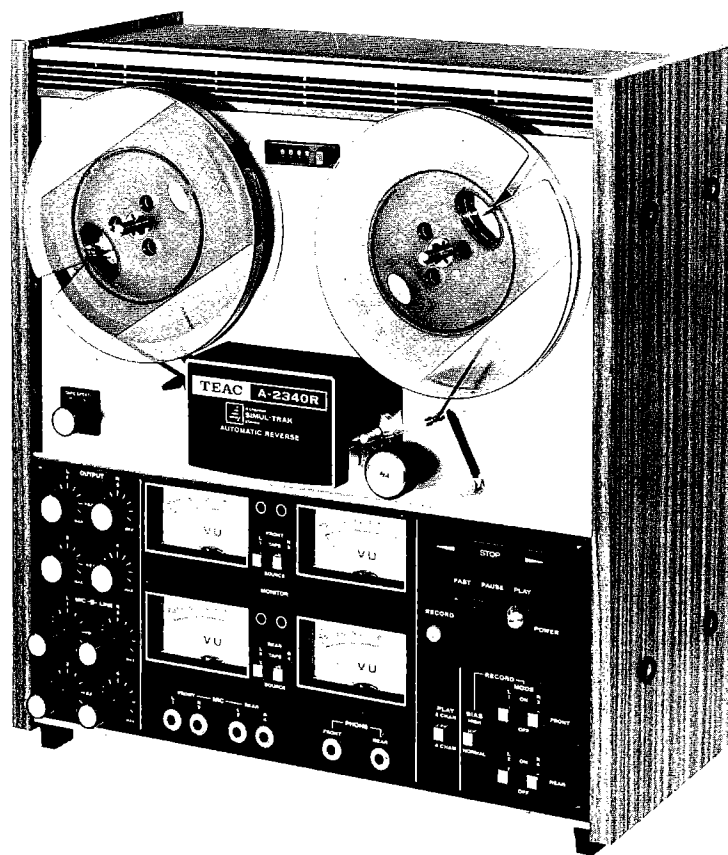


42

TEAC® A-2340R

4CHANNEL SIMUL TRAK
STEREO TAPE DECK
SERVICE MANUAL



TEAC CORPORATION

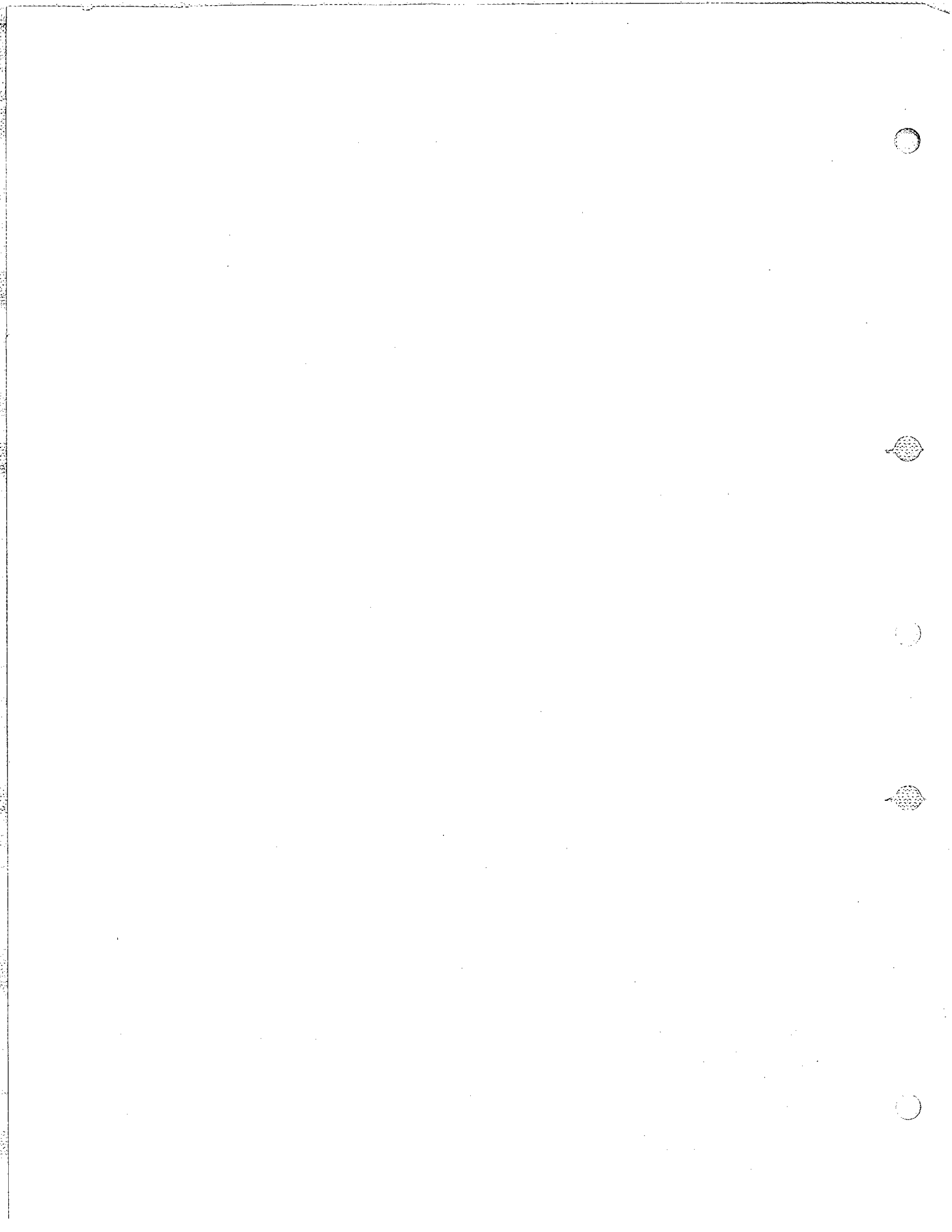
SALES OFFICE: SHINJUKU BUILDING
1-8-1, NISHI-SHINJUKU, SHINJUKU, TOKYO
TEAC HONGKONG LIMITED ROOM NO. 1105
MAIN OFFICE: MELBOURNE PLAZA, 33 QUEEN'S ROAD
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KABELWEG 45-47, AMSTERDAM-W. 2,
HOLLAND



1. GENERAL DESCRIPTION

The TEAC A-2340R is a semi-professional tape deck capable of four channel, stereophonic and monophonic recording and playback, with 2 channel manual or automatic reverse play. It offers operating speeds of 7-1/2ips and 3-3/4ips. The basic design of the A-2340 is highly similar to that of the A-2340R, therefore information in this service manual may be applied to the A-2340.

This service manual provides adjustment and alignment procedures, schematic diagrams and parts replacement information and the proper procedures for obtaining necessary repair parts.

If adjustments or repair procedures are not clear or seem difficult to accomplish or should you desire more detailed technical information, please contact your nearest TEAC dealer, TEAC Corporation or Affiliation Corporations, addresses of which are printed in this manual.

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- SCHEMATIC DIAGRAMS
- PRINTED CIRCUIT BOARD AND PARTS LIST
- EXPLODED VIEW AND PARTS LIST
- MANUAL CHANGES

2. SERVICE DATA

MECHANICAL

TYPE: Four track 4 channel stereophonic
 Four track 2 channel stereophonic
 Four track 1 channel monophonic

HEADS: Three: Erase (Ferrite),
 Record, Playback (Permalloy)

REEL SIZE: 7" maximum NAB reel

TAPE WIDTH: Standard 1/4 inch tape

TAPE SPEED: 7-1/2ips and 3-3/4ips

MOTORS: Two 6-pole eddy current motors for
 reel drive
 4/8 pole hysteresis synchronous
 capstan motor.

WOW AND FLUTTER: 0.12% at 7-1/2ips
 0.15% at 3-3/4ips
 Wow and flutter measured according
 to weighted NAB standard using
 TEAC flutter free tape.

