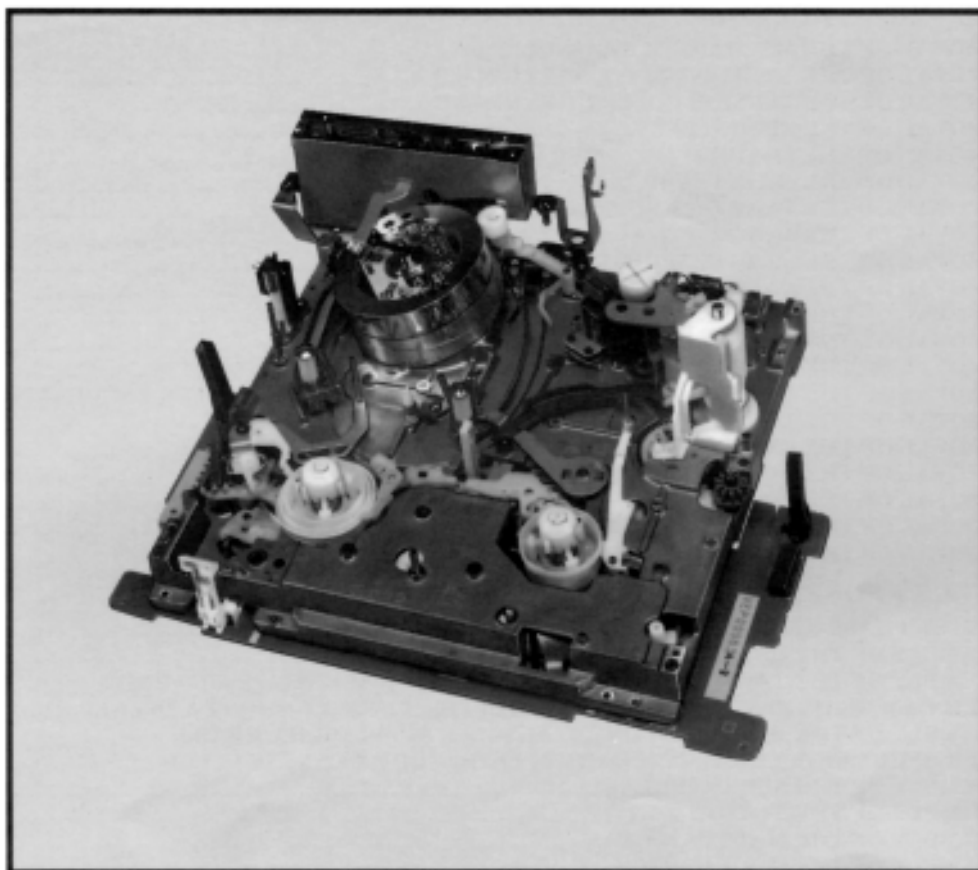


Service Manual



Video Cassette Recorder
Mechanical chassis

No. K



SERVICE INFORMATION\СЕРВИСНАЯ ИНФОРМАЦИЯ
MECHANICAL ADJUSTMENT PROCEDURES\МЕТОДЫ МЕХАНИЧЕСКОЙ
РЕГУЛИРОВКИ
DISASSEMBLY PROCEDURES OF MECHANISM\МЕТОДЫ РАЗБОРКИ
МЕХАНИЗМА
ASSEMBLY PROCEDURES OF MECHANISM\МЕТОДЫ СБОРКИ МЕХАНИЗМА
PARTS CHANGE\ИНФОРМАЦИЯ О ЗАМЕНЕ ЗАПАСНЫХ ЧАСТЕЙ
TROUBLE SHOOTING\УСТРАНЕНИЕ НЕИСПРАВНОСТЕЙ

Panasonic

1. SERVICE INFORMATION

1-1. SERVICE POSITION

When servicing the K-Mechanism, the Mechanism can easily be fixed by standing the Mechanism up in the Main Frame as shown below to check easily.

In this position, the following services are possible.

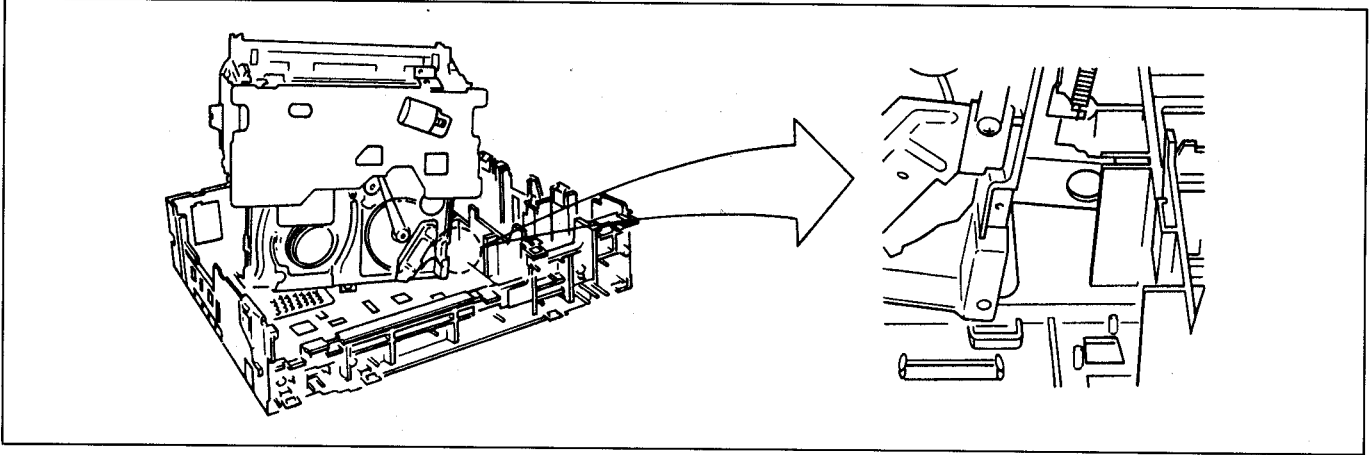


Fig. S1

1-1-1. CHECKING OF GEAR PHASE ALIGNMENT CONDITION

- 1) Remove the Mechanism Connection C.B.A.
- 2) Check gear phase Alignment Condition of Mechanism described on the left (NV-SD series) or bottom (NV-HD series) side of Frame.)

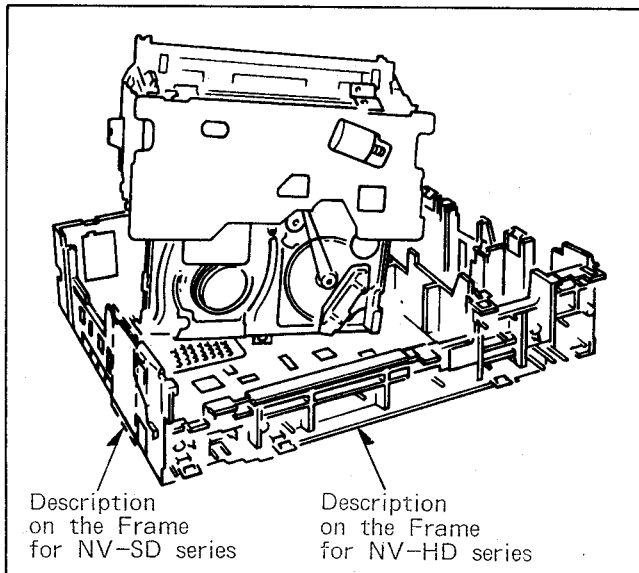


Fig. S2

1. HAND OPERATION

- 1) Remove the Mechanism Connection C.B.A.
- 2) Turn the Worm Gear or the WORM WHEEL GEAR (Remove the loading Motor Unit) manually.

2. BATTERY OPERATION

- 1) Remove the Mechanism Connection C.B.A.
- 2) Connect the Battery (Manganese-Type R6 (AA) 3pcs./+4.5V) or Power Supply (+4.5V) to the Loading Motor terminals.

3. SERVICE INFORMATION DISPLAY OPERATION

- 1) Set the Service Information Display mode.
(Turn the Shuttle Ring to FF then push the Eject button, or press the FF, REW and Eject buttons simultaneously.)
- 2) Make a momentary short circuit as shown in the service manual, or press the TV/VTR button. (The end of display on the Display becomes "—".)

Note:

For NV-HD100AM/MC, NV-F125BD, NV-SD20EE, and NV-SD25AM, make a momentary short circuit between TL7508 and D7517-cathoid For NV-HD100AM/MC and NV-F12513D, or TL7508 and D7527-cathoid for NV-SD20EE and NV-SD25AM.

- 3) In the above Service Information Display mode, The Loading Motor rotates for loading operation when the "PLAY" button is pressed. The Loading Motor rotates for unloading operation when the "STOP" button is pressed.

Remark:

After checking, check the "SERVICE INFORMATION DISPLAY" mode for final confirmation of movement of Mechanism.

1-1-2. Checking of Loading / Unloading Operation.

There are 3 methods for manual operation of loading/unloading operation as follows.

1-1-3. Checking of operation of Reel Gears.

- 1) Remove the Mechanism Connection C.B.A.
- 2) Set mechanism to "PLAY" position by manual operation of loading.
- 3) Turn the "Rotor Unit" to check movement of reel gears.

1-2. REPLACEMENT OF CYLINDER UNIT

The Cylinder Unit can be replaced easily by the following method.

- 1) Remove the Top Panel.
- 2) Remove the 3 screws of the Cylinder Unit with a magnetized screw driver through the holes on the Bottom Plate as shown in Fig.S4.

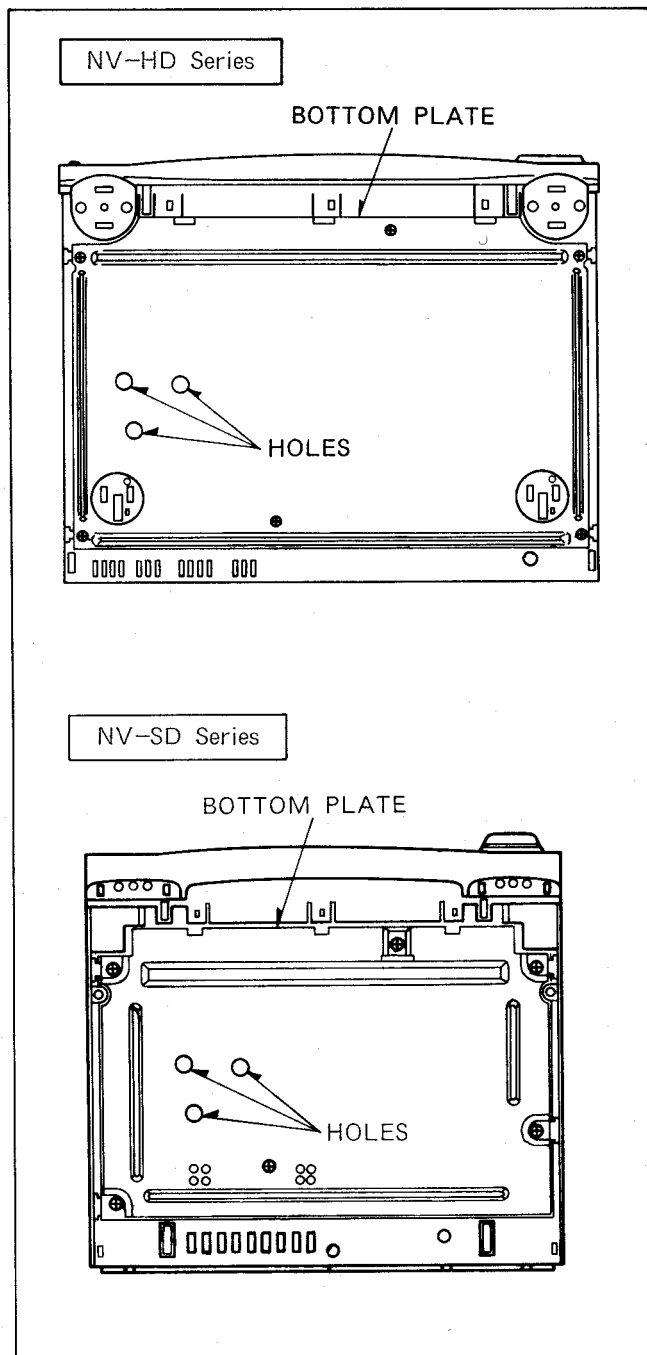


Fig. S4

1-3. ASSEMBLY OF CAPSTAN STATOR UNIT

When replacing the CAPSTAN STATOR UNIT, the CENTRE FIXING TOOL (VFK0851) must be used to fix the centre of CAPSTAN STATOR UNIT.

Method:

- 1) Place the CAPSTAN STATOR UNIT into position.
- 2) Loosely tighten the 3 screws.
- 3) Insert the CENTRE FIXING TOOL (VFK0851) as shown in Fig.S5.
- 4) Tighten the 3 screws.
- 5) Remove the CENTRE FIXING TOOL.

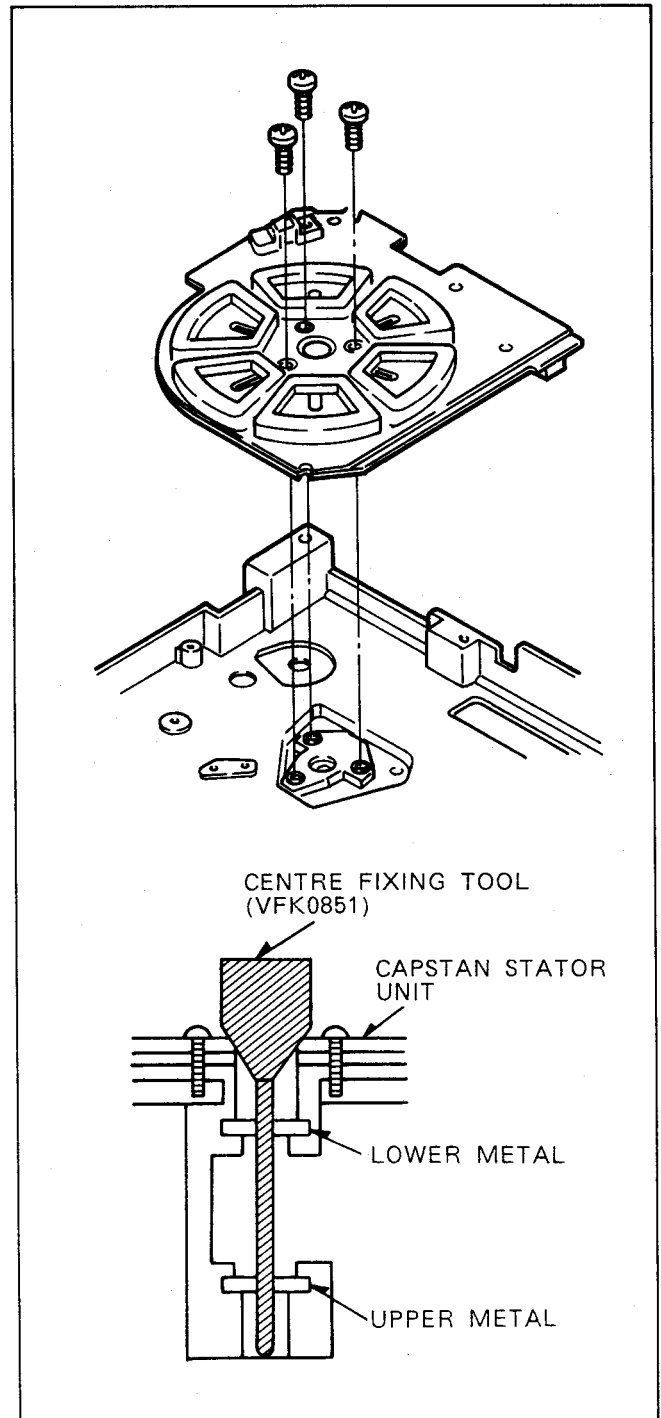


Fig. S5

1-4. EJECT OPERATION

The main cam gear rotates in the direction of the arrow. The projection (B) of the carriage connection gear engages with the recession (A) of the main cam gear. The carriage connection gear rotates in the direction of the arrow to perform the Eject operation.

<NOTE>

If the Eject operation is performed without the cassette carriage installed while repairing or making the mechanical phase alignment, the main cam gear will not engage with the carriage connection gear and will not rotate. For performing the Eject operation with the cassette carriage not installed, it is necessary to rotate the carriage connection gear by hand in the direction of the arrow.

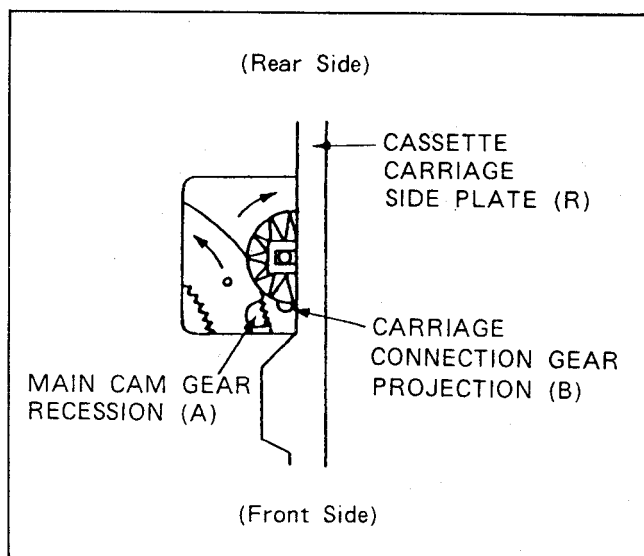


Fig. S6 Top View of Eject Operation

1-5. TAKE-UP PHOTO SENSOR OPERATION

Note the following matters for Take-up Photo Sensor Operation.

- 1) While servicing of the K-Mechanism, the unit will not operate properly if a strong light (ex, Fluorescent light, Spot light) falls on the Take-up Photo Sensor. In this case, cover the Take-up Photo Sensor to prevent the light from falling on it.
- 2) While servicing of the K-Mechanism with "Power On" and without cassette tape inserted, the Unit does not operate properly.

1-6. SERVICING OF POWER TR C.B.A.

When removing the connector on the Power Tr. C.B.A., hold the P. C. Board by hand to prevent damage of the Power Tr.

1-7. REMOVAL OF THE CASSETTE TAPE

If the electrical circuit is defective and the action of unloading and front unloading do not work properly, it is possible to remove the cassette manually. There are 2 methods of removing the cassette.

1. HAND OPERATION

- 1) Remove the bottom plate.
- 2) Turn the WORM GEAR to "A" arrow mark direction manually as shown in Fig.S7, moving the LOADING POST to the unloaded position.
- 3) Turn the CAPSTAN clockwise to take up the tape.
- 4) Turn the WORM GEAR again to eject the cassette.

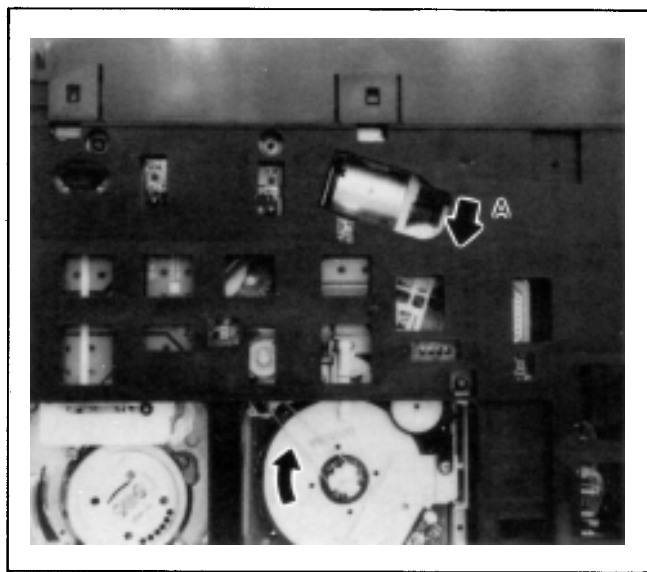


Fig. S7

2. BATTERY OPERATION

- 1) Connect the battery (Manganes-Type R6 (AA) 3pcs./+4.5V) to P1503 as shown in Fig. S8.
- 2) After moving the LOADING POST to the unloaded position, disconnect the battery to stop the motor.
- 3) Turn the CAPSTAN to clockwise to take up the tape.
- 4) Reconnect the battery to eject the cassette.

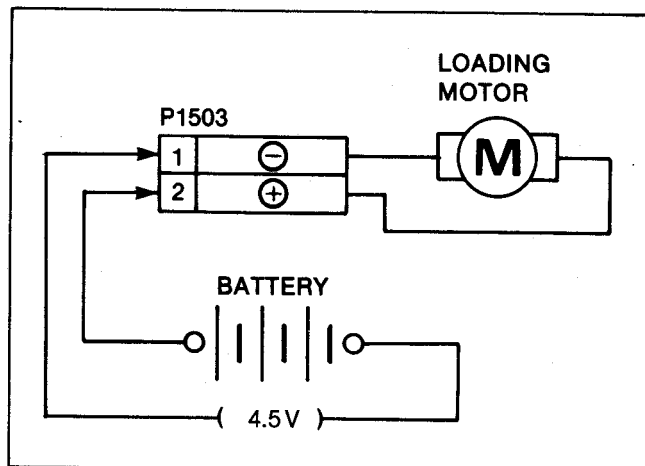


Fig. S8

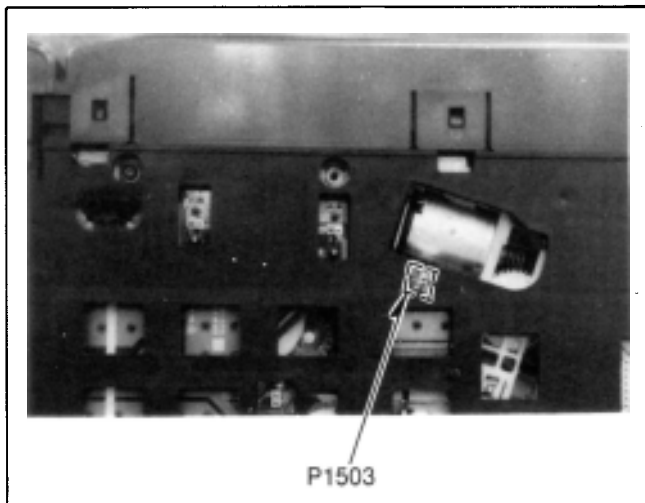


Fig. S9

1-8. INSTALLATION OF FLAT CARD CABLE

When installing of the Flat Card Cable to the connector, make sure the direction of the Flat Card Cable. The Insulation Sheet side is backside.

