

## MECHANICAL ADJUSTMENTS

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## MECHANICAL ADJUSTMENTS

Some disassembly is required to access the adjustment locations. Refer to the "[Disassembly Section](#)" in this service publication for disassembly instructions.

**Caution:** Hot Chassis Ground is used in the power supply section of this instrument. Use an isolation transformer when servicing.

**Note:** Black screws are used on the mechanism to identify screws that require adjustment.

### Grounding Plate Alignment (Fig. 1)

1. Remove the mechanism unit.
2. The grounding plate must be located so that the center line of the plate is less than 1.0mm measured from the center of the grounding plate to the center of the cylinder shaft. If required, adjust the plate position by loosening the black screw (A) shown in Fig. 1.

**Note:** **DO NOT** install the grounding plate toward the other side of the cylinder unit. Incorrect position may cause cylinder buzz.

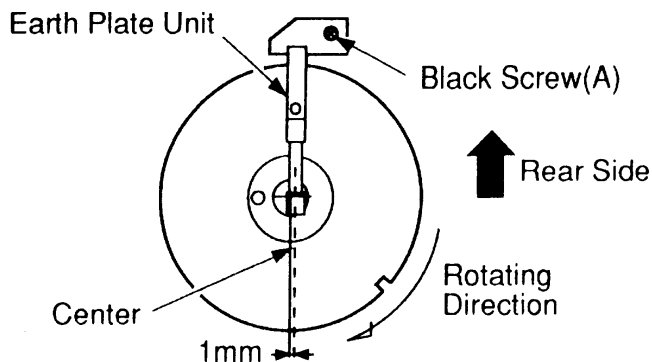


Fig. 1 - Grounding Plate Alignment

### Tension Post Adjustment (Fig. 2)

1. Refer to the "[Service Notes Section](#)" and place the unit in Service Position (1).
2. Remove the cassette-up assembly.
3. Refer to the "[Service Notes Section](#)" and place the unit in the service mode.
4. Place a jumper between TP6003 and TP6009 to defeat the auto tracking.
5. Apply AC power. The unit will go into the play mode.
6. Using a 2mm hex wrench, adjust the nut on the tension band fastener (counterclockwise only) so that there is 1mm between the right edge of the tension post and the left edge of the P1 post (Fig. 2)
7. Remove the hex wrench.
8. Press the *Stop/Eject* button to place the mechanism in the eject mode.

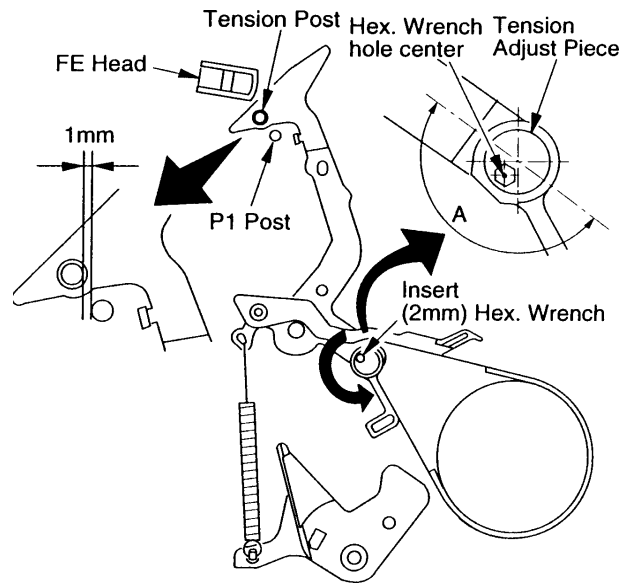


Fig. 2 - Tension Post Adjustment

### Back Tension Measurement/Adjustment (Figs. 3, 4)

#### Measurement Procedure

1. Play back a T-120 tape from the beginning for approximately 20 seconds (to stabilize tape movement).
2. Insert a tension meter into the tape path (Fig. 3) and measure the back tension. The measurement should be 25.0 grams  $\pm$  2.5 grams.

**Note:** • Make sure that all three probes of the tension meter are in contact with the tape, but not touching any other parts of the mechanism.

• It is recommended that measurements be repeated at least three times to verify an accurate reading.