FAST WINDING TIME: Approx. 90 seconds or less for
 1,200 feet.

OPERATING POSITION: Horizontal or vertical

POWER REQUIREMENTS: 100/117/200/220/240 V AC 50/60Hz 140W

WEIGHT: 44 lbs (20 kg) net.

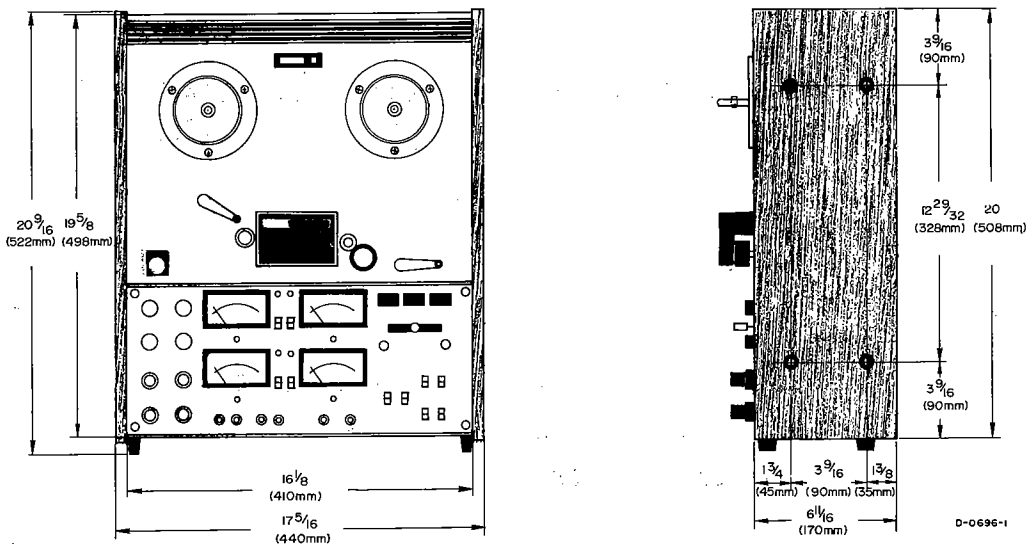


Fig. 2-1 Demensions -A-2340R-

ELECTRICAL

TRANSISTORS:	2SC1000(BL) × 2	2SC 693(GU) × 4
	2SA6661(S) × 2	2SC644(T) × 2
	2SC828(S) × 10	2SC971 × 2
	2SC536(F) × 2	
DIODES:	FR2-06 × 4	
	FR2-10 × 4	
FREQUENCY RESPONSE:	7-1/2ips	40Hz~18kHz ±3dB
	3-3/4ips	50Hz~10kHz ±3dB
INPUT:	MIC:	0.3mV/10kΩ
	LINE:	0.1V/100kΩ
OUTPUT:	LINE:	approx. 0.3V/10kΩ or more
	HEADPHONE:	0.3mW/8Ω
SIGNAL TO NOISE RATIO:	7-1/2ips	48dB or higher
	3-3/4ips	46dB or higher at playback
BIAS FREQUENCY:	100±5kHz push-pull oscillator	
CROSSTALK REJECTION:	35dB or more adjacent track at 100 Hz	
CHANNEL SEPARATION:	45dB or more channel to channel at 1kHz	
ERASE EFFICIENCY:	60dB or more at 7-1/2ips	

NOTE

As a result of continuing changes and improvements during the production run, minor differences may be found between early and later machines. Refer to manual change sheets for information concerning modifications.

3. EQUIPMENT REQUIRED

FOR MECHANICAL MEASUREMENT

SPRING SCALE:	0~4kg (0~8 lbs) #5086025000 0~300g (0~10 oz) #5086026000
TEST TAPE:	TEAC YTT-2003 (7-1/2ips) TEAC YTT-2002 (3-3/4ips)
FLUTTER METER:	Meguro Model MK665B (preferred) or Sentinel FL-3D-1
DIGITAL FREQ. COUNTER:	Capable of 0 to 5kHz indication
TOOLS:	General, 2mm nut driver #5086014000, Hex head, Allen wrench #5086021000

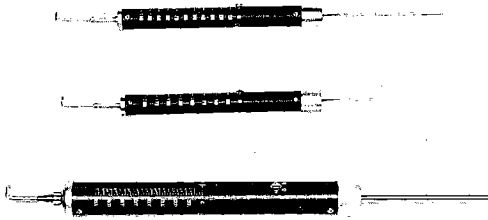


Fig. 3-1 Spring Scale

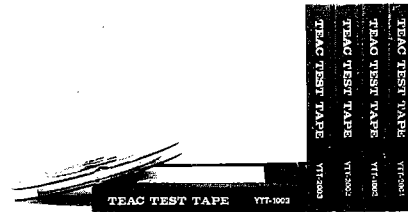


Fig. 3-2 TEAC Test Tape

FOR ELECTRICAL MEASUREMENT

TEST TAPE:	TEAC YTT-1003 for 7-1/2ips TEAC YTT-1002 for 3-3/4ips
EMPTY REEL:	TEAC RE-702 (2" hub) TEAC RE-701 (4" hub)
TEST SET:	TEAC M-826A test set (Level meter)
BAND PASS FILTER:	TEAC M-206A (1kHz)
VTVM:	hp model 4302B or equip
RESISTOR:	Non inductive type 8 ohm/1W
OSCILLOSCOPE:	General purpose

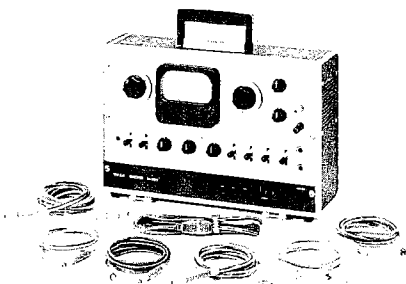


Fig. 3-3 TEAC Test Set

NOTE

Use of the TEAC M-826A test set is recommended. This set incorporates an AC VTVM, Audio Oscillator, Channel Selecting switch, Variable Attenuator, Monitor Speaker and Cables.

TEAC M-826A measures the RMS value of the voltage (0 dB = 0.775 V). Characteristics of this test set are similar to the standard VU-meter.

4. PARTIAL DISASSEMBLY

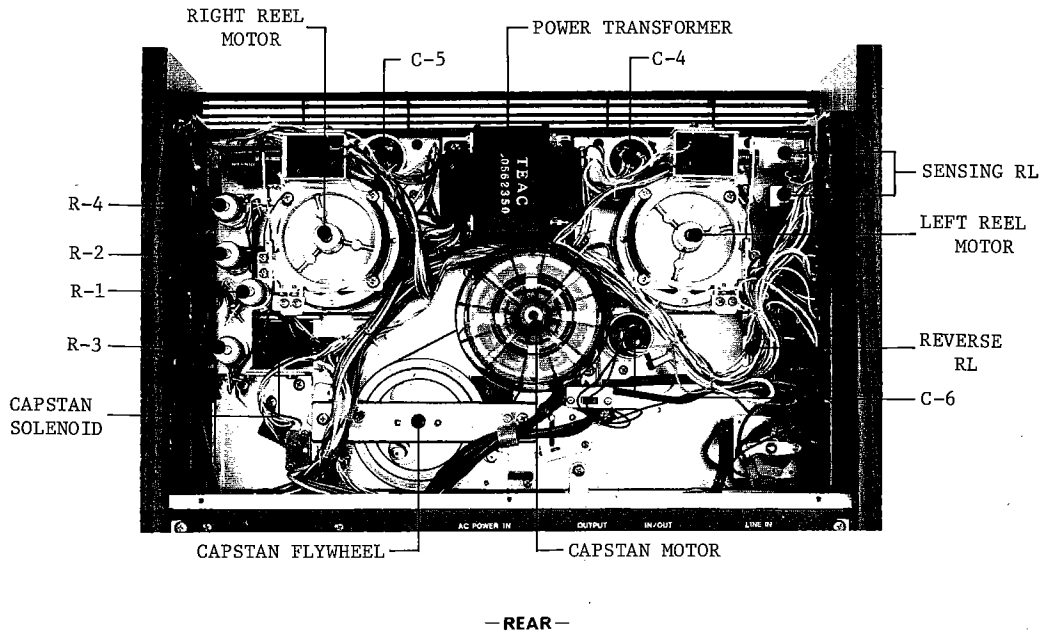


Fig. 4-1 Tape Transport Parts Location

REMOVING WOODEN SIDES AND REAR PANEL

See illustration for complete disassembly instructions.