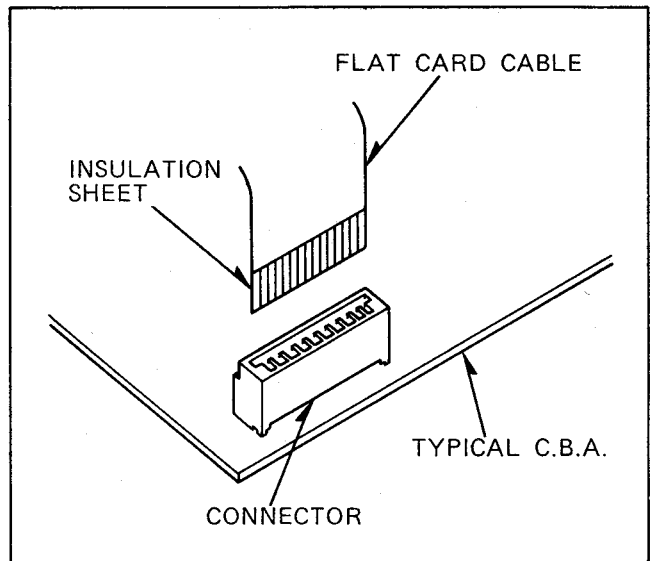


Fig. S10

1-9. SERIAL CLOCK TRANSMISSION ERROR DISPLAY

If the Serial Clock is not transmitted from IC6001 to IC7501, "E9" is displayed as shown in Fig.T1. This indication will be displayed either during the Service Information Display mode or in normal mode.

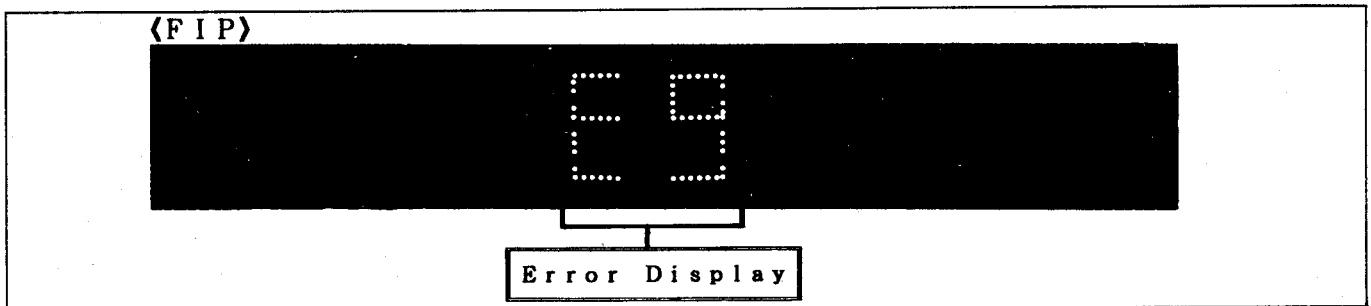


Fig. T1 Serial Data/Clock Transmission Error Display

1-10. SERVICE INFORMATION DISPLAY

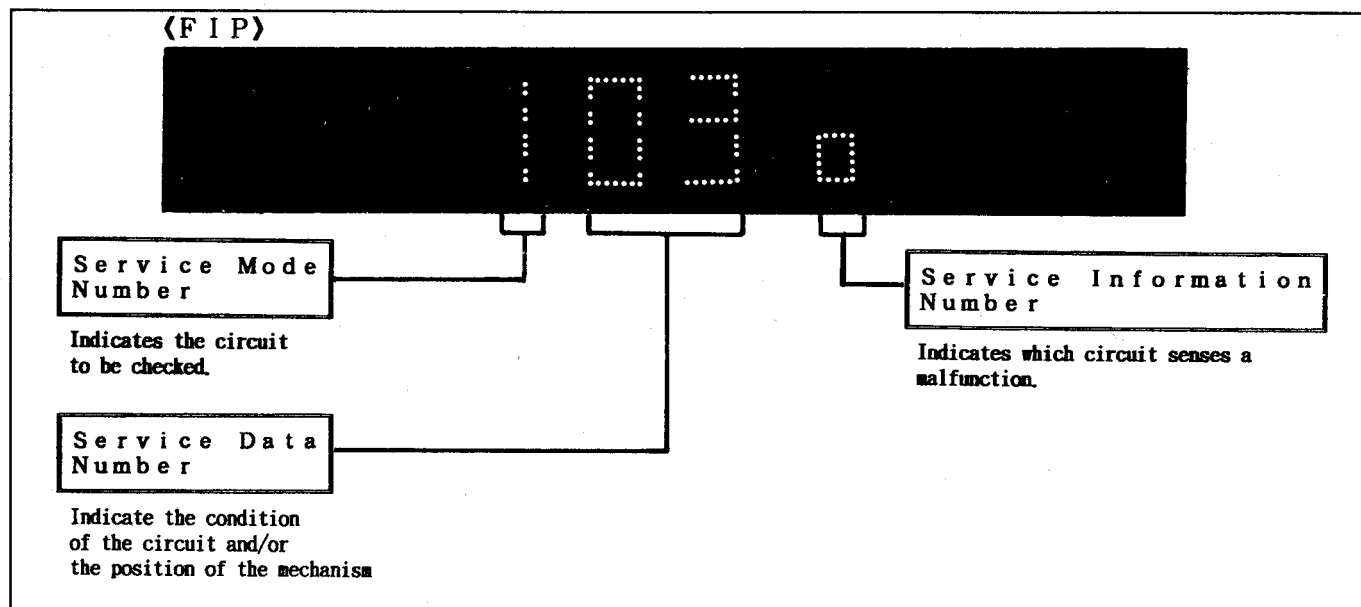


Fig. D1 Service Information Display

1-10-1. Purpose of Service Information Display

This information aids trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician during repair while the service information can be used by the consumer to diagnose malfunctions allowing the technician to provide a more accurate repair cost estimate and reduce repair time.

1-10-2. Turning on Service Information Display

There are two ways to turn on the Service Information Display.

- (1) Turn the Shuttle Ring to FF then push the Eject button. The Service Information will be displayed for 1 minute.
- (2) Connecting a jumper wire between TPSEV and TPGND For NV-SD series (TP6010 and TP6011 for NV-HD series) will display the service information indefinitely.

In the Service Information Display, there are four digits divided into 3 functions. The first digit indicates which other 7 service modes that the unit is Currently in.

- MODE 1 : Check tape protection circuit
- MODE 2 : Check tape transport mechanism
- MODE 3 : Check mode switching operation
- MODE 4 : Check control buttons
- MODE 5 : Check capstan motor
- MODE 6 : Check cylinder motor
- MODE 7 : Check loading/unloading operation

The second and third digits are service data which indicate the condition of the circuit or mechanism being checked.

The forth digit is the service Information display. It is to be used by the consumer to help determine the source of a malfunction. The service information display operates independently of the service modes and stores the fault indication in memory for as long as AC power is supplied.

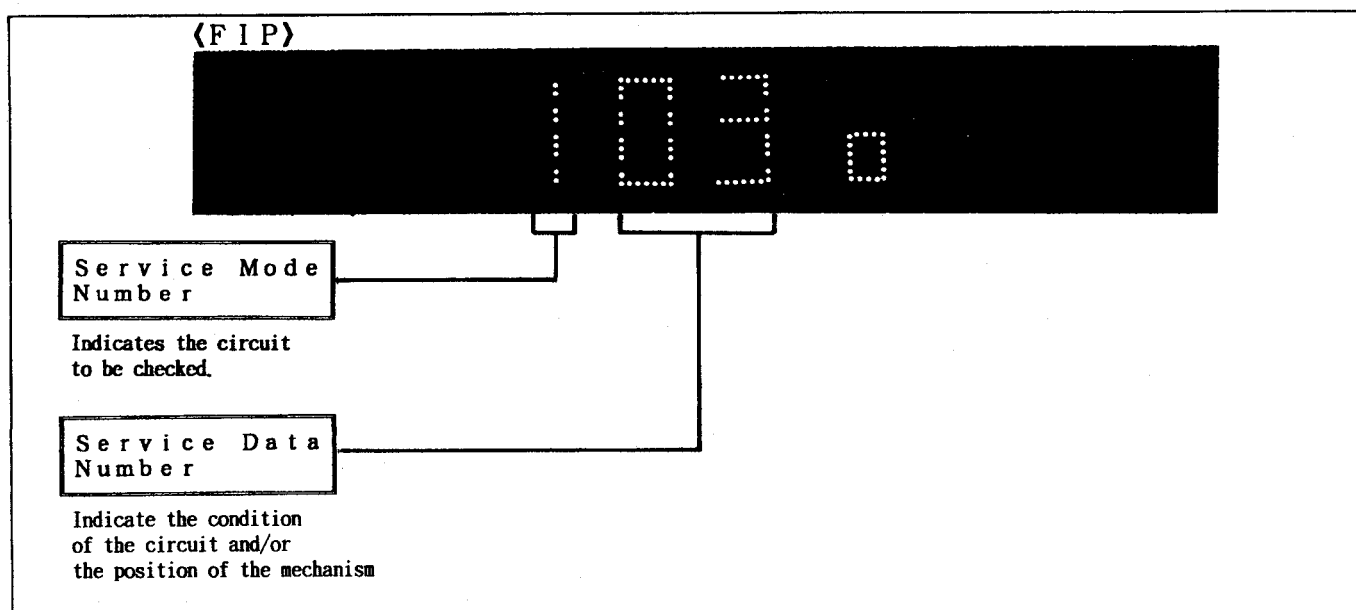


Fig. D2 Service Mode Number and Service Data Number on S.I.D.

- (1) Turn on Service Information Display.
- (2) To change Service Modes turn the shuttle ring to FF then push the Eject button.

- (3) Mode 1 : Checks that the Sensor LED, Supply & Take-up Sensor circuits check the circuits by blocking the light from the Sensor LED to either or both Supply & Take-up Sensors.
When the light is blocked to both sensors, "00" should be indicated on the service data number.
When the light is blocked to the supply sensor, "01" should be indicated.



- (4) Mode 2 : Checks the mode switch circuit while indicating mechanism position.
Service Data Numbers indicate the position of the mode switch and there by the mechanism position.



- (5) Mode 3 : Checks that mode switch circuit operations have been completed.
Service Data Number should indicate "00" after each mechanism operation is completed.



- (6) Mode 4 : Checks the operation circuit.
Indicates if IC6001 receives the operating commands from the mode buttons and/or remote controller.



- (7) Mode 5 : Checks the capstan motor circuit.
Indicates if the IC6001 has received the command to rotate the capstan motor.



- (8) Mode 6 : Checks the cylinder motor circuit.
IC6001 has received the command to rotate the cylinder motor.



- (9) Mode 7: Checks the Loading/Unloading Operation.
The Loading Motor rotates for loading operation when the "PLAY" button pressed.
The Loading Motor rotates For operation when the "STOP" button is pressed.
Note: This mode can be used by the System Control Microprocessor IC6001: MN67434VRSG or MN67434VRSH.



<NOTE>

Refer to Fig.D5 for details of Service Data Number.

1-10-4. Service Information Number

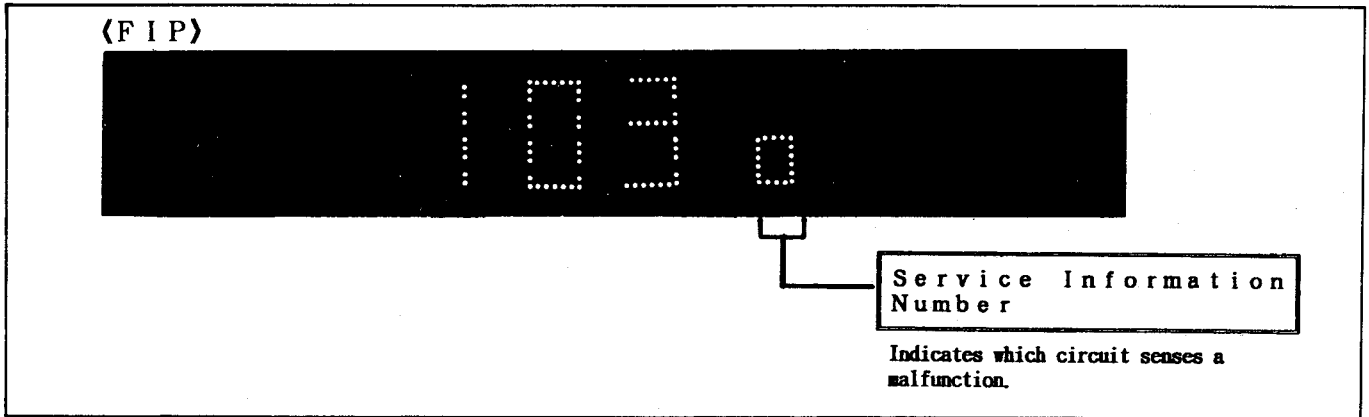


Fig. D3 Service Information Number on S.I.D.

Refer to Fig.D4 for details of Service Information Number.

Note:

The Service Information Number display is independent of the service mode display.
 The Service Information Number will be stored as long as AC power is supplied.
 If a second error occurs, the most current error will be displayed.

Service Information Number	Malfunction
0	Normal (No problem)
1	Cylinder stop
2	Tape reel stop
3	Stop at position other than 4 or 6
4	Stop during unloading
5	Falty capstan rotation
6	Stop during Cassette-In/Eject operation

Fig. D4 Service Information

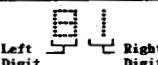
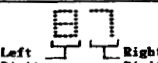

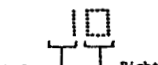
Service mode Number	Note for checking Service Data Numbers	Service Data Numbers	Indication	Remarks
1		00	No light detected at either sensor	Tape not required
		01	Tape Begining. Light to Supply Photo Sensor is blocked.	
		02	Tape End. Light to Take-up Photo Sensor is blocked.	
		03	Light detected at both sensors.	
2		00	EJECT	Tape Reuired *1 : STOP3 ; The Pinch Roller is on the capstan motor shaft. *2 : STOP ; The Pinch Roller is off the capstan motor shaft. Refer to Fig.D7 to Check mechanism Position and timing.
		01	Cassette-down	
		02	REV, REV SLOW	
		03	Loading/Unloading	
		04	PLAY/REC, STILL/PAUSE, CUE, FWD SLOW, STOP3 *1	
		05	STOP*2	
		06	FF/REW	
		07	Intermediate position	
3	Disregard service data displayed until mechanism operation is completed. Then the display should indicate "00".	00	Any display other than "00" indicates a fault in the mode switch circuit or system.	Tape Required.
4	Display only when the operating button is pressed.	Refer to Fig.D6		Tape not required.
5	Left digit only, disregard Right digit display.		8, 9, u, A, -, n, L, and no display indicate that the Capstan motor "PLAY" command recived by IC6001.	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.
	Right digit only, disregard left digit display.		1, 2, 3, 4, 5, 6, 7, indicate that the Capstan motor CUE, FF, Forward slow" commands received by IC6001.	
	Right digit only, disregard left digit display.		8, 9, u, A, -, n, L, and no display indicate that the Capstan motor Reverse, Rew, Reverse Slow commands received by IC6001.	
6	Left digit only, disregard Right digit display.		1, 3, 5, 7, 9, A, n and no display indicate that the cylinder motor "ON" command received by IC6001.	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.

Fig. D5 Service Data Display and Indication

SERVICE DATA NUMBERS	MODE BUTTONS	SERVICE DATA NUMBERS	MODE BUTTONS
3 _n	OPERATE	54	RESET
01	EJECT	5	ZERO STOP
09	AUDIO DUB	-0	INPUT SELECT
A3	INSERT	49.40	INDEX
-9	PAL/MESECAM	A1.A2	TRACKING(+, -)/V-LOCK
—	CHECK/PROG.	9	REPEAT
34 _{OR} 35	^V, +-	8	SKIP
—	NEXT/SP/LP	—	TAPE SELECT
—	SLEEP/SHIFT	—	PROG.
A4	TIMER REC	—	NEXT
08	REC	—	RECORDING SP/LP
—	CLOCK SET	—	CANCEL
—	TUNER PRESET	10	SU(1)
80	PAUSE/STILL	11	MO(2)
00	PLAY	12	TU(3)
00	STOP	13	WE(4)
0-.0 _n	JOG DIAL (FRAME ADV, REVERSE ADV)	14	TH(5)
03.02	SHUTTLE RING (FF, REW)	15	FR(6)
—	TV/VTR	16	SA(7)
—	SCANNER ON/OFF	17	SU-SA(8)
—	TRANSMIT	18	MO-SA(9)
0	SEARCH	19	MO-FR(0)
8L	+ (REMOTE CONTROLLER)	3A	-/--
8	- (REMOTE CONTROLLER)		
—	DISPLAY		

Fig. D6 Service Data Display for Service mode 4

1-10-5. Timing Chart from Mode SW to System control IC6001

System control IC6001 senses the mechanism position through the Mode SW.
Fig.D7 shows the timing for Service Mode Number 2.

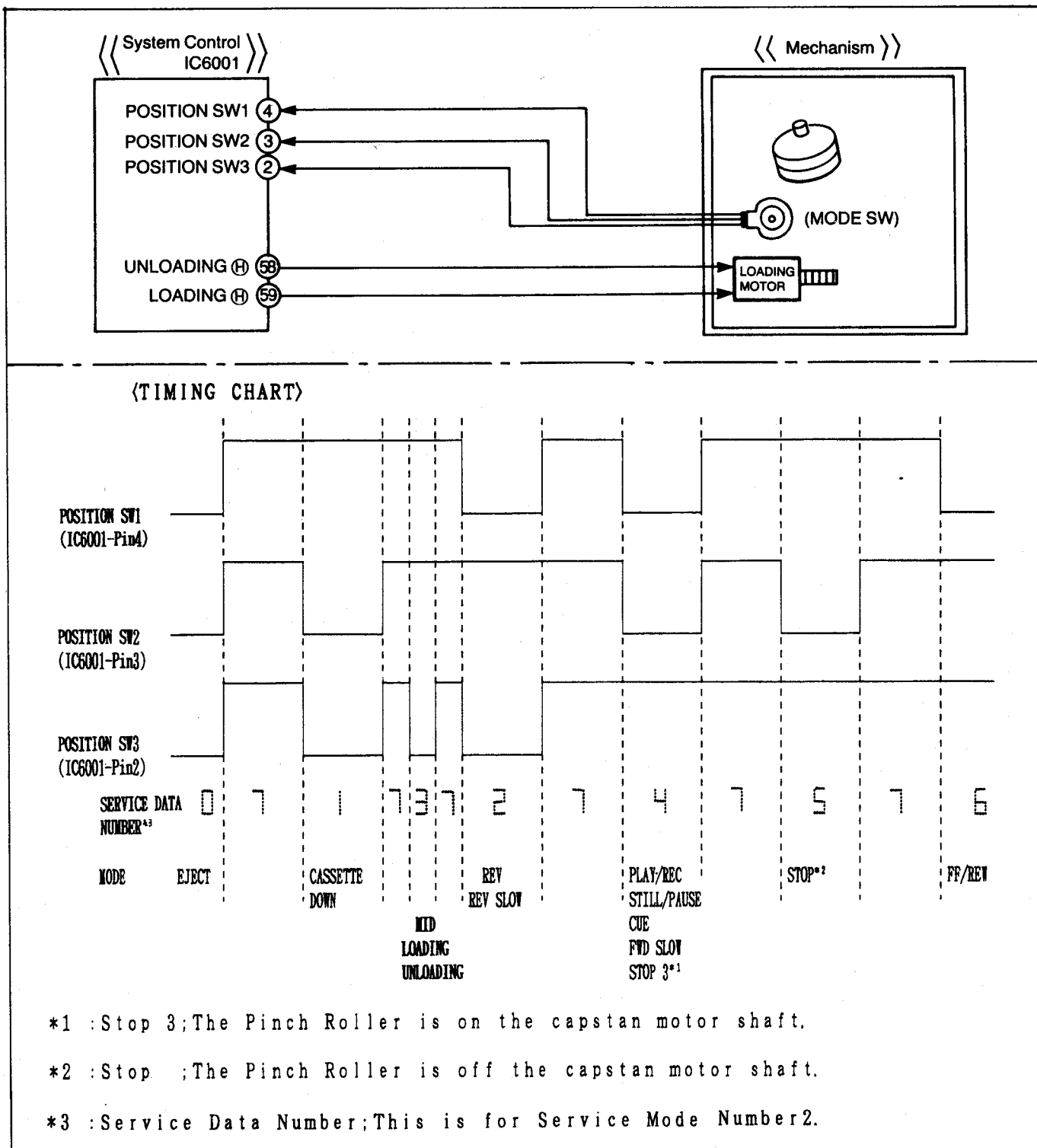


Fig. D7 Timing Chart of Mode SW

2. MECHANICAL ADJUSTMENT PROCEDURES

2-1. TENSION POST POSITION ADJUSTMENT

(Equipment Required)
Hex Wrench (VFK0326)

1. Disconnect the AC plug.
2. Remove the TOP PLATE and CASSETTE HOLDER.
3. Turn the LOADING MOTOR until the loading completes.
4. Adjust the hole of TENSION BAND FASTENER by hex wrench so that the left edge of IMPEDANCE ROLLER and TENSION ARM UNIT as shown in Fig.M1.

