	CASSETTE GUIDE (L) ASSEMBLY	T	M2	(S2)	–
↑ (1)	↑ (2)	↑ (3)	↑ (4)	↑ (5)	↑ (6)

2.2 DISASSEMBLY/ASSEMBLY OF MECHANISM PARTS

This procedure starts with the condition that the cabinet parts and deck parts. Also, all the following procedures for adjustment and parts replacement should be performed in STOP mode. When reassembling, perform the step(s) in the reverse order.

STEP/LOC. No.	PART		Fig. No.	REMOVAL *UNHOOK/UNLOCK /RELEASE/UNPLUG /UNSOLDER	INSTALLATION ADJUSTMENT CONDITION NOTE
①	ROLLER BASE ASSEMBLY	T	M1	(S1)	–
②	TENSION ARM ASSEMBLY	T	M1	(P1), (W1a)	–
③	REEL DISC (SUP)	T	M1	(W1a), (W1b)	–
④	SLANT ARM ASSEMBLY	T	M1	(W1a)	–
⑤	CANCEL LEVER ASSEMBLY	T	M2	(W2)	–
⑥	EJECT LEVER ASSEMBLY	T	M2	(W2)	–
⑦	CASSETTE GUIDE (L) ASSEMBLY	T	M2	(S2)	–
⑧	SUPPLY CLUTCH ASSEMBLY	T	M2	(W2)	–
⑨	WHEEL GEAR	T	M2	(W2)	See, Adjustment procedure for Section 1.3
⑩	ROTARY ENCODER	B	M3	4(S3a)	The function of this part varies according to the assembly (YMA0030A-E/ YMA0031A-E) which this part is incorporated in.
⑪	TIMING BELT	B	M3	–	–
⑫	CENTER PULLEY UNIT	T/B	M3	2(S3a)	–
⑬	CASSETTE GUIDE (R) ASSEMBLY	T	M3	(S3b), (P3)	(Only use YMA0031A-E)
⑭	TU GEAR	T	M3	(W3a)	–
⑮	BRAKE SUB GEAR	T	M3	(W3a)	–
⑯	P.R ARM ASSEMBLY	T	M3	(W3b)	–
⑰	TU GUIDE ARM ASSEMBLY	T	M3	(W3b)	–
⑱	LINK ARM ASSEMBLY	T	M4	(W4)	–
⑲	LED GUIDE	T	M4	(S4a)	–
⑳	A/C HEAD UNIT	T	M4	2(S4b)	–
㉑	SLANT POLE BASE ASSEMBLY	T	M5	(S5a)	–
㉒	CAP MOTOR ASSEMBLY	T	M5	3(S5a)	–
㉓	MOTOR BASE	T	M5	2(S5b), (S5c)	–
㉔	BRUSH	B	M6	(S6a)	–
㉕	DRUM FINAL	T/B	M6	2(S6b), 2(S6c) *CATCHER	–
㉖	GUIDE RAIL	T	M6	8(S6d)	–
㉗	POLE BASE (SUP)	T	M6	–	–
㉘	POLE BASE (TU)	T	M6	–	–
㉙	COVER PLATE	T	M7	–	–
㉚	DRIVE LEVER ASSEMBLY	T	M7	–	–
㉛	MOTOR BRACKET ASSEMBLY	T	M7	3(S7)	–
㉜	CONTROL CAM	T	M8	(W8a)	See, Adjustment procedure for Section 1.3
㉝	LINK LEVER	T	M8	–	–
㉞	MIDDLE GEAR	T	M8	–	–
㉟	LOADING GEAR(T) ASSEMBLY	T	M8	(W8b)	See, Adjustment procedure for Section 1.3
㊱	LOADING GEAR(S) ASSEMBLY	T	M8	(W8b)	–
㊲	LOADING RING ASSEMBLY	T	M8	4(S8)	See, Adjustment procedure for Section 1.3

