

SYLVANIA® Models VC4243AT01, VC4263AT01

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WARRANTY WARNING: Removal of the top or bottom covers or service work performed by anyone other than a manufacturer's authorized service representative may void the manufacturer's warranty on your VCR.

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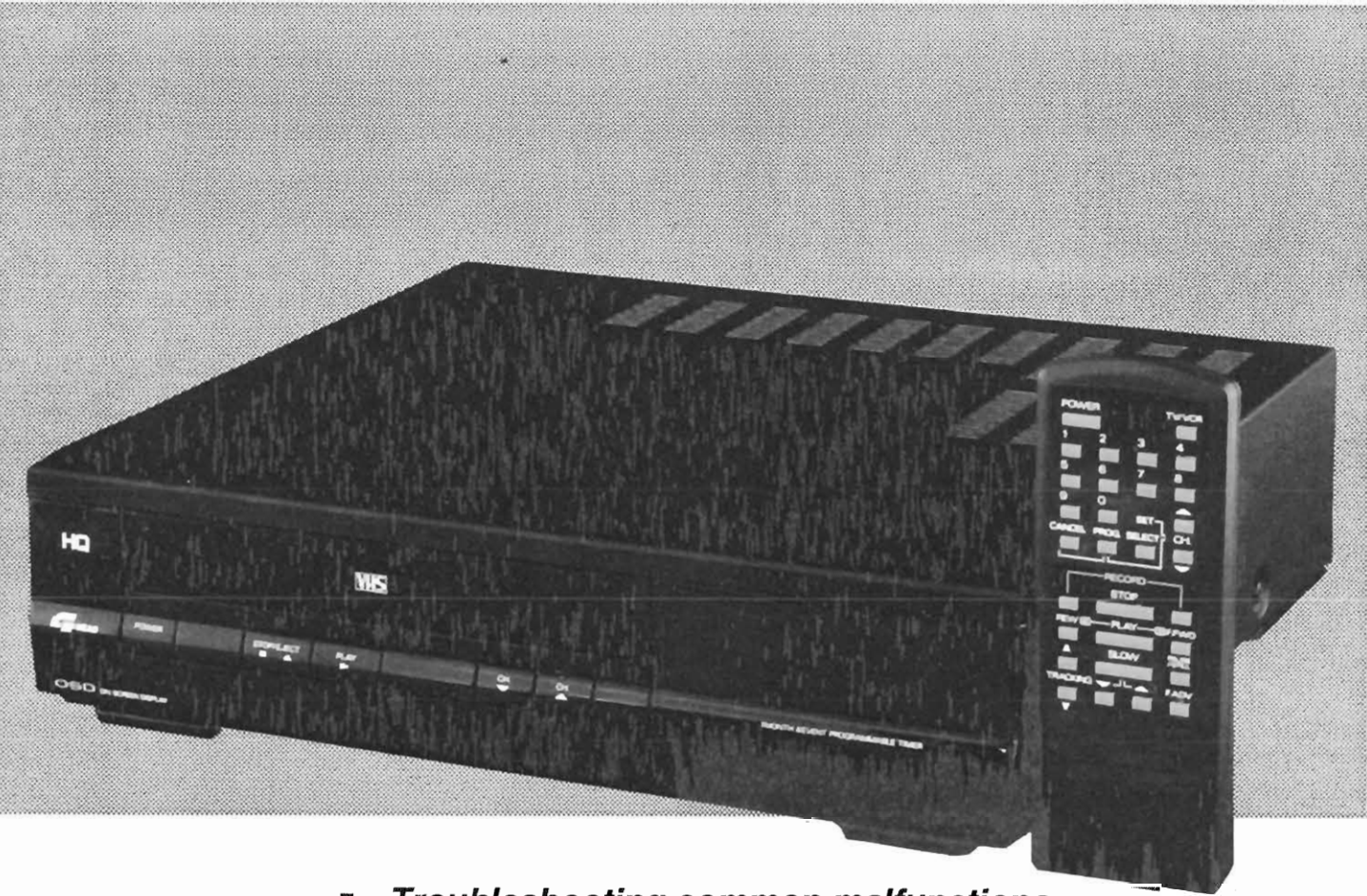
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V C R F A C T S™ VCR66027 MAINTENANCE & REPAIR DATA

Easily repair the top 75% of VCR problems

SYLVANIA® Models VC4243AT01, VC4263AT01



- Troubleshooting common malfunctions
- Guide to disassembly
- Step-by-step servicing and repair
- Mechanical and electrical parts lists

PROMPT™ PUBLICATIONS

VCR66027 SYLVANIA

CARE OF THE VCR

Power Precautions

- This VCR is equipped with a polarized AC plug made to fit into a polarized AC power outlet. Do not defeat the AC plug safety feature.
- Do not allow anything to rest on the AC power cord.
- Periodically examine the power cord for damaged or cracked insulation.
- During electrical storms, unplug the VCR to avoid power surges which could damage the machine.

Safe Environment

- The VCR cabinet is equipped with vents to prevent heat buildup. Never block, cover, or otherwise obstruct these vents with doilies, tapes, or other objects.
- Instruct small children not to drop or push objects into the vents. Better still, put the VCR out of their reach.
- Do not use liquids near the VCR. Do not put potted plants on the unit, because watering them

invites accidents. If liquid is accidentally spilled on or near the unit, unplug it from the wall outlet and allow it to dry normally. Do not use a blow dryer to dry it off, as some parts could be damaged by the concentrated flow of hot air.

- High humidity affects the delicate electronic parts in the VCR. Most units are equipped with dew sensors that prevent it from operating when the humidity is too high.

Routine Cleaning

- Dust the VCR as often as you would your fine furniture. Special dust covers are available commercially for further protection.
- When the cabinet needs a more thorough cleaning, first unplug the unit from the AC power supply. Do not spray pump or aerosol cleaners directly on the VCR. Instead, apply the cleaner to a soft cloth and then wipe the cabinet.
- *Hint:* Run a high quality blank tape through the unit once or twice a month to keep the audio/video heads clean.








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VCRFACTS Department WF
Howard W. Sams & Company
2647 Waterfront Parkway East Drive
Indianapolis, IN 46214

Item	Type No.	Mfr. No.	NTE No.	ECG No.	TCE No.
Q321,22	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q501	DTC144ES	4835-130-47479	NTE2359	ECG2359	SK9959
Q501 (1)	DTC124ES	4835-130-47353	NTE2357	ECG2357	SK9742
Q502	DTC124ES	4835-130-47353	NTE2357	ECG2357	SK9742
Q503	DTC143XS	4835-130-47458			
Q504	DTC114ES	4822-130-60588	NTE2355	ECG2355	SK9957
Q505,6	DTC143XS	4835-130-47458			
Q507	DTA124ES	4835-130-47397	NTE2358	ECG2358	SK9741
Q509,10	DTC124ES	4835-130-47353	NTE2357	ECG2357	SK9742
Q511	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q512	2SA933(Q)	4835-130-47442	NTE290A	ECG290A	SK9132
Q513	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
# Q601	2SB941P	4835-130-47545	NTE55	ECG55	SK3441
Q651	2SB1010(Q)	4835-130-47425			SK9454
Q652	2SD1384(R)	4835-130-47432			SK9453
Q653,54	2SA1317(S)	4835-130-47422	NTE2362	ECG2362	
Q655	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q661,62	DTC124ES	4835-130-47353	NTE2357	ECG2357	SK9742
Q663	DTA124ES	4835-130-47397	NTE2358	ECG2358	SK9741
Q664,65	DTA143XS	4835-130-47544			
Q701	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q751	2SA933(Q)	4835-130-47442	NTE290A	ECG290A	SK9132
Q752,53	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q801,2,3	2SA933(Q)	4835-130-47442	NTE290A	ECG290A	SK9132
Q804,5,6	DTC124ES	4835-130-47353	NTE2357	ECG2357	SK9742
Q851	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q852	DTC124ES	4835-130-47353	NTE2357	ECG2357	SK9742

For SAFETY use only equivalent replacement part.
(1) Used in power supply.

Participating Vendors

EVG / A Division of Russell Industries, Inc. 3000 Lawson Blvd. Oceanside, NY 11572 516-536-5000	 industries, inc.	VCR Belts	Philips ECG, Inc. (A North American Philips Company) Distributor & Special Markets Div. 1025 Westminster Dr. Williamsport, PA 17701 717-323-4691	 Semiconductors
GC-THORSEN 1801 Morgan St. Rockford, IL 61105-1209 815-968-9661		VCR Belts	Projector Recorder Belt Corp. P.O. Box 176 Rte 3, Hwy 59 Whitewater, WI 53190	 VCR Belts
NTE Electronics, Inc. 44 Farrand St. Bloomfield, NJ 07003 201-748-5089		Resistors Semiconductors	Thomson Consumer Electronics, Inc. Distributor and Special Products 2000 Clements Bridge Rd. Deptford, NJ 08096-2088 609-853-2555	 Semiconductors
			Workman Electronic Products, Inc. 11917 County Rd. 10-2 Delta, OH 43515 800-537-7103 FAX 419-923-7145	 VCR Belts



Semiconductors

Item	Type No.	Mfr. No.	NTE No.	ECG No.	TCE No.
D501 - D506	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D507	MTZ6.2B	4835-130-37399	NTE5013A	ECG5013A	SK6A2
D508	MTZ7.5B	4835-130-37405	NTE5015A	ECG5015A	SK7A5
D509 - D514	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D517 - D519	1SS254	4835-130-37145	NTE519	ECG519	SK3100
# D602,3	1N4003	4835-130-37047	NTE552	ECG552	SK9000
# D604	MTZ30A	4835-130-37335	NTE5035A	ECG5035A	SK30A
# D605	BR32J01	4835-130-37471	NTE5313	ECG5313	SK3986
# D606,7,8,9	1N4003	4835-130-37337	NTE552	ECG552	SK9000
# D610	MTZ6.2B	4835-130-37399	NTE5013A	ECG5013A	SK6A2
D651 - D654	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D656	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D701,2	MTZ16C	4835-130-37404	NTE5025A	ECG5025A	SK16A
D703	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D802	MTZ9.1B	4835-130-37402	NTE5018A	ECG5018A	SK9A1
D803	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D805 - D809	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D811	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D816 - D819	1SS254	4835-130-37145	NTE519	ECG519	SK3100
D820,21,23,24		4835-130-87055			
D825 - D830		4835-130-87056			
D831,32		4835-130-87055			
D833,35	1SS254	4835-130-37145	NTE519	ECG519	SK3100
IC1	BA7274S	4835-209-87564			
IC201	BA7767AS	4835-209-87269			
IC301	BA7743S	4835-209-87554			
IC321	BA7703K1	4835-209-87562			
IC322	BA15218N	4835-209-87563			
IC323	AN78M09F	4835-209-87553			
IC501	MN67520IFVCS	4835-209-8755			
IC502	PST529D-2	4835-209-87266			
IC503	BA6209N	4835-209-87271	NTE519	ECG519	SK3100
IC504	BA6219B	4835-209-87268			
IC505,6	BA728	4835-209-87262			
# IC602	AN78L18	4835-209-87552			
# IC603,4	AN7812F	4835-209-87283	NTE966	ECG966	SK3592
# IC651,52	NJM78M05FA	4835-209-87274	NTE960	ECG960	SK3591
IC653	BA7021	4835-209-87559			
IC761	CXA1124AS	4835-209-87565			
IC801	75212ACW	4835-209-87556			
IC802	MN1280L	4835-209-87114			SK9738
IC803	MN1280R	4835-209-87342	NTE15044		SK9854
IC804,5	BA6154	4835-209-87561			
IC851	6450CX-506	4835-209-87557			
Q1	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q2	2SC2058(P)	4835-130-47275	NTE85	ECG85	SK9229
Q3	2SC1740(Q)	4835-130-47435	NTE85	ECG85	SK3122
Q201	2SC2060(Q)	4835-130-47427	NTE293	ECG293	SK3849

MAINTENANCE SCHEDULE

To keep your VCR in top working condition, we recommend the following periodic cleaning, lubricating, and part replacement schedule. The schedule is presented in number of tapes because every user's viewing habits are unique. For example, if you record or watch one 2-hour tape per evening, you should service a new unit after approximately 8

months (250 tapes). To simplify keeping track of the schedule, we recommend that you keep a log of any maintenance performed on the VCR.

