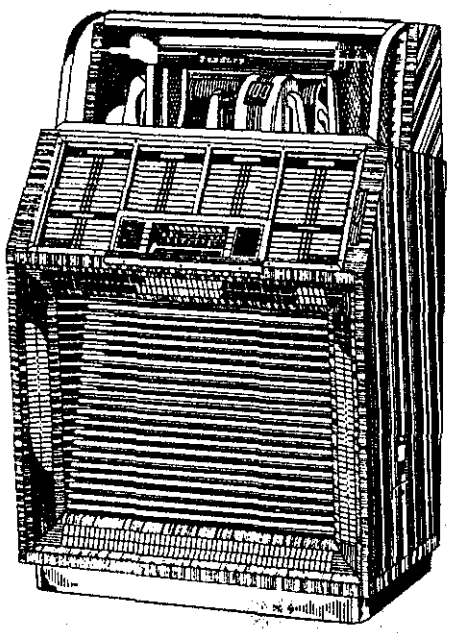
SEEBURG SELECT-O-MATIC "100"
MODEL M100B



The Select-O-Matic "100", Model M100B, 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.

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

The cover glass through which the mechanism may be seen is hinged and opens for changing records and title strips. Service switches, a Popularity Meter and a Selection Counter are accessible with the cover open. The Service switches 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.

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 ten-cent piece 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, locked in a steel case, is removed through a small door at the lower right side of the cabinet.

A Seeburg Magnetic Pickup with one-quarter ounce stylus pressure assures long record life and high quality reproduction unaffected by temperature or humidity conditions. A 25-watt amplifier connects to a 15" dynamic speaker in the cabinet and to remote speakers. 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 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 steel 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) - 235 watts

Cabinet Lighting..... 1 - 33-inch, 25-watt Fluorescent, with Type FS25 Starter

Cabinet Key Number..... G219

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

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

Pickup..... Seeburg Magnetic

Speaker..... 15" Electro-dynamic

Finish: Zebrawood, Plastic Veneer.

Amplifier:
- 8-tube Constant Voltage Type
- Audio Power Output (at full volume):
  - To Phonograph Speaker (adjustable)..... 1.5 to 16 watts
  - To Remote Speakers..... 23 watts, max.
  - Maximum total to Phonograph Speaker & Remote Speakers..... 25 watts

Major Component Assemblies:
- Type 145S2-L6 Select-O-Matic Mechanism with Type 100SA-3 Selector Assembly.
- Type ES6-L6 Electrical Selector.
- Type MRA1-L6 or MRA2-L6 Master Remote Amplifier
- Type WSR5-L6 Wired Selection Receiver.

Remote Control:
- Type..... Seeburg, 3-wire "Wall-O-Matic 100"
- Nominal operating voltage..... 25
- Power source for Wall-O-Matics..... Selection Receiver or Aux. 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 Aux. Power Supply..... 6

Remote Speakers: CV (Constant Voltage) or RS

Tubes:
- 1 - 6J7
- 1 - 6SN7GT
- 4 - 6V6GT
- 1 - 5U4G
- 1 - 2050
- 1 - 6SL7GT

Fuses:
- 3 - 3 amp. 3AG
- 1 - 2 amp. SLO-BLO
- 1 - 3 amp. Fustat

Dimensions:
- Height..... 54 Inches
- Width..... 34 Inches
- Depth..... 28 Inches
- Net Weight..... 310 Pounds
- Shipping Weight..... 385 Pounds
- Record Weight, 50 Records Approx... 2.25 Pounds

INSTALLATION, OPERATION, MAINTENANCE

DAMAGE CAUSED BY SHIPPING

Examine the instrument immediately after unboxing. If any damage is found, notify the transportation representative and get his signature on the transportation bill with notation of damage.

UNBLOCKING

Before placing this phonograph into operation it is necessary to remove or loosen certain shipping hardware used to safeguard the mechanism during transit. Carefully follow instructions on the tags found in several places in the instrument and remove blocks and shipping supports accordingly. CAUTION: Do not attempt mechanism operation by manually turning the flywheel - - this may damage the mechanism. Use the service switches!

