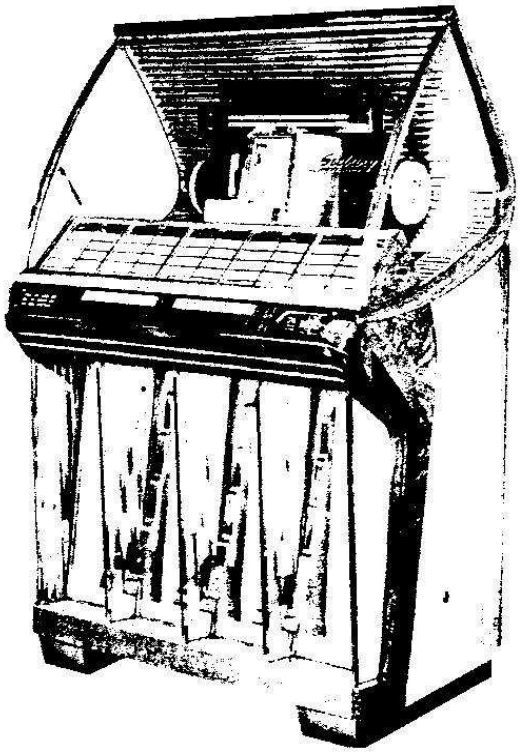
Seeburg HF100 & 100J

Service Manual & Parts Catalog

LEGEND

Pages

Seeburg
HIGH FIDELITY
Select-o-matic 100
MODEL HF100R



The Select-O-Matic "100", Model HF100R, is a coin-operated phonograph using the Seeburg Select-O-Matic Mechanism for selective playing of either or both sides of fifty 45 r.p.m., 7-inch records. Choice of any of the one hundred selections may be made at the instrument with an Electrical Selector or by remote control with 100-selection, 3-wire Wall-O-Matics. A program holder using standard size title strips displays the entire hundred selection program and may be removed as a complete unit or in sections of 20 titles.

The program title strips are back-lighted by a 25-watt fluorescent lamp which also illuminates the mechanism, the speaker grille, the electrical selector escutcheons, grille baffles, and ornaments.

The lid glass through which the mechanism may be seen is hinged and opens for changing records and title strips. The cover is retained at any position of opening by a self-locking support rod. A Service Switch, a Credit Switch, a Popularity Meter and a Selection Counter are accessible with the lid open. The Service Switch and Credit Switch are used to operate the mechanism when servicing the instrument. The Popularity Meter, which is a part of the mechanism, indicates the number of times (up to 50) each record is played. The Selection Counter, which is part of the Electrical Selector, totals the number of selections made with the Electrical Selector and with remote control Wall-O-Matics. A rubber flap covers the counter dials.

Coins are deposited in a single entry coin chute and pass through a 5-, 10-, 25-cent slug rejector to the coin switches. The coin switches are connected for one play for a nickel, two plays for a dime or six plays for a quarter. The coins are stored in a canvas bag which has a capacity of approximately one-hundred fifty dollars. The bag is removed through a small door at the lower right side of the cabinet.

A Seeburg Magnetic Pickup with one-fifth ounce stylus pressure assures long record life and high quality reproduction unaffected by temperature or humidity conditions. A 25-watt High Fidelity Amplifier connects to five permanent magnet type speakers: two 12-inch low frequency speakers and a 5-inch high frequency speaker on the front baffle, and one 8-inch low and middle range speaker on each side

panel. This speaker arrangement provides omnidirectional sound distribution. A terminal strip is provided for connection of High Fidelity Type Remote Speakers. The amplifier incorporates an automatic volume compensator to provide uniform volume level and avoid "blasting" due to "loud" records. A single volume control is used to adjust the volume of sound from the phonograph speaker and the remote speakers. Provision has been made for plug-in connection of a remote volume control that may be up to a hundred feet from the Select-O-Matic without introducing hum or causing distortion.

A Selection Receiver supplies power for remote control Wall-O-Matics and incorporates the switches and relays for operation from remote points as well as from the Electrical Selector. It is equipped with convenient sockets for plug-in connections of the mechanism, cabinet lighting, amplifier, and control circuits.

The Selection Receiver and the Amplifier are mounted in a vertical position on the inside of the cabinet rear door. The door may be opened for access to the tubes and fuses or it may be fully removed. The units are fastened over an opening which is covered by a plate. The plate, which is held in place with wing nuts, may be removed to expose the tube socket and plug connections and the interior wiring of the units for test during normal operation.

A selection cancel switch, effective only when a record is playing, is operated by a small, inconspicuous button on the back near the left side of the cabinet. A remote cancel switch or button may be substituted by plug-in connection to the selection receiver.

SPECIFICATIONS

Power Requirements:

117 volts A.C., 60 cycles
Standby (without Wall-O-Matics) - 85 watts
Operating (without Wall-O-Matics) - 230 watts

Cabinet Lighting:

1 - 25-watt, 33-inch, Daylight Fluorescent (FS25 starter.)

Cabinet Key Number F279

Select-O-Matic Mechanism: .....Type 145S14-L6

Selector Assembly .....Type 100SA8-L6

Record Capacity .....50 records (100 Selections)

Record Type .....45 rpm

7-inch diameter, 1.5-inch center hole

Pickup ..... Seeburg High Fidelity Magnetic

Phonograph Speakers:

2-12" permanent magnet (low frequency)
2- 8" permanent magnet (wide range)
1- 5" permanent magnet (high frequency)

Finish .....Sea Mist & Olive Burl Plastic Veneer

Coin Equipment .....5-, 10-, 25-cent Single Entry Slug Rejector

Amplifier .....Type MRA5-L6

8-tube. High Fidelity, Constant Voltage Type with Automatic Volume Compensation

Audio Power Output:

To Phonograph Speakers (adjustable).....
.....1 to 25 watts

To Remote Speakers.....24 watts max.

Maximum total to Phonograph Speakers & Remote Speakers.....25 watts

Electrical Selector .....Type ES11-L6

Wired Selection Receiver .....Type WSR7-L6

Remote Control:

Seeburg, 3-wire "Wall-O-Matic
Nominal operating voltage.....25

Power Source.....Selection Receiver or Auxiliary Power Supply Type PS6-1Z
Maximum number of Wall-O-Matics powered by Selection Receiver.....6

Maximum number of Wall-O-Matics powered by each added auxiliary power supply.....6

Remote Speakers: .....High Fidelity Types

HFAS2-12	12" Recessed Type
HFCV1-12	12" Recessed Type
HFCV2-8	8" Wall Cabinet
HFCV3-8	8" Corner Cabinet

Tubes:	Fuses:
1 - 5879	1 - 5 Amp. 3 AG
1 - 6SN7GTA/6SN7GT	1 - 3 Amp. 3 AG
1 - 6SK7/6SK7GT	1 - 2 Amp. 3 AG Slo-Blo
1 - 6SL7	1 - 1 Amp. 3 AG Slo-Blo
1 - 12AX7	1 - 3 Amp. Fustat
2 - 6L6G /6L6	
1 - 5U4G	
1 - 2050	

Dimensions:

Height	59 Inches
Width	35½ Inches
Depth	27 Inches
Net Weight	315 Pounds
Shipping Weight	395 Pounds
Record Weight, 50 Records, approx.	3 Pounds

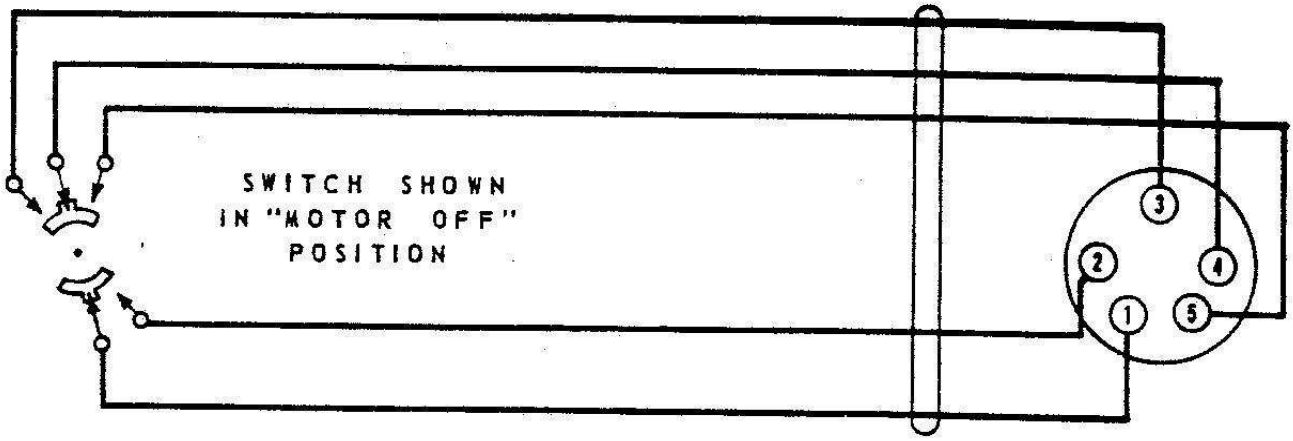


Figure 26. Schematic Diagram - Service Switch

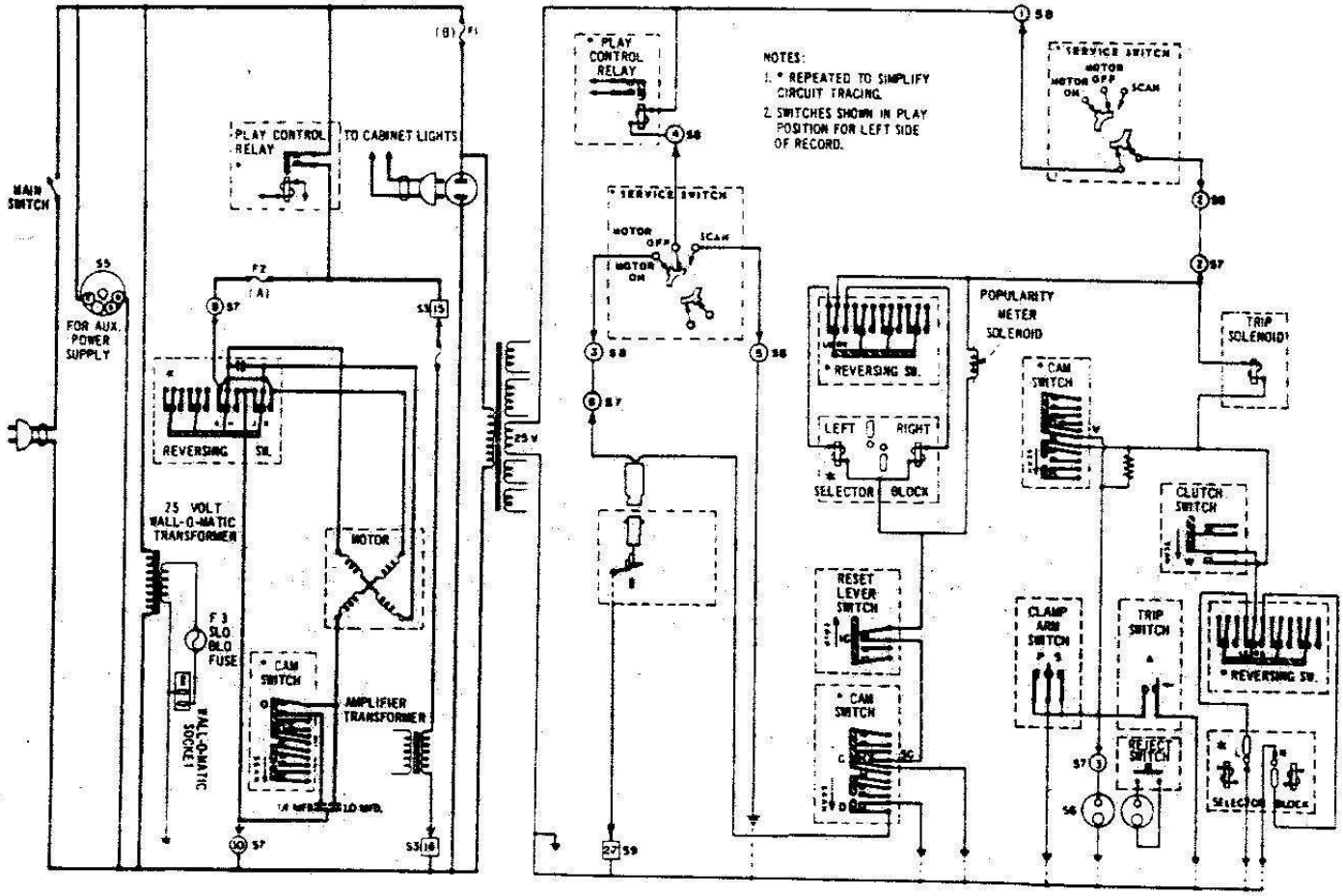


Figure 27. Schematic Diagram - Power & Control Wiring, 145S14-L6 Mechanism & WSR7-L6 Selection Receiver.

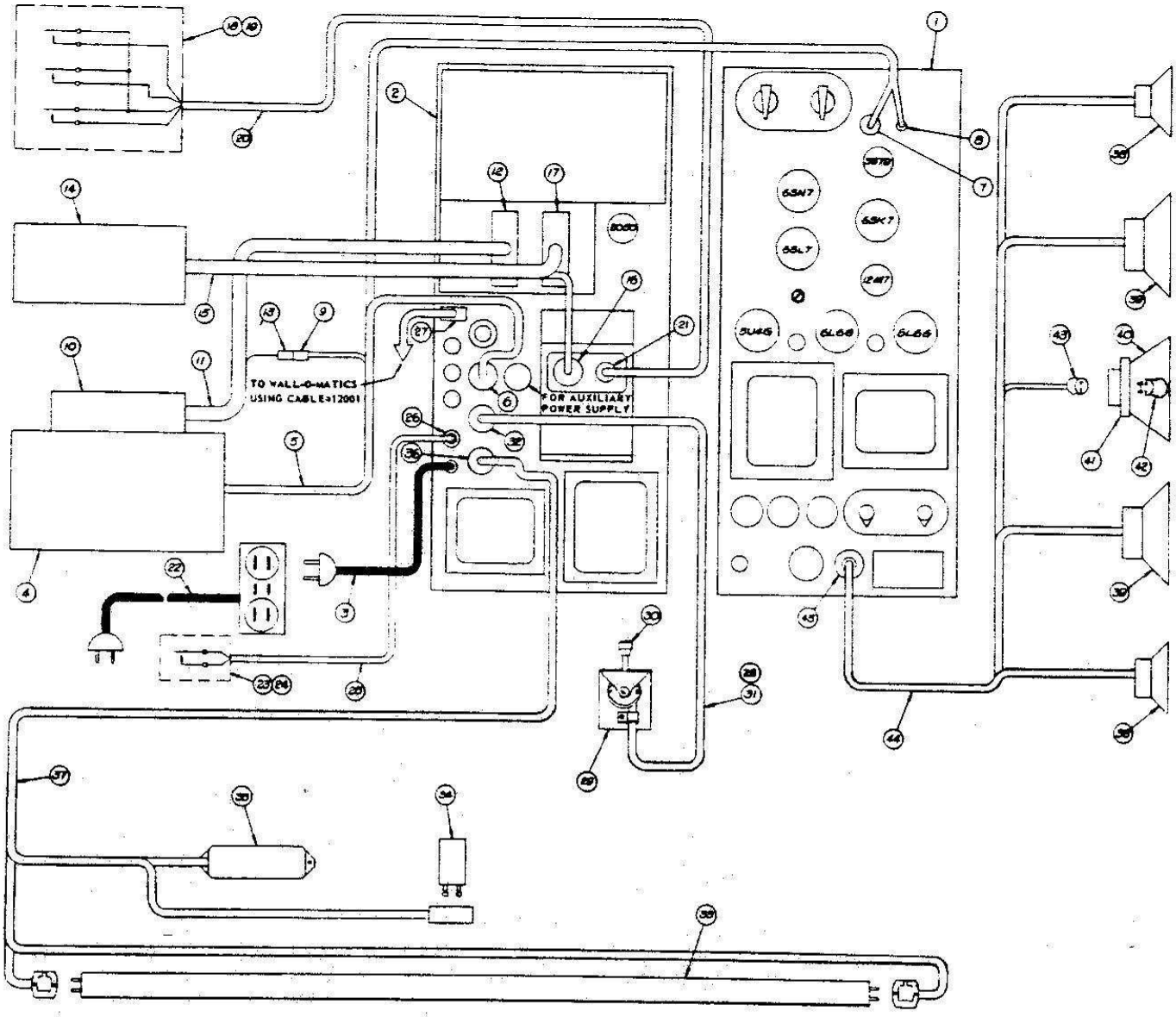


Figure 28. Cabinet Wiring Diagram

PARTS LIST

Item	Part No.	Part Name
1	305152	MASTER REMOTE AMPLIFIER (MRA5-L6)
2	303320	WIRED SELECTION RECEIVER (WSR7-L6)
3	303334	LINE CORD ASSEMBLY
4	246300	SELECT-O-MATIC MECHANISM (145S14-L6
5	246950	CONTROL CABLE AND PLUG ASSEMBLY
6	250942	11 PRONG PLUG
7	A250938	3 PRONG PLUG (MUTE)
8	246957	SINGLE PRONG PLUG
9	250707	CONNECTOR (FEMALE)
10	304452	SELECTOR ASSEMBLY (100SA8-L6
11	304437	SELECTOR CABLE AND PLUG ASSEMBLY
12	F-9461	27 PRONG PLUG
13	250706	CONNECTOR (MALE)
14	410400	ELECTRICAL SELECTOR (ES11-L6)
15	410465	ES CABLE AND PLUG ASSEMBLY
16	12028	OCTAL PLUG
17	400844	27 CONTACT FEMALE PLUG
18	401760	COIN SWITCH AND CABLE ASSEMBLY
19	401314	COIN SWITCH
20	401761	CABLE AND PLUG ASSEMBLY
21	401521	4 PRONG PLUG (SMALL)
22	402152	LINE CORD AND OUTLET ASSEMBLY
23	405654	RECORD REJECT SWITCH AND CABLE ASSEMBLY
24	402065	RECORD REJECT SWITCH
25	405742	RECORD REJECT SWITCH CABLE & PLUG ASSEMBLY

Item	Part No.	Part Name
26	402066	2 PRONG PLUG
27	12015	3 CONTACT PLUG
28	407195	SERVICE SWITCH CABLE, PLUG & BRACKET ASSEMBLY
29	407244	SERVICE SWITCH
30	407239	KNOB
31	407198	SERVICE SWITCH CABLE AND PLUG ASSEMBLY
32	200241	5 PRONG PLUG
33	405136	25 W. FLUORESCENT LAMP
34	405138	STARTER (FLUORESCENT LIGHT) 25 W.
35	405101	BALLAST 25 W. FLUORESCENT LAMP
36	10895	2 PRONG PLUG
37	405693	PROGRAM LIGHT CABLE ASSEMBLY
38	407280	8" SPEAKER
	407282	8" SPEAKER
	407284	8" SPEAKER
	407290	12" SPEAKER
39	407292	12" SPEAKER
	407294	12" SPEAKER
40	407270	HIGH FREQUENCY SPEAKER
41	86218	CONDENSER
42	406261	2 CONTACT MALE SOCKET
43	406349	2 CONTACT FEMALE PLUG
44	407300	SPEAKER CABLE ASSEMBLY
45	F-3150	4 PRONG PLUG

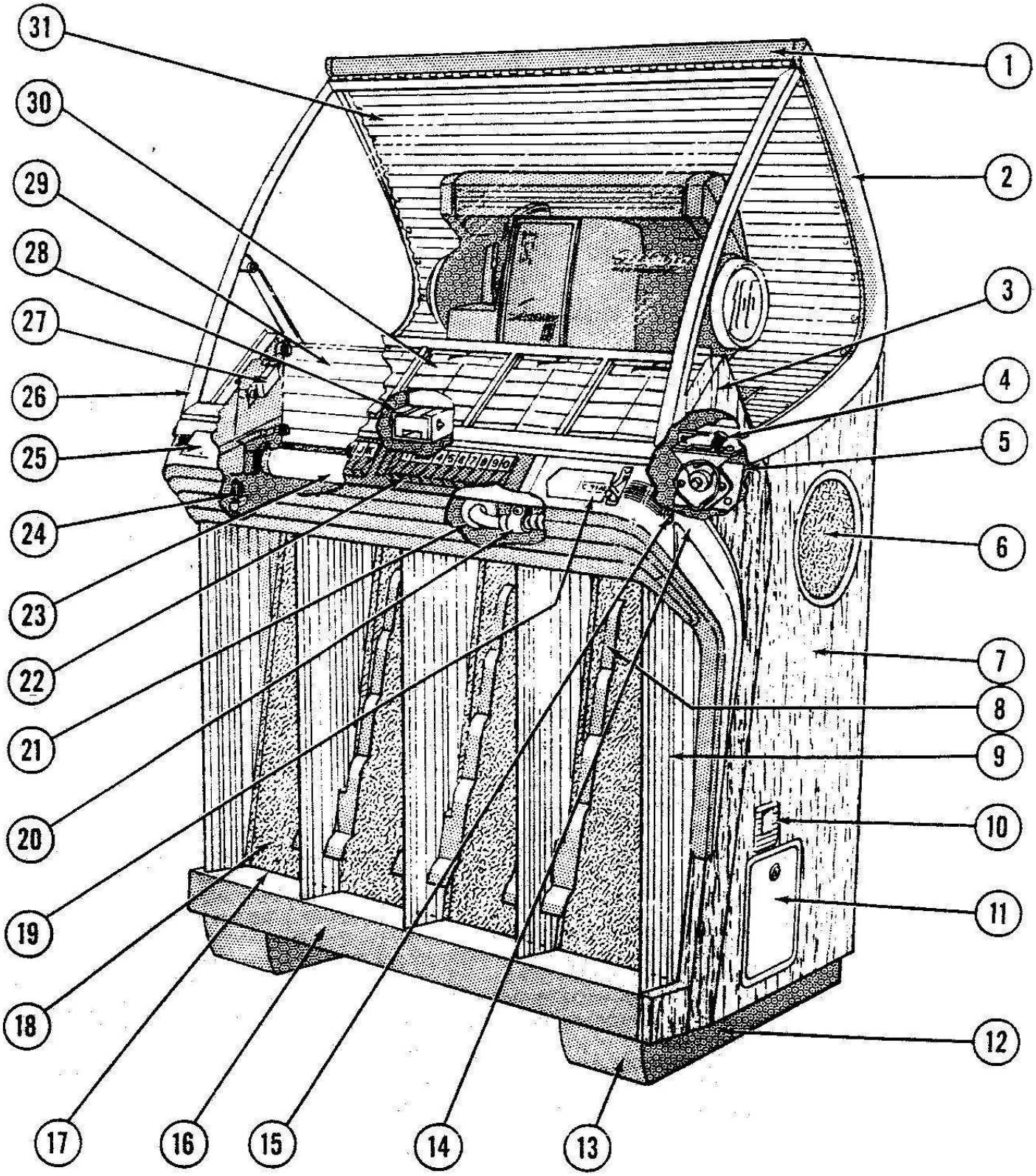


Figure 30. Front View HF100R Cabinet Assembly

SELECT-O-MATIC "100", MODEL HF100R

PARTS LIST

Item	Part No.	Part Name
1	407013	Top Rail
2	407011	Upper Side Casting R.H.
	407012	Upper Side Casting L.H.
	77231	No. 10 x 5/8 Phillips R.H.W.Screw
	70846	8/32 x ¾ Phillips R.H.M.Screw
	407051	Side Glass
	407052	Side Glass Clamp R.H.
	407053	Side Glass Clamp L.H.
	70772	8/32 x 3/8 Phillips R.H.M.Screw
	73082	Lock Washer
3	407324	Program Frame Support and Decal Assembly R.H.
	407321	Decal Blank R.H.
	407017	Program Frame Support Casting R.H.
	407325	Program Frame Support and Decal Assembly L.H.
	407322	Decal Blank L.H.
	407018	Program Frame Support Casting L.H.
4	407244	Service Switch Only
5	407195	Service Switch Assembly
6	407247	Bezel
	407248	Grille Screen (back)
	407249	Grille Screen (front)
	70895	8/32 x ½ Phillips B.H.M.Screw
	72385	Flat Washer
7	407120	Cabinet Only
	407346	Sans Art Pearl Sea Mist Decal 30" x 48"
	407347	Sans Art Olive Burl Decal 34" x 50"
8	407027	Grille Ornament R.H.
	407028	Grille Ornament L.H.
	70886	8/32 x 1" Phillips B.H.M.Screw
	70793	8/32 x ¾ Phillips B.H.M.Screw
	72135	Flat Washer
9	407202	Glass Baffle Assembly R.H.
	407203	Glass Baffle Assembly L.H.
	77239	No. 8 x 5/8 Phillips R.H.W.Screws
10	407304	Slug Receptacle Assembly
11	407141	Cash Box Door Frame
	407142	Cash Box Door Assembly
	407143	Cash Box Door Only
	406340	Cash Box Lock
12	407107	Foot Trim Strip R.H.
	407108	Foot Trim Strip L.H.
13	407021	Toe Casting
	77303	No. 6 x ½ Phillips B.H.W.Screw
14	407144	Cabinet Casting Assembly
	407145	Cabinet Casting Sub Assembly
	407184	Cabinet Corner Casting Assembly R.H.
	407185	Cabinet Corner Casting Assembly L.H.
	407014	Cabinet Center Casting
	406034	Latch Bracket Assembly L.H. (First Electric Selector)
	406035	Latch Bracket Assembly R.H. (First Electric Selector)
15	407156	Lid Lock R.H.
	407157	Lid Lock L.H.
	407065	Lid Lock Bolt
	406043	Bolt Pivot Bar
	70782	10/32 x ¼ Phillips R.H.M.Screw
	72136	Flat Washer
	73091	Lock Washer
16	407242	Kick Plate
	77250	No. 6 x ½ Phillips Flat H.W.Screw
17	407345	Grille Filler (Bottom)
18	407153	Grille Cloth
	407194	Grille Cloth Retainer
19	407130	Coin Window 5 cent Play
	407131	Coin Window 10 cent Play
20	245999	Cable Clamp
21	407251	Cable Bushing
22	410210	Selector Key Panel
23	405136	Fluorescent Light (25 watt)
	407352	Light Socket (2)
	407353	Starter
24	405219	Brush Only
	405220	Brush Holder
25	406180	Instruction Window
	406160	Window Retainer
	70204	Speed Nut
26	407040	Cabinet Lid Assembly
	407041	Cabinet Lid Glass
	407042	Cabinet Lid Frame (Top)
	407044	Cabinet Lid Frame (Side)
	407043	Cabinet Lid Frame (Bottom)
	407046	Lid Catch R.H.
	407047	Lid Catch L.H.
	70781	8/32 x 5/16 Phillips F.H.W.Screw
	407048	Lid Support Bracket Assembly
	407050	Lid Hinge
	71712	6/32 x 3/8 Phillips Flat H.M.Screw
	407045	Glass Retainer
	76192	6/32 x ¼ Phillips B.H.Self Tapping Screw
27	407169	Magnet
28	407162	Chassis Mounting Channel
29	407098	Diffuser Glass
30	407167	Program Holder & Frame Assembly
	407168	Program Frame Assembly
	406300	Program Glass (AB)
	406301	Program Glass (CD)
	406302	Program Glass (EF)
	406303	Program Glass (GH)
	406304	Program Glass (JK)
	406051	Program Holder Assembly (AB)
	406014	Program Holder Only
	406050	Program Holder Spring
	404675	Retainer Washer
	72158	Flat Washer (7/16 x .140 x .031)
	406052	Program Holder Assembly (CD)
	406053	Program Holder Assembly (EF)
	406054	Program Holder Assembly (GH)
	406055	Program Holder Assembly (JK)
	406320 thru 406335	Classification Heading (Sold in Sets Only)
	406061	Program Identification Label Card
31	407059	Interior Trim (Upper)
	407058	Interior Trim (R.H.)
	407059	Interior Trim (L.H.)
	407174	Trim Cap
	407175	Trim Cap
	407176	Trim Cap
	79188	3/16 x 7/32 Plastic Rivet

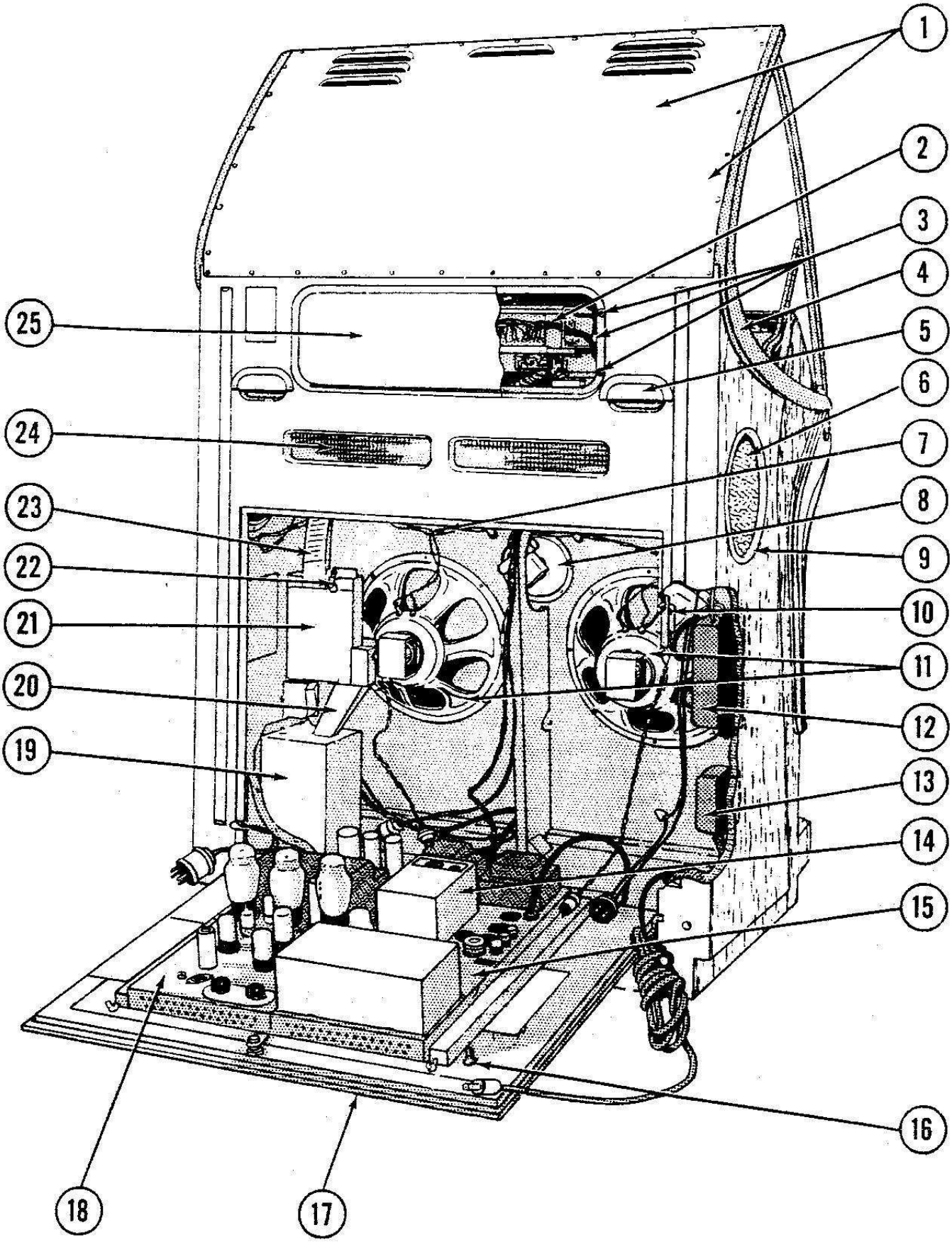
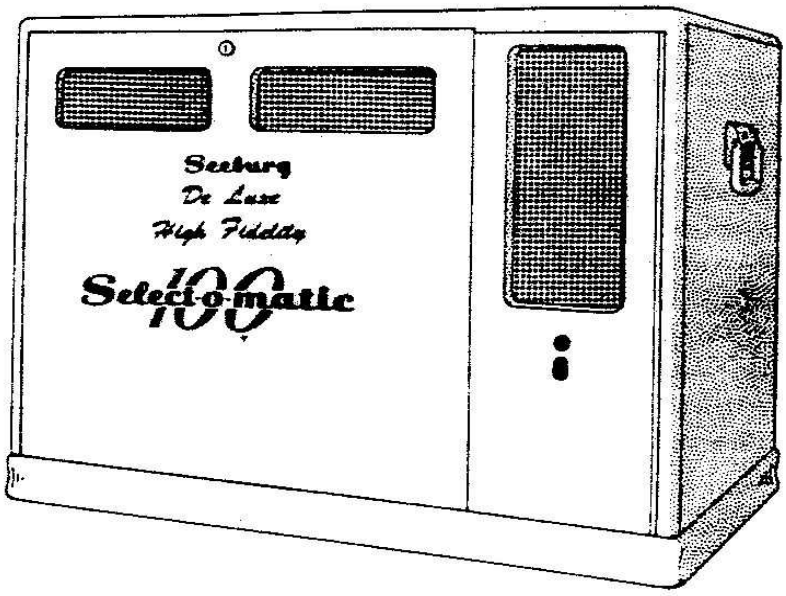


Figure 31. Back View HF100R Cabinet Assembly

PARTS LIST

Item	Part No.	Part Name
1	407061	Back Panel Welded Assembly
	76189	No. 6 x 3/8 Phillips R.H.S.Top Screw
	76190	No. 6 x 5/8 Phillips R.H.S.Top Screw
2	304452	100SA8-L6 Selector Assembly
	304433	Contact Block Assembly
3	407106	Panel Latch Assembly
	407189	Panel Latch Spring
	407192	Bullet Catches
4	407011	Upper Side Casting R.H.
	407012	Upper Side Casting L.H.
	77231	No. 10 x 5/8 Phillips R.H.W.Screw
	70846	8/32 x ⅜ Phillips R.H.W.Screw
5	407327	Cabinet Handle
6	407280	Speaker (8") Permoflux
	407282	Speaker (8") Jensen
	407284	Speaker (8") Utah
7	407300	Speaker Cable Assembly
8	407270	Utah Tweeter
	86218	Condenser (5A) - 406261-2 prong plug)
9	407247	Bezel
	407248	Grille Screen (back)
	407249	Grille Screen (front)
	70895	8/32 x ½ Phillips B.H.M.Screw
	72358	Flat Washer
10	405654	Record Reject Switch Assembly
	402065	Record Reject Switch
	402064	Record Reject Pin
	405742	Record Reject Switch Cable Assembly
11	407290	Speaker (12") Permoflux
	407292	Speaker (12") Jensen
	407294	Speaker (12") Utah
12	405101	Light Ballast (25 watt)
13	402152	Line Cord & Outlet Assembly
14	400640	CCU3-L6 Credit & Cancel Assembly
15	303320	WSR7-L6 Wired Selection Receiver
16	404321	Eye Bolt
	404320	Tee Bolt
	404674	Chain
17	407188	Back Door Assembly (Complete)
	407155	Rear Door Lock
	407328	Lower Rear Door Cover Plate Assembly
18	305152	MRA5-L6 Master Remote Amplifier
19	407193	Cash Box Assembly
	405745	Cash Box Lock Plate
	404659	Cash Bag
20	401298	Lower Coin Chute Welded Assembly
21	401720	Coin Mechanism (Complete)
	401731	Slug Rejector Mtg. Frame Assembly
	401760	Coin Switch Cable Assembly
	401314	Coin Switch
	401521	Plug (4 prong)
	401255	Slug Rejector Mtg. Stud
	404731	Slug Rejector
	405410	Slug Rejector (Alternate for 404731)
	401307	Coin Switch Guard
22	401740	Scavenger Wire & Plunger Assembly
	401741	Scavenger Wire Housing
	401223	Plunger Return Spring
23	401625	Coin Chute
24	407255	Vent Screen
25	407105	Access Panel Riveted Assembly

SEEBURG SELECT-O-MATIC "100"
MODEL HHF100R



The Select-O-Matic "100" R. C. Special, Model HHF100R is for use in "hide-away" installations where the available space does not permit the use of the Model HF100R. It uses the Seeburg Select-O-Matic "100" Mechanism for selective playing of either or both sides of fifty 45 r.p.m., 7-inch records with 1½ inch center hole. Choice of any of the one hundred selections is made by remote control with the 100-selection, 3-wire Wall-O-Matics. Sound is distributed to the areas to be served by means of High Fidelity remote speakers connected to the High Fidelity Master-Remote Amplifier in the R. C. Special.

The cabinet is of wood, finished in blue wrinkle lacquer and is divided into two compartments. One compartment contains the Select-O-Matic "100" Mechanism, the other is used for the electronic equipment. Doors on the front and back provide access to the mechanism for record changing and service. Switches, which operate when the front door is opened, turn on service lights for illumination of the mechanism and connect a monitor speaker for checking records and amplifier operation. A three position service switch is located in the mechanism compartment. When the switch lever is set in the vertical (center) position, the power is off, and the mechanism will not operate even though selections are "set up" on the Selector Assembly. When the switch lever is moved to the left, against the spring return, it causes the mechanism to scan the carriage; in this position it will scan past and bypass selections set up on the Selector Assembly. The service switch must be set towards the right for normal operation.

A Seeburg Magnetic Pickup assures long record life and high quality reproduction uneffected by temperature or humidity conditions. A High Fidelity 25-watt amplifier connects to the monitor speaker and to remote speakers. The amplifier incorporates an automatic volume compensator to provide uniform volume level and avoid "blasting" due to "loud" records. The volume of the sound from the High Fidelity remote speakers is controlled by means of a volume control which can be installed at any conveniently accessible place. The volume control is mounted in a small metal case which includes a push button for cancelling a playing selection.

A Selection Receiver incorporates the switches and relays for remote selection operation as well as the control circuits of the mechanism and provides power for up to six Wall-O-Matics. An Auxiliary Power Supply unit (furnished as standard equipment) provides power for operation of up to six additional Wall-O-Matics. The Selection Receiver and the furnished Power Supply Unit will, then, furnish power for up to twelve Wall-O-Matics. More than twelve Wall-O-Matics may be used by the addition of more auxiliary power supplies – one for each additional six Wall-O-Matics. The Selection Receiver is equipped with sockets for convenient plug-in connections for the mechanism, cabinet lights, amplifier, and control circuits. A Selection Counter is a part of the Receiver and totals the number of selections made from the Wall-O-Matics. It may be used to check the total of coins in the Wall-O-Matics and for an approximate check of the number of plays of the mechanism.

A Popularity Meter is included in the mechanism for determining the number of times the different records have been played.

The Selection Receiver and the Amplifier are mounted on a door at one end of the cabinet and are in a vertical position. The door may be opened for access to the tubes, fuses, and connections or it may be fully removed. The units are hinged at the lower edge and, by removing two readily accessible wing nuts, they may be lifted away from the door panel for inspection or service of the interior wiring or tube and plug socket connections during normal operation.

Major assemblies furnished as standard equipment in the Model HHF100R are:

1 - Type 145S15-L6 Select-O-Matic Mechanism with Type 100SA9-L6 Selector Assembly.

1 - Type MRA5-L6 Master Remote High Fidelity Amplifier.

1 - Type WSR8-L6 Wired Selection Receiver.

1 - Type PS6-1Z Wall-O-Matic Power Supply.

1 - Type MRVC-1 Master Remote Volume Control Kit.

SPECIFICATIONS

Power Requirements:

117 volts, A.C., 60 cycle
Standby (without Wall-O-Matics)..... 40 watts
Operating (without Wall-O-Matics).....200 watts
For each 3W1 Wall-O-Matic, add to standby power requirements..... 15 watts

Cabinet Key Number.....F279

Record Capacity.....50 records (100 selections)

Record Type.....45 rpm, 7-inch diameter, 1.5-inch center hole.

Pickup.....Seeburg High Fidelity Magnetic

Monitor Speaker.....5" p.m.

Amplifier:

8-tube, High Fidelity Constant Voltage Type with Automatic Volume Compensator.

Audio Power Output (at full volume)..... 25 watts, max.

Remote Speakers:

Seeburg High Fidelity Type

Remote Control:

Type.....Seeburg, 3-wire "Wall-O-Matic "100"
Nominal operating voltage..... 25
Power source for Wall-O-Matics.....Selection Receiver and Power Supply.....(Type PS6-1Z).
Maximum number of Wall-O-Matics operated from Selection Receiver..... 6
Maximum number of Wall-O-Matics operated from Power Supply..... 6

Tubes:

1 - 5879
1 - 6SN7
1 - 6SK7
1 - 6SL7
1 - 12AX7
1 - 6L6GT
1 - 5U4G
1 - 2050

Fuses:

1 - 5 amp. 3AG
1 - 3 amp. 3AG
1 - 1 amp. 3AG Slo-Blo
1 - 2 amp. 3AG Slo-Blo
2 - 3 amp. Fustat

Dimensions:

Height ..... 27½ Inches
Width ..... 36 Inches
Depth (front to back) ..... 23 Inches
Net Weight..... 208 Pounds
Shipping Weight..... 254 Pounds

SELECT-O-MATIC "100"
R. C. SPECIAL, MODEL HHF100R
INSTALLATION and OPERATION

The Select-O-Matic "100" Hide-Away Model HHF100R is similar in most operational respects to the Model HF100R. The installation and operation data for the Model HHF100R, manual pages 1211 to 1225, applies except where reference is made to cabinet features, the electrical selector, and the speaker connections. The speaker connections are the same as detailed for the HHF100G on manual pages 1207 and 1208.

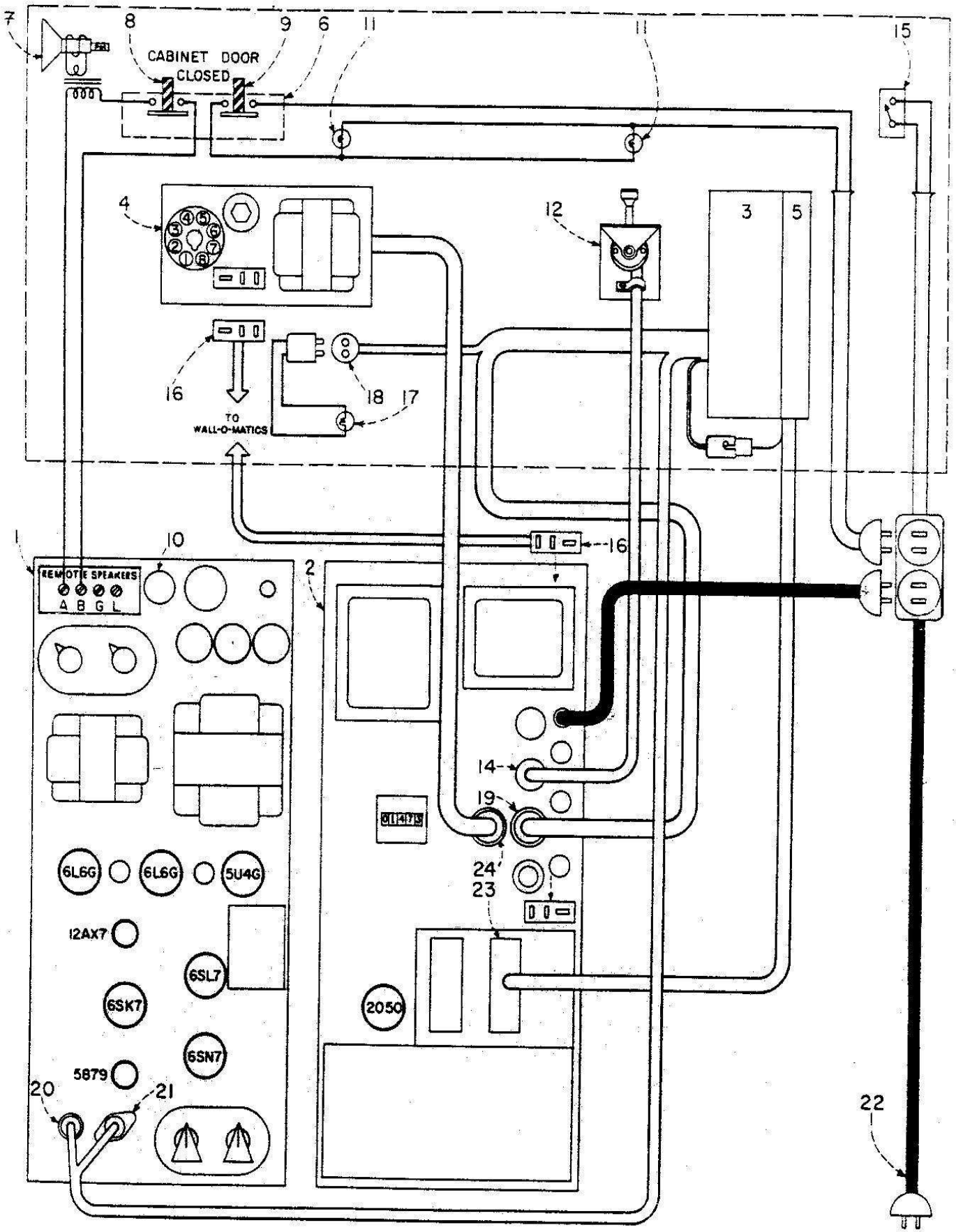
Parts lists for the HHF100R are the same as for the HF100R except as noted in the parts lists below and referenced in the cabinet cabling diagram on page 1234.

PARTS LIST FOR CABINET CABLING DIAGRAM

Item	Part No.	Part Name
1	305152	Power Amplifier, Type MRA5-L6
2	303315	Wired Selection Receiver, Type WSR8-L6
3	246302	Select-O-Matic Mechanism, Type 145S15-L6
4	60485	Auxiliary Power Supply, Type PS6-1Z
5	304319	Selector Assembly, Type 100SA6-L6
6	405370	Speaker & Light Switch Cable Assembly
7	402785	Monitor Speaker
8	600024	Speaker Switch
9	600024	Light Switch
10	305223	4-Prong Plug
11	404165	Cabinet Light Socket
12	407195	Service Switch Assembly
14	200241	5-Prong Plug
15	303112	Toggle Switch
16	12015	3-Prong Plug
17	404825	Pilot Light & Jewel Assembly
18	A251751	2-Prong Socket
19	A250942	11-Prong Plug
20	K228440	Single Prong Plug
21	A250938	3-Prong Plug (Amphenol)
22	405366	117 v. Line & Plug Assembly
23	F-9461	27-Prong Plug
24	12004	9-Prong Plug

ADDITIONAL PARTS LIST

Part No.	Part Name
406573	Cabinet Handle
406574	Floor Screen (Mechanism)
406575	Floor Screen (Electronic)
406576	Cabinet Screen (Electronic)
406579	Lower Chassis Mounting Angle
407382	Hook & Upper Chassis Mtg. Angle
903300	3/16-24 Wing Nut
405395	Hinge & Mtg. Strap Assembly
405392	Latch
407155	Door Lock
406583	Door Vent Screen
502094	"Seeburg" Escutcheon
407162	Chassis Mounting Channel
407262	Caster
404672	Door Chain Assembly
125364	Main Switch Mtg. Plate
916635	Thumb Screw (Shipping)
405272	Caution Label



CABINET CABLING DIAGRAM

Seeburg

SELECT-O-MATIC "100"

MODEL

HF100R-D

The Select-O-Matic "100", Model HF100R-D and Model HF100R are identical except in the coin system and the parts associated with it. The Model HF100R-D is set up for three plays for a 25-cent coin and one play for a dime or two nickels. The specific differences of the two models are in the coin instruction window, the nickel coin switch, the slug rejector and rejector mounting, and the Selection Receiver. Except for these, the description and service information for the HF100R, pages 1209 to 1230, inclusive, apply to both instruments.

The coin instruction window reads "3 plays – quarter – – 1 play – dime or two nickels"

The slug rejector is designed to accept quarters, dimes and nickels and incorporates a "nickel diverter" that makes possible the use of two nickels for one play. Each quarter and dime operates, respectively, a quarter and dime coin switch but only alternate nickels operate the associated nickel coin switch. The operation of the diverter is such that the first of two nickels is diverted from the coin switch. The coin passes into the cash box but tilts the diverter so the second nickel operates the coin switch as it drops from the rejector. In this manner, the 5-cent coin switch is closed only once for two nickels and, because this switch and the dime switch are both connected to the credit solenoid that is in the 1-credit position, one credit will be set up for 10 cents whether it be a single 10-cent coin or two nickels.

The slug rejector with the nickel diverter requires a mounting frame and lower coin chute different than that shown in the parts lists for the HF100R. These and other parts that differ are listed below.

The coin switch assembly with its cable and plug are similar in both models but the 5-cent coin switch actuating lever is 1/16" shorter when the diverter equiped slug rejector is used. The 5-cent and 10-cent coin switches are interconnected in the Credit and Cancel Unit. For this reason, the Credit and Cancel Unit and the Selection Receiver used in the HF100R-D are not interchangeable with those used in the HF100R and are identified by different type and part numbers. These are listed below with reference to their equivalent in the Model HF100R.

PARTS LIST

PAGE	ITEM	DESCRIPTION	Part No. HF100R	Part No. HF100R-D
1226	2	Wired Selection Receiver	303320 (WSR7-L6)	303317 (WSR7-L6D)
	18	Coin Switch & Cable Assembly	401760	401766
	19	Coin Switch	401314	401749
1227	19	Coin Window	407130	407444
1229	14	Credit & Cancel Assembly	400640 (CCU3-L6)	400649 (CCU3-L6D)
	15	Wired Selection Receiver	303320 (WSR7-L6)	303317 (WSR7-L6D)
	20	Lower Coin Chute Welded Assembly	401298	401750
	21	Coin Mechanism (Complete)	401720,	401723
		Slug Rejector Mtg. Frame Assembly	401731	401745
		Coin Switch Cable Assembly	401760	401766
		Coin Switch	401314	401749
		Slug Rejector	404731	401374

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HIGH FIDELITY

Select-o-matic 100

SERVICE DATA

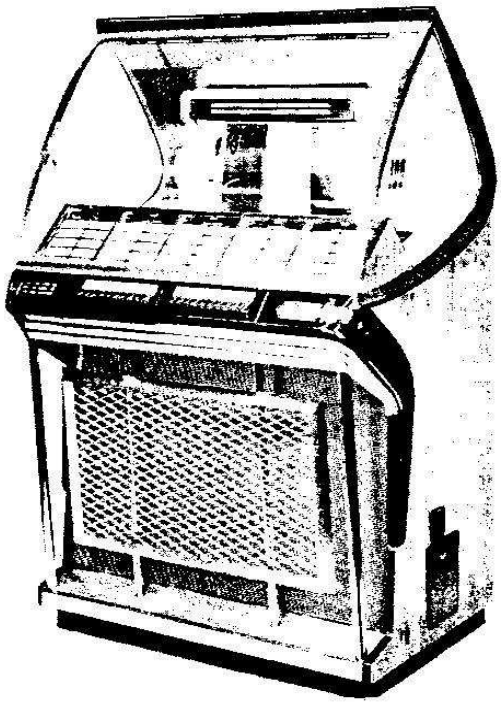
Model 100-J

This manual supplements the Part Number 407436 Service Manual for the Select-O-Matic "100", Model HF100R to provide all data and information for operation, service and parts lists for the Select-O-Matic "100", Model 100J.

J. P. SEEBURG
A Division of
Fort Pitt Industries, Incorporated

Chicago Illinois

Seeburg
HIGH FIDELITY
Select-o-matic 100
MODELS 100J and 100JL



The Select-O-Matic "100" Model 100J and Model 100JL are coin operated phonographs that are the same except in cabinet finish and in the color or finish of some of the exposed mechanism parts. The letter N or D following the model number designates the selection pricing specification. N indicates five cents per selection (six for twenty-five cents); D indicates ten cents per selection (three for twenty-five cents). Both are equipped with the Select-O-Matic "100" Mechanism for selective playing of either or both sides of fifty 45 r.p.m., 7-inch records. Choice of any of the one hundred selections may be made at the instrument with Electrical Selector or by remote control with 100-selection, 3-wire Wall-O-Matics. A program holder using standard size title strips displays the entire hundred selection program and may be removed as a complete unit or in sections of 20 titles.

The program title strips are back-lighted by a 25-watt fluorescent lamp which also illuminates the mechanism, the speaker grille, the electrical selector escutcheons, grille baffles, and ornaments.

The lid glass through which the mechanism may be seen is hinged and opens for changing records and title strips. The cover is retained at any position of opening by a self-locking support rod. A Service Switch, a Credit Switch, a Popularity Meter and a Selection Counter are accessible with the lid open. The Service Switch and Credit Switch are used to operate the mechanism when servicing the instrument. The Popularity Meter, which is a part of the mechanism, indicates the number of times (up to 50) each record is played. The Selection Counter, which is part of the Electrical Selector, totals the number of selections made with the Electrical Selector and with remote control Wall-O-Matics. A rubber flap covers the counter dials.

Coins are deposited in a single entry coin chute and pass through a 5-, 10-, 25-cent slug rejector to the coin switches. The coins are stored in a canvas bag which has a capacity of approximately one-hundred fifty dollars. The bag is removed through a small door at the lower right side of the cabinet.

A Seeburg Magnetic Pickup with one-fifth ounce stylus pressure assures long record life and high quality reproduction unaffected by temperature or humidity conditions. A 25-watt

High Fidelity Amplifier connects to three permanent magnet type speakers: two 12-inch and one 8-inch. A terminal strip is provided for connection of High Fidelity Constant Voltage Type Remote Speakers. The amplifier incorporates an automatic volume compensator to provide uniform volume level and avoid "blasting" due to "loud" records. A single volume control is used to adjust the volume of sound from the phonograph speaker and the remote speakers. Provision has been made for plug-in connection of a remote volume control that may be up to a hundred feet from the Select-O-Matic without introducing hum or causing distortion.

A Selection Receiver supplies power for remote control Wall-O-Matics and incorporates the switches and relays for operation from remote points as well as from the Electrical Selector. It is equipped with convenient sockets for plug-in connections of the mechanism, cabinet lighting, amplifier, and control circuits.

The Selection Receiver and the Amplifier are mounted in a vertical position on the inside of the cabinet rear door. The door may be opened for access to the tubes and fuses or it may be fully removed. The units are fastened over an opening which is covered by a plate. The plate, which is held in place with wing nuts, may be removed to expose the tube socket and plug connections and the interior wiring of the units for test during normal operation.

A selection cancel switch, effective only when a record is playing, is operated by a small, inconspicuous button on the back near the left side of the cabinet. A remote cancel switch or button may be substituted by plug-in connection to the selection receiver.

SPECIFICATIONS

Power Requirements:
- Standby (without Wall-O-Matics) - 85 watts
- Operating (without Wall-O-Matics) - 230 watts

Cabinet Lighting:
- 1 - 25-watt, 33-inch, Daylight Fluorescent (FS25 starter.)

Cabinet Key Number.....F279

Mechanism.....).....100J: Type 145S16-L6
100JL: Type 145S18-L6

Selector Assembly.... 100J: Type 100SA10-L6
100JL: Type 100SA11-L6

Record Capacity.....50 records (100 Selections)

Record Type.....45 rpm
7-inch diameter, 1.5-inch center hole

Pickup.....Seeburg High Fidelity Magnetic

Phonograph Speakers:
- 2 - 12" PM (Low Frequency)
- 1 - 8" PM (High Frequency

Finish..100J: Striped Mahogany and Woven Cane Plastic Veneer
100JL: Bleached Mahogany Plastic Veneer

Coin Equipment.....5-, 10-, 25-cent Single Entry
- Slug Rejector with Nickel Diverter (used on 100J-D and 100JL-D)
- Slug Rejector without Nickel Diverter (used on 100J-N and 100JL-N)

Amplifier..... Type HFMA1-L6J
8-tube, High Fidelity, Constant Voltage Type with Automatic Volume Compensation

Audio Power Output:
- To Phonograph Speakers (adjustable).....
.....1 to 20 watts
- To Remote Speakers.....24 watts max.
- Maximum total to Phonograph Speakers & Remote Speakers.....25 watts

Electrical Selector.....Type ES11-L6

Wired Selection Receiver.....Type WSR7-L6 (used on 100J)
.....Type WSR7-L6D (used on 100J-D)

Remote Control:
- Seeburg, 3-wire "Wall-O-Matic
- Nominal operating voltage.....25
- Power Source.....Selection Receiver or Auxiliary Power Supply Type PS6-1Z
- Maximum number of Wall-O-Matics Powered by Selection Receiver.....6
- Maximum number of Wall-O-Matics powered by each added auxiliary power supply.....6

Remote Speakers:.....High Fidelity Types

HFCV1-12	12" Recessed Type
HFCV2-8	8" Wall Cabinet
HFCV3-8	8" Corner Cabinet

Tubes:	Fuses:
1 - 5879	1 - 5 Amp. 3 AG
1 - 6SN7GTB	1 - 3 Amp. 3 AG
1 - 6SK7/6SK7GT	1 - 2 Amp. 3 AG
1 - 6SL7GT	1 - 1 Amp. 3 AG
1 - 12AX7	1 - 3 Amp. Fustat
2 - 6L6G/6L6	
1 - 5U4GB	
1 - 2050	

DIMENSIONS:

Height	58¾ Inches
Width	35½ Inches
Depth	26¾ Inches
Net Weight	337 Pounds
Shipping Weight	419 Pounds
Record Weight, 50 Records, approx.	3 Pounds

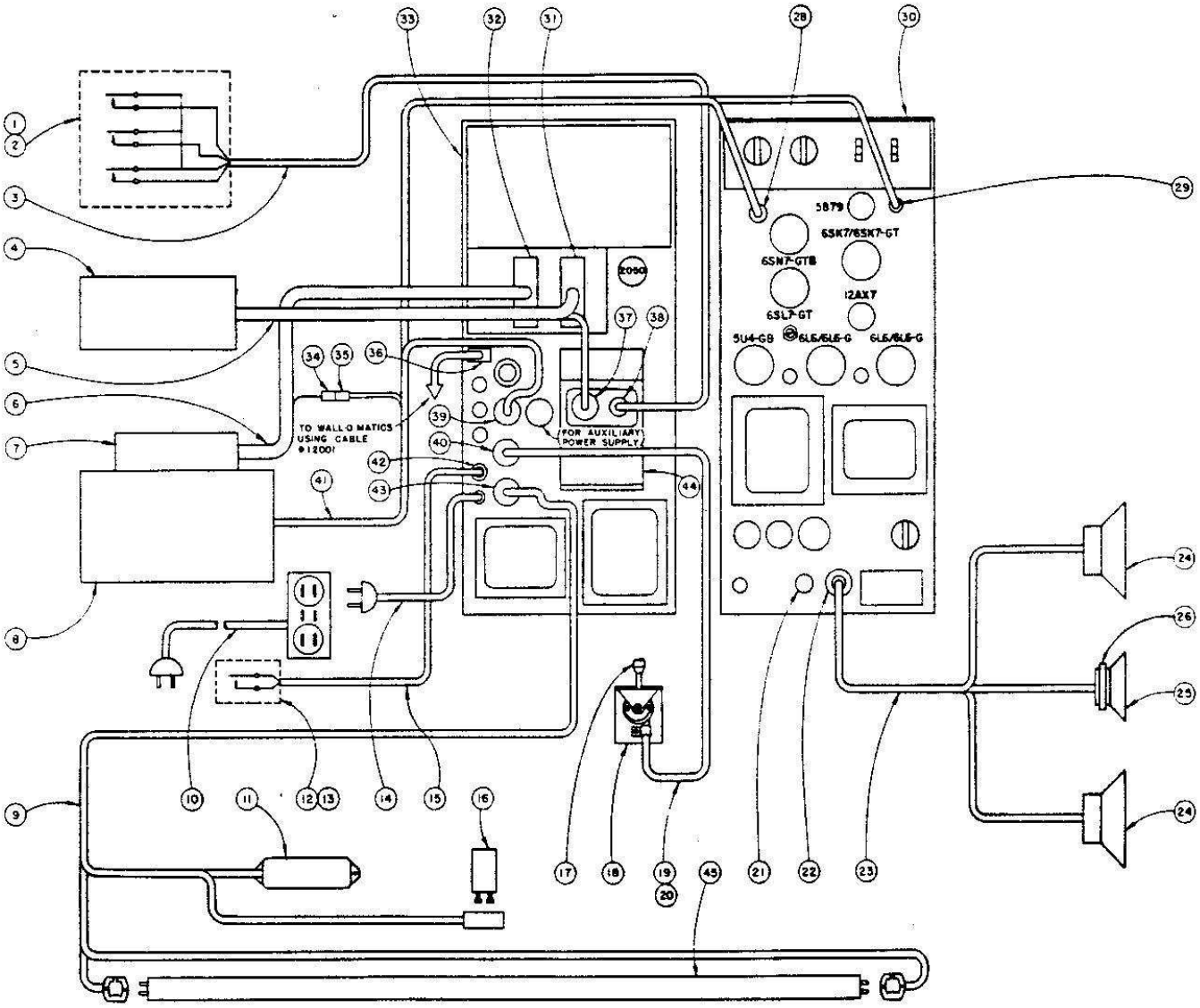
SELECT-O-MATIC "100"

Models 100J & 100J-D

The Select-O-Matic "100" Models 100J and 100J-D differ from the Model HF100R in cabinet design, amplifier and color of some of the visible mechanism parts. The service information for the HF100R applies to the 100J and 100J-D and is indexed below.

The Type HFMA1-L6J amplifier in the Model 100J and the Type MRA5-L6 amplifier in the Model HF100R have the same tube complement and will employ the same approach and techniques in servicing but some of the component parts of the two amplifiers differ. The data, parts list and diagram for the Type HFMA1-L6J appear on pages 4057 to 4060.

- INDEX -



Cabinet Cabling Diagram

PARTS LIST

Item	Part No.	Part Name
1	401766	COIN SWITCH & CABLE ASSEMBLY
2	401749	COIN SWITCH
3	401761	CABLE & PLUG ASSEMBLY
4	410400	ELECTRICAL SELECTOR (ES11-L6)
5	410465	E.S. CABLE & PLUG ASSEMBLY
6	304437	SELECTOR CABLE & PLUG ASSEMBLY
7	304452	SELECTOR ASSEMBLY (100SA10-L6)
8	246307	SELECT-O-MATIC MECHANISM (145S16-L6)
9	407338	PROGRAM LIGHT CABLE ASSEMBLY
10	402152	LINE CORD & OUTLET ASSEMBLY
11	407365	BALLAST 25 W FLUORESCENT LAMP
12	405654	RECORD REJECT SWITCH & CABLE ASSEMBLY
13	402065	RECORD REJECT SWITCH
14	303334	LINE CORD ASSEMBLY
15	405742	RECORD REJECT SWITCH CABLE & PLUG ASSEMBLY
16	405138	STARTER (FLUORESCENT LIGHT) 25W
17	407239	KNOB
18	407244	SERVICE SWITCH
19	407195	SERVICE SWITCH CABLE, PLUG & BRACKET
20	407198	SERVICE SWITCH CABLE & PLUG ASSEMBLY
21	305316	9-PRONG DUMMY PLUG
22	F-3150	4-PRONG PLUG
23	407540	SPEAKER CABLE ASSEMBLY
24	408315	12" SPEAKER
25	408303	8" SPEAKER
26	86215	CONDENSER
28	A250938	3-PRONG PLUG (MUTE)
29	246957	SINGLE PRONG PLUG
30	305270	MASTER REMOTE AMPLIFIER (HFMA1-L6J)
31	400844	27 CONTACT FEMALE PLUG
32	F-9461	27-PRONG PLUG
33	303317	WIRED SELECTION RECEIVER (WSR7-L6D) - USED ON 100J-D
	303320	WIRED SELECTION RECEIVER (WSR7-L6) - USED ON 100J
34	250706	CONNECTOR (MALE)
35	250707	CONNECTOR (FEMALE)
36	12015	3 CONTACT PLUG
37	12028	OCTAL PLUG
38	401521	4-PRONG PLUG (SMALL
39	250942	11-PRONG PLUG
40	200241	5-PRONG PLUG
41	246950	CONTROL CABLE & PLUG ASSEM.
42	402066	2-PRONG PLUG
43	10895	2-PRONG PLUG
44	400649	CREDIT & CANCEL UNIT (CCU3-L6D)
45	405136	25 W. FLUORESCENT LAMP

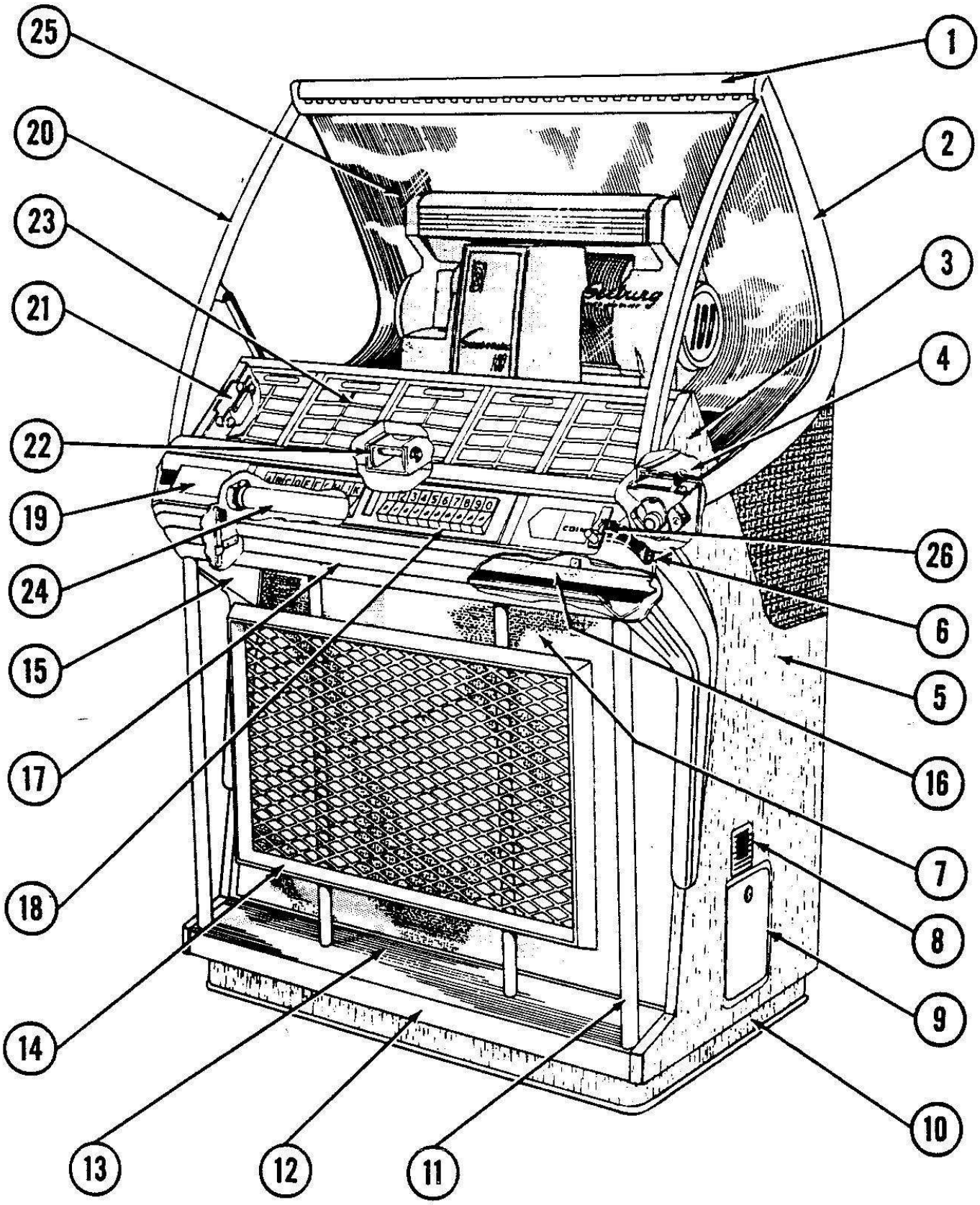


Figure 1. Front View – Cabinet Assembly

SELECT-O-MATIC "100", MODELS 100J and 100JL

PARTS LIST

Item	Part No. 100J	Part No. 100JL	Part Name
1	407013	407013	Top Rail
2	407011	407764	Upper Side Casting, R. H.
	407012	407765	Upper Side Casting, L. H.
	971425		No. 10 x 5/8 Phillips R. H. W. Screw
		961141	No. 10 x 5/8 Phillips R. H. S. M. Screw, Type A
	914668	914668	8/32 x ¼ Phillips R. H. M. Screw
	407051	407051	Side Glass
	407543	407543	Side Glass Clamp, R. H.
	407544	407544	Side Glass Clamp, L. H.
	53403	53403	¼" x 1/8 Adhesive Sponge Rubber
3	407652	407768	Program Frame Support Decal Assembly, R. H.
	407653	407769	Program Frame Support Decal Assembly, L. H.
	407656	407770	Decal Blank, R. H.
	407657	407771	Decal Blank, L. H.
4	407195	407195	Service Switch Assembly
	407244	407244	Service Switch Only
5	407530	407529	Cabinet Only
	407667	407667	Decal (Striped Mahogany)
	407668	407668	Decal (Woven Cane)
		407804	Decal (Bleached Mahogany)
6	407156	407156	Lid Lock Assembly, R. H.
	407157	407157	Lid Lock Assembly, L. H.
	407065	407065	Lid Lock Assembly
	406043	406043	Bolt Pivot Bar
	915380	915380	10/32 x ¼ Phillips R. H. M. Screw
	921242	921242	Flat Washer (Steel-Cad)
	925520	925520	Lock Washer
7	407674	407674	Grille Scrim Cloth
	407568	407568	Grille Screen
	407574	407574	Grille Filler Side
	407573	407573	Grille Filler Bottom
8	407557	407760	Slug Receptacle Assembly
9	407617	407757	Cash Box, Door Frame
	407555	407758	Cash Door Assembly
	407556	407759	Cash Door Only
	406340	406340	Cash Door Lock Assembly
10	407570	407570	Base Trim
	407569	53125	Base Cover
	970680	970660	No. 6 x ½ Phillips Flat H. W. Screw
11	407618	407618	Corner Tube Assembly, R. H.
	407623	407623	Tube Bracket, R. H.
	407635	407635	Tube Plug, R. H. or L. H.
	407619	407619	Corner Tube Assembly, L. H.
	407620	407620	Tube Only - 1" Dia. R. H. or L. H.
	407624	407624	Tube Bracket, L. H.
12	407572	407572	Kick Plate
	970660	960672	No. 6 x ½ Phillips Flat H.W.S. (Steel-Cad)
13	407571	407571	Grille Trim Lower
14	407577	407788	Grille Ornament Assembly
	407578	407789	Grille Frame Assembly
	407632	407632	Grille Frame Tube Assembly
	407633	407633	Grille Tubes Only
	407634	407634	Tube Plugs
15	407541	407541	Side Cover Plate, R. H.
	407542	407542	Side Cover Plate, L. H.
	407025	407025	Shelf Support Casting, R. H.
	407026	407026	Shelf Support Casting, L. H.
16	407641	407799	Grille Shelf Assembly
	407642	407798	Grille Shelf Only
	407151	407151	Shelf Bracket (Rear)
	407338	407338	Program Light Cable Assembly
	407251	407251	Cable Bushing (Black)
	407334	407334	Cable Bushing
	405220	405220	Brush Holder
	405219	405219	Brush
17	407144	407144	Cabinet Casting Assembly
	407145	407145	Cabinet Casting Sub-Assembly
	407184	407184	Cabinet Corner Casting Assembly, R. H.
	407185	407185	Cabinet Corner Casting Assembly, L. H.
	407014	407014	Cabinet Center Casting
	406034	406034	Latch Bracket Assembly, L. H.
	406035	406035	Latch Bracket Assembly, R. H.
18	410210	410210	Selector Key Panel
19	406180	406180	Instruction Window
	407444	407444	Coin Window (Used on 100J-D)
	407130	407130	Coin Window
	406160	406160	Window Retainer
	903150	903150	Speed Nut
20	407659	407659	Cabinet Lid Assembly
	407660	407660	Cabinet Lid Glass
	407042	407042	Cabinet Lid Frame (Top)
	407044	407044	Cabinet Lid Frame (Side)
	407043	407043	Cabinet Lid Frame (Bottom)
	407046	407046	Lid Catch, R. H.
	407047	407047	Lid Catch, L. H.
	407048	407048	Lid Support Bracket Assembly
	407050	407050	Lid Hinge
	914602		8/32 x 5/8 Phillips Flat H. M. S.
		914580	8/32 x 5/8 Phillips R. H. M. S.
	914771	914771	8/32 x 5/16 Phillips Flat H. M. S.
	960726		6/32 x 5/16 Phillips Flat H. Self Tapping Screw
		960754	6/32 x 3/8 Phillips Flat H. Self Tapping Screw
	913192		6/32 x 5/8 Phillips Flat H. M. Screw
		912992	6/32 x 1/4 Phillips Flat H. M. Screw
	407045	407045	Glass Retainer
	960711	960711	6/32 x ¼ Phillips Truss Hd. Self Tapping Screw
21	407169	407169	Magnet
22	407643	407162	Chassis Mounting Channel
	407098	407098	Light Diffuser Glass
23	407626	407793	Program Holder & Frame Assembly
	407627	407794	Program Frame Assembly
	406300	406300	Program Glass (A & B)
	406301	406301	Program Glass (C & D)
	406302	406302	Program Glass (E & F)
	406303	406303	Program Glass (G & H)
	406304	406304	Program Glass (J & K)
	406051	406051	Program Holder Assembly (A & B)
	407389	407389	Program Holder Only
	407388	407388	Program Holder Spring
	404675	404675	Retainer Washer
	406052	406052	Program Holder Assembly (C & D)
	406053	406053	Program Holder Assembly (E & F)
	406054	406054	Program Holder Assembly (G & H)
	406055	406055	Program Holder Assembly (J & K)
	407600	407600	Classification Heading (Hit Tunes) — SOLD IN SETS ONLY
	407601	407601	Classification Heading (All-Time Favorites) — SOLD IN SETS ONLY
	407685	407685	Classification Heading (Rhythm & Blues) — SOLD IN SETS ONLY
	407686	407686	Classification Heading (Folk & Western) — SOLD IN SETS ONLY
	407687	407687	Classification Heading (Classic & Varieties) — SOLD IN SETS ONLY
24	405136	405136	Fluorescent Light (25 Watt)
	405138	405138	Fluorescent Light Starter
25	407649	407649	Interior Trim (Upper)
	407650	407650	Interior Trim, R. H.
	407651	407651	Interior Trim, L. H.
	407665	407665	Trim Retainer
	407547	407547	Trim Support, L. H.
	407545	407545	Trim Support, R. H. Upper
	407648	407648	Trim Support Angle
	407546	407546	Trim Support, R. H. Lower
	407666	407666	Trim Clamp
	407174	407174	Trim Cap
	407175	407175	Trim Cap
	407176	407176	Trim Cap
	981036	981036	3/16 x 7/32 Plastic Rivet (Nylon-Clear)
26	401817	401817	Scavenger Wire & Plunger Assembly
	406032	406032	Coin Slot

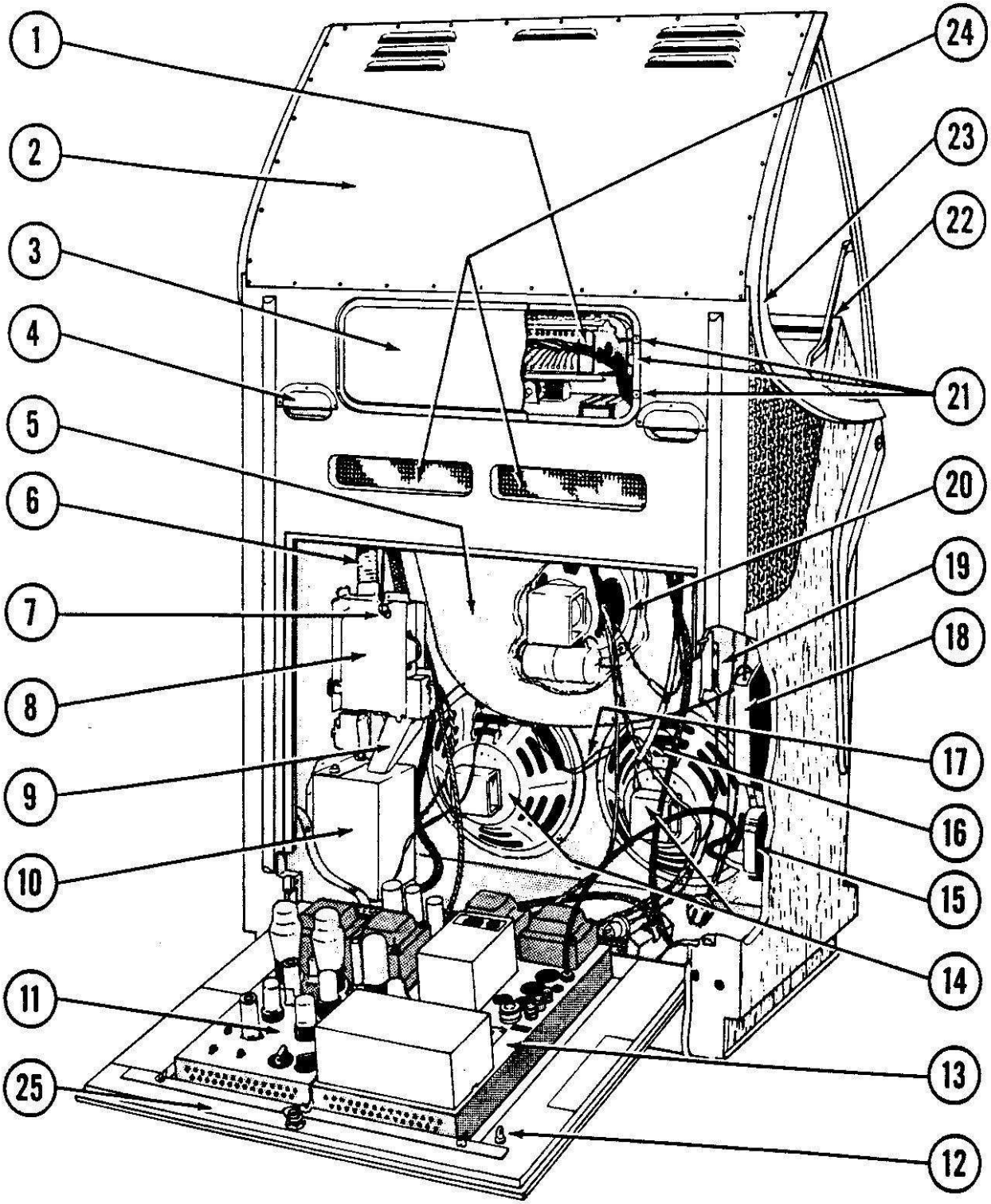


Figure 2. Rear View – Cabinet Assembly

PARTS LIST

Item	Part No. 100J	Part No. 100JL	Part Name
1	304456 (100SA10-L6)	304458 (100SA11-L6)	Selector Assembly
	304433	304433	Contact Block Assembly
2	407562	407766	Back Panel Welded Assembly
	960752		6/32 x 3/8 Phillips P.H.S.T. Screw
		914458	8/32 x 7/16 Phillips B.H.M.S.
	961141	961141	No. 10 x 5/8 Phillips R.H.S.M. Screw, Type A
	914668	914668	No. 8/32 x 3/4 Phillips R.H.W.Screw
3	407559	407762	Access Panel Riveted Assembly
4	407558	407761	Cabinet Handle
5	408049	408049	Speaker Compartment Cover
6	401625	401625	Coin Chute
7	401817	401817	Scavenger Wire & Plunger Assembly
	401819	401826	Scavenger Wire Housing
	401223	401223	Plunger Return Spring
8	401802	401802	Coin Mechanism Complete 10¢ (Used on 100J-D)
	401801	401801	Coin Mechanism Complete 10¢
	401828	401828	Slug Rejector Mounting Frame Assembly 10¢
	401806	401806	Slug Rejector Mounting Frame Assembly 5¢
	401800	401800	Coin Mechanism Complete 5¢
	401822	401822	Coin Switch & Cable Assembly 5¢
	401766	401766	Coin Switch & Cable Assembly 10¢
	401820	401820	Coin Switch Assembly 5¢
	401749	401749	Coin Switch Assembly 10¢
	401521	401521	4 Prong Plug
9	401831	401831	Lower Coin Chute Welded Assembly 10¢
	401811	401811	Lower Coin Chute Welded Assembly 5¢
10	407193	407193	Cash Box Assembly
	405745	405745	Cash Box Lock Plate
	404659	404659	Cash Bag
11	305270	305270	HFMA1-L6J Master Remote Amplifier
12	404320	404320	Tee-Nut
	404321	404321	Eye-Bolt
13	303320	303320	WSR7-L6 Selection Receiver
	303317	303317	WSR7-L6D Selection Receiver (Used on 100J-D)
14	408315	408315	Speaker 12" Jensen
	408317	408317	Speaker 12" Utah
15	402152	402152	Line Cord & Outlet Assembly
16	404672	404672	Chain Assembly
	404673	404673	Snap
	407338	407338	Program Light Cable Assembly
17	407540	407540	Speaker Cable Assembly
18	407365	407365	Fluorescent Lamp Ballast (25 Watt-60 Cycle)
19	405654	405654	Record Reject Switch Assembly
	402065	402065	Record Reject Switch Only
	405742	405742	Record Reject Switch Cable Only
	402064	402064	Record Reject Pin
20	408303	408303	Speaker 8" Jensen
21	407106	407106	Panel Latch Assembly
	407192	407192	Bullet Catches
22	407066	407066	Lid Support
23	407011	407764	Upper Side Casting, R. H.
	407012	407765	Upper Side Casting, L. H.
24	407255	407255	Vent Screen
25	407664	407772	Lower Rear Door Cover Plate
	407155	407155	Rear Door Lock Assembly

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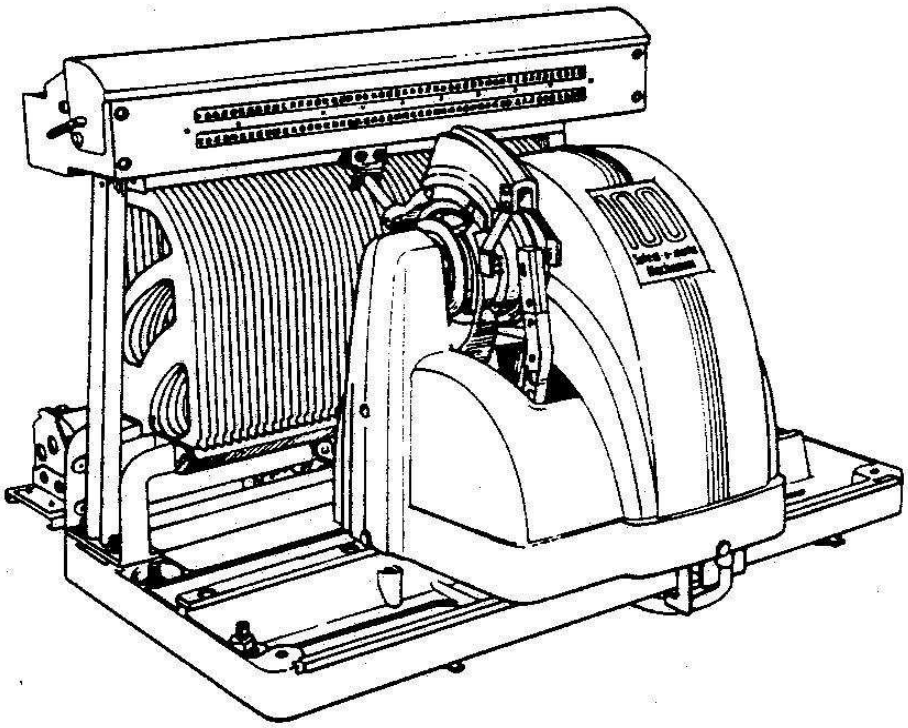
SELECT-O-MATIC "100" MECHANISM



The Select-O-Matic "100" Mechanism, Type 145S7-L6, is designed for automatic selective playing of any of the selections in a program of 50, 45 r.p.m., 7" diameter records with 1½" center hole. The mechanism will play either side or both sides of the records.

