Original

TC-558

R0833 USA Model
Canada Model
PX Model

STEREO TAPECORDER

SPECIFICATIONS

Power Requirements: 120 V ac, 50/60 Hz (USA, Canada Model)
120 V ac, (100, 110, 127, 220, 240 V ac adjustable by authorized Sony personnel), 50/60 Hz (PX Model)

Power Consumption: 70 W (MITI standards)
100 W (CSA, UL and IEC standards)

Track System: 4 tracks, 2 channel stereo or monaural

Reels: 178 mm (7 inches) or smaller

Tape Speeds: 19 cm/s (7½ ips), 9.5 cm/s (3¾ ips)

Frequency Response: NAB: (USA, Canada, PX Model)

tape speed	with normal tape	with SONY SLH tape
19 cm/s (7½ ips)	20~25,000 Hz 30~20,000 Hz (±3 dB)	20~30,000 Hz 30~ 25,000 Hz (±3 dB)
9.5 cm/s (3¾ ips)	20~17,000 Hz	20~20,000 Hz

DIN: (PX Model)

tape speed	with normal tape	with SONY SLH tape
19 cm/s (7½ ips)	30~20,000 Hz	30~25,000 Hz
9.5 cm/s (3¾ ips)	30~13,000 Hz	30~15,000 Hz

S/N Ratio: 56 dB (with SONY SLH tape)
53 dB (with normal tape)

Wow and Flutter: NAB: (USA, Canada, PX Model)
0.05 % at 19 cm/s (7½ ips)
0.09 % at 9.5 cm/s (3¾ ips)
WRMS
DIN: (PX Model)
±0.09 % at 19 cm/s (7½ ips)
±0.12 % at 9.5 cm/s (3¾ ips)

Harmonic Distortion: 1.2 %

Inputs: MICROPHONE (phone jack) . . . 2
Sensitivity 0.2 mV (−72 dB)
Accept low impedance microphones.

LINE IN (phono jack) 2
Sensitivity 0.06 V (−22 dB)
Impedance 100 kΩ

REC/PB (DIN jack) . . (PX Model only)
Impedance lower than 10 kΩ

Outputs: LINE OUT (phono jack) 2
Output level 0.43 V (−5 dB) at load impedance of 100 kΩ, with PB LEVEL controls set to the center detent position (0.775 V = 0 dB . . . with PB LEVEL controls set to MAX.)
Suitable load impedance higher than 10 kΩ

REC/PB (DIN jack) . . (PX Model only)
Output level 0.775 V (0 dB) with PB LEVEL controls set to the center detent position
Impedance lower than 10 kΩ

HEADPHONE (stereo binaural jack) 1
accepts 8 Ω stereo headphones.

Dimentions: 458 (w) x 425 (h) x 213 (d) mm
18 1/8 (w) x 16 3/4 (h) x 8 1/2 (d) inches
including projecting parts and controls

Weight: 20.8 kg (45 lb 14 oz)