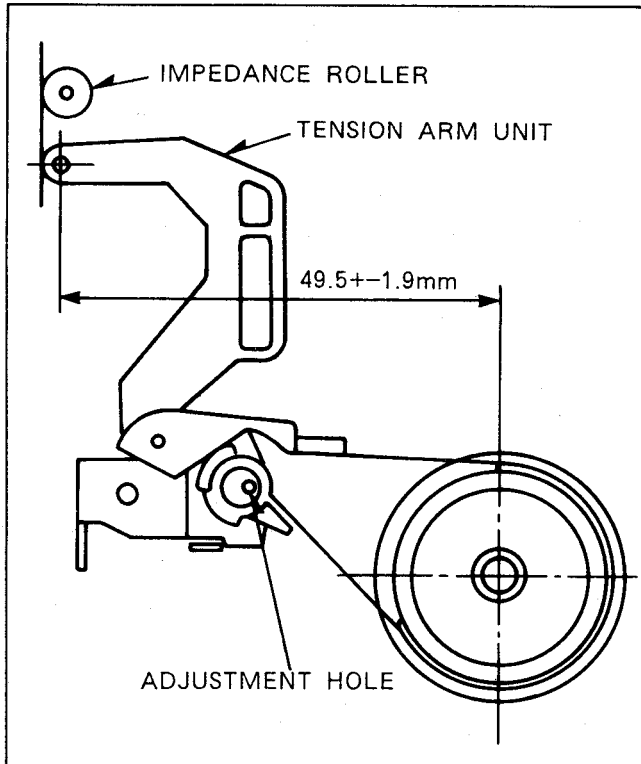


Fig. M1

2-2. BACK TENSION ADJUSTMENT

(Equipment Required)
Back Tension Meter (VFK0132)
VHS Cassette Tape (180 minutes tape:PAL)
(120 minutes tape:NTSC)

(Specification)
22.5-27.5g

1. Playback the cassette tape from the beginning and wait until the tape movement get the stabilization.
(for approx. 10~20 seconds)
2. Insert the Back tension Meter into the path of a tape, and measure the back tension to be within specification as shown in Fig.M2.

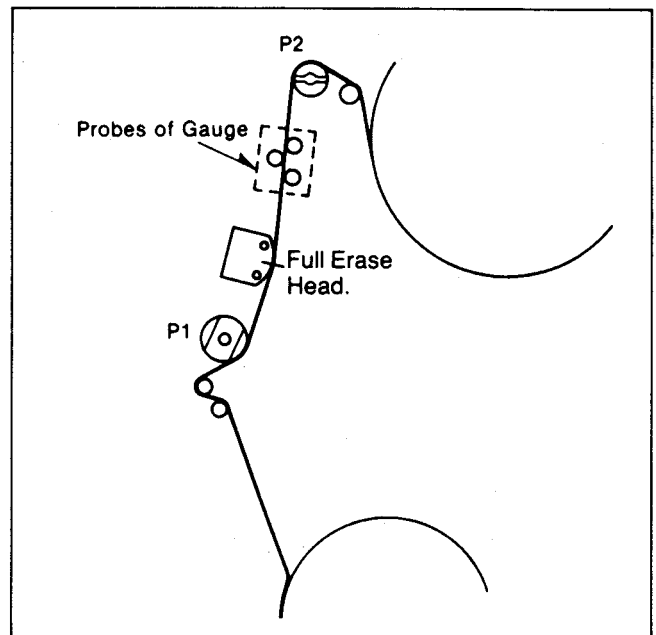


Fig. M2

3. If it is out of specification, change the spring notch as shown in Fig.M3.

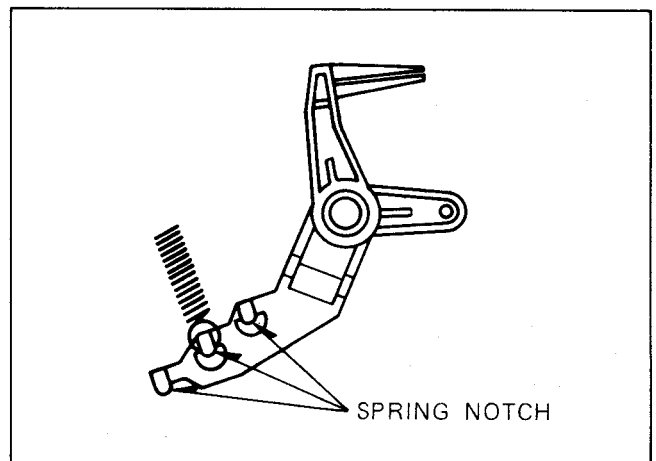


Fig. M3

2-3. P2 AND P3 POSTS ADJUSTMENT (PREADJUSTMENT)

(Equipment Required)
Post Adjustment Screwdriver (VFK0329)

1. Remove the TOP PLATE and CASSETTE HOLDER.
2. Turn the LOADING MOTOR until the unloading completes.
3. Loosen the fixing screw of P2 and P3 POSTS.
4. Rotate the P2 and P3 POSTS clockwise to the end.
5. Rotate the P2 and P3 POSTS twice counterclockwise.

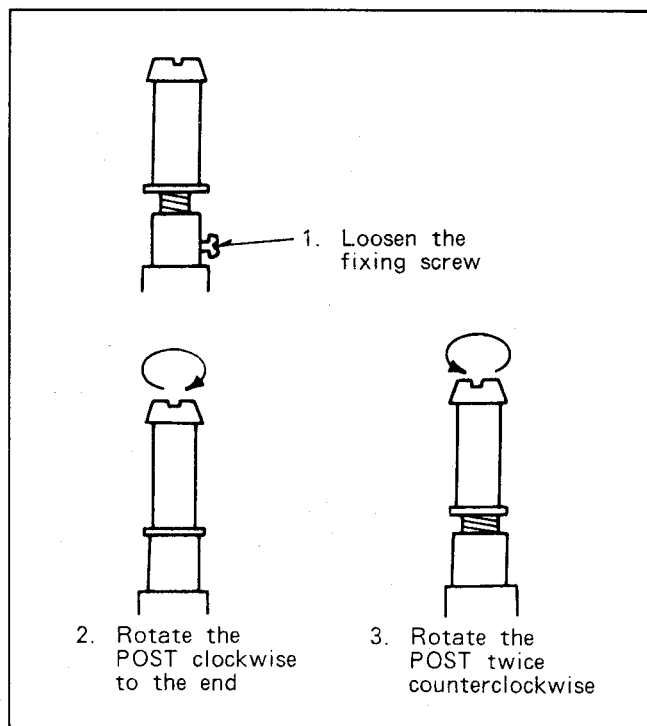


Fig. M4

6. Install the TOP PLATE and CASSETTE HOLDER
7. Playback the cassette tape and make sure that the edges of the tape are not curling at the bottom or top end of the P1, P2, P3 and P4 POSTS as shown in Fig.M5.

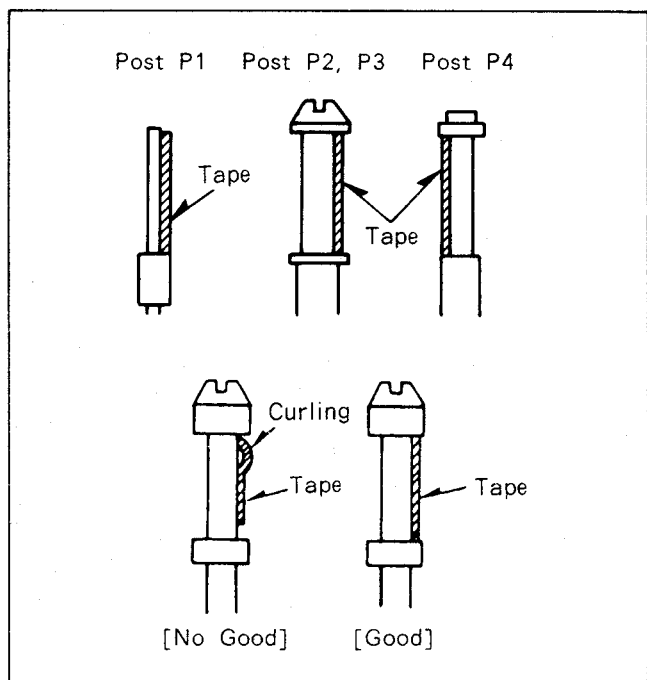


Fig. M5

8. If curling appears, readjusts the P2 and P3 POSTS.

2-4. TAPE INTERCHANGEABILITY ADJUSTMENT

Carry out the following procedures for Tape interchangeability Adjustment to do it correctly and smoothly.

- (1) Adjustment of P2 and P3 Posts.
- (2) Height Adjustment of A/C Head (1).
- (3) Height Adjustment of A/C Head (2).
- (4) Fine-Adjustment of A/C Head
- (5) Horizontal Position Adjustment of A/C Head.

If the Tape Interchangeability Adjustment is not perfect, repeat the above procedures from (1) to (5).

CAUTIONS:

To mark a Adjustment Mode for Tape Interchangeability, connect a Cut Jumper Wire as shown in Fig.M6.

(Auto Tracking is turned off.)

After finishing the adjustment, disconnect the Cut Jumper Wire.

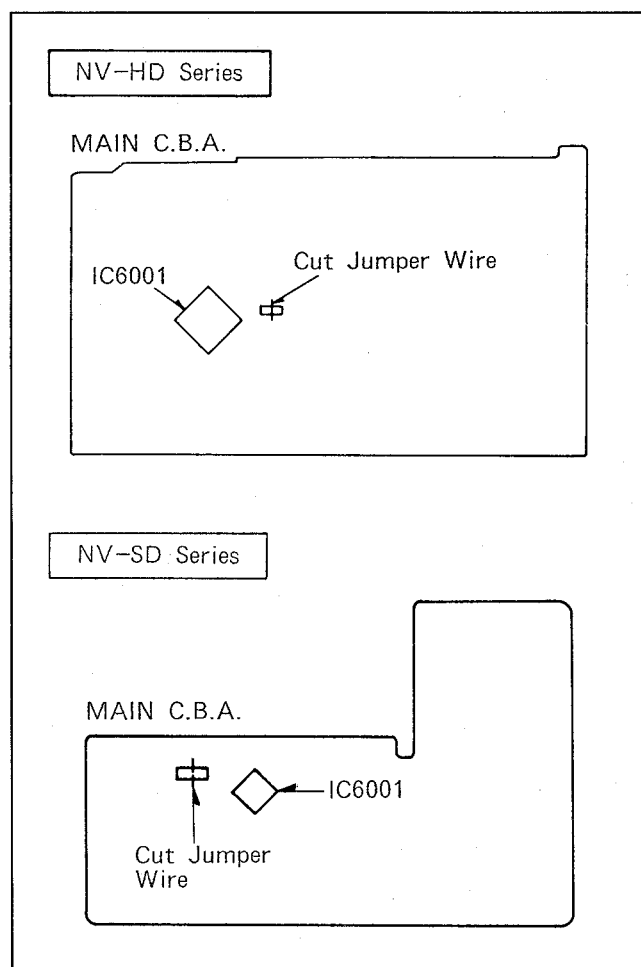


Fig. M6

(1) Adjustment of P2 and P3 Posts

(Equipment Required)

Alignment Tape(PAL/SECAM:VFJ8125H3F,
NTSC:VFM8080HQFP)
Post Adjustment Screwdriver (VFK0329)

1. Set the tracking control into the fix position. (by pressing the tracking (+) and (-) button simultaneously on the Remote Controller)
And connect the oscilloscope to the output of the Head Amp as shown in Fig.M7.

Note:

To get a stable waveform of the Head Amp output on the oscilloscope, use the head switching pulse as a triggering signal as shown in Fig.M7.

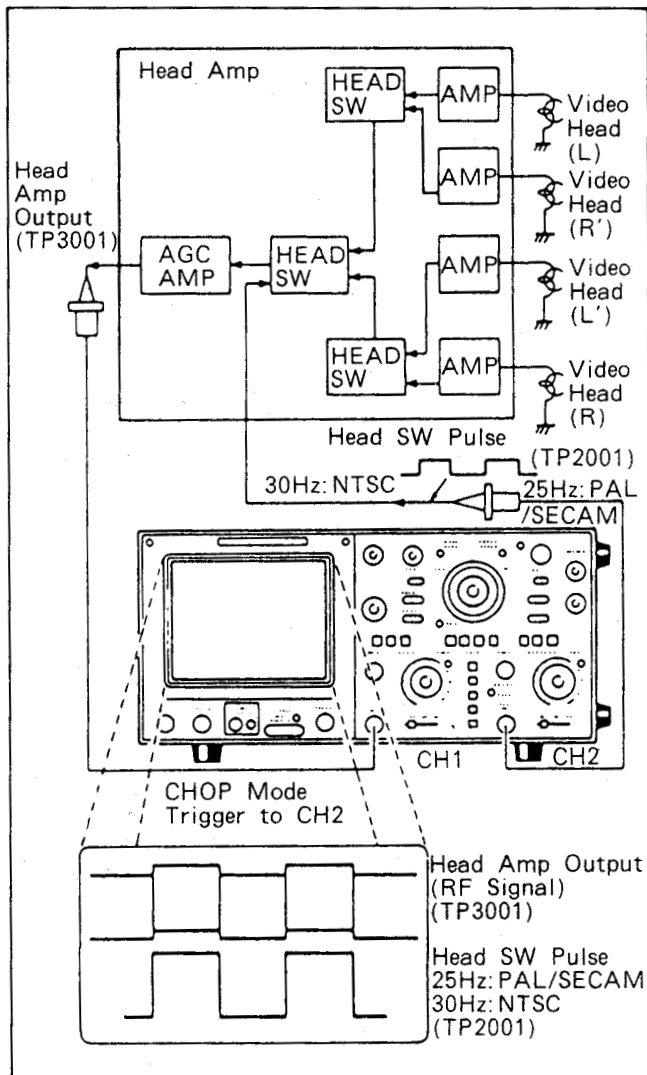


Fig. M7 Connect of Oscilloscope

2. Playback the alignment tape.
3. If the RF envelope appears like example "A" or "B" in Fig.M8 then adjustment of the tape guide post (P2:Entrance) is necessary.
4. Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown in Fig.M8-"C".

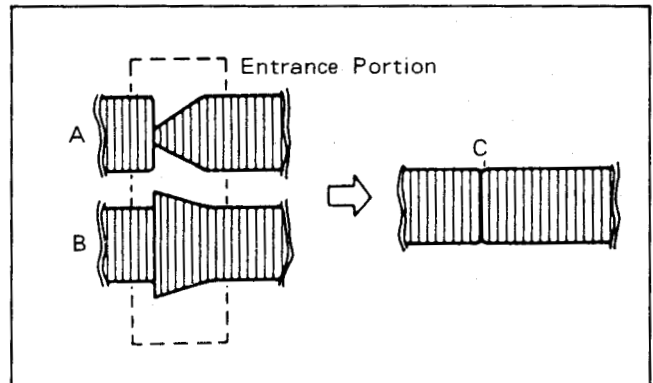


Fig. M8

5. If the RF envelope appears like example "D" or "E" in Fig.M9, then adjustment of the tape guide post (P3:Exit) is necessary.
6. Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in Fig.M9-"F".

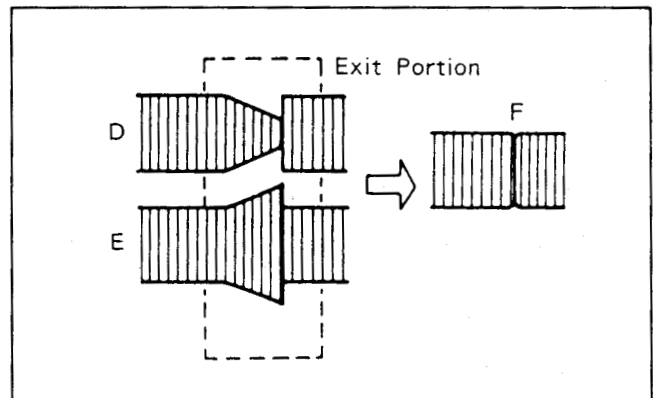


Fig. M9

7. Turn the Tracking VR fully clockwise and counter clockwise. (Keep pressing + button or - button on the Remote Controller) The output envelope should vary nearly parallel with other condition as shown in Fig.M10.
8. Set the tracking control into centre fix position and adjust for maximum RF envelope, whilst being as flat as possible.

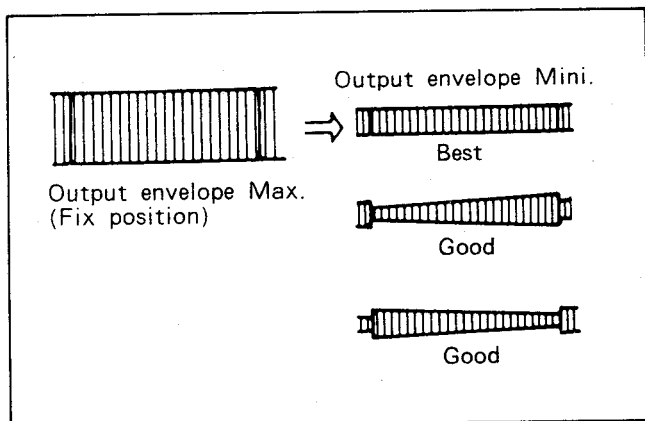


Fig. M10

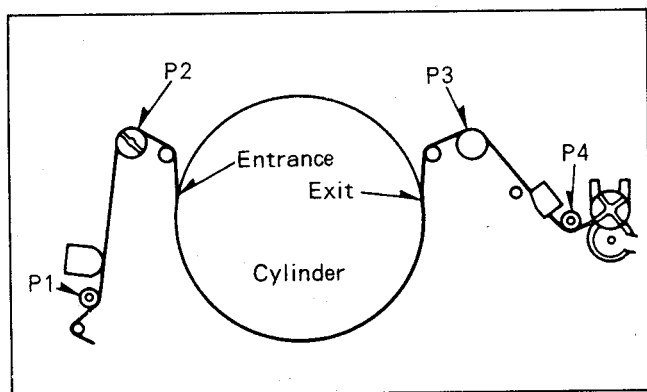


Fig. M11 Loading of Posts

(2) Height Adjustment of A/C Head (1)

- 1) Install the A/C HEAD on the A/C HEAD BASE(E) by 3 screws (A),(B) and (C) with springs.
- 2) Tighten the screw (A) until it touches chassis and then rotate the SCREW (A) counterclockwise for approx. 1.5 times.
- 3) Rotate the 2 screws(B) and (C) until A/C HEAD BASE(D) and (E) is separate.

CAUTION:

When adjusting the Screws (B) and (C) on the A/C HEAD BASE(E), do not touch the Screw Driver to the face of the A/C HEAD.

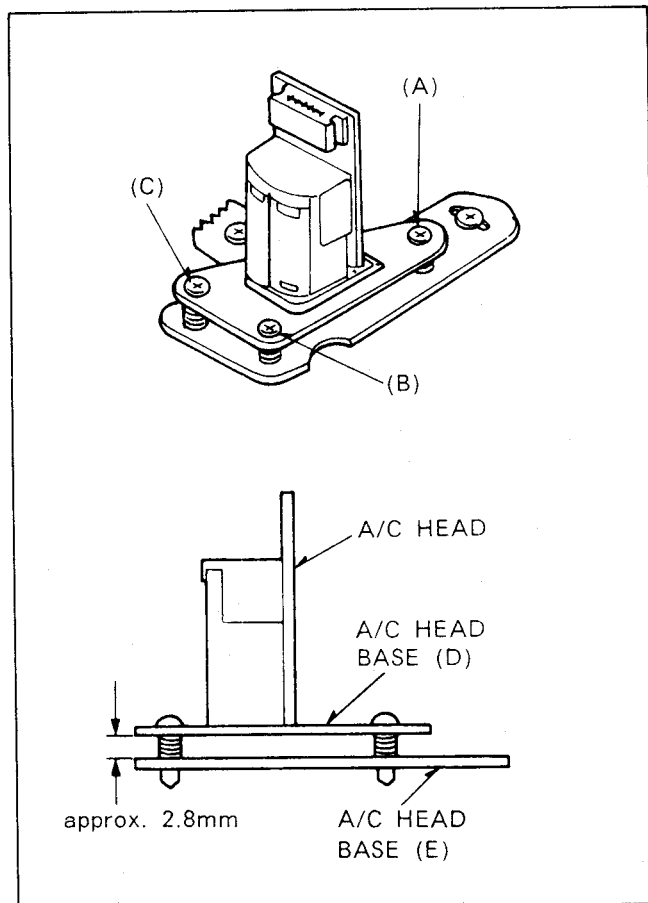
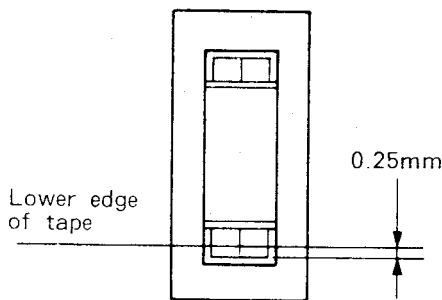
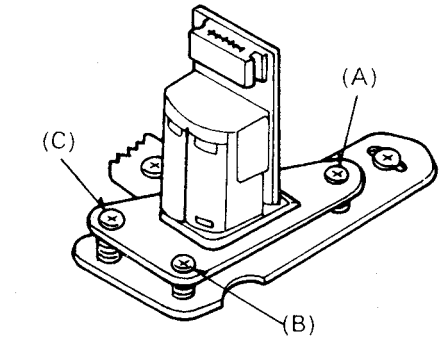


Fig. M12

(3) Height Adjustment of A/C Head (2)

- 1) Playback the alignment tape.
- 2) Rotate the screw (A) or (B) until the wrinkle appears on the lower edge of tape at P4 post.
- 3) Rotate the screw (A) or (B) until the wrinkle just disappears on the lower edge of tape at P4 post.
- 4) Connect the oscilloscope to audio output terminal.
- 5) Rotate the screw (C) until audio signal is maximized.