There are two fundamental parts of the Mechanism – a magazine, and a carriage assembly. The magazine holds the records. The carriage assembly plays the desired program selections by progressively withdrawing the records, playing them, and restoring them to their original position in the magazine.

The record magazine holds the records in a vertical position in openings or spaces that are ¼" wide (center to center). It is filled from the front of the instrument by merely placing the records in the spaces. The spaces are numbered A1 to K10 for convenience in indexing the selections. There are 10 groups with 10 selections in each lettered group. To avoid confusion with the figure "1", the letter "I" is not used.

The carriage assembly moves, or scans from side to side of the instrument on a track parallel to, and in front of, the records. The scanning operation of the carriage commences as soon as a selection is made and will continue until the carriage has moved to a position in front of a record that is to be played. The carriage stops scanning when it comes to the position for playing the selected record and transfers the record from the magazine to the playing position on the carriage. The carriage transfers the record (when it has finished playing) to its original position in the magazine and scans to the next selected record, or, if no other record has been selected, will come to a stop.

SEQUENCE OF PLAYING

The carriage assembly changes direction of scanning only at the ends of the magazine, and the scanning operation is interrupted for playing only when the carriage is scanning toward the selected side of the record. The sequence of

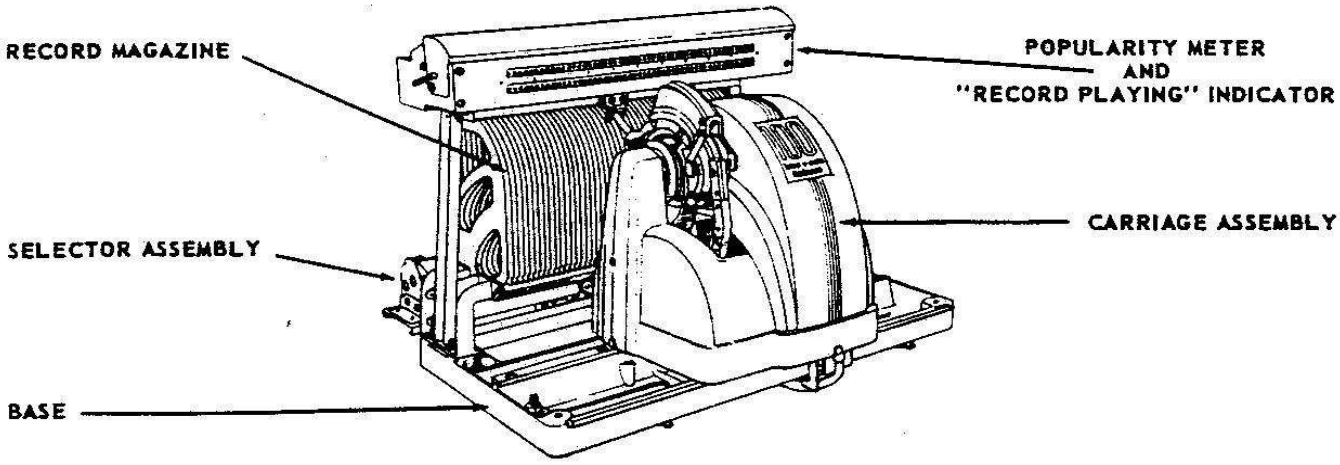


Figure 2.

playing selections will, then, be established by their position in the magazine and the starting position and direction of scanning of the carriage. Selections of the left sides of records will be played as the carriage progresses from the left side of the magazine – right sides as the carriage scans from the right side. If both sides of a record are selected, one side will be played then the carriage will scan to the end of the magazine, reverse direction, and return to the record for playing the remaining side.

SELECTION OF RECORDS

The mechanism is controlled for playing selected records with the Selector Assembly and a movable Contact Block on the back of the mechanism. There are 100 selector levers in the Selector Assembly – two for each record – arranged in two rows of 50 levers each. When a

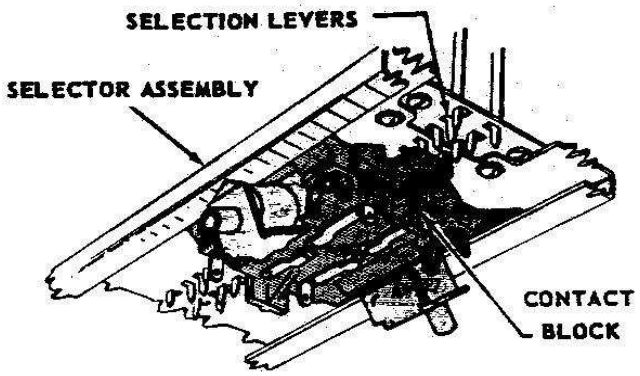


Figure 3.

selection is made with the Electrical Selector, or by remote control, an electromagnet in the selector assembly is momentarily energized and the lever corresponding to the selection number is moved from its normal position to the "play" position. Movement to the play position of any lever closes a circuit which starts the scanning operation of the carriage assembly and positions the lever for electrical contact with a trip contact in the contact block.

The contact block is attached to the carriage assembly with an arm and moves with it on guide rails that are part of the selector assembly. There are two contacts on the block that are for electrical contact with the selector levers that have been moved by selection to the play position. They pass, without touching, the levers in the normal (not selected) position. When one of the contacts touches a selector lever, it is grounded and completes a circuit to a trip solenoid. Operation of the trip solenoid while the carriage is scanning causes the carriage to stop and be accurately detented at the selected record.

When the carriage is detented, the transfer arm rolls the selected record from the magazine, up a ramp to the turntable. After the record has been brought to the turntable, the clamp arm lifts it from the ramp and clamps it, properly centered, in the playing position. Because the turntable is rotating, the record will start to turn as soon as it is clamped. When the clamping operation is completed, the pickup stylus is set on the record and is released so the stylus will follow the record grooves. The mechanism is then in the record-playing position.

When the record has finished playing the pickup will have moved the arm to a position which causes it to operate a trip switch. The

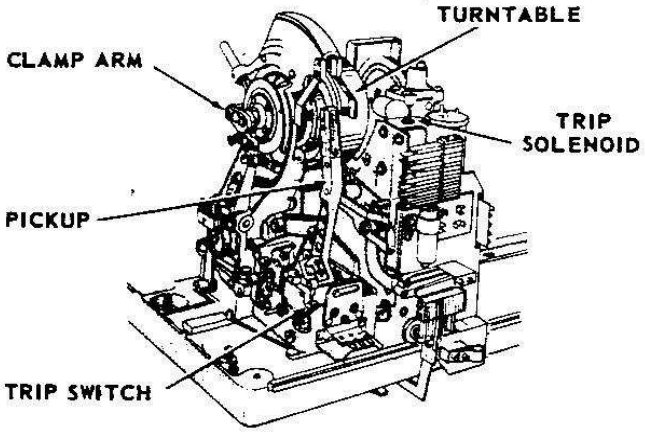


Figure 4.

switch, in turn, closes a circuit to the trip solenoid. This is the same trip solenoid which operated to detent the carriage and initiate the transfer of the record to the playing position. This second operation of the solenoid, occurring at the moment of record trip-off, starts the operation in which the record is transferred from the playing position back to the magazine. In this operation the above cycle is reversed – the pickup is lifted from the record; the clamp arm is withdrawn so the record is released; the transfer arm lowers the record to the magazine. When the record has been fully returned, the carriage again scans or, if no other record has been selected, it comes to a stop.

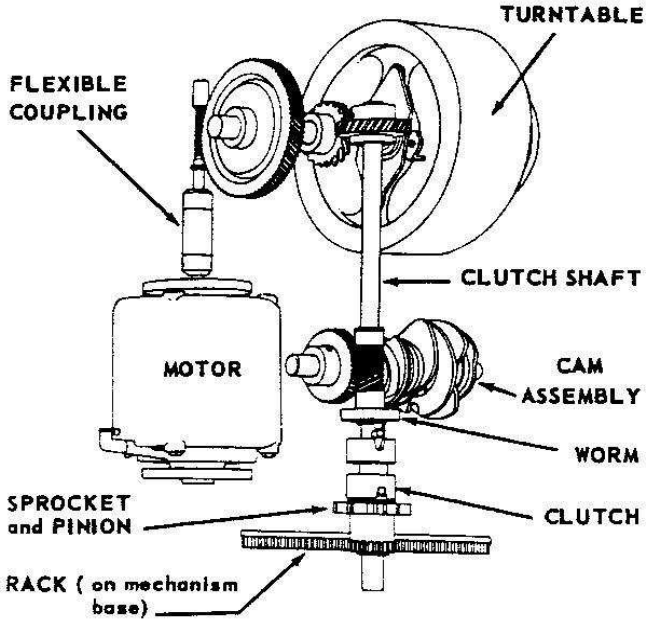


Figure 5.

SCAN – TRANSFER

All the operations of the mechanism – scan, transfer and playing – are powered by a motor through gears to the record turntable and, through a clutch, to a cam assembly or a sprocket assembly. These parts are shown in their relative positions in Figure 5. It can be seen that the turntable and the clutch shaft will turn whenever the motor is running. The clutch member is loosely fitted on the clutch shaft and can be moved vertically. One or both the drive pins shown in the enlarged view of the clutch, Figure 6, will be engaged in the notches of the

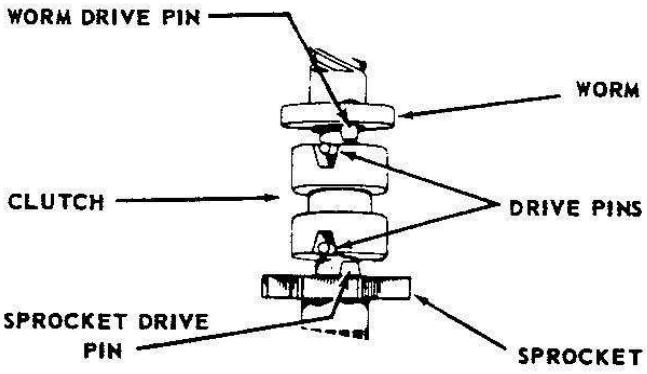


Figure 6.

clutch at all times so the clutch, although free to move up and down, will be turning with the shaft whenever the motor is in operation. In the scan operation of the mechanism, the clutch is lowered and is engaged with the pin on the upper end of the sprocket. In the transfer operation, the clutch is raised and is engaged with the pin on the lower end of the clutch worm. In the play position, the clutch is held between the sprocket and worm pins so that only the turntable is being driven by the motor.

When the rotating clutch is lowered so it is engaged with the sprocket, the pinion (which is part of the sprocket) is also turning. The pinion is meshed with a gear rack which is fastened to the mechanism base and extends the length of the magazine. As the pinion turns, it drives the carriage in the movement referred to as "scanning". The direction of scanning is determined by the direction of rotation of the pinion and is changed by reversing the motor. The motor rotation is changed by a reversing switch that is mounted on the carriage and actuated by "stops" at each end of the base.

When the clutch is raised and engaged with the clutch worm, the cam assembly rotates and, in turning, operates the parts of the carriage that are associated with the record transferring operation. During the transition of the carriage from the scan to the play position, the cam assembly turns one-half revolution. It makes another one-half turn during the change back to the scan position. Its direction of rotation is determined by the direction of rotation of the motor and is the same during both transfer operations so it makes one complete revolution for each record playing cycle.

The cam assembly, although a single unit, has eight individual cam faces each of which has a definite function in the transfer operations. The contour of each of the cams is symmetrical about an axis through its scan and play positions so the sequence and timing of the carriage operations are the same for either rotation direction of the motor.

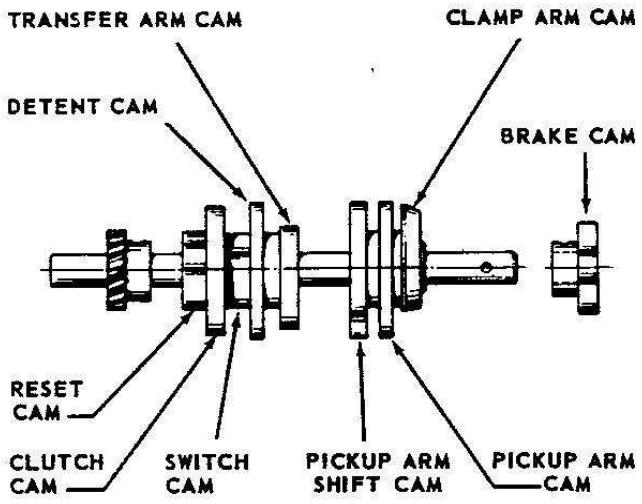


Figure 7.

Figure 7 shows the cam assembly and identifies the different cams. The reset and clutch cams operate in conjunction with a trip mechanism as a part of the clutch control. It is the trip mechanism and the levers associated with it which move the clutch to the scan, transfer and play positions. The third cam – the switch cam – operates a cam switch which, in turn, operates mechanism control circuits. The detent cam operates through a series of levers to hold the carriage at a selected record position (magazine record space) and maintains alignment of the turntable with the magazine while the record is played and also while it is being transferred. The pickup shift cam moves the pickup for left or right side playing of a record. The movement of the pickup arm to and away from the record and to the normal starting position is performed through levers by the pickup arm cam. The clamp arm cam, operating the clamp arm, holds the record in playing position on the turntable. The cam at the right – the brake cam – is not a part of the cam assembly although it is attached to the cam shaft. It stretches and releases a "brake spring" and has a profile designed so the spring equalizes the forces required from the motor at different positions of the cam assembly thereby assuring smooth operation of the mechanism during transfer of the record.

CLUTCH OPERATION

The clutch is shifted by two springs and a series of levers that are parts of the trip mechanism assembly shown in Figure 8. It is linked

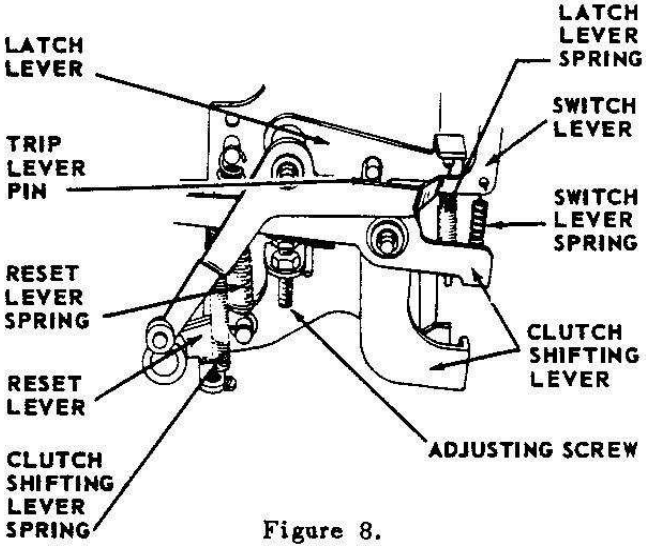


Figure 8.

to the clutch shifting lever and is lifted to the transfer position by the reset lever spring. The force of this spring is applied, upward, to the clutch shifting lever, through the reset lever and the adjusting screw that is in the reset lever.

When the mechanism is scanning or playing a record, the reset lever is held down by the latch lever and the spring is in its charged condition. When the trip solenoid is momentarily energized, it pulls the trip lever pin upward against the latch lever. When the pin hits the latch lever, the reset lever is released and the spring pulls the clutch upward so it engages the pin in the clutch worm.

During the ensuing record transfer operation and cam rotation, the reset cam moves the reset lever to its original latched position and the spring is again charged. This resetting of the trip mechanism begins as soon as the cam assembly starts to turn and is fully completed when approximately one-half the transfer operation is completed.

When the reset lever is returning to the reset position it can no longer hold the clutch shifting lever in the raised position. The clutch would then be lowered until it is no longer engaged with the clutch worm and the transfer operation would cease soon after it is begun. This is prevented by the clutch cam and the roller that is a part of the clutch shifting lever.

The clutch cam is the second from the left in Figure 7. The roller is between the two side frame members of the clutch shifting lever and is above the cam assembly. The roller must be in the "scan notch" of the cam, as in Figure 9a, to permit the clutch to engage the sprocket. The roller, in this position, holds the cam assembly so it cannot turn from the scan position.

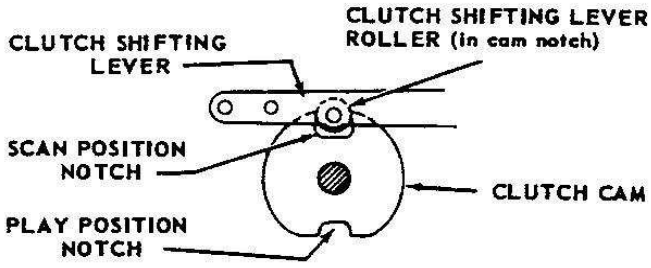


Figure 9a.

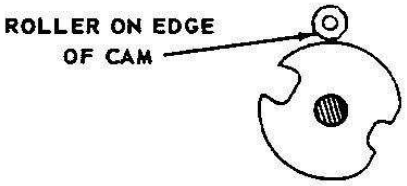


Figure 9b.

When the clutch rises to the transfer position, the clutch shifting lever roller lifts out of the notch. The transfer operation commences as soon as the clutch engages the pin on the clutch worm and, as the cam turns, the roller rides it as in Figure 9b. As long as the roller is on the outer edge of the cam it will hold the lever (and the clutch) in the transfer position.

As the transfer operation progresses, the reset cam, pushing on the reset lever, recharges the reset lever spring and, at the same time, charges the clutch shifting lever spring. This spring pulls downward on the clutch shifting lever so its roller is held firmly against the clutch cam.

In the continuing transfer operation, "play position notch" of the clutch cam is brought under the roller and the roller is pulled down, by the clutch shifting lever spring, into the notch. As the roller enters the notch the clutch also moves down and disengages from the clutch worm so the cam assembly stops turning. The downward movement of the clutch is limited by a mechanism adjustment so it cannot engage the sprocket.

When the clutch shifting lever roller has entered the cam notch, the cam assembly will have rotated one-half turn from its scan position and will be in its "play position", the carriage will be firmly detented at the selected record position, the record will have been transferred to the turntable and been clamped there, the pickup will be on the record and released so it can follow the record grooves and only the turntable is being driven by the motor. This is the "play position" of the mechanism.

CARRIAGE DETENTING

It is necessary to firmly detent and hold the carriage assembly at the selected record position while the record is being transferred to the turntable, played, then returned to the magazine. This is done by engaging a detent roller between two teeth of the sprocket that is at the lower end of the clutch shaft. The roller is supported on the detent arm and is engaged with the sprocket by the lower end of the clutch yoke lever. These parts are shown in Figure 10. *(Page 2124)*

Initial detenting occurs when the trip solenoid is energized and the clutch moves from the scan position to the transfer position. The upward movement of the clutch shifting lever lifts the clutch link and clutch spring, Figure 11, and the clutch yoke lever. The yoke lever pivots, bringing the detent adjusting screw against the detent arm so the detent roller engages the sprocket.

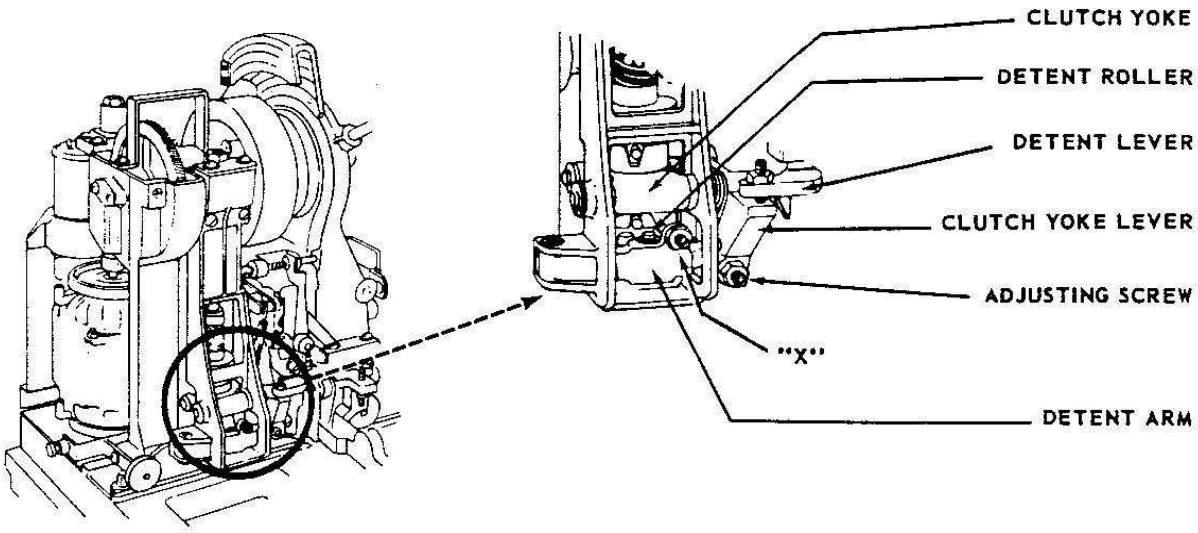


Figure 10.

When the play position of the carriage is attained, the clutch shifting lever drops to disengage the clutch from the clutch worm. Its downward movement relieves the detenting force it applies to the clutch yoke lever but, before the release occurs, the yoke lever will be locked in the detenting position by the detent lever shown in Figure 12.

The detent lever is operated by the detent cam. These are shown in their scan position in Figure 12. As the cam turns from the scan position to the play position, the detent lever is driven downward so the adjusting screw at its end is against the flat horizontal part of the clutch yoke lever effectively locking the detent roller in position.

At the conclusion of playing a record, the trip solenoid again is operated so the clutch moves upward to the transfer position and again the clutch shifting lever supplies detenting force to the clutch yoke lever. In the ensuing rotation of the cam assembly to the scan position the detent lever is raised from the yoke lever so the detenting force is again supplied only from the clutch shifting lever. When the scan position is attained, the clutch drops and the detent roller is retracted from the sprocket so the carriage is free to scan.

Another function of the detent arm and the operations associated with it is retention of the clutch in its correct playing position while a record is playing. The adjusting screw in the detent arm, indicated at "X" in Figure 10, will move toward the clutch when the sprocket is detented and will be held firmly in position by

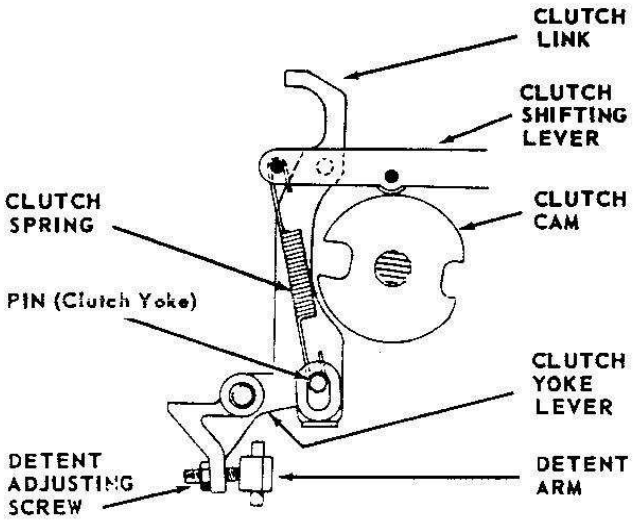


Figure 11.

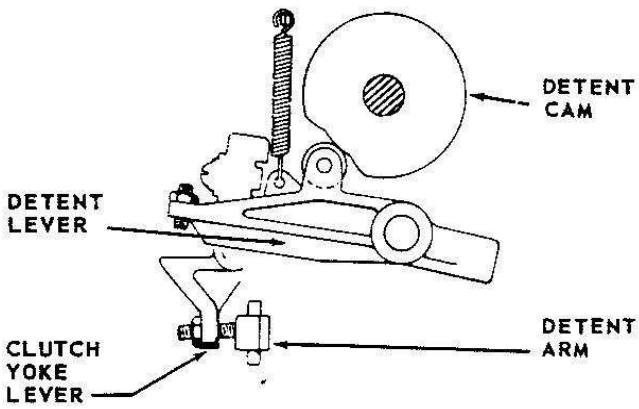


Figure 12.

the locking action of the detent cam and lever at the time the carriage cycles into the play position. When the play position is attained, the clutch disengages but its downward travel is limited by the clutch yoke bearing against the adjusting screw. The length of clutch travel from the transfer position to play position is held to a minimum so the remaining available movement (from play to scan position) will afford the greatest possible displacement of the clutch shifting lever. By maintaining maximum movement of the clutch shifting lever between the scan and play positions, a control switch it operates will be less critical in adjustment and positive contact functioning will be assured.

The transfer arm is controlled by the gear segment and cam shown in Figure 13. The segment pivots on the shaft at A; the arm pivots at B. The gear segment spring biases the roller against the cam and lifts the head of the arm in an arc toward the turntable as the cam rotates from the scan to the play position. In the scan position the arm is below the record magazine. As it starts moving into the magazine, the roller in the head engages the lower projections of adjacent separators so the arm centers in the record space.

As the arm moves upward, the record is rolled onto and up the ramp until the upward

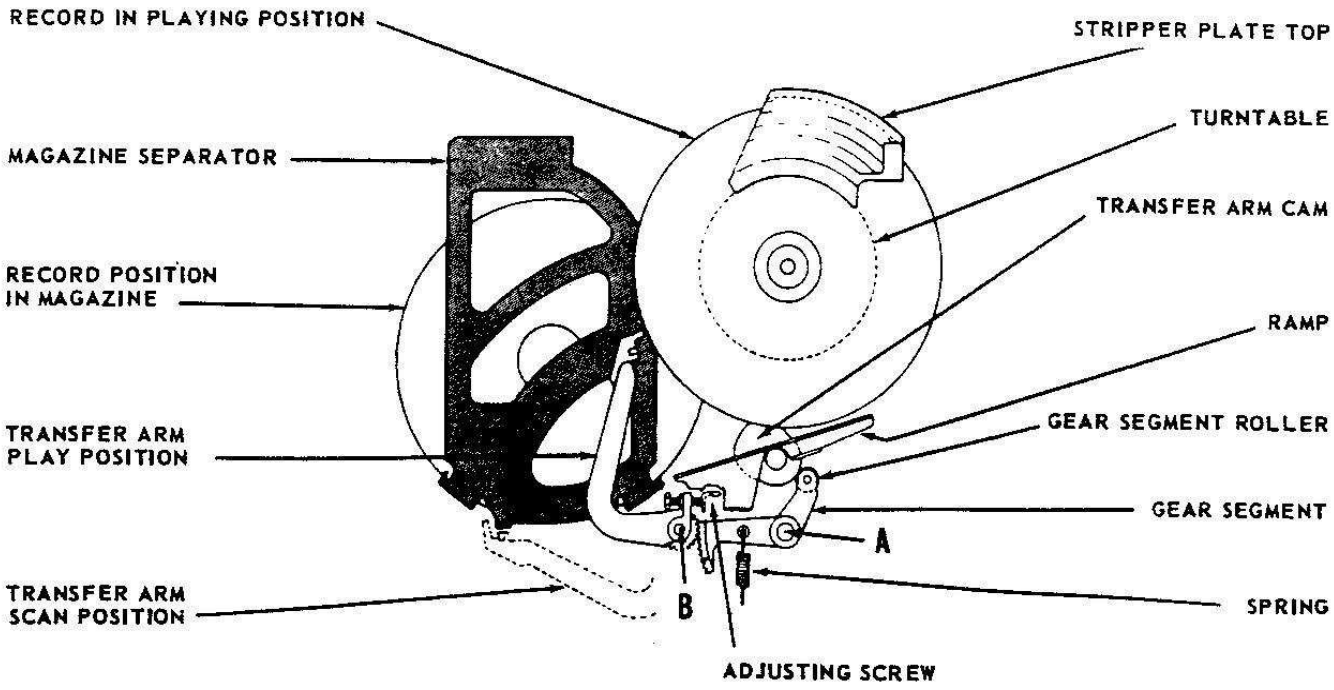


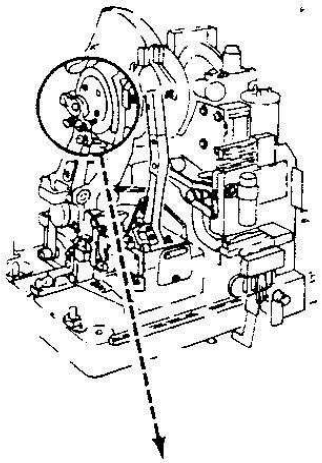
Figure 13.

RECORD HANDLING

Record handling from the magazine to the playing position on the turntable and return to the magazine is performed by the transfer arm and the clamp arm. The record is rolled by the transfer arm from the magazine, upward on the ramp, to a position beside the turntable. After the record has been brought up to the turntable, the clamp arm centers it and clamps it in the playing position. At trip-off, when playing is concluded, the cam assembly rotation retracts the clamp arm to release the record and the transfer arm then lowers it to its original position in the magazine.

movement is arrested by the adjustment screw coming in contact with the stop plate. In this position, the record is cradled in the forked head of the transfer arm and the ramp and is slightly below its centered clamped position.

As soon as the transfer arm and record are in the raised position, the clamp arm, Figure 14, moves toward the turntable and the cone and centering pin on the clamp disc pass through the record center hole. As the centering pin enters the hole in the turntable, the disc is aligned parallel with the turntable and the cone lifts the record so it no longer is touching either the ramp or the transfer arm.



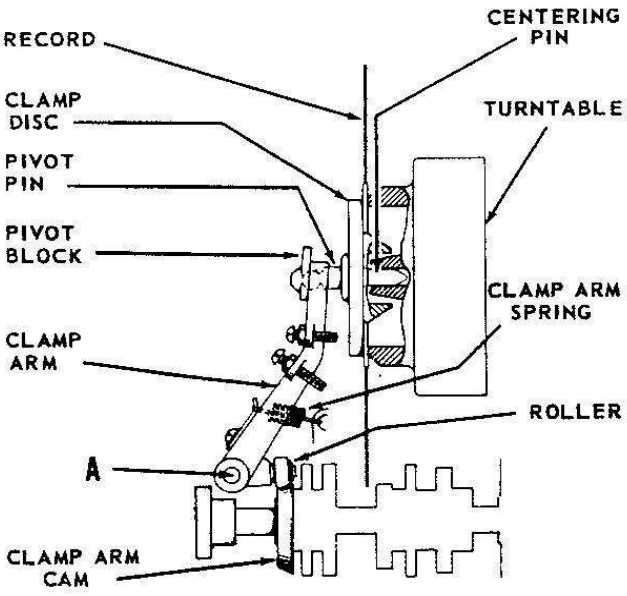


Figure 14.

The clamp arm movement is controlled by the clamp arm cam. The arm pivots at A and is pulled toward the turntable by the clamp arm spring as the roller follows the cam during rotation from the scan to the play position. In the clamping position, the disc rotates with the record and turntable, with the ball on the pivot pin and the pivot block as a bearing.

It will be noted that both the transfer arm and the clamp arm move to their play positions by spring force. If either is obstructed by any abnormal conditions, there are no damaging strains set up. It will be noted, too, that the record is "captive" in that it does not fully leave its magazine space for playing and cannot move past possible clamping position due to the stripper plate top. Lateral random movement of the record, before and after clamping, is prevented by the turntable and the stripper plate.

At trip-off, when the record is to be returned to the magazine, the cam assembly turns to the scan position. The clamp arm is first retracted from the turntable and the stripperplate "strips" the record from the disc cone so it drops to its former cradled position on the ramp and the transfer arm head. The transfer arm then lowers it to its stored position in the magazine space.

SAFETY PLUNGER

If a record is badly warped so it rubs on the magazine separators or for any other reason fails to return fully to its stored position in the magazine, the carriage will not scan to cause possible damage to the records or mechanism. The safety plunger, Figure 15, must move

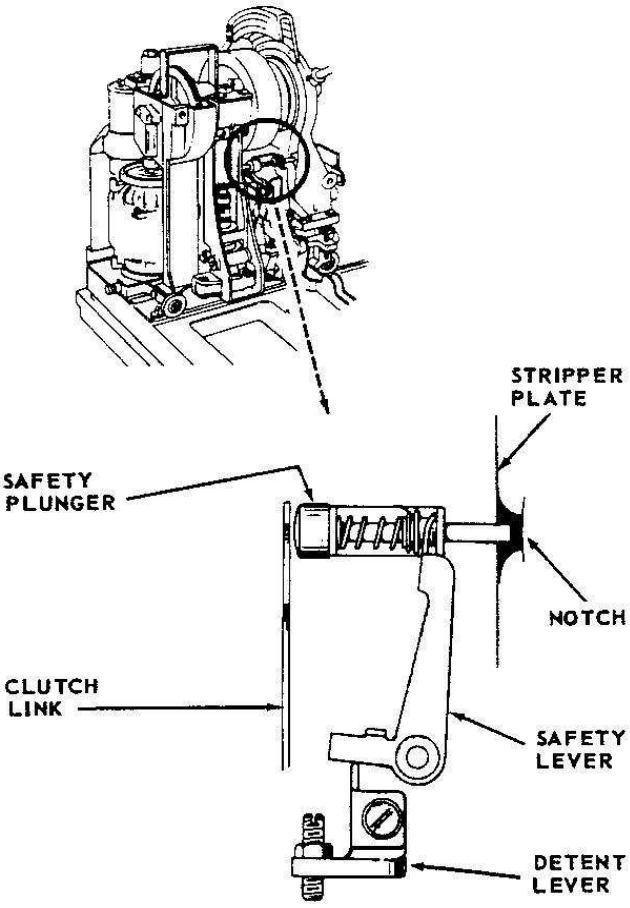
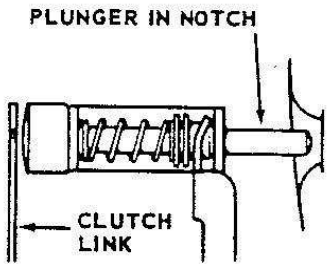
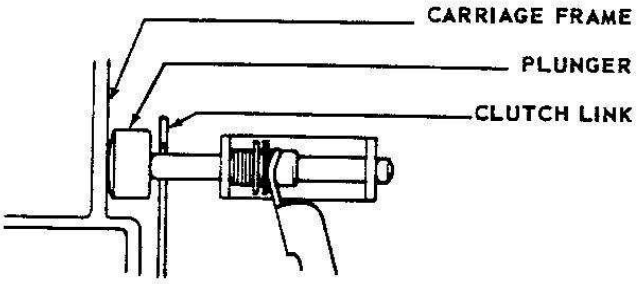


Figure 15.

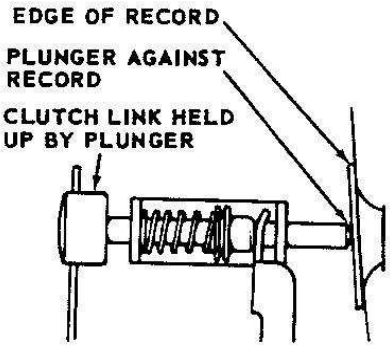
to its normal scan position, Figure 16A, before the carriage can start the scanning operation by engaging the sprocket. In this position the small diameter end of the plunger is in a notch in the stripper plate and the hook at the top of the clutch link (see Figure 11) has moved down past the large end of the plunger to permit the clutch to drop into its scan position.



(A) Normal Scan Position



(B) Play Position



(C) Record Not Returned To Magazine

Figure 16.

In the play position the plunger has been moved by the detent lever and the safety lever so its large end is against the clutch frame as shown in Figure 16B. In this plunger position the hook on the clutch link can move downward far enough to permit the clutch to move to the play position.

If a record is not returned to the magazine, it will block the path of the safety plunger from its scan position as shown in Figure 16C and the hook on the clutch link will rest on the large end of the plunger. With the link held up by the plunger, it cannot drop far enough for release of sprocket detenting or engagement of the clutch and sprocket for carriage scanning.

PICKUP

A pickup with two armature and stylus assemblies plays both sides of the records and is part of a pickup arm system that is moved to the record side that is to be played. The pickup, a magnetic type with replaceable styluses, operates with stylus pressure on the record of seven to eight grams.

The armatures in which the styluses are inserted are hollow tubes, formed at the end to a flat oval. The stylus shank has a slight taper and curvature so it wedges in the armature and is held firmly without clamps or screws. Both armatures are independently supported to provide varying flux density through a single coil that terminates at the two connecting pins in a bakelite block or base. The coil has a d.c. resistance of approximately 450 ohms. The nominal pickup output for 1000 c.p.s. at amplitude of 6 cm/sec is 30 m.v. when connected to a 10,000 ohm load.

PICKUP ARM SYSTEM

The pickup arm position and operation are controlled by two cams. One of these, the pickup cam, places the stylus on the record, releases the arm so the stylus can follow the playing grooves, lifts the pickup from the record at conclusion of playing, returns the arm to the at-rest position and locks it there, ready for the next playing cycle. The other, the shift cam, positions the arm to the left or right of the record to be played for, respectively, left or right side playing.

The movement of the arm as the pickup moves to and from the record and as it follows the irregularities of a warped record has at its axis, at the lower end of the arm, a damping system shown in Figure 17A. The arm pivots on a thin film of viscous oil that is between the bore of the arm and the stator. The stator, as its name implies, does not turn – it is held rigidly between two centering screws in the cradle shown in Figure 18.

The stylus pressure against the record and the arm movement toward the record is obtained from the pressure springs, Figure 17B. When the right side of a record is played, the arm is positioned at the right as shown and the spring at the left provides the stylus pressure. When the left side is played, the arm is positioned to the left of the record so the spring at the right provides the pressure.

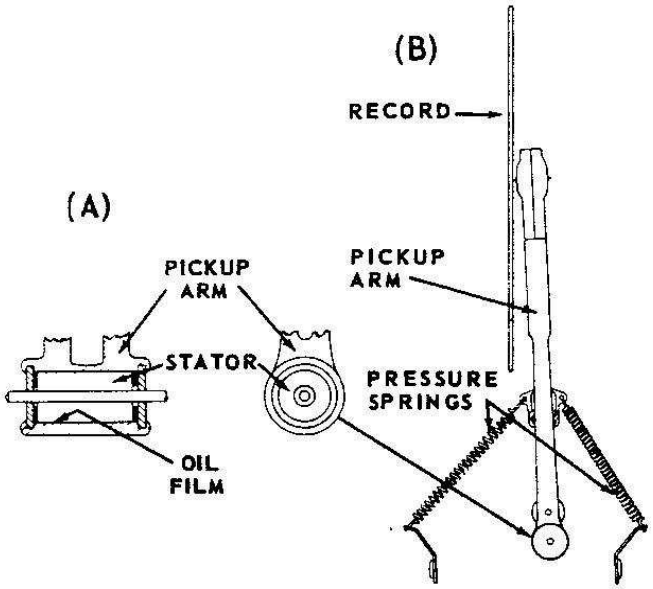


Figure 17.

The axis of lateral movement of the pickup arm (movement parallel to the record surface) is through the pickup cradle ..t the pivot sockets, Figure 18. The pivots are hardened steel points in the cradle frame, Figure 19. The pivot at the right is fixed; the one at the left is moveable so it can be adjusted for free movement of the cradle with neither binding nor undue looseness.

The lateral movement is limited in both directions. The limit of pickup travel toward the edge of the records is controlled by the adjusting screw A, Figure 20, and is established at the point at which the stylus lands on the record at the start of play. The screw is in a projection of the pickup cradle and moves downward in an arc until it stops against the cradle frame. The movement of the pickup toward the record center is controlled by the screw, B. It projects through the frame casting at a point below the axis of movement so it acts as a stop for the swing of the cradle.

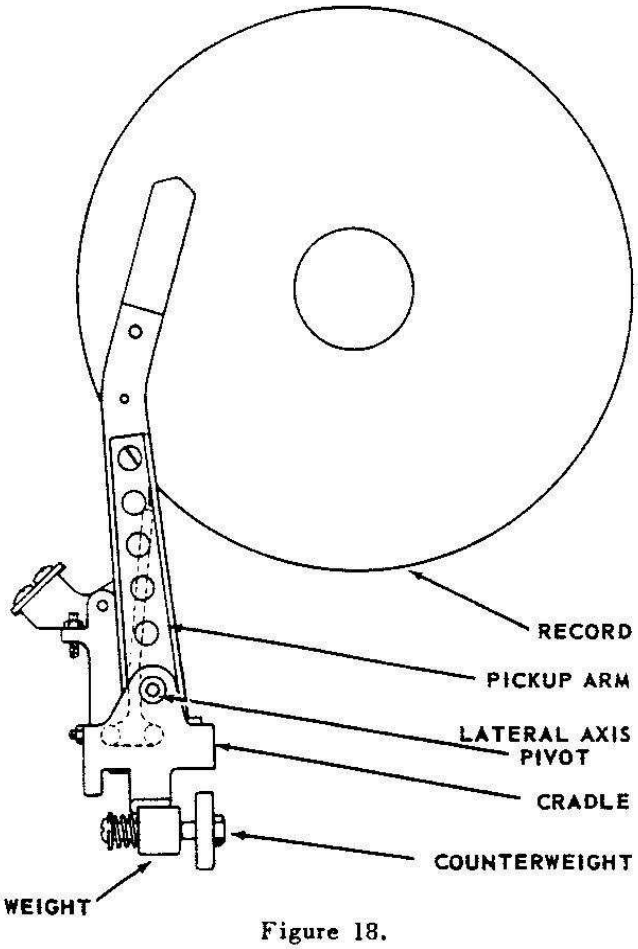


Figure 18.

The arm and cradle, as a unit, are statically balanced by a weight and counterweight that are attached to the bottom of the cradle, Figure 18. The weight is fixed in its position but the counterweight is moveable and is adjusted for correct lateral balance.

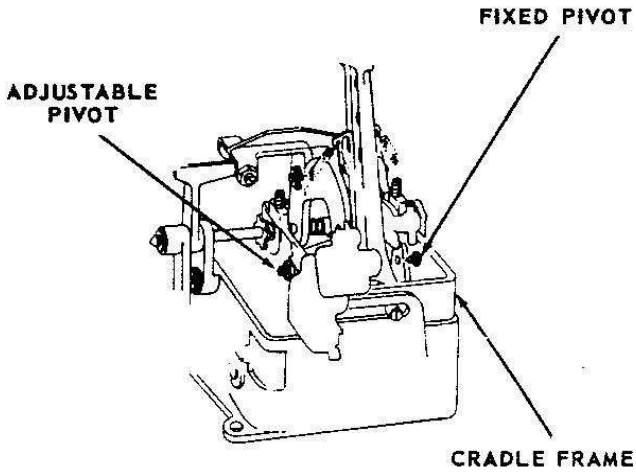


Figure 19.

In addition to balancing for static conditions, provision is made to counteract the lateral forces developed dynamically by friction between the stylus tip and the record. This is done by anchoring the lower ends of the stylus pressure springs at a point that is off-set from the lateral axis of the arm so the spring that is in tension opposes the dynamic force as well as holds the stylus in the record groove.

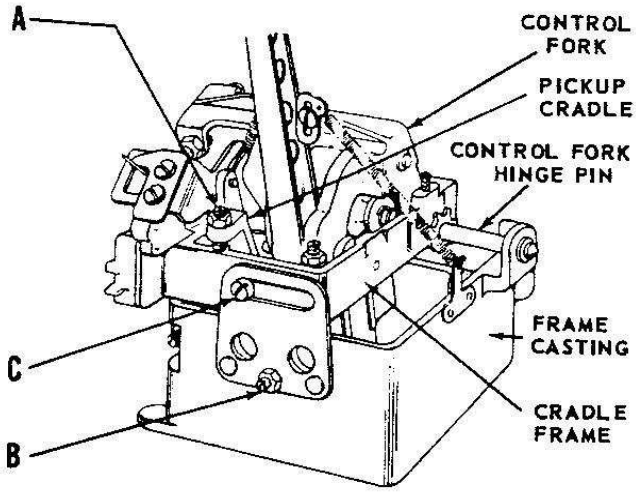


Figure 20.

PICKUP ARM SHIFT

The cradle frame in which the pickup arm and cradle are held is mounted in the frame casting, Figure 20. It is supported on the control fork hinge pin and the screw, C, the head of which rests in the slotted plate at the front of the casting. The assembly is moved, as a whole, to the left or right, by the pickup shift cam operating through the drive crank, cradle actuator lever, and shift collar, Figure 21.

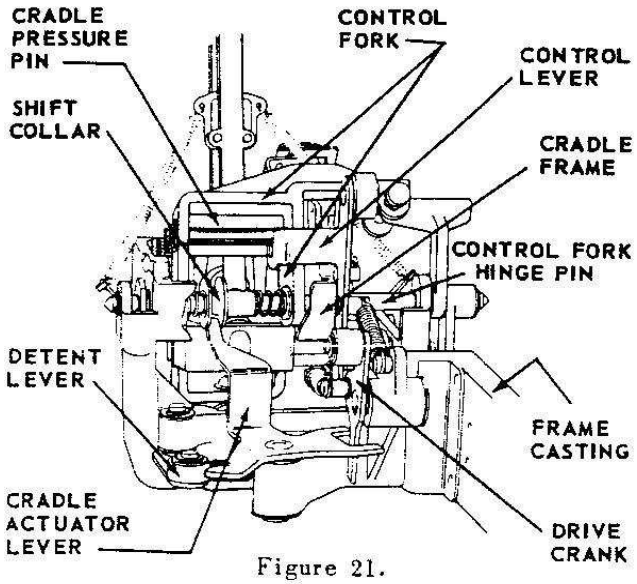


Figure 21.

In the assembly shifting operation, the shift cam rotation direction determines the position of the drive crank. The crank, if it changes position, operates the cradle actuator lever which, in turn, slides the shift collar on the control fork hinge pin. The collar is between two compression springs and the control fork so, when it moves, the control fork and the cradle frame, together, slide with it along the pin until the frame comes to a stop against projections that are at the back of the frame casting.

The movement imparted to the cradle actuator lever by the drive crank is supplemented by the detent lever, Figure 21. In conjunction with the actuator lever, it performs an over-center action that moves the shift collar farther than the stops on the frame casting will permit the cradle frame to move. This over-travel of the collar is absorbed by the compression springs and assures full positioning of the pickup arm to the left or right side playing position. It also holds continuous but controlled force against the control fork and the cradle frame to eliminate possibility of vibration of the assembly.

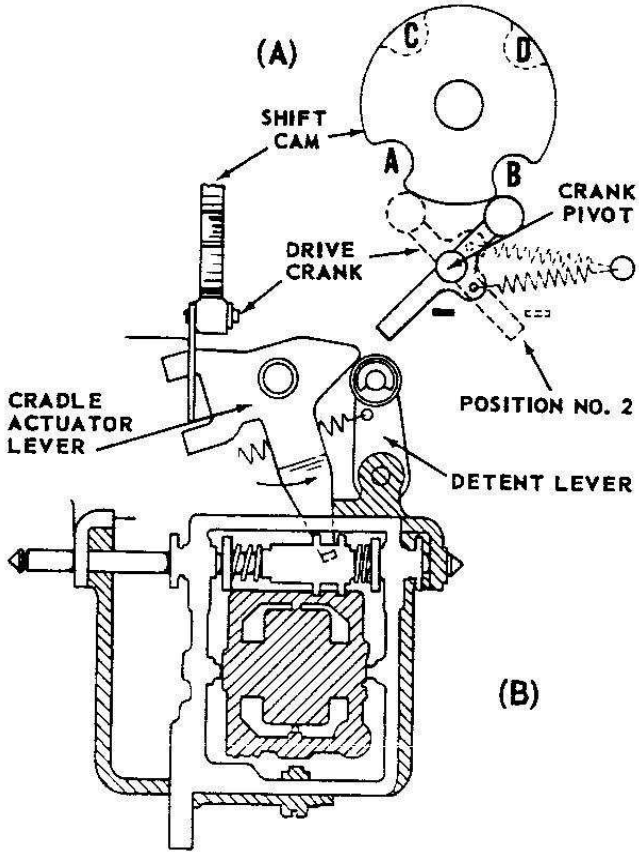


Figure 22.

The drive crank changes position and moves the pickup arm only if the record side next to be

played is opposite that of the record side last played. Figure 22A explains this operation and shows the shift cam and the drive crank in their relative scan positions after the left side of a record has been played. In this view, the cam and crank are shown in their relative positions as though viewed from the clamp arm side of the carriage assembly.

If, on the next play, the right side of a record is to be played, the cam will turn clockwise in the record transfer operation. After a few degrees of cam rotation the roller on the drive crank will fall into the notch, B. As the cam continues to turn, the notch, B, will move to its play position at C with the roller following it until the crank is at position 2. When the crank is in this position, the pickup arm and the levers are positioned as shown in Figure 22B.

If, on the next play, the left side of a record is to be played, the cam will turn counterclockwise from the position shown in Figure 22A and the notch, A, will pass the roller of the drive crank. The roller is momentarily in the notch but there will be no change of position of the crank relative to the cam and the pickup arm position remains unchanged.

PICKUP ARM OPERATION

The pickup arm operations at the beginning and end of record play are performed by the control fork. The fork is actuated by the pickup cam and the control lever and is shown in its play position in Figure 23. In this position, the control lever spring holds the control lever roller in the cam notch and the control fork,

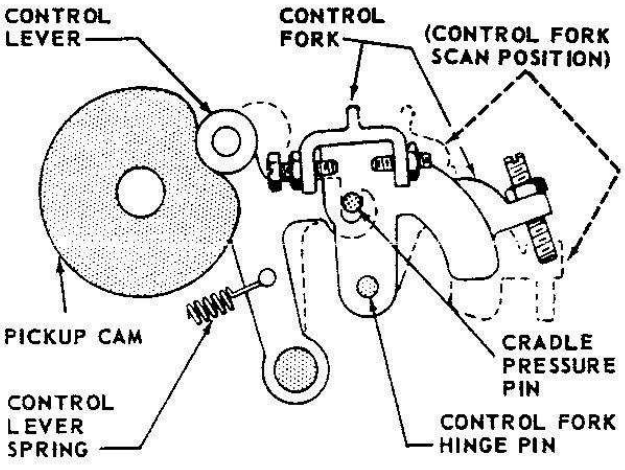


Figure 23.

through coupling with the lever at the cradle pressure pin, is in its play position. As the cam rotates from its play position, the roller on the control lever moves to the longer cam radius and the control fork pivots on the hinge pin to its scan position. While moving from play to scan position, the pickup is lifted from the record, the arm and cradle are then moved to and locked in their scan position. While moving to the play position, the fork lowers the pickup to the record, then releases the arm and cradle so the stylus can follow the record grooves.

The pickup is moved to and from the record surface by the forked downward extension that gives the control fork its name. In the scan position, one or the other of these extensions bears against a roller, that is in the pickup arm above its pivot axis in the cradle, and holds the pickup away from the record. Figure 24 shows the fork and pickup arm with the fork in a position approximately half way between scan and play and with the pickup arm at the right side of a record. In this illustration the

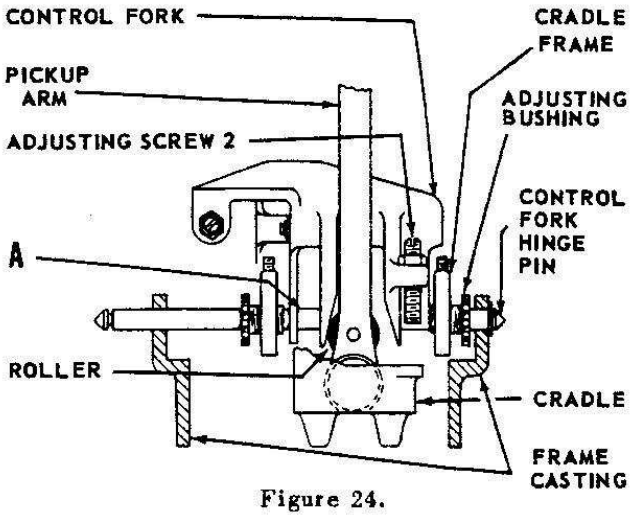


Figure 24.

fork extension at the left is against the roller in the arm and, if it is moved downward to the scan position, it will press against the roller and move the pickup away from the record. If the fork is moved upward to the play position from the position shown, it will fully clear the roller and the pickup arm will be released so the stylus will rest on the record.

Negligible force for lateral movement is imparted to the pickup arm by the lifting operation because the point of contact of the roller and the control fork is on the lateral axis of the system.

If the pickup arm is in position for right side playing and the left side of a record is to be played, it will be shifted as discussed in Pickup Shift. The shift collar and compression spring (Figure 21) will push against the control fork at A, Figure 24, and the fork will move to the left on the hinge pin, until bearing against the left adjusting bushing, it shifts the arm, cradle and cradle frame to the left in the frame casting. As the fork moves from the right to the left side of the cradle frame, the fork extension at the left moves away from the pickup arm roller and the one at the right moves against it. The arm then tilts to the left for pickup clearance with the left side of the record.

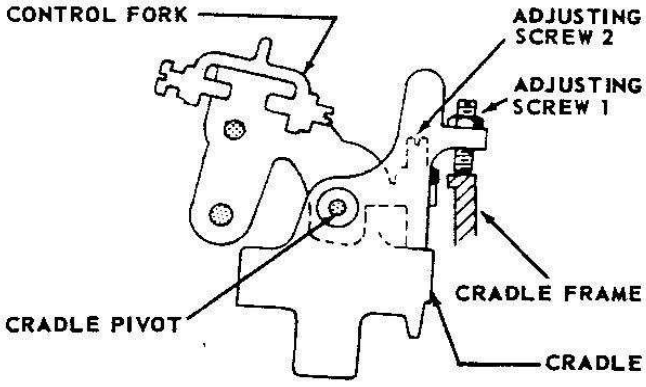


Figure 25.

Return of the pickup and cradle from the released, record playing position to the scan position occurs when the adjusting screw 2 in the control fork, Figures 24 and 25, presses downward on the forward edge of the cradle. The pickup moves with the arm to a position that places the stylus where, without lateral movement, it can move to its starting point on a record at the start of the next play. This position is established by the adjusting screw 1, Figure 25, and adjustment for movement to that position is made with screw 2.

The pickup arm is locked in the scan position and released for playing by the lock lever, Figure 26. The lever pivots at A when the upper end of the control crank is moved by the No. 3 or No. 5 adjusting screws. In the play position, shown in Figure 26, the horizontal part of the lock lever is raised and is held in position by contact with the detent lever at B. The lock lever pin which extends from the cradle can move freely beneath the pointed projection on the lock lever so the pickup arm and cradle are free to swing on the cradle pivots.

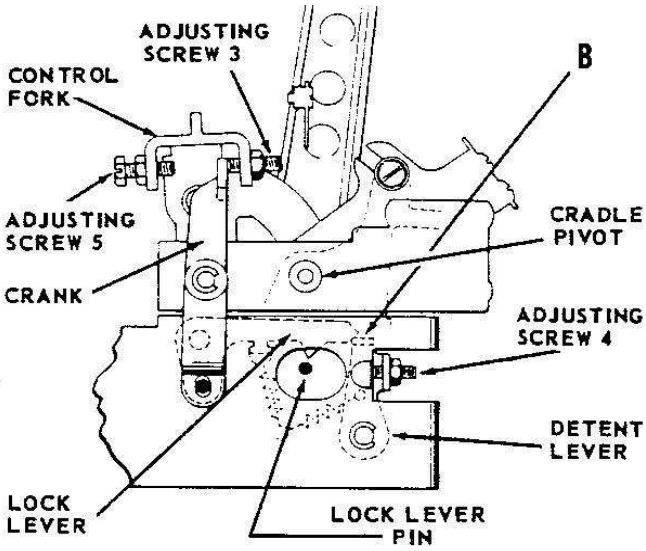


Figure 26.

When the control fork moves to the scan position, the cradle and pickup arm are first moved to their scan position and the lock lever pin is positioned back of the point on the lock lever. When the fork has moved almost fully to its scan position, the No. 5 adjusting screw, presses against the control crank and drives the lock lever downward, past the detent lever, to the scan position shown in Figure 27. The lock lever, in the lowered position, securely holds the lock lever pin (and the pickup arm) in the scan position and is again detented by the detent lever. The force or pressure of detenting is controlled by the tension of the spring that holds the lever toward the lock lever but the No. 4 adjusting screw, in contact with the frame casting, limits the detent lever movement and determines the point of contact of the two levers.

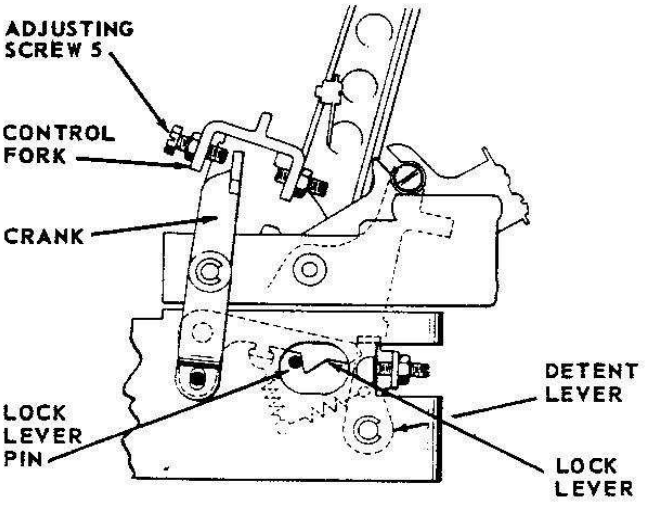


Figure 27.

The pickup arm remains locked in the scan position until, in the next record playing cycle, the control fork has moved almost fully to its play position and the pickup stylus has been placed on the record. The No. 3 adjusting screw then presses against the control crank and lifts the lock lever past the detent lever, to the position shown in Figure 26, so the pickup is released for playing.

MOTOR

All phases of operation of the carriage assembly – scanning, transfer of the record to and from the turntable, and playing – are accomplished with a single motor that is mounted on the carriage assembly. It is a 117-volt A.C., split phase capacitor type of approximately 1/100 h.p. The normal motor speed for record playing at 45 r.p.m. is 1745 r.p.m. During scanning and when a record is being transferred, more torque is required of the motor and is provided for in these operations by connecting additional capacitance across the permanently connected capacitor. This is done with the "O" contacts of the cam switch that are closed except when the carriage is in the play position.

The change in direction of scanning and of the turntable for playing the left or right sides of the records requires a change in direction of rotation of the motor. This change is made with the reversing switch that is on the carriage and operated by "stops" at each end of the base.

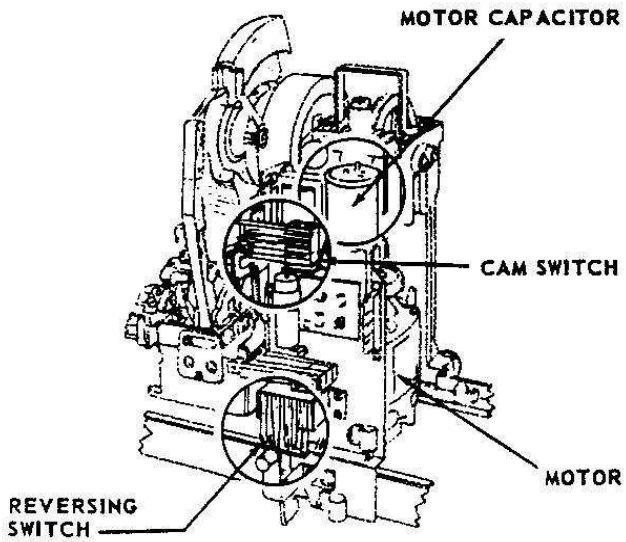


Figure 28.

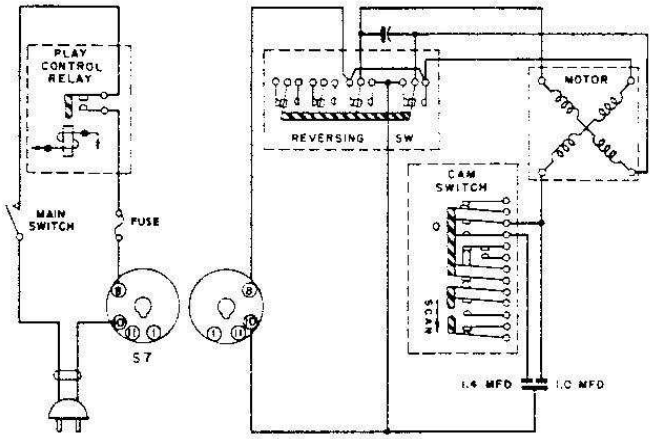


Figure 29.

The direction of rotation is determined by the motor connections and must be such that the carriage will scan to the right when the operating lever of the reversing switch is deflected to the right.

Power for the motor is supplied from the selection receiver in the complete phonograph through the cable to the mechanism and is controlled by the play control relay that is in the receiver.

SELECTOR ASSEMBLY

The selector assembly controls the mechanism so it plays the selections made with the electrical selector or by remote control. This function is performed with selection levers and contact washers that are arranged so the mechanism motor starts when a selection is made and so the trip solenoid will be operated when the carriage approaches the selected record. Power for operation of the selector assembly is supplied at 25 volts, A.C., from the selection receiver.

The selection levers, Figure 30, are extended armatures of selector coils (electro-magnets) and are moved, individually, from their normal position to the play position by passing current through an associated coil. They are spaced on ¼" centers and arranged in two rows of fifty each parallel to the line of travel of the carriage so there is a lever for each record side in line with each record space of the magazine. The fifty levers in the row nearest the magazine are for the right sides of the records; the levers in the row farthest from the magazine are for the left sides.

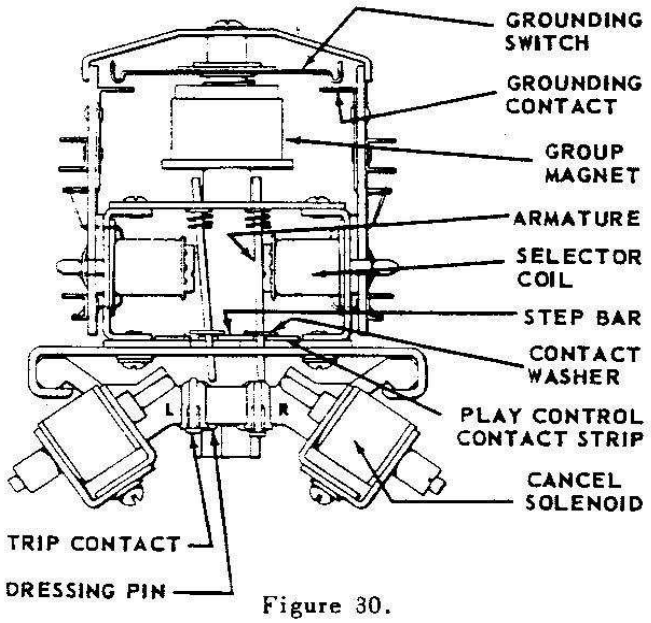


Figure 30.

The contact washers shown in Figure 30 are associated with each selection lever and move with the lever. When the lever is in the play position, the washer connects the play control contact strip to the grounded step bar and completes a circuit that energizes the coil of the play control relay at 25 volts, A. C. The relay, when energized, turns on the power to the mechanism motor (and the phonograph amplifier). The carriage, then, starts scanning as soon as selection lever is moved to the play position. The play control circuit is shown in Figure 31.

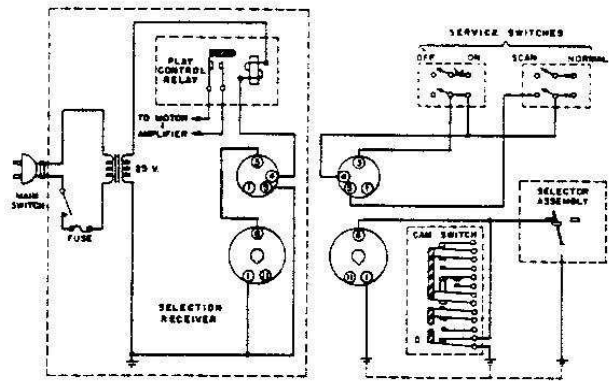


Figure 31.

The selector contact block, supporting two trip contacts, two dressing pins and two cancel solenoids, is attached to the carriage and moves the length of the selector assembly when the carriage scans. The trip contacts are in the trip solenoid circuit and, when grounded, they initiate the playing cycle of the carriage at the time of contact. They are arranged on the block so they contact, during the scanning operation, the selection levers that are moved by selection to the play position. One contact, the L contact, touches and grounds through the levers associated with the left sides of the records; the R contact touches and grounds through the levers for the right sides.

The dressing pins on the block serve merely to assure full position of the selector levers. They move in a path midway between the play and normal position of the selector levers and, by brushing lightly against them, "dress" them fully to either position.

The cancel solenoids reset the selection levers from the play position to the normal position. They center at the lever position that stopped the carriage for playing and, as the record is about to start playing, the appropriate solenoid, right or left side, is energized so its plunger restores the lever to its normal position.

If the lever that will be reset by the cancel solenoid is the only one in the play position, the play control relay circuit through the contact strip will be opened when the record is transferred to the turntable. The relay circuit, then will be maintained by the carry-over switch (D contacts) in the cam switch on the carriage until the record playing cycle has been completed. These contacts parallel, electrically, the contact strip. They close during transfer of a record to the playing position and remain closed until the record is played and no longer on the turntable.

The selector assembly is made up of five sub-assemblies each of which has twenty selector coils and levers, a group magnet and a grounding switch. The grounding switch is operated by the group magnet and, when closed, connects to ground one terminal of each of the twenty selector coils in the sub-assembly. The selector coils are numbered one to ten in ten groups and each group is designated by a letter beginning with the letter A at the left of the mechanism and ending with the letter K at the right. (The letter I is omitted to avoid confusion with the numeral 1.) The equivalent numbered coils in alternately lettered groups are connected together, as shown in the diagram Figure 32, so there are a total of twenty selector coil circuits.

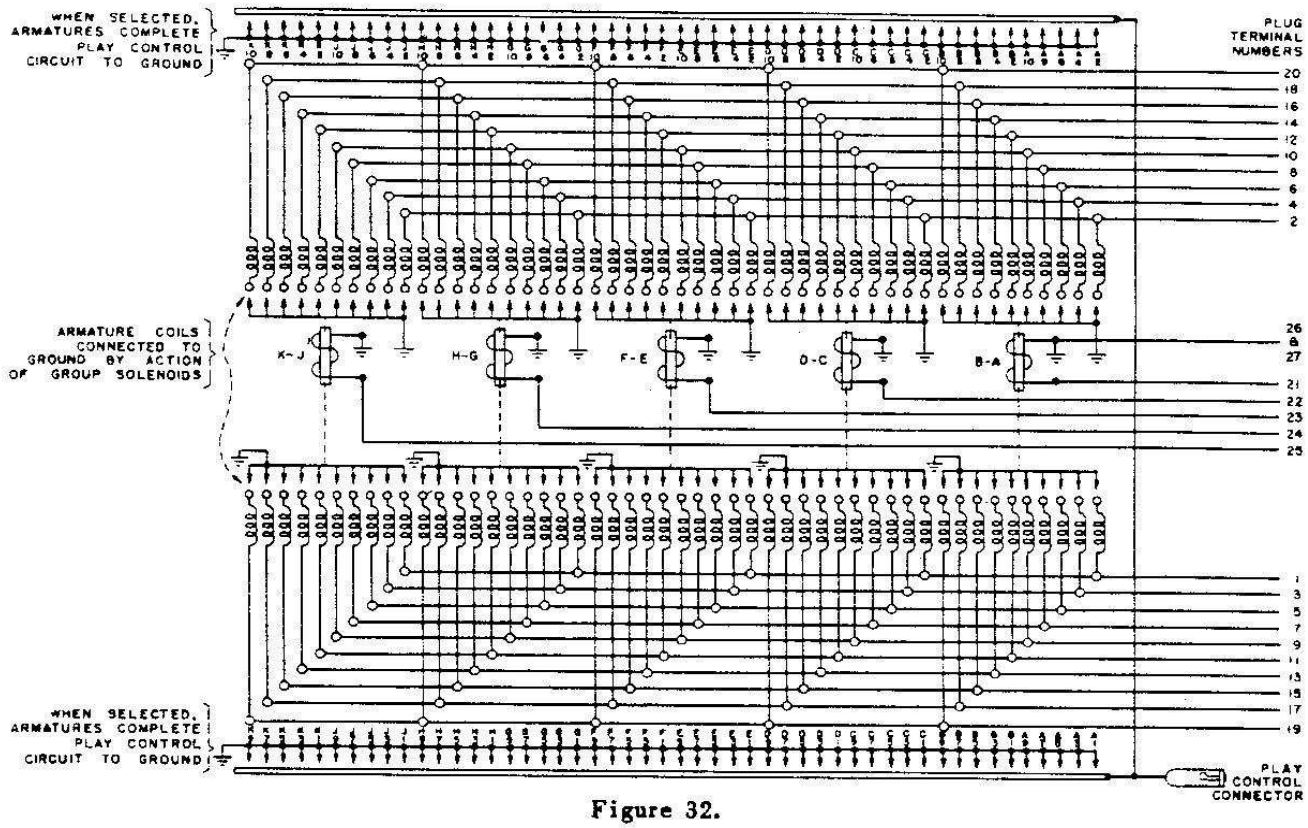


Figure 32.

The five group magnets are identified by the letters used to designate the groups of the sub-assembly with which they are associated. For example: the group magnet that operates the grounding switch for the selector coils of the A and B groups in the sub-assembly at the left is the A-B group magnet.

Power for operation of the selector coils and the group solenoids is supplied at 25-volts from the selection receiver and is distributed through the electrical selector system or through the step switches in the selection receiver. When a selection is made, a group solenoid is energized and one of the twenty selector coil circuits of five coils is connected to the ungrounded side of the 25-volt line. The group solenoid operates the group grounding switches so, of the five coils, only the selector coil associated with the energized group solenoid will have a complete circuit to ground and only that selector coil will be energized.

TRIP SOLENOID CIRCUIT (Figure 34)

The trip solenoid operates at 25 volts, A. C. that is supplied from the selection receiver. It is energized when a record transfer operation is to be initiated. The circuit to the solenoid is closed only when the service switches in the phonograph cabinet are in normal position and the mechanism carriage is either (a) scanning and the clutch switch contact W closed or (b) in, or approaching, the play position so the cam switch contact V is closed.

Contact W is actuated by an extension of the clutch shifting lever and is closed when the lever is in the scan position. It completes the circuit, through the contacts in the reversing switch, to a trip contact so the circuit will be closed when a trip contact engages a selection lever during the scanning operation and opens the circuit when the clutch moves from the scan position in response to the solenoid operation.

The position of the reversing switch determines which trip contact will be in the circuit and, therefore, coordinates the direction of scanning and the turntable rotation with the record side to be played.

The trip contacts are arranged on the contact block so the trip solenoid will be energized before the carriage, moving at its normal scanning rate, is fully at the selected record position. This makes allowance for the brief time interval required for movement of the solenoid plunger and for the clutch to disengage the

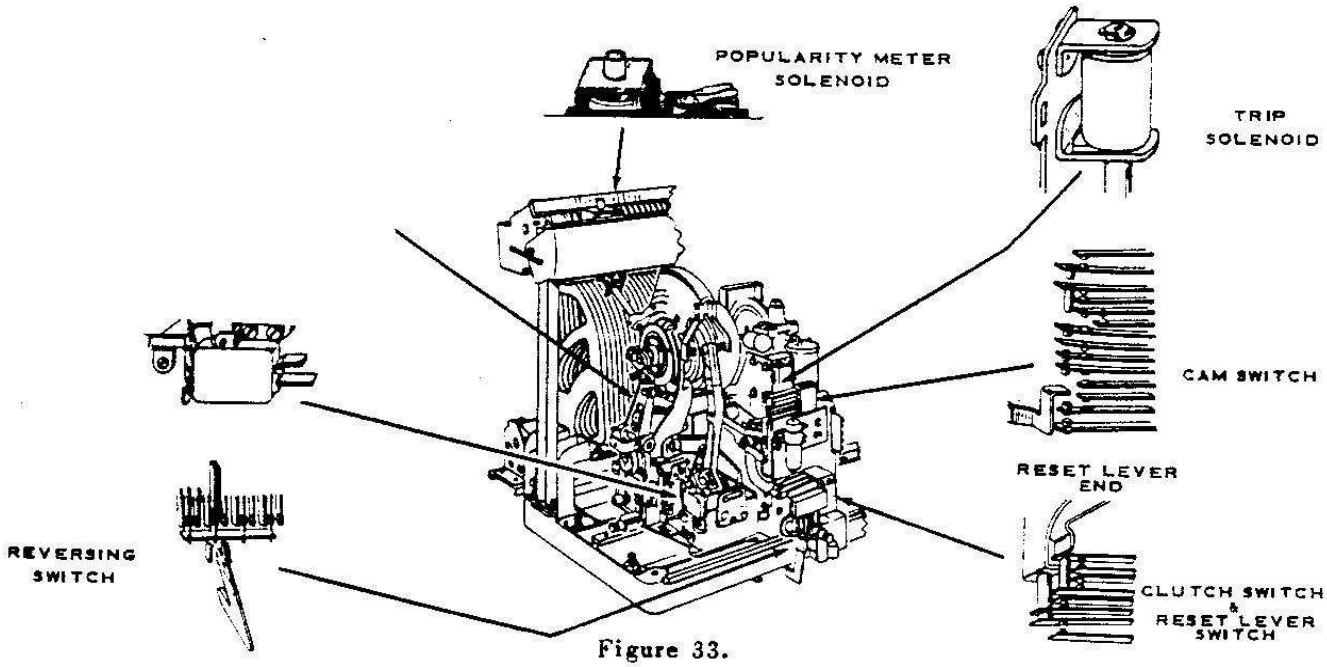


Figure 33.

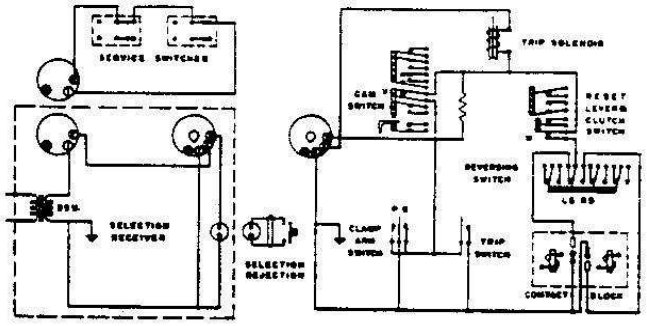


Figure 34.

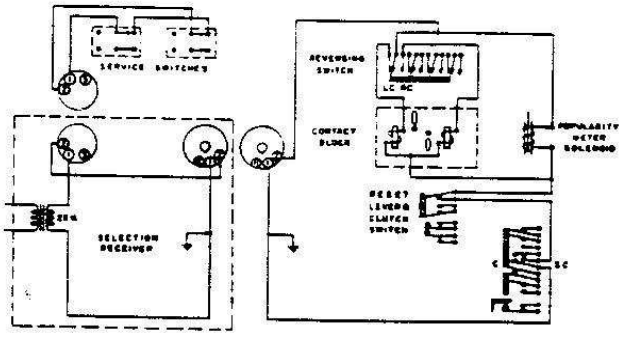


Figure 35.

sprocket. It also provides for a slight separation of the trip contact and the selection lever when the carriage is detented and locked at the record position. The separation of contact and lever insures that the lever will move freely to the off position when the cancel solenoid operates and can move freely to the play position if the same record is again selected before the carriage has moved from that position. The separation also prevents immediate repetition of a selection if some other selection has also been made because the carriage must scan through all selections before the trip contact will again be able to contact the same lever.

Contact V completes the trip circuit to the clamp arm switch, the trip switch and a reject switch. It isolates these switches until, in normal mechanism operation, they are open or, in event of abnormal conditions, they are required to restore the carriage to the scan position. The contact closes when a record is transferred to the playing position at about the time the pickup is placed on the record and reopens immediately after the start of transfer of the record to the magazine.

When the pickup moves to the cut-off point on the record, the trip switch closes the trip solenoid circuit. The switch stays in the closed condition until the pickup arm is reset to its scan position but the trip circuit is opened by contact V.

The S and P contacts of the clamp arm switch are adjusted to be open when a normal record is clamped to the turntable. If the clamping is incomplete or if no record is on the turntable, the S or P contact, respectively, will remain closed so the trip solenoid is energized when contact V closes.

The reject switch is normally in a position where it can be manually operated if, for any

reason, a record in the playing position (or transferring to the playing position) is to be returned to the magazine before completion of playing and normal trip-off. There is no control over the time the reject switch is closed but the V contact opens the circuit to the trip solenoid.

PIN CANCEL SOLENOID CIRCUIT (Figure 35)

The pin cancel solenoids operate at 25 volts, A. C., that is supplied from the selection receiver. They operate, individually, to restore the selection levers to the normal off position after the function of the lever in credit and selection has been performed. The circuit is closed when the service switches in the phonograph cabinet are in normal position if the reset lever switch contacts IC are closed when the cam switch contacts C and SC are closed.

The position of reversing switch determines which cancel solenoid will be in the circuit. The LC (left cancel) and RC (right cancel) connect the solenoid that resets, respectively, the left side and right side selection levers. The C and SC contacts are make-and-break and are closed momentarily at about the time the pickup is placed on the record in the transfer-to-play operation and again immediately after the start of transfer of the record to the magazine. They are operated by force that is applied to them through the blades of the V contacts so they do not close until after the V contacts have closed. The IC contacts are operated by the reset lever and are closed when the trip mechanism is in the reset condition.

The trip mechanism is released at the beginning of a record transfer operation and reset when the operation is approximately half completed. The circuit, then, is completed at the IC contacts at the time the C and SC contacts close during the transfer-to-play operation but it is open at the IC contacts at the time the C and SC contacts close during the transfer of the record to the magazine. There is then only one cancel solenoid operation and it occurs at the time the record is brought to the playing position.

The cancel solenoid does not operate if there is no record in the magazine space at which the record transfer operation takes place or if a record fails to center correctly on the turntable. If either of these conditions prevail, the trip solenoid circuit will be completed through the clamp arm switch at the time the V contact of the cam switch closes. Because the V contact closes before the cancel solenoid circuit can be completed at the C and SC contacts, the reset lever will be released and open the IC contacts. In this sequence the record is returned to the magazine but the selection lever remains in the play position.

If the reject switch is held closed during transfer of a record for playing, the same conditions will prevail – the record will be returned to the magazine and the selection lever will not be reset to the off position.

POPULARITY METER

The popularity meter indicates the approximate number of times each record has been played. It is operated by the solenoid shown in parallel with the pin cancel solenoid in Figure 35. Like the cancel solenoid it is energized once only in each record playing cycle and the meter does not register if no record is in the selected position in the magazine or if a record does not properly center or play.

MUTING CIRCUIT

There is the possibility of objectionable noise output from the phonograph sound system arising from mechanism operation when a record is not being played. This is overcome by grounding the amplifier signal circuit except when the carriage is in the play position. In order to be assured of positive grounding during all phases of mechanism operation, three pairs of contacts on different switches are in parallel. These are the MB contacts in the cam switch, the MA contacts in the reset lever switch and the M contacts in the clutch switch. Because this circuit is in the signal path of the sound system, it is shielded and has its grounded side isolated from the mechanism to avoid hum from ground currents between units. Connection of the muting switches to the amplifier is made through a three-pin plug and socket.

SQUELCH CIRCUIT
(Automatic Volume Compensation)

The amplifier associated with this mechanism has an automatic volume compensation circuit that maintains nearly constant the average

volume of sound from the phonograph regardless of the difference in "loudness" of the records played. This circuit employs a "squelch circuit" that is connected to the amplifier through the same plug and socket used for the muting circuit connections. The switch, contact MS in the cam switch, is closed only in the carriage play position. When the switch is open, the amplifier gain is reduced (squelched). When the switch closes, it grounds a point of the volume controlling circuit so the gain of the amplifier is restored to normal. These changes in amplifier gain and resultant volume changes are not abrupt; they require four to eight seconds to reach their final values.

SUMMARY—OPERATION SEQUENCE

A complete control and record playing cycle of the Select-O-Matic mechanism begins when, with the carriage at stand-by, ready to start scanning, a selection lever is moved to the play position. It ends when the record has played and is no longer on the turntable. Between these there is a fixed pattern of operation that is given below. If this pattern or sequence is known and coupled with the operating information in the preceding pages, it will be helpful in mechanism study and a valuable aid in determining cause for possible abnormal operation.

1. Selector lever moved to play position.
2. Play control relay energized.
3. Motor and amplifier turn on.
4. Carriage scans.
5. Trip contact grounded by selector lever.
6. Trip solenoid energized.
7. (a) Clutch shifted from engagement with sprocket.
   (b) Sprocket engaged by detent roller.
   (c) W contact opens trip circuit.
   (d) Carriage scanning ceases.
8. Clutch engages clutch worm.
9. Cam assembly rotates from scan position.
10. Safety trip plunger moves to play position.
11. Clutch is locked in transfer position by clutch cam and clutch shifting lever roller.
12. Sprocket detent is locked by detent lever.
13. Transfer arm starts upward movement.
14. Reset of trip mechanism commences.
15. Pickup arm shifts (if it is to be shifted).
16. Carry-over (D) contact closes.
17. IC contacts close.
18. Reset of trip mechanism completed.
19. Transfer arm completes travel to play position.
20. Clamp arm centers and clamps record.
21. Pickup stylus placed on record.
22. V contact closes.
23. C contact closes.
24. Pin cancel solenoid resets selection lever.
25. SC contact opens.
26. O contact opens.
27. Pickup arm is released.
28. (a) Clutch disengages from clutch worm and moves to play position.
    (b) Sprocket detent force from clutch shifting lever is released.
    (c) Cam rotation ceases.

RECORD IS NOW PLAYING.