Table 2-2-1

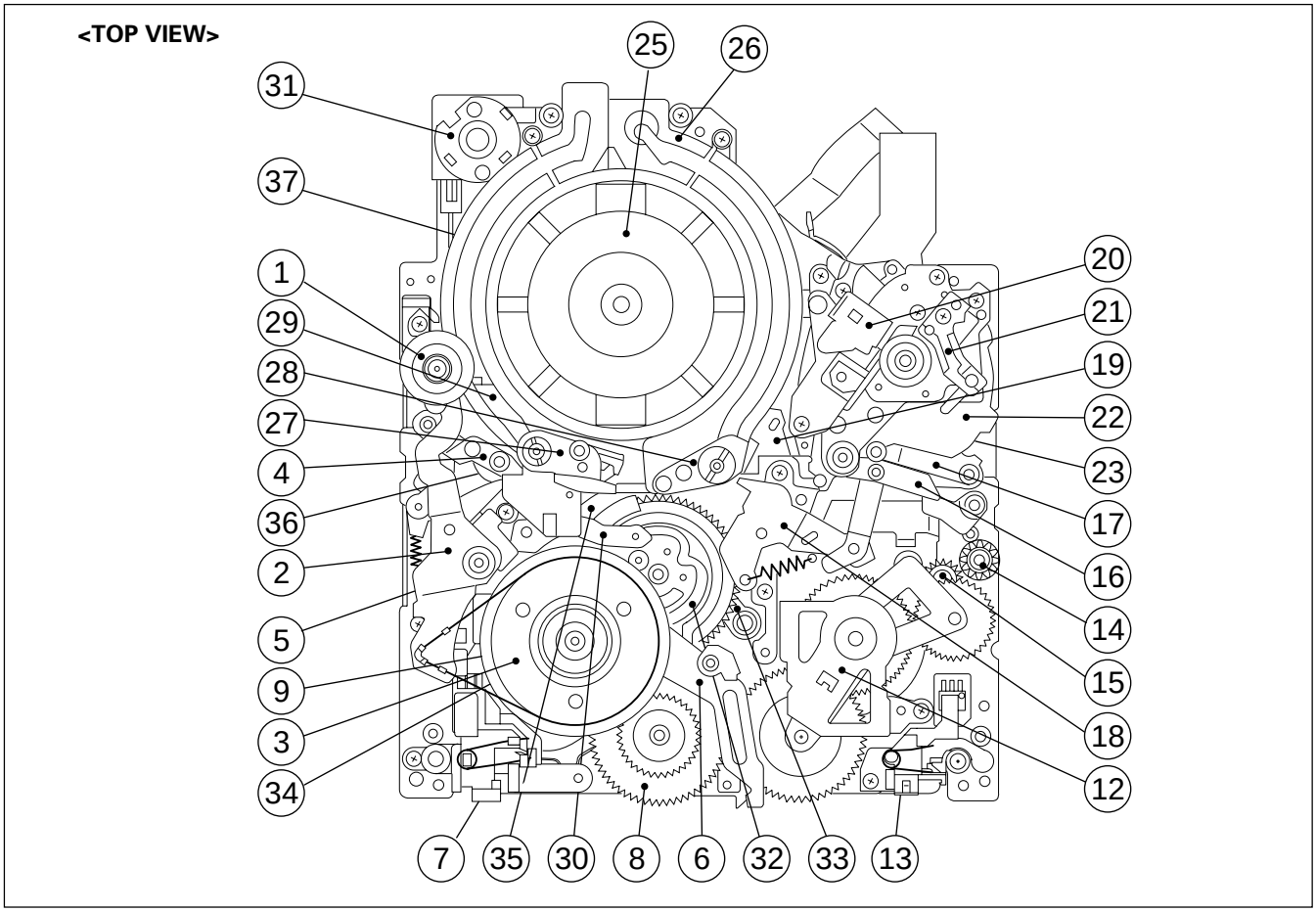


Fig. 2-2-1 TOP VIEW

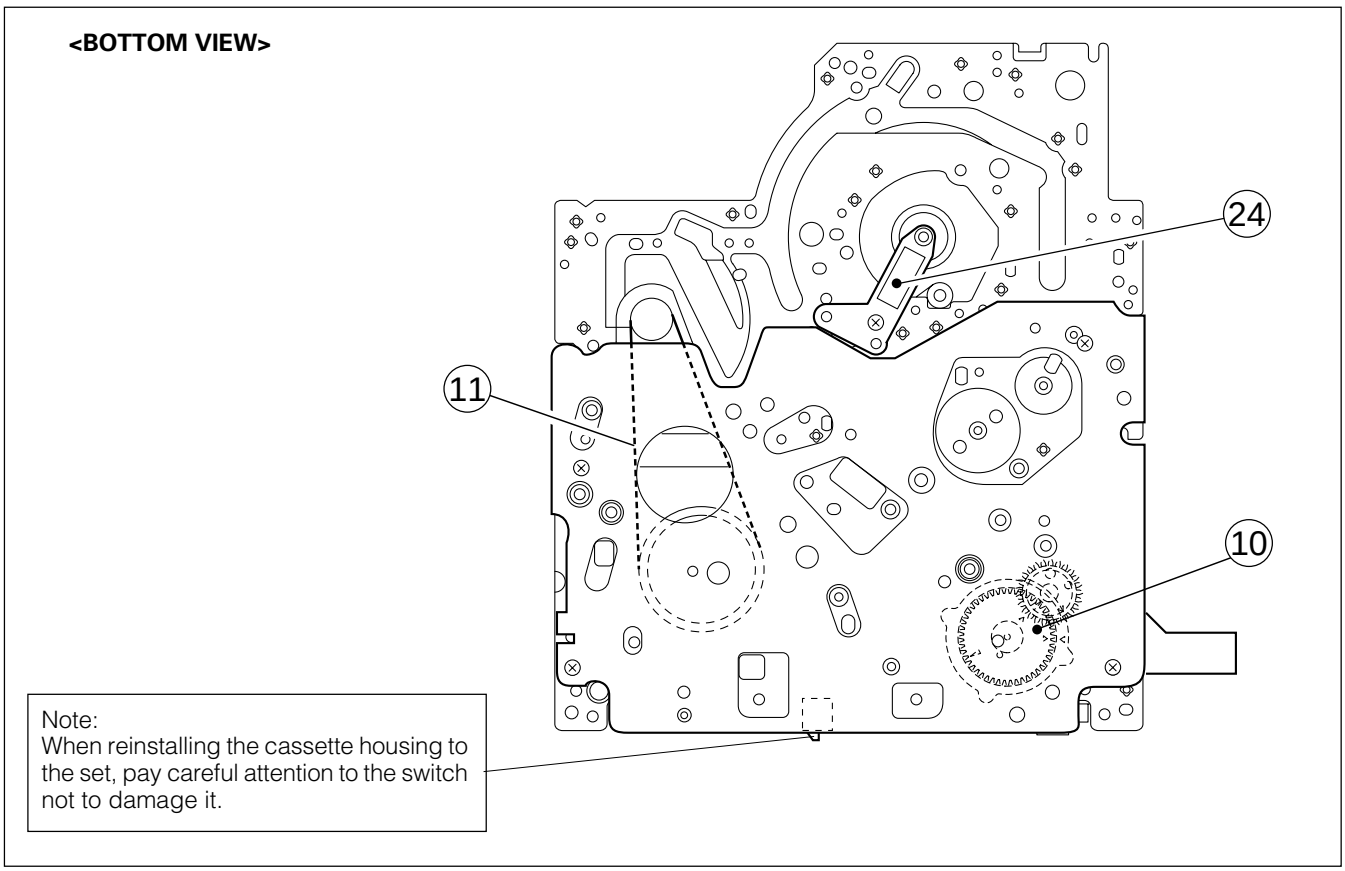


Fig. 2-2-2 BOTTOM VIEW

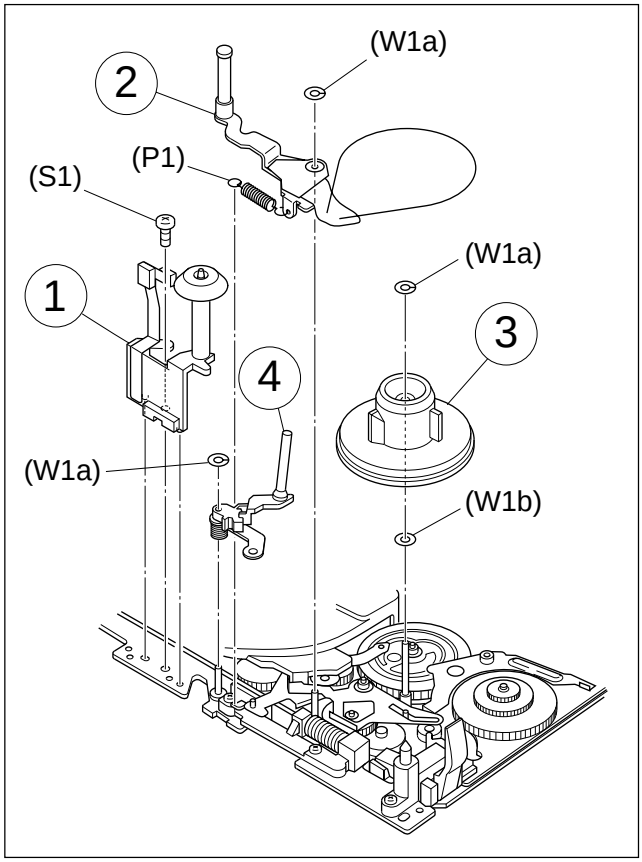


Fig. M1

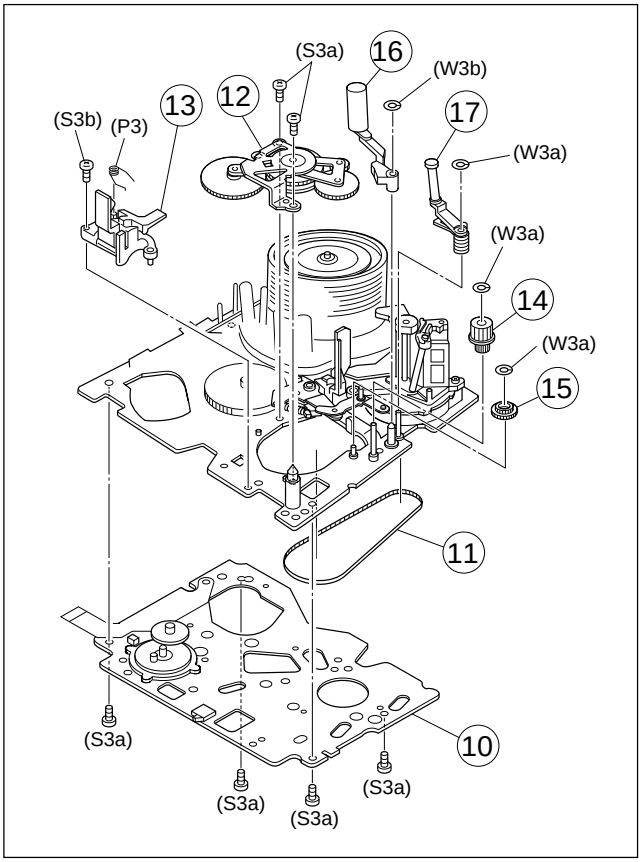


Fig. M3

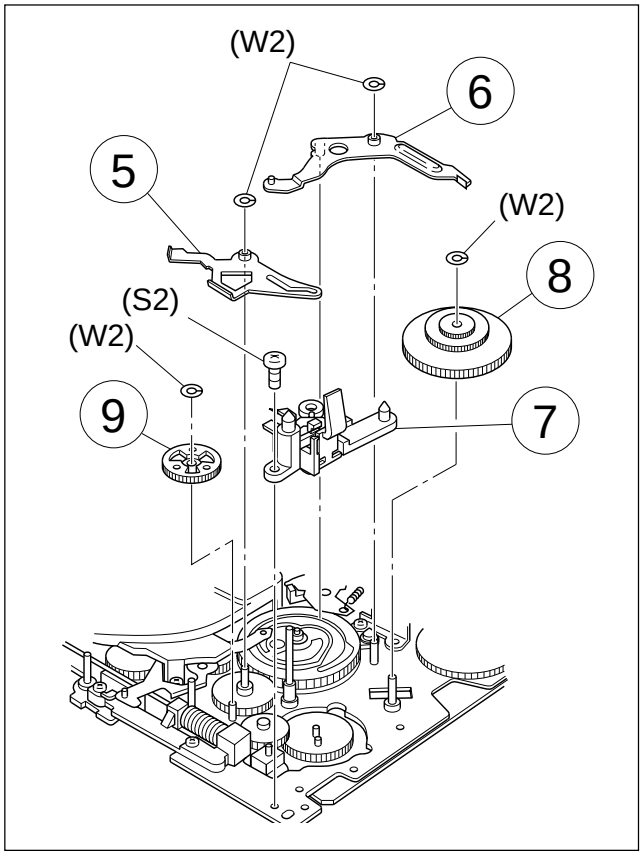


Fig. M2

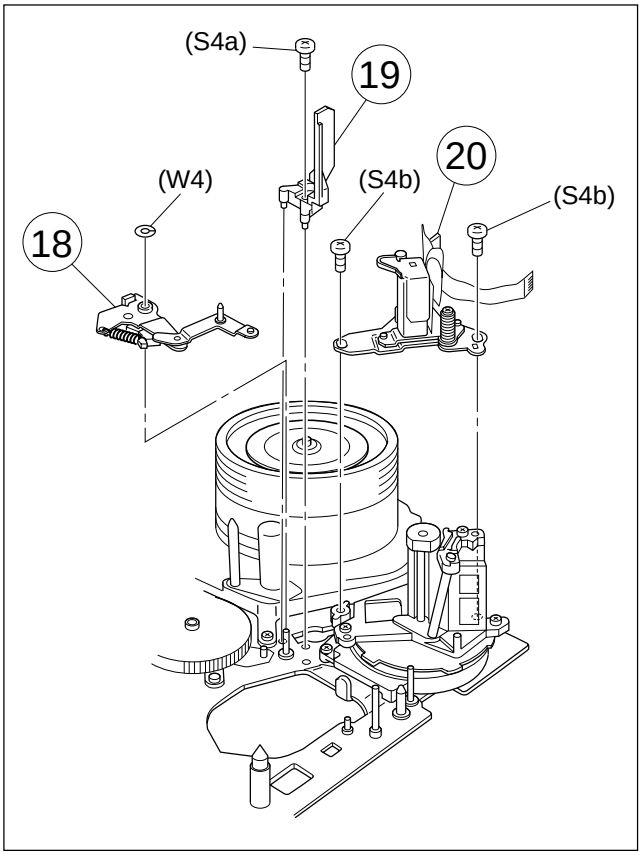


Fig. M4

