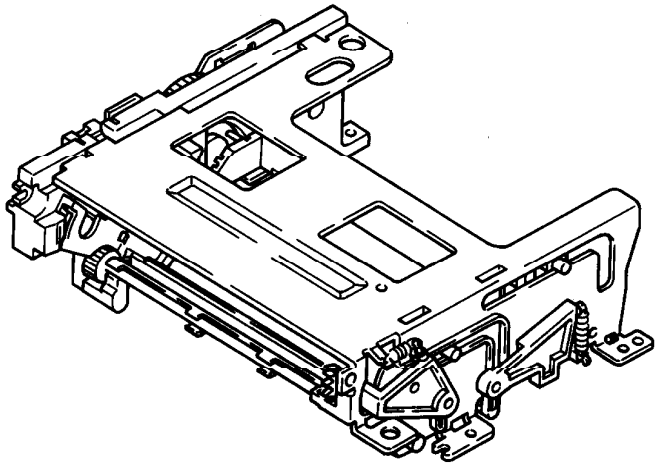
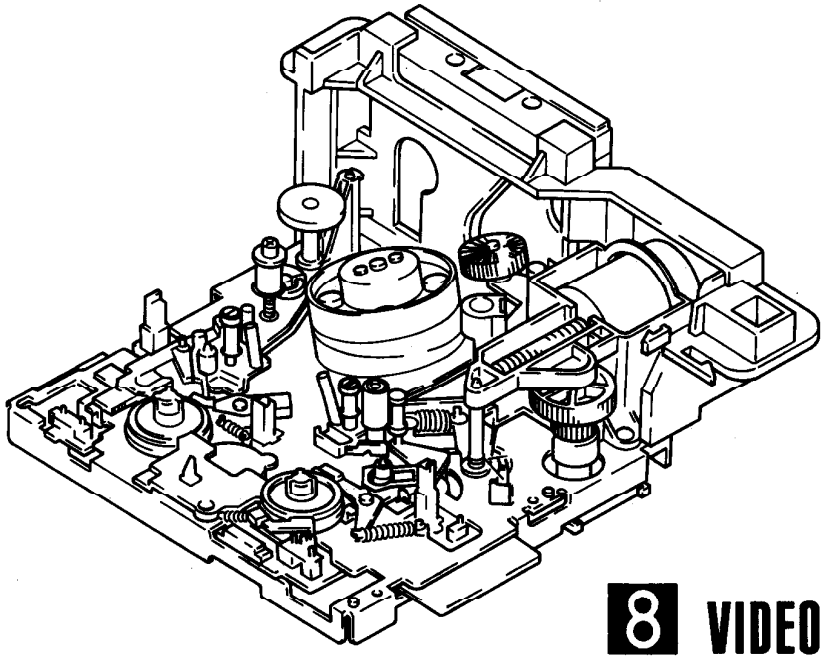
8 mm Video MECHANICAL ADJUSTMENT MANUAL V

F MECHANISM

Video 8

File with the SERVICE MANUAL





8 VIDEO RECORDER

SONY

TABLE OF CONTENTS

1. MAIN FEATURES

The mechanism developed exclusively for the 8mm video provides the following features.

1. Faster rewind time than U mechanism.
   4 times high speed. (about 1 minute in case of P120 cassette.)

2. Jog shuttle supporting by addition of forced swing mechanism.

3. High speed start on Picture mechanism.
   Stop → playback about 0.8 sec.

4. Head clogging prevention by adoption of new cleaning roller.

5. Reduction of the number of parts. (about 40 parts less than U mechanism.)

6. FL capstan motor drive.

2. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the [EJECT] mode. (To select the [EJECT] mode, refer to "2-3, Handling of Mode Selector II".)

2-1. FL CASSETTE COMPARTMENT ASSEMBLY (Fig. 1)

1. Removal

1) Select the [EJECT] mode.
2) Remove three screws ① and remove the FL cassette compartment ② toward the arrow.

2. Mounting

1) Select the [EJECT] mode.
2) Mount the FL cassette compartment ② with its tab Ⓐ engaged with the hole Ⓑ in mechanical chassis.
3) Tighten three screws ①.

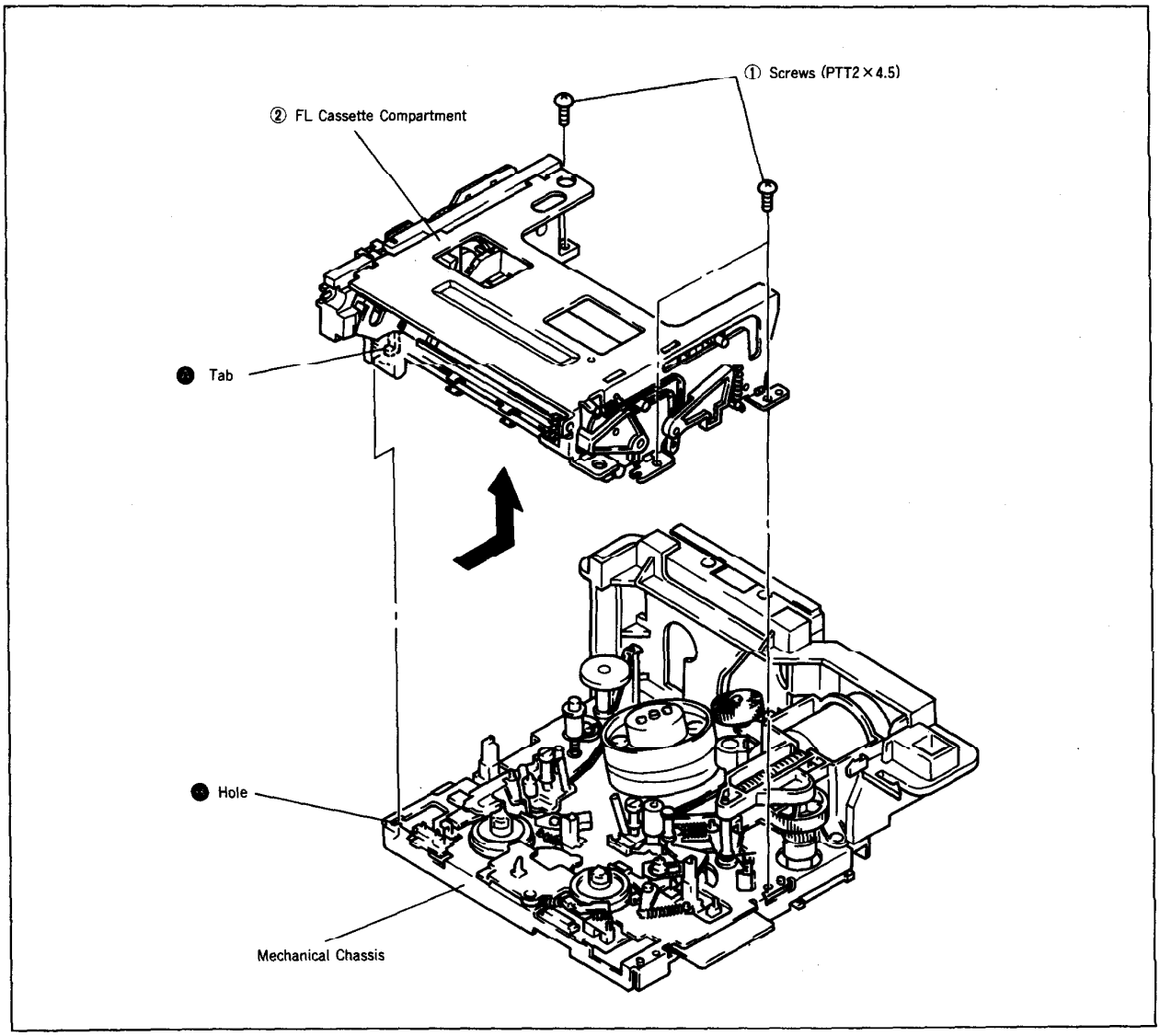


Fig. 1

2-2. OPERATION WITH FL CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 2)

2-2-1. Activating Loading

1) Referring to the Service Guide, supply the power with the cabinet removed.
2) Cover the LED ① with an opaque cap ②.
3) Press the cassette down switch ③ three times.

2-2-2. Activating Play Status

1) Perform each step in 2-2-1. Activating Loading.
2) Press the PLAY button while keeping the cassette down switch pressed.

2-2-3. Activating Ejection

1) Press the EJECT button.

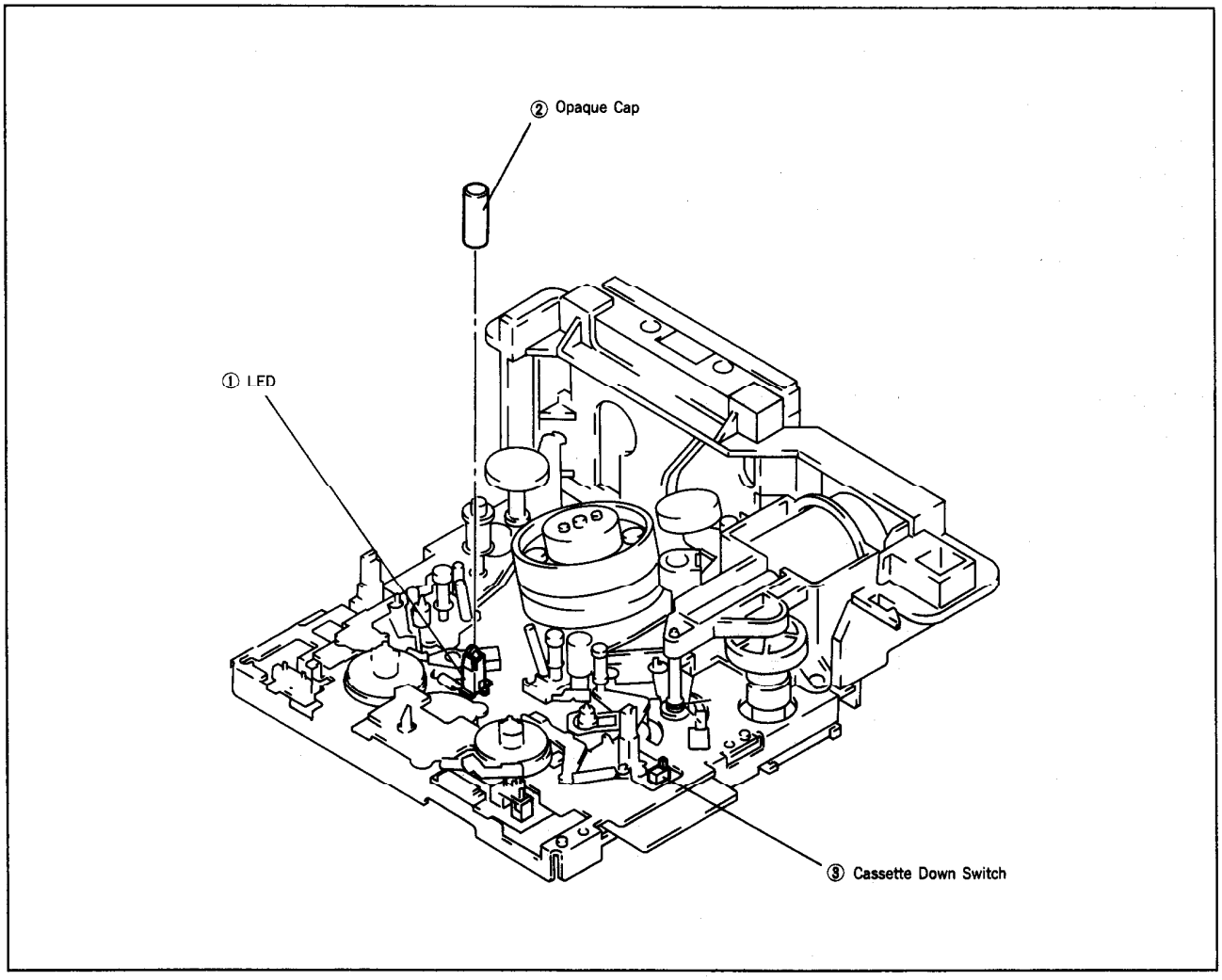


Fig. 2

2-3. HANDLING OF MODE SELECTOR Ⅱ

2-3-1. General

The mode selector is used as a mechanism drive tool to help maintenance of various mechanical decks, and it provides the following functions.

1. MANUAL test

   In this mode, the motor is driven only during the time that the switch is pressed, so that the operator can control the motor freely.

2. STEP test

   In this mode, the motor is driven from the present status attained from sensor until the status changes to another status, so that the operator can confirm every operations.

3. AUTO test

   This mode checks if the mechanism operates normally following the status change table registered to each mechanical deck through a sequence of operation in all statuses of the mechanism. If it detects a faulty status change during operation, it displays "NG" and stops operation.

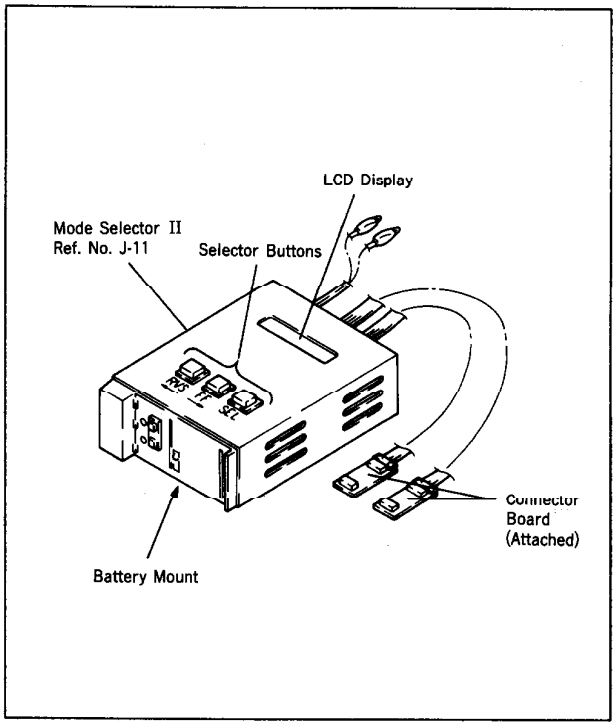


Fig. 3

MODE SELECTOR Ⅱ (J-6082-282-A) CONNECTION

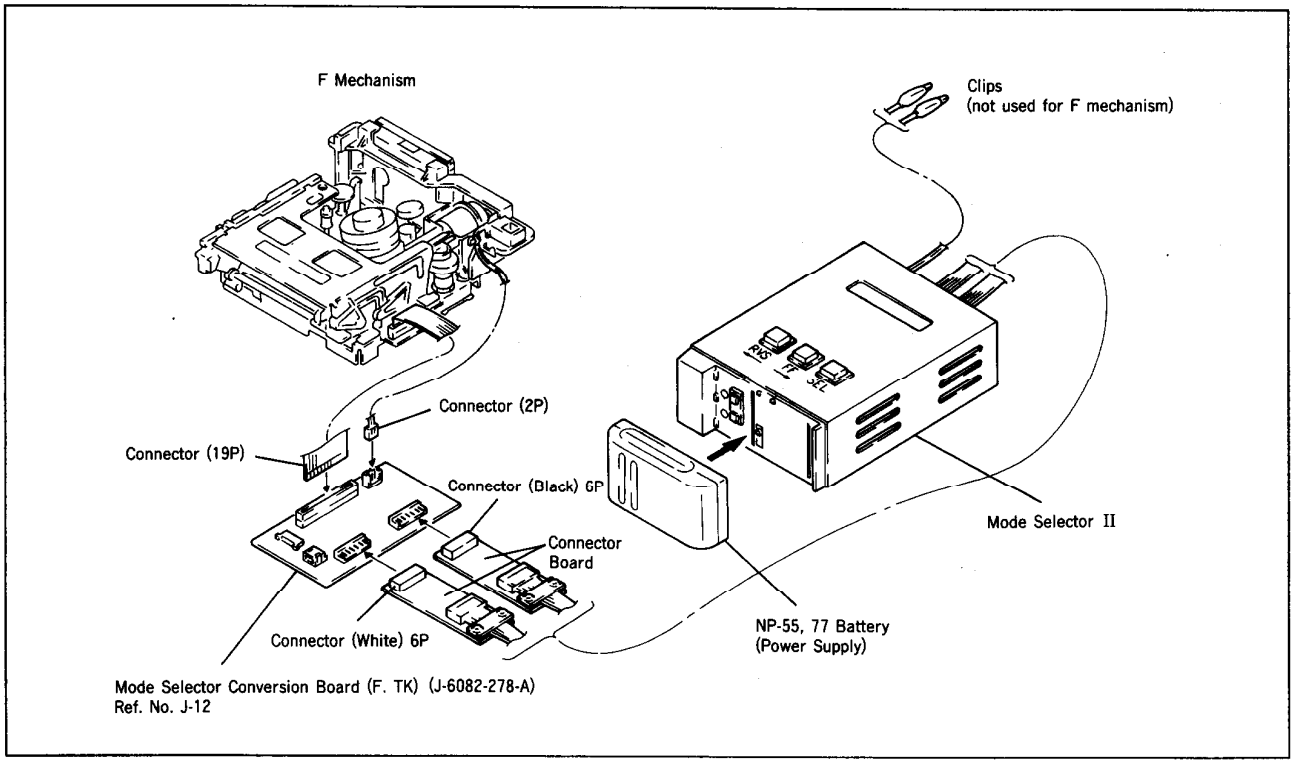
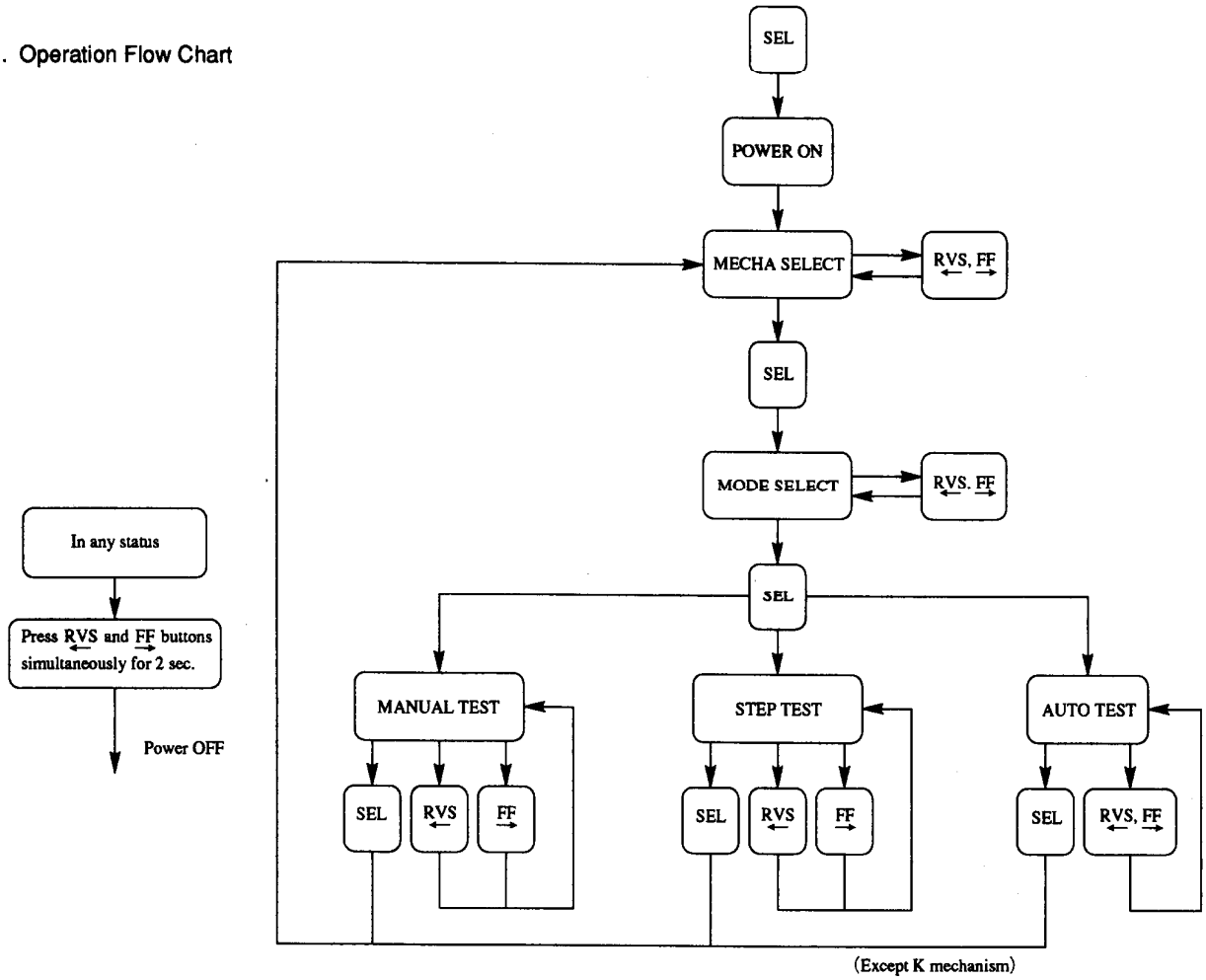


Fig. 4

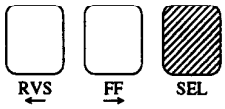
2-3-2. OPERATION

1. Operation Flow Chart



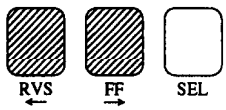
2. Mode Selector II power ON

Press the SEL button to turn on the power supply.



3. Mode Selector II power OFF

At the power ON, press RVS and FF buttons simultaneously for more than 2 seconds to turn off the power supply.



4. Mechanism selection

The "MECHA SELECT" is displayed on LCD immediately after the power supply is turned on. Call the desired mechanism by pressing the RVS or FF button, and press the SEL button. Thus, the mechanism has been selected. (Fig. 5-1 indicates F mechansim.)

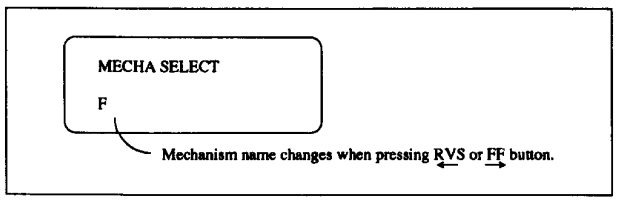


Fig. 5-1

5. Mode selection

Select the test mode "MANUAL", "STEP" or "AUTO" to be executed.
Call the desired mode by pressing the RVS or FF button, and press the SEL button. Thus, the mode has been selected.