Date purchased: _____
From: _____
Serial number: _____

Every	What to do	Which parts	How to	Date done
250 tapes	Clean	Audio/control head	See page 10	_____
		Capstan shaft	See page 19	_____
		Full erase head	See page 12	_____
		Pinch roller	See page 19	_____
		Impedance roller	See page 19	_____
		Reel assemblies	See page 13	_____
		Video heads	See page 11	_____

500 tapes	Grease	Loading cam	See page 23	_____
		Loading gear plate	See page 23	_____
		Right tape loading gear	See page 23	_____
		Tape guide tracks	See page 18	_____

	Oil	Reel assemblies	See page 13	_____

1000 tapes	Replace	Brake arm assemblies	See page 13	_____
		Capstan motor	See page 20	_____
		Reel drive assembly	See page 18	_____
		Drive belt	See page 22	_____
		Front loading belt	See page 22	_____
		Impedance roller	See page 19	_____
		Loading belt	See page 22	_____
		Main belt	See page 22	_____
		Pinch roller	See page 19	_____
		Back tension band	*	_____
1500 tapes	Replace	Upper drum	See page 11	_____

		Audio/control head	*	_____
		Drum ground	See page 11	_____
		Full erase head	See page 12	_____
		Loading motor	See page 20	_____
		Reel assemblies	*	_____

*This operation requires delicate adjustments that should be attempted only if you have the training and special equipment for that purpose. See the manufacturer's documentation.

HOW THE VCR WORKS

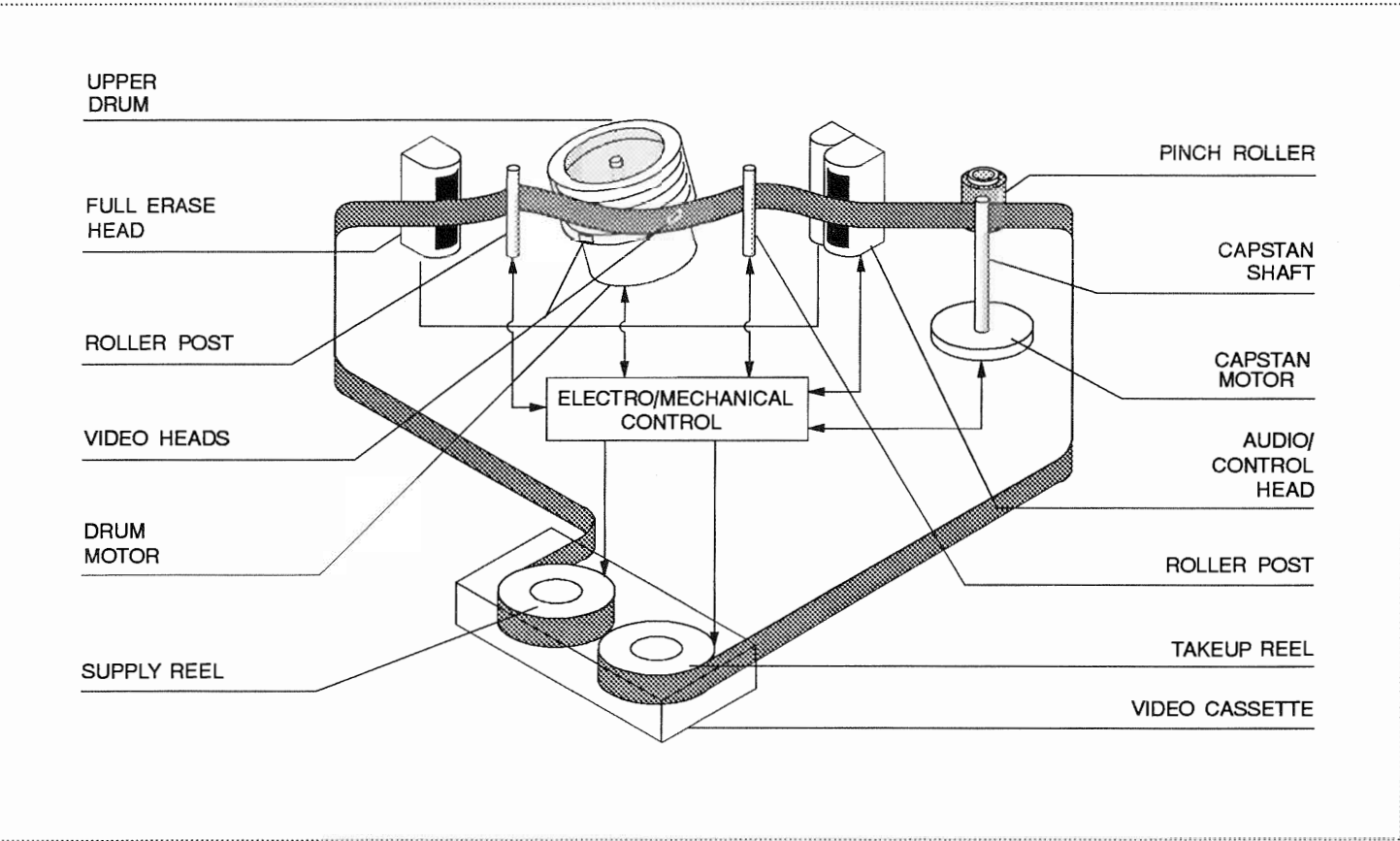
When you power up the VCR and insert a cassette, the cassette loading assembly pulls the cassette down and settles it onto the supply and takeup reel assemblies. When you push Record or Play, the upper drum, driven by the drum motor, starts to spin as the roller posts pull the tape out of the cartridge. The roller post move along the input/output tape guide tracks and wrap the tape approximately three-fourths of the way around the upper drum, which houses the video heads. At the same time, the drum motor unit begins to turn the capstan shaft. The pinch roller moves in and squeezes the tape against the capstan shaft so that the capstan motor can pull the tape through the machine. Meanwhile the takeup reel assembly is activated and rotates to pull the tape back into the cassette. Various rollers regulate the tension and the path of the tape.

As the tape moves through the tape path, it passes various heads whose function is to pick up, record, or

erase the electromagnetic signals on the tape. These are the signals that the VCR sends or receives from the TV monitor as pictures and sound. Accurate pictures and sound are possible because an electromechanical control (EMC) system carefully synchronizes the relative speeds of the drum motor (that moves the video heads) and the capstan motor (that pulls the tape).

When you select Rewind, the EMC system changes the direction the capstan motor turns, and a gear arrangement sets up for high-speed reverse tape travel. Brake pads and a back tension band slow the reel assemblies for a smooth flow of tape. An end-of-tape sensor controls shutoff at the end of the rewind.

Complex electronic circuitry coordinates the precise interaction of all these mechanisms. Quality output depends on aligning the mechanical parts to close tolerances and tightly controlling the signal levels.



ELECTRICAL PARTS

Excluded from these lists are parts that are readily available through your local distributor.

Resistors (Power and Special)

Item	Description	Mfr. No.	NTE No.
# R601	3.3M 10% 1/2W CC	483511047084	HW533
# R604	1.2K 5% 1W CC	483511667054	HW212
# For safety, use only equivalent replacement parts.			

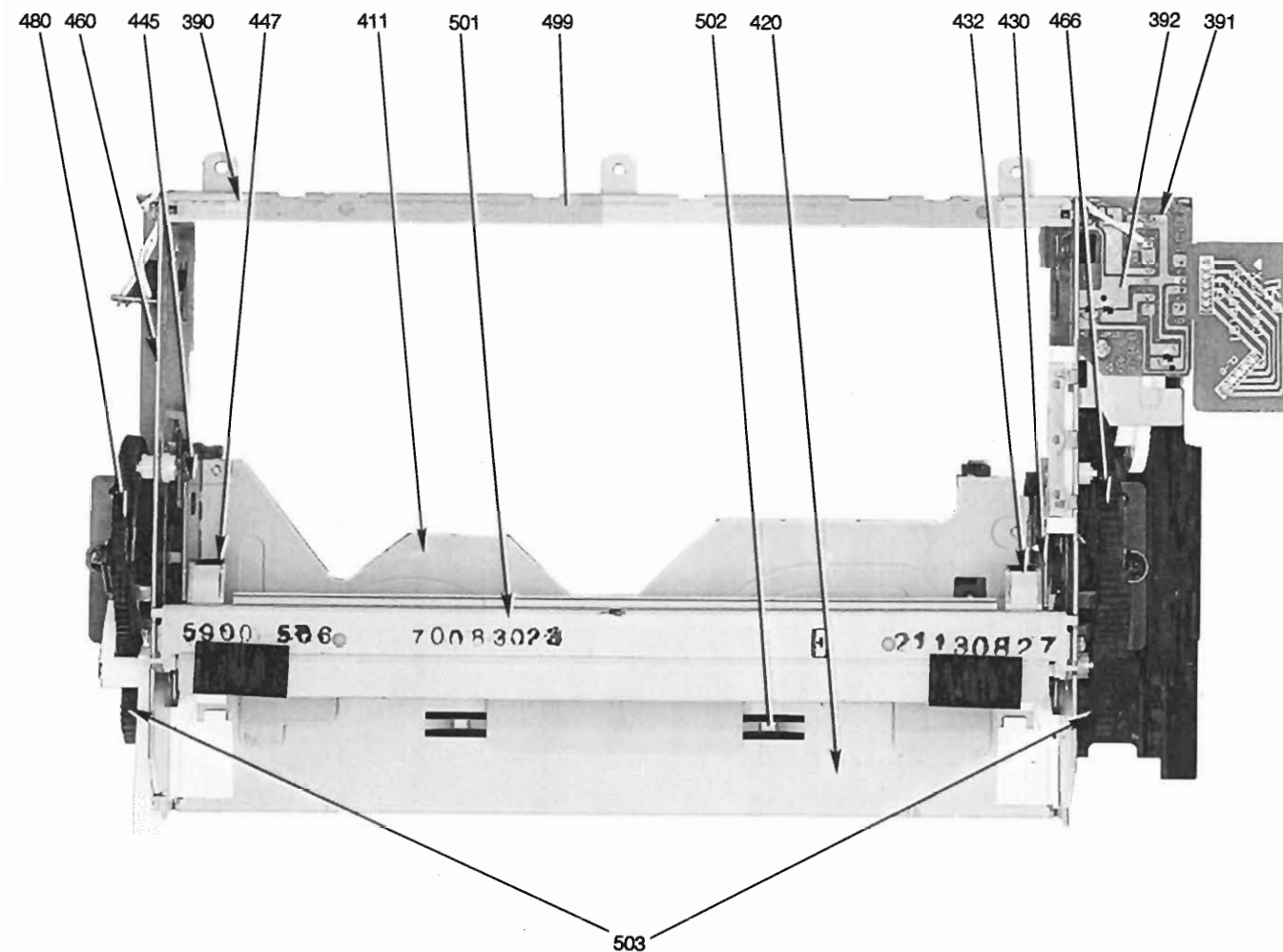
Special Electrical Parts

Description	Mfr. No.
The Printed Circuit Boards part numbers are not supplied with the manufactures service documentation.	

