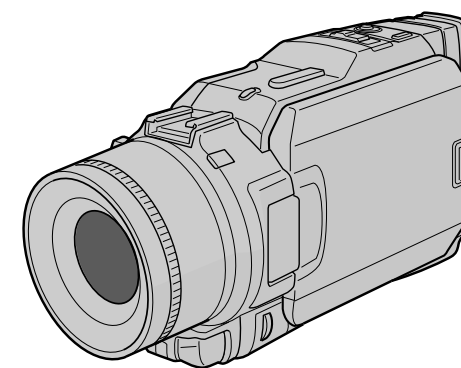


## SERVICE MANUAL

## DIGITAL VIDEO CAMERA

## GR-DV2000U



Mini DV NTSC  
DSC  
DIGITAL  
STILL CAMERA

GR-DV2000U

## JVC SERVICE & ENGINEERING COMPANY OF AMERICA DIVISION OF JVC AMERICAS CORP.

**Head office** : 1700 Valley Road Wayne, New Jersey 07470-9976 (973)315-5000  
**East Coast** : 10 New Maple Avenue Pine Brook, New Jersey 07058-9641 (973)396-1000  
**Midwest** : 705 Enterprise Street Aurora, Illinois 60504-8149 (630)851-7855  
**West Coast** : 5665 Corporate Avenue Cypress, California 90630-0024 (714)229-8011  
**Atlanta** : 1500 Lakes Parkway Lawrenceville, Georgia 30043-5857 (770)339-2582  
**Hawaii** : 2969 Mapunapuna Place Honolulu, Hawaii 96819-2040 (808)833-5828

## JVC CANADA INC.

**Head office** : 21 Finchdene Square Scarborough, Ontario M1X 1A7 (416)293-1311  
**Montreal** : 16800 Rte Trans-Canadienne, Kirkland, Quebec H9H 5G7 (514)871-1311  
**Vancouver** : 13040 Worster Court Richmond, B.C. V6V 2B3 (604)270-1311

JVC

S40895-03

No. 86600

## SPECIFICATIONS

Camcorder		For Connectors	
<b>For General</b>		<b>AV</b>	
Power supply	: DC 6.3 V (Using AC Power Adapter/Charger) DC 7.2 V (Using battery pack)	Video output	: 1 V (p-p), 75 Ω, analog
Power consumption		Video input	: 0.5 V (p-p) – 2.0 V (p-p), 75 Ω, analog
LCD monitor off, viewfinder on	: Approx. 4.4 W	Audio output	: 308 mV (rms), 1 kΩ, analog, stereo
LCD monitor on, viewfinder off	: Approx. 5.3 W	Audio input	: 308 mV (rms), 50 kΩ, analog, stereo
Dimensions (W x H x D)	: 74 mm x 90 mm x 178 mm (2-15/16" x 3-9/16" x 7-1/16") (with the LCD monitor closed and the viewfinder pushed back in, without the lens hood)	<b>DV</b>	
Weight	: Approx. 660 g (1.4 lbs) (without cassette, memory card and battery) Approx. 740 g (1.7 lbs) (incl. cassette, memory card and battery)	Input/output	: 4-pin, IEEE 1394 compliant
Operating temperature	: 0°C to 40°C (32°F to 104°F)	PHONE	
Operating humidity	: 35% to 80%	Headphone output	: ø3.5 mm, stereo
Storage temperature	: -20°C to 50°C (-4°F to 122°F)	MIC	
Pickup	: 1/4" CCD (Progressive Scan)	External microphone input	: 459 μV (rms), high impedance unbalanced, ø3.5 mm (stereo)
Lens	: F 1.8, f = 3.8 mm to 38 mm, 10:1 power zoom lens	PRINTER	: For an optional video printer equipped with a PRINT DATA connector
Filter diameter	: ø52 mm		
LCD monitor	: 3.5" diagonally measured, LCD panel/TFT active matrix system		
Viewfinder	: Electronic viewfinder with 0.44" color LCD		
Speaker	: Monaural		
<b>For Digital Video Camera</b>		<b>AC power adapter/charger AA-V40U</b>	
Format	: DV format (SD mode)	Power requirement	
Signal format	: NTSC standard	U.S.A. and Canada	: AC 120 V~, 60 Hz
Recording/Playback format	: Video: Digital component recording Audio: PCM digital recording, 32 kHz 4-channel (12-bit), 48 kHz 2-channel (16-bit)	Other countries	: AC 110 V to 240 V~, 50 Hz/60 Hz
Cassette	: Mini DV cassette	Power consumption	: 23 W
Tape speed	: SP: 18.8 mm/s LP: 12.5 mm/s	Output	
Maximum recording time (using 80 min. cassette)	: SP: 80 min. LP: 120 min.	Charge	: DC 7.2 V, 1.2 A
		VTR	: DC 6.3 V, 1.8 A
		Dimensions (W x H x D)	: 68 mm x 38 mm x 110 mm (2-11/16" x 1-1/2" x 4-3/8")
		Weight	: Approx. 250 g (0.56 lbs)
<b>For Digital Still Camera</b>		<b>Jack Box CU-V504U</b>	
Storage media	: SD Memory Card/MultiMediaCard	For General	
Compression system	: JPEG (compatible)	Dimensions (W x H x D)	: 37.5 mm x 18.5 mm x 55 mm (1-1/2" x 3/4" x 2-3/16")
File size	: 3 modes (UXGA: 1600 x 1200 pixels/XGA: 1024 x 768 pixels/ VGA: 640 x 480 pixels)	Weight	: Approx. 30 g (0.67 lbs)
Picture quality	: 2 modes (FINE/STANDARD)	For Connectors	
Approximate number of storable images (with the provided MultiMediaCard [16 MB])		USB	: TYPE B
FINE	: 100 (VGA), 48 (XGA), 20 (UXGA)	S-VIDEO	: Y: 1 V (p-p), 75 Ω, analog output C: 0.29 V (p-p), 75 Ω, analog output
STANDARD	: 300 (VGA), 144 (XGA), 60 (UXGA)	EDIT	: ø3.5 mm, 2-pole
(with an optional MultiMediaCard [8 MB])			
FINE	: 50 (VGA), 24 (XGA), 10 (UXGA)		
STANDARD	: 150 (VGA), 72 (XGA), 30 (UXGA)		

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

# TABLE OF CONTENTS

Section	Title	Page	Section	Title	Page
<b>Important Safety Precautions</b>			<b>4. CHARTS AND DIAGRAMS</b>		
<b>INSTRUCTIONS</b>			NOTES OF SCHEMATIC DIAGRAM .....		4-1
<b>1. DISASSEMBLY</b>			CIRCUIT BOARD NOTES .....		4-2
1.1	BEFORE ASSEMBLY AND DISASSEMBLY .....	1-1	4.1	BOARD INTERCONNECTIONS .....	4-3
1.1.1	Precautions .....	1-1	4.2	MAIN IF SCHEMATIC DIAGRAM (1/2) .....	4-5
1.1.2	Assembly and disassembly .....	1-1	4.3	MAIN IF SCHEMATIC DIAGRAM (2/2) .....	4-7
1.1.3	Destination of connectors .....	1-1	4.4	CPU SCHEMATIC DIAGRAM .....	4-9
1.1.4	Disconnection of Connectors (Wires) .....	1-1	4.5	MSD CPU SCHEMATIC DIAGRAM .....	4-11
1.2	JIGS AND TOOLS REQUIRED FOR DISASSEMBLY, ASSEMBLY AND ADJUSTMENT .....	1-2	4.6	DV MAIN SCHEMATIC DIAGRAM .....	4-13
1.2.1	Tools required for adjustments .....	1-2	4.7	V OUT SCHEMATIC DIAGRAM .....	4-15
1.3	DISASSEMBLY/ASSEMBLY OF CABINET PARTS AND BOARD ASSEMBLY .....	1-2	4.8	ANA IN SCHEMATIC DIAGRAM .....	4-17
1.3.1	Disassembly flow chart .....	1-2	4.9	TG/VDR SCHEMATIC DIAGRAM .....	4-19
1.3.2	Disassembly method .....	1-3	4.10	CDS/AD SCHEMATIC DIAGRAM .....	4-21
1.4	⑥ VF UNIT .....	1-7	4.11	DSP SCHEMATIC DIAGRAM .....	4-23
1.4.1	Disassembly/Assembly of the ⑥ VF UNIT .....	1-7	4.12	OP DRIVE SCHEMATIC DIAGRAM .....	4-25
1.5	DISASSEMBLY ⑦ OF THE OP BLOCK AND CCD BOARD ASSEMBLIES .....	1-8	4.13	DSC SCHEMATIC DIAGRAM .....	4-27
1.5.1	Precautions .....	1-8	4.14	P SHIFT SCHEMATIC DIAGRAM .....	4-29
1.5.2	How to remove .....	1-8	4.15	USB SCHEMATIC DIAGRAM .....	4-31
1.5.3	How to install .....	1-8	4.16	DSC IF SCHEMATIC DIAGRAM .....	4-33
1.5.4	Replacement of Service Repair Parts .....	1-8	4.17	MDA SCHEMATIC DIAGRAM .....	4-35
1.6	DISASSEMBLY/ASSEMBLY OF THE ⑫ MONITOR ASSEMBLY .....	1-9	4.18	PRE/REC SCHEMATIC DIAGRAM .....	4-37
1.6.1	⑫ Monitor Assembly and Hinge Assembly .....	1-9	4.19	AUDIO SCHEMATIC DIAGRAM .....	4-39
1.7	MANUAL EJECTION OF THE CASSETTE TAPE .....	1-10	4.20	REG SCHEMATIC DIAGRAM .....	4-41
1.8	EMERGENCY DISPLAY .....	1-11	4.21	MONITOR SCHEMATIC DIAGRAM .....	4-43
1.9	SERVICE NOTE .....	1-12	4.22	JACK SCHEMATIC DIAGRAM .....	4-45
<b>2. MECHANISM ADJUSTMENT</b>			4.23	EJECT AND DECK OPE SCHEMATIC DIAGRAMS ...	4-47
2.1	PRELIMINARY REMARKS ON ADJUSTMENT AND REPAIR .....	2-1	4.24	CCD SCHEMATIC DIAGRAM .....	4-48
2.1.1	Precautions .....	2-1	4.25	ZOOM OPE. UNIT, POWER OPE. UNIT, SUB OPE. UNIT, MENU SW UNIT AND FRONT FPC UNIT SCHEMATIC DIAGRAMS .....	4-49
2.1.2	Notes on procedure for disassembly/assembly .....	2-1	4.26	MAIN CIRCUIT BOARD .....	4-51
2.2	JIGS AND TOOLS REQUIRED FOR DISASSEMBLY, ASSEMBLY AND ADJUSTMENT .....	2-2	4.27	DSC CIRCUIT BOARD .....	4-57
2.2.1	Tools required for adjustments .....	2-2	4.28	PRE/MDA CIRCUIT BOARD .....	4-59
2.3	DISASSEMBLY/ASSEMBLY OF MECHANISM ASSEMBLY ..	2-3	4.29	AUDIO CIRCUIT BOARD .....	4-61
2.3.1	General statement .....	2-3	4.30	REG CIRCUIT BOARD .....	4-63
2.3.2	Explanation of mechanism mode .....	2-3	4.31	MONITOR CIRCUIT BOARD .....	4-65
2.3.3	Mechanism timing chart .....	2-4	4.32	JACK CIRCUIT BOARD .....	4-67
2.4	DISASSEMBLING PROCEDURE TABLE .....	2-5	4.33	EJECT AND DECK OPE. CIRCUIT BOARDS .....	4-69
2.4.1	Disassembly/assembly .....	2-7	4.34	CCD CIRCUIT BOARD .....	4-71
2.4.2	List of procedures for disassembly .....	2-13	4.35	VOLTAGE CHARTS .....	4-72
2.5	CHECKUP AND ADJUSTMENT OF MECHANISM PHASE ..	2-14	4.36	POWER SYSTEM BLOCK DIAGRAM .....	4-77
2.6	MECHANISM ADJUSTMENTS .....	2-15	4.37	REGULATOR SYSTEM BLOCK DIAGRAM .....	4-79
2.6.1	Adjustment of the slide guide plate .....	2-15	4.38	VIDEO SYSTEM BLOCK DIAGRAM .....	4-81
2.6.2	Adjustment of the Tension Arm and Pad Arm Assemblies ..	2-16	4.39	AUDIO SYSTEM BLOCK DIAGRAM .....	4-85
2.6.3	Adjustment of the Slide Lever 2 .....	2-16	<b>5. PARTS LIST</b>		
2.7	JIG CONNECTOR CABLE CONNECTION .....	2-17	5.1	PACKING AND ACCESSORY ASSEMBLY <M1> .....	5-1
2.8	SERVICE NOTE .....	2-18	5.2	FINAL ASSEMBLY <M2> .....	5-2
<b>3. ELECTRICAL ADJUSTMENT</b>			5.3	MECHANISM ASSEMBLY <M3> .....	5-6
3.1	PRECAUTION .....	3-1	5.4	ELECTRONIC VIEWFINDER ASSEMBLY <M4> .....	5-8
3.2	SETUP .....	3-2	5.5	MONITOR ASSEMBLY <M5> .....	5-9
3.3	MONITOR ADJUSTMENT .....	3-3	5.6	ELECTRICAL PARTS LIST .....	5-10
3.3.1	PLL (MONI) .....	3-3	MAIN BOARD ASSEMBLY <01> .....	5-10	
3.4	ELECTRONIC VIEWFINDER (E.VF) ADJUSTMENT ....	3-3	DSC BOARD ASSEMBLY <02> .....	5-17	
3.4.1	PLL (VF) .....	3-3	PRE/MDA BOARD ASSEMBLY <03> .....	5-19	
			AUDIO BOARD ASSEMBLY <04> .....	5-21	
			REG BOARD ASSEMBLY <05> .....	5-23	
			MONITOR BOARD ASSEMBLY <06> .....	5-24	
			JACK BOARD ASSEMBLY <07> .....	5-25	
			EJECT BOARD ASSEMBLY <08> .....	5-26	
			DECK OPE. BOARD ASSEMBLY <09> .....	5-26	
			CCD BOARD ASSEMBLY <10> .....	5-26	

# Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

## ● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  $\triangle$  symbol and shaded (  ) parts are critical for safety.

Replace only with specified part numbers.

**Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.**

3. Fuse replacement caution notice.  
Caution for continued protection against fire hazard.  
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- |                    |                                      |            |
|--------------------|--------------------------------------|------------|
| 1) Insulation Tape | 3) Spacers                           | 5) Barrier |
| 2) PVC tubing      | 4) Insulation sheets for transistors |            |

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

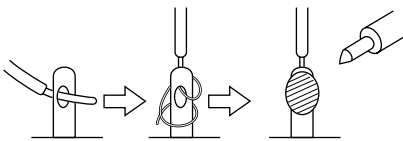


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

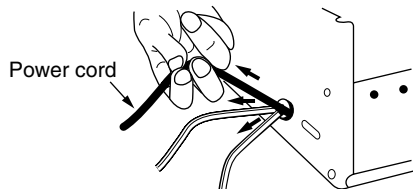


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)  
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

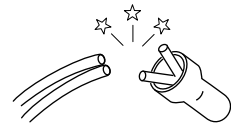
**1) Connector part number :** E03830-001

**2) Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.

**3) Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).



cut close to connector

Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

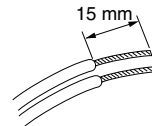


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

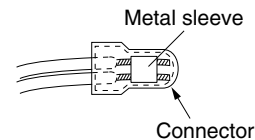


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

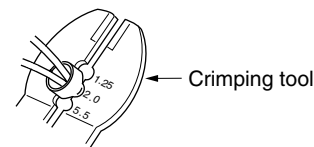


Fig.6

(5) Check the four points noted in Fig.7.

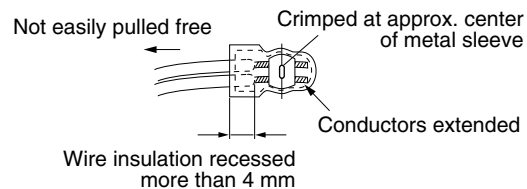


Fig.7

## ● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

### 1. Insulation resistance test

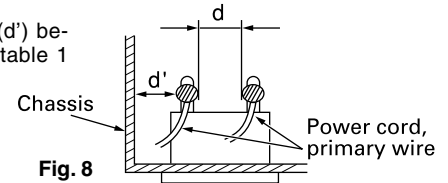
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

### 2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

### 3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

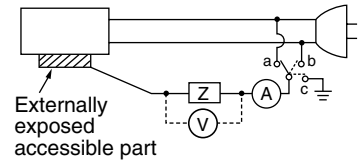


### 4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

**Measuring Method :** (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

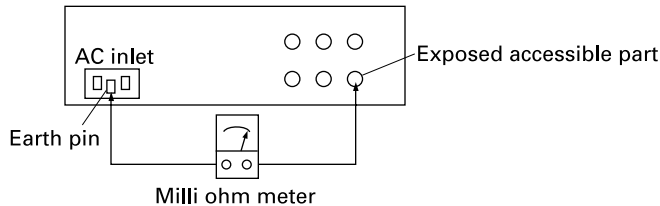


### 5. Grounding (Class 1 model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

**Measuring Method:**

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.



#### Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega/500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	$1 \text{ M}\Omega \leq R \leq 12 \text{ M}\Omega/500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V 200 to 240 V	Europe & Australia	$R \geq 10 \text{ M}\Omega/500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Power cord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan		$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada		$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia		$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
			$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

**Note:** These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.



# SECTION 1 DISASSEMBLY

## 1.1 BEFORE ASSEMBLY AND DISASSEMBLY

### 1.1.1 Precautions

1. Be sure to remove the power supply unit prior to mounting and soldering of parts.
2. When removing a component part that needs to disconnect the connector and to remove the screw for removing itself, first disconnect the connecting wire from the connector and then remove the screw beforehand.
3. When connecting and disconnecting the connectors, be careful not to damage the wire.
4. Carefully remove and handle the part to which some spacer or shield is attached for reinforcement or insulation.
5. When replacing chip parts (especially IC parts), desolder completely first (to prevent peeling of the pattern).
6. Tighten screws properly during the procedures. Unless specified otherwise, tighten screws at a torque of 0.069N·m(0.7kgf·cm).

### 1.1.2 Assembly and disassembly

STEP No.	PART	Fig.No.	POINT	NOTE
①	ZOOM OPE UNIT	Fig.1-3-1	3(S①),(L①a),4(L①b),CN①a	-
②	FRONT COVER ASSY	Fig.1-3-2	CN②a, 2(S②a),(S②b), 2(S②c),2(S②b),CN②b	NOTE②a NOTE②b NOTE②c NOTE②d

(1) (2) (3) (4) (5)

- (1) Indicate the disassembly steps. When assembling, perform in the reverse order of these steps. This number corresponds to the number in the disassembly diagram.
- (2) Indicates the name of disassembly/assembly parts.
- (3) Indicates the number in the disassembly diagram.
- (4) Indicates parts and points such as screws, washers, springs which must be removed during disassembly/assembly.

Symbol Name, Point  
 S Screw  
 L Lock, Pawl, Hook  
 SD Soldering  
 ☆(Others) Connector, Cover, Bracket, etc.

(Example)

- 2 (S1) : Remove the two screws (S1) for removing the part 1.
- CN A : Disconnect the connector A.
- SD1 : Unsolder at the point SD1.

(5) Precautions on disassembly/assembly.

### 1.1.3 Destination of connectors

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

- ↔ : Wire
- ⇔ : Flat wire
- ↔ : Board to Board connector

[Example]

CONN. No.	CONNECTOR				Pin No.
①a	AUDIO	CN203	↔	ZOOM OPE	- 8

### 1.1.4 Disconnection of Connectors (Wires)

Connector

Pull both ends of the connector in the arrow direction, remove the lock and disconnect the flat wire.

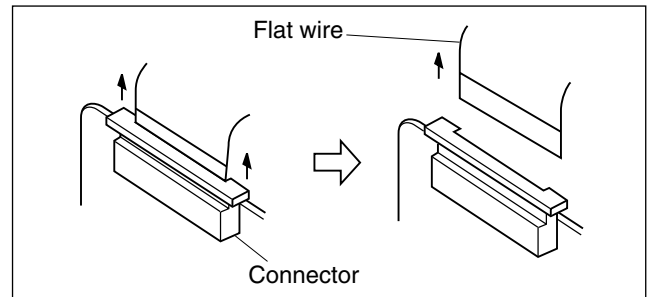


Fig. 1-1-1 Connector 1

Extend the locks in the direction of the arrow for unlocking and then pull out the wire. After removing the wire, immediately restore the locks to their original positions because the locks are apt to come off the connector.

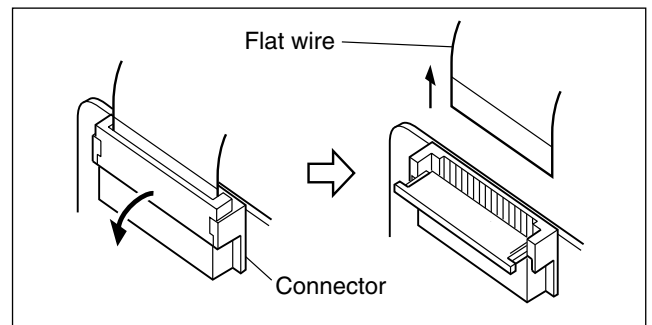


Fig. 1-1-2 Connector 2

B-B connector

Pull the board by both the sides in the direction of the arrow for disconnecting the B-B connector.