SONY®

SERVICE MANUAL

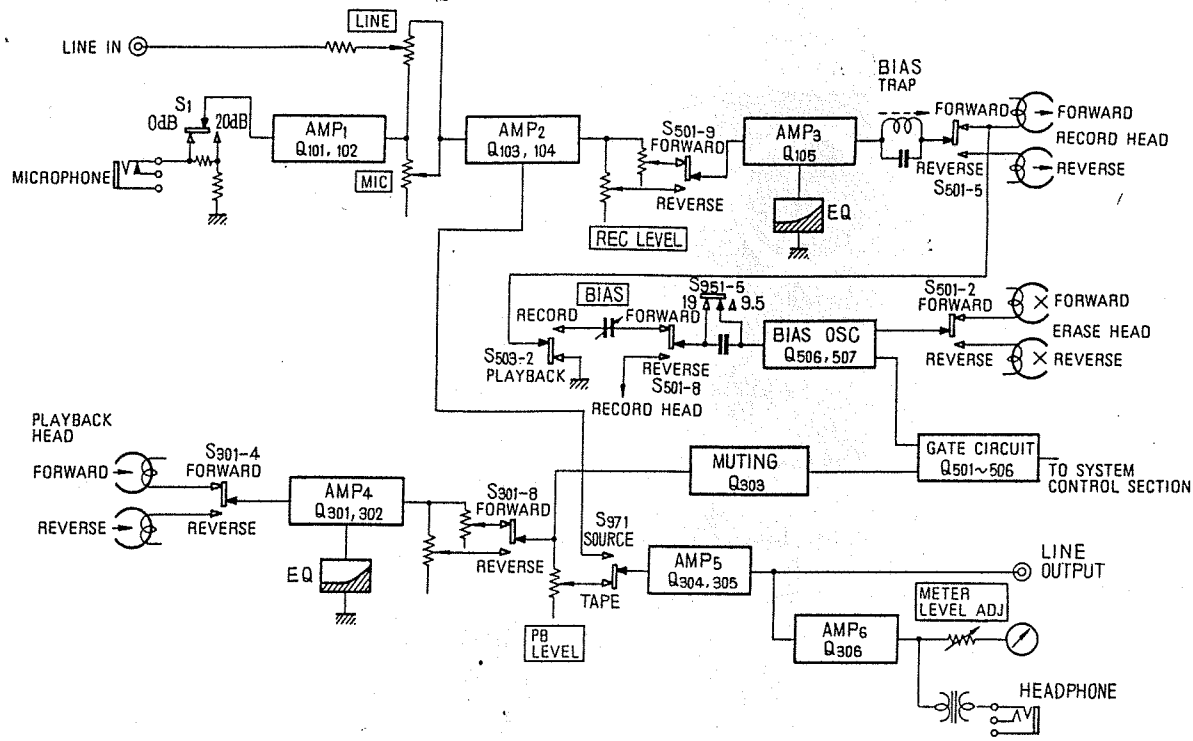
Original

SECTION 1

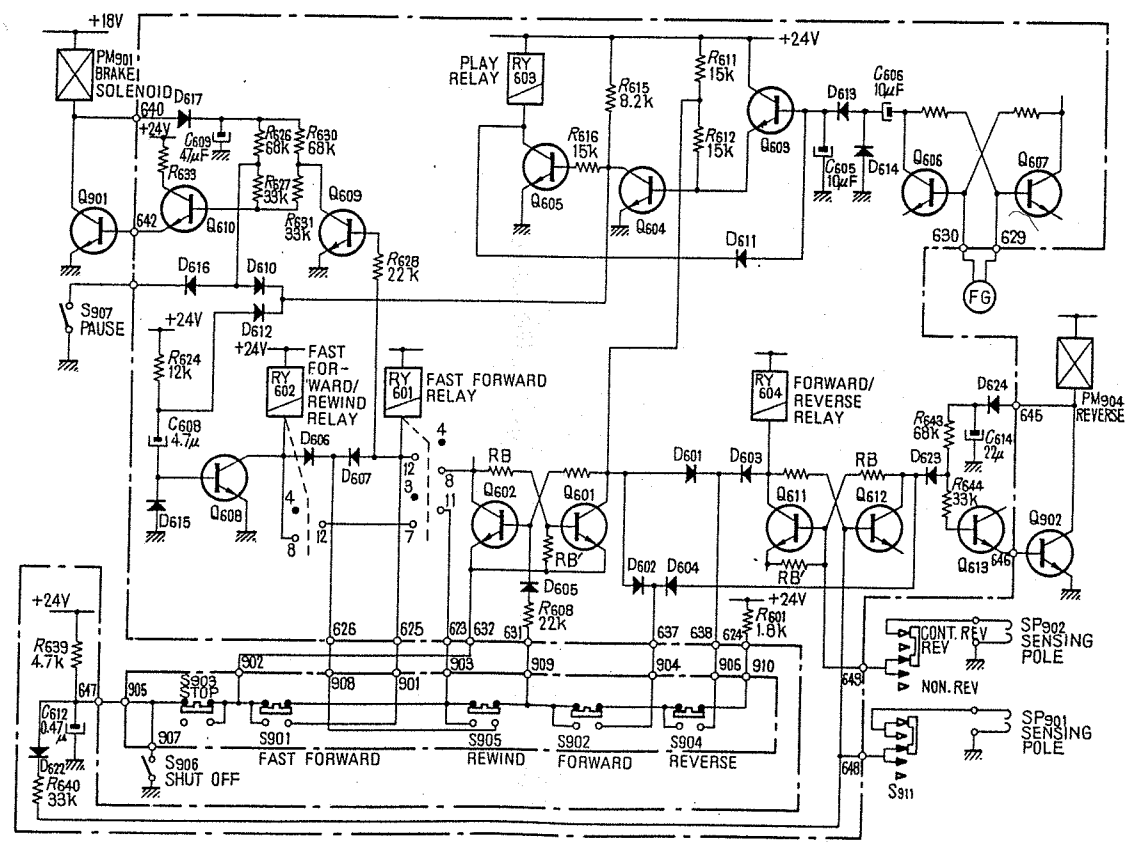
OUTLINE

1-1. BLOCK DIAGRAM

— Amp Section —

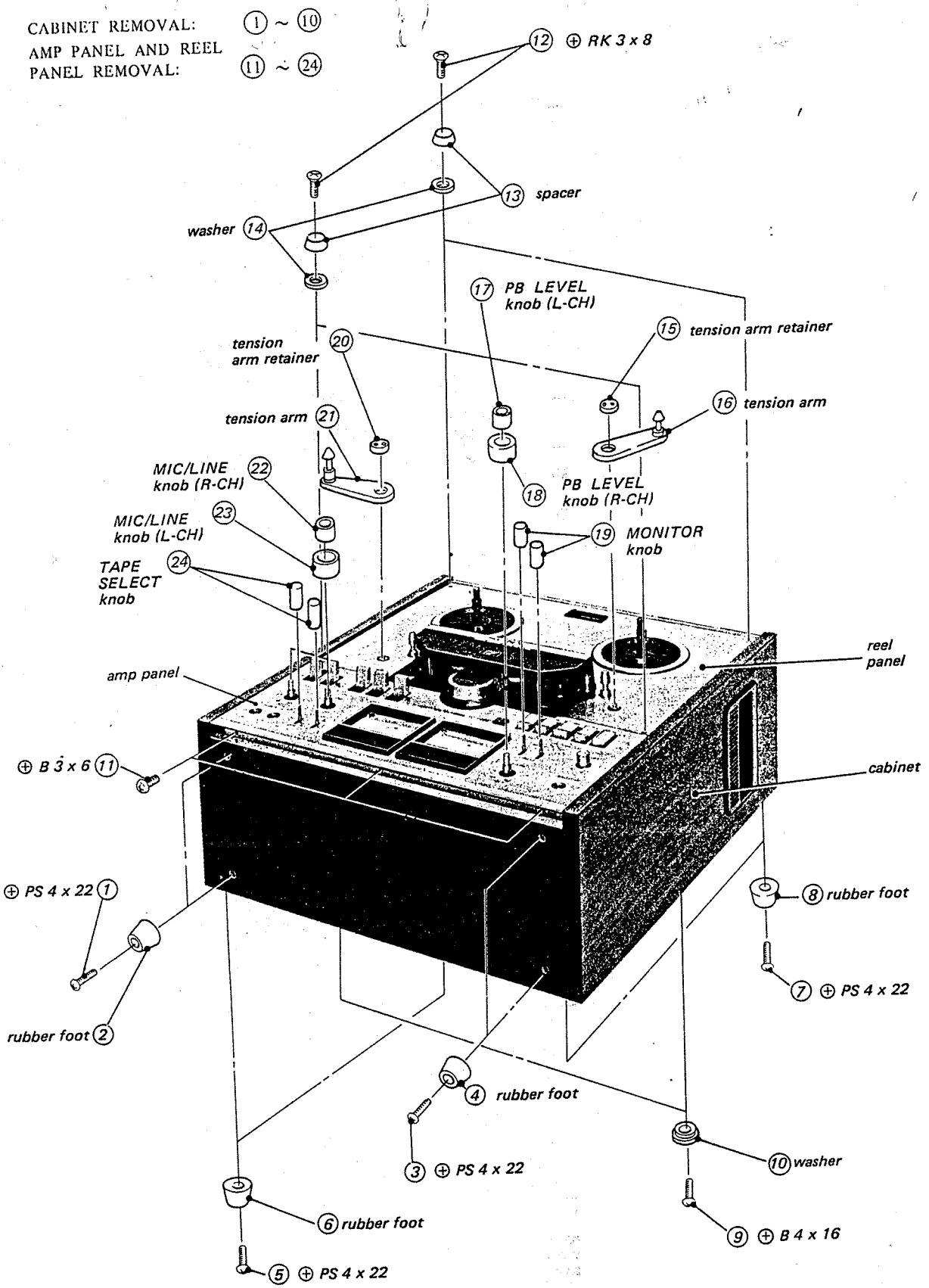


— System Control Section —



SECTION 2
DISASSEMBLY

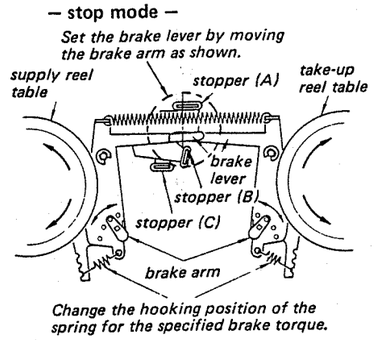
CABINET REMOVAL: ① ~ ⑩
AMP PANEL AND REEL PANEL REMOVAL: ⑪ ~ ㉔



SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

Brake Torque Adjustment
— stop mode —

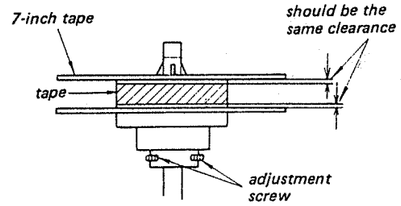


Specification:

Take-up Reel	Supply Reel	Brake Torque
clockwise	counter-clockwise	1000 ~ 1400 g·cm (13.9 ~ 19.5 oz·inch)
counter-clockwise	clockwise	300 ~ 400 g·cm (4.17 ~ 5.55 oz·inch)

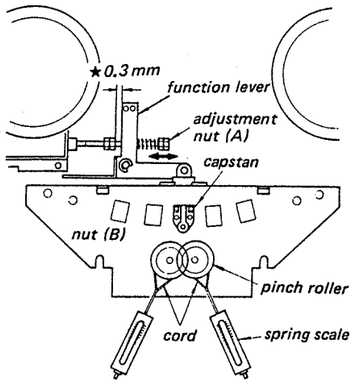
Reel Table Height Adjustment

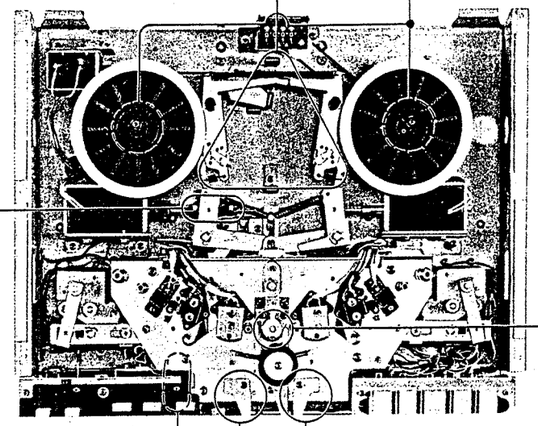
1. Thread a 7-inch tape.
2. Make sure that the tape does not touch the reel flanges in forward playback, reverse playback, fast forward and rewind modes.
3. If the tape touches the reel flanges, adjust the reel table height by loosening the two adjustment screws.



Pinch Roller Pressure Adjustment
— playback mode —

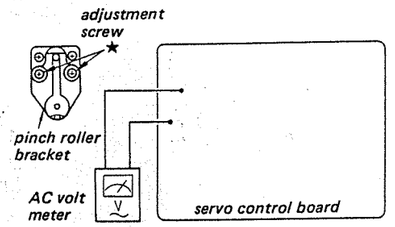
1. Hook the spring scale to the base of the pinch roller shaft.
2. Pull the spring scale in the counter direction of the capstan.
3. Allow the pinch roller to return slowly and measure the pressure (spring scale tension) at the point where the pinch roller just contacts the capstan.
   Specification: 1,200 to 1,400 g·cm (16.7 to 19.4 oz·inch)
4. If necessary, adjust by turning the adjustment nut (A).
5. Make sure of the clearance indicated by ★.
6. After completing the adjustment, apply locking compound to the nuts.





Capstan Shaft Position Adjustment

Test Setup: **— forward or reverse playback mode —**



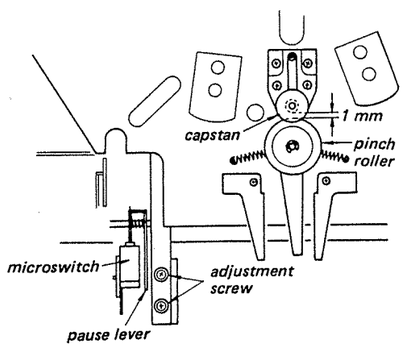
Procedures:

1. Loosen the two adjustment screws, and move the pinch roller bracket to left and right, front and back for maximum meter reading.
2. Tighten the adjustment screws.
3. After completing the adjustment, apply locking compound to the adjustment screws.

Pause Lever Adjustment
— forward or reverse playback mode —

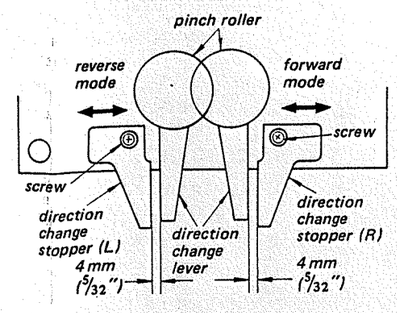
1. With PAUSE button pulled, adjust pause lever position by loosening the two adjustment screws so that clearance between pinch roller and capstan is 1 mm ($\frac{1}{32}$").

   Note: When the mode is changed from forward playback to reverse playback in PAUSE mode or vice versa, PAUSE button should not be released.



Direction Change Stopper Position Adjustment
— forward and reverse playback modes —

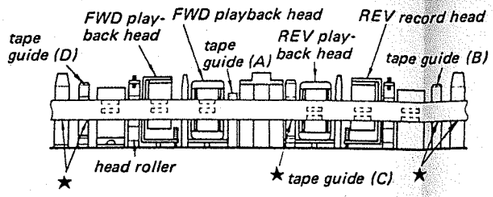
1. Loosen the screws and adjust the direction change stopper position for the clearance shown. Tighten the screws.
2. Make sure of each function in the following order:
   forward playback → rewind → stop → reverse playback → stop → forward playback
3. If each function does not smoothly change, readjust by moving the direction change stopper.
4. Apply locking compound to the screws.



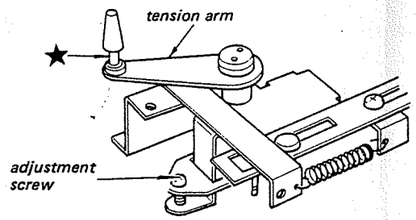
Tape Pass Adjustment

a). Tape Guide Adjustment

1. Thread the tape, and set the TAPE SPEED switch to "19 cm".
2. Make sure that the tape is correctly running in forward and reverse playback mode.
3. Make sure that the tape does not curl at the portions indicated by ★.



4. If necessary, adjust the tape guides (B), (C) and (D) relative to the tape guide (A).
5. Adjust the both tension arm heights by turning the adjustment screws.