DO NOT PUT PACKING BLOCKS, INSTRUCTION CARDS, OR ANY OTHER MATERIAL ON THE AIR INTAKE SCREEN IN THE FLOOR OF THE CABINET, AS THIS WILL OBSTRUCT VENTILATION AND CAUSE OVERHEATING. SUCH OVERHEATING MAY WARP RECORDS AND SHORTEN THE LIFE OF THE EQUIPMENT.

TUBES AND PLUGS

This instrument is shipped with tubes and plugs installed. In shipment they may loosen; for this reason, it is well to see that they are all firmly seated in the sockets before inserting the line cord.

VOLTAGE RATING

Before connecting the line cord to a light socket or outlet make certain that the voltage and frequency on the meter box at the location agree with the markings of voltage and frequency on the instrument name plate.

PLACING THE SELECT-O-MATIC "100"

To obtain best performance and long service from this equipment, it should be placed on a firm, reasonably level surface away from excessive moisture and heat.

WARNING: To prevent warping records place phonograph where the records will not at any time be exposed to direct sunlight or any other radiant heat. Do not reduce ventilation by obstructing the vent screens.

A space of at least two inches must be allowed between the back of the cabinet and the wall, so as to assure adequate ventilation.

SERVICE SWITCHES

Two service switches are located on the left mechanism support post just below the left side of the mechanism. The lower toggle action switch controls the mechanism motor, and the other is a spring return switch that provides the means to scan the carriage. When the motor switch is set to the "up" position it prevents the carriage from operating, even though selections are established on the Selector Assembly. The switches must be left in the "down" position for normal operation.

LOADING RECORDS

To obtain satisfactory performance use only new or nearly new records on the Select-O-Matic "100" Mechanism. Arrange the records so that the most popular tunes will be divided between odd and even numbered selections. This will result in more nearly equal wear on the two styluses of the pickup. Any standard 7-inch commercial 45 rpm record may

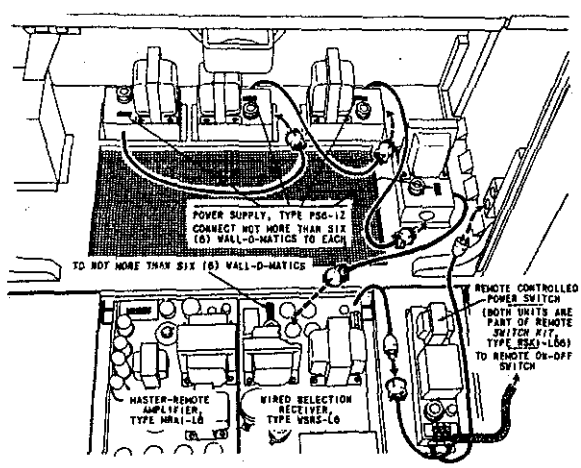


FIGURE 2. SHOWING PLACEMENT OF ACCESSORIES

be used. Occasionally, records will be found that have an undersize center hole. This is caused, in some cases, by the paper label being pushed into the center hole. If the record center hole is undersize, such a defective record may stick on the record center pin.

Throw the main switch "on" (accessible through hole in rear door). Two service switches are located on the left mechanism support post. The lower one is a toggle action switch that controls the mechanism motor, and the other is a spring return switch that provides the means to scan the carriage. Set the lower switch to the "up" position; this keeps the carriage from operating even though credits are established on the Selector Assembly. Hold the scanning switch in the "up" position until the carriage is near the right hand end of base. Release the scanning switch.

Starting at the left end of the magazine (A-1, A-2), *insert one record in each record space*. The left side of all records will be the odd number selections. Thus A-1, A-5, B-7, C-3, D-1, etc., all will be left sides, and A-2, A-6, B-8, C-4, D-2, etc., will be right sides of records. *CAUTION: Do not force records into record spaces!* Any normal record will roll very freely into record spaces. A record which is warped badly enough to have any tendency to bind in the magazine space would not be properly played in any automatic mechanism and should not be used.

