

Service Manual

CASSETTE TAPE DECK

CT-F615

 **PIONEER**

8. MECHANICAL ADJUSTMENTS

8.1 PINCH ROLLER PRESSURE ADJUSTMENT

1. Put the deck into playback mode.
2. Gently push against the pinch roller arm with a tension gauge (spring balance of approximately 500g full scale) and separate the pinch roller slightly from the capstan.
3. Then ease the pinch roller back onto the capstan, and read off the value when the pinch roller starts to rotate. If the reading fails to lie within 240 to 350g, replace the pinch roller pressure spring (RBH-651).

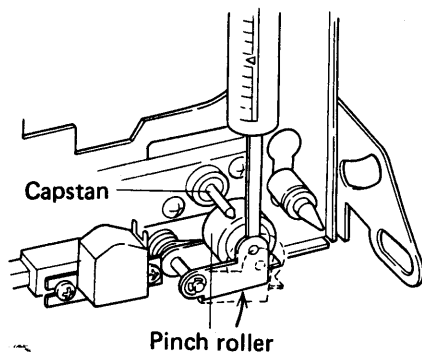


Fig. 8-1 Pinch Roller Pressure Adjustment

8.2 REEL BASE TORQUE ADJUSTMENT

Prior to Adjusting

Wipe both reel bases, the capstan shaft and the pinch roller with Daiflon dipped in a little anhydrous alcohol.

Adjustment

Measure the torque with a torque meter during playback, fast forward and rewind modes. The measured values should normally lie within the allowable ranges listed in the following table. If the measured values lie outside the relevant ranges, replace the take-up reel base ass'y (RXB-272) and/or the drive arm ass'y (RXB-274).

	Take-up reel base	Supply reel base
Playback mode	35~55g·cm	*2~6g·cm
F.F mode	70~120g·cm	*2~6g·cm
REW mode	*2~6g·cm	70~120g·cm

* denotes back tension torque

8.3 TAPE SPEED ADJUSTMENT

1. Connect a frequency counter to the output terminals.
2. Playback the 3kHz portion of the STD-301 test tape. At the beginning, the frequency should lie within the 2995 to 3010Hz range, and may be adjusted by turning the semi-fixed resistor located in the capstan motor adjustment hole (using a suitable size screw-driver). (See Fig.8-2).
3. Tape speed is increased by turning the resistor clockwise, and decreased by turning counter clockwise.

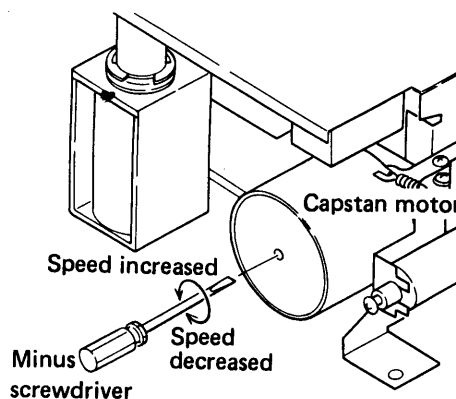


Fig. 8-2 Tape Speed Adjustment

8.4 PLAY SOLENOID ADJUSTMENT

1. Put the deck into playback mode.
2. Loosen screws ① and adjust the mounting position of the play solenoid so that the square hole of the head chassis ass'y fits flush against the shaft bearing holder (i.e. 0 separation), as shown in Fig.8-3.