	SCREW (A)	SCREW (B)
So wrinkle appears on the lower edge of tape	COUNTER-CLOCKWISE	CLOCKWISE
So wrinkle disappears on the lower edge of tape	CLOCKWISE	COUNTER-CLOCKWISE

Fig. M13

(4) Fine-Adjustment of A/C HEAD

<When moving the A/C HEAD up>

- 1) Rotate the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 post.
- 2) Rotate the screw (B) counterclockwise until the wrinkle just disappears on the lower edge of tape at P4 post.
- 3) Rotate the screw (C) counterclockwise until the audio signal is maximized.

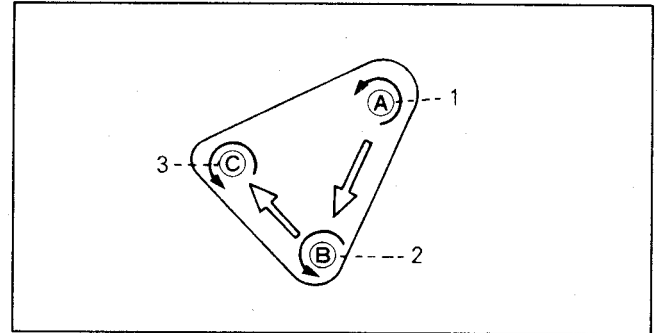


Fig. M14

<When moving the A/C HEAD down>

- 1) Rotate the screw (B) clockwise until the wrinkle appears on the lower edge of tape at P4 post.
- 2) Rotate the screw (A) clockwise until the wrinkle just disappears on the lower edge of tape at P4 post.
- 3) Rotate the screw (C) clockwise until the audio signal is maximized.

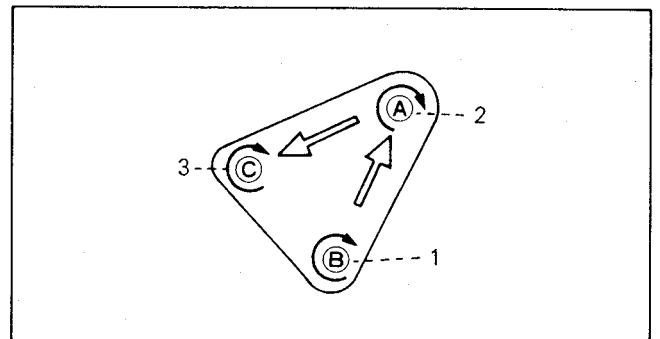


Fig. M15

(5) Horizontal Position Adjustment of A/C HEAD

- 1) Set the tracking control into the centre fix position. (by pressing the tracking (+) and (-) button simultaneously on the Remote Controller)
- 2) Connect the oscilloscope to the output of the Head Amp as shown in Fig.M7.
- 3) Playback the alignment tape.
- 4) Loosen the 2 screws (F) and (G).
- 5) Adjust the A/C HEAD BASE (E) until the RF envelope waveform is maximized.

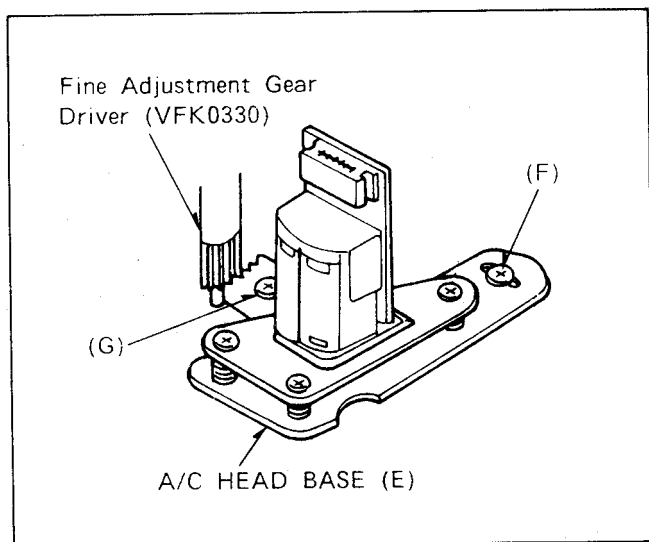


Fig. M16

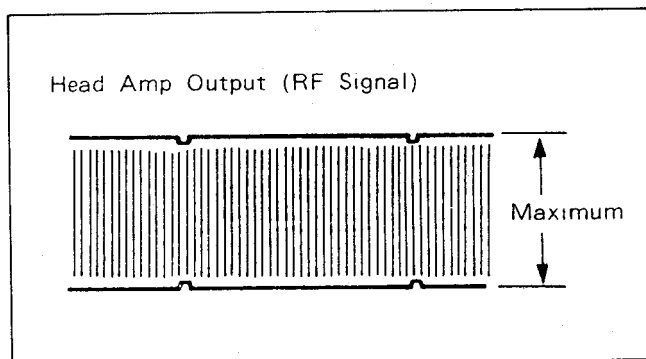
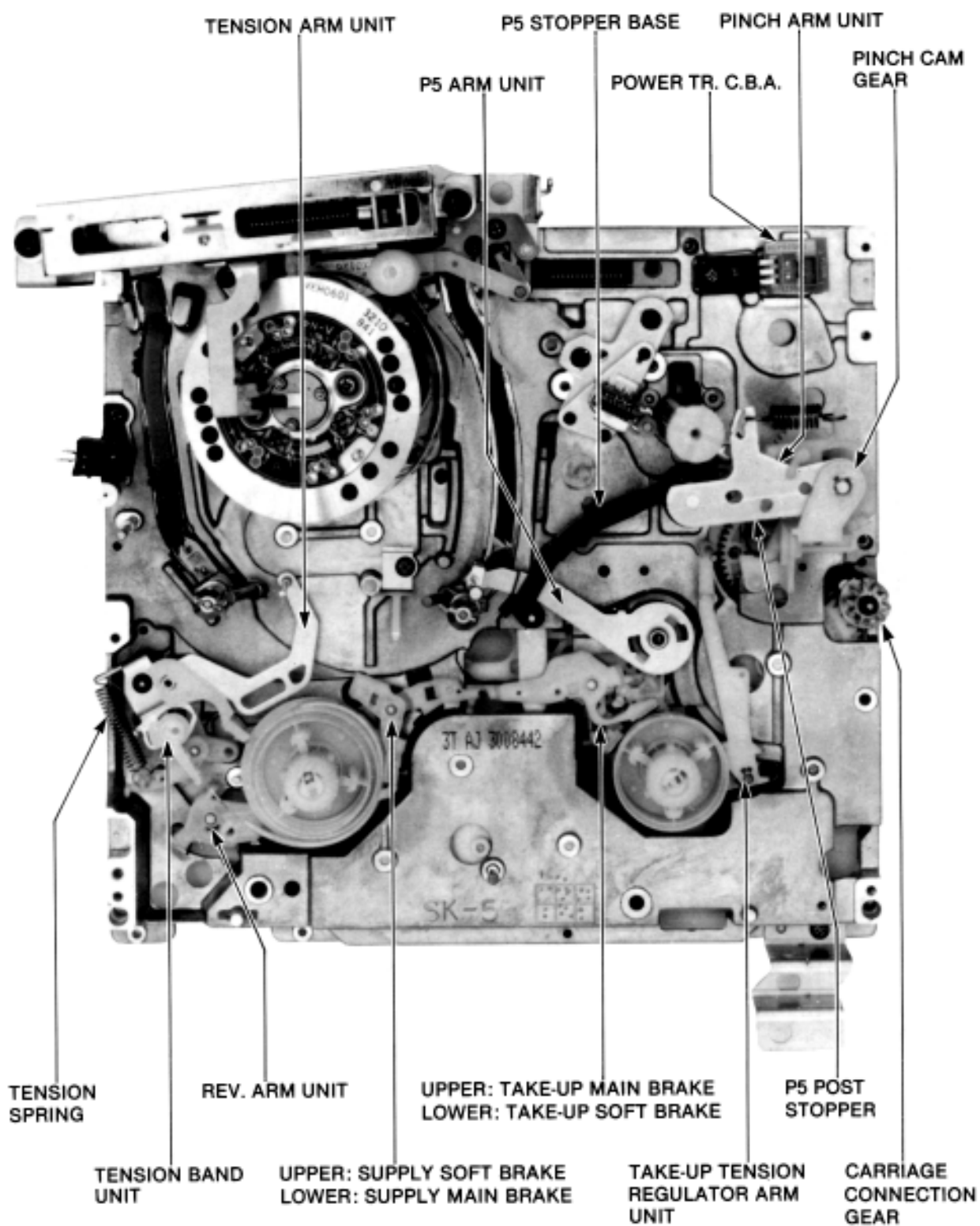


Fig. M17

3. DISASSEMBLY PROCEDURES OF MECHANISM

In order to remove the mechanism components it is first necessary to remove the mechanism chassis.



TOP VIEW OF K-MECHANISM

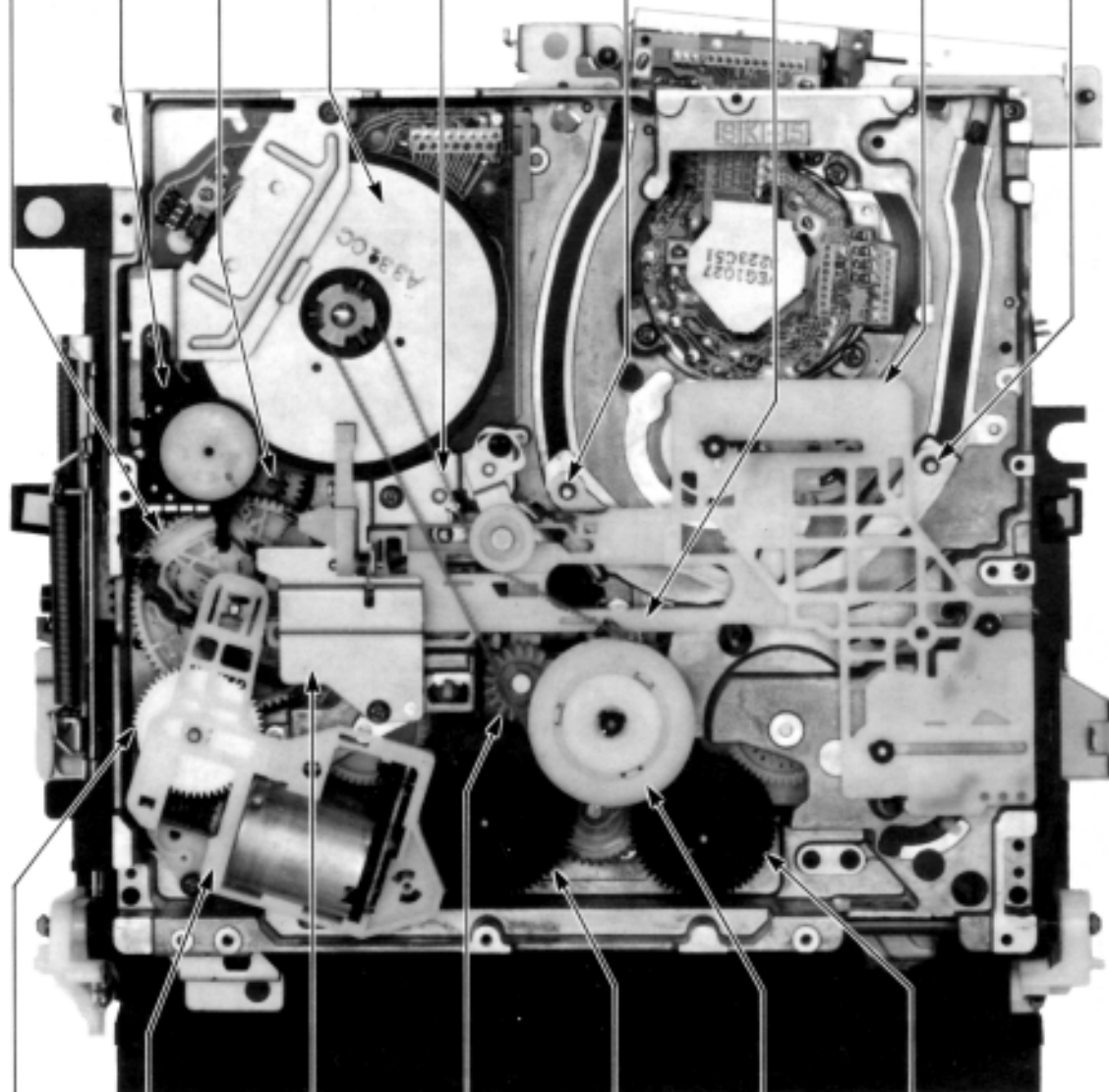
MAIN CAM GEAR SUB CAM GEAR TIMING BELT IDLER FIXING LEVER SUPPLY LOADING ARM

MODE
SWITCH

CAPSTAN
ROTOR UNIT

TAKE-UP
LOADING ARM

MAIN LEVER



LOADING
MOTOR BRACKET

FF/REW
CONNECTION
LEVER UNIT

CENTRE
CLUTCH
UNIT

SUPPLY
REEL GEAR

WORM WHEEL
GEAR

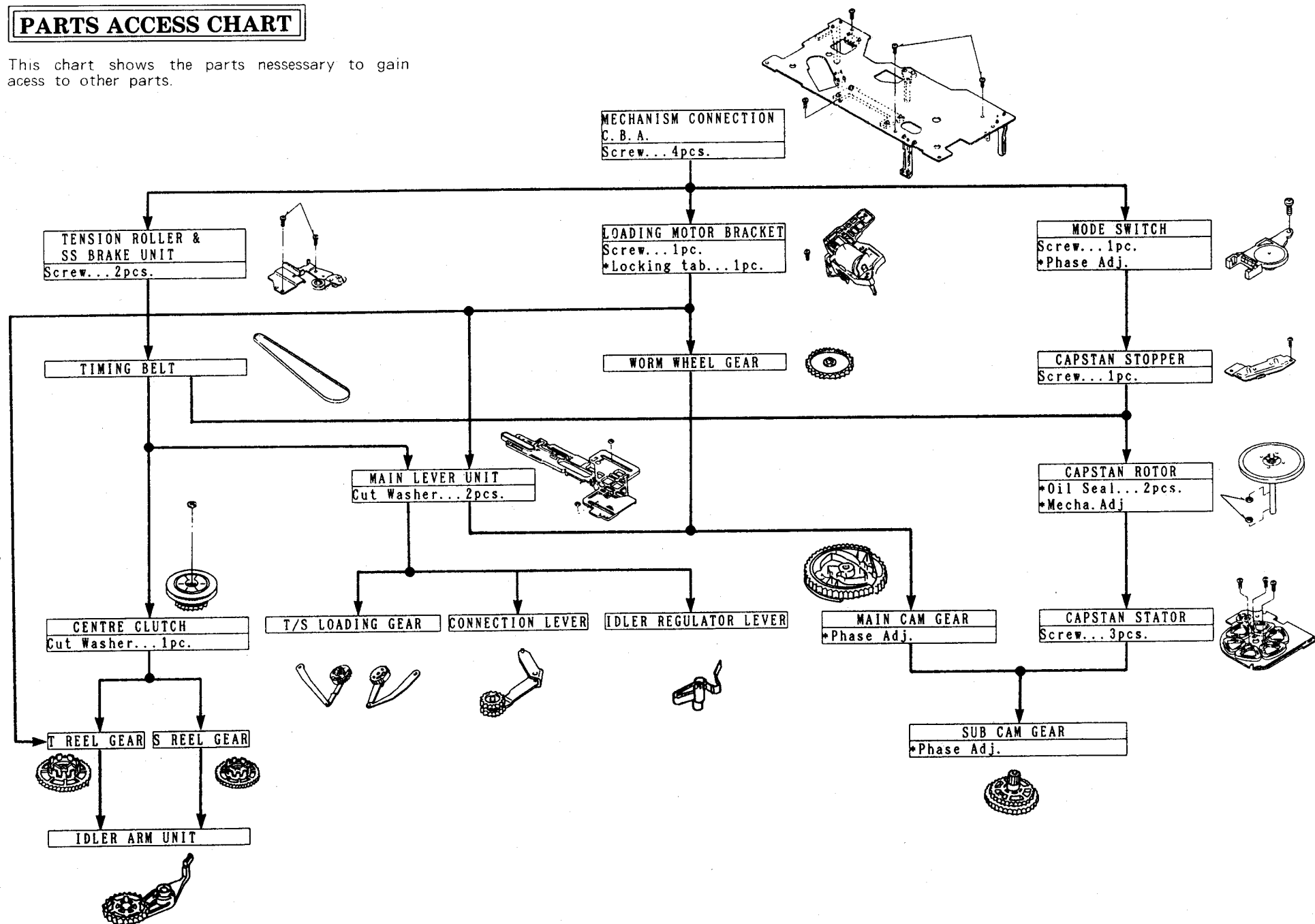
TENSION ROLLER &
SS (STILL/SLOW)
BRAKE

TAKE-UP
REEL GEAR

BOTTOM VIEW OF K-MECHANISM

PARTS ACCESS CHART

This chart shows the parts nessessary to gain access to other parts.



3-1. REMOVAL OF THE MECHANISM CHASSIS

- 1) Remove the 2 screws(A) push the HOLDER PLATE slightly to the rear of mechanism.
- 2) Remove the screw(B).
- 3) Disconnect all cables and connectors on the mechanism chassis and connector P6003 on the MAIN C.B.A.(connecting to DEW SENSOR). (Use extreme care when disconnecting the P1508)
- 4) Lift the mechanism chassis out of the unit.

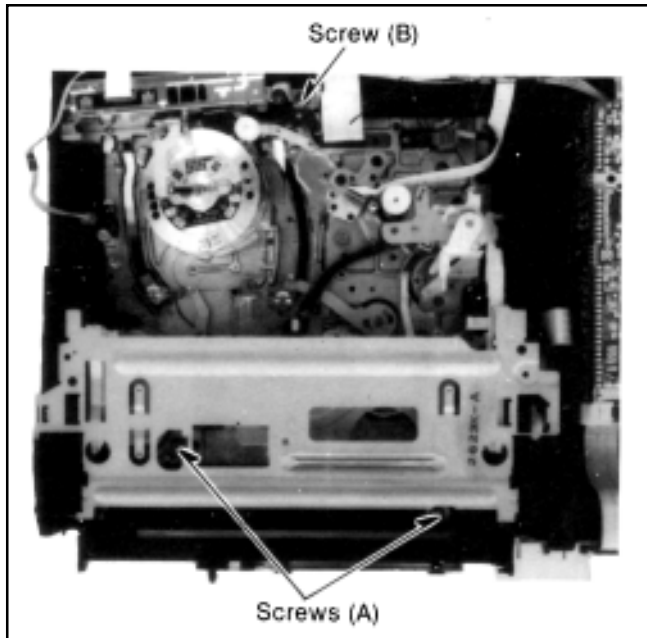


Fig. A1

3-2. REMOVAL OF THE MECHANISM CONNECTION C.B.A.

- 1) Remove the 4 screws(C).
- 2) Lift up on the C.B.A.

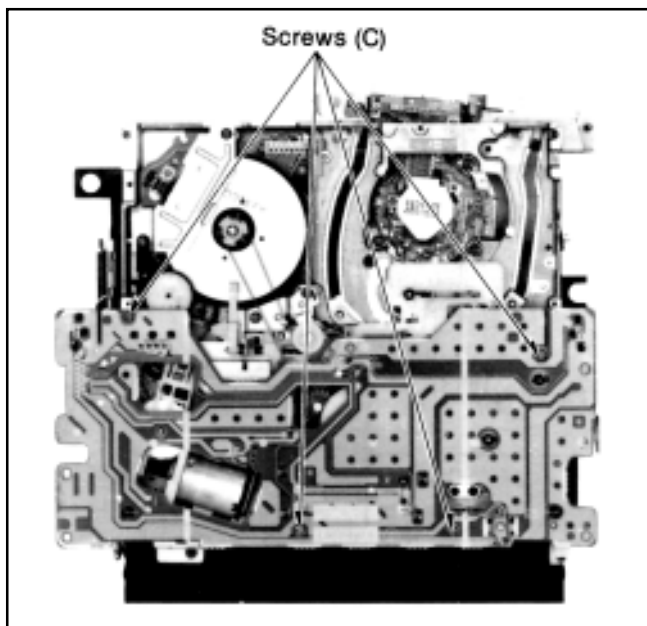


Fig. A2

3-3. REMOVAL OF THE TENSION ROLLER AND SS BRAKE

- 1) Remove the 2 screws(D).
- 2) Remove the TENSION ROLLER and the SS BRAKE.

