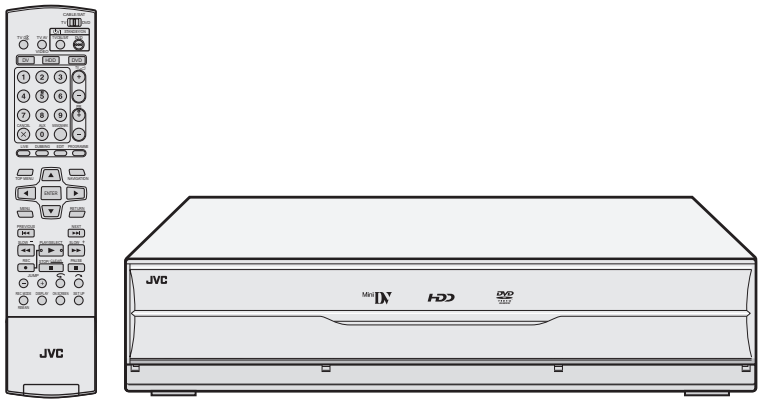
JVC

SERVICE MANUAL

Mini DV & HDD & DVD VIDEO RECORDER

DR-DX5SEK, DR-DX5SEL, DR-DX5SEU, DR-DX5SEY, DR-DX5SEZ



DR-DX5SEK, DR-DX5SEL, DR-DX5SEU, DR-DX5SEY, DR-DX5SEZ [D5MC21]

(EL, EU, EY, EZ model)

(EK model)

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No.YD085
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SPECIFICATION

	DR-DX5SEK	DR-DX5SEL/EU/EY/EZ
GENERAL		
Power requirement	AC 220 V ~ 240 V, 50 Hz/60 Hz	
Power consumption		
Power on	45 W	
Power off	15 W	
Temperature		
Operating	5°C to 35°C	
Storage	-20°C to 60°C	
Operating position	Horizontal only	
Dimensions (W × H × D)	435 mm × 96 mm × 383 mm	
Weight	6.5 kg	
Input/Output		
Video input	0.5 - 2.0 Vp-p, 75 Ω (pin jack)	
Audio input	-8 dB, 50 kΩ (pin jack), Corresponding to mono (left)	
Audio output	-8 dB, 1 kΩ (pin jack)	
21-pin SCART connectors	IN/OUT × 1, IN/DECODER × 1	
S-video input	Y: 0.8 - 1.2 Vp-p, 75 Ω, C: 0.2 - 0.4 Vp-p, 75 Ω	
S-video output	Y: 1.0 Vp-p, 75 Ω, C: 0.3 Vp-p, 75 Ω	
DV	4-pin for DV IN/OUT	
Component video output	Y: 1.0 Vp-p, 75 Ω, CB/CR, PB/PR: 0.7 Vp-p, 75 Ω Corresponding to copy protection	
Digital audio output	Optical, Coaxial Corresponding to Dolby Digital and DTS Digital Surround Bit stream Selectable in digital audio output setting menu	
VIDEO/AUDIO (DVD Deck)		
Recording time	Maximum 8 hours (with 4.7 GB disc) (XP): Approx. 1 hour, (SP): Approx. 2 hours, (LP): Approx. 4 hours (EP): Approx. 6 hours, (FR): Approx. 1 hour - 8 hours	
Audio recording system	Dolby Digital (2 ch), Linear PCM (XP mode only)	
Video recording compression system	MPEG2 (CBR/VBR)	
VIDEO/AUDIO (HDD Deck)		
Video recording compression system	MPEG2 (VBR)	
Audio recording system	Dolby Digital (2 ch), Linear PCM (XP mode only)	
Recording time	Maximum 473 hours (with 250 GB HDD) (XP): Approx. 53 hours, (SP): Approx. 109 hours, (LP): Approx. 218 hours (EP): Approx. 328 hours, (FR): Approx. 473 hours	
VIDEO/AUDIO (DV Deck)		
Signal system	PAL colour signal, 625 lines/50 fields	
Recording system	Digital Component Recording	
Format	DV format (SD mode)	
Cassette	Mini DV Cassette	
Maximum recording time		
(SP)	(SP): 80 min. with M-DV80ME cassette	
(LP)	(LP): 120 min. with M-DV80ME cassette	
Audio recording system	PCM 48 kHz, 16 bit (2 ch)/32 kHz, 12 bit (4 ch)	
TUNER/TIMER		
Tuning system	Frequency synthesized tuner	
Channel coverage	VHF : 44.5 MHz - 143 MHz/143 MHz - 470 MHz UHF : 470 MHz - 862 MHz	VHF : 47 MHz - 89 MHz/104 MHz - 300 MHz/302 MHz - 470 MHz UHF : 470 MHz - 862 MHz
Memory backup time	Approx. 60 minutes	
ACCESSORIES		
Provided accessories	RF cable, 21-pin SCART cable, Infrared remote control unit, "AA/R6" battery × 2	

- Specifications shown are for SP mode unless otherwise specified.
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- VIDEO Plus+ and PlusCode are registered trademarks of Gemstar Development Corporation. The VIDEO Plus+ system is manufactured under license from Gemstar Development Corporation.(EK MODEL)
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SECTION 1
PRECAUTION

1.1 SAFTY 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.

1.1.1 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 ⚠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:
- Wires covered with PVC tubing
- Double insulated wires
- High voltage leads

(5) Use specified insulating materials for hazardous live parts. Note especially:
- Insulation Tape
- PVC tubing
- Spacers
- Insulation sheets for transistors
- Barrier

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

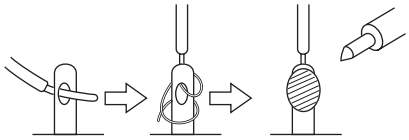


Fig.1-1-1

(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.

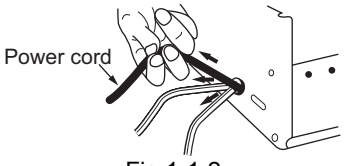


Fig.1-1-2

(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 connectorIn such cases as when replacing the power transformer in sets where the connections between the power cord and power trans former 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.

- **Connector part number** :E03830-001
- **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
- **Replacement procedure**

a) Remove the old connector by cutting the wires at a point close to the connector.Important : Do not reuse a connector (discard it).

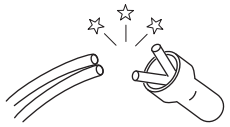


Fig.1-1-3

b) 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.

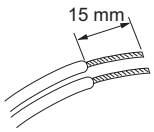


Fig.1-1-4

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

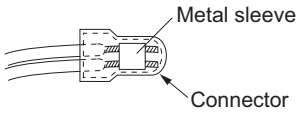


Fig.1-1-5

d) As shown in Fig.1-1-6, 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.

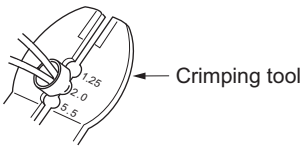


Fig.1-1-6

e) Check the four points noted in Fig.1-1-7.

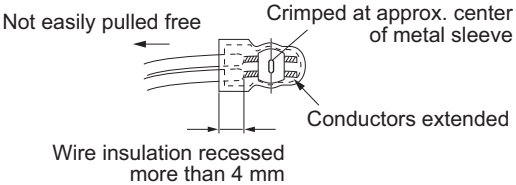


Fig.1-1-7

1.1.2 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 Fig.1-1-11 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 Fig.1-1-11 below.

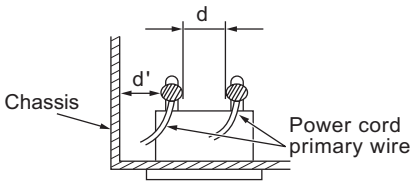


Fig.1-1-8

(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 Fig.1-1-9 and following Fig.1-1-12.

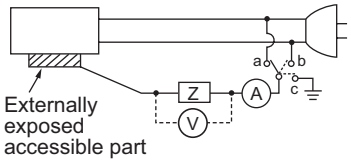
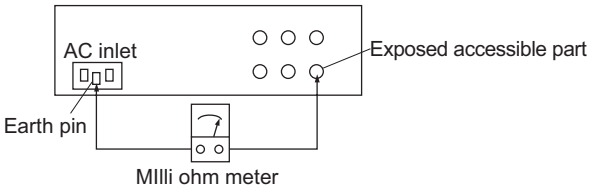


Fig.1-1-9

(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 Fig.1-1-10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

Fig.1-1-10

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

Fig.1-1-11

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Fig.1-1-12

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

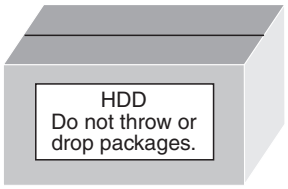
1.2 Hard Disk Drive (HDD) Handling Precautions

The HDD is a precision device for use in reading and writing a large amount of data on or from a disk rotating at a high speed. If it is not handled carefully, either abnormal operation may result or it may not be possible to read data. The HDD is sensitive to the following items and special care is required in safeguarding against them when handling an HDD. Also take care in handling a set incorporating an HDD.

(1) Vibrations and impacts
(2) Static electricity
(3) Rough handling

1.2.1 Handling in transport, etc.

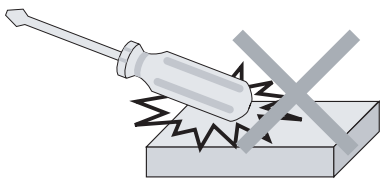
- Be sure to place the HDD in the manufacturer's specified package carton before transport.
- When receiving a package containing an HDD, check that the package carton is not damaged (such as having holes in the carton, crushed corners, etc.).
- Do not impact the packaging carton when loading or unloading it.
- It is not permitted to use the inner package carton only for transporting an HDD.
- Do not stack package cartons one upon another.



Be sure to package and transport the HDDs correctly.

1.2.2 Handling an HDD in the stand-alone status

- When handling an HDD on a hard workbench, place an antistatic mat (rubber sheet) or similar object on the hard surface (to prevent any impacts occurring between the HDD and bench).
- Do not stack the HDDs one upon another.
- Do not knock an HDD with a hard object (such as a screwdriver).
- Do not place an HDD on its side panel without using a support (do not place an HDD in an unstable position).



1.2.3 Handling the installation of an HDD

- Place antistatic mats or similar sheets on all of the surfaces on which work is conducted or when the HDD is transported.
- Do not permit the HDD to knock against the set's brackets.
- When screwing the brackets, be careful not to knock the HDD. When using a power screwdriver, use a low-shock model and arrange the tightening torque properly.
- When mounting an HDD in a main body, take care not to apply excessive force to the brackets.

SECTION 2
SPECIFIC SERVICE INSTRUCTIONS

2.1 Different table of features

The following table indicates main different points between models DR-DX5SEK and DR-DX5SEL/EU/EY/EZ.

ITEM	DR-DX5SEK	DR-DX5SEL/EU/EY/EZ
POWER PLUG	3PIN	CEE
BROADCASTING STANDARD	I	B/G,D/K
STEREO DECODER	NICAM	NICAM/A2
VCR PLUS+	VIDEOPLUS+	SHOWVIEW
VPS/PDC	NOT USED	USED

2.2 Service position

This unit has been designed so that the Mechanism and Main board assemblies can be removed together from the bottom chassis. Before diagnosing or servicing the circuit boards, take out the major parts from the bottom chassis.

2.2.1 How to set the "Service position"

(1) Refer to the disassembly procedure and perform the disassembly of the major parts before removing the Mechanism assembly.
(2) Remove the screws that fix the Mechanism, Main board assembly to the bottom chassis. If any other screws are used to fix the boards, remove them also.
(3) Remove the combined Mechanism, HDD, DVD unit, switching regulator, digital, DV jack, junction and Main board assemblies.
(4) If any other major parts are used, remove them also.
(5) Connect the wires and connectors of the major parts that have been removed in steps (1) to (4). (Refer to Fig. 2-2a.)
(6) Place the combined Mechanism, Main board and other board assemblies upside down.
(7) Insert the power cord plug into the power outlet and then proceed with the diagnostics and servicing of the board assembly.

Notes:

- **Before inserting the power cord plug into the power outlet, make sure that none of the electrical parts are able to short-circuit between the workbench and the board assembly.**
- **For the disassembly procedure of the major parts and details of the precautions to be taken, see "Removing the major parts".**
- **If there are wire connections from the Main board and Mechanism assemblies to the other major parts, be sure to remove them (including wires connected to the major parts) first before performing step (2).**
- **When carrying out diagnosis and repair of the Main board assembly in the "Service position", be sure to ground both the Main board and Mechanism assemblies. If they are improperly grounded, there may be noise on the playback picture or FDP counter display may move even when the mechanism is kept in an inoperative status.**
- **In order to diagnose the playback or recording of the cassette tape, set the Mechanism assembly to the required mode before placing it upside down. If the mechanism mode is changed (including ejection) while it is in an upside down position the tape inside may be damaged.**
- **For some models, the mechanism and board assemblies are attached by connectors only. When carrying out a diagnosis or repair of the boards in the "Service position", make sure that the connectors are not disconnected.**

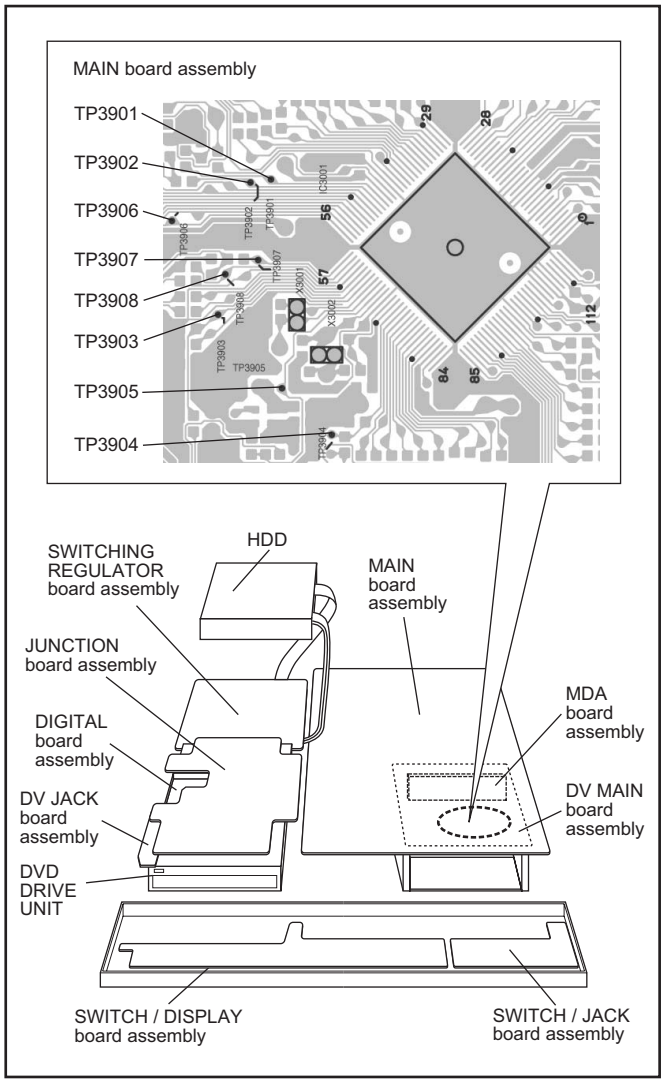


Fig.2-2a

2.3 Jig RCU mode

This unit uses the following two modes for receiving remote control codes.

(1) User RCU mode:Ordinary mode for use by the user.

(2) Jig RCU mode: Mode for use in production and servicing.

When using the Jig RCU, it is required to set the unit to the Jig RCU mode (the mode in which codes from the Jig RCU can be received). As both of the above two modes are stored in the EEPROM, it is required to set the unit back to the User RCU mode each time that an adjustment is made or to check that the necessary operations have been completed.These modes can be set by the operations described below.

Note:

- **When the unit is set to Jig RCU mode and when the unit is under Jig RCU mode, the remote control unit attached to product operates only in "Remote Control Code 1". Since the unit is in "Remote Control Code 3" when it is shipped and just after its batteries are changed, "Remote Control Code 3" needs to be changed to "Remote Control Code 1."**
- **Confirm the RCU mode when exchanged parts. Since some SERVICE PARTS sets the unit to the Jig RCU mode as initial setting. Therefore please set the unit to the user RCU mode after replacing the EEPROM.**

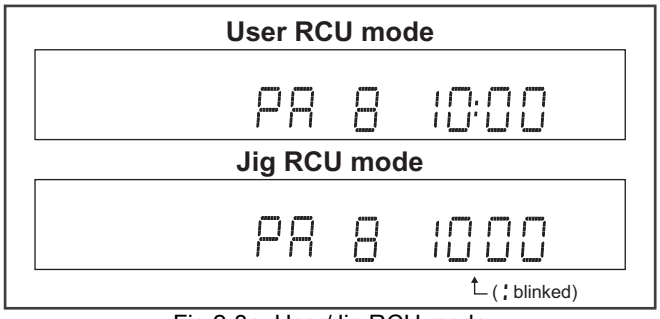


Fig.2-3a User/Jig RCU mode

2.3.1 Changing Remote Control Code

(1) Slide the TV/CABLE/SAT/DVD switch to DVD.

(2) Press the number key "1" of the remote control unit while pressing the "SET UP" button of the remote control unit. Then,press the "ENTER" button, and then release the "SET UP" button.

(3) Press the "POWER" button on the unit to turn off the unit.

(4) Press the "PLAY" button on the unit for over 5 seconds while the unit is turned off. The code currently set appears on the front display panel.

(5) Press the "STOP" button on the remote control to change the unit's code. When FDP indicator displays "DVD1," it means that the Remote Control Code has been changed to "1."

2.3.2 Setting the Jig RCU mode

(1) Turn on the power.

(2) Press the "DV/HDD/DVD" select button repeatedly on the unit so that the DVD lamp lights up on the unit.

(3) Press the following remocon keys continuously within 2 seconds " SET UP " → " 2 " → " 8 " → " ENTER ".
When the unit is set to the Jig RCU mode, the symbols (" : ") in the time display of the FDP are blinked.
(Refer to Fig.2-3a User/Jig RCU mode)

2.3.3 Setting the User RCU mode

(1) Turn off the power.

(2) Press the "REC" and "PAUSE" buttons of the unit simultaneously. Alternatively, transmit the code "43-9D" from the Jig RCU.

SECTION 3
DISASSEMBLY

3.1 Removing the major parts

3.1.1 Destination of connectors

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

⇔ : Flat wire ↔ : Wire ⬌ : Board to board (B-B)

: The connector of the side to remove

CONN. No.	CONNECTOR					PIN No.
WR2a	Main	CN101	⇔	Digital	CN761	40
WR2b	Main	CN103	⇔	Digital	CN762	10

■ **Destination of connectors**

CONN. No.	CONNECTOR					PIN No.
WR2a	Main	CN3104	⇔	Operation/jack	CN7201	15
WR2b	Main	CN3102	⇔	Display/switch	CN7001	15
WR3a	Junction	CN5504	↔	DVD unit		4
WR3b	Digital	CN2201	⇔	DVD unit		40
WR4a	Digital	CN2101	⇔	HDD		40
WR4b	Digital	CN1405	⇔	Junction	CN1406	4
WR4c	Junction	CN5502	↔	Digital	CN1003	6
CN7108 (CN1001)	Junction	CN7108	⬌	Digital	CN1001	28
CN7109 (CN1002)	Junction	CN7109	⬌	Digital	CN1002	20
CN7121 (CN1802)	Junction	CN7121	⬌	Digital	CN1802	14
WR5a	Junction	CN7126	↔	DV jack	CN4104	6
WR6a	SW. REG	CN5304	⇔	Junction	CN5501	19
WR6b	SW. REG	CN5303	↔	HDD		4
WR6c	SW. REG	CN5301	⇔	Main	CN5402	19
WR6d	SW. REG	CN5302	↔	Fun motor		2
WR8a	Junction	CN7127	↔	DV Main	CN2002	6
WR8b	Main	CN3103	⇔	Junction	CN7102	19
WR8c	Main	CN2602	⇔	Junction	CN8001	11
WR8d	Main	CN701	⇔	Junction	CN7123	4
WR8e	Main	CN901	⇔	Junction	CN7107	9
WR9a	Rear jack	CN951	⇔	Main	CN902	8
WR9b	Rear jack	CN952	↔	Main	FW851	3
WR11a	DV Main	CN1502	⇔	DV mechanism sensor		15
WR11b	DV Main	CN4001	⇔	DV drum motor		8
WR11c	DV Main	CN1501	⇔	DV MDA	CN5506	20
WR11d	DV Main	CN5501	↔	Main	CN5403	5
WR12a	Main	CN5404	⇔	DV Main	CN1001	8
WR12b	Main	CN2601	⇔	DV Main	CN3701	8
WR12c	Main	CN501	⇔	DV Main	CN3501	7
WR12d	Main	CN3104	⇔	DV Main	CN1503	7

3.1.2 How to read the procedure table

This table shows the steps for disassembly of the externally furnished parts and board assemblies. Reverse these steps when re-assembling them.

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover	3-1a	4(S1a),(S1b),3(L1a), 2(SD1a),(P1a),(W1a), CN1(WR1a),	<Note 1a>
	Bracket		2(S1c)	

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

(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 name to be removed or installed.

(3) Fig. No. showing procedure or part location.

(4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered.
P= Spring, W= Washer, S= Screw, L= Locking tab, SD= Solder, CN**(WR**)= Remove the wire (WR**) from the connector (CN**).