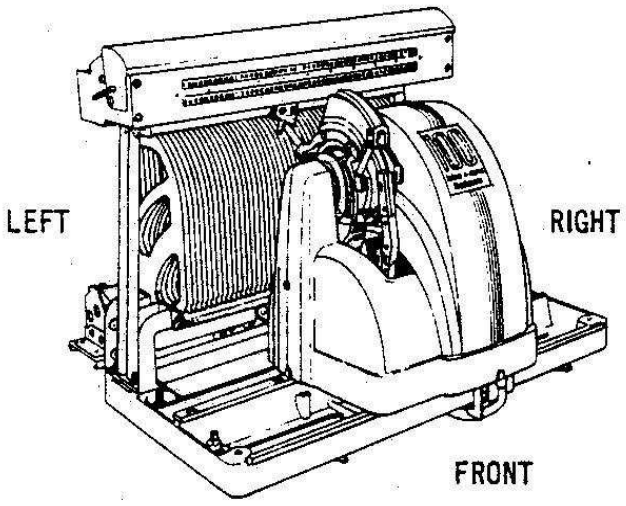
29. Pickup follows record grooves to trip-off.
30. Trip switch closes.
31. Trip solenoid energized.
32. (a) Clutch shifts from play position.
    (b) Sprocket detent force applied by clutch shifting lever.
    (c) IC contact opens.
33. Clutch engages clutch worm.
34. Cam assembly rotates from play position.
35. O contact closes.
36. V contact opens.
37. Clutch is locked in transfer position by clutch cam and clutch shifting lever roller.
38. Pickup is lifted from record.
39. Reset of trip mechanism commences.
40. Pickup arm resets to scan position.
41. Clamp arm releases record.
42. Carry-over (D) contact opens. *(See Note)*
43. Reset of trip mechanism completed.
44. Transfer arm starts downward travel.
45. Detent lock by detent lever relieved.
46. Safety trip plunger moves to scan position.
47. Transfer arm completes travel to scan position.
48. Clutch moves down from transfer position.
49. (a) Clutch engages sprocket.
    (b) Sprocket detent released.
    (c) Cam rotation ceases.
    (d) W contact closes.
50. Carriage scans to the next selection. *(See Note)*

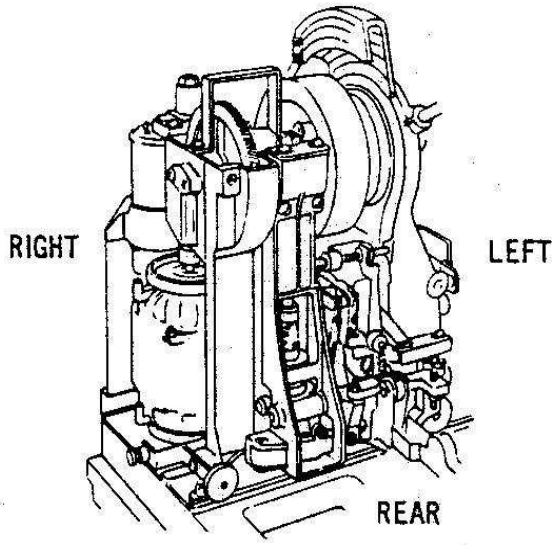
Following opening of the carry-over contact the play control relay will turn off the mechanism motor and the amplifier if another selection is not to be played. When the motor turns off, its momentum will coast the mechanism through some of steps 43 to 50. With normal adjustment of the switch, the mechanism should stop any time after the record is released (Step 41) but before the clutch moves from the transfer position (Step 48).

ADJUSTMENT PREFACE

The adjustments for the 45 r.p.m. Select-O-Matic "100" Mechanism, Type 145S2-L6. are given on the following pages. Each adjustment is associated with a step-by-step procedure which, if followed, will result in correct adjustment and normal operation. These individual adjustments may be made in any sequence but they are, in some instances, dependent on or affected by others. Because of this, they are arranged in a sequence which may be followed from page to page if a completely misadjusted mechanism is to be placed in operating condition. If an individual adjustment is to be checked or made, careful attention should be given to notes indicating dependent adjustments.

Reference is made in these adjustment outlines to the FRONT, REAR, LEFT and RIGHT of the mechanism in order to locate adjusting screws and various mechanical parts. Unless otherwise specified, these are defined as viewed from the front of the cabinet. Reference is also made to right side and left side playing of a record. Right side of a record is defined as viewed from the front of the complete instrument and is played with counter-clockwise rotation of the mechanism flywheel. Left side of a record is defined as viewed from the front of the instrument and is played with clockwise rotation of the flywheel. Counter-clockwise and clockwise rotation of the flywheel are defined as viewed from the left side of the mechanism. These references are used whether the mechanism is in or out of the cabinet.





The operation cycle of the mechanism follows a definite sequence in playing a record. This sequence includes the following:

SCAN - - in which the carriage assembly travels from side to side on the mechanism base.

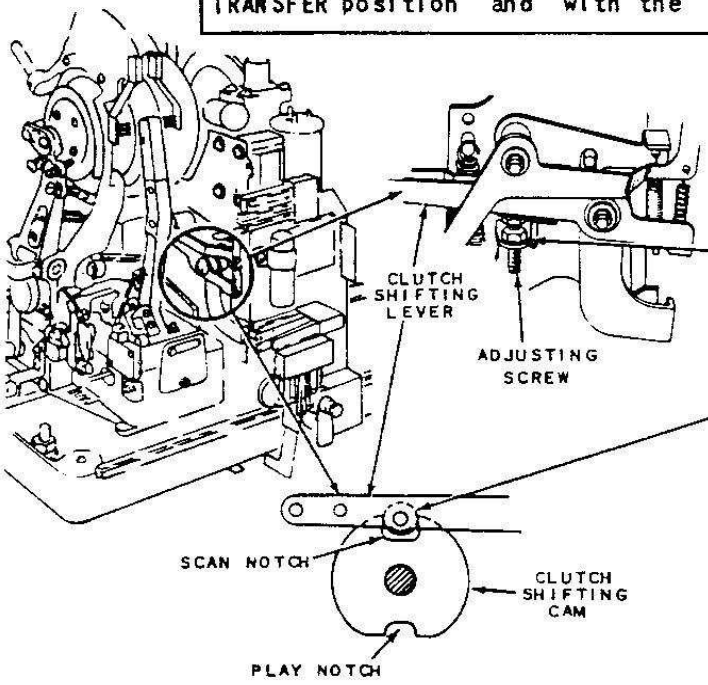
TRANSFER - - in which the record is transferred from the magazine to the playing position or from the playing position to the magazine.

PLAYING - - in which the record is clamped to the turntable and is played.

These terms SCAN - TRANSFER - PLAYING are also used to describe the position of the clutch, cams and levers of the carriage assembly whether or not the motor is in operation.

"CLUTCH 1" - - CLUTCH LIFTING ADJUSTMENT

This adjustment controls the amount of vertical clutch travel and results in full engagement of the Clutch with the Worm Pin in TRANSFER position and with the Sprocket Pin in SCAN position

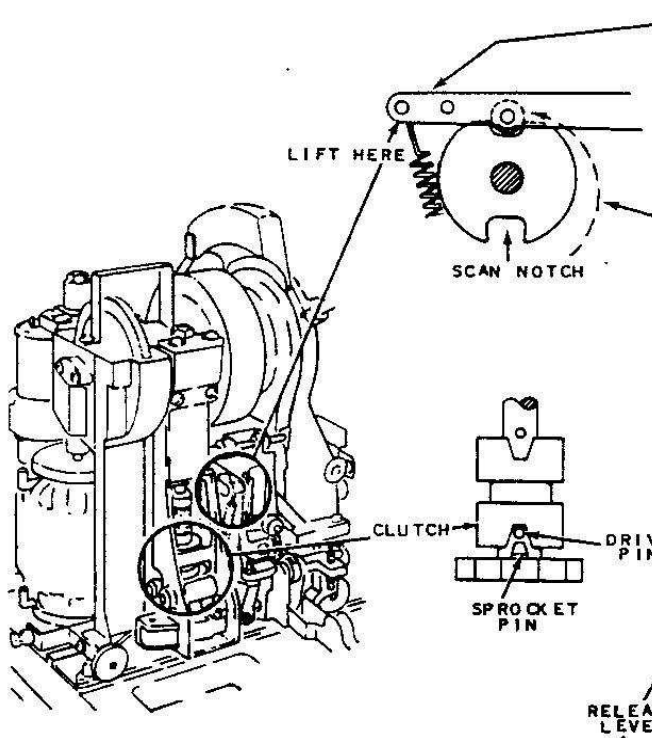


(A) Scan Carriage to front of K9-K10 record space. Leave it in SCAN position.

(B) Loosen lock nut and turn Adjusting Screw down to limit.

(C) Check Clutch Shifting Lever Roller position. The Roller should be in the SCAN Notch.

If the Roller is not in the SCAN Notch, turn the motor shaft until the Roller enters fully into the notch. If the Roller enters the PLAY Notch, it may be necessary to manually lift the Clutch Shifting Lever and - -
turn the motor shaft until the Roller is on the high part of its cam. When the Roller is on the high part of the cam, release the Lever but continue turning the motor shaft until the Roller fully enters the SCAN Notch.



(D) Check Trip Mechanism position. The Trip Mechanism should be latched with Release Lever down to limit.

(E) Check Clutch position. Clutch should be all the way down against Drive Pin and engaged with Sprocket Pin.

(F) While manually holding Clutch Shifting Lever down - -

turn Adjusting Screw UP until screw head just touches Clutch Shifting Lever.

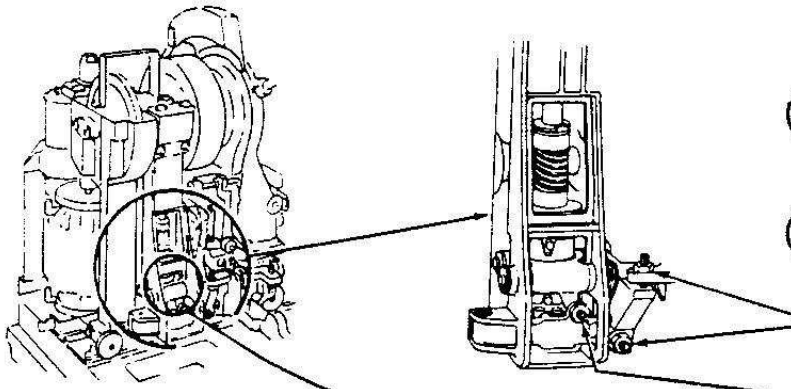
(G) Tighten Lock Nut.

"CLUTCH 2" - - SPROCKET CLEARANCE AND DETENTING ADJUSTMENT

This adjustment establishes correct clearance between the Detent Roller and the Sprocket Teeth when the mechanism is Scanning. It results in clearance between roller and Sprocket Teeth which allows 1/16" movement at end of the Detent Arm.

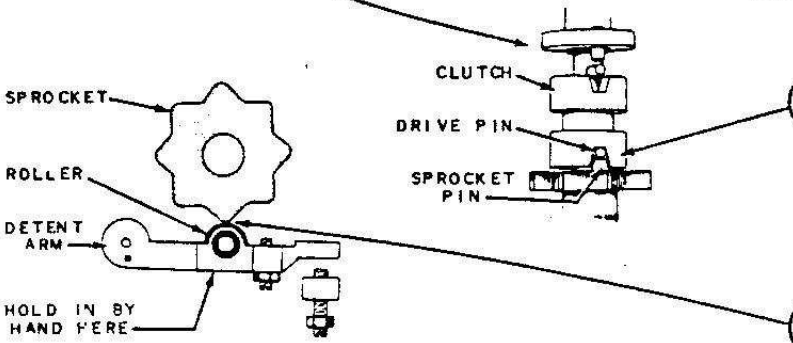
NOTE 1: - "Clutch 1" adjustment should be correct before making this adjustment.

NOTE 2: - If "Clutch 2" adjustment is changed in any way, "Clutch 3 and 4" should be re-adjusted. "Clutch 2, 3 and 4" are related to an extent that a change of "Clutch 2" can cause damaging strains at adjusting screws for "Clutch 3 and 4".



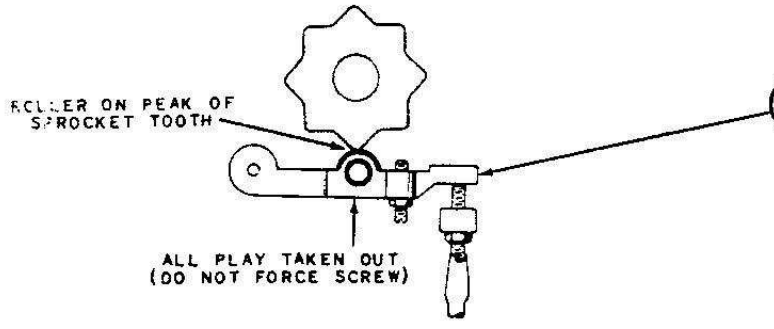
(A) Scan Carriage to right end beyond K10 position.

(B) Loosen lock nuts and turn these adjusting screws out to the limit;

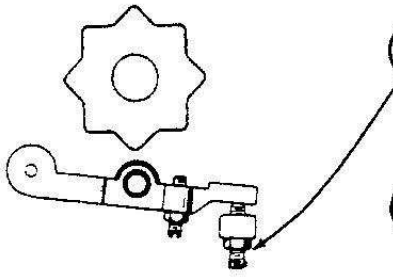


(C) Mechanism should still be in SCAN position, beyond K10, with Clutch all the way down (against lower Drive Pin) and engaged with Sprocket Pin.

(D) Hold Detent Arm in lightly by hand and turn motor shaft until Detent Arm Roller reaches peak of a Sprocket Tooth.



(E) With Detent Roller lined up with peak of Sprocket Tooth, turn adjusting screw in carefully, a little at a time, until there is no "in and out" play between Detent Arm Roller and peak of Sprocket Tooth. (This is the starting point for correct adjustment.)

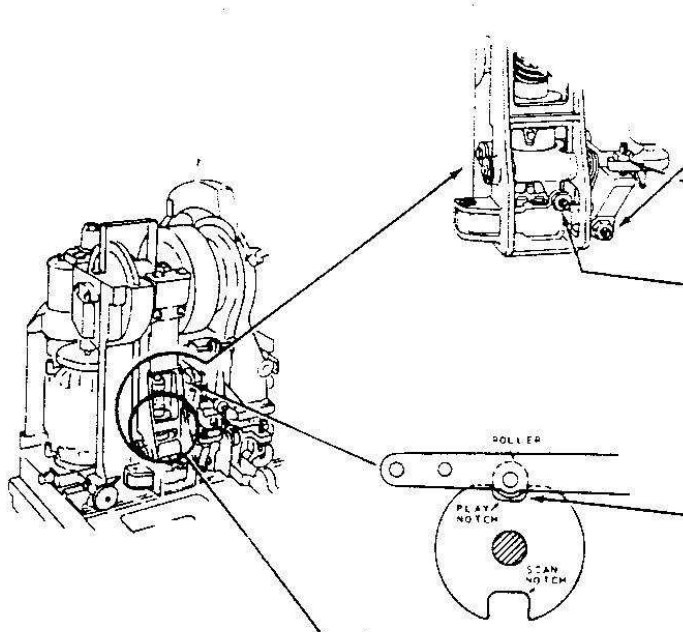


(F) Now, back out, the screw 2 turns and tighten the lock nut. This establishes correct clearance.

(G) After this adjustment has been made, adjust "Clutch 3 and 4" as shown on following pages.

"CLUTCH 3" - - DETENT LOCKING ADJUSTMENT

This adjustment insures proper locking of the carriage while a record is playing. The adjustment takes out all rotational motion of the sprocket resulting in a minimum of lateral play in the carriage.



NOTE: - "Clutch 2" adjustment should be correct before making this adjustment.

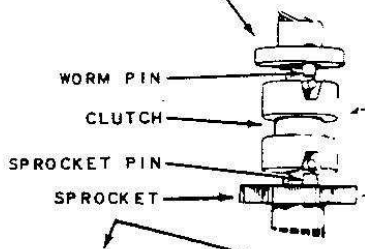
(A) Loosen Lock Nuts and turn these adjusting screws out to the limit:

"Clutch 3"

"Clutch 4"

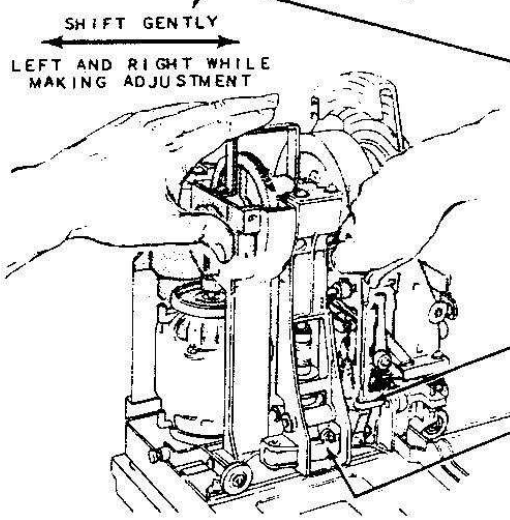
(B) Place mechanism in K10 PLAY position. Be sure mechanism is fully in PLAY position.

Clutch Shifting Lever Roller should be down in PLAY Notch, - - - and - - -



Clutch should be somewhere below the Worm Pin and above the Sprocket Pin.

Note side play in Carriage and rotational motion in Sprocket when Carriage is shifted to left and right by hand. This is due to "Clutch 3" screw being out too far.

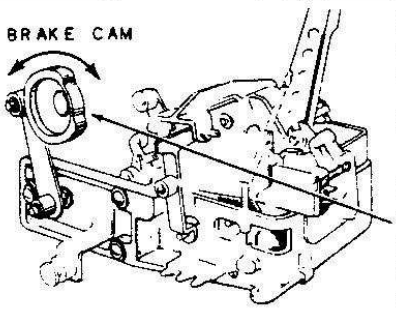


(C) While gently shifting Carriage to Left and Right by hand, - - -

turn "Clutch 3" adjusting screw carefully downward - - -

until all rotational motion is just taken out of Sprocket. Tighten "Clutch 3" Lock Nut.

(D) After this adjustment has been made, adjust "Clutch 4" as shown on the following page.



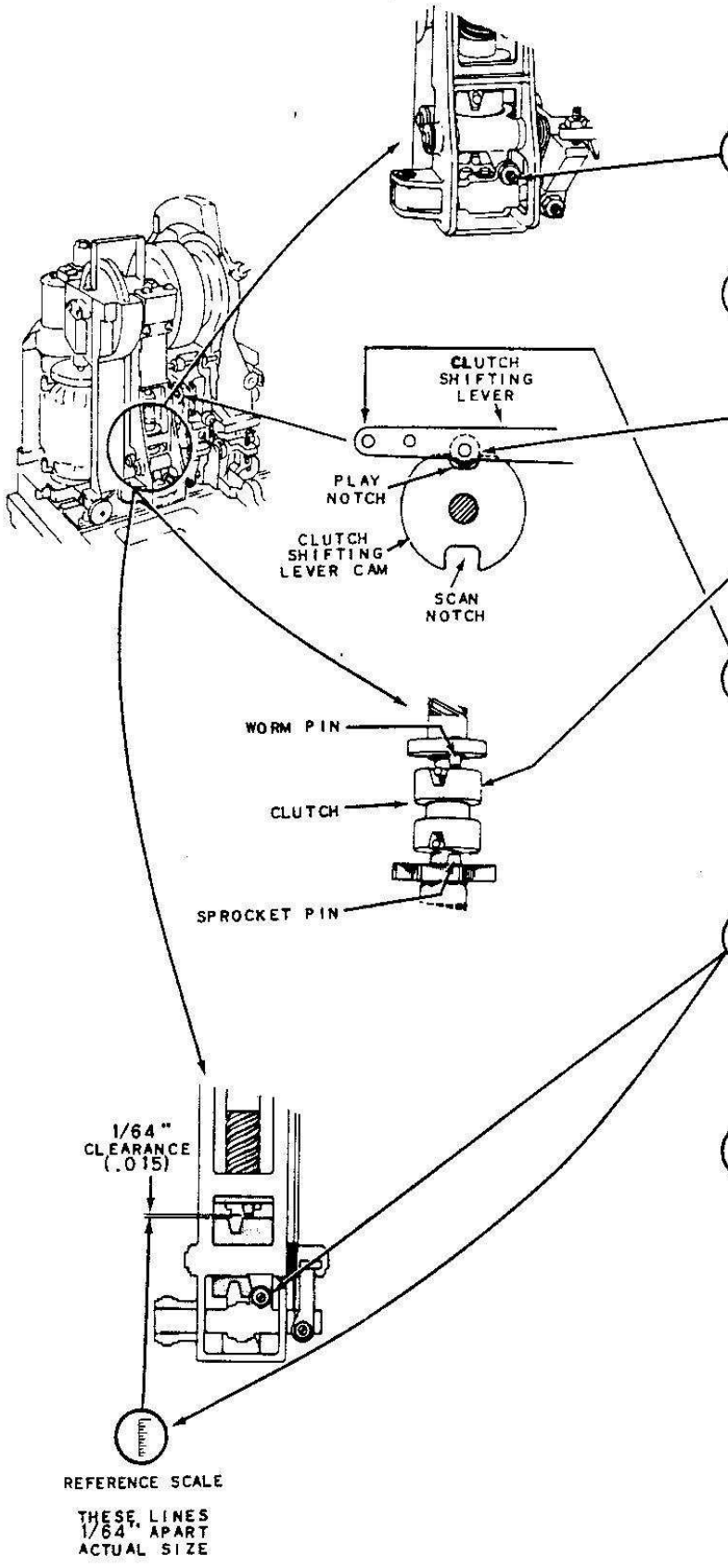
CAUTION: - Note that when adjustment is completed there is no more rotational motion in Sprocket but Carriage still has a slight amount of side play. This is a normal condition due to required gear clearances.

Do not force adjusting screw.

Turning the screw down too far will setup severe strains in the levers and will cause the Cam Assembly to bind when entering PLAY position. When adjustment is completed, check for freedom of action of Cam Assembly by turning Brake Cam by hand in both directions. Cam should have a slight amount of rotational play.

"CLUTCH 4" - - CLUTCH PLAY POSITION ADJUSTMENT

This adjustment establishes the playing position of the Clutch. This results in 1/64" clearance between the Clutch and the Worm Pin in PLAY position.



NOTE: - Before making this adjustment "Clutch 2 and 3" should be correct.

(A) "Clutch 4" adjusting screw should be turned out to the limit.

(B) Place mechanism in K10 PLAY position. Be sure mechanism is fully in PLAY position.

Clutch Shifting Lever Roller should be down in PLAY notch, - - - and - - -

Clutch should be below the Worm Pin and above the Sprocket Pin.

(C) Press downward on end of Clutch Shifting Lever. (This insures that the Clutch has moved to its farthest downward travel before making the adjustment.)

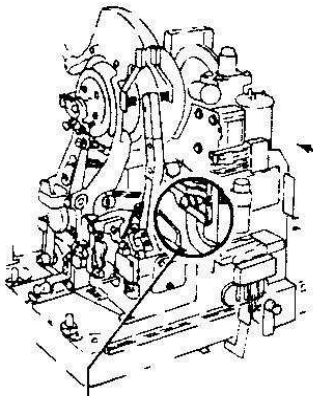
(D) Turn adjusting screw inward until there is 1/64" (.015) clearance between the bottom of the Worm Pin and the top of the Clutch.

(E) Tighten Lock Nut.

NOTE: - Clutch should drop freely, (to 1/64" clearance) every time mechanism enters PLAY position. If Clutch does not drop freely into full PLAY position it may hit Worm Pin as it rotates. This can be caused by "Clutch 3" being too tight or by binds in the Clutch and the Clutch Shifting Lever.

RESET LEVER STOP ADJUSTMENT*

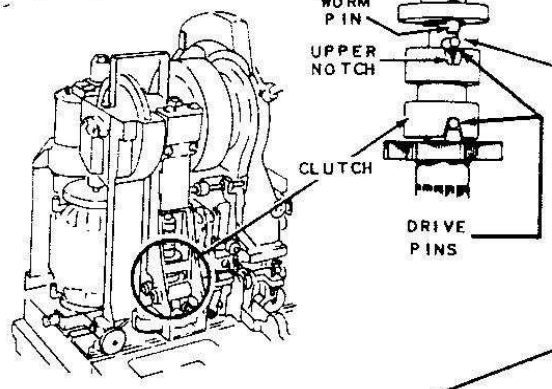
This adjustment positions the Rubber Stop so it minimizes and absorbs mechanical shock at the Reset Lever when the mechanism is tripped. It results in 1/32" clearance between the Limit Pin and the Reset Lever in the tripped position of the mechanism.



NOTE 1: - This adjustment not used if adjustable Trip Solenoid is used. See "Trip Solenoid 1" adjustment.

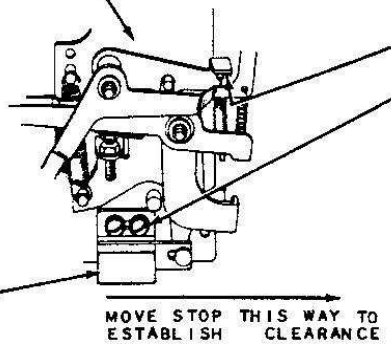
NOTE 2: - "Clutch 1" adjustment should be correct before making this adjustment.

(A) Place mechanism in SCAN position in front of K9-K10 record space.

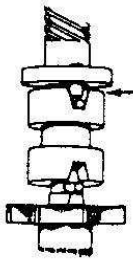


(B) Turn motor shaft manually until upper notch in Clutch is lined up with Worm Pin.

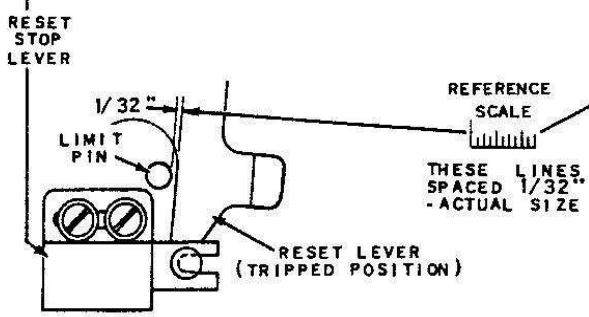
(C) Trip the mechanism by manually lifting the Release Lever.



(D) Loosen screws holding Reset Lever Stop.

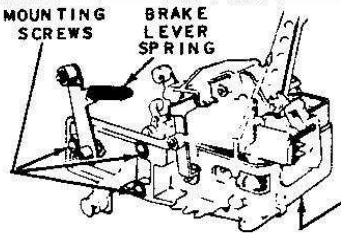


(E) Check Clutch position. Clutch should now be up to limit and engaged with Worm Pin.



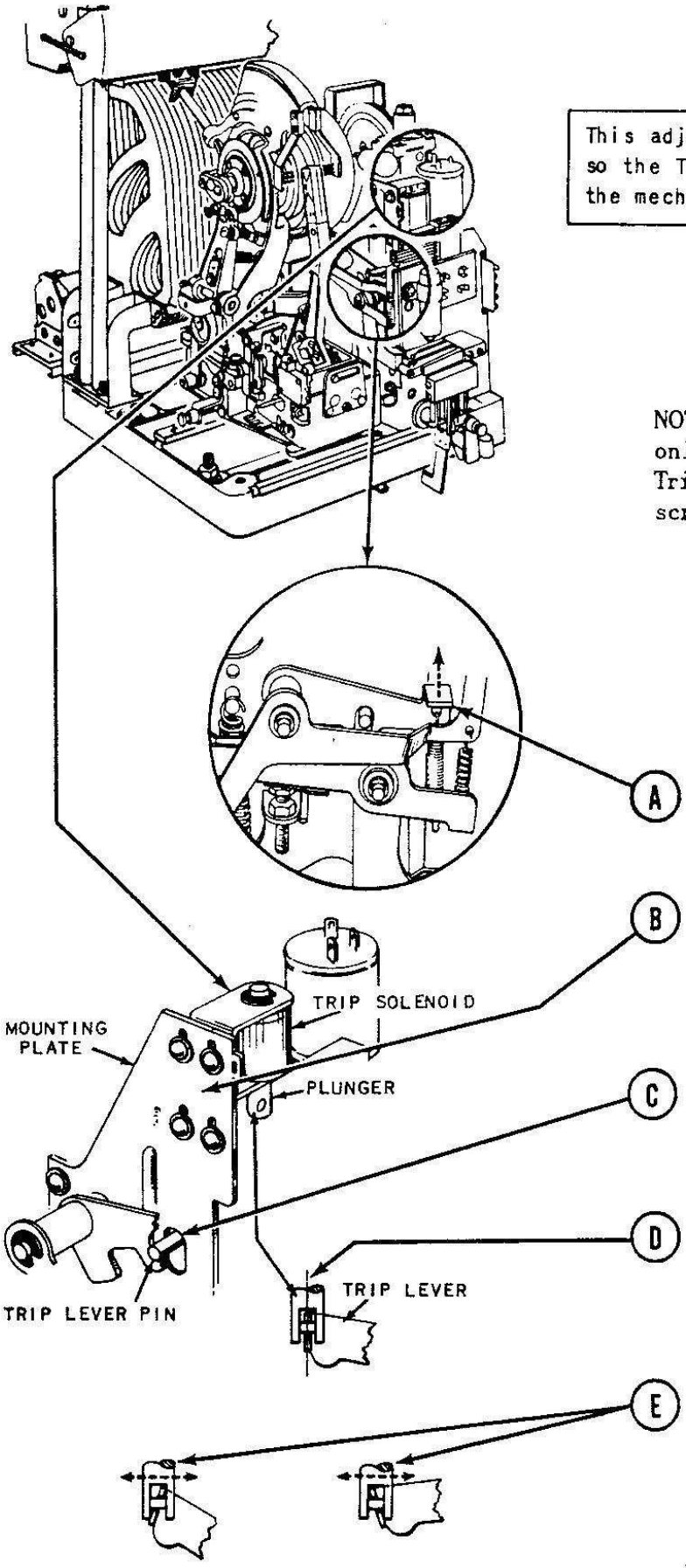
(F) With Clutch engaged with Worm Pin, as shown above, move Reset Lever Stop toward front until Reset Lever clears Limit Pin by 1/32 inch. Tighten screws.

(G) Check Clutch position. Clutch should still be up to limit and engaged with Worm Pin. If it is not against the Drive Pin check "Clutch 1" adjustment.



*It is necessary to remove Pickup Assembly to change above adjustment. This can be done by removing Brake Lever Spring and three mounting screws. When replacing Pickup Assembly on Carriage Casting pull front end of Pickup Base Casting UP before tightening mounting screws, taking out all play in upward direction. This insures that Pickup Casting does not rest against Reset Lever Stop. Check Pickup adjustments after mounting on carriage.

"TRIP SOLENOID I" - - TRIP SOLENOID POSITION



This adjustment positions the Trip Solenoid so the Trip Lever is raised enough to cause the mechanism to "trip".

NOTE: This adjustment applies only if mechanism has adjustable Trip Solenoid with slotted mounting screw holes.

(A) Trip the mechanism by manually lifting the Release Lever.

(B) Loosen four screws holding Trip Solenoid Brackets and - - -

adjust the vertical position of the Solenoid so the Trip Lever Pin clears the upper edge of the Mounting Plate Hole not less than 1/64" when the Solenoid Plunger is in the fully raised position.

(C) Adjust the horizontal position of the Solenoid so the forked end of the Trip Lever, when vertical, is centered in the plunger slot.

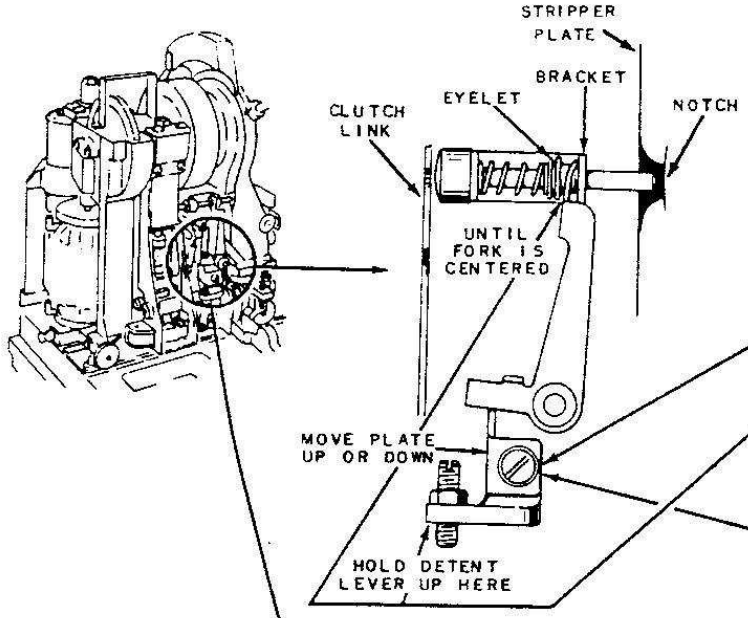
(D) To avoid binds the Plunger must have horizontal play when the Trip Lever is in either extreme up or down position.

(E) The upper and lower brackets holding the Solenoid should be square with the coil.

"SAFETY LEVER I" - - SAFETY LEVER POSITION

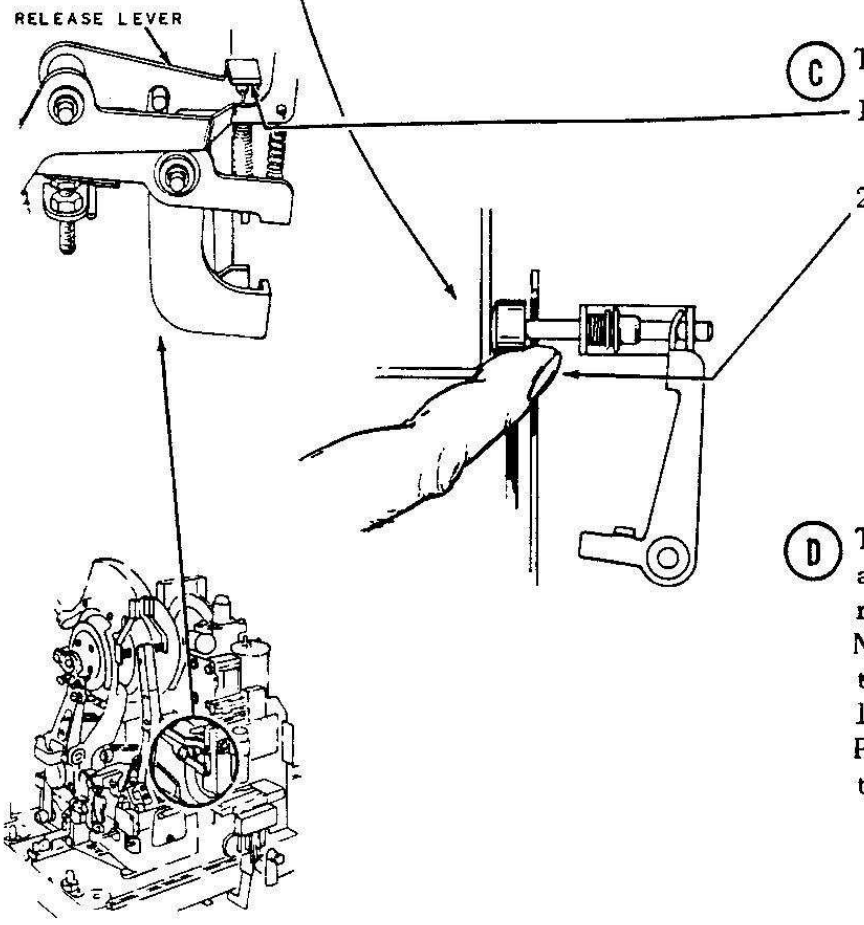
This adjustment establishes the correct position of the Safety Lever and results in proper travel of the Safety Plunger when the mechanism is entering PLAY or SCAN position.

(A) Scan Carriage to right end Beyond K10 and turn off power.



(B) To adjust Safety Lever, - - -

1. Mechanism should still be in SCAN position.
2. Loosen screw.
3. While holding Detent Arm Lever up by hand, move Adjustment Plate up or down until top forked end of Safety Lever is approximately centered between eyelet and bracket.
4. Tighten screw.



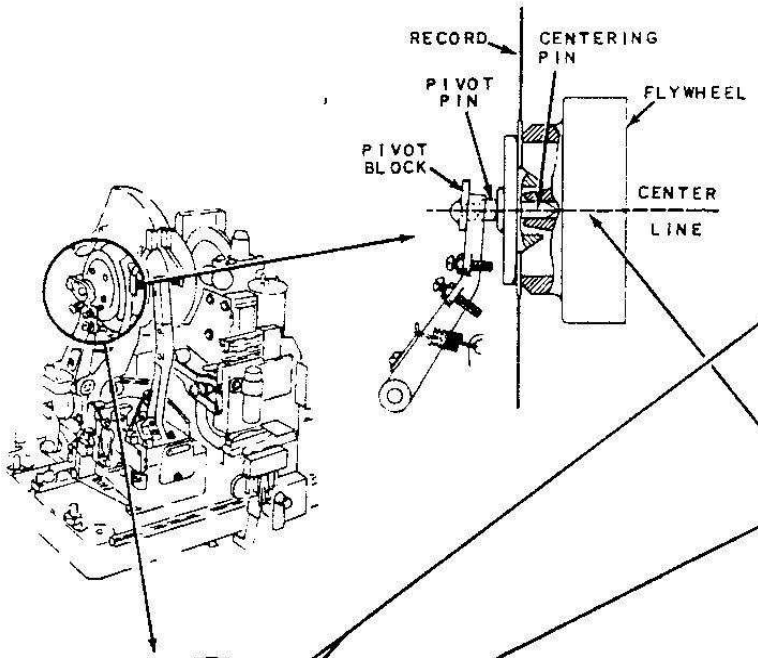
(C) To check Safety Assembly for binds,

1. Trip the mechanism by manually lifting the Release Lever.
2. Pull Plunger all the way over to the left (as shown) and release slowly to right. Plunger should return freely without binds.

(D) To test for correct safety operation, - - hold the edge of a thin record across the Stripper Plate Notch and run mechanism slowly through SCAN. Hook on Clutch link should catch on large end of Plunger and record should be returned to PLAY position.

"CLAMP ARM 1" - - PIVOT PIN ALIGNMENT

This adjustment establishes proper alignment of the Pivot Pin with the Centering Pin and the hole in the Flywheel Shaft.



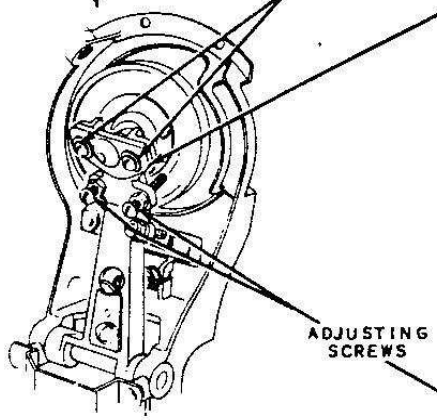
(A) Place mechanism in PLAY position with a record clamped on the Flywheel.

(B) Loosen Pivot Block Screws.

(C) Move Pivot Block, up or down, until center line of Pivot Pin is in line with or 1/32" above the center line of the Flywheel Shaft, and tighten screws.

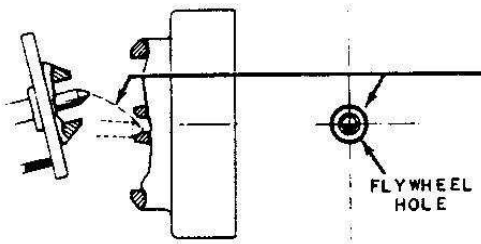
"CLAMP ARM 2" - - CENTERING PIN POSITION

This adjustment establishes the Centering Pin position allowing it to enter freely into the hole of the Flywheel Shaft when a record is being clamped.



NOTE: - "Clamp Arm 1" adjustment should be correct before making this adjustment.

(A) Loosen lock nuts and adjust both screws as required so - - -

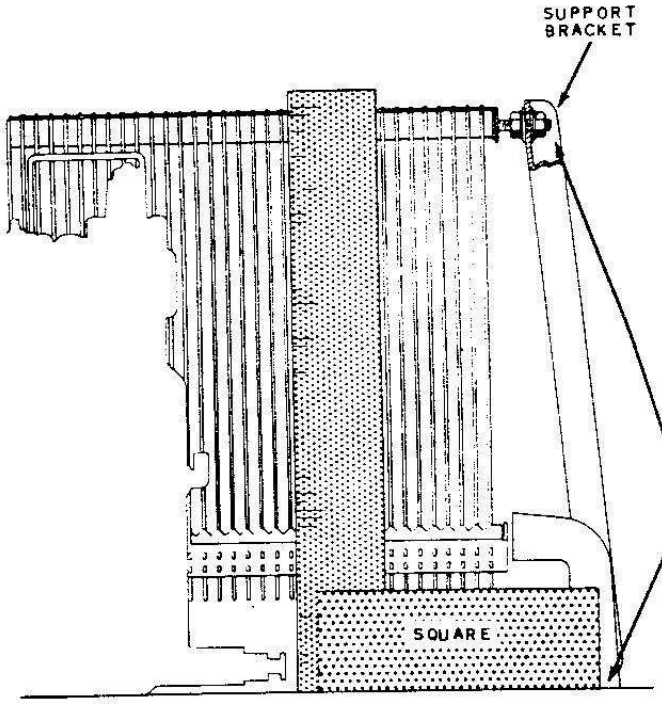


(B) Tip of Centering Pin enters Flywheel hole as shown.

(C) Tighten Lock Nuts.

"MAGAZINE I" - - VERTICAL ALIGNMENT

This adjustment moves the upper end of all the Magazine Separators so the Separators are at right angles with respect to the base. This results in the Separators being parallel to a flat record when the record is in Play position.



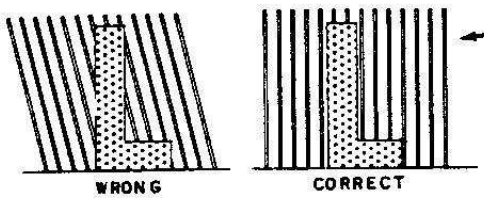
(A) To check Magazine for squareness -

1. Lay the edge of a 12" square along the back rail of the base and line up the vertical edge with one of the Separators as shown.

2. The Magazine Separators should line up with the edge of the square as shown.

(B) To Adjust - - -

1. Loosen Adjusting Nuts at <u>both sides</u> of the magazine and move them to their limit away from their Support Brackets.



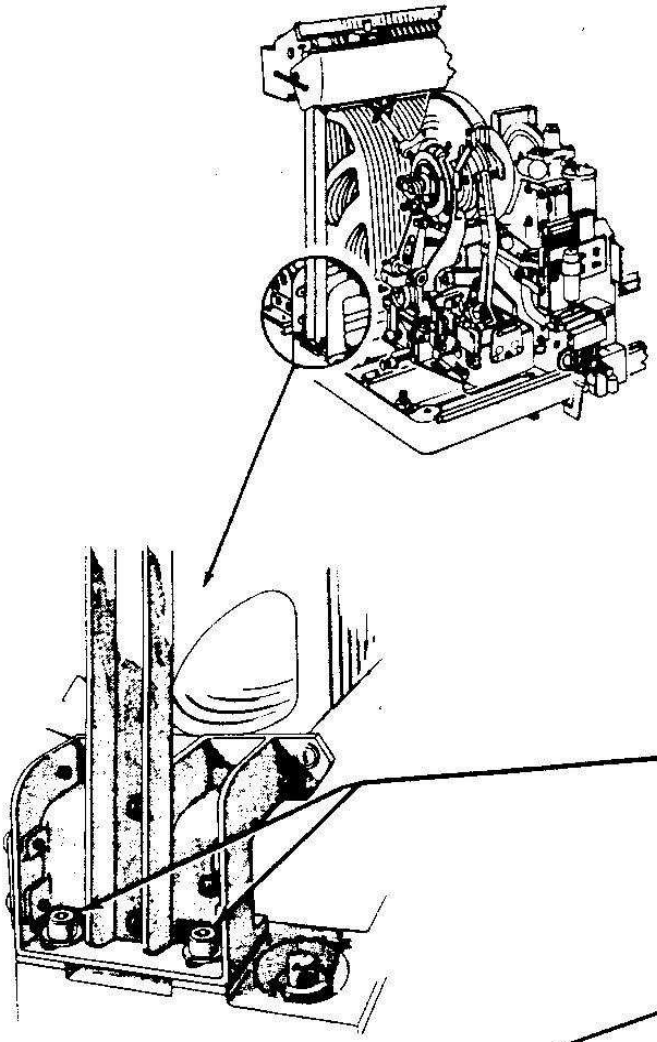
2. Adjust proper nut, on either side, which will align the Separators with the edge of the square.

3. Bring other nuts up to their Support Brackets and tighten.

NOTE: - Check the spacing of the Magazine Separators. All the Separators should be straight and equally spaced.

"MAGAZINE 2" - - HORIZONTAL POSITION

This adjustment establishes the horizontal Magazine position so that when a record is in Play position it is approximately centered with its magazine space.

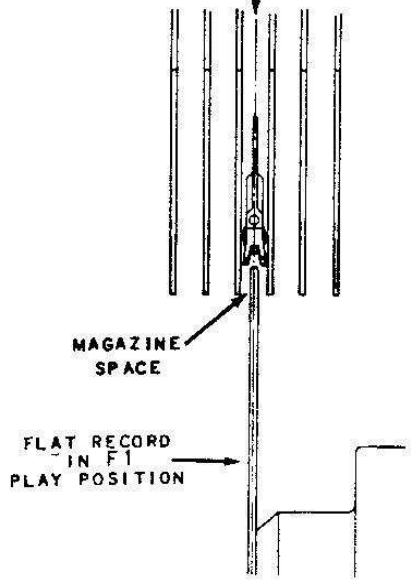


NOTE: - Before making this adjustment the Magazine should be square, as noted in "Magazine 1" adjustment.

(A) Place a FLAT record in F1 PLAY position. (Be sure the record is FLAT - not warped, not dished.)

(B) Loosen the cap screws holding both ends of the Magazine to the Base.

(C) Shift the entire Magazine to Left or Right until the record is in the center of the Magazine Space.



(D) Tighten cap screws. (Be sure the screws are tight.)

NOTE: - If the Magazine position is changed be sure to check and re-adjust.

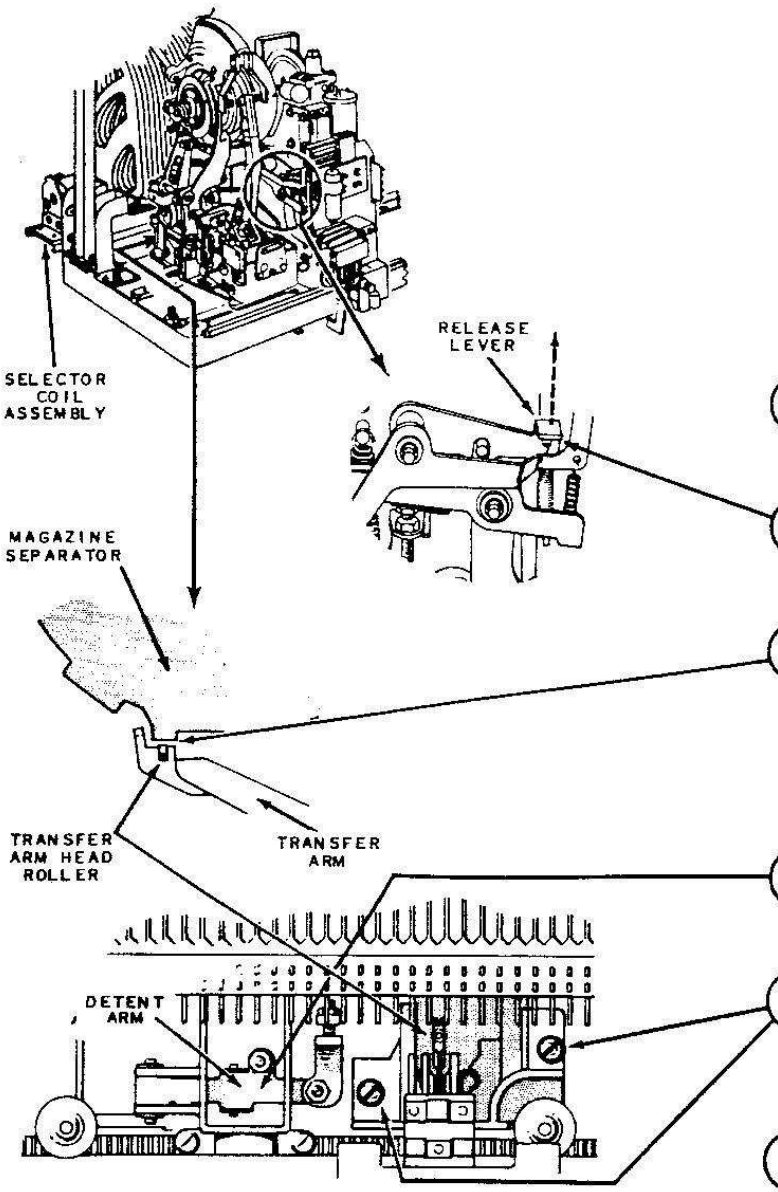
"Transfer Arm 1"

"Contact Block 1"

"Selection Playing Indicator 2"

"TRANSFER ARM 1" - - ALIGNMENT TO MAGAZINE

This adjustment establishes the lateral position of the Transfer Arm so the Transfer Arm Head will be centered in the magazine space when a record is transferred.



REAR VIEW WITH SELECTOR COIL ASSEMBLY REMOVED

NOTE: - The Magazine position (Magazine 2 Adjustment) should be correct before making this adjustment.

The Selector Coil Assembly should be removed for convenience in making this adjustment. This can be done by removing its four mounting screws and sliding Selector Coil Assembly off the Contact Block.

(A) Scan the mechanism to F1 position and turn off power.

(B) Trip the mechanism by manually lifting the Release Lever.

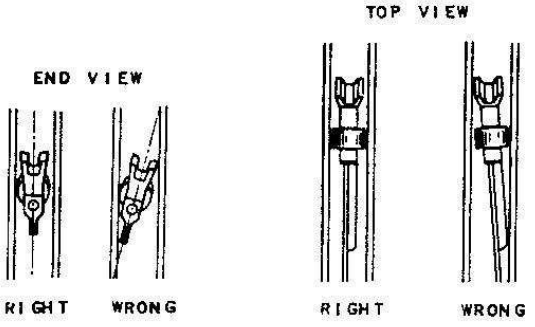
(C) Turn motor shaft until Roller in Transfer Arm Head is approximately 1/32" below the projections on the lower edges of the Magazine Separators.

(D) Push in on Detent Arm to take out Carriage Side Play.

(E) Loosen two screws holding Contact Arm Casting to Carriage Casting and - - -

(F) Shift Contact Arm Casting to left or right until Transfer Arm Head is centered in the space. Tighten screws.

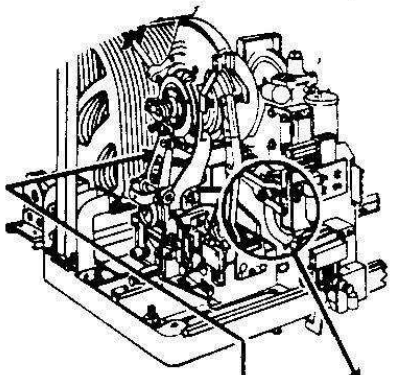
(G) When the Transfer Arm enters the space, the Transfer Arm Head should be parallel to the Magazine Separators as shown. Straighten Arm if necessary to correct Transfer Arm Head alignment.



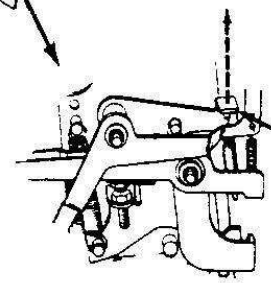
NOTE: - After making this adjustment be sure to check and adjust - "Contact Block 1".

"TRANSFER ARM 2" - - PLAY POSITION CLEARANCE

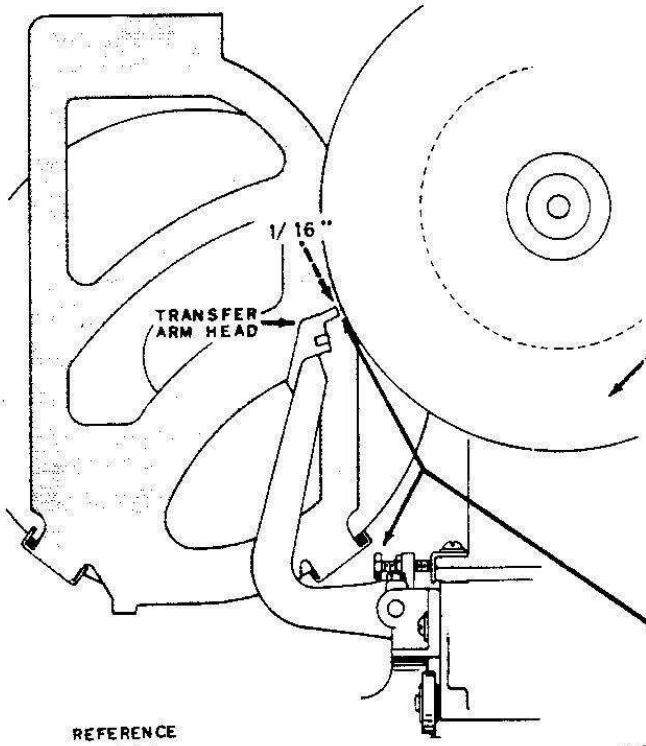
This adjustment establishes the upper limit of travel of the Transfer Arm so that records will be brought up high enough to be properly clamped to the Flywheel by the Clamp Arm.



(A) Scan the carriage to the Left, stopping it one position to the LEFT of A1 so the Transfer Arm will come up outside the magazine.

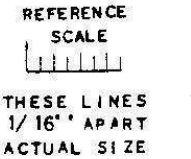


(B) Trip the mechanism by manually lifting the Release Lever.



(C) Place a normal size *record in position on the Transfer Arm Head. Turn motor shaft until record is brought up and clamped in PLAY position. (Transfer Arm and record should come up just outside of the Magazine one position to the left of A1.)

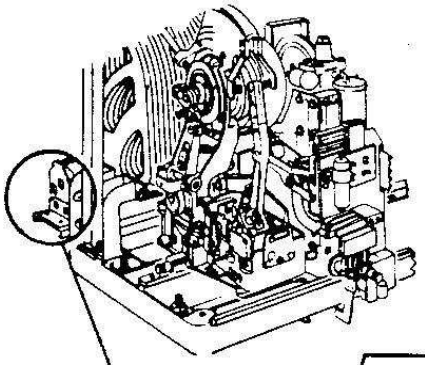
(D) Adjust screw for 1/16" clearance between edge of record and tips of the Transfer Arm Head.

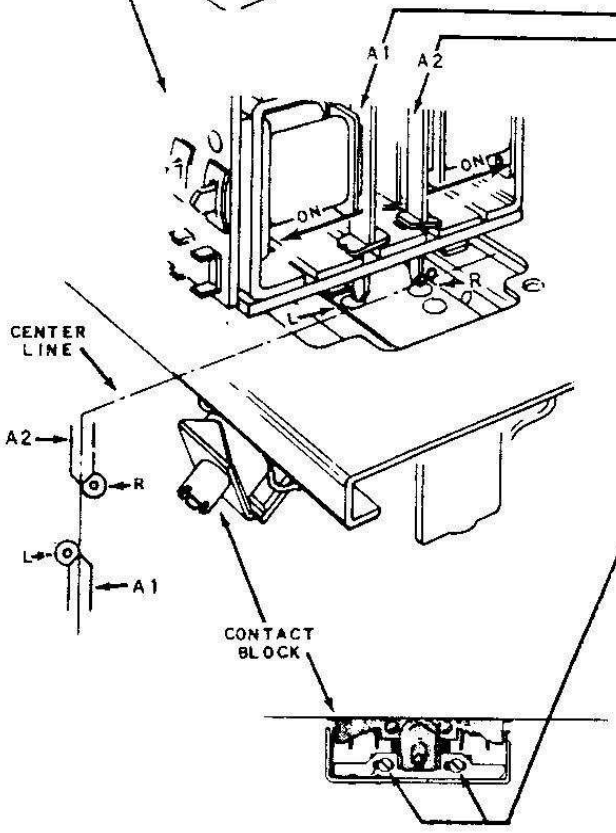


*DIAMETER OF A NORMAL SIZE 45 R.P.M. RECORD IS 6-7/8" ± 1/32"

"CONTACT BLOCK 1" - - CONTACT BLOCK ALIGNMENT

This adjustment positions the Contact Block and determines proper timing for tripping the mechanism at the selected record and proper alignment at the Cancel Solenoid for cancellation at the Selected Lever.





NOTE: - Check "Clutch 3" for minimum Carriage side play, and check "Magazine 2" and "Transfer Arm 1" adjustment before making this adjustment.

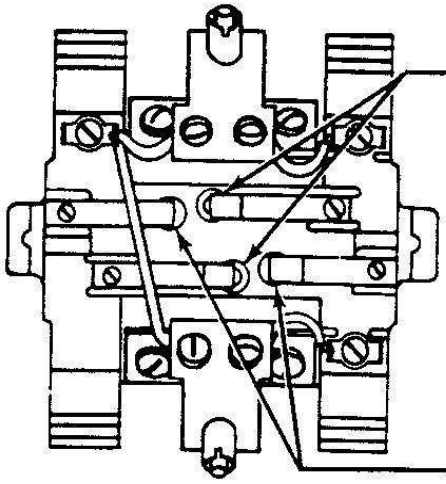
(A) Place mechanism in A1 PLAY position and turn off power.

(B) Move Selection Levers A1 and A2 out to their ON position.

(C) Loosen Contact Block Adjusting Screws.

(D) Position Contact Block so A1 and A2 levers are approximately centered between L and R contacts, as shown, and tighten screws.

(E) Place mechanism in K9 PLAY position and check for equivalent L and R contact alignment with K9-K10 Selection Levers out to their ON position. Exact centering at all points is not necessary -- if the Selection Levers are not equally centered with the L and R contacts at the K9-K10 position, shift the Contact Block, as required, so variation in centering is equally divided between the A1-A2 and the K9-K10 positions.



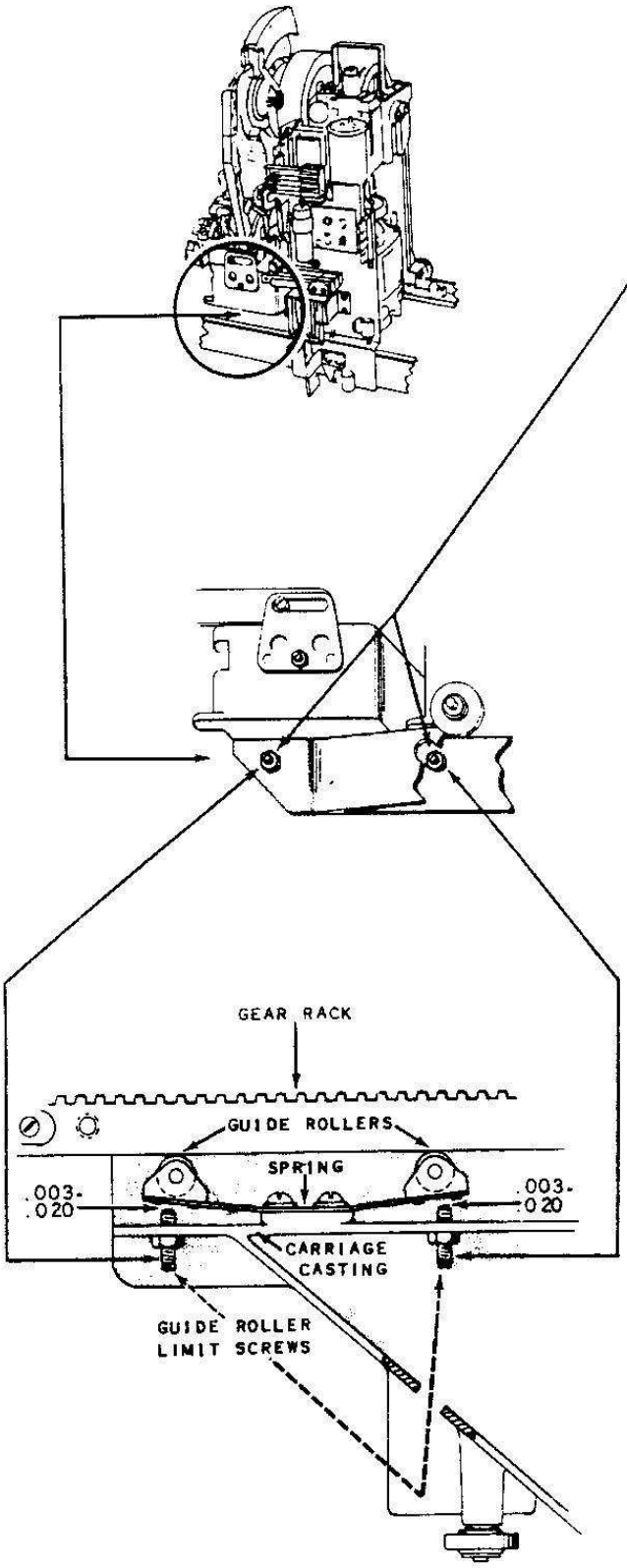
Adjust spring pressure so a 1/2 to 3/4 oz. force is required to move selector contacts.

Adjust spring pressure so a 2 to 2-1/2 oz. force is required to move dressing contacts.

Dressing contacts and selector contacts should move of their own weight (with no spring pressure).

"GUIDE ROLLERS I" - - CARRIAGE GUIDE ROLLER ADJUSTMENTS

This adjustment limits the front to back play of the Carriage.



(A) Front and back play of Carriage on rack should be limited to .003 to .020 by position of Guide Roller Limit Screws.

(B) To adjust Guide Roller Limit Screws - - -

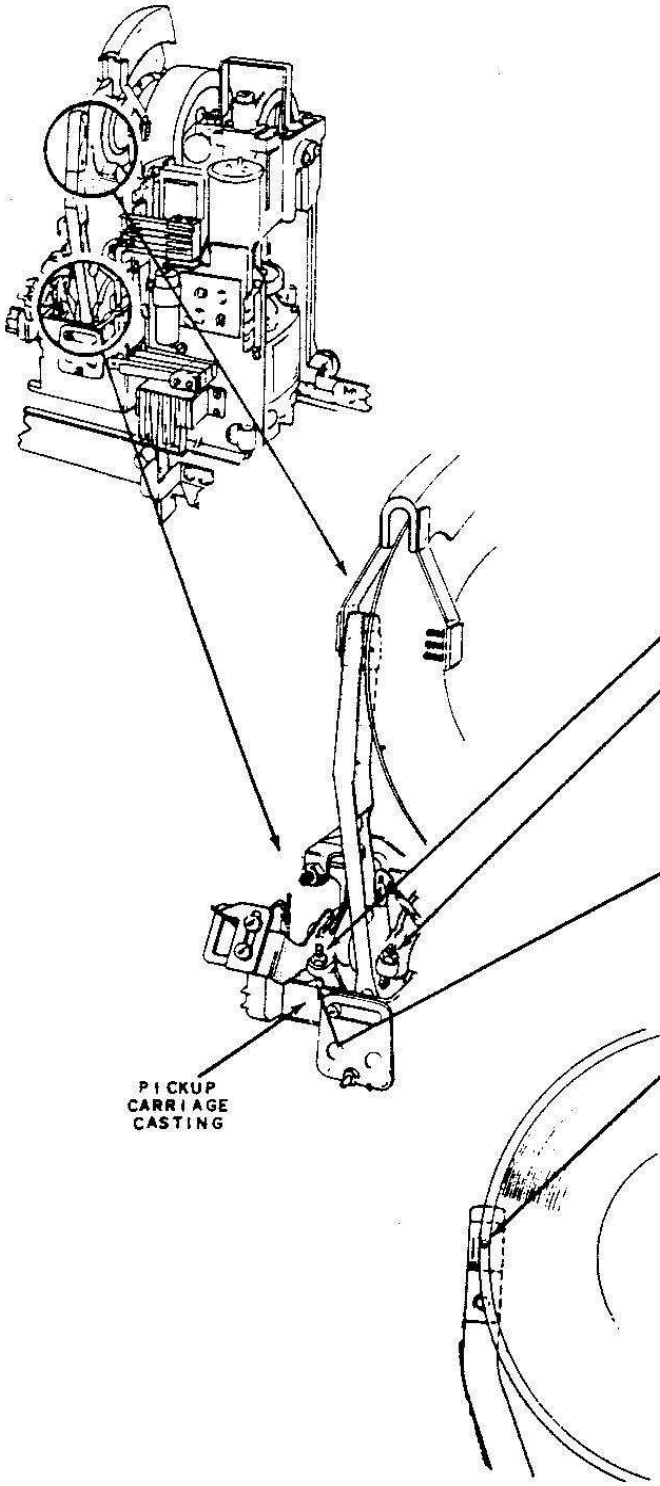
1. Loosen Lock Nuts.
2. Carefully turn screws in, all the way, until all front and back play of Carriage is taken out.
   (DO NOT FORCE SCREWS)
3. When all front and back play is taken out, back out each screw 1/2 turn. (This will result in approximately .015 clearance.)
4. Tighten Lock Nuts.

(C) Check for play along the entire Gear Rack. Back out each screw an additional 1/4 turn if necessary to avoid binding.

(D) To check Guide Roller Spring pressure, - push left side of Carriage toward the rear and release slowly. Repeat with right side of Carriage. Spring pressure on each side should be great enough to fully reset the Carriage to its normal forward positions.

"PICKUP 1" - - NEEDLE LANDING ADJUSTMENT

This adjustment establishes the point of landing of the needle on the record at the beginning of Play. It should be made so the needle lands half way between the edge of the record and the first playing groove.



(A) Select the Left side of a normal* record (preferably a transparent type) and place the record and the mechanism in Left Side PLAY position.

(B) Loosen Lock Nuts on - - - "Pickup 1" and - - - "Pickup 2". Turn Adjusting Screw out to limit. ("Pickup 2" Adjusting Screw is loosened to avoid possibility of binds in the levers when the mechanism is later returned to SCAN.)

(C) Hold Adjusting Screw down against casting and adjust so - - -

(D) - - needle is halfway between outer edge of record and the playing grooves. (If transparent type record is used, point where needle touches can be seen through the record.)

(E) Tighten "Pickup 1" Lock Nut.

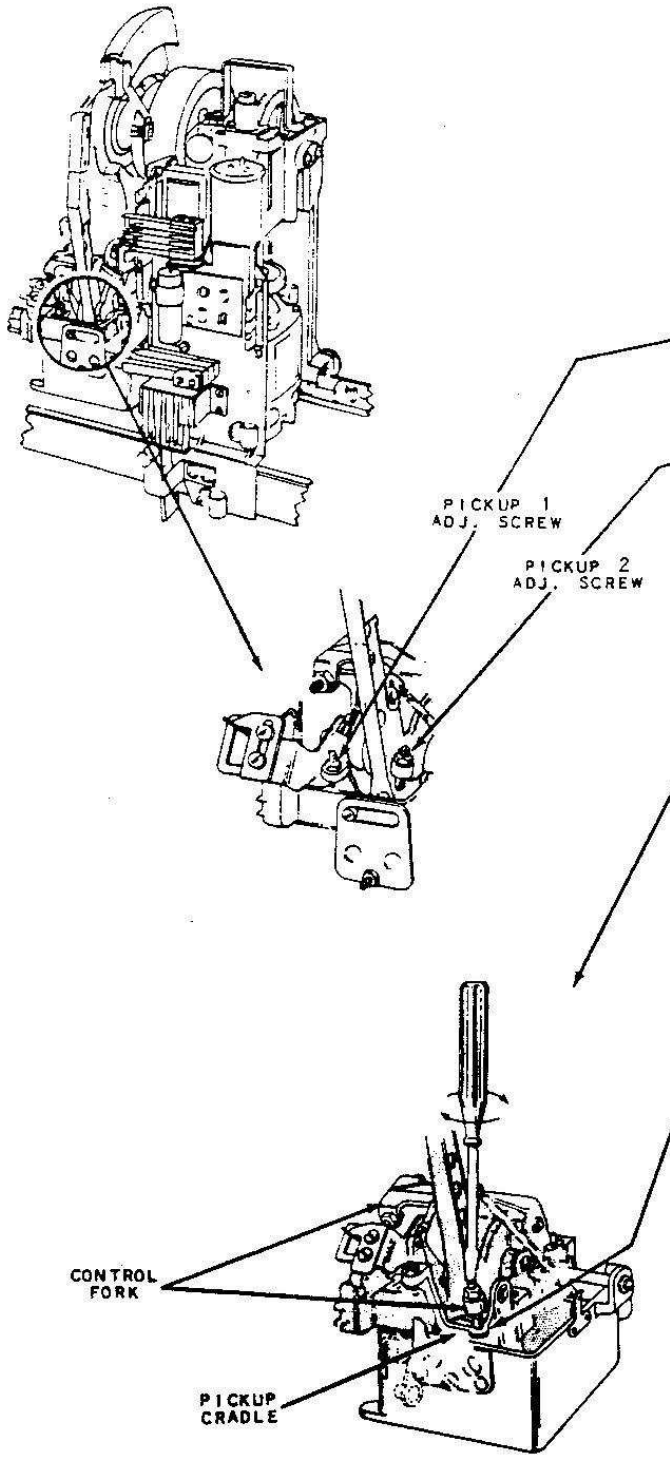
(F) Select the Right side of the same record and check for proper needle landing at the beginning of Right Side PLAY.

(G) After this adjustment had been made, adjust "Pickup 2" as shown on the following page.

*Normal diameter for 45 R.P.M. records is 6-7/8 ± 1/32.

PICKUP 2 - - PICKUP RETURN ADJUSTMENT

This adjustment results in proper return of the Pickup Arm to SCAN position and allows enough play between the Cradle and the Adjusting Screw to avoid binds.



NOTE: - "Pickup 1" adjustment should be correct before making this adjustment.

(A) Place mechanism in SCAN position with Pickup Arm on Left Side. "Pickup 1" Adjusting Screw should be against the casting.

(B) Loosen Lock Nut and turn "Pickup 2" Adjusting Screw out to limit.

(C) Insert screw driver in screw slot. Push straight down on screw with screw driver, then release. Note clearance between screw and cradle and note the up and down play in the Control Fork.

(D) While gently pushing down and releasing the screw with screw driver, turn screw down carefully, a little at a time, until all the up and down play is just taken out.

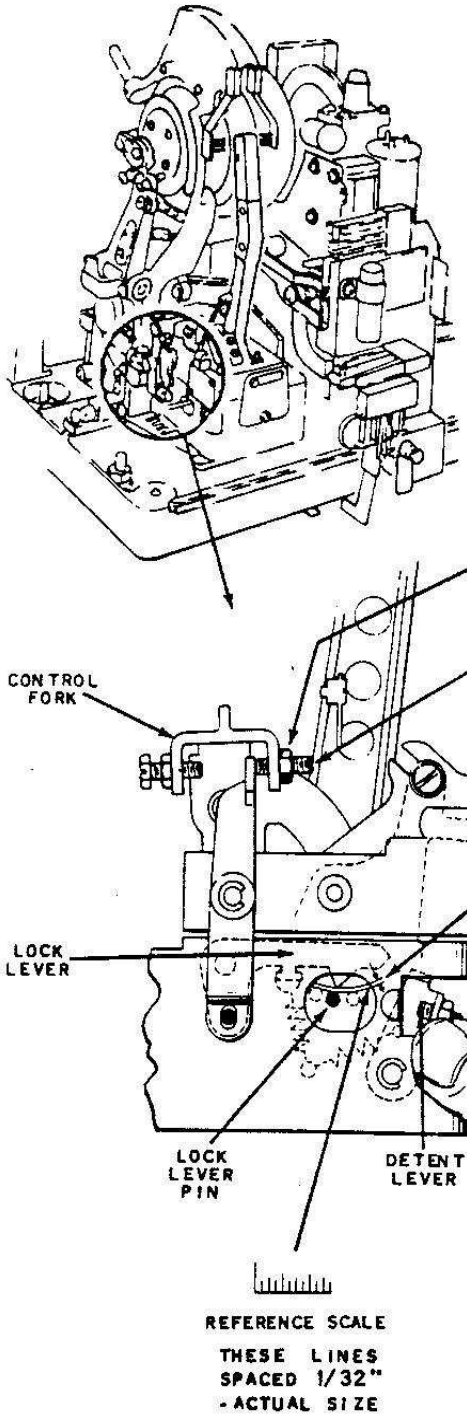
(E) Back out screw 1/4 turn from the above position and tighten Lock Nut. (This allows a small amount of clearance under the screw and a slight amount of up and down play in the Control Fork.)

(F) Place mechanism in Right side PLAY position then return it to SCAN with Pickup Arm on Right Side. Check for equivalent up and down play of Control Fork with Pickup Arm on Right side.

CAUTION: If "Pickup 2" Adjusting Screw is down too far (no up and down play in Control Fork) it may place a bind on the Levers and interfere with proper Pickup shifting action. A check for proper shifting of Pickup can be made by alternately selecting and playing several Right and Left sides of records. Each time Pickup shifts it should move smoothly all the way over to its Right or Left position.

"PICKUP 3" - - PICKUP RELEASE ADJUSTMENT

This adjustment establishes 1/32" clearance between the path of the Lock Lever Pin and the lower projection of the Lock Lever when the mechanism is in PLAY position.



(A) Place mechanism in Left Side PLAY position.

(B) Loosen Lock Nut - - and while holding Detent Lever away from the Lock Lever, - - -

(C) adjust screw so that the lower projection of the Lock Lever and the Lock Lever Pin clear by 1/32" when the Pin is moved past the Lever.

(D) Tighten Lock Nut.

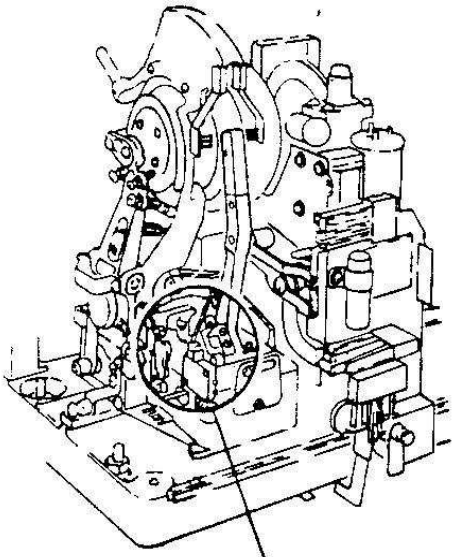
(E) Place mechanism in Right side PLAY position. While holding Detent Lever away from Lock Lever, move Pickup Arm in along record and again check for required 1/32" clearance.

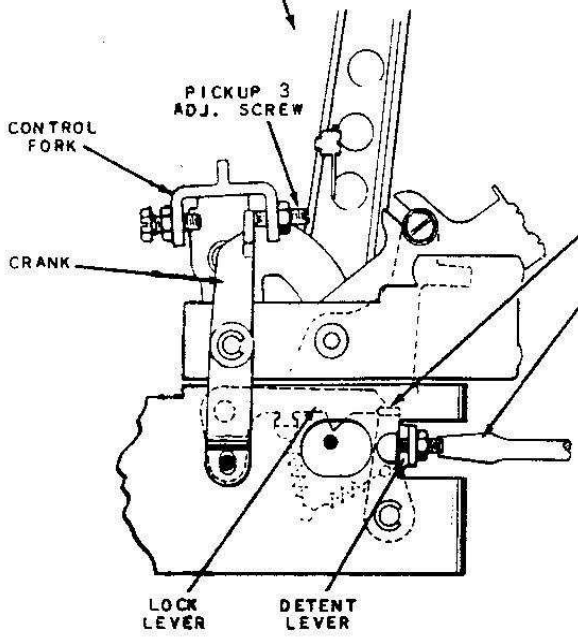
If clearance is not approximately the same in both Right and Left side PLAY positions, check Lock Lever Pin alignment. Straighten Pin, if necessary.

NOTE: - This adjustment should be followed by "Pickup 4" adjustment.

"PICKUP 4" - - DETENT LEVER ADJUSTMENT

This adjustment establishes the Detent Lever position so that it just touches the lower slope of the end of the Lock Lever when the mechanism is in PLAY position.





NOTE: - "Pickup 3" adjustment should be correct before making this adjustment.

(A) Place mechanism in Right side PLAY position.

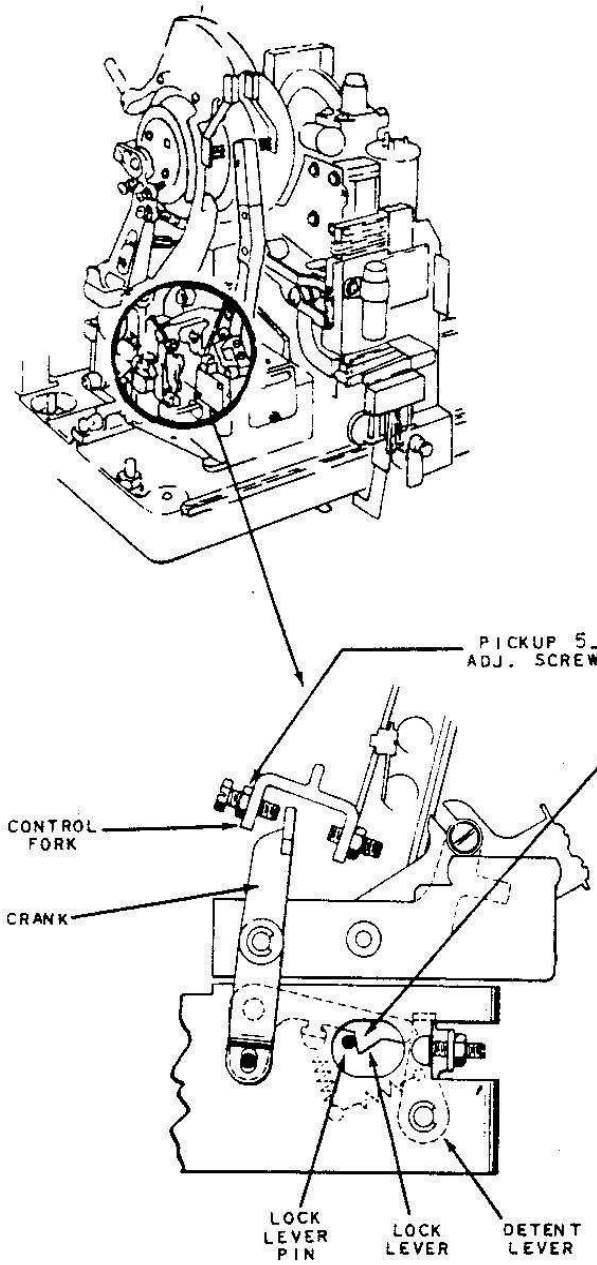
(B) Loosen Lock Nut and adjust the screw until Detent Lever just touches lower slope of Lock Lever, as shown. *The Detent Lever should meet the Lock Lever approximately half way along the lower slope. If the edge of the Detent Lever is above or below the lower slope of the Lock Lever, check "Pickup 3" adjustment.*

(C) Tighten Lock Nut.

(D) To check - - manually pull top of Control Fork away from Crank. The Detent Lever should hold the Lock Lever and the Crank from moving.

"PICKUP 5" - - PICKUP LOCKING ADJUSTMENT

This adjustment establishes 1/32" clearance between the tip of "Pickup 5" adjusting screw and the upper end of the Crank to insure correct locking of the Pickup Assembly in SCAN position.



REFERENCE SCALE — THESE LINES SPACED 1/32" ACTUAL SIZE

NOTE: - "Pickup 4" adjustment should be correct before making this adjustment.

(A) Place mechanism in SCAN position with Pickup Arm and Cradle fully reset on Left side.

(B) Lock Lever should be engaged with Lock Lever Pin. Pull Detent Lever out of way, if necessary, to allow Lock Lever to drop against pin.

(C) Loosen Lock Nut and adjust screw so that clearance between the Crank and the tip of the screw is 1/32'' to 1/16''. Note reference scale.

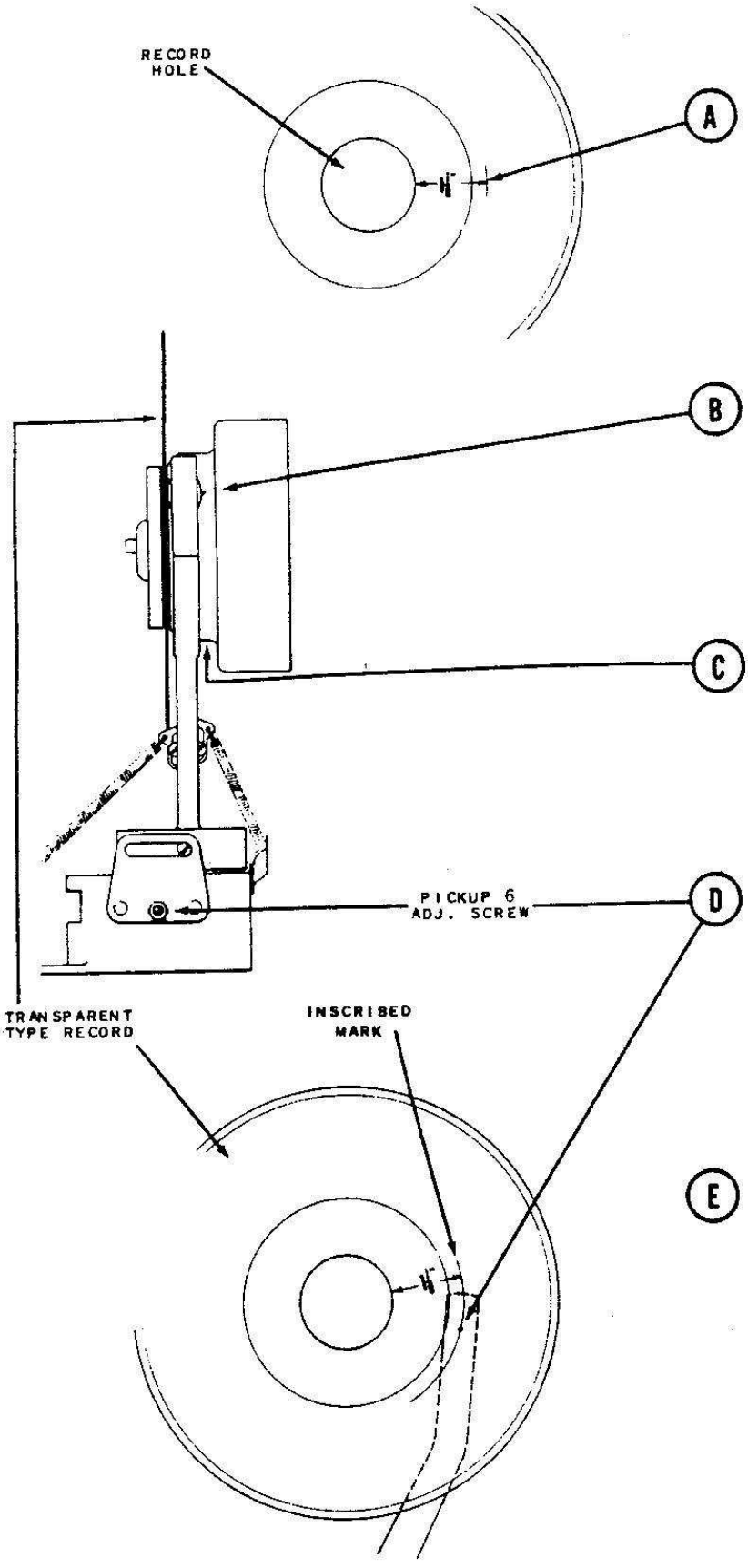
(D) Tighten Lock Nut.