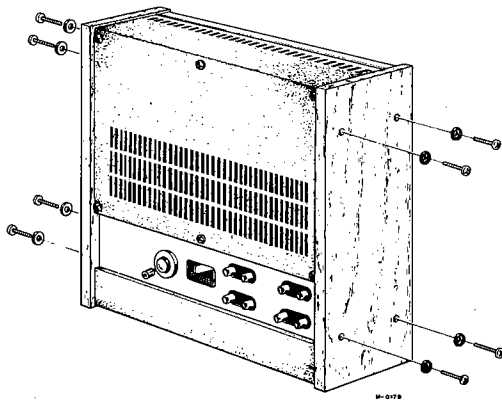


Fig. 4-2 Wood Sides

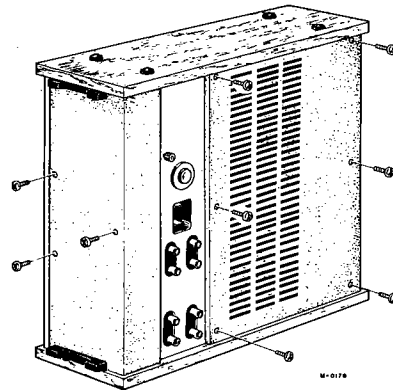


Fig. 4-3 Rear Panel and Bottom Plate

Most amplifier checks and adjustments can be made from the bottom with the plate removed.

These adjustments should be performed by experienced technicians, and then only when going through the complete test and check procedures on the unit which is being tested.

HEAD REPLACEMENT

CAUTION

Power to the unit must be switched off when removing the heads, this will prevent transient pulses from passing through the heads causing strong magnetization or damage to the delicate windings. After head replacement, thorough demagnetization is recommended.

NOTE

The heads of the A-2340R can be changed either as a complete assembly or individually as required.

HEAD ASSEMBLY REPLACEMENT

To change the head assembly as a unit, remove the two mounting screws, (one on each end).

Note the positions of the wires on the circuit board before unsoldering. Solder the wires of the new assembly in exactly the same positions.

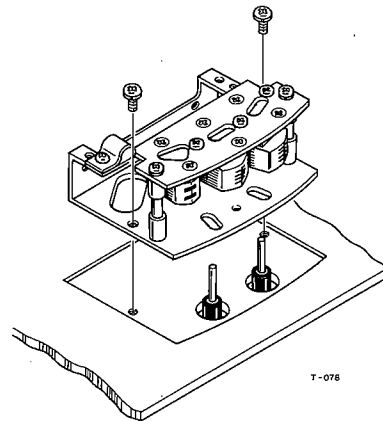


Fig. 4-4 Head Assembly Removal

HEAD REPLACEMENT

To replace a single head, a special 2mm nut driver is required. Remove the two nuts on the defective head through the access hole provided, this releases the head from the mounting plate. Note the position of the wires on the circuit board. Connect the new head in the same manner.

Replace the mounting securing the new head to the plate, perform head alignment before operation.

Head installation mounting provides for left or right positioning. After installing heads, determine proper position while recording or playing back a tape.

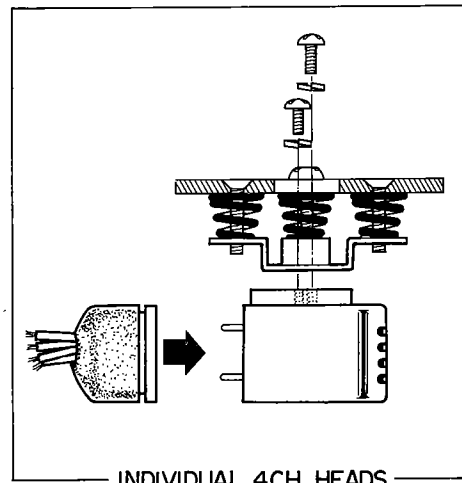


Fig. 4-5 Head Replacement

REMOVAL OF CAPSTAN MOTOR

1. Remove the three screws holding the capstan motor.
2. Unsolder the six wires connecting the capstan motor.
3. Remove the four screws holding the capstan motor.
4. Loosen the two set screws (hex head) in pulley and lift off pulley.

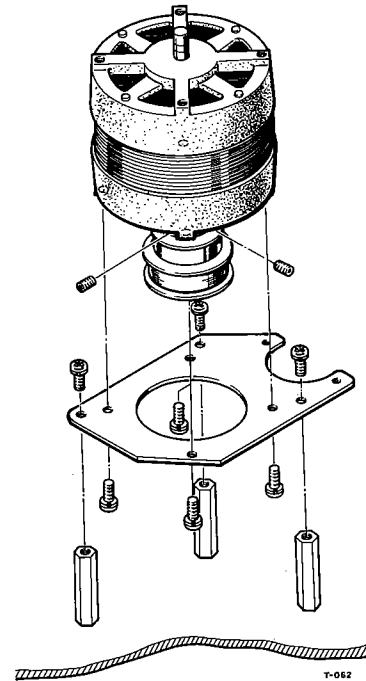


Fig. 4-6 Capstan Motor Removal

REMOVAL OF CAPSTAN ASSEMBLY

1. Unscrew capstan cover (front panel).
2. Remove two screws from rear bracket, allow bracket to drop toward floor of case.
3. Remove capstan belt.
4. Loosen two screws in capstan assy flywheel. Remove flywheel.
5. Remove three screws in capstan assy.
6. Gently move capstan assy up and down until it slides out of panel.

NOTE

A clearance of 0.01" must be maintained between the flywheel and capstan assembly.

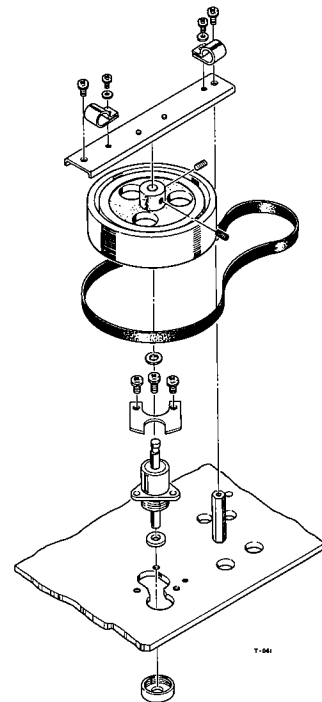
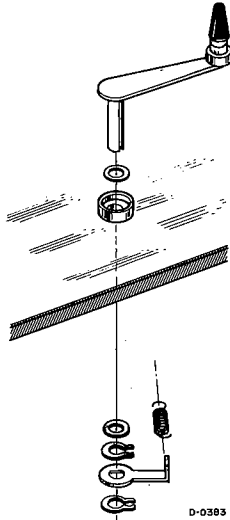


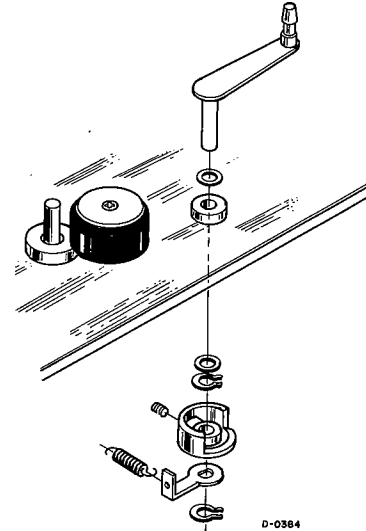
Fig. 4-7 Capstan Assy Removal

REMOVAL OF TENSION ARMS LEFT & RIGHT

See illustration for complete disassembly instructions.