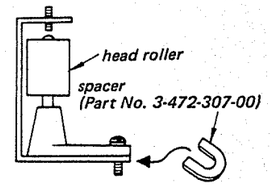


b). Pinch Roller Check

1. Thread a 7-inch tape, and set the TAPE SPEED switch to "19 cm".
2. Make sure that the beginning portion of tape is correctly running, and does not move up and down on the both tape guides near the pinch roller.

c). Head Roller Adjustment

1. Thread a 7-inch tape, and run the tape in forward and reverse playback mode.
2. Make sure that the head roller is rotating, and hold the head roller by fingers.
3. Make sure that the head roller starts rotating again, when taking off fingers from the head roller.
4. Make sure that the tape is not wavy at the head roller.
5. If necessary, adjust the angle of head roller by using the spacer as shown.



d). Adjustments after Playback and Record Head Replacement

Note: When replacement of both playback and record heads is required, leave one of them unremoved for the reference of adjustments. After one head has been replaced and adjusted, replace the other head. Do not remove all the heads at the same time.

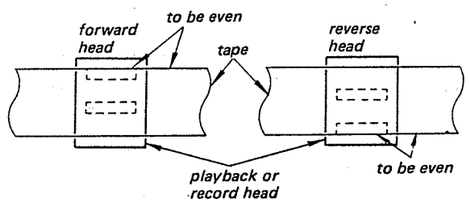
Settings:

TAPE SELECT switch:	BIAS → LOW EQ → NORMAL
MONITOR switch:	TAPE
TAPE SPEED switch:	19 cm or 9.5 cm ($7\frac{1}{2}$ or $3\frac{3}{4}$)
PB LEVEL control:	mechanical mid
LINE control:	normal position

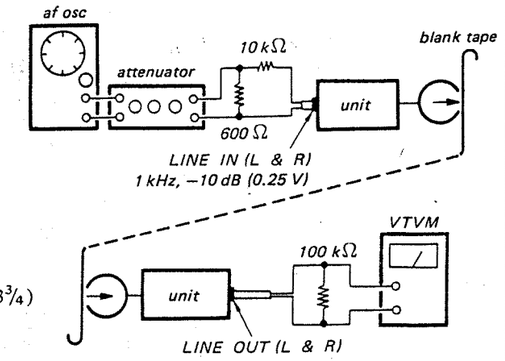
(See page 10.)

Procedure:

1. Thread a tape, and by turning head zenith and head height adjustment screws, adjust the head height as shown.

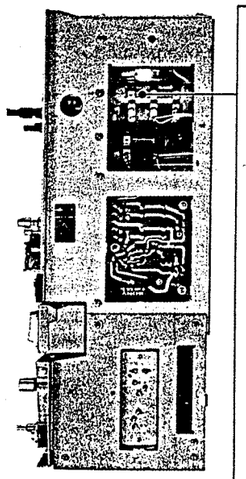


2. Mode: record
   MONITOR switch: TAPE



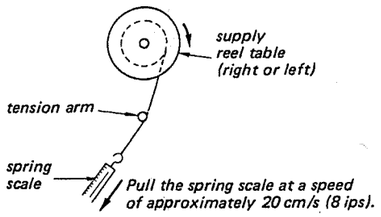
Adjust the head zenith and head height adjustment screws for maximum reading on the VTVM.

3. Perform the playback head azimuth and phase adjustments on Page 13 or the record head azimuth adjustment on Page 15.
4. After completing the adjustment, apply locking compound to the adjustment screws.

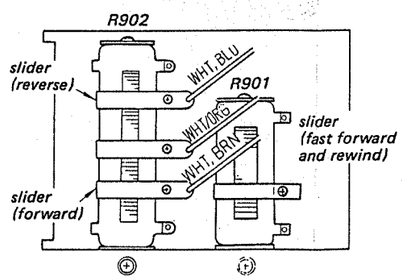


Back Tension Torque Adjustment

1. Measurement

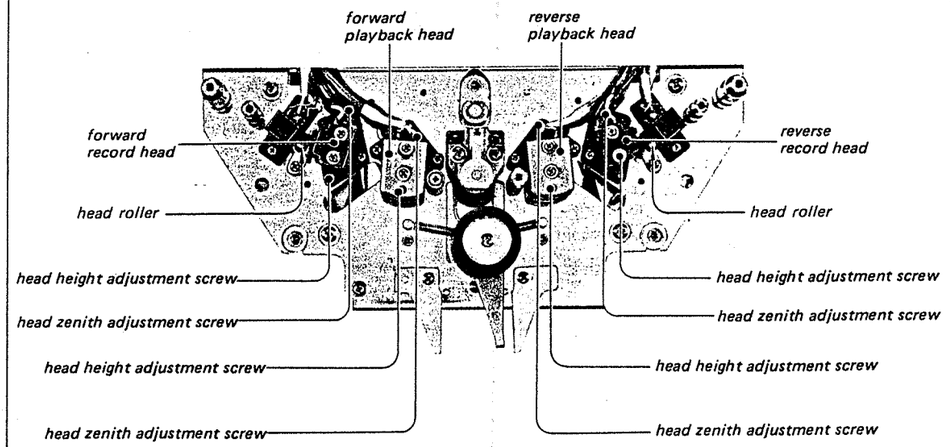


2. If necessary, adjust the torque by moving the slider of R901 and R902.



Specifications:

Mode	Back Tension Torque
fast forward, rewind	40 ~ 50 g·cm (0.55 ~ 0.7 oz·inch)
forward, reverse playback	200 ~ 240 g·cm (2.78 ~ 3.34 oz·inch)



3-2. ELECTRICAL ADJUSTMENTS

Precaution:

1. Clean the following parts with a swab moistened with alcohol:
   - record heads
   - playback heads
   - erase heads
   - capstan
   - pinch roller
   - rubber belts
   - idlers
   - tape guides
2. Demagnetize record, playback and erase heads with a head demagnetizer.
3. Do not use magnetized screwdriver for adjustments.
4. After adjustments, apply locking compound to the adjusted parts.
5. Adjustments should be performed in the order listed in this service manual.
6. Adjustments and measurements should be performed for each L and R channel with the rated power supply voltage unless otherwise specified.
7. Unless otherwise noted, set controls and switches as follows:

TAPE SELECT switch . . . EQ → NORMAL
BIAS → LOW
MONITOR switch . . . . . TAPE
TAPE SPEED switch . . . . 19 cm (7½)
MIC ATT switch . . . . . OFF
AUTO REV switch . . . . . NON REV

Test Equipment/Tools Required:

audio oscillator (af osc)
VTVM
VOM
attenuator (600 Ω)
digital frequency counter
or speed checker (SONY LFM-30)
resistors:
600 Ω, 10 kΩ, 100 kΩ
SONY test tapes:
1). J-19-F2

Tone:	1	2	3	4	5	6	7
Frequency: (Hz)	400	400	10 k	12.5 k	7 k	80	40
Level (dB):	0	−10	−10	−10	−10	−10	−10

2). SPC-47 (4 kHz, 0 dB)
blank tape (completely erased):
SLH-S1

Normal Input Level

	Impedance	Level
LINE IN	10 kΩ	−10 dB (0.25 V)

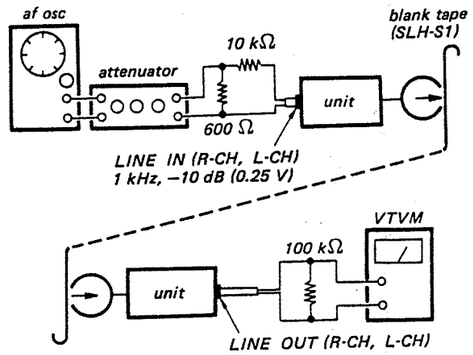
Normal Output Level

	Load Impedance	Level
LINE OUT	100 kΩ	−5 dB (0.44 V)

Normal LINE control setting:

MIC control: MIN
PB LEVEL control: mechanical mid
TAPE SELECT switch: EQ → SLH
BIAS → LOW
MONITOR switch: TAPE

Mode: record

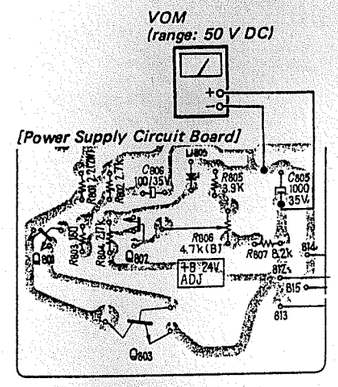


Adjust LINE control for −5 dB (0.44 V) reading on the VTVM.

1. 24 V B⊕ Adjustment

Procedure:

Mode: stop



Adjust R806 for 24 V reading on the VOM.