(E) Check adjusting screw clearance by selecting Right side of a record. Screw tip should not touch Crank while shifting.

(F) Check resetting action - - by returning mechanism to Right side SCAN position. Lock Lever should be returned to Lock position against Pin and clearance between screw tip and Crank should be 1/32".

"PICKUP 6" - - PICKUP ARM STOP

This adjustment limits the inward travel of the Pickup Arm so the Pickup Cartridge cannot move in far enough to hit the Flywheel.



A. Inscribe a mark on a record 1-1/8" away from the edge of hole. Use a transparent type record if available.

B. Place mechanism in Right side PLAY position with inscribed record on Flywheel. Turn off power.

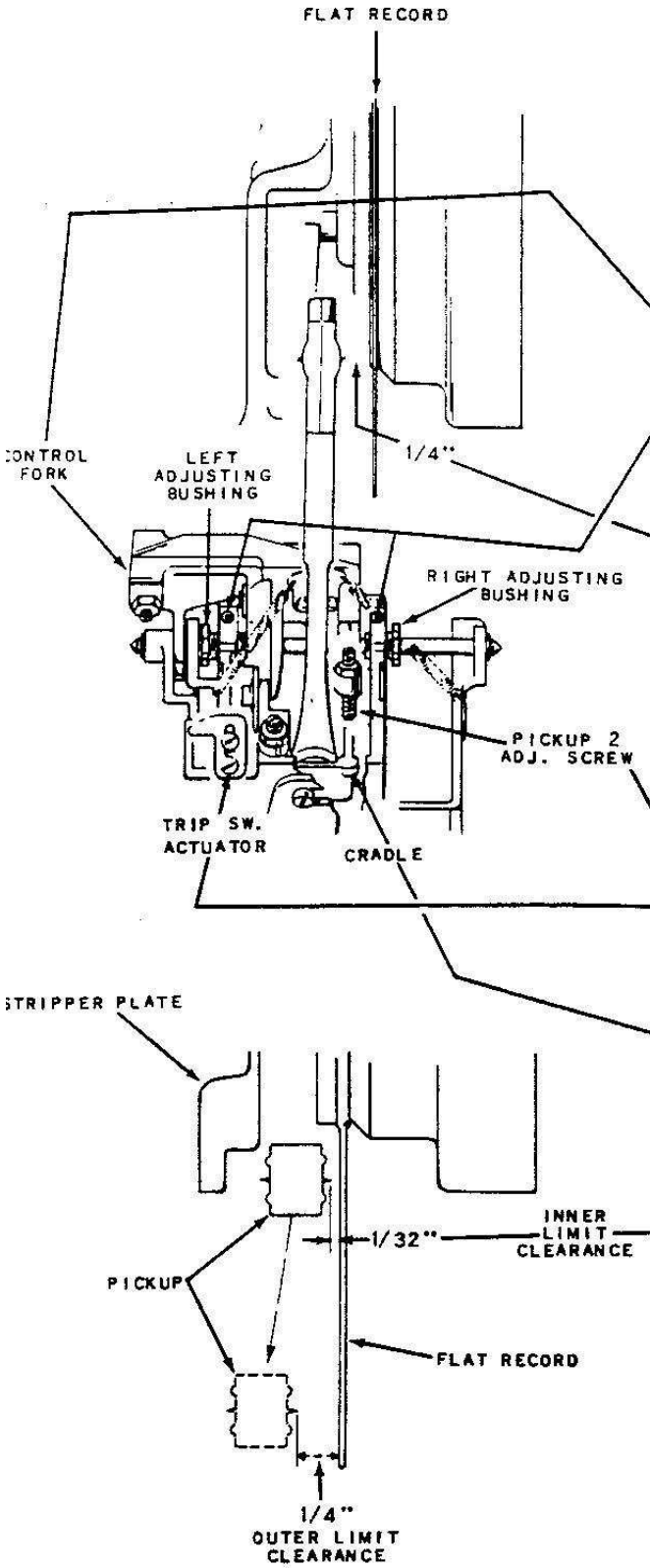
C. Move Pickup Arm in as far as possible toward Flywheel.

D. Loosen Lock Nut and adjust screw so that needle cannot move in toward Flywheel any farther than the inscribed mark, as shown.

E. Tighten Lock Nut.

"PICKUP 7" - - PICKUP LIFTING ADJUSTMENTS

This adjustment establishes correct Pickup lifting action and clearance between the needle and record when the Pickup is lifted and returned to its rest position.



NOTE: - "Pickup 6" adjustment should be correct before making this adjustment.

(A) Place mechanism in Left side PLAY position with a flat record clamped on Flywheel. Turn off power and loosen both socket head set screws holding Adjusting Bushings.

(B) Pull Control Fork forward to the limit of its travel and - - -

(C) adjust Left Adjusting Bushing for 1/4" clearance between record and needle.

(D) Release Control Fork and move Pickup toward center of Flywheel to limit of its travel.

(E) Hold Pickup in this position by pressing inward lightly on Trip Switch Actuator.

(F) Pull Control Fork down lightly until "Pickup 2" adjusting screw just touches Cradle.

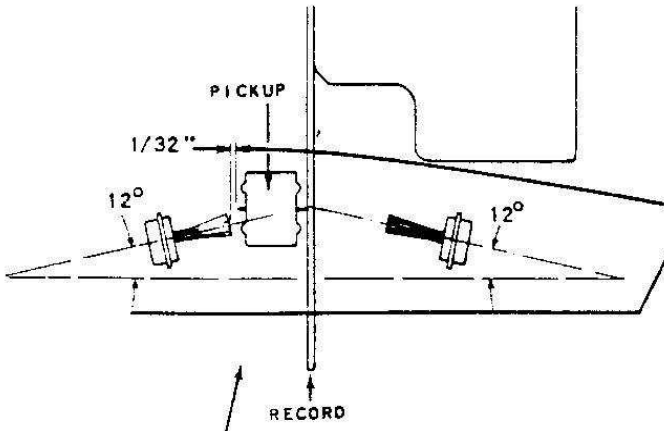
(G) In this position of the Pickup Arm and Control Fork the needle should be a minimum of 1/32" from the record.

(H) Repeat above for Right side PLAY position using Right Adjusting Bushing to make adjustment.

(J) Tighten both set screws.

"PICKUP 8" - - BRUSH POSITION ADJUSTMENTS

This adjustment establishes 1/32" clearance between the outer needle and the Brush while a record is being played.



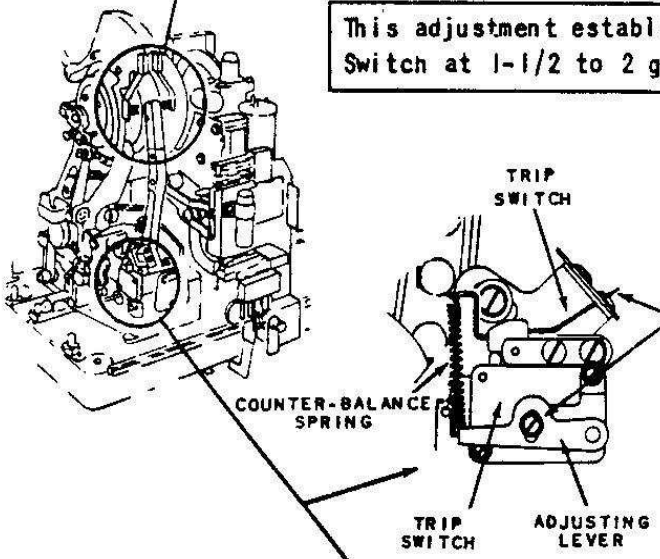
(A) The Brush Mounting Brackets are set so the bristles "point" approximately 12 degrees toward record center.

(B) The Brackets should be formed so the outer needle clears the brush by 1/32" while a record is played.

(C) Check for correct clearance on both Right and Left sides.

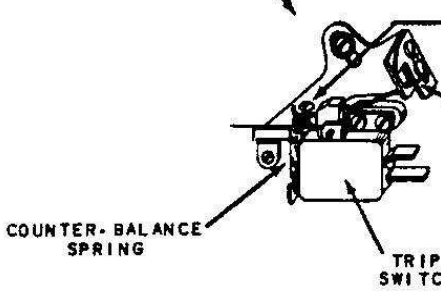
"PICKUP 9" - - TRIP SWITCH PRESSURE ADJUSTMENT

This adjustment establishes the pressure required to operate the Trip Switch at 1-1/2 to 2 grams as measured at the end of the Trip Lever.



(A) Loosen screw and adjust Counter-balance Spring by moving Adjusting Lever up or down.

Pressure required to trip the Switch should be 1-1/2 to 2 grams as measured with a gram scale at this point.

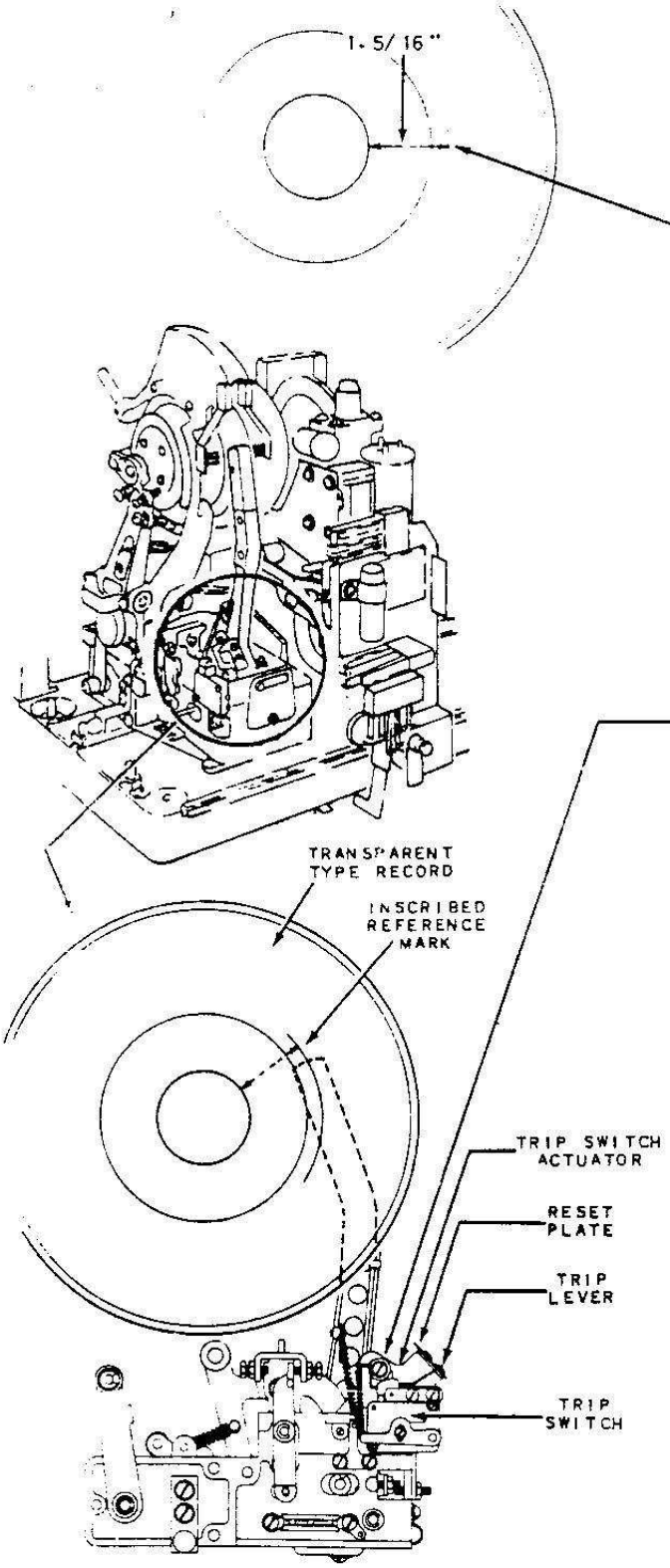


NOTE: - On 145-S2 mechanisms below Serial #2952 the Counter-balance Spring adjustment is made by means of an Adjusting Screw.

Pressure required to trip the Switch should be 1-1/2 to 2 grams as measured with a gram scale at this point.

"PICKUP 10" - - "RECORD CUT-OFF" (TRIP SWITCH ACTUATOR ADJUSTMENT)

This adjustment establishes the "Record Cut-off" position and results in tripping of the mechanism when the needle has reached a point 1-5/16" from the edge of the hole in the record.



NOTE: - "Pickup 9" adjustment should be correct before making this adjustment.

(A) Inscribe a line on a record 1-5/16" away from edge of hole as shown. (Use a transparent type record if available.)

(B) Place mechanism in Right side PLAY position with inscribed record clamped on Flywheel. Turn off power.

(C) Loosen screw and position Trip Switch Actuator so that Trip Switch will operate when needle reaches inscribed mark.

(DO NOT BEND TRIP LEVER TO MAKE ADJUSTMENT.)

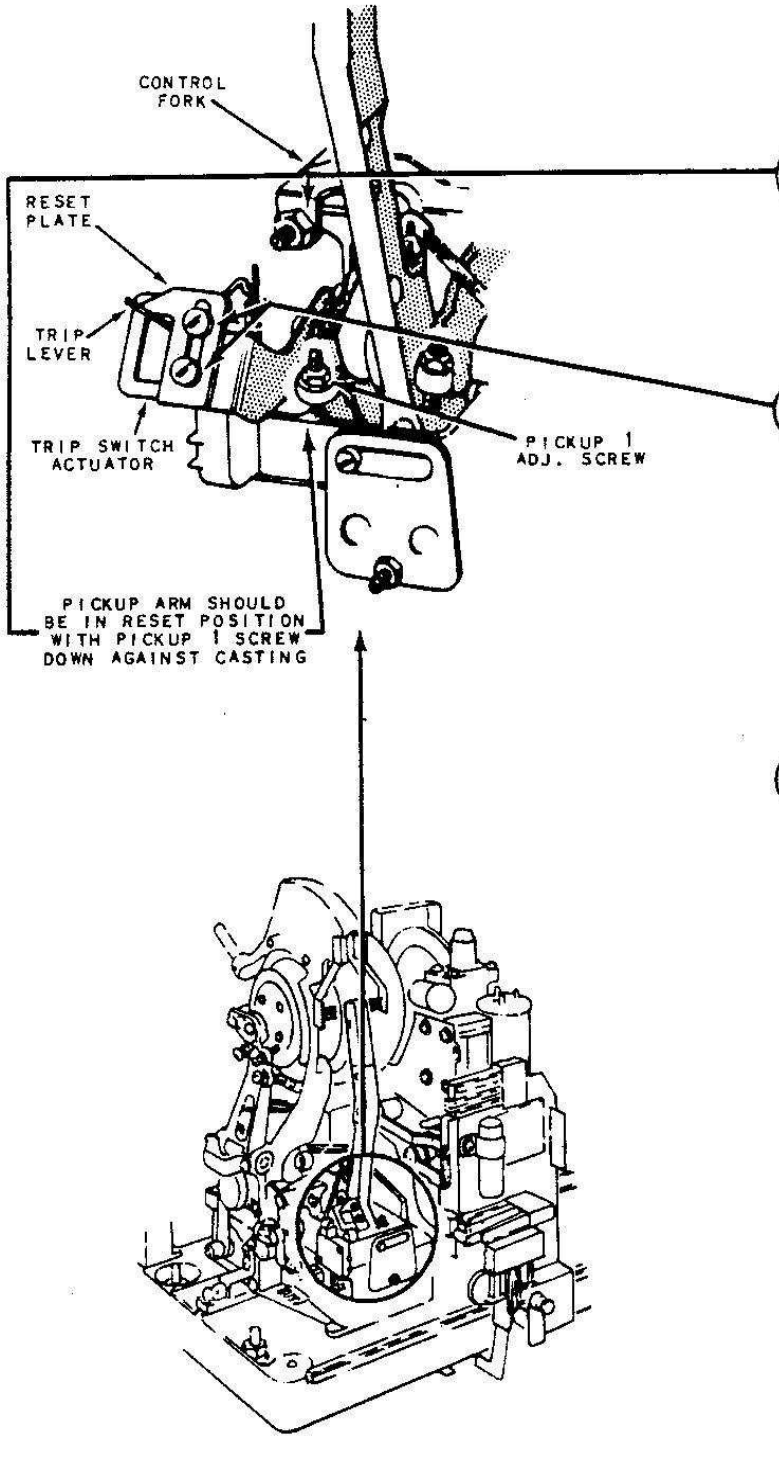
(D) Tighten screw and check for normal operation by playing several Left and Right sides of records.

NOTE: - If the position of the Trip Switch actuator is changed be sure to readjust and check "Pickup 11".

"PICKUP 11" - - TRIP SWITCH RESET ADJUSTMENT

This adjustment results in proper resetting of the Trip Switch when the Pickup Arm returns to its rest position.

NOTE: - "Pickup 9 and 10" adjustments should be correct before making this adjustment.



(A) Place mechanism in PLAY position and pull Control Fork down until Pickup Arm is in its reset position.

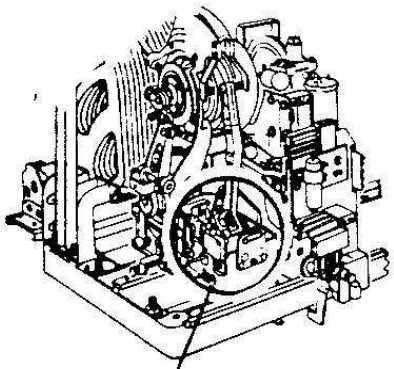
(B) In this position loosen screws and adjust Reset Plate so Trip Switch is fully reset.

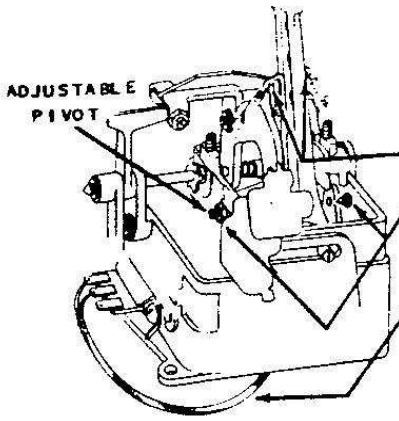
When adjusted correctly the Trip Switch should be reset but the Trip Lever should not apply any upward pressure against the reset plate.

(C) Check by releasing Control Fork. Needle should land properly on record without "Booster" action from Trip Lever.

"PICKUP 12" - - PICKUP BALANCE ADJUSTMENT

This Adjustment results in proper balancing of the Pickup Arm and Cradle Assembly and assures maximum record and needle life.





NOTE: Before making this adjustment:

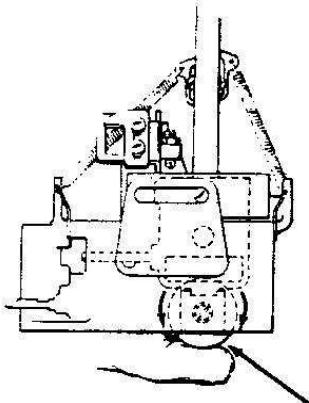
1. Check Cradle Pivots for binds. There should be no play but the Arm and Cradle should move freely on the Pivots.
2. Check Pickup lead to be sure it hangs freely below Cradle and does not touch the carriage or at any place along the base casting.

(A) Place mechanism in PLAY position with a record clamped on Flywheel and turn off power.

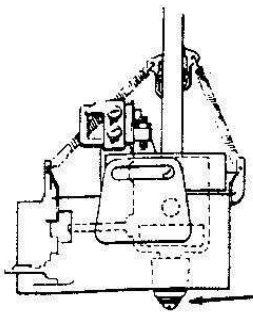
(B) Remove both Needle Pressure Springs.

(C) Adjust the position of the pickup arm counter-weight* so the arm is "in balance" at the record cut-off groove and at a point 1" in from the outer edge of the record.

Check the balance by holding the pickup 1/8" to 1/4" from the record, releasing carefully, and observing the DIRECTION in which it moves. Ignore the slow movement toward or away from the record surface. There should be no in or out movement (toward or away from the record center). In or out movement indicates that the pickup arm is not "in balance" at the point of check and requires adjustment of the counter-weight position.



(D) Replace needle pressure springs and check "Pickup 13" Adjustment.



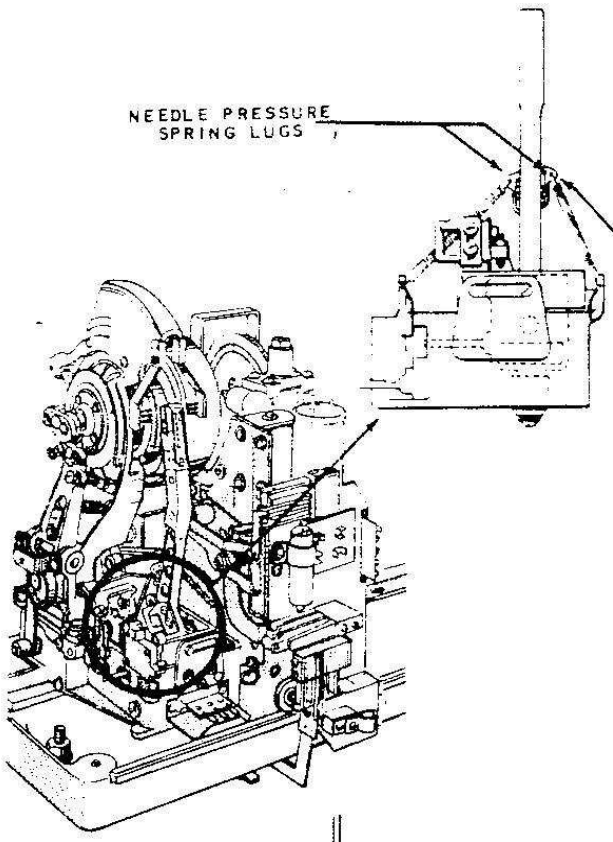
*There are two types of Counter-weights.

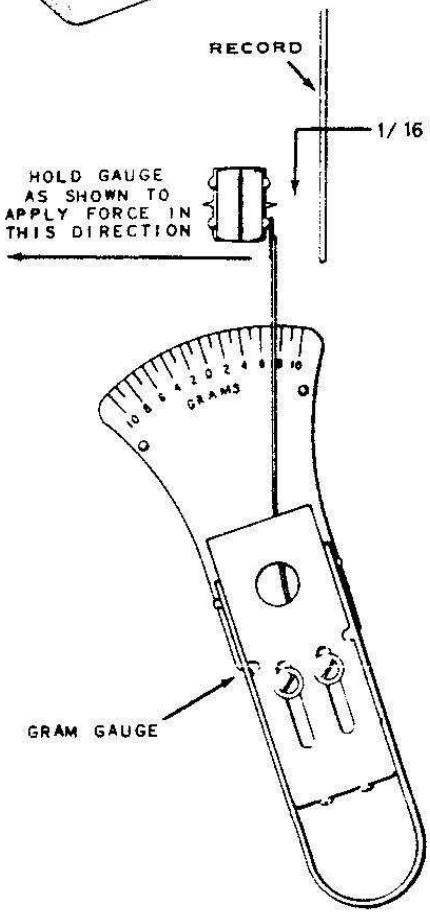
The ROLLER TYPE is adjusted by turning the Roller as shown.

The SLIDING WEIGHT TYPE is adjusted by loosening the screw and sliding the weight forward or back as required.

"PICKUP 13" - - NEEDLE PRESSURE ADJUSTMENTS

This adjustment establishes the needle pressure for both Right or Left sides. Correct pressures result in proper tracking and in a minimum of needle and record wear.





(A) Place mechanism in Left Side PLAY position with a flat record clamped on the Flywheel.

(B) Turn off power so record is not turning.

(C) Adjust position of Pressure Spring Lug on right side of Pickup Arm so that needle pressure is 7 to 8 grams with Part No. 245789 pickup or 4½ to 5½ grams with Part No. 246796 pickup. *

(D) Repeat same procedure on Right Side PLAY position by adjusting the Pressure Spring Lug on left side of the Pickup Arm for 7 to 8 or 4½ to 5½ grams needle pressure. The pressure must be equal on the right and left sides.

NOTE: - For accurate adjustment needle pressure should be measured with a gram gauge as follows:

(1) Place the tip of the gauge spring against the Pickup case at the "Bump" next to the needle tip and lift the Pickup so the needle is about 1/4" from the record.

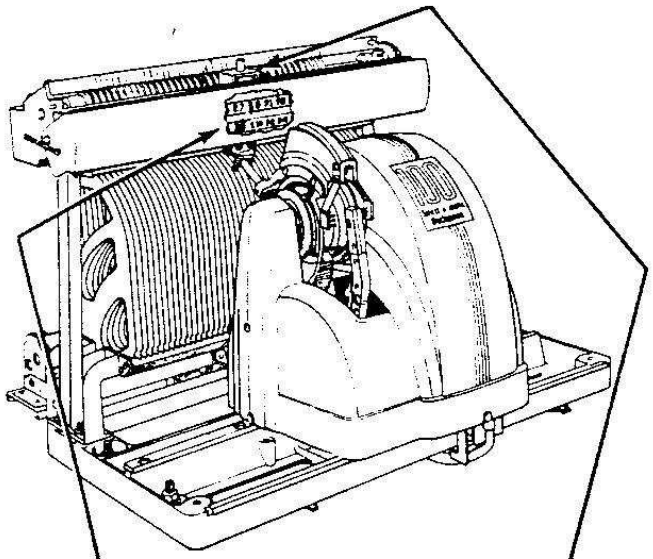
(2) Slowly relax the force of the gauge against the Pickup so the needle moves toward the record.

(3) Stop the inward movement when the needle is about 1/16" from the record and read indicated pressure on gauge.

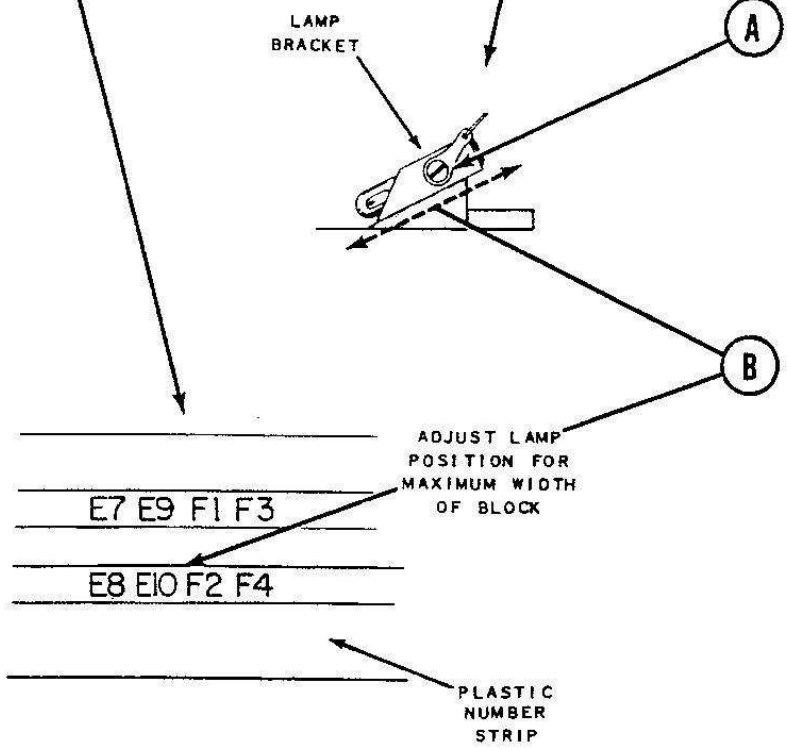
* Part number of pickup is stamped on the side of the cartridge.

"SELECTION PLAYING INDICATOR I" LAMP REPLACEMENT AND ALIGNMENT

This adjustment aligns the Selection Playing Indicator Lamps with the openings in the Slide for maximum width of the Block of light cast on the Plastic Number Strip.



The Selection Playing Indicator illuminates the number of the selection being played. It contains two #47 lamps which are operated alternately through a sliding bar type switch. The lamps shine through windowlike openings in a Slide, projecting a block of light on a Numbered Plastic Strip.

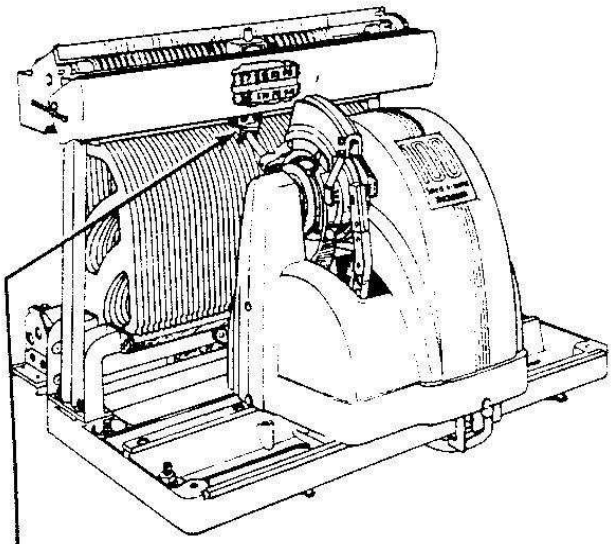


A To replace defective lamps, remove screw and lift out Lamp Bracket. This makes lamps accessible for replacement.

B To adjust lamp position, loosen screw and move Lamp Bracket, as shown, until block of light on Number Strip has maximum width.

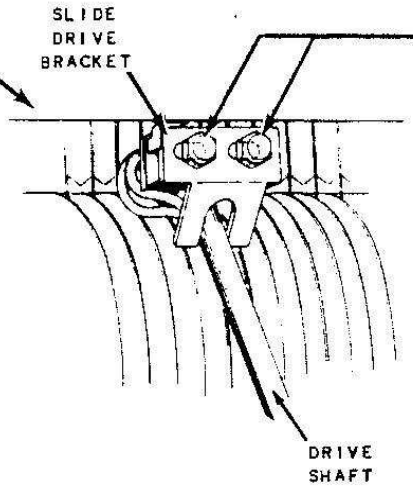
"SELECTION PLAYING INDICATOR 2" - - SLIDE POSITION

This adjustment aligns the Selection Playing Indicator Slide with the numbers on the Plastic Number Strip.



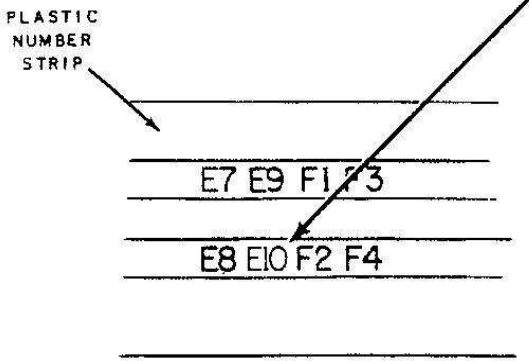
NOTE: "Selection Playing Indicator 1" should be correct before making this adjustment.

(A) Place mechanism in E10 PLAY position.



(B) Loosen Cap Nuts.

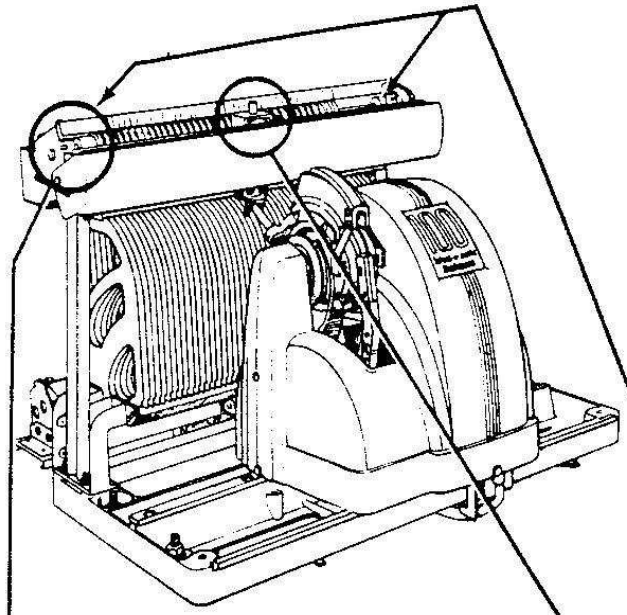
(C) Position Slide Drive Bracket so that block of light from Indicator Lamp is centered with E10 on the Number Strip. Tighten Cap Nuts.

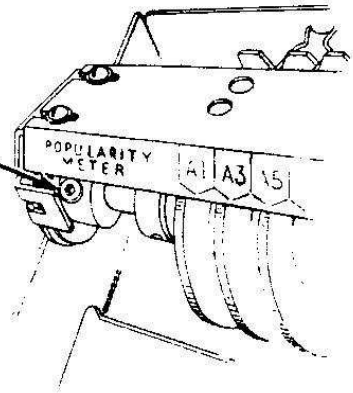


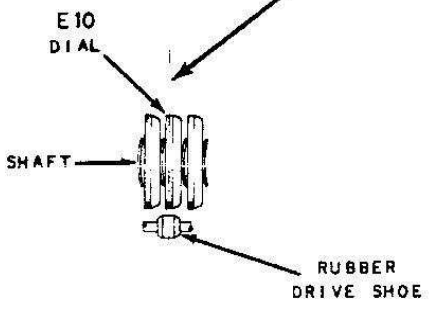
Note that moving the Slide position for this adjustment also changes the position of the rubber Drive Shoe which operates the Popularity Meter Dials. If above adjustment is changed, check "Popularity Meter 1" adjustment.

"POPULARITY METER 1" - - DIAL ASSEMBLY POSITION

This adjustment centers the knurled edges of the Popularity Meter Dials with the Rubber Drive Shoe of the Dial Drive Assembly.







NOTE: "Selection Playing Indicator 2" should be correct before making this adjustment.

The Popularity Meter Dials are driven by a Rubber Drive Shoe which is operated by the Popularity Meter Solenoid. For normal operation of the Popularity Meter, the Rubber Drive Shoe should be approximately centered with the knurled edge of each Dial when the mechanism is locked in its PLAY position. To adjust for correct alignment of the Dials with the Drive Shoe proceed as follows.

(A) Place mechanism in E10 PLAY position.

(B) Loosen set screws on the collars at both ends of the Dial Shaft.

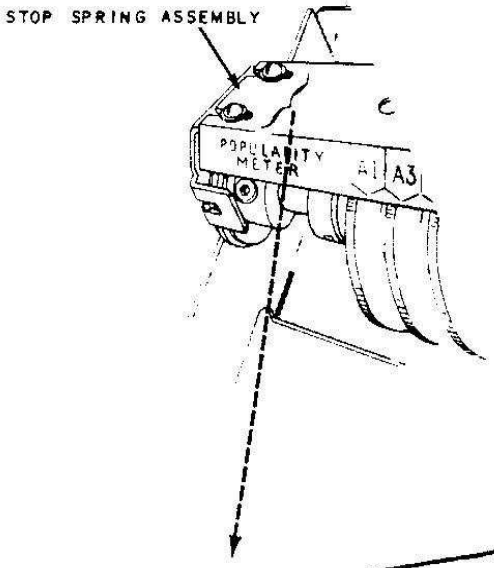
(C) Move Shaft and Dial Assembly to left or right until knurled driving surface of Dial E10 is centered with the Rubber Drive Shoe.

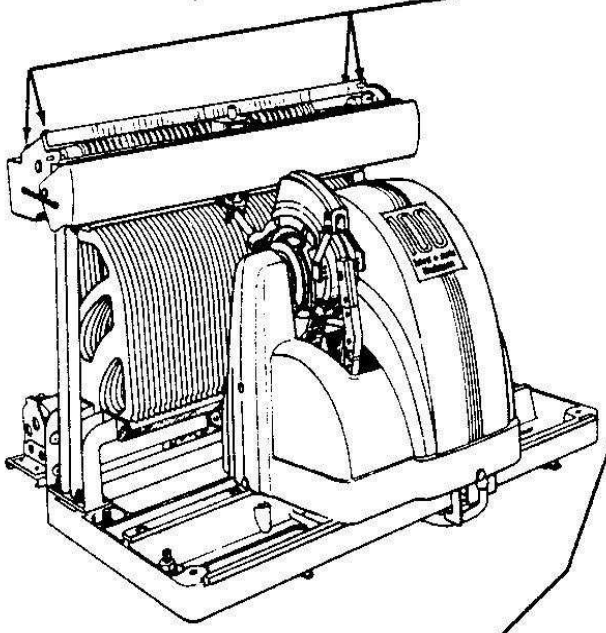
(D) Lock collars in place with set screws allowing about 1/64" end play in shaft to prevent binding.

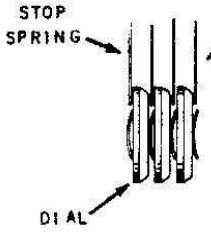
NOTE: If the Dial Assembly position is changed be sure to check "Popularity Meter 2" adjustment.

"POPULARITY METER 2" - - STOP SPRING ASSEMBLY POSITION

The Stop Springs stop the Dials when they reach maximum position and when they are returned to zero position. This adjustment centers the Stop Springs so they do not rub excessively against the Dials or hinder normal operation.







(A) Loosen screws at both ends of Stop Spring Assembly.

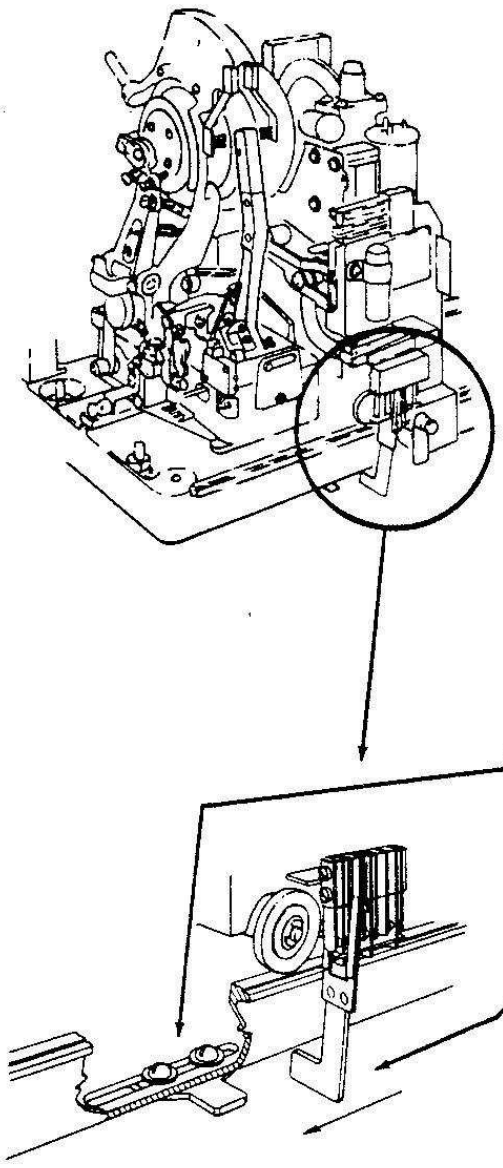
(B) Move Stop Spring Assembly to left or right until all springs are approximately centered between Dials.

(C) Tighten Screws.

NOTE: Dials should not drag against any of the Stop Springs. Check for binds by turning all Dials up to their maximum position by hand then rotating Dial Shaft. All dials should return freely to their zero position without binds.

"REVERSING SWITCH 1" - - SWITCH BRACKETS

This adjustment positions the Reversing Switch Brackets so the Switch operates when the carriage is 1/2" past the end record positions.



(A) Loosen screws holding left Reversing Switch Bracket and move Bracket all the way to the left.

(B) Select A2 and turn off power when selection is playing.

(C) Make a reference mark on the base casting to indicate the A1-A2 record position of the carriage.

(D) Return mechanism to SCAN and turn the motor shaft manually until the mechanism has moved 1/2" to the LEFT of the reference mark made on the base

Reversing Switch Lever should still be to the left.

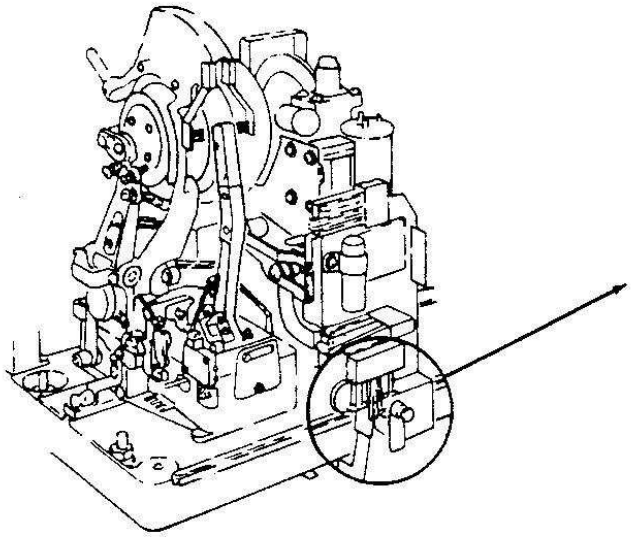
(E) Move the Bracket slowly and carefully to the right until it is at the point where the reversing switch operates.

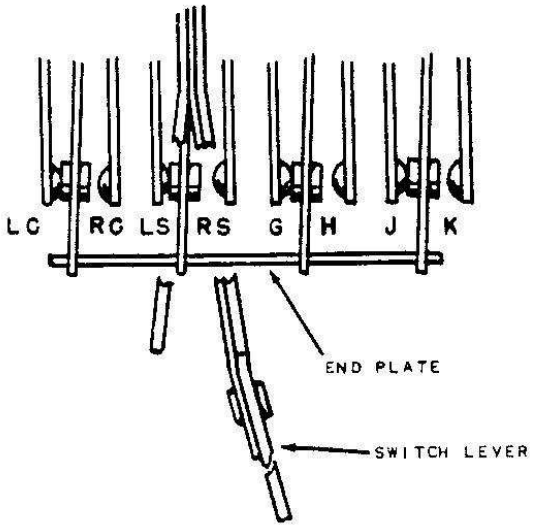
(F) Scan the carriage out of the way to the right, being careful not to move the Bracket, and tighten the bracket holding screws.

(G) Adjust the RIGHT Reversing Switch Bracket so the Switch operates when the carriage is 1/2" to the RIGHT of the K9-K10 record position.

See "Reversing Switch 2" for contact gap adjustment.

"REVERSING SWITCH 2" - - CONTACT GAP AND PRESSURE ADJUSTMENTS





CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS*
L C	1/64" clearance when Switch Lever is to Left.	Connects Left Pin Cancel Solenoid to Cancel Circuit.
R C	1/64" clearance when Switch Lever is to Right.	Connects Right Pin Cancel Solenoid to Cancel Circuit.
L S	1/64" clearance when Switch Lever is to Left.	Connects Trip Solenoid to "L" Trip Contact for Left Side Selections.
R S	1/64" clearance when Switch Lever is to Right.	Connects Trip Solenoid to "R" Trip Contact for Right Side Selections.
G & J	.020" gaps at instant H and K Just open	These contacts closed so motor turns for SCANNING to RIGHT and for PLAYING LEFT SIDES.
H & K	.020" gaps at instant G and J Just open	These contacts closed so motor turns for SCANNING to LEFT and for PLAYING RIGHT SIDES.

*See Schematic Diagrams for Circuit.

ADJUSTMENT PROCEDURE

Caution: - Turn Off Power!! 117 volts on G-H and J-K contacts

A Move Switch Lever to Left

B Adjust LC and LS for 1/64" gaps.

C Push bakelite End Plate slowly to Left. At instant H and K just break, G and J must have .020" gaps.

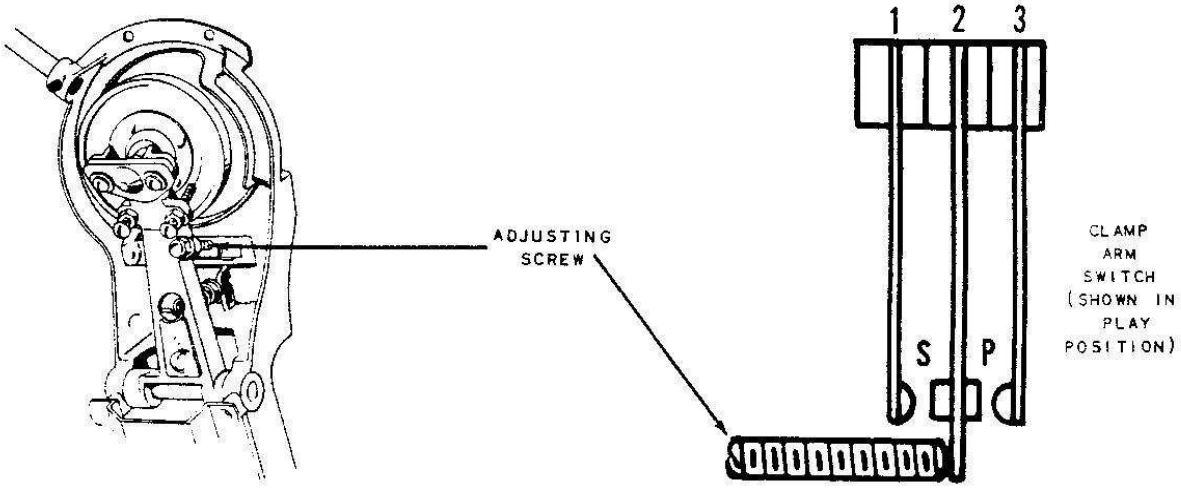
D Move Switch Lever to Right.

E Adjust RC and RS for 1/64" gaps.

F Push bakelite End Plate slowly to Right. At instant G and J just break, H and K must have .020" gaps.

All contacts must have 35 grams (1-1/4 oz.) minimum pressure when closed.

"CLAMP ARM SWITCH" - - CONTACT GAP AND BLADE PRESSURE ADJUSTMENT



CONTACTS	CONTACT GAP	CONTACT FUNCTIONS*
P	1/32" gap in PLAY position with normal record clamped on turntable. Closed in PLAY position if there is no record clamped to turntable.	"No-record" reject. Closes circuit to trip solenoid if there is no record on the turntable when mechanism is in play-position.
S	1/32" gap in PLAY position with normal record clamped on turntable. Closed in SCAN position and stays closed in PLAY if record fails to clamp properly.	Closes circuit to trip solenoid if record fails to clamp properly due to undersize hole, off-center position of record, etc.

*See Schematic Diagrams for Circuit.

ADJUSTMENT PROCEDURE

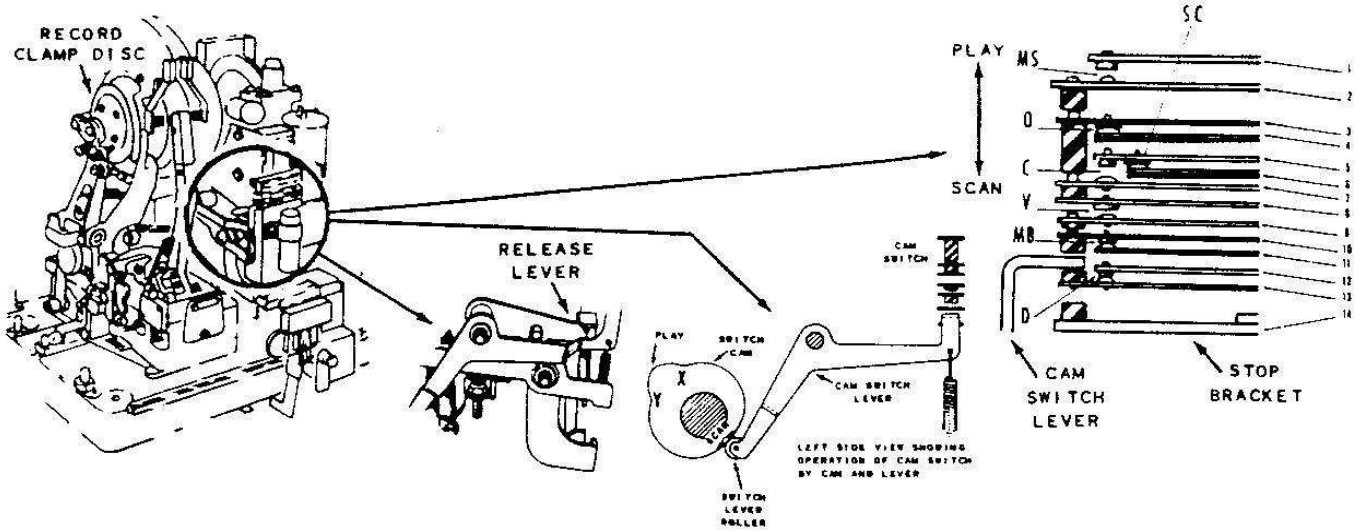
A With mechanism in SCAN, bias center blade (#2) tightly against "S" contact.

B With mechanism in PLAY and a normal record clamped on turntable - -

1. Turn adjusting screw until "P" contact just closes lightly, then back it out one turn. Tighten Lock Nut.
2. Adjust blade #1 for 1/32" gap in "S" contacts.

Contacts should have 1 oz. minimum pressure when closed.

CAM SWITCH – CONTACT GAP AND PRESSURE ADJUSTMENTS



CONTACTS	CONTACT GAP	CONTACT FUNCTIONS *
MS	1/16" gap in SCAN position. Starts to close when pickup approaches record. Closed in PLAY position.	Squelch circuit for use with Automatic Volume Compensator. *See Note.*
O	3/64" gap in PLAY position. Closed in TRANSFER and SCAN.	Adds 1.4 mfd condenser to motor circuit during TRANSFER and SCAN.
SC	1/64" gap in PLAY position. Closed in SCAN position.	Pin Cancel Solenoid Circuits. Just before the mechanism enters PLAY position the C and SC contacts "Make and Break" controlling the Cancel Pulse which operates either the Left or Right Pin Cancel Solenoid.
C	1/32" gap in SCAN and during most of TRANSFER. Starts to close when record Clamp Disc first engages the turntable.	
V	1/32" gap in SCAN and during most of TRANSFER. Starts to close when record Clamp Disc first engages the turntable.	Trip Solenoid Circuit. Completes all circuits which can operate Trip Solenoid in PLAY position.
MB	1/64" gap in PLAY position. Closed in SCAN position.	Mute Circuit. Maintains muting action during SCAN.
D	1/64" to 1/16" gap in SCAN	Motor Carry-over Switch. Keeps motor running (after last Selection Lever has been cancelled) until last selection is played and record is partially returned to the Magazine.

* See Schematic Diagrams for complete circuit.

ADJUSTMENT PROCEDURE

1 Place mechanism in Scan Position and TURN OFF POWER.

2 Trip mechanism by lifting Release Lever and manually turn motor shaft until record Clamp Disc first engages the Turntable. (This places cam so Switch Lever Roller is at position X.)

- **A** Bias blades 9 and 10 down tight against Switch Lever with MB closed. (1½ oz. pressure).
- **B** Bias blade 7 against blade 8 and adjust for 1/32" gap in V Contacts.
- **C** Bias blade 3 down so fiber lift touches blade 7 with O Contacts closed. (1½ oz. pressure). V Contacts should still have 1/32" gap.

D With SC Contacts closed (1½ oz. pressure) adjust for 1/32" gap in C Contacts.

3 Turn motor shaft until mechanism is fully in PLAY position. (This places cam so Switch Lever Roller is on Play position "Peak").

A Adjust blade 4 for 3/64" gap in O Contacts.

B Adjust blade 6 for 1/64" gap in SC Contacts.

C Adjust blade 11 for 1/64" gap in MB Contacts.

4 Trip mechanism by lifting Release Lever and manually turn motor shaft until Clamp Disc begins movement away from Turntable. (This places cam so Switch Lever Roller is at position Y).

A Check for 1/32" gap in C Contacts with SC closed. (1½ oz. pressure).

B Check to see that blades 9 and 10 bear against Switch Lever.

C Check for 1/32" gap in V Contacts.

D Bias blade 13 against Switch Lever with D Contacts closed (1½ to 3 oz. pressure). Fiber stop on the Stop Bracket (14) must clear blade 13 by 3/64".

E Adjust blade 12 by "cut-and try" until mechanism will not coast into Scan Position. (Mechanism can stop any time after record is unclamped and partially returned to the Magazine but it should not coast into SCAN.)

F With mechanism in Scan Position, Adjust position of Stop Bracket (blade 14) for 1/64" to 1/16" gap between D Contacts.

G Adjust blade 1 so fibre lift is touching lightly on blade 3.

5 Trip and operate mechanism until it is in SCAN position. *See Note.*

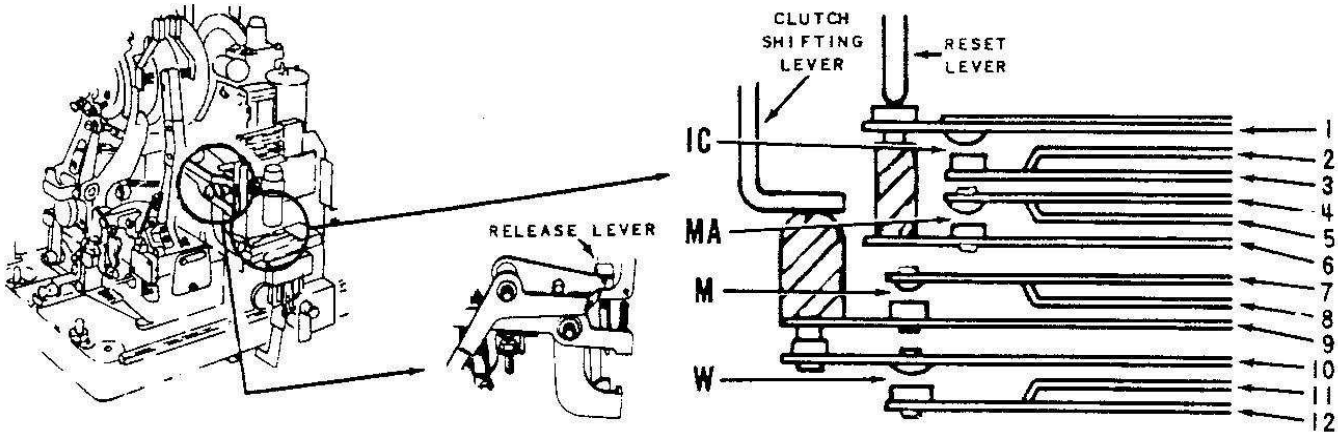
A Adjust blade 2 so fibre lift bears lightly against blade 3.

B Adjust blade 1 for 1/16" gap between MS contacts.

NOTE: Step 5 is for adjustment of the MS contacts. These contacts are not included in the cam switch of mechanisms associated with amplifiers not having automatic volume compensation feature.

Select-O-Matic "100" Mechanism

CLUTCH & RESET LEVER SWITCHES
CONTACT GAP & PRESSURE ADJUSTMENT



NOTE: "Clutch 1" to "4" Mechanical Adjustments must be correct before adjusting these switches.

CONTACTS	CONTACT GAPS	CONTACT FUNCTIONS*
IC	1/16" gap when mechanism trips. Closed in SCAN and PLAY positions.	Part of Pin Cancel Solenoid Circuits. Allows cancellation of Selection Lever when mechanism is transferring into PLAY position but prevents "Extra" cancellation when mechanism is transferring out of PLAY position.
MA	1/64" gap in PLAY position. Closed in Tripped position.	Part of Mute Circuit. Mutes Amplifier at end of record at instant Trip Solenoid is operated.
M	1/64" gap in PLAY position. Closed during Transfer cycles.	Part of Mute Circuit. Maintains Muting action during entire Transfer cycle.
W	1/32" gap in PLAY position. Closed in SCAN position.	Part of Trip Solenoid circuit for both Left and Right side selections.

*See Schematic Diagrams for Circuit.

ADJUSTMENT PROCEDURE

1 Place mechanism in Scan Position and TURN OFF POWER.

2 Trip by manually lifting Release Lever. While mechanism is in this position:

- A Bias blade 1 to within 1/16" of Reset Lever.
- B Bias blade 6 so its fibre lift is against blade 1.
- C Bias blade 9 so its fibre lift is against Clutch Shifting Lever.
- D Bias blade 10 so its fibre lift is against blade 9.
- E Bias blade 3 against bracer blade 2 and adjust blade 2 for 1/16" gap between IC Contacts.

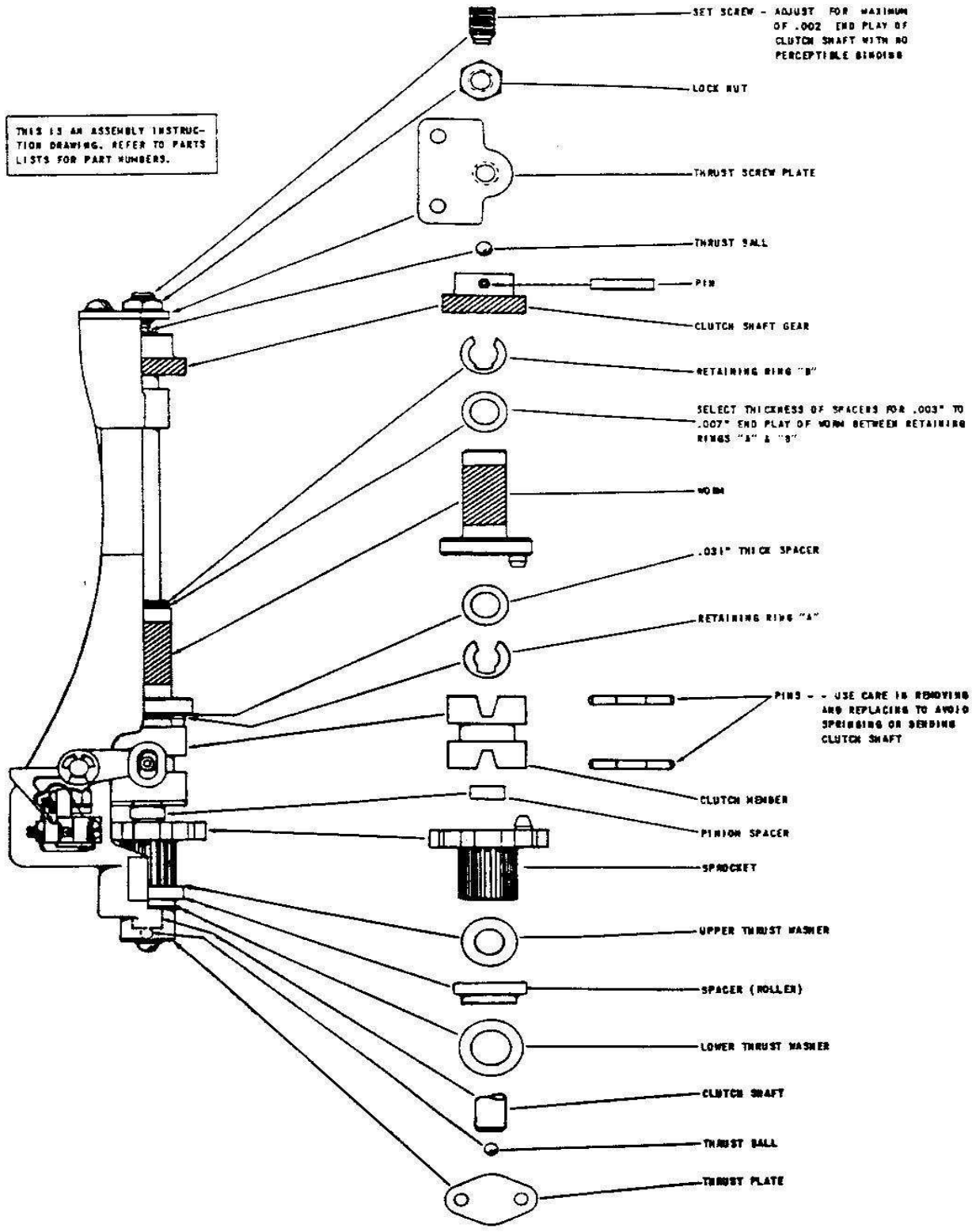
3 Reset mechanism by pressing down on Release Lever.

- A Bias blade 4 against bracer blade 5 and adjust blade 5 for 1/64" gap between MA Contacts.

4 Trip mechanism by lifting Release Lever and turn motor shaft manually until mechanism is in Play Position.

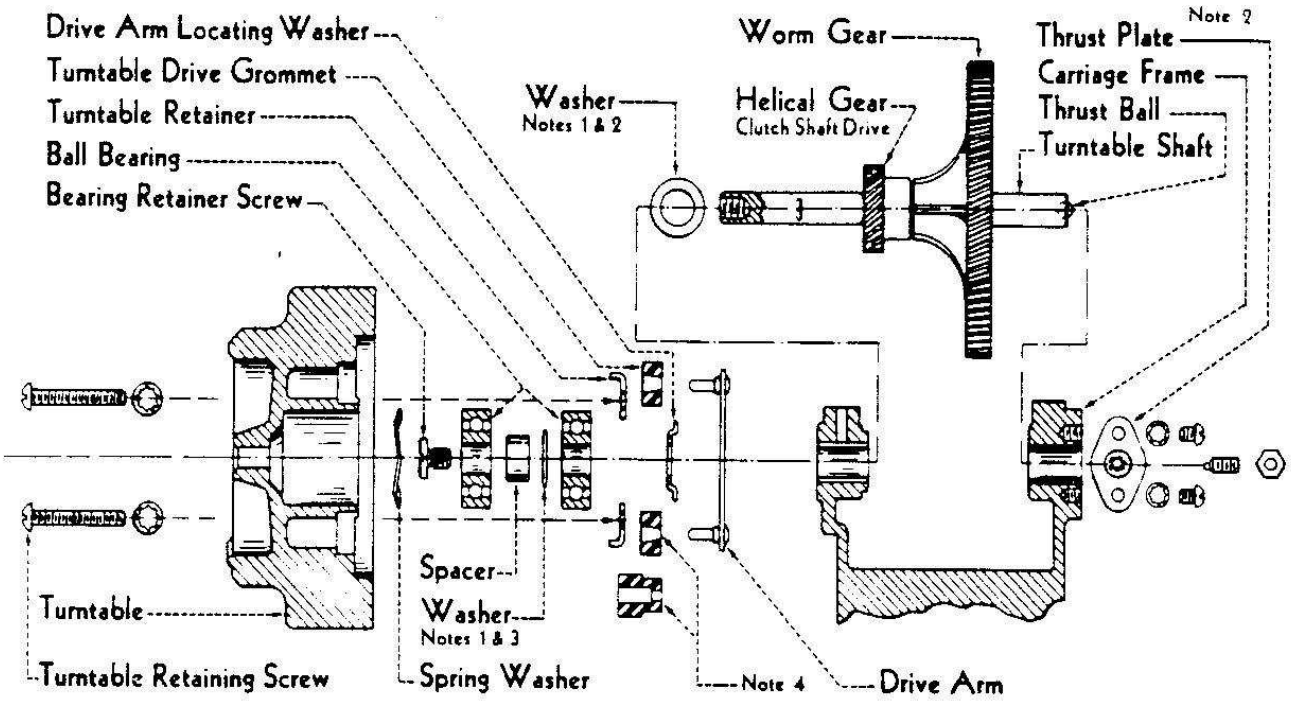
- A Bias blade 7 against bracer blade 8 and adjust blade 8 for 1/64" gap between M Contacts
- B Bias blade 12 against bracer blade 11 and adjust blade 11 for 1/32" gap between W Contacts.

CLUTCH & HOUSING ASSEMBLY, PART #245400, INSTRUCTION



BE SURE CLUTCH WORM AND CAM SHAFT DRIVE GEAR ARE CORRECTLY MESHED BEFORE TIGHTENING CLUTCH ASSEMBLY MOUNTING SCREWS.

TURNTABLE, SHAFT, and GEAR INSTALLATION



Note 1: ..... Washer Part No. 72277 - .005" thick
" " " 72278 - .010" "
" " " 72279 - .015" "

Note 2: ..... Select Washers and install between Clutch Shaft Drive Gear and left Turntable Shaft Bearing so end play of Turntable Shaft is .003" to .007". When thrust plate has screw for adjusting end play of shaft, use one No. 72279 washer and adjust for .003" to .007" end play with screw.

Note 3: ..... Select Washers and install between Spacer and Ball Bearing so end play of Turntable on the Shaft is a maximum of .015". To check this, hold Turntable Shaft firmly against the Thrust Plate, by pressing against the Worm Gear, and move the Turntable to the right in a direction parallel to the Turntable Shaft. The Spring Washer must always take out the end play by returning the Turntable to the left when released.

Note 4: ..... Turntable Drive Grommet with tapered center hole is to be installed with small end of tapered hole toward the Drive Arm. When assembled correctly, the part number, which is molded on the end with the large end of the center hole, will not be visible.

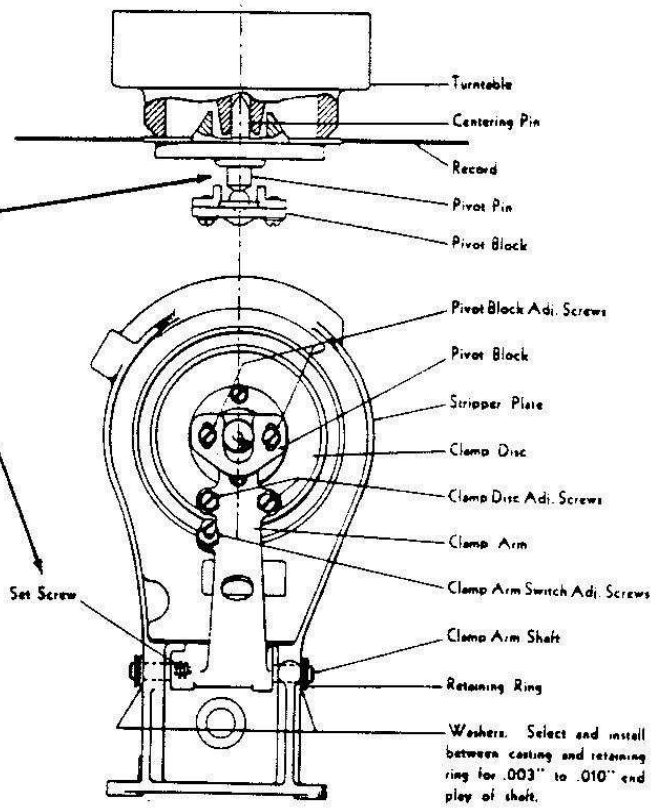
Drive Grommets with "step" should be installed with the small diameter end toward the Drive Arm.

Lubrication: The Gears should have a light coating of Stanodrip #29 (Standard Oil Co) oil. Do not use more oil than will adhere to the Gears. The felt wick in the Thrust Screw for the Turntable Worm (which meshes with the Worm Gear) must be placed in the hole in the screw so it is in contact with the Thrust Ball. The wick should be saturated with Stanodrip #29 oil.

INSTALLATION of CLAMP & TRANSFER ARMS

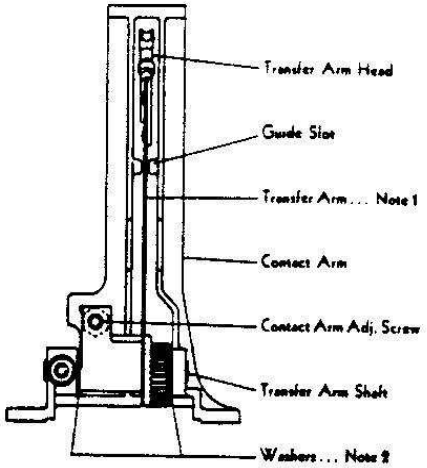
With the Set Screw loose and a Record clamped on the Turntable, adjust the horizontal position of the Clamp Arm so the Center Line through the Pivot Pin forms a right angle with the Clamp Disc and Record.

When installation is complete, readjust Clamp Arm. *Refer to Page 2146.*

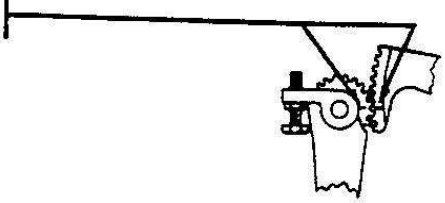


Note 1: Transfer Arm should be straight and should form a right angle with the Transfer Arm Shaft.

Note 2: Washers, Part No. 72174 (.015"), 72280 (.010"), 72281 (.020"), 72282 (.031") should be selected and placed at both ends of the Transfer Arm hub so the Arm falls in the center of the Guide Slot in the Contact Arm and so the end play of the Arm is .003" to .007". There must be at least one washer at each end of the hub.

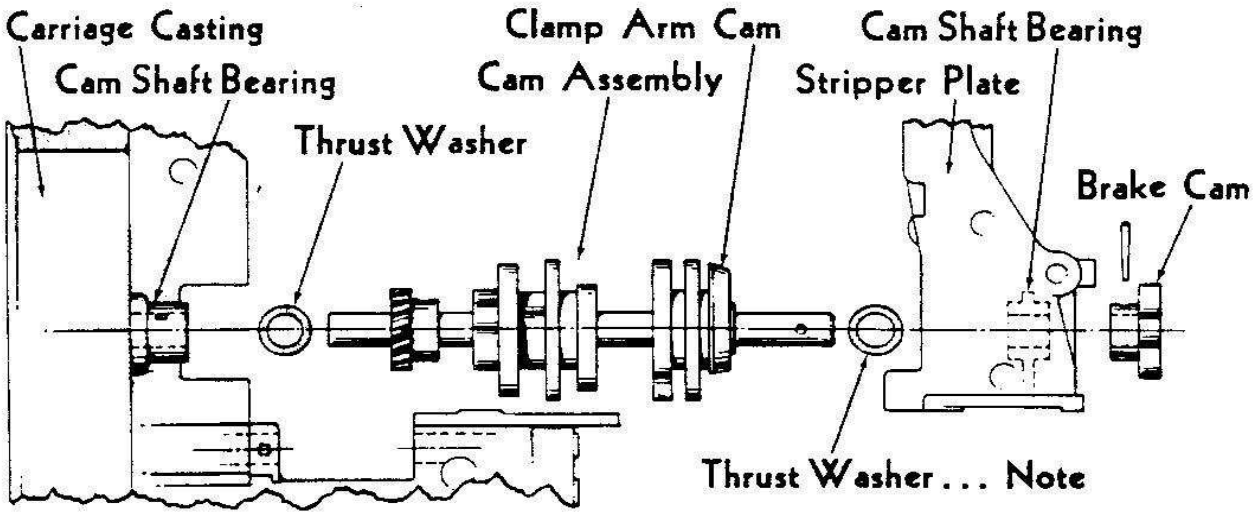


Note 3: When installing assembly on carriage, mechanism and Transfer Arm should be in SCAN position with reference marks aligned as shown.



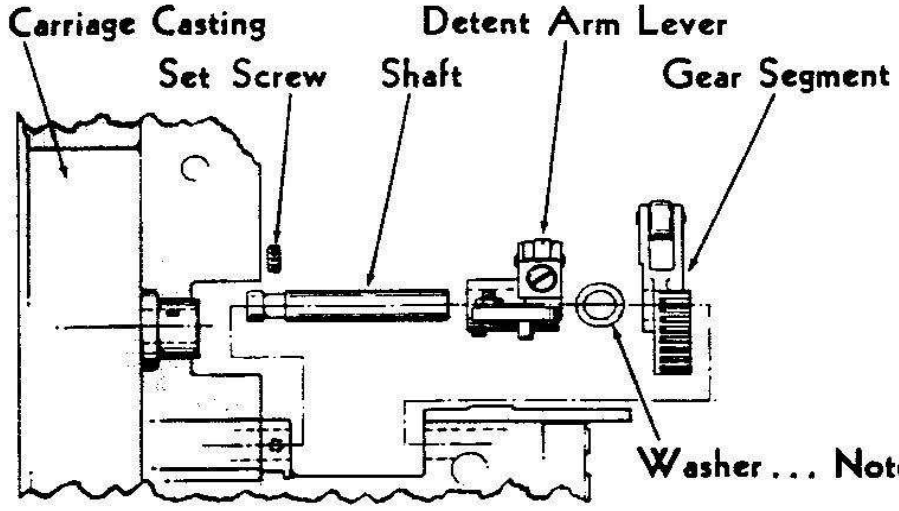
When installation is complete, readjust Transfer Arm. *Refer to Pages 2149 and 2150.*

INSTALLATION of CAM ASSEMBLY, DETENT ARM & GEAR SEGMENT



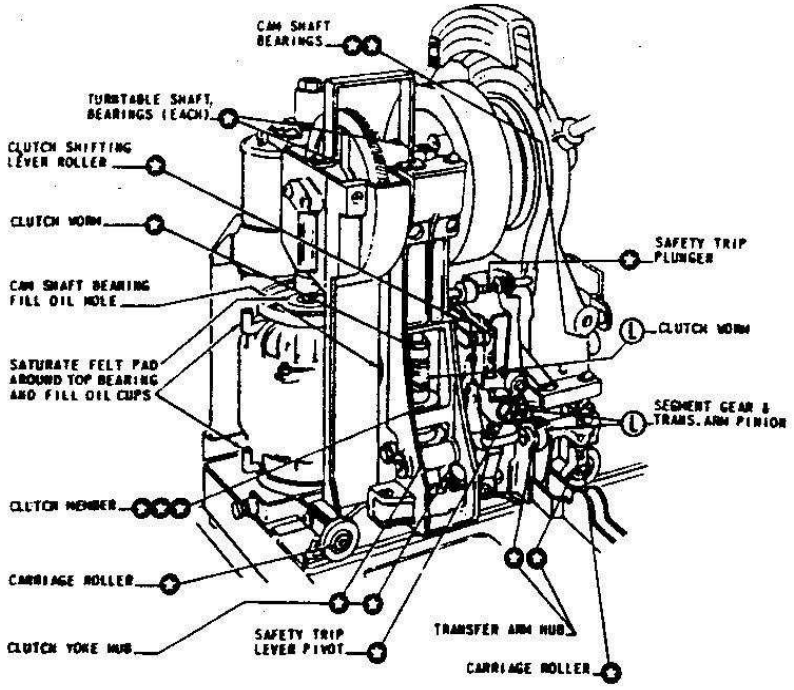
Note: Washers, Part No. 72245 (.020"), 72227 (.005"), 72228 (.010"), 72229 (.015") should be selected and installed between the Clamp Arm Cam and the Thrust Washer so the end play of the Cam Assembly is .003" to .010".

After the proper washers have been installed, the cam assembly should be checked by manual rotation, a full turn in either direction without evidence of binds.



Note: Washers, Part No. 72216 (.015"), 72217 (.010"), 72254 (.005") should be selected and installed between the Detent Arm Lever and the Gear Segment so the end play is .003" to .010".

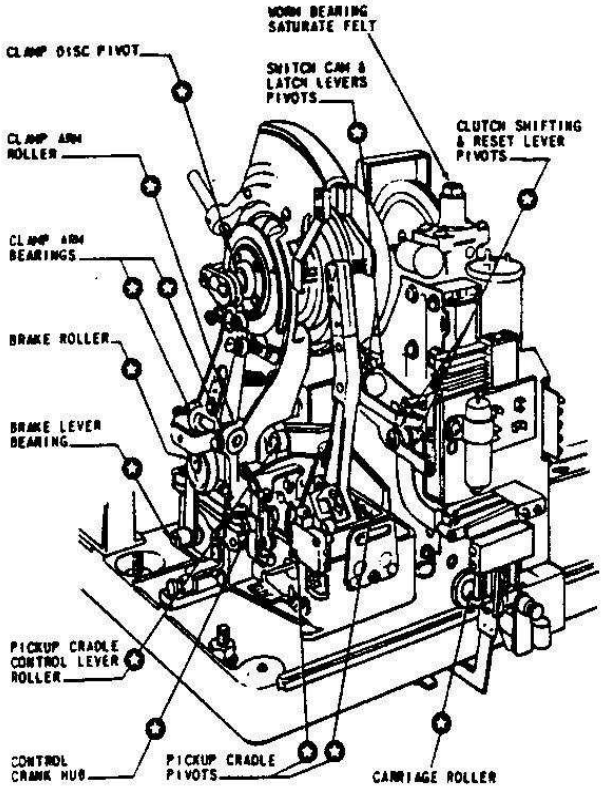
LUBRICATION

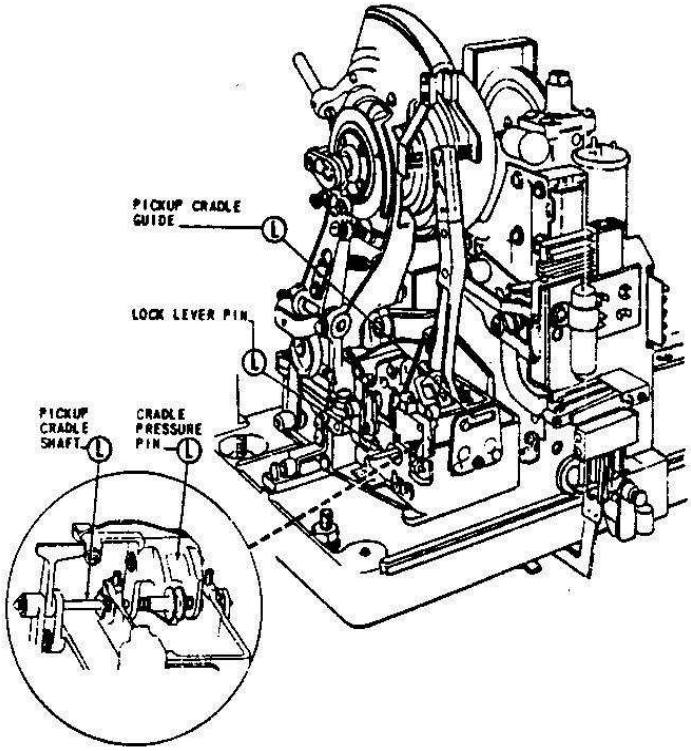


OIL ALL ROLLER PIVOT BEARINGS
1 or 2 DROPS. USE SAE 20 OIL.