LEFT



RIGHT

IMPORTANT
After reassembly check clearance to ascertain that arm moves freely and is not binding.

REMOVAL OF REEL MOTOR ASSY

1. Loosen 2 hex screws in brake drum, lift off brake drum.
2. Remove 4 screws securing the brake assembly to the motor.
3. Remove reel turntable, remove 4 screws securing motor to front panel.

NOTE

Reel motor assemblies are mirror images of each other, these assemblies are not interchangeable.

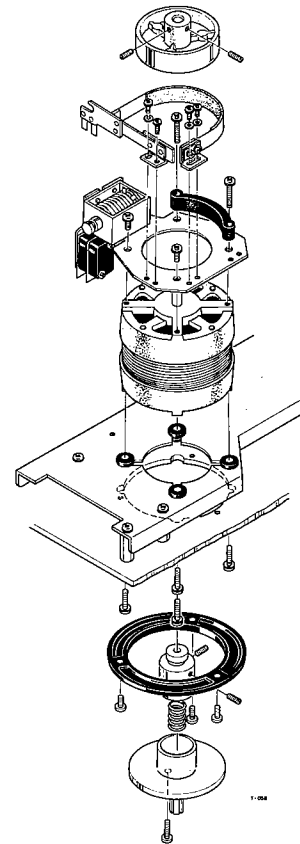


Fig. 4-8 Reel Motor Removal

5. HEAD ALIGNMENT -MECHANICAL-

NOTE

Head alignment is adjusted at the factory to very critical tolerances. Normally HEAD ASSEMBLY replacement will require only minor alignment or adjustments. Complete readjustment should only be necessary after an individual head is replaced. The adjustments are made as follows:

ERASE HEAD SECTION _____

The erase head pole should be above the edge of a threaded tape by the width of heavy pencil line.

RECORD HEAD SECTION _____

The record head pole should be above the edge of a threaded tape by the width of thin pencil line.

PLAYBACK HEAD -FORWARD- _____

The pole of the playback head should be even with the top of a threaded tape.

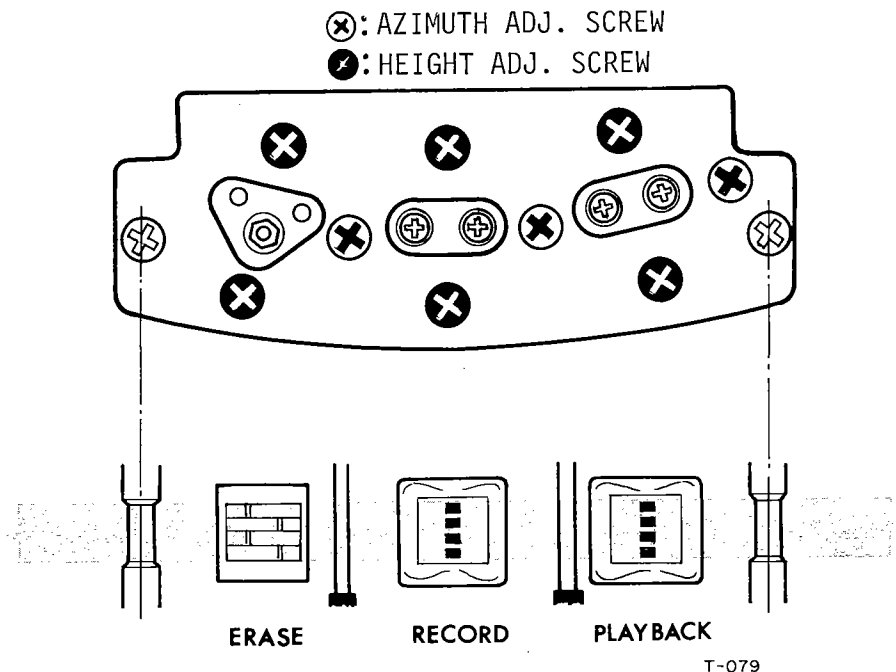


Fig. 5-1 Head Alignment and Adjustment Screws.

NOTE

Azimuth adjustments are given in the section on MEASUREMENTS and ADJUSTMENTS -ELECTRICAL-.

MECHANICAL MIS-ALIGNMENT OF THE HEADS -EXAMPLES-

ALIGNMENT - The physical positioning of a tape head relative to the tape itself. Alignment in all respects must conform to rigid requirements in order for a unit to function properly.

AZIMUTH - The angle of a tape heads pole-piece slot relative to the direction of tape travel.

NOTE

In order for a tape unit to work at its best, with its own tapes as well as ones made on other units, its play and record heads must be aligned to correct the four possible errors as illustrated to the right.

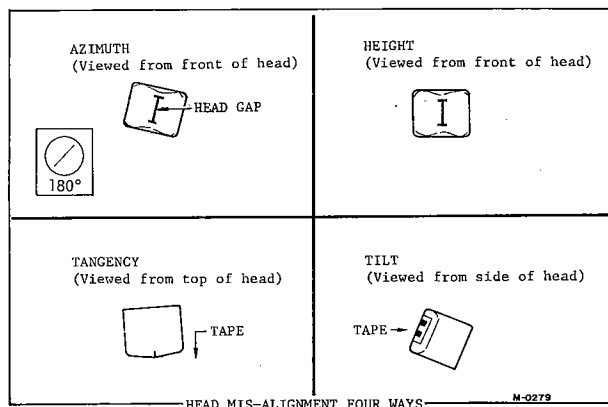


Fig. 5-2 Head Mis-Alignment Four Ways

HEAD WIRING

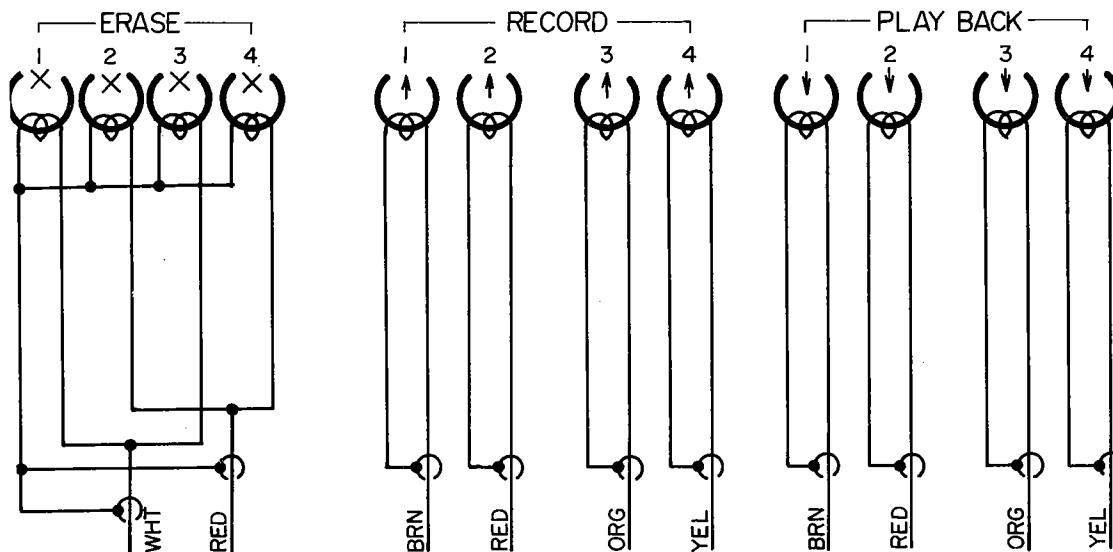


Fig. 5-3 Head Wiring

6. MEASUREMENT AND ADJUSTMENT -MECHANICAL-

The TEAC A-2340R uses a highly reliable three motor drive system and should require a minimum of mechanical maintenance or adjustment.