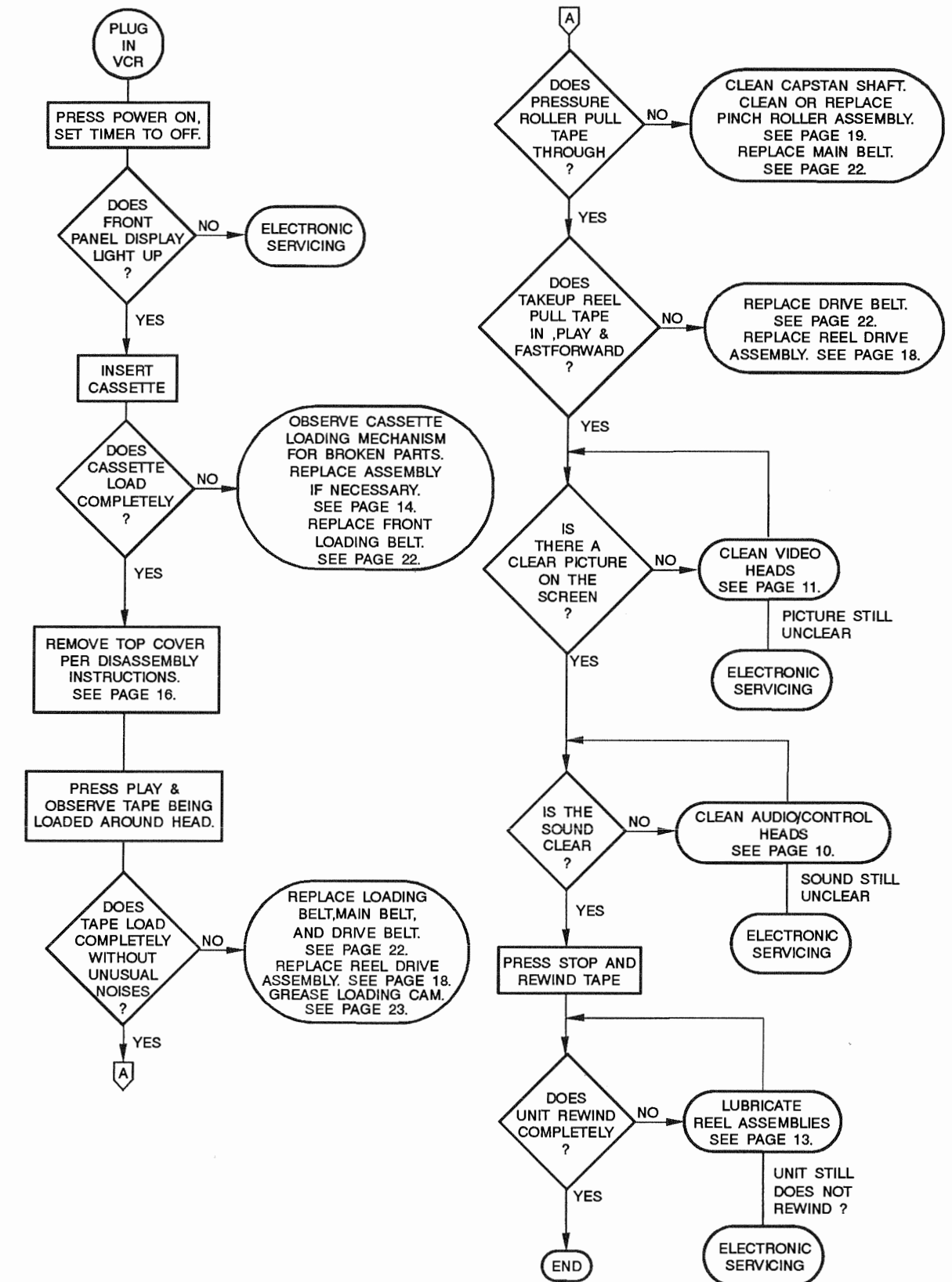
*For information on the nearest
Howard W. Sams & Company
Authorized "Stocking Core" Distributor,
call 317-298-5566.*

Obtaining Parts

When ordering parts, state the model number, the part number, and the part description. For most mechanical parts and for special electronic parts, use only exact replacements from the VCR manufacturer. For semiconductors and VCR belts, comparable replacements are available from the participating vendors listed on page 31.



TROUBLESHOOTING FLOW



TROUBLESHOOTING

When your VCR malfunctions, there are three possible causes: operator problems, mechanical problems, and electrical/electronic problems. This troubleshooting guide will help you detect operator and mechanical problems that you can correct. If those corrections don't work, the problem is probably electrical and you should refer to the manufacturer's detailed specifications.

Start-Up Problems

Power switch "on", nothing happens
Clock display may or may not be lighted

Check that the unit is plugged in. Verify that there is power in the outlet. Inspect the AC power cord for cracks and breaks. Make sure the VCR's Timer function is set to Off. If you just brought the unit in from the cold, wait a half-hour to let any possible condensation evaporate. If these measures don't work, there may be a more serious electrical malfunction.

Cassette Loading Problems

Tape loads but ejects immediately
Cassette does not open for tape loading
Power turns off after tape loading/unloading

Scan the cassette loading mechanism (page 15) for damaged front loading belt, dirty pulleys, cracked or stuck loading gears, an unhooked or missing release lever spring, broken or chipped gear teeth, or cracks in the loading track. Replace the entire assembly if defects are serious (page 14). If problems persist, the end-of-tape sensor may be malfunctioning, an electrical-to-mechanical interface may be out of phase, or the tape transport mechanism may need to be realigned, all of which require the

manufacturer's data and should be attempted only if you have electronics training.

Tape Play Problems

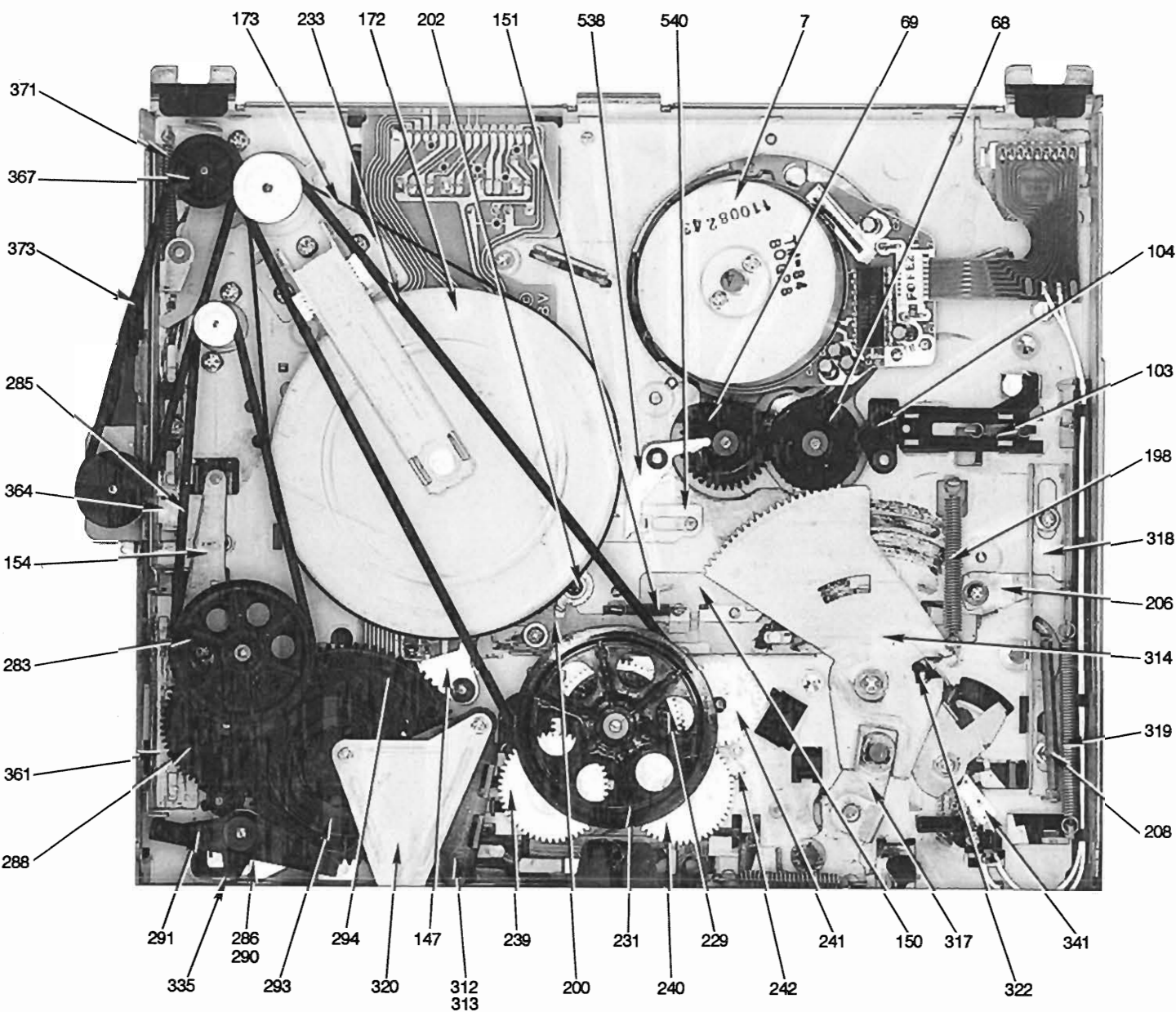
VCR "eats" tapes
Rewind stops before end of tape
Play, fast forward, rewind functions are slow or don't work
Squealing noises

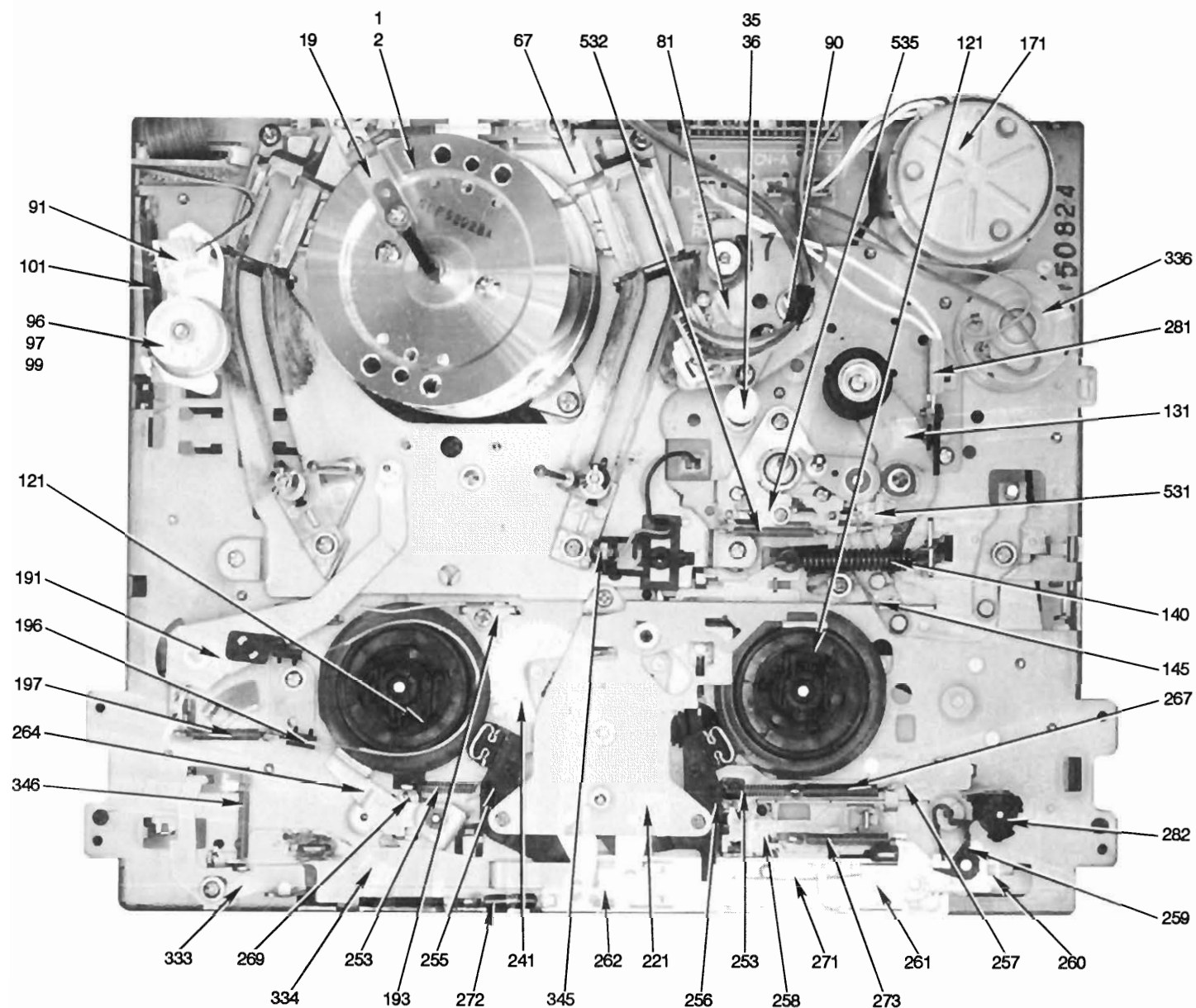
Tape winding and speed problems suggest malfunctions in the various rollers, the capstan motor, or the cassette takeup assemblies. Check the reel drive assembly for wear (page 18). Oil the two reel assembly shafts (page 13). Clean the impedance roller (page 19), the pinch roller (page 19), and the capstan shaft (page 19). Check the drive, loading, and main belts and clean the associated pulleys (page 22,23). If none of these remedies are effective, the problem is probably electrical.

Sound Problems

No audio in playback
Volume too low or fluctuates
Buzz, hum, or previous soundtrack present
Popping or static sounds
Wow and flutter

First try another tape to see if the problem disappears. Adjust the audio controls on the TV and try different audio switches on any stereo that is hooked up to the VCR. Clean the audio/control and full erase head (page 10,12). Check and clean the pinch roller and impedance roller (page 19). Check the main and drive belts for breaks or wear and replace if necessary (page 22,23).