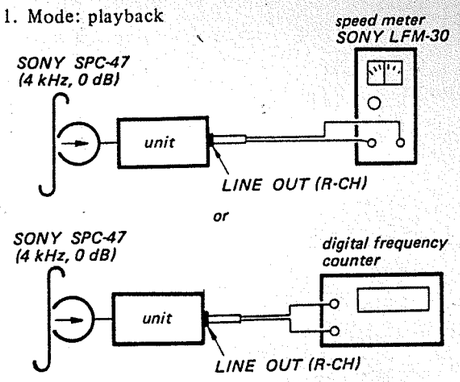
2. Tape Speed Adjustment

Settings:

TAPE SPEED switch: 19 cm and 9.5 cm
(7½ and 3¾)

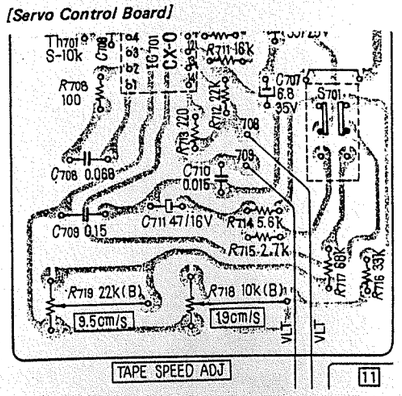
Procedure:

1. Mode: playback



TAPE SPEED	Adjust	Specification	
		speed checker	digital frequency counter
19 cm, 7½	R718	−1 ~ +1 %	3,960 ~ 4,040 Hz
9.5 cm, 3¾	R719	−1 ~ +1 %	1,980 ~ 2,020 Hz

Adjustment Location:



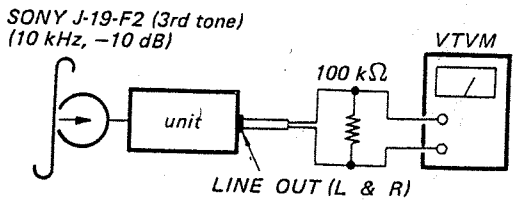
3. Playback Head Azimuth and Phase Adjustments

Settings:

TAPE SPEED switch: 19 cm (7½)

Procedure:

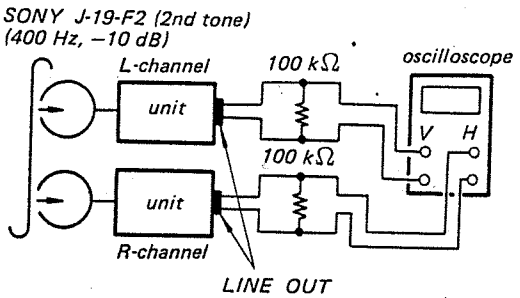
1. Mode: playback



Turn the adjustment screw for the highest reading on the VTVM.

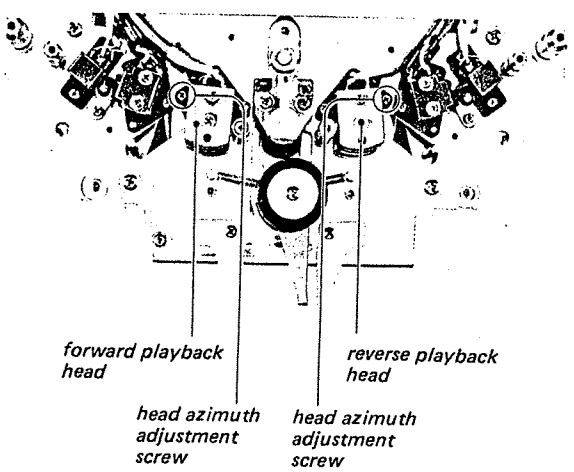
Note: If the highest peak readings at L-CH and R-CH cannot be obtained at the same screw position, take the midway between the both positions of the screw.

2. Mode: playback



Adjust	On the oscilloscope			
azimuth adjustment screw				
	in-phase	*30°*	*90°*	*more than 90°*
	good			wrong

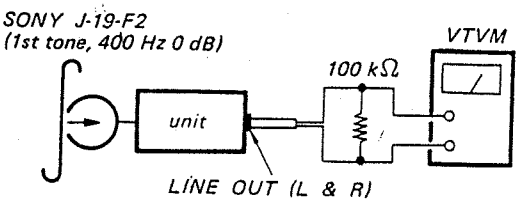
Adjustment Location:



4. Playback Level Adjustment

Procedure:

1. Mode: playback



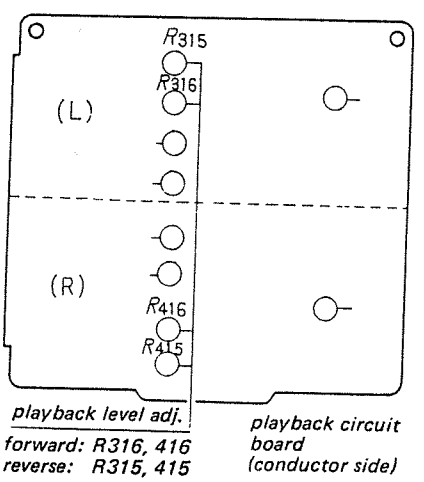
TAPE SELECT (EQ) switch: NORMAL

Mode	Adjust	VTVM reading
forward playback	R316 (L-CH) R416 (R-CH)	−5.5 dB ~ −4.5 dB (0.41 V ~ 0.45 V)
reverse playback	R315 (L-CH) R415 (R-CH)	

TAPE SELECT (EQ) switch: SPECIAL

Mode	Adjust	VTVM reading
forward playback	R316 (L-CH) R416 (R-CH)	−8 dB ~ −7 dB (0.31 V ~ 0.35 V)
reverse playback	R315 (L-CH) R415 (R-CH)	

Adjustment Location:



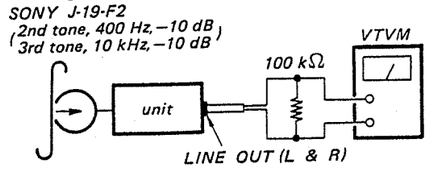
5. Playback Equalizer Adjustment

Settings:

TAPE SELECT (EQ) switch: SPECIAL

Procedure:

Mode: playback

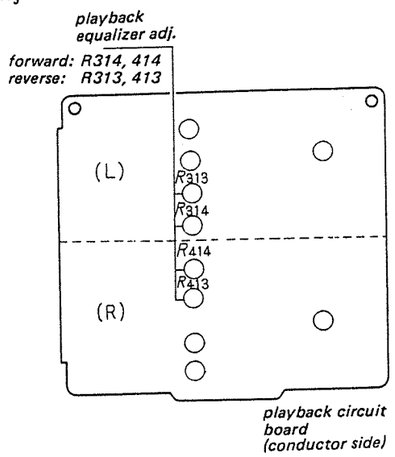


Mode	Adjust	Remarks
forward playback	R314 (L-CH) R414 (R-CH)	Adjust so that 10 kHz level is the same as 400 Hz.
reverse playback	R313 (L-CH) R413 (R-CH)	

Specification:

J-19-F2		Level Difference from 2 nd tone (400 Hz)
Tone	Frequency	
2 nd	400 Hz	0 dB (reference)
3 rd	10 kHz	0 ± 2 dB
4 th	12.5 kHz	0 ± 2 dB
5 th	7 kHz	0 ± 2 dB
6 th	80 Hz	+1 ± 2.5 dB
7 th	40 Hz	+3 ± 2.5 dB

Adjustment Location:



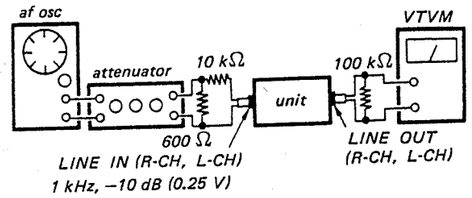
6. Level Meter Calibration

Settings:

MONITOR switch: SOURCE
PB LEVEL control: mechanical mid

Procedure:

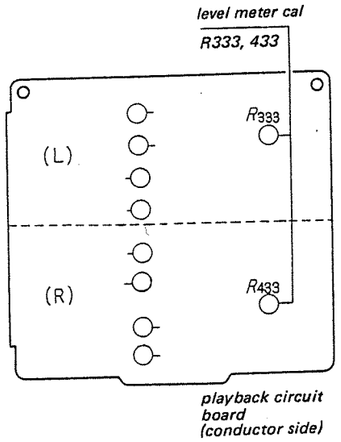
1. Mode: record



2. Adjust LINE IN control for −5 dB (0.44 V) reading on the VTVM.
3. Calibrate the level meters for "0" indication.

Adjust	Level Meter Reading
R333 (L-CH)	"0" VU
R433 (R-CH)	

Adjustment Location:



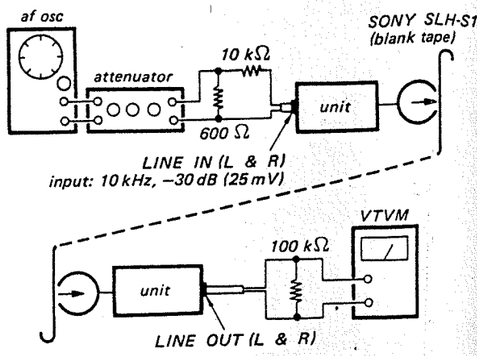
7. Record Head Azimuth Adjustment

Settings:

TAPE SELECT (EQ) switch: SPECIAL
TAPE SELECT (BIAS) switch: LOW
LINE control: normal setting on page 11

Procedure:

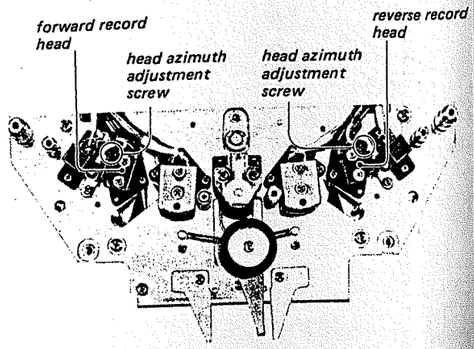
1. Mode: record



Turn the adjustment screw for the highest reading on the VTVM.

Note: If the highest peak readings at L-CH and R-CH cannot be obtained at the same screw position, take the midway between the both positions of the screw.