When the left half of the magazine has been loaded with records, scan the carriage to the left end of the base and load the right half of the magazine. *After the magazine has been loaded, set the lower service switch to the "down" position.*

PROGRAM HOLDERS

A complete set of title strips is provided with the instrument. These can be found in the cash bag. Title strips are loaded into program holders by sliding the strip into the desired slot. The record titles for both sides of a record are to be put on one individual double strip, with the title for left side on the upper half of the strip and the title for the right side on the lower half of the strip. Thus when a record is inserted in the magazine the selection corresponding to the top title will face left. The individual program holders can be removed separately as desired by hooking a finger under the top of the program holder and sliding it up out of the guides. CAUTION: Whenever program holders are to be removed or replaced, have the lower service switch in "up" position. Spare classification headings (blue) are provided and these can be found in the cash bag. Classification headings can be changed in the program holder by sliding the retainer springs up onto adjoining ledges and replacing the classification heading.

AUDIO CONTROLS

The Master Remote Amplifier is equipped with a keyed volume control which is accessible through a hole in the rear door. It is inoperative when a remote volume control is used.

Bass and treble controls are located at the top of the amplifier panel and are accessible by opening the rear door. Room size and wall coverings determine the proper setting for each control. With typical records and location, very realistic reproduction is obtained by setting Bass on #2 or #3 and setting treble on #3. Treble boost is obtained on #4 and rather severe treble cut is had on #1.

POPULARITY METER

A popularity meter is provided behind the "Record Now Playing" indicator at the top of the magazine. It is exposed to view by swinging the cover downward past the front of the "Record Now Playing" indicator. The popularity of each of the fifty records is indicated by 50 indicator wheels. Each wheel is calibrated from 0 to 50 and shows approximate total number of plays (both sides) the corresponding record has had.

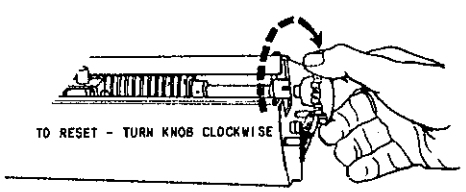


FIGURE 3. RESETTING POPULARITY METER

For a quick check of record popularity, the indicating wheels are part blue and part aluminum finish. Less than 10 plays are shown in the blue area while 11 or more are indicated in the aluminum area.

To reset the Popularity Meter, the knob at the right hand end must be turned in a clockwise direction (as viewed from the right) until all wheels indicate zero.

SELECTION COUNTER

A selection counter is built into the left side of the electrical selector. This counter totals SELECTIONS made from the electrical selector and Wall-O-Matics. The counter may be read by lifting the left-hand title holder as shown in Figure 4.

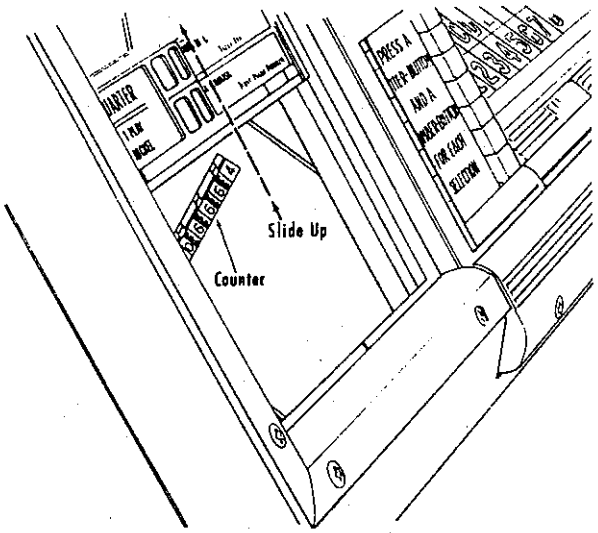


FIGURE 4. LOCATION OF SELECTION COUNTER

Although this counter is intended primarily as a selection counter, the approximate total value of coins received in the phonograph and Wall-O-Matic cash boxes may be figured as follows (assuming six plays for a quarter):

1. Subtract the present counter reading from the last reading. (The reading taken when the cash boxes were last emptied.)

2. From this figure subtract the total number of quarters in all cash boxes (phonograph plus all connected Wall-O-Matics.)

3. Multiply by .05 to obtain value in dollars.

EXAMPLE:

Present counter reading	11792
Last counter reading	10680
Difference	1112
Number of quarters	78
	1034
	x.05
Approximate cash	$51.70

NOTE: The counter may register slightly higher or lower than the actual number of selections, because of the multiple count during simultaneous operation of two or more wall boxes.