USE SAE 20 OIL EVERY SIX MONTHS IN THE AMOUNT SHOWN . . . . .
1 DROP FOR EACH ✪

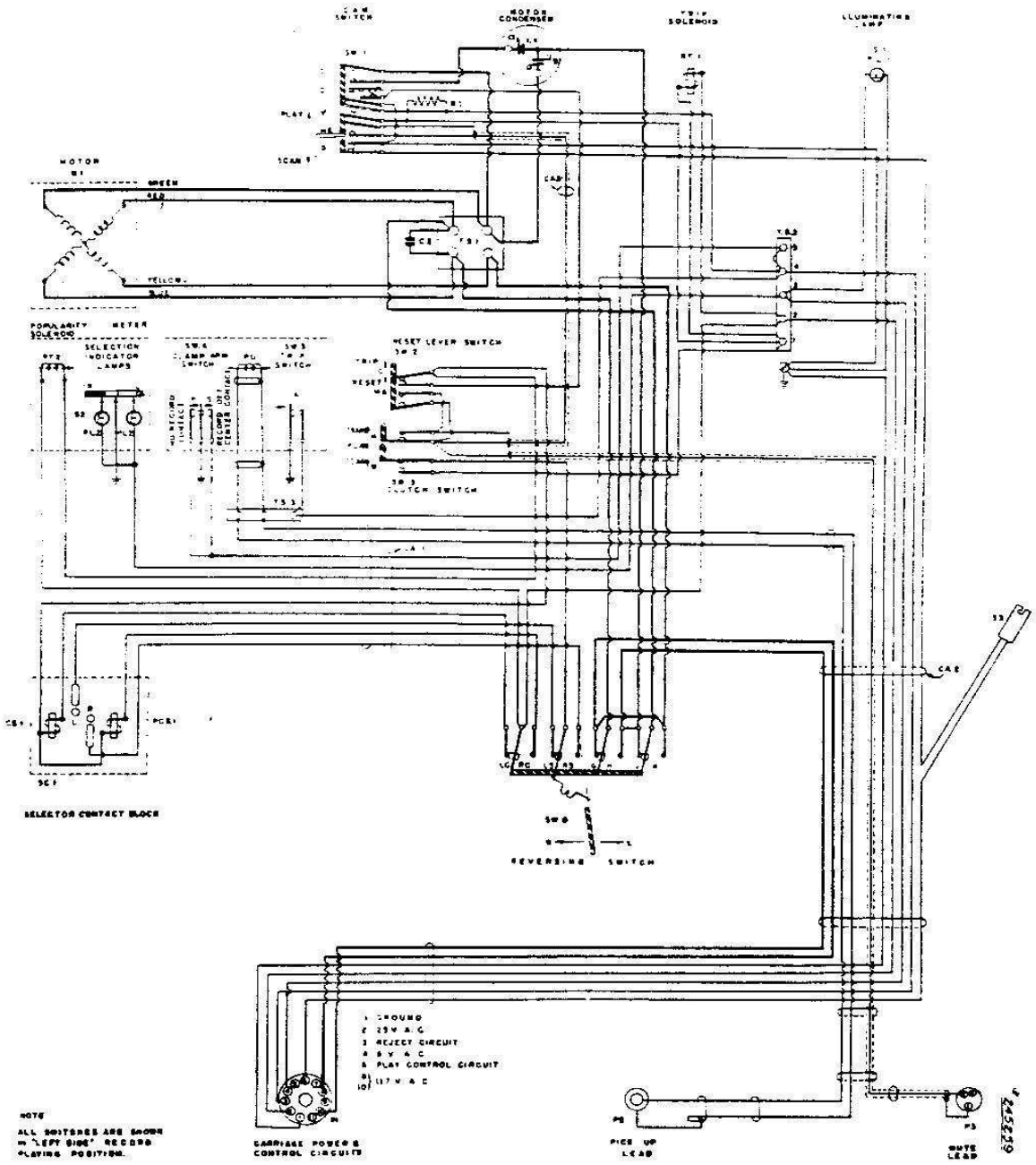
USE AERO LUBRIPLATE* SPARINGLY EVERY SIX MONTHS AT (L)





AERO LUBRIPLATE MAY BE OBTAINED FROM THE SERVICE PARTS DEPARTMENT AT YOUR DISTRIBUTOR

SCHEMATIC DIAGRAM



PARTS LIST

ITEM	PART NO.	PART NAME
C1a C1b	86172	1.4 mfd. 1.0 mfd. Motor Condenser
C2	86155	0.1 mfd. 600 v. Condenser
CA1	245915	Cable
CA2	245920	Cable Assembly
CA3	245916	Mute Cable
M1	A250251	Motor Assembly
P1	A250942	11-prong Plug
P2	K228440	Single-prong Plug
P3	A250938	3-prong Plug
PU	245789	Pickup Cartridge
	245795	Sapphire Stylus (card of 2)
PL1	7817	No. 81 Lamp
PL2	302141	No. 47 Lamp
PSC1	304370	Pin Cancel Solenoid
R1	82704	1500 ohm 1 watt Resistor

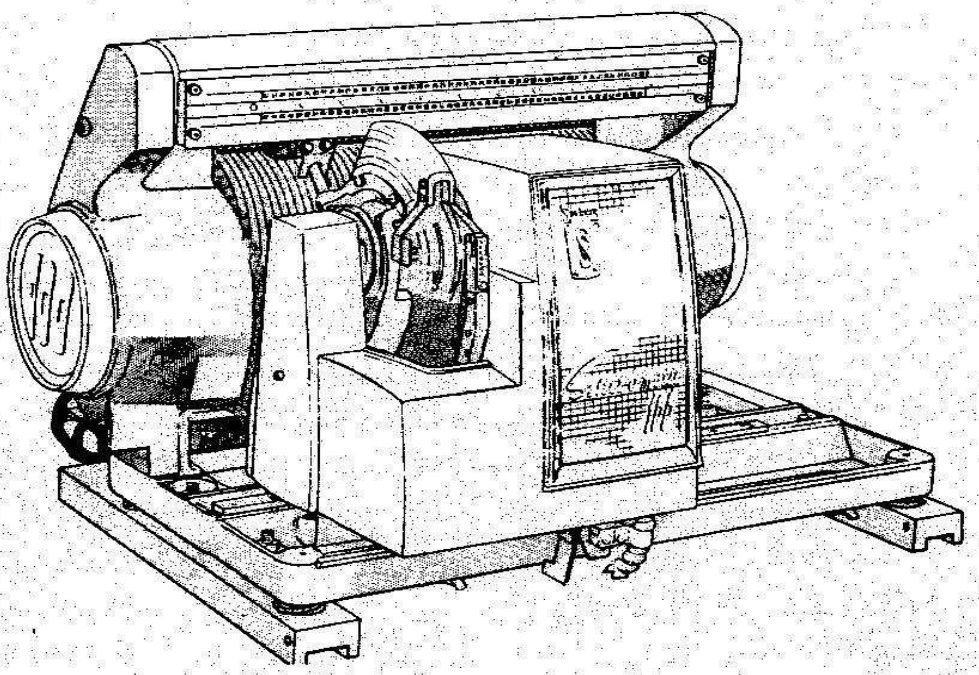
ITEM	PART NO.	PART NAME
RY1	245578 245549	Trip Solenoid*
RY2	245159	Popularity Meter Solenoid
S1	245250	Lamp Socket
S2	245142	Lamp Socket
S3	250707	Connector
SC1	304363	Selector Contact Block, complete
SW1	245911	Cam Switch
SW2 SW3	245912	Clutch Switch Reset Lever Switch
SW4	245065	Clamp Arm Switch
SW5	245816	Record Trip Switch
SW6	245907	Reversing Switch
TS1	245909	Motor Terminal Strip
TS2	245910	5-lug Terminal Strip
TS3	245755	3-lug Terminal Strip

*see pages 2197 - 2198

SEEBURG

SELECT-O-MATIC "100" MECHANISM

Type 145S14-L6

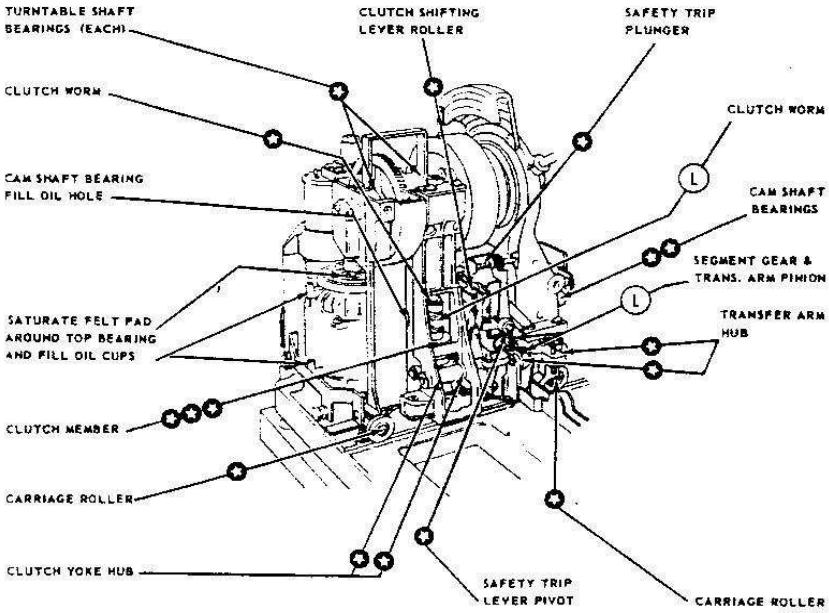


The Select-O-Matic "100" Mechanism, Type 145S14-L6, is designed for use with 45 r.p.m., 7" records, in the Select-O-Matic "100", Model HF100R. The difference between the 145S14-L6 and the 145S2-L6 mechanisms is in the adjustment of the stylus force, adjustment pickup 13, shown on Page 2164. The needle pressure for the 145S14-L6 mechanism is 4½ to 5½ grams. The difference between the 145S14-L6 and the 145S2-L6 mechanism parts is principally in the color of those parts that are exposed, the decorative trim, and in the Popularity Meter. An index for service data and parts is given on the following page and should be referred to.

A complete listing of the parts for the 145S14-L6 Mechanism begins on page 2281.

SELECT-O-MATIC "100" MECHANISM, TYPE 145S14-L6

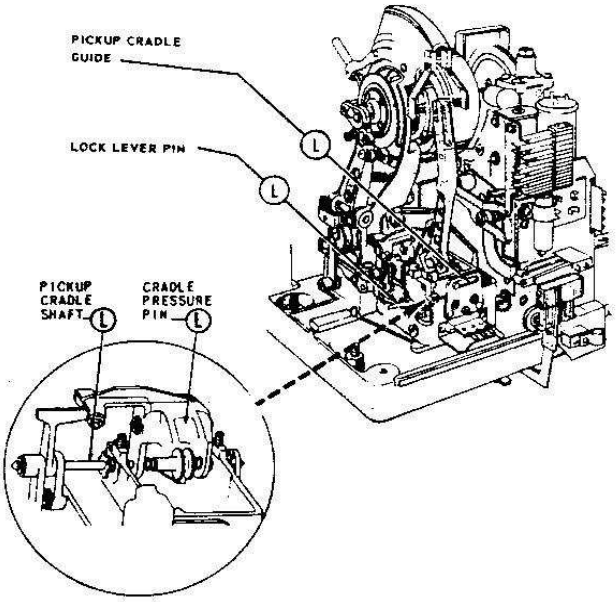
LUBRICATION CHART

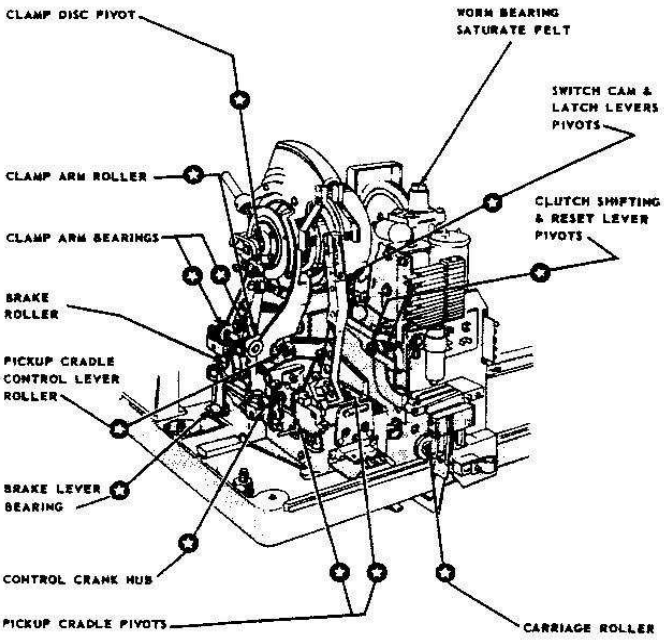


OIL ALL ROLLER PIVOT BEARINGS — 1 OR 2 DROPS

USE AERO LUBRIPLATE** SPARINGLY EVERY (L) SIX MONTHS . . .

USE SEEBURG SPECIAL PURPOSE OIL* EVERY SIX MONTHS IN AMOUNT SHOWN . . . (1) 1 DROP FOR EACH

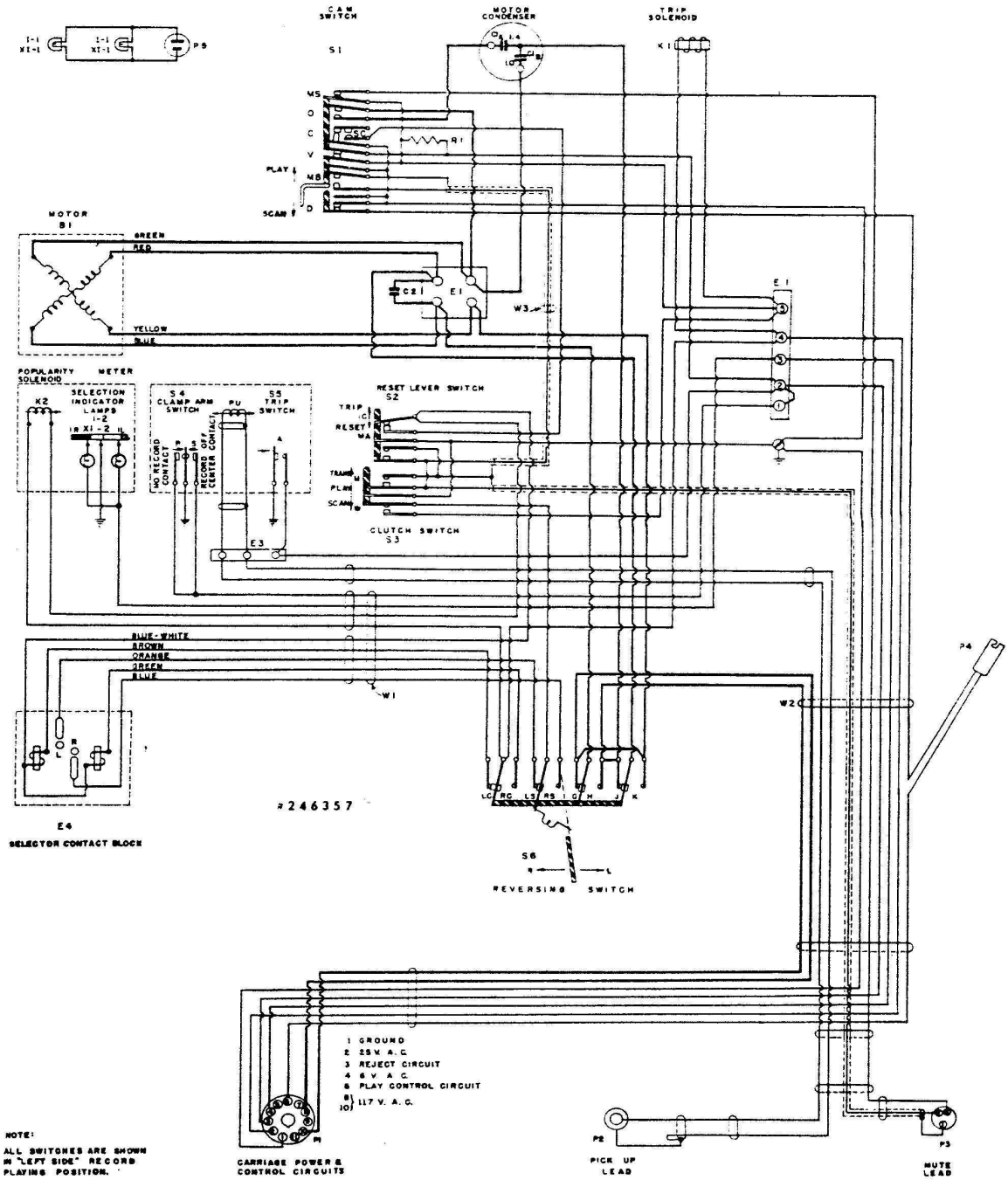




* SEEBURG SPECIAL PURPOSE OIL NO. 53014 MAY BE OBTAINED FROM YOUR SERVICE PARTS DEPARTMENT AT YOUR DISTRIBUTOR.

** AERO LUBRIPLATE MAY BE OBTAINED FROM YOUR SERVICE PARTS DEPARTMENT AT YOUR DISTRIBUTOR.

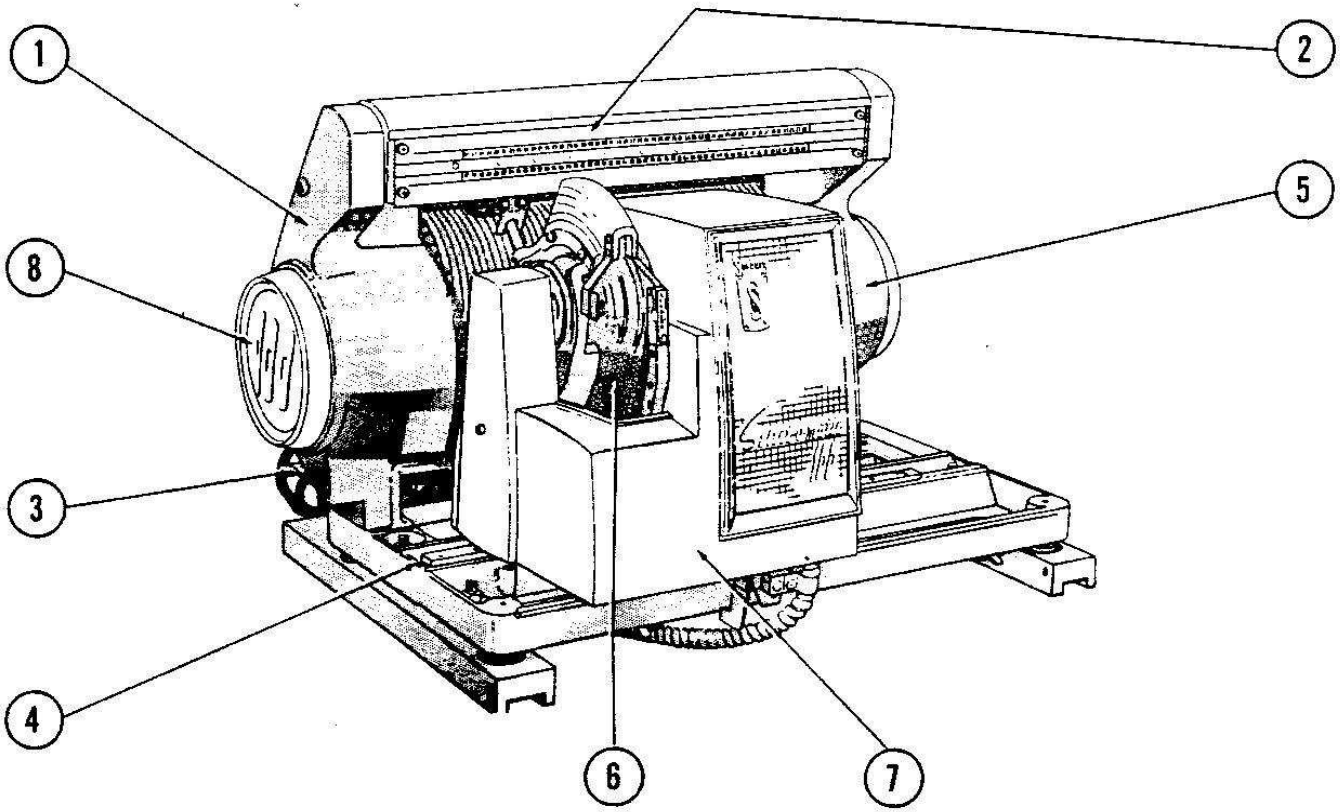
SCHEMATIC DIAGRAM



PARTS LIST

ITEM	PART NO.	PART NAME
C1a C1b	86172	1.4 Mfd. Motor 1 Mfd. Condenser
C2	86155	0.1 Mfd. 600 V. Tub. Condenser
E1	245910	5 Lug Terminal Strip
E2	245909	Motor Terminal Strip
E3	245755	3 Lug Terminal Strip
E4	304364	Selector Contact Block
I 1	402180	No. 81 Lamps
I 2	10192	No. 44 Lamps
K1	245578	Trip Solenoid
K2	245159	Popularity Meter Solenoid
M1	A250251 250278	Motor Assembly
P1	A250842	11-Prong Plug
P2	246957	Single Prong Plug
P3	A250938	3-Prong Plug
P4	250707	Connector
P5	F402066	2-Prong Plug
PU	246796	Magnetic Pickup
R1	82704	1500 Ohms 1 Watt Resistor
S1	246920	Cam Switch
S2 S3	246944	Clutch Switch Reset Lever Switch
S4	245065	Clamp Arm Switch
S5	245816	Record Trip Switch
S6	245907	Reversing Switch
W1	245935	Cable (Internal)
W2	246952 246950	Cable Assembly
W3	245916	Mute Cable
XI-1	246223	Lamp Socket Assembly
XI-2	245142	Lamp Socket

MECHANISM ASSEMBLY - PARTS INDEX & PARTS LIST

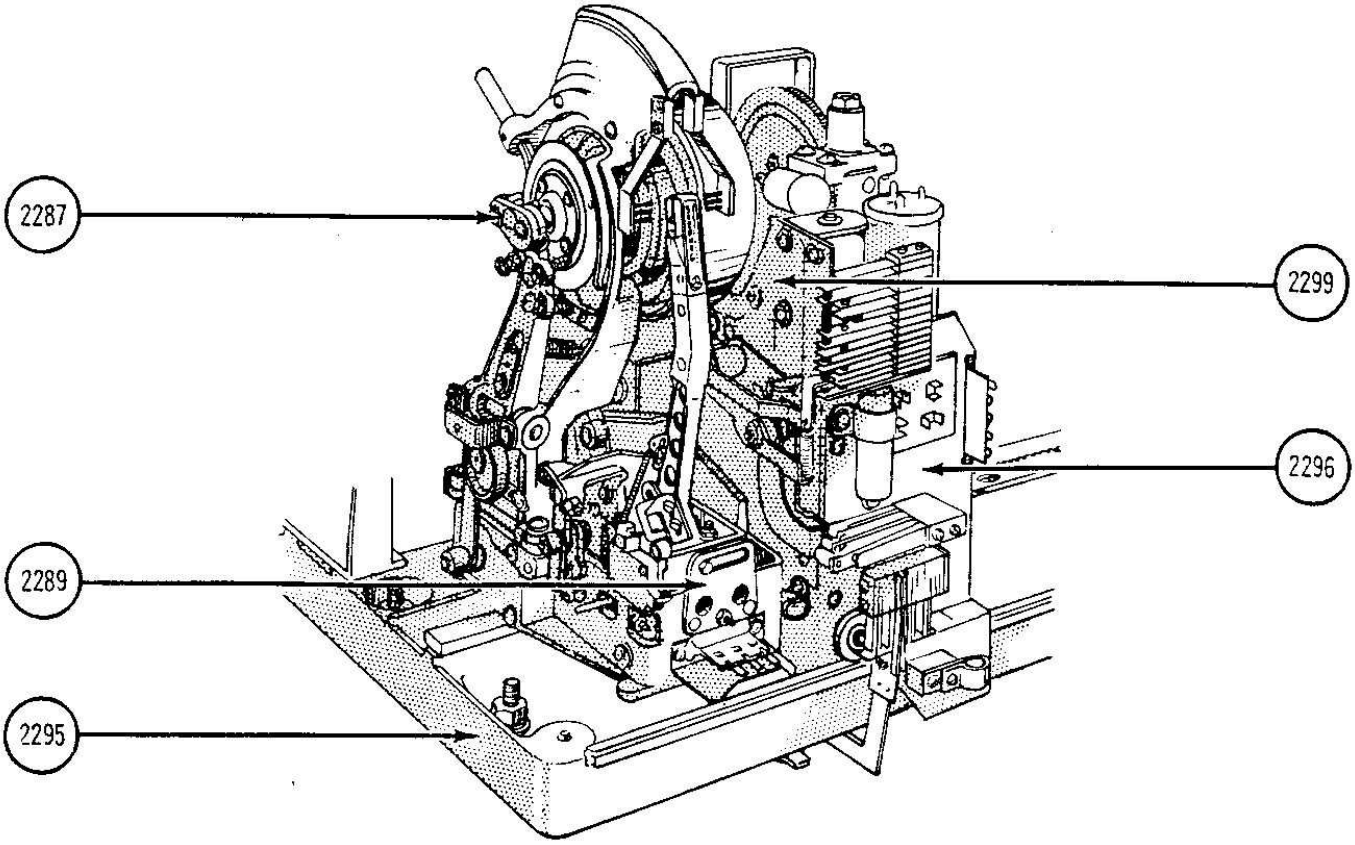


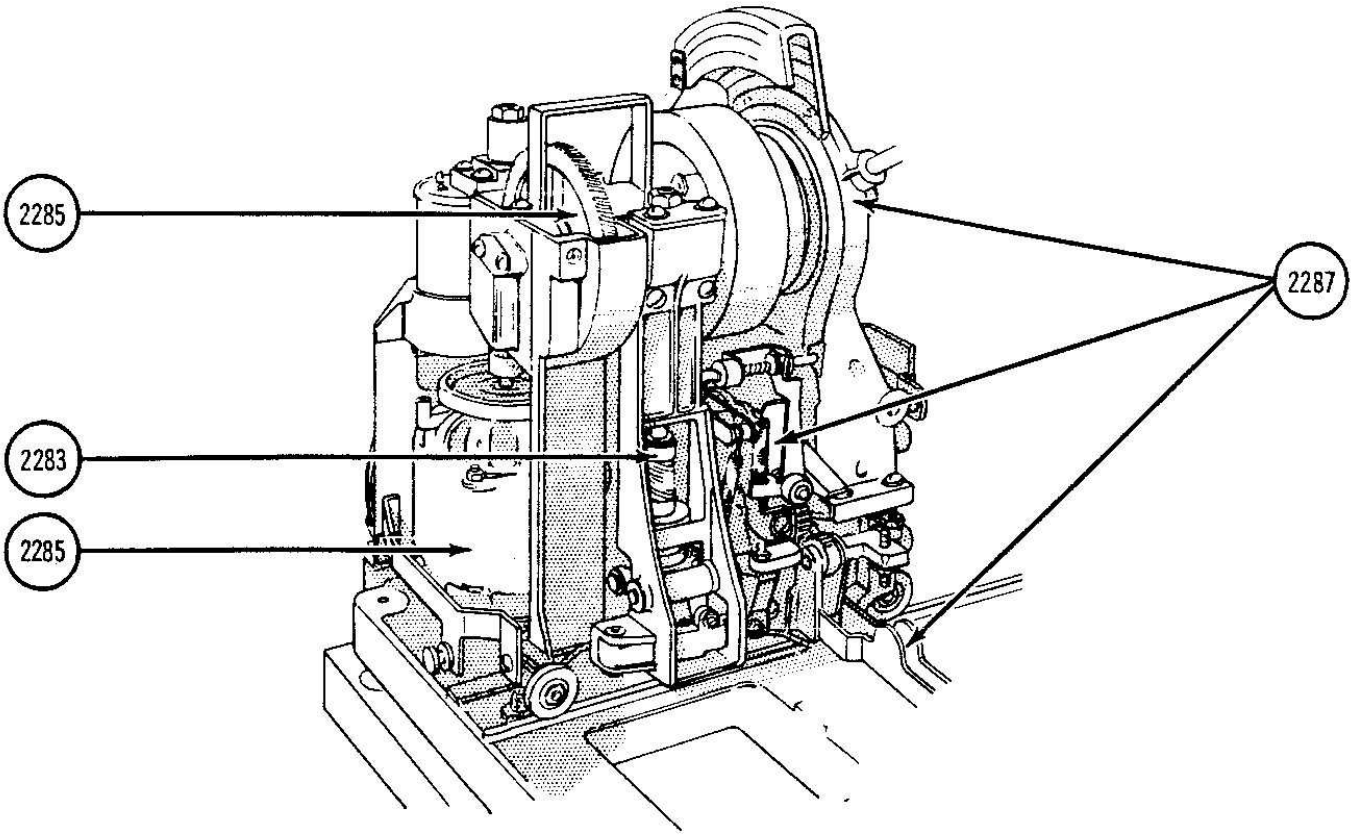
PARTS LIST

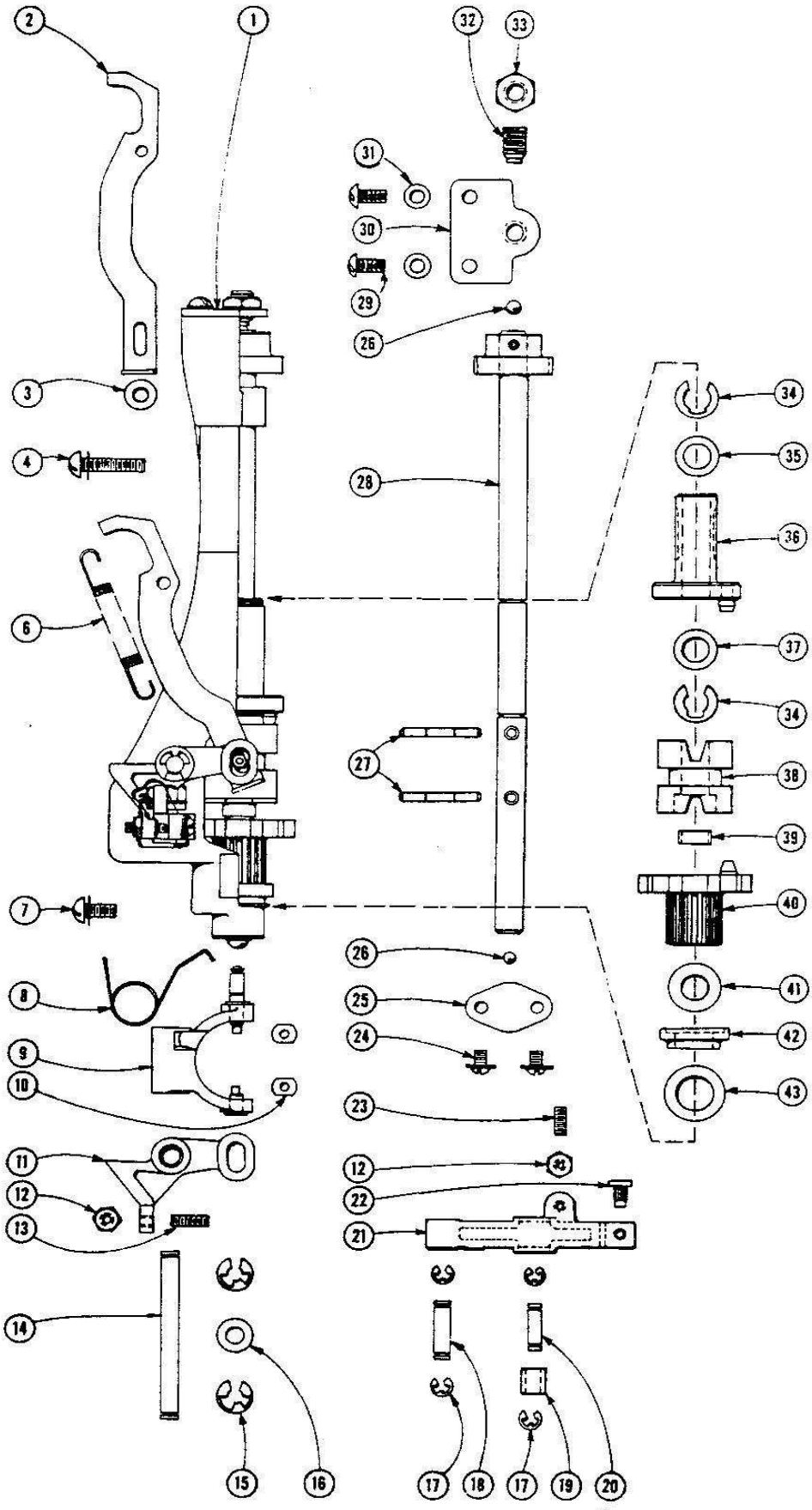
Item	Part No.	Part Name
1	246350	Magazine End Housing Assembly, L. H.
	246201	Magazine End Housing, L. H.
	246221	Retaining Spring
	925343	1206 Lock Washer
	960706	No. 6 x ¼ Self Tapping Screw
	914543	½" Housing Mounting Screw
	914925	1-9/16" Housing Mounting Screw
2		Magazine & Popularity Meter (Page 2291)
		Popularity Meter Slide Assembly (Page 2293)
3	304452	Selector Assembly Type 100SA8-L6 (Page 2297)
4	246321	Base Assembly (Page 2295)
5	246351	Magazine End Housing Assembly, R. H.
	246200	Magazine End Housing, R. H.
	246221	Retaining Spring
	925343	1206 Lock Washer
	960706	No. 6 x ¼ Self Tapping Screw
	914543	½" Housing Mounting Screw
	914925	1-9/16" Housing Mounting Screw
6		Carriage Assembly (Page 2282)
7	246210	Carriage Cover Assembly
	246207	Carriage Cover
	246213	Carriage Cover Escutcheon
	914543	½" Cover Mounting Screw
	246356	Shoulder Screw
8	246202	Magazine End Cover Insert

CARRIAGE ASSEMBLY PARTS INDEX

Circled numerals indicate page numbers







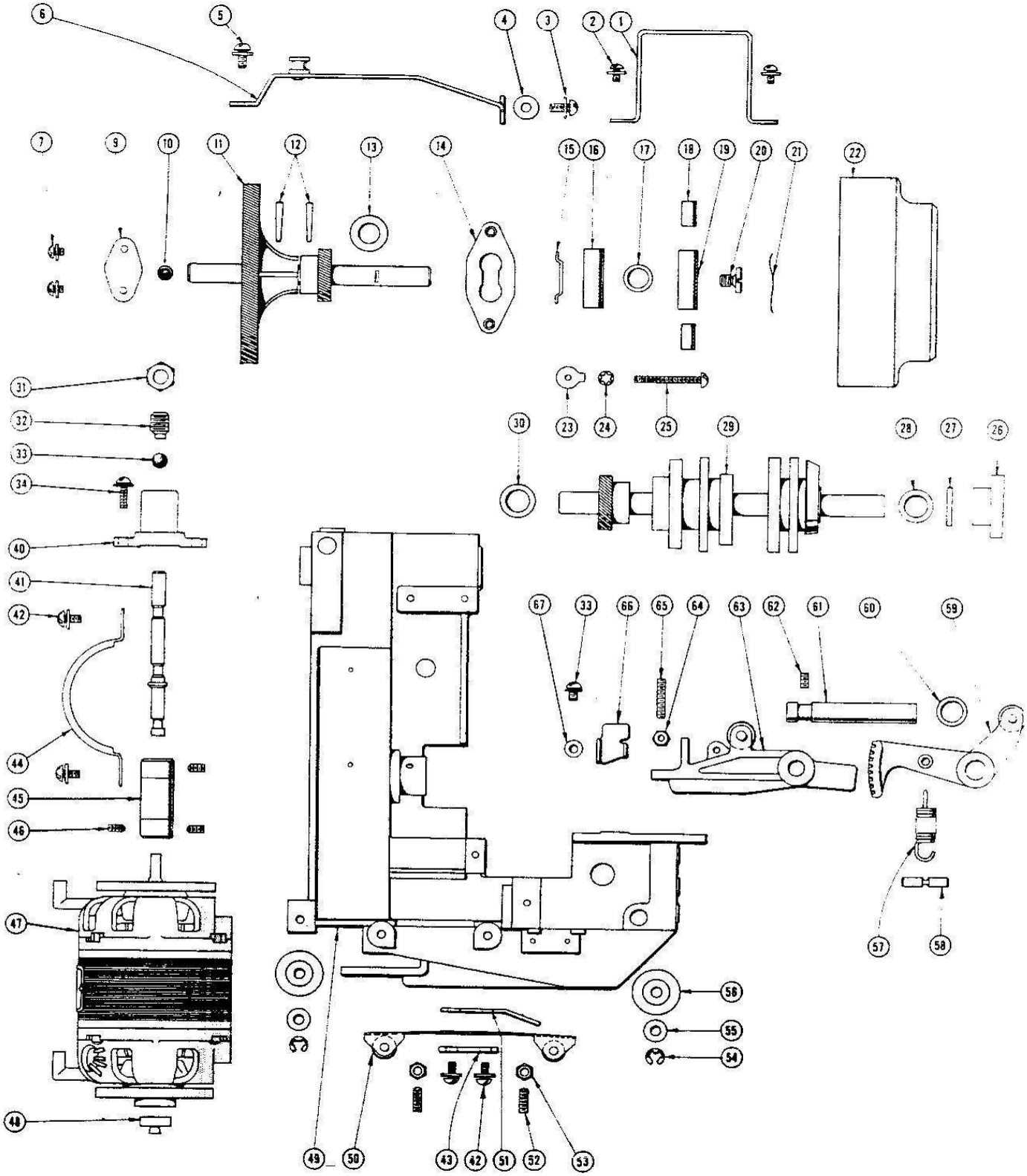
CLUTCH ASSEMBLY

SELECT-O-MATIC "100" MECHANISM, TYPE 145S14-L6

PARTS LIST for CLUTCH ASSEMBLY

(Preceding Page)

Item	Part No.	Part Name
1	245400	Complete Assembly
	245406	Clutch Housing Casting
2	245426	Connecting Link
3	72292	Flat Washer, Steel
4	915784	10 x 7/8 Sems Fastener
6	245248	Clutch Spring
7	915548	10 x 7/16 Sems Fastener
8	A250141	Detent Arm Retarding Spring
9	245408	Clutch Yoke Assembly
10	A250529	Bearing Block
11	245427	Clutch Yoke Lever
12	901661	8-32 Hexagon Nut
13	918612	8-32 x 5/8 Set Screw
14	A250516	Clutch Yoke Shaft
15	S229220	Snap Washer
16	72174	Spring Steel Flat Washer
17	R231163	Snap Washer
18	A250520	Detent Arm Pivot Pin
19	A250518	Detent Arm Roller
20	A250519	Detent Arm Roller Pin
21	A250506	Clutch Detent Arm
22	246438	Detent Stud
23	918634	8-32 x 5/8 Set Screw
24	914143	8-32 x ¼ Sems Fastener
25	245424	Thrust Plate
26	A250125	Steel Ball
27	A250523	Pin
28	245410	Shaft & Gear Assembly
	245411	Shaft, only
	245412	Gear, only
	80108	Pin
29	915545	10-32 x ½ Phillips R.H.Machine Screw
30	245425	Thrust Screw Plate
31	925492	Lock Washer
32	918970	Socket Head Set Screw
33	904401	5/16-24 Hexagon Nut
34	A250507	Snap Washer
35	72175	Spring Steel Flat Washer .031 Thick
	72216	Spring Steel Flat Washer .015 Thick
	72217	Spring Steel Flat Washer .010 Thick
36	245415	Clutch Worm
37	72175	Spring Steel Flat Washer .031 Thick
38	245417	Clutch Member
39	245418	Pinion Spacer
40	245438	Pinion Assembly
41	245421	Upper Thrust Washer
42	245422	Clutch Shaft Spacer
43	245423	Lower Thrust Washer

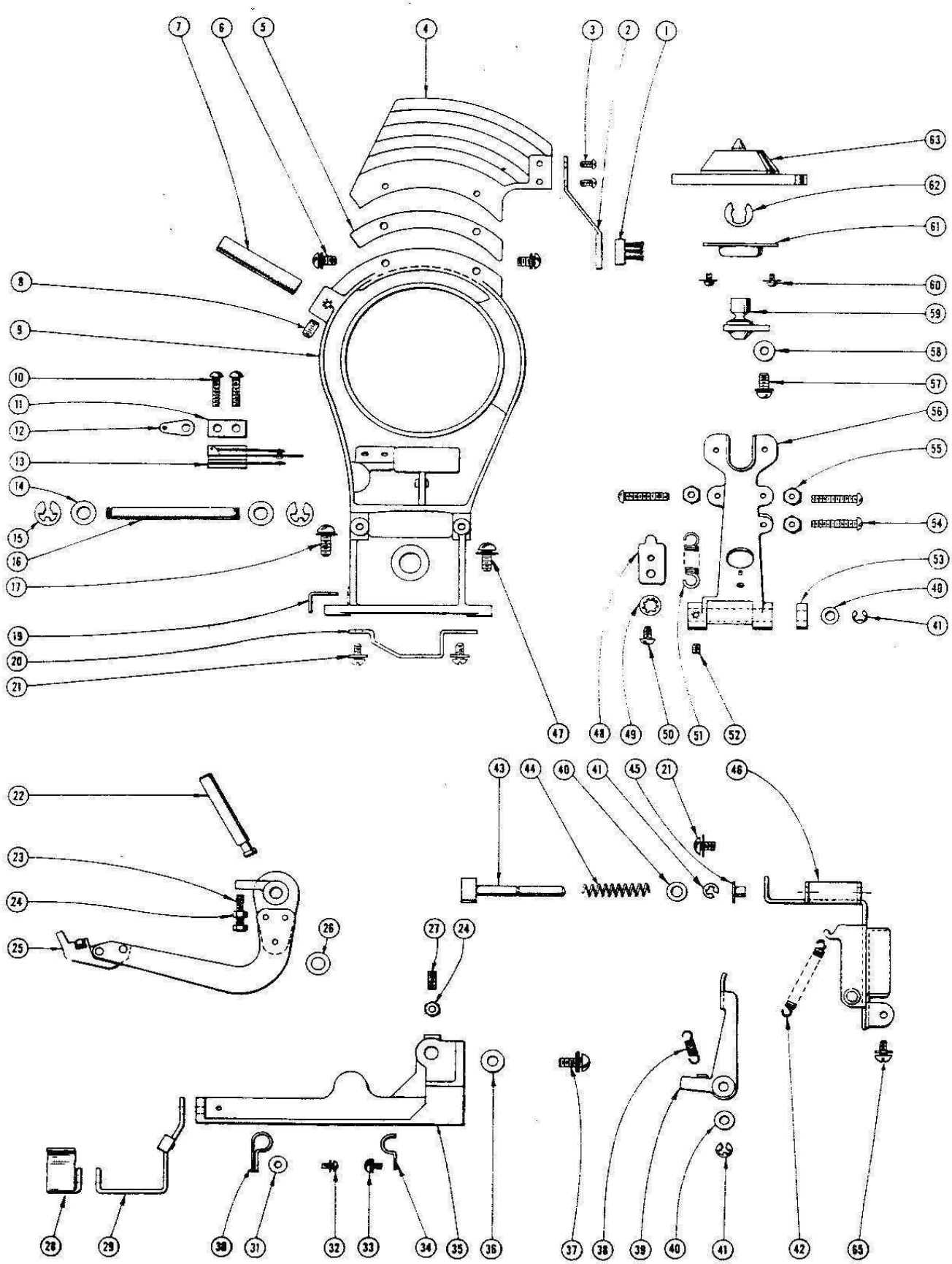


CARRIAGE FRAME ASSEMBLY

PARTS LIST for FRAME ASSEMBLY

(Preceding Page)

Item	Part No.	Part Name
1	246157	Carriage Cover Bracket
2	914143	8-32 x ¼ Sems Fastener
3	914332	8-32 x 3/8 Sems Fastener (Phillips)
4	72113	Flat Washer
5	914143	8-32 x ¼ Sems Fastener
6	246353	Guide Stud & Bracket
7	914143	8-32 x ¼ Sems Fastener
9	245424	Thrust Plate
10	250125	Steel Ball
11	245257	Turntable Shaft & Gear Assembly
12	951790	Taper Pin, 3/0 x ¾
13	72277	Spring Steel Flat Washer .010 Thick
	72278	Spring Steel Flat Washer .015 Thick
	72287	Spring Steel Flat Washer .005 Thick
14	245467	Drive Arm Assembly
15	245055	Drive Arm Locating Washer
16	245056	Ball Bearing
17	245057	Ball Bearing Spacer
18	245464	Drive Bushing
19	245056	Ball Bearing
20	245058	Bearing Retainer Screw
21	72288	Spring Washer, Steel
22	245060	Turntable
23	245479	Turntable Retainer
24	73088	Lock Washer
25	913715	6-32 x 1-3/8 R. H. Machine Screw
26	245016	Brake Cam
27	80108	Roll Pin, 1/8 Dia. x ¼
28	72227	Spring Steel Flat Washer .005 Thick
	72228	Spring Steel Flat Washer .010 Thick
	72229	Spring Steel Flat Washer .015 Thick
	72245	Spring Steel Flat Washer .020 Thick
29	245062	Cam & Gear Assembly
30	250064	Thrust Washer - Cam Shaft
31	904401	5/16 - 24 Hexagon Nut
32	918971	Set Screw
33	245180	Steel Ball
34	914485	8-32 x ½ Sems Fastener
40	245020	Bearing Bracket Assembly
41	245044	Turntable Shaft Worm
42	914225	8-32 x 5/16 Sems Fastener
43	245299	Spacer Guide Roller Spring
44	250111	Clamp Bracket
45	245083	Motor Coupling Assembly
46	918520	8-32 x 3/16 Socket Head Set Screw
47	250251	Motor
48	245086	Motor Support Plug
49	245021	Carriage Frame Assembly
50	245031	Guide Roller & Spring Assembly
51	245965	Leaf Spring
52	918612	8-32 x ½ Set Screw
53	901661	8-32 Hexagon Nut
54	R231163	Snap Washer
55	72177	Spring Steel Flat Washer .015 Thick
56	245082	Carriage Roller
57	245080	Gear Segment Spring
58	245081	Spring Pin
59	245041	Gear Segment Assembly
60	72216	Spring Steel Flat Washer .015 Thick
	72217	Spring Head Flat Washer .010 Thick
	72254	Steel - Blue Flat Washer .005 Thick
61	245043	Shaft
62	918751	10-32 x ¼ Allen Head Set Screw
63	245037	Detent Arm Lever Assembly
64	902360	10-32 Hexagon Nut
65	918830	10-32 x ¾ Set Screw
66	245040	Adjustment Plate
67	72113	Flat Washer .031 Thick Steel



CARRIAGE FRAME

PARTS LIST for CARRIAGE FRAME ASSEMBLY

(Preceding Page)

STRIPPER PLATE ASSEMBLY

Item	Part No.	Part Name
1	251684	Brush
2	245295	Brush Holder, R. H.
	245296	Brush Holder, L. H.
3	911645	4 x 3/16 B. H. Machine Screw
4	245110	Stripper Plate Top
5	245135	Stripper Plate Top Shim
6	914225	8-32 x 5/16 Sems Fastener
7	245183	Sel. Indicator Drive Tube
8	918552	8-32 x ¼ Set Screw
9	246161	Stripper Plate
10	912550	5-40 x 5/8 Fil. H. Machine Screw
11	400597	Tension Plate
12	940710	Solder Lug
13	245065	Clamp Arm Switch
14	72280	Flat Washer
15	S229220	Retaining Ring
16	245354	Shaft
17	915578	10-32 x ½ Sems Fastener
19	245134	Transfer Arm Stop

Item	Part No.	Part Name
20	245121	Carriage Cover Bracket
47	915548	10-32 x 7/16 Sems Fastener
48	245070	Clamp Arm Spring Plate
49	925431	1208 Lock Washer
50	961015	8-32 x 3/8 R.H.Thread Cutting Screw
51	245079	Clamp Arm Spring
52	918520	8-32 x 3/16 Set Screw
53	245038	Roller
54	914735	8-32 x 7/8 R.H.Machine Screw
55	901661	8-32 Hexagon Nut
56	246163	Clamp Arm & Pin Assembly
57	914332	8-32 x 3/8 Sems Fastener
58	72240	Flat Washer
59	246166	Pivot Pin & Block Assembly
60	911625	4-40 x 3/16 Sems Fastener
61	250235	Clamp Disc. Cover
62	250507	Snap Washer
63	245072	Record Clamp Disc. Assembly

CONTACT AND TRANSFER ARM ASSEMBLIES

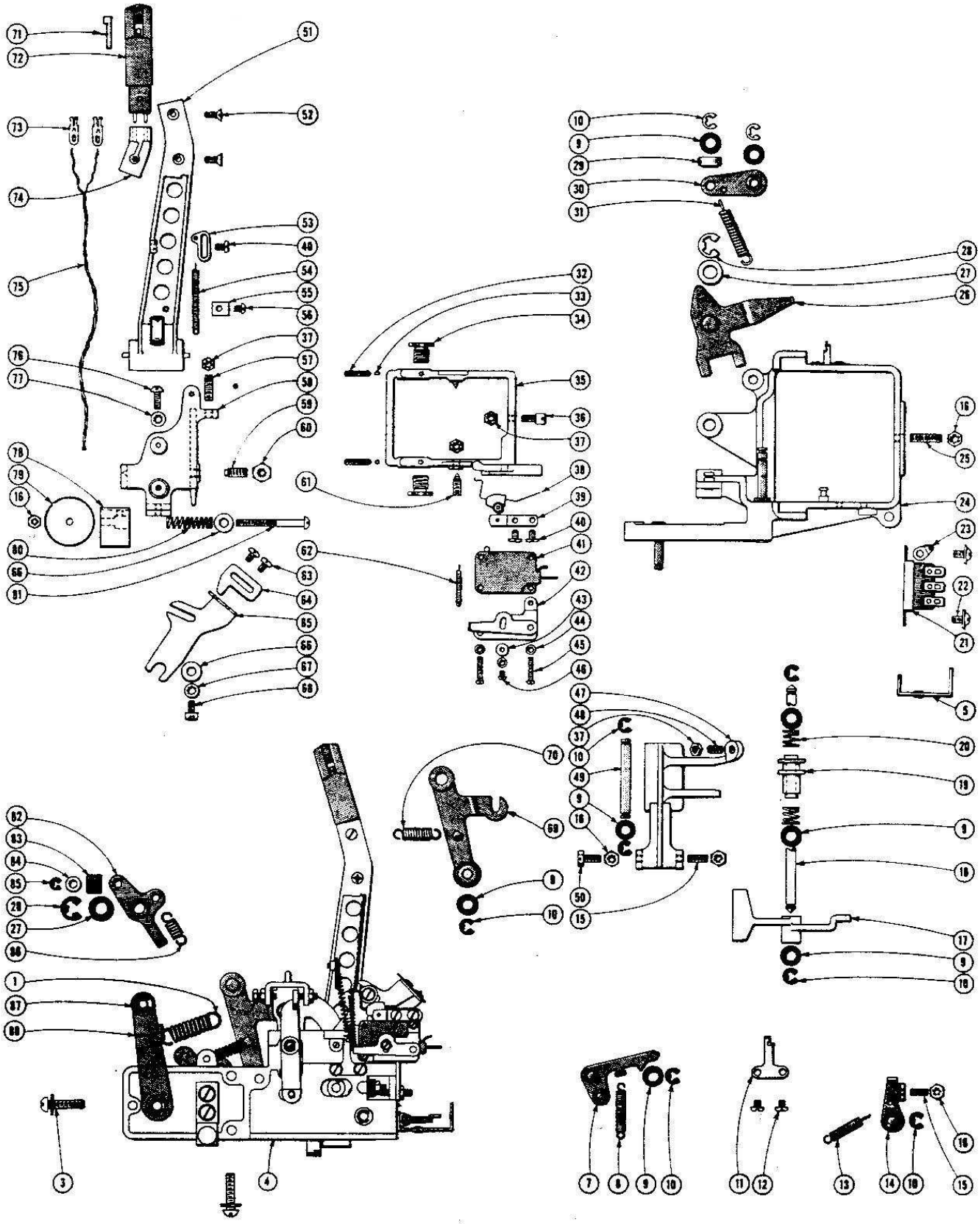
Item	Part No.	Part Name
22	245109	Transfer Arm Shaft
23	245557	Adjustment Screw
24	901660	8-32 Hexagon Nut
25	245239	Transfer Arm
26	72282	.031" Thick Steel Washer
	72281	.020" Thick Steel Washer
	72174	.015" Thick Steel Washer
	72280	.010" Thick Steel Washer
27	918590	8-32 x 7/16 Set Screw
28	245230	Drive Bracket

Item	Part No.	Part Name
29	245136	Drive Bracket Support
30	602190	Clamp
31	72230	Flat Washer
32	912959	6-32 x ¼ Sems Fastener
33	914110	8-32 x ¼ Sems Fastener
34	402098	Cable Clamp
35	245108	Contact Arm
36	72135	Flat Washer
37	915548	10-32 x 7/16 Sems Fastener

SAFETY TRIP ASSEMBLY

Item	Part No.	Part Name
21	914110	8-32 x ¼ Sems Fastener
38	245103	Safety Trip Lever Spring
39	245094	Lever & Hub Assembly
40	72177	Flat Washer Spring Steel
41	R231163	Snap Washer
42	245102	Detent Arm Spring

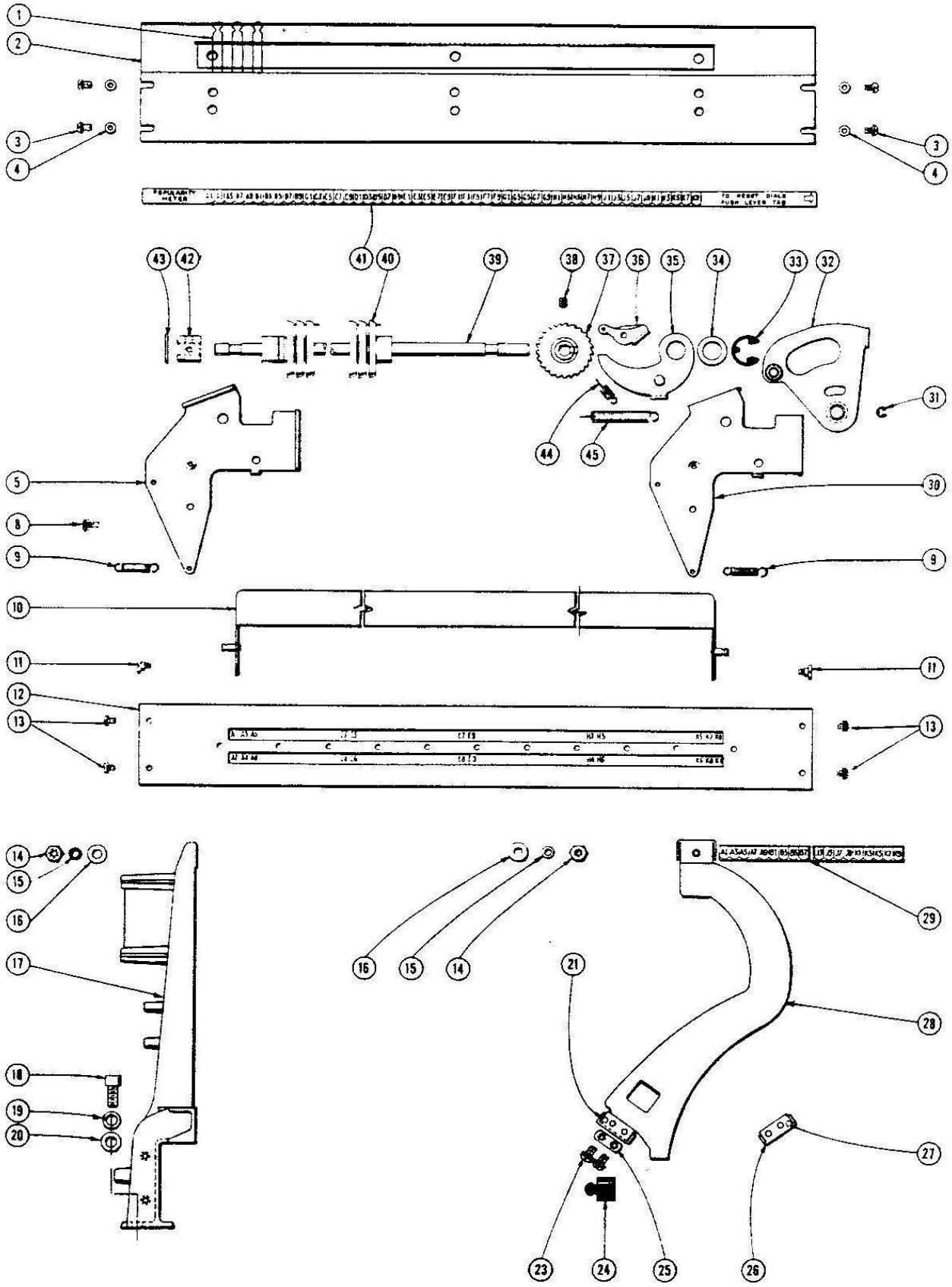
Item	Part No.	Part Name
43	245098	Plunger
44	245100	Plunger Spring
45	245101	Eyelet
46	245088	Safety Trip Bracket Assembly
65	914115	8-32 x ¼ Sems Fastener



PICKUP ARM FRAME ASSEMBLY

PARTS LIST

Item	Part No.	Part Name
1	245243	Brake Lever Spring
3	915724	10-32 x 3/4 Sems Fastener
4	246702	Pickup Arm & Frame Assembly
5	246784	Terminal Strip Shield
7	245765	Pickup Arm Lock Lever
8	245792	Lock Lever Spring
9	72177	Flat Washer
10	R231163	Retaining Ring
11	245825	Pickup Arm Spring Lug
12	912305	5-40 x 1/8 B.H.Machine Screw
13	245773	Lock Lever Detent Spring
14	245800	Lock Lever Detent
15	918372	6-32 x 3/8 Slotted Head Set Screw
16	901102	6-32 Hexagon Nut
17	245711	Lock Lever Control Crank
18	245728	Control Fork Hinge Pin
19	245729	Shifting Collar
20	245791	Spring
21	245755	3 Lug Terminal Strip
22	912959	6-32 x 1/4 Sems Fastener
23	940742	Solder Lug
24	245753	Pickup Arm Frame Assembly
25	918421	6-32 x 5/8 Set Screw
26	245758	Cradle Actuator Lever
27	72174	Flat Washer
28	S229220	Retaining Ring
29	245740	Detent Roller
30	245762	Detent Lever
31	245764	Detent Lever Spring
32	918210	5-40 x 3/8 Socket Head Set Screw
33	245772	Lock Plug
34	245737	Adjusting Bushing
35	245771	Cradle & Pin Assembly
36	245726	Support Pin
37	901631	8-32 Hexagon Nut
38	245714	Trip Switch Lever
39	245724	Support Lug
40	911644	4-40 x 3/16 B.H.Machine Screw
41	245816	Trip Switch
42	245818	Adjusting Lever & Plate
43	72005	Flat Washer
44	925072	Lock Washer
45	910615	2-56 x 1/2 R.H.Machine Screw
46	910408	2-56 x 1/8 R.H.Machine Screw
47	245709	Control Fork
48	918642	8-32 x 3/4 Slotted Head Set Screw
49	245732	Cradle Pressure Pin
50	913228	Slotted Hexagon Head Machine Screw
51	246792	Pickup Arm & Roller Assembly
52	911290	4-36 x 5/16 Phil. Flat Head Mach. Screw
(a)	911281	4-36 x 5/16 F.H.Machine Screw
53	245715	Pickup Arm Spring Clip
54	246799	Pickup Arm Spring
55	245823	Wire Retainer
56	911575	4-40 x 1/8 R.H.Machine Screw
57	918612	8-32 x 1/2 Slotted Head Set Screw
58	245779	Pickup Arm Cradle & Pin Assembly
59	245805	P.U.Arm Shaft Set Screw
60	902360	10-32 Hexagon Nut
61	245777	Pivot Screw
62	245817	Trip Switch Balance Spring
63	911586	4-40 x 1/8 B.H.Machine Screw
64	245783	Trip Switch Actuator Plate
65	245723	Trip Switch Actuator
66	72064	Flat Washer
67	925343	Lock Washer
68	913020	6-32 x 1/4 Socket Head Cap Screw
69	245766	Control Lever & Roller
70	245769	Control Lever Spring
71	246797	Sapphire Armature Only
	246788	Diamond Armature Only
72	246816	Magnetic Pickup with 246797 Armature
	246817	Magnetic Pickup with 246788 Armature
	246796	Magnetic Pickup Only
73	941320	Solder Lugs
74	245713	Pickup Cartridge Socket
75	246734	Pickup Lead
76	913151	6-32 x 3/8 R.H.Machine Screw
77	925343	Lock Washer
78	246795	Pickup Arm Weight
79	246733	Pickup Arm Counterweight (.273" thick)
80	245821	Lock Spring
81	913685	6-32 x 1-1/4 R.H.Machine Screw
82	245760	Drive Crank
83	245745	Drive Crank Roller
84	72272	Flat Washer
85	125448	Retaining Ring
86	245782	Drive Crank Spring
87	245157	Brake Cam Roller
88	245242	Brake Cam Lever

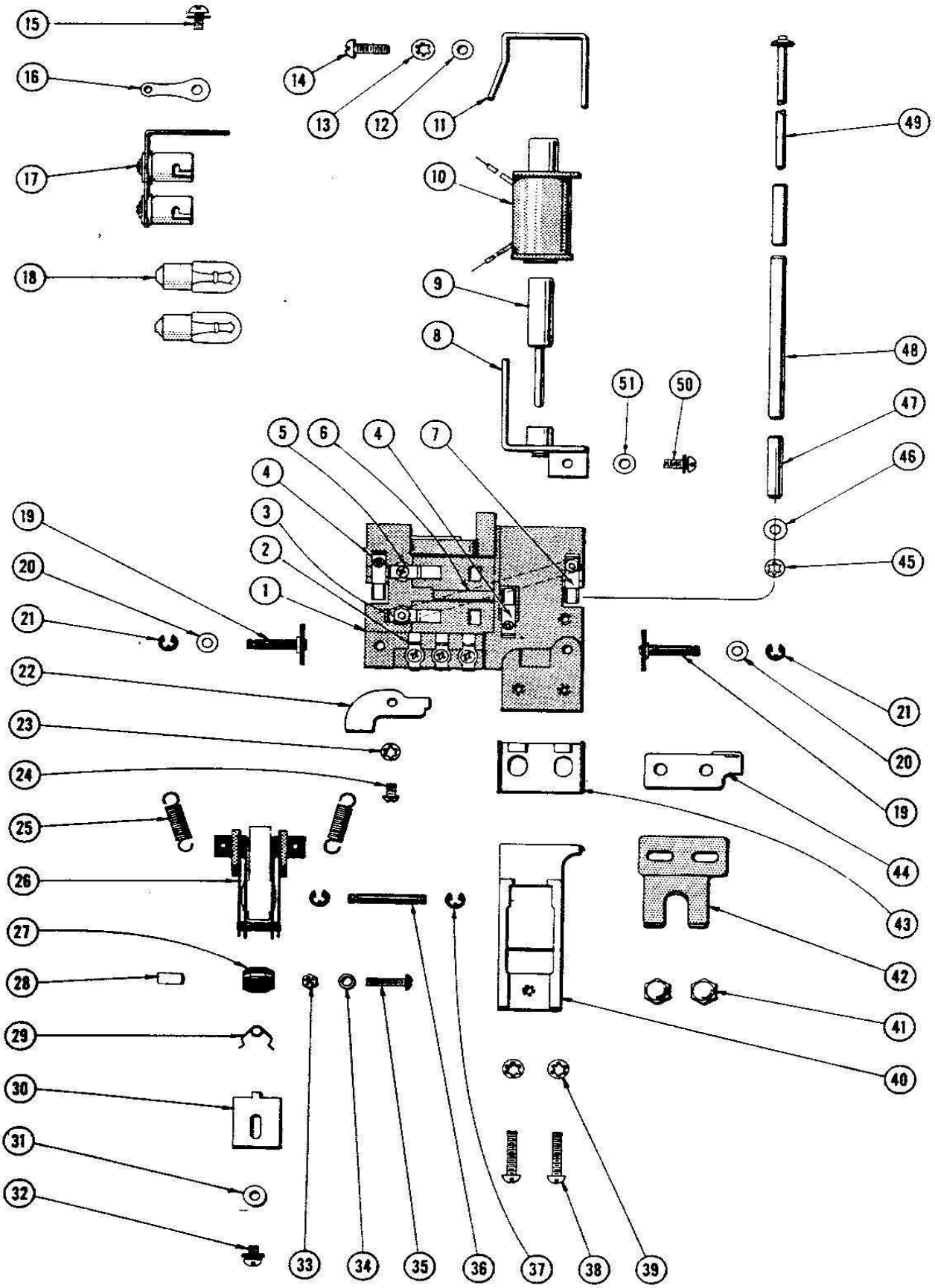


POPULARITY METER & MAGAZINE ASSEMBLY

PARTS LIST for POPULARITY METER & MAGAZINE ASSEMBLY

(Preceding Page)

Item	Part No.	Part Name
1	245185	Dial Stop Spring
2	246344	Tie Plate & Angle Assembly
3	912944	6-32 x ¼ B.H.Machine Screw
4	72356	Flat Washer
5	246342	Indicator Bracket & Stud Assembly, L.H.
8	914332	Sems Fastener
9	245229	Popularity Meter Cover Spring
10	246346	Cover & Stud Assembly
11	245228	Meter Cover Pivot
12	246124	Selector Indicator Channel Assembly
13	912879	Sems Fastener
14	902360	10-32 Hexagon Nut
15	925492	No. 10 Kantlink Lock Washer
16	73135	Flat Washer
17	246204	Brace, R. H.
	246205	Brace, L. H.
18	916430	¼ - 20 x 9/16 Socket Hd. Cap Screw
19	925583	¼" Kantlink Lock Washer
20	72171	Flat Washer
21	245334	Record Cushion
23	913048	Sems Fasteners
24	245291	Rubber Bumper
25	245313	Plate
26	246451	Magazine Channel Assembly
27	245468	Record Cushion
28	246450	Separator & Channel Assembly
29	246413	Number Strip
30	246341	Indicator Bracket & Stud Assembly, R.H.
31	R231163	Retaining Ring
32	245645	Meter Reset Lever
33	245648	Retaining Ring
34	72259	Flat Washer
35	245642	Cam Lever
36	245644	Meter Reset Pawl
37	245636	Ratchet
38	918751	10-32 x ¼ Socket Head Set Screw
39	245625	Popularity Meter Dial & Shaft Assembly
40	245119	Popularity Dial
41	246130	Number Strip
42	245222	Thrust Collar
43	73181	Thrust Washer (Spring)
44	245673	Pawl Spring
45	245672	Cam Lever Spring



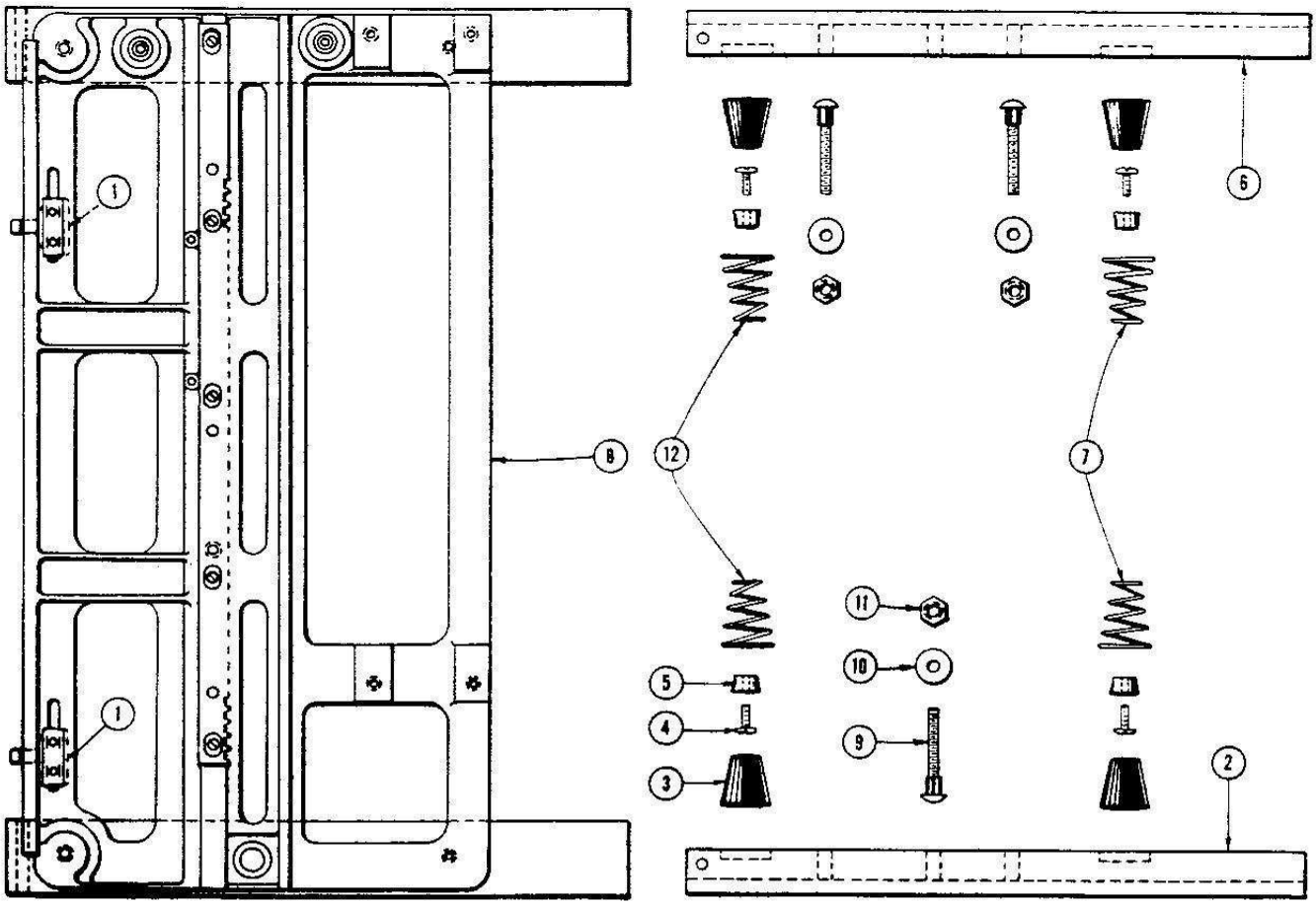
POPULARITY METER SLIDE ASSEMBLY

2293

PARTS LIST for SLIDE ASSEMBLY

(Preceding Page)

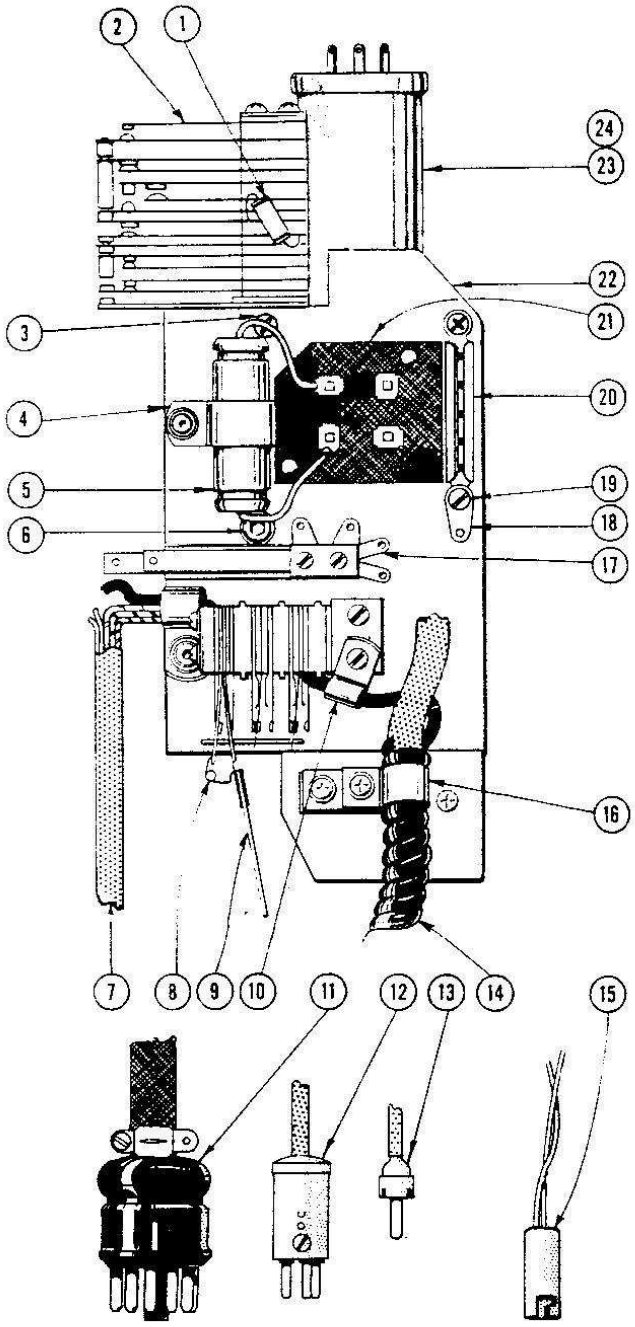
Item	Part No.	Part Name
1	245128	Selection Indicator Slide
2	940410	Solder Lug
	960366	No. 4 x 1/4 R. H. Self Tapping Screw
3	245156	Lamp Socket Contact Spring
	910615	2-56 x 1/2 R. H. Machine Screw
	925072	1202 Lock Washer
	900200	2-56 Hexagon Nut
4	245143	Indicator Slide Contact Spring
	960252	2-56 x 3/16 R. H. Self Tap Screw
5	245156	Lamp Socket Contact Spring
	960252	2-56 x 3/16 R. H. Self Tap Screw
6	245155	Conductor Strip
7	245143	Indicator Slide Contact Spring
	910615	2-56 x 1/2 R. H. Machine Screw
	925072	1202 Lock Washer
	900200	2-56 Hexagon Nut
8	245198	Solenoid Bracket & Stop Assembly
9	245200	Plunger Assembly
10	245159	Solenoid
11	245151	Solenoid Bracket, Upper
12	72230	Flat Washer
13	925343	1206 Lock Washer
14	913240	6-32 x 7/16 R. H. Machine Screw
15	912959	Sems Fastener
16	940695	Solder Lug
17	245142	Dual Lamp Socket Assembly
18	10192	No. 44 Mazda Lamp
19	245191	Roller & Shaft Assembly
20	72272	Flat Washer
21	125448	Retaining Ring
22	245346	Right End Guide
23	925174	1204 Lock Washer
24	911644	No. 4-40 x 3/16 B. H. Machine Screw
25	245212	Rocker Arm Spring
26	245204	Rocker Arm Assembly
27	245209	Drive Shoe
28	245210	Drive Shoe Spacer
29	245154	Toggle Spring
30	245146	Spring Fulcrum Plate
31	72230	Flat Washer
32	912852	Sems Fastener
33	900550	4-40 Hexagon Nut
34	925150	No. 4 Kantlink Lock Washer
35	911912	No. 4-40 x 1/2 B. H. Machine Screw
36	245211	Rocker Arm Shaft
37	125448	Retaining Ring
38	913403	No. 6-32 x 5/8 R. H. Machine Screw
39	925343	1206 Lock Washer
40	245153	Rocker Arm Bracket
41	90030	No. 6-32 Hexagon Cap Nut
42	246343	Drive Bracket
43	245350	Adjuster Wedge
44	245347	Left End Guide
45	404675	Retaining Ring
46	72001	Flat Washer
47	245196	Selection Indicator Insulator
48	245195	Selection Indicator Contact Sleeve
49	245194	Indicator Slide Pin Assembly
50	912852	Sems Fastener
51	72230	Flat Washer



BASE ASSEMBLY

PARTS LIST

Item	Part No.	Part Name
1	246327	Rev. Switch Stop
	901556	Twin Speed Nut
2	246323	Chassis Mtg. Cleat Assembly, R. H.
3	245268	Chassis Mtg. Spring Plug
4	914565	8-32 x 9/16 B. H. Machine Screw
5	245117	Spring Retainer
6	246325	Chassis Mtg. Cleat Assembly, L. H.
7	245116	Chassis Mtg. Spring
8	246322	Base
9	245184	Shipping Bolt
10	72034	Flat Washer 7/8 x 3/8 x 5/64
11	904300	5/16-18 Hex. Nut, 9/16 A. F.
12	245267	Chassis Mtg. Spring, Rear

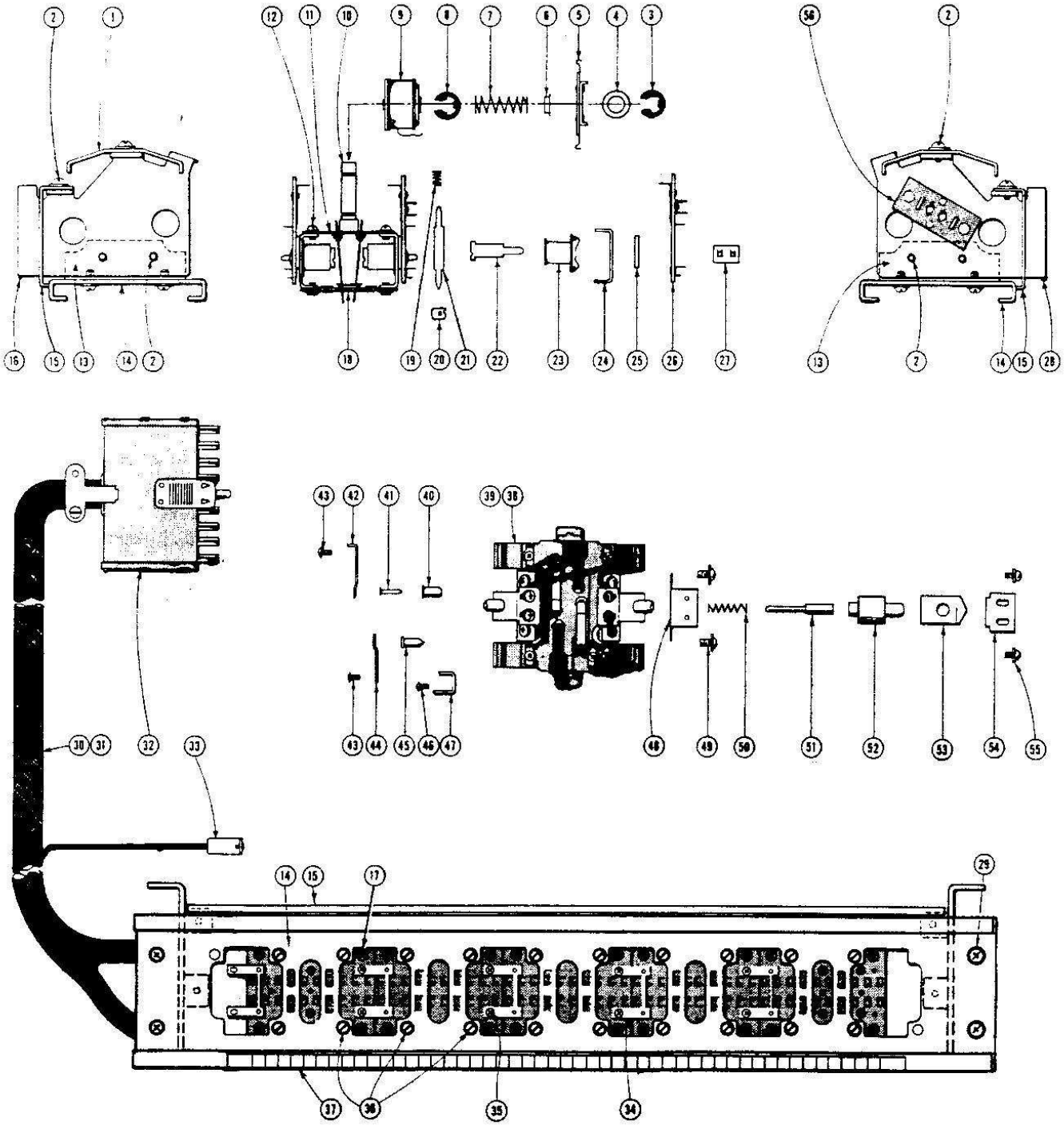


No. 246902

SWITCH PLATE ASSEMBLY

PARTS LIST

Item	Part No.	Part Name
1	82704	1500 ohm 10% w. Resistor
2	246920	Cam Switch
	245944	Switch Stop Plate & Lifter Assembly
	400597	Tension Plate
	912795	5-40 x 2 Fil. H. Mach. Screw, Steel-Cad
3	912920	6-32 x ¼ R. H. Machine Screw
	925343	No. 1206 Lock Washer
4	602190	Plastic Clamp
5	86174	.1 mfd. 600 v. Tub. Condenser
6		Switch Plate Mounting Hardware
	914185	8-32 x ¼ Allen Socket Head Cap Screw
	914545	8-32 x ½ Allen Socket Head Cap Screw
	925434	No. 1208 Lock Washer
	72113	Flat Washer 3/8 O. D. x 11/64 I. D. x 1/32 Thk.
7	245915	Internal Cable
	246934	Taper Tab Receptacle
8	245948	Spring
9	245907	Reversing Switch Assembly, Complete
	245908	Reversing Switch Bracket
	912845	6-32 x 3/16 Sems Fastener
	245946	Actuator Assembly
	245947	Tie Plate
10	602435	Plastic Clamp
	913153	6-32 x 3/8 Sems Fastener
11	250942	11-prong Plug Assembly
12	250938	3-prong Plug Assembly
13	246957	Single Prong Plug
14(a)	246950	Control Cable & Plug Assembly
	246951	Cable Moulded Assembly
(b)	246952	Cable Assembly
	246953	Control Cable, Cable Only
15	250707	Connector
16	602377	Plastic Clamp
17	246944	Clutch & Reset Lever Switch
	912755	5-40 x 1½ Fil. H. Mach. Screw
	400597	Tension Plate
18	940630	Solder Lug
19	912845	6-32 x 3/16 R. H. Machine Screw
20	245910	Terminal Strip
21	245909	Terminal Board
22	245906	Switch Plate
	245918	Riveted Assembly consisting of Items 21 & 22
23	86172	Motor Condenser
24	245917	Condenser Strap

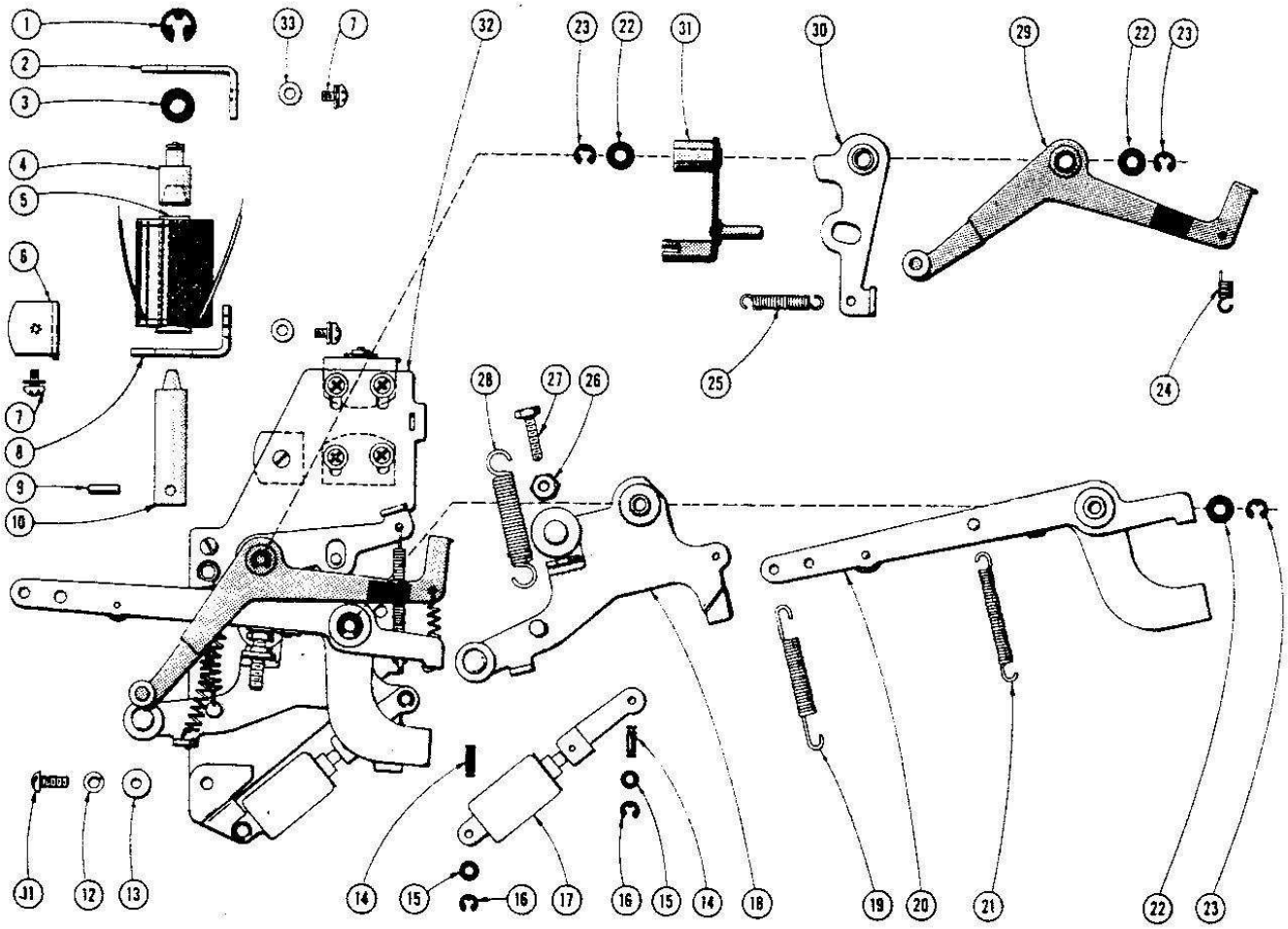


TYPE 100SA8 SELECTOR ASSEMBLY

PARTS LIST for SELECTOR COIL & ARMATURE ASSEMBLY

(Preceding Page)

Item	Part No.	Part Name
1	304357	Cover Plate
2	914225	Sems Fastener
3	304390	Retaining Ring, Bronze
4	304405	Paper Washer
5	304352	Group Magnet Arm. Assembly
6	79539	Eyelet
7	304351	Compression Spring
8	304391	Retaining Ring
9	304346	Group Magnet Assembly
10	304327	Selector Coil & Arm. Assembly
11	304336	Armature Hinge Plate Assembly
12	911625	Sems Fastener
13	304358	Rail End Bracket
14	304326	Selector Block Guide Rail
15	304431	Shield Panel
16	304429	Selector Support Bracket Assembly, L.H.
17	911645	4-40 x 3/16 B.H.Machine Screw
	925150	No. 4 Kantlink Lock Washer
18	304342	Armature Guide Plate Assembly
19	304339	Armature Spring
20	304341	Contact Washer
21	304340	Armature
22	304335	Core
23	304333	Selector Coil
24	304332	Selector Channel
25	304331	Terminal Board Spacer
26	304329	Coil Terminal Board Assembly
27	903050	Twin Hole Speed Nut
28	304430	Sel. Support & Bracket Assembly, R.H.
29	912852	Sems Fastener
30	304437	Cable & Plug Assembly (Items 32, 31 & 33)
31	304438	Cable
32	F9461	27-prong Plug
33	250706	Connector
34	304377	Terminal Lug
35	910499	2-56 x ¼ Phillips B. H. Machine Screw
	925071	Lock Washer
36	911692	Sems Fastener (4-40 x ¼)
37	304397	Selector Lever Number Strip
38	304433	Contact Block Assembly, complete
39	304434	Contact Block
40 / 41	304411	Selection Contact Assembly
42	251268	Contact Spring
43	960252	2-56 x 3/16 R. H. S. T. Screw
44	304369	Dressing Spring
45	304365	Dressing Contact
46	960259	3 x ¼ R. H. S. T. Screw
47	304432	Taper Tab Solder Lug
48	304371	Cancel Coil Mtg. Bracket
49	912959	Sems Fastener
50	304413	Plunger Return Spring
51	304415	Spring & Plunger Assembly
52	304370	Cancel Coil Assembly
53	304396	Pointer
54	304372	Cancel Coil End Bracket
55	911625	Sems Fastener
	72000	Flat Washer
56	301019	Socket Connector



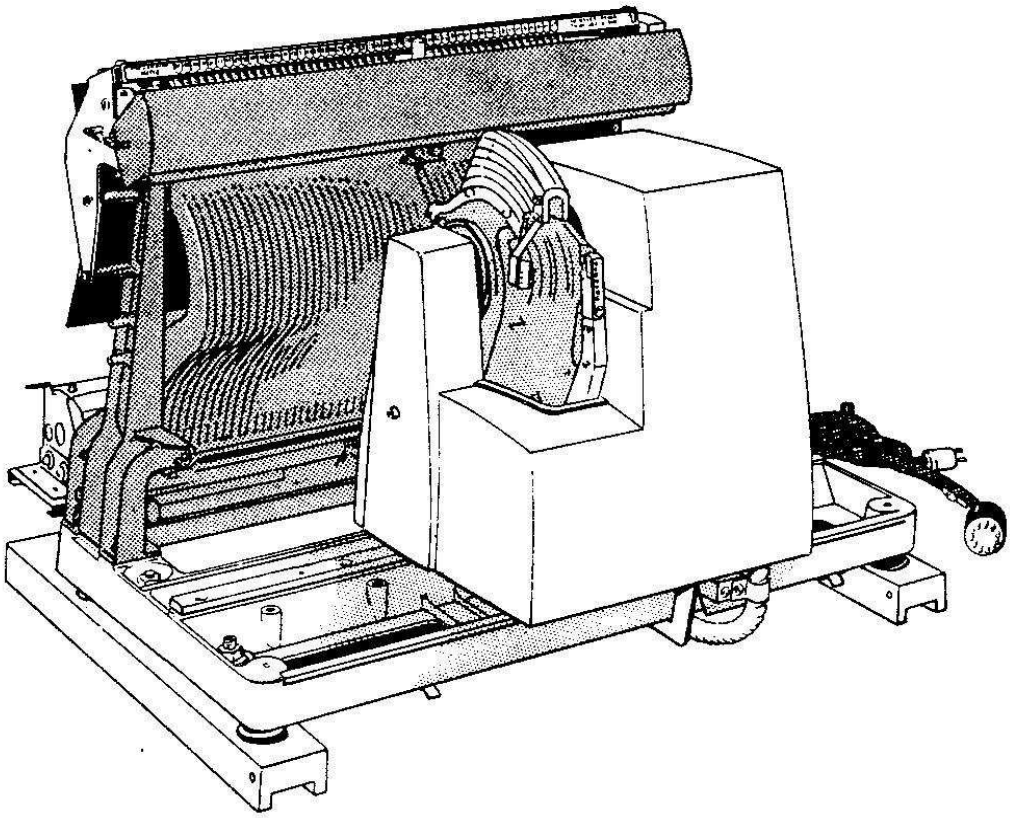
No. 245502 TRIP MECHANISM ASSEMBLY

PARTS LIST

Item	Part No.	Part Name
1	S229220	Retaining Ring
2	245575	Solenoid Bracket - Top
3	400602	Rubber Washer
4	245576	Plug Assembly
5	245578	Solenoid
6	245582	Trip Plate Support Bracket
7	914143	8-32 x 1/4 Sems Fastener
8	245579	Solenoid Bracket - Bottom
9	952250	5/32 x 7/16 Roll Pin
10	245581	Plunger
11	914320	8-32 x 3/8 R. H. Machine Screw
12	925401	No. 8 Lock Washer
13	72279	Flat Washer
14	245523	Dash Pot Pivot Pin
15	72272	Flat Washer
16	125448	Retaining Ring
17	245595	Dash Pot Assembly
18	245588	Reset Lever & Roller Assembly
19	245248	Clutch Spring
20	245525	Clutch Shifting Lever Assembly
21	245573	Clutch Shifting Lever Spring
22	72177	Flat Washer
23	R231163	Snap Washer
24	A250091	Switch Lever Spring
25	245552	Latch Lever Spring
26	901661	8-32 Hexagon Nut
27	245557	Adjustment Screw
28	245550	Reset Lever Spring
29	245539	Switch Lever Assembly
30	245593	Latch Lever Assembly
31	245545	Trip Lever Assembly
32	245583	Mounting Plate
33	72297	Flat Washer

SEEBURG SELECT-O-MATIC "100" MECHANISM

TYPE 145S15-L6



The Select-O-Matic "100" Mechanism, Type 145S15-L6, is designed for use with the Select-O-Matic "100" R. C. Special, Type HHF100R. All information and adjustments of this mechanism are the same as given for the Type 145S14-L6 Mechanism and are indexed on Page 2278.