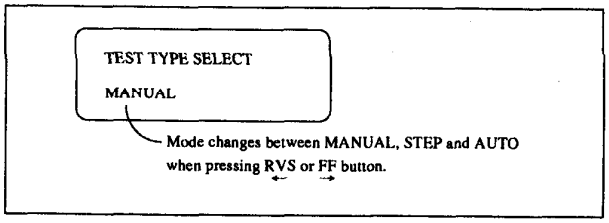


Fig. 5-2

6. MANUAL test

This mode drives the motor only during the time that the RVS or FF button is pressed.

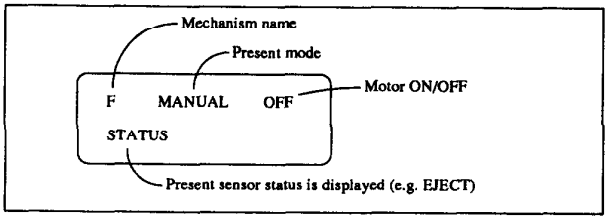


Fig. 5-3

7. STEP test

This mode drives the motor from the present status until the status changes in the direction selected with RVS or FF button.

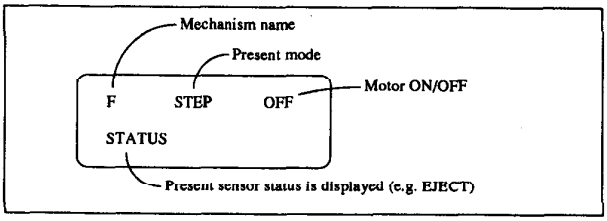


Fig. 5-4

8. AUTO test

This mode checks if the operation sequence stored for each mechanical deck is normal, and if the signals from sensors that execute a sequence of operation meet the stored sequence. The same operation is executed if either RVS or FF is pressed.

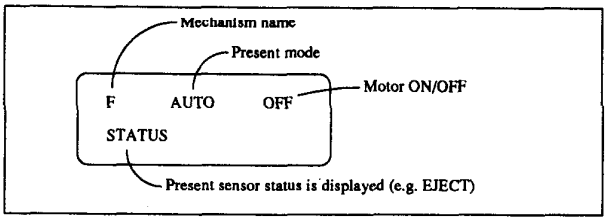


Fig. 5-5

Mechanism status (position) change sequence

After selection of mechanism, if either MANUAL or STEP mode is selected and the RVS or FF button is pressed, the mechanism status (position) can be designated. (Designated status is displayed at STATUS position.)
EJECT ⟷ UNLOAD END ⟷ STOP 1 ⟷ HIGH SPEED REW ⟷ DEW ⟷ LOAD END ⟷ STOP 2 ⟷ FWD. P ⟷ RVS. P

MD name / Code					F mechanism
A	B	C	D		
0	1	1	1	1	EJECT
0	0	1	1	2	UNLOAD END
1	0	1	0	3	STOP 1
1	0	1	1	4	HIGH SPEED REW
1	0	0	0	5	DEW
1	1	0	0	6	
1	1	1	0	7	LOADE END
0	1	1	0	8	STOP 2
0	1	0	0	9	
1	1	0	1	10	FWD. P/FWD
0	0	0	1	11	RVS. P/RVS
1	0	0	1	12	

9. Battery alarm display

In case of low voltage of battery, which is a power supply of Mode Selector, the alarm message is displayed (not synchronous display).
In such a case, no operation is available, requiring battery replacement.

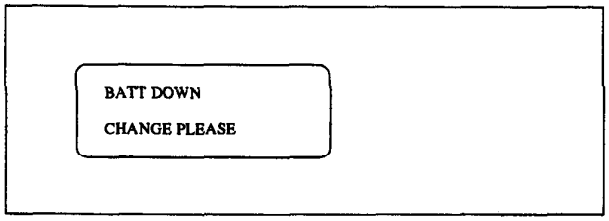


Fig. 5-6

3. PERIODIC CHECK AND MAINTENANCE

• Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

3-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

3-2. CLEANING OF TAPE PATH (Fig.6)

1) In the [EJECT] mode, clean the tape running system (TG1, 2, 3, 4, 5, 6, 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

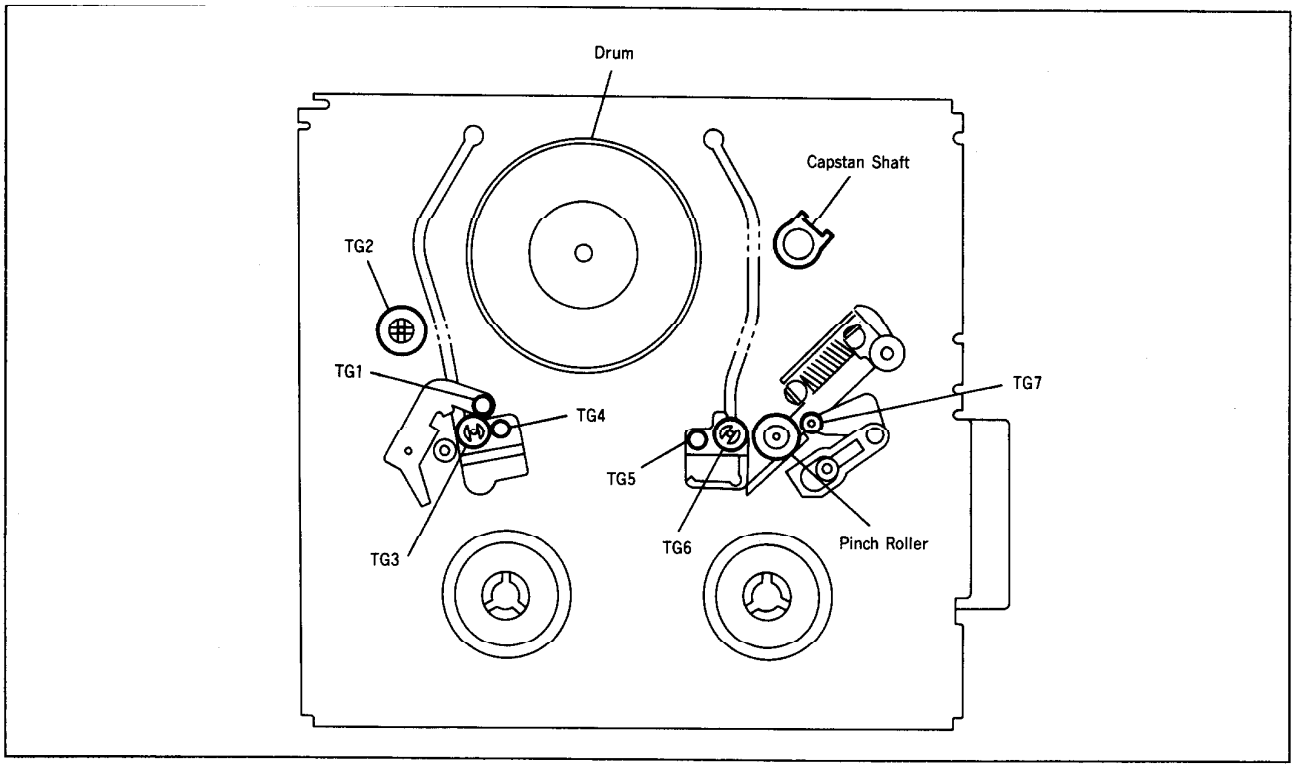


Fig. 6

3-3. PERIODIC CHECK ITEMS

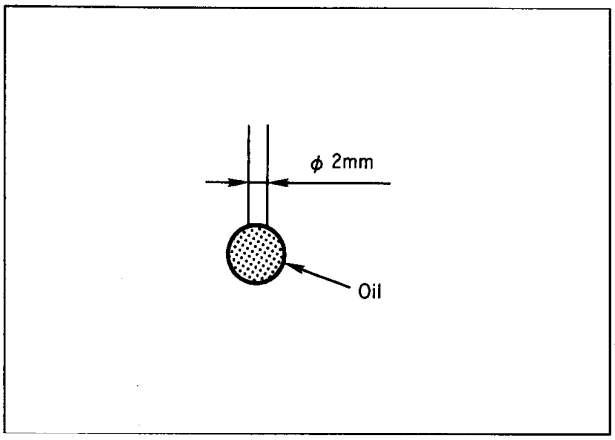
Location of Maintenance and check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape transportion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Timing belt Timing belt (FL)	–	☆	–	☆	–	☆	–	☆	–	☆	3-953-986-01 3-954-079-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Be absolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	X-3942-946-1
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD. RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concering oil

- Be sure to use specified oil. (If you use oil with different viscosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT-68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be wron out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.



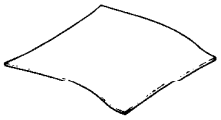
3-4. SERVICE JIGS LIST

Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1NP) PAL (WR5-1CP)	8-967-995-02 8-967-995-07		Tape path
J-7	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-8	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-9	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-10	Adjusting remote controller (Modified RM-95)	J-6082-053-B		Tape pathe (Setting of PATH mode)
J-11	Mode selector II	J-6082-282-A		For all models
J-12	Mode selector conversion board (F, TK)	J-6082-278-A		
J-13	FWD B.T. adjusting driver chip	J-6082-187-A		

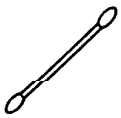
Other equipment • Oscilloscope
• Analog tester (20 kΩ)

J-1

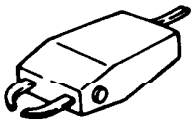
J-2



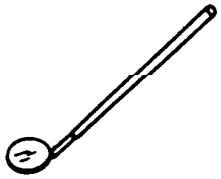
J-3



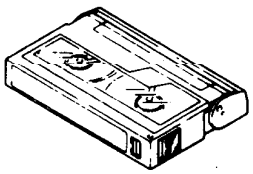
J-4



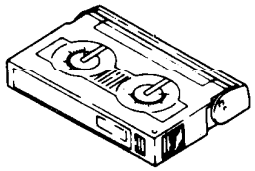
J-5



J-6



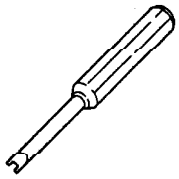
J-7



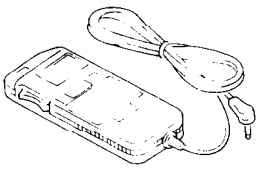
J-8

(Attached to the maintenance rotary upper drum)

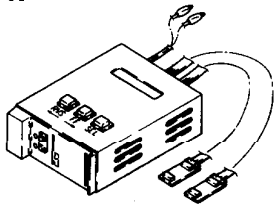
J-9



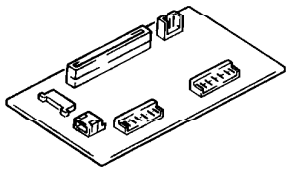
J-10



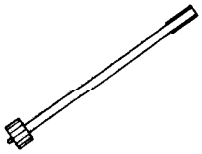
J-11



J-12



J-13



4. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the Mode selector II (Ref. No. J-11) for the following mechanical checks, adjustments and replacements.

Note : The modes in [ ] are those set by pressing the Mode selector buttons.

4-1. RP BLOCK (Fig.7)

1. Removal

1) Remove a screw ①.
2) Disconnect the connector ②.
3) Disengage claws Ⓐ at two places and remove the RP block ③.
4) Remove a screw ④, then the RP frame ⑤ in arrow direction.

2. Mounting

1) Mount the RP frame with its slot Ⓑ engaged with the chassis Ⓒ.
2) Tighten a screw ④.
3) Mount the RP block ③ and tighten a screw ①.
4) Connect the connector ②.

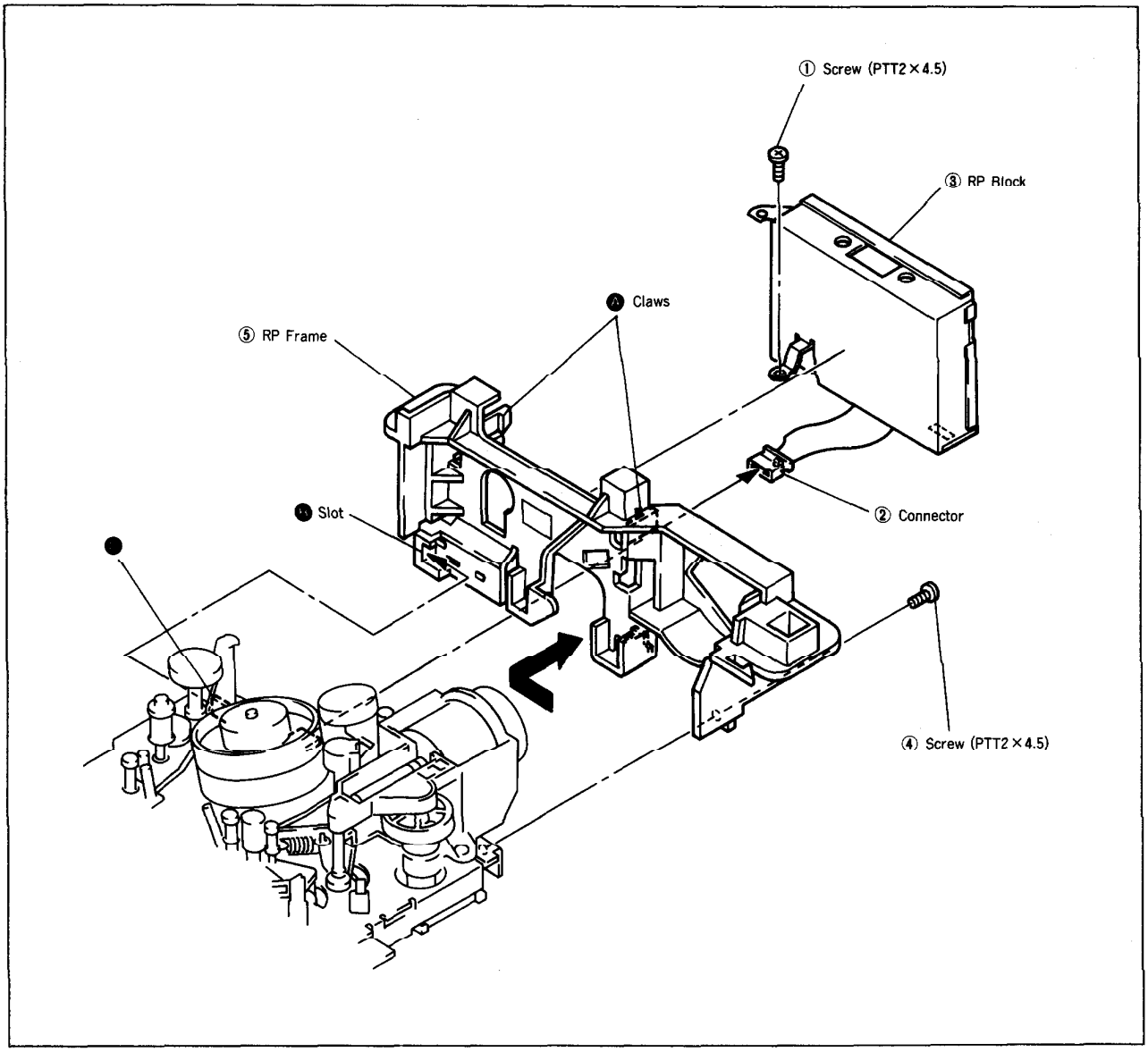


Fig. 7

4-2. IMPEDANCE ROLLER (Fig. 8)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Referring to 4-1, remove the RP block.
3) Remove a tension coil spring ①.
4) Disengage a claw Ⓐ and remove the impedance roller base assembly ②.
5) Disengage a claw Ⓑ and remove the impedance roller ③.

2. Mounting

1) Mount the impedance roller ③, then the impedance roller base assembly ②.
2) Attach a tension coil spring ①.
3) Referring to 4-1, mount the RP block.
4) Referring to 2-1, mount the FL cassette compartment assembly.

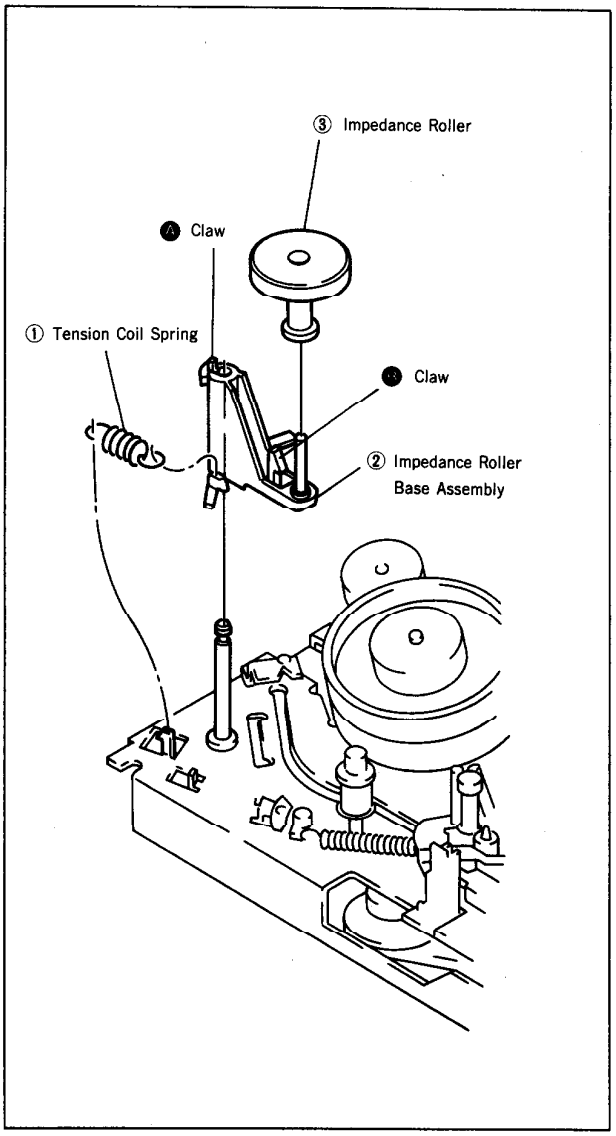


Fig. 8

4-3. HC ROLLER ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 4-1, remove the RP block.
2) Disengage a claw Ⓐ and remove the HC arm assembly ①.
3) Remove a lock washer ②, then the HC roller assembly ③.

2. Mounting

1) Mount the HC roller assembly ③ and fix with a lock washer ②.
2) Mount the HC arm assembly ①.
3) Referring to 4-1, mount the RP block.

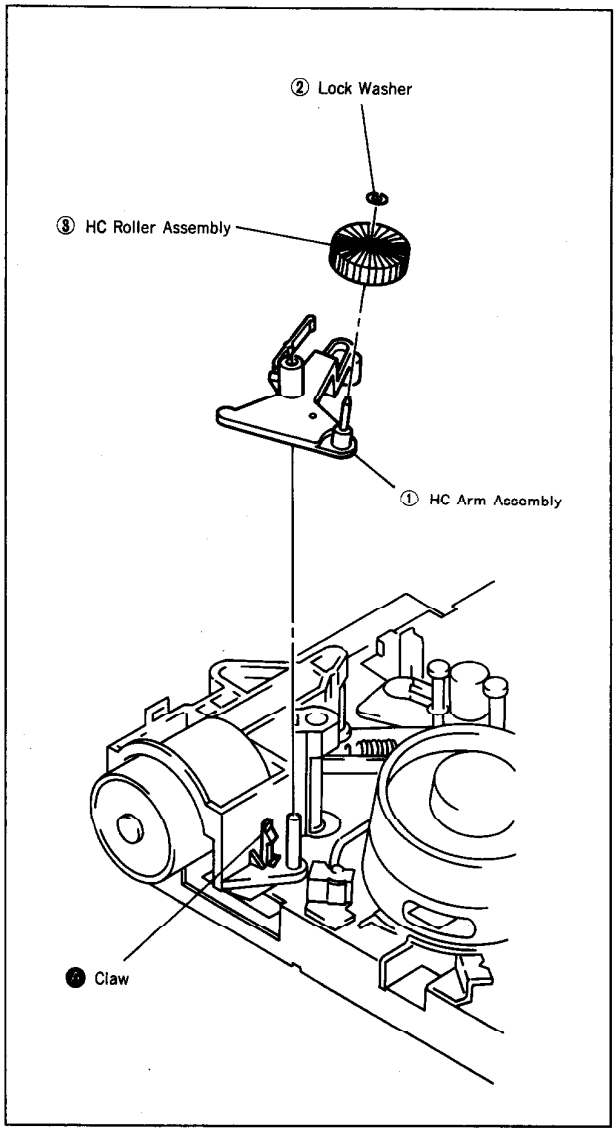


Fig. 9

4-4. PENDULUM BASE ASSEMBLY AND SOFT BRAKE ASSEMBLY (T) (Fig. 10)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Remove a tension coil spring ①.
3) Disengage a claw Ⓐ and remove the soft brake (T) assembly ②.
4) Remove two screws ③, then the reel unlock plate ④.
5) Remove the pendulum base assembly ⑤.

2. Mounting

1) Mount the pendulum base assembly ⑤ with its shaft Ⓑ inserted in the Ⓒ of pendulum forcing arm.
2) Mount the reel unlock plate ④ and tighten two screws (3).
3) Mount the soft brake (T) assembly ② and attach a tension coil spring ①.
4) Referring to 2-1, mount the FL cassette compartment assembly.