WALL-O-MATIC "100"

The remote choice of 100 selections is made possible by the Wall-O-Matic "100" which pulses the Selection Receiver to register selections on the Select-O-Matic "100" Mechanism. A sufficient number of these units should be used and placed to provide convenient selection from all parts of the location.

Power to operate up to six Wall-O-Matics is available from the Wired Selection Receiver. When more than six Wall-O-Matics are used, additional power supplies (Type PS6-1Z are required. For each power supply that is added, six additional Wall-O-Matics may be used. Placement of Type PS6-1Z Power Supplies and the Type RCPS1-L56 Remote Controlled Power Switch in the Select-O-Matic is illustrated by Figure 2.

The wiring of the Wall-O-Matics is facilitated by the use of special cable, Seeburg Part No. 12015, which is available in continuous lengths as required. Details of wiring and installing the Wall-O-Matic "100" are included in the instruction folder shipped with each Wall-O-Matic "100".

Bar Bracket Assembly, Seeburg Part No. 500185, is available for rigidly mounting the Wall-O-Matic on bars, counters and tables.

SPEAKERS

The audio output of the Master-Remote Amplifier operates the large speaker mounted in the Select-O-Matic cabinet, and also

terminates on the amplifier terminal board for powering remote speakers.

The audio system is of the "constant voltage" type, in which the amplifier output does not change when the speaker load is varied. This means that the volume from any speaker in the system will not change noticeably when other speakers are added or removed. It also facilitates adjustment of volume at each speaker; connections and speaker runs are simplified and, within certain limits, impedance matching problems are eliminated.

Except in very small locations, adequate distribution of sound at uniform level thruout the service area can be obtained only by careful placement of a sufficient number of speakers, and by adjusting the volume of the speakers individually to suit local conditions. The adjustment of the volume level at each speaker is simplified by the use of Seeburg Constant Voltage (CV) Speakers. While the older Type RS Speakers may be used with the Model M100B, the Type CV Speakers are recommended because the volume level (watts) can be adjusted at each speaker. *WARNING: 8 OHM SPEAKERS SHOULD NEVER BE CONNECTED DIRECTLY TO THE TERMINAL BOARD OF THE AMPLIFIER.*

Recommended Speaker Types are as follows:

Type CVS4-8, Wall Speaker (Teardrop - Ivory).

Type CVS5-12, Wall Speaker (Walnut Wood Cabinet).

Type CVS6-8, Recessed Speaker (Grill Type for wall or ceiling - Ivory).

Type CVS7-12, Recessed Speaker (Grill Type for wall or ceiling - Ivory).

All the above speakers can be connected for four different volume steps, from 1/16 watt to 4 watts for Type CVS4-8 and CVS6-8 and from 1/8 watt to 8 watt for Types CVS5-12 and CVS7-12.

After the speakers have been mounted, one or more cables can be run from the phonograph, one cable for each group of speakers. The cable can be run from one speaker to the next, cutting the cable at each speaker and using the speaker terminals as junction points.

NOTE: For installation and wiring of the speakers, see instruction folder packed with each speaker.

Be sure that the phasing of all speakers is the same; this will be accomplished if the same wire of the speaker cable is connected to the common "C" terminal at all speakers. This wire should be connected to the common "C" terminal at the amplifier. The other wire in the cable is connected to the "H" terminal at the amplifier when using Type CV speakers, as shown in Figure 5.

After the installation is finished, a critical listening test should be made and the volume (Watts) readjusted at certain speakers where required to obtain uniform sound coverage under normal noise conditions. The power consumed at each speaker will depend on the connections that have been made at the speaker (See Speaker Installation Folder.)

SELECT-O-MATIC SPEAKER

Set the Select-O-Matic Speaker Switch to the volume step which gives the best balance between the Select-O-Matic Speaker and the remote speakers with normal volume control setting. THE SELECT-O-MATIC SPEAKER SWITCH POSITIONS ARE AS FOLLOWS: VOL. STEP 4 (0.5 watts), VOL. STEP 5 (1.5 watts), VOL. STEP 6 (4 watts), VOL. STEP 6.5 (8 watts) or VOL. STEP 7 (16 watts). IF NO REMOTE SPEAKERS ARE USED, THE SWITCH MUST BE SET TO VOL. STEP 7 (16 watts).