Note:

- **The bracketed ( ) WR of the connector symbol are assigned nos. in priority order and do not correspond to those on the spare parts list.**

(5) Adjustment information for installation

3.1.3 Disassembly procedure

Step/ Loc No.	Part Name	Fig. No.	Point	Note
[1]	Top cover	3-1b	8(S1a)	
[2]	Front panel assembly (Operation jack board assembly) (Display/switch display board assembly)	3-1a 3-1b	(S2a),3(L2a),5(L2b) CN3104(WR2a),CN3102(WR2b)	<Note2a> <Note2b>
[3]	DVD unit (Bracket)	3-1a 3-1b	4(S3a),4(S3b) CN5504(WR3a),CN2201(WR3b)	<Note2a>
[4]	Digital board assembly	3-1a 3-1b	4(S4a),CN2101(WR4a) CN1405(WR4b),CN5502(WR4c), CN7108(CN1001),CN7109(CN1002) CN7121(CN1802)	<Note2a>
[5]	DV jack board assembly	3-1a,3-1b	(S5a),CN7126(WR5a)	<Note2a>
[6]	Switching regulator board assembly	3-1a 3-1b	4(S8a) CN5304(WR6a),CN5303(WR6b), CN5301(WR6c),CN5302(WR6d)	
[7]	HDD (Bracket),(Sheet)	3-1a 3-1b	4(S7a),4(S7b)	<Note2a>
[8]	Junction board assembly	3-1a 3-1b	(S8a),CN7127(WR8a), CN3103(WR8b), CN2602(WR8c), CN701(WR8d),CN901(WR8e)	<Note2a>
[9]	Rear jack board assembly	3-1b	3(S9a),CN951(WR9a),CN952(WR9b)	
[10]	Rear cover	3-1b	6(S10a),(S10b),3(L10a)	
[11]	DV mechanism assembly	3-1a 3-1b	3(S11a),CN1502(WR11a), CN4001(WR11b), CN1501(WR11c),CN5501(WR11d)	
[12]	DV main board assembly (Bracket)	3-1a 3-1b	4(S12a),4(S12b),CN5404(WR12a), CN2601(WR12b),CN501(WR12c), CN3104(WR12d)	
[13]	Bracket(DV MAIN)	3-1b	3(S13a)	<Note3a>
[14]	Main board assembly	3-1a,3-1b	3(S14a)	<Note3b>

< Note 2a >

- Be careful not to damage the connector and wire etc. during connection and disconnection.
- When connecting the flat wire to the connector, be careful with the flat wire direction.

< Note 2b >

- When attaching the Front panel assembly, make sure that the door opener of DV deck is in the down position.

< Note 3a >

- When reattaching the bracket(DV MAIN), secure the screws (S13a) in the order of 1,2,3.

< Note 3b >

- When reattaching the Main board assembly, secure the screws (S14a) in the order of 1,2,3.

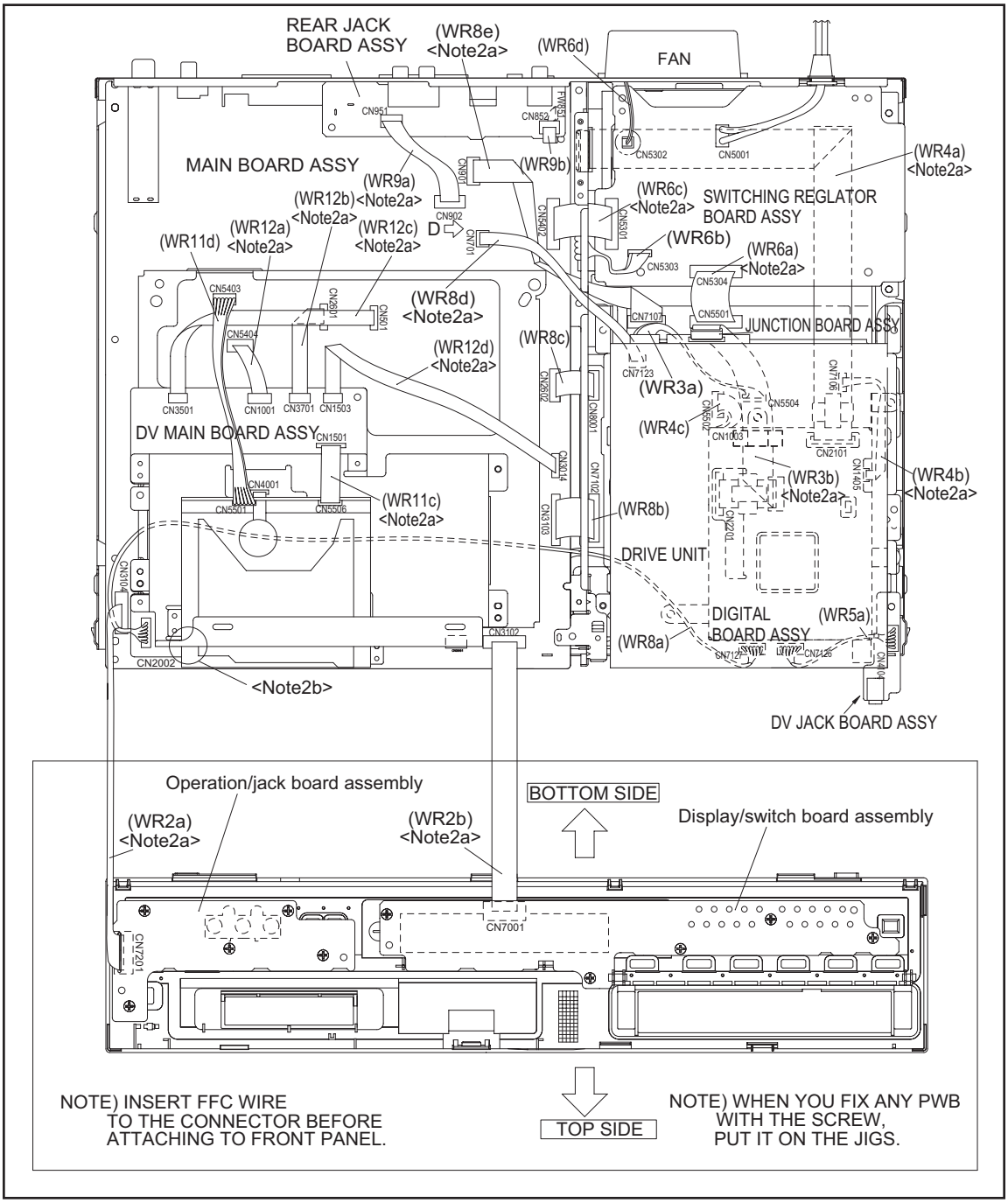


Fig.3-1a

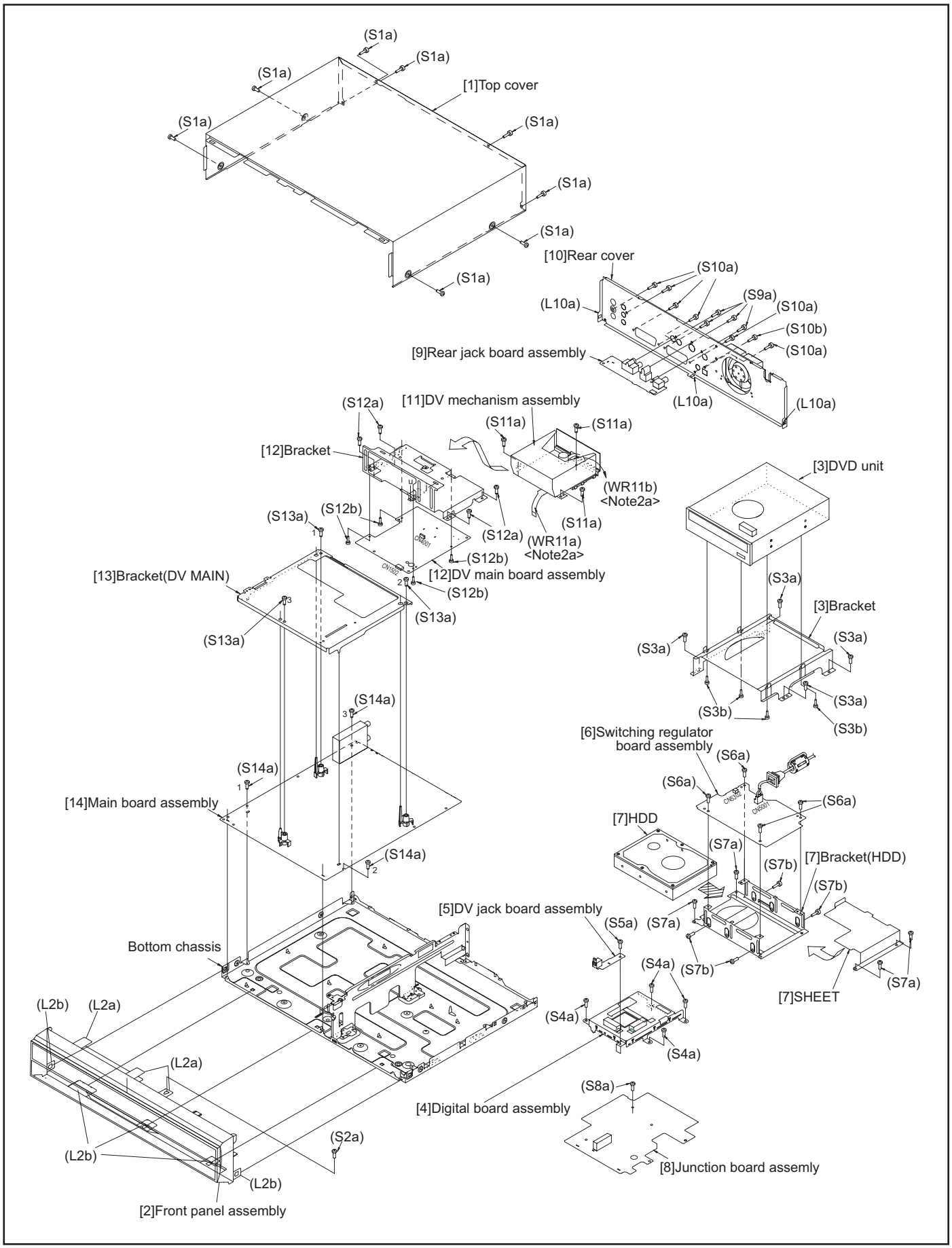

(S1a)
[1]Top cover
[10]Rear cover
(S10a)
(S9a)
(L10a)
(S10b)
[9]Rear jack board assembly
(L10a)
(S12a)
[11]DV mechanism assembly
(S11a)
[12]Bracket
(WR11b)
<Note2a>
(S13a)
(S12b)
(WR11a)
<Note2a>
[12]DV main board assembly
[13]Bracket(DV MAIN)
[3]DVD unit
[3]Bracket
(S3a)
(S3b)
(S14a)
[14]Main board assembly
[6]Switching regulator
board assembly
(S6a)
[7]HDD
(S7a)
(S7b)
[7]Bracket(HDD)
[5]DV jack board assembly
(S5a)
(S4a)
[7]SHEET
Bottom chassis
(L2b)
(L2a)
[4]Digital board assembly
(S8a)
[8]Junction board assemly
(S2a)
[2]Front panel assembly

Fig.3-1b

SECTION 4
ADJUSTMENT

4.1 Before adjustment

4.1.1 Precautions

(1) Observe the specified screw tightening torque when attaching parts. The torque should be 0.04 Nm (0.4 kgfcm) unless otherwise specified.
(2) Always disconnect the power supply unit before proceeding to solder or attach parts.
(3) When plugging or unplugging a wire, be careful not to damage the connector.
(4) When replacing a part, be careful not to damage other parts or to mistakenly attach parts.

4.1.2 Tools required for adjustments

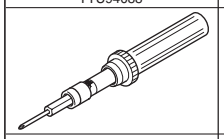
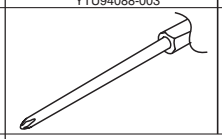
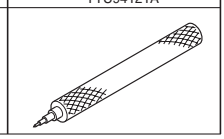
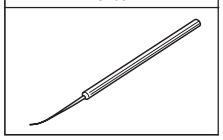
1 TORQUE DRIVER YTU94088	2 BIT YTU94088-003	3 Tool for installing slit washer YTU94121A
		
4 Tool for replacing tip IC PTS40844-2		
		

Table 4-1-1

4.1.3 Disassembly and assembly procedures

The following table shows the steps for assembling or disassembling the mechanism parts. Read the following descriptions carefully before actual assembly/disassembly operations.

(1) : Order of disassembly steps. Reverse this order when assembling.
(2) : Name of the disassembled/assembled part.
(3) : Surface where the disassembled/assembled part is mounted. T = Top. B: Bottom.
(4) : Number of disassembly drawing.
(5) : Parts to be removed in disassembly/assembly, such as screws, washers and springs, and the points.

Symbol	Name & Point
S	Screw
W	Washer
P	Spring
*	Connector, lock(L), soldering(SD), shield, etc.

[Example] • (W1) = Remove the washer W1.
• (P1) = Remove the spring P1.

(6) : Notes for disassembly/assembly.
(7) : For the phase alignment in disassembly/assembly and the parts which require phase adjustments after assembly, see "4.7 Mechanism phase check/adjustment".

4.1.4 Screws and washers used in disassembly/assembly of the mechanism assembly

Table 4-1-2 shows the symbols and part numbers of the screws and washers used in the mechanism assembly.
When disassembling or assembling the mechanism assembly,be sure to attach screws and washers correctly by referring to the following table.

Symbol	Part number
(S1)	QYSDSP2005ZA
(S2)	YQ43893
(S3)	YQ43893-7

Symbol	Part number
(W1)	YQ44246
(W2)	YQ44246-3

Table 4-1-2

Step/Loc No.	Part Name		Fig. No.	Point	Note	Discription
1	[A] Cassette housing assembly/ [B] Mechanism assembly	T	1	2(S1),(L1) (L5)	1	
2	[1]Drum assembly	T	2	3(S2)	2,3	
3	[2]Motor bracket assembly	T	2	4(S2)	2,4	
4	[3]Middle catcher assembly	T	3	3(S2)		
	(1)	(2)	(3)	(4) (5)	(6)	(7)

4.2 Disassembly/assembly of the mechanism assembly

4.2.1 Introduction

The disassembly and assembly of the mechanism assembly should usually be performed in the ASSEMBLY mode.(Table 4-2-1)
Note that the mechanism is in the cassette in (C-IN) mode when the mechanism assembly is taken out of the set and that the C-IN mode should be switched to the ASSEMBLY mode in this case.
To set the ASSEMBLY mode, apply 3 V DC to the electrodes on the upper part of the loading motor as shown in Fig. 4-2-7.

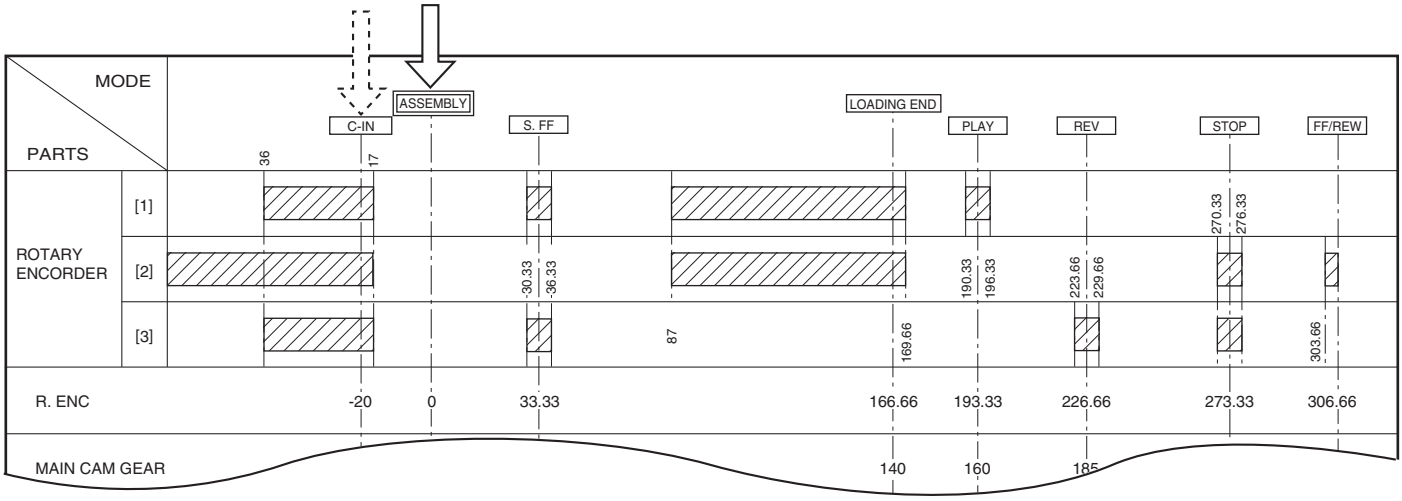


Table 4-2-1

4.2.2 Mechanism modes

The mechanism has 6 modes as shown in Table 4-3-1. The current mode can be confirmed by the positioning of the "ℴ" marking on the sub-cam gear and the "▲" marking on the mechanism. See the following figures (Figs. 4-2-1 to -6) for details.

Note:

- This mechanism assembly has another ASSEMBLY mode. However, this mode cannot be identified from the markings because it corresponds to an intermediate position between the C-IN (C) mode and S-FF (H) mode. This mode can be confirmed by the rotary encoder phase. See Fig. 4-2-7.

1. Checking the mechanism mode

＜C−IN : [C] ＞

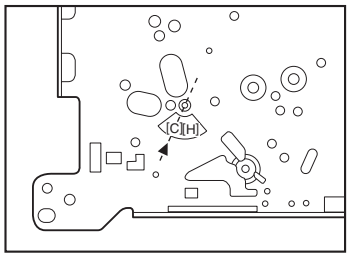


Fig.4-2-1

＜S−FF : [H] ＞

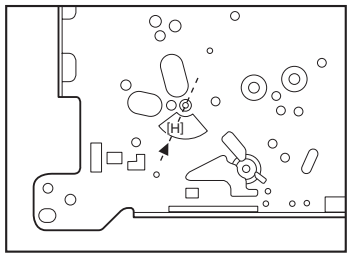


Fig.4-2-2

＜PLAY : [P] ＞

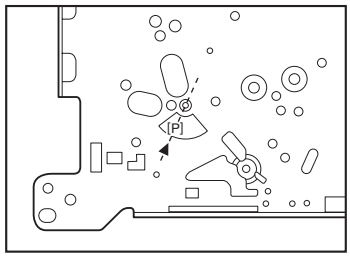


Fig.4-2-3

＜REV : [R] ＞

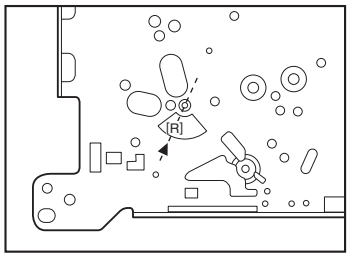


Fig.4-2-4

＜STOP : [S] ＞

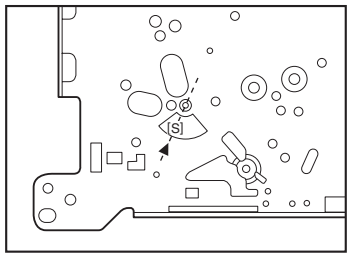


Fig.4-2-5

＜FF/REW : [F] ＞

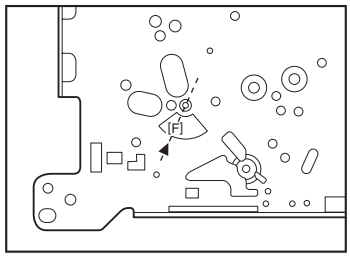


Fig.4-2-6

2. Setting/checking the ASSEMBLY mode

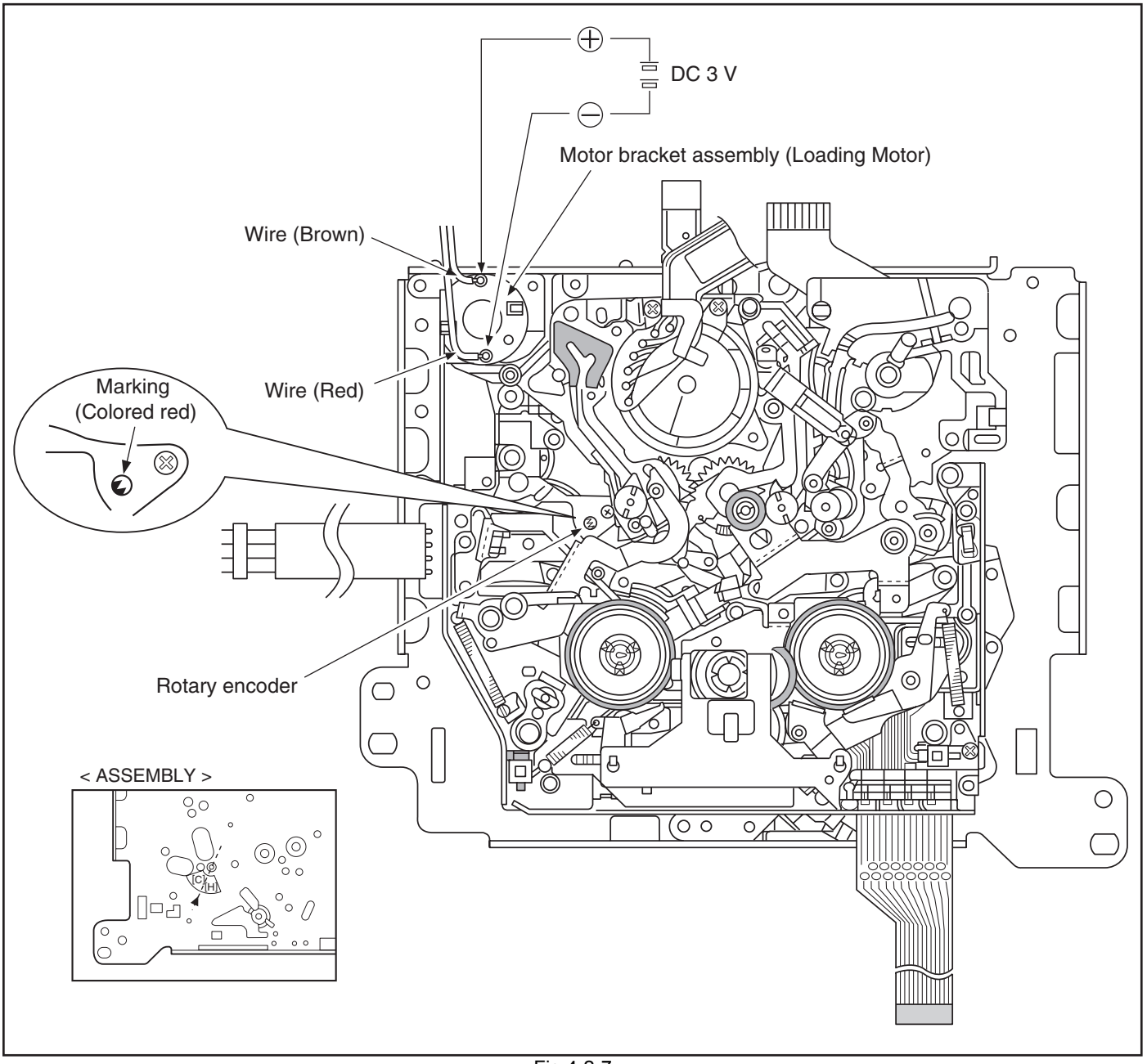


Fig.4-2-7

4.3 Mechanism timing chart

See following table (Table 4-3-1).