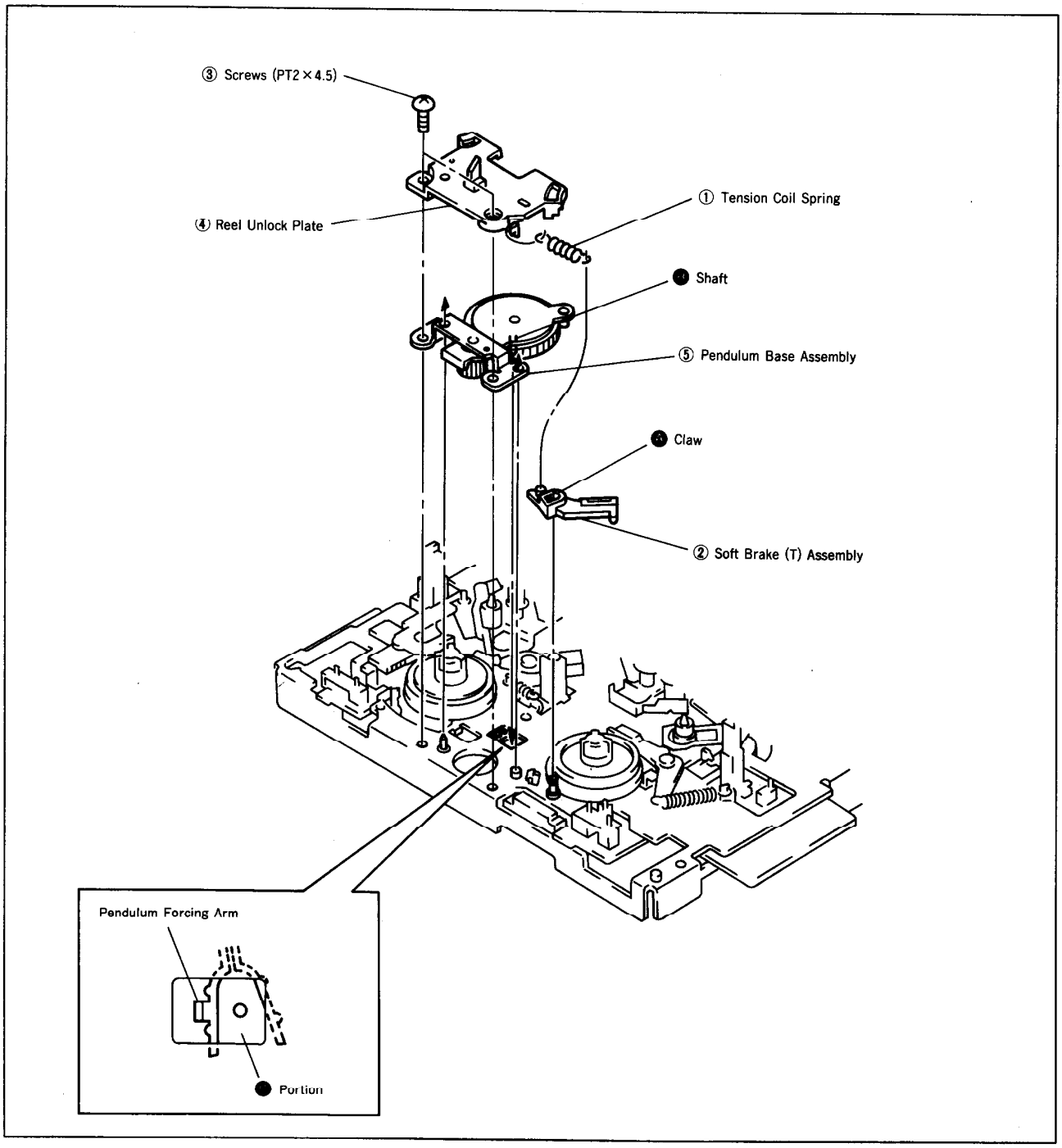


Fig. 10

4-5. BRAKE (S) ARM AND BRAKE (T) ARM ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Remove a tension coil spring ①.
3) Disengage a claw Ⓐ and remove the brake (S) arm ②.
4) Remove a tension coil spring ③.
5) Remove a lock washer 1.5 ④, then the brake (T) arm assembly ⑤.

2. Mounting

1) Mount the brake (T) arm assembly ⑤ with its shaft inserted into a hole Ⓓ in mechanical chassis.
2) Attach a lock washer ④.
3) Attach a tension coil spring ③.
4) Insert the shaft Ⓔ of brake (S) arm ② into a groove Ⓕ of slide plate, and the shaft Ⓖ of brake (S) drive lever into a hole Ⓗ in brake (S) arm respectively.
5) Attach a tension spring ①.
6) Referring to 2-1, mount the FL cassette compartment assembly.

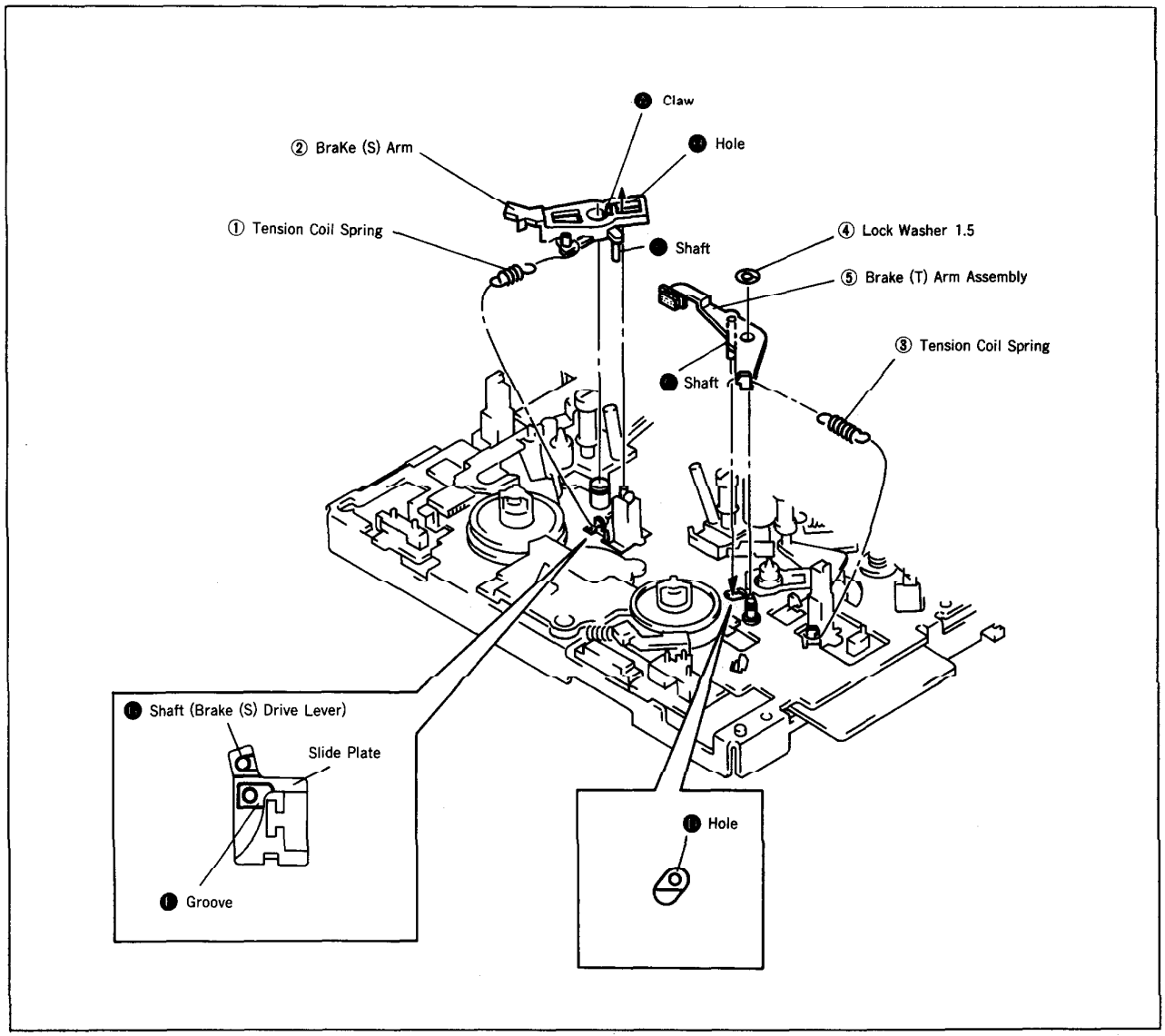


Fig. 11

4-6. TENSION REGULATOR ASSEMBLY, REEL TABLE (S) ASSEMBLY AND REEL TABLE (T) ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Referring to 4-5, remove the brake (S) arm and brake (T) arm assembly.
3) Remove a tension coil spring ①.
4) Remove a screw ②, then the tension regulator band assembly ③ and the tension regulator assembly ④.

Note : Do not twist or bend, or do not touch the felt surface when removing the tension regulator band assembly.

5) Remove the reel table (S) assembly ⑤ and the reel table (T) assembly ⑥.

2. Mounting

1) Mount the reel table (S) assembly ⑤ and the reel table (T) assembly ⑥.
2) Mount the tension regulator assembly ④ with its shafts Ⓐ, Ⓑ inserted into holes Ⓒ, Ⓓ in chassis respectively.
3) Wind the tension regulator band assembly ③ onto the reel table (S) assembly ⑤.

Note : Do not twist or bend, or do not touch the felt surface when mounting the tension regulator band assembly.

4) Mount the tension regulator band assembly ③, meeting with the dowels Ⓔ of the chassis.
5) Tighten a screw ②.
6) Attach a tension coil spring ①.
7) Referring to 4-5, mount the brake (S) arm and the brake (T) arm assembly.
8) Referring to 2-1, mount the FL cassette compartment assembly.
9) Referring to 4-23, adjust the tension regulator position.
10) Referring to 4-24, adjust the FWD back tension.

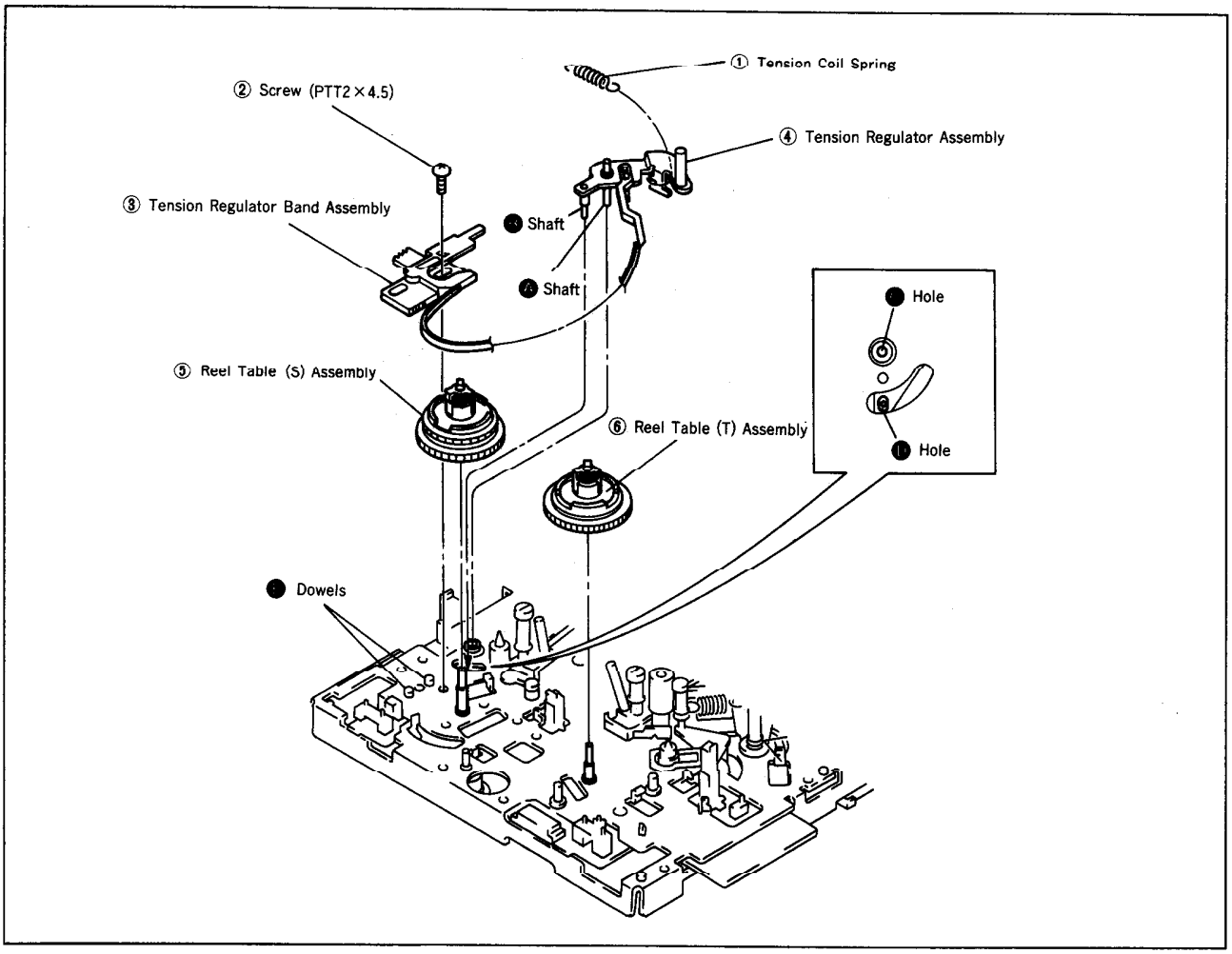


Fig. 12

4-7. TG2 ASSEMBLY (Fig. 13)

1. Removal

1) Remove the TG2 upper flange ①.
2) Remove the TG2 roller ②, TG2 sleeve ③, TG2 lower flange ④ and compression coil spring ⑤.

2. Mounting

1) Mount the compression coil spring ⑤, TG2 lower flange ④, TG2 sleeve ③ and TG2 roller ②.
2) Rotate the TG2 upper flange ① by 4 to 6 turns to fix on the shaft.

3. Presetting of TG2 Height

1) Rotate to adjust the TG2 upper flange ① so that the height from top surface of mechanical chassis to top surface of TG2 upper flange is 22.12mm.

Note : After mounting, perform 5. Tape Path Adjustment.

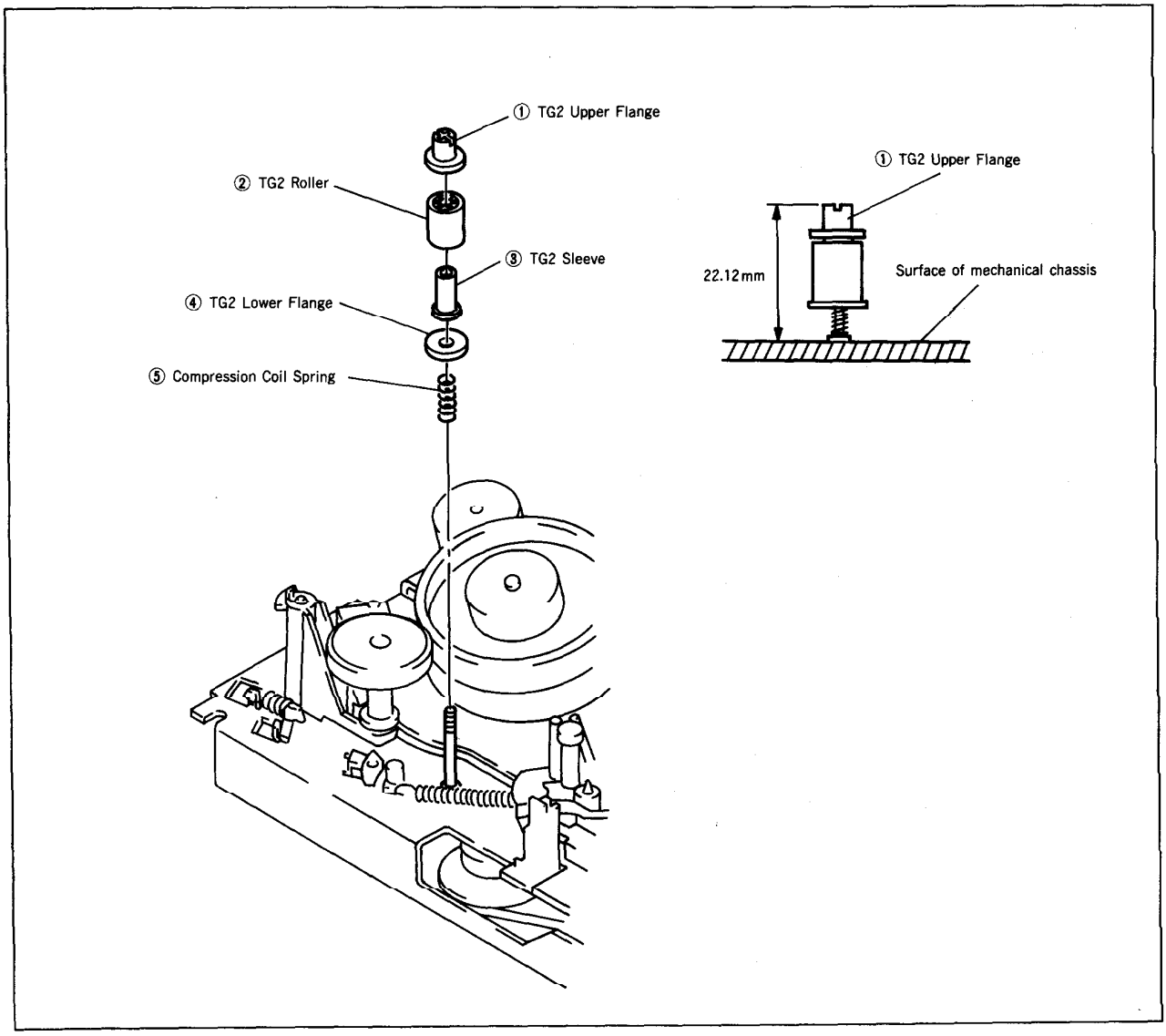


Fig. 13

4-8. TG7 ARM ASSEMBLY (Fig.14)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Remove the TG7 height adjusting screw ①, then the TG7 spacer ② and reel table thrust washer ③.
3) Remove the TG7 arm assembly ④ and a torsion coil spring ⑤.

2. Mounting

1) Insert the shaft Ⓐ of TG7 arm assembly ④ into a groove Ⓑ in TG7 drive lever, and attach a torsion coil spring ⑤ as shown below.
2) Mount a reel table thrust washer ③ and a TG7 spacer ②, and tighten tentatively the TG7 height adjusting screw.
   At this time, the height from mechanical chassis top surface to TG7 arm top surface should be 3.3mm.
3) Referring to 2-1, mount the FL cassette compartment assembly.

Note : After mounting, perform 5. Tape Path Adjustment.

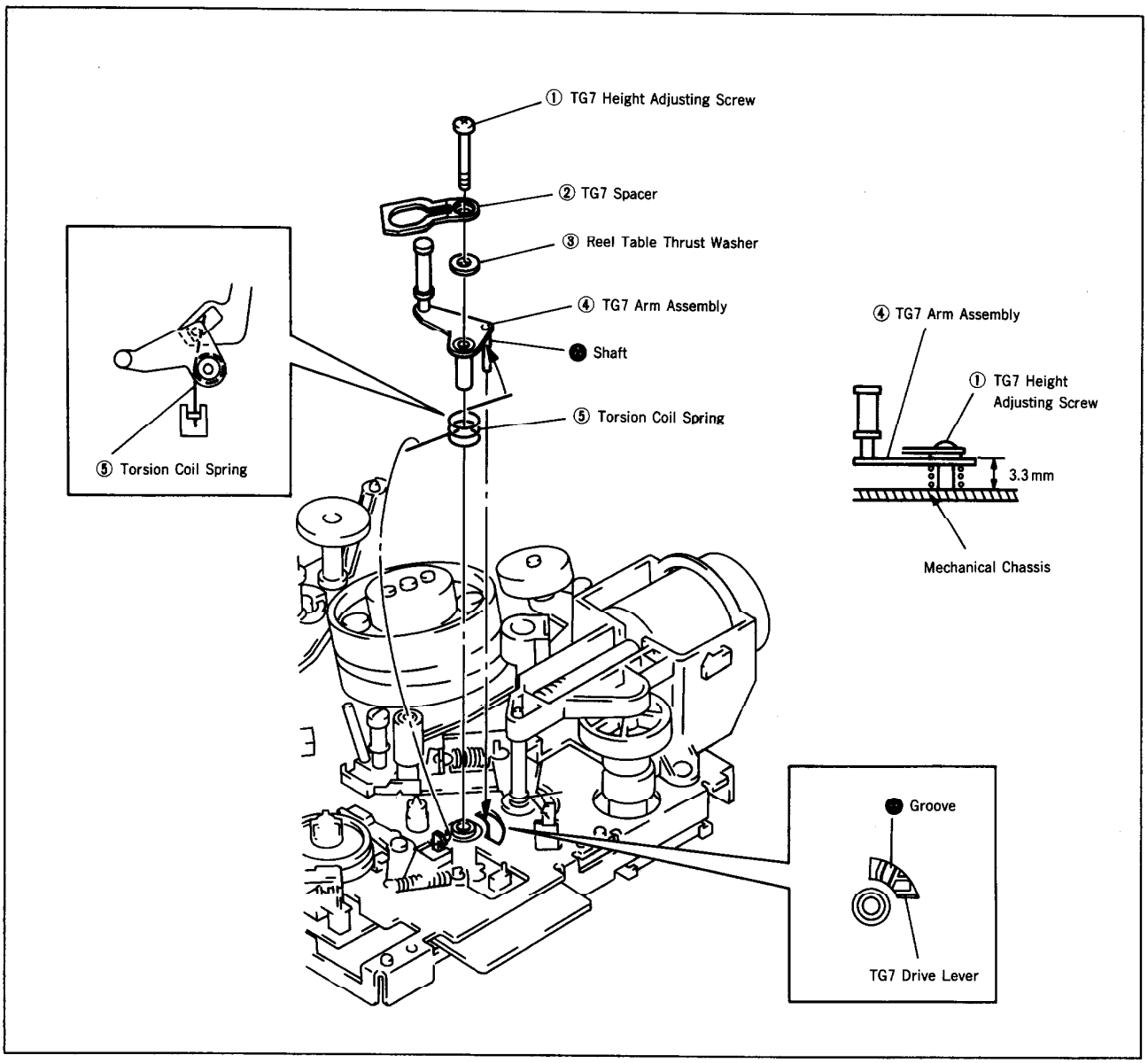


Fig. 14

4-9. CAM MOTOR ASSEMBLY (Fig. 15)

1. Removal

1) Referring to 4-1, remove the RP block.
2) Remove a screw ①.
3) Disengage a claw Ⓐ and remove the cam motor assembly ② in the arrow direction.

2. Mounting

1) Mount the cam motor assembly ② with its hole Ⓒ inserted into the shaft Ⓑ of chassis.
2) Tighten a screw ①.
3) Referring to 4-1, mount the RP block.