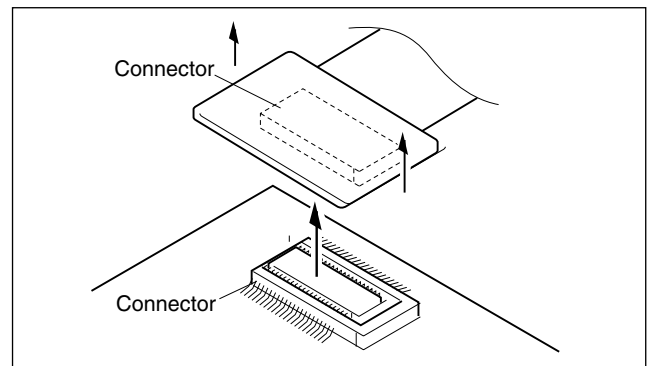


Fig. 1-1-3 Connector 3

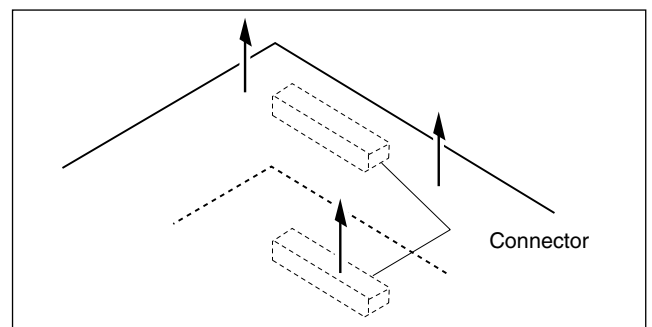


Fig. 1-1-4 Connector 4

## 1.2 JIGS AND TOOLS REQUIRED FOR DISASSEMBLY, ASSEMBLY AND ADJUSTMENT

### 1.2.1 Tools required for adjustments

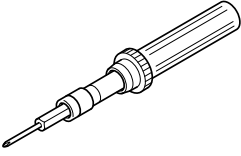
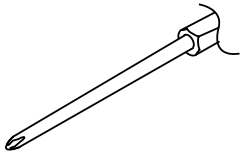
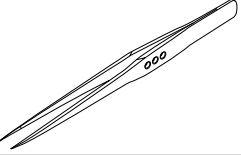
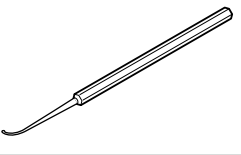
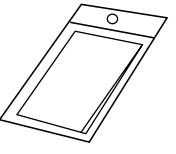
1	Torque Driver YTU94088	2	Bit YTU94088-003
			
3	Tweezers P-895	4	Chip IC Replacement Jig PTS40844-2
			
5	Cleaning Cloth KSMM-01		
			

Table 1-2-1

1. Torque driver  
Be sure to use to fastening the mechanism and exterior parts because those parts must strictly be controlled for tightening torque.
2. Bit  
This bit is slightly longer than those set in conventional torque drivers.
3. Tweezers  
To be used for removing and installing parts and wires.
4. Chip IC replacement jig  
To be used for adjustment of the camera system.
5. 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 AND BOARD ASSEMBLY

### 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.

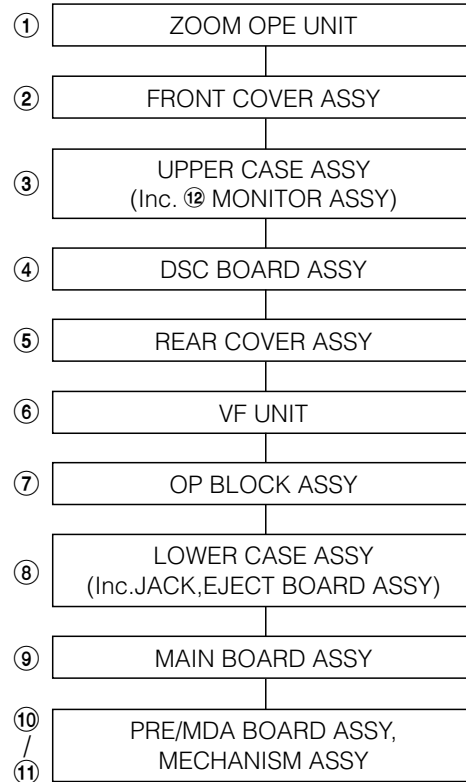


Table 1-3-1

### 1.3.2 Disassembly method

STEP No.	PART	Fig.No.	POINT	NOTE
①	ZOOM OPE UNIT	Fig.1-3-1	3(S1), (L1a), 4(L1b), CN1a	-
②	FRONT COVER ASSY	Fig.1-3-2	CN2a, 2(S2a), (S2b), 2(S2c), 2(S2b), CN2b	NOTE②a NOTE②b NOTE②c NOTE②d
③	UPPER CASE ASSY Inc. MONITOR ASSY	Fig.1-3-3	3(S3a), 6(S3b), (S3c), CN3a	NOTE③a NOTE③b NOTE③c
④	DSC BOARD ASSY	Fig.1-3-4	(S4), LUG WIRE, HEAT SINK, (L4), CN4a, CN4b	NOTE④a NOTE④b
⑤	REAR COVER ASSY	Fig.1-3-5	CN5a, 2(S5a), (S5b)	-
⑥	VF UNIT	Fig.1-3-6	HEAT SINK(MAIN), CN6a, (S6a), 2(S6b), (L6a), (L6b), 2(L6c)	NOTE⑥
⑦	OP BLOCK ASSY	Fig.1-3-7	(S7a), LUG WIRE, CN7a, CN7b, CN7c, CN7d, 2(S7b), (L7a), (L7b)	-
⑧	LOWER CASE ASSY	Fig.1-3-8	CN8a, CN8b, 3(S8a), (S8b), 2(L8a), (L8b)	-
⑨	MAIN BOARD ASSY	Fig.1-3-9	CN9a, (S9), (L9)	-
⑩ / ⑪	PRE/MDA BOARD ASSY, MECHANISM ASSY	Fig.1-3-10	3(S10a), BKT(MECHA) ASSY, 2(S10b), (L10), SHIELD COVER(PRE/REC), CN10a, CN10b, CN10c, CN10d, CN10e, CN10f, 3(S10b)	NOTE⑩a NOTE⑩b

Table-1-3-2

**Note ②a:** Open the cassette cover after removing the screws.

**Note ②b:** Be careful not to damage the FPC when unplugging it.

**Note ②c:** As the ⑦ OP Block Assembly is exposed as a result of the above steps, be careful not to damage any of its parts. Take particular care not to scratch the lens surfaces.

**Note ②d:** When mounting the parts, set the REC MODE switch to "video". Also set the lever to the uppermost position at the same time.

**Note ③a/③b:** Be sure to confirm the position of the screws.

**Note ④a:** Be careful not to damage the CONNECTOR.

**Note ③c:** For the disassembly of the ⑫ Monitor Assembly, see section 1.6, "Disassembly/Assembly of ⑫ Monitor Assembly".

**Note ④b:** Handle the peeled-off heat sink carefully because it should be reused in the assembly.

**Note ⑥:** For the disassembly of the ⑥ VF Unit, see section 1.4, "Disassembly/Assembly of ⑥ VF Unit".

**Note ⑩a:** The FPC of the loading motor should be mounted by inserting it between the Mechanism Assembly and the PRE/MDA Board Assembly.

**Note ⑩b:** When mounting the shield cover, push down the FPC of the drum while attaching it.

**Note:** Remove the parts marked in [shaded box].

CONN. No.	CONNECTOR				Pin No.	
①a	AUDIO	CN203	↔	ZOOM OPE	-	8
②a	AUDIO	CN201	↔	MAIN	CN112	80
②b	EJECT	CN2421	↔	FRONT FPC	-	12
③a	MAIN	CN108	↔	MONITOR	-	50
④a	DSC	CN8401	↔	MAIN	CN105	120
④b	DSC	CN8402	↔	JACK	CN301	20/45
⑤a	MAIN	CN109	↔	REG	CN601	80
⑥a	MAIN	CN110	↔	VF UNIT	CN501	22
⑦a	MAIN	CN102	↔	CCD	-	20
⑦b	MAIN	CN101	↔	CCD	-	2
⑦c	MAIN	CN103	↔	OP BLOCK ASSY	-	2
⑦d	MAIN	CN104	↔	OB BLOCK ASSY	-	39
⑧a	EJECT	CN2422	↔	MAIN	CN113	13
⑧b	JACK	CN301	↔	MAIN	CN111	24/45
⑨a	MAIN	CN106	↔	PRE/MDA	CN401	80
⑩a	PRE/MDA	CN406	↔	SENSOR	-	16
⑩b	PRE/MDA	CN405	↔	CAPSTAN MOTOR	-	18
⑩c	PRE/MDA	CN404	↔	DRUM MOTOR	-	11
⑩d	PRE/MDA	CN402	↔	HEAD	-	8
⑩e	PRE/MDA	CN407	↔	ROTARY ENCODER	-	6
⑩f	PRE/MDA	CN403	↔	LOADING MOTOR	-	6

