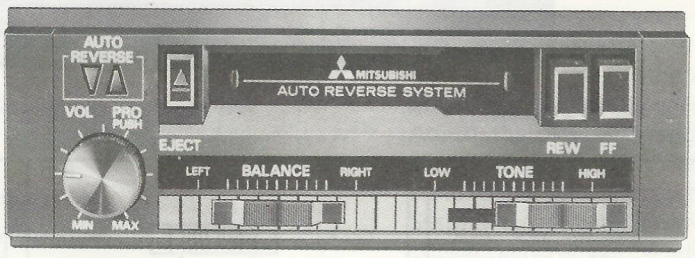
MITSUBISHI

SERVICE MANUAL

CASSETTE CAR STEREO

MODEL : GX-I I IEM



SPECIFICATION

• Power Source:	DC 14.4V (11-16V) Negative Ground
• Current Consumption:	0.7A (at 1W output)
• Wow and Flutter:	0.13% (JIS WRMS)
• Frequency Response:	40 – 12000Hz
• Signal to Noise Ratio:	52dB
• Cross Talk:	50dB
• Output Power:	6W x 2 (MAX.) 5W x 2 (THD 10%)
• Output Impedance:	4Ω
• FF/REW Time:	140 sec. (C-60)
• Tape Speed:	4.76cm/sec.
• Size:	140(W) x 50(H) x 148(D)mm
• Weight:	5 1/2(W) x 2(H) x 5 7/8(D) INCH 1.0Kg (2.2 lbs)

FEATURES

- **Automatic Reverse Control**

  Double-detecting-system for automatic reverse control Program selectable only by pushing PROBUTTON

- **FF/REW**

  Easier operating Autoreverse cassette with locking Fast Forward/Rewind

- **Hard Permalloy Head**

  Regenerating chromium tape by employing a hard and wear-resisting permalloy head

MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD.

73-75 EPPING ROAD NORTH RYDE N. S. W. 2113 SYDNEY AUSTRALIA

OPERATING INSTRUCTION

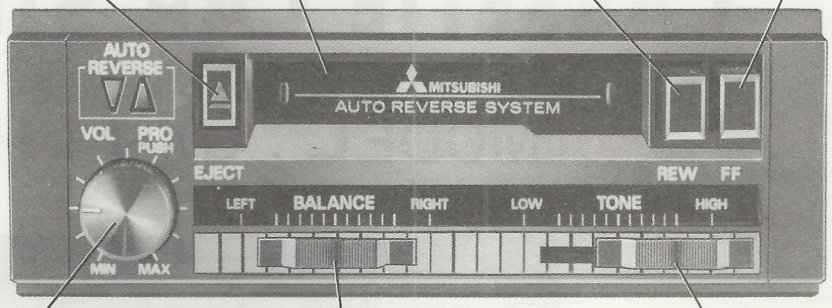
Tape-Running Indicator (Green)
The indicator lamp ▲ is on, when A-side cassette is running.
The indicator lamp ▼ is on, when B-side cassette is running.
While the indicator lamp ▲ is on, if FF-button is pushed, the light stays in the indicator window ▲, if REW-button is pushed, the light switches to another direction.
While the indicator lamp ▼ is on if FF-button is pushed, the light stays in the indicator window ▼, if REW-button is pushed, the light switches to the another direction.

Eject Button
Push Eject button to eject the cassette.

Cassette Holder
When the cassette is loaded, the power switch automatically turns on and the cassette starts to play.

REW Button
Push REW-button in as far as it is locked so as to rewind the tape.
Push softly FF-button to release the function.

FF Button
Push FF-button in as far as it is locked so as to run the tape with fast speed.
Push softly the REW-button to release the function.



Volume-Button (VOL)
Turning this button clockwise, sound is louder.

PRO-Button (PRO)
When you push this button in, tape-running turns adversely and the program changes.