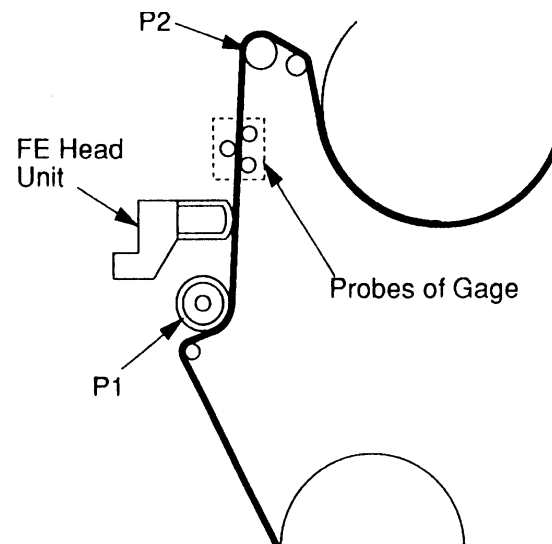


Fig. 3 - Back Tension Measurement/Adjustment

**MECHANICAL ADJUSTMENTS (Continued)**

**Note:** If the specified tension cannot be obtained, make sure that there is no dust or foreign material between the tension band and the reel table. If cleaning the reel table does not correct the tension measurement, the tension spring and tension band should be replaced.

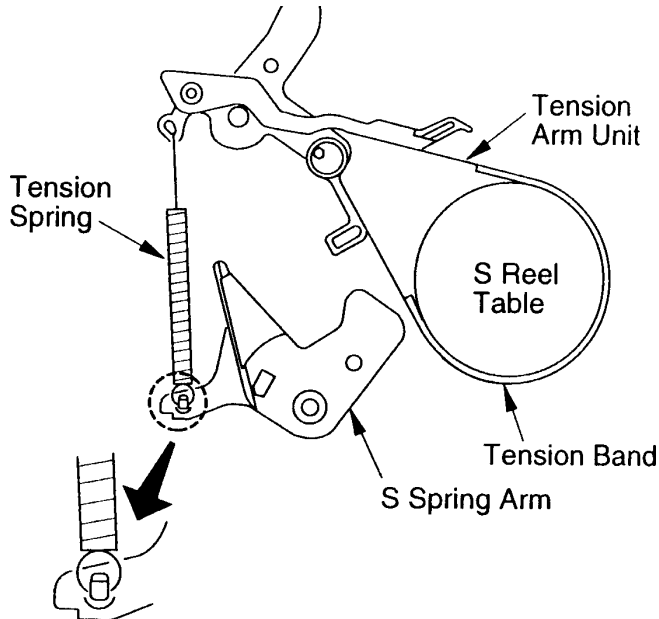


Fig. 4 - Back Tension Measurement/Adjustment

**P2/P3 Post Height Adjustment (Figs. 5, 6, 7)**

1. Remove the cassette-up assembly.
2. Position the post adjustment plate over the reels (Fig. 5).
3. Place the fixture on the post adjustment plate (Fig. 6) and zero the fixture (**DO NOT** use the cut-out portion of the post adjustment plate).
4. Loosen the black lock screw and lower each post below the top edge of the post adjustment plate and then raise each post until it contacts the foot of the reel table height fixture. For proper adjustment, the reel table height fixture foot should be positioned as shown in Fig. 7.
5. Tighten the black lock screws.

**Note:** Upon completion of this procedure, perform the "Tape Travel Confirmation Procedure" and the "Envelope Output Adjustment Procedure" in the "Mechanical Adjustment Section" of this service publication. Take care not to overtighten the P2/P3 posts.