Table-1-3-3

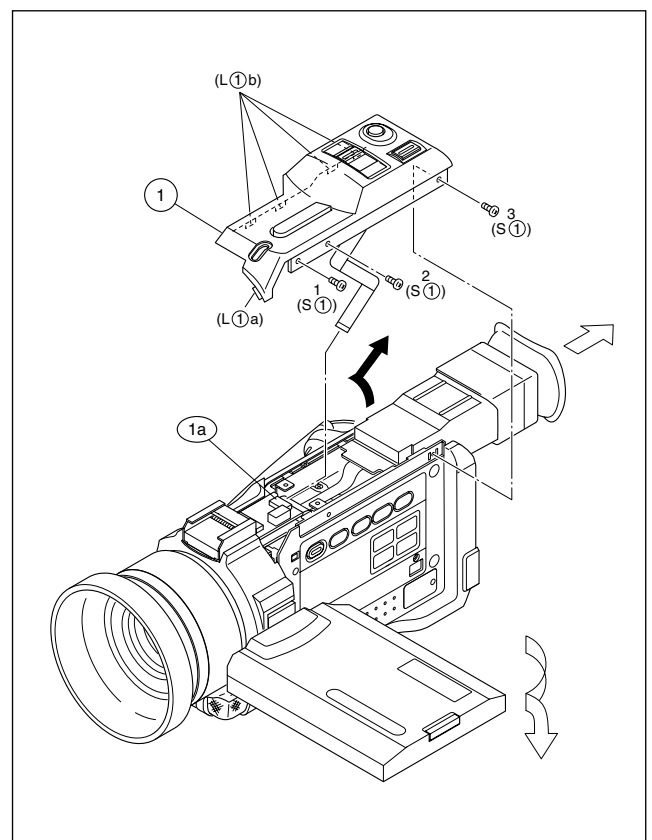


Fig. 1-3-1



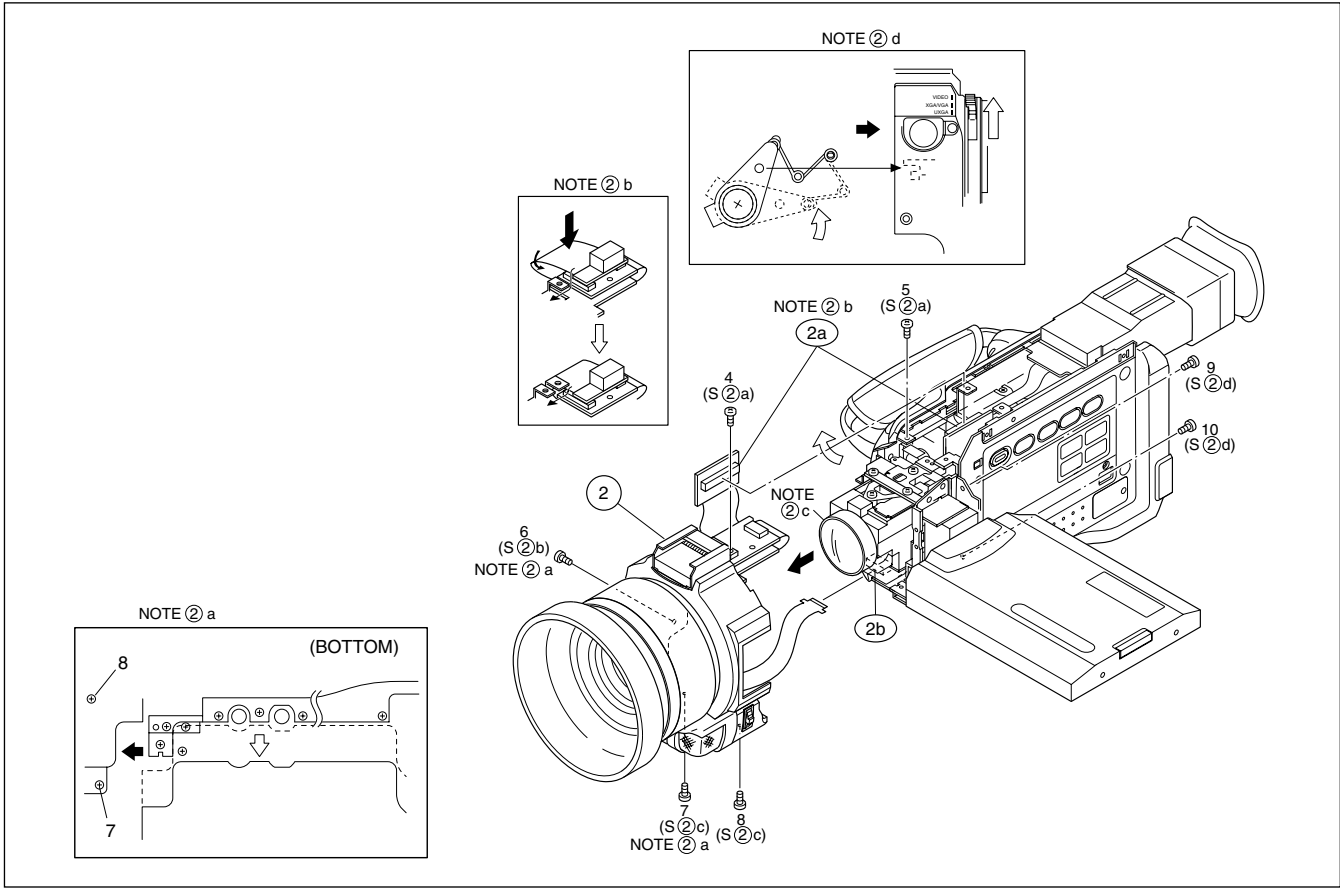


Fig. 1-3-2

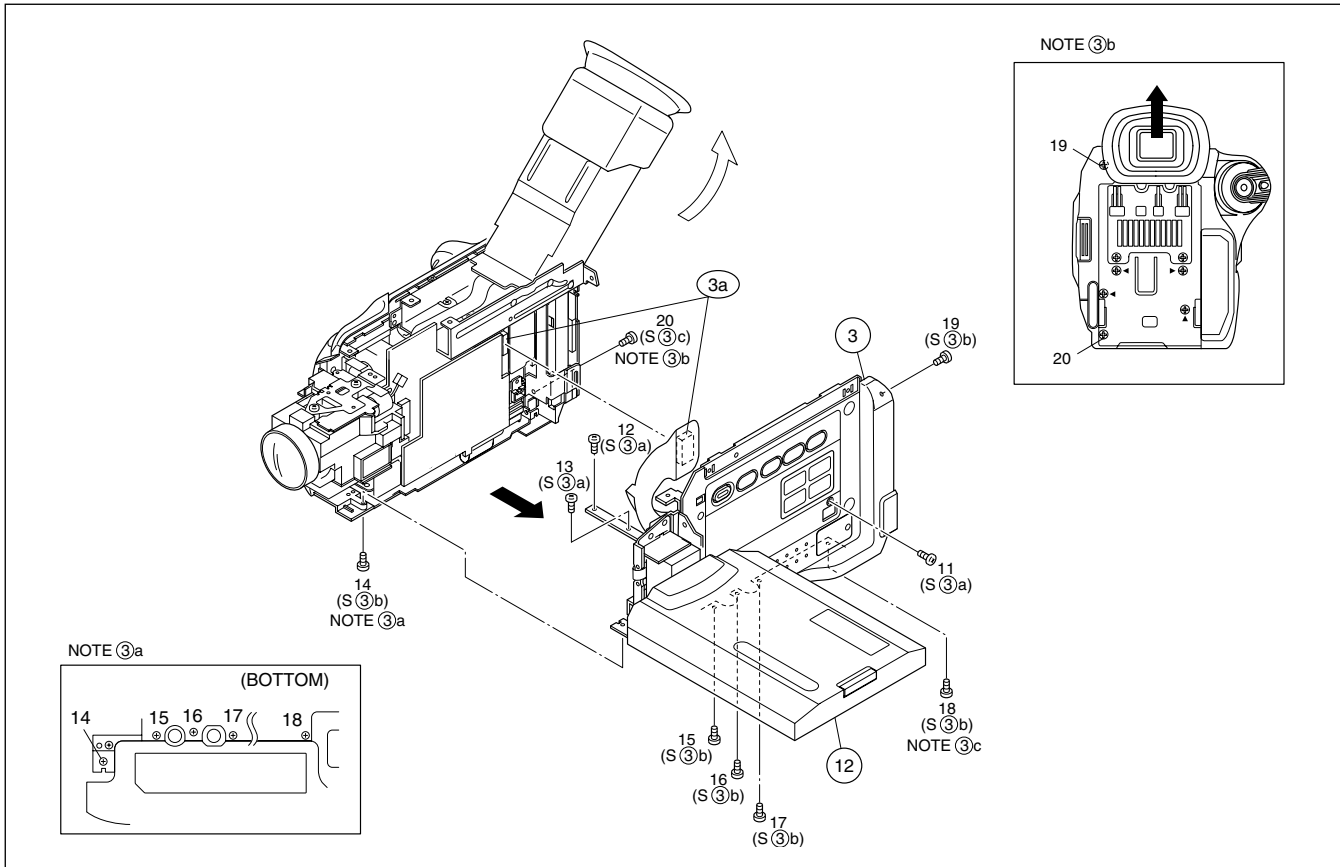


Fig. 1-3-3

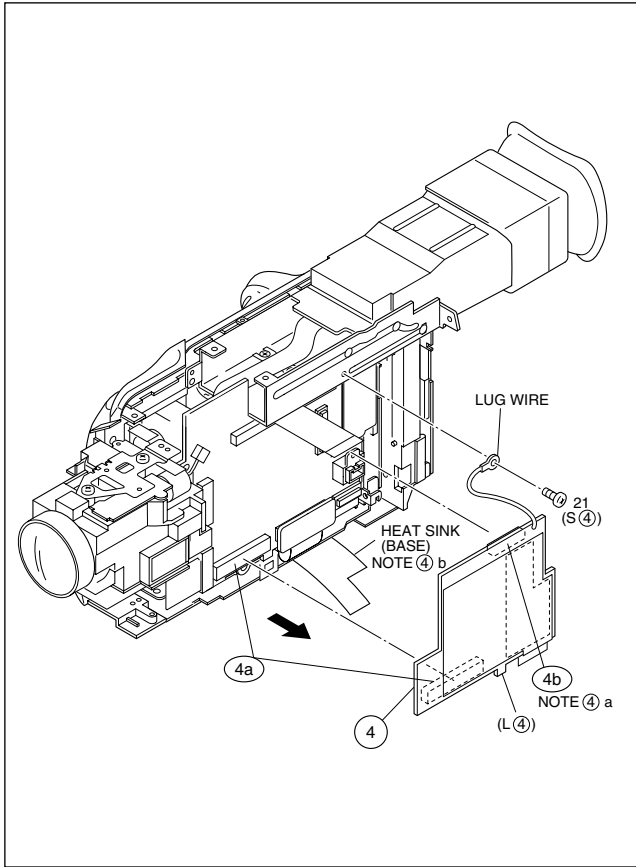


Fig. 1-3-4

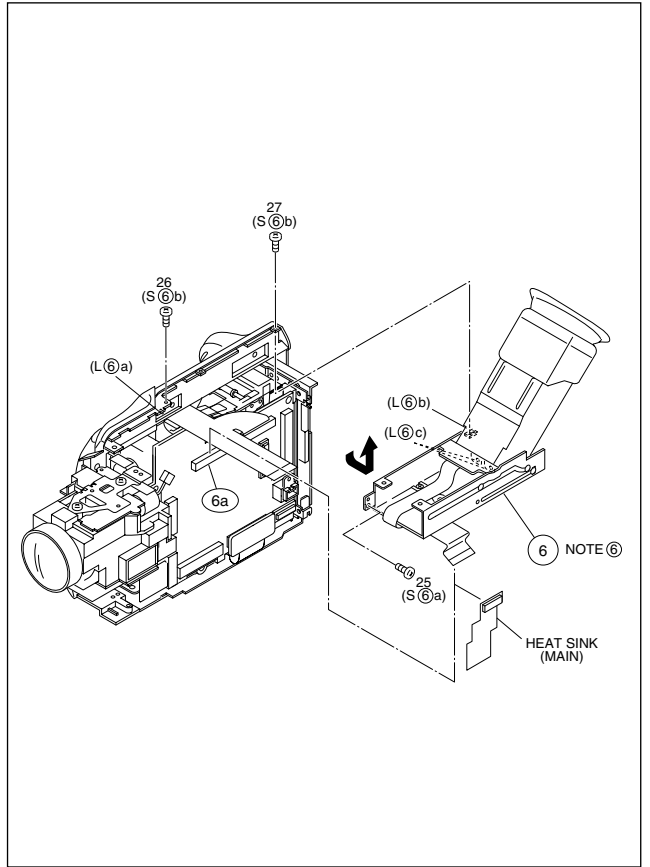


Fig. 1-3-6

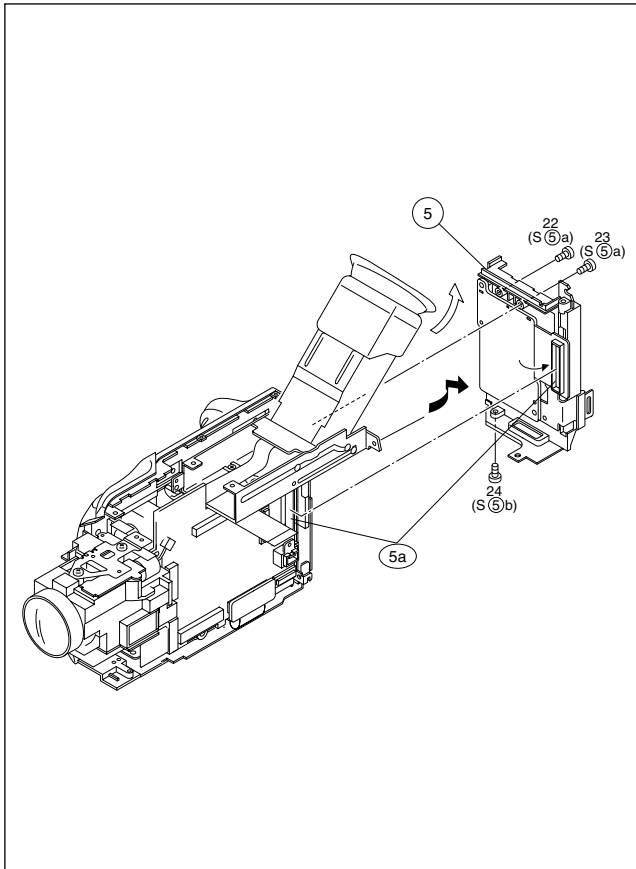


Fig. 1-3-5

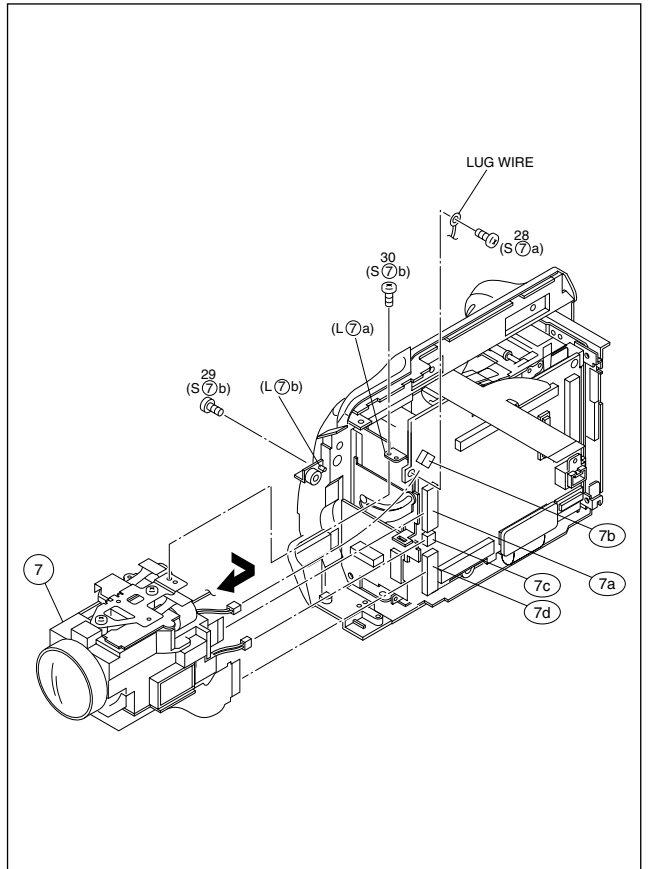


Fig. 1-3-7

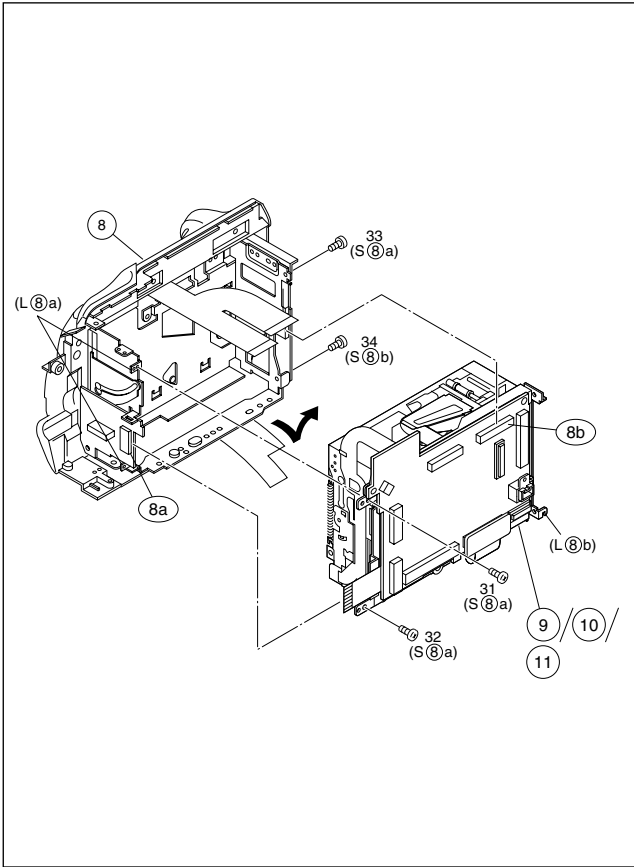


Fig. 1-3-8

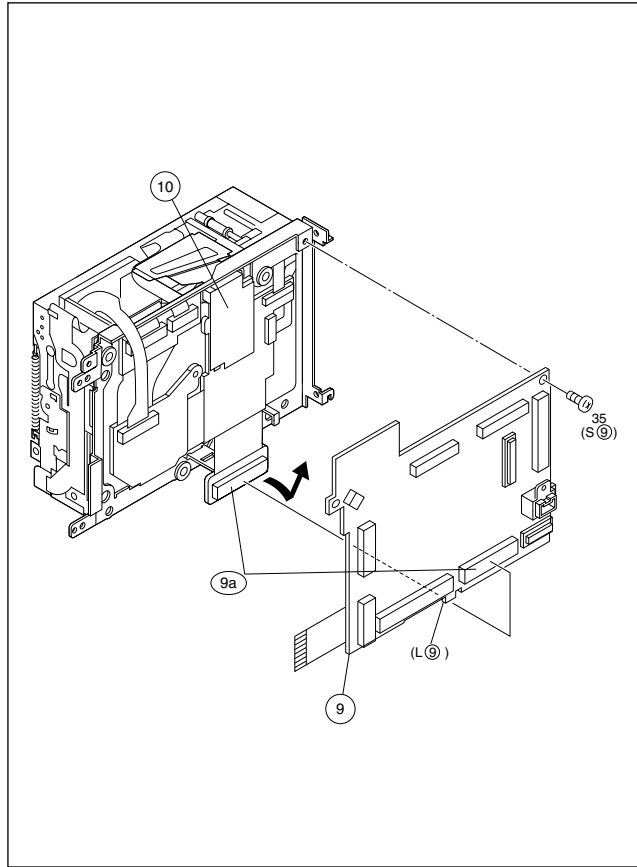


Fig. 1-3-9

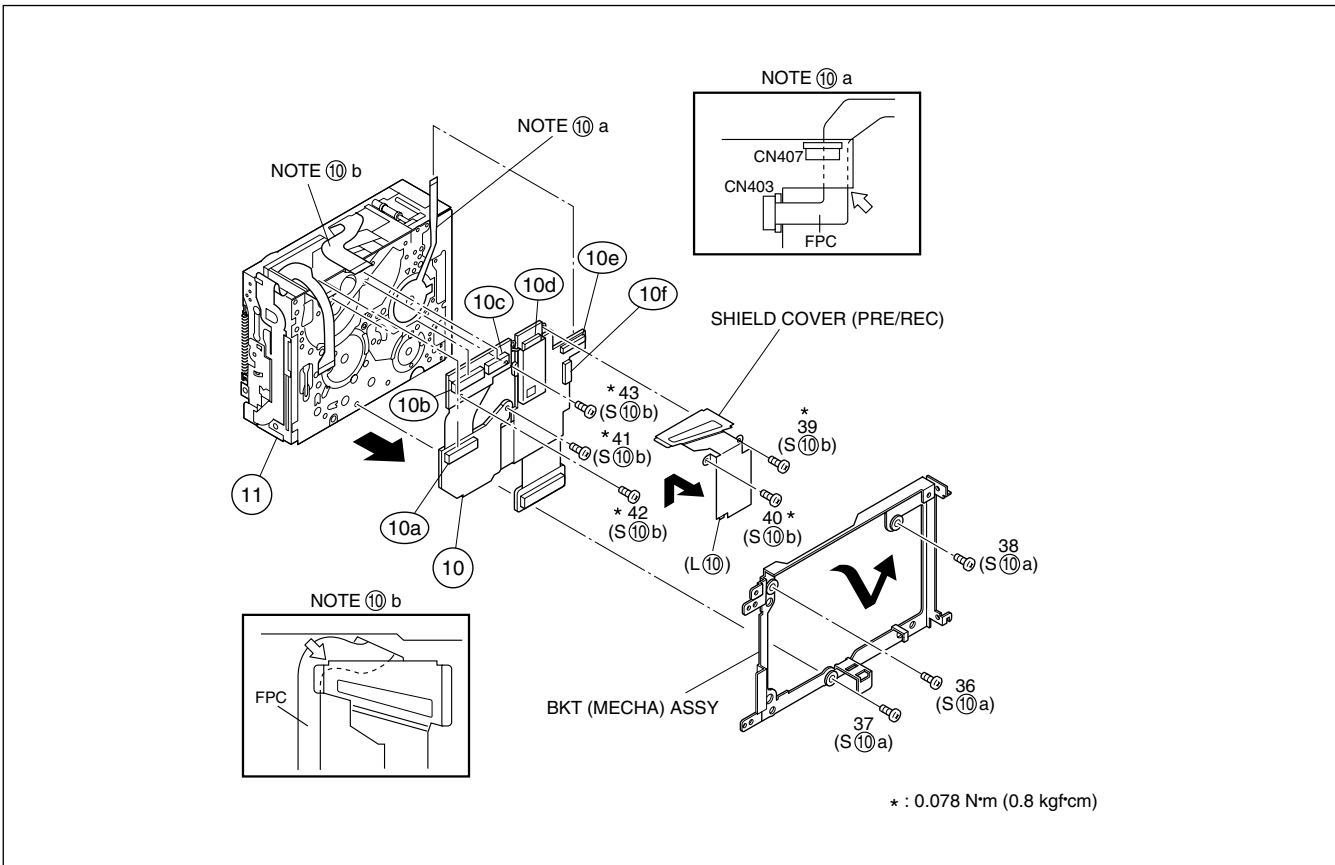


Fig. 1-3-10

## 1.4 ⑥ VF UNIT

### 1.4.1. Disassembly/Assembly of the ⑥ VF UNIT

1. Remove the 2 screws (1 and 2) and then remove the EYE CAP.
2. Remove the 2 screws (3 and 4).
3. Pull out the VF assembly and then remove the 4 screws (5 to 8) to release the FPC ASSY.
4. Remove the 2 screws (9 and 10) then lift the VF UNIT from the BRACKET (VF) ASSY and take out the FPC ASSY.

**Note⑥a :** Be careful not to disconnect or break the FPC ASSY wire.

5. Remove the 2 screws (11 and 12) to remove the UPPER CASE ASSY.

**Note⑥b :** Be careful not to lose any of the parts.

6. Remove the LCD UNIT from the BOTTOM CASE ASSY.

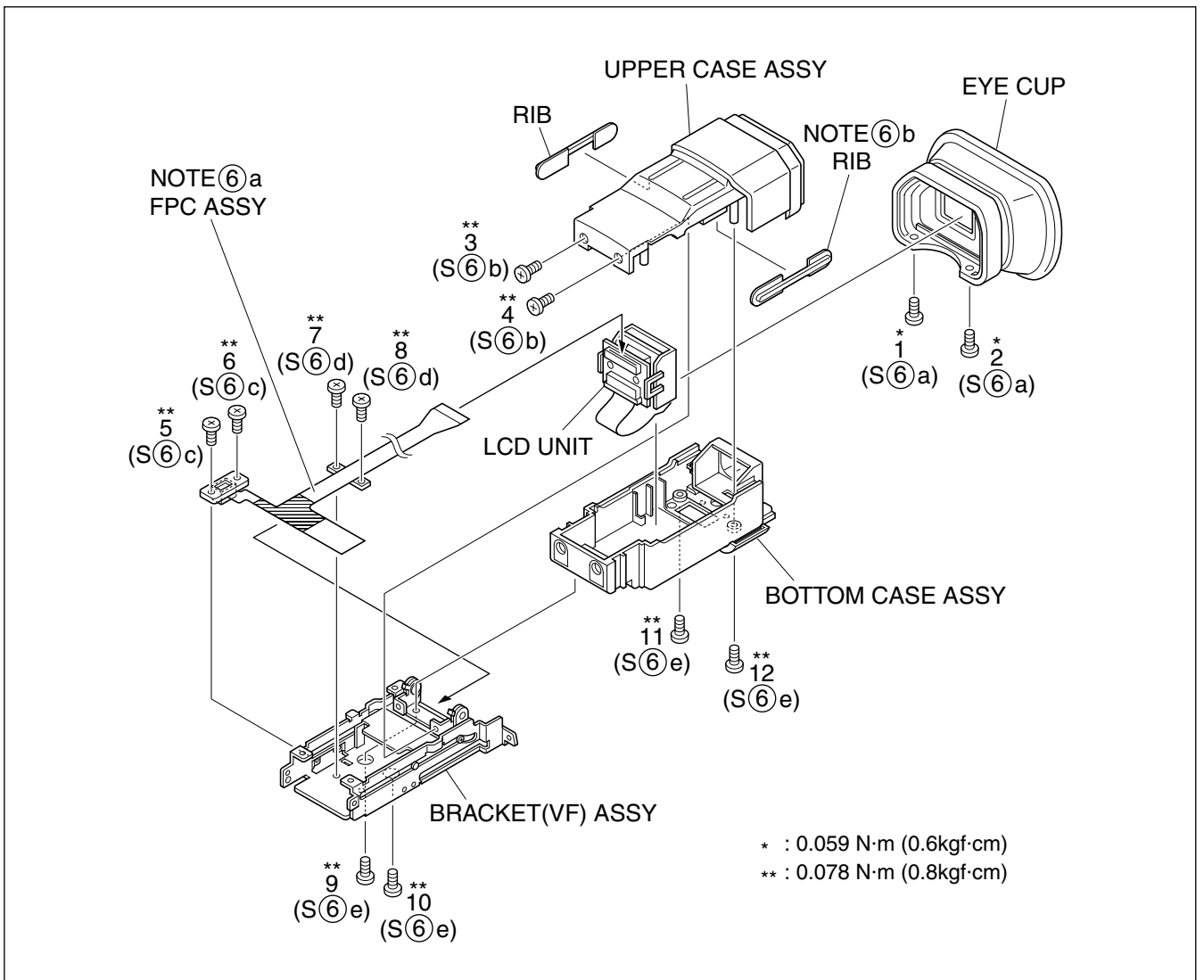


Fig. 1-4-1

## 1.5 DISASSEMBLY ⑦ OF THE OP BLOCK AND CCD BOARD ASSEMBLIES

### 1.5.1 Precautions

1. Take care in handling the CCD image sensor, optical LPF and lens components when performing maintenance etc., especially with regard to surface contamination, attached dust or scratching. If fingerprints are present on the surface they should be wiped away using either a silicon paper, clean chamois or the cleaning cloth recommended by the Video Product Division.
2. The CCD image sensor may have been shipped with a protective sheet attached to the transmitting glass. When replacing the CCD image sensor, do not peel off this sheet from the new part until immediately before it is mounted in the OP Block Assembly.

### 1.5.2 How to remove

1. Remove the solder (SD1) from the 16 soldered points on the CCD Board Assembly and take the assembly out.
2. Remove the two screws (1, 2) and take out the CCD Base Assembly.

**Note ⑦a:** When removing the CCD Base Assembly, be careful not to take out the CCD image sensor together with the spacer rubbers attached to it.

**Note ⑦b:** The CCD image sensor should not be replaced as a single part but should be replaced together with the entire CCD Base Assembly.

### 1.5.3 How to install

1. With the spacer rubbers attached to the CCD base, mount the CCD base in the OP Block Assembly and tighten them together using the two screws (1, 2).
2. Mount the CCD Board Assembly and attach solder to the 16 points (SD1).

### 1.5.4 Replacement of Service Repair Parts

The service repair parts for the OP Block Assembly are as listed below.

Before replacement of these parts, remove the bracket (OP assembly) as required.

Take special care not to disconnect any of the FPC wires or cause any damage due to soldering (excessive heating).

1. Focusing motor
2. Zoom motor
3. Iris motor unit

**Note ⑦c:** When replacing the focusing motor or the zoom motor, solder the FPC at a space of about 1 mm above the terminal pin.

**Note ⑦d:** The iris motor unit includes the FPC Assembly and two sensors.

**Note ⑦e:** Be careful not to damage the switch.

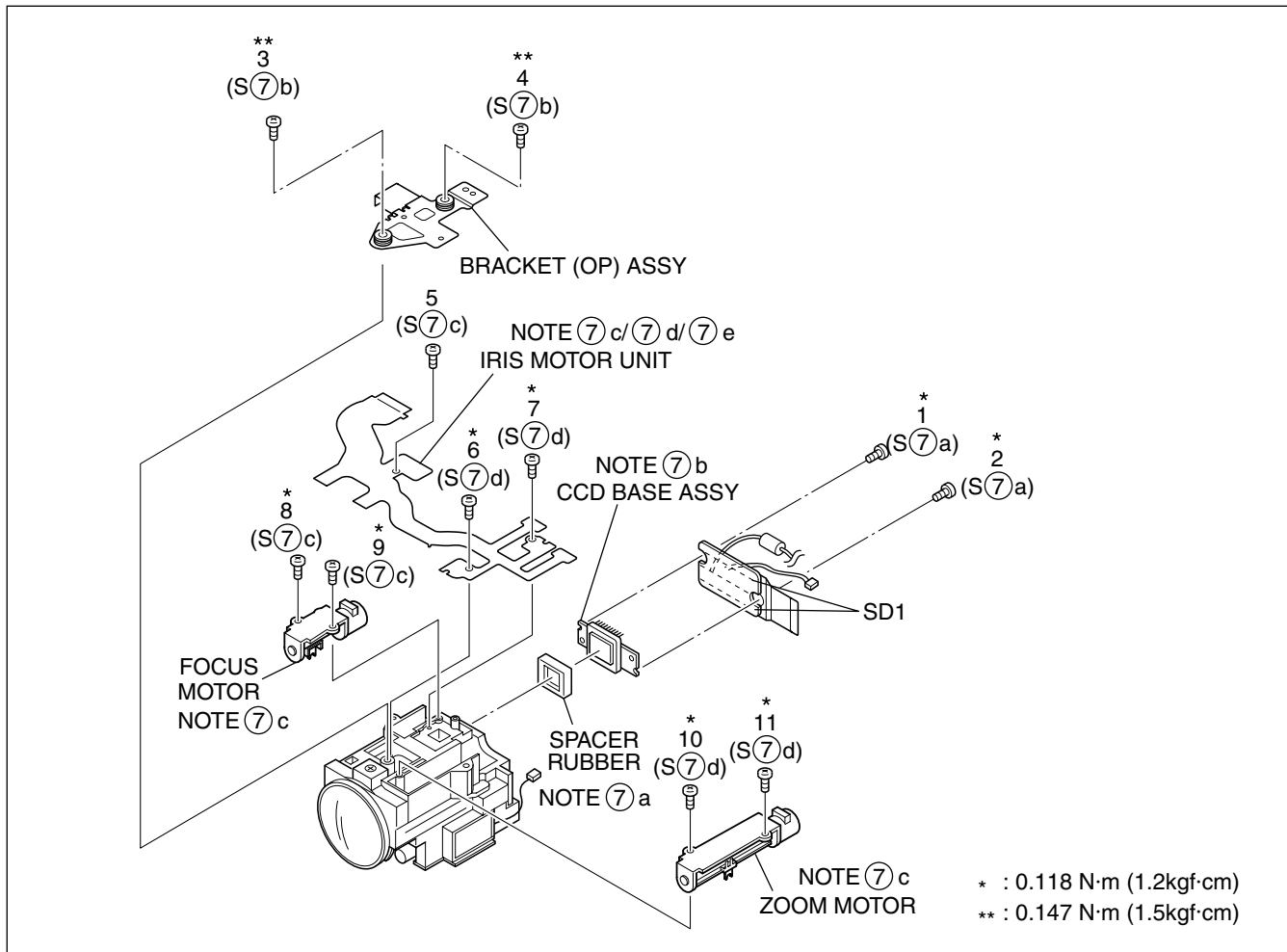


Fig. 1-5-1

## 1.6 DISASSEMBLY/ASSEMBLY OF THE 12 MONITOR ASSEMBLY

### 1.6.1 12 Monitor Assembly and Hinge Assembly

1. Remove the four screws (1 to 4), disengage the four hooks (L12 a to d) in order, and take out the Monitor Cover Assembly.
2. Unlock the connector (a) and, while lifting the Hinge Assembly, unplug and take out the FPC.
3. Remove the screw (5) and take out the bracket (MONITOR CASE).
4. Unplug the FPC from the connector (d) and take out the Monitor Board Assembly and the backlight.
5. Remove the LCD module by disengaging the five hooks (L12 e to j).
6. Remove the two screws (6, 7) and take out the hinge covers (1, 2) by disengaging the four hooks (L12 k, l) at both sides of each of the hinge covers.
7. Remove the FPC Assembly from the Hinge Assembly.