Adjustment Location:



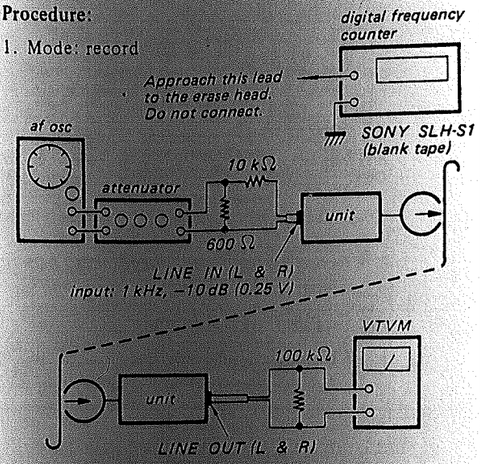
8. Record Bias and Bias Frequency Adjustment

Settings:

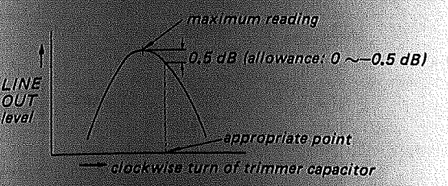
TAPE SELECT (EQ) switch: SPECIAL
TAPE SELECT (BIAS) switch: LOW
LINE control: normal setting on page 11

Procedure:

1. Mode: record



Mode	Adjust	Remarks
forward record	trimmer capacitor C512 (L-CH) C513 (R-CH)	Slowly turn the trimmer capacitor clockwise until VTVM reads 0.5 dB below and beyond the maximum reading as shown.
reverse record	trimmer capacitor C514 (L-CH) C515 (R-CH)	



2. In forward record mode, be sure that the frequency counter reading is as specified.
   Specification: 160 ± 3 kHz
3. In reverse record mode, adjust the trimmer capacitor C508 until VTVM reads the same frequency as step 2.

Adjustment Location: See Fig. A. on next page.

Adjustment Location:

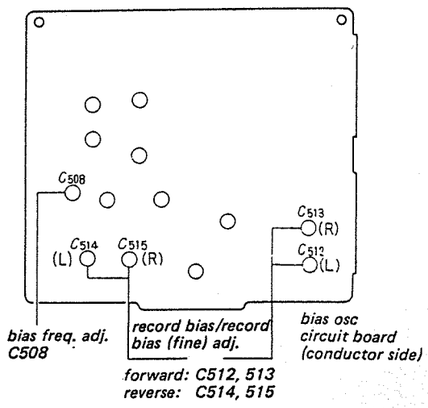


Fig. A. Record bias and frequency, record bias fine adjustment location

9. Record Bias Fine Adjustment

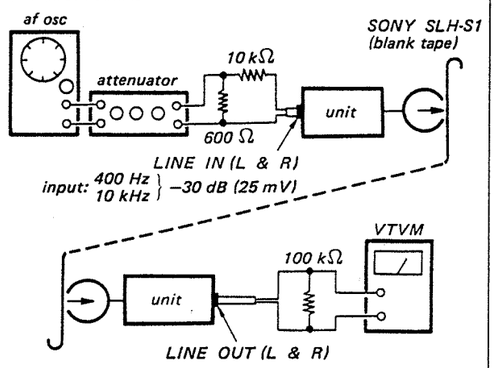
Note: Perform this adjustment after the record bias and bias frequency adjustment.

Settings:

TAPE SELECT (EQ) switch: SPECIAL
LINE control: normal setting on page 11

Procedure:

1. Mode: record



Mode	Frequency	Adjust	Remarks
forward record	400 Hz	trimmer capacitor C512 (L-CH) C513 (R-CH)	Adjust so that 10 kHz level is the same as 400 Hz.
	10 kHz		
reverse record	400 Hz	trimmer capacitor C514 (L-CH) C515 (R-CH)	
	10 kHz		

Adjustment Location: See Fig. A above.

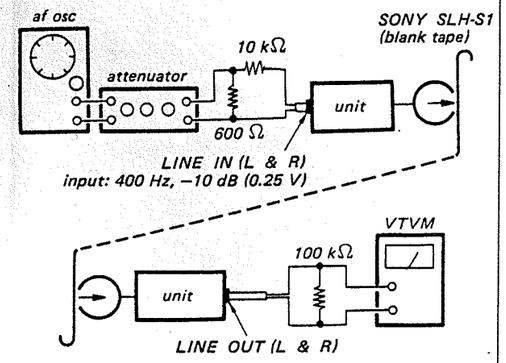
10. Record Level Adjustment

Settings:

SPEED SELECT switch: 19 cm and 9.5 cm ($7\frac{1}{2}$ and $3\frac{3}{4}$)
TAPE SELECT (EQ) switch: SPECIAL
LINE control: normal setting on page 11

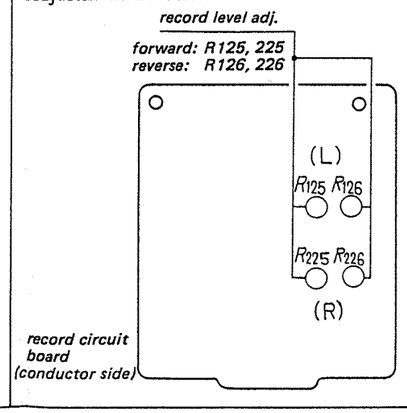
Procedure:

1. Mode: record



Mode	Tape Speed	Adjust	VTVM Reading
forward record	19 cm/s ($7\frac{1}{2}$)	R125 (L-CH) R225 (R-CH)	–5 dB±0.5 dB (0.41 ~ 0.45 V)
	9.5 cm/s ($3\frac{3}{4}$)		–5 dB±2 dB (0.35 ~ 0.55 V)
reverse record	19 cm/s ($7\frac{1}{2}$)	R126 (L-CH) R226 (R-CH)	–5 dB±0.5 dB (0.41 ~ 0.45 V)
	9.5 cm/s ($3\frac{3}{4}$)		–5 dB±2 dB (0.35 ~ 0.55 V)

Adjustment Location:



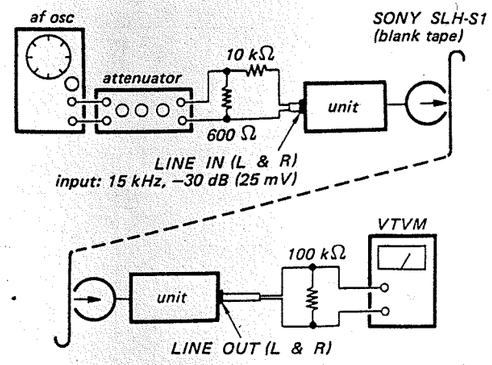
11. Dummy Coil Adjustment

Settings:

TAPE SELECT (EQ) switch: SPECIAL
LINE control: normal setting on page 11

Procedure:

1. Mode: record



Step	Mode	Adjust	VTVM Reading
1	stereo record	—	Memorize
2	R channel record forward: reverse:	L506 L508	R-ch: same as in stereo record mode
3	L channel record forward: reverse:	L505 L507	L-ch: same as in stereo record mode

Adjustment Location:

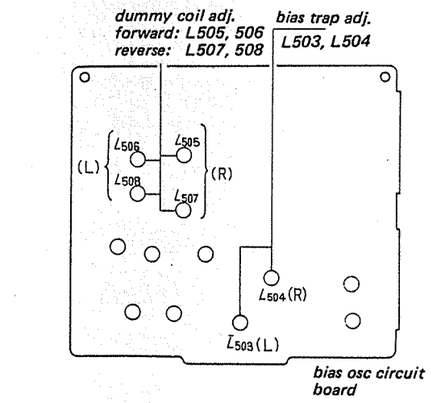


Fig. B. Dummy coil and bias trap adjustment location

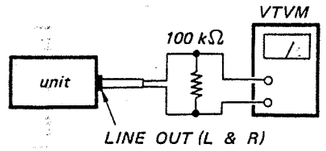
12. Bias Trap Adjustment

Settings:

MONITOR switch: SOURCE

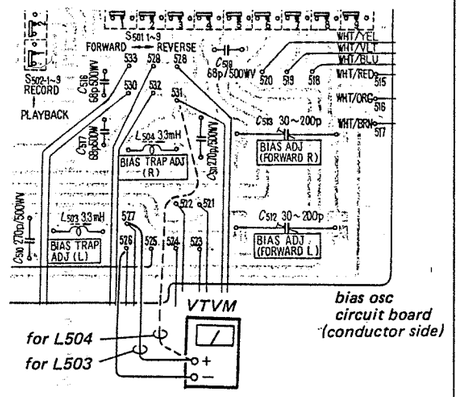
Procedure:

1. Mode: forward stereo record



Be sure that the VTVM reading is less than –40 dB (7.7 mV).