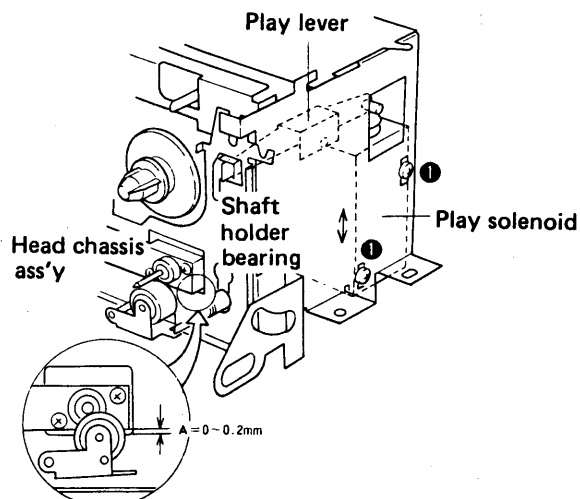


Fig. 8-3 Play Solenoid Adjustment

8.5 F.F SOLENOID ADJUSTMENT

1. Put the deck into fast forward mode.
2. Loosen screws ② and adjust the fast forward solenoid mounting position so that the square hole of the reel base ass'y is flush against the boss of the drive arm ass'y (i.e. 0 separation) as shown in Fig.8-4.

8.6 REW SOLENOID ADJUSTMENT

1. Put the deck into rewind mode.
2. Loosen screws ① and adjust the rewind solenoid mounting position so that the boss of the drive arm ass'y fits flush against the square hole of the reel base ass'y (i.e. 0 separation) as shown in Fig.8-4.

8.7 REC SOLENOID ADJUSTMENT

1. Put the deck into recording mode.
2. Loosen screws ① and adjust the recording solenoid mounting position so that the recording spring is stretched by 0.5 to 1mm as shown in Fig.8-5.

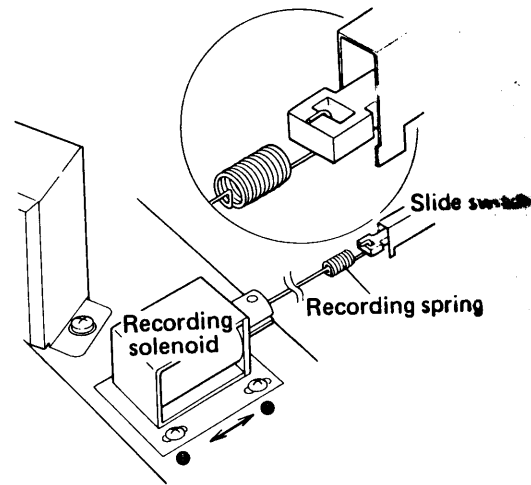


Fig. 8-5 Recording Solenoid Adjustment

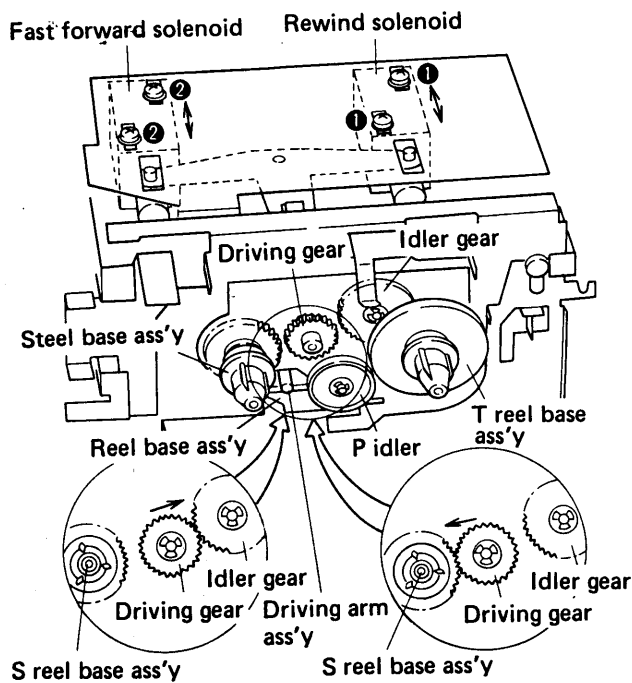


Fig. 8-4 Fast Forward and Rewind Solenoid Adjustment

9. ELECTRICAL ADJUSTMENTS

Before Starting Any Electrical Adjustments, First Check Through the Following List of Preparatory Items.