Picture Problems

VCR on, but no picture
 "Snow" on video screen
 "Noise" bars at top or bottom
 Intermittent jagged lines
 Horizontal lines that follow a set path,
 then disappear (indicating scratched tape)
 Bending images

Make sure the TV controls are set so that normal television signals are received clearly. Make sure the TV/VCR switches are in the VCR position on both units. Check the connections to the VCR. Try a different tape in the VCR. Adjust the VCR's tracking control, if your model has one. Check for electrical interference from an appliance operating nearby. Look for foreign objects in the unit, and clean any debris from the tape guide tracks (page 21). Clean the video heads (page 11). Clean all the other parts of the tape path: full erase head, impedance roller, audio/control head, capstan shaft, and pinch roller (pages 10,12,19). Most picture problems will be solved by one of these remedies. If not, electronic servicing is probably needed. (Note: There may be incompatible circuitry in recent VCR models when used with older TV sets.)

WHAT TO LOOK FOR INSIDE THE UNIT

Dirty Heads and Rollers

The various heads and rollers often pick up electromagnetic debris after hours of close contact with moving tapes. This debris consists of magnetic oxides that appear as a dusty film.

Worn Rubber Parts

Belts, tires, and other rubber parts that are worn appear dry and dull. If you carefully stretch and bend them, you may find tiny hidden cracks. Don't replace these until you locate the proper replacement parts, as the VCR may still operate even with worn parts. When you do replace them, remove and replace one at a time to avoid confusion.

Broken or Chipped Gears

Look for missing teeth, cracks, and other breaks in the system of plastic gears. Some of these may be deep inside the unit and can only be repaired by a trained technician.

Foreign Objects

People report finding everything from marbles to peanut butter and jelly sandwiches in the units they've had to repair. But look also for smaller pieces of debris such as sprung springs and chips from plastic parts.

Proper Sequence of Operation

Observe the unit in operation to see whether the proper sequence of events occurs as described in "How the VCR Works."

Burns, Smoke, or Smells

If you find these, don't attempt any repairs unless you are qualified. These symptoms spell DANGER.

How to Use This Data

- The troubleshooting and servicing information in this VCRFACT is to help you find and correct common mechanical problems in the cassette loading and tape transport mechanisms and to show you how to clean the audio and video heads.
- These types of problems account for 75% of VCR malfunctions and can easily be fixed by a home electronics hobbyist or audio buff who has completed at least a high school science course.
- The remaining 25% of malfunctions are electronic and involve working with live power or fine-tuning adjustments using highly specialized measurement equipment. These problems, and any that require extensive disassembly, should be tackled only if you have special training in electricity and electronics. You will need to refer to schematics and adjustment details furnished in the manufacturer's documentation.
- Use the table of contents at the back of this VCRFACT to locate the information you need to perform a specific servicing task. If you wish to purchase the manufacturer's documentation for electronic repairs, write to:

Service Company
Technical Publication Dept.
P.O.Box 555, Old Andrew Johnson Hwy.
Jefferson City, TN. 37760

Before Taking Apart an Assembly

- Whether you are troubleshooting, cleaning, or simply observing the internal workings of the VCR, realize that this is a complex piece of equipment that is easily damaged by careless handling. Do not attempt any task that you are not confident you can complete successfully.

- Take a careful look at the assembly before removing anything. Note which parts are involved and how they interconnect. If you must disconnect any wires, tape a note to the end of each wire to remind you where it attaches. Be especially wary of any part replacement or servicing that requires extensive disassembly in the guts of the machine. Attempt such tasks only if you are qualified.
- Do not set out to tighten what appear to be loose screws, nuts, or knobs. Some of the adjustments in a VCR are so critical that a simple half-turn on any of them could require lengthy realignment using very specialized technical equipment.

Remove AC Power

- Always unplug the VCR before servicing. Qualified service technicians may wish to troubleshoot by running a videotape through the machine while the covers are off. Do not attempt this unless you have special training in electricity and electronics. Live power is involved and there is danger of shock in untrained or careless hands.
- For added protection even if you do not intend to work with live power, operate the equipment on an outlet that has a ground fault interrupt (GFI) detector. The fault detector will sense when an electrical connection is disrupted and will shut off power to the equipment.

Drain Electrostatic Charge

- Semiconductor devices like VCRs are easily damaged by static electricity. You can pick up an electrostatic charge simply by walking across a carpet, changing position in a fabric or plastic covered chair, combing your hair, or just brushing off your clothes.
- Before handling printed circuit boards (for example, during disassembly), drain off any

Ref.No.	Mfr. No.	Description	Ref.No.	Mfr. No.	Description
335	483552617007	Record Actuate Spoke	501	483546697032	Upper Plate
336	483528097004	Dew Sensor	502	483552617008	Synchronize Shaft
341	483526717001	Leaf Switch	503	483552237114	Synchronize Gear (A)
345	483546477064	Lamp Board	531	483546697033	RG Slide Plate
346	483549297105	Record Lever Spring	532	483549297107	RG Slide Spring
361	483540297259	Eject Actuator	535	483540297263	RG Arm Semi Assembly
364	483546697029	Loading Brake Plate	538	483540297261	RG Actuate Arm
367	483546477065	E Idler Arm Assembly	540	483540297262	RG Actuator
371	483549297106	Idler Arm Spring			
373	483535837078	Front Loading Belt****			* Main belt also available from EVG, a Division of Russell Industries (No. 1407-521), GC Thorsen (No.1426-59), PRB (No. FRX11.7)
390	483569127043	Front Loading Mechanism			** Drive belt also available from EVG, a Division of Russell Industries (No. 1425-36), PRB (No. SCX14.7), GC Thorsen (No.1425-36)
391	483546477071	Cassette Load Bracket Assembly			*** Loading belt also available from EVG, a Division of Russell Industries (No. 1407-450), GC Thorsen (No.1427-06), PRB (No. SCA8.0), Workman (1425-10).
392	483552827007	Front Loading Clutch Assembly			**** Front loading belt also available from EVG, a Division of Russell Industries (No. 1425-75), GC Thorsen (No. 1427-50), PRB (No. SCA7.5), Workman (1407-160).
411	483546477066	Cassette Holder Assembly			
420	483546477067	Front Angle Assembly			
430	483546477068	Right Side Plate Assembly			
432	483546697031	Cassette Push Plate			
445	483546477069	Left Side Plate Assembly			
447	483546697031	Cassette Push Plate			
460	483546477073	Right Frame Assembly			
466	483552237115	Right Lift Gear Assembly			
480	483546477072	Left Frame Assembly			
499	483528097005	End Sensor Wire			

MECHANICAL PARTS

The reference numbers of this list are keyed to photographs of the chassis showing the location of each part. The photos appear on pages 26 thru 28.

You may obtain these parts from the manufacturer or an authorized service center. Use only the exact replacements.

Ref.No.	Mfr. No.	Description	Ref.No.	Mfr. No.	Description
1	483569127112	Cylinder Assembly	233	483535837076	Drive Belt**
2	483569127115	Upper Drum	239	483552237111	Play Gear Assembly
7	483536127059	TM84 Motor	240	483552237112	Reverse Fast Forward Gear Assembly
19	483529087033	Drum Ground	241	483552237109	Return Gear Assembly
35	483540297234	Tape Guide	242	483540297247	Return Arm
36	483549297083	Tape Guide Spring	253	483549297096	Brake Arm Spring
67	483546477054	Loading Base Assembly	255	483546477059	Supply Brake Arm Assembly
68	483552237106	Left Loading Gear Assembly	256	483546477061	Takeup Brake Arm Assembly
69	483552237107	Right Loading Gear Assembly	257	483546647015	Lifter Brake
81	483546477056	Head Base Assembly	258	483546647016	Lifter Brake Actuator
90	483549297088	Head Spring	259	483540297249	Trigger Hook
91	483546477055	Full Erase Plate Assembly	260	483540297248	Trigger Lever
96	483552877033	Impedance Roller	261	483546697026	Brake Plate
97	483553087066	Impedance Roller Sleeve	262	483546647014	Brake Actuate Base
99	483549297086	Tape Guide Flange Spring	264	483546647017	Supply Soft Brake
101	483549297085	Full Erase Plate Spring	267	483549297099	Lifter Brake Actuator Spring
103	483549297087	Full Actuate Spring	269	483549297101	Supply Soft Brake Spring
104	483540297236	Full Erase Lever	271	483549297102	Trigger Lever Spring
121	483552817108	Reel Assembly	272	483549297097	Brake Actuate Base Spring
131	483546477057	Pinch Roller Arm Assembly	273	483549297098	Brake Plate Spring
140	483549297091	Pinch Roller Spring	281	483536127041	Loading Motor Assembly
145	483540297237	Pinch Actuate Arm	282	483546477063	Trigger Bearing Assembly
146	483549297089	Pinch Actuate Arm Spring	283	483552887012	Loading Pulley
147	483540297239	Pinch Crank	285	483535837077	Loading Belt***
150	483540297238	Pinch Slider	286	483540297251	Search Arm (B)
151	483549297092	Pinch Slider Spring	288	483552237113	Loading Gear
154	483540297241	Pinch Cam Lever	290	483540297252	Brake Actuate Arm
171	483536127039	Capstan Motor Assembly	291	483540297253	Eject Actuate Arm
172	483552867002	Capstan Flywheel	293	483552837007	Loading Cam
173	483535837075	Main Belt*	294	483546477062	S Brush
191	483540297245	Back Tension Arm	312	483540297255	Loading Lever Semi Assembly
193	483540297242	Back Tension Support	313	483552877034	Cam Roller
196	483546317003	Back Tension Band	314	483540297254	Loading Gear Plate
197	483549297094	Band Holder Spring	317	483540297256	Loading Actuate Lever Semi Assembly
198	483549297093	Back Tension Spring	318	483546697028	Loading Actuate Plate Semi Assembly
200	483546697025	Back Tension Change Plate	319	483549297103	Loading Actuate Spring
202	483540297244	Back Tension Return Lever	320	483546697027	Loading Lever Reinforce Plate
206	483540297243	Back Tension Lever	322	483549297104	Loading Gear Plate Spring
208	483549297095	Back Tension Actuate Plate Spring	333	483540297257	Record Lever
221	483546477058	Reel Drive Assembly	334	483540297258	Record Actuator
229	483552237108	Clutch Assembly			
231	483552887011	Middle Pulley Assembly			

electrostatic charge on your body by touching a known earth ground. Examples of grounds are a plumbing pipe or the metal screws on the coverplates of wall switches and receptacles. Anti-static devices (e.g., a wristband) are available commercially for people who do a lot of work with electronic parts.

Demagnetize the Heads

- The buildup of magnetic tape coating material on the upper cylinder and video heads eventually may cause them to become polarized. This will make the heads less and less sensitive to the minute values of information on the tape.
- You can use a demagnetizer to neutralize the charged particles on the heads. This restores their sensitivity and gives better results from head cleaning. But make sure you hold the demagnetizer at least an inch away from the delicate video heads.
- Avoid using magnetized materials anywhere near the VCR. Even a magnetized screwdriver could cause havoc.

Working with Power

CAUTION: Do not work with electrical and electronic parts unless you are qualified by special training.

- Upon completion of service, replace all insulators, knobs, and shields, and restore to their original position any wires that you moved.
- Before returning the VCR to service, perform an AC leakage test using an AC voltmeter with at least 5000 ohms per volt sensitivity. Connect a 0.15µF AC capacitor in parallel with a 1500-ohm 10-watt resistor from a good earth ground to all exposed metal parts on the VCR cabinet. A voltmeter reading higher than 0.3 volts RMS across the 10-watt resistor indicates a shock hazard and must be corrected.