2. Test Setup (forward stereo record mode).



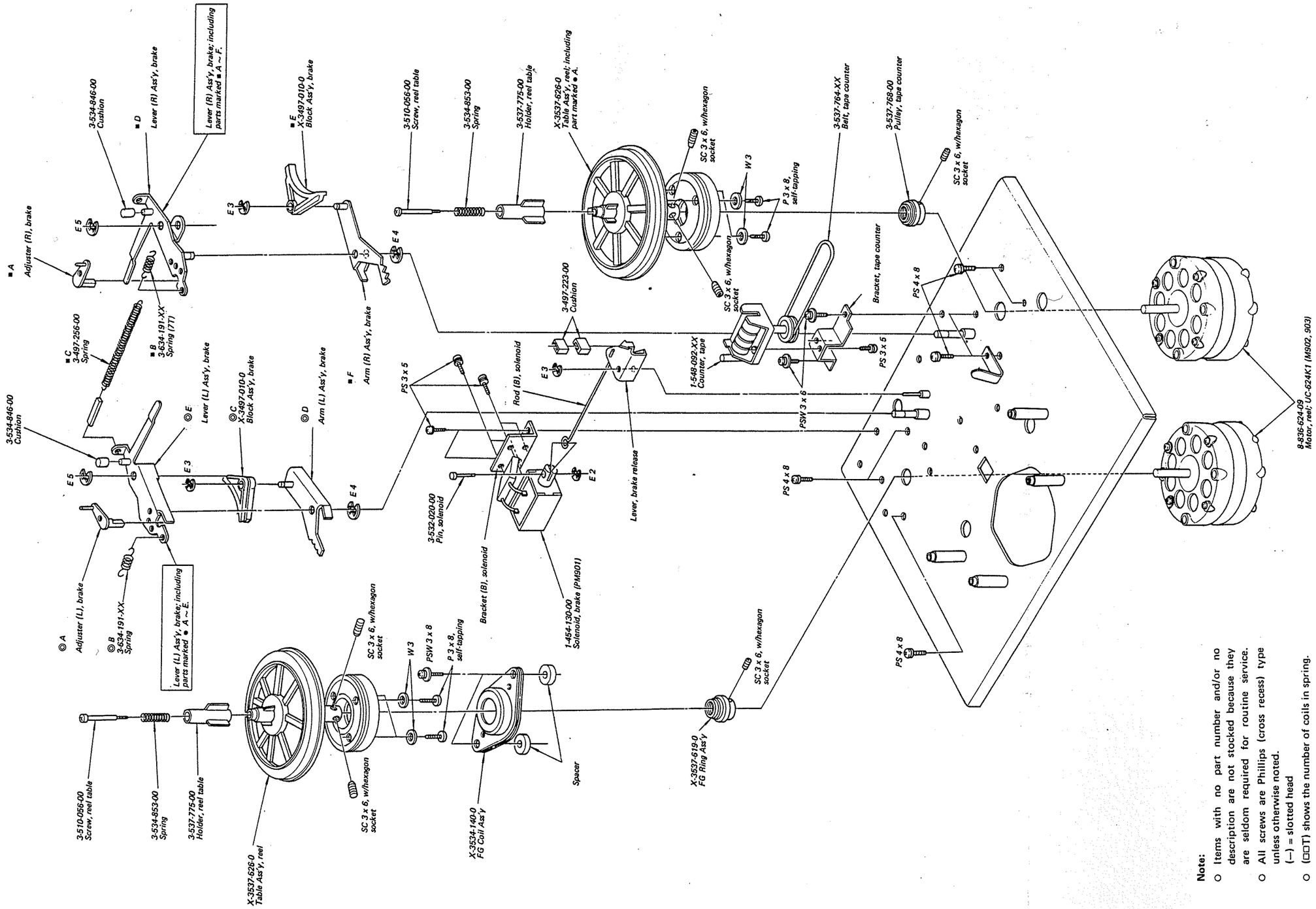
Adjust	VTVM reading
L503	minimum
L504	minimum

Adjustment Location: See Fig. B on the left.

SECTION 5

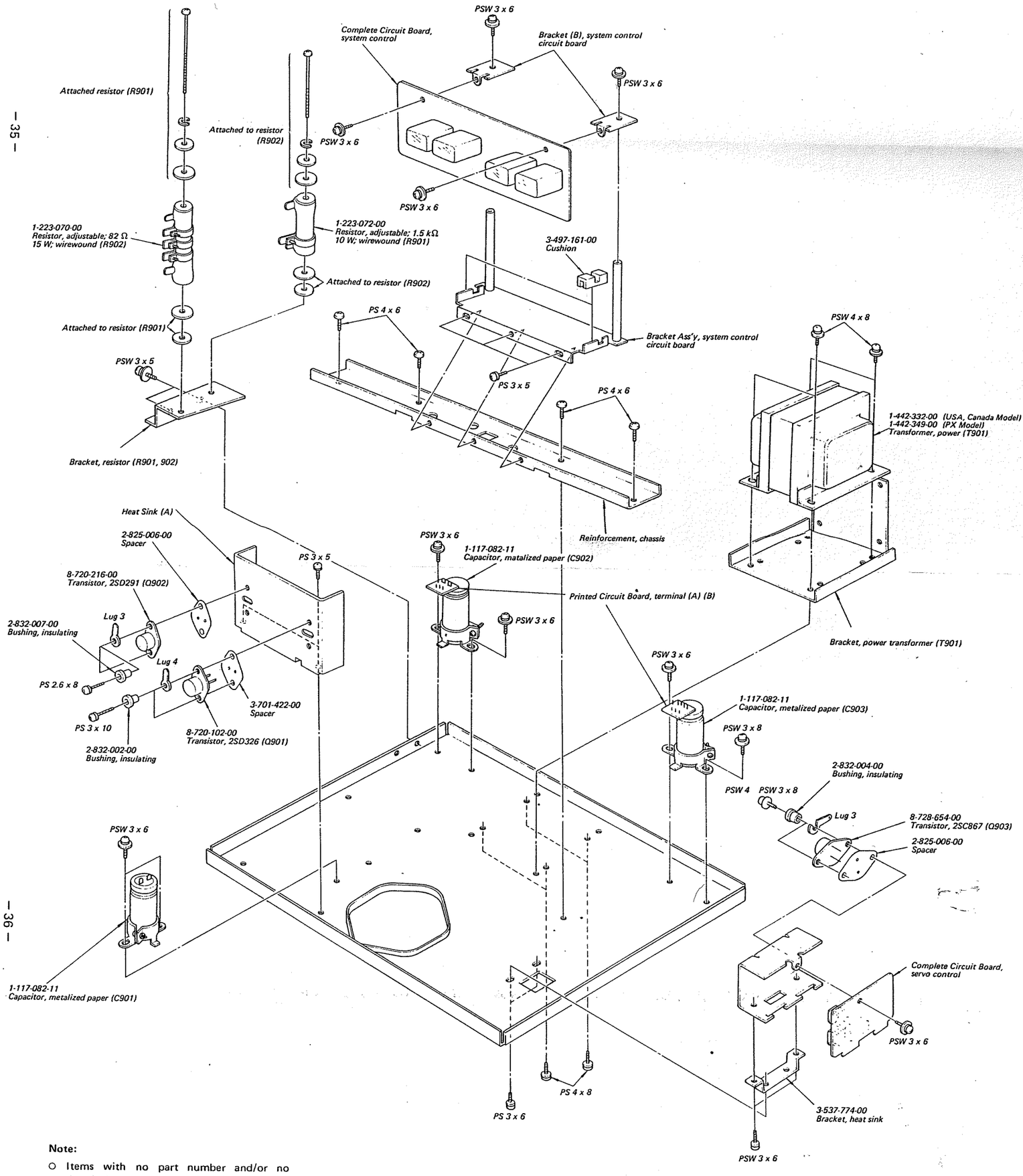
EXPLODED VIEWS

5-1. EXPLODED VIEW (1)



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.

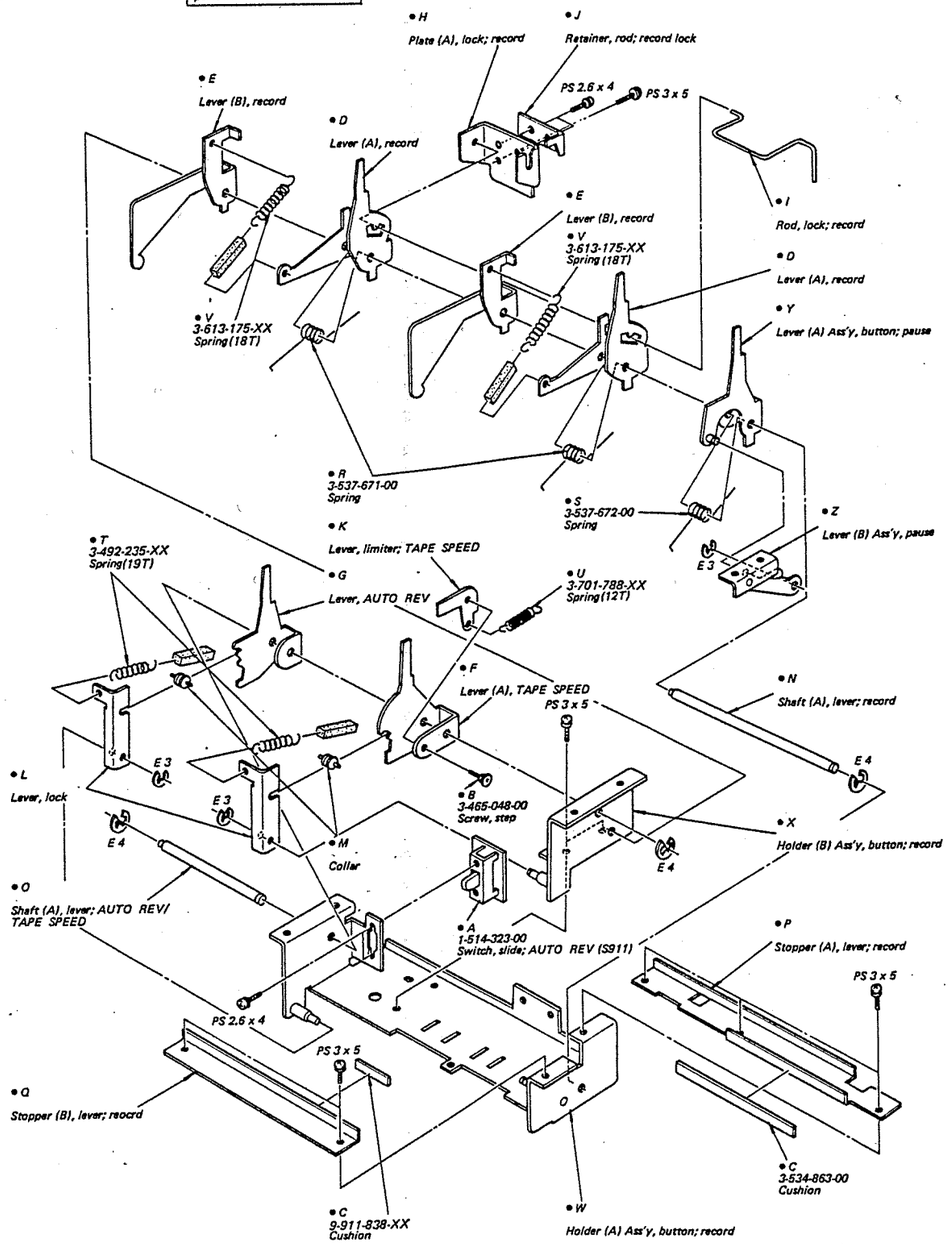


Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (—) = slotted head
- (□□T) shows the number of coils in spring.