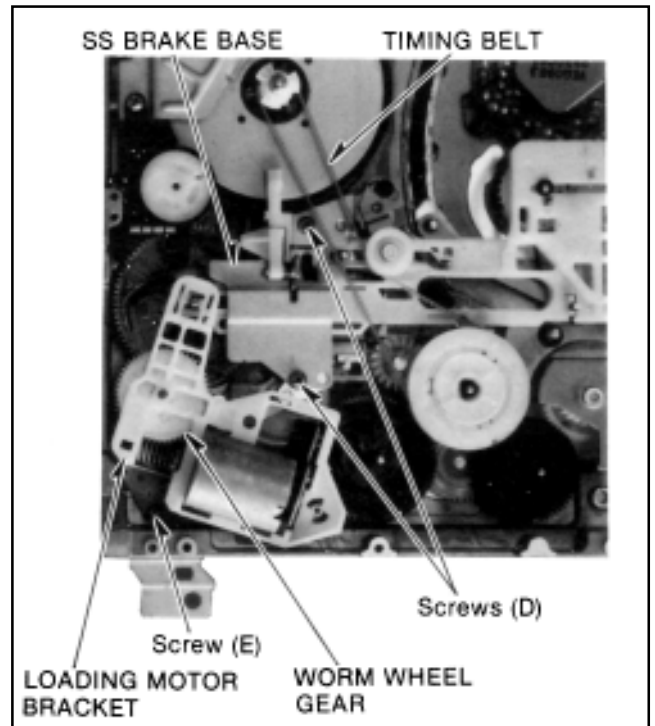


Fig. A3

3-4. REMOVAL OF THE TIMING BELT

- 1) Remove the TIMING BELT.

3-5. REMOVAL OF THE LOADING MOTOR BRACKET

- 1) Remove the screw(E) as shown in Fig.A3.
- 2) Disconnect the locking tab on the right by pushing the locking tab in as shown in Fig.A4.
- 3) Lift up on the LOADING MOTOR BRACKET and push the BRACKET towards the MAIN CAM GEAR as shown in Fig.A3.
- 4) Lift the WORM WHEEL GEAR off the shaft.

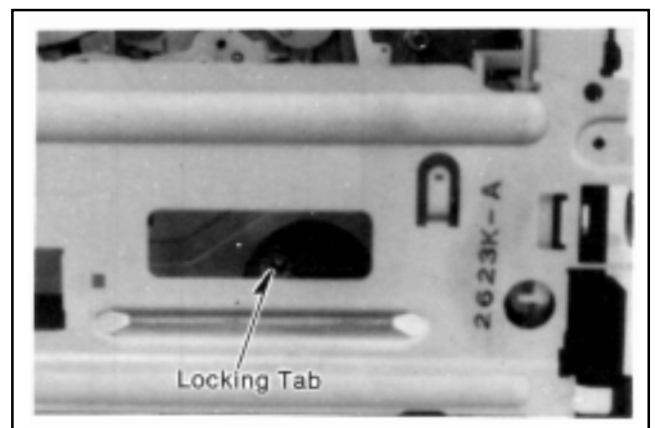


Fig. A4

3-6. REMOVAL OF THE MAIN LEVER UNIT

- 1) Remove the 3 cut washers.
- 2) Remove the MAIN LEVER UNIT.

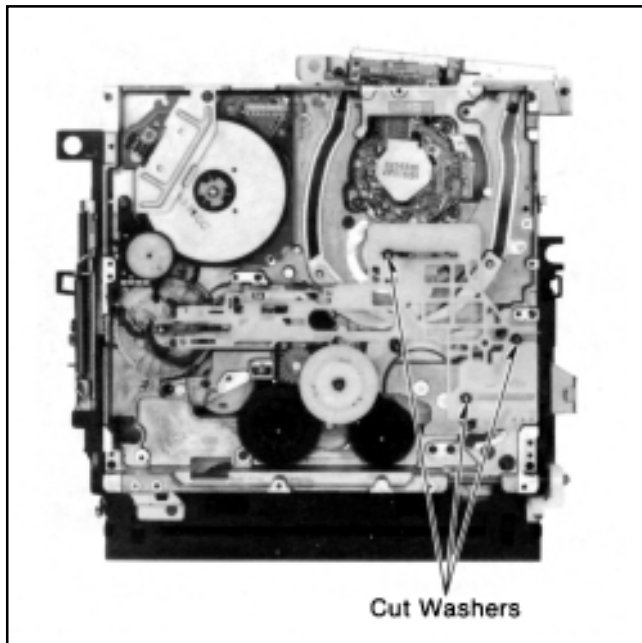


Fig. A5

3-7. REMOVAL OF THE TAKE-UP AND SUPPLY LOADING ARMS

- 1) Remove the TAKE-UP and SUPPLY LOADING GEARS by lifting them up off the post.

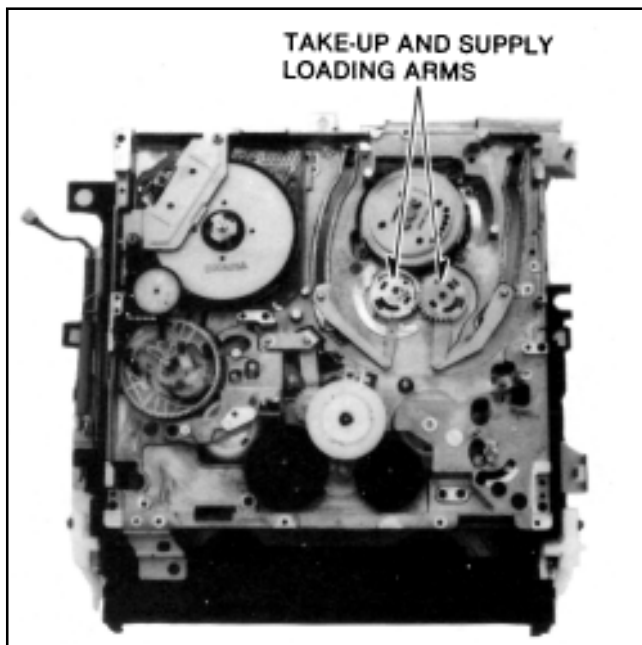


Fig. A6

3-8. REMOVAL OF THE MODE SWITCH

- 1) Remove screw(F).
- 2) Remove the MODE SWITCH.

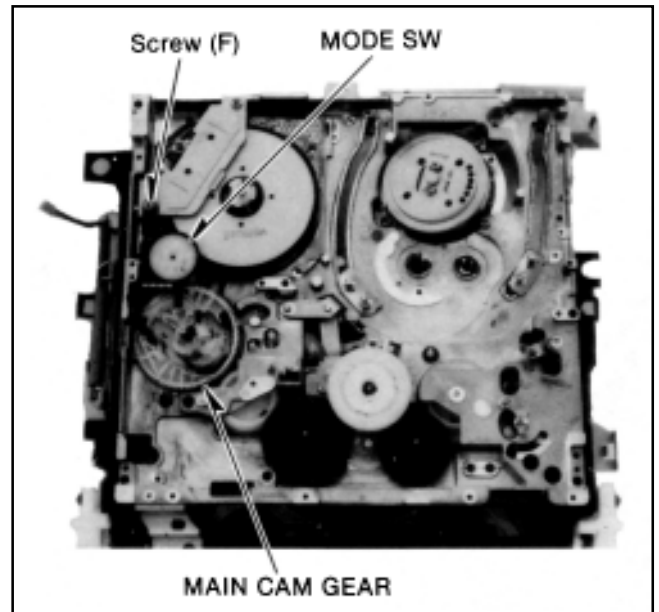


Fig. A7

3-9. REMOVAL OF THE MAIN CAM GEAR

- 1) Lift the MAIN CAM GEAR off the shaft.

3-10. REMOVAL OF THE CAPSTAN ROTOR UNIT

- 1) Remove the screw(G) and remove the CAPSTAN STOPPER as shown in Fig.A8.

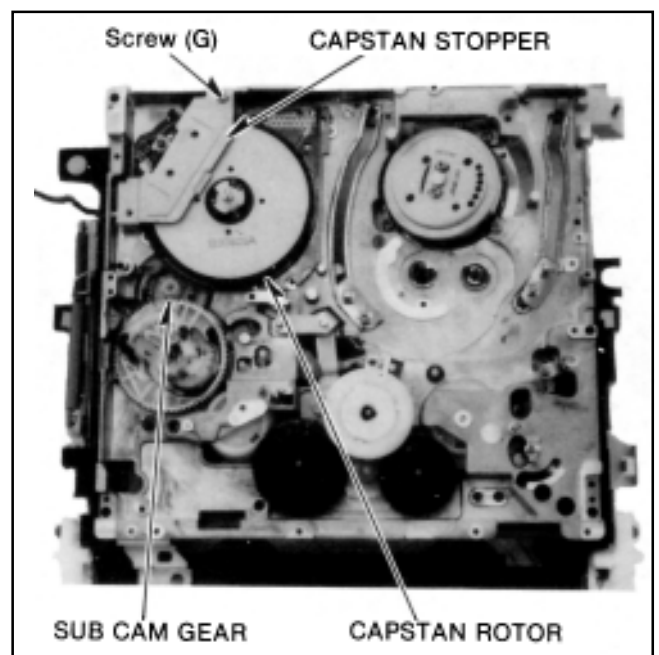


Fig. A8

- 2) Pull out the CAPSTAN ROTOR.
(When the CAPSTAN ROTOR is removed, 2 OIL SEALS are left in the CAPSTAN ROTOR HOUSING Fig.A9.. To avoid losing the OIL SEALS, place them back on the CAPSTAN SHAFT.)

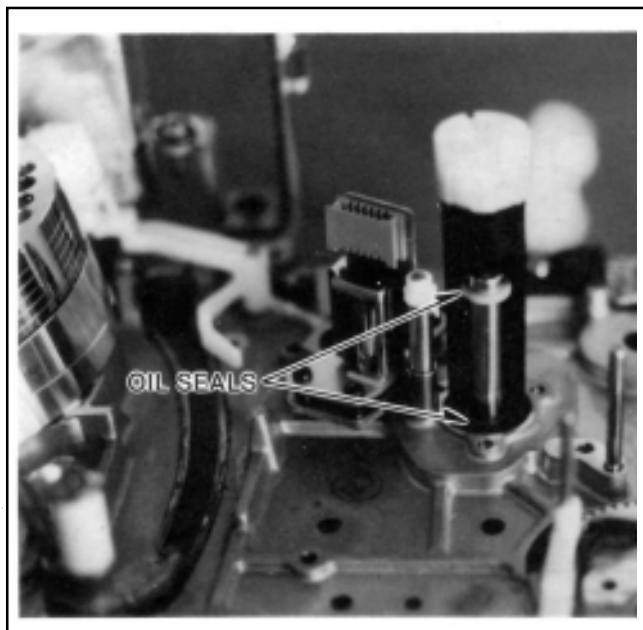


Fig. A9

- 3) Remove the 3 screws(H) and remove the CAPSTAN STATOR as shown in Fig.A10.

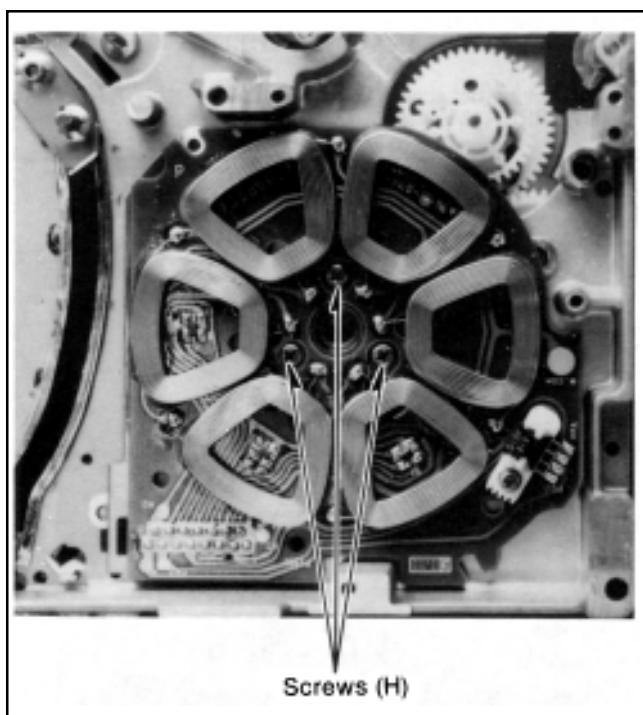


Fig. A10

3-11. REMOVAL OF THE SUB CAM GEAR

- 1) Lift the SUB CAM GEAR off the shaft.

3-12. REMOVAL OF THE CENTRE CLUTCH

- 1) Remove the cut washer.
- 2) Remove the CENTRE CLUTCH.

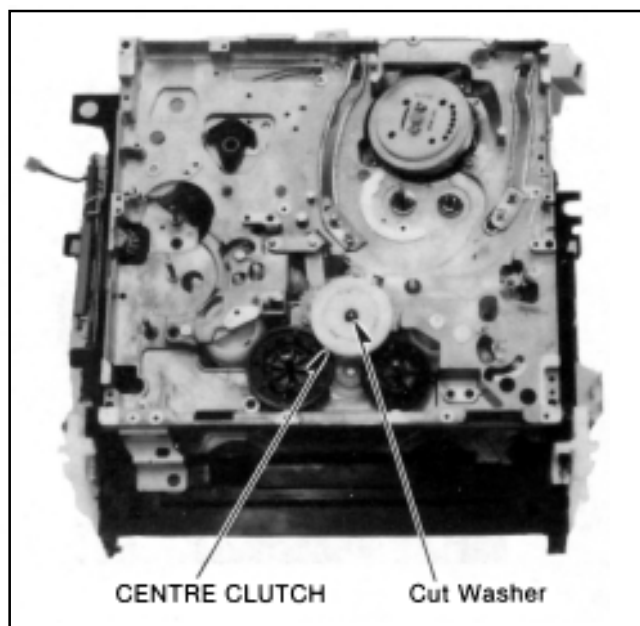


Fig. A11

3-13. REMOVAL OF THE TAKE-UP AND SUPPLY REEL GEARS

- 1) Unlock the locking tab and lift up on the reel.

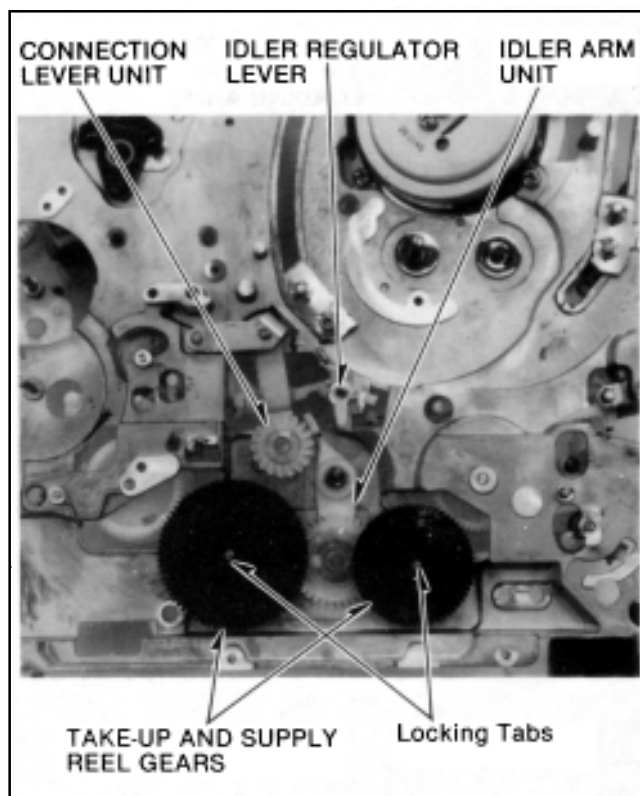


Fig. A12

3-14. REMOVAL OF THE IDLER ARM UNIT, CONNECTION LEVER UNIT AND IDLER REGULATOR LEVER

- 1) Lift the IDLER ARM UNIT and CONNECTION LEVER UNIT off the shaft.
- 2) Remove the IDLER REGULATOR LEVER.

3-15. REMOVAL OF THE TOP PLATE

- 1) Push the locking tabs from the outer side to inside as shown in Fig.A13.
- 2) Lift up on the TOP PLATE.

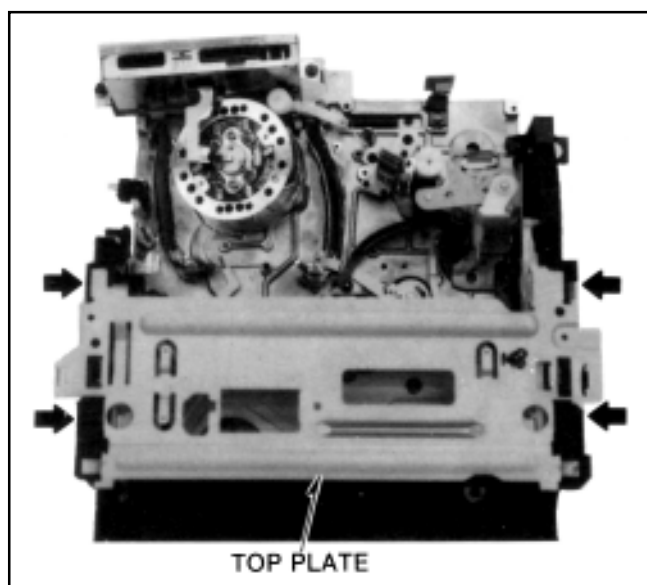


Fig. A13

NOTE:

If locking tab is broken, TOP PLATE can be installed by screws(XTB26+8G) as shown in Fig.A14.

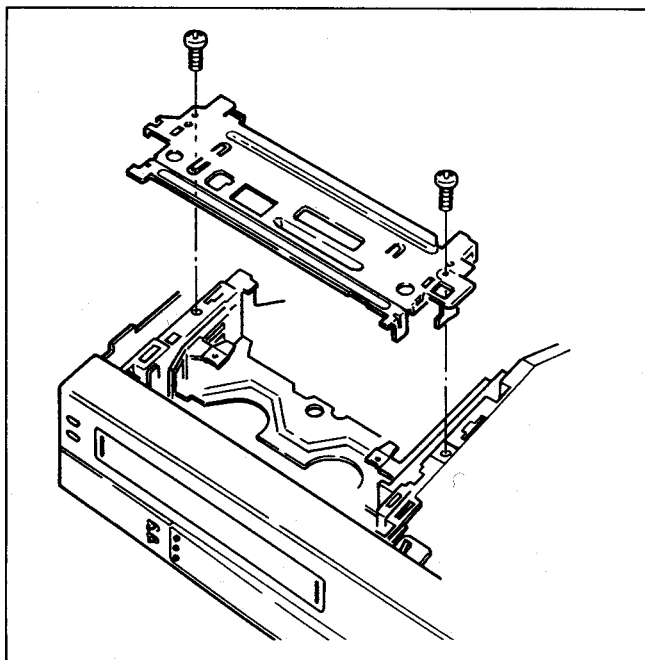


Fig. A14

3-16. REMOVAL OF THE CASSETTE HOLDER

- 1) Slide the HOLDER PLATE in the rear and lift up.
- 2) Remove the 4 screws(I).
- 3) Remove the CASSETTE HOLDER.

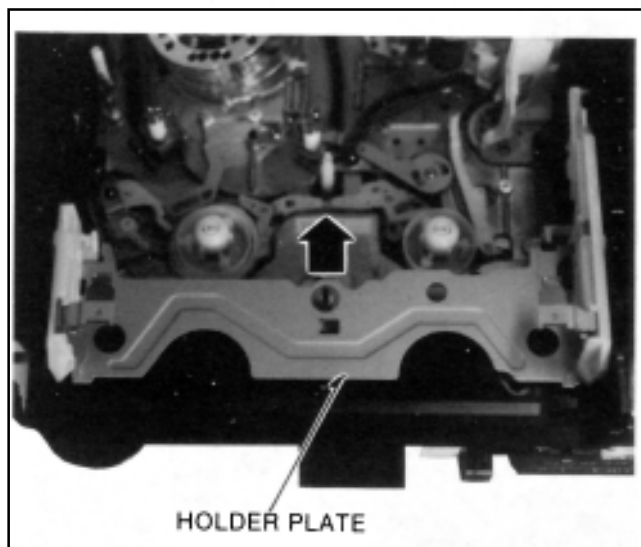


Fig. A15

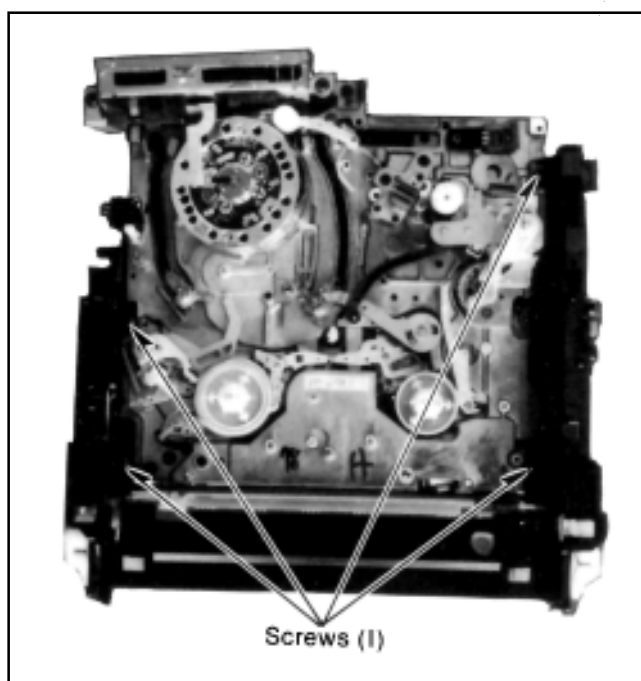


Fig. A16

3-17. REMOVAL OF THE PINCH ARM UNIT

- 1) Unlock the locking tab on the OPENER PIECE and remove it from the shaft.
- 2) Remove the PINCH ARM UNIT from the shaft.