DISASSEMBLY TOOLS

For the mechanical servicing described in these pages, you will need these items:

- 5 millimeter nut driver
- Small point phillips screwdriver
- Medium point phillips screwdriver

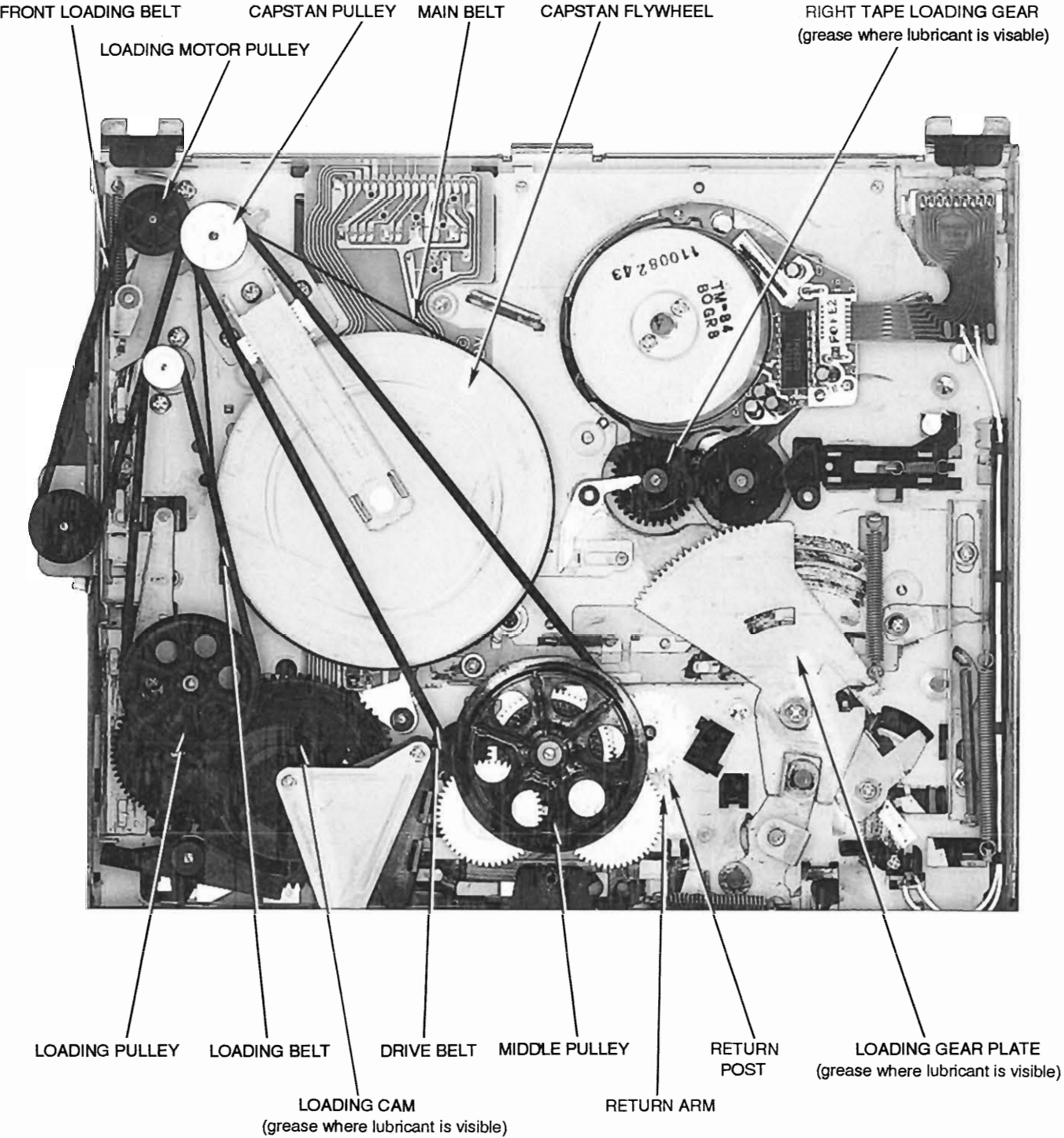
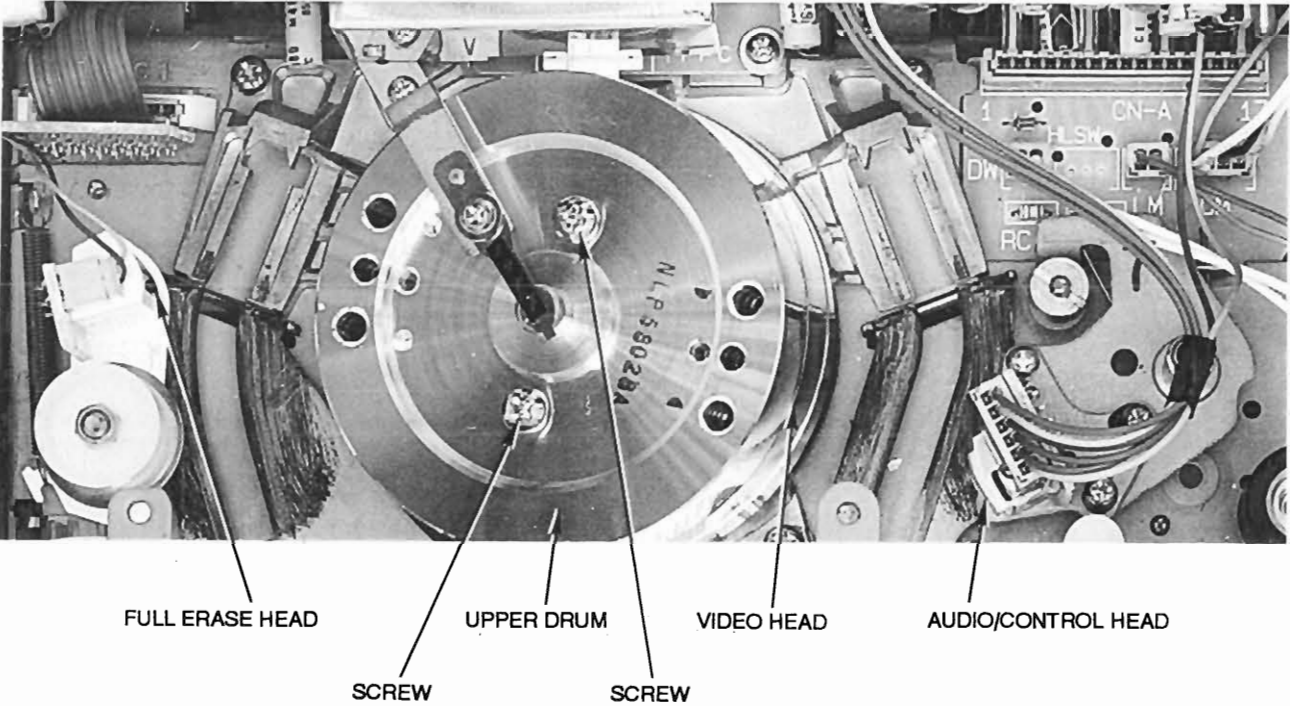
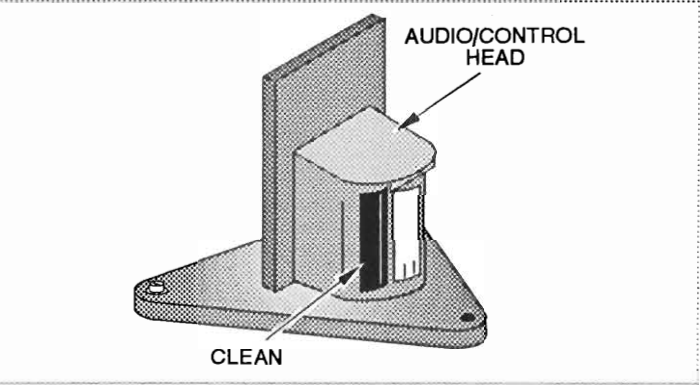
AUDIO & VIDEO HEADS

Removing the magnetic oxide buildup on the heads can solve many picture and sound problems. Before cleaning the video, audio, or full erase heads, read about cleaning materials on page 17. Follow the basic disassembly instructions on page 16. The instructions given here assume you are cleaning manually rather

than using a tape cleaning cassette. If your VCR shows no improvement after cleaning, you may need to replace the heads, as described in this section, the problem may lie in the electronic circuitry, in which case you will need to refer to the manufacturer's documentation.

Cleaning the Audio/Control Head

- 1. Remove the top cover. Using a head cleaning stick dampened with cleaning solvent, gently rub the audio/control head in the same direction as the tape travels during forward play.
- 2. Do not rub up and down on the head, or use more than a gentle pressure.



Replacing the Front Loading Belt

1. Remove the bottom cover.
2. Remove the old front loading belt from the eject pulley and the front loading clutch pulley.
3. Clean the eject pulley and front loading clutch pulley with a swab and cleaning solvent. Make sure they are dry before you install the new belt.
4. Carefully place the new front loading belt around the eject pulley and front loading clutch pulley. Be sure not to nick, cut, or overstretch the new belt.

Replacing the Loading Belt

1. Remove the bottom cover.
2. Remove the old loading belt from the loading pulley and the loading motor pulley.
3. Clean the loading pulley and loading motor pulley with a swab and cleaning solvent. Make sure they are dry before you install the new belt.
4. Carefully place the new loading belt around the loading pulley and loading motor pulley. Be sure not to nick, cut, or overstretch the new belt.

Replacing the Main Belt

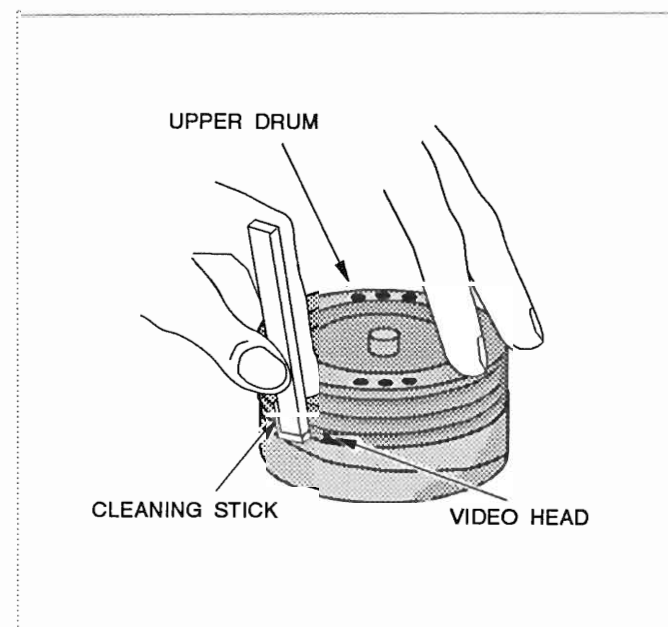
1. Remove the bottom cover. Remove the drive belt.
2. Remove the old main belt from the capstan pulley and the capstan flywheel.
3. Clean the capstan pulley and capstan flywheel with a swab and cleaning solvent. Make sure they are dry before you install the new belt.
4. Carefully place the new main belt around the capstan pulley and capstan flywheel. Be sure not to nick, cut, or overstretch the new belt.

Replacing the Drive Belt

1. Remove the bottom cover.
2. Remove the old drive belt from the capstan pulley and the middle pulley.
3. Clean the capstan pulley and middle pulley with a swab and cleaning solvent. Make sure they are dry before you install the new belt.
4. Carefully place the new drive belt around the capstan pulley and middle pulley. Be sure not to nick, cut, or overstretch the new belt.