These adjustments are made at the factory. Readjustment should only be required after many hours of operation or component replacement.

PINCH ROLLER PRESSURE _____

NOTE

Pinch roller pressure is supplied by the pinch roller spring arm and it is most important that the solenoid plunger be fully bottomed before taking pressure measurement.

Procedure for Check and Adjustment

1. Load tape or block the shut-off arm in the ON position.
2. Attach a suitable spring scale to the pinch roller shaft.
3. Place the unit in the PLAY mode (▶), and holding the spring scale as illustrated, slowly draw it away from the pinch roller.
4. Do not allow the string to rub against the pinch roller.
5. Note the reading on the spring scale at the instant the pinch roller stops rotating.
6. The scale should indicate 2.1~2.3 kg. Optimum value is 2.2 kg.
7. If needed adjust solenoid limit position so that the gap between capstan shaft and pinch roller is approximately 7mm when solenoid is not actuated. Limit is adjusted by loosening the mounting screw (A) (mount slot is elongated), slide limit until proper gap is obtained.

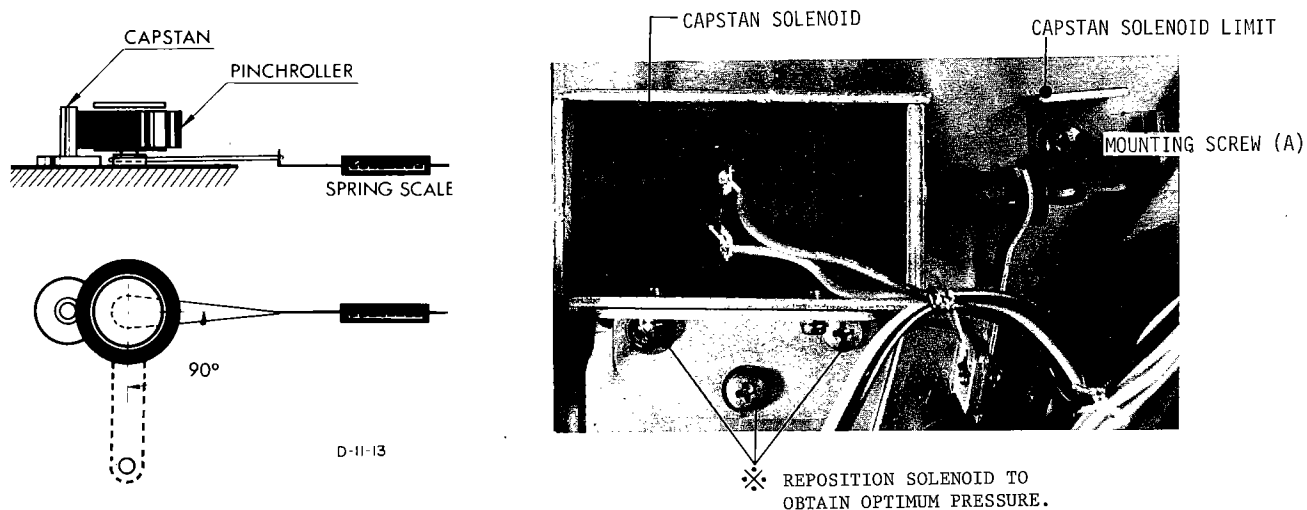


Fig. 6-1 Pressure Measurement -Pinch Roller-

TORQUE ADJUSTMENT PROCEDURE

IMPORTANT

Be sure the full required line voltage is applied and that the unit is set to the proper line frequency.

1. Measure the back tension of the left reel motor and the take-up torque of the right reel motor.
2. Adjust R-1 (50 Ω) if measurement value of right or left reel motor exceeds the specified limits. (Coarse adjustment)
3. After adjusting R-1, adjust R-2 to bring back tension and take-up torque to exact specified limits.

NOTE

Adjustments will interact. Several adjustments may be required to bring both motors within specifications.

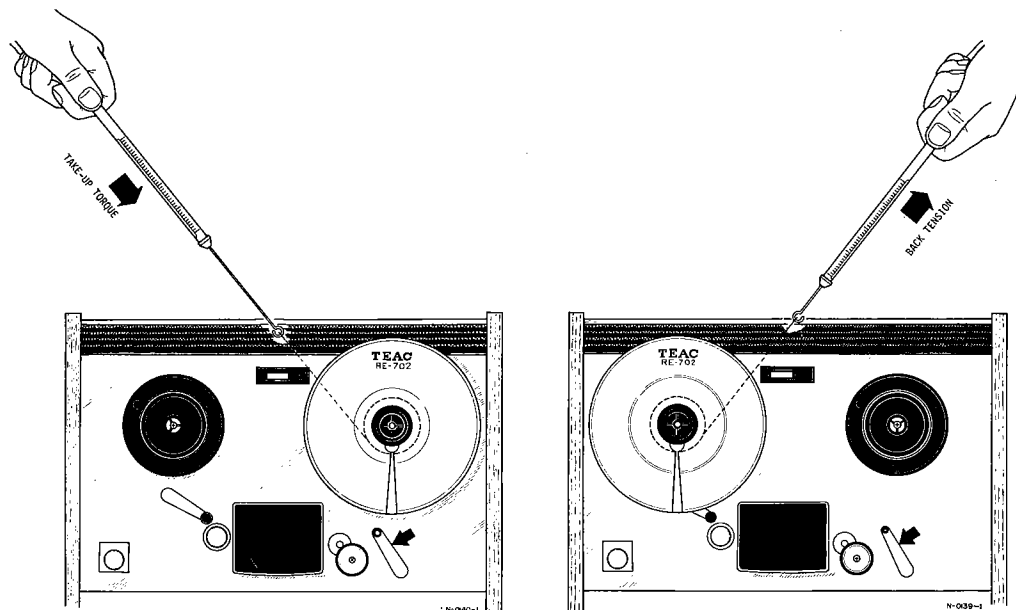
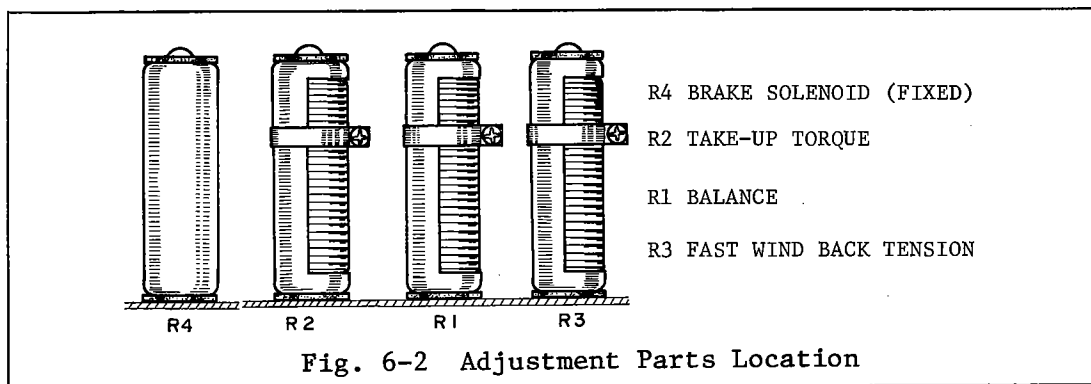


Fig. 6-3 Torque Measurement

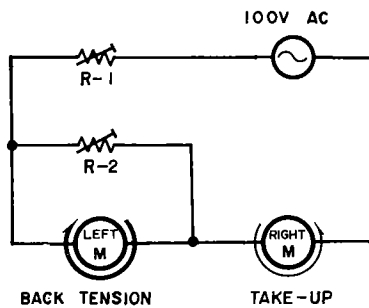
TORQUE MEASUREMENT PROCEDURE

BACK TENSION

1. Block the shut-off arm in the ON position.
2. Place an empty 7" reel with a 2" diameter hub on left reel table.
3. Rotate the reel and wind several turns of string around the hub. Attach spring scale to string.
4. Place the unit in the (▶) play mode.
5. Pull the scale away from the reel against the motor torque, with a steady smooth motion.
6. Note the scale reading while it is in steady motion.
7. Make sure the string does not rub against the reel flanges.
8. The reading should be approximately 180~220g-cm (2.8~3.1 oz-inch).