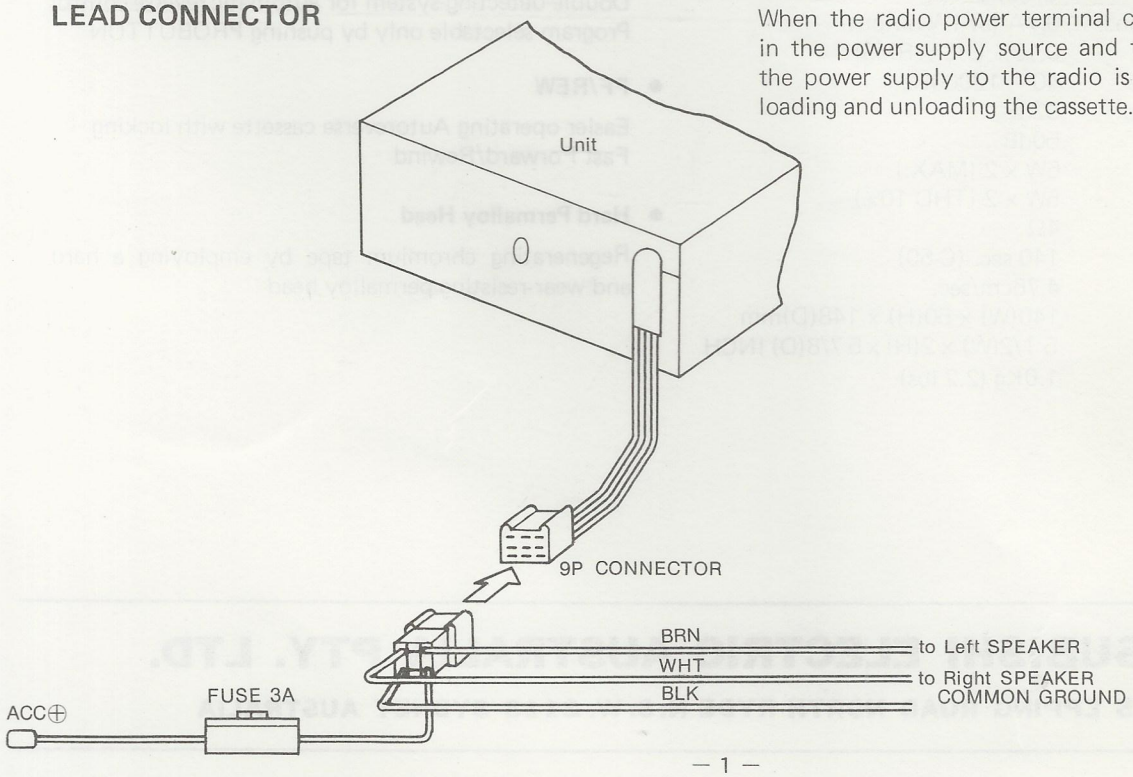
Balance-Knob
← →
Sliding this knob to left, right-side sound is diminishing
Sliding this knob to right, left-side sound is diminishing

Tone-Knob
← →
Sliding this knob to left, the high-frequency-range is decreasing
Sliding this knob to right, the high-frequency-range is increasing

NOTE:
On rewinding, push the button until it is locked, if not to the position locked, program will be changed. On releasing the fast forwarding, push the button lightly.

LEAD CONNECTOR

When the radio power terminal connects to the red-lead in the power supply source and the power switch is on, the power supply to the radio is up to the condition of loading and unloading the cassette. (Refer below Fig.)



DISASSEMBLING PROCEDURE

1. Assembled-Deck

(1) Remove Upper-cover.
(2) Remove Assy-panel (including Volume-button, Side-panel).
(3) Remove 4 screws holding Assembled-deck installed on Chassis.
. . . Now Assembled-deck can be drawn out.

2. PWB-AF

(1) Remove the nut holding Control-volume.
(2) Remove 2 screws holding Heat-sink for IC-302 which is installed on Chassis.
(3) Remove 2 screws holding PWB.
. . . Now PWB-AF can be repaired.

3. PWB-MECHANISM-CONTROL

(1) Remove 4 screws holding PWB (including holding IC-1).
(2) Detach PWB.
. . . Now PWB-MECHANISM-CONTROL can be repaired.

4. Gum Belt Replacement (Refer Fig. 1)

(1) Remove 2 screws holding PWB-sensor.
(2) Detach PWB-sensor
. . . Now PWB-sensor and gum belt can be repaired.

NOTE:

- Avoid stain and greasy dirt.
  If the belt is dirty, use a cleaner.
- No need to detach the flywheel, even if difficult to put the belt.
- Care should be taken to prevent the belt from twisting damaging when repairing.

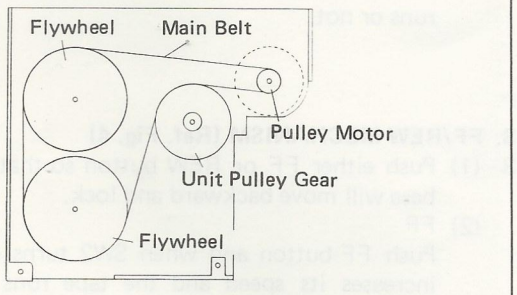


Fig. 1

5. Magnetic Head Replacement

(1) Remove 5 lead-wires from PWB-head.
(2) Remove 2 screws holding Tape-guide which is installed on Magnetic-head.
. . . Now Magnetic-head can be replaced.
(3) Assemble components as before and adjust the Head-Azimuth-screw.

6. Playback Head Adjustment (Azimuth)

(1) Test-tape
TEAC-MTT-113 or PONY C-5 (6.3KHz).
(2) Connection
Connect AC VOLT-METER to left output channel.
(3) Condition
The tone-control should be at "HI" position.
The center is the normal position of the Balance-control.
(4) Alignment Procedure
Insert a test tape for the Azimuth adjustment and drive the screw a little once.
Adjust the playback head so as to get equal and maximum output of right and left channel in either track, lossing the screw.
Seal the screws with Screw-lock-paint not to loosen after accomplishing the adjustment.

EXPLANATION ON DECK MECHANISM

1. Loading and Unloading the Cassette

1-1 Loading Procedure (Ref. Fig. 2)

(1) When you load a cassette, Eject-roller will be pushed backward by the cassette.