Parts lists for the 145S14-L6 Mechanism, Pages 2281 to 2299 apply to the 145S15-L6 Mechanism with the following exceptions:

1. The cable assembly shown as item 14 on Page 2296 and the dust shield at the back of the record magazine are listed below.

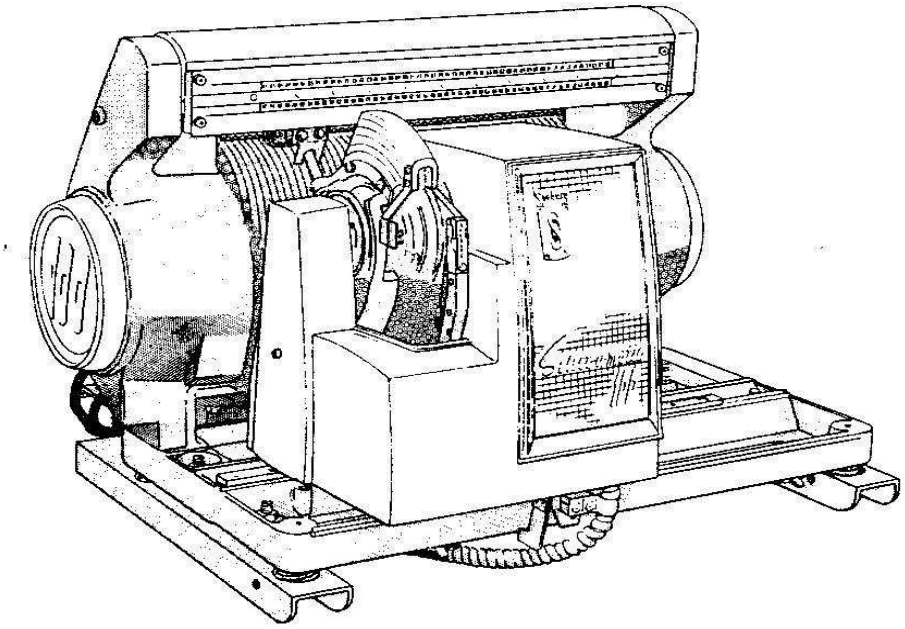
   The cables for the 145S14-L6 and 145S15-L6 mechanism are not interchangeable. The lengths of the cables as well as the locations are different. The cable for the 145S15-L6 also includes a 2-wire tap and socket for a pilot light. The pilot light is a part of the HHF100R Cabinet Assembly used to indicate when the main switch is turned on.

2. The Selector Assembly used is 100SA9 and except for the absence of socket connector item 56, is identical to 100SA8 as shown on Page 2297.

PARTS LIST

Item	Part No.	Part Name
14	246931	Cable Assembly, complete with plugs
	246932	Control Cable, only
(not shown)	251751	2-prong Socket, (for pilot light circuit)
"	245450	Magazine Dust Shield
"	246363	Dust Shield Support Bracket, R. H.
"	246364	Dust Shield Support Bracket, L. H.

SEEBURG
SELECT-O-MATIC "100" MECHANISM
Type 145S16-L6, 145S17-L6, 145S18-L6, 145S19-L6



The Select-O-Matic "100" Mechanism Types 145S16-L6 and 145S18-L6 are designed for use with 45 r.p.m., 7-inch records, in, respectively, the Select-O-Matic "100" Models 100J and 100JL. They are the same as the Type 145S14-L6 Mechanism used in the Model HF100R except in the color of some of the exposed parts and trim: These parts are shown in the list for the Type 145S14-L6 Pages 2281 to 2299. A reference for parts having different numbers due to color difference is given on Page 2304. The Service Data and Adjustments are the same as for the Type 145S14-L6 Mechanism and are indexed below.

All service data and parts lists for the 145S16-L6 and 145S18-L6 apply to the 145S17-L6 and 145S19-L6 mechanisms.

– INDEX –

PARTS LIST

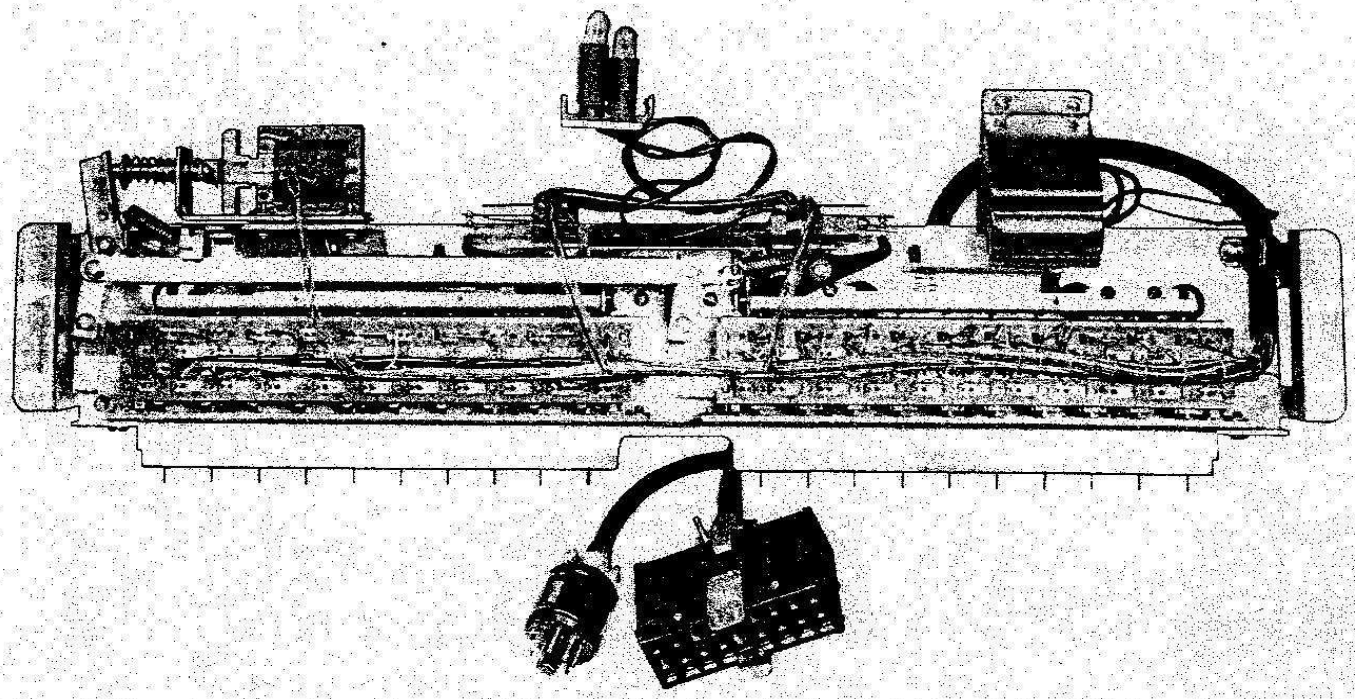
The parts for the Type 145S16-L6 and Type 145S18-L6 Mechanisms and for the Type 145S14-L6 Mechanism are interchangeable and the same in all respects except in the color of some of the exposed items and are shown in the lists, Pages 2281 to 2299. Parts having a different color have a different part number and are listed below. These part numbers must be used when 145S16-L6 or 145S18-L6 parts are ordered.

REFERENCE PARTS LIST

PAGE	ITEM	PART NO. (145S16-L6)	PART NO. (145S18-L6)	PART NAME
2281	1	246394	246487	Magazine End Housing Assembly, L. H.
	1	246396	246485	Magazine End Housing, L. H.
	3	304456 (100SA10-L6)	304458 (100SA11-L6)	Selector Assembly (Page 2297)
	4	246380	246240	Base Assembly (Page 2295)
	5	246393	246486	Magazine End Housing Assembly, R. H.
	5	246395	246484	Magazine End Housing, R. H.
	7	246390		Carriage Cover Assembly
	7	246391		Carriage Cover
	7	246392		Carriage Cover Escutcheon
	8	246397		Magazine End Cover Insert
2285	7	914332		8-32 x 3/8 Sems Fastener
		918921		Set Screw
		903801		¼ - 20 Hex Nut
	9	247226		Thrust Screw Casting
	13	922272		Flat Washer, Spring Steel .015 Thick
2287	9	246230	246242	Stripper Plate
	56	246232	247366	Clamp Arm & Pin Assembly
	59	246235	247368	Pivot Pin & Block Assembly
2289	51	246707	247732	Pickup Arm & Roller Assembly
2291	5	246384		Indicator Bracket & Stud Assembly, L. H.
	10	246389	247488	Cover & Stud Assembly
	12	246385		Selector Indicator Channel Assembly
	17	246443	246456	Magazine Support, R. H.
	17	246444	246457	Magazine Support, L. H.
	28	246440	246453	Separator & Channel Assembly
	29	246445		Number Strip
	30	246383		Indicator Bracket & Stud Assembly, R. H.
2293	42	246388	246239	Drive Bracket
2295	1	246382	246327	Rev. Switch Stop
	1	901560	901561	Twin Speed Nut
	2	247017		Chassis Mtg. Cleat Assembly, R. H.
	3	247046		Chassis Mtg. Spring Plug
	3	247047	247104	Felt Plug
	4	247048		Chassis Mtg. Spring Screw
	6	247018		Chassis Mtg. Cleat Assembly, L. H.
	8	246381	246241	Base
2297	15	304439	304470	Shield Panel

ELECTRICAL SELECTOR

Type ES11-L6



The Electrical Selector, Type ES11-L6, is an assembly with two in-line selector switch assemblies of ten switches each. It is designed for use with the Select-O-Matic "100" Model HF100R and is operated from a selector key panel that has a row of ten lettered keys and a row of ten numbered keys. The Selector key panel is not a part of the Electrical Selector assembly but is part of the phonograph cabinet.

The Electrical Selector is part of an electrical system which includes the Type CCU-3 Credit and Cancel Unit in the Selection Receiver and the Selector (Coil) Assembly on the Select-O-Matic Mechanism. Its principle functions are to connect a selector coil circuit and a group magnet of the Selector Assembly to current supply circuits in the Selection Receiver and to complete a circuit that initiates the operational sequence of the system. These functions are performed when two selection switches – one in each of the two selector switch assemblies – are operated by pressing a lettered selector key and a numbered key. The keys may be operated in either sequence – first a numbered key, then a lettered key or a lettered key followed by a numbered key.

The component parts of the Selector are assembled on a steel frame and are protected by a steel cover. The complete Selector is easily removed from the cabinet, however, all switch contacts and adjustments are accessible without doing so. All electrical connections to the associated Credit and Cancel Unit and to the Selector (Coil) Assembly are made with an octal plug and a 27-prong plug.

The principle component parts of the Selector include, in addition to the two selector switch assemblies, a latch bar operating solenoid, a credit indicating light, a selection service switch and two switch groups each of which has two pairs of contacts. There is also a counter that totals the number of selections made with the Selector and with Wall-O-Matics that may be used for remote selection.

The Credit indicating (SELECT) light connects to a credit circuit through the Credit and Cancel Unit and is lighted when a credit switch is closed. It indicates, when lighted, that selection can be made.

The selection credit switch is a push button type. When it is held in the pushed position, selections can be made without setting up credits.

The Letter and Number selector switch assemblies are identical and interchangeable. They each incorporate a latch bar and ten selection switches for connecting the current supply to the desired selection coil circuits. The latch bar function is to hold a selection switch (and selector key) in the pressed-in position when a selection is being made and to release it when the selection sequence is completed. The bars in both switch assemblies are controlled through levers, by the latch bar solenoid.

The linkage between the latch bar solenoid and the latch bars is spring biased so the bars are in a position that permits free in-and-out movement of the selection switches when the solenoid is not energized. When the solenoid is energized, the bars move to a position in which they will hold a pressed-in switch. The solenoid is energized when a credit switch in the Credit and Cancel Unit is closed.

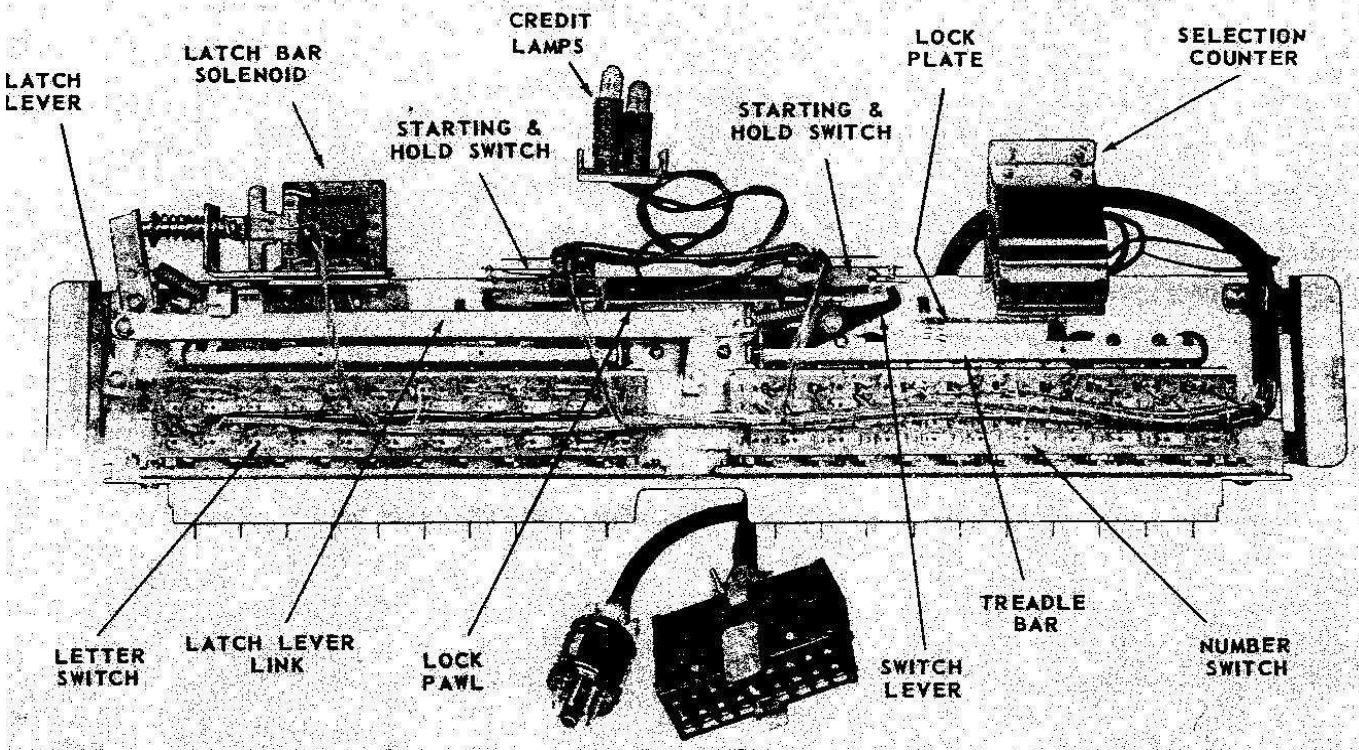


Figure 1.

Each selector switch assembly is associated with a switch group comprising two spring-leaf switches that are operated through a treadle bar, a switch lever, and other levers shown in Figure 4. The switch contacts toward the front of the assembly are Hold Switches; the others, toward the back, are Starting Switches.

The two Hold Switches are parallel connected and are part of a timing relay circuit. In the normal, at-rest position these contacts are held open by the switch lever, (Figure 4). When a selection switch is pressed, its shaft moves against the treadle bar which, in turn, causes the switch lever to pivot so the contacts of the Hold Switch will close. The switch will close when the selection switch has travelled only a short way.

The Starting Switches in the two groups are in series and are part of a cancel circuit of the Selector system. When both switches are closed the cancel solenoid in the Credit and Cancel Unit is energized. The associated circuit is shown in the simplified diagram, Figure 2.

The Starting Switches are linked to their related selector switch assemblies so they close simultaneously when the second key of a selection is pressed. The second key may be that of a letter switch or a number switch and the operation will be essentially the same for either sequence.

The linkage between each Starting Switch and its related selector switch consists of the treadle bar and switch lever (that also operates the Hold Switch), a lock pawl, a lock plate and a coupling spring. These are shown in Figure 4.

When a selection switch is pressed in, the shaft tilts the treadle bar against the switch lever and, through the coupling spring, applies pressure against the vertical part of the lock plate. It should be noted that the only pressure applied to the lock plate is through the coupling spring. The lock plate is hinged on the same pins that support the treadle bar and, if it were free to move, it would close the related starting switch. The lock plate, however, cannot be moved by the force through the coupling spring because it is held by two lock pawls.

These two lock pawls are concentric and pivot on hinge pins that are common to both. Each pawl has, at each end, a hook that engages a blued steel blade that is riveted to the horizontal part of each lock plate. The pawls are designed so that in the normal rest position, their hooks engage independently, each of the lock plates. In this at-rest position they prevent the lock plates from being moved by the force exerted by the coupling spring.

There is also a vertical projection on each of the lock pawls. The outer pawl has the projection at the left end; the inner pawl has it at the right end. The switch levers, when pivoted by the treadle bars, bear against the lock pawl projections so the pawls swing toward the back of the selector and the hooks are no longer engaged with the blades on the lock plates. A letter selection key, when pressed, will swing the outer lock pawl so its hooks clear both lock plates; operation of a number switch key swings the inner pawl so its hooks do not engage the lock plates if both letter and number keys are pressed, both pawls are moved and both lock plates are free to operate from the

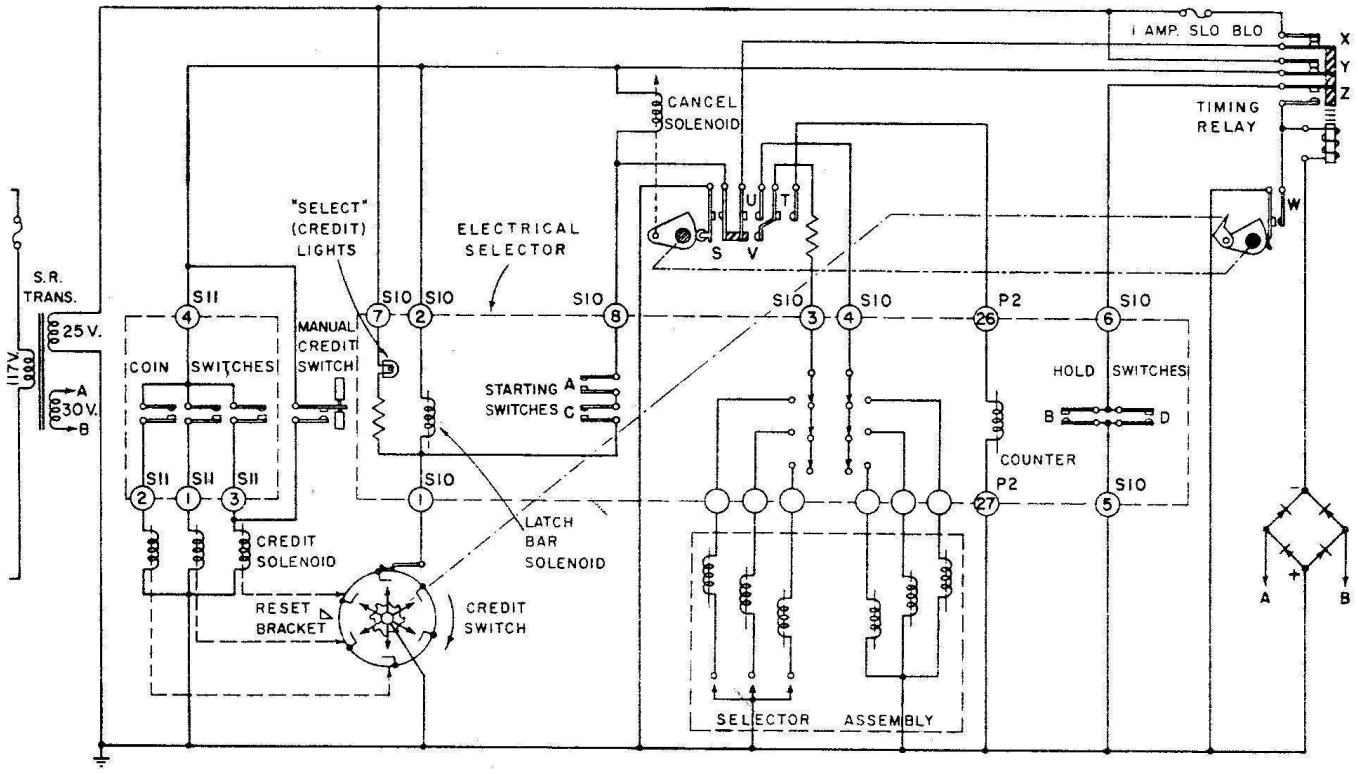


Figure 2.

force applied to them by the coupling springs. Because the coupling spring force builds up as the selector keys are pressed, both lock plates will pivot when released by operation of the lock pawl associated with the second selector key whether the second one is a letter or a number key. The purpose in releasing the lock plates in this manner is to delay closing either Starting Switch until both letter and number keys are operated.

The lock plates have two other functions. When they are tilted enough to close the starting switches, they lock the selection switches in either the pressed-in or released position and they also prevent starting switch losing if, in addition to a normally operated selection switch, there is one that is pressed in part way. Both functions are closely related and make use of the vertically formed front edges of the lock plates and the projections that are on the lower edges of the selection switch shafts.("X", Fig. 4)

The lock plates are arranged in relation to the selection switches so their vertical front edges stop against the switch shafts when they are released by the lock pawls. This places the edges in the line of travel of the projections on the switch shafts and, at the same time, determines how far the plates can tilt. Also, When the plates are in the tilted position, the projections on switches in the normal released position are in front of the edge. Switches that have been pressed in far enough to cause the lock pawls to release the plates will have their projections back of the edge. The plates, then, when tilted, lock out all selection switches except those that were fully pressed to release them.

If a selection switch in the letter and number switch assemblies is pressed in and, in addition, another in either or both groups is moved partially to the pressed-in position, the lock plates will be released by the pawls but the plate associated with the partially pressed-in switch will not move to its fully tilted position. It is prevented from doing so by the projection on the shaft of the partially pressed in switch. When this occurs, the related starting switch will not close because it is adjusted to close only when the plate is fully tilted.

Because the operation sequence of the selection system cannot be started until both starting switches are closed, it is necessary that selection switches in the letter and number switch assemblies are pressed in fully and that those that are not used for selection are locked in the released position.

The principle elements of the Credit and Cancel Unit which is an integral part of the electrical selector system are a credit switch and three credit solenoids, a cancel solenoid, two cam operated switch groups and a timing relay. These may be identified in Figure 3.

The credit switch is a rotating element supporting six equally spaced snap-action switches which are parallel connected and terminate at a collector ring and the grounded frame of the unit. The snap-action switches are operated by the plungers of the credit solenoids. One solenoid is operated by the

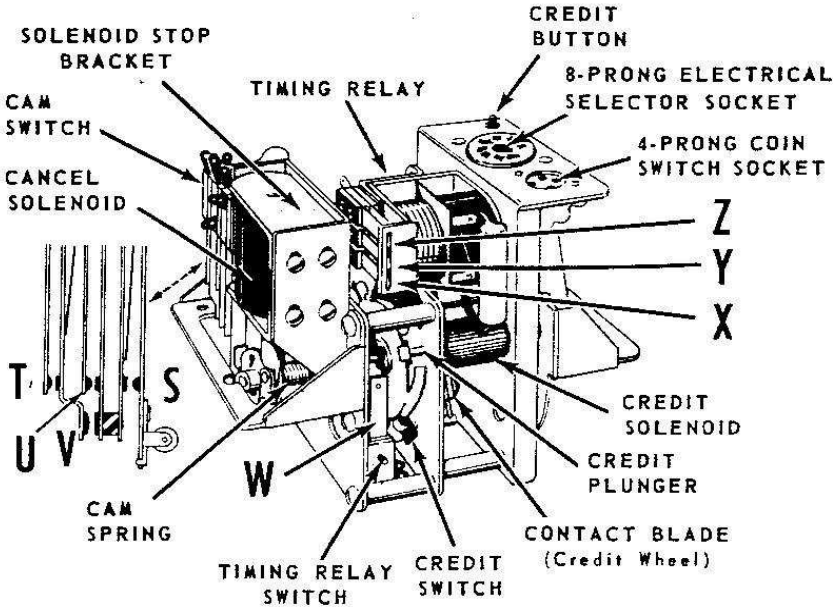


Figure 3.

nickel operated coin switch, one by the dime coin switch, one by the quarter switch. Closing any one of the snap-action switches establishes "credit" so selections can be made. Each time a selection is made, the cancel solenoid in the Unit advances the snap-action switches one sixth turn. They are advanced, therefore, one position – the distance between them – for each selection made.

A reset bracket is mounted on the assembly so a snap-action switch moves past it each time a selection is made. When a snap-action switch that has been turned "on" (by a credit solenoid plunger) passes the bracket, it is engaged by the bracket and reset to the "off" position.

The "5¢ solenoid" is mounted so its plunger turns on the snap-action switch which is one position from the reset bracket. Because the switch will be opened with one operation of the cancel solenoid, one credit is set up when a 5¢ coin is deposited.

The "10¢ solenoid" turns on the snap-action switch which is two positions from the reset bracket allowing two selections to be made before the switch is reset.

The "25¢ solenoid" is six positions from the reset bracket and will turn on a snap-action switch permitting six selections to be made.

The cancel solenoid plunger is linked to one of the switch cams so the cam is rotated approximately 60 degrees when the solenoid is energized. This cam is pinned to a shaft which drives the other of the two switch cams. A pawl on the second cam engages a ratchet on the credit switch and moves it one position each time the solenoid plunger operates.

The Timing Relay operates with approximately 25-volts d.c. which is supplied through a selenium rectifier in the Selection Receiver. The relay is loaded with copper slugs to cause slow starting of the armature and introduce a time delay for positive control of the current pulse to the selector coils and group magnet in the selector assembly on the Select-O-Matic mechanism.

The sequence of operation of the Electrical Selector system begins when a coin passes through the slug rejector and momentarily closes a coin switch. When the coin switch is closed, a credit solenoid in the Credit and Cancel Unit is energized and the solenoid plunger closes a snap-action credit switch. With the credit switch closed, the credit indicating light is turned on and the latch bar solenoid is energized so selection buttons will latch in place when pressed.

As selection is made by pressing a lettered button and a numbered button (simultaneously or in either sequence), the hold circuit switches are closed, a selector coil circuit and a group magnet are connected to their respective current supply circuits and the starting switches close to complete a circuit to the Cancel Solenoid.

The "S", "T", "U", "V", and "W" contacts of the two switch groups in the Credit and Cancel Unit are closed when the plunger of the Cancel Solenoid rotates the switch cams. Contact "S" parallels the starting switches in a carry-over circuit to insure a full stroke of the cancel solenoid plunger. Contacts "U" and "V" complete the selector coil and group magnet circuits so the coil and magnet are energized and a selector lever is moved to the playing position. Contact "T" completes the circuit for operation of the selection counter solenoid which is part of the Electrical Selector. Contact "W" completes the timing relay circuit so the relay is energized.

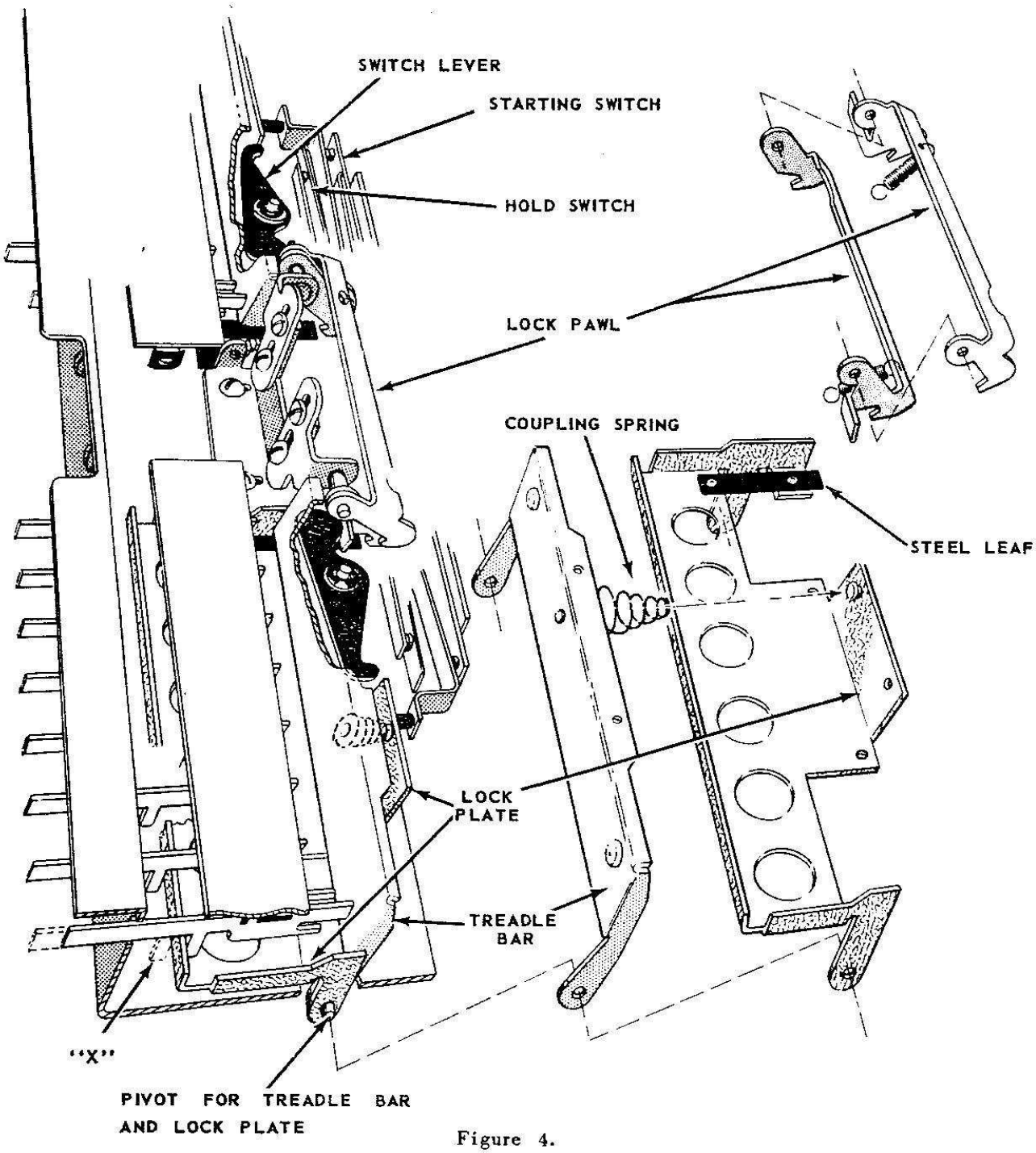


Figure 4.

The timing relay, after an interval of delay due to the copper slugs, opens the "X" and "Y" contacts and closes the "Z" contacts. Contact "X", when opened, breaks the selector coil and group magnet circuit cutting off the current to those coils. Contact "Y" opens the circuit to the cancel solenoid and the latch bar solenoid. Contact "Z", in series with the two hold switches in the Electrical Selector, will hold the timing relay energized as long as any button of the Selector is held in the operated position. The time during which the selector coil is energized is effected by the gap of contact "W"; the delay in starting of the timing relay and the gaps of contacts "U" and "V".

When the circuit of the cancel solenoid is interrupted at contact "Y" of the timing relay, its plunger is returned to normal position by a spring. On the return stroke, the credit switch operating pawl engages in the switch ratchet and advances the switch. When the latch bar solenoid is no longer energized, the selector keys are released and can return to their normal position.

REMOVAL OF ELECTRICAL SELECTOR

All adjustments of the mechanical linkage, all switch adjustments and all circuits of the Selector are accessible for inspection and service without removing it from the cabinet. The entire unit may, however, be removed by pulling out the two connecting plugs at the end of the cable and taking out two screws that are readily accessible, back of the selector key panel, at each end of the Selector frame.

When replacing the Selector in the cabinet it should be fastened securely with the mounting screws. It should be positioned so there is a little clearance between the ends of the selection switch shafts and the back of the selector keys. If it is too far toward the keys the selection switches may not return far enough to the released position to open the timing relay circuit.

REPLACING CREDIT LIGHTS

Access to the credit (SELECT) lights may be had by pulling the socket assembly from back of the selector key panel. The light assembly is replaced with the lamps one above the other and the edge with the two spring clips at the top.

LUBRICATION

Oil all pivots with one (1) drop *Seeburg No. 53014 Special Purpose Oil.* Use Aero Lubriplate * sparingly at place shown in Figure 5.

* *Aero Lubriplate is available at your distributor.*

The selector key panel, complete with the keys, can be removed by pulling up on the sliding catches that are behind the panel and at each end of it.

The individual selector keys pivot, at the upper end, on a projection in the key frame. They may be removed by swinging inward at the bottom after loosening the key bearing strip. The upper end of the keys are prevented from rattling by spring clips that extend under adjacent keys. The clips will be loose and can fall from place if two adjacent keys are removed from the frame.

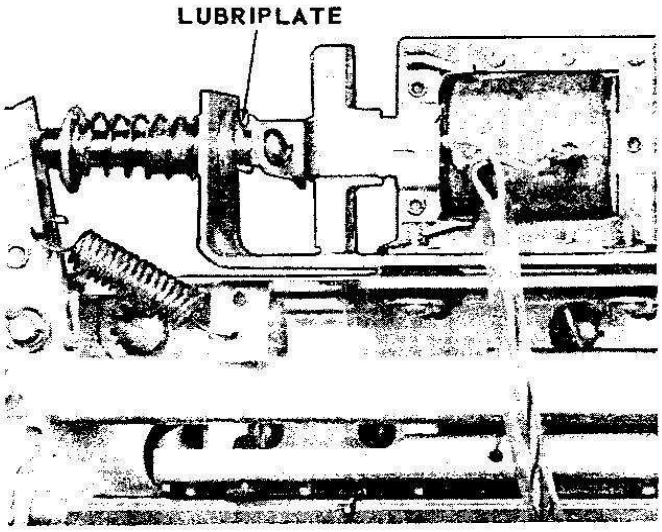
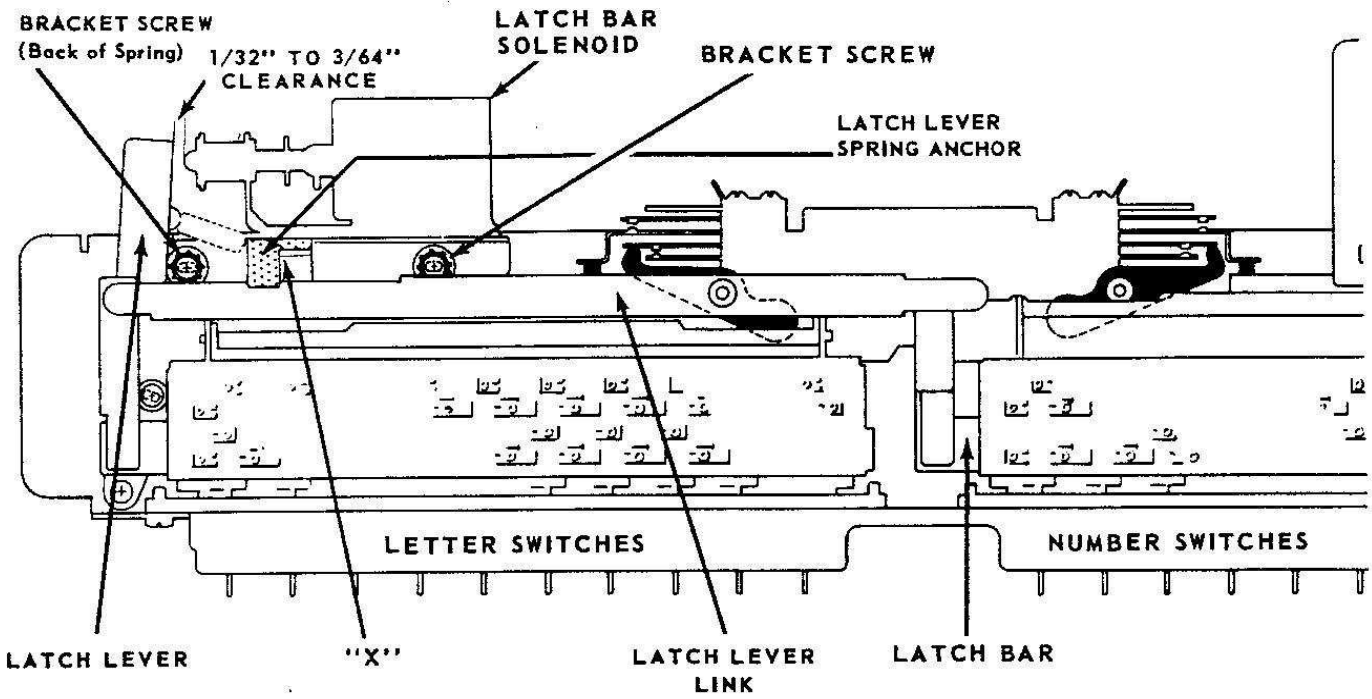
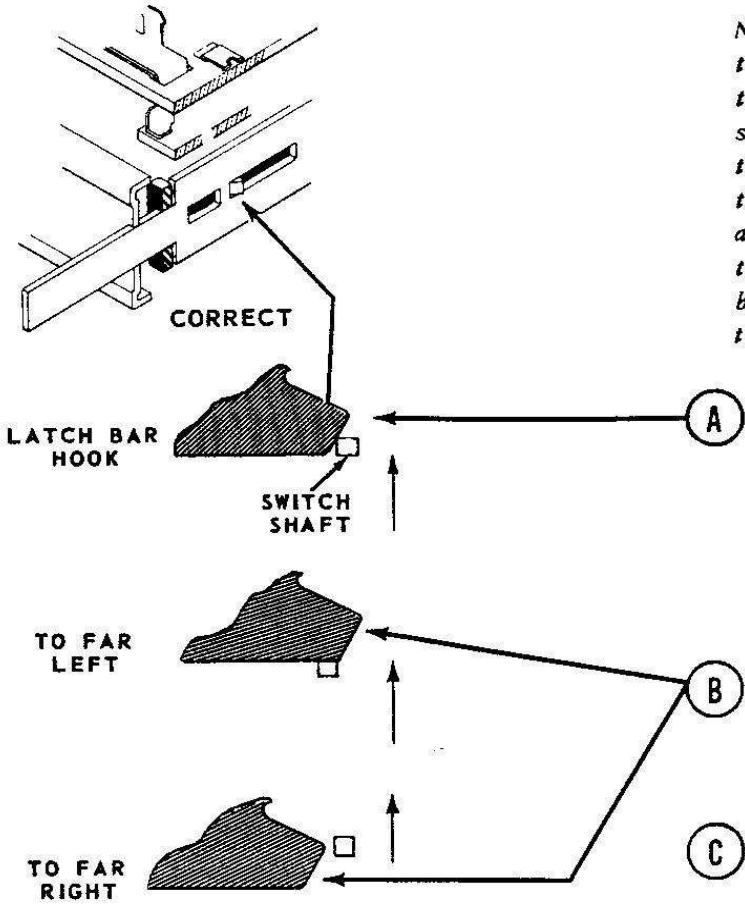


Figure 5.

NUMBER SWITCH ADJUSTMENT

This adjustment positions the latch bar in the NUMBER selector switch so that when credits are established, the numbered selector switches will latch in the pressed-in position but permit change of selection by operating another numbered switch.





NOTE: When making this adjustment the selector key panel should be removed for observing the latch bar position; the latch bar solenoid should be in the energized position; the projection on the latch lever link should be against the latch lever spring anchor at "X"; linkage and levers must be free to move without binding; there should be 1/16" to 3/32" clearance between the tip of the latch bar solenoid and the latch lever.

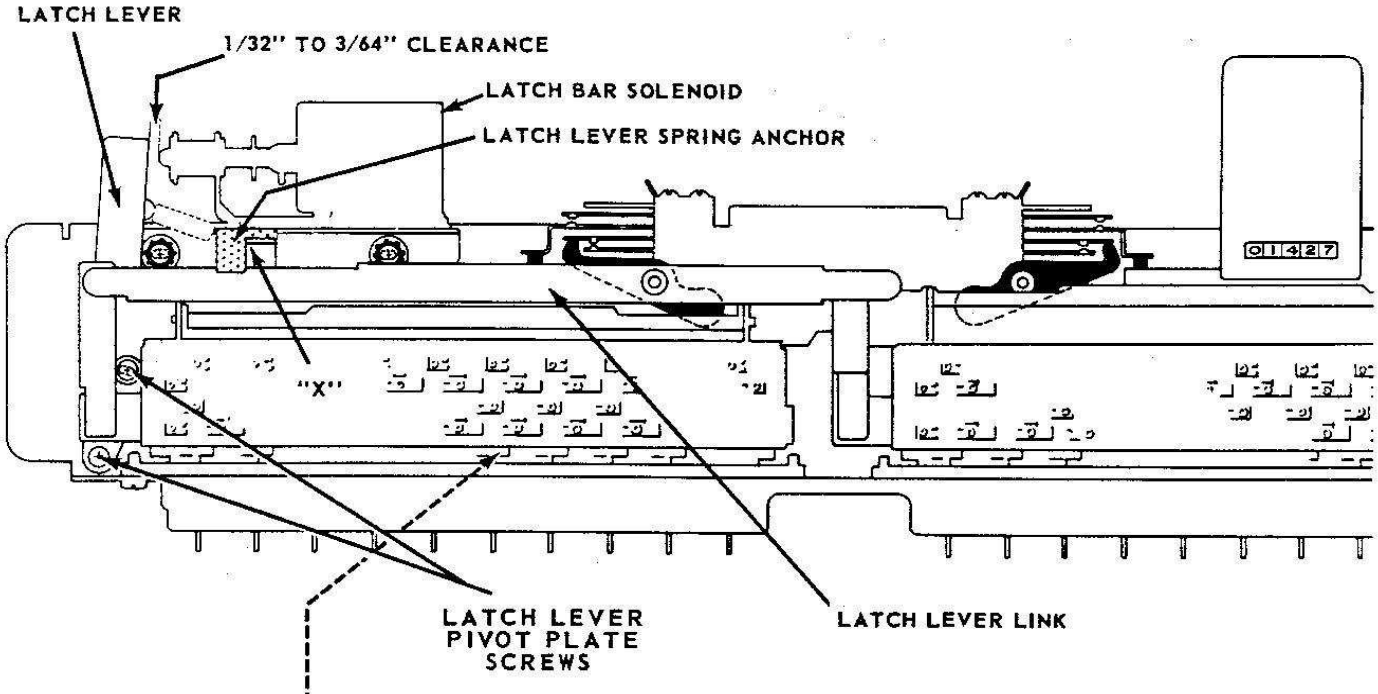
(A) Loosen the screws holding the Latch Bar Solenoid Bracket and adjust the position of the bracket and solenoid so the shaft of a number selector switch, when pressed in, will engage the latch bar at the midway point of the sloping edge of the latch bar hook as shown.

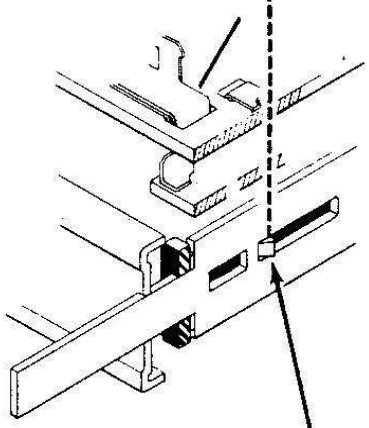
(B) If the Solenoid is too far to the left, the selector keys will be locked. If the Solenoid is too far to the right, the selector keys will not latch or the latching will be erratic.

(C) After the correct position of the Solenoid has been made, the bracket holding screws must be securely tightened.

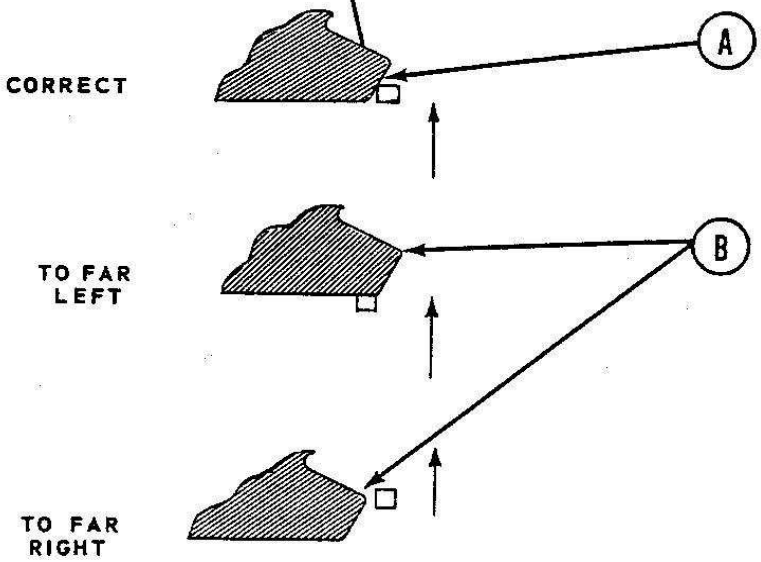
LETTER SWITCH ADJUSTMENT

This adjustment positions the latch bar of the LETTER selector switch so the lettered selector switches will operate in the same manner provided for the numbered switches in adjustment No. 1.





NOTE: When making this adjustment the selector key panel should be removed for observing the latch bar position; the latch bar solenoid should be in the energized position; the projection on the latch lever link should be against the latch lever spring anchor at "X"; linkage and levers must be free to move without binding; there should be 1/16" to 3/32" clearance between the tip of the latch bar solenoid and the latch lever.



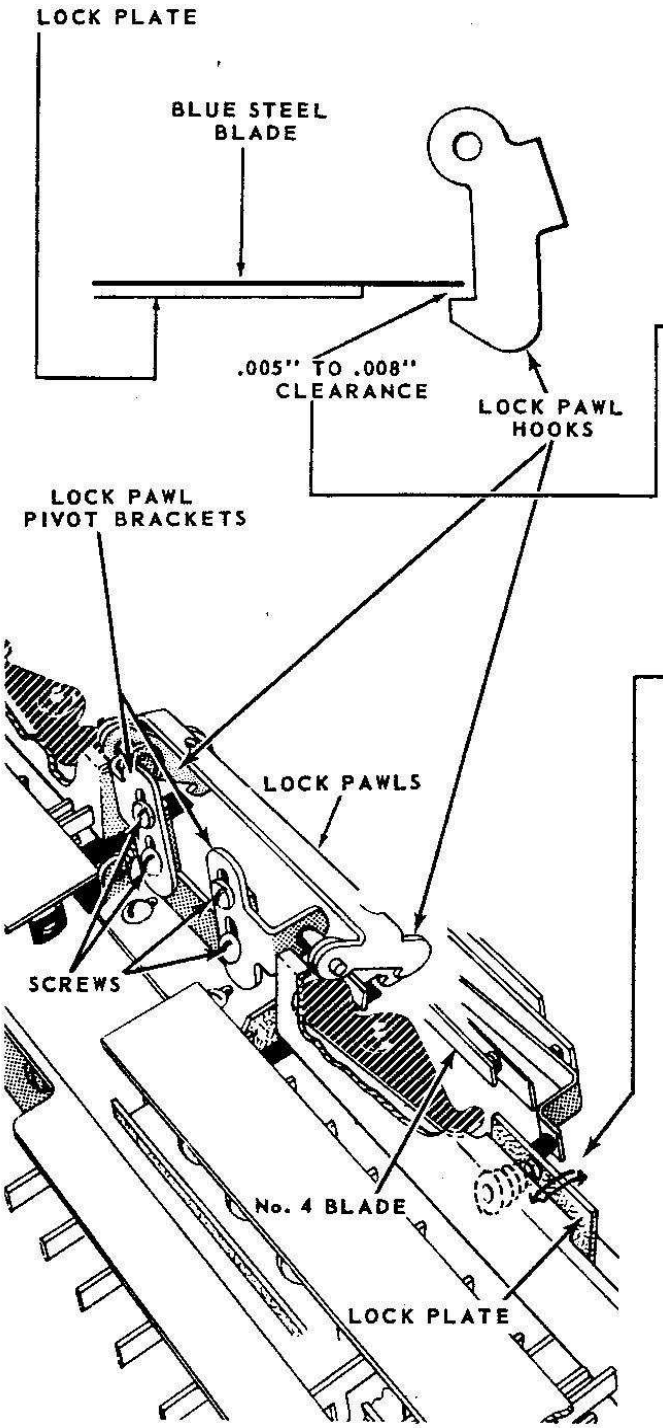
A Loosen the screws holding the latch lever pivot plate and shift the plate so the shaft of a lettered selector switch, when pressed in, will engage the latch bar at the midway point of the sloping edge of the latch bar hook.

B Check this adjustment by pressing a numbered and a lettered selector key while manually holding the Latch Bar Solenoid in the energized position then slowly releasing the solenoid. The lettered and the numbered keys should release at the same time. If the pivot plate is too far to the left, the lettered switch key will release before the numbered key; if the plate is too far to the right, the lettered key will release after the numbered key.

LOCK PAWL 1 – VERTICAL POSITION

This adjustment positions the Lock Pawls, vertically, for correct clearance between their hooks and the blue steel blades on the Lock Plates.

***Lock Pawl 1 and 2 adjustments are so related that a change of one may require readjustment of the other.



(A) Loosen four screws holding the Lock Pawl Pivot Brackets.

(B) Adjust the position of both ends of the Lock Pawls by moving the Pivot Brackets up or down to establish .005 "to .008" clearance between the hooks on the Lock Pawls and the lower surfaces of the blue steel blades on the Lock Plates.

(C) Tighten the screws and check for clearance by gently rocking each Lock Plate. The movement noted at the upper edge of the vertical part of the Lock Plates should be approximately .010". (.010" is the thickness of the No. 4 switch blade.)

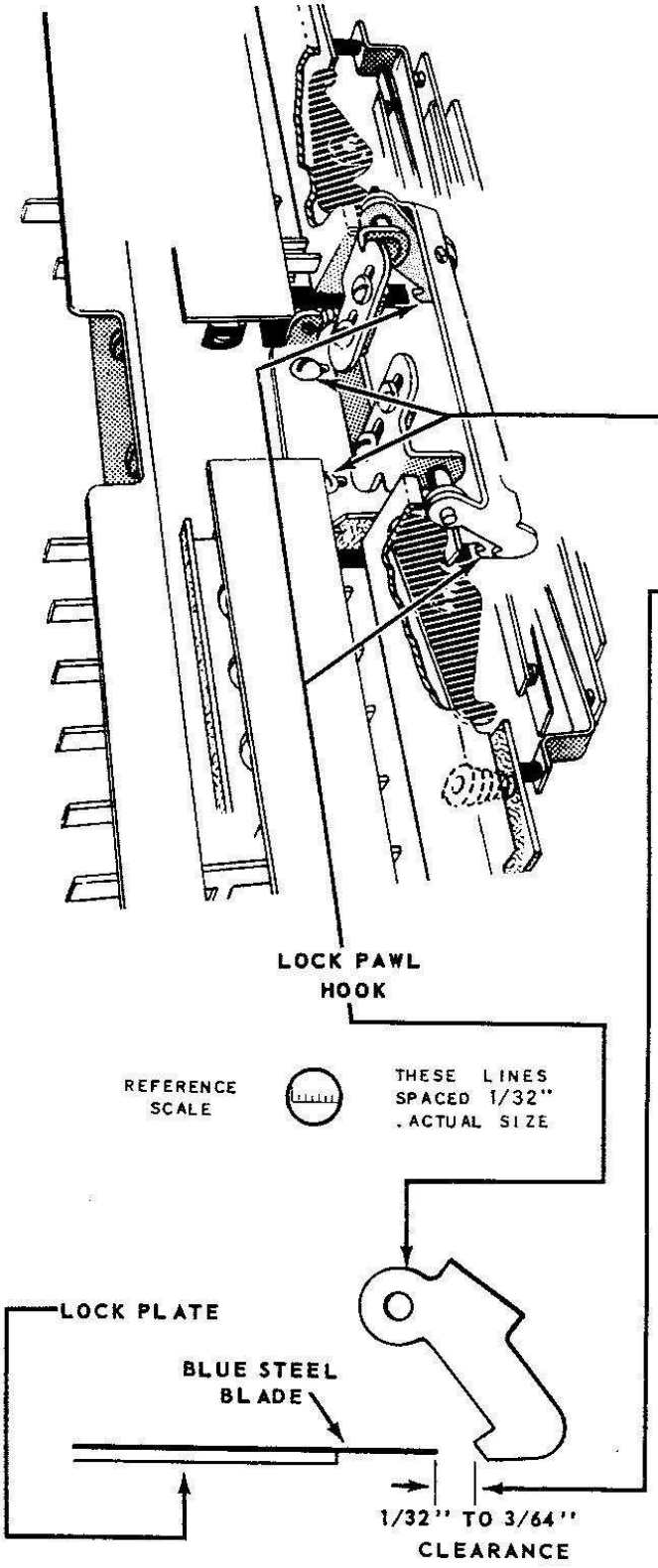
NOTE: If the Lock Pawl Brackets are too high there will be no movement noted of the vertical part of the Lock Plates. Lack of movement indicates not enough clearance to permit the Pawl hooks to move freely under the blue steel blades.

If the Brackets are too low there will be excessive hook clearance that will be indicated by too much movement of the Lock Plates. Excessive clearance and Lock Plate movement can result in premature closing of the Start Switches or in a requirement of critical adjustment of them. It can also cause premature lockout of the selection switches so a latched-in switch cannot be released by operating another one.

LOCK PAWL 2 – HORIZONTAL POSITION

This adjustment establishes the horizontal position of the Lock Pawls so the Pawl hooks will release the Lock Plates before the selection switches are latched.

***Lock Pawl 1 and 2 adjustments are so related that a change of one may require readjustment of the other.



(A) With power turned off, block or tie the Latch Bar Solenoid plunger in the energized position.

(B) Press a Letter Switch and a Number Switch to the latched position.

(C) Loosen the two screws holding the Lock Pawl Bracket.

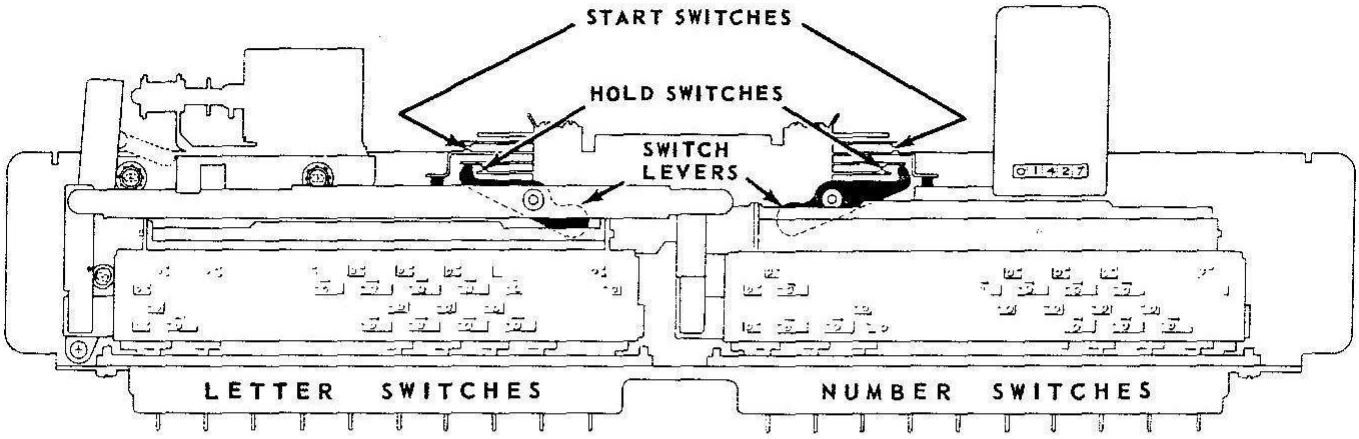
(D) Position the Bracket so it is parallel with the selector frame and so there is 1/32" to 3/64" clearance between the Lock Pawl hooks and the ends of the blue steel blades of both Lock Plates. This clearance should be the same at both ends of the Lock Pawls so both Lock Plates will be released simultaneously.

(E) Tighten Bracket holding screws.

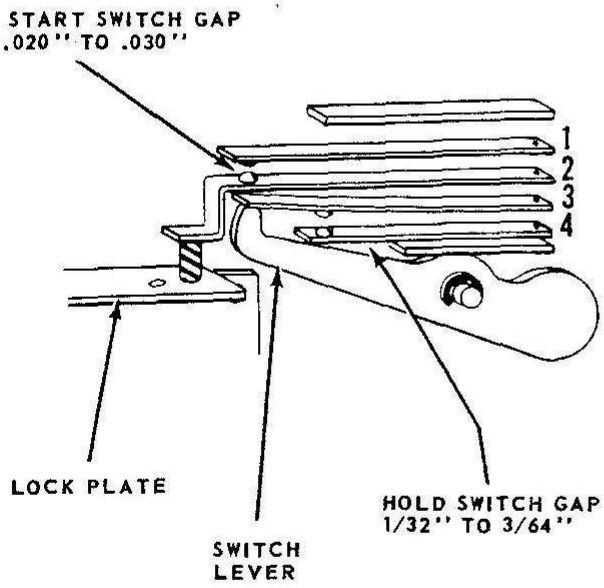
Check adjustment by fully latching a letter switch then slowly operating a number switch. Both Lock Plates should be released simultaneously just prior to selection switch latching. Check also by first latching a number switch, then slowly operating a letter switch. It should not be possible to latch any switch without releasing the Lock Plates.

HOLD SWITCH AND START SWITCH ADJUSTMENT

The Hold Switches are open 1/32" to 3/64" in the at-rest position and close when an associated selection switch shaft is pressed in.
The Starting Switches are open 1/64" to 1/32" in the at-rest position and close only when both letter and number switches are pressed.



NOTE: Before making switch adjustments, each treadle bar and lock plate should be checked for free and smooth operation. There should be some end-play on both. The treadle bars, when slowly released by the selection switches, should have complete return to the at-rest position with their rubber bumpers against the selector switch frames: The vertical and horizontal adjustments of the lock pawls should be checked for correct operation of the lock plates.



(1) With all selection switches in the released position.

A. Bias No. 3 blades against the end of the switch levers with spproximately 2 oz. pressure as measured at the tip of the blades.

B. Adjust No.4 blades for .030" to .050" gap (1/32" to 3/64").

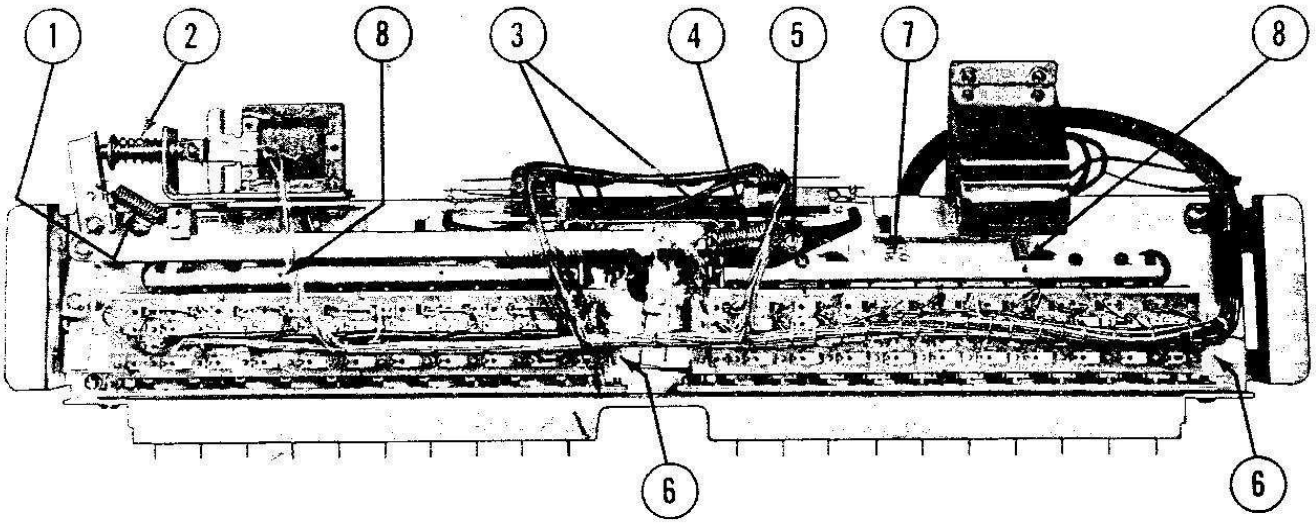
C. Bias No. 2 blades so the fibre lifts bear against the lock plates with approximately 1 oz. pressure as measured at the tip of the blades.

D. Adjust No. 1 blades and bracer blades for .020" to .030" gap (1/64" to 1/32").

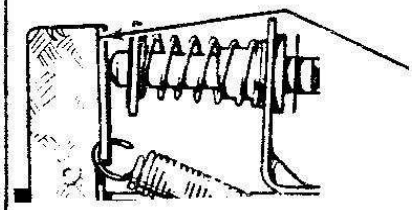
(2) Check operation of Start Switches and Lock Plates:

A. With only one selection switch operated, either letter or number, its associated Start Switch should not close.

B. With latch bar solenoid in credit position, press in a letter switch to latched position and partially operate (1/16" to 1/8") a number switch. While holding this position of the number switch, fully operate a second number switch and note that neither Start Switch closes due to interference between the horizontal part of the lock plate and the projection on the lower edge of the selection switch shaft. With the selector switches in this position, the Starting Switch gaps should not be less than 1/64". Both Starting Switches should close when the partially operated switch is released or fully pressed in. This test should be made with partial operation of letter switches A, E and K and number switches 1, 5 and 0. Failure to operate in this manner indicates incorrect Starting Switch adjustment or incorrect vertical position of lock pawls. See Lock Pawl No. 1 Adjustment notes.



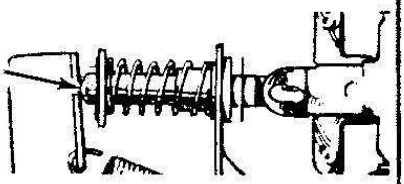
1 LATCH LEVER SPRING



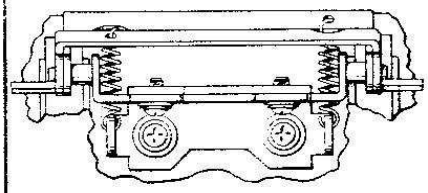
9 TO 10 OUNCES HERE TO MOVE LATCH LEVER.

2 COMPRESSION SPRING

1 LB. HERE TO START MOVEMENT OF SOLENOID ARMATURE.

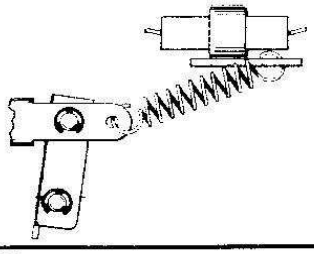


3 PAWL SPRING



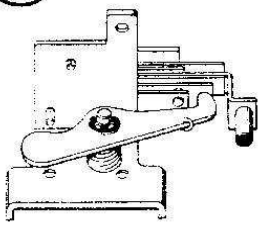
FORCE REQUIRED TO LIFT PAWL CLEAR OF BLUED STEEL BLADE 2 TO 2½ OUNCES.

4 LINK RETURN SPRING



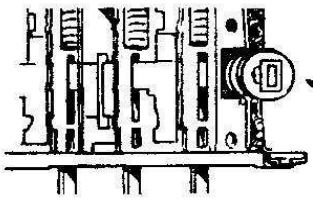
REMOVE SPRING. STRETCH TO 1-3/4 INCHES (NO CREDIT POSITION) FORCE SHALL BE 1 LB. AND 6 OUNCES.

5 SWITCH LEVER SPRING



FORCE OF 4 TO 4½ OUNCES REQUIRED TO START LEVER TIP MOVING AWAY FROM SWITCH BLADE. NULLIFY AFFECT OF NO. 4 BLADE BY RETRACTING.

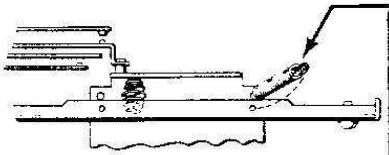
6 LATCH BAR SPRING



6 TO 7 OUNCES HERE TO START MOVEMENT.

7 COUPLING SPRING (Compression)

REMOVE LOCK PLATE SPRING AND FORCE FROM SWITCH LEVER AND NO. 3 SWITCH BLADE. MEASURE FORCE AT TOP OF TREADLE BAR-2½ TO 3 OUNCES.



8 LOCK PLATE SPRING

RETURNS THE LOCK PLATE FULLY TO NORMAL REST POSITION AND HOLDS IT THERE, SO TIP OF THE LOCK PAWL HOOK CAN MOVE FREELY UNDER BLUED STEEL BLADE. SERVES AS TIE BAR LINK NOT AS A SPRING.

CREDIT AND CANCEL UNIT

MECHANICAL ADJUSTMENTS

1. The Pawl Arm Stop limits the rotation of the credit switch when the Cancel Solenoid plunger returns to normal rest position. It should be adjusted so the credit switch rotates far enough to allow the Lock Pawl to fall into the ratchet and have approximately 1/64" overtravel. The adjustment must be checked at all six positions of the credit wheel and the ratchet. After adjustment, set the locknut tight. See Figure 1.

2. Adjust the position of the Cancel Solenoid Stop Bracket so the Cancel Pawl over-travels the ratchet teeth approximately 1/32" when the solenoid plunger bottoms against the Stop. Set the Stop mounting screws firmly after adjustment. See Figure 2.

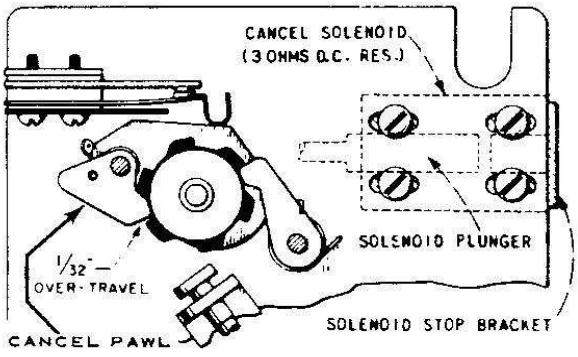


Figure 2.

3. Set the end of the Cam Spring in the first hole in the panel. The Cam Spring may be identified in Figure 3. Check operation by closing all snap-action credit switches and allow the Cam Spring to rotate the switches past the reset bracket. This should be checked slowly to determine if the Spring pressure is adequate to reset the switches without benefit of inertia. If more spring pressure is required, move to the second hole and repeat the test. Use the lowest possible spring pressure (consistent with positive operation) to insure minimum wear and optimum low voltage operation.

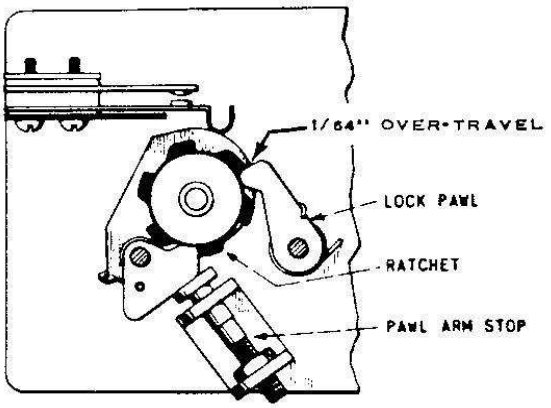


Figure 1.

4. The pressure of the collector ring contact against the ring on the credit switch should be approximately 2½ oz. Excessive pressure will result in excessive wear and sluggish rotary action of the credit switch.

5. Credit Solenoid Plungers should move freely in the pin guides through a full stroke and should be checked in several positions by turning them to different positions.

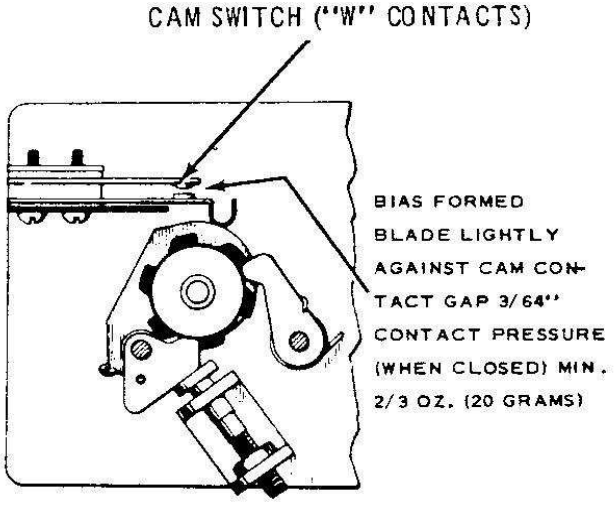


Figure 3.

CREDIT AND CANCEL UNIT

CAM SWITCH (S, U, V & T CONTACTS)

1. All mechanical adjustments must have been made before proceeding with switch adjustments.
2. Adjust roller blade so that roller rests against cam in normal position with 1 oz. pressure.
3. Adjust contact "S" for 1/32" gap after setting center blade against fiber lift.
4. Adjust contacts "T", "U" and "V" for 1/64" gap.
5. Bracer blades should properly support their associated contact blades.
6. Move solenoid plunger to end of power stroke and check pressure of contacts by lifting top contacts away from bottom contacts.

Adjustment check:

T = 1¼ oz. min.
V = 1 oz. min.
U = 1¼ oz. min.
S = more than 3½ oz.

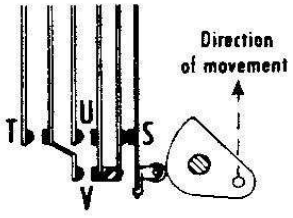


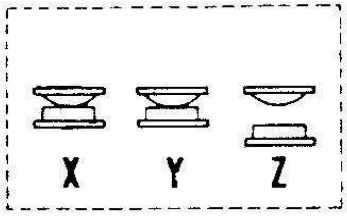
Figure 4.

TIMING RELAY

1. Contacts "X" and "Y" normally closed.
2. Contact "Z" normally open.
3. Contact gaps 1/32" max.
4. Contact pressure 1 to 1½ oz.
5. Armature gap 3/64".
6. Pressure to start relay, see Figure 5. D.C. Coil Resistance 400 ohms.

Contact Functions:

"X" – Selection Circuit.
"Y" – Cancel and coin switch circuits.
"Z" – Timing Relay hold circuit.



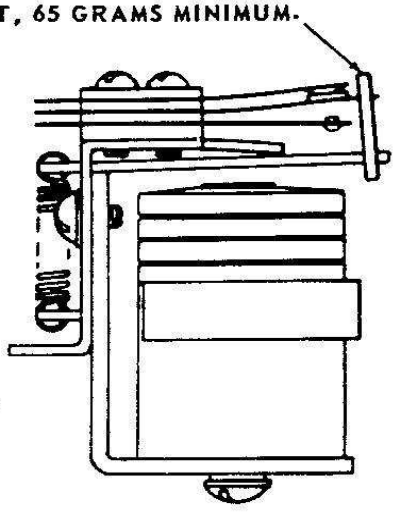
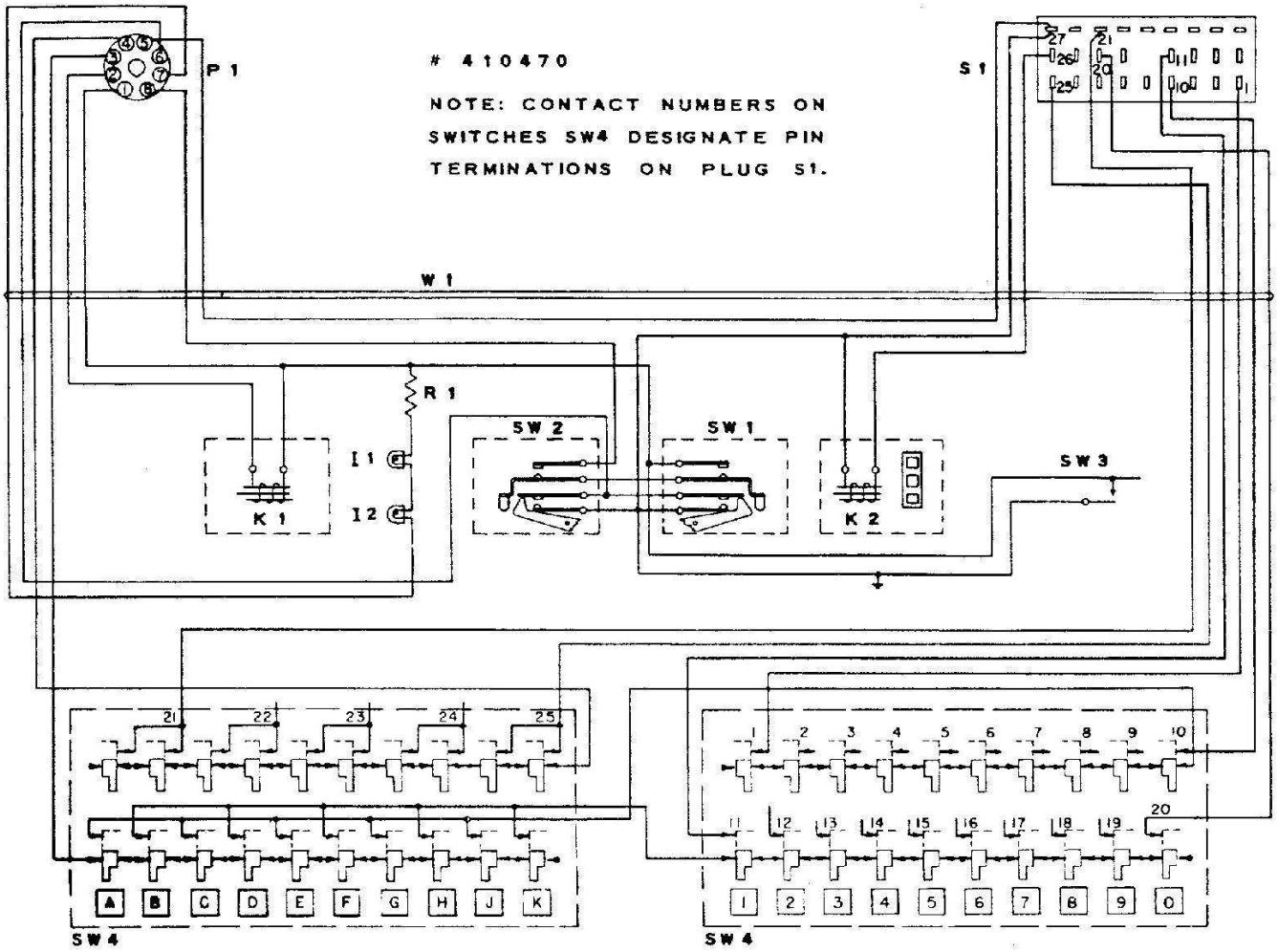
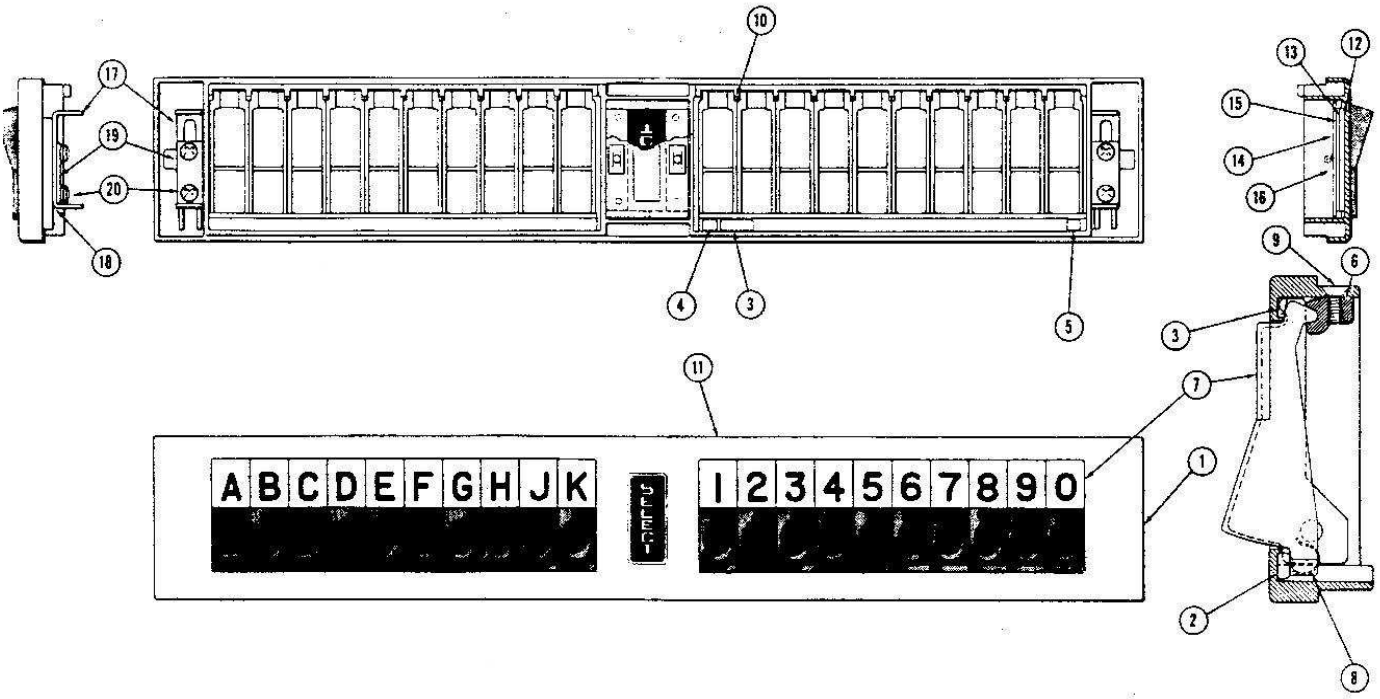


Figure 5.