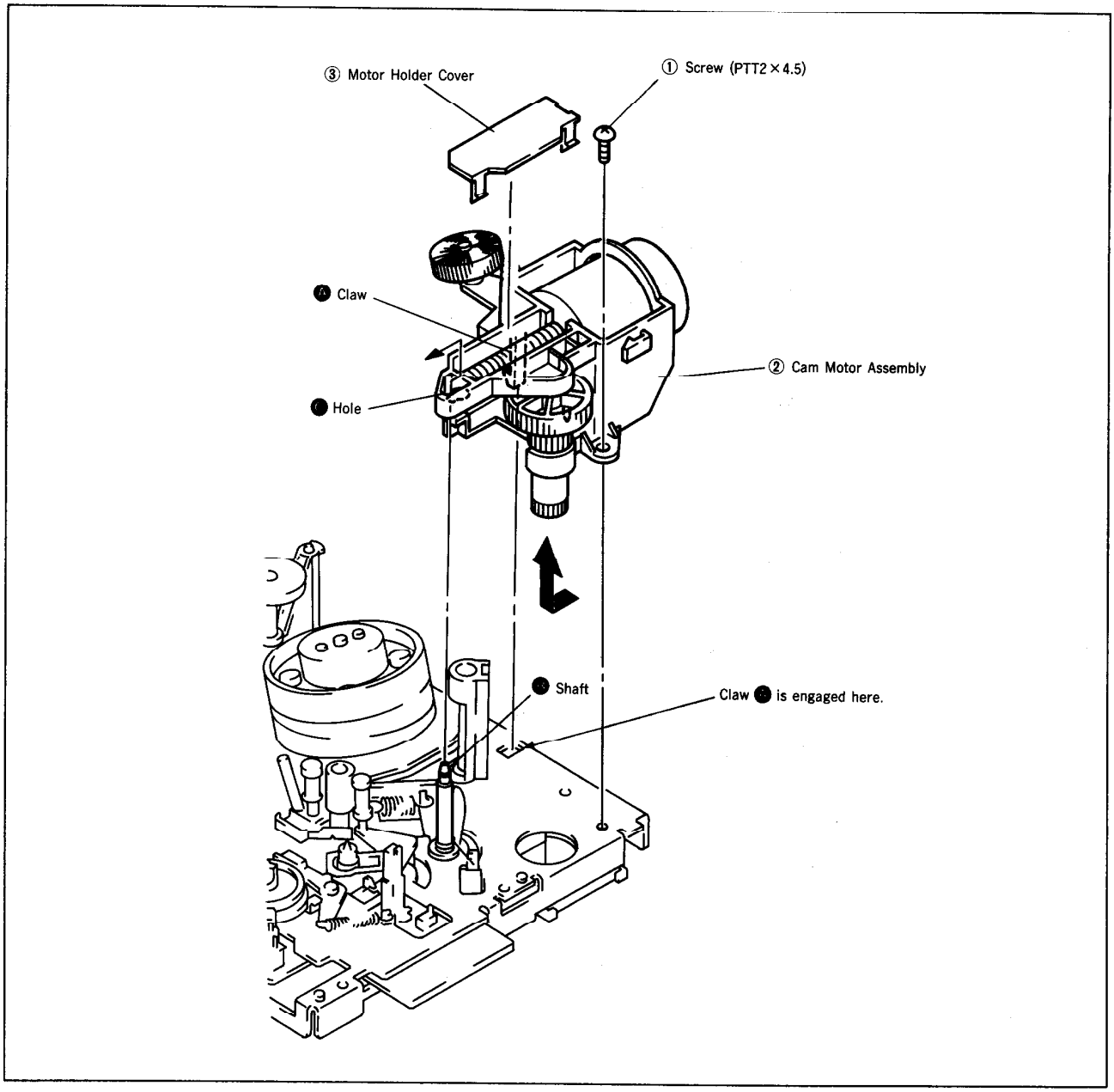


Fig. 15

4-10. PINCH ARM ASSEMBLY (Fig. 16)

1. Removal

1) Referring to 2-1, remove the FL cassette compartment assembly.
2) Execute the loading until the pinch arm assembly ② becomes level.
3) Referring to 4-9, remove the cam motor assembly.
4) Remove a torsion coil spring ①, then the pinch arm assembly ②.

2. Mounting

1) Mount the pinch arm assembly ② with its hole Ⓐ inserted into the claw Ⓑ of pinch drive lever on the chassis.
2) Attach a torsion coil spring ① as shown below.
3) Referring to 4-9, mount the cam motor assembly.
4) Referring to 2-1, mount the FL cassette compartment assembly.

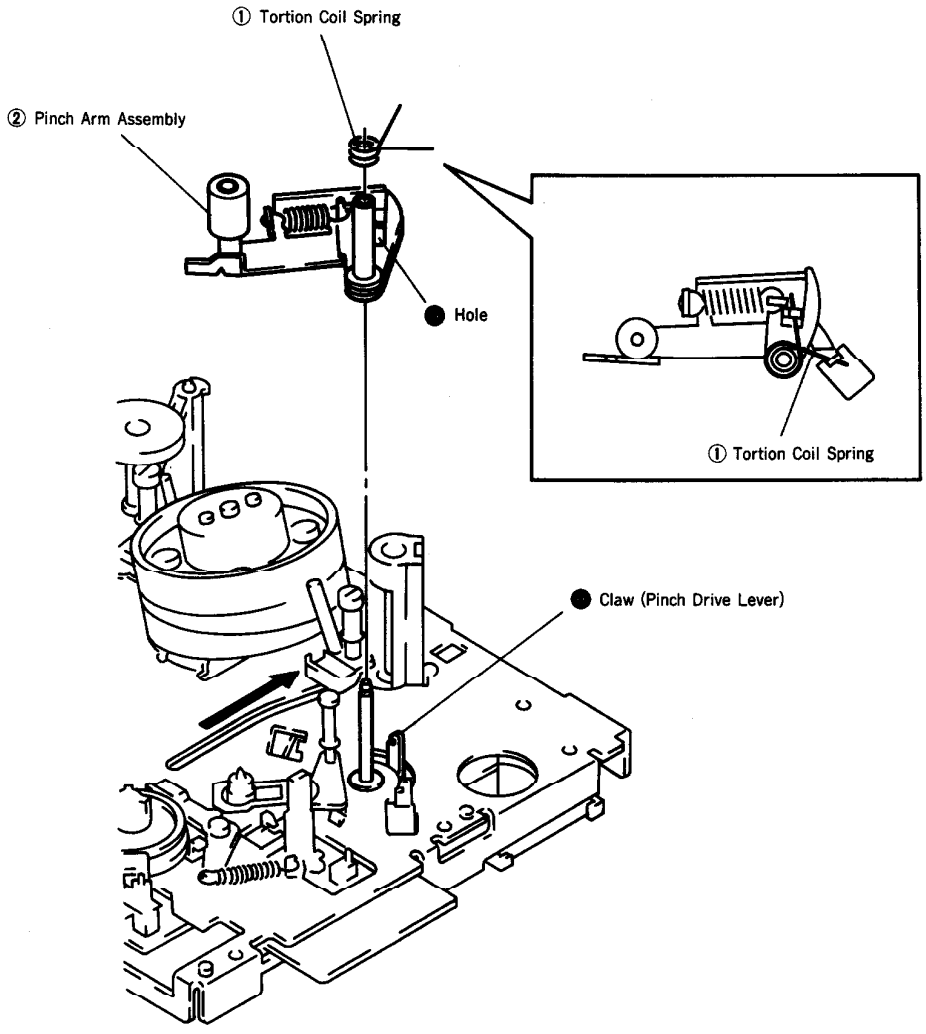


Fig. 16

4-11. WORM WHEEL BRACKET (Fig. 17)

1. Removal

1) Remove a screw ①, then the shaft earth assembly ②.
2) Remove a screw ③, then the worm wheel bracket ④ in the arrow direction.

2. Mounting

1) Mount the worm wheel bracket ④ with its hole Ⓑ inserted into the shaft Ⓐ of mechanical chassis.
2) Tighten a screw ③.
3) Mount the shaft earth assembly ② and tighten a screw ①.

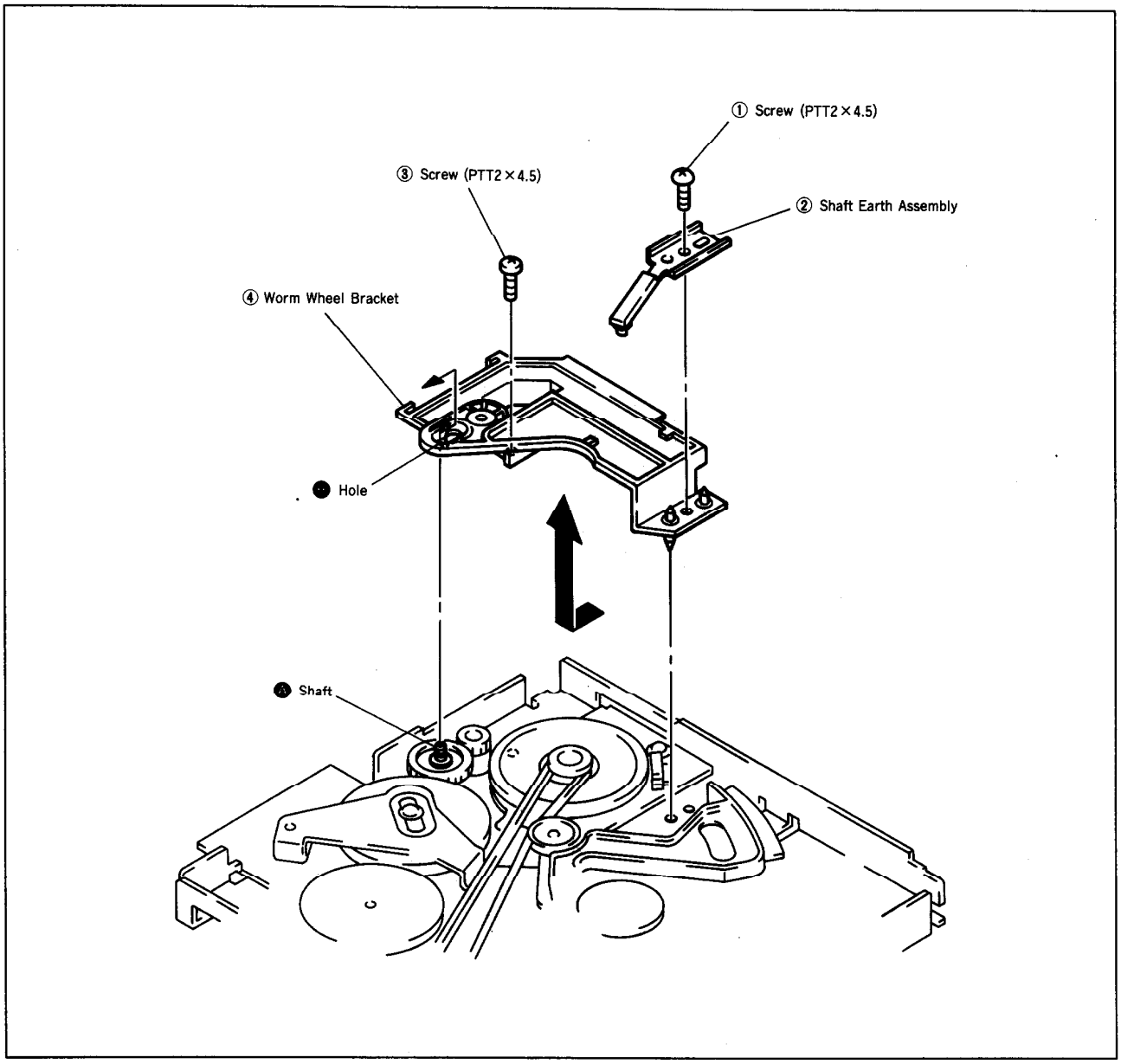


Fig. 17

4-12. CAPSTAN MOTOR (Fig. 18)

1. Removal

1) Referring to 4-11, remove the worm wheel bracket.
2) Disengage the timing belt ①.
3) Remove a screw ②, then the capstan motor ③.

2. Mounting

1) Mount the capstan motor ③ with its dowels ❽ inserted into holes ❹ in the mechanical chassis at two places.

Note : Do not touch the capstan motor shaft, oil seal and rotor.

2) Tighten a screw ②.
3) Engage the timing belt ①.
4) Referring to 4-11, mount the worm wheel bracket.

Note : After mounting, perform 5. Tape Path Adjustment.

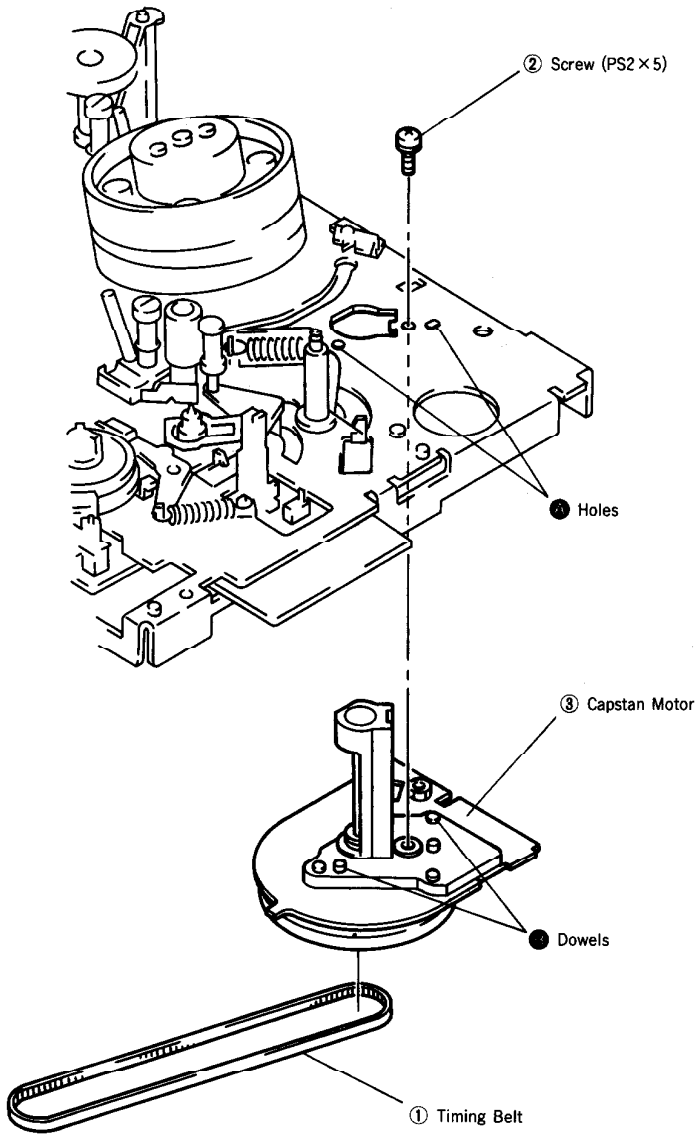


Fig. 18

4-13. DRUM ASSEMBLY (Fig. 19)

1. Removal

1) Referring to 4-1. RP Block, disconnect the connector for drum.
2) Remove three screws (M2x5) ①.
3) Remove the drum assembly ②.

Note : Do not touch the outer surface of drum; hold portions (A) and (B) of drum.

2. Mounting

1) Mount the drum ② while aligning with dowels Ⓐ of chassis at two places.

Note : Do not touch the outer surface of drum; hold portions (A) and (B) of drum.

2) Tighten three screws (M2x5) ①.
   2)-1 Tighten a screw ⓐ to the torque 29.42mN·m (300g·cm).
   2)-2 Tighten a screw ⓑ to the torque 29.42mN·m (300g·cm), then return 45°. (Apply a screw locking agent.)
   2)-3 Tighten a screw ⓒ to the torque 29.42mN·m (300g·cm), then return 45°. (Apply a screw locking agent.)

Note : After mounting, perform 5. Tape Path Adjustment.

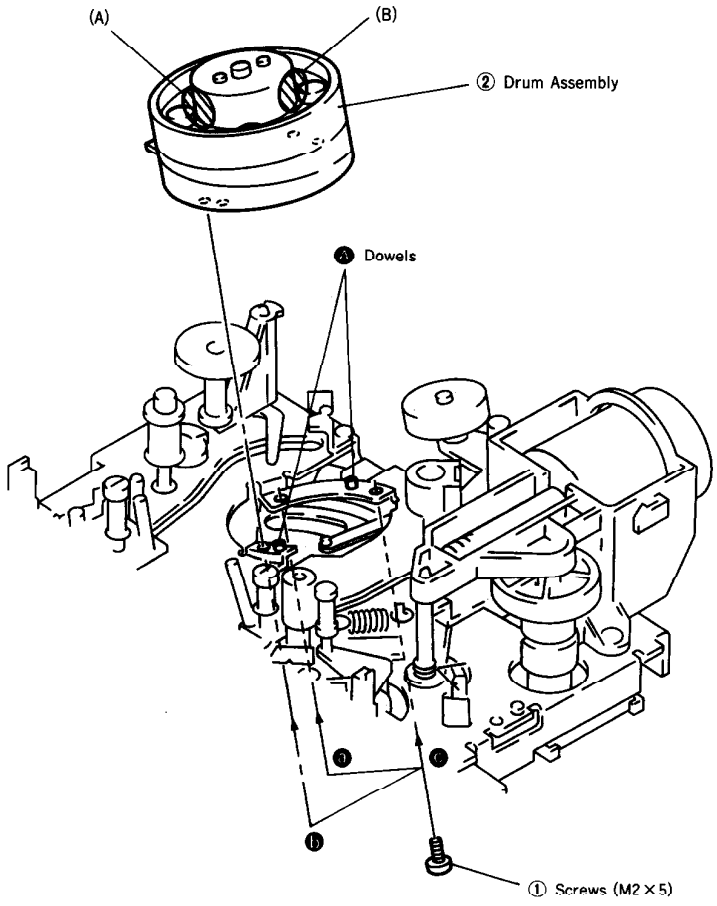


Fig. 19

4-14. PULLEY BASE ASSEMBLY (Fig. 20)

1. Removal

1) Remove a screw ①, then the W2, middle ②.
2) Disengage a claw Ⓐ and remove the pulley base assembly ③.

2. Mounting

1) Mount the pulley base assembly ③ on the shaft Ⓓ of mechanical chassis, and engage the timing belt Ⓒ with the pulley Ⓑ.
2) Mount the W2, middle ② and tighten tentatively the screw ①.
3) Tighten the screw ① at the position where the portion (A) of pulley base assembly ③ is pushed with 14g force.

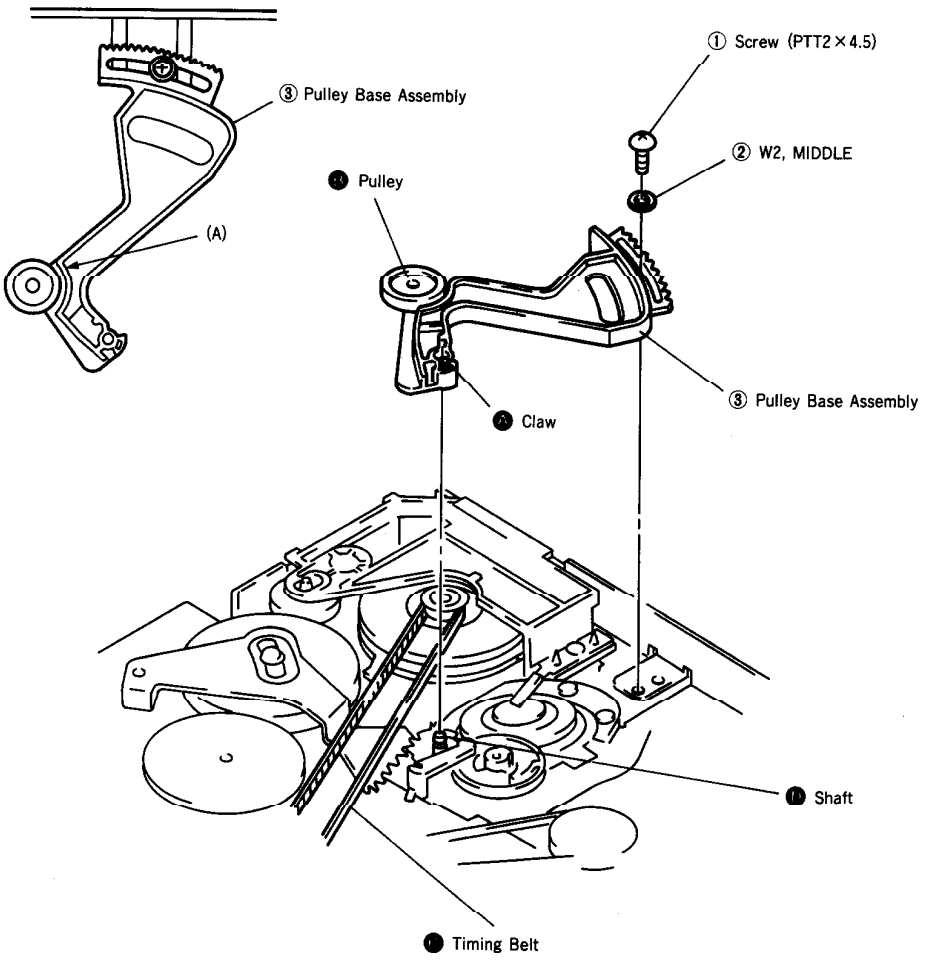


Fig. 20

4-15. LOADING DRIVE LEVER (Fig. 21)

1. Removal

1) Disengage the timing belt ①.
2) Remove a screw ②, then the W3, small ③.
3) Remove the loading drive lever ④.

2. Mounting

1) Mount the loading drive lever ④ on the shaft Ⓐ of chassis with its shaft Ⓓ inserted into the loading roller ⑤.
   At this time, insert the shaft Ⓑ of main cam into the hole Ⓒ in loading drive lever, the shaft Ⓓ of loading drive lever into a slot Ⓔ in main cam, and align a line Ⓕ on loading drive lever with a line Ⓖ on loading gear (T) respectively.
2) Mount the W3, small ③ and tighten tentatively the screw ②.
3) Engage the timing belt ①.