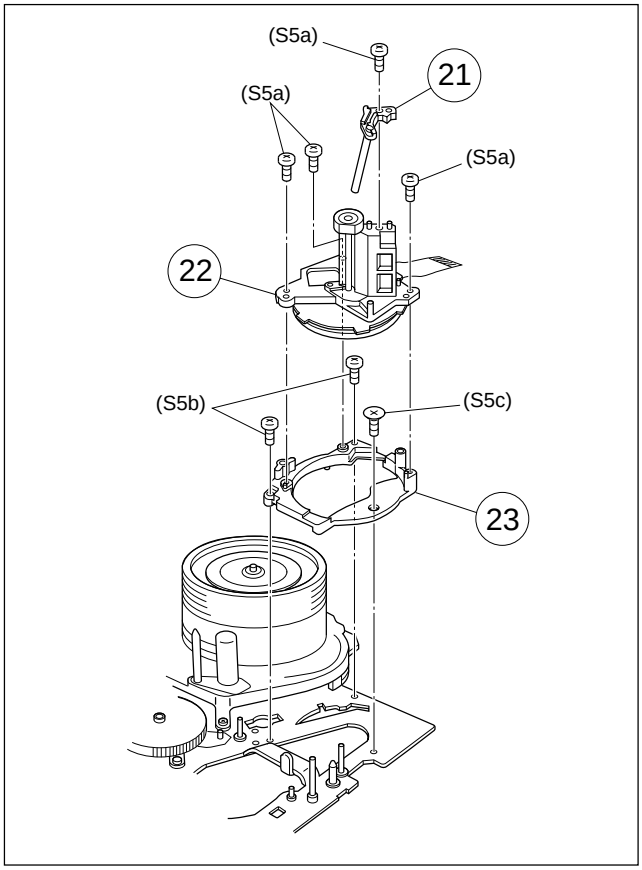


Fig. M5

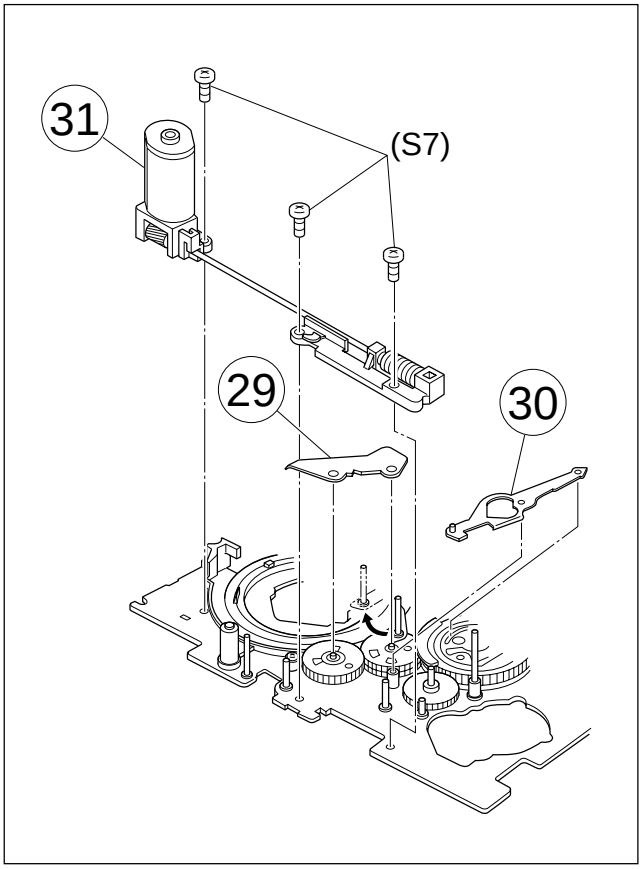


Fig. M7

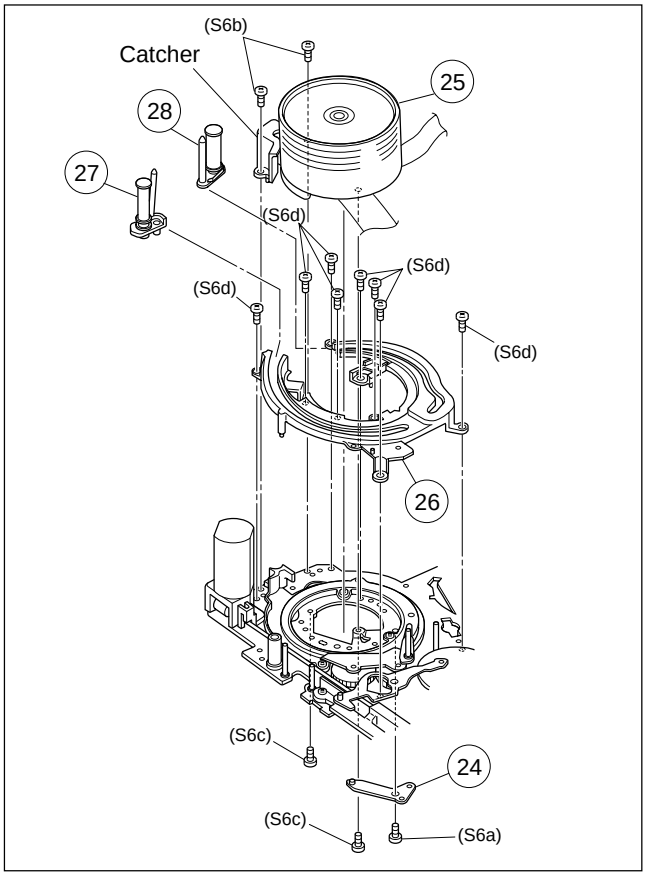


Fig. M6

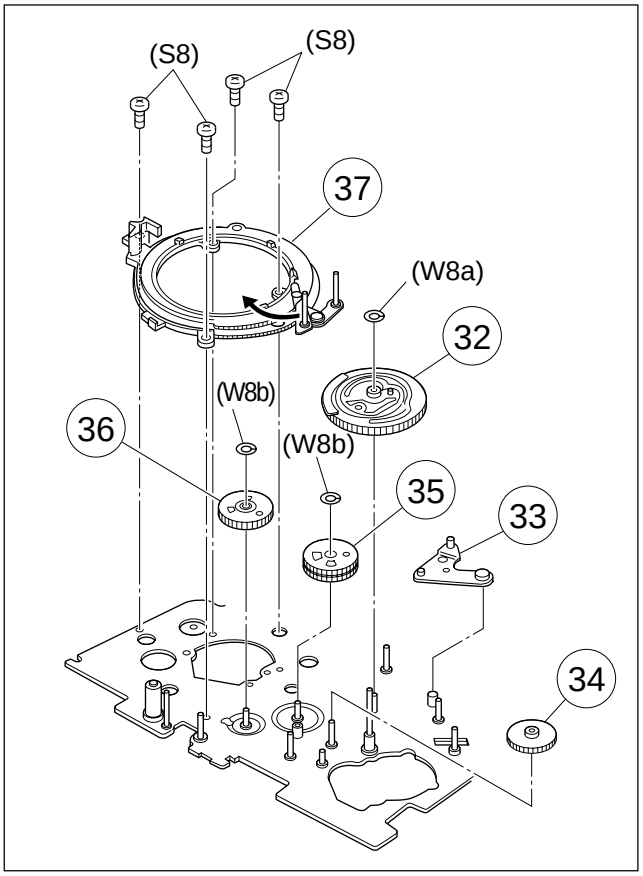


Fig. M8

2.3 CHECKUP AND ADJUSTMENT OF MECHANISM PHASE

Note: *Pay careful attention to the installing order and phase of mechanism parts of the loading system.*