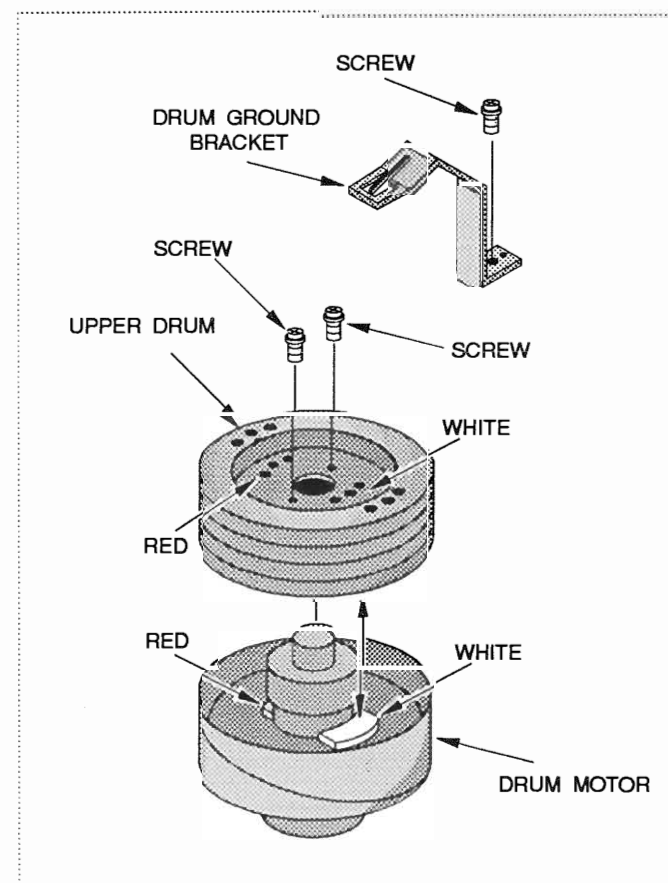
Cleaning the Video Heads

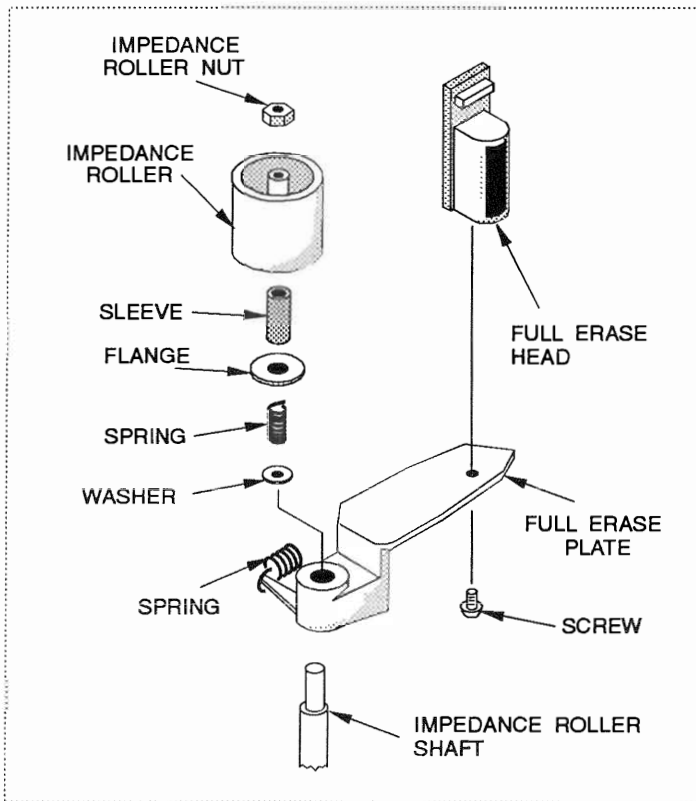
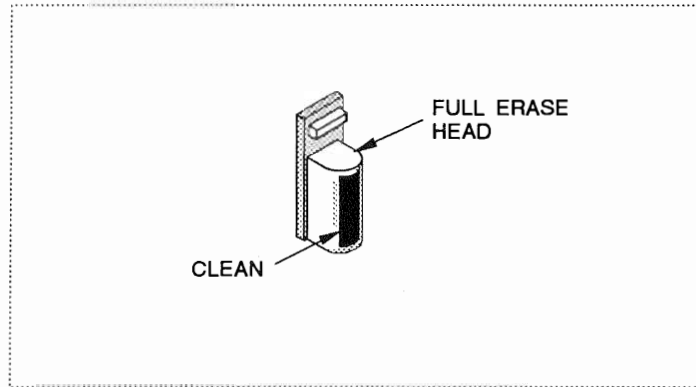
1. Remove the top cover. Hold the top of the upper drum so it will not turn during cleaning. *Do not touch the video heads.*
2. Using a head cleaning stick dampened with cleaning solvent, gently rub the video heads in the same direction as the tape travels.
3. Do not rub up and down on the heads or use more than the gentlest pressure.
4. If tape buildup does not immediately rub off, continue rubbing gently until the head is clean.
5. Avoid getting head cleaner on any plastic surface.



Replacing the Upper Drum

1. Remove the top cover. Remove the screw securing the drum ground, and remove the drum ground.
2. Remove the two screws securing the upper drum to the drum motor, and lift the upper drum up to remove it.
3. Install the replacement upper drum by aligning the white and red video heads, located on the bottom of the upper drum, with the white and red connector boards on the lower drum. *Do not touch the video heads.*
4. Install the two screws securing the upper drum to the drum motor. Alternately tighten the screws until both screws are equally tightened. Install the drum ground and tighten the screw.
5. Before you reinstall the top cover, load a blank tape and make a recording. Play it back to test the replacement upper drum and video heads. Watch for signs of curling or creasing as the tape travels. This may indicate a mechanical alignment problem that will require specialized tools and measurement equipment.



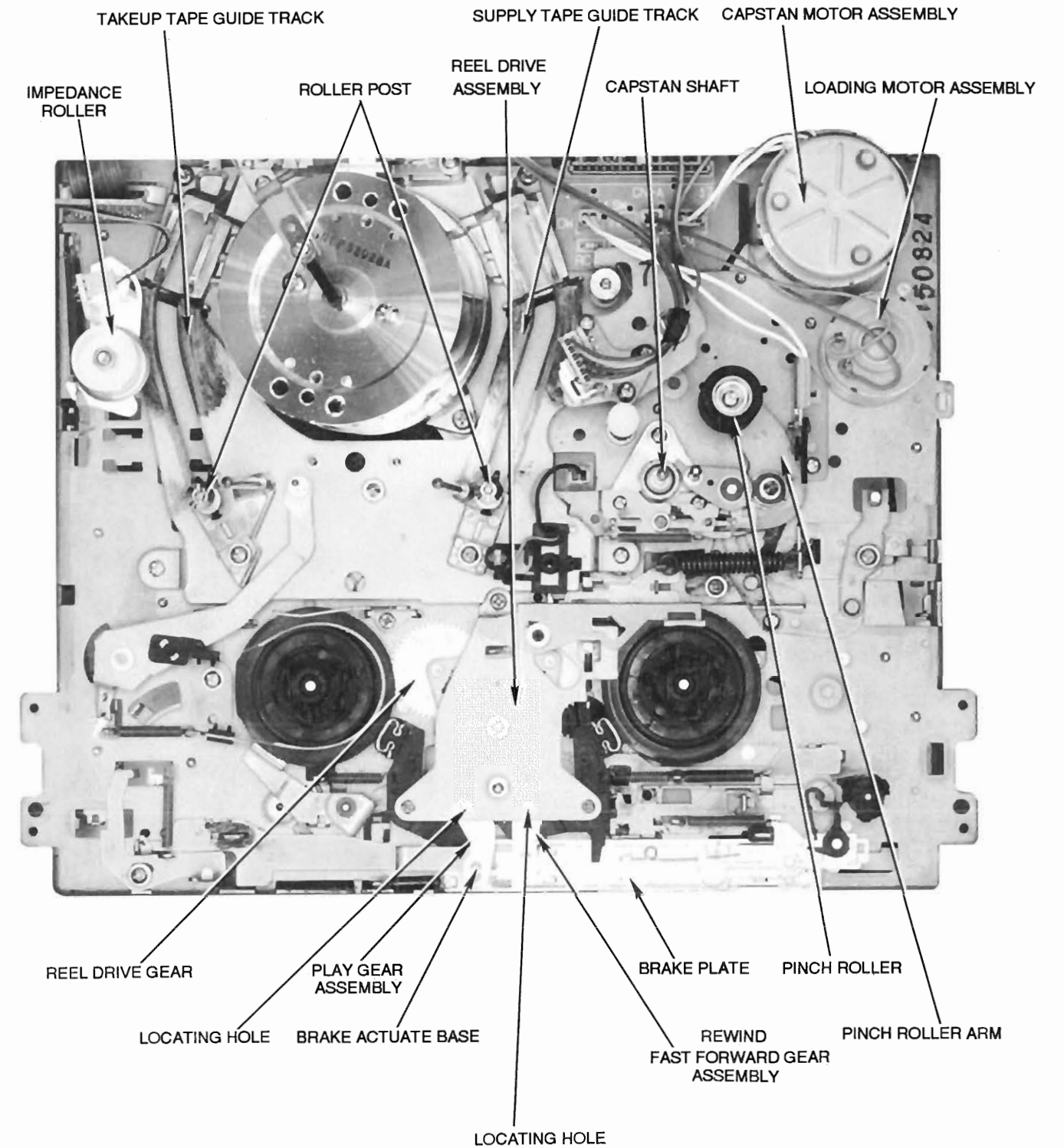


Cleaning the Full Erase Head

1. Remove the top cover. Using a head cleaning stick dampened with cleaning solvent, gently rub the full erase head in the same direction as the tape travels.
2. Avoid scratching or denting the smooth face of the erase head.

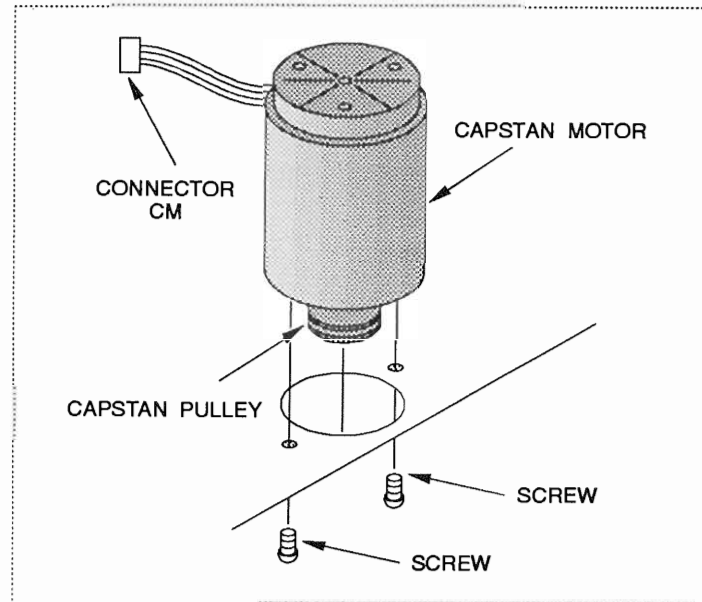
Replacing the Full Erase Head

1. Remove the top cover. Disconnect the full erase head electrical connector, and remove the spring between the full erase plate and the chassis.
2. Record the number of turns required to remove the impedance roller nut so that it can be properly reinstalled. Remove the impedance roller nut, impedance roller, sleeve, flange, spring, and washer from the impedance roller shaft.
3. Slide the full erase plate off of the impedance roller shaft and remove the screw, securing the full erase head, from the bottom of the full erase plate.
4. Position the replacement full erase head on the full erase plate and replace the screw.
5. Slide the washer, spring, flange, sleeve, and impedance roller onto the impedance roller shaft.
6. Install the impedance roller nut and tighten it the same number of turns that was required to remove it. Reconnect the full erase head electrical connector.
7. After replacing the full erase head, load a cassette and play it. Ensure that the tape does not ride over or under the impedance roller. If the tape rides too high, turn the impedance roller nut counter-clockwise to properly adjust the impedance roller. If the tape rides too low, turn the impedance roller nut clockwise to properly adjust the impedance roller.



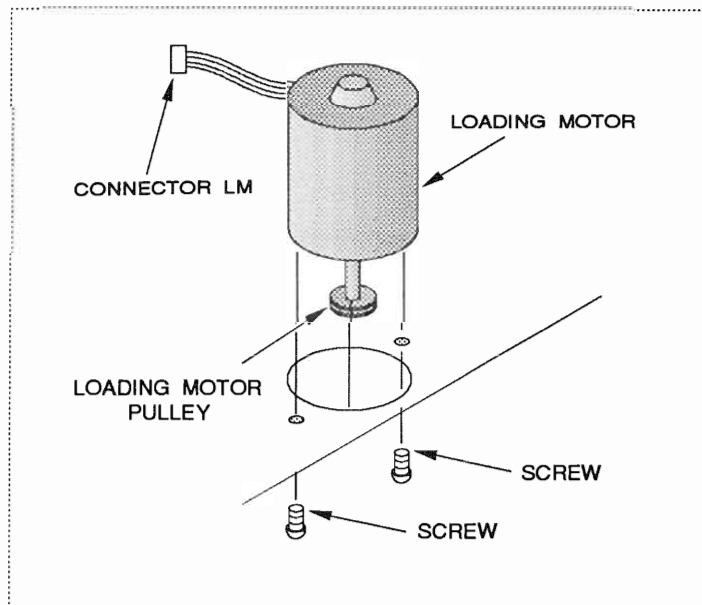
Replacing the Capstan Motor

1. Remove the top and bottom covers, and remove the main board (see page 16).
2. Disconnect connector CM from the base board.
3. Remove the drive belt and the main belt from the capstan pulley.
4. Remove the two screws, securing the capstan motor, from the bottom of the chassis and remove the capstan motor.
5. Install the replacement capstan motor and tighten the two screws. Reinstall the main belt and the drive belt onto the capstan pulley.
6. Reconnect connector CM to the base board.