**Caution:** Overtightening the P2/P3 posts can strip the threads.

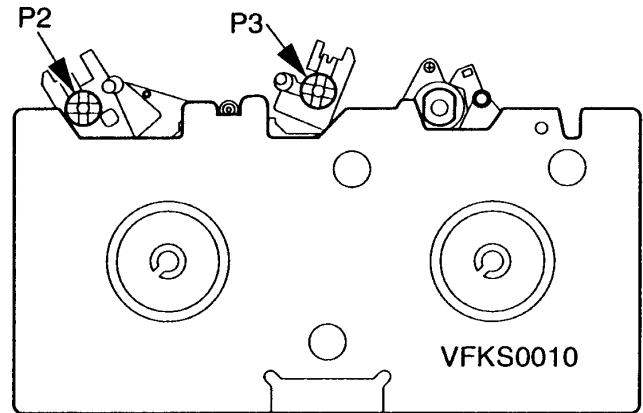


Fig. 5 - P2/P3 Post Height Adjustment

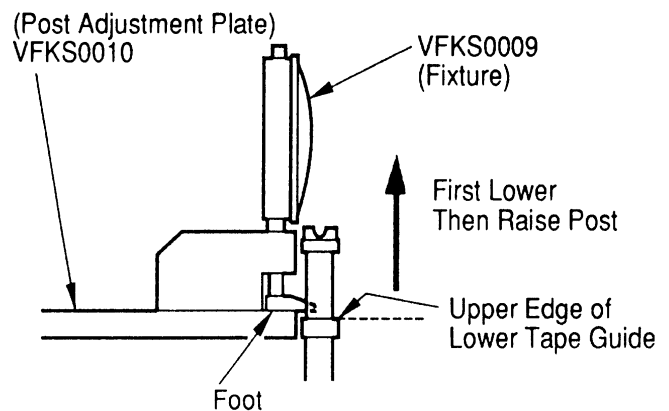


Fig. 6 - P2/P3 Post Height Adjustment

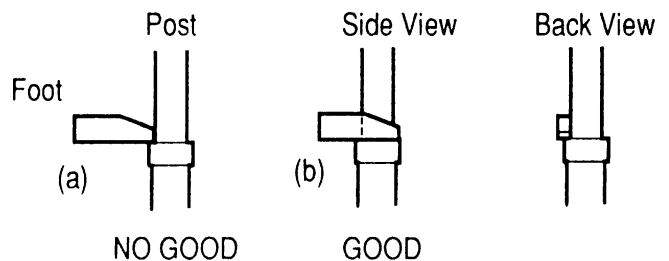


Fig. 7 - P2/P3 Post Height Adjustment

## MECHANICAL ADJUSTMENTS (Continued)

### FG Head Gap Adjustment (Fig. 8)

#### Adjustment Procedure

1. Remove the VCR chassis unit and the VCR Main circuit board. Refer to the "Disassembly Section" for instructions.

**Caution:** DO NOT touch the outside circumference of the capstan rotor surface with any tool and keep magnetic material (especially metal particles) away from the capstan rotor magnet.

2. From the bottom side of the chassis, slightly loosen the black screw (A) and insert a number 1 or number 2 phillips screwdriver into hole (A) as shown in Fig.8.
3. Adjust the FG Head counterclockwise until the FG Head touches the rotor and then turn it slightly clockwise to provide 0.13mm +/-0.02mm clearance between the FG head and the capstan rotor.
4. Tighten the black screw (A).
5. Reinstall the VCR chassis unit and the Main circuit board.

#### Confirmation Procedure

6. Connect a video signal to the VCR Video Input Jack.
7. Connect a scope probe (10mV/1 msec/div) to pin 7 of P2502 on the Capstan Motor Block.
8. Insert a cassette tape and place the VCR in the SLP record mode.
9. Confirm that the FG Head output level is greater than 15mVp-p. If not, adjust the FG Head gap.