1. Electrical adjustments should only be commenced after all mechanical adjustments have been completed.
2. Levels during measurements are based on $0\text{dBv} = 1\text{V}$. Connect a $50\text{k}\Omega$ ($47 \sim 52\text{k}\Omega$) dummy resistor to the OUTPUT terminals.
3. Designated test tapes must be used for all relevant adjustments. Although both side A and B of the test tapes have been prepared, it is recommended that only side A (the side with the label) be used.

STD-331A: general purpose during playback mode.

STD-341A: adjustments during playback mode.

STD-601: STD blank tape.

STD-603: CrO_2 blank tape.

STD-604: METAL blank tape.

SONY DUAD C-60: Fe-Cr blank tape

4. Prepare the following measuring apparatus.
AC millivoltmeter, low frequency oscillator, attenuator, oscilloscope.
5. Unless otherwise specified, all adjustments are for both left and right channels.
6. Clean and demagnify the head.
7. Leave the DOLBY NR switch off unless directed otherwise.
8. Let the deck warm up (aging) for a few minutes before proceeding with the adjustments. Before starting the recording and playback frequency response adjustments, wait for about 3 to 5 minutes.

9. Proceed with each adjustment in the specified order. Altering the order can hinder proper adjustment, resulting in loss of performance.

Adjustment Order

1. Head azimuth adjustment
2. Playback equalizer check
3. Playback level adjustment
4. F.L. meter adjustment
5. Recording rough adjustment
6. Erasure current adjustment
7. Bias trap adjustment
8. Recording bias rough adjustment
9. Recording/playback frequency response adjustment/check
10. Recording level adjustment

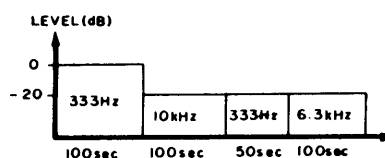


Fig. 9-1 Test tape STD-341A

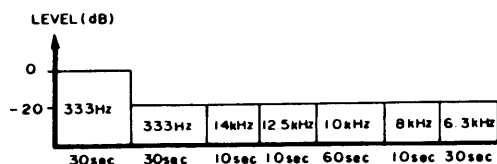


Fig. 9-2 Test tape STD-331A

9.1 HEAD AZIMUTH ADJUSTMENT

1. Connect the AC millivoltmeter to the OUTPUT terminals.
2. Turn up the OUTPUT level control to maximum position, and set the TAPE switch to the STD position. Then turn VR101 (Lch) and VR201 (Rch) up to maximum positions.
3. Play the 10kHz/-20dB portion of the STD-331A test tape, and turn the head azimuth adjustment screw so as to obtain maximum output levels in both left and right channels.
4. After completing this adjust, lock the screw with "screw lock".

9.2 PLAYBACK EQUALIZER CHECK

1. Again connect the AC millivoltmeter to the OUTPUT terminals, and set the TAPE switch to STD.
2. Play the 333Hz (-20dB) and 6.3kHz portions of the STD-341A test tape, and check that the difference in output level between the two is $+0.5 \pm 1\text{dB}$.
3. Next set the TAPE switch to the Fe-Cr position (or the CrO_2 or METAL position), and repeat step 2. In this case, the 6.3kHz output should differ from the 333Hz output level by $-3.5 \pm 1\text{dB}$.

9.3 PLAYBACK LEVEL ADJUSTMENT

1. Connect the AC millivoltmeter to TP3 (Lch) and TP4 (Rch) of the mother ass'y. (The OUTPUT level control may be set to any position).
2. Play the 333 Hz/0dB portion of the STD-341A test tape, and adjust VR101(Lch) and VR201 (Rch) so that the AC millivoltmeter reads 1 dBV (1.1V).

9.4 F.L METER ADJUSTMENT

1. Apply a 333Hz/-10dBv (316mV) signal to the INPUT terminals with the deck in recording mode.
2. Connect the AC millivoltmeter to TP1(Lch) and TP2(Rch) of the mother ass'y, and adjust the INPUT level control to obtain a millivoltmeter reading of -23dBv (70mV).
3. Once the above settings have been completed, turn VR304 (mother ass'y) counter clockwise to the point where the -20dB segment of the F.L meter goes out (i.e. at the very instant).
4. Then adjust the INPUT level control to obtain a millivoltmeter reading of -3dBv (700mV), and adjust VR501(Lch) and VR502(Rch) on the F.L meter ass'y so that the F.L meter reads 0dB (turn VR501 and VR502 around clockwise and stop at the point where the 0dB segment lights up).
5. While turning the INPUT level control up gradually from minimum position, check that the AC millivoltmeter gives the following reading at the corresponding F.L meter positions.