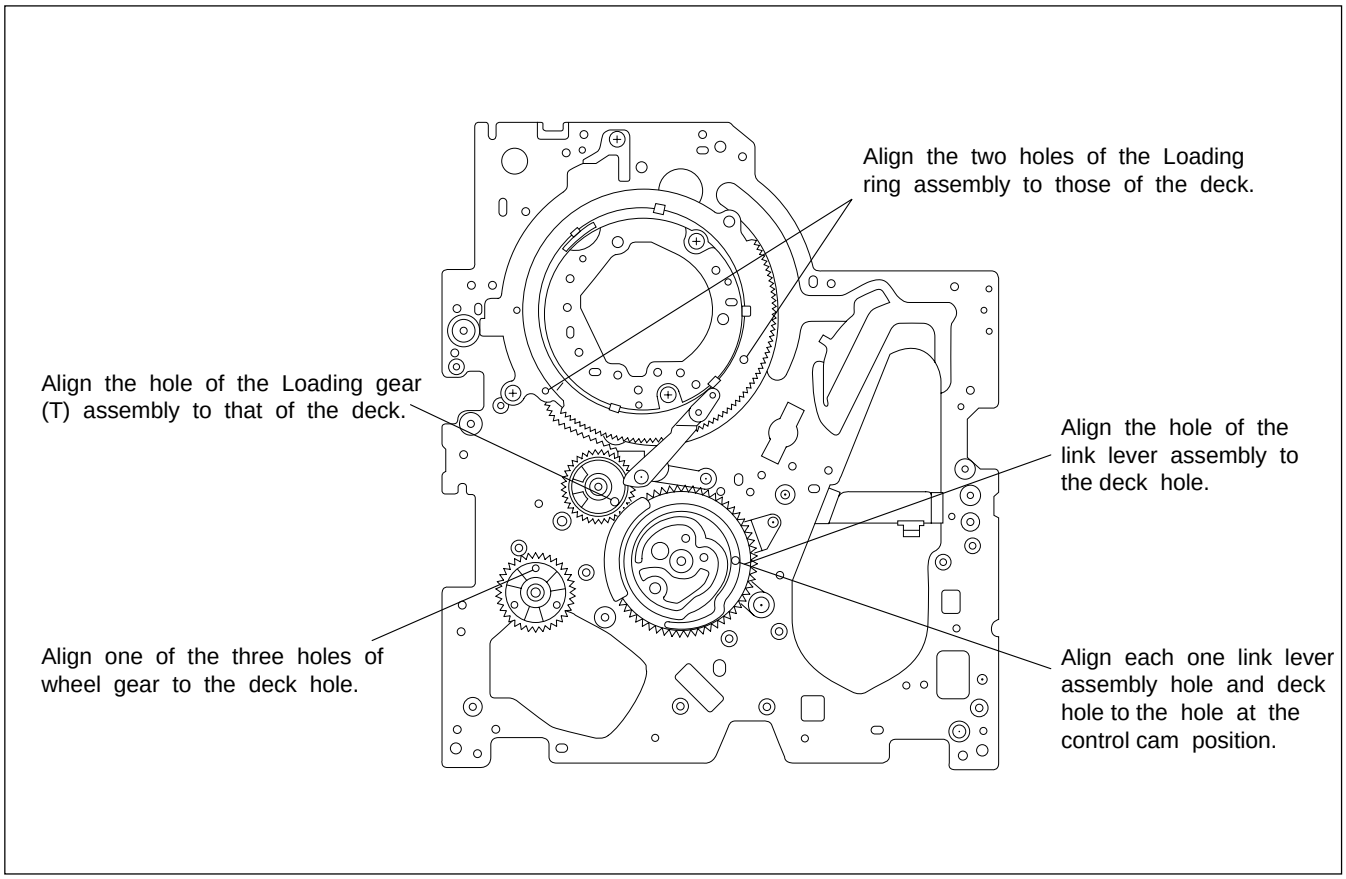


Fig. 2-3-1 Top of main deck

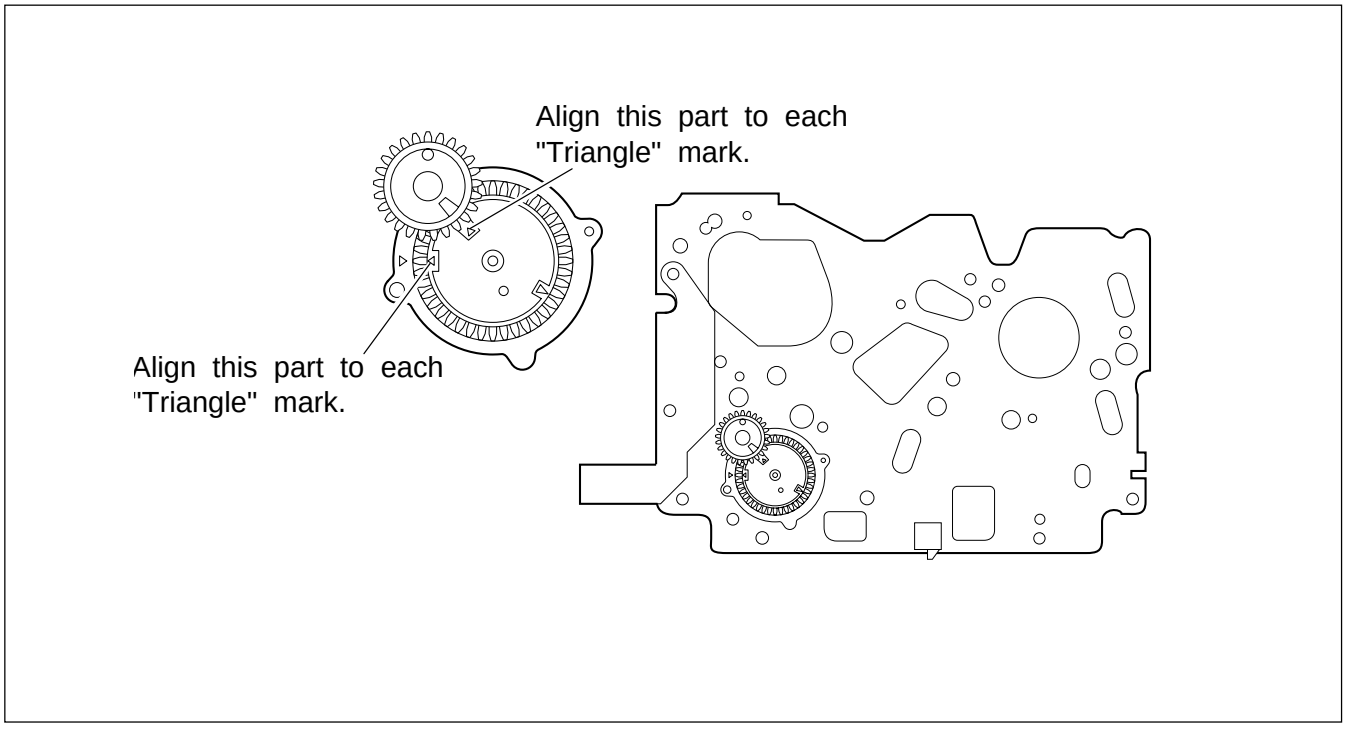


Fig. 2-3-2 Rotary encoder

2.4 TAPE TRANSPORT ADJUSTMENT

In most cases the deck section is in need electrical adjustment, it results from replacement of worm mechanical parts or video heads. In the event of malfunction with electrical circuits, troubleshouting with the aid of proper test instruments most be done first, and then commence necessary repair, replacement and adjustment, etc.

2.4.1 Back tension

1. Set a cassette torque meter onto the deck and measure the back tension in standard REC mode to confirm that the back tension is $0.7x10^{-3}$–$1.37x10^{-3}$N·m.
2. If not, replace the tension band.
   When the value widely fluctuates in the measurement, replace the supply reel disk.
3. With the cassette torque meter, confirm that the play torque is $1.47x10^{-3}$–$2.45x10^{-3}$N·m.
   If necessary, replace the center pully unit.

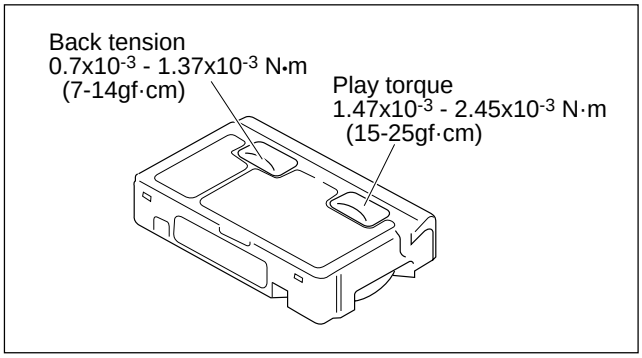


Fig. 2-4-1 Cassette torque meter

2.4.2 Tape pattern

1. Remove the Cover (JIG) shwon on Fig. 2-6-1 (Page 2-10).
2. Connect the jig connector cable to CN25 on the MAIN board as shwon on Fig. 2-6-1 (Page 2-10).
3. Observe signal at V. TP FM with external trigger from V. FF on the jig connector cable.
4. Playback the SP stairstep signal of the alignment tape and maximize the FM waveform by the tracking button.
5. Set the tracking control to the center position by simultaneously pressing the tracking (-) and (+) buttons and maximize the FM waveform by the tracking button.
6. If the observed FM waveform is not flat, adjust the height of the supply of take-up guide roller with the roller driver.

   Note: *To prevent the tape from damage, turn the guide rollers slowly.*

7. By operating the tracking button (both in + and – directions) in the manual tracking mode, vary the output level of the FM waveform from maximum to minimum and vice versa to confirm that the waveform varies nearly in a flat shape.
8. When the FM waveform breaks in the level varying process, subtly adjust the height of guide rollers at every breaking point so that the waveform varies as flat as possible.
   Repeat the above steps 6. and 7. several times to confirm that the waveform is flat as a whole.
9. Playback the SP stairstep signal of alighment tape and adjust the tracking control to maximize the FM waveform, confirm that FM waveform variation is always flat.
10. Record the signal and play it back in both of the SP and EP modes, and confirm that the FM waveform is flat in both modes.