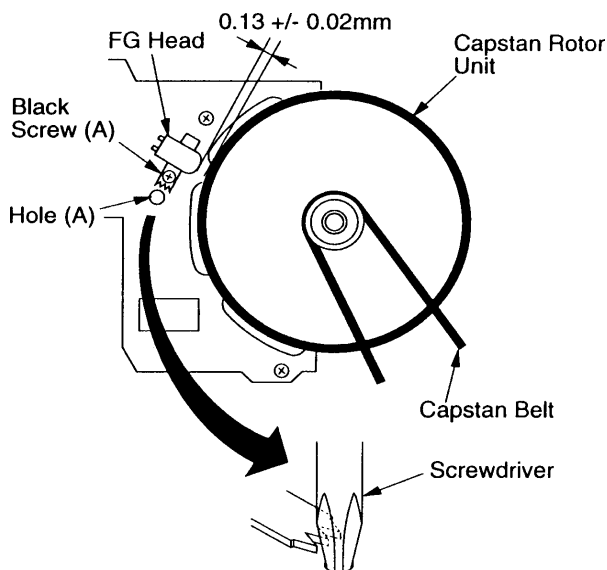


Fig. 8 - FG Head Gap Adjustment

### Tape Interchangeability Adjustments/Confirmations (Figs. 9 through 17)

When performing the following adjustment and confirmation procedures, make sure that the tracking control is set to nominal. Tracking is returned to nominal each time the cassette tape is ejected and reinserted in the instrument. Defeat the auto tracking by placing a jumper between TP6003 and TP6009 on the Main circuit board (system control section). Make sure that the tracking is in the neutral position before performing each adjustment/confirmation by ejecting and reinserting the cassette tape.

#### Tape Travel Confirmation (Fig.9)

Playback a T-120 cassette tape and check for tape curling at the upper and lower guides of the P2 and P3 posts. If curling is apparent, adjust the height of the post(s) with the post adjustment screwdriver (Fig. 9).

**Note:** To adjust the post height, loosen the black locking screw (using the lock screw wrench) at the base of each post, then turn each post with the post adjustment screwdriver. Upon completion of the adjustment, tighten the black locking screws using the lock screw wrench.

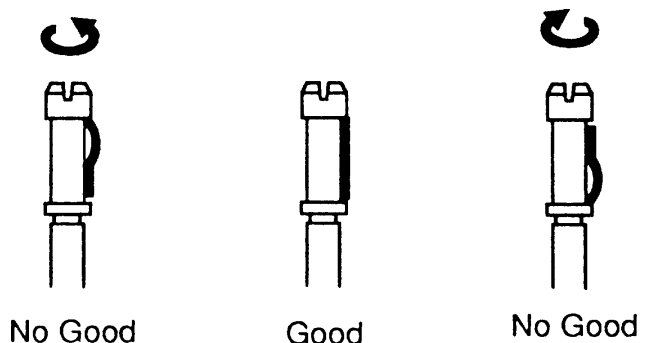


Fig. 9 - Tape Travel Confirmation

#### A/C Head Height Adjustment/Confirmation (Fig. 10)

**Note:** The height of the A/C Head replacement part is preset at the factory.

1. Playback a T-120 cassette tape and check that the lower edge of the tape runs approximately 0.25mm above the lower edge of the A/C head (Fig. 10).
2. If necessary, adjust screws (A) and (B) clockwise (in equal amounts) to lower the tape or counterclockwise (in equal amounts) to raise the tape.

**Note:** Upon completion of this procedure, perform the "A/C Head Tilt Adjustment/Confirmation Procedure" and the "A/C Head Azimuth Adjustment/Confirmation Procedure".

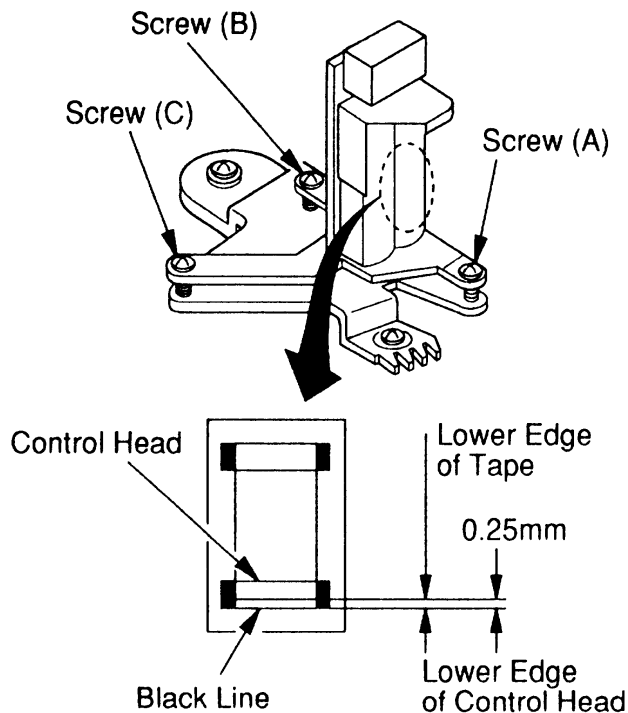
**MECHANICAL ADJUSTMENTS (Continued)**

Fig. 10 - A/C Head Height Adjustment/Confirmation

**A/C Head Tilt Adjustment/Confirmation (Figs. 10, 11)**

1. Play back a T-120 cassette tape and check that the tape travels smoothly between the upper and lower guides of the P4 post.
2. If necessary, adjust the black screw (B) shown in Fig. 10 clockwise until the tape begins to curl at the lower edge of the P4 post. Then adjust the screw counterclockwise until the curling is eliminated (Fig. 11).