The Wattage of all speakers must be added (including the Select-O-Matic Speaker) and the total watts absorbed by all speakers must not exceed 25 watts, which is the power rating of the Master-Remote amplifier. For best operation, the total watts should be not less than 6 watts (25%of rated amplifier load.) If Seeburg Type CV speakers are used, and the speaker load is 25% to 100% rated amplifier load (6 to 25 watts), no external impedance matching transformers are required. Within the limits described above, the problems of impedance matching are eliminated when using Type CV speakers on the MRA1-L6 Power Amplifier.

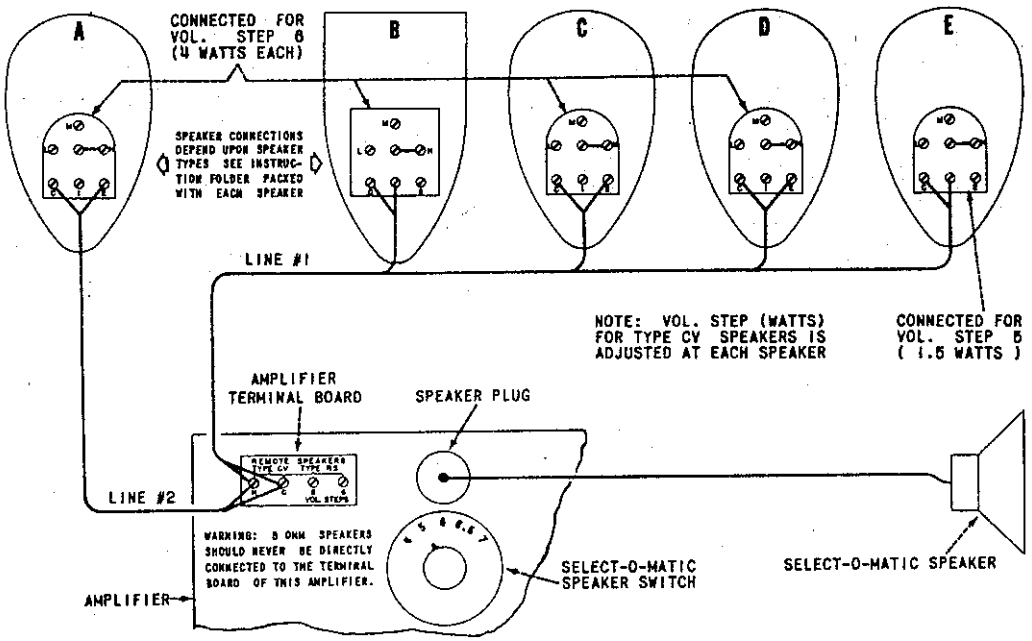


FIGURE 5. A TYPICAL CV SPEAKER INSTALLATION

TOTAL WATTS OF SPEAKER LOAD

Line #1:	1 (Speaker)	X	2	(watts)	=	2.0 watts
	2 (Speakers)	X	4	(watts)	=	8.0 watts
	1 (Speaker)	X	1	(watts)	=	1.0 watts
Line #2:	1 (Speaker)	X	4	(watts)	=	4.0 watts
Select-O-Matic Speaker:	(Vol. Step 5)				=	1.5 watts
				Total Load	=	16.5 watts

This is between 6 and 25 watts, and is a satisfactory amplifier load.

When a listening test was conducted on the above installation during typical operating periods, it was found necessary to increase the input to Speaker "B" to 8 watts.