(2) As the Eject-roller further goes in, Arm-EV and Holder-EV move down by the Spring-ejector. By this action Timing-plate is pushed by the cassette.

(3) When the Timing-plate turns, Unit-head-base is unlocked then Head and Pinch-roller move to the set position to playback. Set the Power-source switch on, then the Muting-switch will release and the cassette is on standby to play.

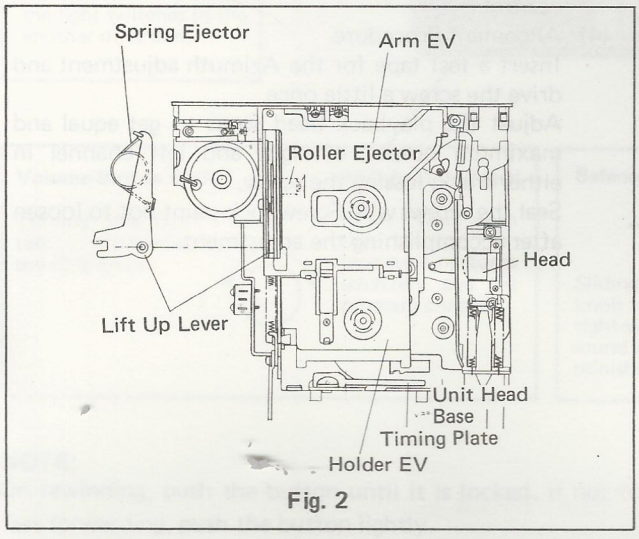


Fig. 2

1-2 Unloading Procedure (Ref.Fig. 2)

(1) Push the Eject-button, the Unit-head-base moves down and acts upon the Lift-up-lever and Arm-EV to the cassette to lift up.

(2) When the cassette completely lifts up by the Eject-roller, the cassette can be unloaded.

2. Tape Transmitting Mechanism (Ref. Fig. 3)

(1) Process of the Tape Transmitting.

MOTOR

BELT → FLYWHEEL → CAPSTAN + PINCH ROLLER

PULLEY GEAR → CENTER GEAR → IDLER GEAR → REEL

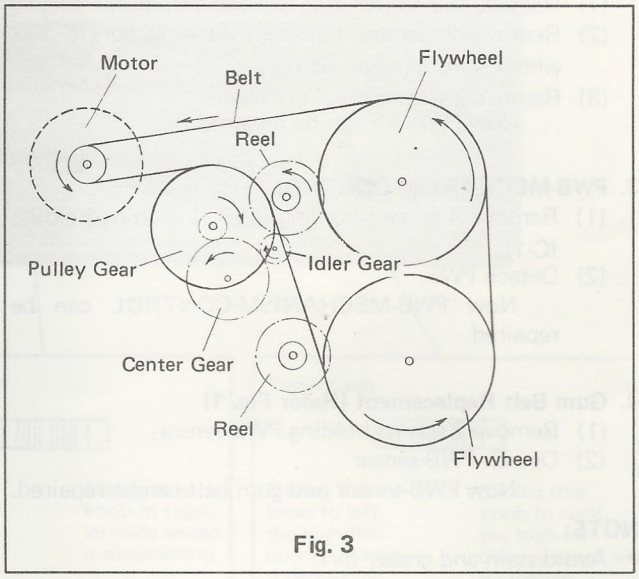


Fig. 3

(2) Designed to prevent the belt from slipping by equipping with a reversible electric motor.

(3) The tape will run reversely in consequence of the motor's reverse-rotation. The magnet installed on the Reel and the Hole IC on the PWB-sensor will detect whether the tape runs or not.

3. FF/REW MECHANISM (Ref. Fig. 4)

3 - (1) Push either FF or REW button so that the head-base will move backward and lock.

(2) FF
Push FF-button and when SW2 turns on, Motor increases its speed and the tape runs with fast speed. This is Fast-Forward operation.

(3) REW
Push REW-button, and when REW button contacts with both SW1 and SW2, the Motor shifts its rotation. This causes the tape to begin to run fast rewinding.

(4) Release FF-lock
Push REW-button, and SW2 will be released by the Lock-plate. Then the tape runs forward and plays.

(5) Release REW-lock
Push FF-button, and SW1,2 will be released by the Lock-plate. Then the tape begins to run forward and play.

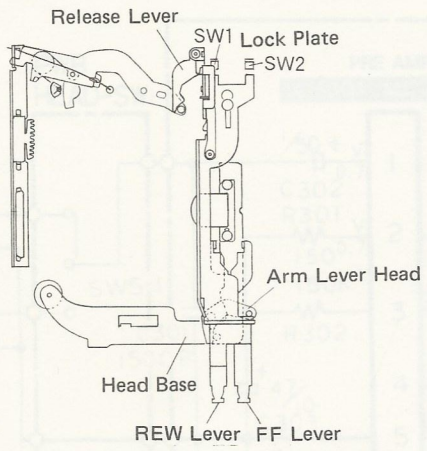


Fig. 4

(6) Eject
When the Eject-button is pushed, FF and REW-lock will be released by the action of Lock-plate which connected to the Main-switch-arm.