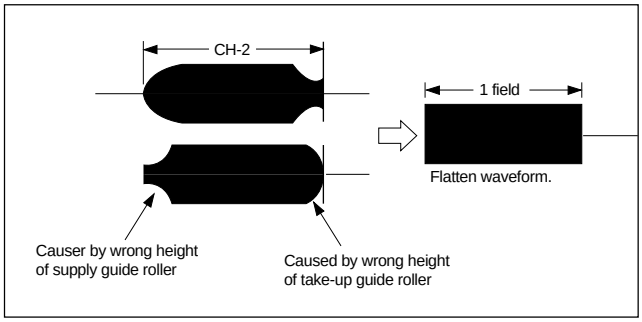


Fig. 2-4-2 FM waveform-1

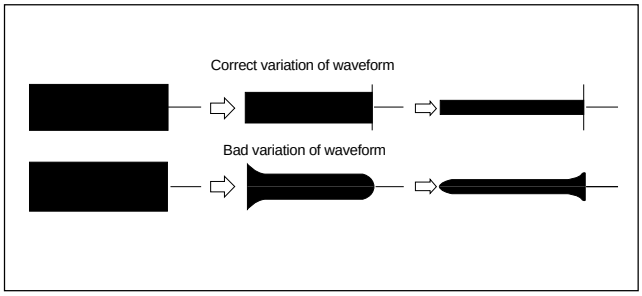


Fig. 2-4-3 FM waveform-2

11. Through the above steps, confirm that there occur no wrinkling and damage in the tape around the pinch roller and TU guide pole whenever the deck is in operation of Loading/Unloading, Search Rewind and at mode change from Search Rewind to play mode. If wrinkling or damage in the tape occurs around the TU guide pole, adjust the angle (slant) of the A/C head to the tape. So that the tape normally runs along the lower flange of the guide pole.

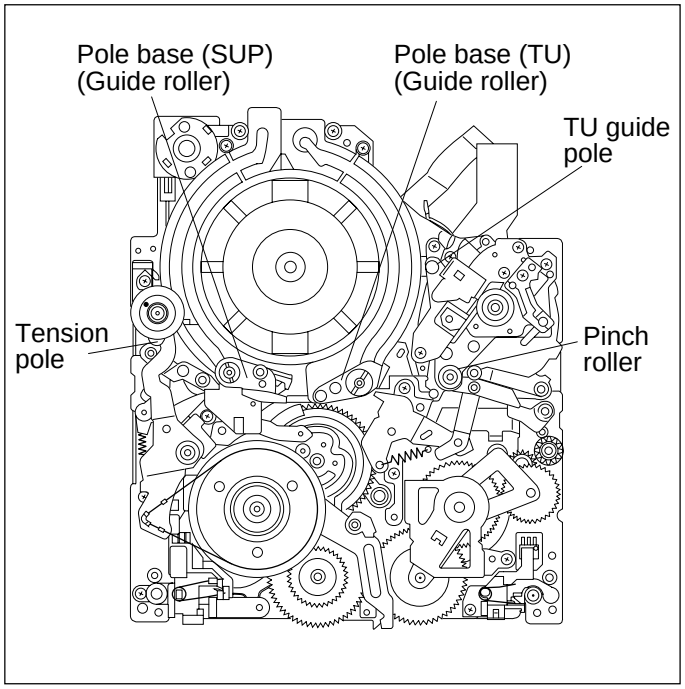


Fig. 2-4-4 Tape transport system

2.4.3 A/CTL head height & azimuth

1. Connect the jig connector cable to CN25 on the MAIN board.
2. Connect the channel-1 scope probe to the audio output and connect the channel-2 scope probe to PB CTL.
3. Playback the alignment tape.
4. Set the tracking to its center range by pressing the (+) and (–) tracking controls simultaneously.
5. Adjust screws Ⓐ , Ⓑ and Ⓒ approximately 45 degrees in the same direction to obtain maximum audio output and CTL signal levels.
6. As a final fine adjustment, adjust screw Ⓑ for minimum signal level fluctuation and screw Ⓒ for maximum output signal level.

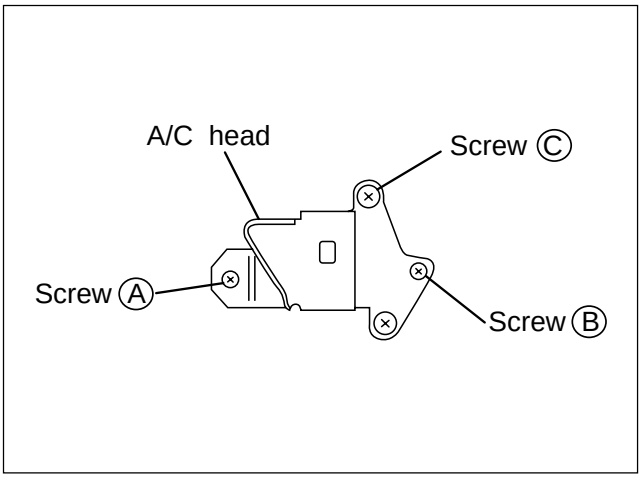


Fig. 2-4-5 A/C head

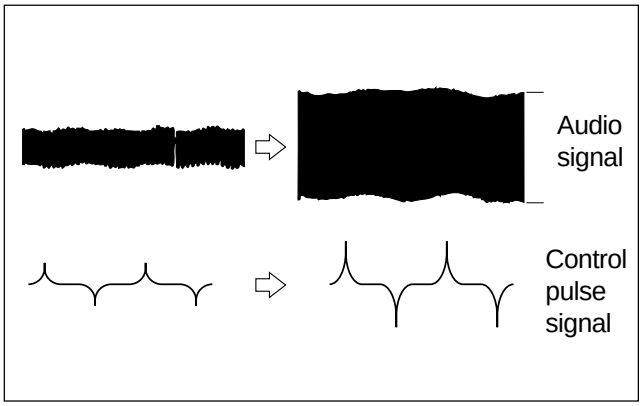


Fig. 2-4-6 Audio and CTL signal

2.4.4 Phase of control head (X value)

1. Connect the jig connector cable to CN25 on the MAIN board.
2. Playback the SP stairstep signal of the alignment tape and observe signal at V.TP FM with external trigger from V.FF on the jig connector cable.
3. Operate the tracking button in the center and manual tracking mode by pressing the tracking (+) and (–) buttons and confirm that the FM output level is maximum at the center position as shown in Fig. 2-4-8.
4. If necessary, slightly loosen the setscrews Ⓓ and Ⓔ and insert the Tweezers into the notch and guide hole to move the A/C head fully in the direction of the capstan to the extent.
5. Gradually move the A/C head toward the drum to find the position where the FM output level maximum for the first time (a' – b' in Fig. 2-4-8).
6. Fine adjust the phase of the A/C head and tighten the screws Ⓓ and Ⓔ at the point a.

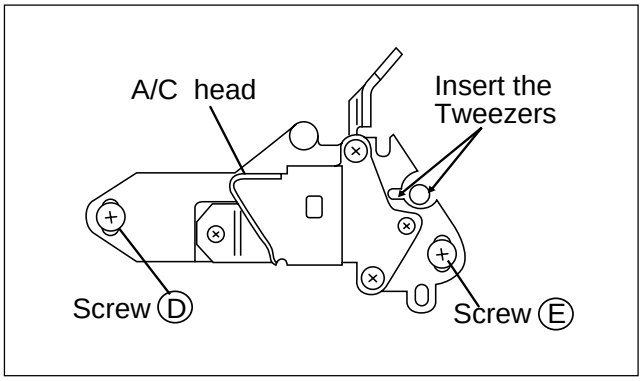


Fig. 2-4-7 Phase of control head

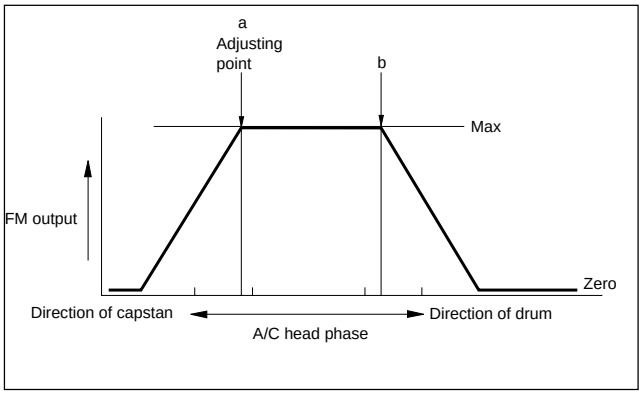


Fig. 2-4-8 Phase adjustment point of control head

2.5 REMARKS

2.5.1 Cleaning

1. For cleaning of the upper drum (particularly video heads), use fine-woven cotton cloth or Kimwipe with alcohol soaks through. Do not move the cloth but turn the upper drum counterclockwise.

   Note: *Make sure not to move the cloth in the vertical direction to the video head, since it may cause damage of the video heads.*

2. For cleaning of parts of the tape transport system except the upper drum, use fine-woven cotton cloth or cotton swab soaked alcohol.
3. After cleaning, confirm that the cleaned parts are completely dry before loading the deck with cassette tape.

2.5.2 Applying oil and grease

1. Periodical oiling and greasing are not required but should be done to new parts when replacing. If oil and grease on the other parts of the other party are old and dirty, wipe them clean and apply new oil or grease.
2. For parts and points to apply oil and grease, refer to the exploded view of the mechanism assembly (M3). Table 2-5-1pecifies oil and grease to be used.
3. When oiling, clean the objective parts with alcohol first and apply one or two drop(s) of oil. Too much oiling causes rotary parts to slip because of oil leakage.