5-4. EXPLODED VIEW (4)

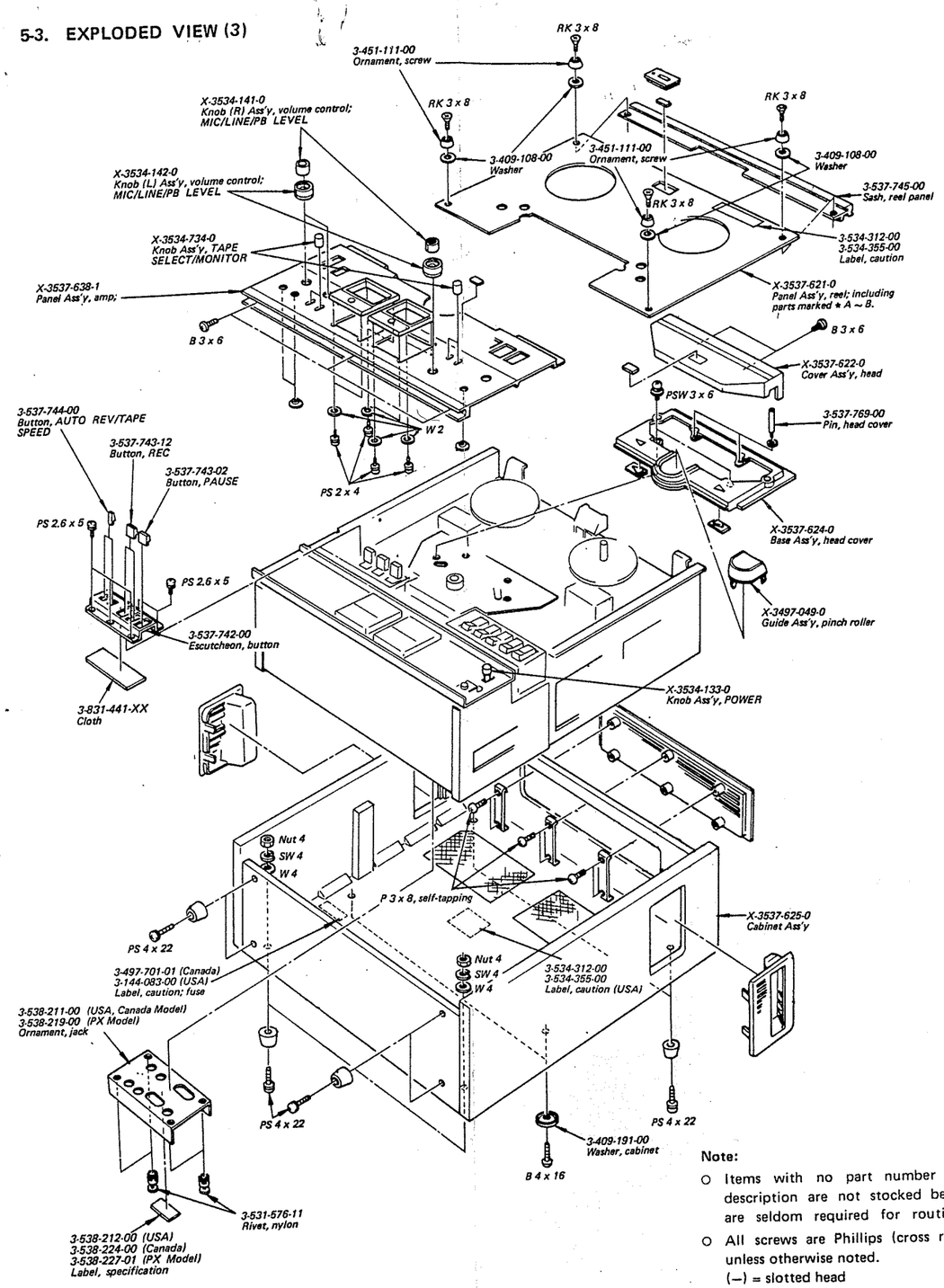
Button Ass'y, record; including parts marked • A ~ Z.



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.

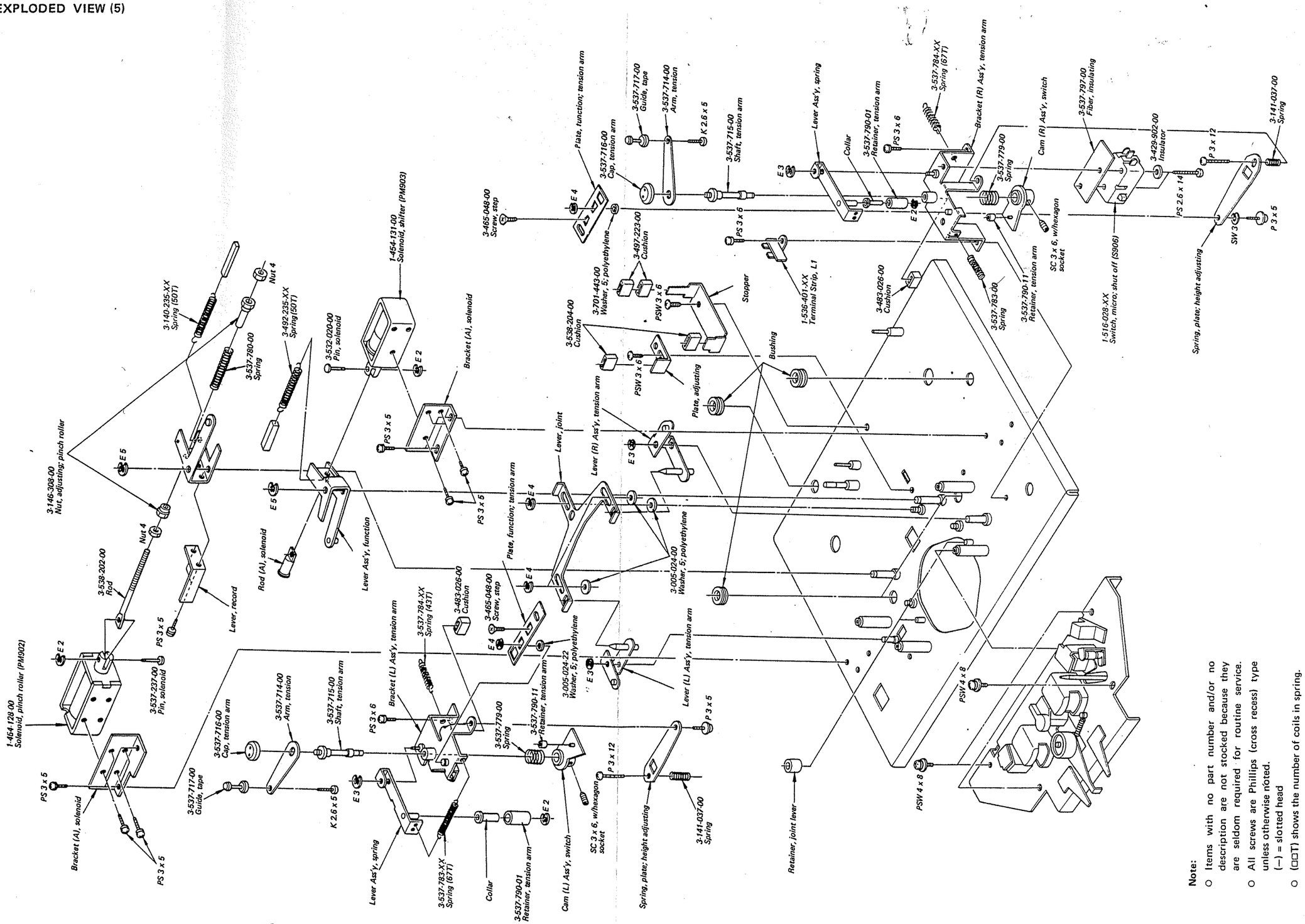
5-3. EXPLODED VIEW (3)



Note:

- Items with no part number and/or description are not stocked because th are seldom required for routine servi
- All screws are Phillips (cross recess) ty unless otherwise noted.
  (–) = slotted head