(7) Completion of tape-running
When the tape reaches its end, in the condition of FF-locked, the Motor turns adversely then the Assy-release works on the Lock-plate to release the FF-lock.
In the condition of REW-locked, the Motor turns twice then the Assy-release works on the Lock-plate to release the REW-lock.

4. MECHANISM and Operation for the Completion of Tape-Running (Auto-reverse-operation . . . Ref. Fig. 5)

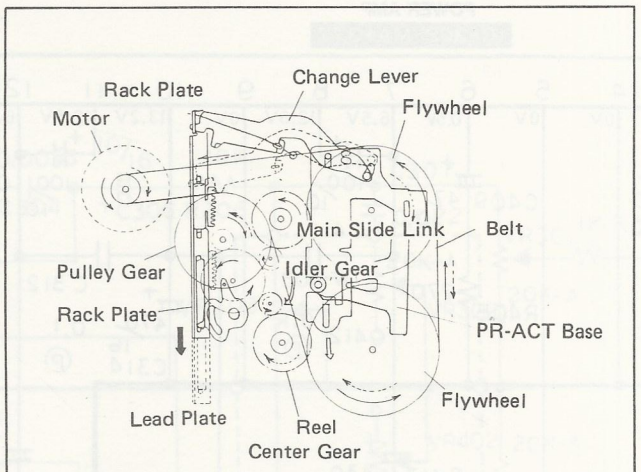


Fig. 5

(1) As the Center-gear rolls, the Idler-gear moves as gearing along with the Central-gear to the position marked. ⇨
(2) An action of Lead-plate hooked up with Central-gear works on the lever supporting the Idler-gear.
(3) When the Lead-plate starts the action, the Rack-plate slides toward the direction ➡.
(4) By snapping the Rack-plate's rack with the Pinion-gear, the Rack-plate causes the Change-lever to act.
(5) Just before snapping, Tension-spring gives impetus to the Rack-plate to facilitate to snap. This snapping powers the Rack-plate to slide forward.
(6) The Change-lever begins the action then the Main-slide-link works on the PR-ACT-base to move.
When the rotation of the both left and right Pinch-rollers are adversely shifted, simultaneously the Tape-running switch turns also adversely by the Change lever.
The tape is now on standby for the reverse-side play.

When IC hole detects the completion of the Tape-running, while all parts engaged in this MECHANISM function according to the direction of transmittion →, the Motor shits adversely its turn and evidently all parts follow the direction of transmittion--→

5. Tape-Speed Adjustment (Ref. Fig. 6)

Provided with a Reversible-Motor, Forward and Reverse function is equipped and the tape speed adjustment can be operated.

(1) Adjust with Volume RT1 and RT2 which are semi-fixed on the PWB-WB-MECHA (Ref. Fig. 6).

(2) Use a test-tape . . . TEAC MTT-111 or equivalent . . . to check that the output is 3030Hz.

a) Adjust with the Volume RT1 for the Forward.

b) Adjust with the Volume RT2 for the Reverse.