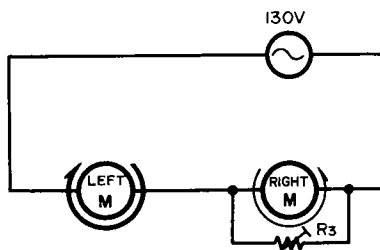
TAKE-UP TORQUE

1. Place the empty reel and attached spring scale on the right reel table.
2. Place the unit in the (▶) play mode.
3. Allow the rotation of the reel to slowly draw the scale toward the hub.
4. Hold the spring scale with enough force to allow a steady reading.
5. It should be approximately 360~400g-cm (4.1~4.8 oz-inch).



REWIND BACK TENSION

1. Load a full 1,800ft reel of tape on the right reel table.
2. Place the empty reel with 2" hub on the left reel table.
3. Place the unit in the fast rewind mode.
4. At this time observe the right tension arm. Adjust R-3 so that the arm moves approx. 1" to the right and remains there.



NOTE

The brake torque is actuated mechanically. Pressure is set by the variable spring force. While making this measurement and adjustment, be careful not to bend the brake bands. As brake torque will change with cleaning, brake drums and brake shoes should be cleaned only when absolutely necessary. If cleaning is required, use TEAC cleaner TZ-251B only. After cleaning operate the machine for many days before performing the procedures below.

Brake adjustments are made with no power connected to the equipment.

Procedure for Check and Adjustment

1. Place an empty 2" hub reel on the left reel table, and fasten one end of a 30" length of string to the reel anchor.
2. Wind several turns of string counterclockwise around the hub and attach a suitable spring scale to the free end of the string. Slowly draw the spring scale away from the reel, making sure that the string does not rub against the reel flanges.
3. Take a reading only when the reel is in steady motion since the force required to overcome static friction will produce a false, excessively high initial reading.
4. The reading should be 1.8 kg-cm \pm 0.1 kg (25 oz-inch).
5. If adjustment is required, loosen the two screws shown and position the brake for optimum torque.
6. The adjustment of the right brake is the same, with the exception that rotations are clockwise.

NOTE

The difference in readings between the right and left brakes should be kept within 50 g-cm (0.7 oz-inch).

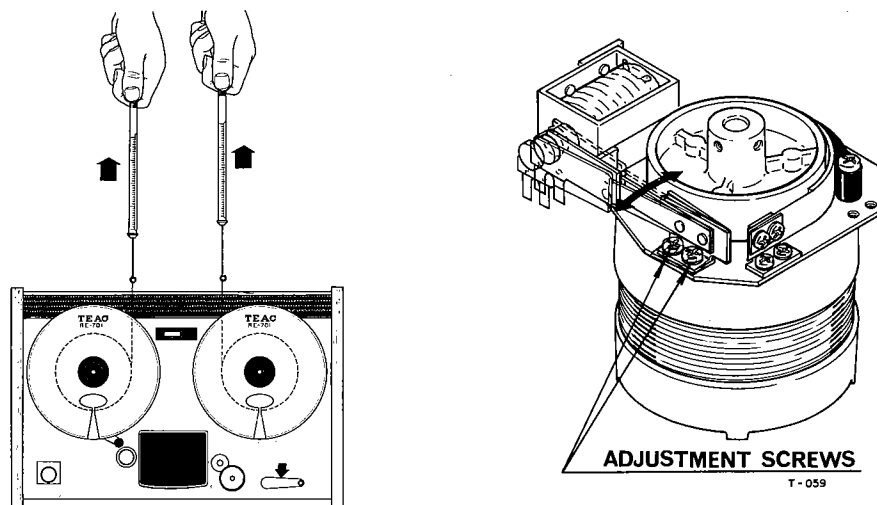


Fig. 6-4 Torque Measurement and Adjustment Location
-Brake-

REEL HEIGHT ADJUSTMENT

Reel height adjustment is required only if a motor has been replaced or if tape rubs excessively against the reel. Adjustment is accomplished by FINE ADJ. screw in the reel turntable. Reel turntable height should be adjusted using standard 7" reels. With a tape threaded on the machine, position the reel height for smooth tape travel.

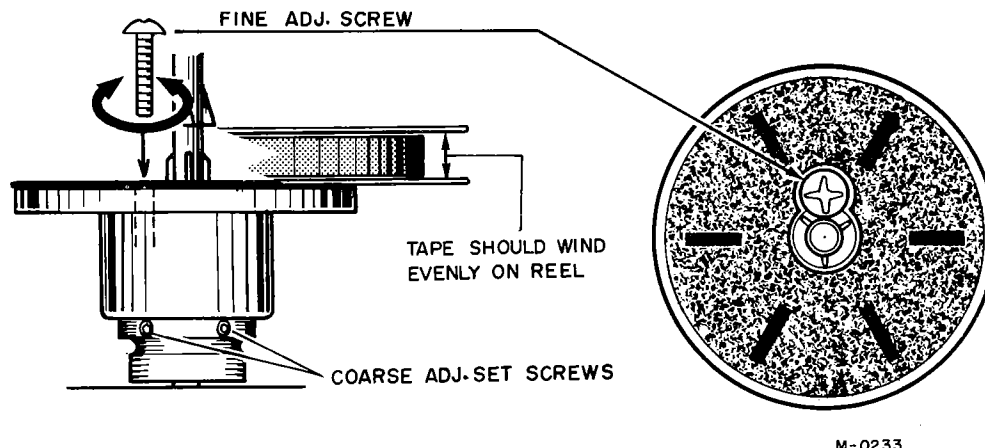


Fig. 6-5 Reel Height Adjustment Location

FLUTTER

Flutter should be measured in playback mode using a TEAC flutter free tape YTT-2003.2002 and Meguro model MK665B flutter meter. Measurement of flutter should be made in accordance with NAB standards.

Values obtained with different standards or equipment cannot be compared.

Flutter should not exceed. 7-1/2ips: 0.20%
3-3/4ips: 0.25%

These figures apply to any tape position and direction (such as full take-up reel, full supply reel or about mid point).

TAPE SPEED

The tape speed should be measured using TEAC flutter free tape, model YTT-2003.2002. These tapes contain a highly accurate 3 kHz tone. Connect a digital frequency counter to either line OUTPUT jack. The indicated frequency should be 3 kHz $\pm 0.7\%$ for all speeds.

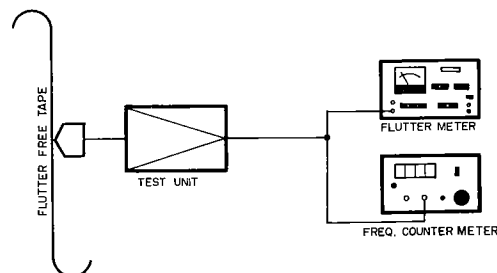


Fig. 6-6 Test Equipment Set-up

VOLTAGE AND FREQUENCY CONVERSION

Unit must be set to the power line frequency available. Improper frequency setting will result in a 20% error between the tape speed and reel motors torque.