F.L Meter Reading	AC mV Meter Reading
-20dB	$-23 \pm \frac{4}{2}$ dBv (56mV~112mV)
+5dB	$+2 \pm 2$ dBv (1V~1.58V)

Note: If the above ranges are not satisfied, repeat steps 3 and 4 several times to readjust.

9.5 RECORDING ROUGH ADJUSTMENT

1. Apply a 333Hz/-10dBv (316mV) signal to the INPUT terminals with the deck in recording mode. (Since the bias oscillator becomes operable during recording mode, short circuit the base of Q304 to ground).
2. Connect the AC millivoltmeter to TP1 (Lch) and TP2 (Rch) of the mother ass'y, and adjust the INPUT level control so that the millivoltmeter reads -3dBv (700mV).

3. Then set the TAPE switch to the STD position, and connect the AC millivoltmeter to terminals no.69 and no.70 (and then no.78 and no.79) on the mother ass'y.
4. Adjust VR103 (Lch) and VR203 (Rch) so that the millivoltmeter reads 0.34mV (34μA).

9.6 ERASURE CURRENT ADJUSTMENT

1. Adjust VR303 on the mother ass'y to the mechanical center position, and put the deck into recording mode.
2. Turn the INPUT level control down to minimum position (but without short circuiting the base of Q304 to ground).
3. Next set the TAPE switch to the METAL position, and connect the AC millivoltmeter to terminals no.41 and no.37 (ground) on the mother ass'y. Adjust VR303 until the millivoltmeter reads 180mV (180mA).

9.7 BIAS TRAP ADJUSTMENT

1. Put the deck into recording mode, and turn the INPUT level control down to minimum position.
2. With the TAPE switch still in the METAL position, connect the AC millivoltmeter to TP3 (Lch) and TP4 (Rch) on the mother ass'y. Adjust L102 (Lch) and L202 (Rch) to obtain minimum millivoltmeter reading.

9.8 RECORDING BIAS ROUGH ADJUSTMENT

1. Put the deck into recording mode and turn the INPUT level control down to minimum position.
2. Set the TAPE switch to the STD position, and connect the AC millivoltmeter to the mother ass'y terminals no.71 and no.72 (and then no.76 and no.77). Adjust VR301 (Lch) and VR302 (Rch) to obtain a millivoltmeter reading of 3.4mV (340μA).

9.9 RECORDING/PLAYBACK FREQUENCY RESPONSE CHECK AND ADJUSTMENT

1. Connect the AC millivoltmeter to the OUTPUT terminals, set the TAPE switch to STD, and turn the DOLBY NR switch off.
2. Apply a 333Hz -30dB (31.6mV) signal to the INPUT terminals, and adjust the INPUT level control to obtain a millivoltmeter reading of -27dBv (44 mV).
3. Record and then play back the 333Hz and 6.3kHz signal in the STD-601 test tape, and adjust VR301 (Lch) and VR302 (Rch) to obtain a difference in output level of +0.5dB.