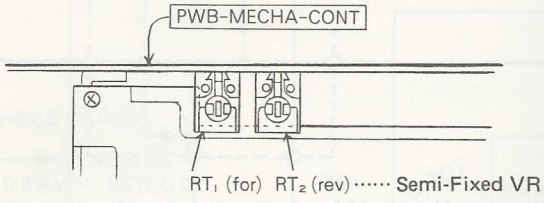
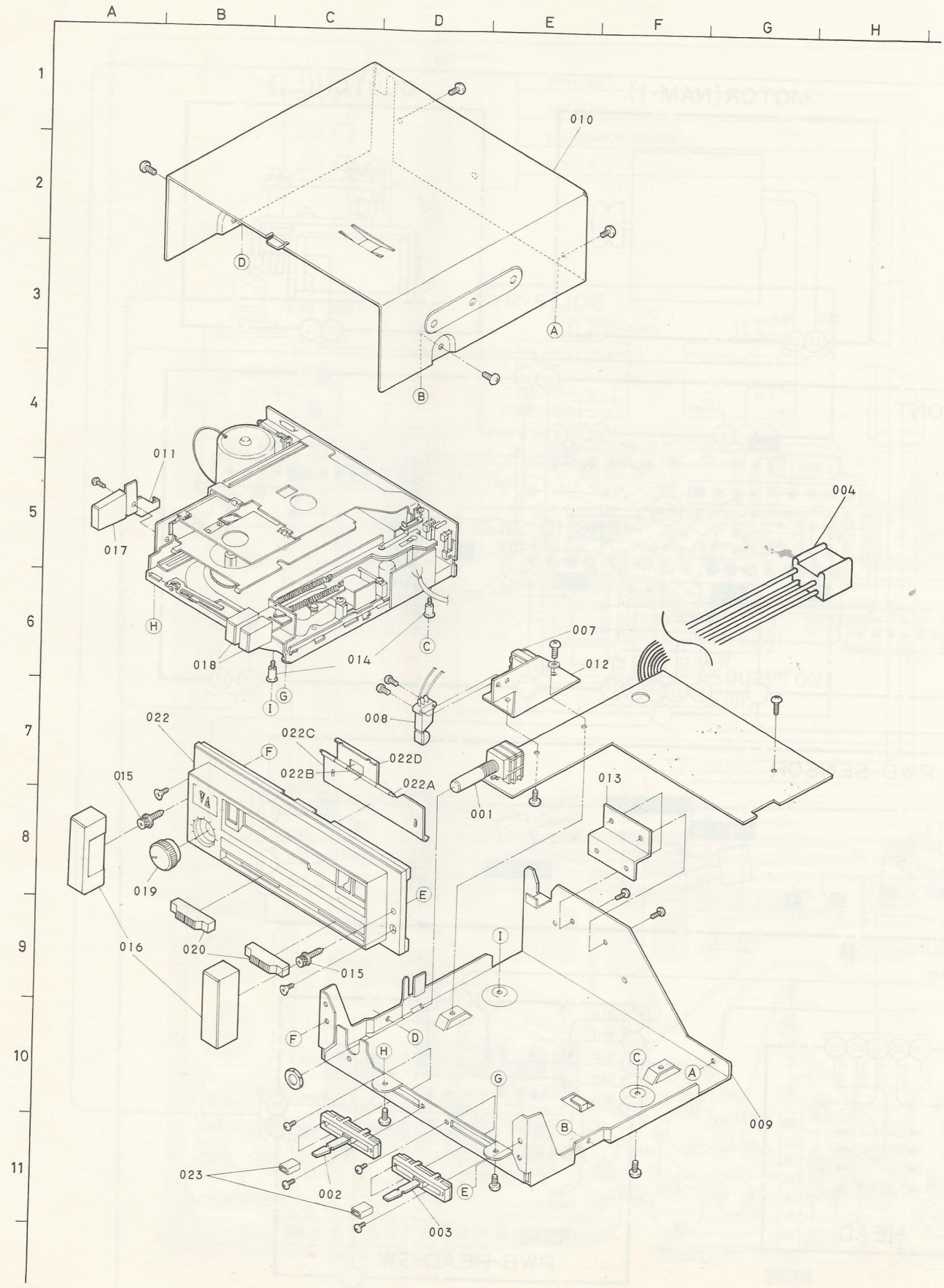
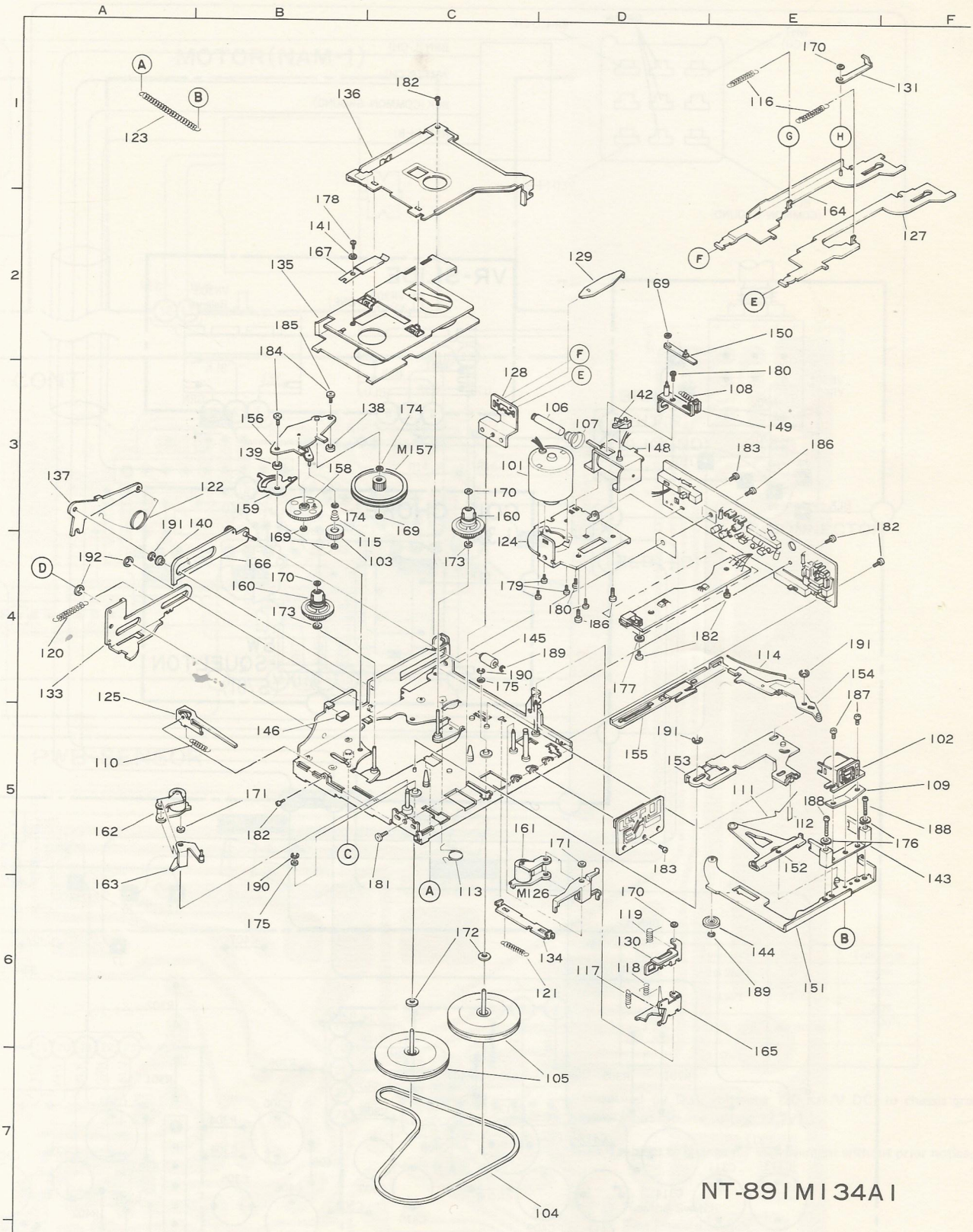