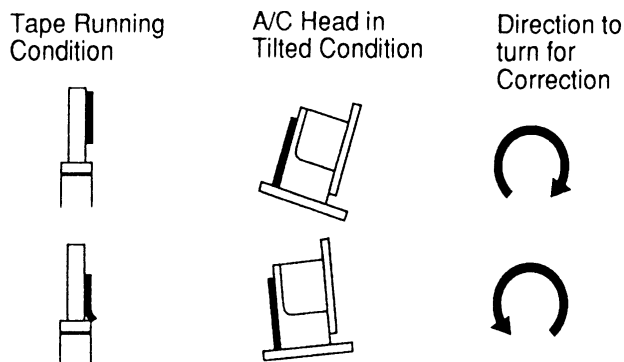


Fig. 11 - A/C Head Tilt Adjustment/Confirmation

**A/C Head Azimuth Adjustment/Confirmation (Figs. 10, 12)**

1. Connect an oscilloscope to the VCR audio output jack.
2. Play back the monoscope portion (6kHz mono audio) of the VHS alignment tape. Refer to the "Replacement Parts List" for the alignment tape stock number.
3. Adjust the black screw (C) shown in Fig. 10 for maximum audio signal.

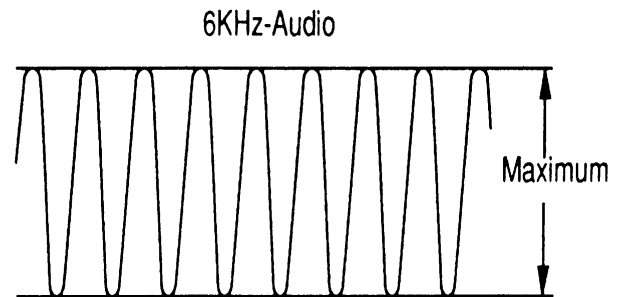


Fig. 12 - A/C Head Azimuth Adjustment/Confirmation

**A/C Head Horizontal Position Adjustment/Confirmation (Figs. 13, 14)**

1. Connect an oscilloscope to TP3002 and use TP6205 as a trigger. The test points are located on the Main Circuit Board.
2. Defeat the auto tracking by placing a jumper between TP6003 and TP6009 (+5V) on the Main circuit board.
3. Eject and reinsert the monoscope VHS alignment tape to reset the tracking to its nominal (neutral) position.
4. Play back the monoscope portion (6kHz mono audio) of the VHS alignment tape and confirm that the envelope output waveform (Fig. 14) appears on the scope.
5. If adjustment is necessary, slightly loosen the black screw (D) (Fig. 13). Insert the H-position adjustment screwdriver into hole (A) and adjust slightly in both directions to find the point of maximum envelope.
6. Press the *Tracking UP* button and count the number of times the button is pressed to produce an envelope level that is one half of the maximum envelope level.
7. Eject and reinsert the tape and then place the unit in the play mode.
8. Press the *Tracking Down* button and count the number of times the button is pressed to produce an envelope level that is one half of the maximum envelope level.
9. If the number of button presses in steps six (6) and eight (8) are not equal, slightly readjust using the H-position adjustment screwdriver (hole A) and then repeat steps six (6) through eight (8).
10. Tighten the black screw (D) and remove the jumpers.