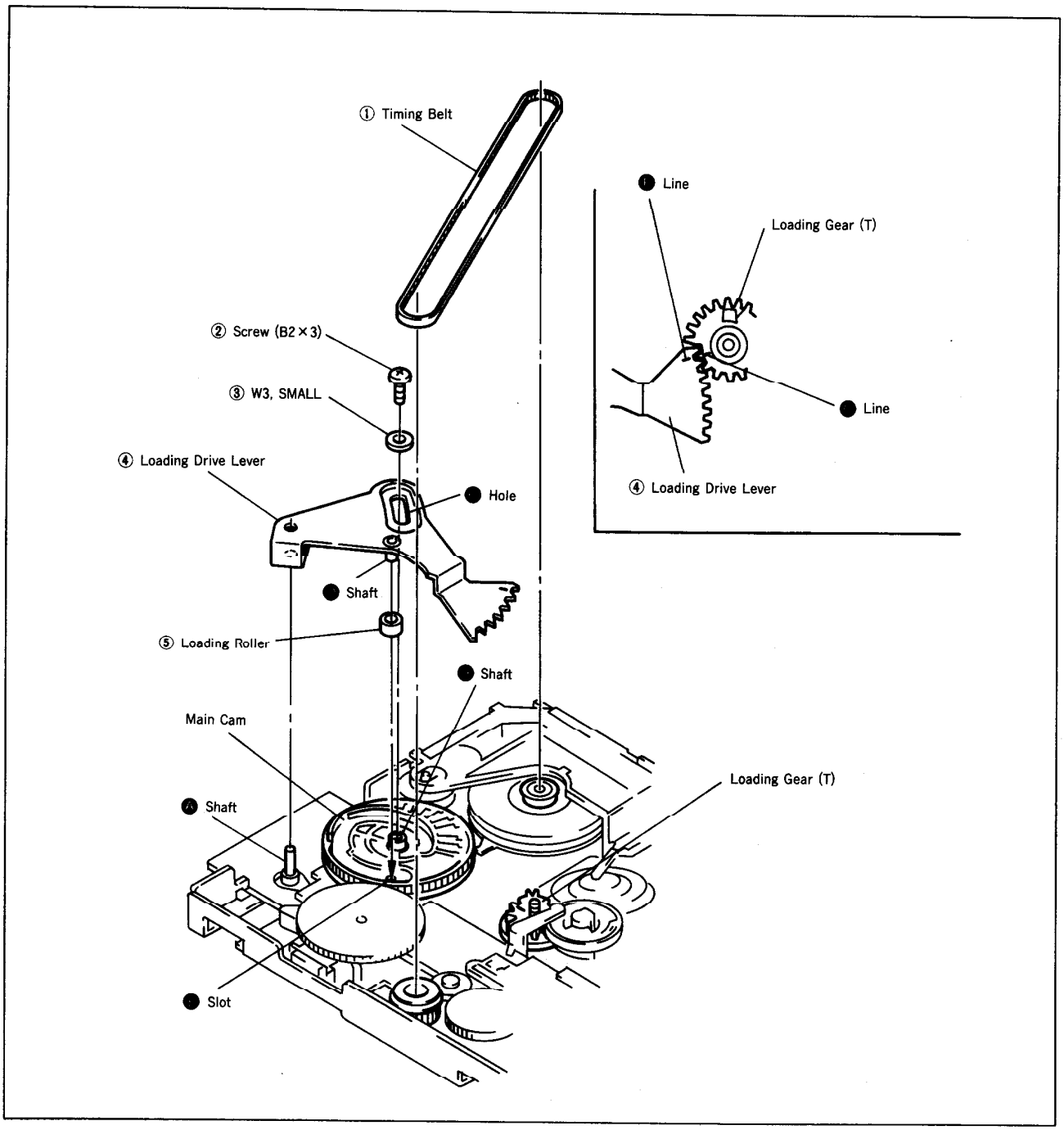


Fig. 21

4-16. ROTARY SWITCH AND MAIN CAM (Fig. 22)

1. Removal

1) Referring to 4-11, remove the worm wheel bracket.
2) Referring to 4-15, remove the loading drive lever.
3) Remove the cam relay gear ①.
4) Disengage claws Ⓐ at two places, and disconnect the rotary switch ② from the connector Ⓑ.
5) Remove the main cam ③.

2. Mounting

1) Mount the main cam ③ with its cam groove Ⓒ inserted into the shaft Ⓓ of slide plate drive lever, and cam groove Ⓔ into the shaft Ⓕ of pinch drive lever respectively.
2) Referring to 4-15, mount the loading drive lever.
3) Mount the cam relay gear ①.
4) Referring to 4-11, mount the worm wheel bracket.
5) Connect the rotary switch ② to the connector Ⓑ while aligning ▲ marks each other, and its recess Ⓗ with the recess Ⓖ of main cam ③.

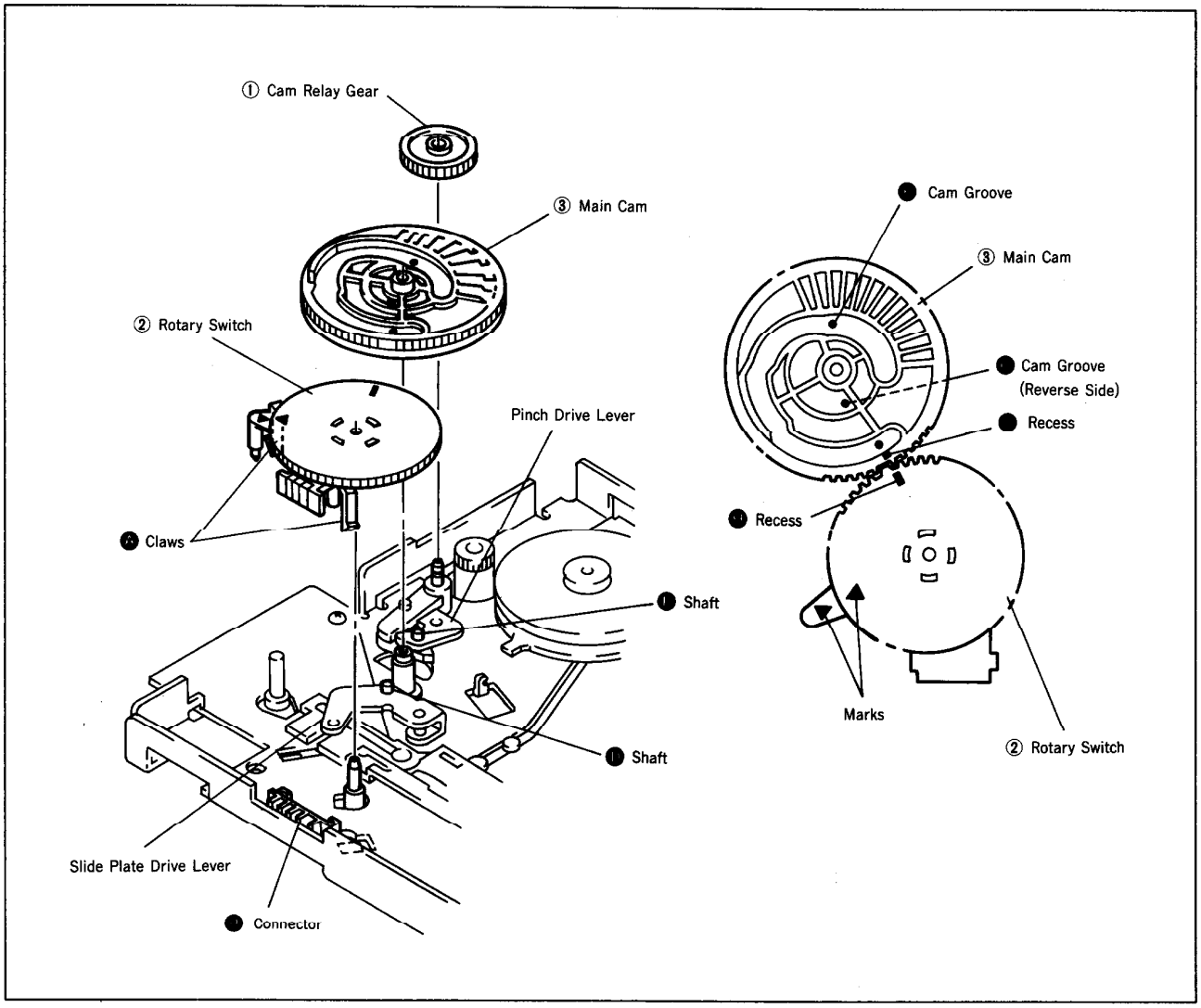


Fig. 22

4-17. SLIDE PLATE (Fig. 23)

1. Removal

1) Referring to 4-11, remove the worm wheel bracket.
2) Referring to 4-15, remove the loading drive lever.
3) Referring to 4-16, remove the rotary switch and main cam.
4) Remove the slide plate drive lever ①.
5) Disengage the timing belt ②.
6) Disengage a claw Ⓐ and remove the FL pulley gear (drive) ③.
7) Remove a tension coil spring ④, then the FL switching arm assembly ⑤.
8) Remove the brake (S) drive lever ⑧.
9) Remove two lock washers 1.5 ⑥, then the slide plate ⑦.

2. Mounting

1) Mount the slide plate ⑦ with its groove Ⓑ inserted into the shaft Ⓒ of chassis, the groove Ⓓ into the shaft Ⓔ of S take-up assembly, and the groove Ⓕ into the shaft Ⓖ respectively.
   At this time, insert the shaft Ⓗ into the groove Ⓚ in slide plate while holding the tension regulator sub-arm toward the arrow.
2) Mount two lock washers 1.5 ⑥.
3) Referring to 3) of Mounting in 4-18, mount the brake (S) drive lever ⑧.
4) Mount the FL switching arm assembly ⑤ and a tension coil spring (4).
5) Mount the FL pulley gear (drive) ③ and engage the timing belt ②.
6) Mount the slide plate drive lever ① with its shaft Ⓜ inserted into a groove Ⓝ in slide plate ⑦, and its hole into the shaft Ⓟ of chassis.
7) Referring to 4-16, mount the rotary switch and main cam.
8) Referring to 4-15, mount the loading drive lever.
9) Referring to 4-11, mount the worm wheel bracket.

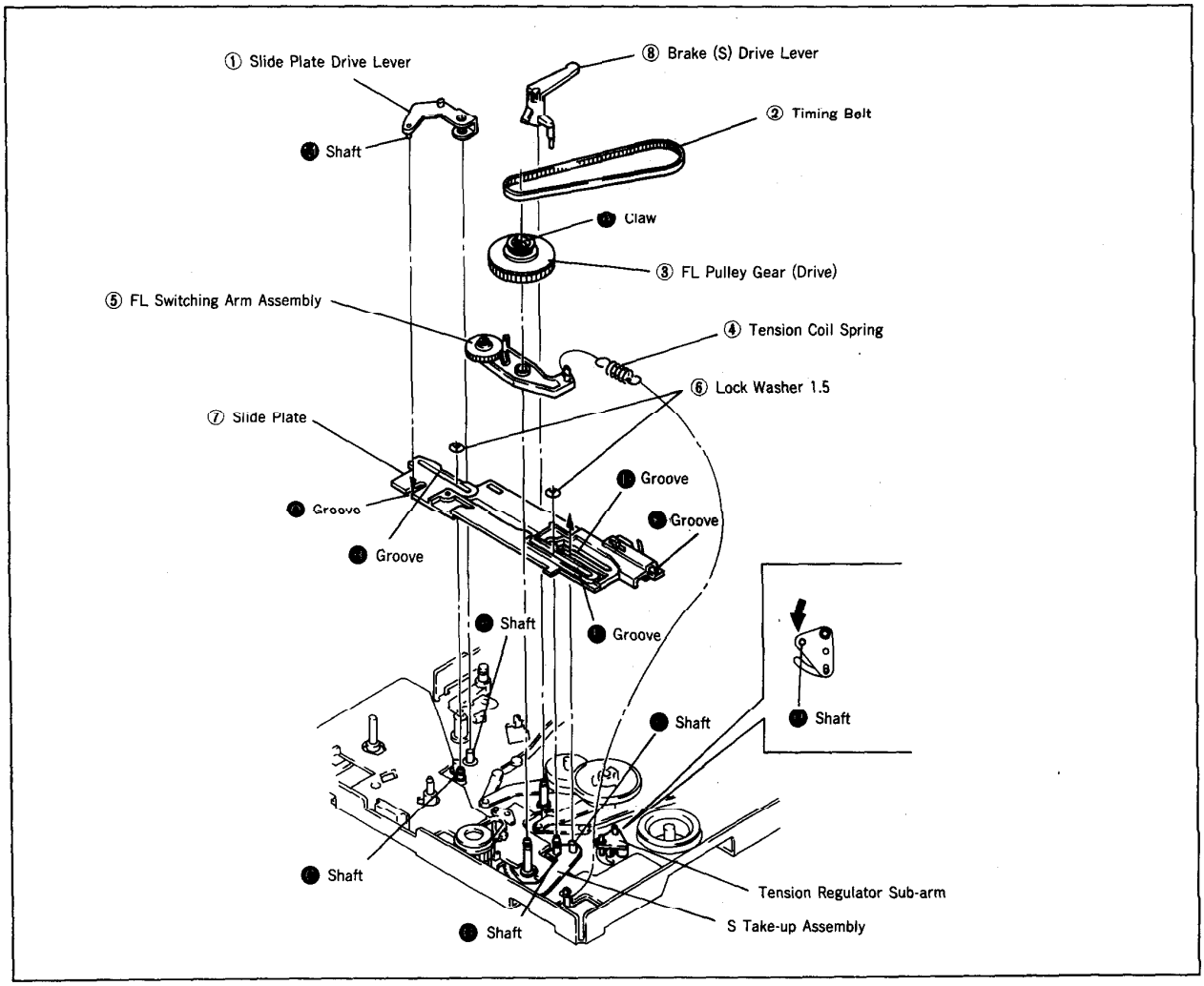


Fig. 23

4-18. LOADING GEAR (S) ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 4-15, remove the loading drive lever.
2) Disengage a claw Ⓐ and remove the brake (S) drive lever ①.
3) Remove the coaster leaf spring ②.
4) Disengage a claw Ⓑ and remove the loading gear (S) assembly ③.

2. Mounting

1) Mount the loading gear (S) assembly ③ on the shaft Ⓒ of chassis with its arm engaged with the shaft Ⓓ of coaster.
   At this time, align the portion Ⓔ of loading gear (T) assembly with the portion Ⓕ of loading gear (S) assembly.
2) Mount the coaster leaf spring ②.
3) Mount the brake (S) drive lever ① on the shaft Ⓜ of chassis with its shaft Ⓙ inserted into the portion Ⓖ of brake (S) arm, and the shaft Ⓗ into the groove Ⓚ in loading gear (S) assembly ③.
4) Referring to 4-15, mount the loading drive lever.

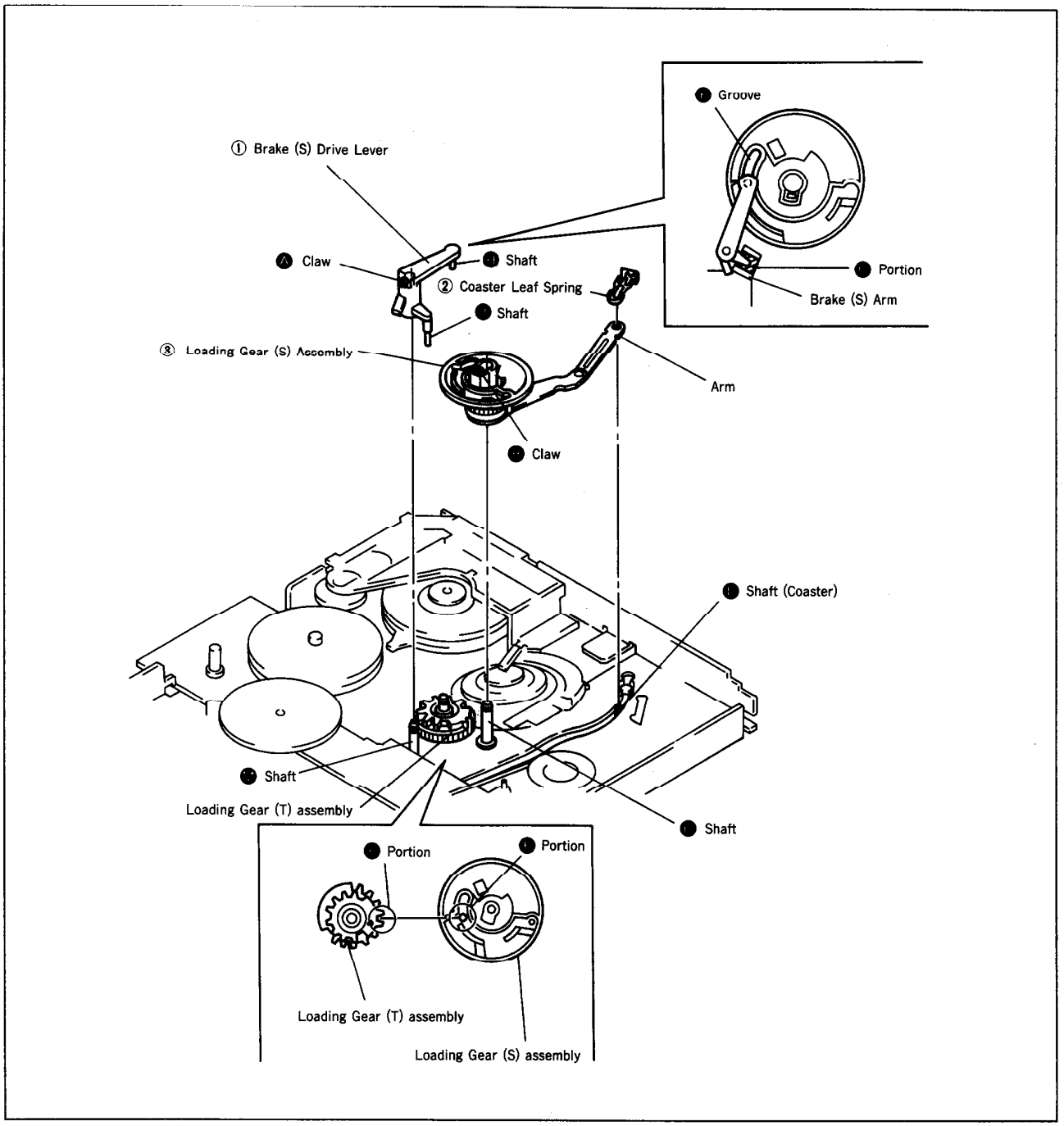


Fig. 24

4-19. LOADING GEAR (T) ASSEMBLY (Fig. 25)

1. Removal

1) Referring to 4-15, remove the loading drive lever.
2) Referring to 4-18, remove the loading gear (S) assembly.
3) Remove the coaster leaf spring ①, then the loading gear (T) assembly ②.

2. Mounting

1) Mount the loading gear (T) assembly ② on the shaft Ⓐ of chassis with its arm engaged with the shaft Ⓑ of coaster.
2) Mount the coaster leaf spring ①.
3) Referring to 4-18, mount the loading gear (S) assembly.
4) Referring to 4-15, remove the loading drive lever.

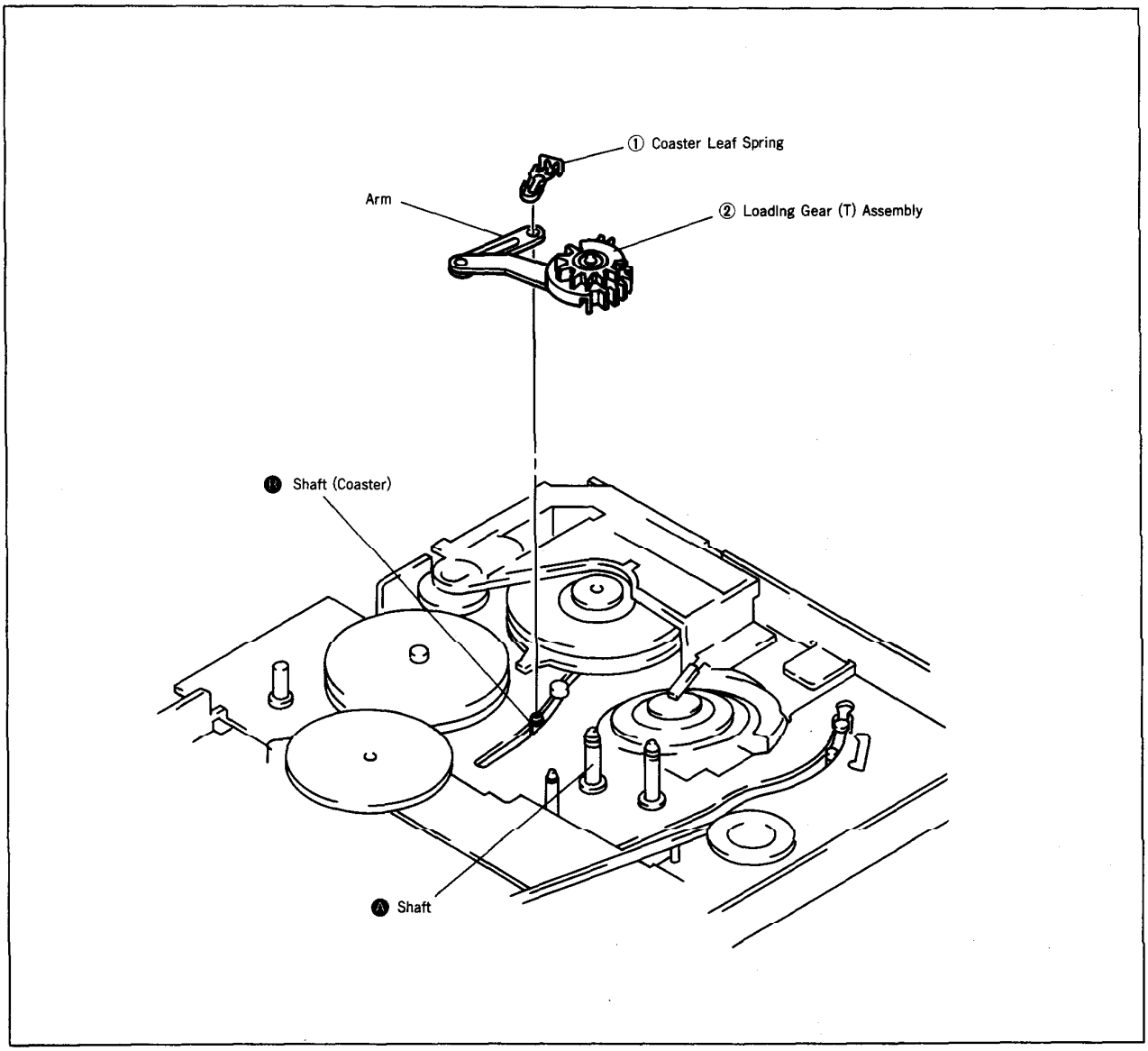


Fig. 25

4-20. COASTER (S) (Fig. 26)

1. Removal

1) Referring to 4-2, remove the impedance roller assembly.
2) Remove a screw ①, then the catcher (S) ②.
3) Remove the coaster leaf spring ③, then the coaster (S) ④.

2. Mounting

1) Mount the coaster (S) ④.
2) Mount the catcher (S) ② with its holes inserted into dowels Ⓐ of chassis at two places.
3) Tighten a screw ①.
4) Referring to 4-18 Loading Gear (S) Assembly, mount the coaster leaf spring ③.
5) Referring to 4-2, mount the impedance roller assembly.

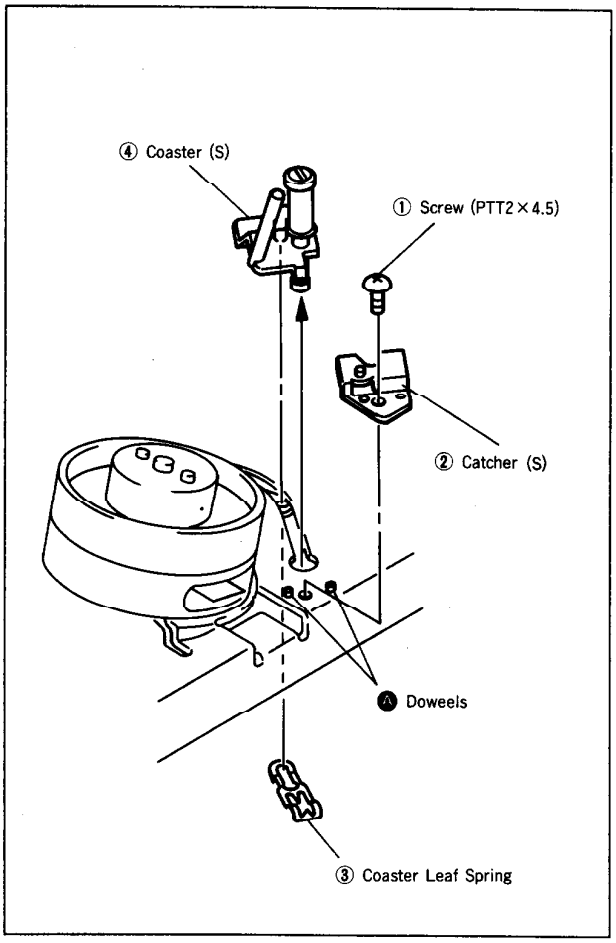


Fig. 26

4-21. COASTER (T) (Fig. 27)

1. Removal

1) Remove a screw ①, then the catcher (T) ②.
2) Remove the coaster leaf spring ③, then the coaster (T) ④.