Fig. 6

EXPLODED VIEW
(1) CHASSIS



(2) DECK



MECHANICAL PARTS LIST

(1) CHASSIS

REF. NO.	PART NO.	DESCRIPTION	INDEX	REF. NO.	PART NO.	DESCRIPTION	INDEX
1	123L060O1	VR-DOUBLE	E-8	17	704M513O1	KNOB EJECT	A-5
2	129L148O1	VR-SLIDE	D-11	18	704M514O1	KNOB-FR	B-6
3	129L149O1	VR-SLIDE	E-11	19	704M515O1	KNOB-VR	B-8
4	241L25701	LEAD CONNECTOR (9P)	H-5	20	704M516O1	KNOB SLIDE	B-9
				21	838M002O1	LEAD CLAMPER	
				22	963L219O1	ASSY PANEL	B-7
7	351P001O8	TRANS CHOKE	F-6	22A	531M072O7	SHAFT SHUTTER	D-7
8	439L001O1	SW-SQUELTON	D-7	22B	570M407O1	SPRING SHUTTER	C-7
9	560K110O1	CHASSIS	G-10	22C	768M125O1	SHUTTER	C-7
10	590K302O1	UPPER COVER	E-2	22D	768M124O1	HOLDER SHUTTER	D-7
11	591M964O1	LEVER EJECT	B-4	23	641M310O1	SPACER	B-11
12	591M965O1	HOLDER-SW	F-6				
13	591M974O1	HEAT SINK	F-7				
14	630M508O1	POST-D	D-6				
15	669M073O2	SCREW	A-7				
			C-9				
16	702M038O3	SIDE PANEL	A-9				

(2) DECK

REF. NO.	PART NO.	DESCRIPTION	INDEX	REF. NO.	PART NO.	DESCRIPTION	INDEX
101	288L020O1	MOTOR	D-3	118	570J002O3	RELEASING SPRING	D-6
102	460L024O1	HEAD	E-5	119	570J002O4	SPRING PLATE LOCK	D-6
103	520J001O1	IDLER GEAR	B-3	120	570J002O5	SPRING EJECT	A-4
104	521L003O1	MAIN BELT	C-7	121	570J002O6	SPRING MAIN-SW	D-6
105	524J001O1	FLYWHEEL	C-6	122	570J002O7	SPRING EJECT	A-3
106	531J001O1	MOVABLE IRON CORE	D-3	123	570J002O8	SPRING HEAD	A-1
107	570J001O1	SPRING PLU	D-3	124	590J026O1	BRACKET MOTOR	D-3
108	570J001O2	SPRING LEVER	D-3	125	590J026O2	TIMING PLATE	B-5
109	570J001O3	P-SPRING HEAD	E-5	126	590J026O3	ARM-MAIN-SW	D-5
110	570J001O4	SPRING-TIMING PLATE	B-5	127	590J026O4	LEVER-FF	F-2
111	570J001O5	SPRING-PR	E-5	128	590J026O5	LEVER BRACKET	C-3
112	570J001O6	SPRING-SW-ACT	E-5	129	590J026O6	PLATE NONLOCK	D-2
113	570J001O7	SPRING CHANGE LEVER	C-5	130	590J026O7	PLATE LOCK	D-6
114	570J001O8	SPRING TENSION	E-4	131	590J026O8	PLATE PUSH RELEASE	F-1
115	570J001O9	SPRING IDLER GEAR	B-3	133	590J027O1	LEVER EJECT	A-4
116	570J002O1	SPRING LEVER	E-1	134	590J027O2	LEVER MAIN-SW	C-6
117	570J002O2	SPRING-MIN	D-6	135	590J027O3	HOLDER-EV	C-2