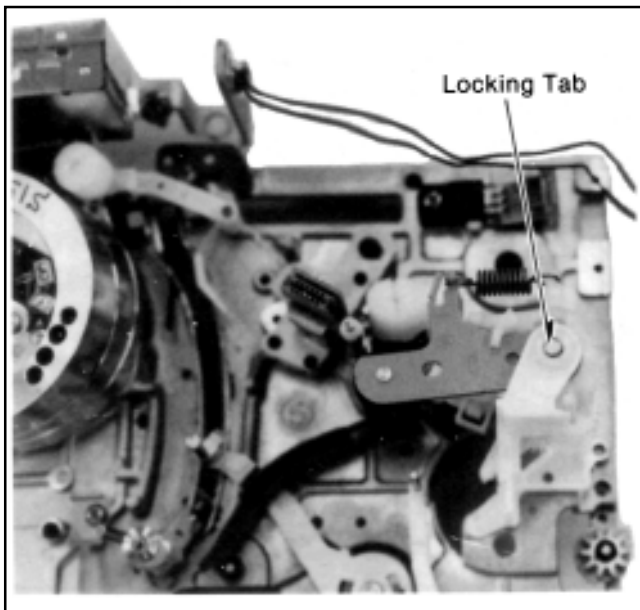


Fig. A17

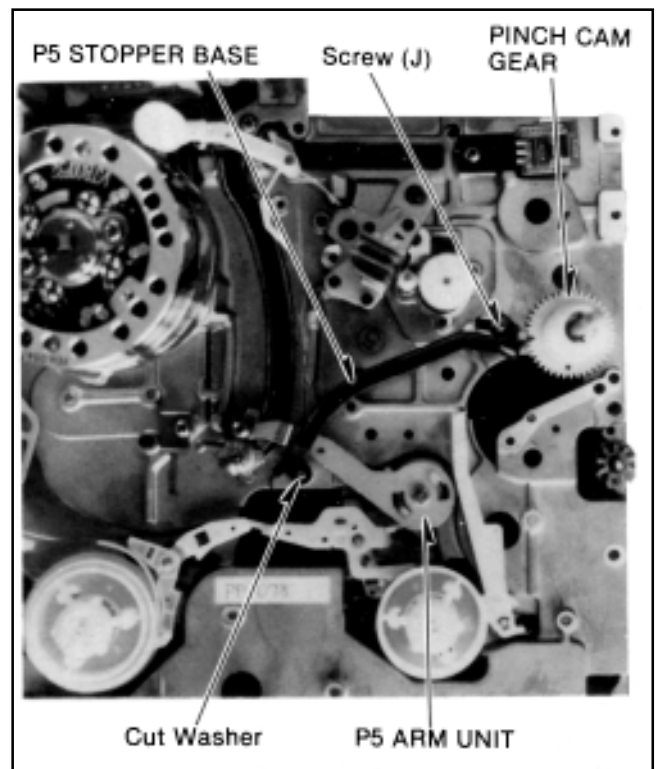


Fig. A19

3-18. REMOVAL OF THE PINCH CAM GEAR AND P5 ARM UNIT

- 1) Unlock the locking tab of the P5 STOPPER and remove the P5 STOPPER.
- 2) Remove the screw(J) and the cut washer.
- 3) Remove the P5 STOPPER BASE.
- 4) Remove the PINCH CAM GEAR and P5 ARM UNIT.

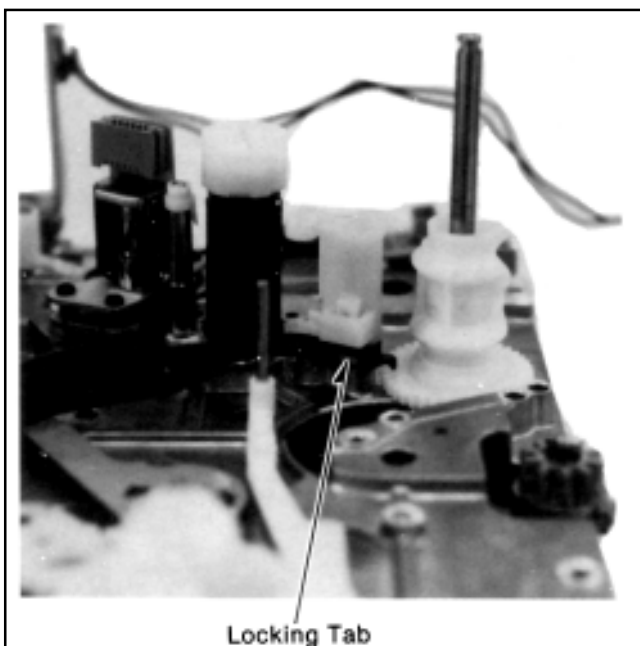


Fig. A18

3-19. REMOVAL OF THE TAKE-UP TENSION REGULATOR ARM UNIT

- 1) Disconnect the spring from the bottom of the chassis.
- 2) Unlock the locking tab and lift the TAKE-UP TENSION REGULATOR ARM UNIT off the shaft.

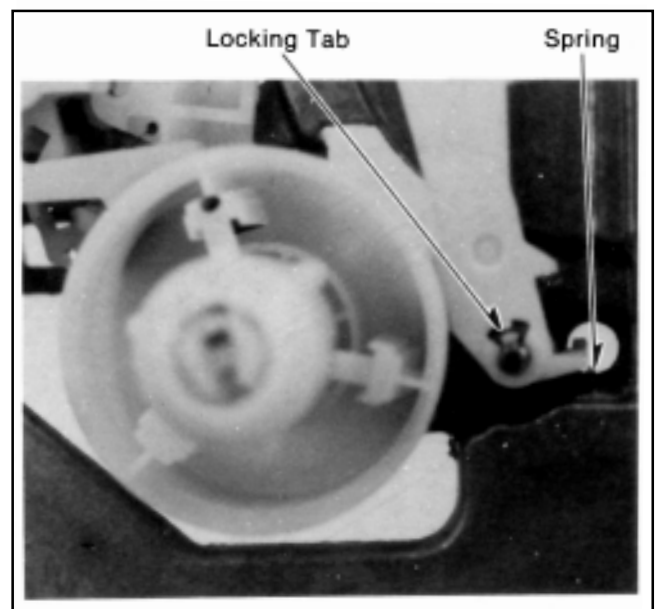


Fig. A20

3-20. REMOVAL OF THE CARRIAGE CONNECTION GEAR

- 1) Remove the cut washer.
- 2) Lift the CARRIAGE CONNECTION GEAR off the shaft.

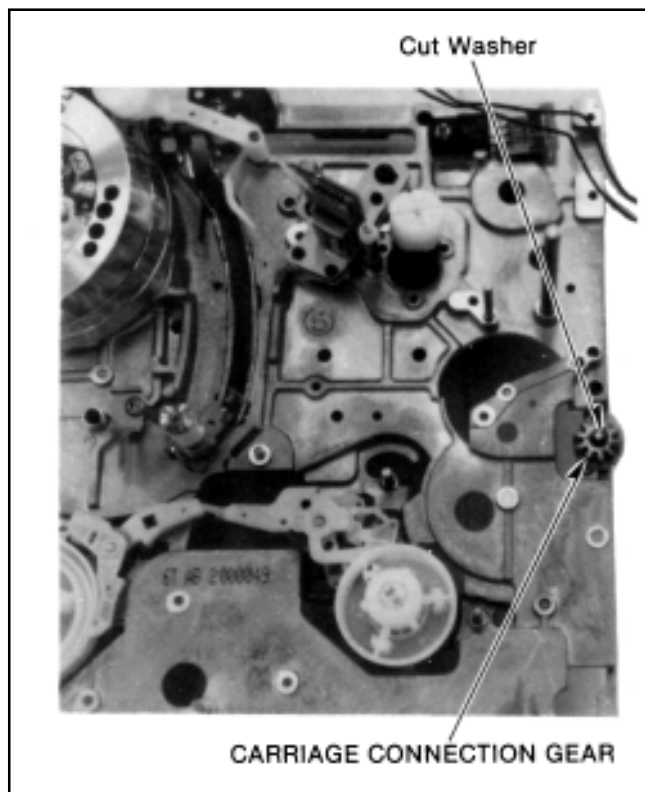


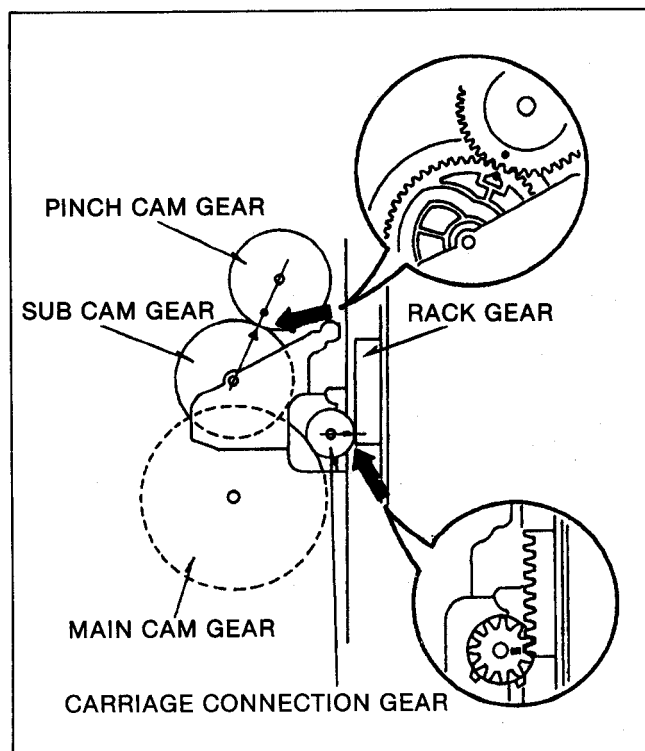
Fig. A21

4. ASSEMBLY PROCEDURES OF MECHANISM

4-1. VIEW OF PHASE ALIGNMENT

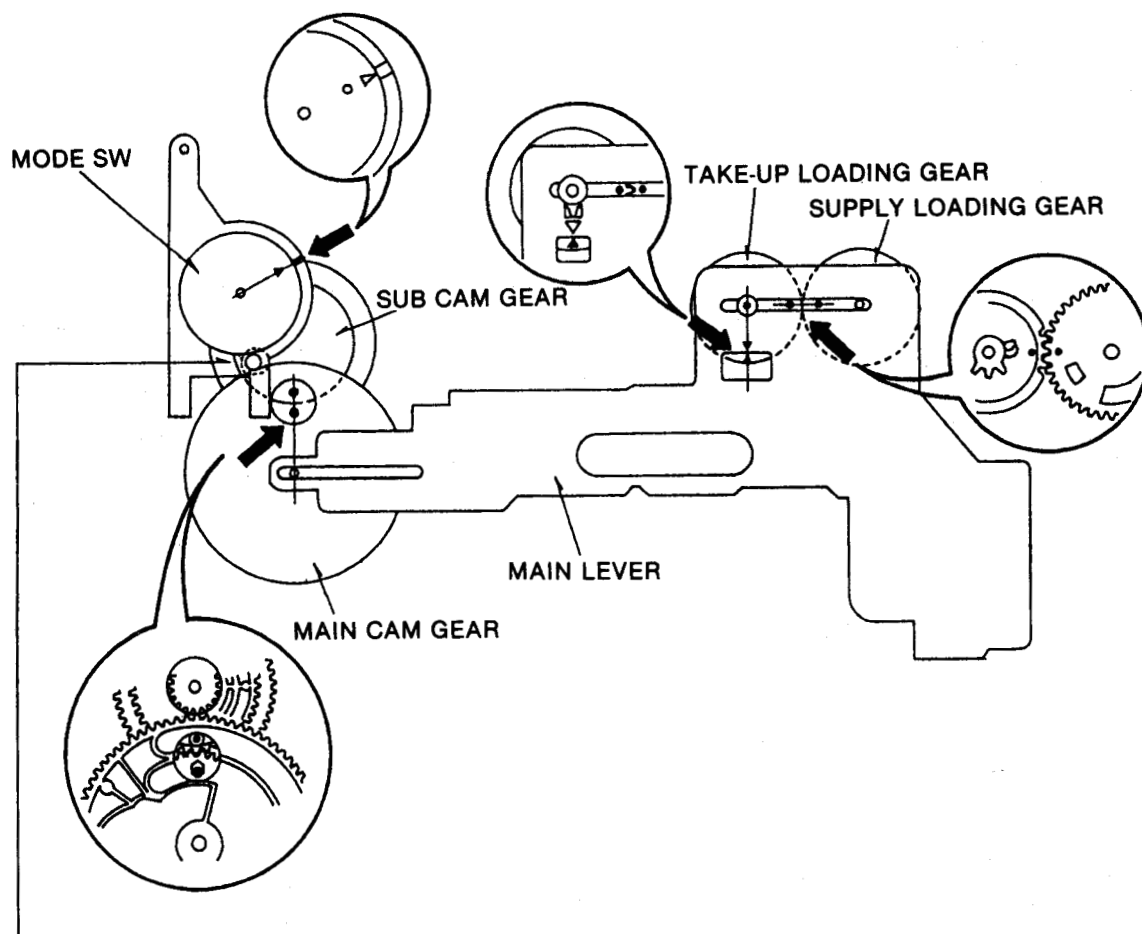
The gear phase alignment is performed in the cassette down position and is crucial for the K-Mechanism to operate correctly.

- 1) Top View of Gear Phase Alignment Marks. There are alignment marks on the Pinch Cam Gear and Sub Cam Gear. There is one alignment mark on the carriage connection gear.



Top View of Gear Phase Alignment

- 2) Bottom View of Gear Phase Alignment Marks.
 There are alignment marks on Take-up Loading Gear and Supply Loading Gear.
 There is an additional mark on the Take-up Loading Gear that aligns with the mark on the main lever. There are alignment marks on the Main Cam Gear and the Sub Cam Gear. The mode switch gear mark aligns with a notch in the mode switch frame.



There is a hole on the Sub-Cam Gear and a hole on the chassis that are used for alignment reference.

Bottom View of Gear Phase Alignment

4-2. ASSEMBLY OF THE CARRIAGE CONNECTION

- 1) Install the CARRIAGE CONNECTION GEAR as shown in Fig.A21.
- 2) Install the cut washer.

4-3. ASSEMBLY OF THE TAKE-UP TENSION REGULATOR ARM UNIT, P5 ARM UNIT PINCH CAM GEAR, P5 STOPPER BASE, P5 STOPPER, PINCH CAM UNIT AND OPENER PIECE

- 1) Install the TAKE-UP TENSION REGULATOR ARM UNIT.
- 2) Hook the spring to hole on the chassis.
- 3) Install the P5 ARM UNIT and PINCH CAM GEAR.
- 4) Install the P5 STOPPER BASE with cut washer and screw(J).
- 5) Install the P5 STOPPER, PINCH ARM UNIT and OPENER PIECE.

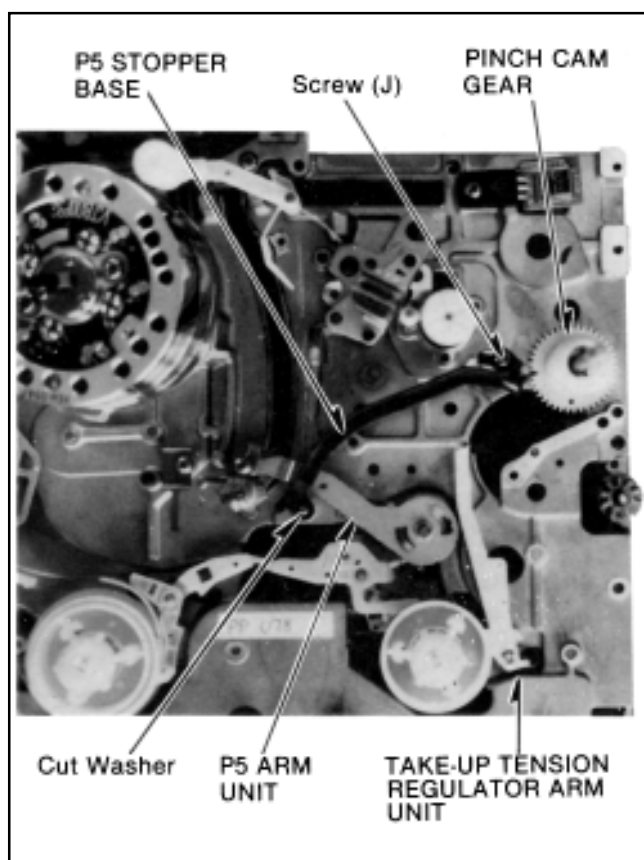


Fig. K1

4-4. ASSEMBLY OF THE IDLER ARM UNIT, TAKE-UP AND SUPPLY REEL GEARS, IDLER REGULATOR LEVER, CONNECTION LEVER UNIT AND CENTRE CLUTCH

- 1) Install the IDLER UNIT, TAKE-UP and SUPPLY REEL GEARS, IDLER REGULATOR LEVER and CONNECTION LEVER UNIT.
- 2) Install the CENTRE CLUTCH with cut washer.

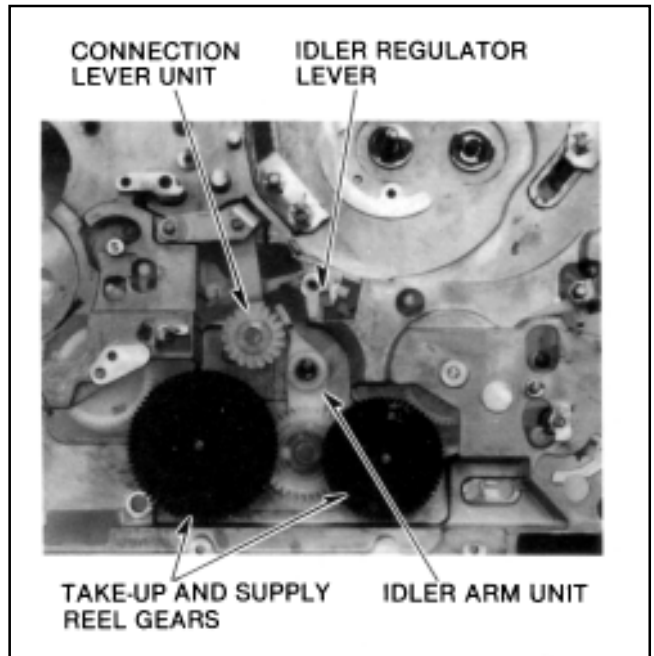


Fig. K2

4-5. ASSEMBLY OF THE SUB CAM GEAR

The SUB CAM GEAR is used for the reference of the phase.

- 1) Install the SUB CAM GEAR so that the chassis hole aligns with hole in the SUB CAM GEAR. Also, the hole in the outer gear of the SUB CAM GEAR must align with the hole in the PINCH CAM GEAR. The boss on the PINCH ARM must be installed in the cam groove of the SUB-CAM GEAR. This is used for the reference of the phase. To aid installation of the SUB-CAM GEAR insert a fixing pin into the holes of the SUB-CAM GEAR and the chassis.

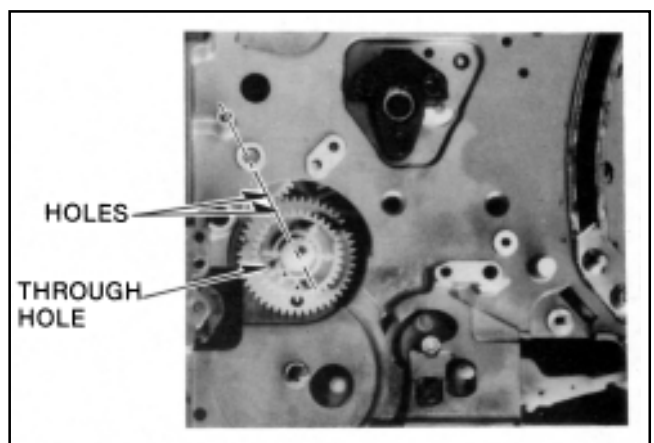


Fig. K3

4-6. ASSEMBLY OF THE STATOR UNIT

- 1) Place the STATOR UNIT into position. Loosely reinstall the 3 screws that secure the STATOR and HOUSING UNIT. Next insert the CENTERING PIN then tighten the 3 screws as shown in Fig.K4.