**Note 12a:** Don't reuse the screw, because screw lock bond was applied to them.

**Note 12b:** Be careful not to damage the FPC or the connector when removing the Monitor Cover Assembly.

**Note 12c:** Be careful not to damage the parts when removing or mounting the Hinge Assembly.

**Note 12d:** To unplug the FPC, release only the lock of the connector and remove the FPC together with the Hinge Assembly.

**Note 12e:** As the backlight is soldered at two points on the Monitor Board Assembly, the solder should be removed when disassembling the backlight as a single part.

**Note 12f:** Take care when handling the FPC.

**Note 12g:** Be careful not to lose the magnets and attach them in the correct orientation.

**Note 12h:** When mounting the FPC Assembly, wrap it around the Hinge Assembly by 3-1/2 turns.

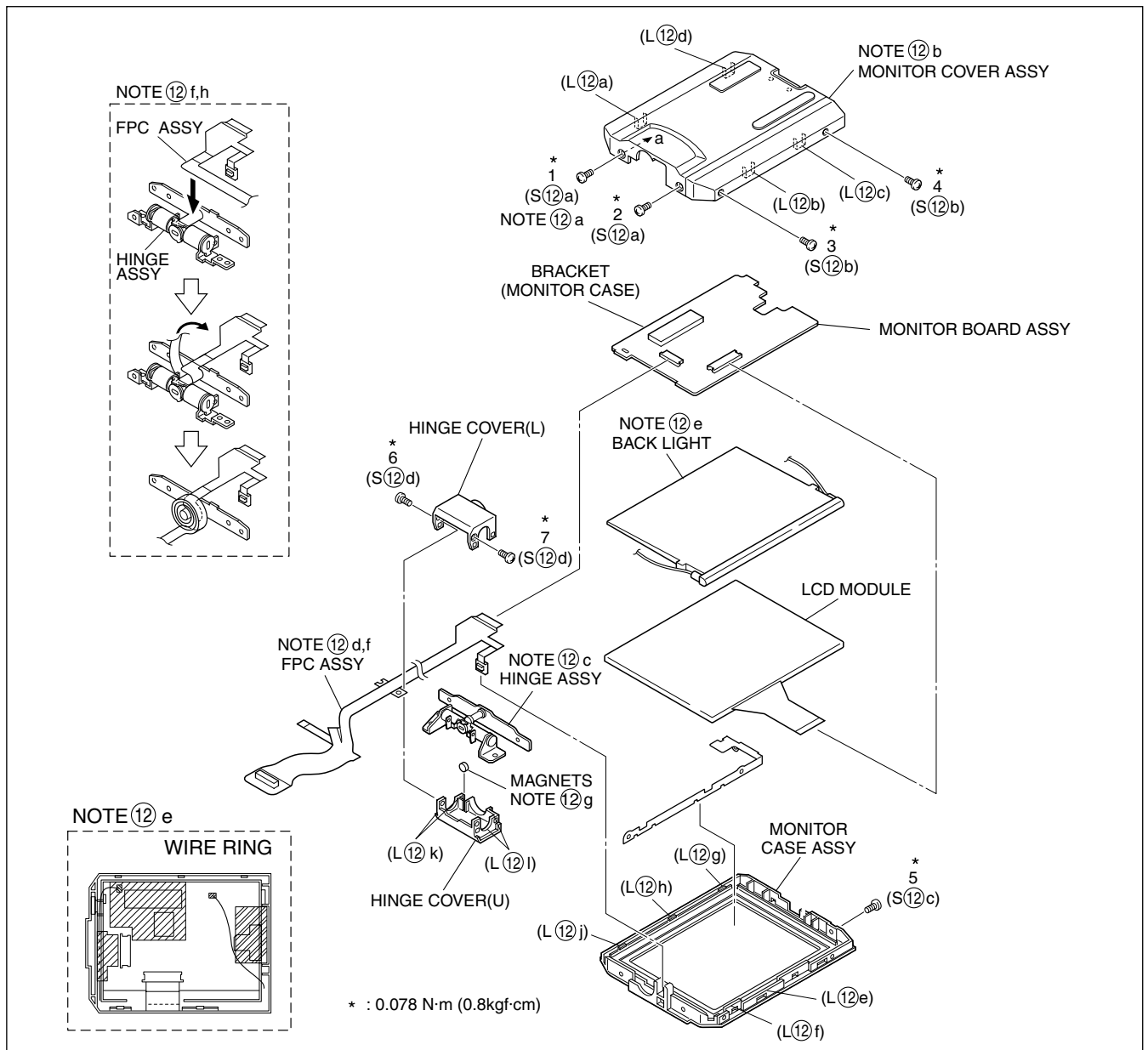


Fig. 1-6-1

## 1.7 MANUAL EJECTION OF THE CASSETTE TAPE

**Note:** The following procedure describes a simplified method of ejecting the cassette tape in case it is not possible to eject it, due to an electrical failure.

*Be careful not to damage any of the parts or the tape when performing repairs or maintenance work.*

1. Remove the Power Unit (battery, DC code, etc.) from the main unit.
2. Open the cassette cover.
3. Attach a piece of PVC tape at the front of the cassette housing.

**Note:** This helps prevent the tape from being damaged when the Cassette Housing Assembly is moved upward at the unloading end.

4. In order to change the mechanism mode at the unloading end apply 3 V, DC to the electrode on the top surface of the Loading Motor Assembly and then set it to the eject mode.
5. If there is any slack tape in the tape transport system, wind it inside the cassette tape by turning the Supply Reel Disk from the backside of the Slide Deck Assembly.
6. Peel off the PVC tape and take out the cassette tape from the cassette housing.

**Note:** Make sure that grease or a similar substance is not attached to the surface of the tape.

*Similarly, also make sure that grease or a similar substance is not attached on the Mechanism Assembly.*

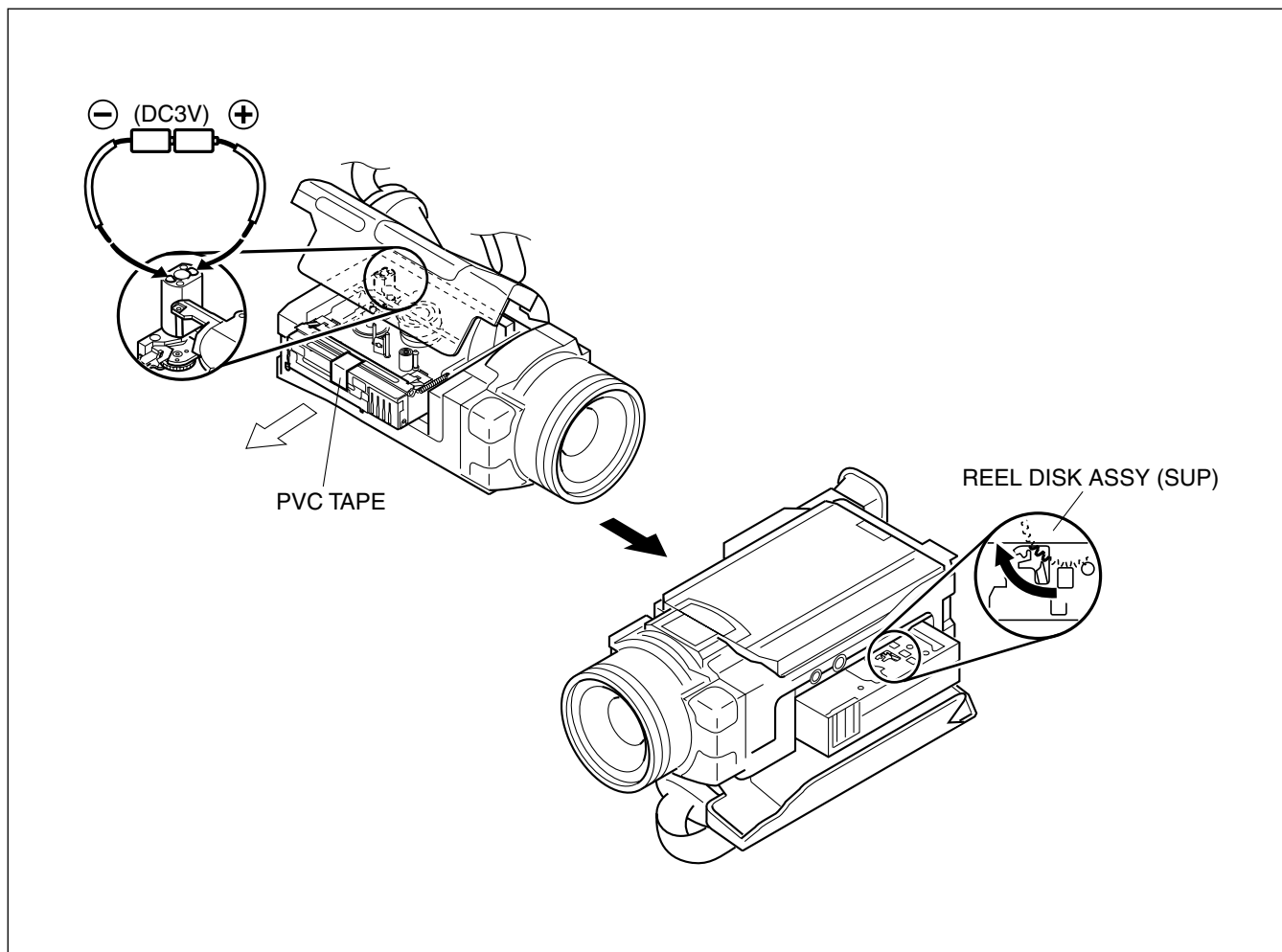


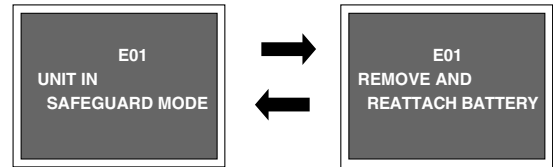
Fig. 1-7-1

## 1.8 EMERGENCY DISPLAY

Whenever some abnormal signal is input to the syscon CPU, an error number (E01, as an example) is displayed on the LCD monitor or (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):



LCD display	Emergency mode	Details	Possible cause
E01	LOADING	In the case the encoder position is not shifted to the next point though the loading motor has rotated in the loading direction for 4 seconds or more. This error is defined as [E01].	<ol style="list-style-type: none"> <li>1. The mechanism is locked during mode shift.</li> <li>2. The mechanism is locked at the mechanism loading end, because the encoder position is skipped during mechanism mode shift.</li> <li>3. No power is supplied to the loading MDA.</li> </ol>
E02	UNLOADING	In the case the encoder position is not shifted to the next point though the loading motor has rotated in the unloading direction for 4 seconds or more. This error is defined as [E02].	<ol style="list-style-type: none"> <li>1. The mechanism is locked during mode shift.</li> <li>2. The mechanism is locked at the mechanism loading end, because the encoder position is skipped during mechanism mode shift.</li> </ol>
E03	TU & SUP REEL FG	In the case no REEL FG is produced for 4 seconds or more in the capstan rotation mode after loading was complete, the mechanism mode is shifted to STOP with the pinch roller set off. This error is defined as [E03]. However, no REEL EMG is detected in the SLOW/STILL mode.	<ol style="list-style-type: none"> <li>1. The idler gear does not engage with the reel disk well.</li> <li>2. Though the idler gear and reel disk are engaged with each other, the tape is not wound because of overload to the mechanism.</li> <li>3. No FG pulse is output from the reel sensor.</li> <li>4. No power is supplied to the reel sensor.</li> <li>5. Tape transport operation takes place with a cassette having no tape inside.</li> <li>6. The tape slackens and no pulse is produced until the slack is taken up and the tape comes into the normal status.</li> </ol>
E04	DRUM FG	In the case there is no DRUM FG input in the drum rotation mode for 4 seconds or more. This error is defined as [E04], and the mechanism mode is shifted to STOP with the pinch roller set off.	<ol style="list-style-type: none"> <li>1. The drum cannot be started or drum rotation is stopped because tape transport load is too high. <ol style="list-style-type: none"> <li>1) Tape tension is extremely high.</li> <li>2) The tape is damaged or soiled with grease, etc.</li> </ol> </li> <li>2. The DRUM FG signal is not received by the syscon CPU. <ol style="list-style-type: none"> <li>1) Disconnection in the middle of the signal line.</li> <li>2) Failure of the DRUM FG pulse generator (hall element).</li> </ol> </li> <li>3. No drum control voltage is supplied to the MDA.</li> <li>4. No power is supplied to the DRUM MDA.</li> </ol>
E05	–	–	–
E06	CAPSTAN FG	In the case no CAPSTAN FG is produced in the capstan rotation mode for 2 seconds or more. This error is defined as [E06], and the mechanism mode is shifted to STOP with the pinch roller set off. However, no CAPSTAN EMG is detected in the STILL/FF/REW mode.	<ol style="list-style-type: none"> <li>1. The CAPSTAN FG signal is not received by the syscon CPU. <ol style="list-style-type: none"> <li>1) Disconnection in the middle of the signal line.</li> <li>2) Failure of the CAPSTAN FG pulse generator (MR element).</li> </ol> </li> <li>2. No capstan control voltage is supplied to the MDA.</li> <li>3. No power is supplied to the CAPSTAN MDA.</li> <li>4. The capstan cannot be started or capstan rotation is stopped because tape transport load is too high. <ol style="list-style-type: none"> <li>1) Tape tension is extremely high. (Mechanical locking)</li> <li>2) The tape is damaged or soiled with grease, etc. (Tape tangling occurs, etc.)</li> </ol> </li> </ol>

(DVC\_03)

Table 1-8-1



## 1.9 SERVICE NOTE

Symbol No.	①										②										③																																																																					
Removing order of screw →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20																																																																						
Place to stick screw →	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*																																																																						
Reference drawing →	Fig. 1-3-1																														Fig. 1-3-2																														Fig. 1-3-3																													
Screw tightening torque →	I																														I																														I																													

Symbol No.	④						⑤						⑥						⑦						⑧						⑨					
Removing order of screw →	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35																					
Place to stick screw →				*	*	*	*	*	*	*	*	*	*	*	*																					
Reference drawing →	Fig. 1-3-4						Fig. 1-3-5						Fig. 1-3-6						Fig. 1-3-7						Fig. 1-3-8						Fig. 1-3-9					
Screw tightening torque →	I						I						I						I						I						I					

Symbol No.	⑩							⑪							⑫													
Removing order of screw →	36	37	38	39	40	41	42	43	1	2	3	4	5	6	7	8	9	10	11	12								
Place to stick screw →																												
Reference drawing →	Fig. 1-3-10																											
Screw tightening torque →	I							II							III							II						

Symbol No.	⑬ OP BLOCK ASSY												⑭ VF UNIT												⑮ MONITOR ASSY						
Removing order of screw →	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
Place to stick screw →																									*	*	*	*	*	*	*
Reference drawing →	Fig. 1-5-1												Fig. 1-4-1												Fig. 1-6-1						
Screw tightening torque →	IV												V												II						

< NOTE >

- 1) \* ; Don't reuse the screw, because screw lock bond was applied to them.
- 2) Pay careful attention to tightening torque for each screw.
 

I	: 0.069N·m (0.7kgf·cm)	II	: 0.078N·m (0.8kgf·cm)	III	: 0.059N·m (0.6kgf·cm)
IV	: 0.118N·m (1.2kgf·cm)	V	: 0.147N·m (1.5kgf·cm)		

Table 1-9-1

## SECTION 2 MECHANISM ADJUSTMENT

### 2.1 PRELIMINARY REMARKS ON ADJUSTMENT AND REPAIR

#### 2.1.1 Precautions

1. When fastening parts, pay careful attention to the tightening torque of each screw. Unless otherwise specified, tighten a screw with the torque of 0.039 N·m (0.4 kgf·cm).
2. Be sure to disconnect the set from the power supply before fastening and soldering parts.
3. When disconnecting/connecting wires, be careful not to get them and their connectors damaged. (Refer to the Section 1.)
4. When replacing parts, be very careful neither to damage other parts nor to fit wrong parts by mistake.

#### 2.1.2 Notes on procedure for disassembly/assembly

The disassembling procedure table (Table 2-4-1 on page 2-5, a part of the table is shown below for reference) shows the procedure to disassemble/reassemble mechanism parts.

Carefully read the following explanation before starting actual disassembling/reassembling work. The item numbers (circled numbers) in the following explanation correspond to those appearing under respective columns of the table.

- (1) Circled numbers appearing in this column indicate the order to remove parts. When reassembling, follow these numbers in the reverse order. Circled numbers in this column correspond to those appearing in drawings of this section.
- (2) This column shows part names corresponding to circled numbers in the left column.
- (3) The symbol (T or B) appearing in this column shows the side which the objective part is mounted on.  
T = the upper side, B = the lower side
- (4) Symbols appearing in this column indicate drawing numbers.  
Step Part Name Fig. Point Note Remarks

- (5) This column indicates parts and points such as screws, washers, springs, and others to be removed/fitted for disassembling/reassembling the mechanism. Besides such the parts, this column occasionally indicates working points.

P = Spring  
W = Washer  
S = Screw  
\* = Lock (L), soldering (SD), shield, connector (CN), etc.

- Example
- Remove ((W1)=Washer W1.
  - \*\*Remove the solder at (SD1)=Point SD1.
  - \*\*Disconnect (A) =Connector (A) .

- (6) Numbers in this column represent the numbers of notes in the text. For example, "1" means "Note 1". (For parts that need phase adjustment after reassembling, refer to "2.6 MECHANISM ADJUSTMENTS".)

- (7) This column indicates required after-disassembling/-reassembling work such as phase adjustment or mechanism adjustment.

NO.	PART NAME		FIG.	POINT	NOTE	REMARKS
①	CASSETTE HOUSING ASSY	T	Fig.2-4-3	3(S①),(L①a)-(L①e)		ADJUSTMENT
②	UPPER BASE ASSY	T	Fig.2-4-4	(S②),(L②a),(L②b)		
③	DRUM ASSY	T		(S③a),2(S③b)		
④	REEL DISK ASSY(SUP)	T	Fig.2-4-5	(W④)		
⑤	REEL DISK ASSY(TU)	T		(W⑤)		
⑥	REEL COVER ASSY	T		2(W⑥),(S⑥a),2(S⑥b)		ADJUSTMENT

↑  
(1)

↑  
(2)

↑  
(3)

↑  
(4)

↑  
(5)

↑  
(6)

↑  
(7)

## 2.2 JIGS AND TOOLS REQUIRED FOR DISASSEMBLY, ASSEMBLY AND ADJUSTMENT

### 2.2.1 Tools required for adjustments

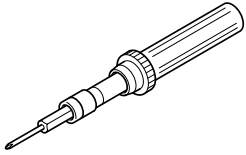
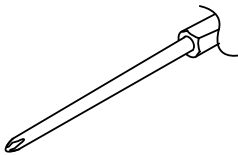
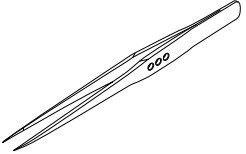
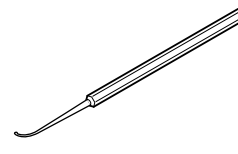
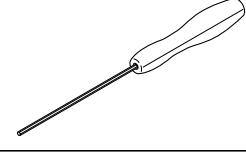
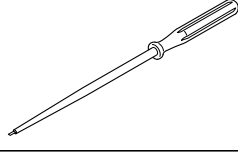
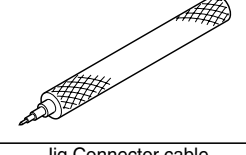
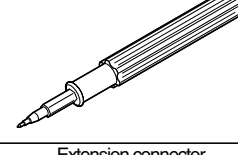
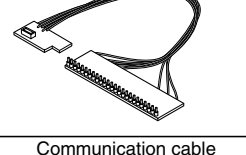
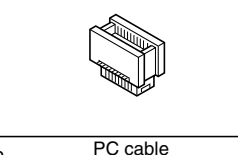
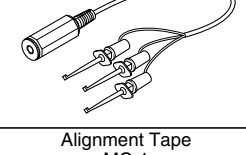
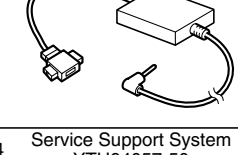
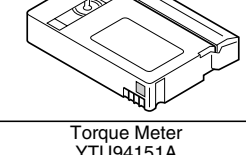

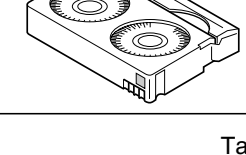
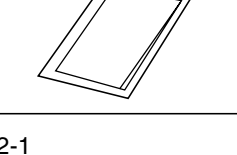
1	Torque Driver YTU94088	2	Bit YTU94088-003
			
3	Tweezers P-895	4	Chip IC Replacement Jig PTS40844-2
			
5	Guide Driver (Hexagonal) D-770-1.27	6	Adjustment Driver YTU94028
			
7	Slit Washer Installation Jig YTU94121A	8	Slit Washer Installation Jig YTU94121B
			
9	Jig Connector cable YTU93106B	10	Extension connector YTU94145C-30
			
11	Communication cable YTU93107A	12	PC cable QAM0099-002
			
13	Alignment Tape MC-1	14	Service Support System YTU94057-50
			
15	Torque Meter YTU94151A	16	Cleaning Cloth KSM-01
			

Table 2-2-1

#### 1. Torque Driver

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

#### 2. Bit

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

#### 3. Tweezers

To be used for removing and installing parts and wires.