REF. NO.	PART NO.	DESCRIPTION	INDEX	REF. NO.	PART NO.	DESCRIPTION	INDEX
136	590J02704	ARM-EV	C-1	173	640J00105	CUT WASHER (P)	
137	590J02705	LEVER LIFT UP	A-3	174	640J00106	CUT WASHER (P)	
138	630J00101	COLLAR (L)	B-3	175	640J00107	CUT WASHER (P)	
139	630J00102	COLLAR (R)	B-3	176	680M00201	WASHER	
140	630J00103	ROLLER GUIDE EJECTOR	A-4	177	680M00202	WASHER	
141	630J00104	COLLAR SP-PACK	B-2	178	669J00101	CAMERA SCREW	
142	641J00101	CAM-SW	D-3	179	669J00102	CAMERA SCREW	
143	641J00102	TAPE GUIDE	E-5	180	669J00103	CAMERA SCREW	
144	641J00103	ROLLER HEAD BASE	E-6	181	669J00104	CAMERA SCREW	
145	641J00104	ROLLER EJECTOR	C-4	182	669J00105	TAP CAMERA SCREW	
146	765J00101	CUSHION RUBBER	B-5	183	669J00106	TAP CAMERA SCREW	
147	891J00201	UNIT MAIN BASE		184	669J00107	TAP CAMERA SCREW	
148	891J00203	ASSY PLUNGER	D-3	185	669J00108	TAP CAMERA SCREW	
149	891J00204	UNIT PLATE-PLU	E-3	186	669J00109	TAP CAMERA SCREW	
150	891J00205	UNIT LEVER CAM-SW	E-2	187	669J00201	SCREW	
151	891J00206	UNIT HEAD BASE	E-5	188	669J00202	SCREW SEMS	
152	891J00207	UNIT PINCH ROLLER	E-5	189	685L02101	E-WASHER	
153	891J00208	UNIT MAIN SLIDE LINK	D-5	190	685L02102	E-WASHER	
154	891J00209	UNIT CHANGE LEVER	E-4	191	685L02103	E-WASHER	
155	891J00301	UNIT RACK PLATE	D-5	192	685L02104	E-WASHER	
156	891J00302	ASSY PLATE GEAR	B-3				
157	891J00303	UNIT PULLEY GEAR	C-3				
158	891J00304	UNIT CENTER GEAR	B-3				
159	891J00305	UNIT LEAD PLATE	B-3				
160	891J00306	ASSY REEL	C-3, B-4				
161	891J00307	ASSY PINCH ROLLER (L)	C-5				
162	891J00308	ASSY PINCH ROLLER (R)	A-5				
163	891J00309	UNIT ARM LEVER HEAD	A-5				
164	891J00401	UNIT LEVER-RWD	E-1				
165	891J00402	ASSY RELEASE	D-6				
166	891J00403	UNIT EJECTOR	B-4				
167	891J00404	UNIT SPRING PACK	B-2				
169	640J00101	CUT WASHER (P)					
170	640J00102	CUT WASHER (P)					
171	640J00103	CUT WASHER (P)					
172	640J00104	CUT WASHER (P)					