NOTE

US model is preset to 117V AC and 60 Hz. No frequency conversion is required. If it should be necessary to convert the A-2340R deck to operate from a power source of different voltage or frequency, it may be easily accomplished as follows:

Voltage Conversion:

The A-2340R may be set for 100, 117, 200, 220 or 240 volts. To change the voltage unscrew the fuse in the center of the voltage selector plug. Pull out the plug and reinsert it so the desired voltage shows in the cut-out. Reinstall the fuse.

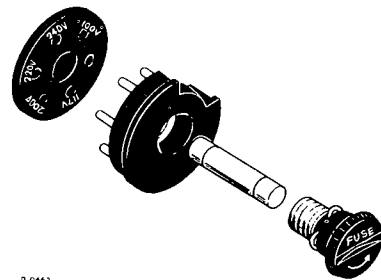


Fig. 6-7 Voltage Conversion

Frequency Conversion:

1. Remove the power cord and all connecting cables.
2. Take off tape deck rear cover by removing the six screws holding it.
3. To convert the unit from 50 to 60 Hz operation reposition the capstan belt as shown in the illustration below.
4. Slide frequency selector switch inside the rear of the tape deck must be switched to the frequency of the power line.
5. Reinstall rear cover.

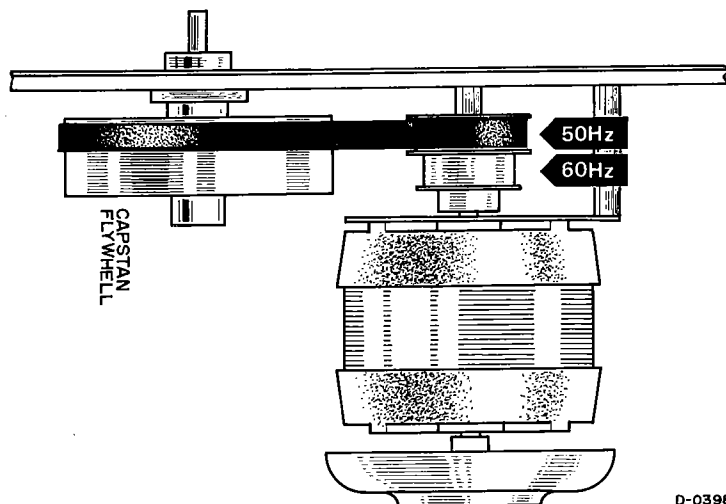


Fig. 6-8 Frequency Conversion

7. MEASUREMENT AND ADJUSTMENT — ELECTRICAL —

GENERAL NOTICE

Outlined procedures refer only to **FRONT** channels, the same procedures also apply to **REAR** channels.

Before performing maintenance on this unit, thoroughly clean and demagnetize the entire tape path.

TEAC maintenance equipment to be used:

TEAC TZ-261 A/B for cleaning

TEAC TZ-255 A/B for oiling

TEAC E-1 for demagnetizing

Place **MONITOR** switches (L1-R3, L2-R4) in **TAPE** position, place **TAPE SPEED** control at **H**(high), place **PLAY** switch in **4 CHAN** position.

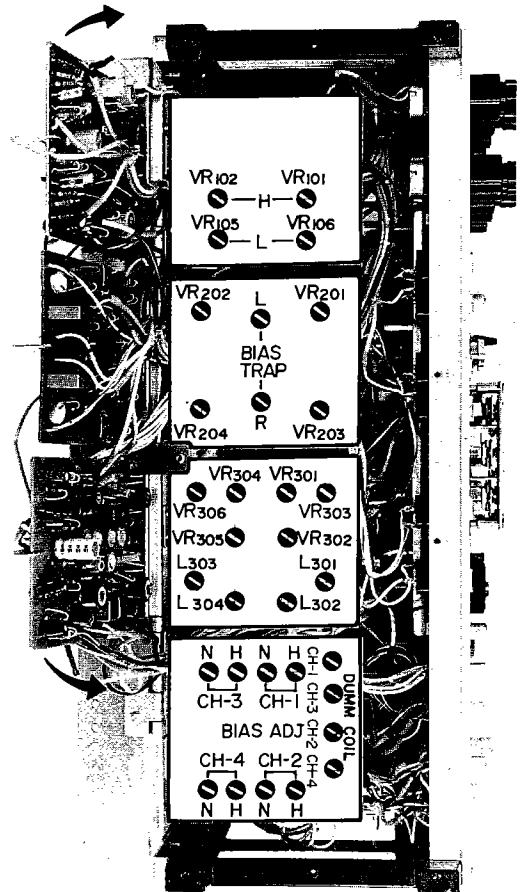
Power supply check and adjustment.

Check the voltage at VR-1 and adjust to +23V DC if required. (Refer to control board on the schematic diagram).

Procedures for checks and adjustments, unless otherwise indicated, are for the left channel at a tape speed of 7-1/2ips. The same procedures are to be applied to the other channels and again for both channels at 3-3/4ips. All controls mentioned in this book will be printed in bold letters and will be exactly as they appear on the unit.

Double designated symbol numbers refer to left channel/right channel.

Only **FRONT** adjustments are illustrated, **REAR** adjustments are identical.



T-085

Fig. 7-1 Adjustment Location

L CHANNEL	R CHANNEL	LOCATION
VR101	VR102	PLAYBACK EQ. (HIGH)
VR105	VR106	PLAYBACK EQ. (LOW)
VR201	VR203	PLAYBACK LEVEL
VR505	VR506	REV PLAYBACK LEVEL
VR202	VR204	PLAYBACK METER LEVEL
VR303	VR306	REC METER LEVEL
VR301	VR304	SOURCE MONITOR LEVEL
L 301	L 303	REC EQ.
VR302	VR305	RECORD LEVEL
L 302	L 304	BIAS TRAP
VC501	VC503	BIAS NORMAL ADJ.
VC502	VC504	BIAS HIGH ADJ.

PLAYBACK PERFORMANCE

PLAYBACK HEAD AZIMUTH ADJUSTMENT

Coarse Adjustment

1. Connect a level meter to either OUTPUT jack.
2. Thread a TEAC test tape YTT-1003 on the unit.
3. Play the 15 kHz test tone in section 2 of the test tape.
4. Slowly rotate the azimuth screw until maximum indication is obtained on the level meter.

NOTE

If during playback, a slight pressure on the heads results in a rise of the reading of the level meter, head alignment adjustments should be accomplished.

Fine Adjustment

CAUTION

After coarse adjustment, do not make large corrections, turn azimuth screw 1/4 turn or less.

5. It is absolutely essential to accomplish the coarse adjustment before using this method to avoid phase errors larger than 45°.
6. Connect the test equipment as shown in Fig. 7-2.
7. Play a 10 kHz signal and adjust the azimuth screw until the oscilloscope shows that the signals are less than 45° in phase.
8. Secure the screw with a drop of LOCTITE.