Replacing the Loading Motor

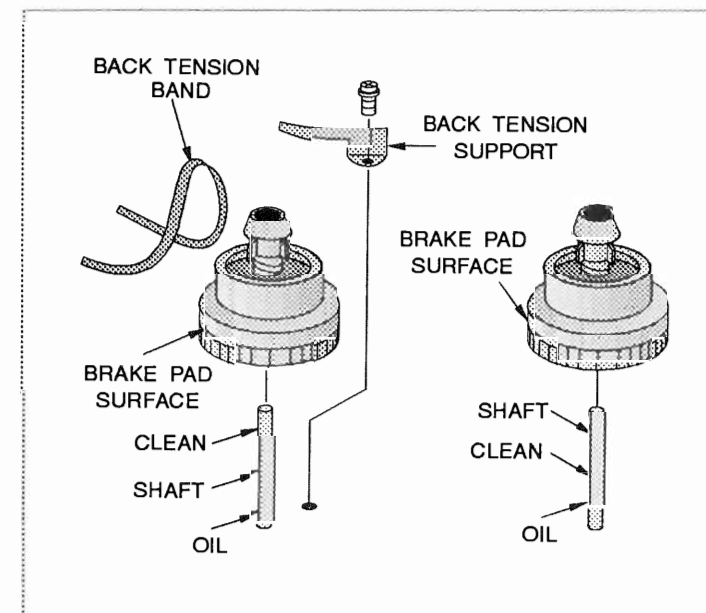
1. Remove the top and bottom covers, and remove the main board (see page 16).
2. Disconnect connector LM from the base board.
3. Remove the loading belt from the loading motor pulley.
4. Remove the two screws, securing the loading motor, from the bottom of the chassis and remove the loading motor.
5. Install the replacement loading motor and tighten the two screws. Reinstall the loading belt onto the loading motor pulley.
6. Reconnect connector LM to the base board.



CASSETTE HOLDER ASSEMBLY

Cleaning the Reel Assemblies

1. Remove the top cover, following the disassembly instructions on page 16.
2. Use a cleaning swab slightly dampened with a solvent that won't harm plastic.
3. Wipe the brake surfaces of the supply reel and takeup reel assemblies, being careful not to wet the brake pads. Don't run a tape until the pads are dry and free of cleaning solution.

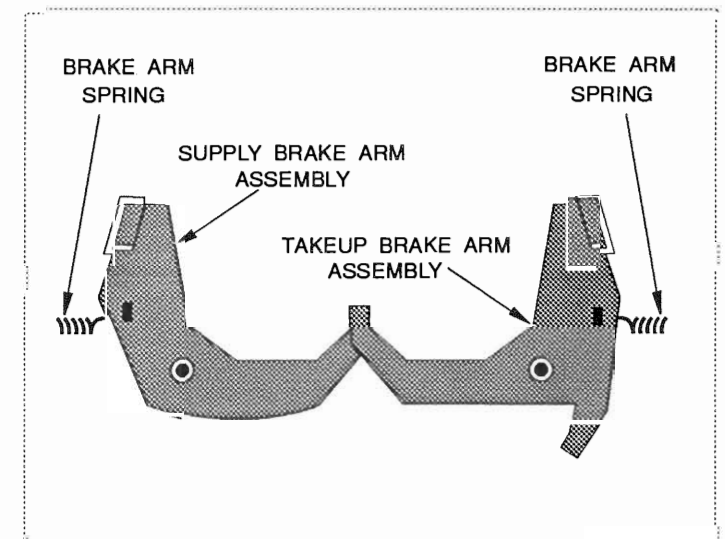


Oiling the Reel Assemblies

1. Remove the top cover, the main board, the cassette loading mechanism, and the reel drive assembly.
2. Remove the screw securing the back tension support and remove the support. Reposition the back tension band so that the supply reel assembly can be removed.
3. Move the brake arm assemblies away from the reel assemblies and slide the supply and takeup reel assemblies off of the shafts. Be careful not to lose the washers that are located under the reel assemblies.
4. Clean the shafts with a cleaning swab and solvent. After the solvent dries apply oil to the shafts.
5. Reinstall the washers and reel assemblies onto the shafts and clean the reel assemblies.
6. Reposition the back tension band around the supply reel assembly. Reinstall the back tension support and tighten the screw.
7. Reinstall the reel drive assembly and the cassette loading assembly.

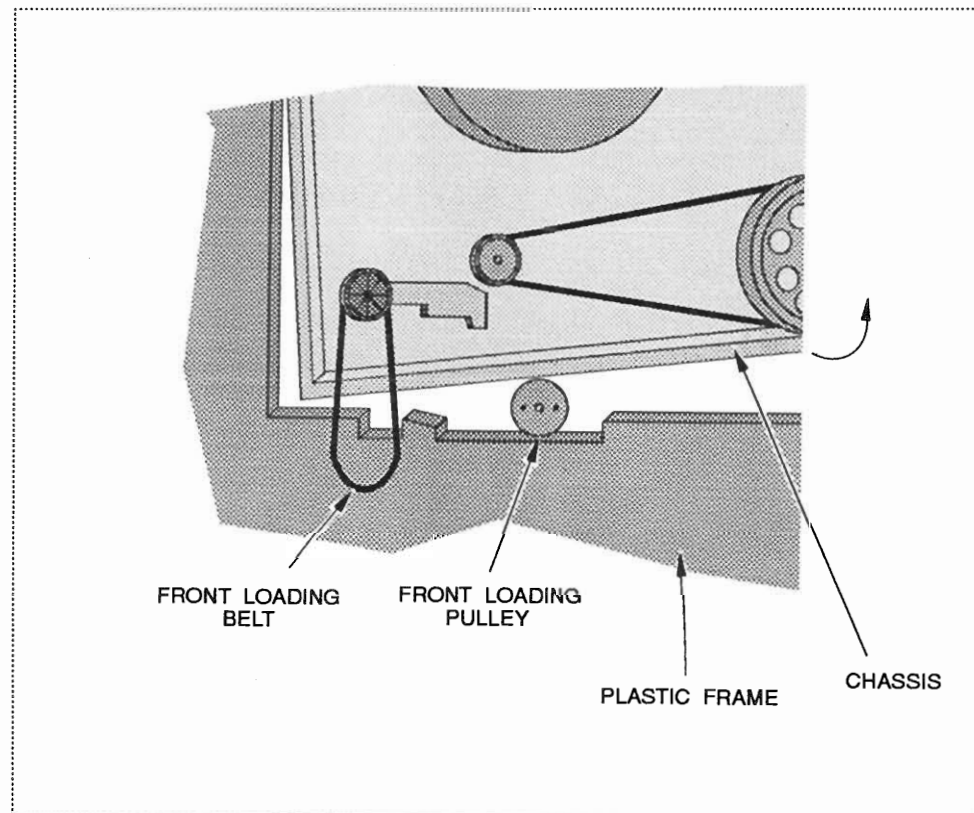
Replacing the Brake Arm Assemblies

1. Remove the top cover, the main board, the cassette mechanism, and the reel drive assembly.
2. Remove the brake arm springs from the supply and takeup brake arm assemblies. Note how the brake arm assemblies are positioned. Remove the brake arm assemblies.
3. Install the replacement supply and takeup brake arm assemblies. Reinstall the brake arm springs.



Replacing the Cassette Loading Mechanism

1. Although it is possible to replace individual parts in this assembly, such replacements should be attempted only if you have the special equipment necessary to align the parts properly. Others should consider replacing the entire assembly.
2. Remove the top, bottom, and front covers, and remove the main board (see page 16).
3. Remove the two side chassis screws.
4. Remove the four screws securing the cassette loading mechanism. Slide the cassette loading mechanism far enough towards the front of the VCR to release the tabs from the slots in the chassis. If the front chassis screw needs to be loosened remove the head amp board by releasing the two latches and pull the board straight up and loosen the chassis screw.
5. Set the VCR on its right side and remove the front loading belt.
6. Remove the cassette loading mechanism by carefully moving the mechanism over and up just enough to allow the front loading pulley room to slide between the chassis and the plastic frame. Carefully remove the cassette loading mechanism from the unit.
7. Install the replacement cassette loading mechanism by following the above procedures in the reverse order.

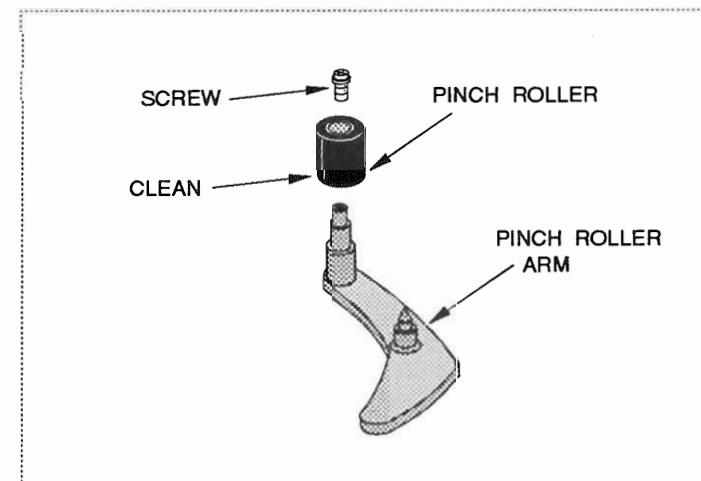


Cleaning the Capstan Shaft

1. Remove the top cover. Clean the capstan shaft next to last because, next to the pressure roller, it is the part of the tape path most likely to accumulate debris.
2. Wipe the shaft in the direction of forward tape travel, using a swab dampened with cleaning solvent. Do not let excess liquid run along the shaft into the dust seals.
3. Make sure the shaft is dry before inserting a test cassette.

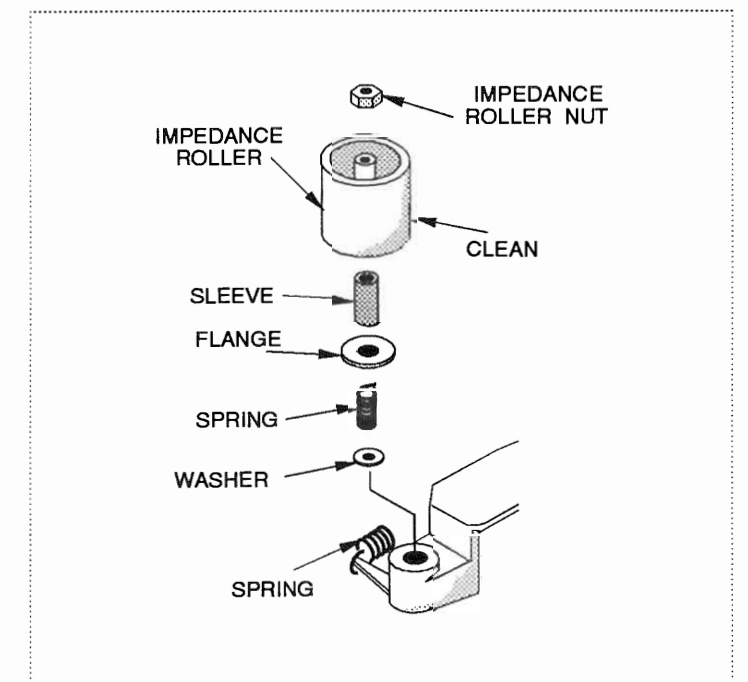
Cleaning and Replacing the Pinch Roller Assembly

1. Remove the top cover. The pinch roller is made of rubber. Rubber can be dissolved by alcohol, so clean this part only if it looks dirty.
2. If it does need to be cleaned, clean it last, because it will blacken the cleaning swab and load it with debris. Wipe with a solvent in the direction of tape travel. After cleaning, wipe away any residual alcohol quickly and completely.
3. To replace the pinch roller, remove the screw securing the pinch roller to the pinch roller arm.
4. Install the replacement pinch roller onto the pinch roller arm and tighten the screw.



Cleaning and Replacing the Impedance Roller

1. Remove the top cover. Clean the impedance roller using a head cleaning stick dampened with cleaning liquid.
2. Gently rub only in the direction of forward tape travel, taking care not to scratch or dent the smooth surface of the roller.
3. To remove the impedance roller, record the number of turns required to remove the impedance roller nut so that it can be properly reinstalled. Remove the impedance roller nut and impedance roller.
4. Place the replacement impedance roller onto the shaft. Install the impedance roller nut and tighten it the same number of turns that was required to remove it.
5. Load a cassette and play it. Ensure that the tape does not ride over or under the impedance roller. If the tape rides too high, turn the impedance roller nut counterclockwise to properly adjust the impedance roller. If the tape rides too low, turn the impedance roller nut clockwise to properly adjust the impedance roller.