The new speaker load on the amplifier:

Line #1:	1 (Speaker)	X	8	(watts)	=	8.0 watts
	2 (Speakers)	X	4	(watts)	=	8.0 watts
	1 (Speaker)	X	1	(watts)	=	1.0 watts
Line #2:	1 (Speaker)	X	4	(watts)	=	4.0 watts
Select-O-Matic Speaker						1.5 watts
				New Total	=	22.5 watts -- Satisfactory Load

TYPE RS SPEAKER

If Type RS Speakers are used with the Select-O-Matic Model M100B, they may be wired as shown in Figure 6. Any group wired as shown may be connected to amplifier terminals "C" and "Vol. Step 5" for 1.5 watts per speaker, or may be connected to terminals "C" and "Vol. Step 6" for 4 watts per speaker. Set the SELECT-O-MATIC SPEAKER switch to the volume step which gives the best balance between the Select-O-Matic Speaker and the remote speakers with normal volume control setting. While this arrange-

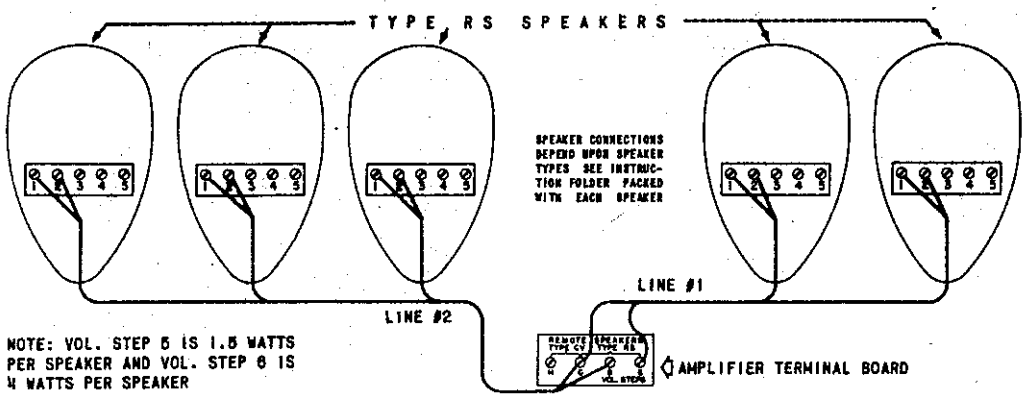


FIGURE 6. A TYPICAL RS SPEAKER INSTALLATION

SPEAKER LOAD ON THE AMPLIFIER

Line #1:	2 (Speakers)	X	4 (watts)	=	8.0 watts
Line #2:	3 (Speakers)	X	1.5 (watts)	=	4.5 watts
Select-O-Matic Speaker (Vol. Step 6)				=	4.0 watts
			Total Load		16.5 watts

This is a satisfactory speaker load.

ment is not as flexible as the Type CV method, it does permit two or more groups of speakers at two different volume levels. When using the Type RS speakers, it is necessary to add the Watts of all speakers, including the Select-O-Matic Speaker, and make sure this total wattage does not exceed 25 watts, and is not less than 6 watts. NOTE: If the wattage of all speakers (including the Select-O-Matic Speaker) to be connected to the Master-Remote Amplifier exceeds 25 watts, an Auxiliary Remote Amplifier, Seeburg Type ARA1-L6, may be used to supply part of the speaker load, or lower volume steps may be used. When using CV type speakers on ARA1-L6, set the speaker matching plug to "2" and make connections to terminals marked "Speakers".

SPEAKER CONTROL, TYPE 25LT-1 (Accessory)

The speaker control is a housed adjustable autoformer that may be installed in any 70 volt CV speaker line for the purpose of separately controlling the volume from any single speaker or group of speakers. In installations involving speakers in several rooms these Speaker Controls are especially useful to obtain flexibility of control.

MASTER REMOTE VOLUME CONTROL, TYPE MRVC-1 (Accessory)

The Master Remote Volume Control, Type MRVC-1 comes completely wired and ready for use. It is only necessary to remove the 7-prong dummy plug from the Master Remote Amplifier and the 2-prong Cancel Plug from the Wired Selection Receiver and replace with the corresponding plugs on the cable of the MRVC-1, and dress the cable to the permanent position selected for the control unit. Screws and cable clamps furnished with this kit make it easy to do a neat, workmanlike installation.

MICROPHONE PRE-AMPLIFIER AND MIXER, TYPE PAK1-L56 (Accessory)

The Microphone Pre-Amplifier and Mixer Kit, Type PAK1-L56, may be used with the Select-O-Matic Model M100B on any installation requiring the transmission of voice or live music thru the Seeburg Sound Distribution System.