Classification	Name	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	YTU94027	BB

Table 2-5-1 Specific oil and grease to be used

2.5.3 Checkup

After replacement of the supply reel disk and tension band, make sure to inspect back tension according to the adjustment procedure of MECHANISM ADJUSTMENT section.

2.6 JIG CONNECTOR CABLE CONNECTION

Remove the cover (JIG).

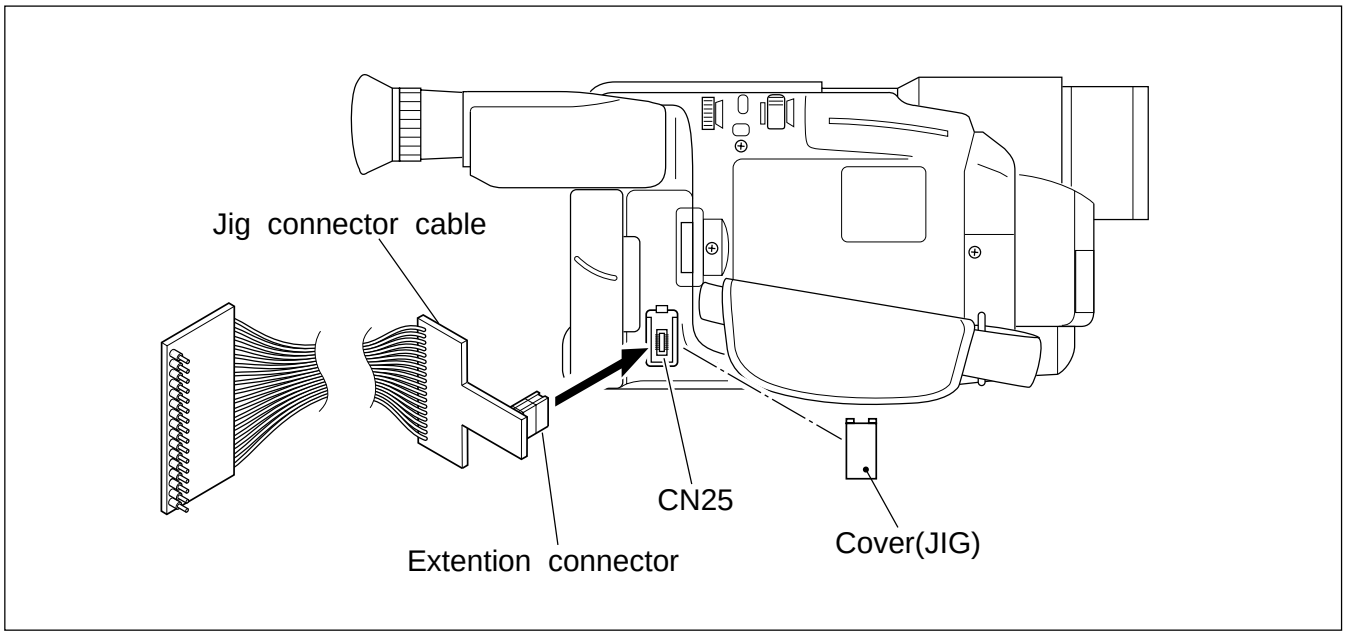


Fig. 2-6-1 Jig connector cable connection

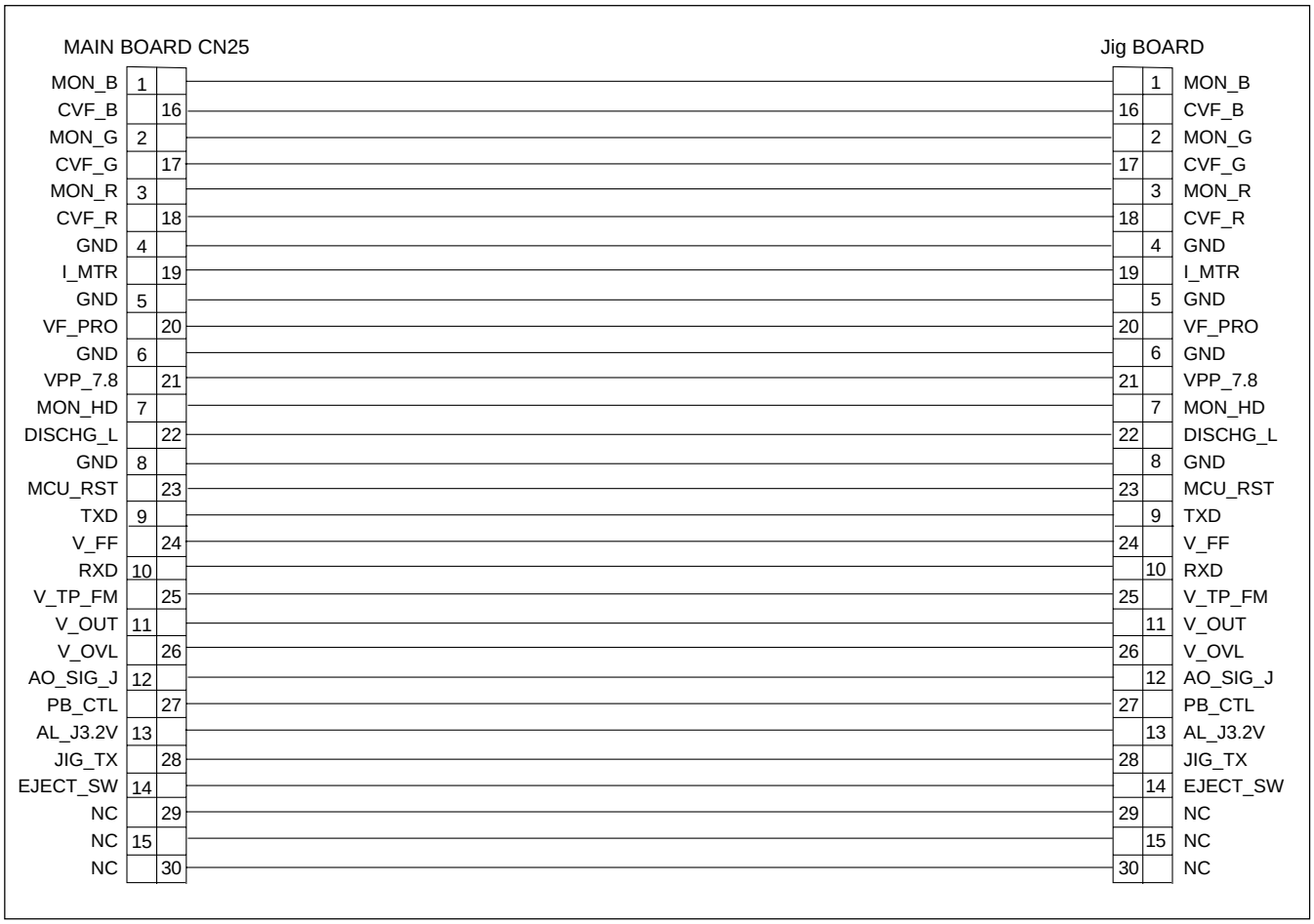


Fig. 2-6-2 Jig connector cable schematic diagram

SECTION 3
ELECTRICAL ADJUSTMENT

3.1 ELECTRICAL ADJUSTMENT

3.1.1 PREPARATION

1. Precaution

This model does not contain adjustment controls (VR). General deck system, camera system and monitor system adjustment are not required. However, if MAIN board and MONITOR board need replacement, please use original E^2PROM on to new board. Then adjustment are not required. And if parts such as the following need replacement, special computerized adjustment are required (Refer to sec. 3.1.1-4). Please contact to JVC Service for detaile information.

- OP block
- EEP ROM (IC104 of MAIN board)
- MONITOR

In the event of malfunction with electrical circuits, trouble-shooting with the aid of proper test instruments most be done first, and then commence necessary repair, replacement and adjustment, etc.

1. In case of wiring to chip test points for measurement, use IC clips, etc. to avoid any stress.
2. Since connectors are fragile, carefully handle them in disconnecting and connecting.
3. Shortcircuit between operation un it and DECK chassis.

2. Required test equipment

1. Color TV monitor.
2. AC power adapter
3. Oscilloscope (dual-trace type, observable 100 MHz or higher frequency)
   * It is recommended to use one observable 300 MHz or higher frequency.
4. Digital voltmeter
5. Frequency counter (with threshold level adjuster)
6. Personal computer

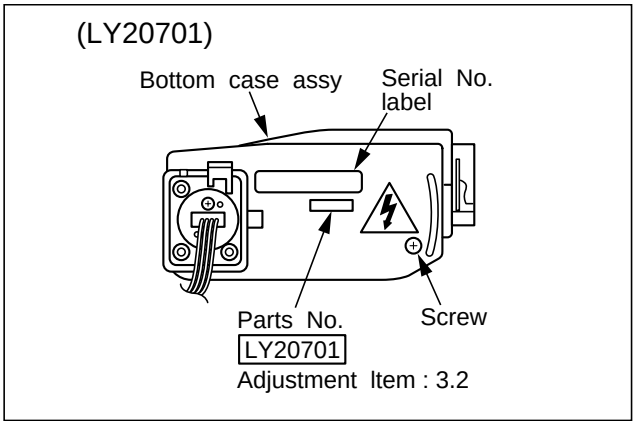
3. Required adjustment tools

For detsails of special jigs necessary for adjustment, refer to page 1-2 and 1-3 of the Section 1.