TAPE TRANSPORT ASSEMBLY

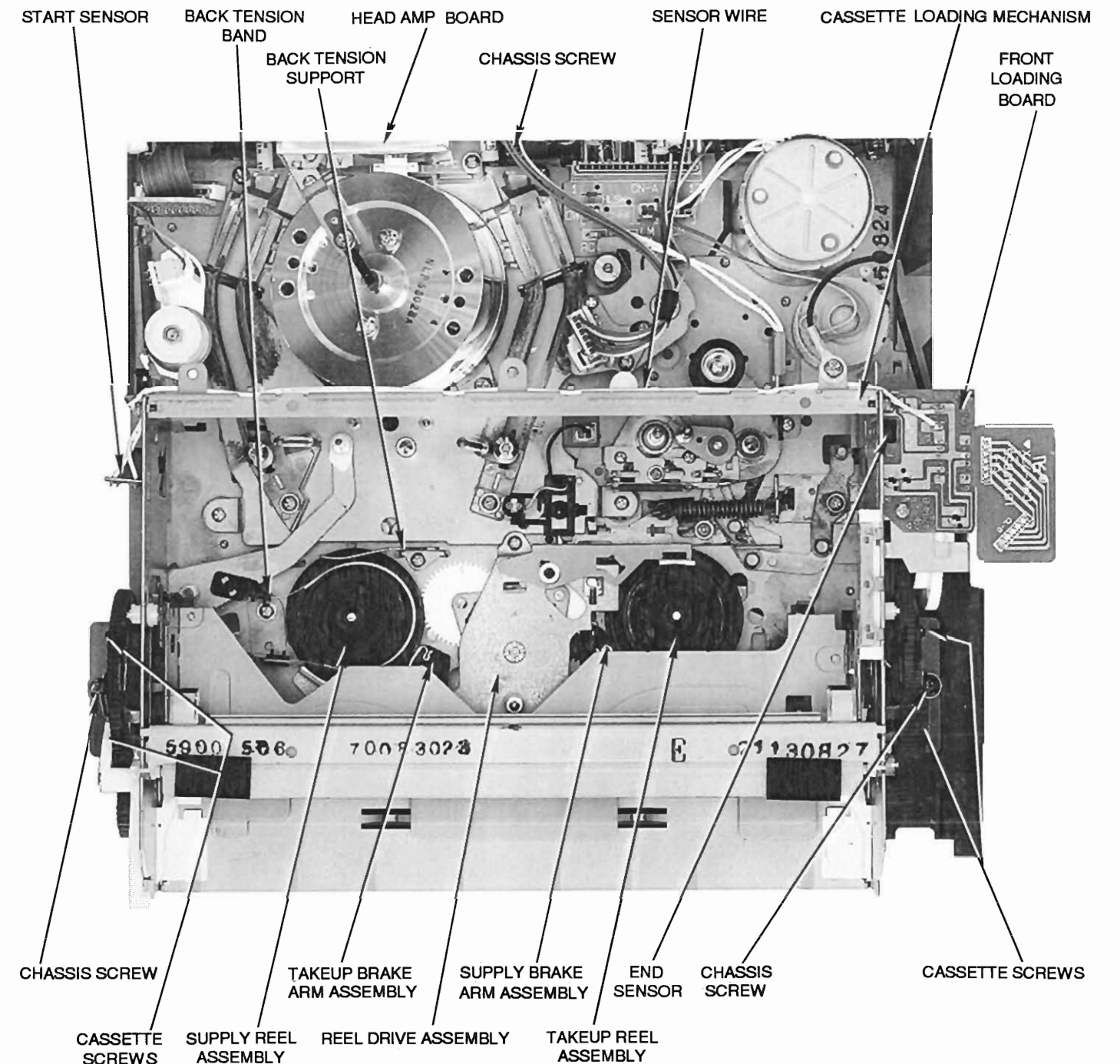
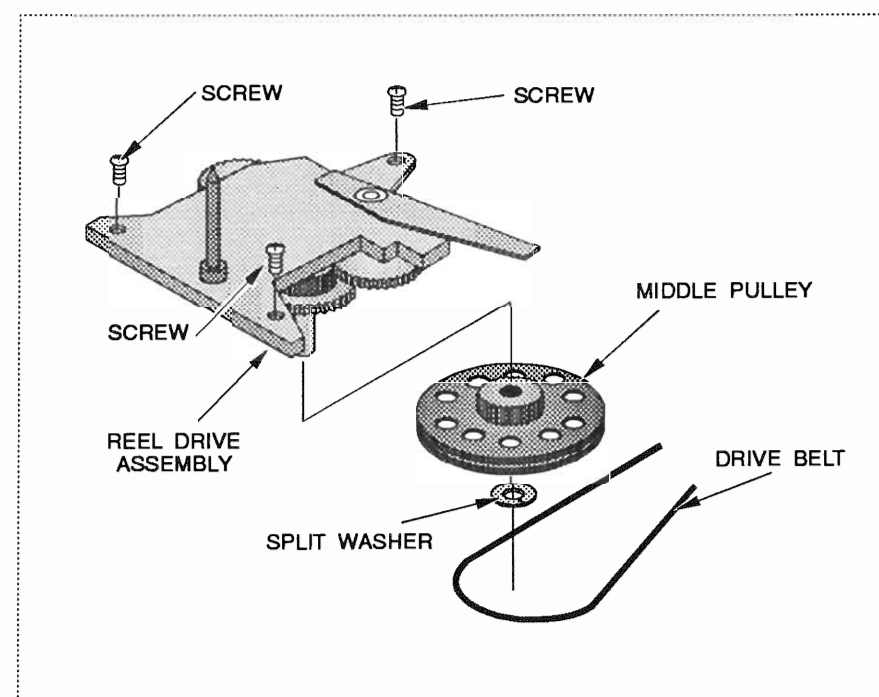
Replacing the Reel Drive Assembly

1. Remove the top and bottom covers. Remove the cassette loading mechanism.
2. Remove the drive belt from the middle pulley. Remove the split washer that secures the middle pulley and remove the middle pulley.
3. Remove the three screws that hold the reel drive assembly to the chassis and remove the reel drive assembly.
4. Position the replacement reel drive assembly onto the chassis. Ensure that the posts on the play and rewind fast forward gear assemblies properly engage the locating holes in the reel drive assembly (page 21). Place the slots in the play and rewind fast forward gear assemblies onto the posts on the brake actuate base and the brake plate respectively (page 21).
5. Install the two front reel drive assembly screws but do not tighten them. Put the reel drive gear shaft into the hole in the return arm, and ensure that the return arm is placed to the left of the return post (page 23).

6. Install the rear reel drive assembly screw and tighten the three reel drive assembly screws. Install the middle pulley and split washer onto the shaft and replace the drive belt onto the middle pulley.

Greasing the Input/Output Tape Guide Tracks

1. Wipe away the old grease from the tape guide track surfaces and around the guide roller bases (See page 21). Do not loosen any screws on the guide roller bases or on the V-stopper pieces that receive them when the VCR is operating. These positions are set at the factory using special tools and fixtures.
2. Apply new grease to the track surfaces, using a thick film to achieve smooth movement of the left and right loading blocks. Do not get grease on the roller posts or on any other surfaces over which the tape travels.
3. Clean the roller post with a swab dampened with cleaning solvent.



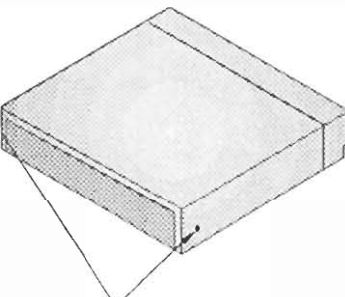
DISASSEMBLY

This section explains the preliminary disassembly required for most cleaning, troubleshooting, and servicing of the VCR. Any additional disassembly required to access specific parts is explained along with the specific procedures. Before beginning, read the "Servicing Guide" section on pages 8 and 9.

CAUTION: Before disassembling any part of the VCR, unplug the AC power cord and touch ground to discharge any static electricity.

Top Cover

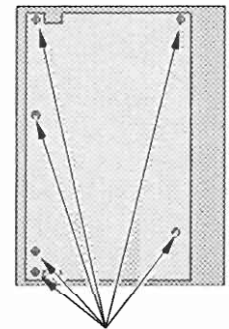
1 Place the VCR in a normal upright position.



2 Remove the two screws securing the top cover and remove the top cover.

Bottom Cover

1 Stand the VCR with the tape loading side down.



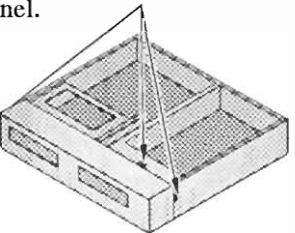
2 Remove the six screws securing the bottom cover and remove the bottom cover.

Front Panel

1 Remove the top and bottom covers.

2 Place the VCR in a normal upright position.

3 Release the three locking tabs on top of the front panel.



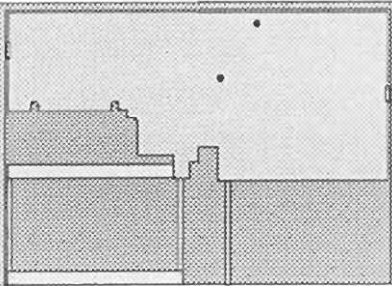
4 Tilt the panel forward until the three tabs on the bottom release.

Main Board Removal

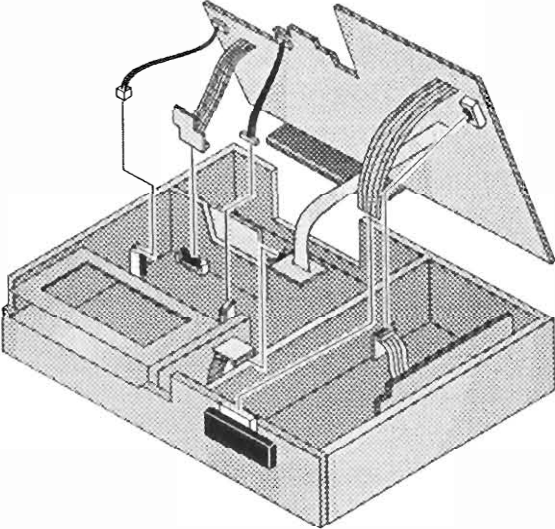
1 Place the VCR in a normal upright position.

2 Remove the top cover.

3 Remove the two screws securing the main board.



4 Release the tab at each end of the main board and lift the board.



5 Remove the electrical connectors as shown and move the board back.

CLEANERS AND LUBRICANTS

Solvents

- Choose a cleaning solvent that does not leave a residue. Denatured alcohol, methyl alcohol, and typewriter cleaner are suitable. Isopropyl (rubbing) alcohol is sometimes used. The solvent must dry without leaving a residue, so wipe up excess solvent right away.
- When using any cleaning solvent, be sure your work area is well ventilated.
- Solvent may damage plastic parts, so wipe up any solvent that touches them.

Sticks and Swabs

- You may clean VCR heads with cellular foam swabs, chamois leather cloth, or a special lint-free cloth. Do not use ordinary cotton swabs, because they shred and leave a residue in the tape path or on the video heads. Special cotton swabs are available on which the cotton is tightly wound. You may use these to clean the tape path *but not* the video heads.

Cleaning Kits

- Local electronics supply stores and VCR sales outlets stock cleaning kits that contain sufficient materials for one or more jobs.

Cleaning Cassettes

- Special cassettes are available for cleaning the video heads. There are three types of cassettes: a "wet" cleaning type and two "dry" cleaning types.
- Wet cleaning tapes are made of a chamois material that may be thicker than ordinary videotape. You moisten it with a few drops of cleaning liquid, insert the cassette into the VCR, and set the unit in

Play or Record mode. As the moistened chamois travels the normal tape path, it passes over the video and audio heads and wipes them clean. *Caution:* Wet cleaning cassettes have been known to unscrew or break tape guides, lodge under the video heads, and damage the assembly. Use the cassette with the thinnest possible chamois.

- One type of dry cleaning cassette uses a fibrous material that cleans by rubbing the heads as it passes over them.
- The other type of dry cleaning cassette uses a fine abrasive that cleans by scraping the accumulated oxides from the heads. This abrasive type of cassette should be used sparingly--a few seconds of use are equivalent to many hours of wear from a normal videotape. It should be used only when the VCR shows signs of a clogged head (for example, snow in the picture, or no video).
- If you decide to clean with a cassette, follow the manufacturer's instructions carefully.

Grease & Oil

- Before you lubricate, clean off the old lubricant with a dry cotton swab. In applying the new lubricant, use only enough to do the job. It's easy to overdo, especially with oil, because it seeps and moves around so easily. Use no spray lubricants, and take care not to get grease or oil on belts, pulleys, or rubber tires.
- When oiling is recommended, use one-half to one drop of lightweight, good quality machine oil. The reel tables may require two drops.
- When greasing is recommended, use manufacturer's recommended grease or white lithium grease. Sometimes different kinds of greases are specified for different operations. Some greases react with plastics and metals and may cause problems. Petroleum-based greases tend to gum up more quickly than synthetic ones.