#### 4. Chip IC replacement Jig

To be used for adjustment of the camera system.

#### 5. Guide Driver (Hexagonal)

To be used to turn the guide roller to adjustment of the linearity of playback envelope.

#### 6. Adjustment Driver

To be used for adjustment.

#### 7. Slit washer Installation Jig

To be used to install slit washers.

#### 8. Slit washer Installation Jig (NEW TYPE)

To be used to install slit washers.

#### 9. Jig Connector cable

Connected to CN107 of the main board and used for electrical adjustment, etc.

#### 10. Extension connector

Connect this extension connector to the connector of the jig connector cable for extending the cable connector.

**Note:** For supplying the power through the coupler by removing the cover (for jig), use this extension connector double for connecting the jig connector cable.

#### 11. Communication cable

Connect the Communication cable between the PC cable and Jig connector cable when performing a PC adjustment.

#### 12. PC cable

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

#### 13. Alignment Tape

To be used for check and adjustment of interchangeability of the mechanism.

#### 14. Service Support System

To be used for adjustment with a personal computer.

#### 15. Torque Meter

This is used to check the back tension and play torque during mechanism adjustment.

#### 16. Cleaning Cloth

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

## 2.3 DISASSEMBLY/ASSEMBLY OF MECHANISM ASSEMBLY

### 2.3.1 General statement

The mechanism should generally be disassembled/assembled in the C.IN mode (ASSEMBLY mode). (Refer to Fig. 2-3-1,2.)

However, when the mechanism is removed from the main body, it is set in the STOP mode. Therefore, after the mechanism is removed from the main body, supply 3 V DC to the electrode on the top of the loading motor to enter the mechanism mode into the C,IN mode compulsory.

#### <Mechanism assembly/Cassette housing assembly>

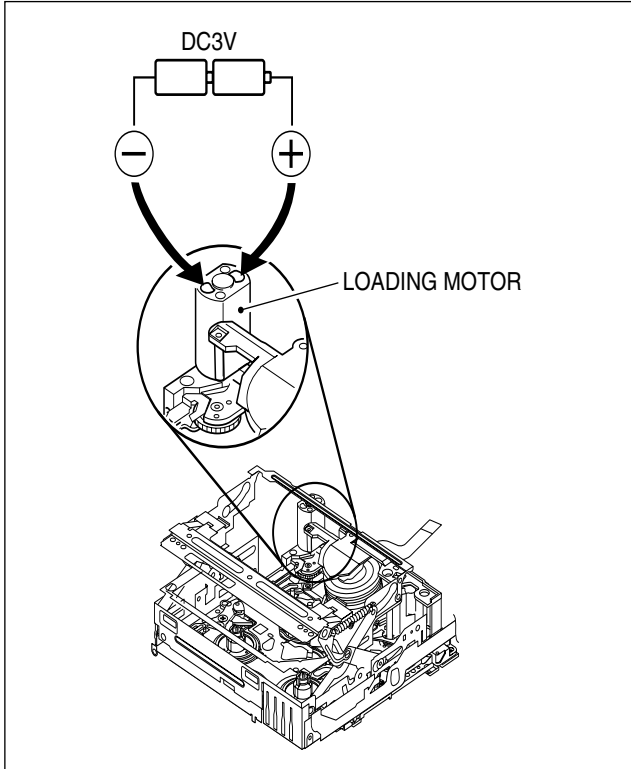


Fig. 2-3-1

#### <Back side of the mechanism assembly>

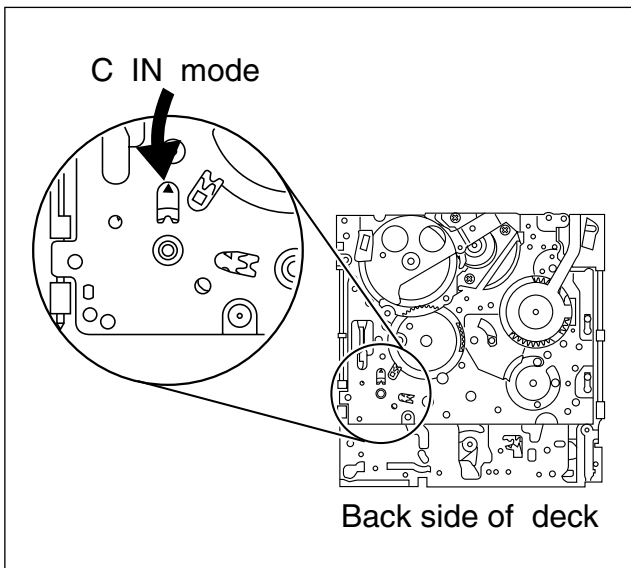


Fig. 2-3-2

### 2.3.2 Explanation of mechanism mode

The mechanism mode of this model is classified into five modes as shown in Table 2-3-1. Each mechanism mode can be distinguished from others by the relative position of "△", "○", "□" marks on the sub cam gear to the inner or outer protrusion on the main deck.

Refer to Fig. 2-3-3 to 2-3-8 below.

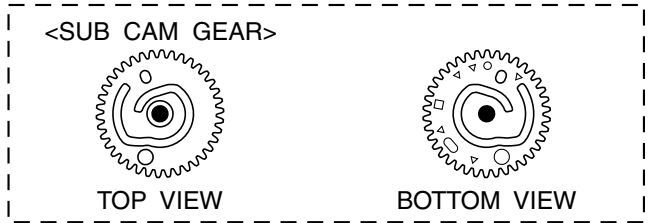


Fig. 2-3-3

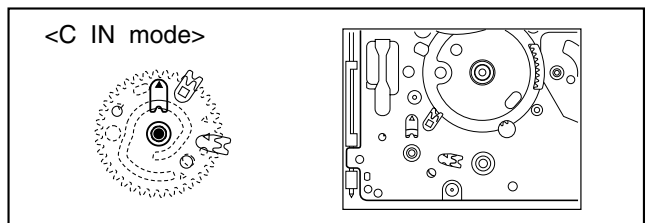


Fig. 2-3-4

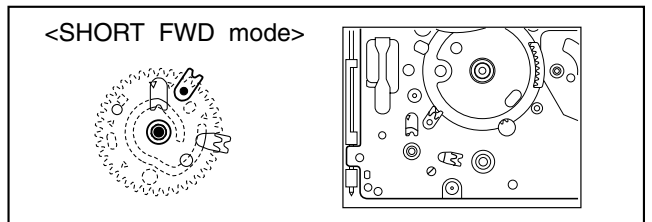


Fig. 2-3-5

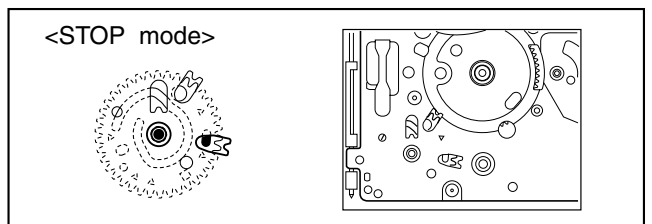


Fig. 2-3-6

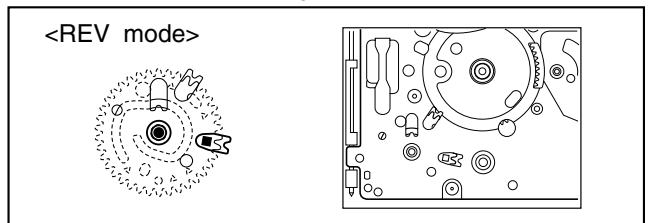


Fig. 2-3-7

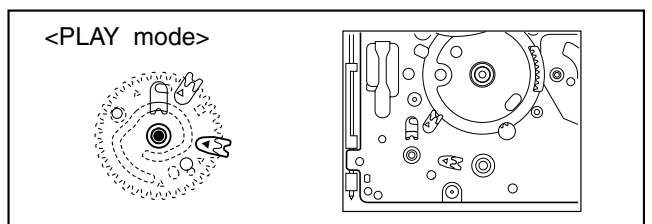


Fig. 2-3-8

### 2.3.3 Mechanism timing chart

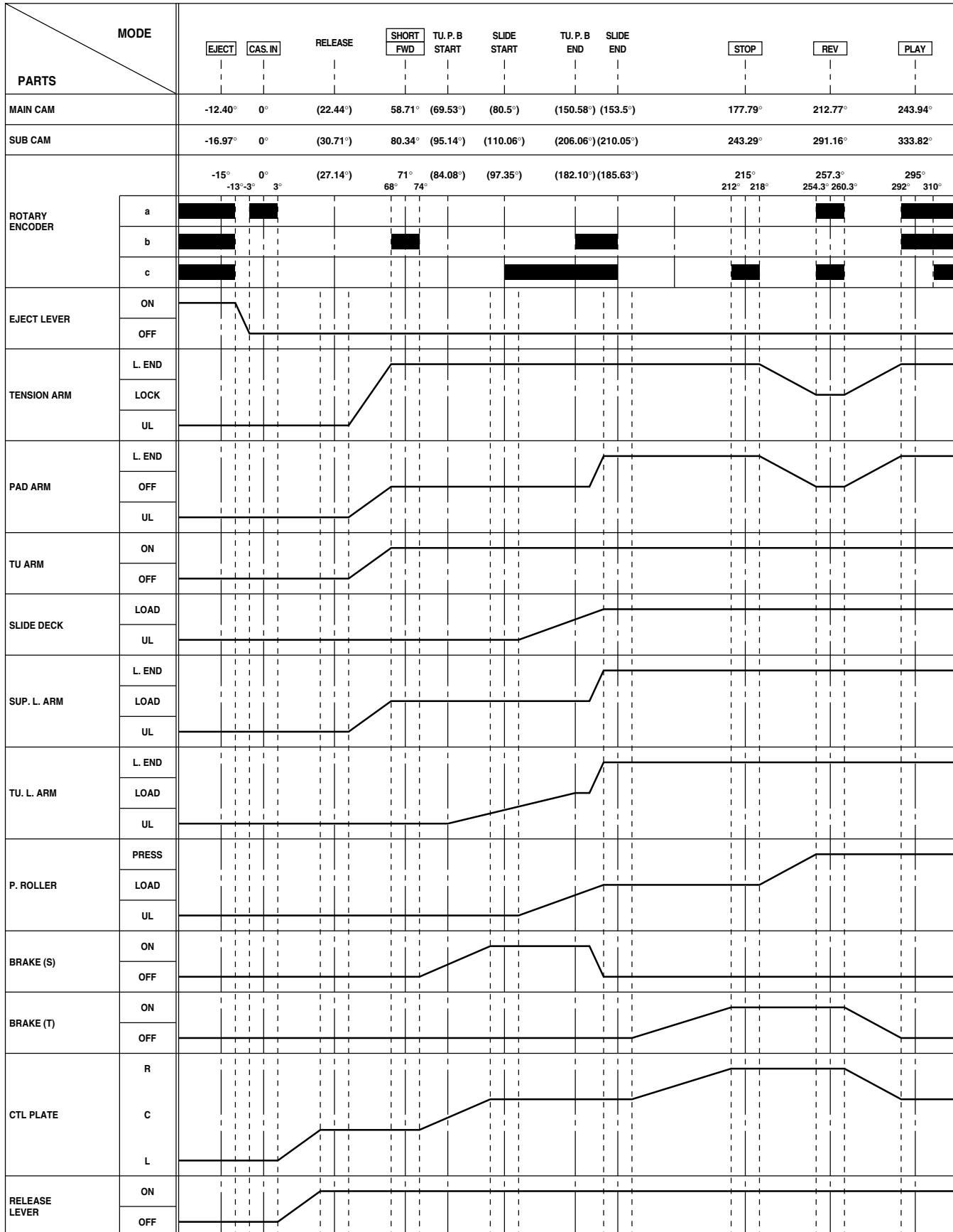


Table 2-3-1

## 2.4 DISASSEMBLING PROCEDURE TABLE

NO.	PART NAME		FIG.	POINT	NOTE	REMARKS
①	CASSETTE HOUSING ASSY	T	Fig.2-4-3	3(S①),(L①a)-(L①e)		ADJUSTMENT
②	UPPER BASE ASSY	T	Fig.2-4-4	(S②),(L②a),(L②b)		
③	DRUM ASSY	T		(S③a),2(S③b)		
④	REEL DISK ASSY(SUP)	T	Fig.2-4-5	(W④)		
⑤	REEL DISK ASSY(TU)	T		(W⑤)		
⑥	REEL COVER ASSY	T		2(W⑥),(S⑥a),2(S⑥b)		ADJUSTMENT
⑦	SLANT POLE ARM ASSY	T	Fig.2-4-6	—		ADJUSTMENT
⑧	TENSION ARM ASSY	T		—		ADJUSTMENT / ★
⑨	TU ARM ASSY	T		—		ADJUSTMENT
⑩	SWING ARM ASSY	T		(S⑩)		ADJUSTMENT
⑪	SLIDE DECK ASSY	T	Fig.2-4-7a	(W⑪),2(S⑪a),(S⑪b), 2(L⑪a),2(L⑪b),(L⑪c)		ADJUSTMENT / ★
⑫	PAD ARM ASSY	T	Fig.2-4-7b	(P⑫),(L⑫),(W⑫)		ADJUSTMENT / ★
⑬	SUP BRAKE ASSY	T		(P⑬),(L⑬),(S⑬)		ADJUSTMENT
⑭	TU BRAKE ASSY	T		(P⑭),(L⑭),(W⑭)		ADJUSTMENT
⑮	TENSION CTL LEVER ASSY	T	Fig.2-4-8	—		ADJUSTMENT
⑯	CENTER GEAR	T		—		
⑰	PINCH ROLLER ARM F. ASSY	T		(W⑰)		
⑱	TENSION CTL PLATE ASSY	T		—		ADJUSTMENT
⑲	BRAKE CTL LEVER ASSY	T		—		ADJUSTMENT
⑳	MOTOR BRACKET ASSY	T	Fig.2-4-9	3(S⑳),(L⑳a),2(L⑳b)		ADJUSTMENT
㉑	GUIDE RAIL ASSY	T		2(W㉑),(S㉑),2(L㉑a),(L㉑b)		ADJUSTMENT
㉒	SLIDE LEVER 2 ASSY	T		—		ADJUSTMENT / ★
㉓	LOADING PLATE ASSY	T		(W㉓)		ADJUSTMENT
㉔	MODE GEAR	T		—		
㉕	EJECT LEVER	T		(W㉕)		ADJUSTMENT
㉖	BASE R ASSY	T	Fig.2-4-10	(S㉖a),(S㉖b),2(L㉖)		ADJUSTMENT
㉗	ROTARY ENCODER	T		2(S㉗)		PHASE ADJUSTMENT
㉘	GEAR COVER ASSY	T		(S㉘a),2(S㉘b)		
㉙	MAIN CAM ASSY	T		—		PHASE ADJUSTMENT
㉚	SLIDE ARM ASSY	T	Fig.2-4-11	—		ADJUSTMENT
㉛	CONNECT GEAR 2	T		—		
㉜	SUB CAM ASSY	T		(S㉜)		PHASE ADJUSTMENT
㉝	CONTROL ARM ASSY	T		—		ADJUSTMENT
㉞	REEL GEAR 1	T		—		
㉟	DRUM BASE ASSY/ CAPSTAN MOTOR	T	Fig.2-4-12	3(S㉟)		ADJUSTMENT
㊱	CAPSTAN MOTOR	T		(S㊱)		ADJUSTMENT
㊲	MAIN DECK ASSY	T		—		

MARK: ★ After assembly, perform adjustments.