4. Also record and playback the 12kHz signal, and check that the results satisfy the specifications. If it becomes necessary to readjust VR301 and VR302 due to the specifications not being satisfied, or after checking the frequency response of other tapes (CrO₂, METAL, Fe-Cr), adjust these 2 VRs so as to obtain a playback output difference of $0^{+1}_{-0.5}$ dB with the 6.3kHz signal.
5. Next set the TAPE switch to the Fe-Cr, CrO₂, and METAL positions in turn, and record and play back the prescribed frequencies in the Duad C-60, STD-603 and STD-604 test tapes respectively, checking that the specified ratings are satisfied in each case.
3. Adjust the INPUT level control to obtain a millivoltmeter reading of -3dBv (700mV).
4. Next turn the DOLBY NR switch on, and record the 333Hz signal onto the STD-601 test tape.
5. Play back the signal and adjust VR103(Lch) and VR203 (Rch) so that the millivoltmeter reads -3dBv (700mV).
6. Then switch the TAPE switch to the CrO₂ position and turn the DOLBY NR switch on. Record the 333Hz/-10dBv (316mV) signal onto the STD-603 test tape, and then while playing it back check that a millivoltmeter reading of -3dBv (700mV) ± 1.5 dB is obtained.
7. Finally set the TAPE switch to the METAL position and record the same signal used in step 6 above onto the STD-604 test tape. Play this signal back in the same way again, and check that a millivoltmeter reading of -3dBv (700mV) ± 1.5 dB is obtained in this case also.

9.10 RECORDING LEVEL ADJUSTMENT

1. Connect the AC millivoltmeter to TP1 (Lch) and TP2 (Rch) on the mother ass'y.
2. Set the TAPE switch to the STD position, and turn the DOLBY NR switch off. Then apply a 333Hz/-10dBv (316mV) signal to the INPUT terminals.

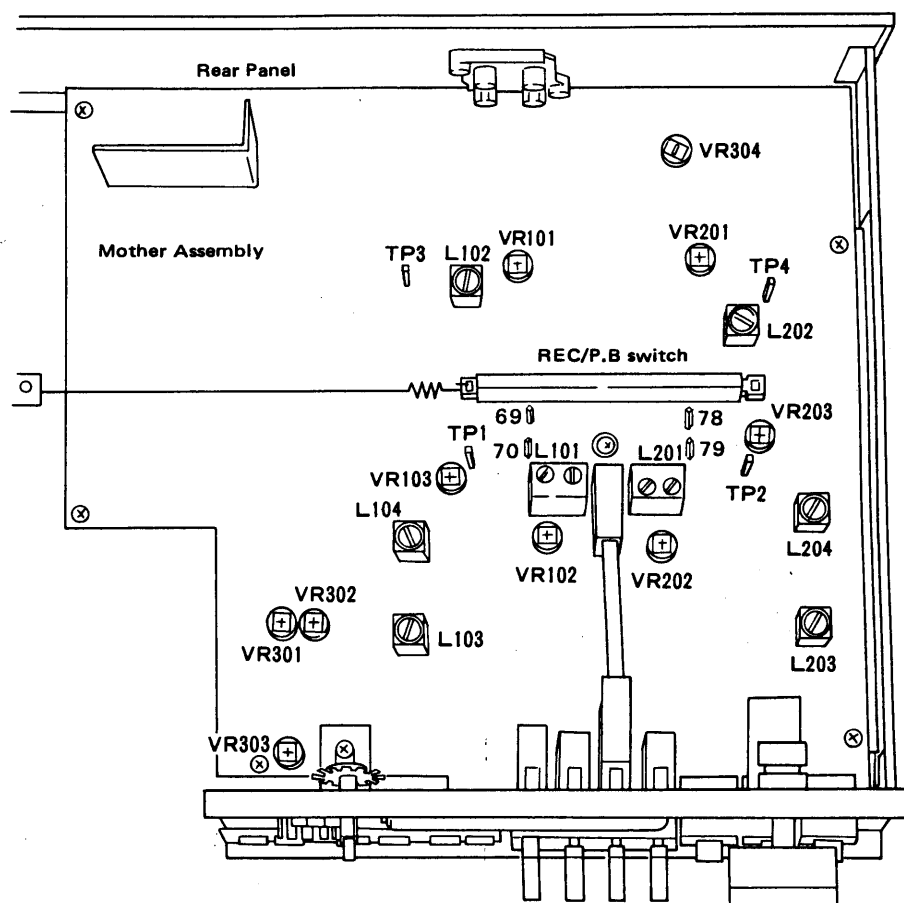


Fig. 9-3 Adjustment Points