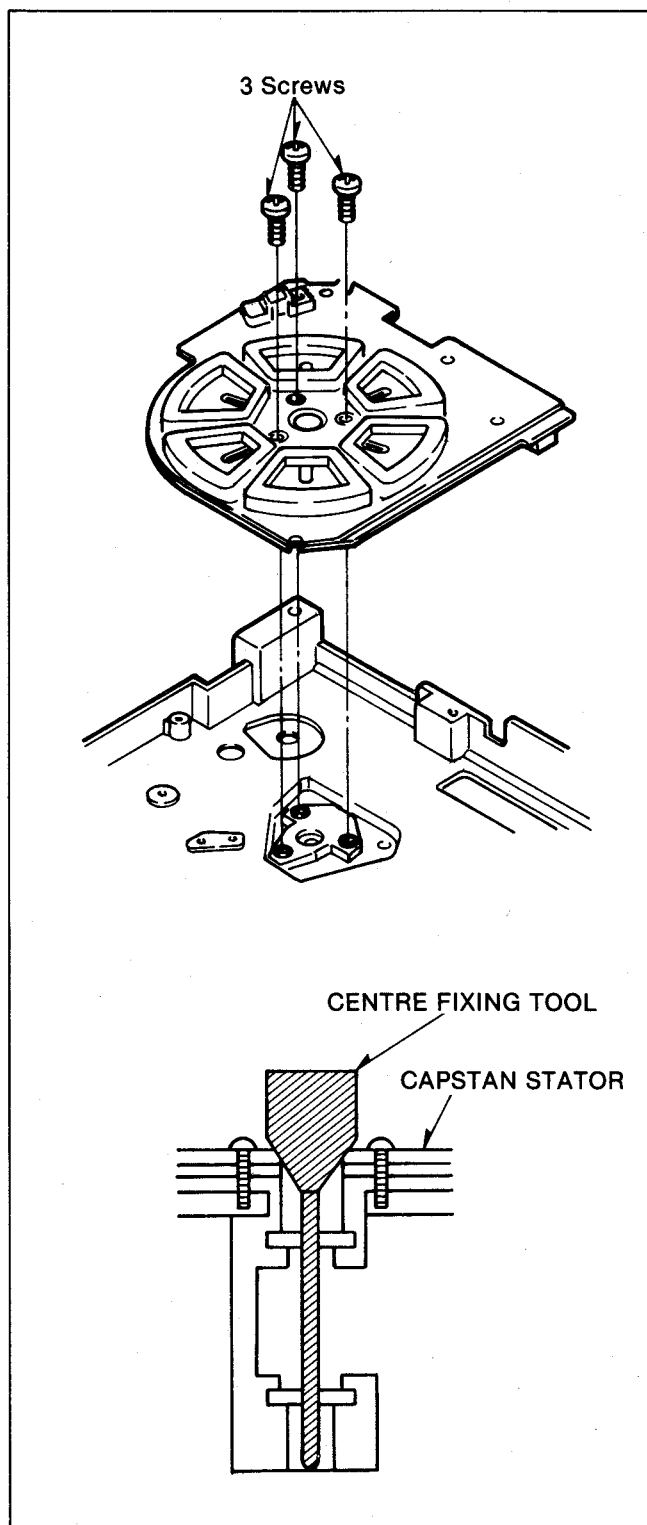


Fig. K4

- 2) Remove the oil seal from the ROTOR SHAFT. Partially install the ROTOR SHAFT into the lower position and install the oil seal. Insert the ROTOR SHAFT further into the housing and install the second OIL SEAL in the upper position. Push the lower OIL SEAL down the ROTOR SHAFT into the housing.

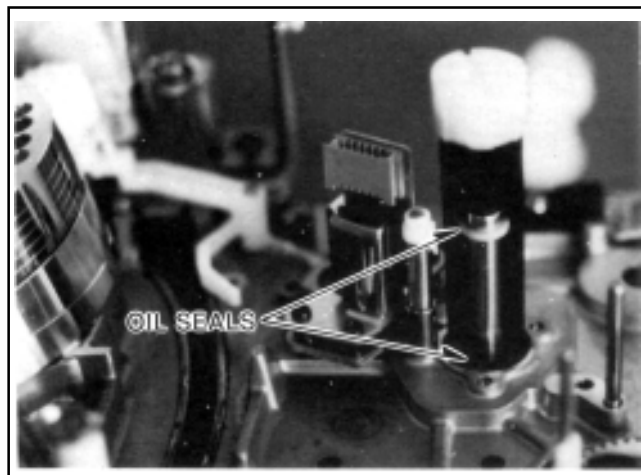


Fig. K5

- 3) Clean the ROTOR SHAFT after replacement. Reinstall the ROTOR STOPPER and the screw on the top side.

4-7. ASSEMBLY OF THE MAIN CAM GEAR

NOTE:

Before installing the MAIN CAM GEAR, set the CONNECTION GEAR so that the side of the gear with no teeth is towards the MAIN CAM GEAR.

- 1) Install the MAIN CAM GEAR so that the hole marker aligns with the SUB-CAM GEAR and insert the boss of the TAKE-UP TENSION REGULATOR ARM into the slot on the bottom of the MAIN CAM GEAR.

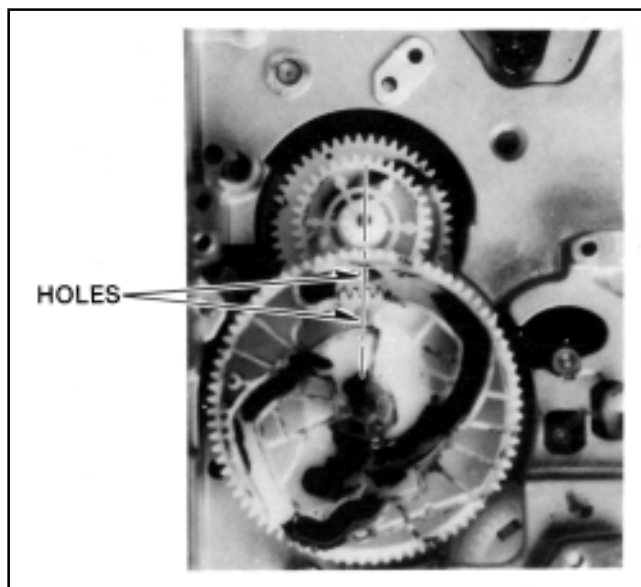


Fig. K6

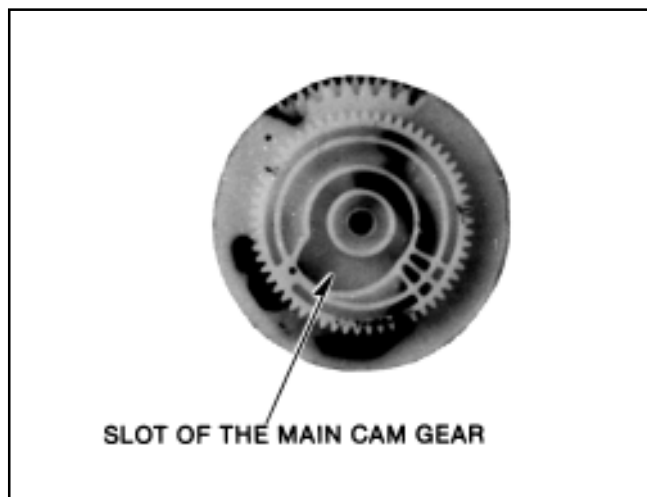


Fig. K7

4-8. ASSEMBLY OF THE MODE SW

- 1) Align the mark on the MODE SWITCH GEAR with the notch on the MODE SWITCH FRAME.
- 2) Install the MODE SWITCH taking care that all the phase alignments are correct. Check the CAM GEAR timing by rotating the MAIN CAM GEAR.
- 3) Install the screw(K) the retains the MODE SWITCH and ROTOR STOPPER.

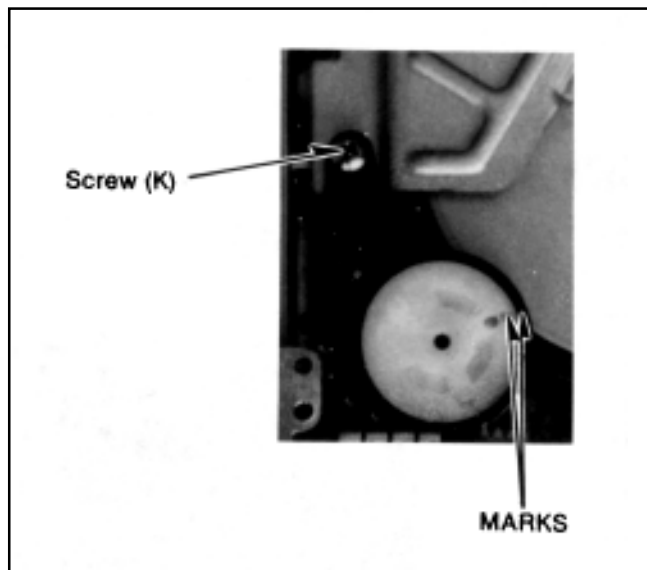


Fig. K8

4-9. ASSEMBLY OF THE T & S LOADING ARMS

- 1) Set the shaft holders to the unloaded position. Take care that the P5 POST does not interfere with the P3 Post or prevent it from going to the unloaded position. The TENSION ARM must be set to the position that will allow the P2 POST to move back to the unloaded position.
- 2) Install the TAKE-UP LOADING ARM and SUPPLY LOADING ARM, aligning the marks on the both GEARS.

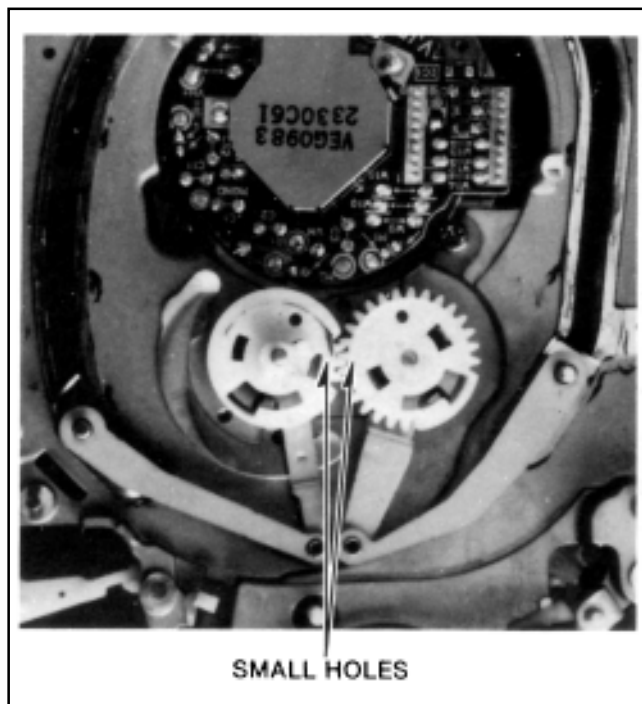


Fig. K9

4-10. ASSEMBLY OF THE MAIN LEVER

- 1) Install the MAIN LEVER ARM checking that the boss arms and shafts are in the correct position and the mark on the MAIN LEVER ARM is aligned with mark on the TAKE-UP LOADING GEAR.
- 2) Install the 3 cut washers.

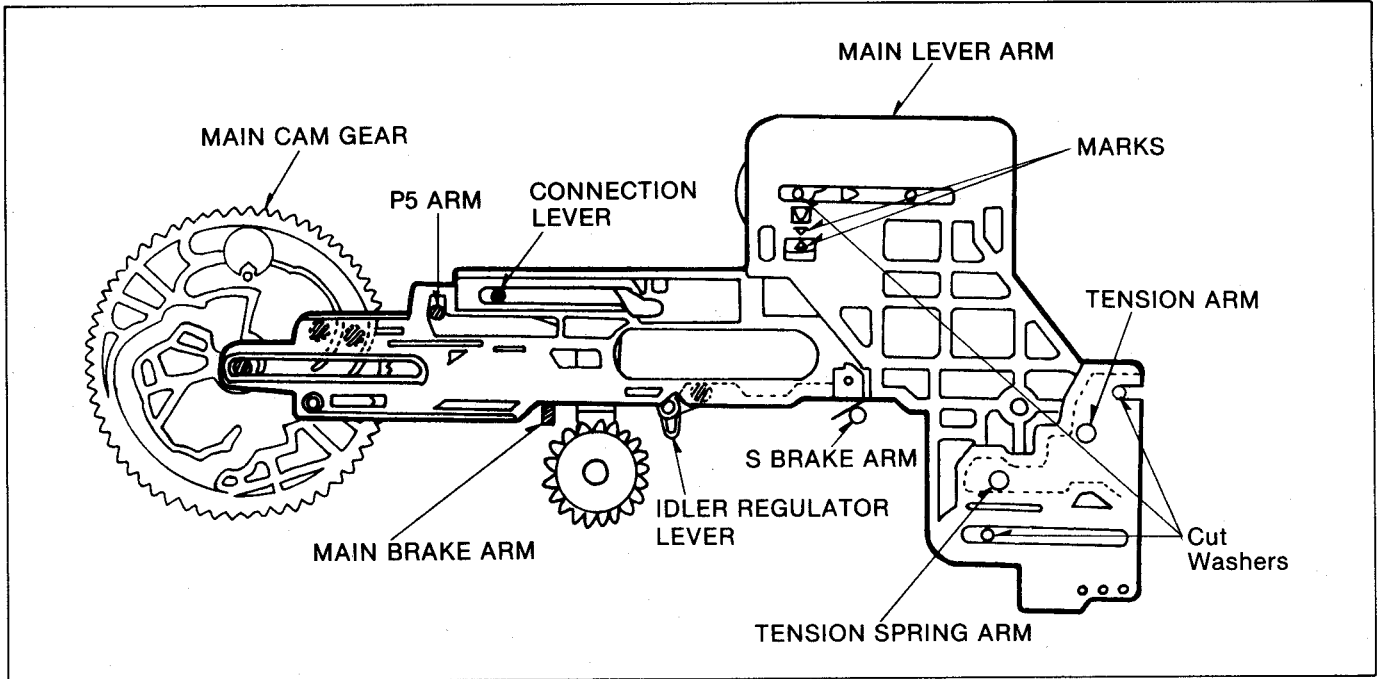


Fig. K10

4-11. ASSEMBLY OF THE WORM WHEEL GEAR & LOADING MOTOR BRACKET

- 1) Reinstall the WORM WHEEL GEAR.
- 2) Install the LOADING MOTOR BRACKET. First set the BRACKET over the MAIN CAM GEAR shaft and slide until it locks. Then push down on the BRACKET until the locking tab is connected to the chassis. Reinstall the screw(L).

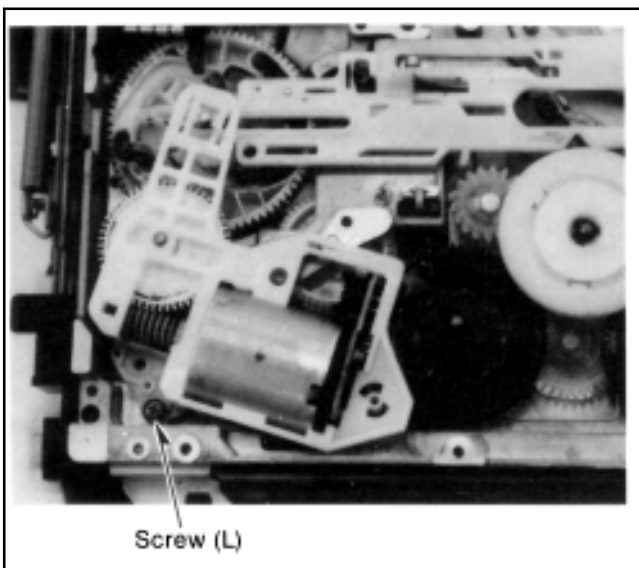


Fig. K11

4-12. ASSEMBLY OF THE TIMING BELT & SS BRAKE BASE

- 1) Install the TIMING BELT.
- 2) Put the TIMING BELT onto the TENSION ROLLER, slide the SS BRAKE BASE into position and install 2 screws(M).

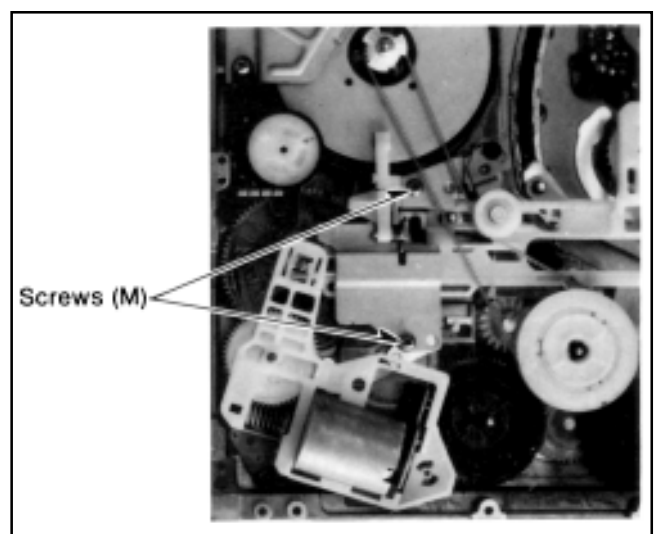


Fig. K12

4-13. ASSEMBLY OF THE PINCH ARM UNIT

- 1) Install the OPENER PIECE by inserting the boss into the PINCH ARM UNIT. Push down until the lock engages the shaft.

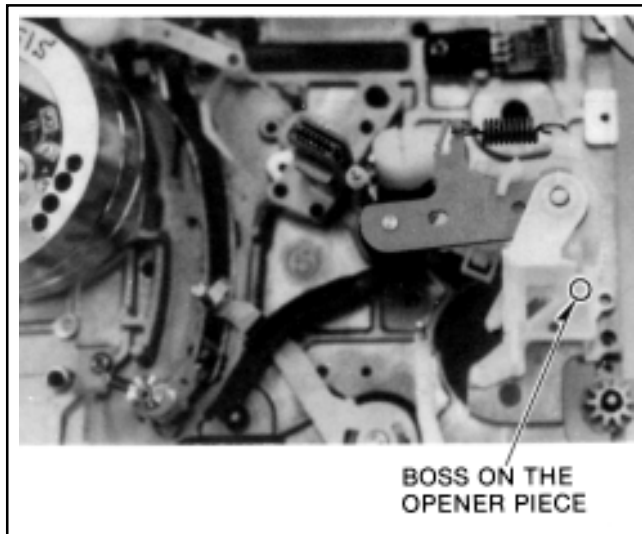


Fig. K13

4-14. CHECKING THE MECHANISM MOVEMENT

- 1) Check by moving the mechanism by hand then re-check using a battery to power the motor.
- 2) Rotate the LOADING MOTOR by hand in the loading direction while checking the movement of each gear. If the mechanism operates correctly when moved by hand, connect a battery to the LOADING MOTOR and re-check the movement of each gear as shown in Fig.S1/S2/S3.
- 3) Connect the battery to check the loading operation and then reverse the battery connection to check the unloading operation.
- 4) Reverse the battery to move the mechanism to the cassette down position.

4-15. ASSEMBLY OF THE CASSETTE HOLDER

1. ASSEMBLE A CASSETTE HOLDER AS A UNIT COMPLETE UNIT

- 1) Put the CASSETTE HOLDER into the cassette up condition by moving the WIPER ARM.
- 2) Turn the LOADING MOTOR by hand in the unloading direction until the CARRIAGE CONNECTION GEAR and the MODE SW is eject position as shown in Fig.K14/K15.

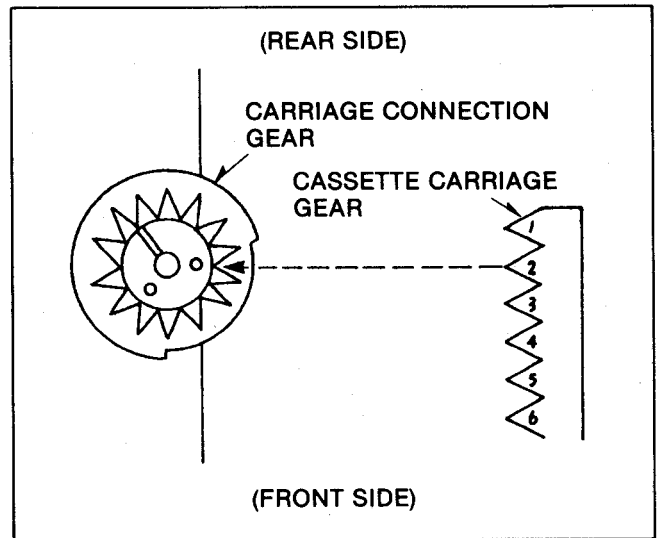


Fig. K14

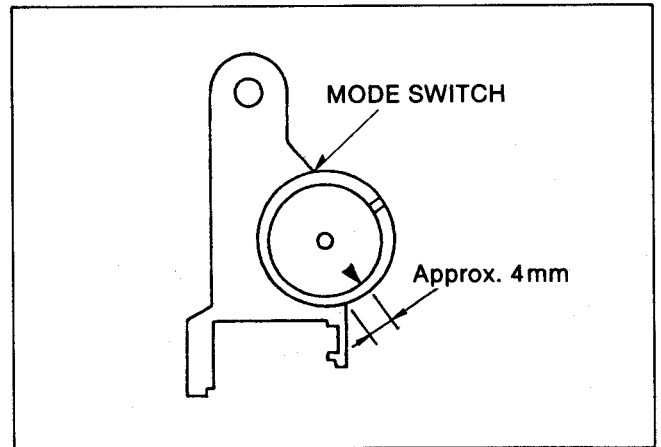


Fig. K15

- 3) Install the CASSETTE HOLDER UNIT as shown in Fig.K14.
- 4) Install 4 screws to attach the CASSETTE HOLDER UNIT.