2. Mounting

1) Mount the coaster (T) ④.
2) Mount the catcher (T) ② with its holes inserted into dowels Ⓐ of chassis at two places.
3) Referring to 4-19 Loading Gear (T) Assembly, mount the coaster leaf spring ③.

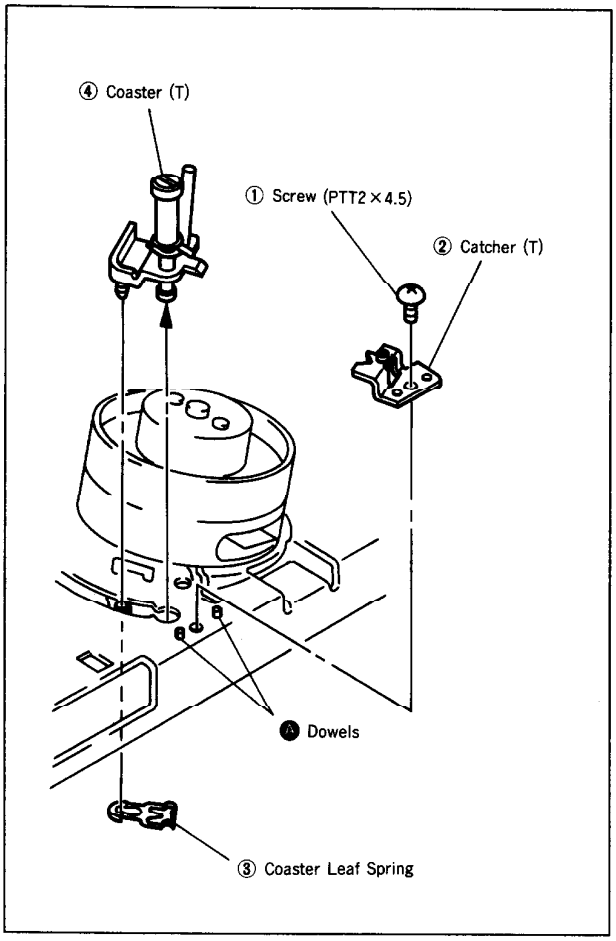


Fig. 27

4-22. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

• If possible, make a recording before removal.

1) Remove the two screws ① (Fig. 28).
2) Mount the jig ② (Ref. No. J-8) with the two supplied screws ③, then screw the attached hexagon socket screws ④ to the jig ②. The rotary upper drum ⑤ will move upward and come off (Fig. 29).

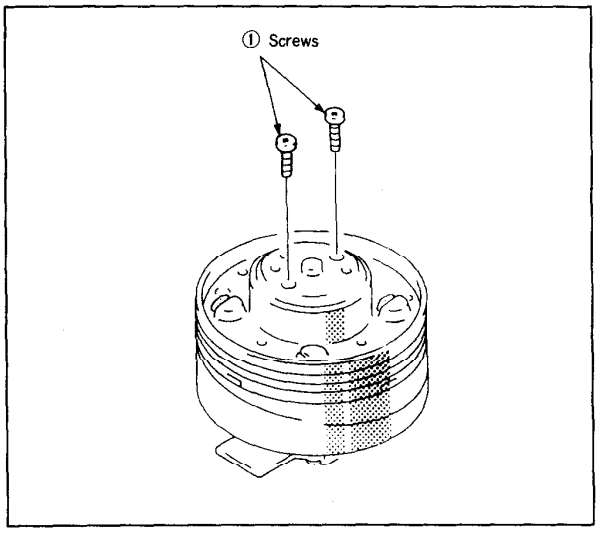


Fig. 28

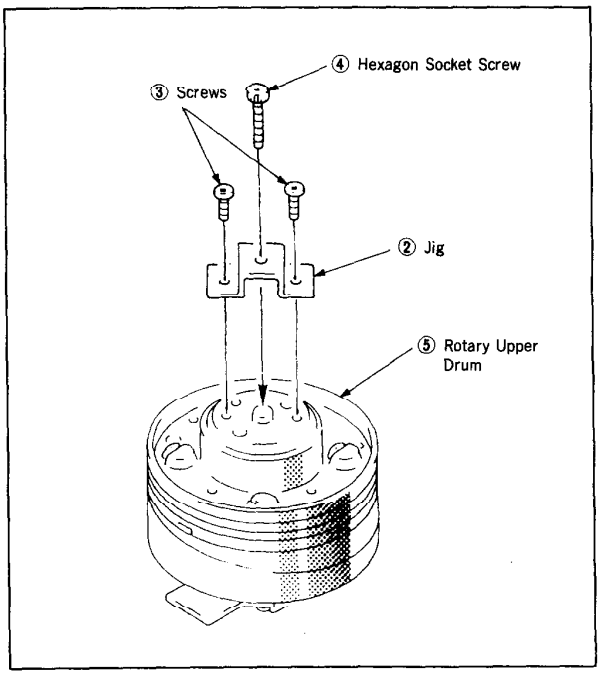


Fig. 29

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ⑤ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ⑥ (Ref. No. J-8) into the drum positioining hole, then set then set the rotary upper drum ⑤ by passing the jig through its positioning hole ⑦. (Fig.30)
3) Remove the jig ⑥ and push down the rotary upper drum ⑤ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws ① alternately (Fig.28).
4) Tighten strongly both two screws ①, and loosen both screws once, then tighten them again (for stable seating).
5) Insert the jig ⑥ into the positioning hole ⑦ again and confirm that it goes in smoothly. If it does not, loosen the two screws ①, repeat step 2) of the Removal paragraph and restart the setting procedure.
6) Tighten the screws ①.

Note : After installing, be sure to perform tape path adjustment as described in section 5.

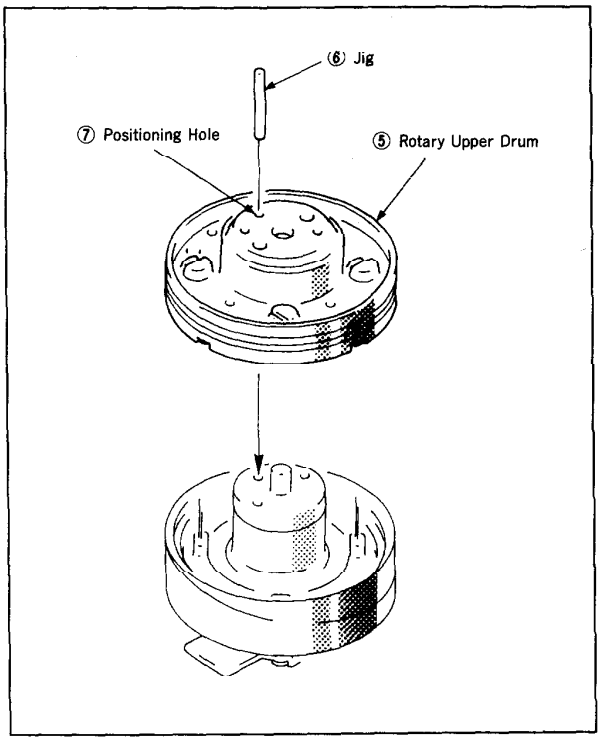


Fig. 30

4-23. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 31)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 5.5 mm. (On the centerline of TG2 guide)
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw ①.
5) If No.1 guide is located inside the specified position, shift the tension adjusting base toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-13). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw ①.

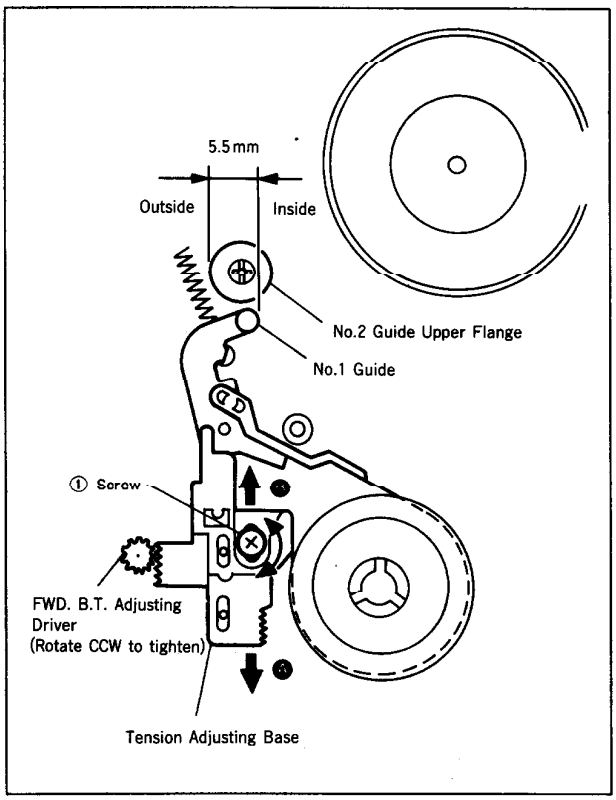


Fig. 31

4-24. FWD BACK TENSION ADJUSTMENT (Fig. 32)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-10).
2) Set the torque cassette (Ref No. J-7).
3) Select the FWD mode, and check that the torque of S reel table is 0.88 ~ 1.17mN·m (9 ~ 12g·cm). If it is out of standard, adjust the tension adjusting arm position.

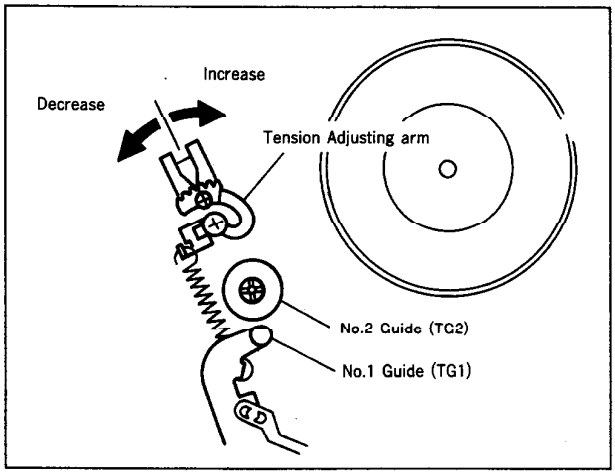


Fig. 32

4-25. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 0.98 ~ 1.96mN·m (10 ~ 20g·cm).
3) Select the RVS mode, and check that the torque fluctuation center of S reel table is 1.77 ~ 2.75mN·m (18 ~ 28g·cm).
4) Select the REV mode, and check that the torque of T reeltable is 0.98 ~ 1.96mN·m (10 ~ 20g·cm).
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4-26. FL WORM WHEEL (Fig. 33)

1. Removal

1) Disengage tabs Ⓐ at four places and remove the gear cover ①.
2) Remove the drive gear ②, then the FL worm wheel ③.

2. Mounting

1) Mount the FL worm wheel ③.
2) Meet a hole Ⓑ in drive arm (T) on right side with a hole in chassis, and also a hole Ⓒ in FL worm wheel ③ with a hole in side plate.
   Meet a hole Ⓓ in drive gear ② with a hole in side plate.
   Meeting respective holes, mount the drive gear ②.
3) Mount the gear cover ①.

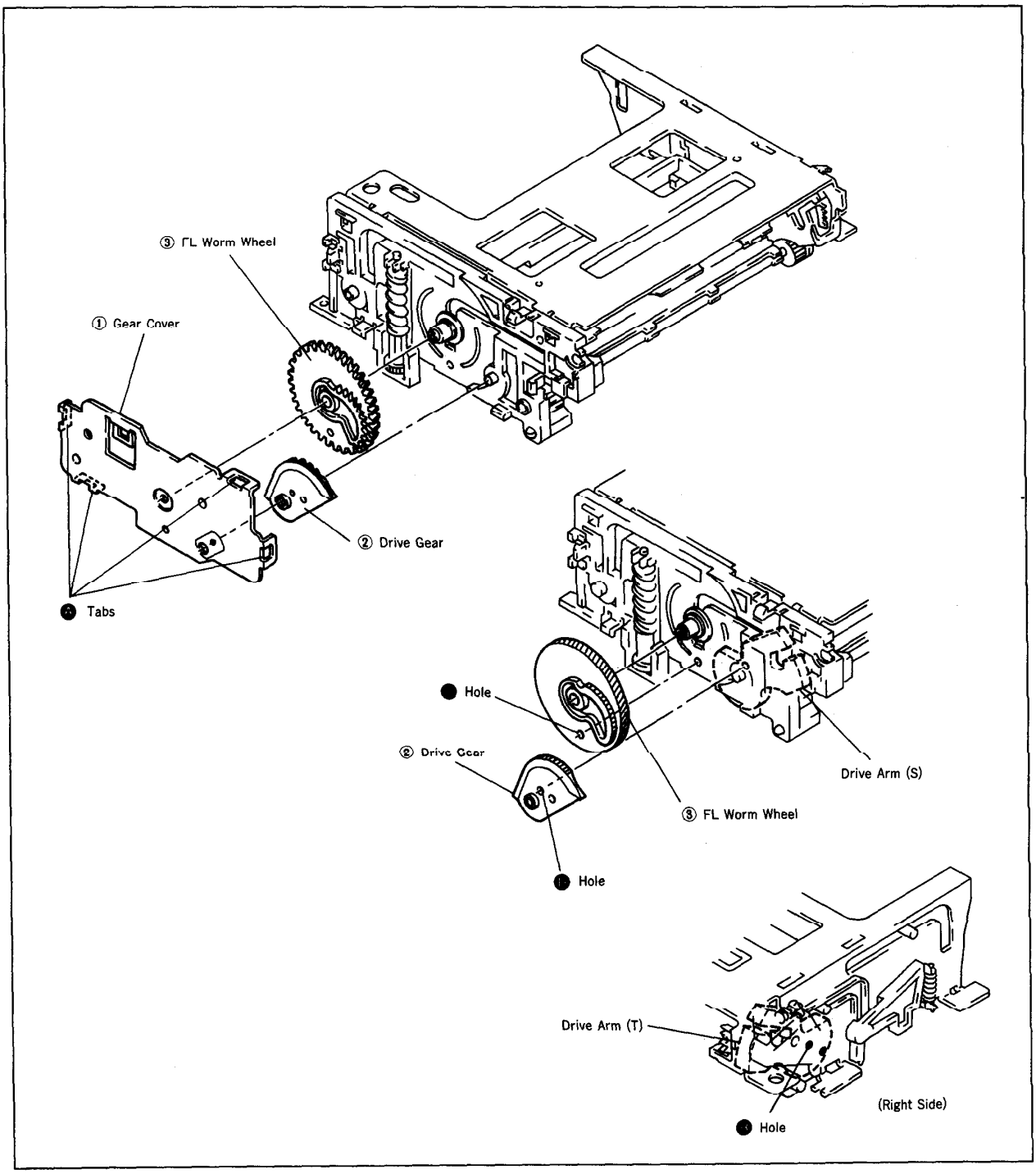


Fig. 33

5. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the F mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No. J-10). So, fine tracking adjustment can be easily done.
Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

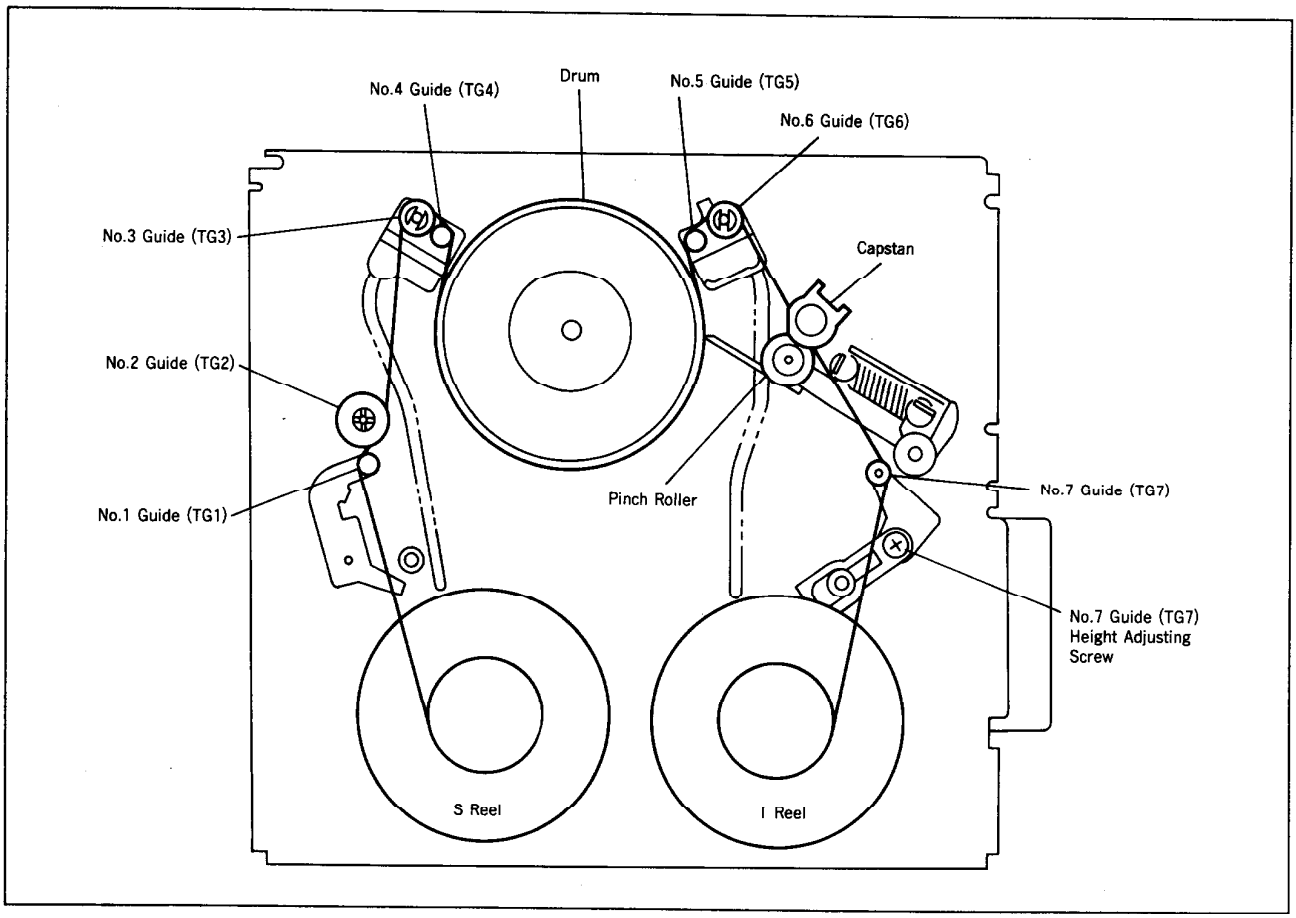


Fig. 34

[Note on Adjustment of No.7 Guide (TG7)]

The height adjustment screw for No.7 guide (TG7) is located at some distance from the guide (refer to Fig.42).
Therefore, when performing section 5-4. No.7 Guide (TG7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

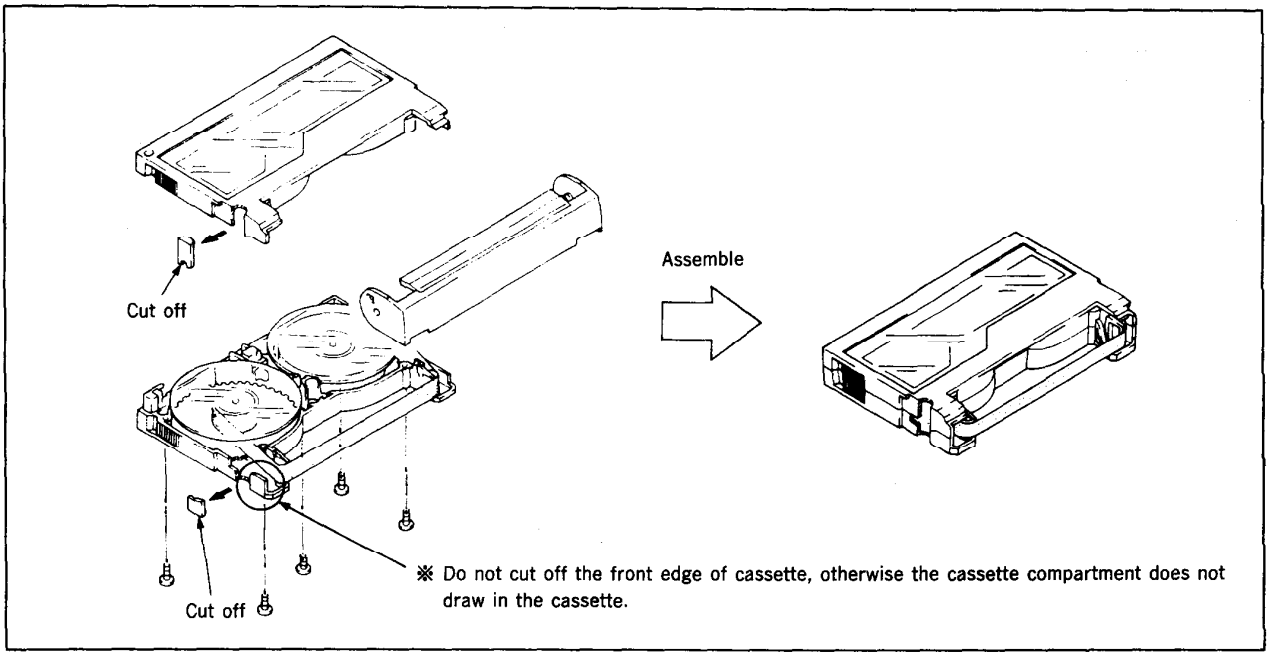


Fig. 35

5-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
4) Play back a tracking alignment tape (NTSC : WR5-1NP, or PAL : WR5-1CP).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 36 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 36 ⓑ and ⓒ.