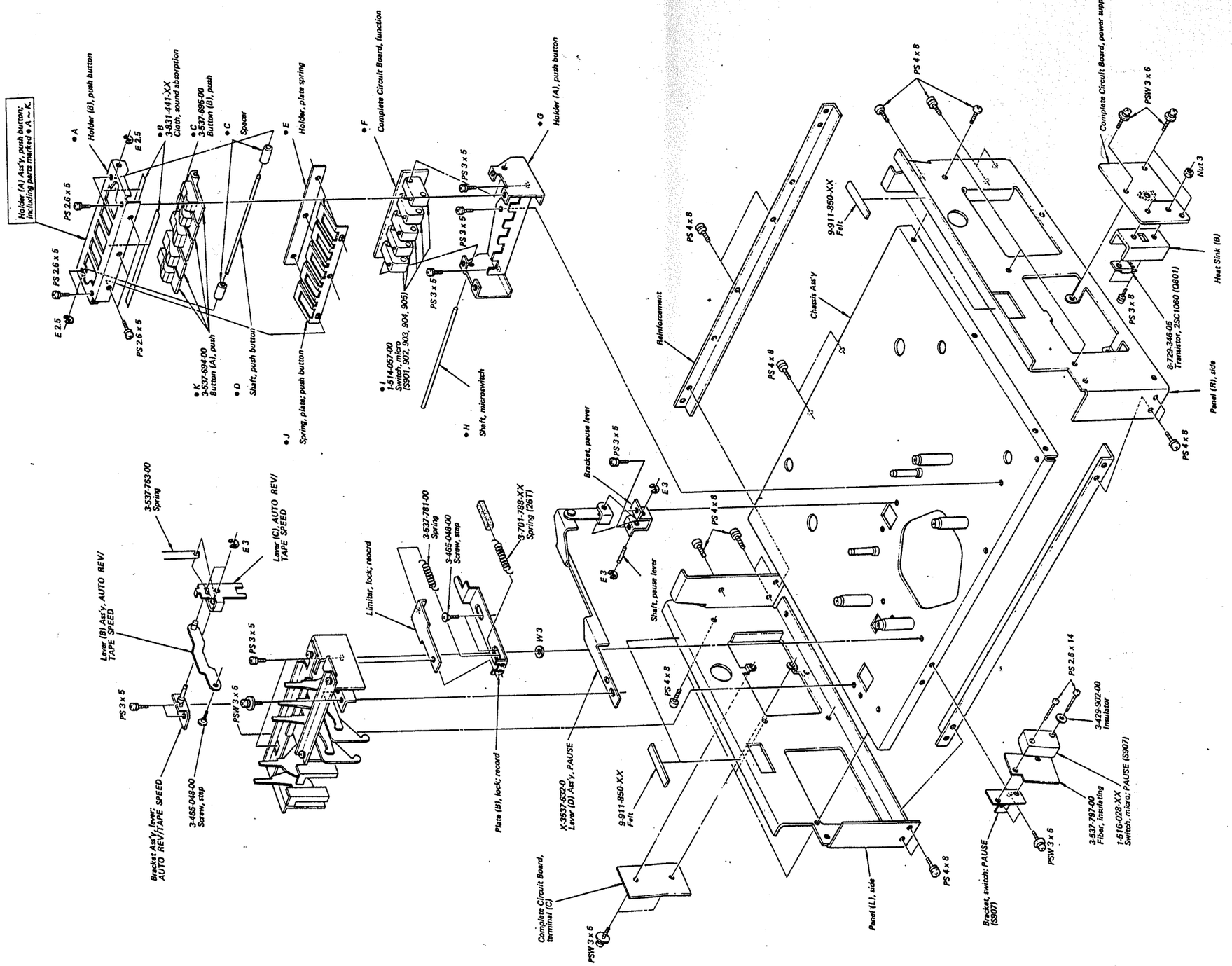
5-5. EXPLODED VIEW (5)



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (—) = slotted head
- (□□T) shows the number of coils in spring.

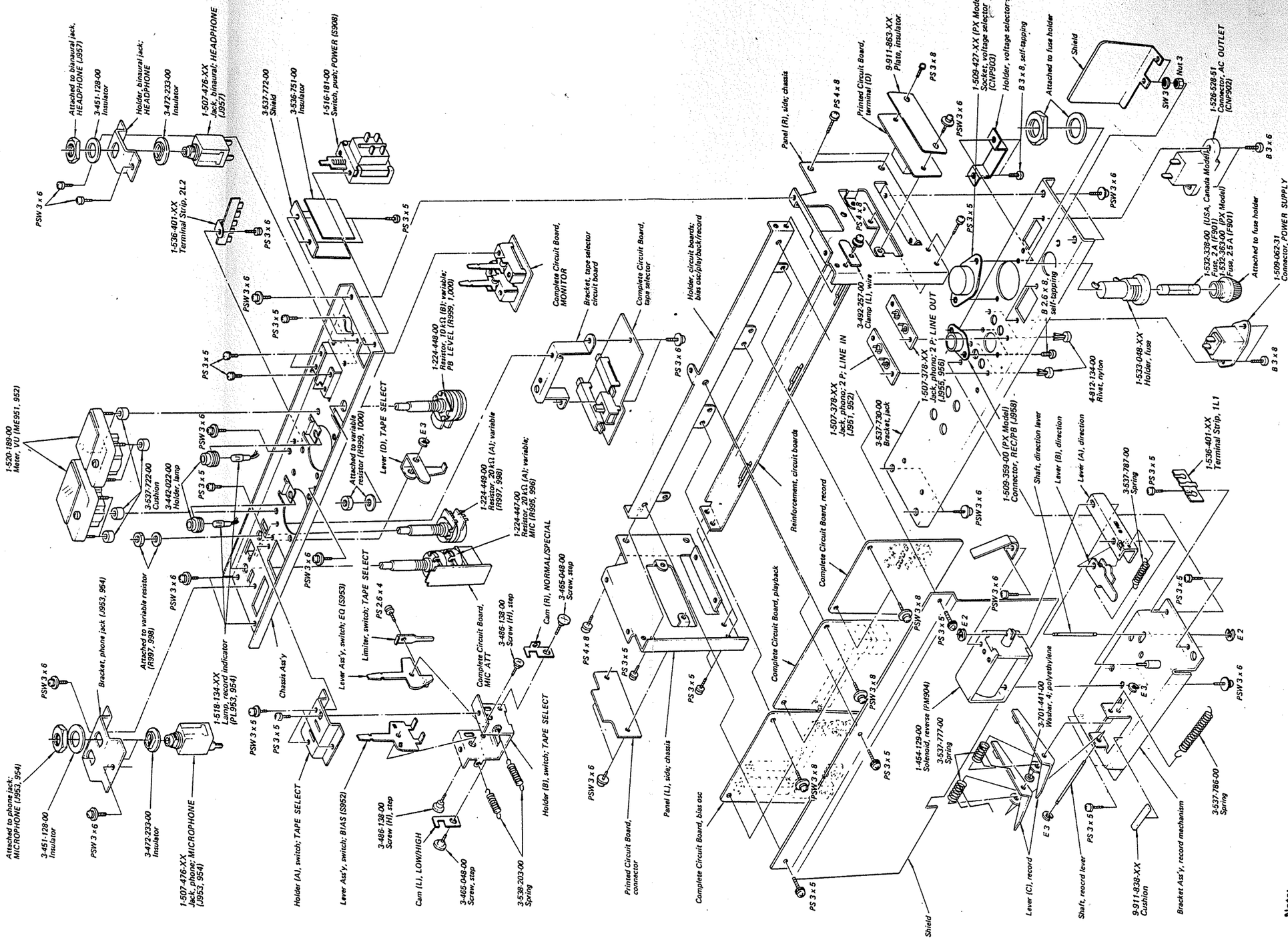
5-6. EXPLODED VIEW (6)



Note:

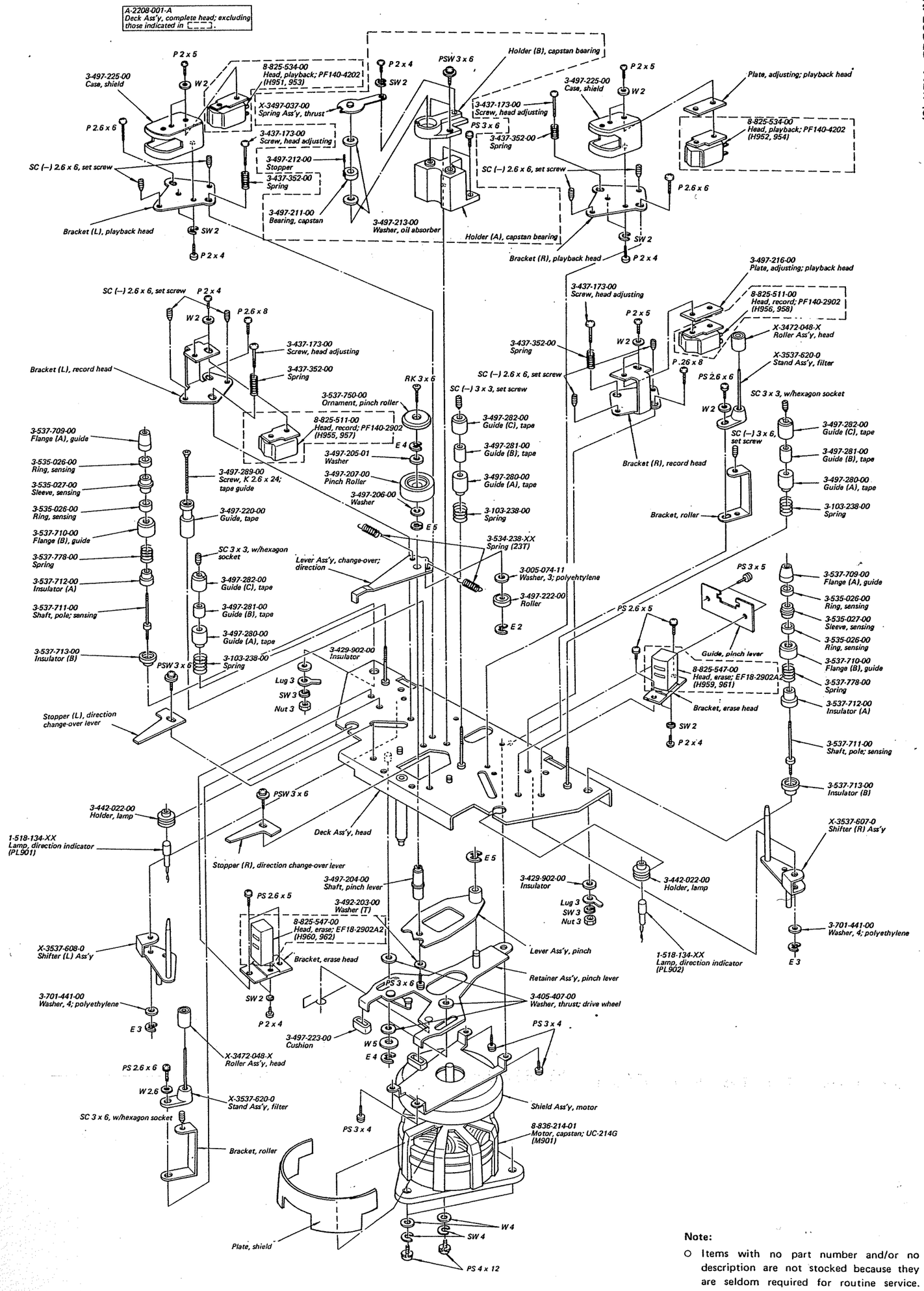
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.

5-7. EXPLODED VIEW (7)



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head



Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- (□□T) shows the number of coils in spring.