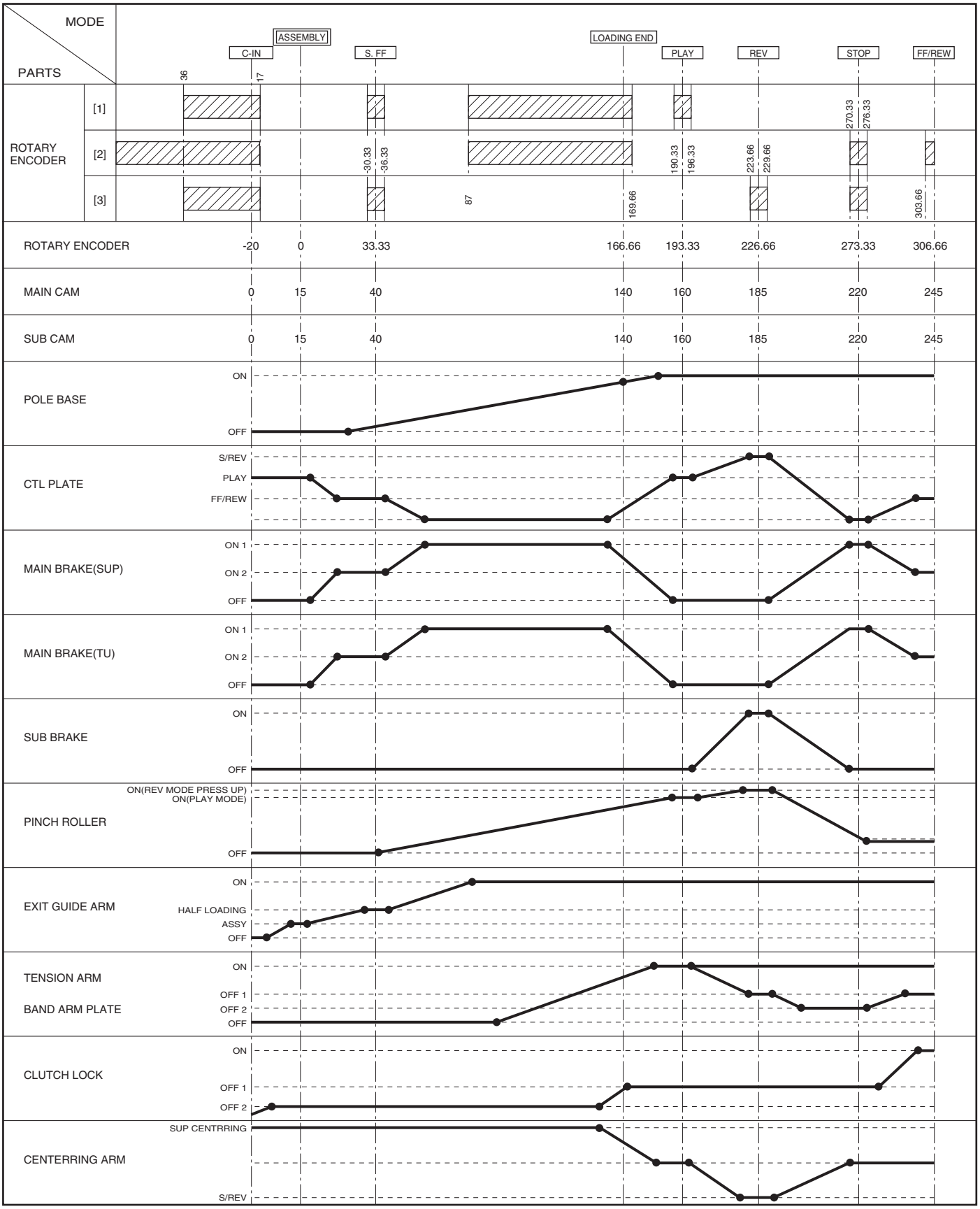
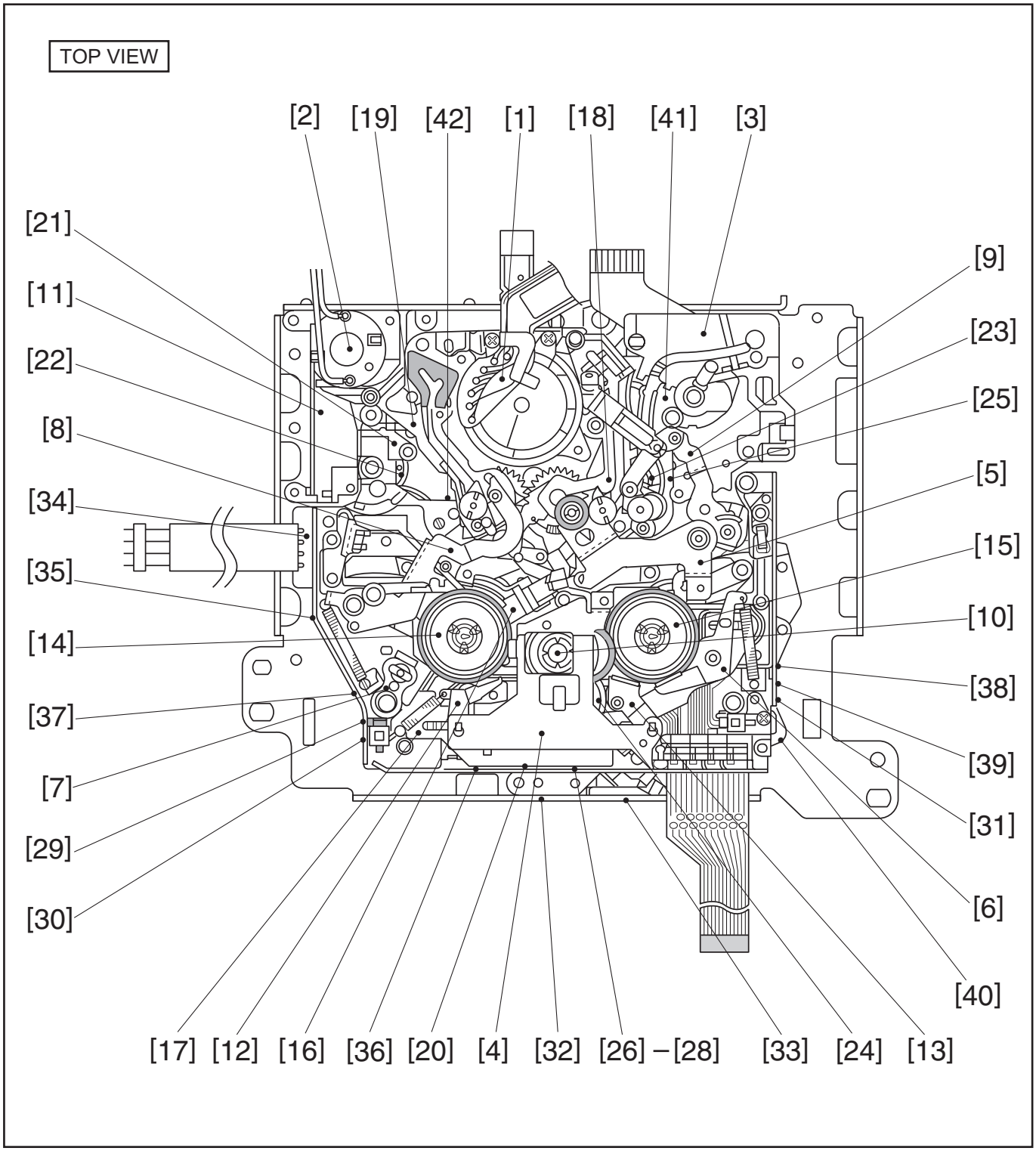


Table 4-3-1

4.4 Mechanism assembly/disassembly procedure table

Step/Loc No.	Part Name		Fig. No.	Point	Note	Discription
1	[A] Cassette housing assembly/ [B] Mechanism assembly	T	4-5-1	2(S1),(L1) (L5)	1	
2	[1] Drum assembly	T	4-5-2	3(S2)	2,3	
3	[2] Motor bracket assembly	T	4-5-2	4(S2)	2,4	
4	[3] Middle catcher assembly	T	4-5-3	3(S2)		
5	[4] Reel cover assembly	T	4-5-3	(S2), 2(L6)	5	
6	[5] Pinch roller arm assembly	T	4-5-4	(W1), (L7)	6	
7	[6] Sub brake assembly	T	4-5-4	(P1), (W1), (L8)		
8	[7] Band arm plate sub assembly	T	4-5-4	(S3), (L9), (P2), (W2)	7,8	
9	[8] Tension arm sub assembly	T	4-5-4	(P3)	8	
10	[9] EXIT guide arm assembly	T	4-5-5	(W1)		
11	[10] Swing arm assembly	T	4-5-5			Position alignment
12	[11] Sub deck assembly	T	4-5-6	4(S2)	9	Position alignment
13	[12] Main brake (Supply) assembly	T	4-5-6	(P4), (L10)		
14	[13] Main brake (Take up) assembly	T	4-5-6	(P5), (L11)		
15	[14] Reel disk assembly (Supply)	T	4-5-7			
16	[15] Reel disk assembly (Take up)	T	4-5-7			
17	[16] Prism	T	4-5-7	(S2)		
18	[17] Control plate	T	4-5-7	2(L12)		
19	[18] Guide rail (Take up) assembly	T	4-5-8	4(S2)	10	Position alignment
20	[19] Guide rail (Supply) assembly	T	4-5-8	(S2), 2(L13)	10	Position alignment
21	[20] Base plate assembly	T	4-5-8	(S2), 2(L14)		
22	[21] Ent. guide base assembly	T	4-5-9	(S2)		
23	[22] Worm wheel 2	T	4-5-9		11	Phase alignment
24	[23] Timing belt	T	4-5-9			
25	[24] Center gear assembly	T	4-5-9			
26	[25] Reel drive pulley assembly	T	4-5-10	(W1)		
27	[26] Push plate	T	4-5-10	(W1)		
28	[27] Clutch lock gear (2)	T	4-5-10			
29	[28] Clutch lock gear (1)	T	4-5-10	(P6)		
30	[29] Tension control arm assembly	T	4-5-11	(L15)	12	Position alignment
31	[30] Brake control arm assembly	T	4-5-11	(W1), (L16)	12	Position alignment
32	[31] Charge arm assembly	T	4-5-11	(L17)	13	Position alignment
33	[32] Connect gear 2	T	4-5-12	(S2)		(Phase alignment)
34	[33] Connect gear 2	T	4-5-12	(S2)		(Phase alignment)
35	[34] Rotary encoder assembly	T	4-5-13	2(S2)	14	Phase alignment
36	[35] Main cam	T	4-5-13	(W1)	15	Phase alignment
37	[36] Arm gear 1 assembly	T	4-5-13	Collar	15,16	Position alignment
38	[37] Centering arm assembly	T	4-5-13	(L18)	15	Position alignment
39	[38] Sub cam	T	4-5-14	(S2)	17	Phase alignment
40	[39] Arm gear 2 assembly	T	4-5-14		17	Position alignment
41	[40] Clutch lock lever assembly	T	4-5-14	(L19)	17,18	Position alignment
42	[41] Capstan motor	T	4-5-15	(P7), Adjust nut		Vertical adjustment
43	[42] Drum base deck	T	4-5-15	3(S2)		


TOP VIEW
[2]
[19]
[42]
[1]
[18]
[41]
[3]
[21]
[11]
[22]
[8]
[34]
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[4]
[32]
[26] – [28]
[33]
[24]
[13]

Fig.4-4-1

4.5 Disassembly/assembly

1. [A] Cassette housing assembly/ [B] Mechanism assembly

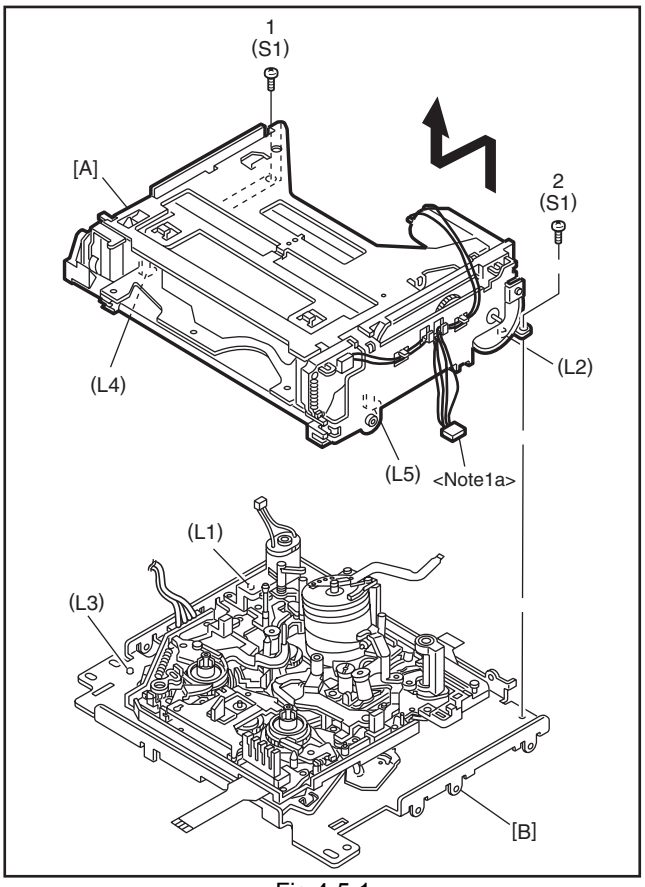


Fig.4-5-1

< Note 1a >:

If the wires for the cassette housing motor are connected to the circuit board, remove them before disassembly.

2. [1] Drum assembly / [2] Motor bracket assembly

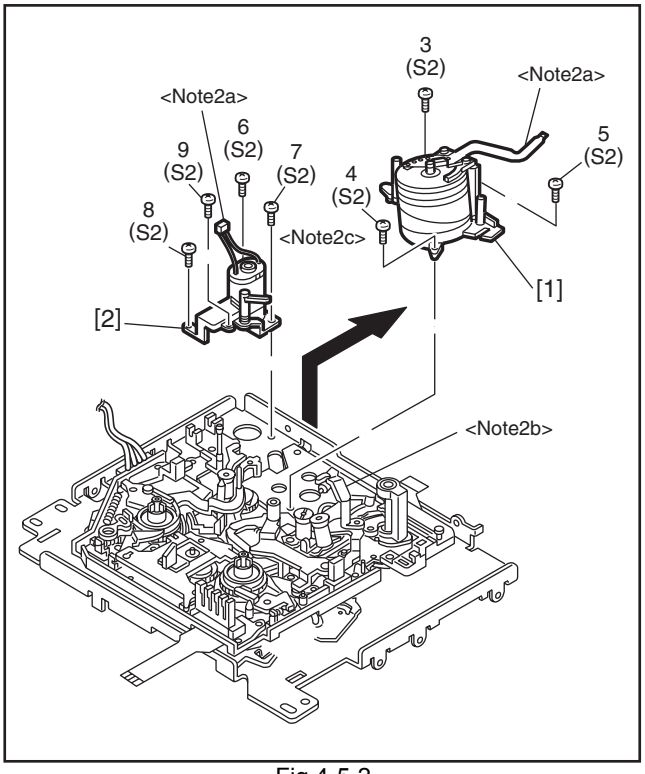


Fig.4-5-2

< Note 2a >:

If wires are connected to the circuit board, remove them before disassembly.

< Note 2b >:

Be careful not to damage the drum assembly when removing it.

< Note 2c >:

The bracket (DV) may come in the way of removal of screw (7). Be sure to remove the bracket before proceeding to the screw removal.

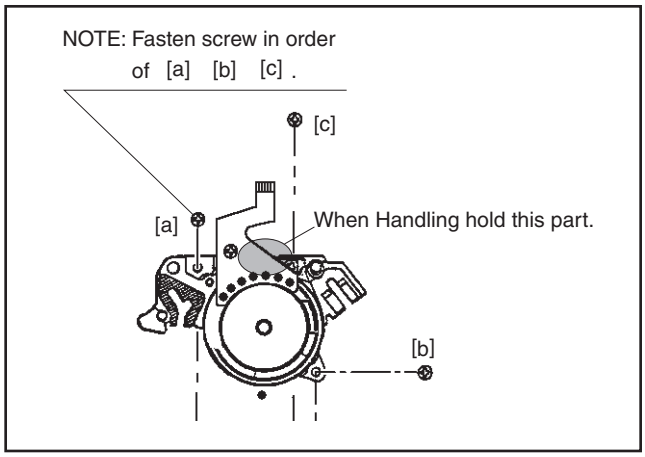


Fig.4-5-2a

3. [3] Middle catcher assembly/ [4] Reel cover assembly

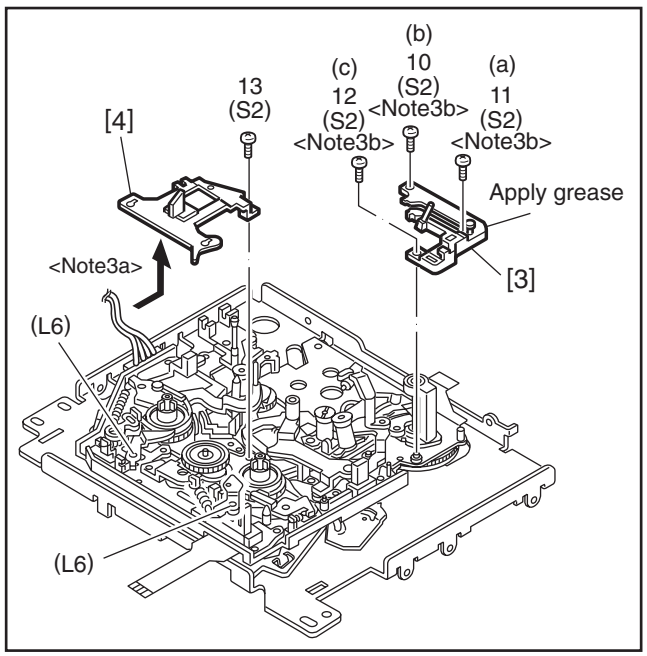


Fig.4-5-3

< Note 3a >:
Once the reel cover assembly has been removed, the parts located below it tend to slip out easily: Be careful.