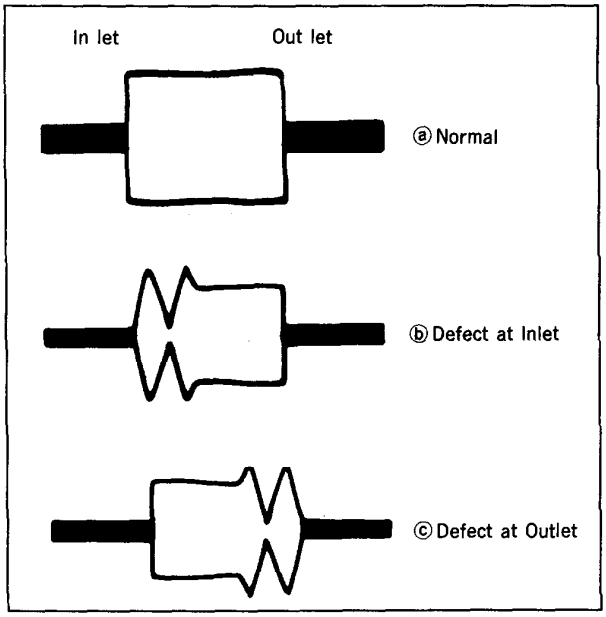


Fig. 36

5-2. TRACKING ADJUSTMENT (Fig. 37, 38)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG3) lock screw ① and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG3) lock screw ① to lock the No.3 guide.
4) Loosen the No.6 guide (TG6) lock screw ② and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG6) lock screw ② to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

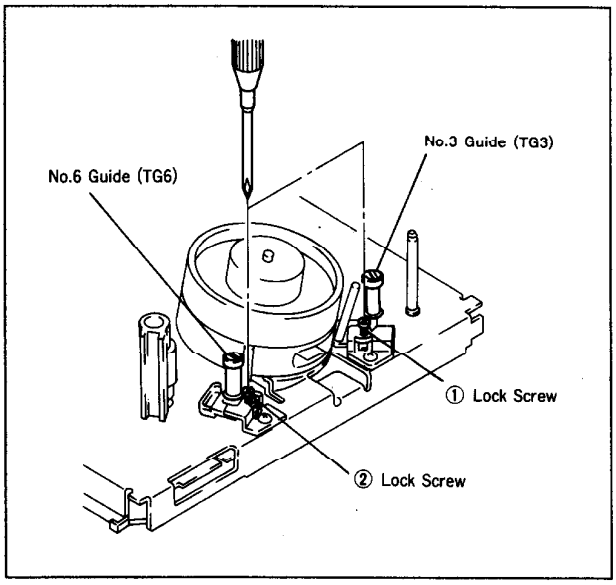


Fig. 37

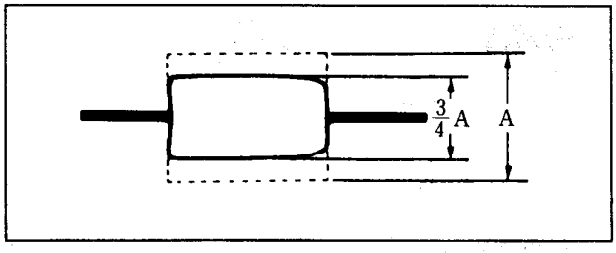


Fig. 38

5-3. No.2 GUIDE (TG2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

5-3-1. No. 2 GUIDE (TG2) HEIGHT PRESETTING (Fig. 39)

1) Rotating the TG2 upper flange, adjust the height from top surface of mechanical chassis to top surface of TG2 upper flange to 22.12mm.

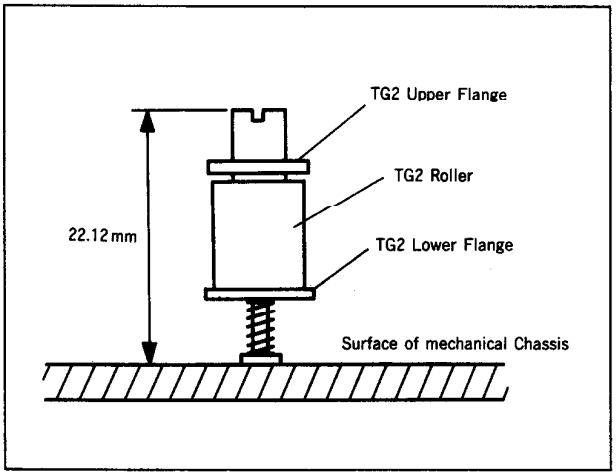


Fig. 39

[Reference]

This F mechanism is equipped with four adjustable guides (TG2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG7	Raise	Clockwese
	Lower	Counterclockwise

5-3-2. No. 2 GUIDE (TG2) ADJUSTMENT (Fig. 40, 41)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ② of the No.2 guide (TG2) ① (Fig. 40). If it is, turn the upper flange ③ of the No.2 guide (TG2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 5-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 41), turn the upper flange ③ of the No. 2 guide (TG2) ① 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

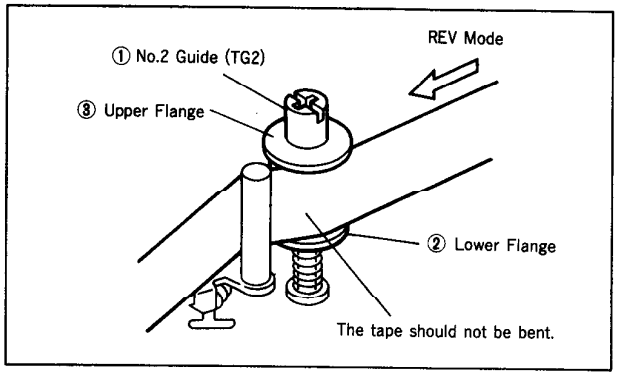


Fig. 40

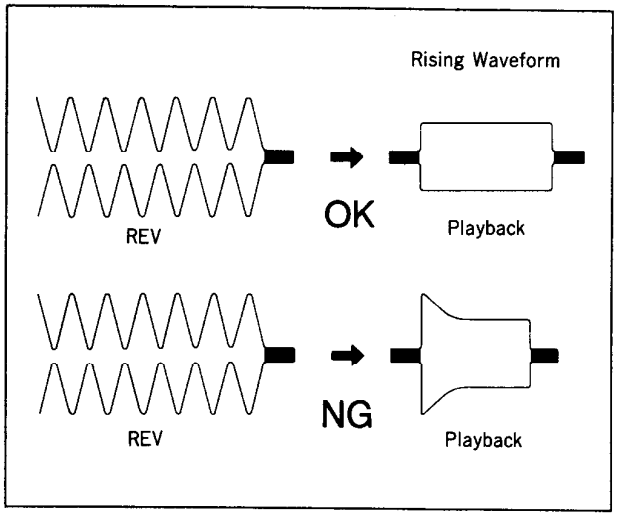


Fig. 41

5-4. No.7 GUIDE (TG7) ADJUSTMENT (Fig. 42)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 35).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG6) ① and the capstan ②. If it is, turn the hight adjusting screw ④of the No.7 guide (TG7) ③ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ② and the No.7 guide (TG7) ③ (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the hight adjusting screw ④ until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG6) ① and the capstan ② is 0.3mm or less, adjustment can be considered completed.

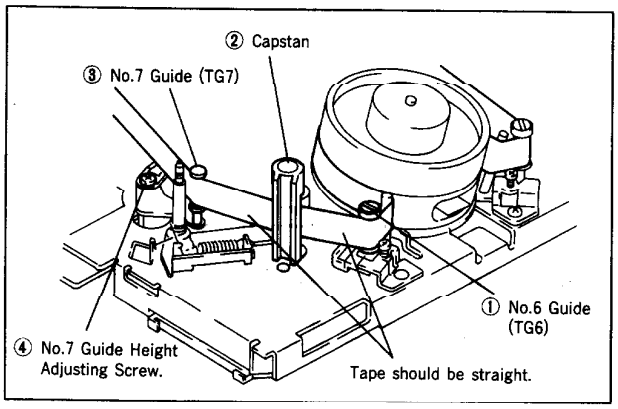


Fig. 42

5-5. CUE AND REV WAVEFORM CHECK (Fig. 43)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 43). In case pitch is not constant, perform section 5-2.Tracking Fine Adjustment and section 5-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig. 43).
   Otherwise, perform section 5-2 Tracking Fine Adjustment.

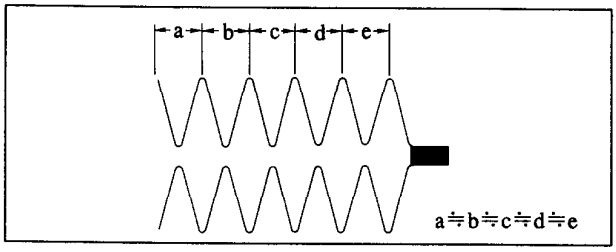


Fig. 43

5-6. CHECK AFTER ADJUSTMENT

5-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 44).
2) Then, confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (Fig. 45).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

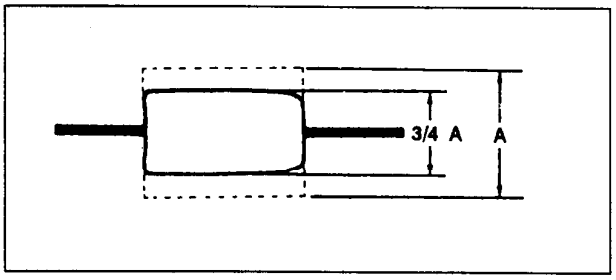


Fig. 44

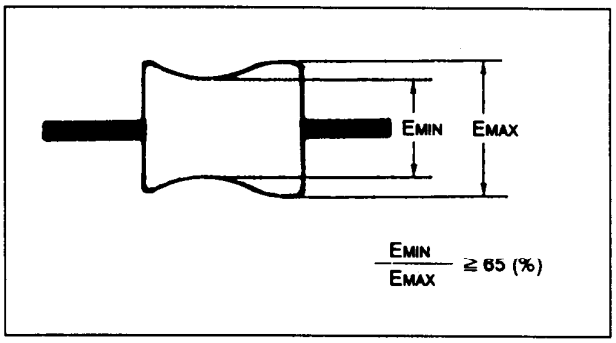


Fig. 45

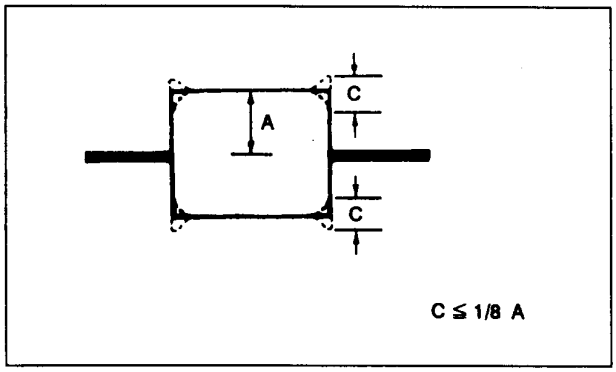


Fig. 46

5-6-2. RISING CHECK (Fig. 47)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

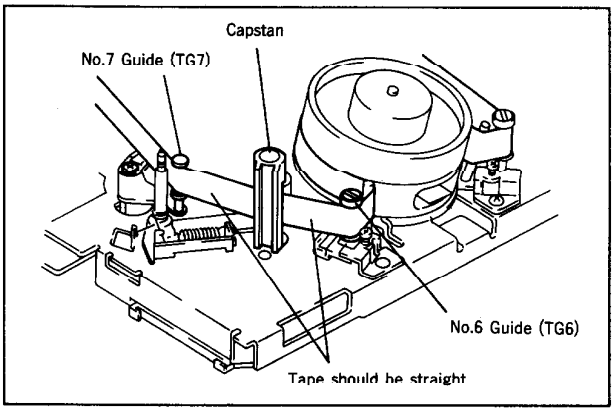


Fig. 47

5-6-3. TAPE PATH CHECK (Fig. 48)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

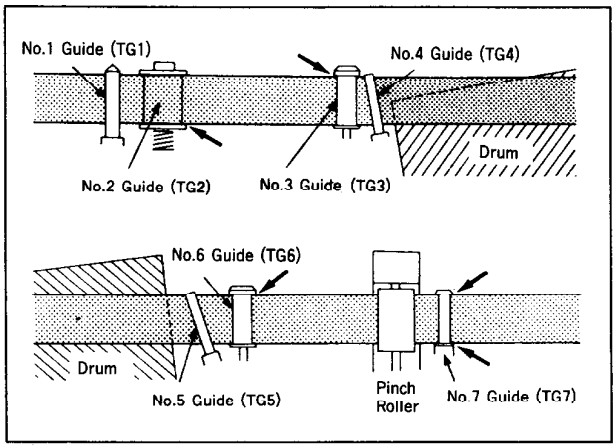


Fig. 48

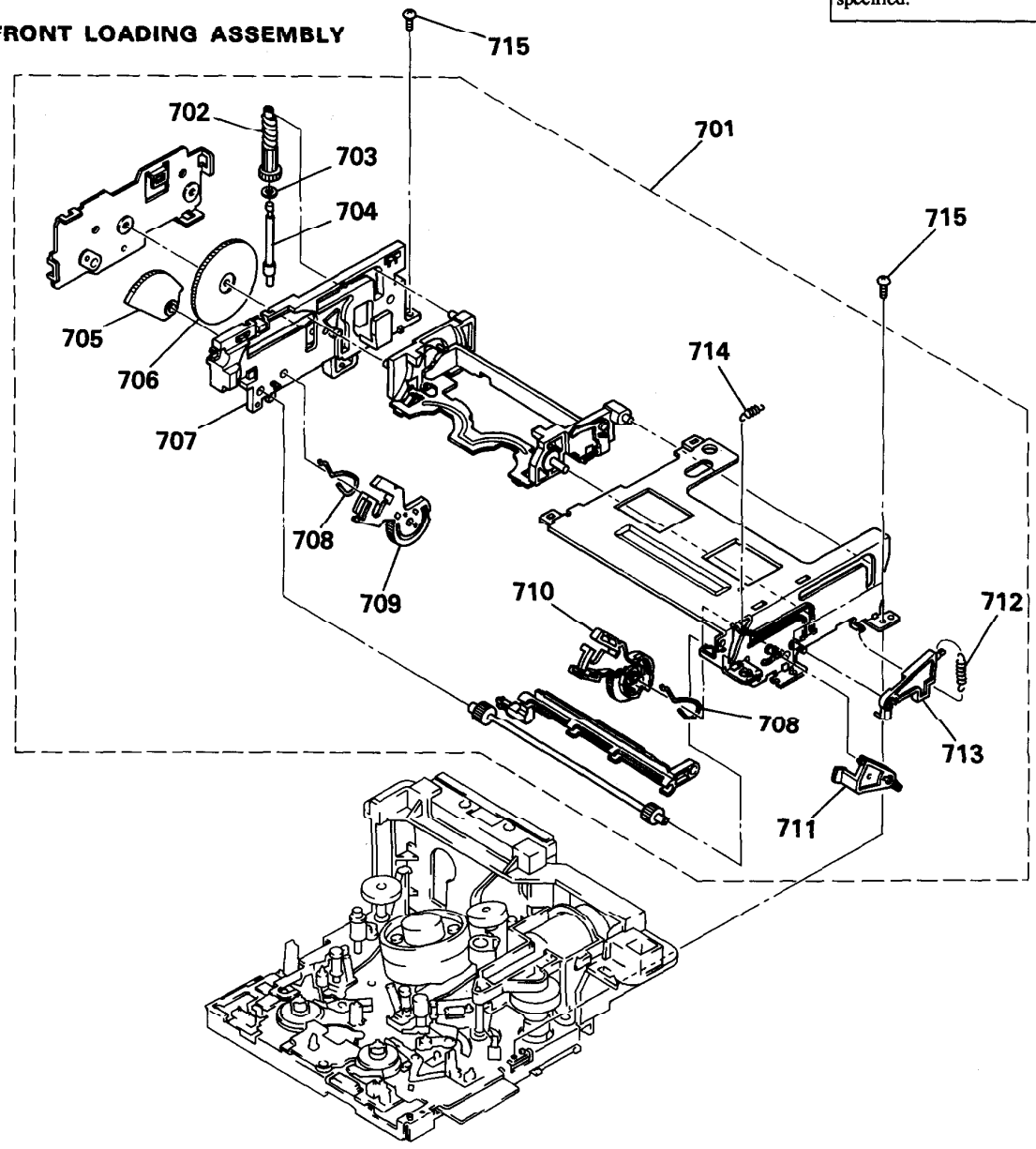
SECTION 6
EXPLODED VIEWS

NOTE:

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

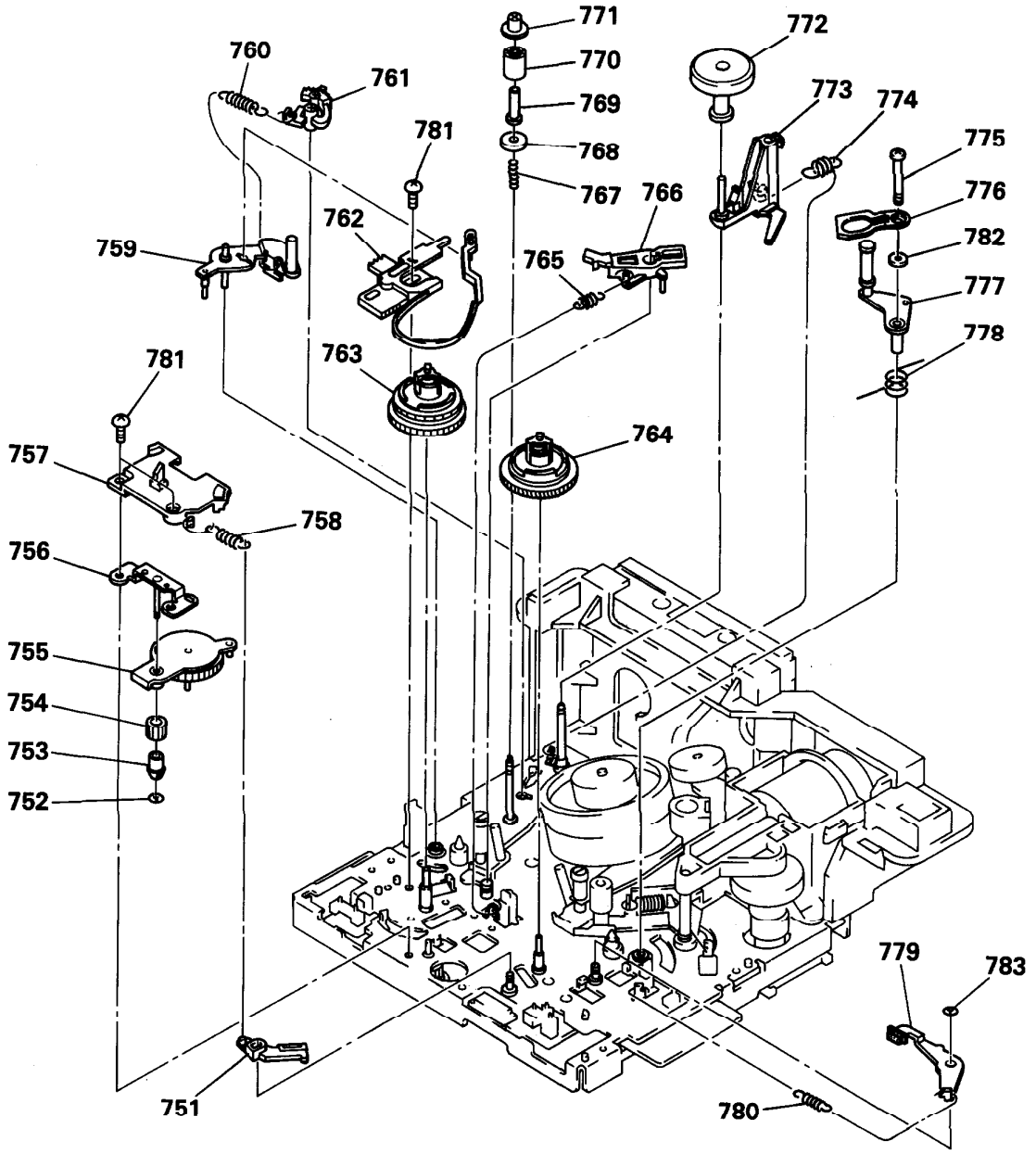
6-1. FRONT LOADING ASSEMBLY



Ref.No.	Part No.	Description	Remark
701	A-7091-941-A	FL BLOCK ASSY	
702	3-954-028-01	GEAR, FL WORM	
703	3-738-212-11	RETAINER, THRUST, REEL TABLE	
*704	3-954-029-01	SHAFT, FL WORM GEAR	
705	3-954-020-01	GEAR, DRIVING	
706	3-954-019-01	WHEEL, FL WORM	
*707	3-954-032-01	PLATE (S), SIDE	
708	3-954-042-01	SPRING, PRESS	

Ref.No.	Part No.	Description	Remark
709	3-954-034-01	ARM (S), DRIVING	
710	3-954-033-01	ARM (T), DRIVING	
*711	3-954-041-01	ARM, DOOR SWITCHING	
712	3-954-043-01	SPRING, TENSION	
*713	3-954-040-01	ARM, CASSETTE IN SWICH	
714	3-954-044-01	SPRING, TENSION	
715	3-732-817-01	SCREW (2X4.5), TAPPING	