4. Setup for E. VF section adjustment

1. B/W VF (For AXM230/SXM330)

Referring to “SEC. 1 DISASSEMBLY” and connect the E. VF WIRE to CN12 of the MAIN board.



2. COLOR VF (For SXM930)

Referring to "SEC. 1 DISASSEMBLY" and connect the E. VF FPC to CN11 of the MAIN board.

Note:

- *This adjustmentalls into a special adjustment that requires a personal computer.*
  For details, refer to “3.1.1 Preparation”.

5. Connection for Service support system

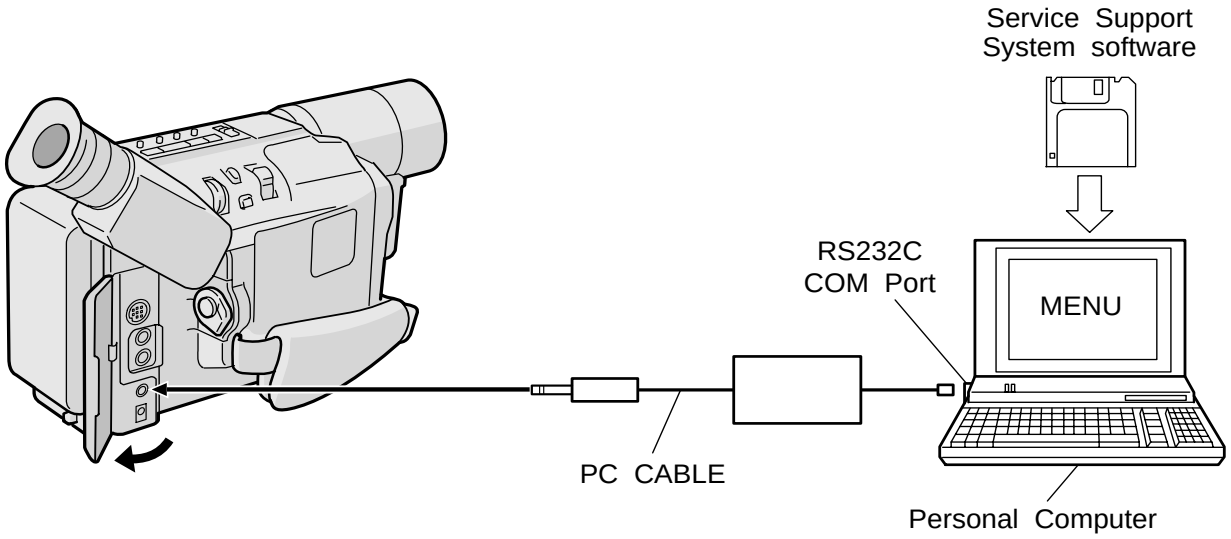


Fig. 3-1-1 Connection for Service support system

■ FUSE LOCATION FOR MAIN BOARD ASSEMBLY

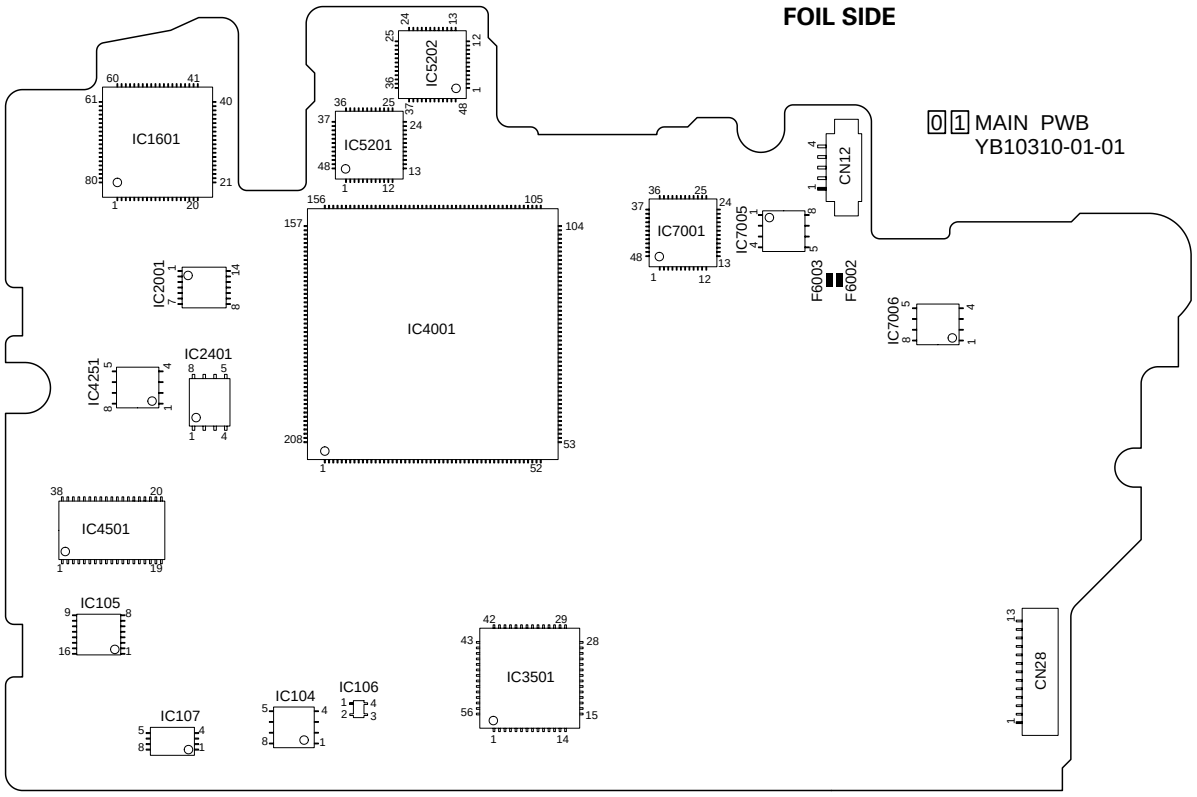


Fig. 3-1-2 FUSE location for MAIN board assembly (FOIL SIDE)

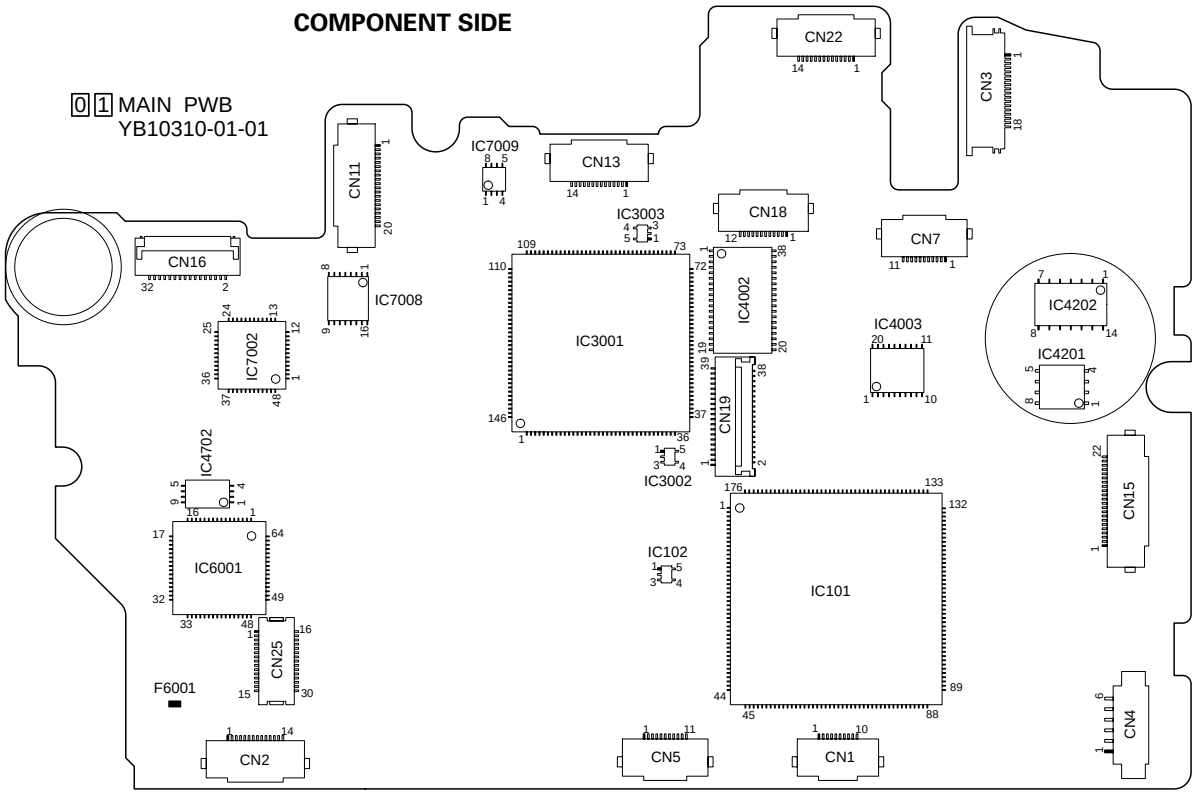


Fig. 3-1-3 FUSE location for MAIN board assembly (COMPONENT SIDE)