< Note 3b >:
When attaching these screws, screwing order (a),(b),(c)

4. [5] Pinch roller arm assembly/[6] Sub brake assembly/[7] Band arm plate sub assembly/ [8] Tension arm sub assembly

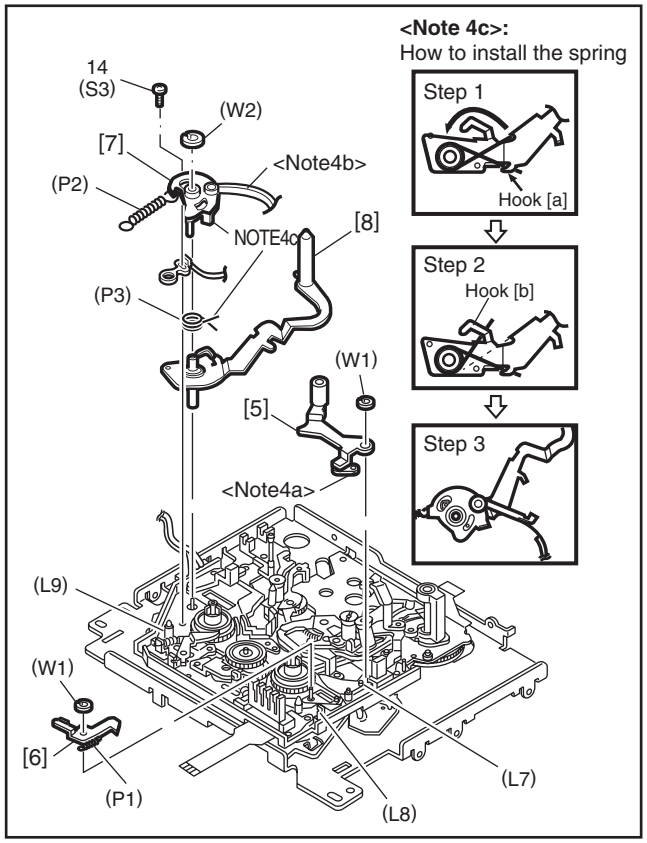


Fig.4-5-4

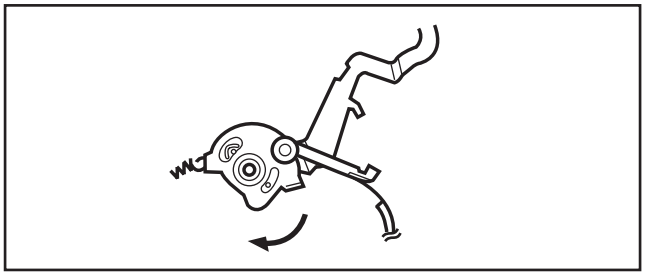


Fig.4-5-4a

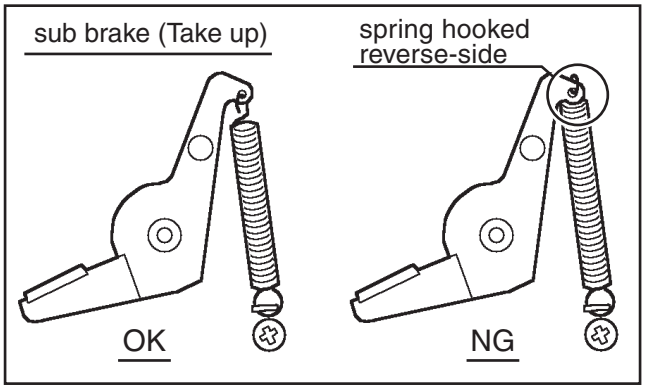


Fig.4-5-4b

< Note 4a >:
When attaching this part, fit it in the boss (L7) on the charge arm assembly.

< Note 4b >:
When attaching or removing this part, take care of the handling of the band section.

< Note 4c >:
After fitting the spring on the shaft, engage it with hook [a] first then with hook [b] .
After attaching it, set it to the positioning shown in "Step 3" and confirm that band arm plate sub assembly [7] can be rotated in the direction of the arrow as shown below.

5. [9] Exit guide arm assembly/ [10] Swing arm assembly

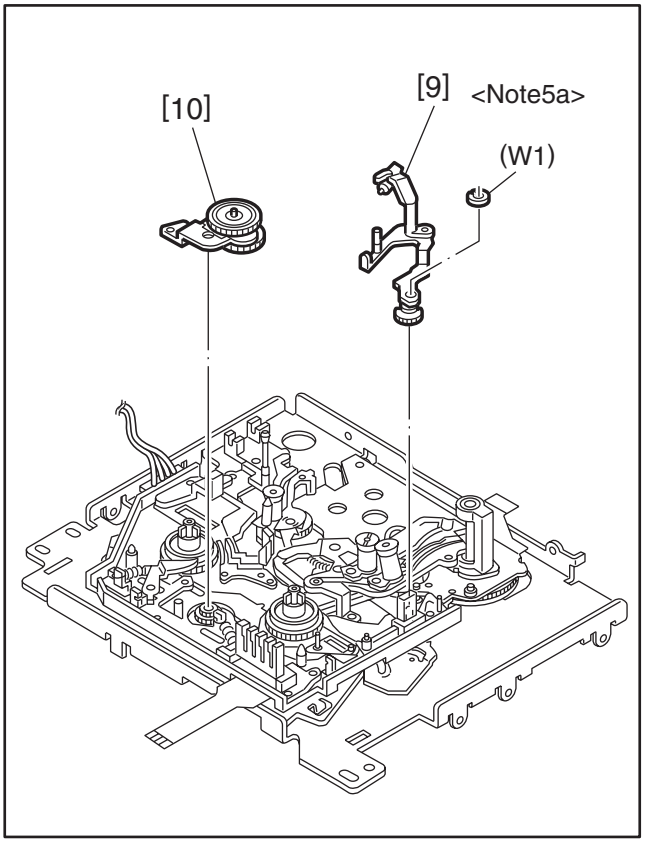


Fig.4-5-5

< Note 5a >:

Exit guide arm assembly phase alignment.

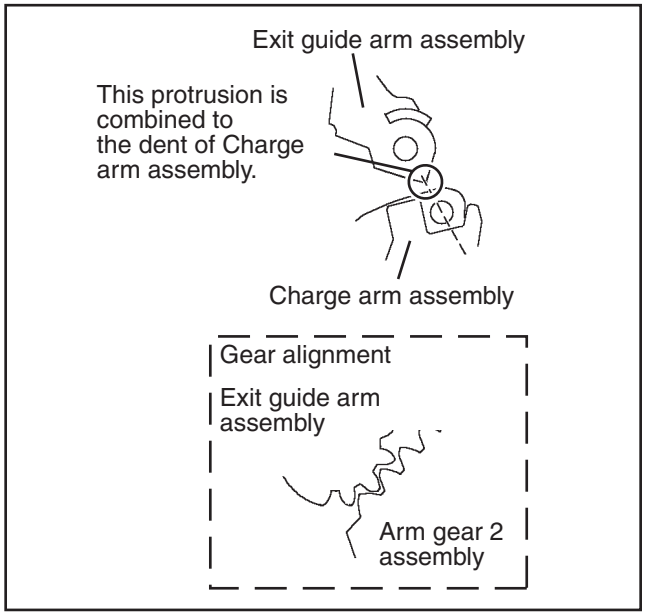


Fig.4-5-5a

6. [11] Sub deck assembly/ [12] Main brake (Supply) assembly/[13] Main brake (Take up) assembly

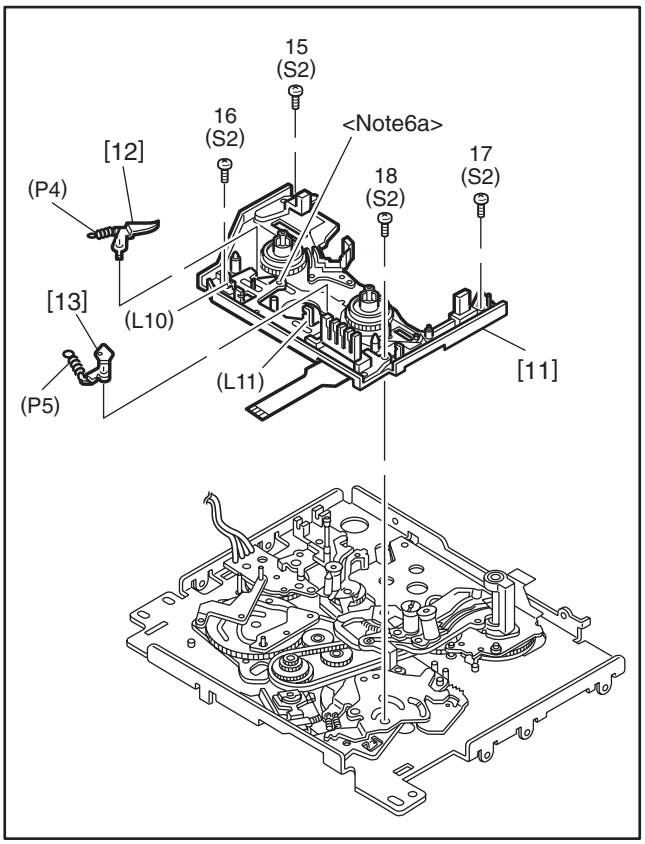


Fig.4-5-6

< Note 6a >:

When attaching the sub deck assembly, make sure to adjust the phase of the control plate.

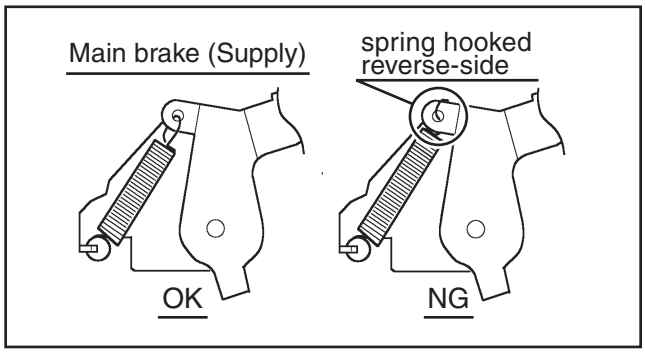


Fig.4-5-6a

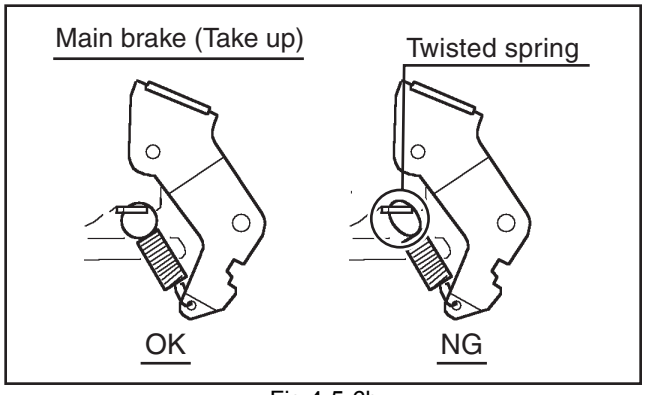


Fig.4-5-6b

7. [14] Reel disk assembly (Supply) / [15] Reel disk assembly (Take up) / [16] Prism / [17] Control plate

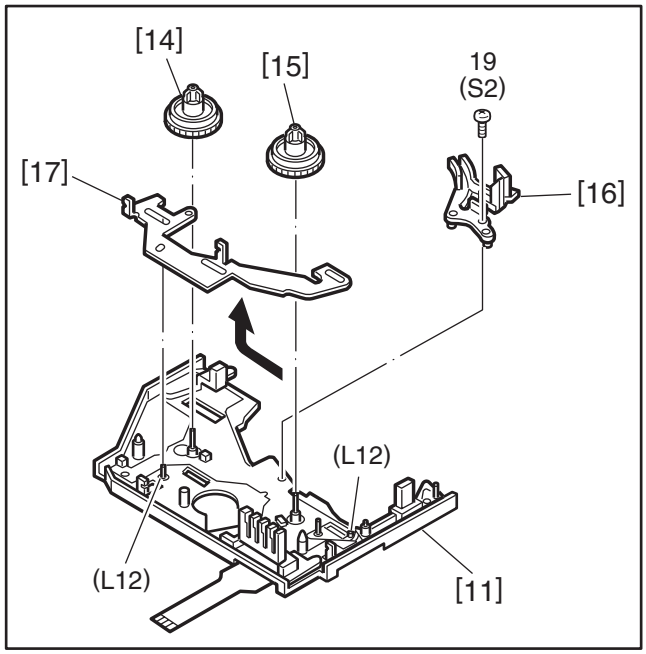


Fig.4-5-7

8. [18] Guide rail (Take up) assembly / [19] Guide rail (Supply) assembly / [20] Base plate assembly

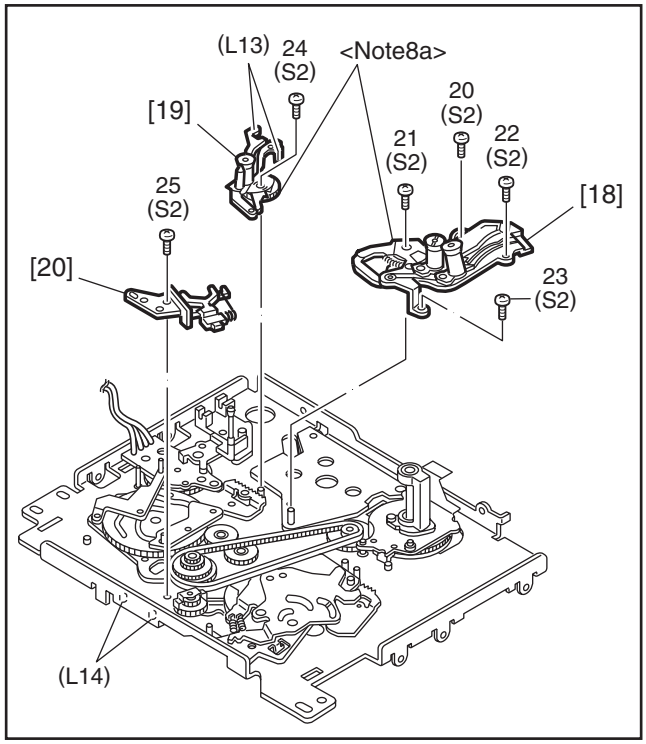


Fig.4-5-8

< Note 8a >:

When attaching, set the alignment markings of the two gears so that the markings face opposite to each other.

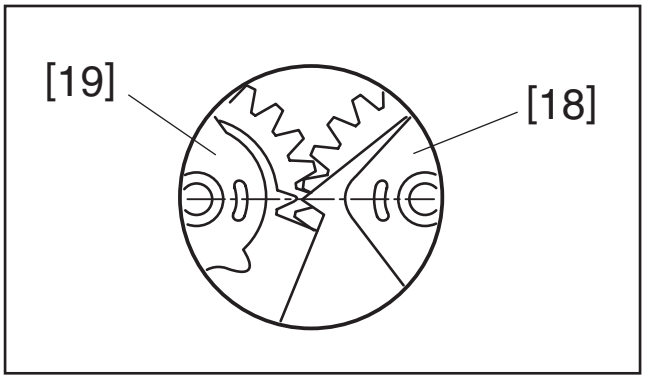


Fig.4-5-8a

9. [21] Ent. guide base assembly / [22] Worm wheel 2 / [23] Timing belt / [24] Center gear assembly

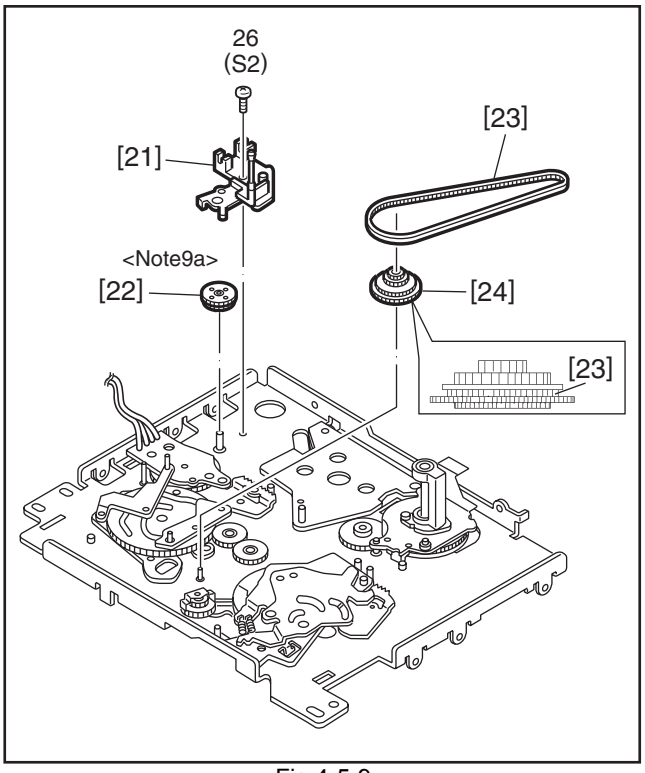
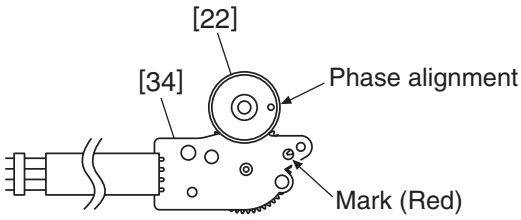


Fig.4-5-9

< Note 9a >:

How to attach the worm wheel 2 [22] .



Align the phase of the rotary encoder assembly [34], then attach it by aligning the phase hole of the mechanism assembly.

Fig.4-5-9a

10. [25] Reel drive pulley assembly / [26] Push plate/ [27] Clutch lock gear (2) / [28] Clutch lock gear (1)

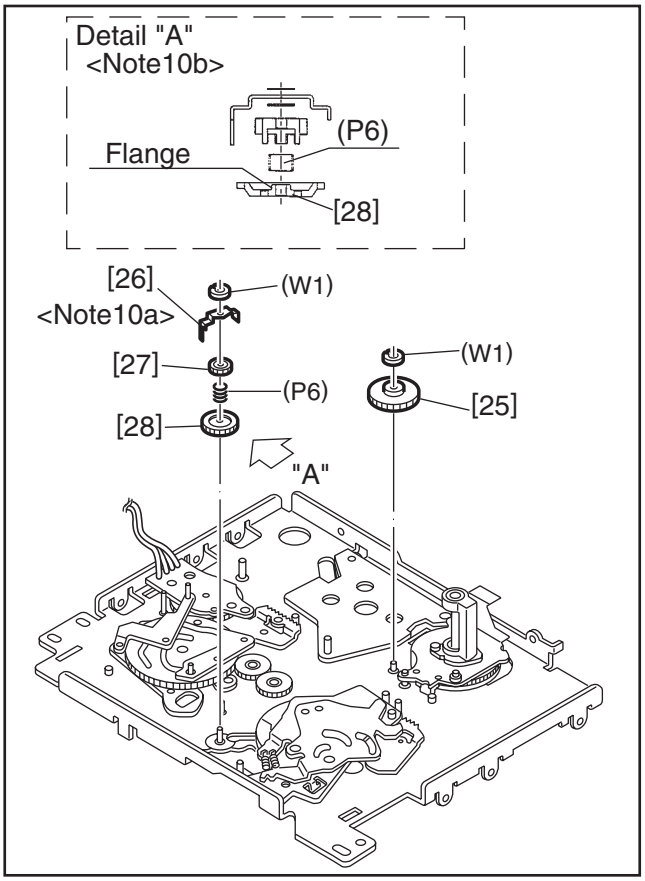


Fig.4-5-10

< Note 10a >:

After attaching (W1), confirm that pushes [26] from the top and hit to MAIN DECK. If there are a rattling or inclination in [26] , reconfirm the attachment of (P6). (Take care to the oblique insertion of (P6).)

< Note 10b >:

Attach (P6) straight for it which does not get on on the flange of [28]

11. [29] Tension control arm assembly/ [30] Brake control arm assembly / [31] Charge arm assembly

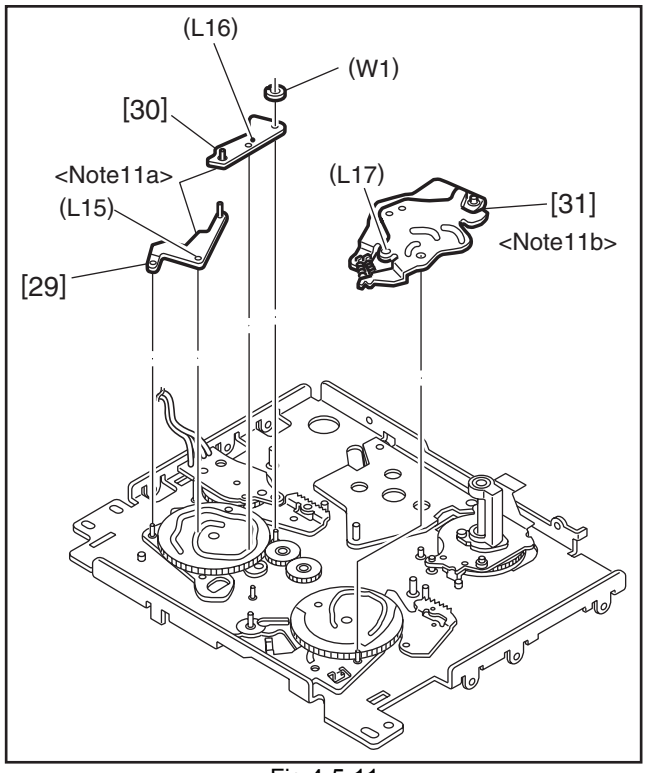


Fig.4-5-11

12. [32] Connect gear 2 / [33] Connect gear 2

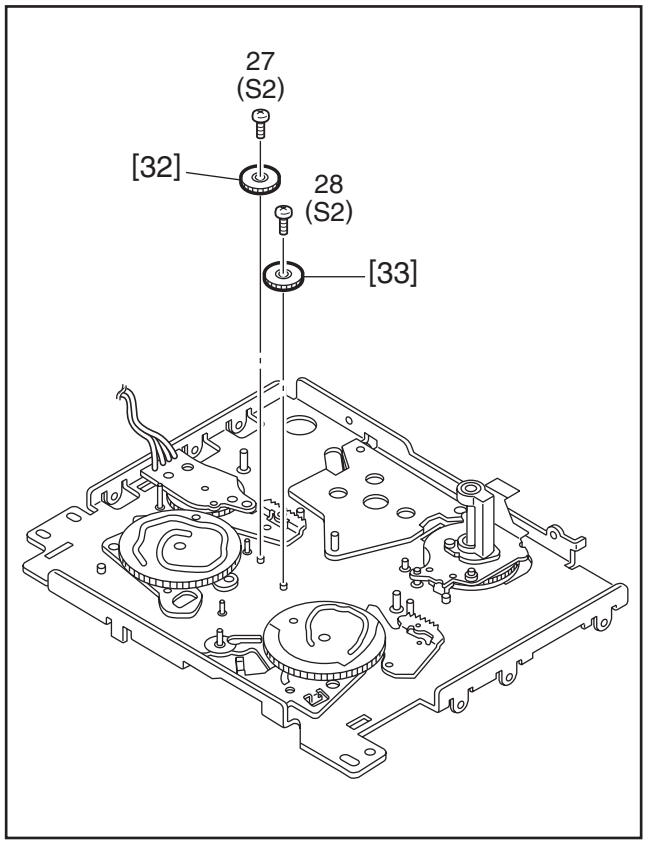
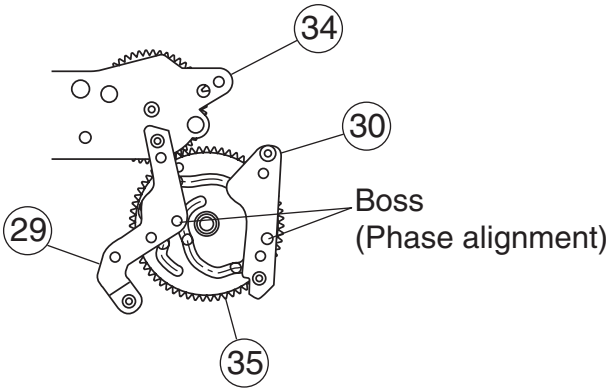


Fig.4-5-12

< Note 11a >:

How to attach the tension control arm assembly [29] / Brake control arm assembly [30] .