PARTS LIST

Item	Part No.	Part Name
I 1 I 2	302141	Credit Lamp No. 47
K1	410081	Latch Solenoid
K2	410308	Counter Assembly
P1	12028	8 Prong Octal Plug
R1	81173	Resistor, 100 ohm, 7 watt W.W.
S1	400844	27 Prong Plug
SW1	410462	Number Leaf Switch
SW2	410462	Letter Leaf Switch
SW3	410486	Latch Solenoid Switch
SW4	410425	Selector Switch
W1	410466	Cable Only

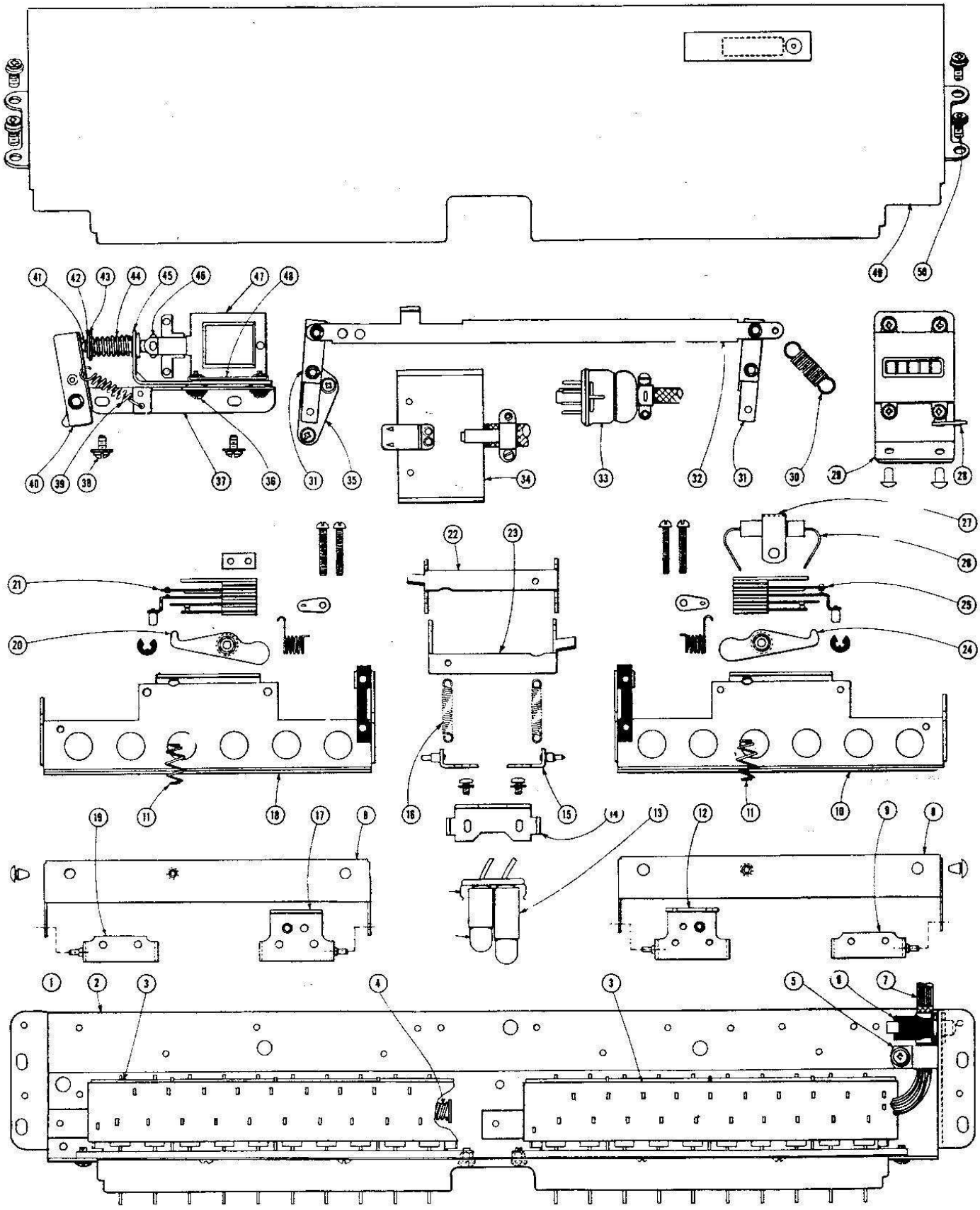


ATTACH CLIP (8) BEFORE PUTTING SELECTOR KEYS IN FRAME.

PARTS LIST

Item	Part No.	Part Name	Item	Part No.	Part Name
1	410222	Selector Key Panel	11	410210	Selector Key Panel (Complete)
2	410226	Selector Key Stop	12	410227	Credit Window
3	410336	Spring	13	410343	Rubber Strip
4	410337	Spring - End R.H.	14	410355	Retaining Plate
5	410338	Spring - End L.H.	15	410229	Diffuser
6	410223	Bearing Strip	16	70204	Speed Nut
7	410221	Selector Key (Set of 20)	17	410230	Latch
8	410225	Spring Clip	18	410231	Spacer
9	70786	Machine Screw No. 6-32 x 5/16	19	410232	Plate
10	410353	Selector Key Separator	20	71816	Sems No. 8-32 x ½ LG B.H.M.S.

ELECTRICAL SELECTOR, TYPE ES11-L6



PARTS LIST

Item	Part No.	Part Name
1	410400	Complete Electrical Selector
2	410420	Selector Frame Assembly
3	410425	Selector Switch Assembly
	71817	Sems Fastener 6-32 x ¼ B.H.M.Screw
	71566	8-32 x 5/16 B.H.M.Screw
	70008	8-32 Hexagon Nut
	73082	Lock Washer
4	410349	Latch Bar Spring
	400864	Spring Retainer
5	A-251287	Clamp
6	410486	Latch Solenoid Switch
7	410465	Cable & Plug Assembly
	410466	Cable
8	410434	Treadle Bar Assembly
	410267	Bumper
9	410443	Hinge Assembly (Number-Right)
10	410439	Lock Plate Assembly (Number)
11	410445	Compression Spring Lock Plate
12	410430	Treadle Bar Hinge Assembly (Number-Left)
	71817	Sems (6-32 x ¼)
13	410309	Credit Lamp Assembly
	410310	Base
	302141	No. 47 Lamp
14	410447	Pawl Mounting Bracket
	71817	Sems (6-32 x ¼)
15	410448	Pawl Pivot Bracket Assembly
	72219	Flat Washer
16	410453	Spring (Lock Pawl)
17	410429	Treadle Bar Hinge Assem.(Letter-Right)
	71817	Sems 6-32 x ¼
18	410438	Lock Plate Assembly (Letter)
19	410442	Hinge Assembly (Letter-Left)
20	410454	Treadle Bar Switch Lever Assem.(Letter)
	125402	Retainer
	410477	Spring-Switch Lever (L.H.)
21	410461	Leaf Switch Assembly (Letter)
	410483	Guard Blade
	400597	Tension Plate
	70524	5-40 x 13/16 R.H.M.Screw
	74122	Terminal Lug
22	410451	Lock Pawl (Letters)
	71817	Sems
23	410452	Lock Pawl (Numbers)
	71817	Sems
24	410455	Treadle Bar Switch Lever Assem.(Number)
	125402	Retainer
	410476	Spring-Switch Lever (R.H.)
25	410462	Leaf Switch Assembly (Number)
26	81173	W.W.Resistor 7 watt, 100 ohm
27	410482	Clamp
	71162	5-40 x ¼ R.H.M.Screw
	73116	Lock Washer
28	10060	Terminal Lug
29	410308	Counter Assembly
	71817	Sems 6-32 x ¼
	79024	1/8 Dia. x 5/32 Tub. Rivet
30	410481	Spring (Link Return)
31	410259	Latch Lever Assembly
	410261	Pin
	410262	Stud
	125402	Retainer
32	410478	Link Bar Assembly
	72039	Flat Washer (Steel Copper Plate)
	125402	Retainer
33	12028	Octal Plug
34	410844	27-Prong Socket
35	410426	Pivot Plate Assembly
	71817	Sems 6-32 x ¼
	72064	Flat Washer
	125402	Retainer
36	78031	Grommets
37	410294	Latch Bracket & Pin Assembly
38	71818	Sems 8-32 x 5/16
39	410305	Spring (Latch Lever)
40	410302	Latch Lever & Bushing Assembly
	125402	Retainer
41	410300	Solenoid Rod
42	125403	Retainer
43	72028	Flat Washer
44	410301	Compression Spring
45	410297	Solenoid Bracket & Bushing Assem.
46	80135	1/8 x ¾ Cotter Pin
47	410081	Solenoid
48	70206	Speed Nut
49	410468	Cover Assembly
	410472	Label
50	71817	Sems Fasteners 6-32 x ¼ Phillips B.H.M.Screw

SEEBURG

HIGH FIDELITY MASTER-REMOTE AMPLIFIER,

Type MRA 5-L 6

The Master-Remote Amplifier, Type MRA5-L6 is a low distortion, wide frequency range, constant voltage type designed for use in the Select-O-Matic "100". It has eight tubes, two of which are 6L6's in a push-pull output stage to supply 25 watts of audio power for operation of the Select-O-Matic speakers and remote speakers.

The output of the low impedance magnetic pickup of the Select-O-Matic "100" mechanism is connected through a single-contact socket to a 5879 voltage amplifier. The 5879 is followed by a 6SN7 dual triode. The first section of the 6SN7 provides additional amplification, the second section is a cathode follower for low impedance input to bass and volume control circuits. A treble control circuit and connections for a muting switch are between the two 6SN7 sections. The output from the volume control is amplified by the first section of a 12AX7. The second section of the 12AX7 is a phase inverter and drives the 6L6 output tubes.

An automatic volume compensator is incorporated in this amplifier. It compensates for the variations in the average volume levels of different records and makes possible a volume control setting for normal records without danger of blasting or high volume due to exceptionally "loud" records. A 4-position AVC Switch provides a choice of degree of volume compensation from zero (off) to more than 20 db compression.

The compensator uses a 6SL7GT and a 6SK7 tube. One half of the 6SL7 is an amplifier; the other half serves as a rectifier. The 6SK7 is the compensation control tube. The position of these tubes in the amplifier as well as the other tubes is shown in the block diagram, Figure 2.

Use is made of inverse feedback to obtain output regulation necessary for constant voltage operation and to insure a minimum of distortion and hum. The inverse feedback is supplied from a secondary of the output transformer to the cathode circuit of the amplifier section of the 12AX7

The output transformer has two secondaries. One of these is for the Select-O-Matic speakers and is tapped for switch control of the power to the speakers. The other is for remote speakers and has taps to a terminal strip to accommodate High Fidelity Remote Speakers.

The volume control adjusts the level of sound from the Select-O-Matic speaker and the remote speakers. It is located on the amplifier so it is accessible at the back of the cabinet. Connections for the control are made through a socket and dummy plug on the amplifier chassis. A remote volume control may be used by replacing the dummy plug with the 7-prong plug of a remote volume control, Type MRVC-1 or DRVC-1. The remote volume control cable may be up to one hundred feet in length without introducing hum, distortion or loss of volume.

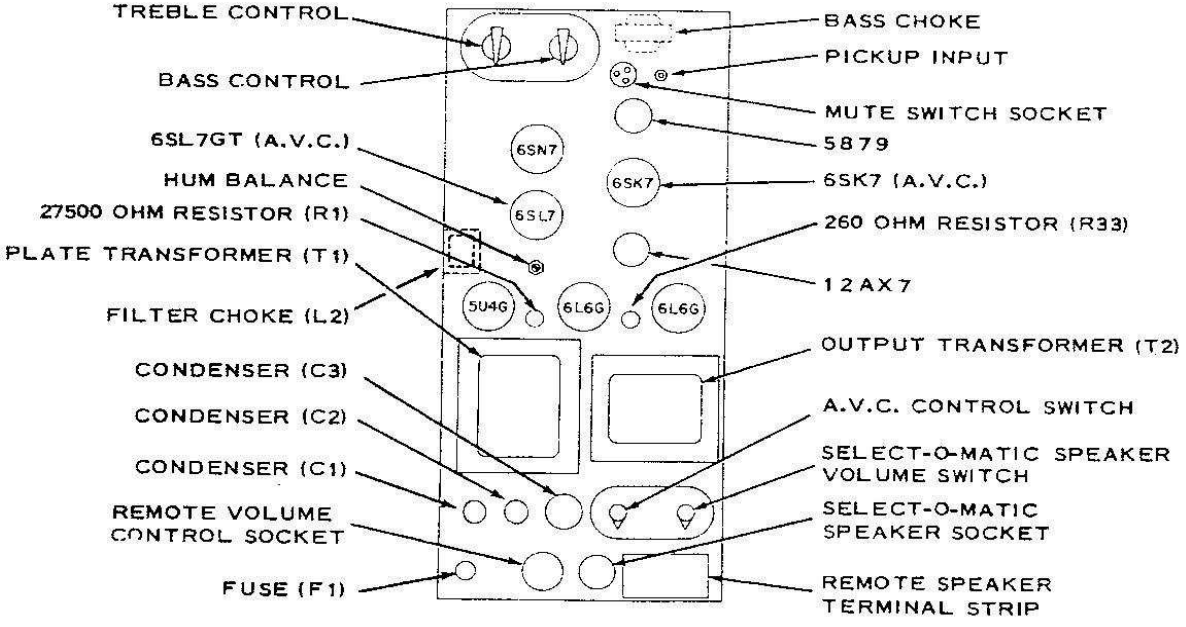


Figure 1. Top View – Master-Remote Amplifier, Type MRA5-L6

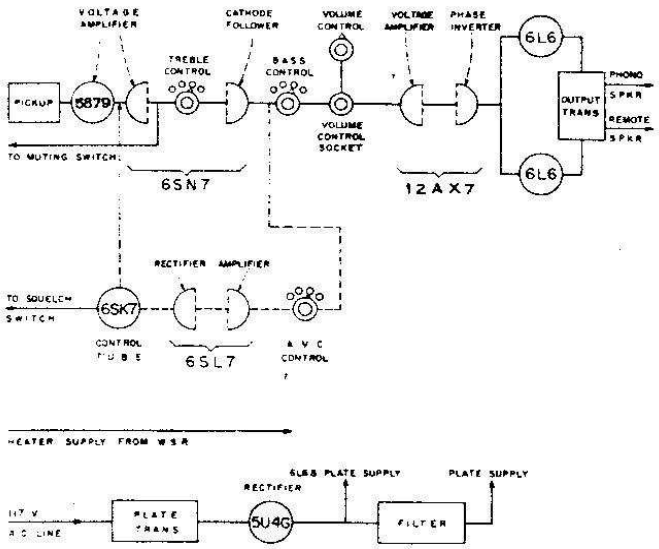


Figure 2. Block Diagram – Type MRA5-L6

Heater current for the amplifier tubes is supplied at 6.3 volts from the Selection Receiver. Plate current for the tubes is from an included plate supply transformer and 5U4G rectifier. The plate supply transformer primary is protected by a fuse located on the amplifier chassis.

The total amplifier output power of 25 watts can be divided between the Select-O-Matic speakers and remote speakers with the proportions of volume conveniently adjusted by use of the Select-O-Matic Speaker Switch located at the lower end of the amplifier and shown in Figure 3. The switch is set to provide the desired balance of volume between the Select-O-Matic speakers and the remote speakers but the total power (in watts) of all the speakers in use must not exceed 25. The load (in watts) should also not be lower than 25% of the total, (6 watts).

IF NO REMOTE SPEAKERS ARE USED, THE SPEAKER SWITCH MUST BE SET AT THE 25 WATT POSITION.

The terminal strip shown in Figure 4 provides connections for high or low impedance remote speakers. The high impedance output terminates at A and B and is for 70-volt Constant Voltage Speakers. The low impedance output terminates at L and G and is for speakers that use inputs directly to the voice coils.

A 16-ohm speaker connected to L and G will draw 8 watts; two 16-ohm speakers in parallel or an 8-ohm speaker will draw 16 watts. Because the total load on the amplifier must not be more than 25 watts, the load connected to L and G is limited to a maximum of the equivalent of three parallel connected 16-ohm speakers. If it is necessary to connect low impedance speakers representing a load greater than 25 watts or if the low impedance load plus that taken from the 70-volt CV terminals and the Select-O-Matic cabinet speakers is greater than 25 watts, a transformer must be used to reflect a correct load ratio from the low impedance speakers.

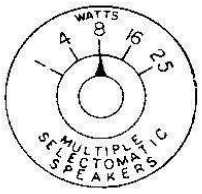


Figure 3.
Speaker Switch

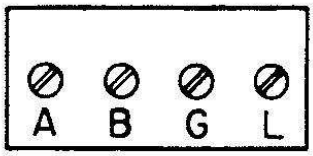


Figure 4.
Terminal Strip

If the total watts of the remote speakers and the Select-O-Matic cabinet speakers exceed 25 watts, an external Power Amplifier, *Seeburg Type HFA1-L6* may be used to supply part of the load.

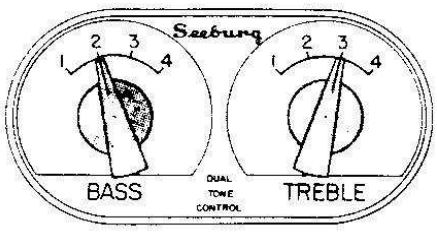
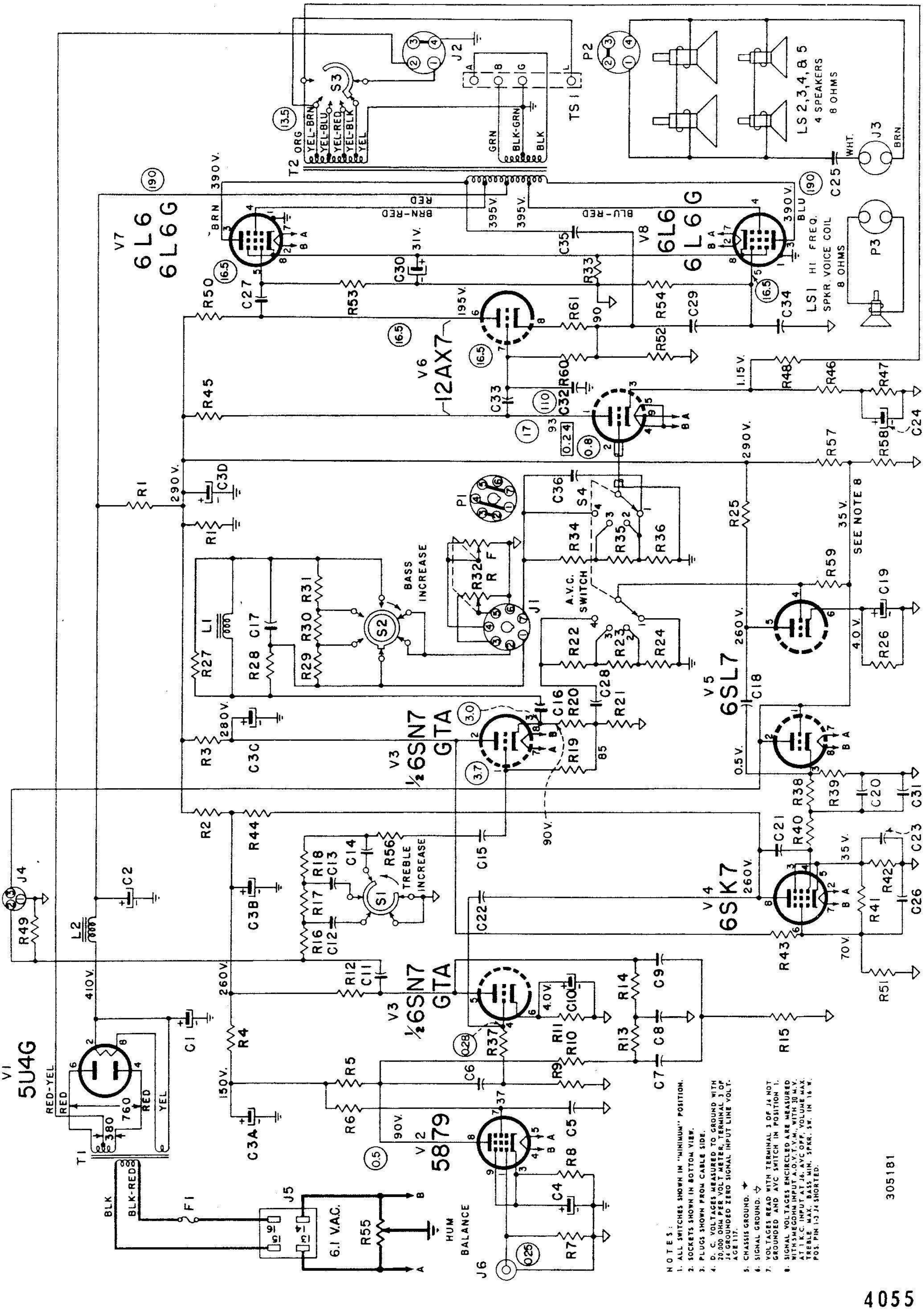


Figure 5. Tone Controls

The Bass and Treble controls are four-position switches with an indicating escutcheon shown in Figure 5. The position of the controls when an amplifier is in normal use is determined by the records being reproduced, the room size and other acoustical conditions. "Flat" response of the amplifier is had with the bass control at 2 and the treble control at 3 but with average conditions and typical records, very realistic reproduction is obtained by setting the bass at 3 and the treble at 3.



V1 5U4G
V2 5879
V3 ½6SN7 GTA
V4 6SK7
V5 6SL7
V6 12AX7
V7 6L6 6L6G
V8 6L6 6L6G
T1
T2
L1
L2
J1
J2
J3
J4
J5
J6
P1
P2
P3
S1 TREBLE INCREASE
S2 BASS INCREASE
S3
S4 A.V.C. SWITCH
TS1
R55 HUM BALANCE
6.1 V.A.C.
LS 2,3,4,& 5 4 SPEAKERS 8 OHMS
LS1 HI FREQ. SPKR. VOICE COIL 8 OHMS
SEE NOTE 8
305181

PARTS LIST

Item	Part No.	Part Name
C1		
C2	87596	40 mfd. 450 V. Lytic
	10832	Electrolytic mtg. plate
C3a		10 mfd. 350 V. Lytic
C3b		20 mfd. 350 V. Lytic
C3c	87612	20 mfd. 400 V. Lytic
C3d		40 mfd. 400 V. Lytic
	602125	Electrolytic mtg. plate
C4	87598	100 mfd. 6 V. Lytic
C5	86146	.05 mfd. 600 V. Paper
C6	86140	.05 mfd. 400 V. Paper
C7	86213	.005 mfd. 400 V. ± 10% Paper
C8	86212	.01 mfd. 400 V. ± 10% Paper
C9	86213	.005 mfd. 400 V. ± 10% Paper
C10	87568	20 mfd. 25 V. Lytic
C11	86146	.05 mfd. 600 V. Paper
C12	86207	.001 mfd. 200 V. Paper
C13	86207	.001 mfd. 200 V. Paper
C14	86207	.001 mfd. 200 V. Paper
C15	86140	.05 mfd. 400 V. Paper
C16	86230	1 mfd. 200 V. Paper
C17	86231	0.5 mfd. 200 V. Paper
C18	86154	.02 mfd. 600 V. Paper
C19	87568	20 mfd. 25 V. Lytic
C20	86232	0.5 mfd. 200 V. Paper
C21	86212	.01 mfd. 400 V. Paper
C22	86233	.06 mfd. 400 V. ± 10%
C23	87597	10 mfd. 50 V. Lytic
C24	87568	20 mfd. 25 V. Lytic
C25	86218	2 mfd. 200 V. Paper
C26	86140	.05 mfd. 400 V. Paper
C27	86146	.05 mfd. 600 V. Paper
C28	86158	.02 mfd. 200 V. Paper
C29	86146	.05 mfd. 600 V. Paper
C30	87604	25 mfd. 50 V. Lytic
C31	86170	0.5 mfd. 100 V. Paper
C32	85003	50 mmfd. 500 V. Mica
C33	86146	.05 mfd. 600 V. Paper
C34	86221	50 mmfd. 1000 V. Ceramic
C35	86220	5 mmfd. 1000 V. Ceramic
C36	*86222	470 mmfd. 1000 V. Ceramic
F1	303087	2 amp. Slo-Blo Fuse
	300061	Fuse Receptacle
J1	84265	Volume Control Socket
J2	305206	Speaker Socket
J3	406349	2 Prong Socket
J4	12034	Mute Socket
	400954	Socket Retainer
J5	300007	Power Connector
J6	300152	Pu Socket
	305022	Insulating Washer
L1	305106	Bass Choke
L2	305205	Filter Choke
P1	305019	Dummy Plug Assembly
P2	F-3150	Speaker Plug
R1	87115	27,500 ohm, tap at 2500 ohm 20 W. 5% W.W.
R2	82776	8200 ohm ± 10% 1 W.
R3	82424	1000 ohm ± 10% 1 W.
R4	82448	0.1 Meg. ± 10% ½ W.
R5	82675	82 K ± 5% ½ W.
R6	82456	.47 Meg. ± 10% ½ W.
R7	*82460	1 Meg. 10% ½ W.
	82444	47K ± 10% ½ W.
R8	82677	520 ohm± 10% ½ W.
R9	82460	1 Meg. ± 10% ½ W.
R10	82455	0.39 Meg. ± 10% ½ W.
R11	82425	1200 ohm ± 10% ½ W.
R12	82676	47 K ohm ± 5% ½ W.
R13	82457	.56 Meg. ± 10% ½ W.
R14	82457	.56 Meg. ± 10%
R15	82453	.27 Meg. ± 10% ½ W.
R16	82442	33 K ohm ± 10% ½ W.
R17	*82443	39 K ohm ± 10% ½ W.
	82439	18K ± 10 % ½ W.
R18	*82445	56 K ohm ± 10% ½ W.
	82442	33 K ± 10% ½ W.
R19	82453	0.27 Meg. ± 10% ½ W.
R20	82418	330 ohm ± 10% ½ W.
R21	82820	8200 ohm ± 10% 2W.
R22	82666	.1 Meg. ± 5% ½ W.
R23	82444	47 K ± 10% ½ W.
R24	82442	33 K ± 10% ½ W.
R25	82456	.47 Meg. ± 10% ½ W.
R26	82445	56 K ± 10% ½ W.
R27	82436	10 K ohm ± 10% ½ W.
R28	82432	4700 ohm ± 10% ½ W.
R29	82426	1500 ohm ± 10% ½ W.
R30	82427	1800 ohm ± 10% ½ W.
R31	82428	2200 ohm ± 10% ½ W.
R32a)	302007	16 K ohm Volume
R32b)	302007	5 K ohm Control
	302047	Volume Control Key
	305002	Volume Control Bracket
R33	81145	260 ohm ± 5% W.W.
R34	82642	33 K ± 5% ½ W.
R35	82438	15 K ± 10% ½ W.
R36	82642	33 K ± 5% ½ W.
R37	82666	0.1 Meg ± 5% ½ W.
R38	82467	3.9 Meg. ± 10% ½ W.
R39	82468	4.7 Meg. ± 10% ½ W.
R40	82460	1 Meg. ± 10% ½ W.
R41	82438	15 K ± 10% ½ W.
R42	82438	15 K ± 10% ½ W.
R43	82445	56 K ± 10% ½ W.
R44	82452	0.22 Meg. ± 10% ½ W.
R45	82667	0.47 Meg. ± 5% ½ W.
R46	82659	330 ohm ± 5% ½ W.
R47	82433	5600 ohm ± 10% ½ W.
R48	82629	5600 ohm ± 5% ½ W.
R49	82457	0.56 Meg. ± 10% ½ W.
R50	82789	.39 Meg. ± 5% ½ W.
R51	82455	56 K ± 10% ½ W.
R52	82789	.39 Meg. ± 5% ½ W.
R53	82453	0.27 Meg. ± 10% ½ W.
R54	82453	0.27 Meg. ± 10% ½ W.
R55	602846	75 ohm W.W. Hum Bal. 1 W.
R56	82448	0.1 Meg. ± 10% ½ W.
R57	82460	1 Meg. ± 10% ½ W.
R58	82457	0.56 Meg. ± 10% ½ W.
R59	82453	0.27 Meg. ± 10% ½ W.
R60	82457	.56 Meg. 10% ½ W.
R61	Q2433	5600 ohm 10% ½ W.
LS1	407270	5" Speaker
LS2, LS3	407290	12" Speaker
LS4, LS5	407280	8" Speaker
S1	305025	Treble Switch
S2	305026	Bass Switch
S3	305111	Speaker Switch
S4	305107	D.P. 4 Pos. 2 Gang Sw.
T1	305203	Power Transformer
T2	305165	Output Transformer
TS1	305185	Terminals Strip 4 Lugs
–	602046	Tube Clamp
–	84220	Octal Socket
–	305210	5-lug Terminal Strip
–	305208	11-lug Terminal Strip
–	305209	7-lug Terminal Strip
–	305167	Tone Control Escutcheon
–	305183	Speaker-AVC Escutcheon
–	300076	Tone Control Bar Knob
–	305027	Speaker-AVC Knob

* Used Below Serial No. 41280.

Seeburg

HIGH FIDELITY MASTER AMPLIFIER,

Type HFMA1-L6

The High Fidelity Master Amplifier, Type HFMA1-L6 is a low distortion, wide frequency range, constant voltage type. It has eight tubes, two of which are 6L6's in a push-pull output stage to supply 25 watts of audio power for operation of the Select-O-Matic speakers and remote speakers.

The output of the low impedance magnetic pickup of the Select-O-Matic "200" mechanism is connected through a single-contact socket to a 5879 voltage amplifier. The 5879 is followed by a 6SN7 dual triode. The first section of the 6SN7 provides additional amplification, the second section is a cathode follower for low impedance input to bass and volume control circuits. A treble control circuit and connections for a muting switch are between the two 6SN7 sections. The output from the volume control is amplified by the first section of a 12AX7. The second section of the 12AX7 is a phase inverter and drives the 6L6 output tubes.

An automatic volume compensator is incorporated in this amplifier. It compensates for the variations in the average volume levels of different records and makes possible a volume control setting for normal records without danger of blasting or high volume due to exceptionally "loud" records. Use of the feature is optional and is controlled by the AVC switch on the amplifier.

The compensator uses a 6SL7GT and a 6SK7 tube. One half of the 6SL7 is an amplifier; the other half serves as a rectifier. The 6SK7 is the compensation control tube. The position of these tubes in the amplifier as well as the other tubes is shown in the block diagram, Figure 2.

Use is made of inverse feedback to obtain output regulation necessary for constant voltage operation and to insure a minimum of distortion and hum. The inverse feedback is supplied from a secondary of the output transformer to the cathode circuit of the amplifier section of the 12AX7.

The output transformer has two secondaries. One of these is for the Select-O-Matic speakers and is tapped for switch control of the power to the speakers. The other is for remote speakers and has taps to a terminal strip to accommodate High Fidelity Remote Speakers.

The volume control adjusts the level of sound from the Select-O-Matic speaker and the remote speakers. It is located on the amplifier so it is accessible at the back of the cabinet. Connections for the control are made through a socket and dummy plug on the amplifier chassis. A remote volume control may be used by replacing the dummy plug with the 9-prong plug of a remote volume control, Type MRVC-2. The remote volume control cable may be up to one hundred feet in length without introducing hum, distortion or loss of volume.

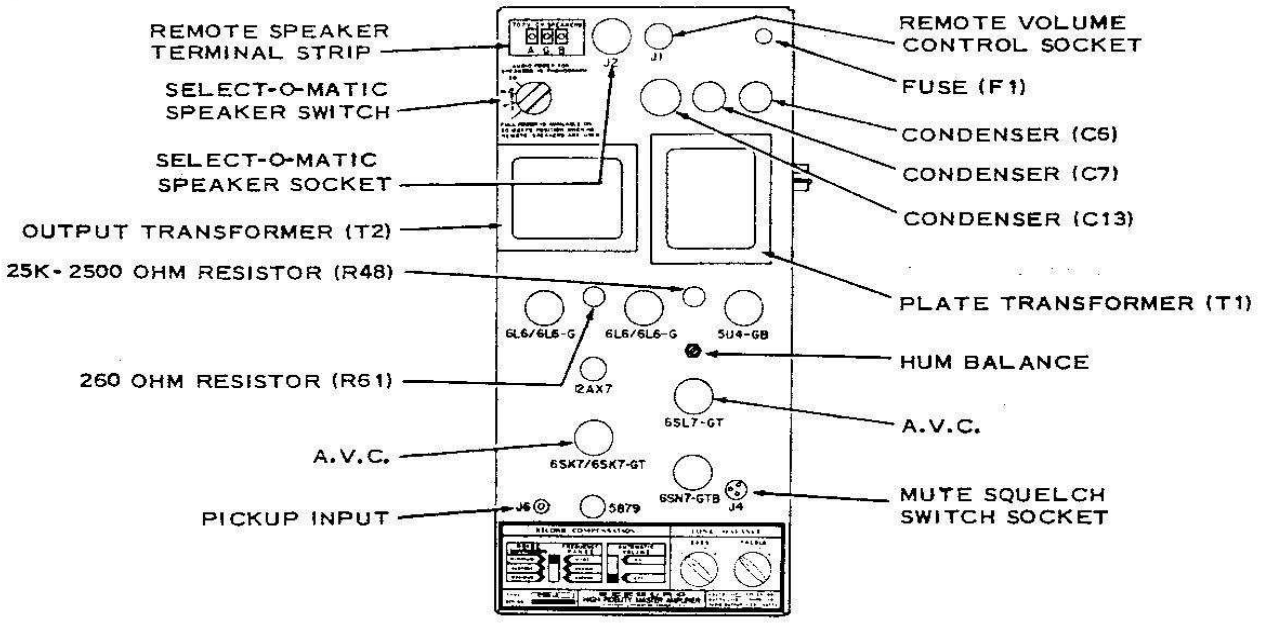


Figure 1. Top View

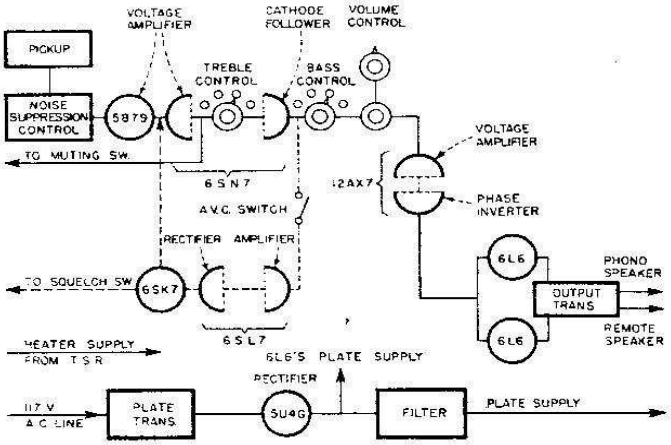


Figure 2. Block Diagram

Heater current for the amplifier tubes is supplied at 6.3 volts from the Selection Receiver. Plate current for the tubes is from an included plate supply transformer and 5U4G rectifier. The plate supply transformer primary is protected by a fuse located on the amplifier chassis.

The total amplifier output power of 25 watts can be divided between the Select-O-Matic speakers and remote speakers with the proportions of volume conveniently adjusted by use of the Select-O-Matic Speaker Switch located at the upper end of the amplifier and shown in Figure 3. The switch is set to provide the desired balance of volume between the Select-O-Matic speakers and the remote speakers but the total power (in watts) of all the speakers in use must not exceed 25. The load (in watts) should also not be lower than 25% of the total, (6 watts).

IF NO REMOTE SPEAKERS ARE USED, THE SPEAKER SWITCH MUST BE SET AT THE 20 WATT POSITION.

The terminal strip shown in Figure 4 provides connections for high impedance remote speakers. The high impedance output terminates at A and B and is for 70-volt Constant Voltage Speakers. The G terminal is provided for grounding of shielded speaker lines.

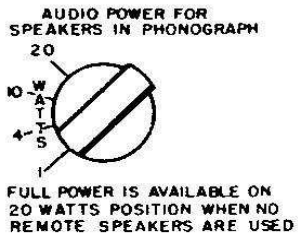


Figure 3.

Speaker Switch

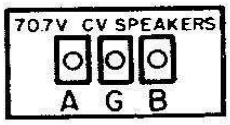


Figure 4.

Terminal Strip

If the total watts of the remote speakers and the Select-O-Matic cabinet speakers exceed 25 watts, an external Seeburg Power Amplifier, may be used to supply part of the load.

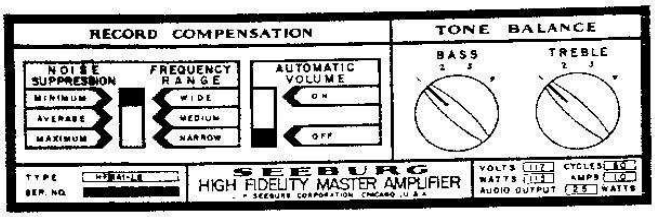
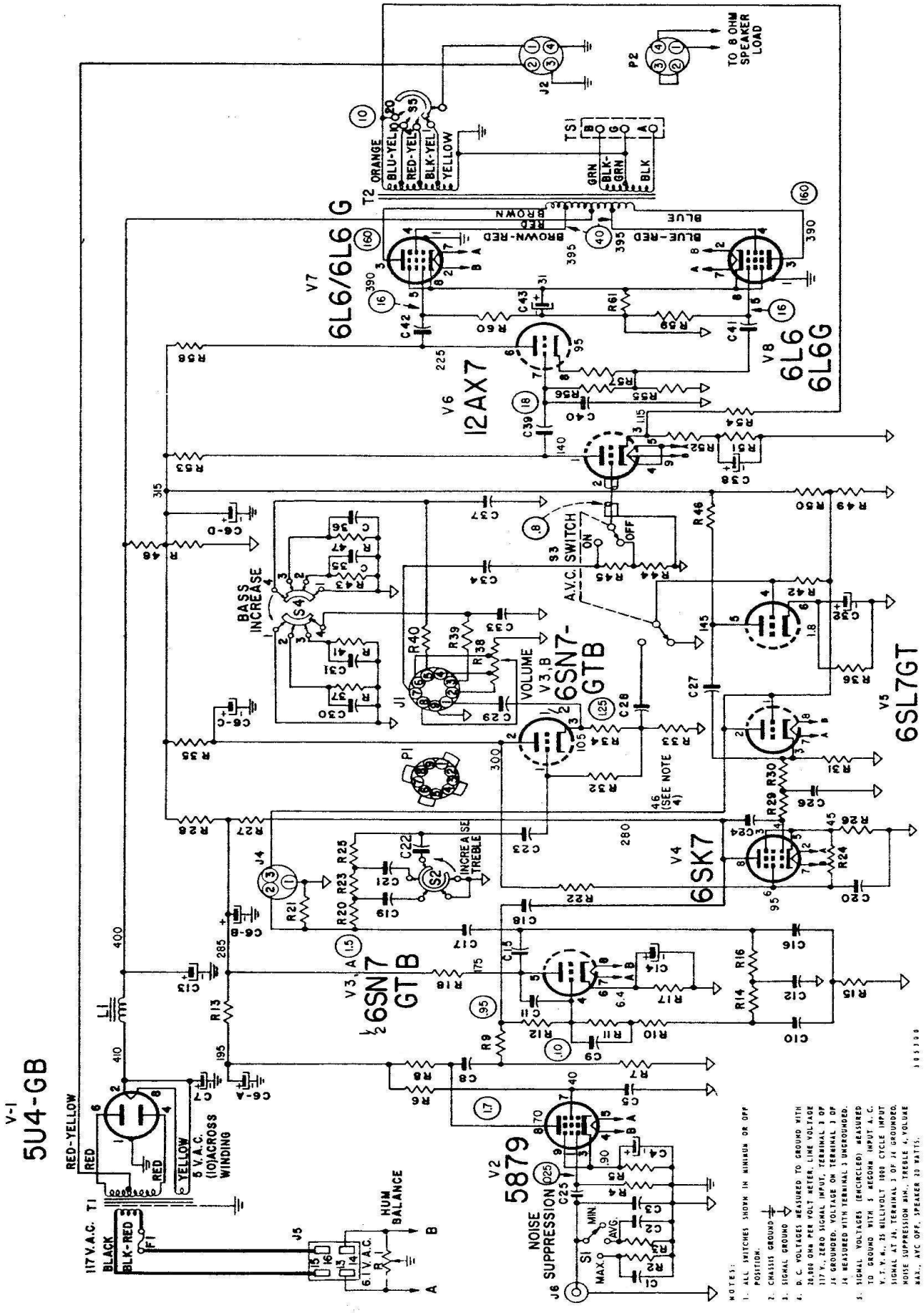


Figure 5. Tone Controls

A three position Noise Suppression Switch controls the frequency range of the amplifier. The switch is set to the position that provides the most satisfactory reproduction consistent with conditions of records to be played.

The Bass and Treble controls are four-position switches with an indicating escutcheon shown in Figure 5. The position of the controls when an amplifier is in normal use is determined by the records being reproduced, the room size and other acoustical conditions. "Flat" response of the amplifier is had with the bass control at 1 and the treble control at 4 but with average conditions and typical records, very realistic reproduction is obtained by setting the bass at 2 and the treble at 3.

HIGH FIDELITY MASTER AMPLIFIER, TYPE HFMA1-L6



PARTS LIST

Item	Part No.	Part Name
C1	86247	.0068 mfd. 200 V. Paper
C2	86240	1500 mmfd. 500 V. Ceramic
C3	86239	330 mmfd. 500 V. Ceramic
C4	87598	100 mfd. 6 V. Lytic
C5	86237	.15 mfd. 400 V. Paper
C6a	87612	10 mfd. 350 V. Lytic
C6b		20 mfd. 350 V. Lytic
C6c		20 mfd. 400 V. Lytic
C6d		40 mfd. 400 V. Lytic
C7	87596	40 mfd. 450 V. Lytic
C8	86154	.02 mfd. 600 V. Paper
	*86212	.01 mfd. 400 V. Paper
C9	86222	470 mmfd. 1000 V. Ceramic
C10	86213	.005 mfd. 400 V. Paper
C11	86263	22 mmfd. 500 V. Ceramic
	*86242	68 mmfd. 500 V. Ceramic
C12	86212	.01 mfd. 400 V. Paper
C13	87596	40 mfd. 450 V. Lytic
C14	87568	20 mfd. 25 V. Lytic
C15	86146	.05 mfd. 600 V. Paper
C16	86213	.005 mfd. 400 V. Paper
C17	86212	.01 mfd. 400 V. Paper
C18	86140	.05 mfd. 400 V. Paper
C19	86244	680 mmfd. 500 V. Ceramic
C20	86140	.05 mfd. 400 V. Paper
C21	86239	330 mmfd. 500 V. Ceramic
C22	86243	150 mmfd. 500 V. Ceramic
C23	86213	.005 mfd. 400 V. Paper
C24	86212	.01 mfd. 400 V. Paper
C25	86158	.02 mfd. 200 V. Paper
C26	86245	1.0 mfd. 200 V. Paper
C27	86154	.02 mfd. 600 V. Paper
C28	86158	.02 mfd. 200 V. Paper
C29	86246	1.0 mfd. 200 V. Paper
C30	86248	.15 mfd. 200 V. Paper
C31	86248	.15 mfd. 200 V. Paper
C32	87568	20 mfd. 25 V. Lytic
C33	86248	.15 mfd. 200 V. Paper
C34	86235	.05 mfd. 200 V. Paper
	*86158	.02 mfd. 200 V. Paper
C35	86248	.15 mfd. 200 V. Paper
C36	86248	.15 mfd. 200 V. Paper
C37	86248	.15 mfd. 200 V. Paper
C38	87568	20 mfd. 25 V. Lytic
C39	86146	.05 mfd. 600 V. Paper
C40	86241	33 mmfd. 500 V. Ceramic
C41	86146	.05 mfd. 600 V. Paper
C42	86146	.05 mfd. 600 V. Paper
C43	87604	25 mfd. 50 V. Lytic
F1	303087	2A- Slo Blo
J1	84298	Remote Volume Socket
J2	305206	Speaker Socket
J4	12034	Mute Socket
J5	300007	Power Connector
J6	300152	Phono Input
L1	305205	Filter Choke
P1	305316	Dummy Plug Assembly
R1	602846	75 Ohms, W. W. 1 W.
R2	82442	33K 10% ½ W.
R3	82445	56K 10% ½ W.
R4	82452	220 K 10% ½ W.
R5	82424	1000 Ohms 10% ½ W.
R6	82607	750 K 5% ½ W.
R7	82460	1 meg. 10% ½ W.
R8	82791	180K 5% ½ W.
R9	82666	100K 5% ½ W.
R10	82679	820K 5% ½ W.
	* 82665	1 meg. 5 % ½ W.
R11	82665	1 meg. 5% ½ W.
R12	82681	430K 5% ½ W.
R13	82448	100K 10% ½ W.
R14	82458	680K 10% ½ W.
	*82457	560K 10% ½ W.
R15	82791	180K 5% ½ W.
	*82450	150K 10% ½ W.
R16	82458	680K 10% ½ W.
	*82457	560K 10% ½ W.
R17	82429	2700 Ohms 10% ½ W.
R18	82676	47K 5% ½ W.
R20	82442	33K 10% ½ W.
R21	82457	560K 10% ½ W.
R22	82832	47K 5% 2 W.
R23	82446	68K 10% ½ W.
R24	82635	12K 5% ½ W.
R25	82450	150K 10% ½ W.
R26	82634	10K 5% ½ W.
R27	82452	220K 10% ½ W.
R28	82776	8200 Ohms 10% 1 W.
R29	82460	1 meg. 10% ½ W.
R30	82467	3.9 meg. 10% ½ W.
R31	82468	4.7 meg. 10% ½ W.
R32	82456	470K 10% ½ W.
	*82791	180K 10% ½ W.
R33	82820	8200 Ohms 10% 2 W.
R34	82418	330 Ohms 10% ½ W.
R35	82424	1000 Ohms 10% ½ W.
R36	82432	4700 10% ½ W.
R37	82426	1500 Ohms 10% ½ W.
R38	305193	25K Volume Control
R39	82425	1200 Ohms 10% ½ W.
R40	82425	1200 Ohms 10% ½ W.
R41	82631	7500 Ohms 5% ½ W.
R42	82453	270K 10% ½ W.
R43	82424	1000 Ohms 10% ½ W.
R44	82695	56K 5% ½ W.
R45	82989	39K 5% ½ W.
R46	82456	470K 10% ½ W.
R47	82430	3.3K 10% ½ W.
R48	81175	25K - 2500 Ohms W. W. 5% 20 W.
R49	82457	560K 10% ½ W.
R50	82460	1 meg. 10% ½ W.
R51	82433	5600 Ohms 10% ½ W.
R52	82659	330 Ohms 5% ½ W.
R53	82667	470K 5% ½ W.
R54	82610	6200 Ohms 5% ½ W.
R55	82789	390K 5% ½ W.
R56	82457	560K 10% ½ W.
R57	82433	5600 Ohms 10% ½ W.
R58	82789	390K 5% ½ W.
R59	82453	270K 10% ½ W.
R60	82453	270K 10% ½ W.
R61	81145	260 Ohms 5% W. W., 10 W.
S1	305289	Noise Suppression Switch
S2	305312	Treble Switch
S3	305288	AVC Switch
S4	305311	Bass Switch
S5	305290	Speaker Switch
T1	305320	Power Transformer
T2	305304	Output Transformer
TS1	305309	Terminal Strip Remote Speaker
V1	308506	5U4GB
V2	308004	5879
V3	308622	6SN7GTB
V4	308618	6SK7GT
V5	308620	6SL7
V6	308120	12AX7
V7	308612	6L6G
V8	308612	6L6G

* USE ON HIGH FIDELITY MASTER AMPLIFIER, TYPE HFMA1-L6J

SEEBURG

WIRED SELECTION RECEIVER

TYPE WSR7-L6

The Wired Selection Receiver, Type WSR7-L6, is the power distribution and control center of the Select-O-Matic for operation from the Electric Selector and Wired Wall-O-Matics. Power enters the Receiver through the line cord and main switch and is distributed, directly at 117-volts or through transformers, to the electric selector, the Select-O-Matic Mechanism, the cabinet lighting, the amplifier, and the Wall-O-Matics. All connections to the Receiver are made with plugs which are of different types and sizes to avoid possibility of incorrect connections.

Included in the Receiver are a Step Switch and Relay Assembly, a 2050 tube, and a Credit and Cancel Unit for selection of records. The Step Switch and Relay Assembly and the 2050 tube are for selections from Wired Wall-O-Matics. The Credit and Cancel Unit is a part of the electric selector system for selections made at the Select-O-Matic.

A 25-volt transformer supplies power for up to six Type "3W-1" Wired Wall-O-Matics. Another transformer, the selection receiver power transformer, has five output windings for control circuits, the Select-O-Matic Mechanism indicator lights, and heater current for the tubes in the Master Remote Amplifier.

One of the secondaries of the selection receiver power transformer provides approximately 30-volts, a.c. This 30-volt output is rectified by a full-wave selenium rectifier for 25-volt d.c. supply for some of the relays of the Step Switch and Relay Assembly, for d.c. supply for a timing relay in the Credit and Cancel Unit, and for bias supply for the 2050 tube. Another secondary provides approximately 150-volts for operating the step switches through the plate circuit of the 2050 tube.

Access to the interior wiring and components is had, while the unit is normally operating, by removing the cover plate on the outside of the rear door of the Select-O-Matic "100". To remove the cover plate, take off the three wing-nuts located inside the door just above the amplifier and selection receiver and loosen the screw at the center of the bottom edge of the plate. After removing the nuts, pull out on the plate so the three bolts are out of the holes in the door and lift up on the plate to disengage

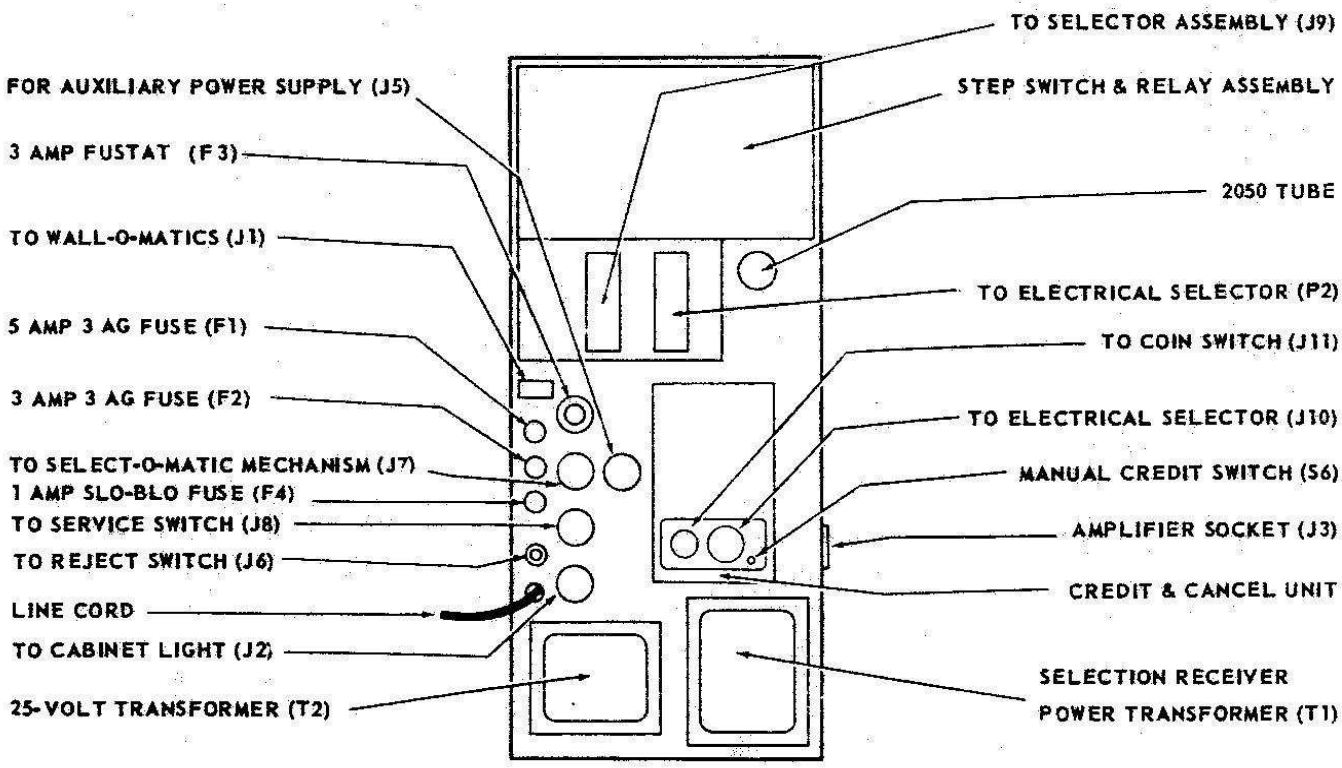


Figure 1. Top View of Selection Receiver

5095

hooks at the lower edge.

The Selection Receiver may be removed from its mounting by removing the cover plate and loosening the four screws holding the flanges of the unit. With the four screws loosened, slide the unit away from the amplifier to disengage the locating pins and amplifier sockets connection. It may then be lifted from the mounting frame.

CREDIT AND CANCEL UNIT, TYPE CCU-3

The Credit and Cancel Unit, although included in the selection receiver, is a part of the electrical selector system of the Select-O-Matic "100". The operation and adjustments of the unit are discussed in detail in the information on the Electrical Selector, Type ES11-L6, beginning on page 3069.

STEP SWITCH AND RELAY ASSEMBLY OPERATION

The fundamental purpose of the Step Switch and Relay Assembly is to energize a selector coil and a group solenoid in the Solenoid Assembly (of the Select-O-Matic Mechanism) according to the selection made with a Type "3W-1" Wired Wall-O-Matic. The Assembly consists of two step switches, a reset magnet, a transfer relay, two timing relays, and a play control relay. (The play control relay is not directly involved in the operation of the remote control system.)

When a selection is made from a Wall-O-Matic, a rotating switch blade in the Wall-O-Matic causes intermittant grounding of the grid of the 2050 tube in the selection receiver. The grounding occurs in two series of "pulses". These pulses are of approximately 1/25 second duration with a 1/25 second interval between each successive pulse and with approximately 1/5 second interval between the two series. The number of pulses in each of the two series is determined by which selector buttons are operated at the Wall-O-Matic and will determine, in turn, which selector coil and which group solenoid will be energized.

Each time the grid of the 2050 tube is grounded during one of the "pulses", the tube passes current through its plate circuit and a step relay coil in that circuit. The relay coil attracts its armature and operates the ratchet of the step switch so the switch is advanced one step. In the normal rest position of the Assembly, none of the relays are energized, the two step switches are in "zero" position and the coil of the Unit Step Relay is in the plate circuit of the 2050 tube through Contact "A" of the Transfer Switch. When a selection is made, the first pulse of the first series energizes the Unit Step Relay, advances the step switch one contact, and closes contacts "G" and "F". Contact "G" completes a d.c. circuit to the Reset Magnet causing that magnet to be energized and engage pawls with the ratchets of both step relays. Contact "F" completes a d.c. circuit to the Transfer Relay so it is energized, opening Contact "D" and closing Contact "E". Both the Reset Magnet and the Transfer Relay have slow-release timing so they remain in the energized positions for an appreciable time after the first pulse from the 2050 tube had ended to permit the Step Relay armature to return to its normal position with Contacts "G" and "F" open. Before either relay will drop out, the second pulse of the series operates the armature of the Unit Step Relay and again the relays are energized. As long as the pulses continue with 1/25 second intervals between them the following condition will prevail: Contacts "G" and "F" open and close with each "pulse" from the Wall-O-Matic, the pawls engage with the step switch ratchets, and the Transfer relay Contact "E" remains closed. Because the step switch ratchets are engaged by the pawls, the step relay will advance the step switch one step or contact with each pulse.

When the second pulse of the first pulse series advances the Unit Step Switch a second time, a cam on that switch operates the make-before-break contacts of the Transfer Switch so the 2050 tube plate circuit is connected to the Unit Step Relay through Contacts "B" ("A" open) and Contact "E" of the Transfer Relay. This circuit condition is retained through subsequent steps of the Unit Step Switch.

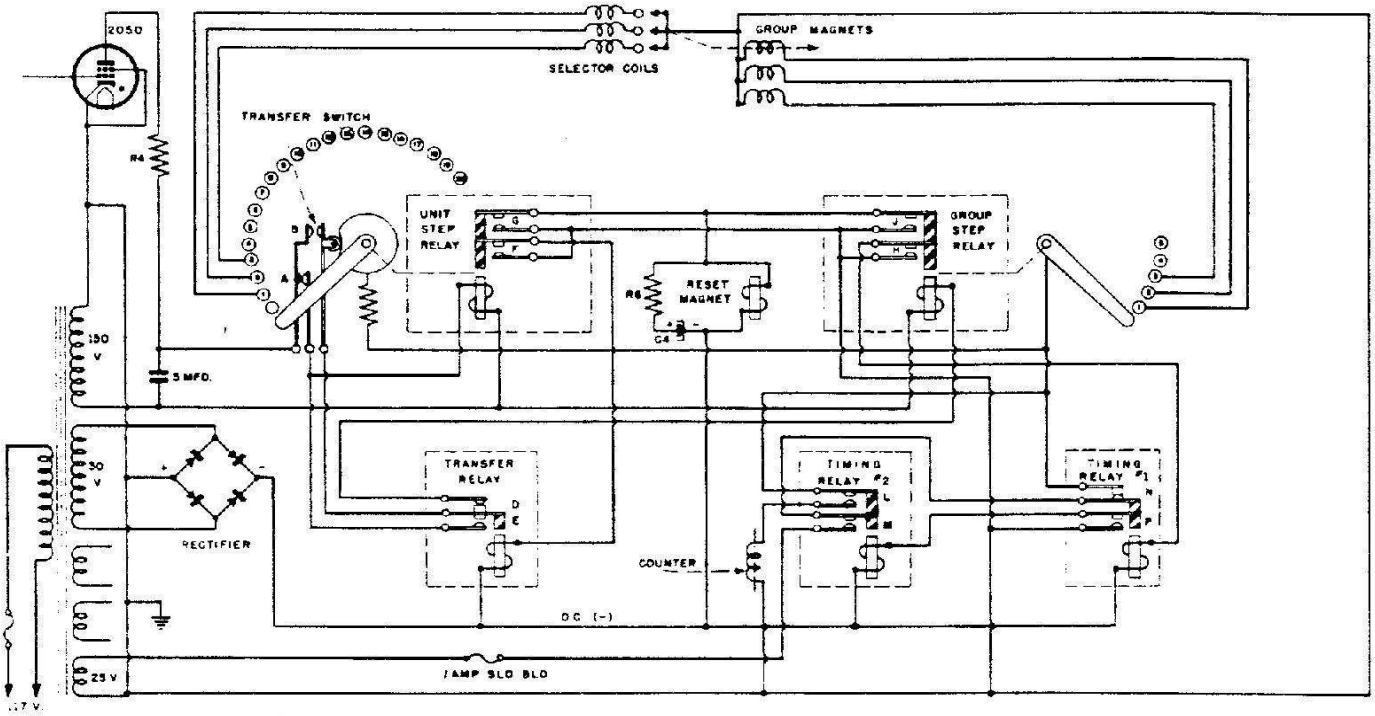


Figure 2. Simplified Schematic Diagram - Step Switch Assembly

The 1/5 second interval between the end of the last pulse of the first series and the beginning of the first pulse of the second series causes the Unit Step Relay to open the "G" and "F" contacts long enough to allow the Transfer Relay to drop out but not long enough to allow the Reset Magnet to disengage the Step Switch ratchet pawls. Therefore, during this 1/5 second interval when the Transfer Relay drops out, the Unit Step Switch remains in the advanced position and the plate circuit of the 2050 tube is transferred to the Group Step Relay through Contacts "B" and "D". When the first pulse of the second series operates the 2050 tube, the Group Step Relay will be energized and Contacts "J" and "H" will be closed for the duration of the pulse.

Contact "J" energizes the Reset Magnet so it maintains its energized position as long as the pulses of the second series operate the Group Step Relay. Contact "H" closes the d.c. circuit to the No. 1 Timing Relay. This relay has slow-release timing so it remains in the energized position during the 1/25 second intervals between the pulses forming the second series. When the No. 1 Timing Relay is energized Contact "N" opens and Contact "P" closes. Contact "P" closes the d.c. circuit to the No. 2 Timing Relay which, in turn, closes Contact "M" and Contact "L".

The conditions prevailing as long as the pulses of the second series continues with 1/25 second interval between them are: advance of the Group Step Switch with each pulse (Group Step Relay energized through Contacts "B" and "D"); the Reset Magnet energized so the Unit Step Switch is in its advance position; the Timing Relays No. 1 and No. 2 energized; Contact "M" closed; Contact "L" closed; Contact "N" open.

After the last pulse of the second series has operated the Group Step Relay, Contacts "J" and "H" remain open and the No. 1 Timing Relay drops out. When this occurs, Contact "P" opens and Contact "N" closes. Contact "N" will close the "Selection Circuit" for current supply to a selector coil and a group solenoid. The No. 2 Timing Relay has slow-release timing so there will be an interval of approximately 1/20 second before Contact "M" is opened to interrupt the selection circuit. The Reset Magnet timing is such that it drops out after Contact "M" has opened, releases the Step Switch ratchet pawls, and the step switches reset to normal position.

Contact "L", which is closed during the second series of pulses, completes a circuit to a selection counter solenoid in the Electrical Selector.

The number of steps the Unit Step Switch makes during the first series of pulses determines which one of twenty selector coil circuits will be energized. Because there is one open contact for the first step, the number of this circuit will be, numerically, one less than the number of pulses in the first series. The number of steps made by the Group Step Switch will determine which one of five group solenoids will be energized. The first pulse of the second series will advance the group switch to the A-B solenoid circuit, the second to the C-D solenoid circuit, and so on to the fifth pulse for the J-K solenoid circuit. The selection made, then, will require from two to twenty-one pulses in the first series and from one to five in the second series with the predetermined interval of approximately 1/5 second between the two series.

It is to be noted that operation of the relays is determined largely by the time interval between pulses, not by the duration of the individual pulses. The individual pulses of a selection series must be of only sufficient duration to insure full operating strokes of the step relay armatures but may be of any duration more than this minimum requirement. The intervals between the pulses must be long enough for the step relay armatures to return to normal position for another stroke but not enough to permit the transfer relay to release during the first series or the No. 1 Timing Relay to release during the second series. The interval between the last pulse of the first series and the first pulse of the second series must be timed to permit the transfer relay to release but must not be long enough to allow the release magnet to return to normal position.

Both the pulse length and the intervals between pulses is determined by the design and operation of the Wall-O-Matic. The contacts on the selector plate and the rotating control arm of the Wall-O-Matic are arranged for correct pulsing when the arm operates between the speed limits of 22 to 26 revolutions per minute.

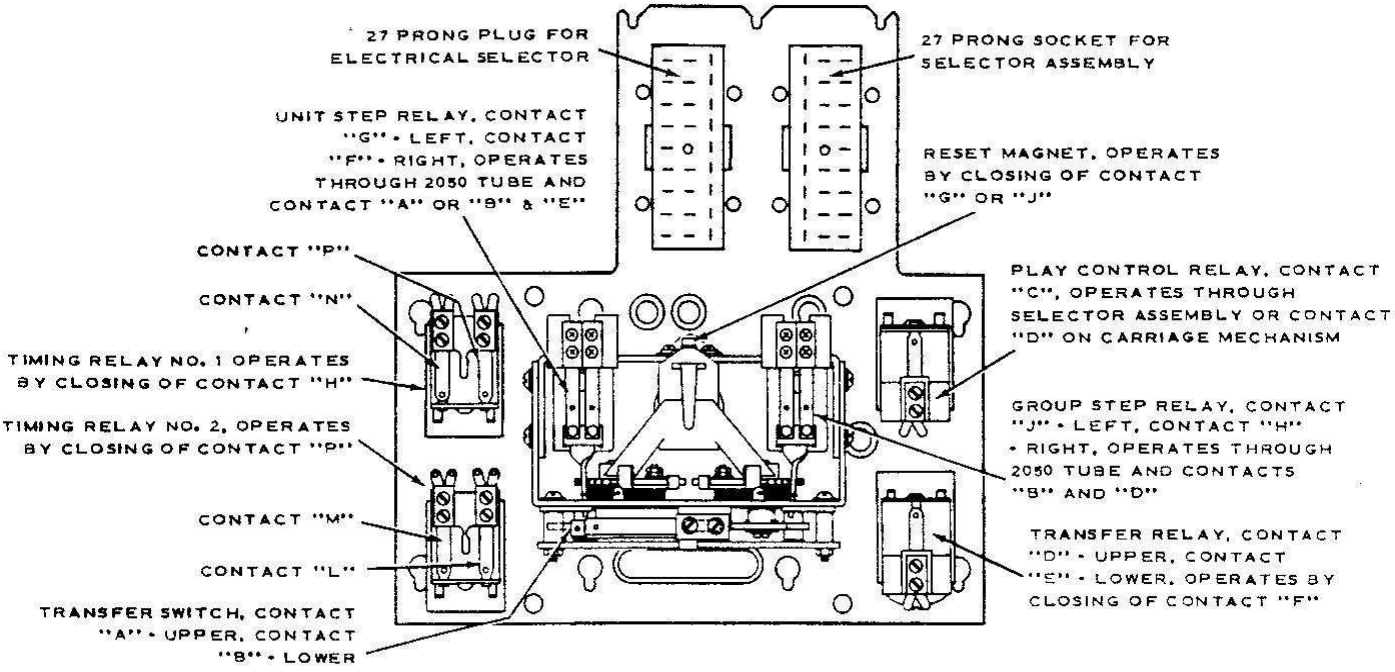


Figure 3. Top View of Step Switch & Relay Assembly

RELAY ADJUSTMENTS

Relay	Armature Gap	Contact	Contact Gap	Normal Position
Timing Relay #1	1/32"	N	1/64"	Closed
		P	1/64"	Open
Timing Relay #2	1/32"	L	1/64"	Open
		M	1/64"	Open
Transfer Relay	3/64"	D	1/32"	Closed
		E	1/32"	Open
Play Control Relay*	3/64"	C	1/32"	Open
Transfer Switch	See Step Switch Adjustments	A	1/64"	Closed
		B	App. 1/32"	Open
Group Step Magnet		H	1/64"	Open
		J	1/64"	Open
Unit Step Magnet		F	1/64"	Open
		G	1/64"	Open
Reset Magnet**	See RESET MAGNET POSITION, Page 5101			

All Coil Resistance = 500 ohms, except * = 40 ohms & ** = 325 ohms

STEP SWITCH ASSEMBLY

ADJUSTMENTS

RATCHET AND SWITCH

The ratchets are attached to the switch shafts with pins or set screws. They should be positioned so the outer blades of the step switches are approximately centered on the lowest contact (on the contact plate) when the stud on the side of the ratchet wheel is against the stop on the assembly frame.

The ratchets should be set on the shafts for a minimum of end play consistent with no binding.

RATCHET RETURN SPRING

The ratchet return spring for the unit step switch should have enough tension to require 90 to 115 grams (3-1/4 to 4 oz.) tangential force to move the ratchet to the 5th position of the step switch. This force is measured at the point of a ratchet tooth with the switch contact plates removed and will be approximately correct if the spring is wound one full turn when the switch is in the rest position.

The return spring for the group step switch should require 60 to 75 grams (2 to 2-3/4 oz.) tangential force to move the ratchet to the 5th position. The tension will be approximately correct if the spring is wound 3/4-turn when the switch is in the rest position.

STEP RELAY MAGNET POSITION

Adjust the step relay magnet vertically so the ratchet wheel tooth will over-ride the end of the release dog .010" to .020" when the armature is seated.

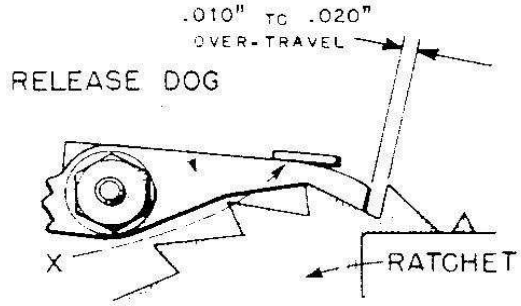


Figure 5. Side View - Release Dog & Ratchet

The upper edge of the pawl guide opening is the stop for upward travel of the pawl. With the pawl against the guide, the clearance between the ratchet teeth and the pawl should not be less than .005".

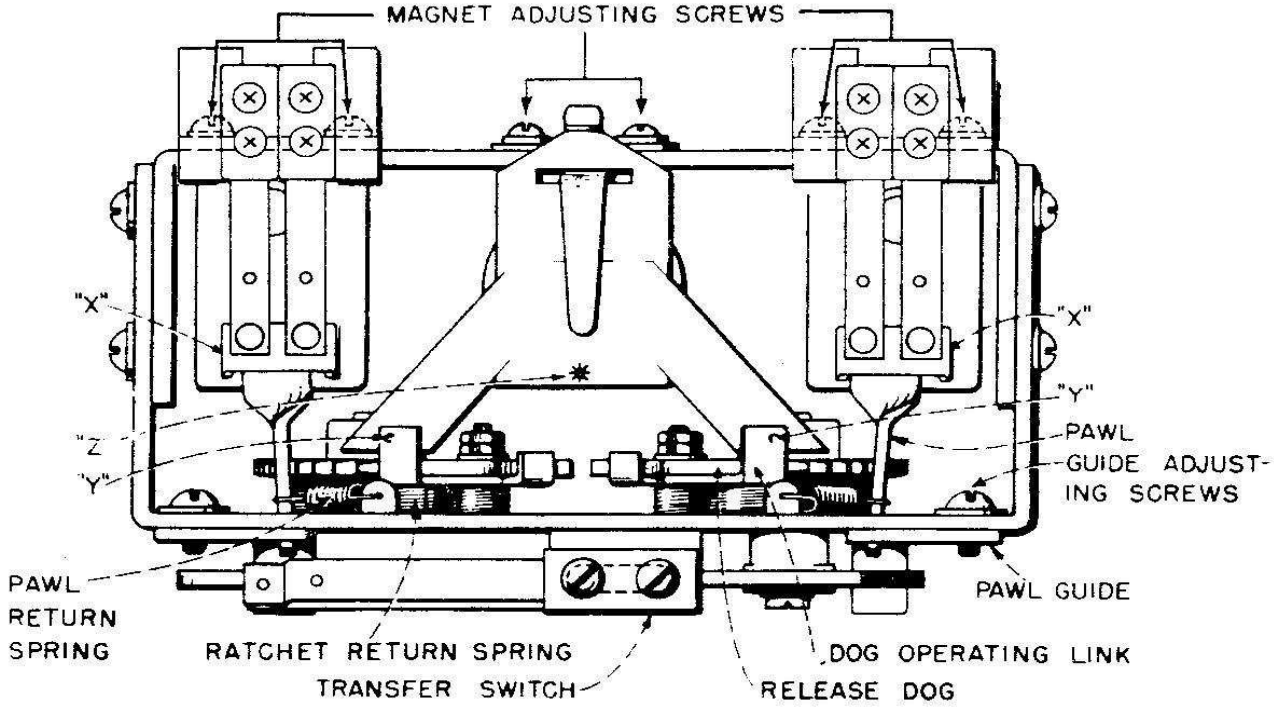


Figure 4. Top View of Step Switch Assembly

PAWL GUIDE

The pawl guides are adjusted so the pawls will strike the bottom of the ratchet teeth when the pawl moves down to engage the ratchet.

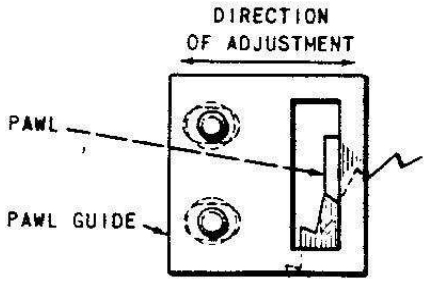


Figure 6. Pawl Guide Position

The guide adjustment must be made so there will be a .004" to .010" gap between the pawl and the guide at the bottom of the stroke.

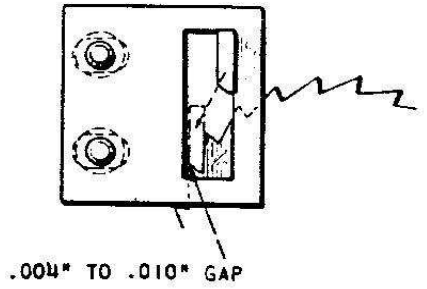


Figure 7. Pawl & Guide Gap

PAWL RETURN SPRING

The pawl return spring should have enough tension to require 10 to 15 grams (approximately 1/2 oz.) force to start the pawl away from the side of the pawl guide. This force is measured on the pawl, at the spring, with the pawl in the rest position.

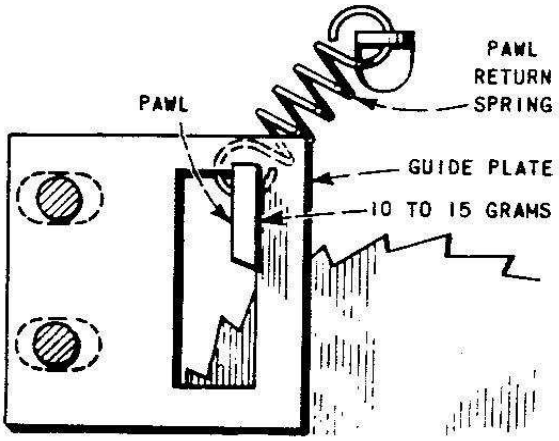


Figure 8. Return Spring Tension

STEP MAGNET TAIL SPRINGS

The tail spring pressure, measured at the front of the bridge on the step magnet armature ("X", Figure 4) should be 50 to 75 grams (1-3/4 to 2-1/2 oz.) to just close the switch contacts (when the contacts are correctly adjusted).

CONTACT PLATE SWITCH BLADES

The switch blades should have 10 to 35 grams pressure against the contacts. The pressure will be approximately correct if the blades are formed so their tips extend 5/32" above the contact assembly when the plates are removed.

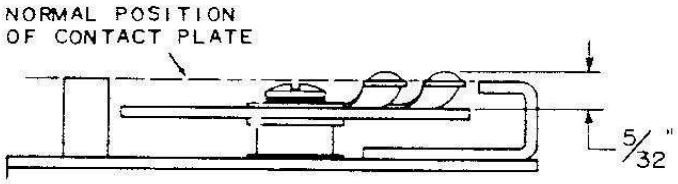


Figure 9. Switch Blade Position

When the contact plates are in position the switch blades should move freely over the contacts. If the contacts become rough or gummed, they should be cleaned with a clean cloth. Tarnish or dirt can be removed by polishing with a clean cloth moistened, slightly, with light oil. *Do not use sandpaper or emery cloth for cleaning the contacts and do not lubricate them with vaseline, grease or oil.*

RESET MAGNET POSITION

Adjust the reset magnet vertically so the release dogs engage the ratchet teeth with the armature extension clearing the dimples ("Y", Figure 4) on the dog operating links 1/64" when the magnet is energized.

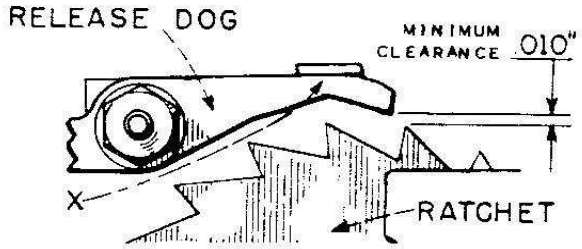


Figure 10. Release Dog Clearance

The armature travel must be sufficient to permit the release dogs to lift and clear the ratchet teeth .010" minimum when the magnet is not energized.

The tabs on the release dog operating links which engage the dogs and couple them to the reset magnet should not bind tightly but should not permit more than .005" free travel between the dogs and the links.

RESET MAGNET TAIL SPRING

The pressure applied to the end of the reset magnet armature ("Z", Figure 4) to start it from the rest position should be 100 to 140 grams (3-1/2 to 5 oz.).

RELEASE DOG SPRINGS

An upward pressure of 15 to 20 grams (1/2 to 3/4 oz.) applied at the dimple on the release dog operating links ("Y", Figure 4) should start the dogs from seated position. This pressure will be approximately correct if the springs are wound 1/2 to 3/4 turn.

TRANSFER SWITCH POSITION

Adjust the position of the switch on the mounting bracket so the roller is in the notch of the contactor assembly disc and the first operation of the step magnet causes no change from normal position of the roller blade. The second operation of the step magnet should raise the roller to the outer diameter of the disc.

The position of the switch should be such that the disc does not bind or drag on the flanges of the roller and the roller bracket should not strike the switch contact plate.

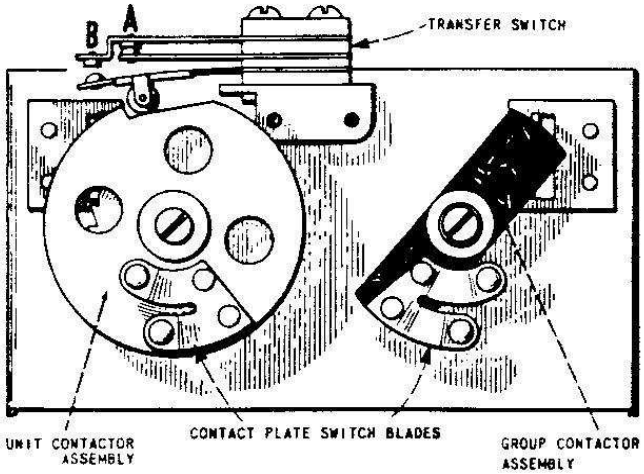


Figure 11. Side View - Transfer Switch

TRANSFER SWITCH CONTACTS

1. With the step switch in the rest position so the roller is in the notch of the contactor disc, adjust the lower blade for 1/2 to 3/4 oz. pressure of the roller against the disc.

   Adjust contact "B" gap 1/64".
   Adjust contact "A" pressure 1 oz.

2. The second operation of the step magnet should result in closing contact "B" with 1 oz. pressure and opening contact "A" 1/64" to 1/32" gap.

LUBRICATION

The following points should be lubricated with a drop of *Seeburg No. 53014 Special Purpose Oil.*

1. Pawl pivots and sliding surfaces of the pawls on the step relay armatures.
2. Pawl guides at area of contact with pawls.
3. Step switch shaft bearings.
4. Roller on roller blade of transfer switch.
5. Relay hinges.