■ FUSE LOCATION FOR MONITOR BOARD ASSEMBLY

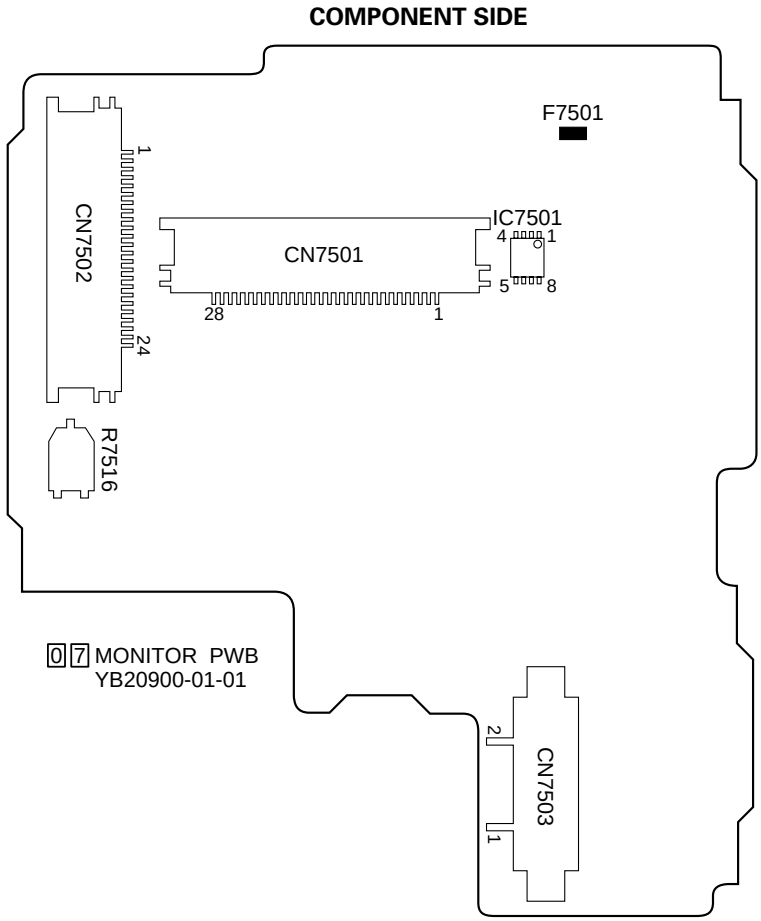
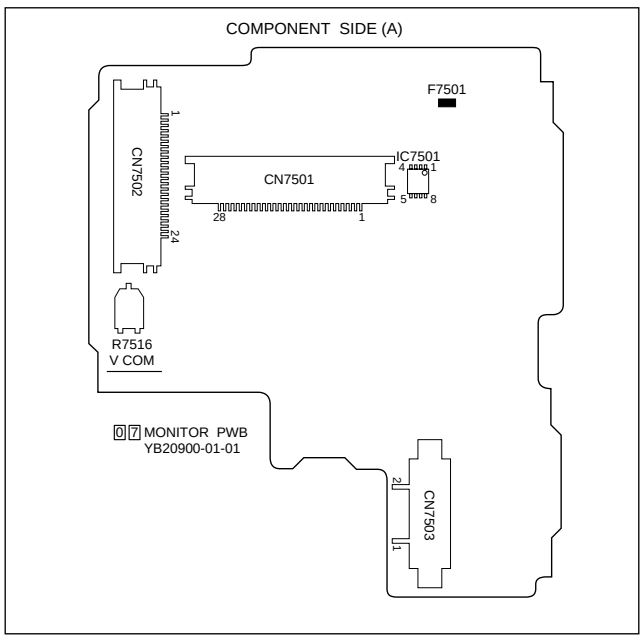


Fig. 3-1-4 FUSE location for MAIN board assembly (COMPONENT SIDE)

3.2 MONITOR ADJUSTMENT

Notes: *Unless otherwise specified, all measurement points and adjustment parts are located on MONITOR board.*



3.2.1 V COM

Signal	• Alignment tape • Stairstep
Mode	• PB
Equipment	• LCD MONITOR
Measurement point	• –
Adjusting part	• R7516 (V COM)
Specification	• Black level must correctly be reproduced on the LCD MONITOR. (There is a sharp contrast between black and white parts.)

(1) Adjust R7516 to make sharp contrast between black and white parts on the LCD MONITOR screen.
(2) Adjust R7516 so that black and white levels (patticularly black level in the contour) is sharply reproduced on the LCD MONITOR screen.

3.3 ELECTRONIC VIEWFINDER (E. VF) ADJUSTMENT

Notes:

- *Unless otherwise specified, all measurement points and adjustment parts are located on E. VF board.*
- *After adjustment or replacement of the deflection yoke or the centering magnet, fix it by the band as shown the figure below.*

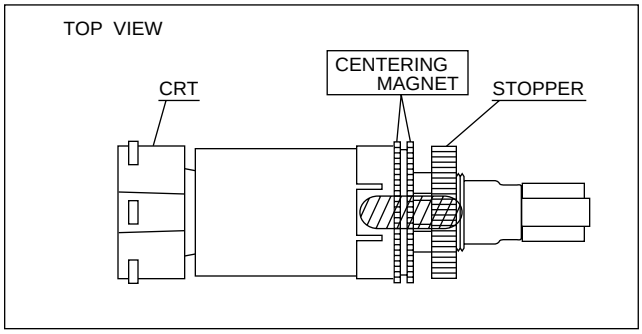


Fig. 3-3-1 E. VF

- *After adjustment is completed, compare the picture on the E. VF screen with the monitor TV.*

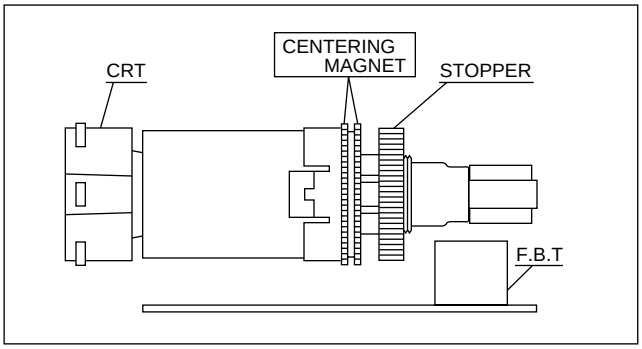


Fig. 3-3-2 E. VF

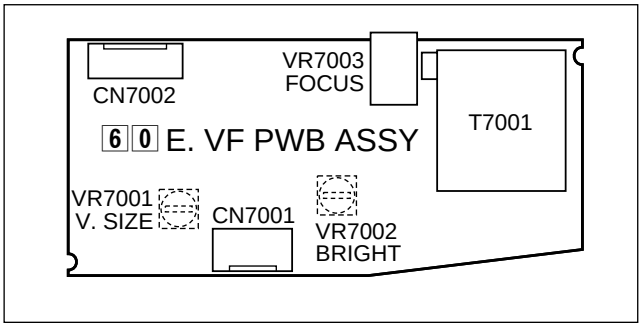


Fig. 3-3-3 E. VF board

3.3.1 Tilt

Subject	• Alignment tape • Stairstep
Mode	• PB
Equipment	• E. VF
Measurement point	• E. VF screen
Adjusting part	• Deflection yoke
Specification	• The picture is visible as same as monitor TV.

1) Put the deflection yoke to the most inner side of CRT neck first. Then fix the stopper temporary.
2) Adjust the tilt of picture on the E. VF screen by tilting the deflection yoke.
3) Fix the stopper completely.

3.3.2 Centering

Subject	• Alignment tape • Stairstep
Mode	• PB
Equipment	• E. VF
Measurement point	• E. VF screen
Adjusting part	• Centering magnet (CRT assy)
Specification	• The center of the E. VF screen

1) While observing the viewfinder screen, adjust the centering magnet to locate the stairstep in the center of the viewfinder screen.

3.3.3 Vertical scanning

Subject	• Camera picture
Mode	• EE
Equipment	• E. VF
Measurement point	• E. VF screen
Adjusting part	• VR7001 (V. SIZE)
Specification	• Normal picture amplitude

1) Observing the viewfinder screen, adjust VR7001 for normal picture amplitude.

3.3.4 Brightness

Subject	• –
Mode	• EE • Lens closed
Equipment	• E. VF
Measurement point	• E. VF screen
Adjusting part	• VR7002 (BRIGHT)
Specification	• The CRT raster is just barely visible

1) Close the lens with the cap and adjust VR7002 so that the raster of the CRT is just visible in the E. VF.

3.3.5 Focus

Subject	• Camera picture
Mode	• EE
Equipment	• E. VF
Measurement point	• E. VF screen
Adjusting part	• VR7003 (FOCUS)
Specification	• The center area is clear and defined

1) While observing the viewfinder screen, adjust VR7003 so that the picture at the central area of the screen is clear and defined.