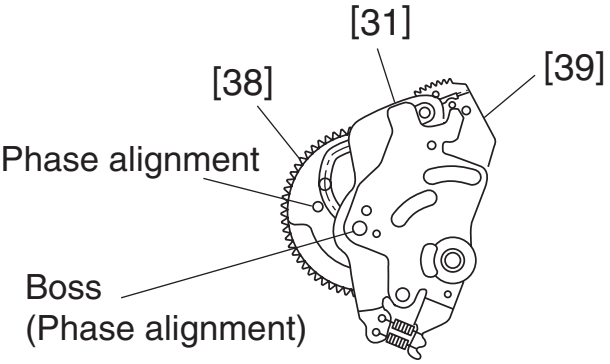


Align the phase of the main cam [35], then attach it by fitting the bosses into the cam slot.

Fig.4-5-11a

< Note 11b >:

How to attach the charge arm assembly [31]



Align the phase of the sub cam [38], then attach it by fitting the boss into the cam slot.

Fig.4-5-11b

13. [34] Rotary encoder assembly / [35] Main cam / [36] Arm gear 1 assembly / [37] Centering arm assembly

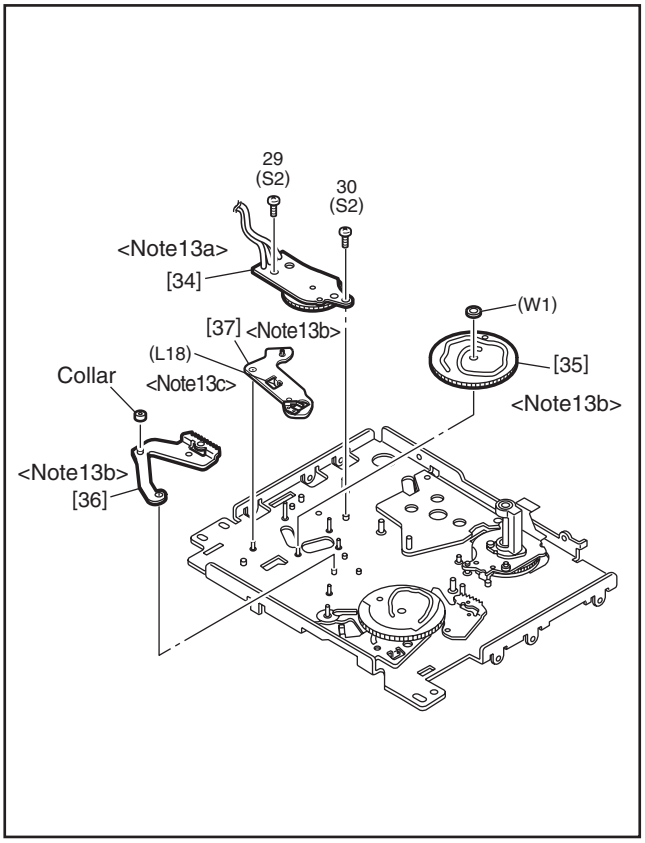
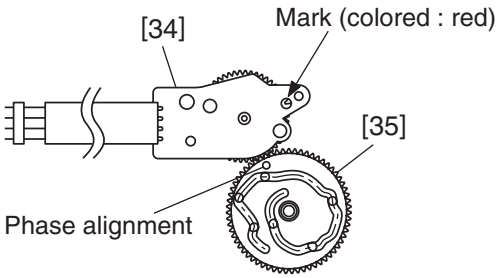


Fig.4-5-13

< Note 13a >:

How to attach the rotary encoder assembly [34].

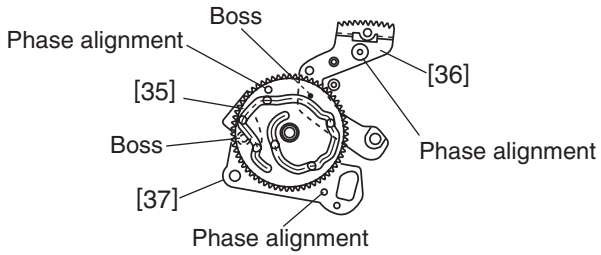


Align the phase of the main cam [35],then attach it by placing the (red) coloured markings (on 2 gear teeth) within the encircled area.

Fig.4-5-13a

< Note 13b >:

How to attach the main cam [35] .



Align the phases of the arm gear 1 assembly [36] and centering arm assembly [37],then attach the arm gear 1 assembly [36]/centering arm assembly [37] by fitting the bosses into the lower cam slot,and fit the slit washer.

Fig.4-5-13b

< Note 13c >:

How to remove the centering arm assembly[37] The center arm assembly is located behind the mechanism assembly when the phase is aligned correctly. The center arm assembly can be removed by displacing it in the direction of the arrow.

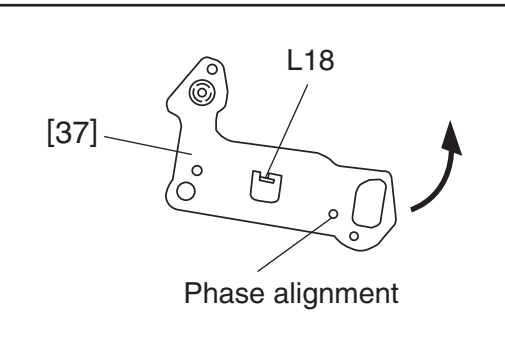


Fig.4-5-13c

14. [38] Sub cam / [39] Arm gear 2 assembly / [40] Clutch lock lever assembly

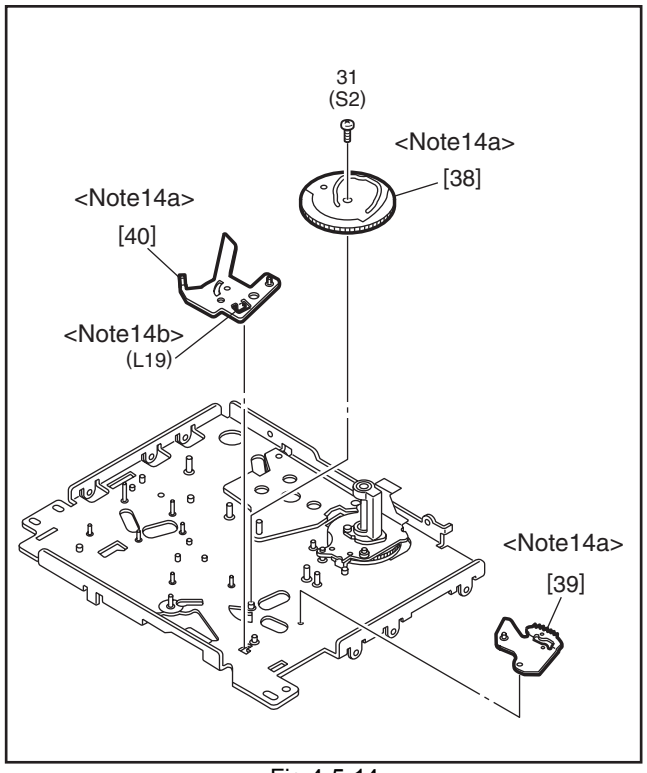
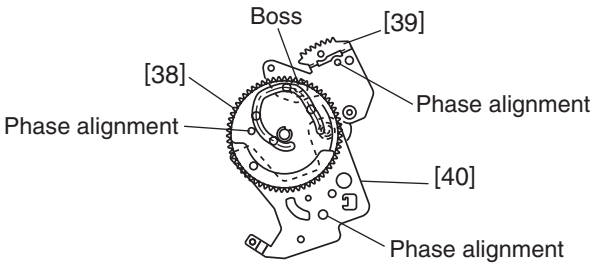


Fig.4-5-14

< Note 14a >:

How to attach the sub cam [38].



Align the phases of the arm gear 2 assembly [39] and clutch lock lever assembly [40],then attach them by fitting the boss into the lower cam slot and tighiten the screws.

Fig.4-5-14a

< Note 14b >:

How to remove the clutch lock lever assembly [40] L19 is located behind the mechanism assembly when the phase is aligned correctly. The clutch lock lever assembly can be removed by displacing it in the direction of the arrow.

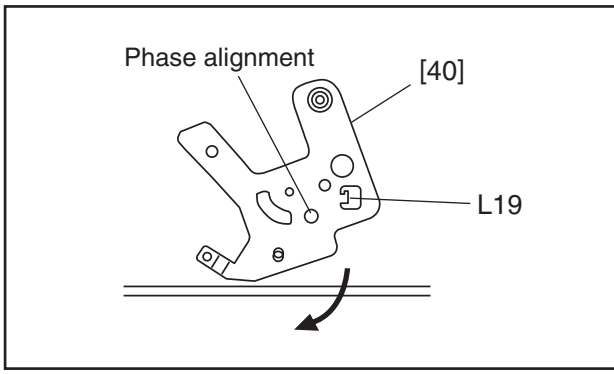


Fig.4-5-14b

15. [41] Capstan motor / [42] Drum base deck

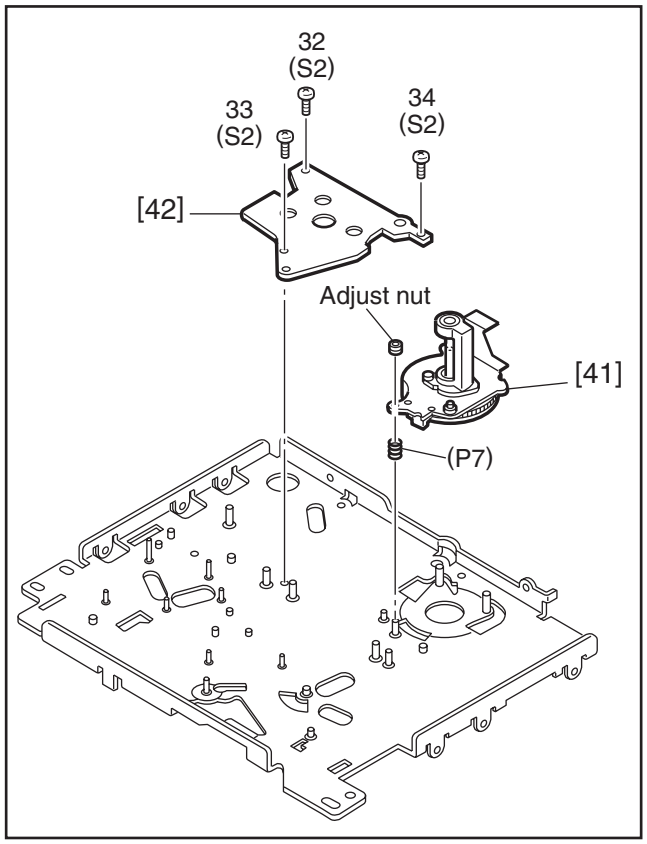


Fig.4-5-15

4.6 List of procedures or disassembly

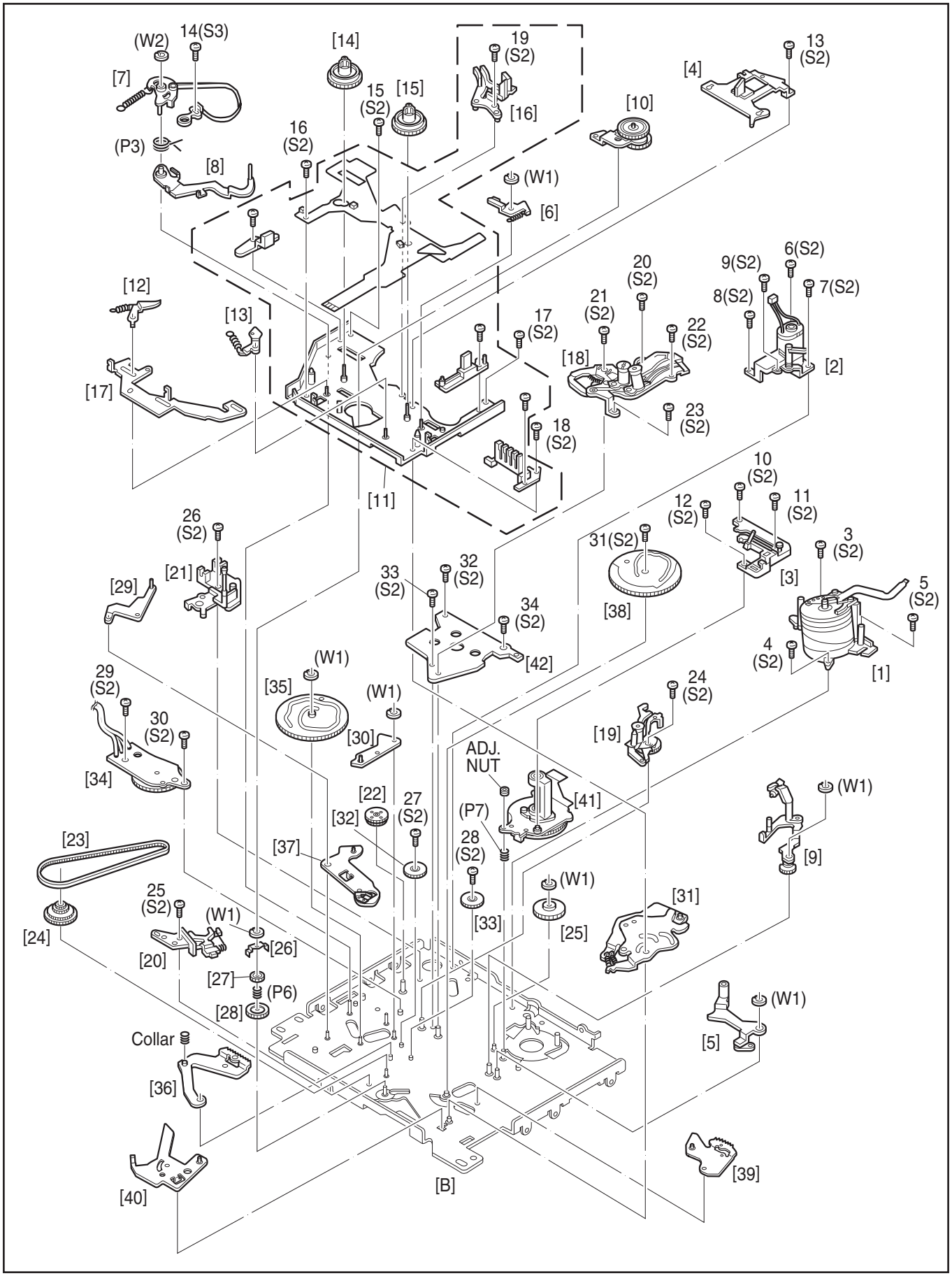


Fig.4-6-1

4.7 Mechanism phase check/adjustment

See Fig 4-7-1.

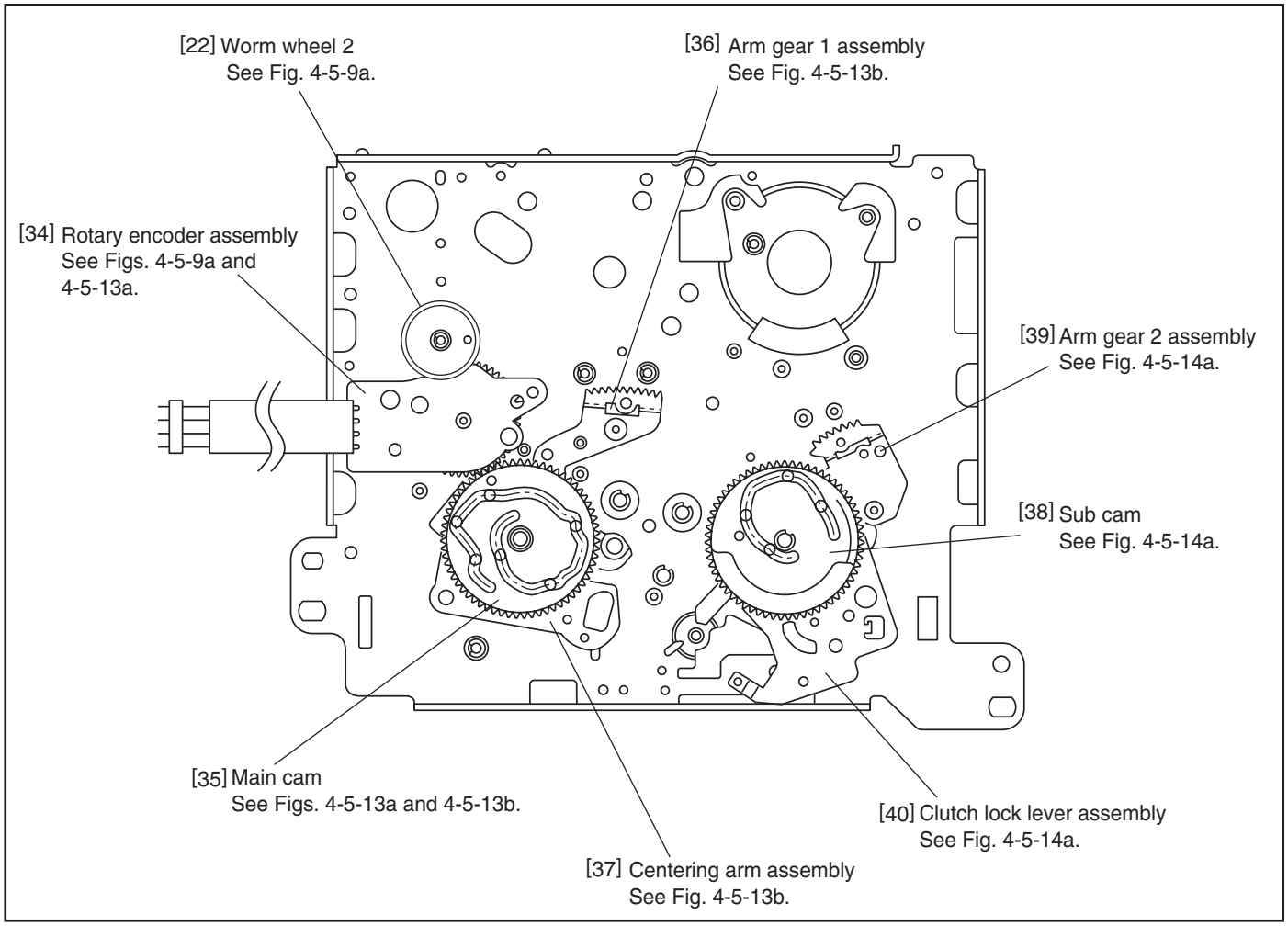
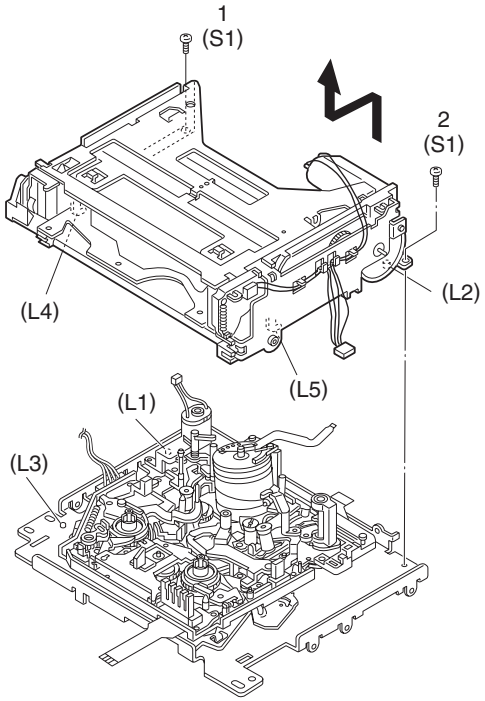


Fig.4-7-1

4.8 Mechanism disassembly/assembly sheet

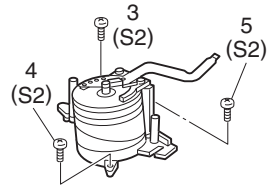
Screw Management Table																			
Fig. No.	[A]		[1]			[2]				[3]			[4]	[7]	[11]				
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Type	S1	S1	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S3	S2	S2	S2	S2
Attachin																		
Ref. Fig.	4-5-1		4-5-2							4-5-3				4-5-4	4-5-6				