Table 2-4-1

< TOP VIEW >

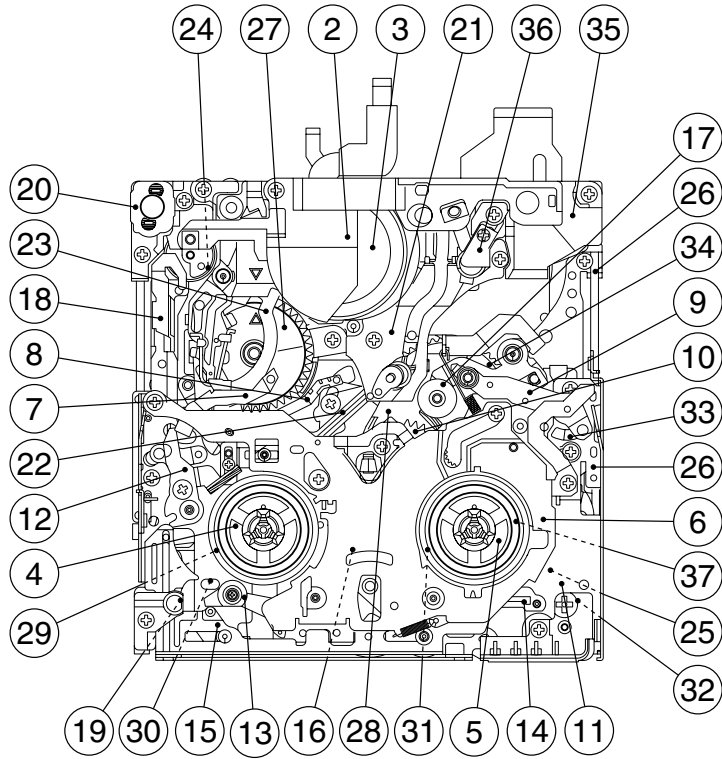


Fig. 2-4-1

< BOTTOM VIEW >

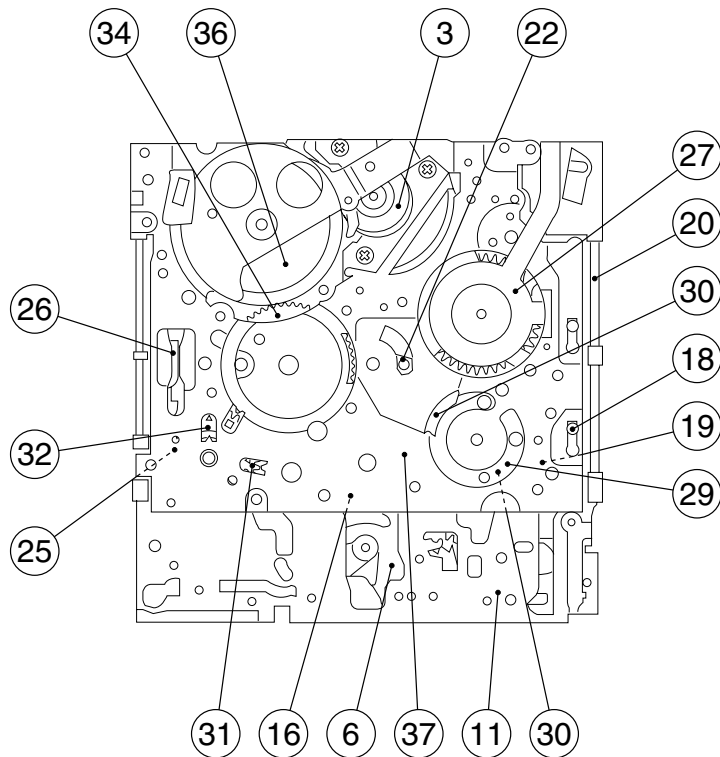


Fig. 2-4-2

### 2.4.1 Disassembly/assembly

1. ① CASSETTE HOUSING ASSY

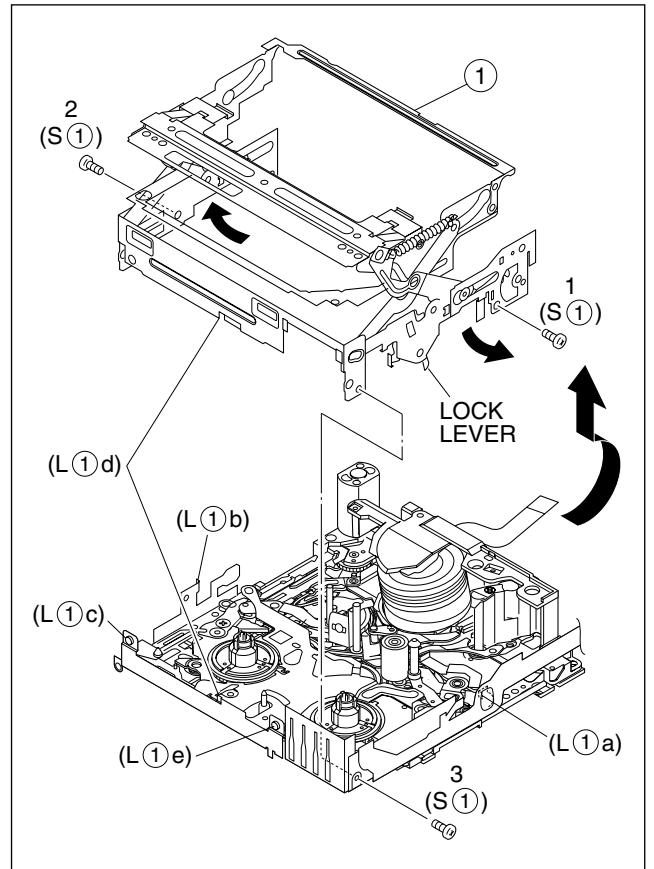


Fig. 2-4-3

2. ② UPPER BASE ASSY
3. ③ DRUM ASSY

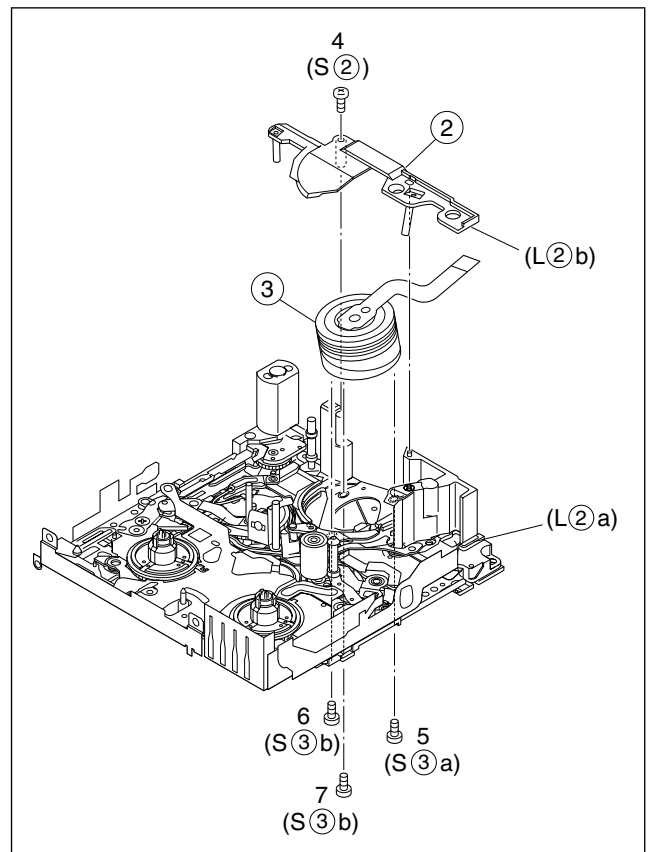


Fig. 2-4-4



- 3. ④ REEL DISK ASSY(SUP)
- ⑤ REEL DISK ASSY(TU)
- ⑥ REEL COVER ASSY

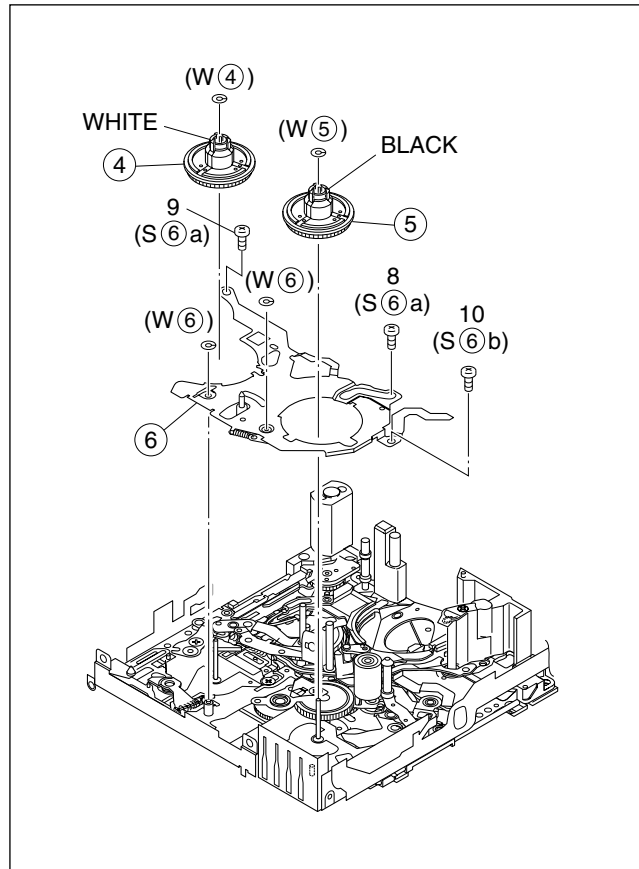


Fig. 2-4-5

- 4. ⑦ SLANT POLE ARM ASSY
- ⑧ TENSION ARM ASSY
- ⑨ TU ARM ASSY
- ⑩ SWING ARM ASSY

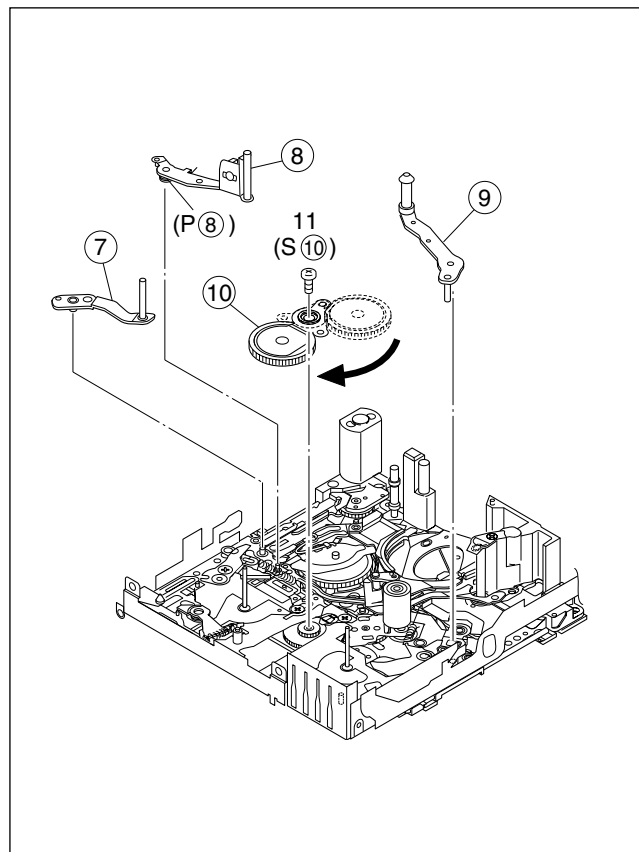


Fig. 2-4-6

5. ⑪ SLIDE DECK ASSY

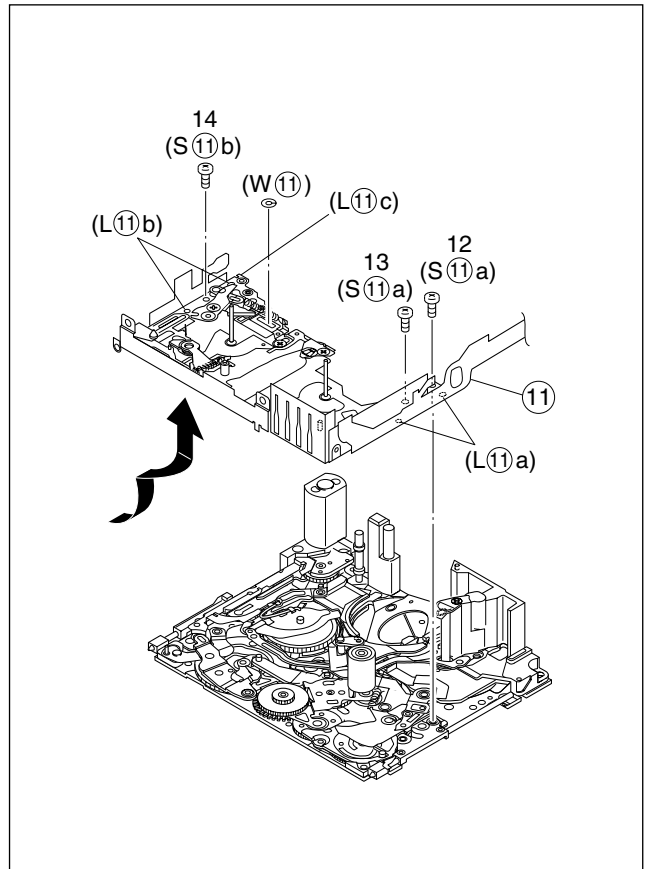


Fig. 2-4-7a

6. ⑫ PAD ARM ASSY  
 ⑬ SUP BRAKE ASSY  
 ⑭ TU BRAKE ASSY

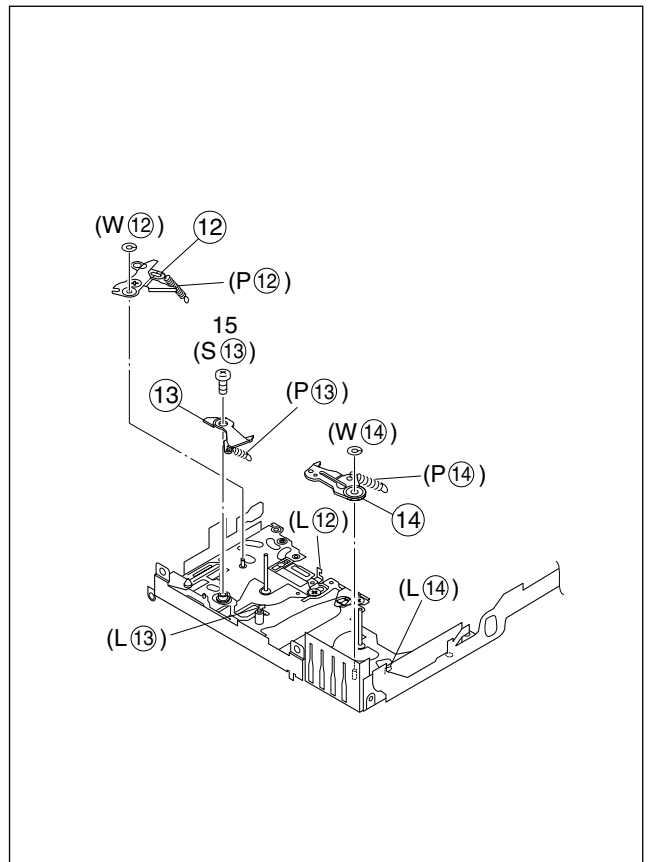


Fig. 2-4-7b

- 7. ⑮ TENSION CTL LEVER ASSY
- ⑯ CENTER GEAR
- ⑰ PINCH ROLLER ARM F. ASSY
- ⑱ TENSION CTL PLATE ASSY
- ⑲ BRAKE CTL LEVER ASSY

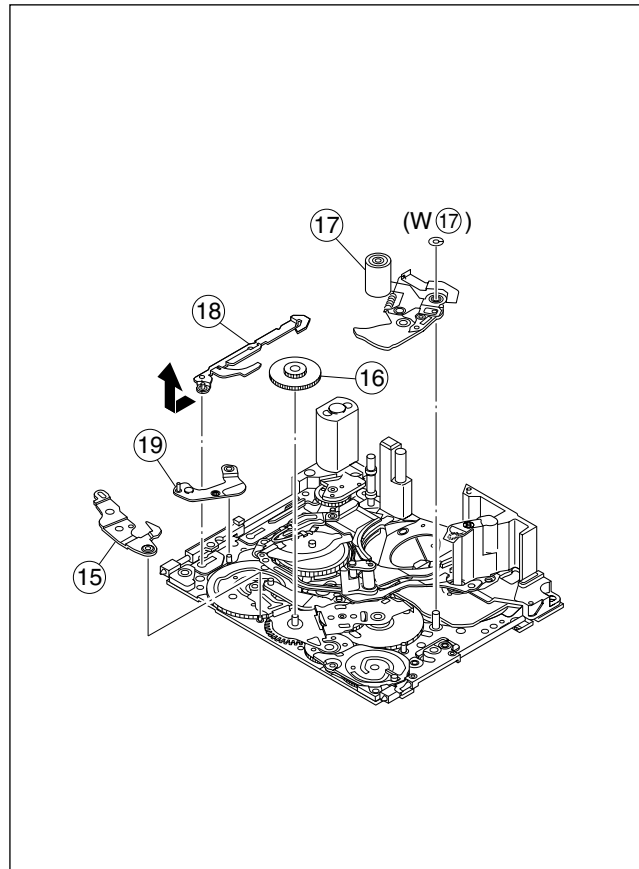


Fig. 2-4-8

- 8. ⑳ MOTOR BRACKET ASSY
- ㉑ GUIDE RAIL ASSY
- ㉒ SLIDE LEVER 2 ASSY
- ㉓ LOADING PLATE ASSY
- ㉔ MODE GEAR
- ㉕ EJECT LEVER