## MECHANICAL ADJUSTMENTS (Continued)

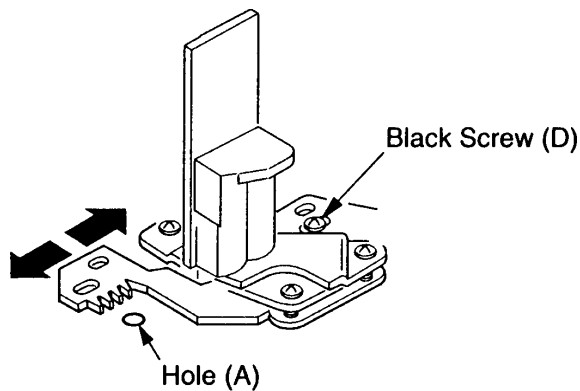


Fig. 13 - A/C Head Horizontal Position Adjustment/Confirmation

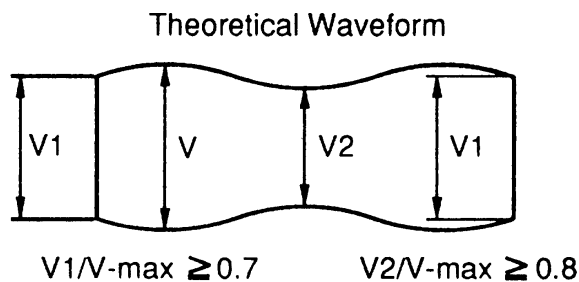


Fig. 14 - A/C Head Horizontal Position Adjustment/Confirmation

*Envelope Output Adjustment (Figs. 14 through 17)*

1. Connect an oscilloscope to TP3002 on the Main Circuit Board and use TP6205 as a trigger.
2. Defeat the auto tracking by placing a jumper between TP6003 and TP6009 on the Main circuit board.
3. Eject and reinsert the monoscope VHS alignment tape to reset the tracking to its nominal (center) position.
4. Play back the monoscope portion (6kHz mono audio) of the VHS alignment tape and adjust the P2 and P3 posts so that the waveform becomes as flat as possible ( $V1$  divided by  $V_{max}$  is 0.7 or greater) (Fig. 14).
5. Remove the jumper after completing the adjustment procedure.

**Note:** • If the waveform exhibits dropout at the beginning of the track (Fig. 15), adjust the height of the P2 post. To adjust post height, loosen the black locking screw (using the lock screw wrench) at the base of each post, then turn each post with the post adjustment screwdriver. Upon completion of adjustment, tighten the black locking screws using the lock screw wrench.

- If the waveform exhibits dropout at the end of the track (Fig. 16), adjust the height of the P3 post. To adjust the P3 post, loosen the black locking screw at the base of the post. Then turn the post with the post adjustment screwdriver. Upon completion of the adjustment, tighten the black locking screws using the lock screw wrench.
- Reconfirm the A/C head position by removing the jumpers and pressing the *Tracking Up* and *Tracking Down* buttons to confirm symmetry of the envelope. ■

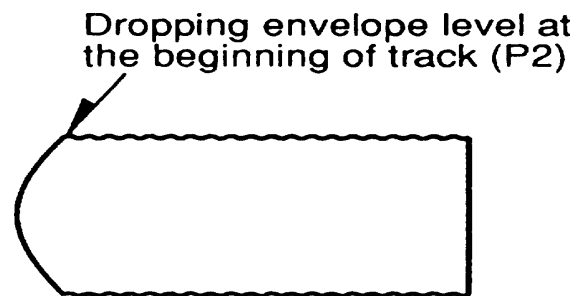


Fig. 15 - Envelope Output Adjustment

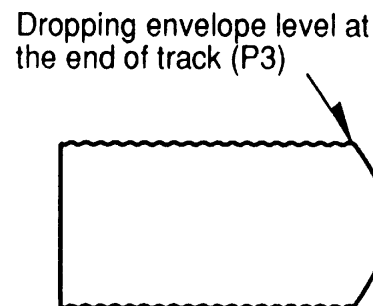


Fig. 16 - Envelope Output Adjustment

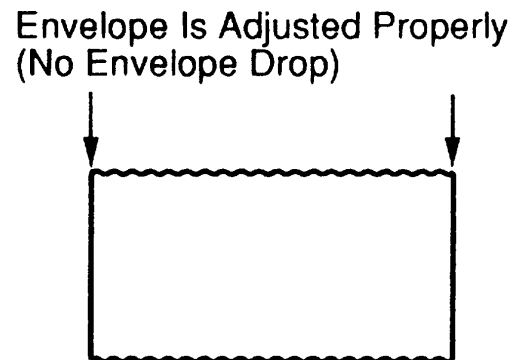


Fig. 17 - Envelope Output Adjustment