[A] Cassette housing assembly



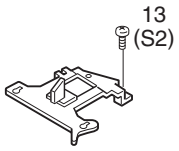
S1×2, L1-L5

[1] Drum assembly



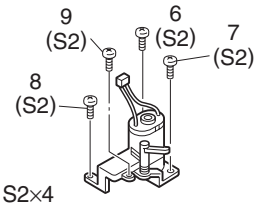
S2×3

[4] Reel cover assembly



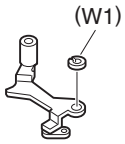
S2, L6×2

[2] Motor bracket assembly



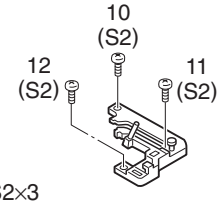
S2×4

[5] Pinch roller arm assembly



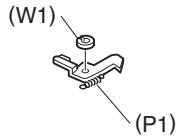
W1, L7

[3] Middle catcher assembly



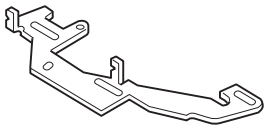
S2×3

[6] Sub brake assembly



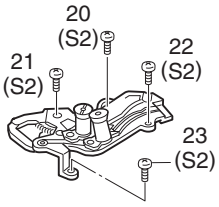
P1, W1, L8

[17] Control plate



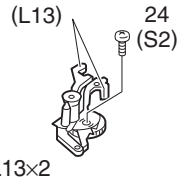
L12×2

[18] Guide rail (Take up) assembly



S2×4

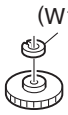
[19] Guide rail (Supply) assembly



S2, L13×2

[24] Center gear assembly

[25] Reel drive pulley assembly

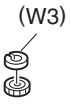


W1

[26] Push plate

W1

[27] Clutch lock gear (2)

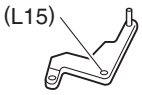


W3

[28] Clutch lock gear (1)

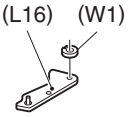
P6

[29] Tension control arm assembly



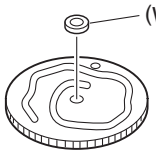
L15

[30] Brake control arm assembly



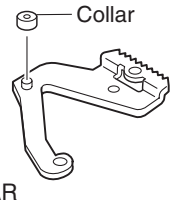
W1, L16

[35] Main cam



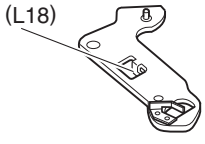
W1

[36] Arm gear 1 assembly



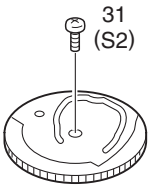
COLLAR

[37] Centering arm assembly



L18

[38] Sub cam

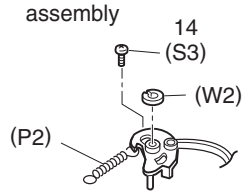


S2

Fig.4-8-1a

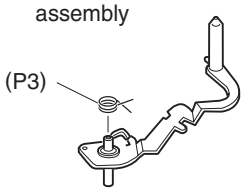
[16]	[18]				[19]	[20]	[21]	[32]	[33]	[34]		[38]	[42]		
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2	S2
4-5-7	4-5-8						4-5-9	4-5-12		4-5-13		4-5-14	4-5-15		

[7] Band arm plate sub assembly



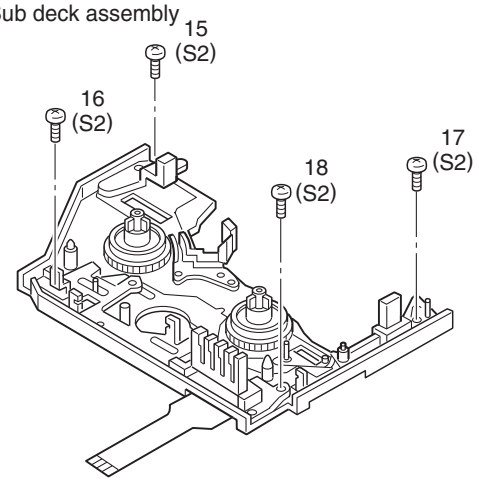
S3, P2, L9, W2

[8] Tension arm sub assembly



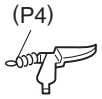
P3

[11] Sub deck assembly



S2×4

[12] Main Brake(Supply) assembly



P4, L10

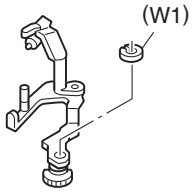
[13] Main Brake(Take up) assembly

P5, L11

[14] Reel disk assembly (Supply)

[15] Reel disk assembly (Take up)

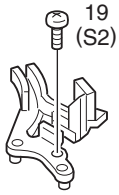
[9] EXIT guide arm assembly



W1

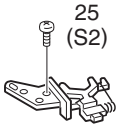
[10] Swing arm assembly

[16] Prism



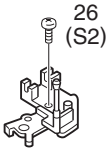
S2

[20] Base plate assembly



S2, L14×2

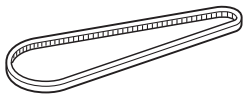
[21] Ent. guide base assembly



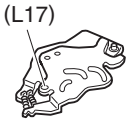
S2

[22] Worm wheel 2

[23] Timing belt

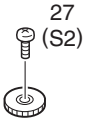


[31] Charge arm assembly



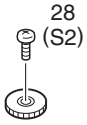
L17

[32] Connect gear 2



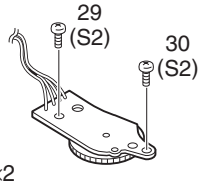
S2

[33] Connect gear 2



S2

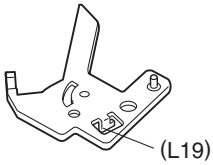
[34] Rotaly encoder assembly



S2×2

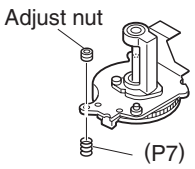
[39] Arm gear 2 assembly

[40] Clutch lock lever assembly



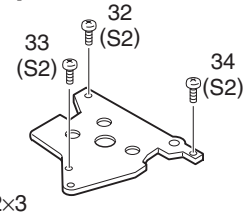
L19

[41] Capstan motor



Adjust nut, P7

[42] Drum base deck



S2×3

Fig.4-8-1b

4.9 Positioning the tension pole

See Fig.4-9-1.

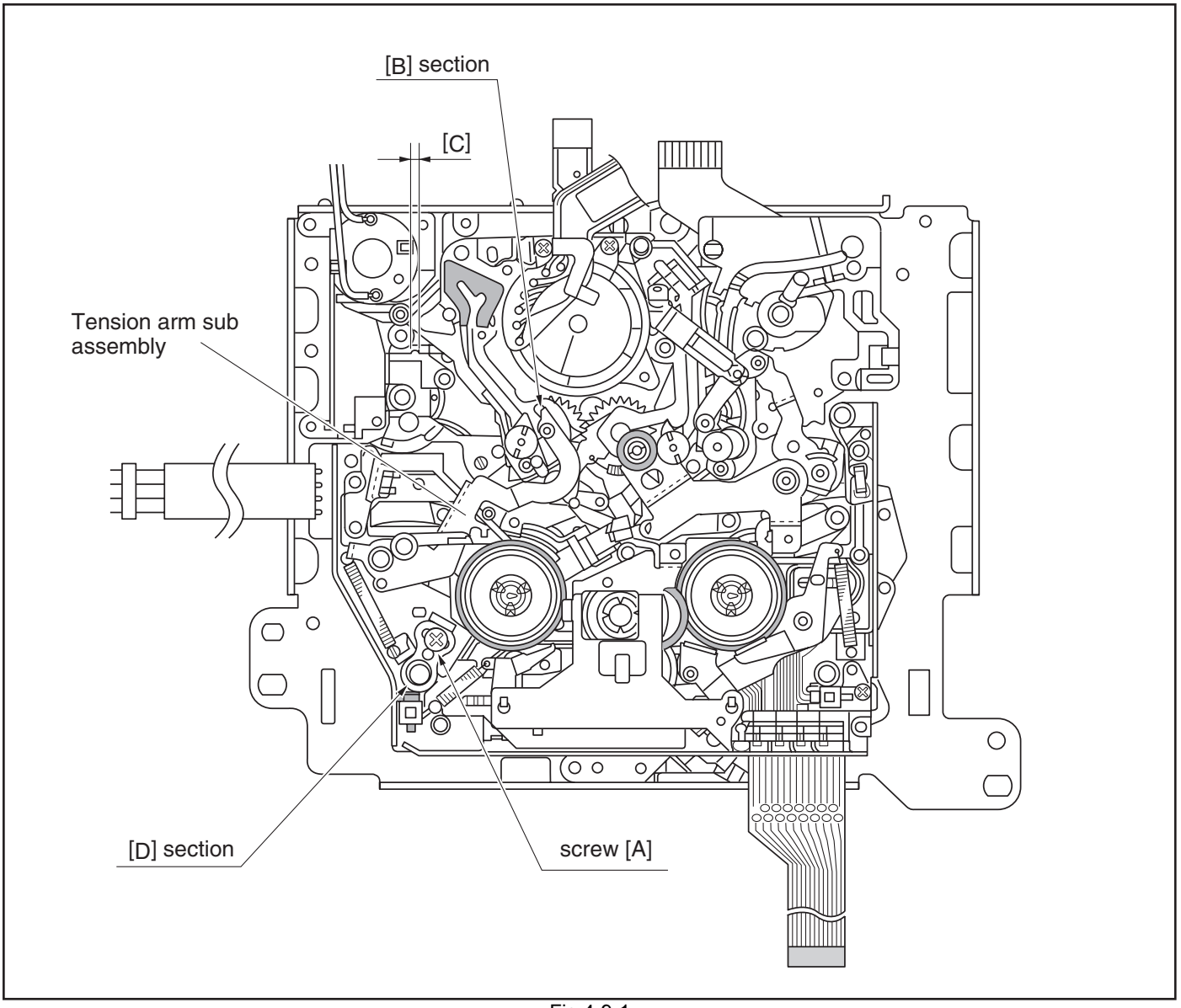


Fig.4-9-1

4.9.1 Adjustment Method

Note:

- Remove the cassette housing assembly in advance.
  (1) Set the mechanism mode to the PLAY mode. (See 4.2.2 Mechanism modes)
  (2) Loosen a screw [A].
  (3) Check the location of the tip (section [B]) of the tension arm assembly to make sure that it is within area [C]. If it is located outside, turn part D to bring it within the specified area.
  (4) Tighten the screw [A].

Note :

Tightening torque for the screw [A] : 0.06 N.m (0.6kgf.cm)

4.10 Compatibility and error rate adjustment

4.10.1 Preparation

Before disassembly and adjustment, back up the data stored in the EEPROM (IC1504 on the DV MAIN board) using the Service Support System Software (SSS software).

Table 4-13-1 shows the important service points for the compatibility and error rate adjustments.

	Linearity adjustment	PB Switching point adjustment	Error rate adjustmenmt
Drum replacement	Required Note 1	Required	Required
Transport part replacement	Required Note 1	Not	Check
Transport part (drum) repair	Required Note 1	Not	Check
IC4001(PRE/REC amp on DV MAIN board) replacement	Not	Not	Check
IC2001(PB. EQ on DV MAIN board) replacement	Not	Not	Required
DV MAIN board replacement Note 2	Not	Required	Required

Table 4-13-1

Note 1 :

- The linearity adjustment is required only after servicing or replacing the drum or the take up/supply guide rail.

Note 2 :

- After replacing the DV MAIN board, write the original data in the EEPROM of the new board. If write communication is not possible, mount the original EEPROM on the new board.

When adjustments of more than one item are required, use the following order for the adjustments.

4.10.3 Linearity adjustment
↓
4.10.4 PB switching point adjustment
↓
4.10.5 Error rate adjustment

4.10.2 Adjustment

The actual adjustment requires the following preparation.

4.10.2.1 Tools required for adjustment

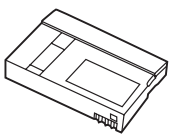
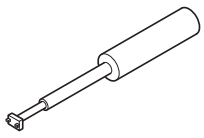
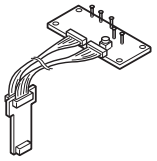
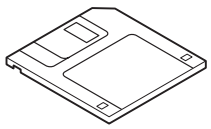
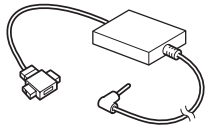
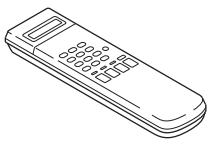
Alignment tape US : MC-1 PAL : MC-2	Guide driver YTU94085	Jig connector cable PTU94018B
		
SSS software PTU94016-5	PC cable US : QAM0099-002 PAL : QAM0099-005	Jig RCU PTU94023B
		

Fig.4-10-1

4.10.2.2 Procedure

(1) Take out the 6 screws, then remove the top cover. (See SECTION 3 DISASSEMBLY)
(2) Connect the jig connector cable to CN2001 on the DV MAIN board.

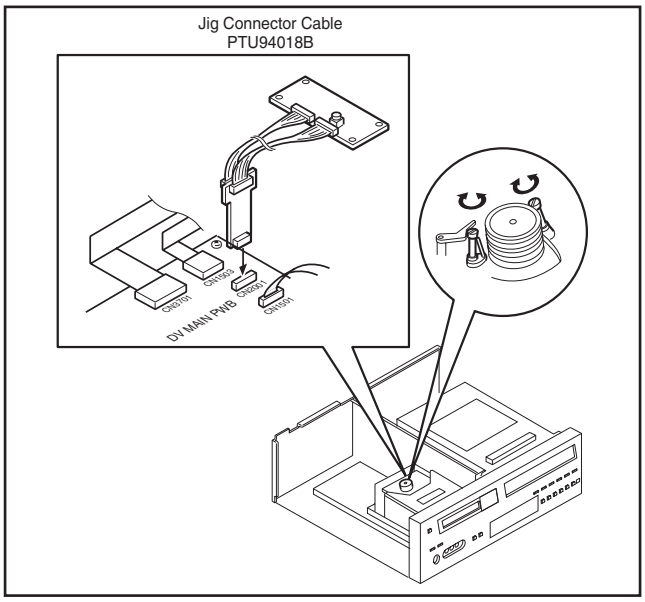


Fig.4-10-2

4.10.2.3 Setup for computer adjustment

-Setup by extending the jig connector-

Connect the Jig Connector Cable and setup the SSS software. It automatically becomes the TCCS mode and "TCCS" is displayed on the FDP.
To cancel the TCCS mode, press the CANCEL button of the remote control unit.
The "TCCS" display on the FDP disappears.

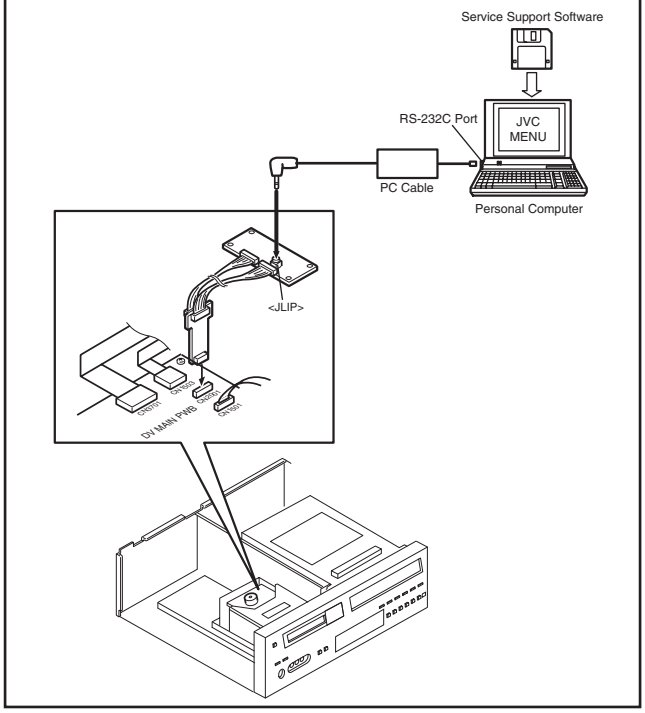


Fig.4-10-3

4.10.3 Linearity adjustment

The following flowchart shows the linearity check/adjustment procedure.

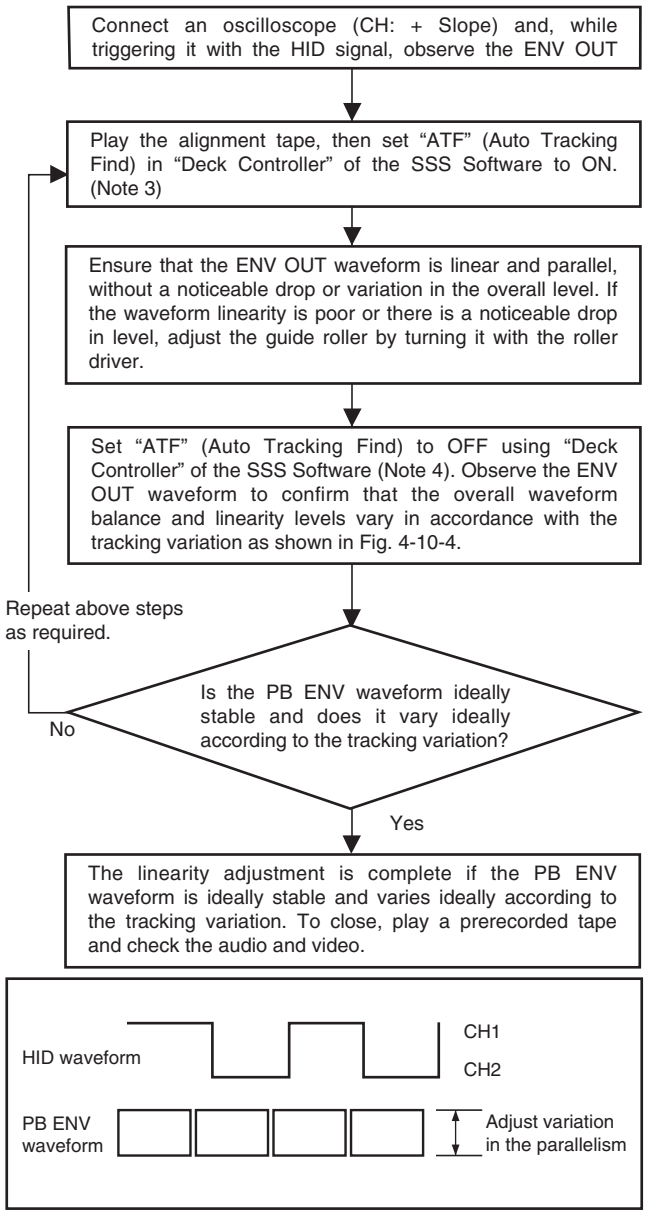


Fig.4-10-4

Note 3 :

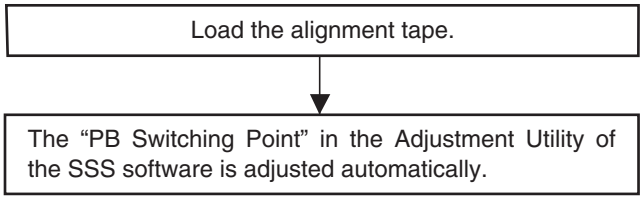
- If ATF is turned off, the DV section performs tracking only of the speed system. Therefore, as time passes, the servo will be lost and the linearity adjustment will become difficult.

Note 4 :

- Since the speed servo function is active when ATF is off, there will be no problem even if the DVC ATF function is off, provided that it is for a few minutes.

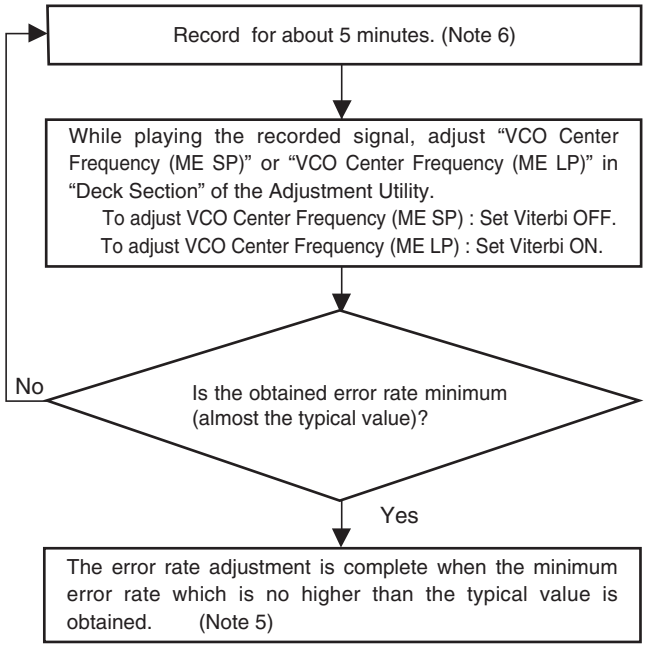
4.10.4 PB switching point adjustment

The following flowchart shows the PB switching point adjustment procedure.



4.10.5 Error rate adjustment

The following flowchart shows the error rate adjustment procedure.



Note 5 :

- The "typical value" refers to the following:CH1 or CH2: < 498 ; with Viterbi OFF. Inter-channel difference: < 10 times between CH1 and CH2.