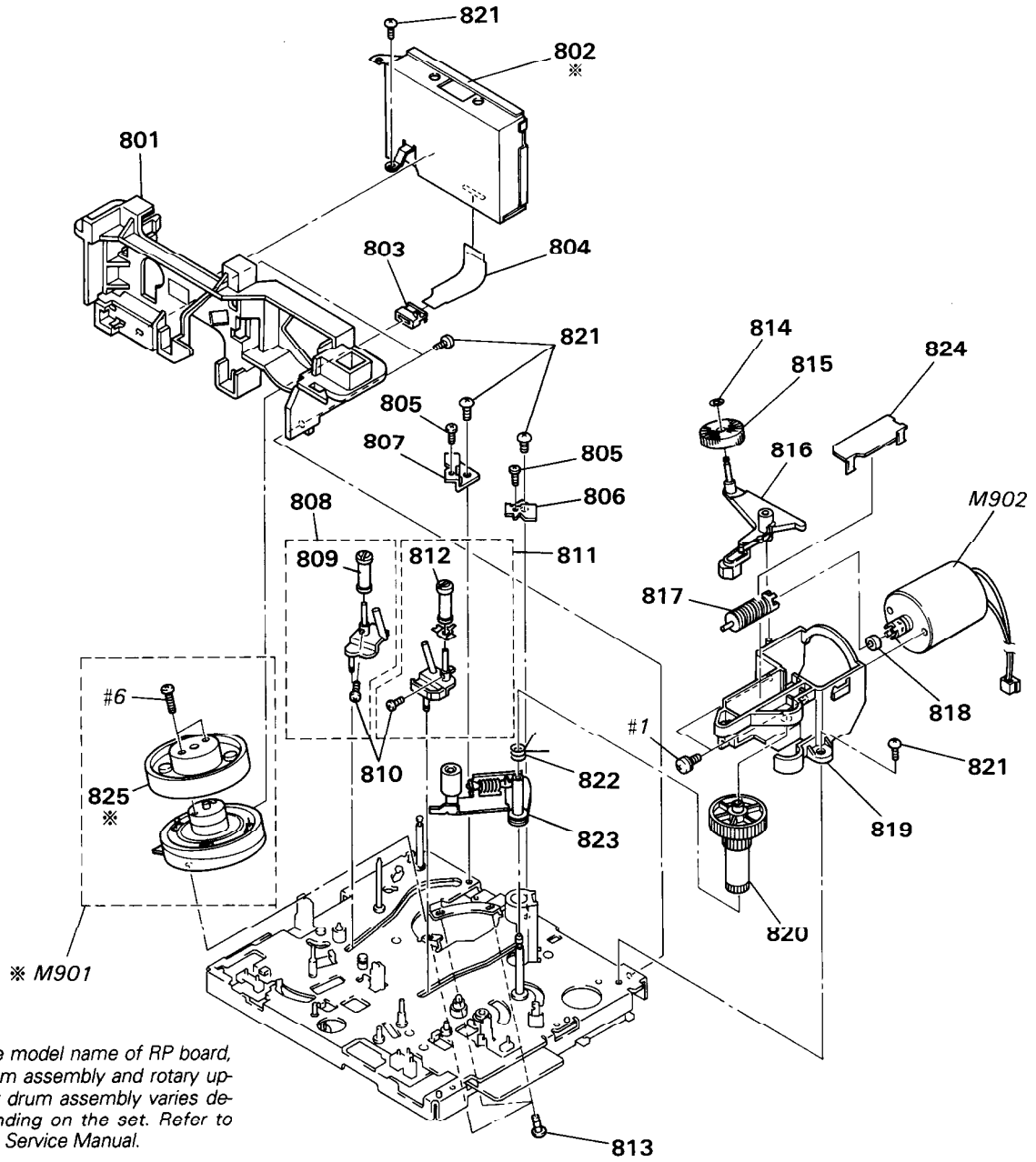
6-2. MD CHASSIS ASSEMBLY (1)



Ref.No.	Part No.	Description	Remark
751	X-3943-111-1	BRAKE (T) ASSY, SOFT	
752	3-726-829-01	WASHER, STOPPER	
753	3-954-321-01	BEARING, PENDULUM DRIVING	
754	3-954-059-01	GEAR, PENDULUM DRIVING	
755	X-3942-951-1	GEAR ASSY, PENDULUM	
756	X-3943-162-1	BASE ASSY, PENDULUM	
*757	3-954-063-01	PLATE, RELEASE, REEL LOCK	
758	3-955-142-01	SPRING, TENSION	
759	X-3942-955-1	TENSION REGULATOR ASSY	
760	3-954-074-01	SPRING, TENSION	
761	3-954-103-01	ARM, TENSION ADJUSTMENT	
762	X-3942-956-1	BAND ASSY, TENSION REGULATOR	
763	X-3942-954-1	TABLE (S) ASSY, REEL	
764	X-3942-953-1	TABLE (T) ASSY, REEL	
765	3-954-085-01	SPRING, TENSION	
766	3-954-071-01	ARM, BRAKE (S)	
767	3-954-001-01	SPRING, COMPRESSION	

Ref.No.	Part No.	Description	Remark
768	3-726-882-02	FLANGE, LOWER, TG2	
769	3-726-885-01	SLEEVE, TG2	
770	3-726-883-31	ROLLER, TG2	
771	3-726-884-01	FLANGE, UPPER, TG2	
772	3-954-282-01	ROLLER (M)	
773	X-3943-015-1	BASE ASSY, ROLLER	
774	3-954-284-01	SPRING, TENSION	
775	3-954-096-01	SCREW, TG7 HEIGHT ADJUSTMENT	
776	3-954-093-01	SPACER, TG7	
777	X-3942-958-1	ARM ASSY, TG7	
778	3-954-003-01	SPRING (TG7), TORSION	
779	X-3943-161-1	BRAKE (T) ASSY	
780	3-953-978-01	SPRING, TENSION	
781	3-732-817-01	SCREW (2X4.5), TAPPING	
782	3-738-212-11	RETAINER, THRUST, REEL TABLE	
783	3-669-465-00	WASHER (1.5), STOPPER	

6-3. MD CHASSIS ASSEMBLY (2)

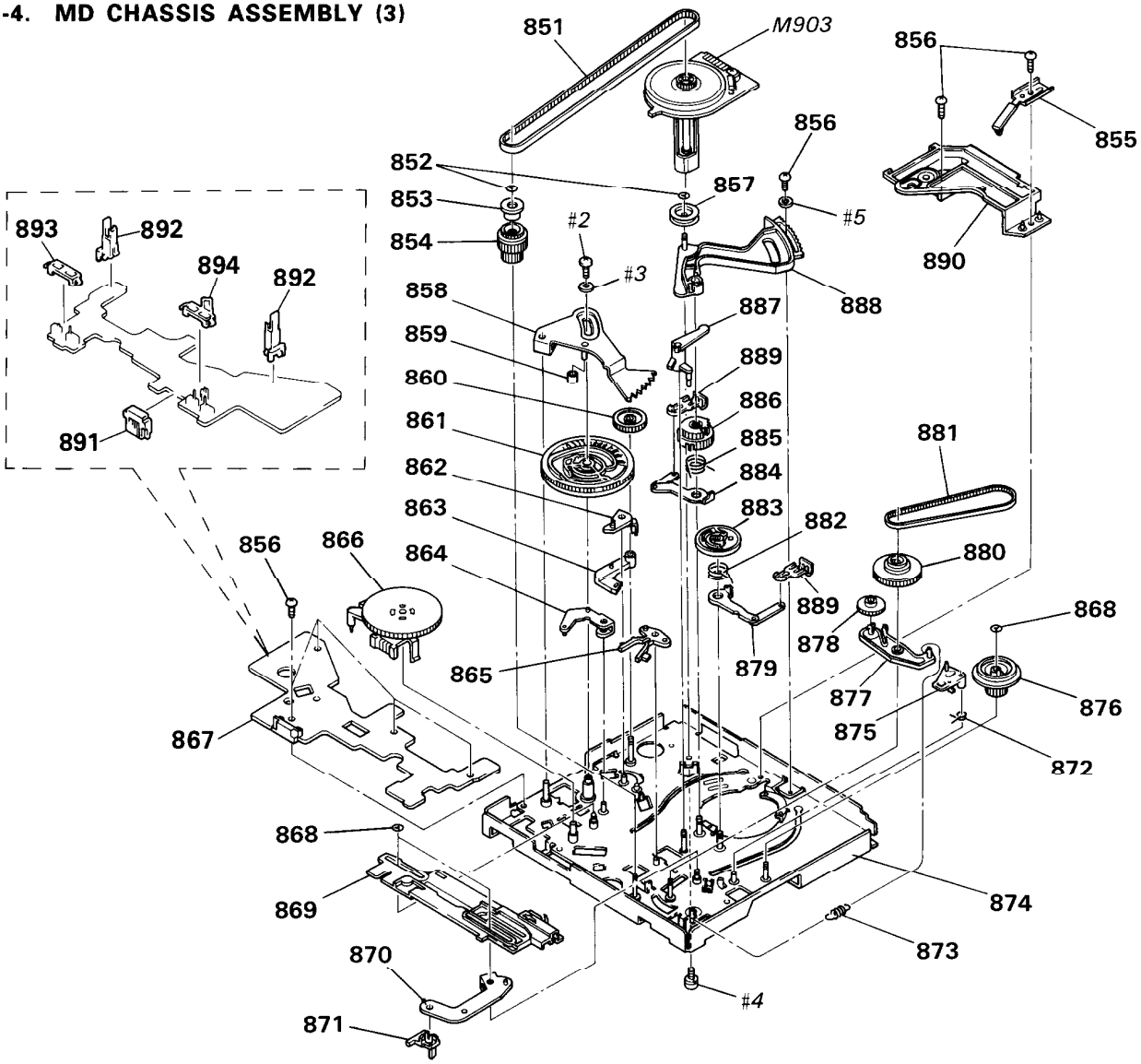


※ *The model name of RP board, drum assembly and rotary upper drum assembly varies depending on the set. Refer to the Service Manual.*

Ref.No.	Part No.	Description	Remark
*801	3-955-623-01	FRAME, RP	
*802	※	RP BOARD, COMPLETE	
803	1-691-471-11	CONNECTOR, TRANSLATION 11P	
804	1-649-565-11	FP-696 FLEXIBLE BOARD	
805	3-954-285-01	SCREW (M1.4X0.2)	
806	3-954-091-01	CATCHER (T)	
807	3 954 090 01	CATCHER (S)	
808	A-7040-338-A	COASTER (S) BLOCK ASSY	
809	X-3941-755-1	ROLLER ASSY (2), TG3	
810	3-947-504-01	SCREW (M1.2X2)	
811	A-7040-339-A	COASTER (T) BLOCK ASSY	
812	X-3941-756-1	ROLLER ASSY (2), TG6	
813	3-686-493-01	SCREW (M2X5), P1	
814	3-321-393-01	WASHER, STOPPER	

Ref.No.	Part No.	Description	Remark
815	X-3943-192-1	ROLLER ASSY, HC	
816	X-3942-947-1	ARM ASSY, HC	
817	3-733-395-01	GEAR (CAM), WORM	
818	3-696-388-01	RUBBER, JOINT	
819	3-954-024-01	HOLDER, MOTOR	
820	3-954-023-01	WHEEL, CAM WORM	
821	3-732-817-01	SCREW (2X4.5), TAPPING	
822	3-954-105-01	SPRING (PINCH DRIVING)	
823	X-3942-945-1	ARM ASSY, PINCH	
824	3-958-047-02	MOTOR HOLDER COVER	
825	※	DRUM, UPPER, ROTARY	
M901	※	DRUM ASSY	
M902	X-3942-946-1	MOTOR ASSY, CAM	

6-4. MD CHASSIS ASSEMBLY (3)

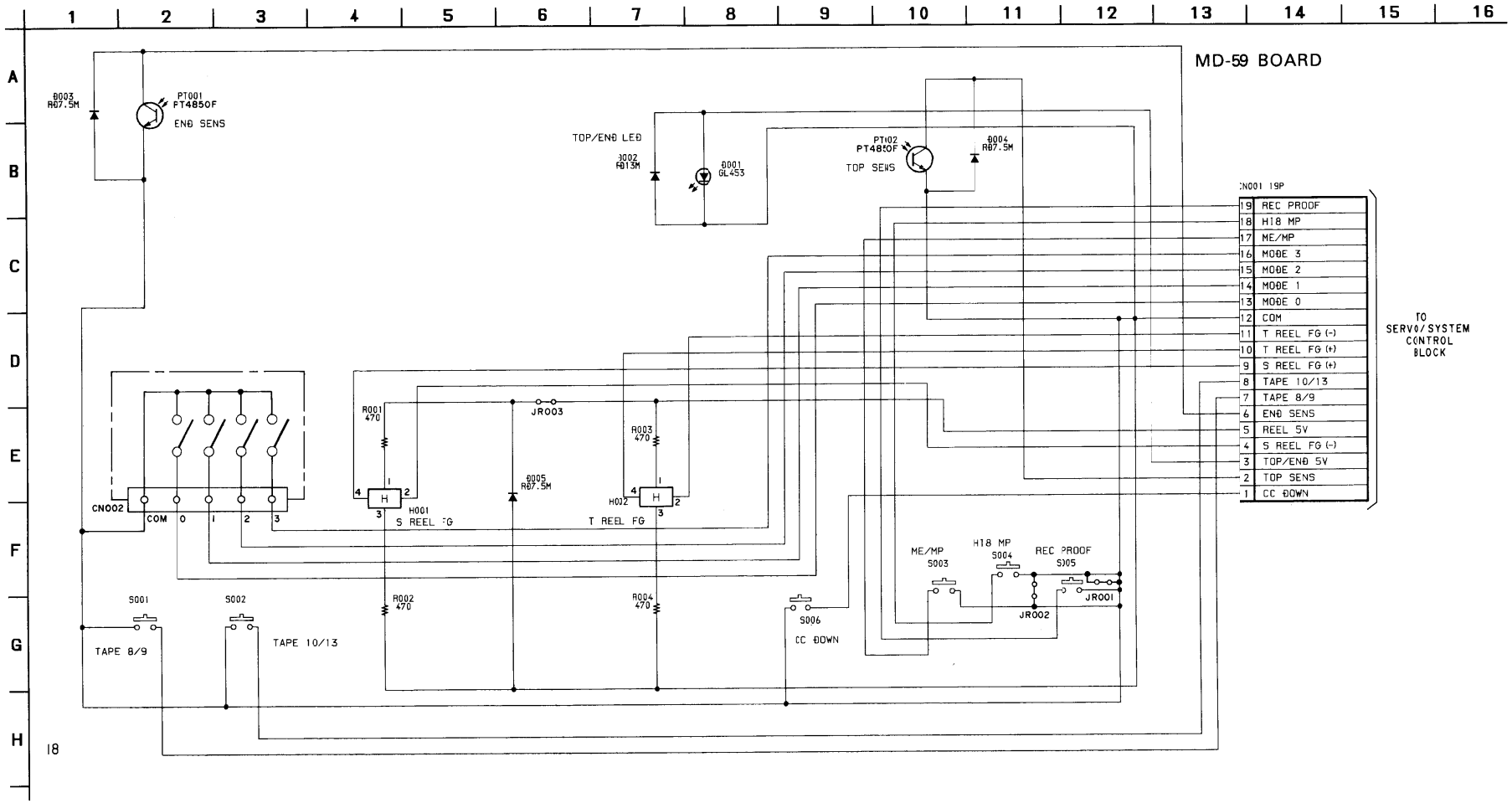


Ref.No.	Part No.	Description	Remark
851	3-953-986-01	BELT, TIMING	
852	3-726-829-01	WASHER, STOPPER	
853	3-954-102-02	FLANGE, REEL RELAY	
854	3-954-061-01	GEAR, REEL RELAY	
855	X-3942-960-1	GROUND ASSY, SHAFT	
856	3-732-817-01	SCREW (2X4.5), TAPPING	
857	X-3943-016-1	PULLEY ASSY, BELT	
*858	3-954-014-01	LEVER, LOADING DRIVING	
859	3-954-323-01	ROLLER, LOADING	
860	3-954-015-01	GEAR, CAM RELAY	
861	3-954-050-01	CAM, MAIN	
*862	3-954-009-01	LEVER, PINCH DRIVING	
863	3-954-016-01	LEVER, TG7 DRIVING	
*864	3-954-007-01	LEVER, SLIDE PLATE DRIVING	
865	3-953-973-01	ARM, PENDULUM COMPULSION	
866	1-692-498-11	SWITCH, ROTARY	
*867	1-648-300-11	MD-59 BOARD	
868	3-669-465-00	WASHER (1.5), STOPPER	
869	3-953-972-01	PLATE, SLIDE	
*870	3-953-974-01	ARM, S TAKE-UP	
871	3-953-975-01	CLAW, S TAKE-UP	
872	3-956-366-01	SPRING, TORSION	
873	3-953-982-01	SPRING, TENSION	

Ref.No.	Part No.	Description	Remark
*874	X-3942-952-1	CHASSIS ASSY, MECHANICAL	
875	3-954-100-01	ARM, TENSION REGULATOR SUB	
876	3-953-983-01	GEAR, FL PULLEY	
877	3-953-979-01	ARM, FL SELECTION	
878	3-953-980-01	GEAR, FL SELECTION	
879	X-3942-949-1	ARM (S) ASSY, LOADING	
880	3-953-981-01	GEAR (DRIVING), FL PULLEY	
881	3-954-079-01	BELT (FL), TIMING	
882	3-953-998-01	SPRING (S), TORSION	
883	3-953-991-01	GEAR (S), LOADING	
884	X-3942-948-1	ARM (T) ASSY, LOADING	
885	3-954-000-01	SPRING (T), TORSION	
886	3-953-992-01	GEAR (T), LOADING	
887	3-954-072-01	LEVER, BRAKE (S) DRIVING	
888	X-3942-962-1	BASE ASSY, PULLEY	
889	3-956-649-01	SPRING, LEAF, COASTER	
*890	3-954-049-01	RETAINER, WORM WHEET	
891	1-750-620-11	CONNECTOR (MM8 MD)	
892	3-953-985-01	HOLDER, ST SENSOR	
893	3-954-638-01	HOLDER (S), PUSH SWITCH	
894	3-954-639-01	HOLDER (T), PUSH SWITCH	
M903	8-835-499-01	MOTOR, DC SCE-0501A	

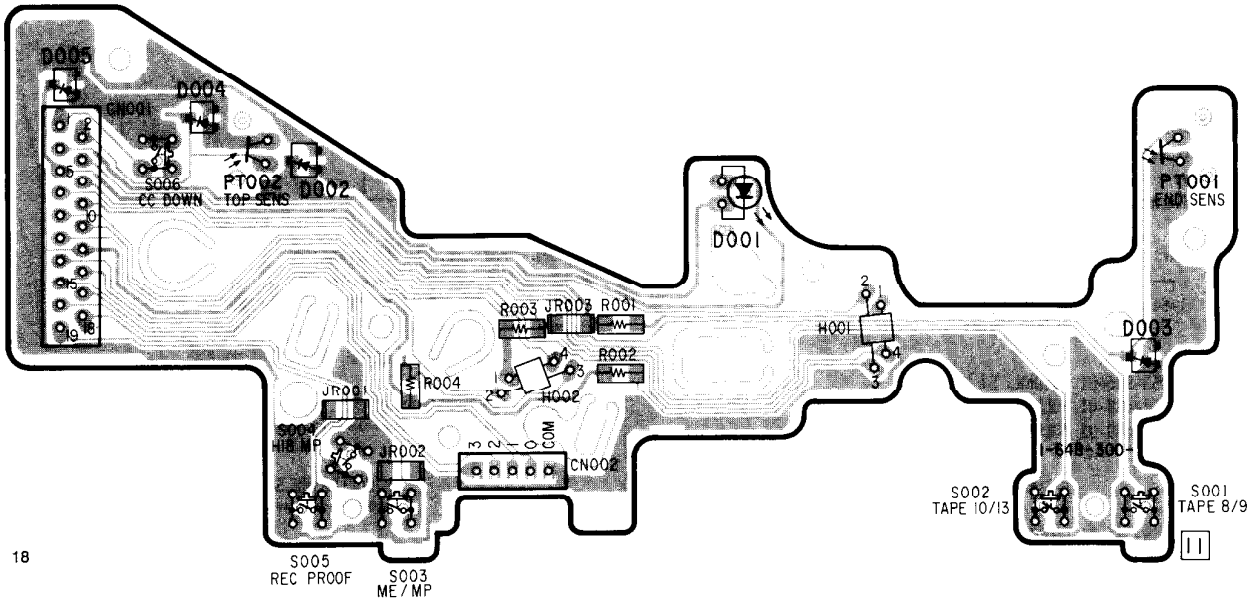
SECTION 7
DIAGRAMAS

SCHEMATIC DIAGRAM



PRINTED WIRING BOARD

MD-59 BOARD



SECTION 8
ELECTRICAL PARTS LIST

MD-59

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example:
  uA··· : μA···, uPA··· : μPA···,
  uPB··· : μPB···, uPC··· : μPC···, uPD··· : μPD···
- CAPACITORS
  uF : μF
- COILS
  uH : μH

When indicating parts by reference number, please include the board.

Ref.No.	Part No.	Description			Remark
*	1-648-300-11	MD-59 BOARD			
		**********			
	3-953-985-01	HOLDER. ST SENSOR			
	3-954-638-01	HOLDER (S), PUSH SWITCH			
	3-954-639-01	HOLDER (T), PUSH SWITCH			
		< CONNECTOR >			
CN001	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
*CN002	1-750-620-11	CONNECTOR (MM8 MD)			
		< DIODE >			
D001	8-719-988-42	DIODE GL453S			
D002	8-719-106-79	DIODE RD13M-B1			
D003	8-719-106-23	DIODE RD7.5M-B2			
D004	8-719-106-23	DIODE RD7.5M-B2			
D005	8-719-106-23	DIODE RD7.5M-B2			
		< HOLE ELEMENT >			
H001	1-808-118-11	ELEMENT, HALL HW-300A			
H002	1-808-118-11	ELEMENT, HALL HW/300A			
		< JUMPER RESISTOR >			
JR001	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR002	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR003	1-216-296-00	METAL CHIP	0	5% 1/8W	
		< TRANSFORMER >			
PT001	8-729-907-25	TRANSISTOR PT4850F			
PT002	8-729-907-25	TRANSISTOR PT4850F			
		< RESISTOR >			
R001	1-216-190-00	METAL GLAZE	470	5% 1/8W	
R002	1-216-190-00	METAL GLAZE	470	5% 1/8W	
R003	1-216-190-00	METAL GLAZE	470	5% 1/8W	
R004	1-216-190-00	METAL GLAZE	470	5% 1/8W	
		< SWITCH >			
S001	1-692-497-11	SWICH, PUSH (TAPE 8/9)			
S002	1-692-497-11	SWICH, PUSH (TAPE 10/13)			
S003	1-692-497-11	SWICH, PUSH (ME/MP)			
S004	1-692-497-11	SWICH, PUSH (HI8 MP)			
S005	1-692-497-11	SWICH, PUSH (REC PROOF)			
S006	1-570-953-11	SWITCH, PUSH (1 KEY) (CC DOWN)			
**********					
		MISCELLANEOUS			
		**********			
803	1-691-471-11	CONNECTOR, TRANSLATION 11P			
804	1-649-565-11	FP-696 FLEXIBLE BOARD			
825	※	DRUM ASSY			
866	1-692-498-11	SWITCH, ROTARY			
891	1-750-620-11	CONNECTOR (MM8 MD)			
M901	※	DRUM ASSY			
M902	X-3942-946-1	MOTOR ASSY, CAM			
M903	8-835-499-01	MOTOR, DC SCE-0501A			
**********					
		**********			
		HARDWARE LIST			
		**********			
#1	7-682-645-01	SCREW +PS 3X4			
#2	7-621-772-08	SCREW +B 2X3			
#3	7-688-003-01	W 3, SMALL			
#4	7-628-253-15	SCREW +PS 2X5			
#5	7-688-001-01	W 2, MIDDLE			
#6	7-627-853-57	PRECISION SCREW +P 2X5 TYPE3			

9-973-445-11

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