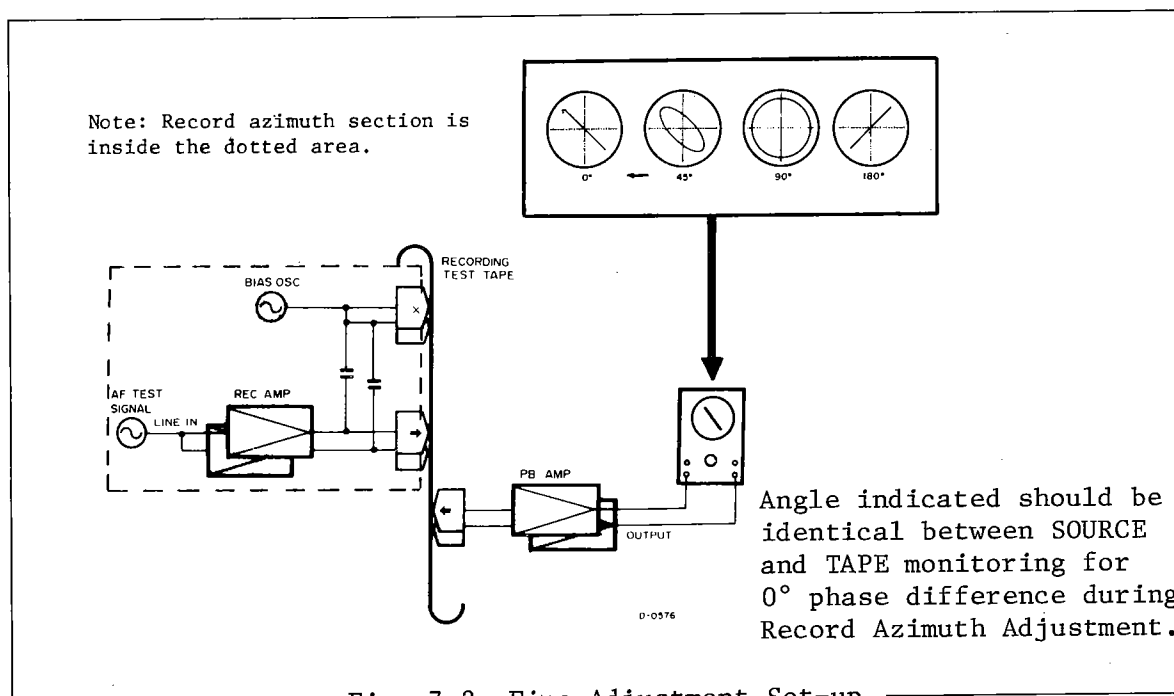


Fig. 7-2 Fine Adjustment Set-up
-Head Azimuth-

SPECIFIED OUTPUT LEVEL SET

Connect a 10k Ω load to the OUTPUT jacks when not using TEAC M-826A (0 dB = 0.775V) output meter.

1. Play the 400 Hz tone in section 1 of the test tape. This tone is recorded at operating reference level (1% of the THD level).
THD: Third Harmonic Distortion
2. Turn the OUTPUT controls fully clockwise, and adjust VR-201/203 for -2 dB reading on level meter.
3. Then retard OUTPUT controls until a -8 dB is obtained on the level meter at the OUTPUT jacks.
4. Align the reference marks of the 4 OUTPUT controls so that they are positioned alike. This will be at approximately the two o'clock position.

IMPORTANT

This is the specified output level set. Do not disturb this setting until the remaining adjustments have been completed.

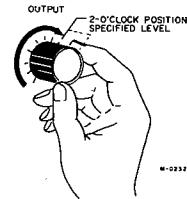
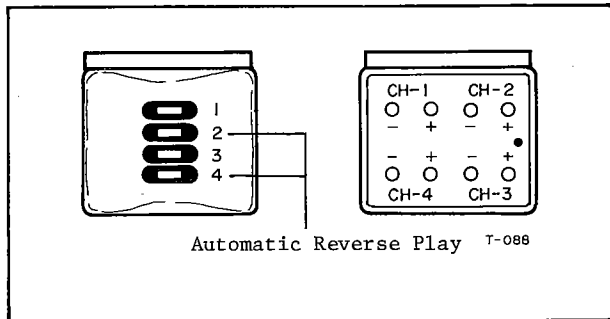


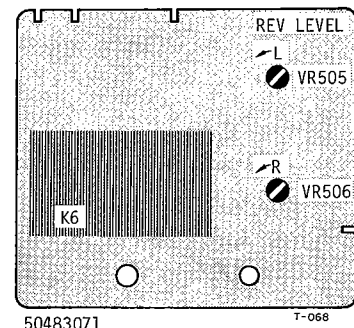
Fig. 7-3 Output Level Setting

REVERSE LEVEL CHECK

5. Place the unit in the REVERSE mode (◀).
6. Adjust VR 505/506 to obtain a specified output level of -2 dB at OUTPUT jacks.
7. Retard OUTPUT controls to obtain a level of approximately -8 dB at OUTPUT jacks.
8. Leave controls as set. Begin Forward playback and VU meter should indicate -8 dB \pm 0.5 dB all channel.



4 CH Head Configuration



Reverse PC Board

VU METER CALIBRATION

1. While playing the 400 Hz tone (1% THD) in section 1 of the test tape.
2. With MONITOR switches FRONT and REAR in the TAPE position, adjust VR-202/204 for a reading of 0 VU on the VU meters.

FREQUENCY RESPONSE

5. Set TAPE SPEED to H (high) position. Using test tape YTT-1003, play the test tones from 15 kHz down to 40 Hz (recorded at 10 dB below operating reference level).
6. Compare the readings obtained on the level meter with the response limits given in figure 7-4.
7. In case of any deviation in the response curve, check head azimuth alignment, clean the heads, then adjust VR-101/102 for the best response.
8. Set TAPE SPEED to L (low) using test tape YTT-1002. Adjust VR-105/106 as in H (high) position.

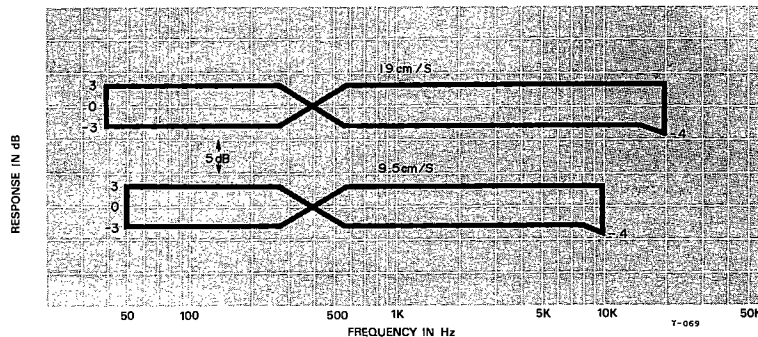


Fig. 7-4 Frequency Response Limits -Playback-

SIGNAL TO NOISE RATIO

IMPORTANT

OUTPUT control should be at specified output level. The signal to noise ratio must meet factory standards. The values given are obtained using an unweighted level meter while the supply and take-up motors have voltage applied but are not rotating. The values are with reference to a 3% THD peak recording level.

1. Thread a tape on the unit, leaving the tape outside the capstan and pinch roller. Tension arm should be in ON position.
2. Place the unit in the PLAY mode (▶) (the tape will not move).
3. The level meter connected to the OUTPUT jacks should indicate -56 dB or less.
4. This corresponds to a signal to noise ratio of 48 dB (difference between residual noise -56 dB and specified output level -8 dB for 1% THD).

For a 3% THD signal to noise ratio, 6 dB is added, giving 56 dB (3% THD is 6 dB above 1% THD level).

MONITOR PERFORMANCE

MINIMUM INPUT LEVEL _____

LINE Input

With OUTPUT controls at specified output level

1. Connect an AF oscillator to the LINE IN jacks.
2. Apply a 400 Hz signal at -18 dB.
3. Place the MONITOR switches FRONT and REAR in the SOURCE position and turn the LINE controls fully clockwise.
4. Adjust VR 301/304 to obtain a specified output level of -8 dB at OUTPUT jacks.

MIC Input

5. After adjusting VR 301/304, apply a 400 Hz signal at -70 dB to the MIC IN jacks.
6. Rotate the MIC controls fully clockwise.
7. The output should be -8 dB (specified output level).

SPECIFIED INPUT LEVEL SET _____

With OUTPUT controls at specified output level

8. Apply a 400 Hz signal at -8 dB to the LINE IN jacks.
9. Adjust the line controls for -8 dB at the OUTPUT jacks.

NOTE

Do not disturb the specified input level position of these controls until the remaining checks and adjustments are completed. The difference between the channels must not exceed ± 2 dB as indicated on the level meter. If they are not within limits, check the amplifier gain and the LINE control settings.

VU METER CALIBRATION -RECORD- _____

10. With the same 400 Hz signal at -8 dB applied and the MONITOR switches FRONT and REAR in SOURCE, adjust VR 303/306 for 0 VU on the VU meters.