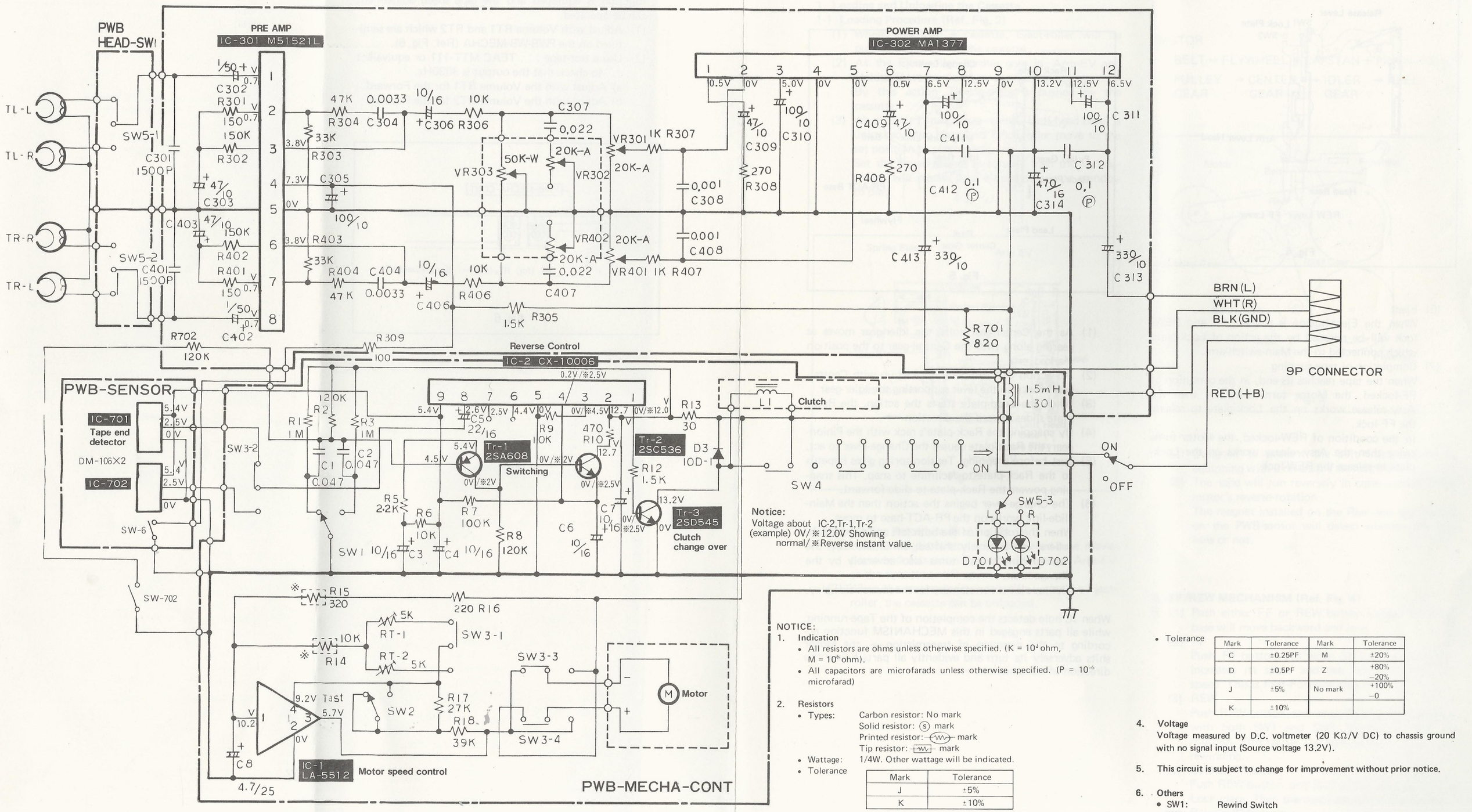
ELECTRICAL PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
RESISTORS AND CAPACITORS		
R14	103M02801	R-CARBON 10K
R15	103M02802	R-CARBON 320
VR301, 401	123L06001	VR-DOUBLE
w/SW701		
VR302, 402	129L14901	VR-SLIDE
VR303	129L14801	VR-SLIDE
RT1, 2	127L00301	VR-SEMIFIXED
SEMICONDUCTORS		
Tr1	260M01301	TR 2SC608SP
Tr2	260M01302	TR 2SB536SP
Tr3	260M01303	TR 2SD545
IC1	266M01601	IC LA-5512K
IC2	266M01602	IC CX-1006
IC301	266P31601	IC M51521L
IC302	266P35901	IC HA1377
IC701, 702	266M01603	IC DM-106
D3	264L02001	DIODE 10D-1
D701, 702	264P19803	DIODE LEGL-9GP6

REF. NO.	PART NO.	DESCRIPTION
COIL AND TRANSFORMER		
L301	351P00108	TRANS CHOKE
OTHERS		
	242L03600	LEAD SP
	242M22504	LEAD POWER
	242M14702	LEAD-1P
	288L02001	MOTOR
SW1, 2	435L02801	SW-LEAF
SW3-1, 4	431L05301	SW-LEAF
SW4	431L05302	SW-SLIDE
SW5-1, 3	431L05303	SW-SLIDE
SW6	435L02803	SW-LEAF
SW701	439L00101	SW-SQUELTON
	460L02401	HEAD
L1	891J00203	ASSY PLUNGER

SCHEMATIC DIAGRAM

MODEL : GX-111EM



NOTICE:

1. **Indication**
   - All resistors are ohms unless otherwise specified. (K = 10^3 ohm, M = 10^6 ohm).
   - All capacitors are microfarads unless otherwise specified. (P = 10^{-6} microfarad)

2. **Resistors**
   - Types: Carbon resistor: No mark
     Solid resistor: (S) mark
     Printed resistor: (Ⓜ) mark
     Tip resistor: mark
   - Wattage: 1/4W. Other wattage will be indicated.
   - Tolerance

Mark	Tolerance
J	±5%
K	±10%

3. **Capacitors**
   - Types: Ceramic condenser: No mark
     Semiconductor ceramic condenser: (BC) mark
     Polyester film condenser: (P) mark
     Styrol condenser: (S) mark
     Tantalic condenser: (T) mark
     Aluminum electrolytic condenser: (Al) mark
     Tip condenser: mark
   - Tolerance

Mark	Tolerance	Mark	Tolerance
C	±0.25PF	M	±20%
D	±0.5PF	Z	+80% −20%
J	±5%	No mark	+100% −0
K	±10%		

4. **Voltage**
   Voltage measured by D.C. voltmeter (20 KΩ/V DC) to chassis ground with no signal input (Source voltage 13.2V).

5. **This circuit is subject to change for improvement without prior notice.**

6. **Others**
   - SW1: Rewind Switch
   - SW2: Fast Foward Switch
   - SW3-1 ~ 4: Reverse Switch
   - SW4: Eject Switch
   - SW5-1 ~ 2: Head Switch
   - SW5-3: LED Switch
   - SW6: Muting Switch
   - SW701: Main Switch
   - SW702: Program Switch

PRINTED CIRCUIT BOARD(Pattern Side)

MODEL : GX-111EM