<Eject Operation>

The main cam gear rotates in the direction of the arrow. The projection (B) of the carriage connection gear engages with the recession (A) of the main cam gear. The carriage connection gear rotates in the direction of the arrow to perform the Eject operation.

<NOTE>

If the Eject operation is performed without the cassette carriage installed while repairing or making the mechanical phase alignment, the main cam gear will not engage with the carriage connection gear and the carriage connection gear will not rotate. For performing the Eject operation with the cassette carriage not installed, it is necessary to rotate to the carriage connection gear by hand in the direction of the arrow.

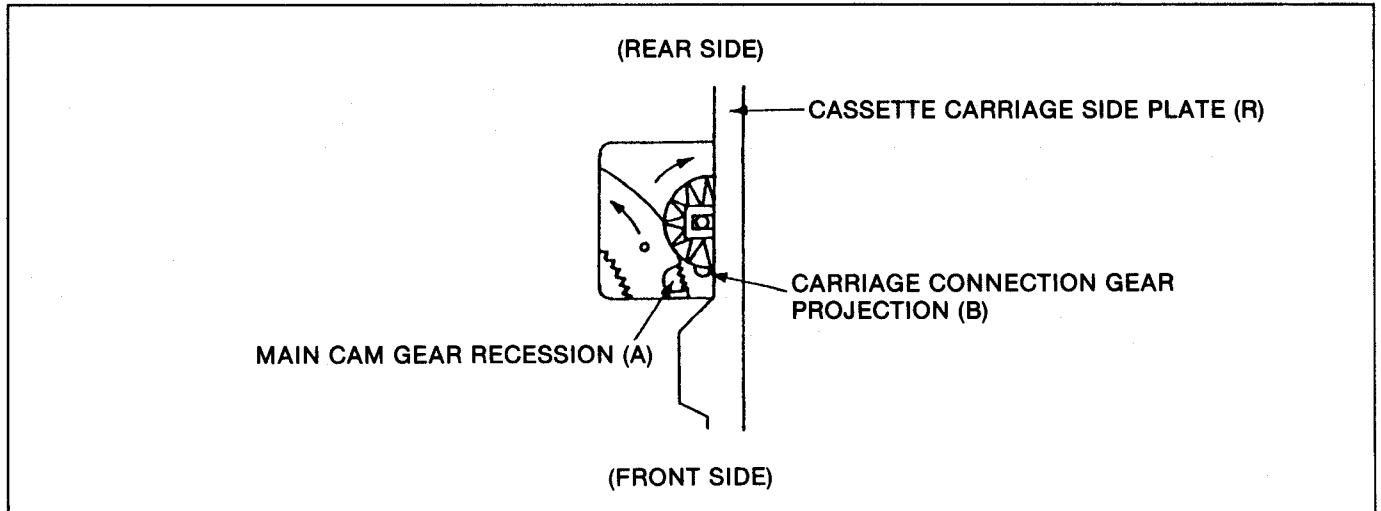


Fig. K16 Top View of Eject Operation

2. ASSEMBLE A CASSETTE HOLDER SEPARATELY

- 1) Put the CASSETTE HOLDER into the cassette down position by moving the WIPER ARM. Check the position of the WIPER ARM and RACK A. The mark of RACK A aligns with the mark on the WIPER ARM.

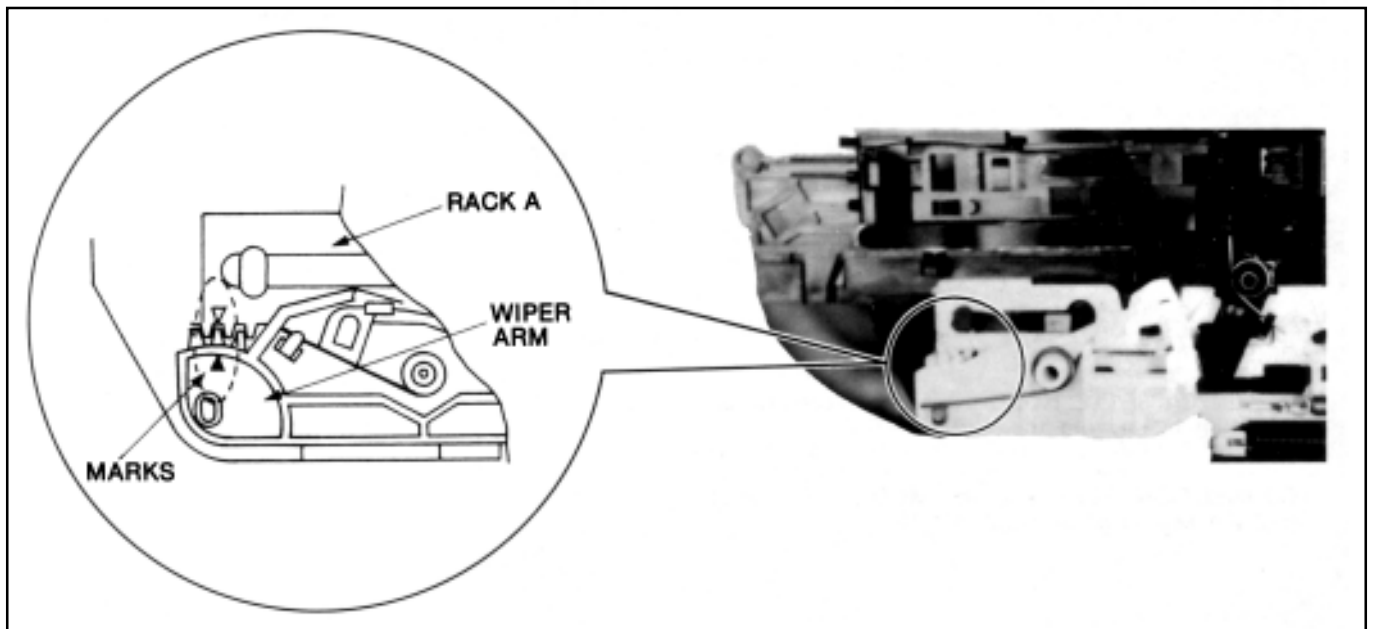


Fig. K17

- 2) Install the SIDE PLATE ASSEMBLY so that the first gear of RACK B aligns with the mark on the CARRIAGE CONNECTION GEAR.

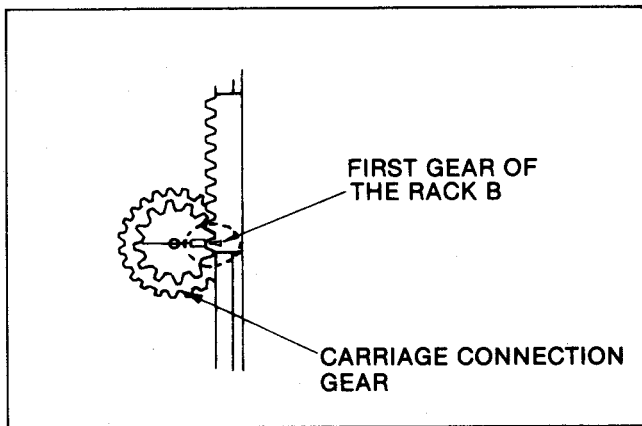


Fig. K18

- 3) Install 4 screws to attach the SIDE PLATE ASSEMBLY.
- 4) Turn the LOADING MOTOR by hand to the cassette up position while pushing the WIPER ARM to the cassette up position.
- 5) Insert the 5 posts on the CASSETTE HOLDER into the Side Plate.
- 6) Set the TOP PLATE on the Side Plate then push it down until it locks.

4-16. ASSEMBLY OF THE MECHANISM CHASSIS

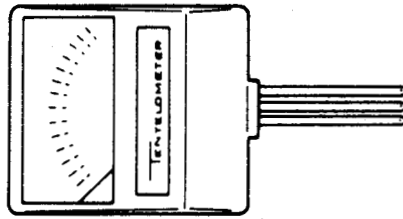
- 1) Install the MECHANISM CONNECTION C.B.A. onto the chassis. Then install the chassis into the frame and connect all the cables and connectors.
- 2) Clean the DD CYLINDER after reinstallation.
- 3) Insert a cassette and adjust the tape travel and check all the operation modes.

Servicing Fixtures & Tools

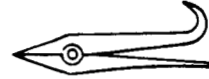
VFJ8125H3F
PAL VHS Alignment Tape
VFM8080HQFP
NTSC VHS Alignment Tape



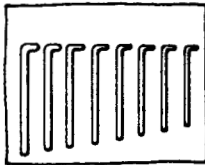
VFK0132
Back Tension Meter
(Tentelometer, Made in U.S.A.)



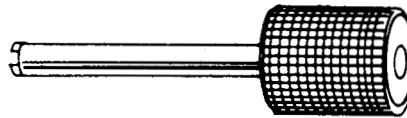
VFK0335
Retaining Ring Remover
(3mm/4mm)



VFK0326
Hex. Wrench Set
(0.7, 0.9, 1.2, 1.5, 1.6, 2.0, 2.4, 3.0mm)



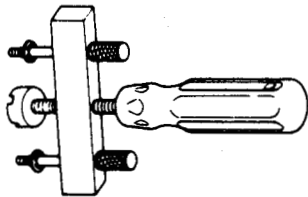
VFK0329
Post Adjustment Screw Driver



VFK0330
Fine Adjustment Gear Driver



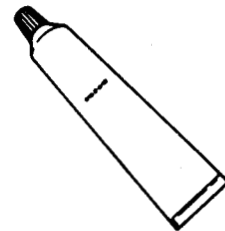
VFK0341
Upper Cylinder Remover



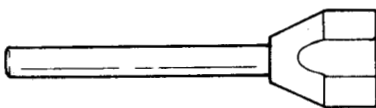
VFK27
Hand Cleaning Stick



MOR265
Morlytone Grease



VFK0851
CENTRE FIXING TOOL



5. PARTS CHANGE

5-1. Parts List

This list shows parts change for SUPPLE 1~3(SUPPLEMENT 1~3). When using or ordering the parts below, refer to this.

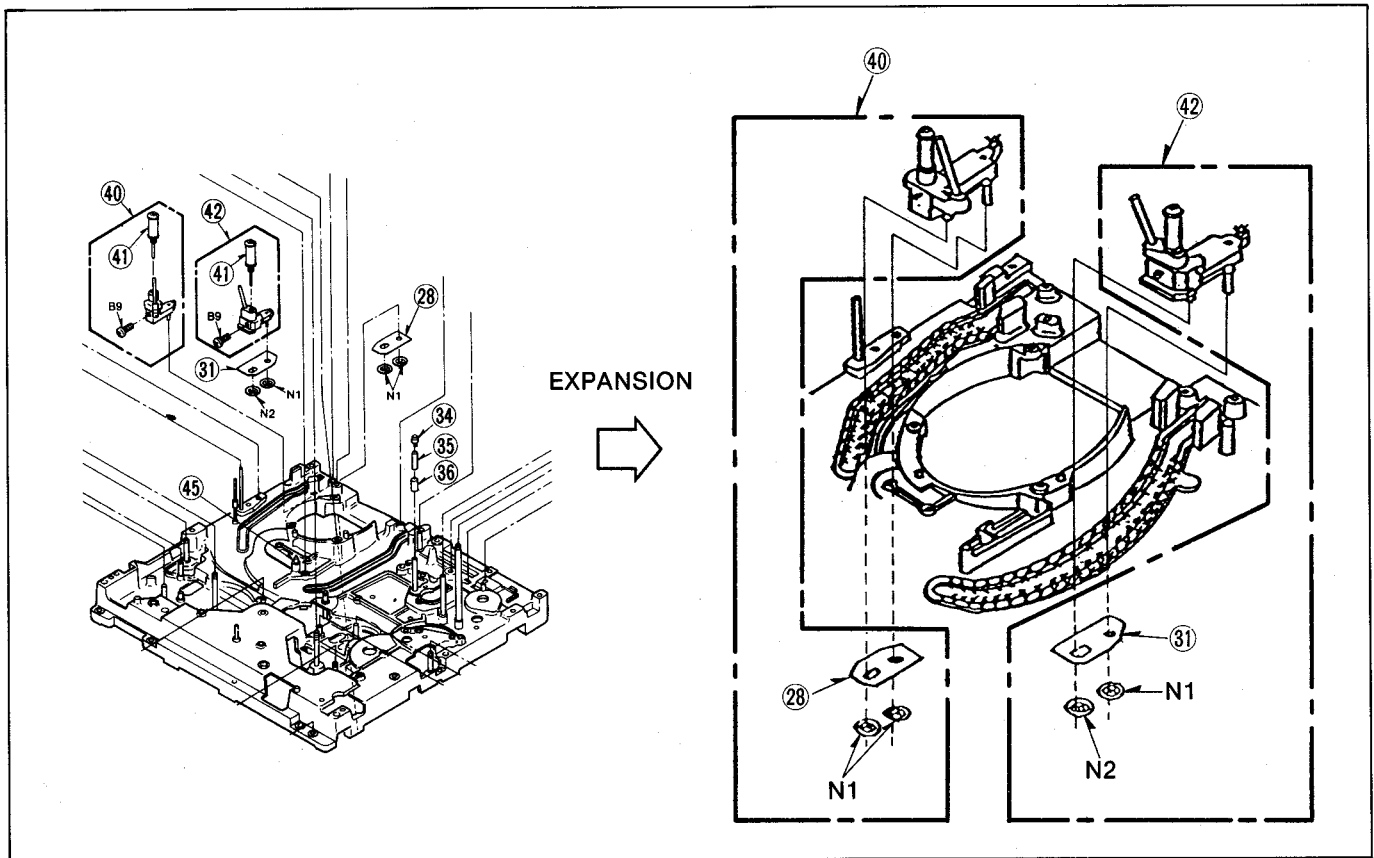
Note:(1)Parts indicated by " ▲ " do not have interchangeability.

(2)Parts indicated by " ● " should be used on New Part(SUPPLE1,2 or 3).

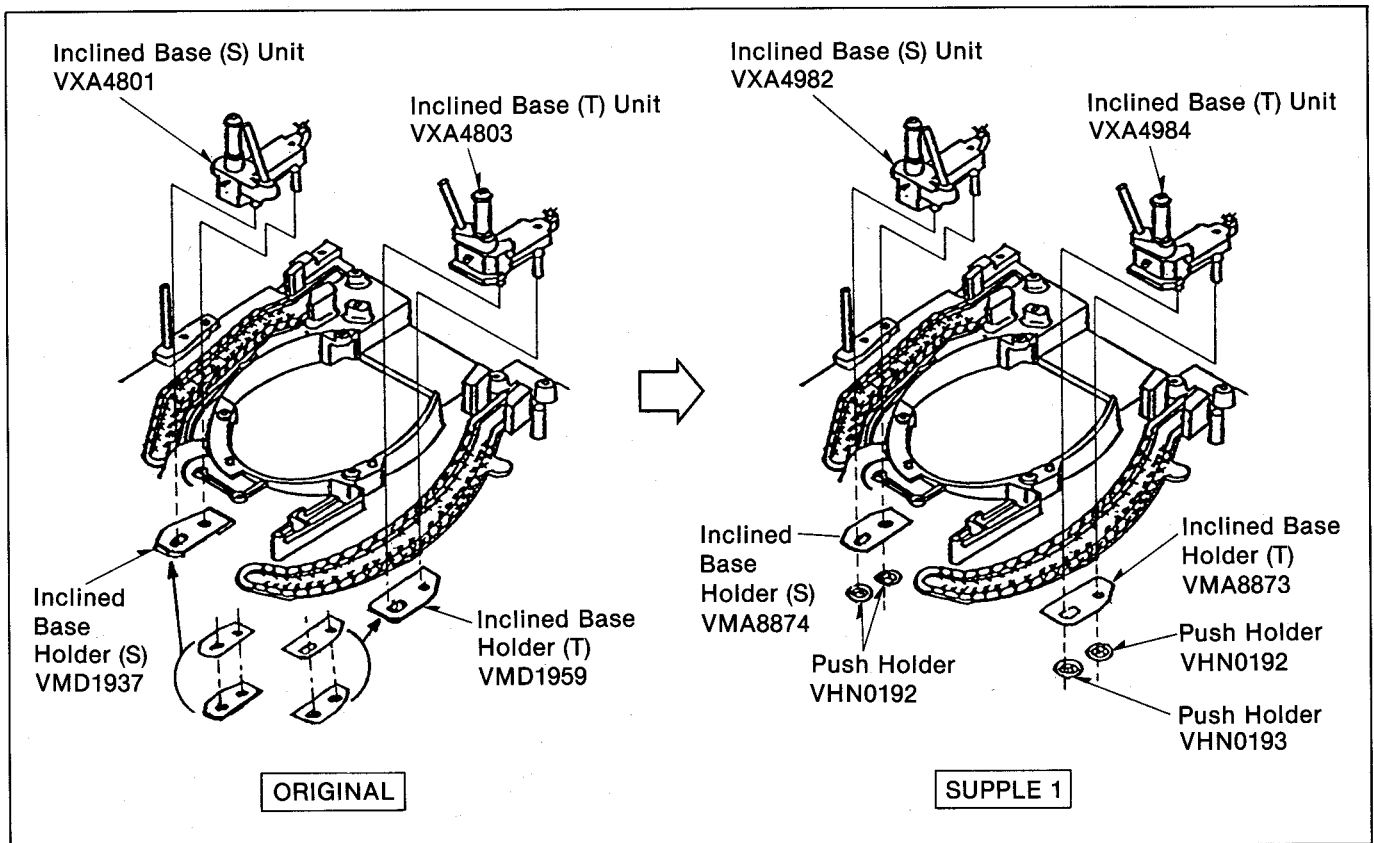
Ref.No.	Part Name	Original	SUPPLE1	SUPPLE2	SUPPLE3	
20(1)	A/C HEAD(1) UNIT	VED0182	VED0205			
28(1) ●	INCLINED BASE HOLDER(S)	VMD1937	VMA8874			
31(1) ●	INCLINED BASE HOLDER(T)	VMD1959	VMA8873			
32(1) ●	OPENER PIECE	VMD1960	VMD2101			
37(1)	TENSION RELEASE ARM	VML2772	-----			
40(1) ●	INCLINED BASE(S) UNIT	VXA4801	VXA4982KIT			
40(1) ●	INCLINED BASE(S) UNIT	VXA4982	VXA4982KIT			
41(1) ●	ROLLER POST	VXP1363A	VXP1415			
42(1) ●	INCLINED BASE(T) UNIT	VXA4803	VXA4984KIT			
42(1) ●	INCLINED BASE(T) UNIT	VXA4984	VXA4984KIT			
43(1)	ROLLER POST(T)	VXP1363	-----			
45(1) ●	CASSETTE POSITION	VMS2558	VMS5383			
	FIXTURE					
N1	PUSH HOLDER	-----	VHN0192			
N2	PUSH HOLDER	-----	VHN0193			

SUPPLE1(SUPPLEMENT SERVICE MANUAL) ... Order No. VRD9305S015

5-2. Exploded Views of Inclined Base (S),(T) Unit



5-3. Inclined Base (S),(T) Unit Changes



6. TROUBLE SHOOTING

SYMPTOM	CAUSE/*CHECK POINT
NO SOUND IN SELF RECORD	REPLACE A/C HHEAD *IC600(34)(35) ⇨ OK
TAPE STUCK WHEN EJECTED	TAKE UP BRAKE ARM UNIT(VXZ0313) OFF *TAKE UP REEL NOT ROTATING
NOISY PICTURE IN PLAYBACK	DD CYLINDER CUT LEAD OF LOWER CYLINDER(VEG0987) *RF ENVELOPE DOESN' T APPEAR
CASSETTE BLINDER DOESN' T CLOSE	PHASE ERROR BETWEEN SIDE PLATE & CARRIAGE CONNECTION GEAR(VXA4806 & VDG0871) *VISUALLY CHECK
BAR NOISE IN PLAYBACK	DUST IN INCLINED BASE(VXA4801) *P. B PRE-RECORDED TAPE ⇨ NG SELF-RECORDED TAPE ⇨ OK
NOISY PICTURE IN SELF-REC/P. B	A/C HEAD IS DIRTY *NO CONTROL PULSE
TAPE CHEWED	P5 ARM UNIT BENT, BROKEN P5 STOPPER (VXL2306, VXA2229) *VISUALLY CHECK
THE TAPE DOESN' T LOAD	IDLER CONTROL LEVER(VML2725) NOT INSTALLED CORRECTLY
TAPE RUNNING NOISE WHEN FF	IDLER ARM(VXL2229)

SYMPTOM	CAUSE/*CHECK POINT
NOISY PICTURE IN SELF-REC/P. B(LP)	A/C HEAD DIRTY *NO CONTROL PULSE
TAPE EJECTED INSTANTLY AFTER INSERTING	PHASE ERRER BETWEEN SIDE PLATE & CARRIAGE CONNECTION GEAR(VXA4806 & VDG0871) *VISUALLY CHECK
UNIT IS IN CUE MODE WHEN PLAY BUTTON PRESSED	INCLINED BASE(S), VXA4801 NOT COMPLETELY LOCKED *GREASE TO V STOPPER AND INCLINED BASE
CAN NOT INSERT TAPE	BROKEN HOLDER PLATE LEVER(VXA4661)
TAPE DAMAGE	REPLACE PINCH ROLLER(VXA2246)