Note 6 :

- It is desirable to use a brand-new tape or an unused section of tape. This is to assure the adjustment reliability because using a damaged tape increases the error rate.

4.10.6 Error rate measuring method

It is not necessary to use the error rate jig (YTU93083) or a frequency counter. The Service Support System Software displays the error rates of video CH1, CH2 and totals. When measuring the error rate of a channel, be sure to total the values of the video and the audio errors.

4.11 Electrical adjustment (DV SECTION)

4.11.1 Precautions

(1) The DV section of this model is based on a special adjustment method using a PC. However, ordinary adjustment is required only when the part listed below has been replaced. In this case, the adjustment should be performed by a service center equipped with the required facilities.
• **E2 PROM (IC1504 on DV main board)**
In case of trouble with the electrical circuitry, First identify the faulty position with a measuring tool as described below. Proceed to repair, replacement and/or adjustment only after the troubleshooting.

(2) When observing a chip TP, use an IC clip or similar tool to protect the chip against stress. When replacing a chip part (IC, particularly), remove solder completely before replacing. (This is to prevent separation of the pattern.)

(3) The connectors are fragile. Be careful when plugging or unplugging a wire.

4.11.2 Equipment required for adjustment

- Personal computer (Windows compatible)
- Color monitor
- Oscilloscope (2-CH, 100 MHz or more)
- Frequency counter

4.11.3 Tools required for adjustments

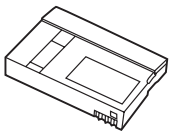
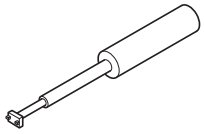
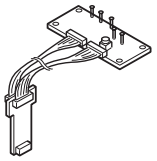
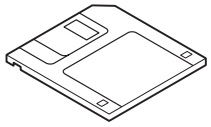
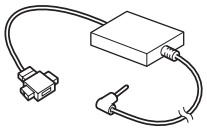
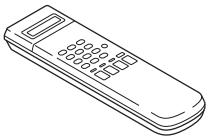
Alignment tape US : MC-1 PAL : MC-2	Guide driver YTU94085	Jig connector cable PTU94018B
		
SSS software PTU94016-5	PC cable US : QAM0099-002 PAL : QAM0099-005	Jig RCU PTU94023B
		

Fig.4-11-1

4.11.4 Setup

1. Setup for computer adjustment

- Setup by extending the jig connector -

-Setup by extending the jig connector-
Connect the Jig Connector Cable and setup the SSS software. It automatically becomes the TCCS mode and "TCCS" is displayed on the FDP.
To cancel the TCCS mode, press the CANCEL button of the remote control unit.
The "TCCS" display on the FDP disappears.

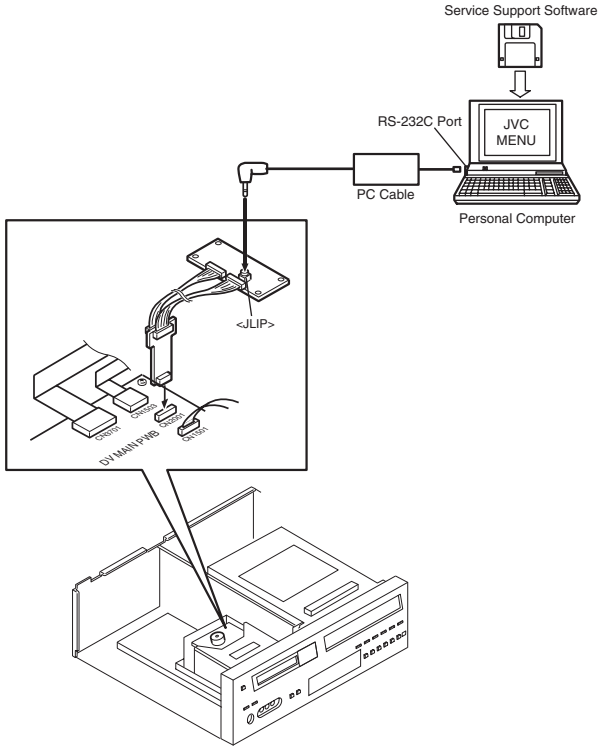


Fig.4-11-2

4.12 Electrical adjustment (DVD SECTION)

Note:

The following adjustment procedures are not only necessary after replacement of consumable mechanical parts or board assemblies, but are also provided as references to be referred to when servicing the electrical circuitry.

In case of trouble with the electrical circuitry, always begin a service by identifying the defective points by using the measuring instruments as described in the following electrical adjustment procedures. After this, proceed to the repair, replacement and/or adjustment. If the required measuring instruments are not available in the field, do not change the adjustment parts (variable resistor, etc.) carelessly.

4.12.1 DVD Video circuit

Note

- **When perform these adjustments, set the unit to DVD mode.(DVD lamp lights up)**

4.12.1.1 EE Composite Y level

Signal	(A)	• Internal colour bar
Mode	(B)	• EE
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• L-1 connector pin19
EVR mode EVR address	(F1) (F2) (F3) (F4) (F5)	• Jig code “43-95” • "ADJUST01 : **" • Jig code “43-21” • Jig code “43-18” or “43-19” (Channel +/-) • Jig code “43-3C”
Specified value	(G)	• 1.00 ± 0.02 Vp-p (terminated)
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Observe the V OUT waveform at the measuring point (D).
(2) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU.
(3) Set the EVR address to (F2) by transmitting the code (F3) from the Jig RCU.
(4) Transmit the code (F4) from the Jig RCU to adjust so that the Y level of the V OUT waveform becomes the specified value (G).
(5) Release the EVR mode of the VCR by transmitting the code (F5) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

Fig.4-12-1 EE composite Y level

4.12.1.2 EE Y level

Signal	(A1) (A2)	• Ext. input • Color (colour) bar signal
Mode	(B)	• EE
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• L-1 connector pin19
EVR mode EVR address	(F1) (F2) (F3) (F4) (F5)	• Jig code “43-95” • "ADJUST02 : **" • Jig code “43-22” • Jig code “43-18” or “43-19” (Channel +/-) • Jig code “43-3C”
Specified value	(G)	• 1.00 ± 0.02 Vp-p (terminated)
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Observe the V OUT waveform at the measuring point (D).
(2) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU.
(3) Set the EVR address to (F2) by transmitting the code (F3) from the Jig RCU.
(4) Transmit the code (F4) from the Jig RCU to adjust so that the Y level of the V OUT waveform becomes the specified value (G).
(5) Release the EVR mode of the VCR by transmitting the code (F5) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

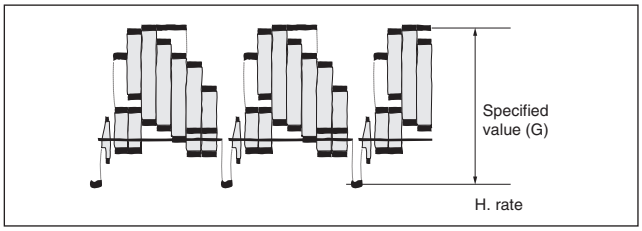


Fig.4-12-2 EE Y level

4.12.1.3 EE composite burst level

Signal	(A)	• Internal colour bar
Mode	(B)	• EE
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• L-1 connector pin19
EVR mode EVR address	(F1) (F2) (F3) (F4) (F5)	• Jig code “43-95” • "ADJUST00 : **" • Jig code “43-20” • Jig code “43-18” or “43-19” (Channel +/-) • Jig code “43-3C”
Specified value	(G)	• 0.30 ± 0.01 Vp-p (terminated)
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Observe the V OUT waveform at the measuring point (D).
(2) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU.
(3) Set the EVR address to (F2) by transmitting the code (F3) from the Jig RCU.
(4) Transmit the code (F4) from the Jig RCU to adjust so that the burst level of the V OUT waveform becomes the specified value (G).
(5) Release the EVR mode of the VCR by transmitting the code (F5) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

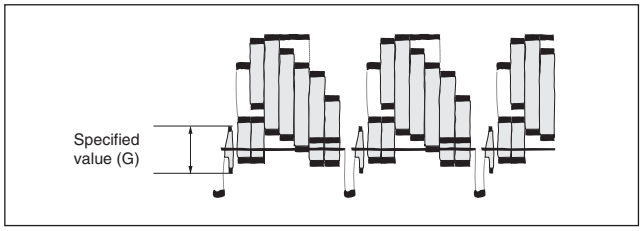


Fig.4-12-3 EE composite burst level

4.12.1.4 EE R/G/B level

Signal	(A)	• Internal colour bar
Mode	(B)	• EE
Equipment	(C)	• Oscilloscope
Measuring point	(D1) (D2) (D3)	• L-1 connector pin15(R) • L-1 connector pin11(G) • L-1 connector pin7(B)
EVR mode EVR address	(F1) (F2) (F3) (F4) (F5)	• Jig code “43-95” • "ADJUST05 : **" • Jig code “43-25” • Jig code “43-18” or “43-19” (Channel +/-) • Jig code “43-3C”
Specified value	(G)	• 0.70 ± 0.02 Vp-p (terminated)
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Observe the R OUT waveform at the measuring point (D1).
(2) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU.
(3) Set the EVR address to (F2) by transmitting the code (F3) from the Jig RCU.
(4) Transmit the code (F4) from the Jig RCU to adjust so that the R level of the R OUT waveform becomes the specified value (G).
(5) Release the EVR mode of the VCR by transmitting the code (F5) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)
(6) Observe the G OUT waveform at the measuring point (D2).
(7) Repeat steps (2) to (5) above.
(8) Observe the B OUT waveform at the measuring point (D3).
(9) Repeat steps (2) to (5) above.

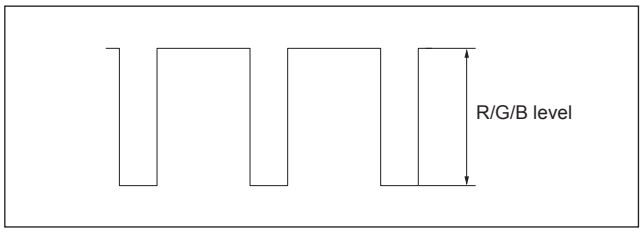


Fig.4-12-4 EE R/G/B level

4.12.1.5 EE COMPONENT PB/CB level

Signal	(A)	• Internal colour bar
Mode	(B)	• EE
Equipment	(C)	• Oscilloscope
Measuring point	(D)	• COMPONENT PB/CB terminal
EVR mode EVR address	(F1) (F2) (F3) (F4) (F5)	• Jig code “43-95” • "ADJUST06 : **" • Jig code “43-26” • Jig code “43-18” or “43-19” (Channel +/-) • Jig code “43-3C”
Specified value	(G)	• 0.70 ± 0.02 Vp-p (terminated)
Adjustment tool	(H)	• Jig RCU [PTU94023B]

(1) Observe the CB OUT waveform at the measuring point (D).
(2) Set the VCR to the EVR mode by transmitting the code (F1) from the Jig RCU.
(3) Set the EVR address to (F2) by transmitting the code (F3) from the Jig RCU.
(4) Transmit the code (F4) from the Jig RCU to adjust so that the CB level of the CB OUT waveform becomes the specified value (G).
(5) Release the EVR mode of the VCR by transmitting the code (F5) from the Jig RCU again. (When the EVR mode is released, the adjusted data is memorized.)

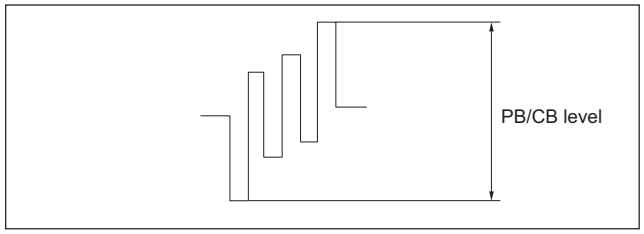


Fig.4-12-5 EE component PB/CB level

4.12.2 Syscon circuit

4.12.2.1 Timer clock

Signal	(A)	• No signal
Mode	(B)	• EE
Equipment	(C)	• Frequency counter
Measuring point	(D1) (D2) (D3)	• IC3001 pin 61 • IC3001 pin 17 • C3026 + and -
Adjustment part	(F)	• C3025 (TIMER CLOCK)
Specified value	(G)	• 1024.008 ± 0.01 Hz (976.5549 ± 0.0010 usec)

(1) Connect the frequency counter to the measuring point (D1).
(2) Connect the short wire between the short point (D2) and Vcc (5V).
(3) Short the leads of capacitor (D3) once in order to reset the microprocessor of the Syscon.
(4) Disconnect the short wire between the short point (D2) and Vcc then connect it again.
(5) Adjust the Adjustment part (F) so that the output frequency becomes the specified value (G).

SECTION 5
TROUBLESHOOTING

5.1 Manually removing the cassette tape

If a loaded cassette tape cannot be ejected due to a failure in the electrical circuitry, take the cassette tape out using the following procedure. However, this method consists of a forced driving of the loading motor. Therefore, the following description assumes that there is no trouble in the mechanism operations.

(1) Unplug the power plug from the power outlet, then remove the top cover.

(2) Apply 3 V DC to the electrodes (Red wire: + pole. Brown wire: - pole) on the upper part of the loading motor to perform the unloading operation so that the pole base assemblies are returned on the inner side of the tape. At this time, the exit guide arm assembly should return toward the drum assembly and the mechanism should enter the C-IN mode. As the tape is left without winding, be careful not to damage the tape or leave grease on it.

(3) If the tape is slack, wind it up by turning the shaft on the top-side of the capstan motor in the direction of the arrow using a pointed tool (chip IC replacement jig).This operation may be difficult because the shaft is located below the housing motor of the cassette housing assembly. Be careful not to damage parts during it.

(4) After confirming that the tape is fully wound up, take out the cassette tape by turning the gear of the cassette housing assembly in the direction of the arrow.

Note :

- After ejecting the tape, check that grease or similar foreign material is not attached to the wound tape. Also perform similar checking for the mechanism assembly, particularly the tape transport system.

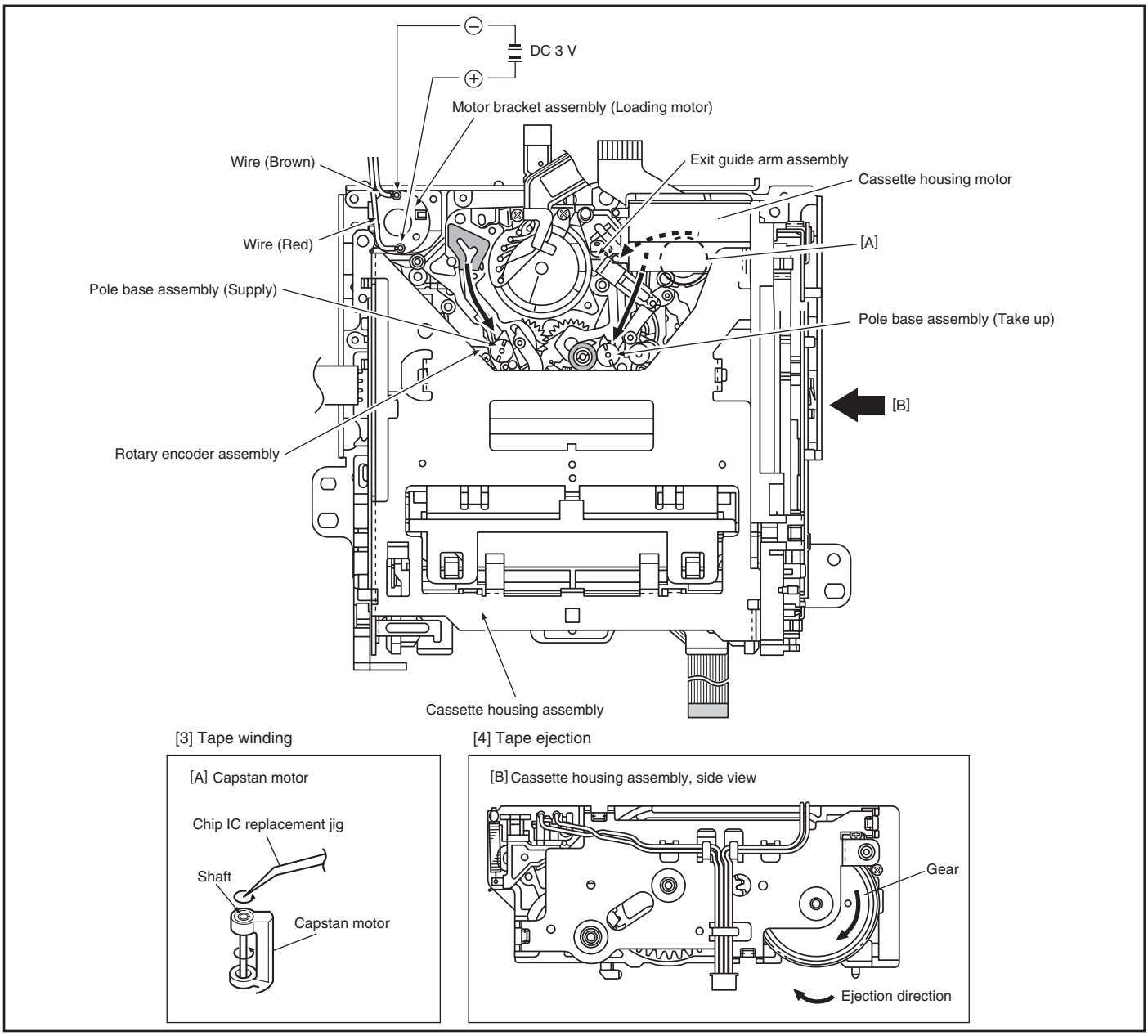


Fig.5-1a

5.2 Manually removing the disk(DVD/CD)

If you cannot remove the disk which is loaded because of any electrical or mechanical failures, manually remove it by taking the following steps.

5.2.1 Method 1

(1) AC Plug is pulled out at once and inserted again.
(2) It is displayed on FDP as "LOADING", and while it blinks, pushing the OPEN/CLOSE button is continued.
(3) After a while, a tray opens (About 20 seconds).
(4) After removed a disk, press the OPEN/CLOSE button again to close the tray.
(5) The "LOADING" blink display of FDP disappears and it will be in a standby mode.
(6) If the POWER button is pushed, it will usually be operating.

5.2.2 Method 2

(1) Unplug the ACpower cord from the AC outlet.
(2) Remove the top cover and front panel assembly.
(Refer to the disassembly procedure and perform the disassembly of the major parts before removing)
(3) Pass a thin wire through a hole in the DVD unit.
(4) The disc tray comes out slightly. Take out the disc tray manually.(See Fig.5-2a)

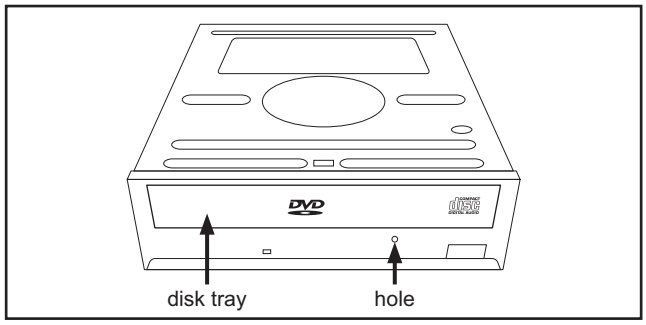


Fig.5-2a

5.3 Emergency display function (DV SECTION)

This unit saves details of the last emergency as the EMG history and allows the status of the unit and the mechanism each emergency to be shown both on the display and as OSD information. When using the emergency function, it is required to set the unit to the Jig RCU mode.

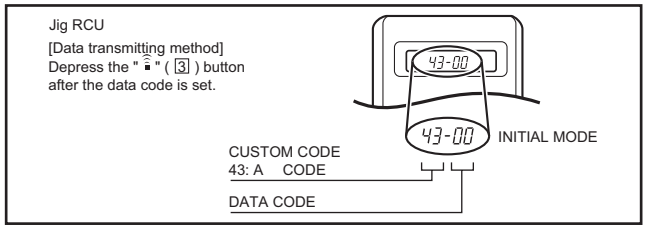


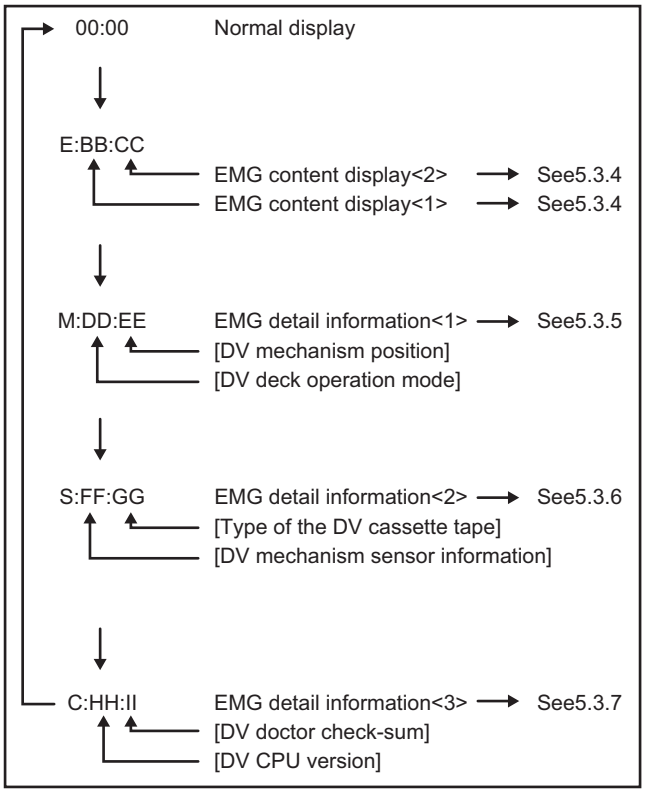
Fig.5-3a Jig RCU [PTU94023B]

5.3.1 Displaying the EMG information

The EMG detail of information can be displayed by transmitting the code "43-59" from the Jig RCU.