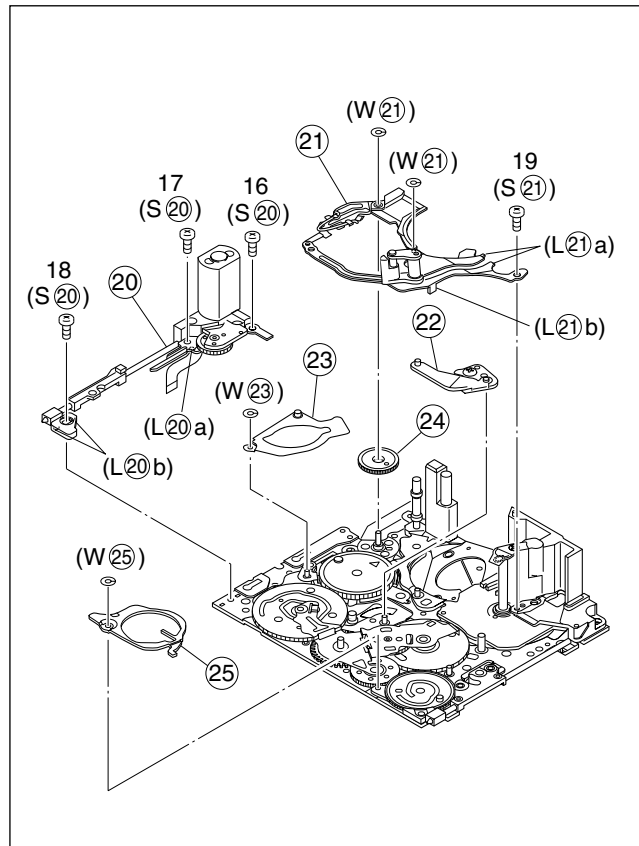


Fig. 2-4-9

- 9. ②⑥ BASE R ASSY
- ②⑦ ROTARY ENCODER
- ②⑧ GEAR COVER ASSY
- ②⑨ MAIN CAM ASSY

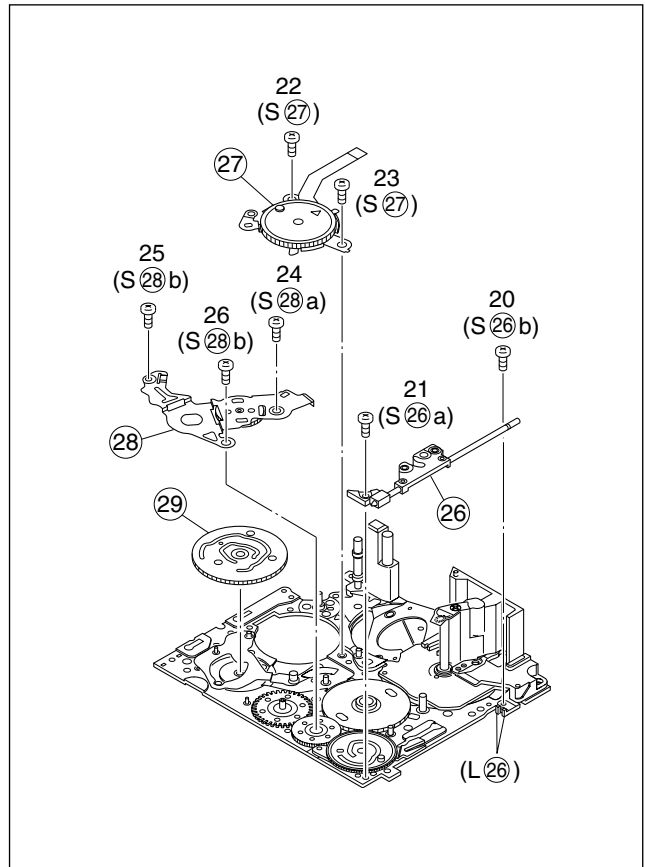


Fig. 2-4-10

- 10. ③⑩ SLIDE ARM ASSY
- ③① CONNECT GEAR 2
- ③② SUB CAM ASSY
- ③③ CONTROL ARM ASSY
- ③④ REEL GEAR 1

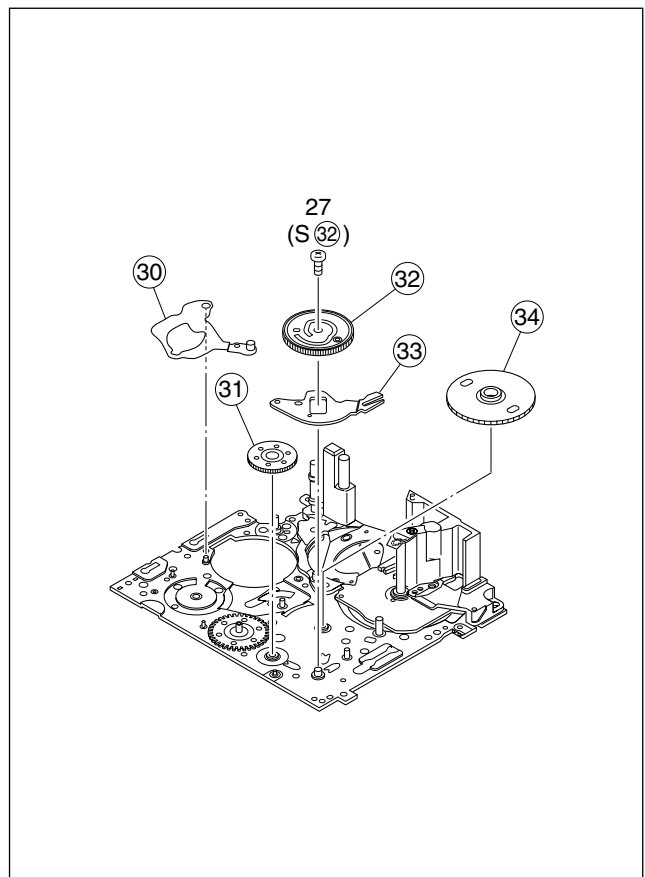


Fig. 2-4-11

- 11. 35 DRUM BASE ASSY/CAPSTAN MOTOR
- 36 CAPSTAN MOTOR
- 37 MAIN DECK ASSY

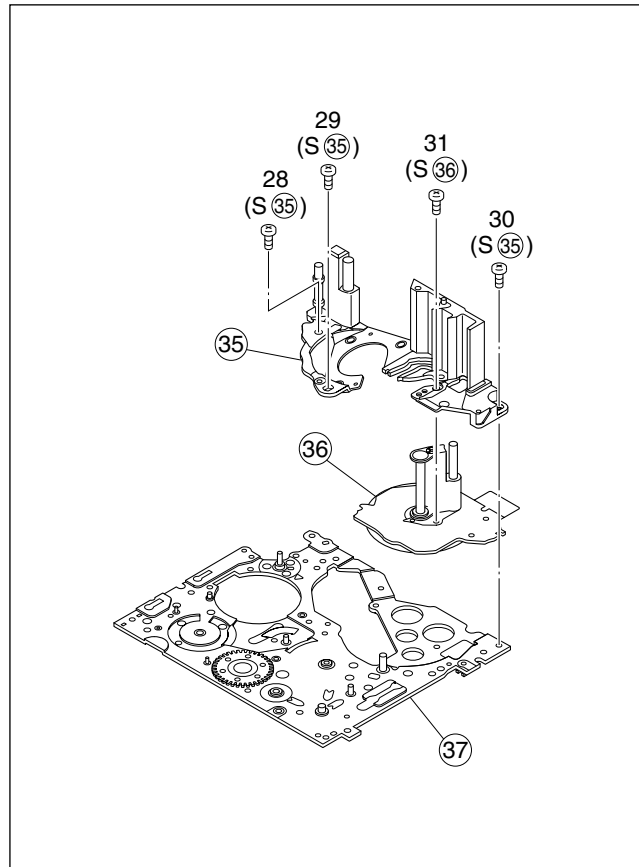


Fig. 2-4-12

2.4.2 List of procedures for disassembly

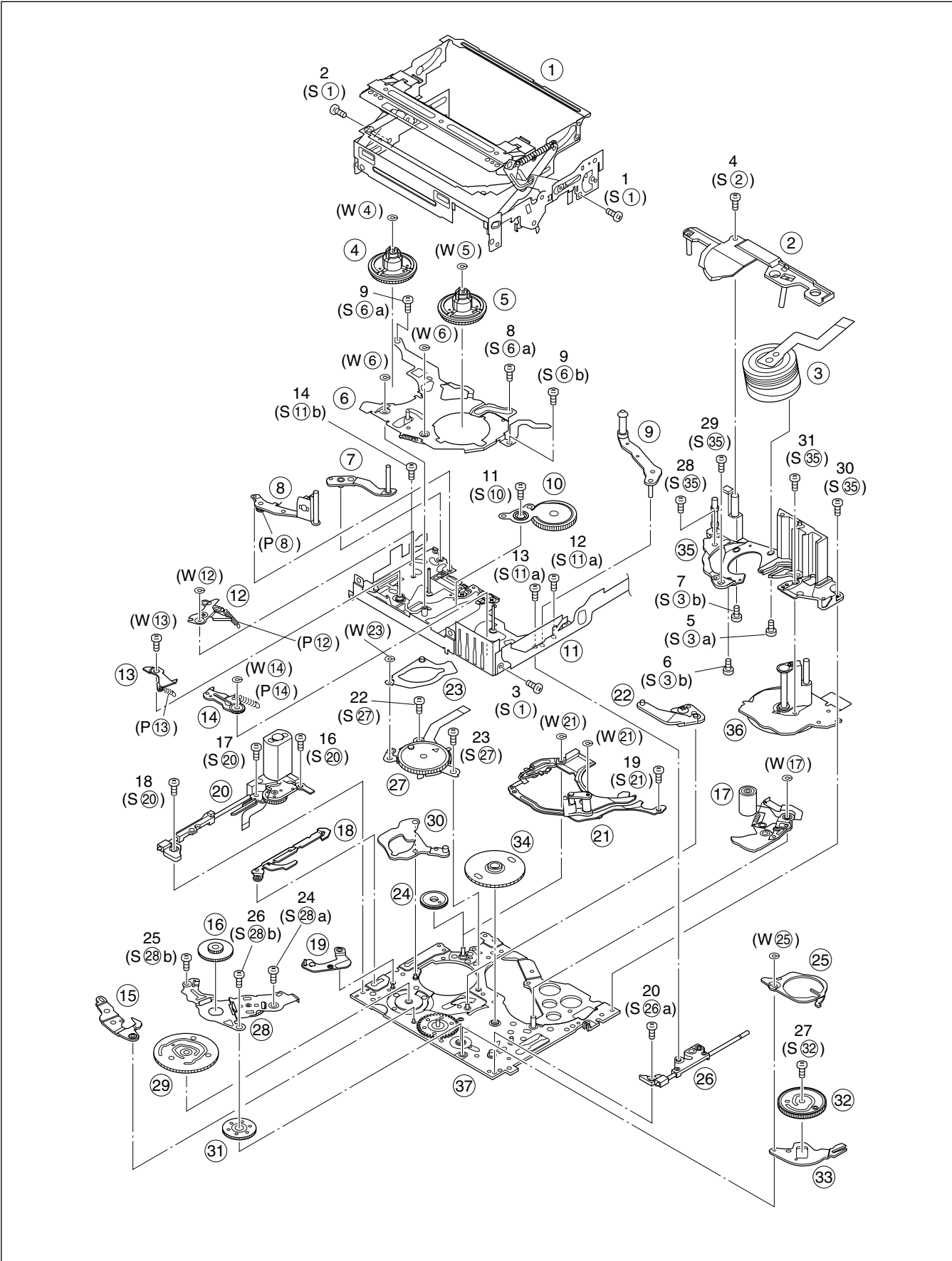


Fig. 2-4-13

## 2.5 CHECKUP AND ADJUSTMENT OF MECHANISM PHASE

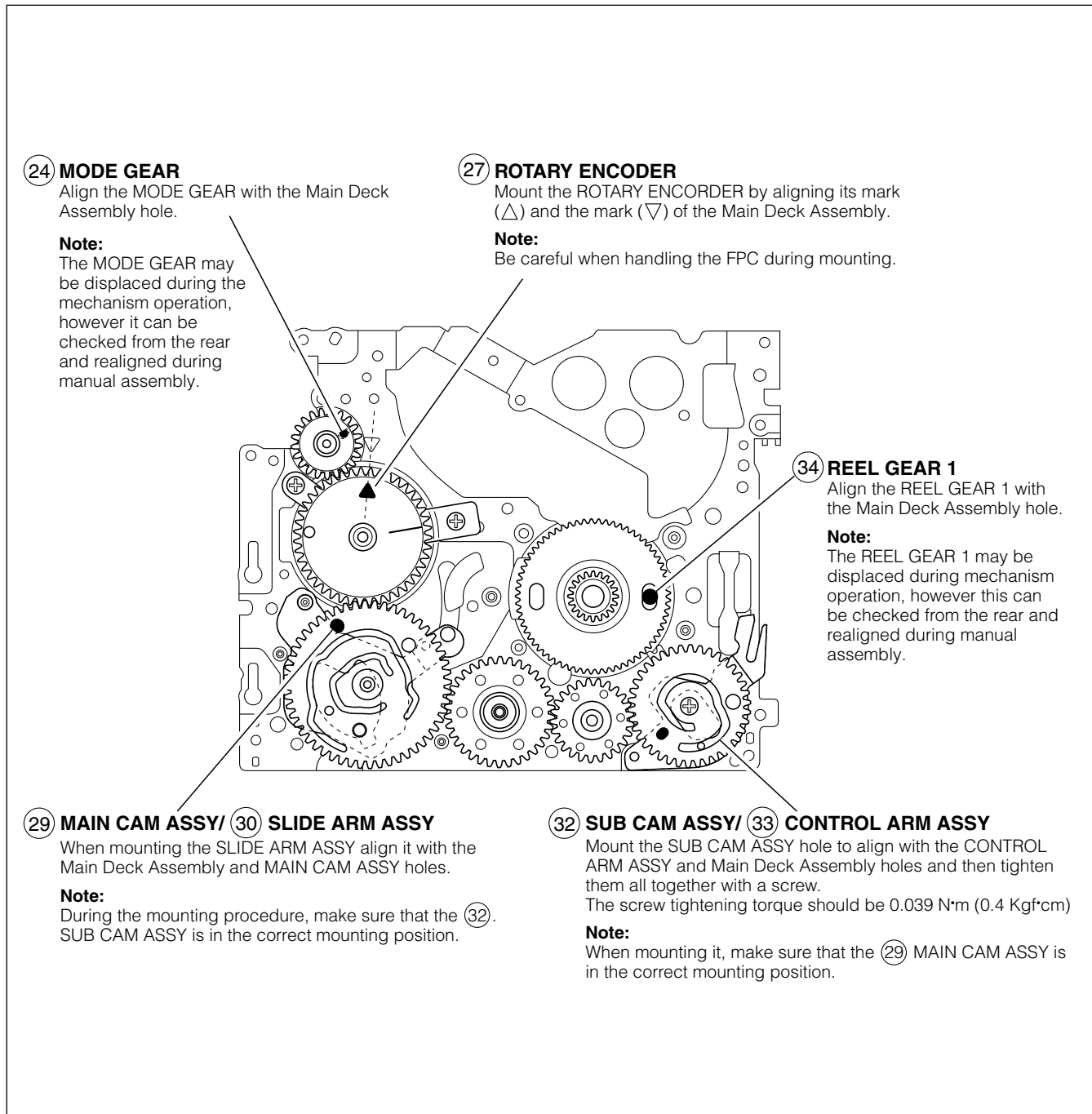


Fig. 2-5-1

## 2.6 MECHANISM ADJUSTMENTS

### 2.6.1 Adjustment of the slide guide plate

Use Fig. 2-6-1 as the reference unless otherwise specified.

1. Set the PLAY mode.  
See Fig. 2-3-8.
2. Loosen the screws (A),(B).
3. With the Main Deck Assembly and Slide Deck Assembly pushed inside the unit, tighten the screws (A),(B) while applying pressure on the slit washers of the slide guide plate.  
The pressure applied should be enough to enable utilization of the rebounding force of the springs.  
The tightening torque should be  $0.069 \text{ N}\cdot\text{m}$  ( $0.7 \text{ kgf}\cdot\text{cm}$ ).
4. Check the operation.  
Repeat unloading and loading several times and make sure that these operations can be performed smoothly without producing rattles.

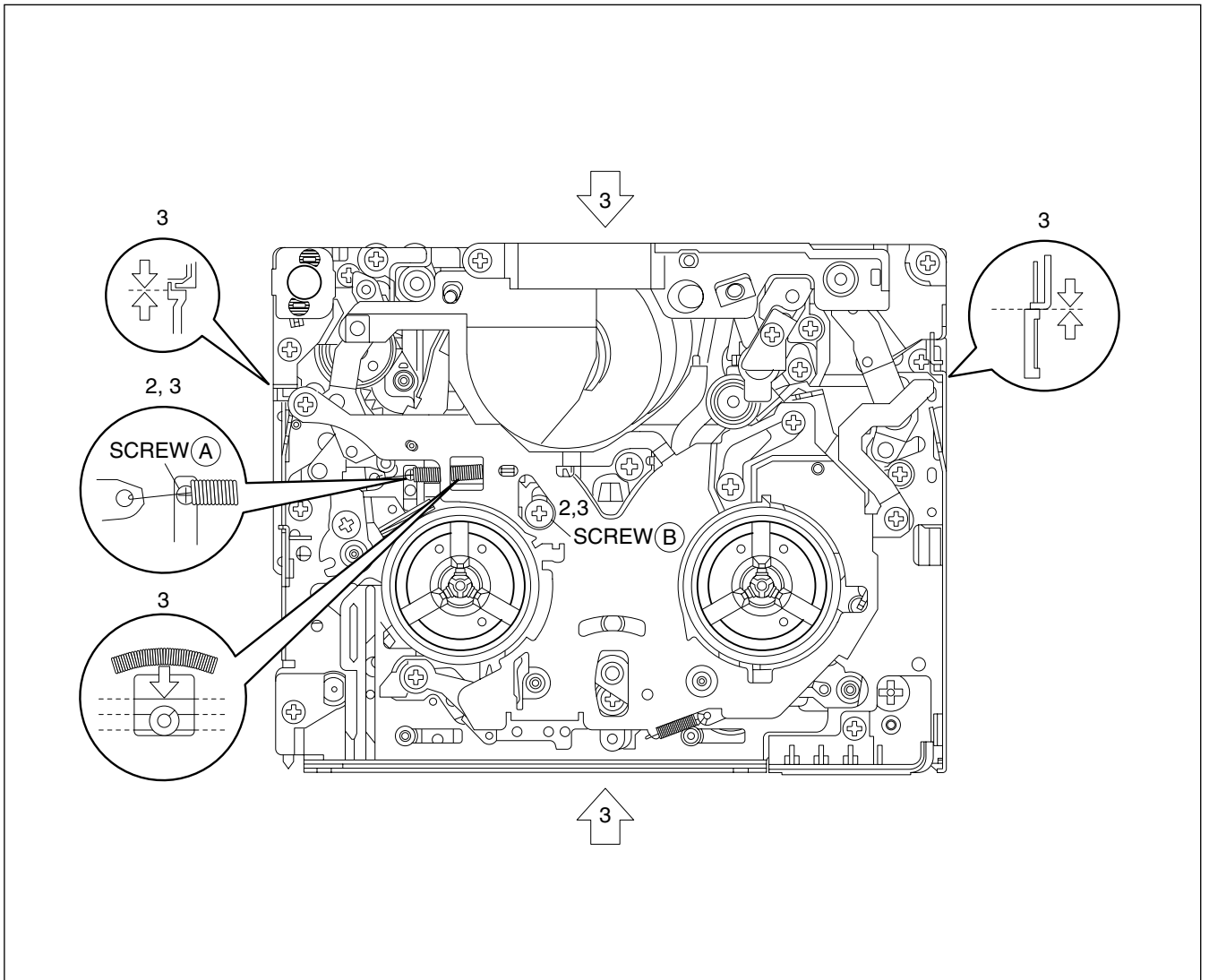


Fig. 2-6-1



### 2.6.2 Adjustment of the Tension Arm and Pad Arm Assemblies

Use Fig. 2-6-2 as the reference unless otherwise specified.

1. Set the PLAY mode.  
See Fig. 2-3-8.
2. Loosen the screw (A).
3. With the take-up side at the bottom, align the extreme end of the Tension Arm Assembly with the crossed grooves on the screw (B) that retains the Loading Motor Assembly and then tighten the screw (A).  
The tightening torque should be 0.069 N·m (0.7 kgf·cm).
4. Check the operation.  
Repeat unloading and loading several times and make sure that the Tension Arm Assembly is located within the normal range.

**Note :** *With the above checking method, a Torque Meter is not used.  
When a Torque meter is used, the following are the reference values:*

Back Tension : 2.0 to 6.0 g·cm  
Play Torque : 8.3 to 12.5 g·cm

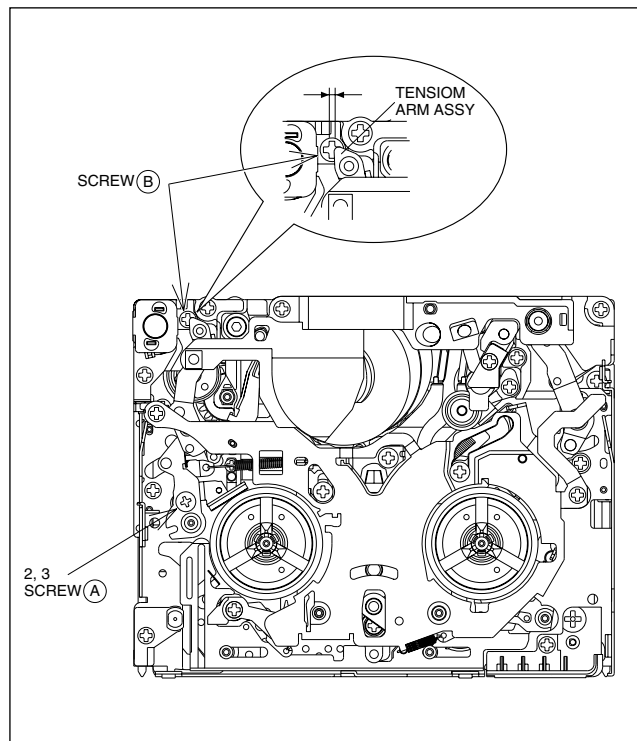


Fig. 2-6-2

### 2.6.3 Adjustment of the Slide Lever 2

Use Fig. 2-6-3 as the reference unless otherwise specified.

1. Set the C IN mode.  
See Fig. 2-3-4.
2. Loosen the screw (A).
3. Set the Main Deck and Slide Deck Assemblies apart so that they do not rattle, then tighten the screw (A) by screwing it fully toward the Drum Assembly.  
The tightening torque should be 0.069 N·m (0.7 kgf·cm).
4. Check the operation.  
Repeat unloading and loading several times and make sure that these operations can be performed smoothly without producing rattles.

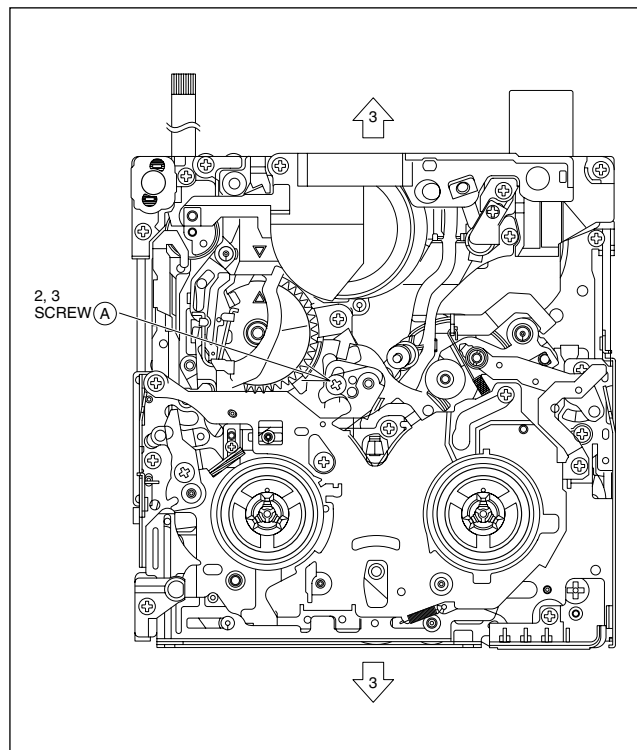


Fig. 2-6-3

## 2.7 JIG CONNECTOR CABLE CONNECTION

Remove one screw (1) first and the cover (JIG) next.

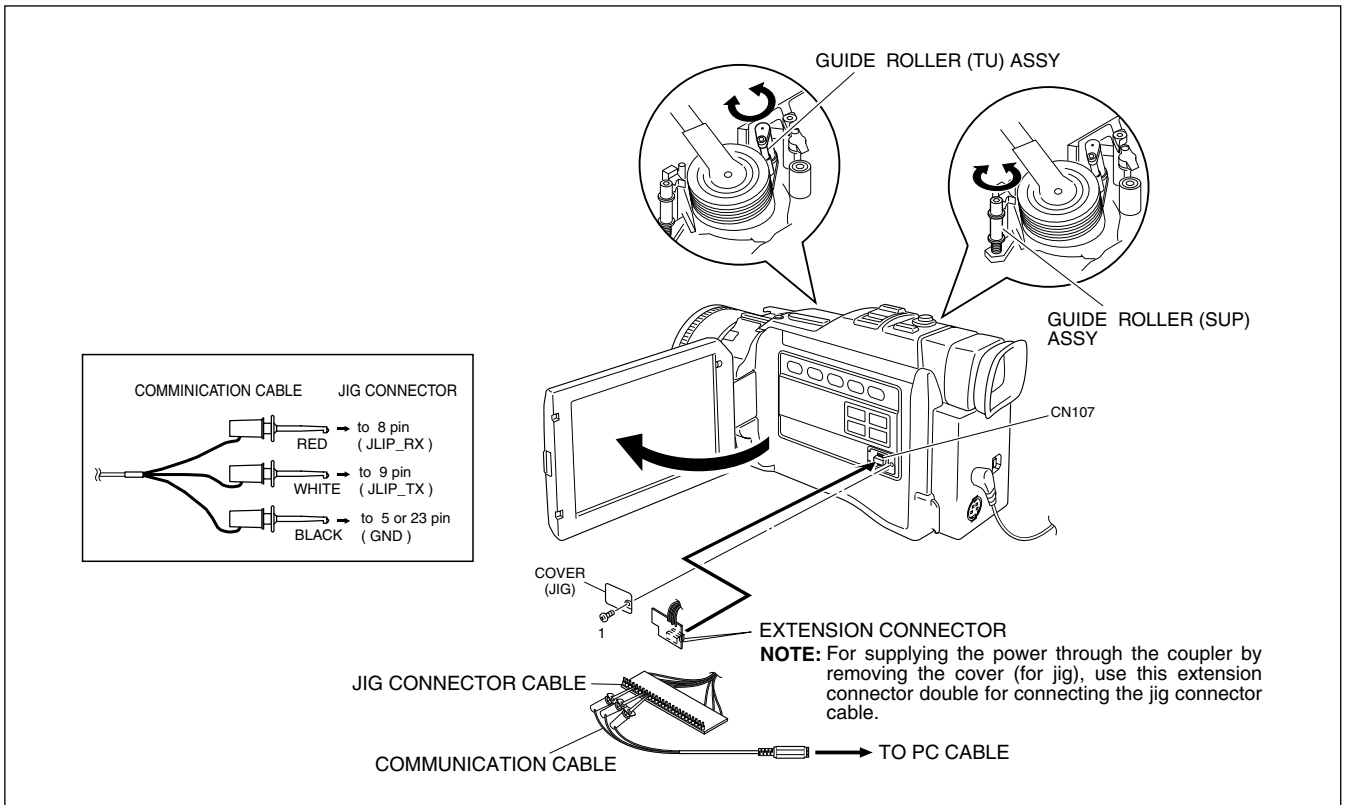


Fig. 2-7-1

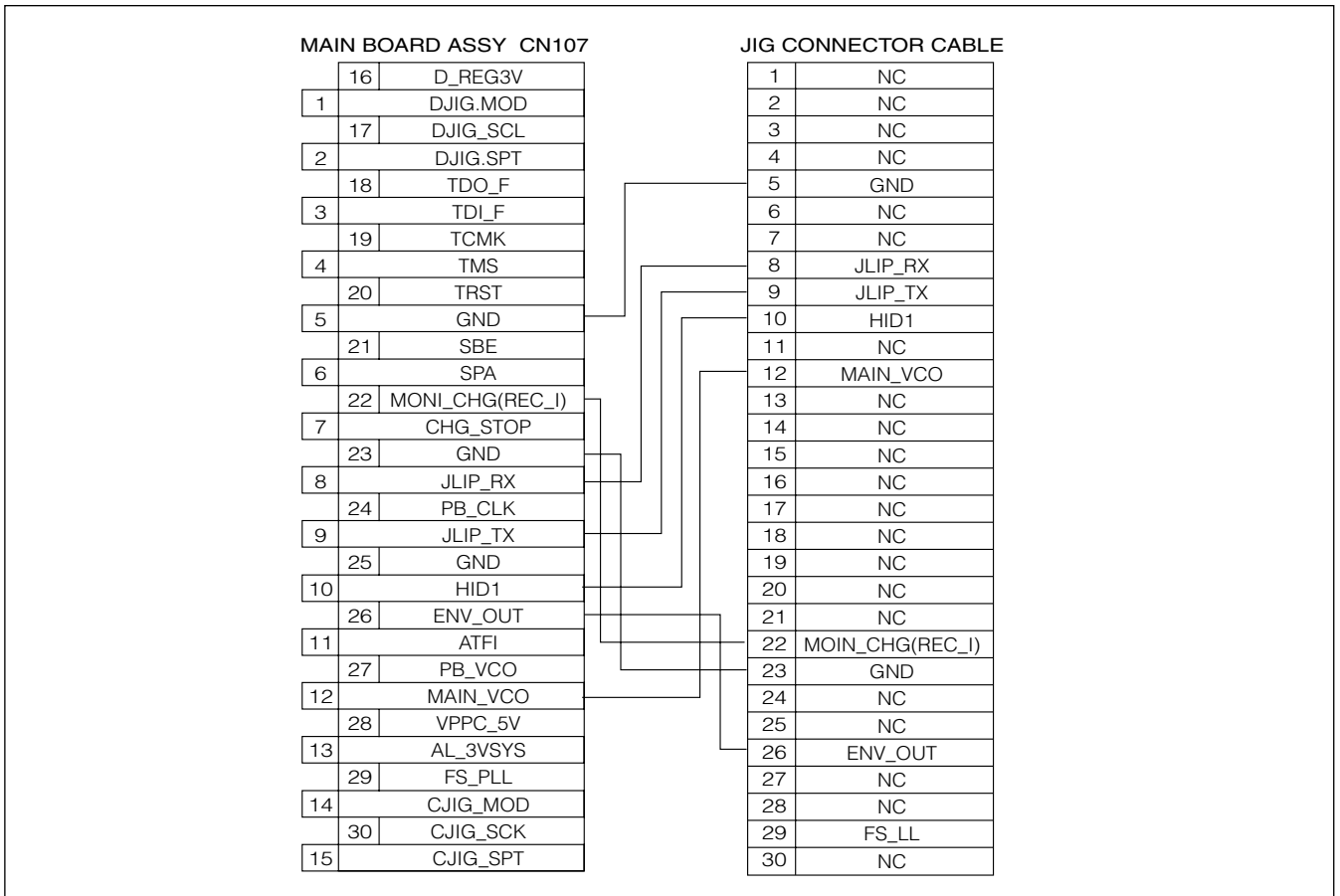


Fig. 2-7-2

## 2.8 SERVICE NOTE

Use the following chart to manage mechanism parts that are removed for disassembling the mechanism.