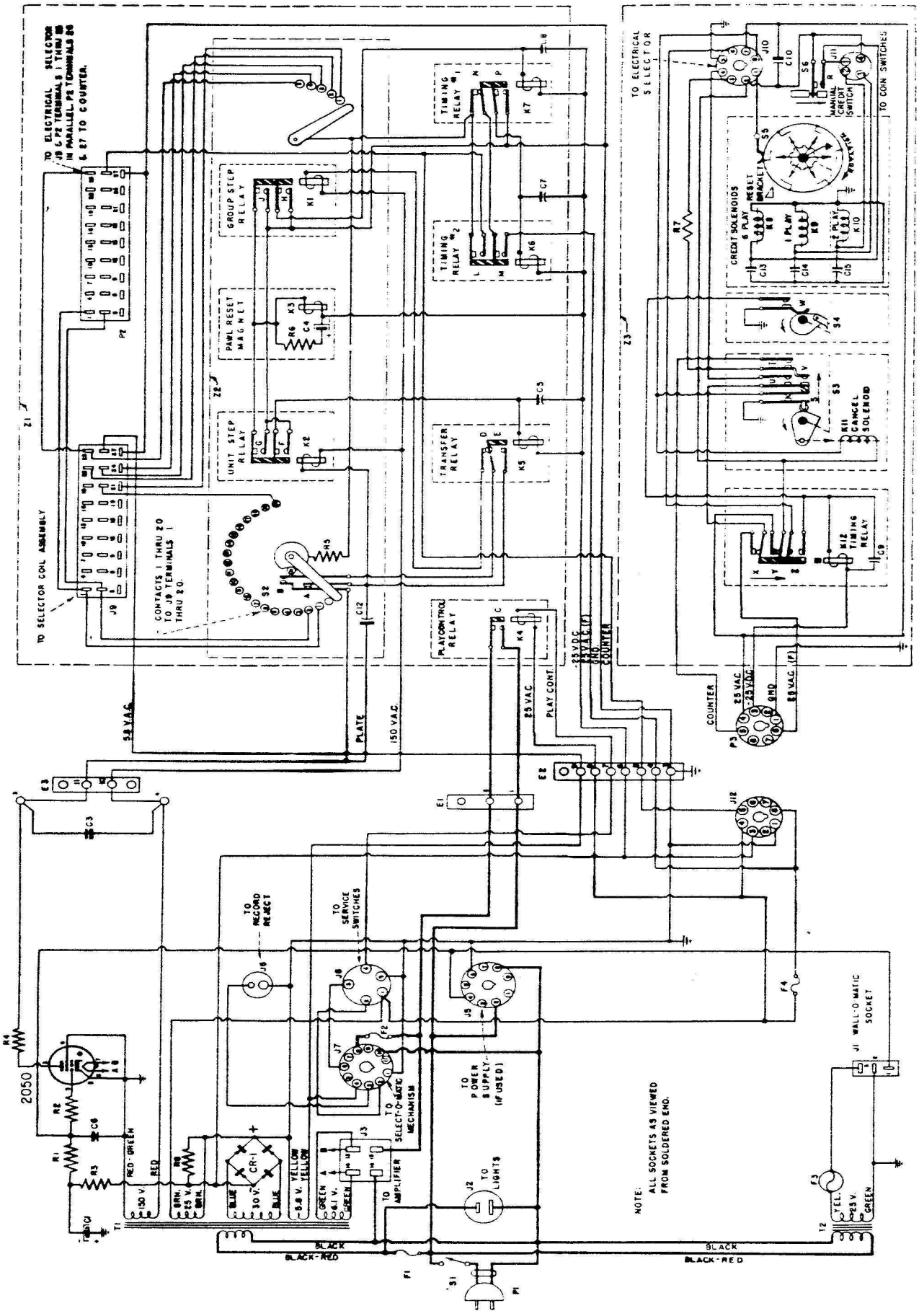


Figure 12. Schematic Diagram

PARTS LIST

Item	Part No.	Part Name
C1	87571	25 mfd. 50 v. Electrolytic
C3	11076	5.0 mfd. 300 v. Condenser
C4	87611	300 mfd. 50 v. Electrolytic
C5	86009	.05 mfd. 200 v. Condenser
C6	86009	.05 mfd. 200 v. Condenser
C7	86009	.05 mfd. 200 v. Condenser
C8	86009	.05 mfd. 200 v. Condenser
C9	86009	.05 mfd. 200 v. Condenser
C10	86009	.05 mfd. 200 v. Condenser
CR1	400587	Selenium Rectifier
C12	86069	.005 mfd. 1000 v. Condenser
C13	86173	.01 mfd. 200 v. Condenser
C14	86173	.01 mfd. 200 v. Condenser
C15	86173	.01 mfd. 200 v. Condenser
E1	303361	Terminal Strip
E2	303363	Terminal Strip
E3	303365	Terminal Strip
F1	602411	5 amp. Fuse, 3 AG
F2	303257	3 amp. Fuse, 3 AG
F3	301205	3 amp. Fuse, Fustat
F4	303275	1 amp. Fuse, Slo-Blo
J1	12006	3 Contact Socket
J2	11401	A.C. Socket
J3	301020	4 Contact Socket
J5	84244	9 Contact Socket
J6	301019	2 Contact Socket
J7	303253	11 Contact Socket
J8	84283	5 Contact Socket
J9	11202	27 Contact Socket
J10	84292	Octal Socket
J11	84293	Small 4 Contact Socket
J12	84292	Octal Socket
K1	303393	Group Step Relay
K2	303391	Unit Step Relay
K3	303392	Pawl Release Magnet
K4	303077	Play Control Relay
K5	303074	Transfer Relay
K6	303255	Timing Relay No. 2
K7	303075	Timing Relay No. 1
K8	400664	Credit Solenoid
K9	400664	Credit Solenoid
K10	400664	Credit Solenoid
K11	400685	Cancel Solenoid
K12	400696	Timing Relay Assembly
P1	303334	Line Cord & Plug Assembly
P2	303080	27 Prong Plug
P3	400695	Octal Plug
R1	82448	.1 meg 10% ½ w. Resistor
R2	82436	10,000 ohm 10% ½ w. Resistor
R3	82444	47,000 ohm 10% ½ w. Resistor
R4	82764	47 ohm 10% 1 w. Resistor
R5	81169	1 ohm w.w. 4 w. Resistor
R6	82403	18 ohm 10% ½ w. Resistor
R7	81169	1 ohm w.w. 4 w. Resistor
R8	82432	4700 ohm 10% ½ w. Resistor
S1	303112	Toggle Switch
S2	303115	Transfer Switch
S3	400686	Cam Switch Assembly
S4	400589	Timing Relay Switch
S5	400665	Credit Switch Assembly
S6	400671	Manual Credit Switch
T1	303340	Power Transformer
T2	303342	25 v. Transformer
Z1	303370	Step Switch & Relay Assembly
Z2	303390	Step Switch Assembly
Z3	400640	Credit & Cancel Assembly

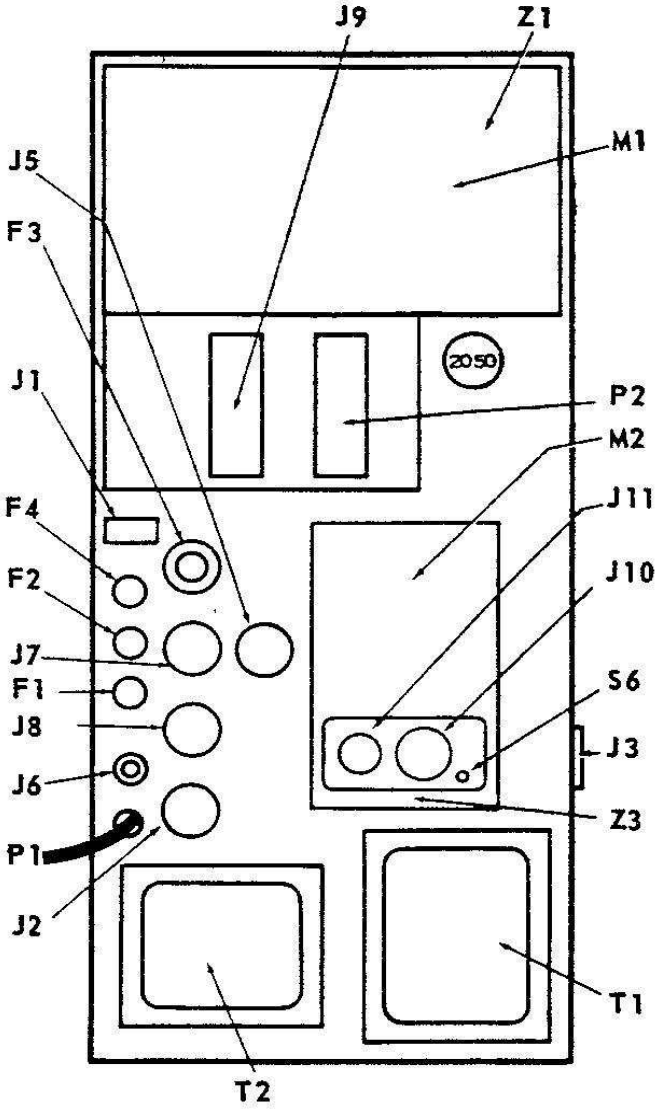


Figure 13.

PARTS LIST

Item	Part No.	Part Name
F1	602411	5 amp. 3AG Fuse
	300061	Fuse Receptacle
F2	303257	3 amp. 3AG Fuse
	300061	Fuse Receptacle
F3	301205	3 amp. Fustat
	303380	Fustat Receptacle
F4	303275	1 amp. Slo-Blo Fuse
	300061	Fuse Receptacle
J1	12006	3-contact Socket
J2	11401	A.C. Socket
J5	84244	9-contact Socket
J6	301019	2-contact Socket
J7	303253	11-contact Socket
J8	84283	5-contact Socket
J9	11202	27-contact Socket
J10	84292	Octal Socket
J11	84293	Small 4-contact Socket
M1	303345	Adjustment Label
M2	400694	Adjustment Label
P1	303334	Line Cord & Plug
P2	303080	27-contact Plug
S6	400671	Manual Credit Switch
	400597	Tension Plate
	70822	Screws - 2 Required
T1	303340	Power Transformer
T2	303342	25-volt Transformer
Z1	303370	Step Switch & Relay Assembly
Z3	400640	Credit & Cancel Assembly
Z4	303336	Cover
Z5	400687	Cover

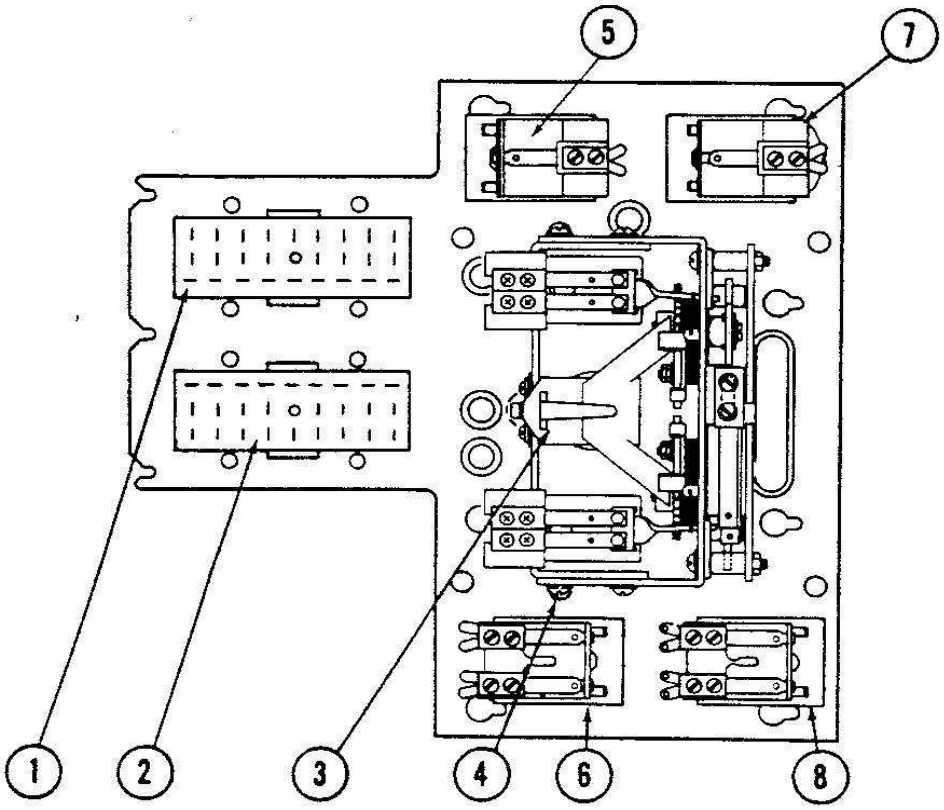


Figure 14. No. 303370 Step Switch & Relay Assembly

PARTS LIST

Item	Part No.	Part Name
1	11202	27-contact Socket (J9)
2	303080	27-contact Plug (P2)
3	303390	Step Switch Assembly (Z)
4	10848	Cup Washer
	78000	Grommet
5	303077	Play Control Relay (RY4)
	303128	Coil & Frame Assembly
	303127	Contact Assembly (C)
6	303075	Timing Relay No. 1 (K7)
	303094	Coil & Frame Assembly
	303093	Contact Assembly (N)
	303092	Contact Assembly (P)
7	303074	Transfer Relay (K5)
	303130	Coil & Frame Assembly
	303129	Contact Assembly (D & E)
8	303255	Timing Relay No. 2 (K6)
	303096	Coil & Frame Assembly
	303095	Contact Assembly (M)
	303095	Contact Assembly (L)

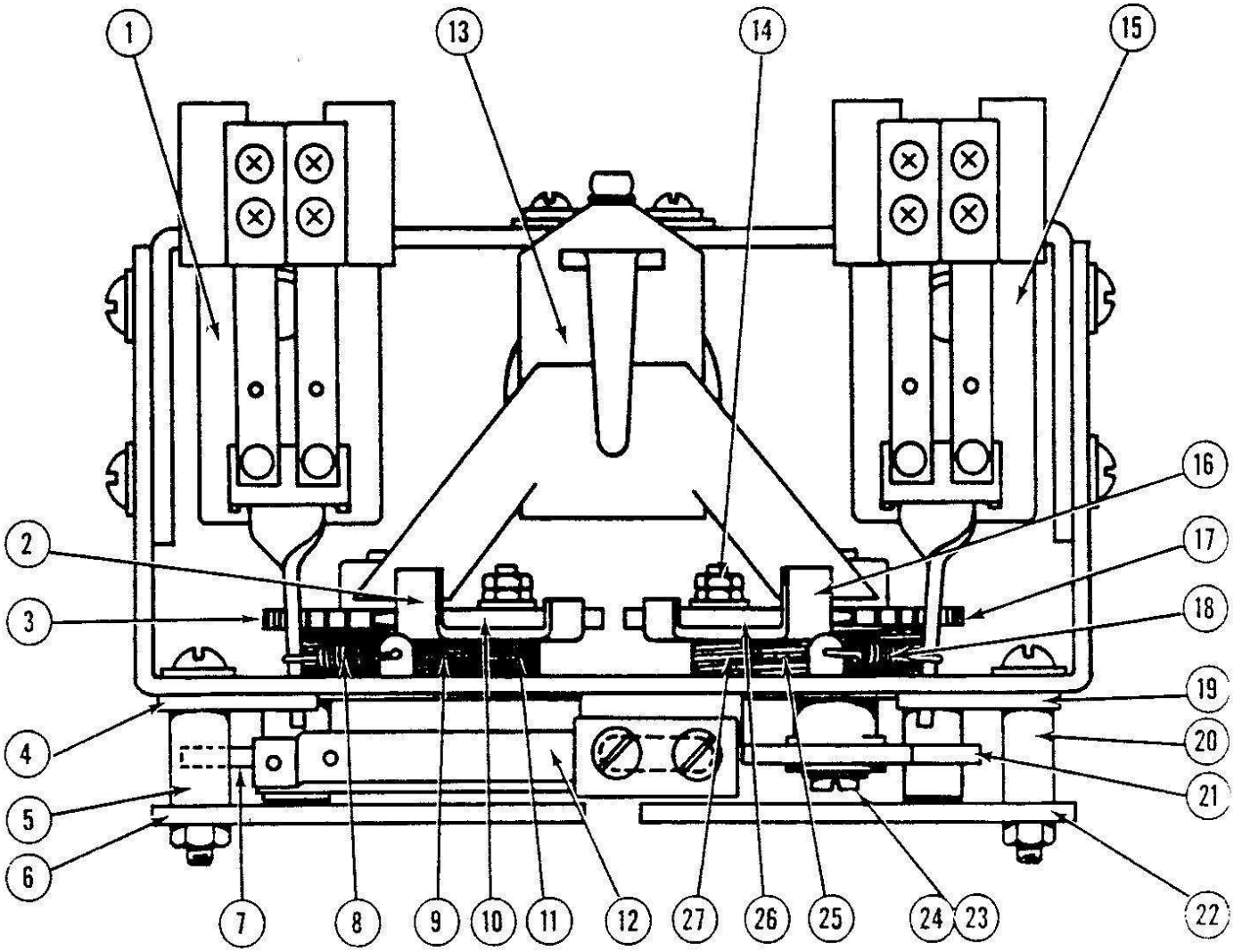


Figure 15. No. 303390 Stepper Assembly

PARTS LIST

ITEM	PART NO.	PART NAME
1	303397	UNIT STEPPER RELAY (INCLUDES 303391, 303100, 303102)
	303391	MAGNET & FRAME ASSEMBLY
	303100	ARMATURE ASSEMBLY
	303102	TAIL SPRING
	303192	SWITCH ASSEMBLY (CONTACT G AND F)
	303191	SWITCH MOUNTING SCREWS (3-48 X 11/32 R.H.)
	303176	SWITCH MOUNTING BRACKET
2	303177	DOG OPERATING LINK
3	303179	RATCHET AND SHAFT
4	303187	PAWL GATE
5	303188	CONTACT PLATE SPACER
6	303394	CONTACT PLATE
7	303071	CONTACTOR
	303184	CONTACTOR MOUNTING WASHER (NOT SHOWN)
	303183	CONTACTOR MOUNTING SCREW (NOT SHOWN)
8	303106	PAWL RETURN SPRING
9	303104	RETURN SPRING
10	303181	DOG
11	303107	DOG RETURN SPRING
12	303099	TRANSFER SWITCH ASSEMBLY (INCLUDES FOLLOWING 4 ITEMS)
	303182	SWITCH MOUNTING SCREWS (5-40 X 9/16)
	303117	SWITCH MOUNTING BRACKET
	303115	TRANSFER SWITCH (CONTACTS A AND B)
	303189	SWITCH RETAINER PLATE
13	303392	PAWL RELEASE MAGNET, COMPLETE
	303103	TAIL SPRING, ONLY
14	303185	2-56 HEX. NUTS
	303186	NO. 2 WASHERS (UNDER NUTS)
15	303398	GROUP STEPPER RELAY (INCLUDES 303393, 303101, 303102)
	303393	MAGNET AND FRAME ASSEMBLY
	303101	ARMATURE ASSEMBLY
	303102	TAIL SPRING
	303192	SWITCH ASSEMBLY (CONTACT J AND H
	303191	SWITCH MOUNTING SCREWS (3-48 X 11/32)
	303176	SWITCH MOUNTING BRACKET
16	303178	DOG OPERATING LINK
17	303180	RATCHET AND SHAFT
18	303106	PAWL RETURN SPRING
19	303187	PAWL GATE
20	303188	CONTACT PLATE SPACER
21	303072	CONTACTOR
22	303395	CONTACT PLATE
23	303184	CONTACTOR MOUNTING WASHER
24	303183	CONTACTOR MOUNTING SCREW
25	303105	RETURN SPRING
26	303181	DOG
27	303108	DOG SPRING

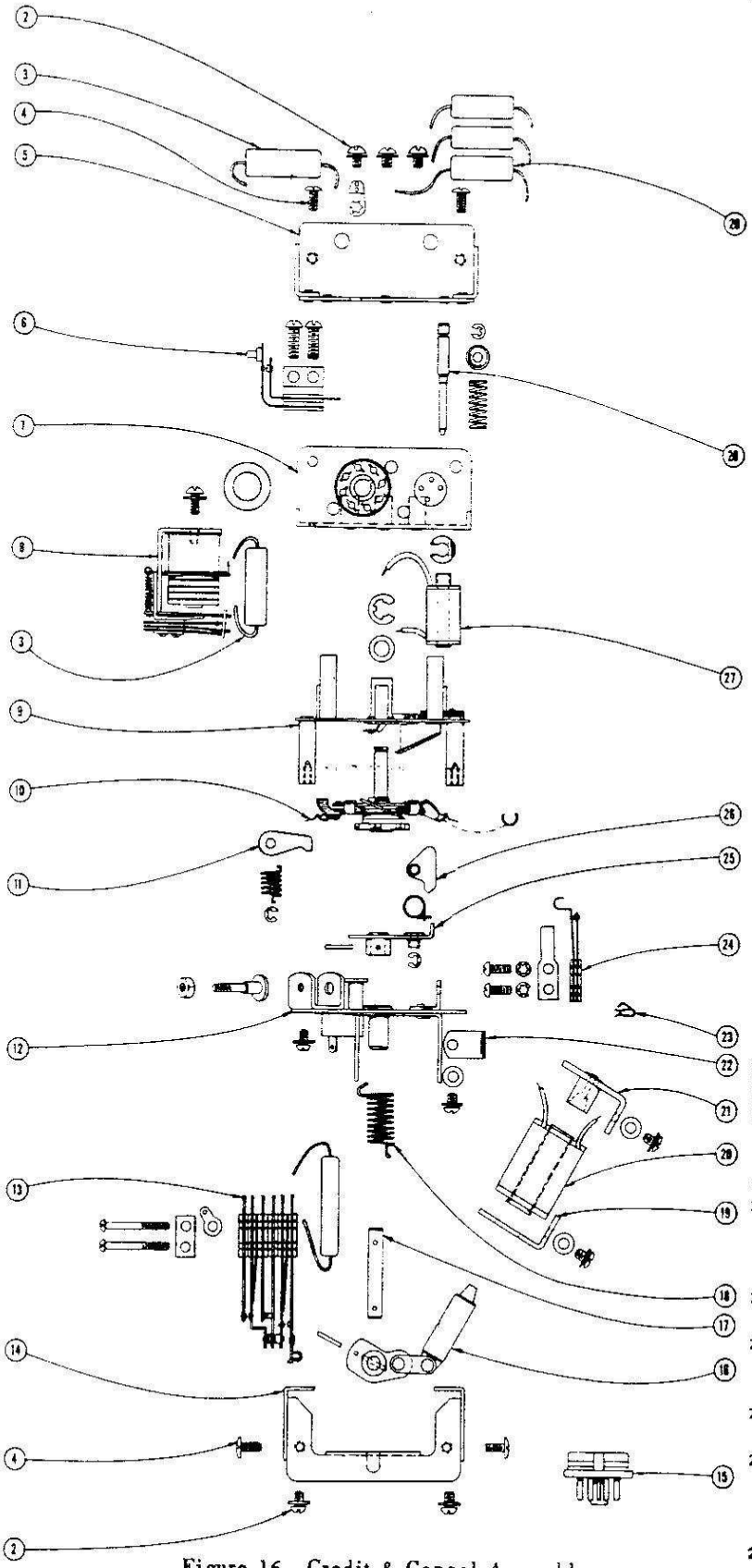


Figure 16. Credit & Cancel Assembly

PARTS LIST

Item	Part No.	Part Name
1	400640	COMPLETE CREDIT & CANCEL UNIT
	400687	COVER (NOT SHOWN)
	400694	INSTALLATION LABEL (NOT SHOWN)
2	71757	8-32 X 1/4 R . H. MACHINE SCREW, SEMS
	74106	SOLDER LUG
3	86009	.05 MFD 200 V. CONDENSER (PAPER)
4	71950	8-32 X 3/8 B. H. MOUNTING SCREWS
5	400674	RETAINER PLATE
6	400671	MANUAL CREDIT SWITCH
	400597	TENSION PLATE
	70822	5-40 X 9/16 R. H. MACHINE SCREW
7	400667	SOCKET PANEL ASSEMBLY
	84292	OCTAL SOCKET
	84293	4 PIN SOCKET
	78042	RUBBER GROMMET
8	400696	TIMING RELAY
	71755	8-32 X 1/4 R. H. MACHINE SCREW, SEMS
	400612	CONTACTS & ARM
	400613	TAIL SPRING
9	400660	COIN SOLENOID PANEL ASSEMBLY
10	400665	ROTARY CREDIT SWITCH ASSEMBLY
	504142	"C" SPRING
	72293	SPRING WASHER
	125403	RETAINING RING
11	400682	LOCK PAWL & SHAFT ASSEMBLY
	400545	LOCK PAWL SPRING
	R231163	RETAINER
12	400677	FRONT PANEL ASSEMBLY
	400540	PAWL ARM STOP
	70003	10-32 HEXAGON NUT
	71757	8-32 X 1/4 R. H. MACHINE SCREW, SEMS
13	400686	CAM SWITCH ASSEMBLY
	70823	5-40 X 1 1/4 R. H. MACHINE SCREW
	400597	TENSION PLATE
	74007	SOLDER LUG
	81169	1 OHM RESISTOR
14	400684	TOP MOUNTING BRACKET
	71757	8-32 X 1/4 R. H. MACHINE SCREW, SEMS
15	400695	OCTAL PLUG
16	400931	CAM & PLUNGER ASSEMBLY
	80093	GROOVE PIN
17	400929	ROTARY SWITCH SHAFT
18	400557	CAM SPRING
19	400570	SOLENOID BRACKET
	71794	8-32 X 1/4 B. H. MACHINE SCREW, SEMS
20	400685	CANCEL SOLENOID
21	400958	SOLENOID BRACKET & STOP ASSEMBLY
22	127085	CABLE CLAMP
	72191	3/8 X 0.172 X 1/32 FLAT WASHER
	71755	8-32 X 3/8 R. H. MACHINE SCREW, SEMS
23	400972	SPRING CLIP
24	400589	TIMING RELAY SWITCH
	400611	BUFFER SPRING
	71676	5-40 X 7/16 R. H. MACHINE SCREW
	73023	NO. 2 LOCK WASHER
25	400549	PAWL ARM & HUB ASSEMBLY
	80098	GROOVE PIN
26	400553	PAWL & PIN ASSEMBLY
	400556	PAWL SPRING
	R231163	RETAINER RING
27	400664	CREDIT SOLENOID
	11445	"C" WASHER
28	400672	SOLENOID PLUNGER ASSEMBLY
	400658	COMPRESSION SPRING
	400603	CUP WASHER
	R231163	RETAINER
29	86173	.01 MFD 200 V. CONDENSER (PAPER)

SEEBURG WIRED SELECTION RECEIVER

Type WSR8-L6

The Wired Selection Receiver, Type WSR8-L6, is the power distribution and control center of the Select-O-Matic "100" R. C. Special, Model HHF100R for operation from wired Wall-O-Matics, Type 3W1. Power enters the Receiver through the line cord and main switch and is distributed, directly at 117-volts or through transformers, to the Select-O-Matic Mechanism, the cabinet lighting, the amplifier, and the Wall-O-Matics. All connections to the Receiver are made with plugs which are of different types and sizes to avoid possibility of incorrect connections. Included in the Receiver are a Step Switch and Relay Assembly, and a 2050 tube, for selection of records from Wired Wall-O-Matics.

A 25-volt transformer supplies power for up to six Type "3W-1" Wired-O-Matics. Another transformer, the selection receiver power transformer, has five output windings for control circuits, and heater current for the tubes in the Master Remote Amplifier.

One of the secondaries of the selection receiver power transformer provides approximately 30-volts, a.c. This 30-volt output is rectified by a full-wave selenium rectifier for 25-volt d.c. supply for some of the relays of the Step Switch and Relay Assembly, and for bias supply for the 2050 tube. Another secondary provides approximately 150-volts for operating the step switches through the plate circuit of the 2050 tube.

Operation of Selection Receiver, Type WSR8-L6, is the same as that of the Type WSR7-L6. All service notes, schematic diagrams, and parts lists applying to the Type WSR7-L6 apply to the Type WSR8-L6 except that there is no Credit and Cancel Unit incorporated for operation of an electrical selector. The space on the chassis of the WSR8-L6 is used for a Selection Counter, Part No. 400624. The parts list for this counter is given below.

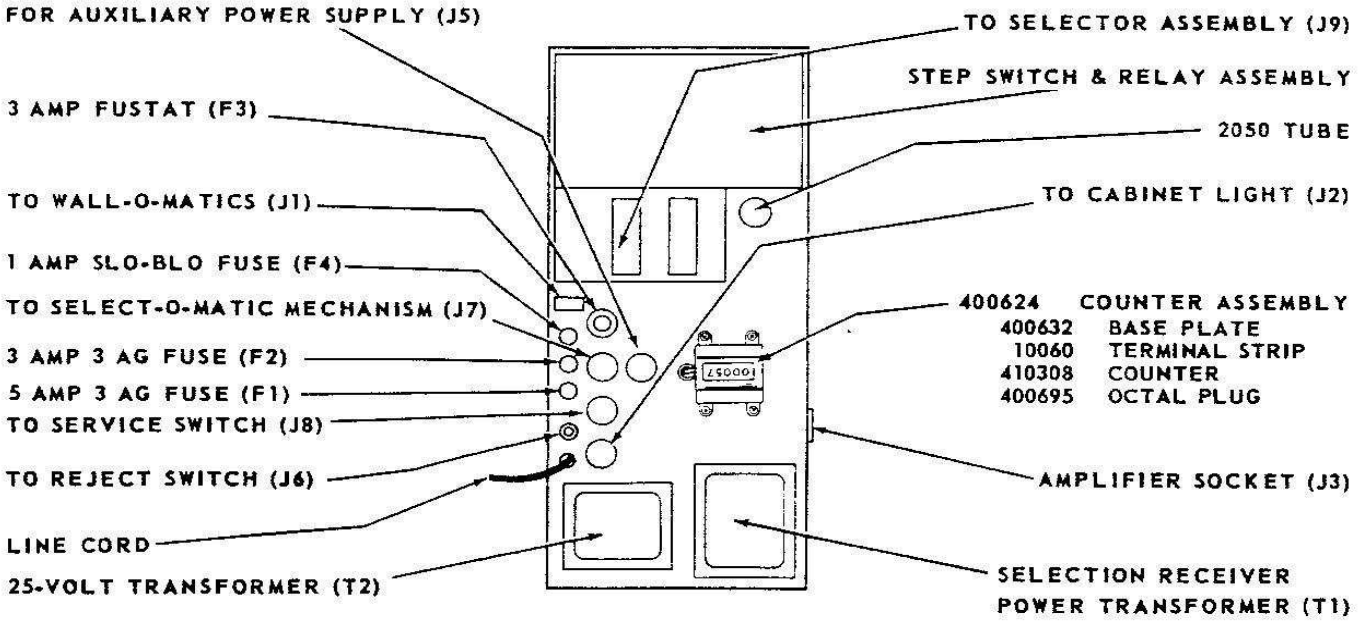


Figure 1. Top View of Selection Receiver

Seeburg

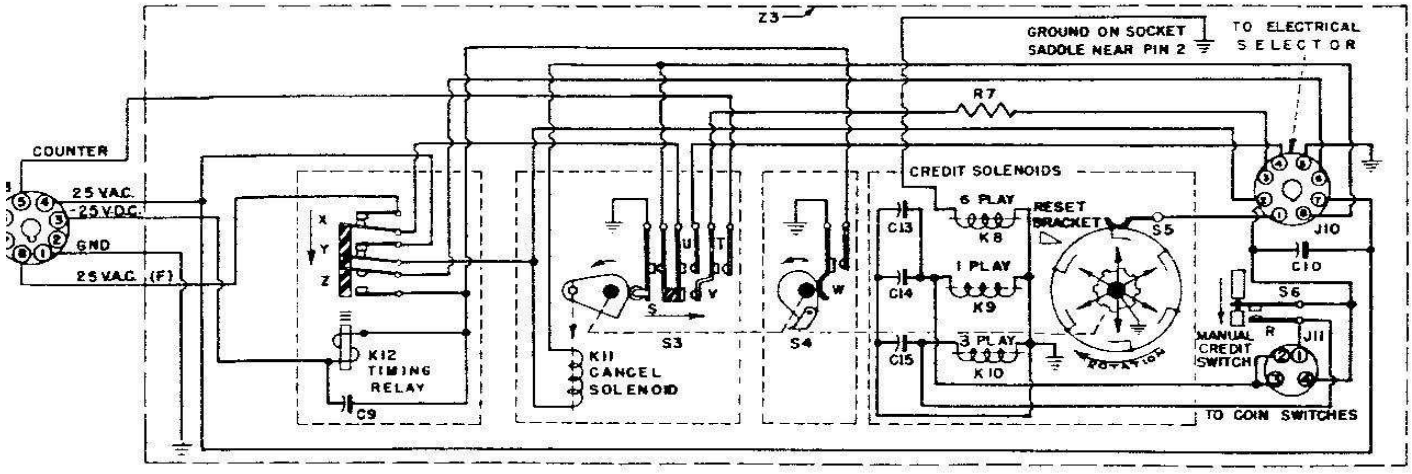
WIRED SELECTION RECEIVER
Type WSR7-L6D

The Wired Selection Receiver, Type WSR7-L6D, is the power distribution and control center of the Select-O-Matic "100" for operation from the Electrical Selector and Wall-O-Matics. It is the same as the Type WSR7-L6 in all respects except that the Credit and Cancel Unit is arranged for three plays for a 25-cent coin and one play for either a dime or two nickels. Operation for two nickels is made possible only by association of this receiver with a slug rejector that incorporates a "nickel diverter." Such a slug rejector is designed to accept quarters, dimes and nickels. Each quarter and dime operates, respectively, a quarter and dime coin switch but only alternate nickels operate the associated nickel coin switch. Operation of the nickel coin switch by alternate nickels is accomplished with the nickel diverter. Its operation is such that the first of two nickels is diverted from the coin switch. The coin passes into the cash box but tilts the diverter so the second nickel operates the coin switch as it drops from the rejector. In this manner the 5-cent coin switch will be closed only once for two nickels, and, because this switch and the dime switch are both connected to the credit solenoid that is in the 1-credit position, one credit will be set up for 10 cents whether it be a single 10-cent coin or two nickels.

If the WSR7-L6D Selection Receiver is associated with a slug rejector that does not incorporate the nickel diverter, it is necessary that the path of the nickels through the rejector be obstructed so the 5-cent coins will be rejected. If this is not done, a single credit will be established in the Credit and Cancel Unit for each nickel that passes into the cash box.

All of the operational and service information given in pages 5095 to 5108 for the WSR7-L6 applies equally well to this receiver, with the exception of the Credit and Cancel Unit portion of the diagram on page 5103 and the references to the type and part number of the Credit and Cancel Unit.

The Credit and Cancel Unit used in this receiver is Type CCU3-L6D shown below. The part number of the CCU3-L6D is 400649. It is identified as Item Z3 on Page 5105 and as Item 1 on page 5108. Except for the part number for the complete Credit and Cancel Unit, all of the parts and part numbers listed on page 5108 are for the CCU3-L6 and the CCU3-L6D.



Schematic Diagram. Type CCU3-L6D

CONSTANT VOLTAGE WALL SPEAKER
TYPE CVS4-8
8-INCH

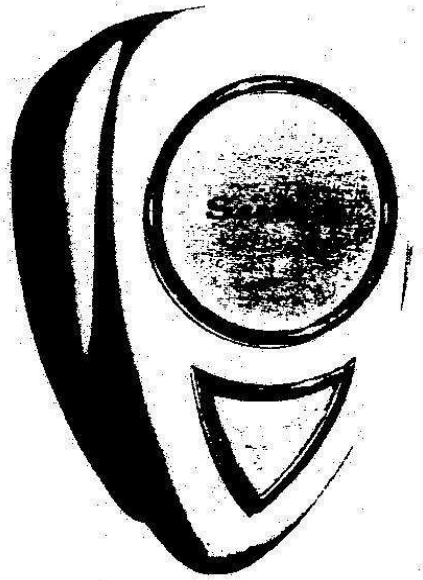
INSTALLATION INSTRUCTIONS

This speaker is designed for use with any constant voltage distribution system employing a 70.7 volt line. The amplifier for a system of this type is designed to deliver rated power output at 70.7 volts R.M.S. with good regulation. Speakers are connected in parallel across the line from the amplifier. For proper phasing, connect the "C" terminal of all speakers to the wire that is fastened to the common terminal of the amplifier. Each speaker can be connected to give audio output at any one of four different steps of volume. The correct volume step should be selected for the speaker location depending upon the number of speakers, room size, background noise and type of service. The volume step connection is made with the wire coming from the speaker voice coil. Being equipped with a spade lug, it is to be fastened to one of the four marked terminals for desired volume level. The volume step connection should be made at the time of the speaker installation and left alone.

The figures on the terminal panel indicate the audio power taken from the line by the speaker when it is connected at any one of the four different steps of volume. Speakers can be added to the line from the amplifier until the total power taken from the line (the sum of the wattage figures at which each speaker is connected) is equal to the power output rating of the amplifier. The total number of speakers used on an amplifier can be connected to draw less (BUT MUST NOT BE CONNECTED TO DRAW MORE) power in watts than the power output rating of the amplifier. Due to speaker transformer losses, any wattage less than 1 watt should be considered as equal to 1 watt when computing the total speaker load connected to an amplifier (1/16 or 1/4 watt connections should be considered as 1 watt loads.)

SPEAKER WIRING

Three types of speaker cable are available:



Part No.	Description
502229	Main Line Speaker Cable
502294	Branch Line Speaker Cable
502090	Remote Speaker Cable

The Main Line Speaker Cable is a pair of well insulated No. 16 wires in a braided shield. This is for use on long main line runs from a high power amplifier.

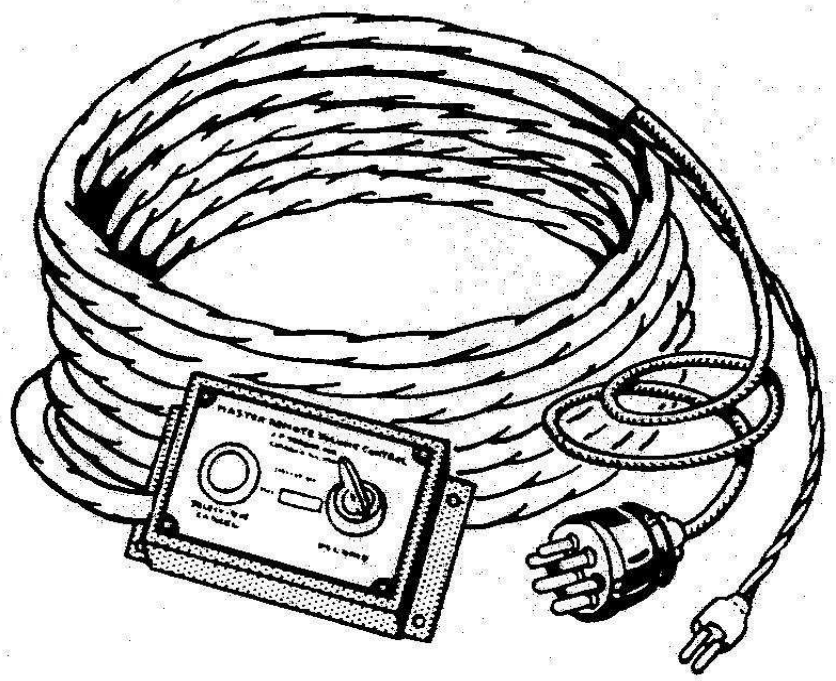
The Branch Line Speaker Cable is a pair of well insulated No. 20 wires in a braided shield. This is for use on branch runs from the main line cable or for runs from a low power amplifier.

The Remote Speaker Cable is a pair of insulated No. 24 wires designed for use with Seeburg Coin-Operated Music Systems.

SPEAKER MOUNTING

Measure the distance from the floor to the point where the bottom edge of the speaker will be. From this point draw a vertical chalk line upward approximately 18 inches. Two and one half inches from the bottom of this line, drill a 3/4 inch deep hole with a #28 drill. Drive the longer of the two furnished wood screws into this hole until the bottom of the screw head is 7/16 inch from the wall surface or 5/8" when rubber bumpers are on speaker back.

MASTER REMOTE VOLUME CONTROL
TYPE MRVC-I



INSTALLATION INSTRUCTIONS

1. Determine location of the Remote Volume Control and best routing for the cable, keeping in mind appearance and possibility of physical damage to the cable as well as convenience of control.

2. Remove the back door of the Phonograph. Replace the 7-prong dummy plug in the Amplifier chassis with the large 7-prong plug on the cable of the Remote Volume Control.

3. Replace the Selection Cancel plug in the Selection Receiver with the 2-prong plug on the Remote Volume Control cable.

4. Arrange the cable from the plugs so it passes through the notch in the back door.

5. Fasten the cable to the wall of the cabinet with one of the clamps, allowing enough slack cable in the cabinet to avoid strain on the cable or plugs.

6. Lay the cable from the cabinet to the Remote Volume Control, passing the cable loosely over pipes and through necessary holes in walls and floors.

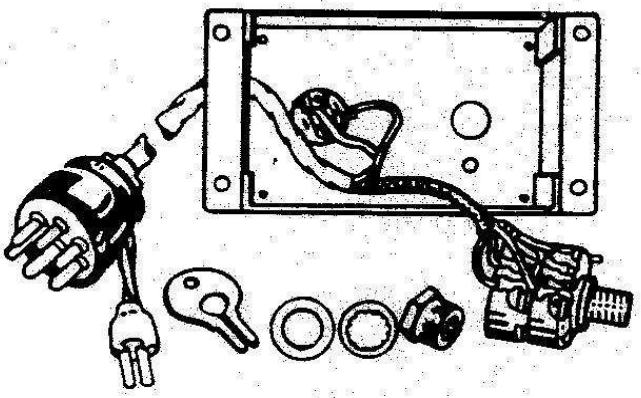
7. Fasten the control box securely in place with screws.

8. Fasten the cable securely, starting at the control with a clamp adjacent to the control box. Take up excess cable as it is fastened.

9. When the cable is installed, excess cable can be coiled or folded in the cabinet. Leave enough slack to permit moving the phonograph from the wall for maintenance and cleaning.

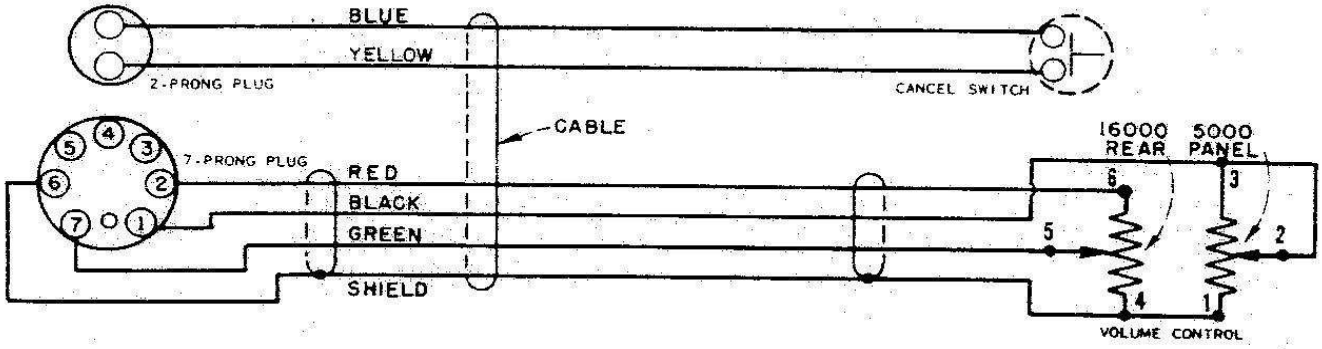
10. If it is necessary to disconnect the Control to pass the cable through holes in walls or floors, prepare it as shown in Figure A and reconnect it according to the diagram. Solder all connections. *Do not use acid core solder or acid solder flux.*

PARTS LIST



Part No.	Description
503034	Control Box
302007	Volume Control
73110	Lock Washer
72162	Flat Washer
12105	Selection Cancel Button
302070	Acorn Nut
503037	Cable
402041	7-Prong Large Plug
402066	2-Prong Plug
302047	Key
402098	Cable Clamp (10)

SCHEMATIC DIAGRAM



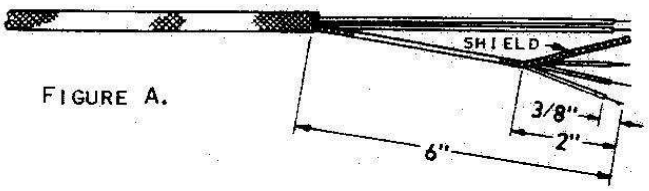
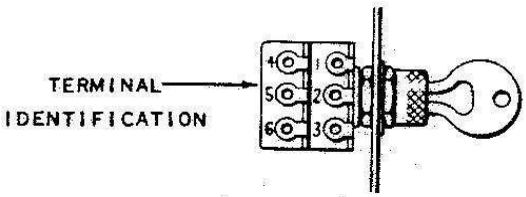


FIGURE A.



8006

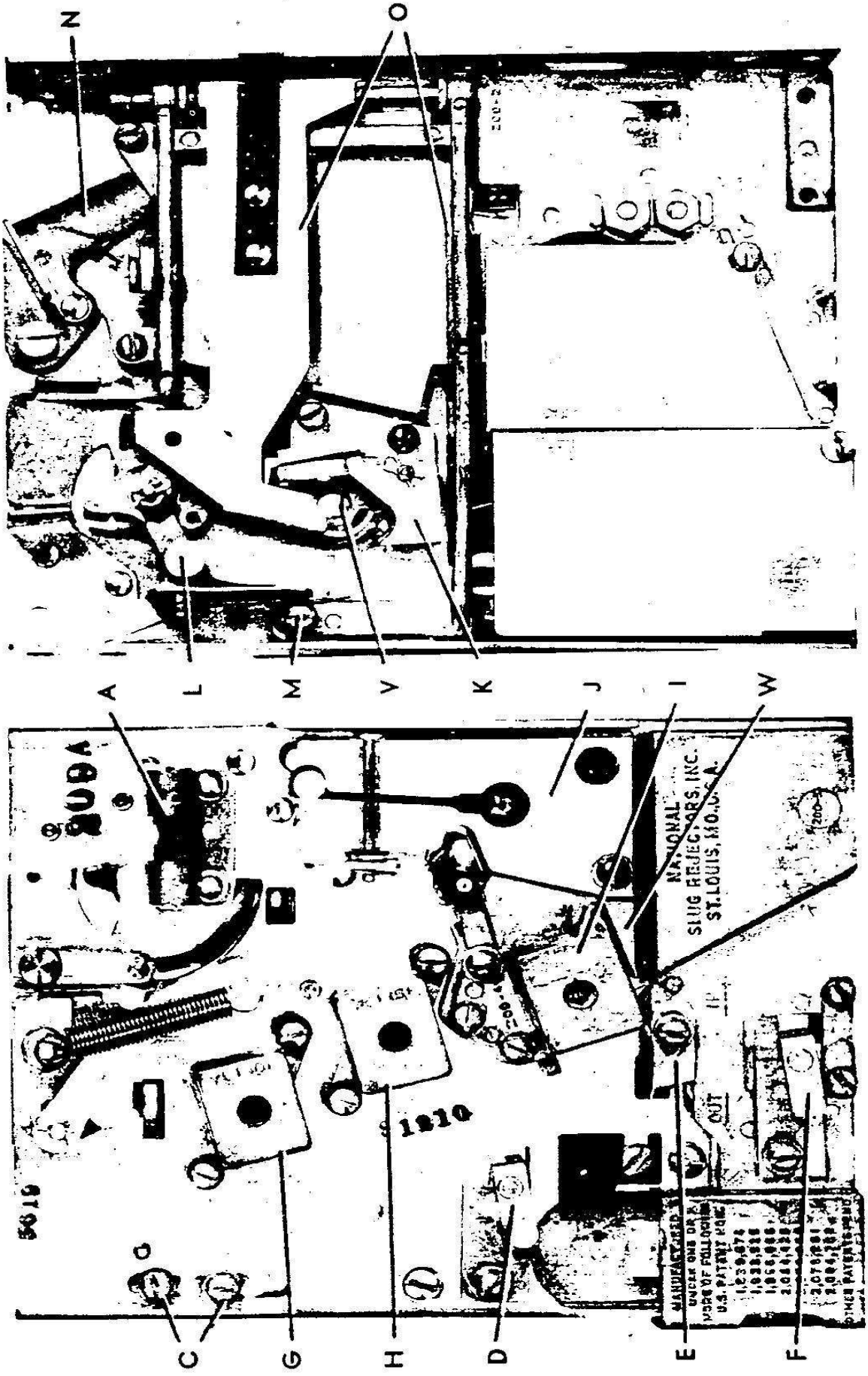
5—10—25c SLUG REJECTOR

THEORY OF OPERATION

When a piece of metal that is an electrical conductor is passed through a magnetic field, a small voltage is generated within the metal. The voltage thus generated, short-circuited within the body of the metal, causes currents to flow in it. These currents set up magnetic forces in opposition to the magnetic field. The opposing fields tend to resist the force which drives the metal.

Since various metals have different degrees of electrical conductivity, it is possible to detect one metal from another by noting the behavior of each in the magnetic field.

The speed of a metal coin rolling or falling through a magnetic field will be governed by the electrical conductivity of the metal. This is the basic principle used in the detection of coins in the 5 — 10 — 25c slug rejector.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NATIONAL
SLUG REJECTORS, INC.
ST. LOUIS, MO., U.S.A.
1810
OUT

FIG. 1

LEVELING

IT IS ABSOLUTELY NECESSARY THAT THE SLUG REJECTOR BE LEVEL. The spirit level, (A), is provided for indicating the position of the rejector.

SERVICE NOTES

It is recommended that the magnets never be removed unless absolutely necessary. If they are removed, they should be handled with care and a soft iron "keeper" should be placed across the pole faces.

The 10c scavenger gate, (J), has an adjusting screw, (M), which is set to allow the gate to just close. If the screw is not far enough in, the gate will not close. If the screw is too far in, the rear scavenger gates, (O), will be held open.

The 5c undersize gauge, (K), must work freely at all times. If any adjustment is made, the unit should be tested with dimes as well as nickels since the undersize gauge wire, (V), on this gauge, also serves to deflect dimes into the proper path.

The rotary quarter sizer, (L), has no adjustment but should work freely at all times, turning easily with the weight of the quarter.

The scavenger wiper blade, (N), is effected by the adjustment of the deflector, (C), for fast moving 25c size slugs. It is important that this part move freely and returns to its normal position after the scavenger is released.

Use no lubricants.

KEEP THE REJECTOR CLEAN AND LEVEL. If it is necessary to dismantle the rejector for cleaning, be sure to replace washers under the screw heads so the screws will not protrude into the path of a coin.

Adjustments of the slug rejector are given in Figures 2 to 9, inclusive. These illustrations also show the paths of coins and slugs through the rejector. Before making any adjustments, study the illustrations so the reason for the adjustment is fully understood. Guess work and "cut and try" is seldom successful and usually results in unsatisfactory operation.

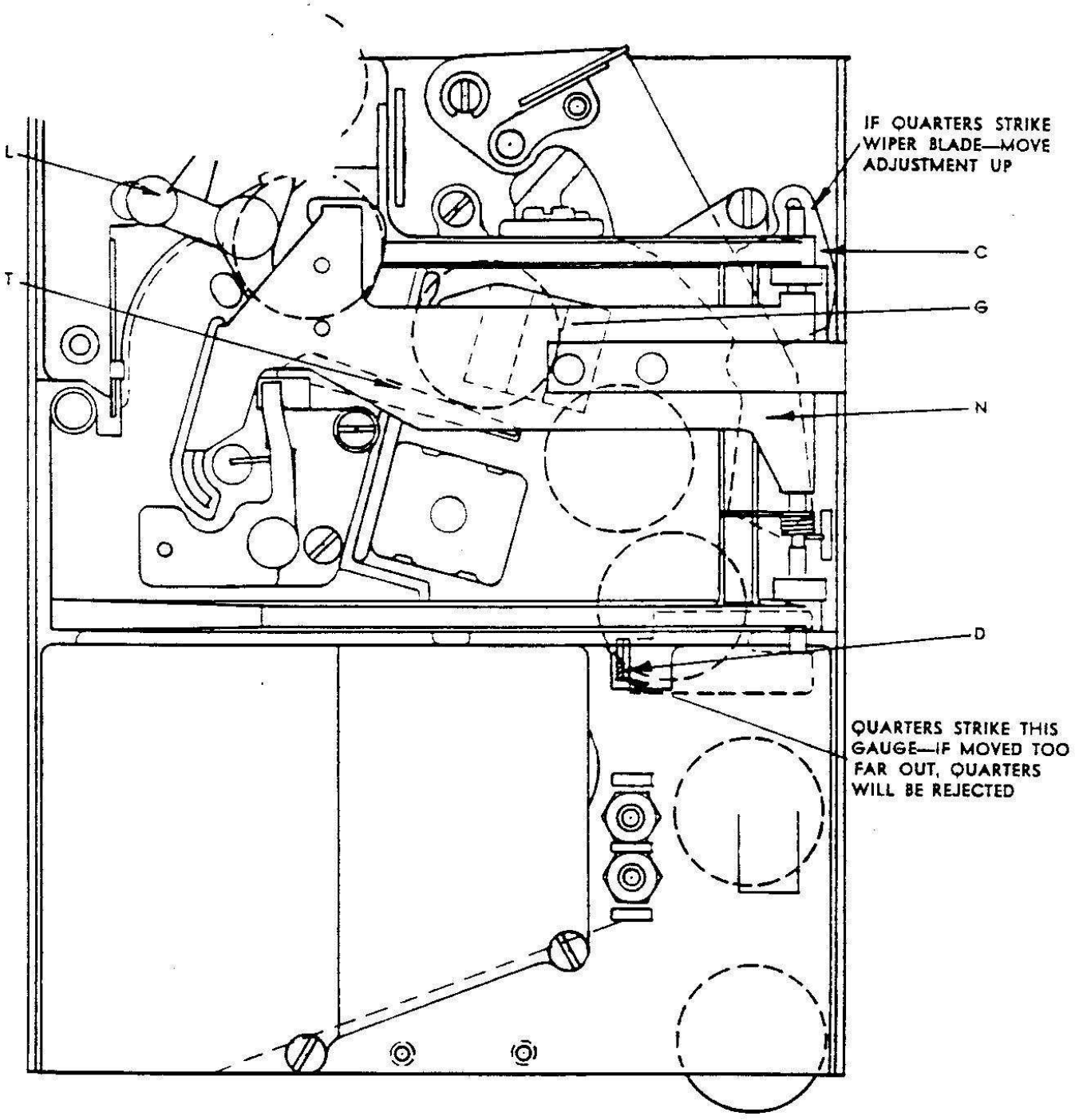


FIG. 2—PATH OF 25c COIN

Fig. 2 shows the path of a genuine 25 cent coin. The coin first drops in the arms of the rotary sizing gauge (Item L) which turns under the weight of a good coin and deposits it upon inclined rail (Item T). As the coin rolls down the rail past the 25c magnet (Item G) its speed is checked (by generated currents) and it leaves the rail at an angle that will permit it to miss the brass deflector (wiper blade) (Item N) and land with its center of gravity to the right of the copper deflector (Item D), thus it is accepted.

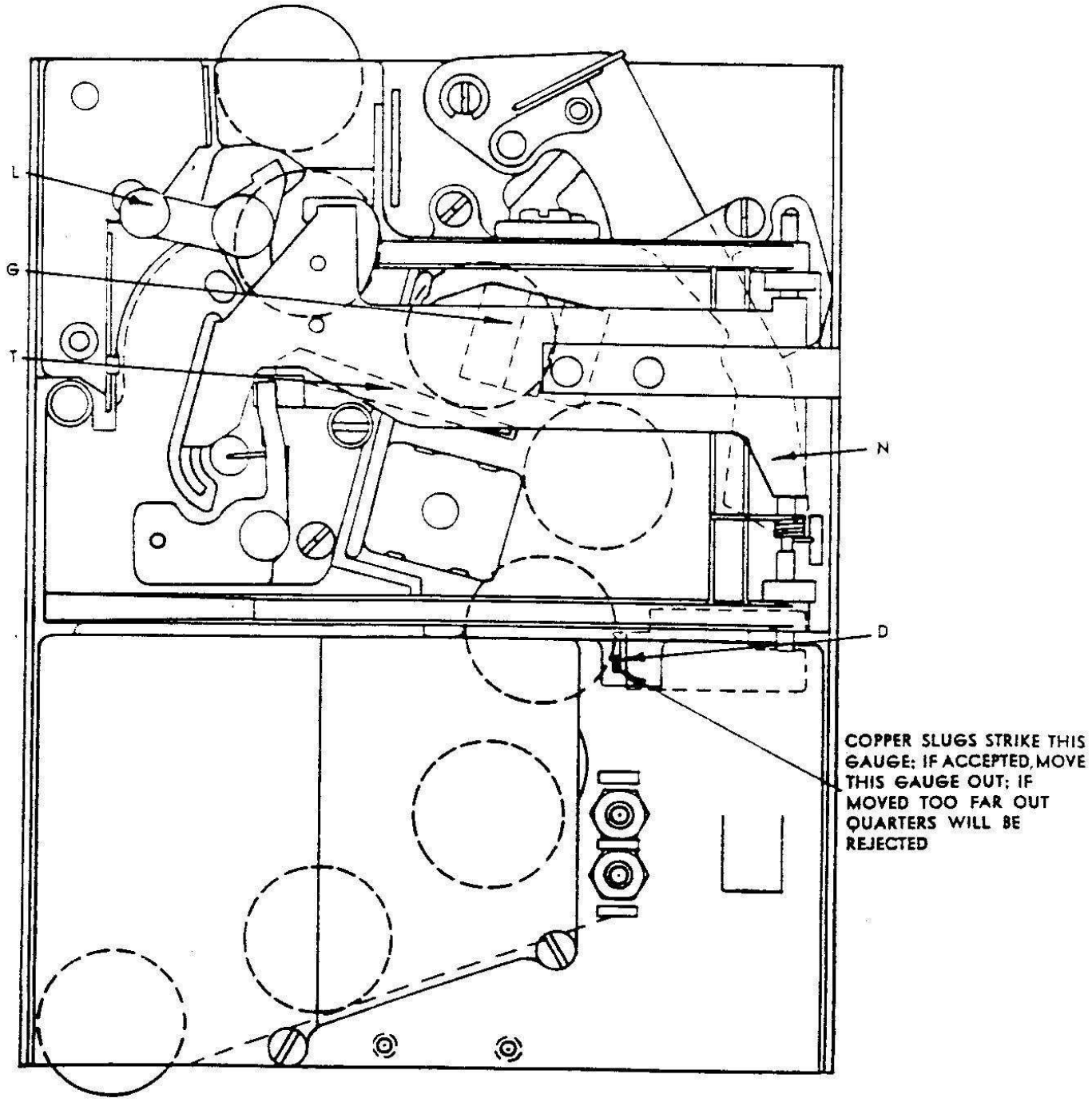


FIG. 3—PATH OF 25c SIZE COPPER SLUGS

A 25c size slug of copper follows the same path as the quarter until it reaches the magnet (Item G). Since copper is a very good electrical conductor, currents of a rather high order are generated. The copper slug will drop almost straight down at the end of the rail and strike the copper deflector (Item D) with its center of gravity to the left.

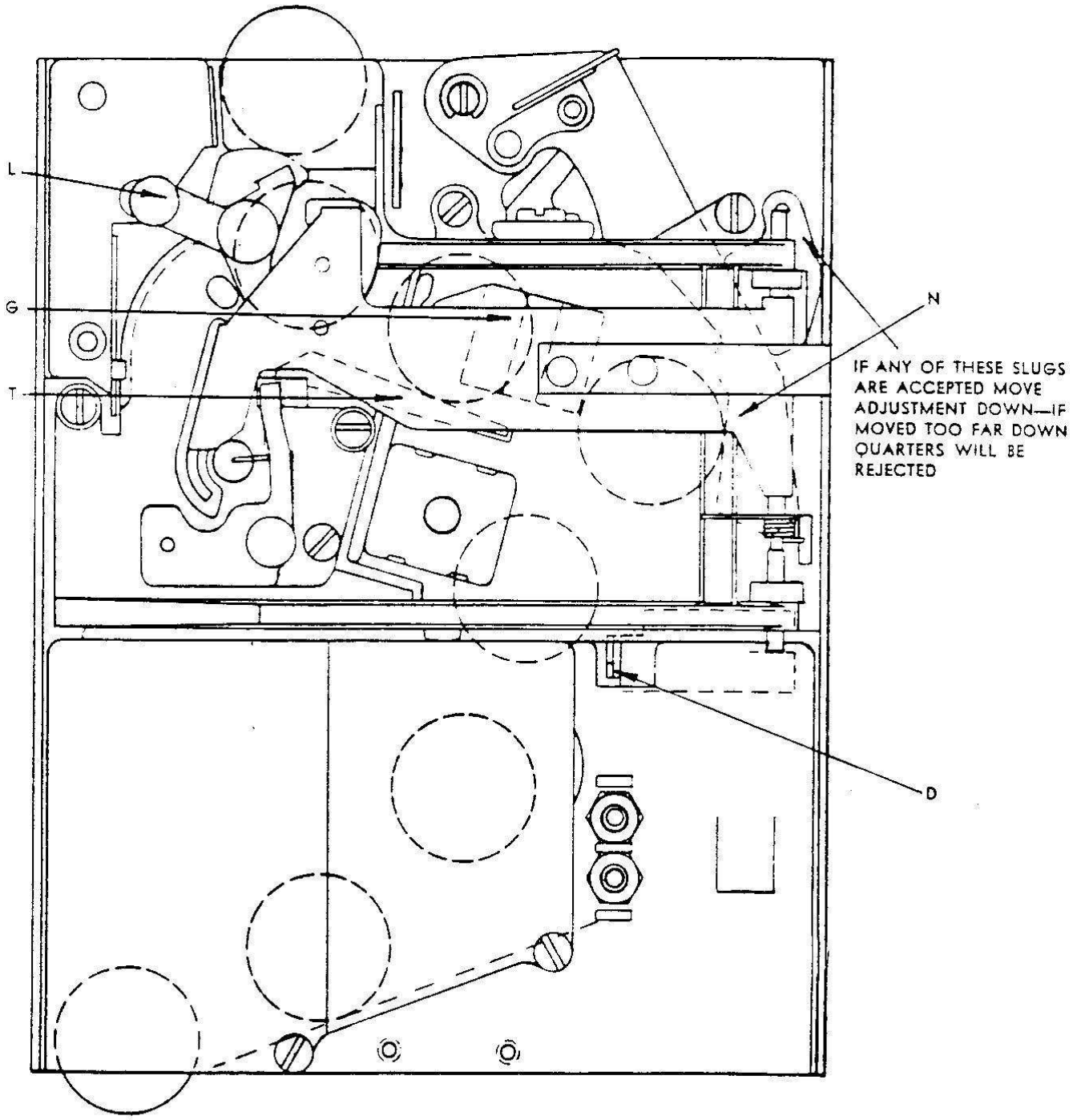


FIG. 4—PATH OF 25c SIZE BRASS, LEAD, ZINC, OR GERMAN SILVER SLUGS

25c size slugs of brass, lead, zinc or German silver have a higher electrical resistance than a quarter and as a result go through the magnetic field at a greater speed. This raises the angle in which they leave the rail to a point where they strike the brass deflector (wiper blade) (Item N) and are deflected to the left of the copper gauge (Item D).

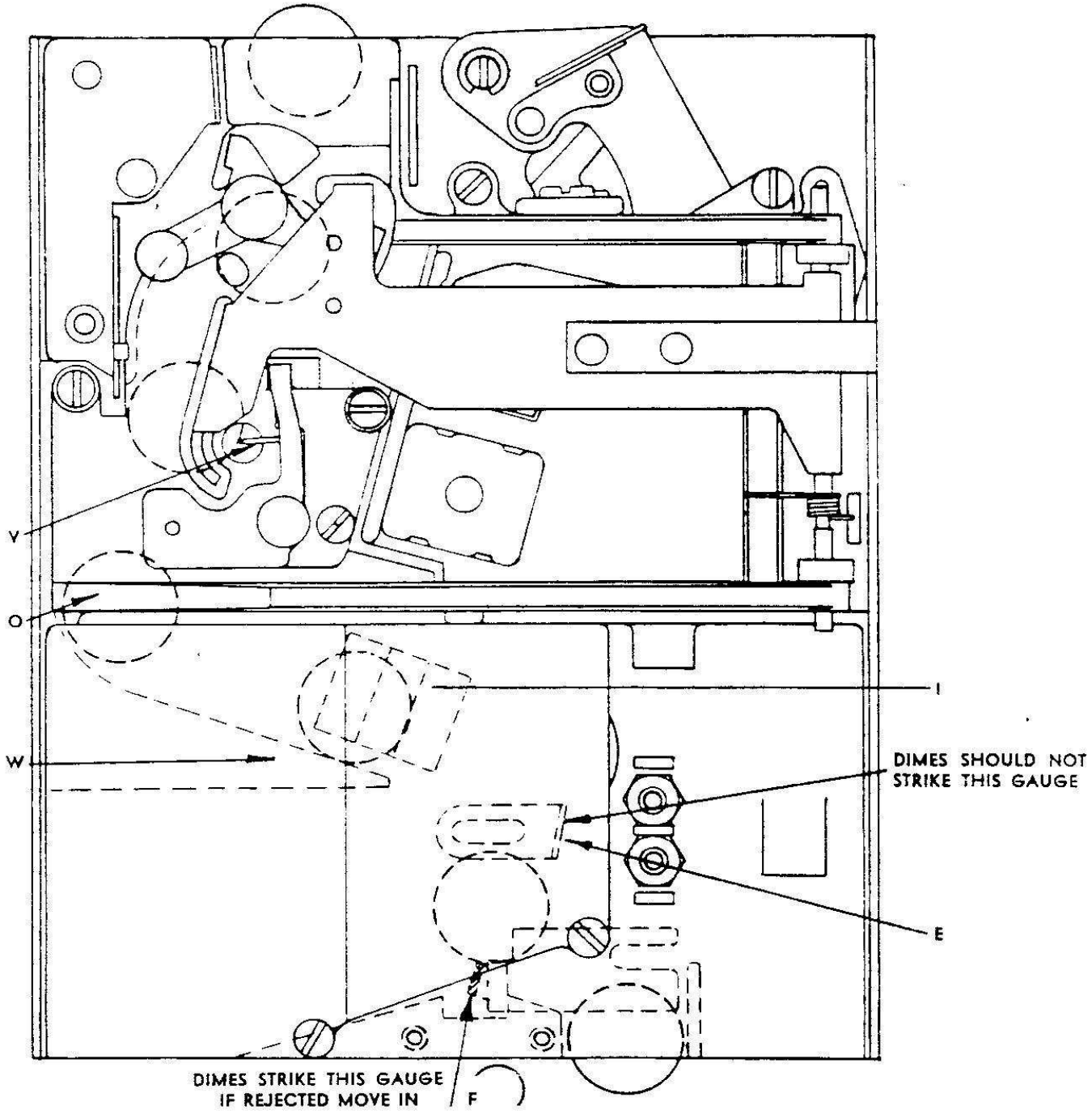
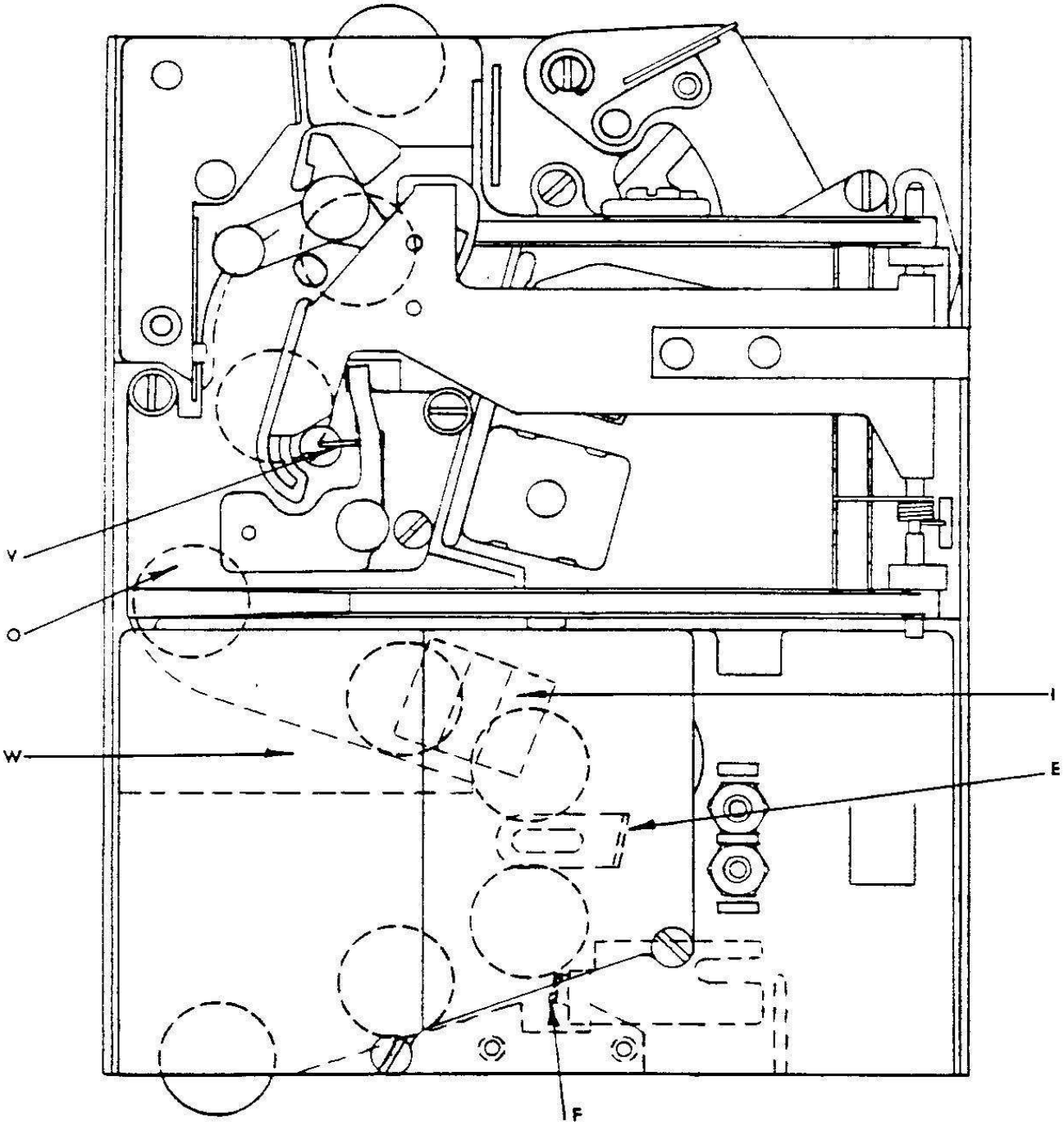


FIG. 5—PATH OF 10c COIN

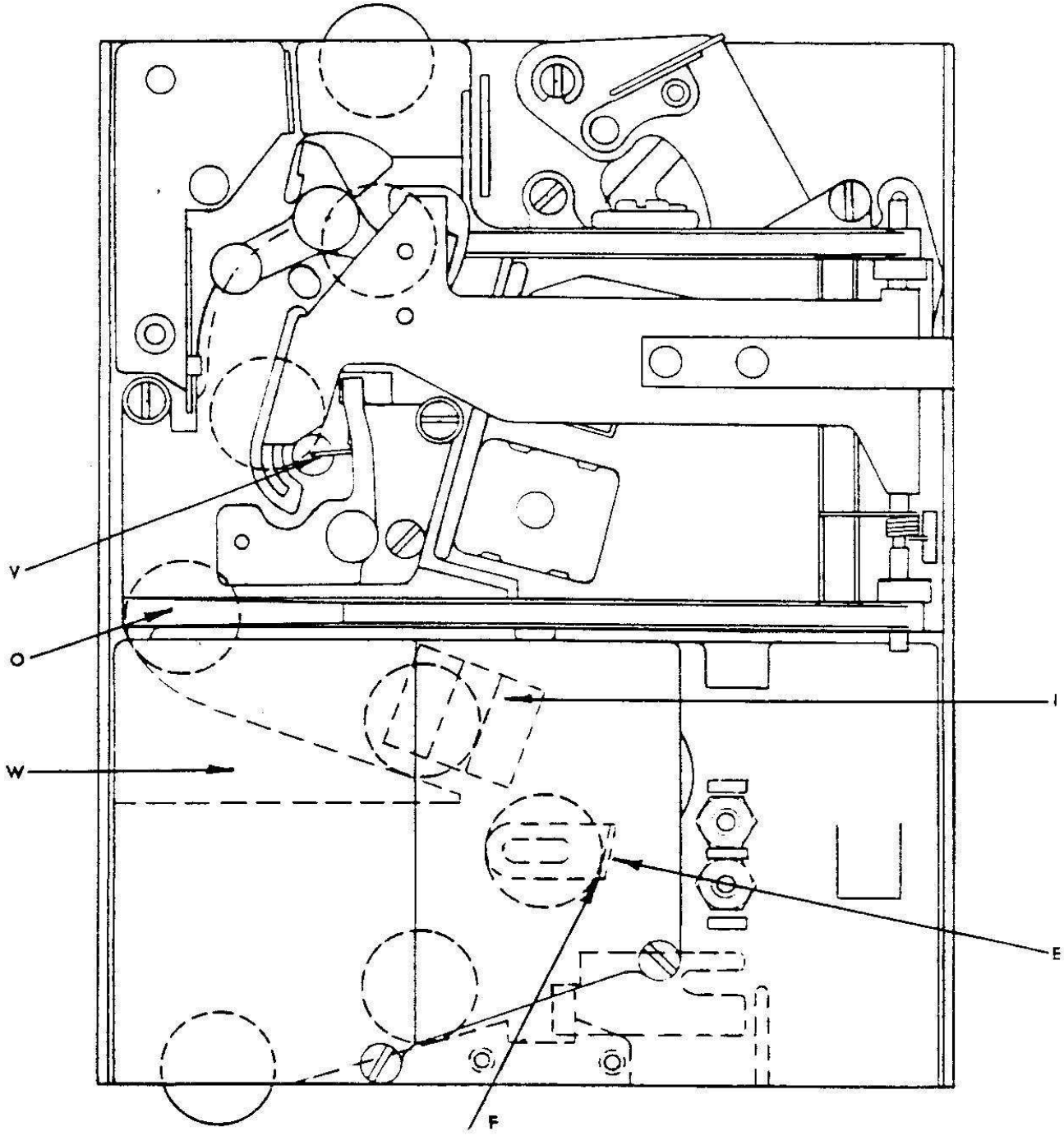
As a 10c size coin enters the slug rejector it passes through the 25c rotary gauge and to the left of the 5c undersize gauge wire (Item V) (oversize 10c slugs stop here). At the bottom edge of the scavenger gate (Item O) the dime is deflected through an opening in the frame plate of the unit and is deposited on the 10c rail (Item W) which is mounted on the bottom edge of the 10c scavenger gate (undersize slugs are rejected here) if the coin is of the correct size it rolls down the 10c rail (Item W), passing through the field of magnet (Item I) where its speed is retarded enough to prevent it from striking brass deflector (Item E) and will land on copper deflector (Item F) with its center of gravity to the right.



COPPER SLUGS STRIKE THIS GAUGE—IF ACCEPTED MOVE GAUGE OUT
IF MOVED TOO FAR OUT DIMES WILL BE REJECTED

FIG. 6—PATH OF 10c SIZE COPPER SLUGS

10c size slugs of copper follow the path of the dime to the magnet where it is retarded more than a dime due to the higher conductivity of copper. The copper slug as a result drops off the rail onto the copper deflector gauge (Item F) with its center of gravity to the left.



THESE SLUGS MUST STRIKE THIS GAUGE TO BE REJECTED

FIG. 7—PATH OF 10c SIZE LEAD, ZINC, BRASS, OR GERMAN SILVER SLUGS

10c size slugs of brass, lead, zinc or German silver also pass the magnet (Itm I) via the route of a good 10c coin, here again the spurious coins having a higher electrical resistance will leave the rail (Item W) at a higher rate of speed and strike the brass deflector (Item E).

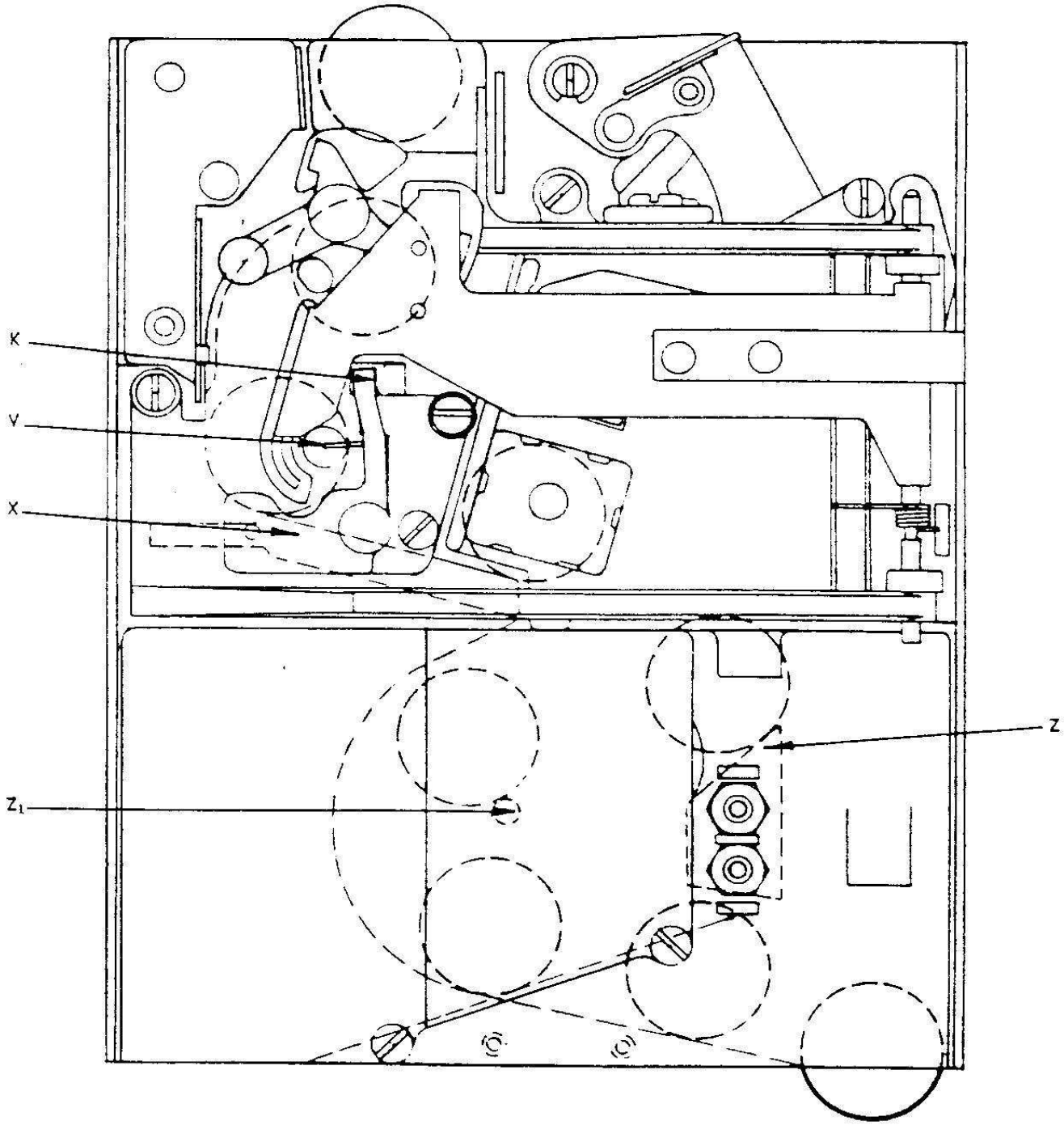


FIG. 8—PATH OF 5c COIN

The 5c coin will pass through the 25c rotary gauge and engage the 5c undersize gauge lever (Item K). If the coin is of the correct diameter, lever K will turn slightly on its pivot and withdraw undersize gauge wire (Item V) from the path of the coin to permit it to drop on the rail (Item X). The genuine 5c coin, having an unusually high resistance will roll down rail X at a high rate of speed striking the anvil (Item Z) from which it will rebound with enough force to clear the barrier stud (Item Z1). Thus it is shown that 5c coins are tested for hardness as well as electrical resistance.

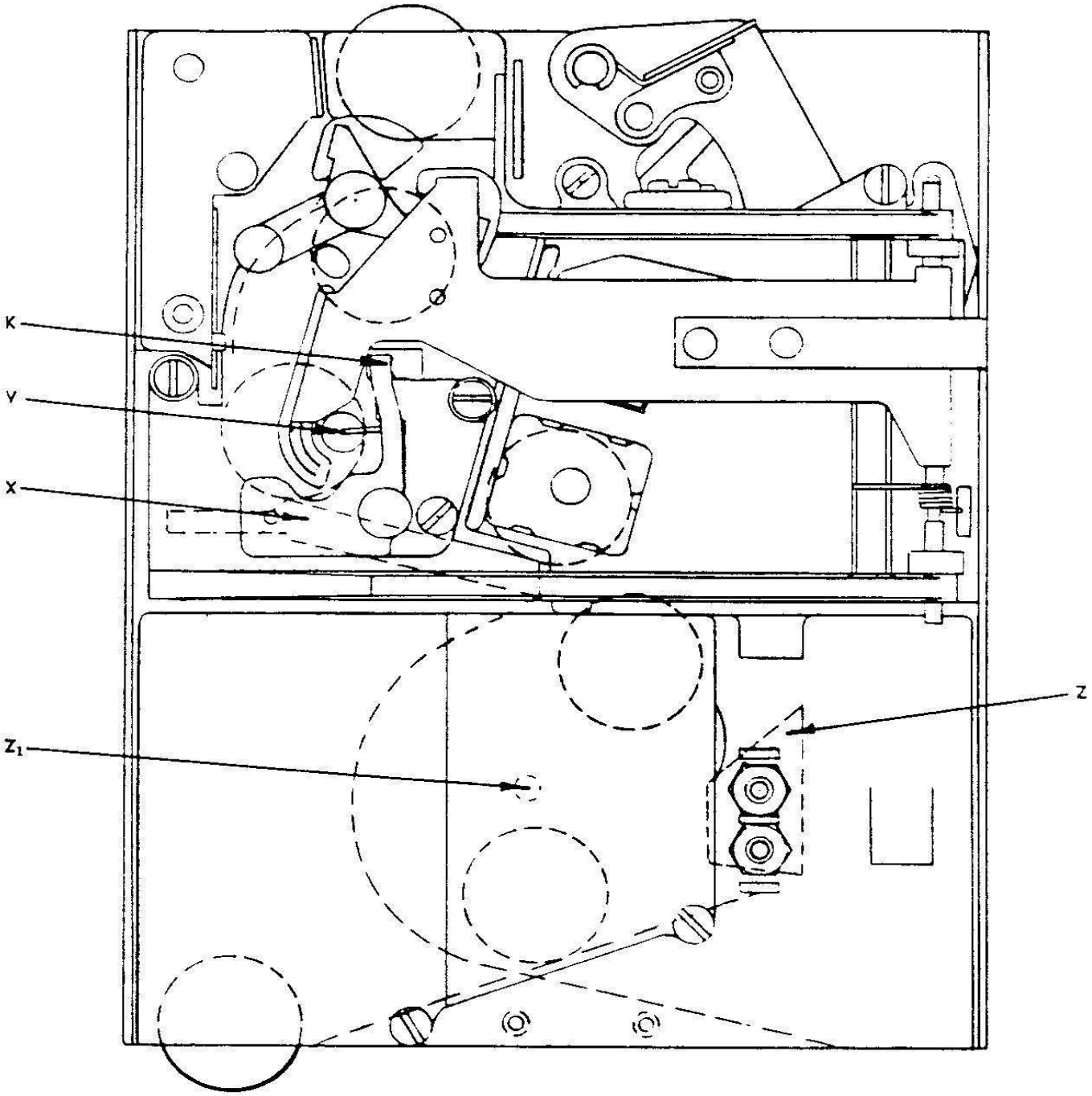


FIG. 9—PATH OF 5c SIZE BRASS, ZINC OR COPPER SLUGS

5c size slugs of brass, copper or zinc all have electrical resistance much lower than the alloy of which nickels are made and as a result will be slowed down in the magnetic field, this will cause all such spurious coins to strike the anvil too low or miss it entirely and thus be rejected.

March 21, 1955

TO: Seeburg Operators

SUBJECT: Conversion to 10¢ - 3 for 25¢

To convert a Seeburg "100" Selection Phonograph to 10¢ and 3 for 25¢ play, proceed as follows:

1. Remove back panel from lower back door. (This panel covers amplifier and selection receiver.)

2. If phonograph is a model "R" remove the credit and cancel unit from the machine. No matter what the model proceed as follows:

3. Remove three screws holding plate that is back-stop for coin solenoid plungers. On "R'S" this is part of mounting bracket. On others, a terminal board is mounted on the plate. Remove the three coin solenoid plungers and springs.

4. Remove the four screws on the next plate. This plate holds the coin solenoid in position. On other than "R'S", this is the plate that holds the credit and cancel unit in the selection receiver. So, as the last screw is removed, unless you hold the credit and cancel unit it will fall into bottom of phonograph.

5. Now shift positions of the coin solenoids. Trade positions of the 5¢ solenoid and 10¢ solenoid. The 10¢ solenoid will have a spot of orange paint on it. The 5¢ solenoid will not be painted. Put the 25¢ solenoid (the one with red paint) in the position next to the 5¢ solenoid. In other words, next to where the 10¢ solenoid was originally.

6. Using reverse procedure, reassemble the unit.

7. Remove the slug rejector. On the front lower half of the slug rejector will be found a thin plate. Remove the one screw and one nut securing this plate. Under this plate will be found a 5¢ pendulum. Secure this pendulum in the down position. Replace plate.

8. Coin Instructions: On models A, G, W, and R it is necessary to change an instruction glass on the front of the cabinet. On models B, BL, and C, a small piece of plastic in the title strip holder acts as instruction card. On the "A", the six screws securing the coin insert casting must be taken out in order to remove the casting to change the glass. On models G, W, and R simply remove the two tinnerman speed nuts found holding lower strip behind the instruction glass. The glass can now be worked loose and the new one installed. If the speed nuts were not broken when removed pinch them with a pair of pliers and re-use.

You are now set for 10¢ and 3 for 25¢ play.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