Note:

- **Press DV/HDD/DVD on the unit repeatedly or DV on the remote so that the DV lamp lights up on the unit.**
- **The EMG detail information < 1 >< 2 > show the information on the latest EMG.**
It becomes " - - : - - : - - " when there is no latest EMG record.



EMG display of FDP display mode

(1) Transmit the code “43-59” from the Jig RCU.
The FDP shows the EMG content in the form of “E:**:**”.

<Example 1> E : 00 : 80
EMG content display(2)
EMG content display(1)

<Example 2> E : - - : - - ← No EMG record

(2) Transmit the code "43-59" from the Jig RCU again.
The FDP shows the EMG detail information < 1 > in the form of "DD" and "EE".
DD : DV deck operation mode at the moment of EMG
EE : DV mechanism mode position at the moment of EMG

(3) Transmit the code "43-59" from the Jig RCU once again.
The FDP shows the EMG detail information < 2 > in the form of "FF" and "GG".
FF : DV mechanism sensor information
GG: Type of the DV cassette tape

(4) Transmit the code "43-59" from the Jig RCU once again.
The FDP shows the EMG detail information < 3 > in the form of "HH" and "II".
HH : DV CPU version information
II : DV doctor check-sum

(5) Transmit the code “43-59” from the Jig RCU once again to reset the display.

5.3.2 Clearing the EMG history

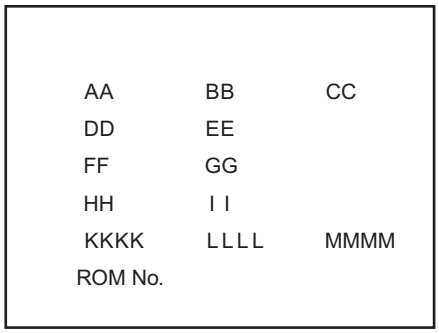
(1) Display the EMG history.
(2) Transmit the code “43-36” from the Jig RCU.
(3) Reset the EMG display.

5.3.3 Details of the OSD display in the EMG display mode

During the EMG display, the OSD shows the data on the deck mode, etc. The details of the display contents are as follows.

Notes:

- **The sensor information in the OSD display contents is partially different from the mechanism sensor information in EMG detail information < 1 >.**



AA : Key code (JVC code)
BB : EMG content display < 1 >
CC : EMG content display < 2 >
DD : DV deck operation mode (See EMG detail information < 1 >)
EE : DV mechanism position (See EMG detail information < 1 >)
FF : Dv mechanism sensor information (See EMG detail information < 2 >)
GG : Type of DV cassette tape (See EMG detail information < 2 >)
HH : DV CPU version
I I : DV doctor check-sum
KKKK : General data display area
LLLL : General data display area
MMMM : General data display area

5.3.4 EMG content description

5.3.4.1 EMG content display < 1 >(BB)

FDP DISPLAY	EMG MODE	CONTENT	CAUSE
E : 41 : 00	Mechanism Mode Transition Failure (Loading)	If the mechanism mode does not change to the next mode within 4 seconds after the loading motor starts rotating in the loading direction, [E : 41 : 00] is identified and the power is switched OFF.	1. The mechanism is locked in the middle of the mode transition. 2. The mechanism overruns the encoder position during the mode transition, and is locked at the mechanism loading end. 3. Power is not supplied to the loading MDA.
E : 42 : 00	Mechanism Mode Transition Failure (Unloading)	If the mechanism mode does not change to the next mode within 4 seconds after the loading motor starts rotating in the unloading direction, [E : 42 : 00] is identified and the power is switched OFF.	1. The mechanism is locked in the middle of the mode transition. 2. The mechanism overruns the encoder position during the mode transition, and is locked at the mechanism loading end. 3. Power is not supplied to the loading MDA.
E : 04 : 00	Take Up Reel FG	When the take-up reel pulse has not been generated for more than 3 seconds in the capstan rotating mode,[E : 04 : 00] is identified, the pinch rollers are turned off and stopped, and the power is turned off.	1. The take-up reel pulse is not generated in the FWD transport modes (PLAY/FWD SEARCH/FF, etc.) because; 1) The idler gear is not meshed with the take-up reel gear. 2) The idler gear is meshed with the take-up reel gear, but incapable of winding due to t
E : 08 : 00	Supply Reel FG	When the supply reel pulse has not been generated for more than 3 seconds in the capstan rotating mode, [E : 08 : 00] is identified and the pinch rollers are turned off and stopped, and the power is turned off.	1. The supply reel pulse is not generated in the FWD transport mode (PLAY/FWD SEARCH/FF,etc.) because; 1) A cassette with broken tape is inserted, and PLAY/FWD SEARCH/FF are carried out. 2) A mechanical factor caused tape slack inside/ outside the supply
E : 10 : 00	Drum FG	When the drum FG pulse has not been input for more than 4 seconds in the drum rotating mode, [E : 10 : 00] is identified, the pinch rollers are turned off and stopped, and the power is turned off.	1. The drum could not start or the drum rotation has stopped due to too large load on the tape, because; 1) The tape tension is abnormally high. 2) The tape is damaged or a foreign object (grease, etc.) adheres to the tape. 2. The drum FG pulse did not re
E : 20 : 00	Capstan FG	When the capstan FG pulse has not been generated for more than 2 seconds in the capstan rotating mode, [E : 20 : 00] is identified, the pinch rollers are turned off and stopped.	1. The capstan could not start or the capstan rotation has stopped due to too large load on the tape, because; 1) The tape tension is abnormally high (mechanical lock); 2) The tape is damaged or a foreign object (grease, etc.) is adhered to the tape (occu

5.3.4.2 EMG content display < 2 >(CC)

FDP DISPLAY	EMG MODE	CONTENT	CAUSE
E : 00 : A0	Housing Motor Operation Failure (Cassette ejection)	If the operation has not been completed 3 seconds after the cassette housing started the cassette ejection operation, [E : 00 : A0] is identified, the cassette is taken in, and the mode is switched to STOP the pinch roller OFF.	1. The cassette cannot be ejected due to a failure in the drive mechanism of the housing. 2. When the housing load increases during ejection, the loading motor is stopped because of lack of headroom in its drive torque. Housing load increasing facto
E : 00 : C0	Housing Motor Operation Failure (Cassette insertion)	If the operation has not been completed 3 seconds after the cassette insertion, [E : 00 : C0]n is identified, and the cassette is ejected.	1. The cassette cannot be ejected due to a failure in the drive mechanism of the housing. 2. When the housing load increases during ejection, the loading motor is stopped because of lack of headroom in its drive torque. Housing load increasing facto

5.3.5 EMG detail information < 1 >

The status (electrical operation mode) of the unit and the status (mechanism operation mode/mechanism position) of the mechanism in the latest EMG can be confirmed based on the figure in EMG detail information < 1 > .

[FDP/OSD display] (DD, EE)

DD : DV deck operation mode at the moment of EMG

EE : DV mechanism position at the moment of EMG

DD : DV deck operation mode

Display	Deck operation mode	Display	Deck operation mode
00	UNLOADING STOP	1a	POWER OFF
01	CASSETTE EJECT	1b	REC LOCK
02	LOADING STOP	1c	1ST REC
03	PLAY (Normal playback)	1d	LOCK
04	STILL	1e	REC
05	FF	3a	POWER OFF REQUEST
06	REW	5a	POWER OFF REQUEST2
07	SEARCH FWD	aa	WAIT
08	SEARCH REWIND	ba	NO DATA
09	FWD SLOW	7F	FWD SEARCH(high speed)
0a	REV SLOW	6F	FWD SEARCH(middle speed)
0b	AUDIO DUB	5F	FWD SEARCH(low speed)
0c	AUDIO DUB PAUSE	4F	FWD PLAY
0d	RETAKE FF	3F	FWD LINEAR SLOW
0e	RETAKE REW	2F	FWD INTERMITTENT SLOW
10	REHEARSAL UNLOADING STOP	1F	FWD FRAME ADVANCE
11	REHEARSAL EJECT	0F	STILL
12	REHEARSAL LOADING STOP	FF	REV FRAME ADVANCE
13	REC	EF	REV INTERMITTENT SLOW
14	REC PAUSE	DF	REV LINEAR SLOW
15	DV REC	CF	REV PLAY
16	DV REC PAUSE	BF	REV SEARCH(low speed)
17	VIDEO INSERT	AF	REV SEARCH(middle speed)
18	VIDEO INSERT PAUSE	9F	REV SEARCH(high speed)
19	SOFT PAUSE		

EE : DV mechanism position

Display	DV mechanism position	Display	DV mechanism position
0	Cassette being inserted	8	Capstan REV
1	Intermodal position	9	Intermodal position
2	Short FF	0A	Stop
3	Intermodal position	0B	Intermodal position
4	Loading end	0C	FF/REW
5	Intermodal position	0D	Intermodal position
6	Capstan FWD	0E	Mechanism being initialized
7	Intermodal position		

5.3.6 EMG detail information < 2 >

FF : DV mechanism sensor information

Display	DV mechanism sensor information	Display	DV mechanism sensor information
bit7	Tape end	bit3	Tape ID detect
bit6	Tape start	bit2	Tape exist
bit5	Rec safety switch		

Note:

The display of DV mechanism sensor information differs according to the operation mode.

GG : Type of DV cassette tape (bit3, bit2)

Display	DV mechanism sensor information	Display	DV mechanism sensor information
00	MP type	10	Not used
01	Cleaning tape	11	ME type

5.3.7 EMG detail information < 3 >

HH : DV CPU version

DV SYSCON CPU version is displayed.

II : DV doctor check-sum

It is not usually used.

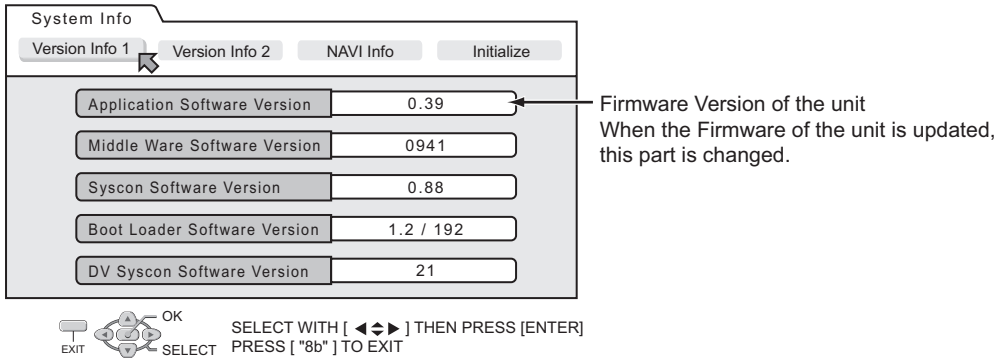
5.4 Display function of DVD section

5.4.1 Displaying SYSTEM INFO

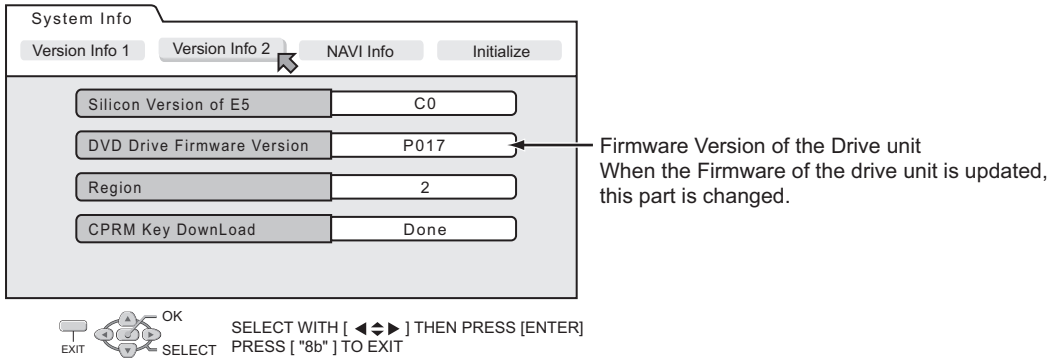
SYSTEM INFO contains information on firmware version of the unit and the mechanism drive, and an initialize execution menu.

(1) Set the unit to the Jig RCU mode.
(2) Press DV/HDD/DVD SELECT button on the unit repeatedly so that the HDD lamp lights up on the unit.
(3) Transmit "43-8b" from the Jig RCU.
(4) SYSTEM INFORMATION menu is displayed in the screen.
(5) To move cursor in SYSTEM INFO, use the " ▲", "▼ ", "◀ ", and "▶ " buttons of a remote control unit attached to product.
(6) To quit the SYSTEM INFO menu, transmit "43-8b" from the Jig RCU..
(7) Cancel Jig RCU mode.

The example of a display **< Version Info 1 >**



The example of a display **< Version Info 2 >**



NOTE:

Items other than the ones described above are not used in service work.

5.4.2 Updating the firmware of the unit

- Firmware update disc supports CD-R media.
- When firmware update is necessary, information is available from the homepage of DIGITAL VIDEO STORAGE CATEGORY, CS group.

5.4.2.1 Creating an update disc

Please check the details of the update disc creation method by JS-NET.

(1) Down load the update file from JS-NET.
(2) Write the update file into CD-R. Pay attention in the following points when writing the update disc.

- Make sure to write in “Disc at Once”.
- Set the file compatibility to “ISO9660 format”. (ROMEO, JOLIET are disapproved.)
  If the writing method is not correct, the update results in an error.

5.4.2.2 Update procedure

- There are two methods of updating firmware, using JIG RCU mode < method 1 > or not using JIG mode(User update mode) < method 2 >.
  Updating can be operated in either method.

< Method 1 >

(1) Set to the Jig RCU mode.
(2) Press DV/HDD/DVD SELECT button on the unit repeatedly so that the DVD lamp lights up on the unit.
(3) Load the update disc on the tray, and then close the tray.
(4) When the disc reading operation is completed, transmit “43-70” with the Jig remote control unit.
If the update disc is not correct, FDP indicator displays an “ERROR” after transmitting “43-70”. Transmit “43-70” once and make the FDP indicator to normal display, and then reload the disc then transmit “43-70” again.
(5) “UPDATE” is displayed in the FDP indicator, and the FDP indicator changes to “UPDATE” afterwards. It takes approx. 2 minutes for the change.
(6) Remove the disc as the tray is ejected, and then transmit “43-70” with the Jig remote control unit. Then the FDP indicator changes from “UPDATE” to the normal display.
(7) Close the tray and turn the unit OFF. Pull out the power code from the wall socket, then plug the power cord into the wall socket again.
(8) When “LOADING” in the FDP indicator disappears, turn the unit ON.
(9) Display the SYSTEM INFO menu, and check the version of the firmware.
(10) Cancel the Jig RCU mode.

< Method 2 >

(1) Turn the power ON. Load the update disc on the tray and close the tray.
(2) When the disc reading operation is completed, turn the power OFF.
(3) Keep pressing the “PAUSE” button and the “POWER” button at the same time. (Until FDP indicator changes to “UPDATE”).
(4) In approx. 2 minutes the tray is ejected. Remove the disc and close the tray.
(5) Reset operation is carried out automatically, and it becomes standby condition.
(6) Then, display the SYSTEM INFO menu in the Jig RCU mode and check the version.

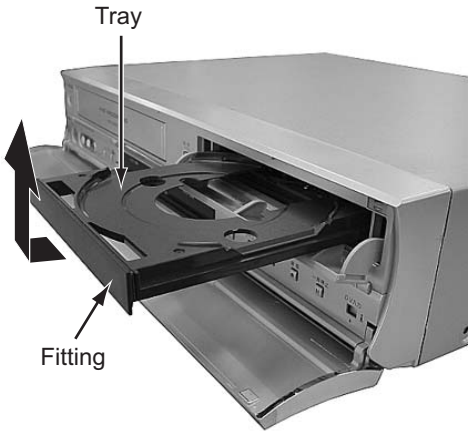
5.4.3 Updating the firmware of the drive unit

- Firmware update disc supports only DVD-RAM media.
- When firmware update is necessary, written discs are distributed by DIGITAL VIDEO STORAGE CATEGORY, CS group.

(1) Turn the unit ON.
(2) Press DV/HDD/DVD SELECT button on the unit repeatedly so that the DVD lamp lights up on the unit.
(3) Load the update DVD-RAM disc on the tray and close the tray.
(4) “READING” is displayed in the FDP indicator and the update is started.
(5) In a short while “READING” in the FDP indicator disappears, open the tray to remove the disc and close the tray.
(6) Turn the power OFF and pull out the power code from the wall socket, then plug the power cord into the wall socket again.
(7) Set to the Jig RCU mode and check the firmware version of the drive.

5.4.4 Exchanging the fitting

As the fitting that comes with the service drive unit cannot be used, make sure to attach a service fitting when the drive unit is exchanged. The fitting that is removed from the old drive unit can be attached to the new drive unit.
The fitting can be removed by pulling upwards while opening out the lower part of the fitting outwards.



5.4.5 Initialization to the factory shipment state

When the initialization is operated, internal information changes as follows. It is essential to obtain the client's permission before the operation.

- All DVD library is all deleted.
- All the DVD initial settings go back to the initial status.
  (1) Set to the Jig RCU mode.
  (2) Press DV/HDD/DVD SELECT button on the unit repeatedly so that the DVD lamp lights up on the unit.
  (3) Transmit "43-6F" with the Jig remote control unit.
  (4) FDP indicator displays "FACTORY", and changes to "CHECK OK" after blinking for a short while.
  (5) Pull out the power code from the wall socket.
  (6) The Jig RCU mode is forced to cancel at the same time with the initialization, check whether the Jig RCU mode is canceled by plugging the power code into the wall socket again. (The colon ":" in time display should be continuously ON, not blinking.)
  If the Jig RCU mode is not canceled, transmit "43-9D" with Jig remote control unit to cancel the Jig RCU mode.

5.4.6 Setting after the drive unit replacement

When the drive unit is replaced, it is necessary to set a region code. Service drive units for replacement are not set for any region code, and they are in an indefinite condition.
Make sure to set region code after attaching the drive unit to the unit.
Without the setting of the region code, discs that have regions cannot be played back.

5.4.6.1 Creating a region setting disc.

Please check the details of the region setting disc creation method by JS-NET.

(1) Download the region setting file from JS-NET.
(2) Write the region setting file into CD-R. Pay attention in the following points when writing the file into CD-R.
  - Make sure to write in "Disc at Once".
  - Set the file compatibility to "ISO9660 format". (ROMEO, JOLIET are disapproved).
  If the writing method is not correct, the normal setting cannot be performed.

5.4.6.2 Setting the region

(1) Set for the Jig RCU mode.
(2) Press DV/HDD/DVD SELECT button on the unit repeatedly so that the DVD lamp lights up on the unit.
(3) Load the region setting disc on the tray, and then close the tray.
(4) When the disc reading operation is completed, transmit "43-70" with the Jig remote control unit.
(5) FDP indicator changes to "UPDATE". Remove the disc as the tray will open for a few seconds.
(6) Then, check whether the FDP indicator is "REGION 2".
(7) Transmit "43-70" with the Jig remote control unit. When FDP indicator changes to "OPEN", close the tray.
(8) Turn the power OFF, and pull out the power code, and then plug the power code in again.
(9) Cancel the Jig RCU mode.

5.4.7 Booting the system using the CD

The firmware of this device is stored in the Hard Disk Drive (HDD). If the firmware is collapsed for its contents, [LOADING] is repeatedly displayed on the FDP display of the main unit and the system becomes inoperative. The system operation cannot be resumed even if the AC plug is disconnected from the AC power source.
In such a situation, the operation may be resumed on a temporary basis to normal using a CD that stores the firmware. This causes the firmware in the HDD to be updated and the system may be brought to a normal operation. Refer to the following descriptions for detail.

5.4.7.1 Downloading the firmware from JS-NET to create a booting disk

NOTE:

For details of creating the booting disk, see the instructions provided in the JS-NET web site.

(1) Download all the relevant files from the JS-NET and decompress it.
(2) The file termed "bootup1.blx" will accordingly be created. Copy this file in a root directory of the CD-R.
(3) Set the track setting to [MODE2 XA] for writing the software, and select [JOLIET] as an exchangeable file name. Be sure to write the disk in [Disk at once] mode.

5.4.7.2 Booting using the Disk

The following explanation is made assuming the system operation is being unable with [LOADING] repeatedly displayed.

(1) Disconnect the AC plug and then connect it again. Immediately after this, press and hold the DVD ON/OFF button until the tray comes out.
(2) Put the booting disk on the tray and close the tray.
(3) Disconnect the AC plug. Press and hold the STOP button and connect the AC plug.
(4) Keep the button pressed for 20 seconds and release the button (Timing must be precise).
(5) [LOADING] will be displayed repeatedly for a while and the system will be brought to the standby state.
(6) Press the OPEN/CLOSE button to remove the booting disk.
(7) Turn the system on and confirm that the operation is normal. If so, the system should be properly booted from the CD-R.

5.4.7.3 Updating the firmware after booting with the CD

By updating the firmware using the CD, the built-in firmware in the HDD will be overwritten, allowing the firmware to be renovated. The system may be resumed to a normal state using this method. Be sure to download the latest version of the update firmware when you attempt to create and use the firmware. For the updating procedures, refer to 5.4.2.

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