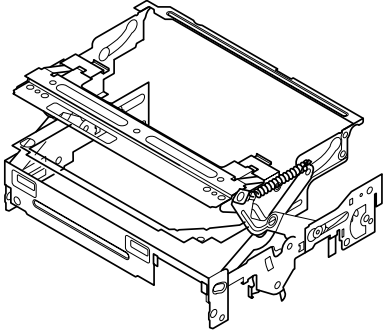
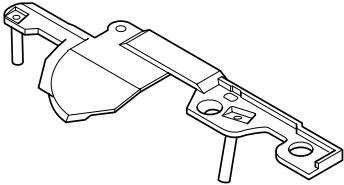
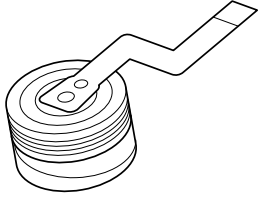
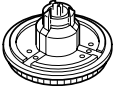
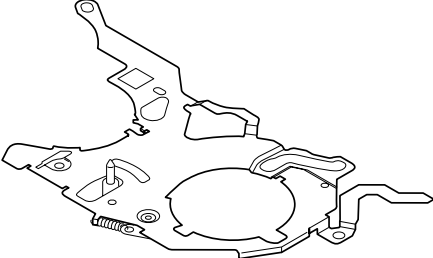
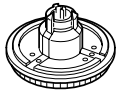

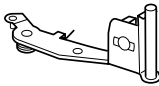
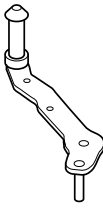

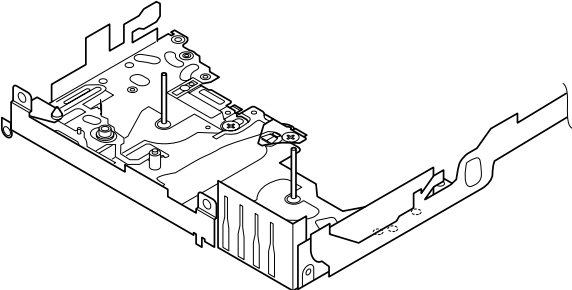



Fig.    2 1 4 1 3	<b>① CASSETTE HOUSING ASSY</b>  	Fig.    2 1 4 1 4	<b>② UPPER BASE ASSY</b>  	<b>③ DRUM ASSY</b>  		
Fig.    2 1 4 1 5	<b>④ REEL DISK ASSY(SUP)</b>  	<b>⑥ REEL COVER ASSY</b>  				
	<b>⑤ REEL DISK ASSY(TU)</b>  					
Fig.    2 1 4 1 6	<b>⑦ SLANT POLE ARM ASSY</b>  	<b>⑧ TENSION ARM ASSY</b>  	<b>⑨ TU ARM ASSY</b>  	<b>⑩ SWING ARM ASSY</b>  		
Fig.    2 1 4 1 7 a	<b>⑪ SLIDE DECK ASSY</b>  		Fig.    2 1 4 1 7 b	<b>⑫ PAD ARM ASSY</b>  	<b>⑬ SUP BRAKE ASSY</b>  	<b>⑭ TU BRAKE ASSY</b>  

Table 2-8-1a

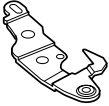

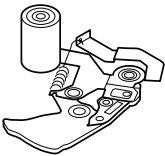
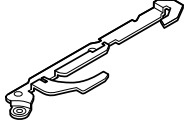

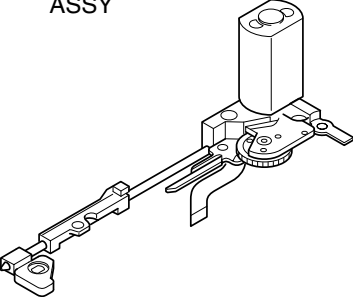
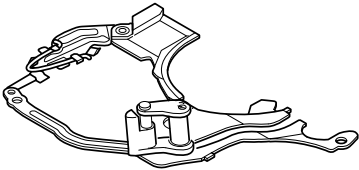


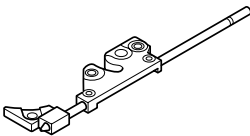
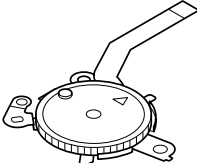
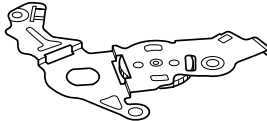

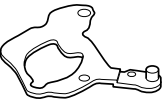



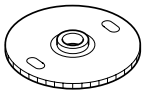
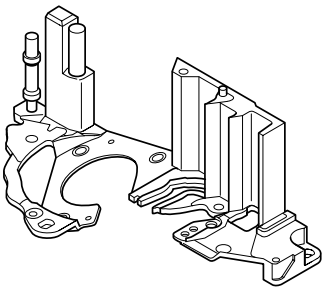
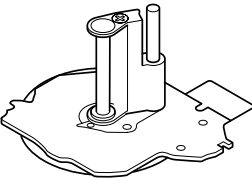
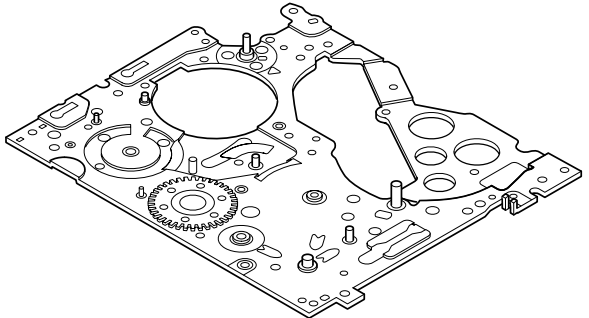
Fig. 2   4   8	<p>①5 TENSION CTL LEVER ASSY</p> 	<p>①6 CENTER GEAR</p> 	<p>①7 PINCH ROLLER ARM F. ASSY</p> 	<p>①8 TENSION CTL PLATE ASSY</p> 	<p>①9 BRAKE CTL LEVER ASSY</p> 
Fig. 2   4   9	<p>②0 MOTOR BRACKET ASSY</p> 		<p>②1 GUIDE RAIL ASSY</p> 	<p>②2 SLIDE LEVER 2 ASSY</p> 	<p>②3 LOADING PLATE ASSY</p> 
Fig. 2   4   10	<p>②6 BASE R ASSY</p> 	<p>②7 ROTARY ENCODER</p> 	<p>②8 GEAR COVER ASSY</p> 	<p>②9 MAIN CAM ASSY</p> 	
Fig. 2   4   11	<p>③0 SLIDE ARM ASSY</p> 	<p>③1 CONNECT GEAR 2</p> 	<p>③2 SUB CAM ASSY</p> 	<p>③3 CONTROL ARM ASSY</p> 	<p>③4 REEL GEAR 1</p> 
Fig. 2   4   12	<p>③5 DRUM BASE ASSY</p> 		<p>③6 CAPSTAN MOTOR</p> 	<p>③7 MAIN DECK ASSY</p> 	

Table 2-8-1b

# SECTION 3 ELECTRICAL ADJUSTMENT

## 3.1 PRECAUTION

### 1. Precaution

Both the camera and deck sections of this model needs a personal computer for adjustment except simple adjustment with potentiometers. If some of the following parts is replaced for repair or other reason, the repaired set must be adjusted with a personal computer.

- OP block
- E<sup>2</sup>PROM (IC1003 of MAIN board)
- MONITOR
- E<sup>2</sup>PROM (IC7302 of MONITOR board)

In the event of malfunction with electrical circuits, troubleshooting with the aid of proper test instruments must 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/charger
3. Oscilloscope (dual-trace type, observable 100 MHz or higher frequency)

**Note :** *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. Tools required for adjustments

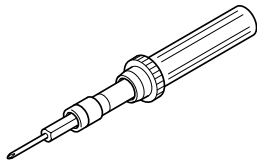
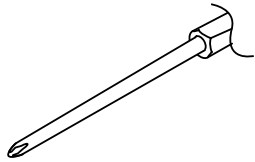
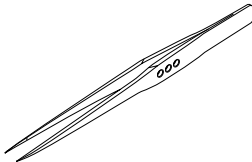
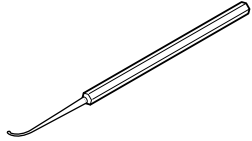
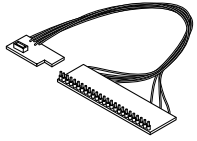

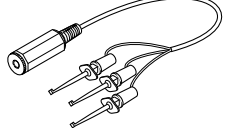
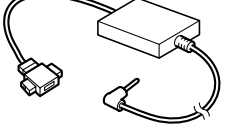
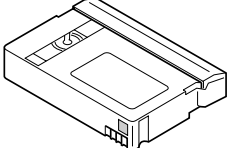
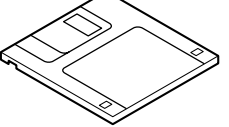
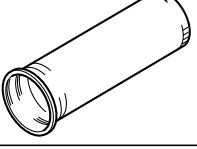
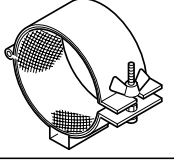
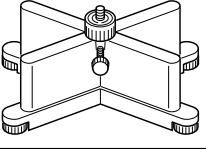
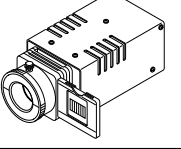
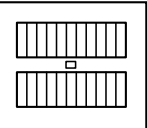
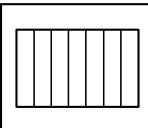
1	Torque Driver YTU94088	2	Bit YTU94088-003
			
3	Tweezers P-895	4	Chip IC Replacement Jig PTS40844-2
			
5	Jig Connector Cable YTU93106B	6	Extension connector YTU94145C-30
			
7	Communication Cable YTU93107A	8	PC Cable QAM0099-002
			
9	Alignment Tape MC-1	10	Service Support System YTU94057-50
			
11	INF Adjustment Lens YTU92001B	12	INF Adjustment Lens Holder YTU94087
			
13	Camera Stand YTU93079	14	Light box Assembly YTU93096A
			
15	Gray Scale Chart YTU94133A	16	Color Bar Chart YTU94133C
			

Table-3-1-1

1. **Torque driver**  
Be sure to use to fastening the mechanism and exterior parts because those parts must strictly be controlled for tightening torque.
2. **Bit**  
This bit is slightly longer than those set in conventional torque drivers.
3. **Tweezers**  
To be used for removing and installing parts and wires.
4. **Chip IC replacement jig**  
To be used for adjustment of the camera system.
5. **Jig connector cable**  
Connected to CN107 of the main board and used for electrical adjustment, etc.
6. **Extension connector**  
Connect this extension connector to the connector of the jig connector cable for extending the cable connector.  
**Note :** *For supplying the power through the coupler by removing the cover (for jig), use this extension connector double for connecting the jig connector cable.*
7. **Communication Cable**  
Connect the Communication cable between the PC cable and Jig connector cable when performing a PC adjustment.
8. **PC cable**  
To be used to connect the VideoMovie and a personal computer with each other when a personal computer is used for adjustment.
9. **Alignment tape**  
To be used for check and adjustment of interchangeability of the mechanism.
10. **Service support system**  
To be used for adjustment with a personal computer.
11. **INF adjustment lens**  
To be used for adjustment of the camera system.
12. **INF adjustment lens holder**  
To be used together with the camera stand 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.
13. **Camera stand**  
To be used together with the INF adjustment lens holder.
14. **Light box assembly**  
To be used for adjustment of the camera system.
15. **Gray scale chart (for Light box assembly)**  
To be used for adjustment of the camera system.
16. **Color bar chart (for Light box assembly)**  
To be used for adjustment of the camera system.

### 3.2 SETUP

1. Setup for electrical adjustment with personal computer

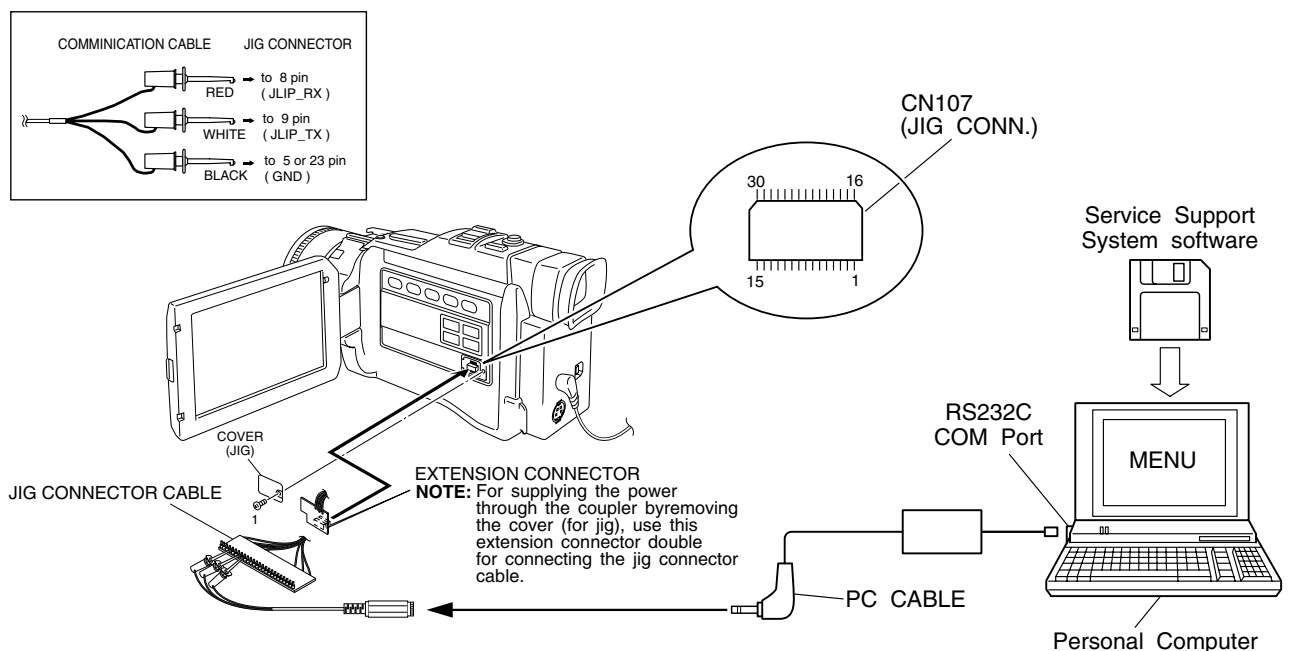


Fig. 3-2-1 Connection for Service support system

### 3.3 MONITOR ADJUSTMENT

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

#### 3.3.1 PLL (MONI)

Subject	<ul style="list-style-type: none"> <li>• Camera picture</li> <li>• Gray scale</li> </ul>
Mode	• EE
Equipment	• Oscilloscope
Measurement point	• IC7301 pin 24 (RPD) or TL7301 (RPD)
Adjustment part	• R7321 (PLL MONI)
Specification	• A = B

- 1) Observe waveform at pin 24 of the IC7301 or TP7301 (RPD).
- 2) For the wavefor shown in the waveform chart (Fig. 3-3-1), equalize the width of A and B with each other by adjusting R7321.

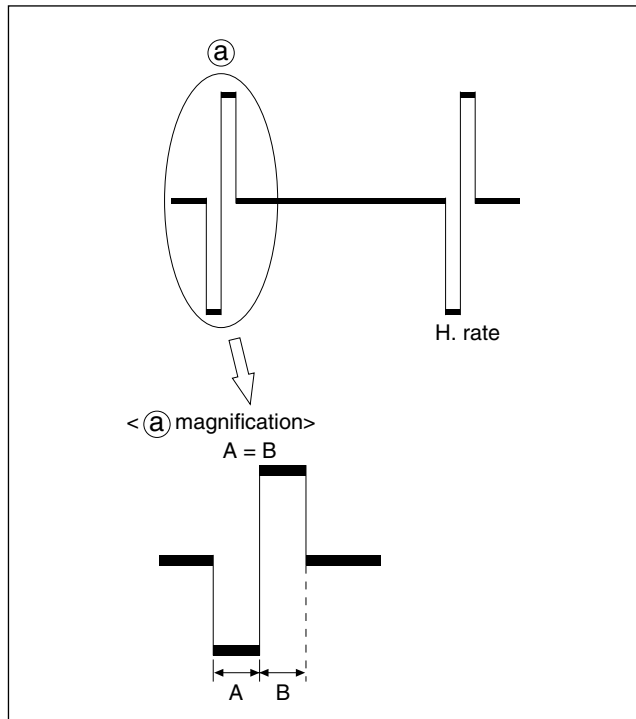


Fig. 3-3-1 PLL (MONI)

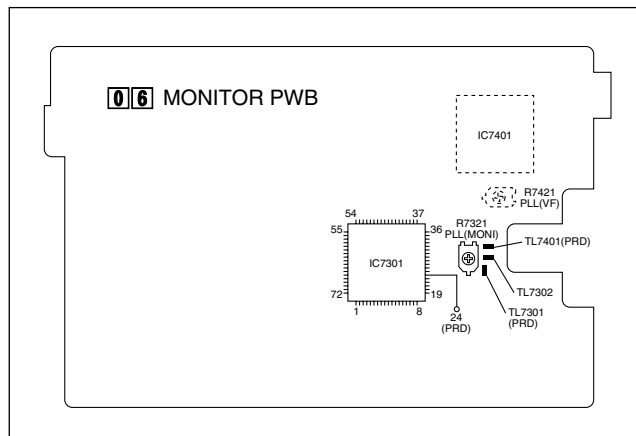


Fig. 3-3-2 MONITOR board (COMPONENT SIDE)

### 3.4 ELECTRONIC VIEWFINDER (E.VF) ADJUSTMENT

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

#### 3.4.1 PLL (VF)

Subject	<ul style="list-style-type: none"> <li>• Camera picture</li> <li>• Gray scale</li> </ul>
Mode	• EE
Equipment	• Oscilloscope
Measurement point	• IC7401 pin 24 (RPD) or TL7401 (RPD)
Adjustment part	• R7421 (PLL VF)
Specification	• A = B

- 1) Observe waveform at pin 24 of the IC7401 or TL7401 (RPD).
- 2) For the wavefor shown in the waveform chart (Fig. 3-4-1), equalize the width of A and B with each other by adjusting R7421.

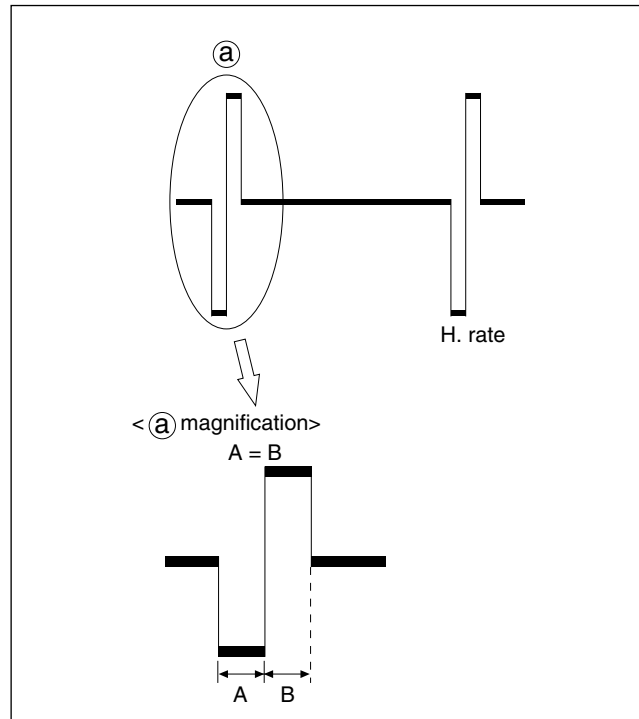


Fig. 3-4-1 PLL (VF)

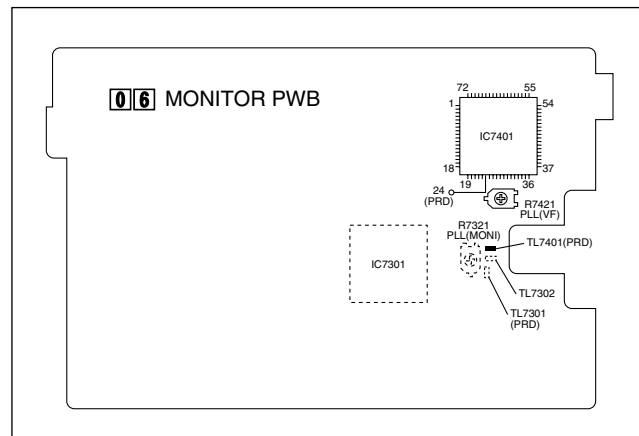


Fig. 3-4-2 MONITOR board (COMPONENT SIDE)