REMOTE CONTROLLED POWER SWITCH, TYPE RCPS1-L56 (Accessory)

Remote Controlled Power Switch, Type RCPS1-L56 makes it possible to turn the

power on and off from a remote point. For installation in M100B Cabinet, see Figure 2.

TESTING

After the installation has been completed, all units should be carefully tested to see that they perform properly. Make several selections from the Electrical Selector and from each Wall-O-Matic and see that the selections made have correctly registered on the Solenoid Assembly. Check the quality of music, and note that music can be heard at a comfortable volume level in all parts of the service area. See that all cables are dressed into inconspicuous places to present a neat appearance and prevent mechanical damage to them.

REMOVING CARRIAGE COVER

The carriage cover may be removed for lubricating the mechanism and for servicing by:

1. Removing two oval head screws; one is on the top, and the other on the lower left side.
2. Removing the top screw on the right hand brush holder and turning holder until the brush is at the top.

It is important that the pickup arm be moved to the left before removing the carriage cover; otherwise damage to the pickup is likely to occur. Whenever possible, carefully slide the protecting paper tube over the pickup before starting work on the mechanism.

When the carriage cover is replaced, care should be used to see that the lower edge of the cover engages slots in the guide studs on the front and sides of the carriage.

LUBRICATION

The mechanism and other mechanical parts should be lubricated periodically. See the above instructions before removing mechanism cover. Follow the lubrication chart posted on the rear record shield.

PICKUP STYLUSES

In order to retain good quality of reproduction it is necessary to keep the pickup and styluses clean and in good condition. *Caution: The pickup and styluses must be handled carefully or the delicate armature suspension may be damaged.*

When records are changed, or the equipment is cleaned the styluses and the stylus brushes should be cleaned by using the small brush furnished for this purpose and mounted in a clip on the left diffuser block.

STYLUS REPLACEMENT

The styluses used with the Seeburg magnetic pickup are tipped with natural Swiss sapphire, which is excelled in hardness and wear resistance only by diamond. However, all materials wear in the presence of friction; wear of a stylus starts with the first play and continues until the stylus is replaced. The tone quality is good and distortion remains at a low figure for the first few thousand plays but gradually distortion increases until a disagreeable amount is noticed. If the styluses are not replaced *before* objectionable distortion sets in, the records may be permanently damaged, and replacing the styluses will not restore the original tone quality. Because the cost of a pair of styluses is only a small fraction of the cost of a set of records, it is economically sound to replace styluses on a regular schedule rather than on a hit-or-miss basis. In addition, regular replacement of styluses will result in uniform, high quality music.

When only pure vinylite 45 rpm records are used, styluses should be changed every four or five thousand plays to maintain good quality. Diamond styluses last approximately 10 times longer than sapphire.

To replace Styluses:

1. Remove the slotted-head screw at the top of the arm and remove the pickup by lifting straight up. Thread the screw into the pickup so as not to lose it.

2. Remove one of the installation tools (with new stylus) from the card and thread the old stylus through the hole in the rounded end of the tool. Lift out the old stylus by gently pulling straight up.

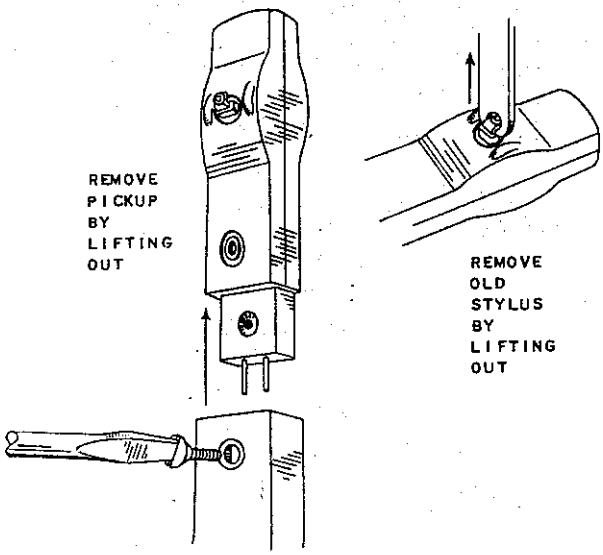


FIGURE 7. STYLUS REMOVAL

3. Gently insert the new stylus - *DO NOT FORCE*. Slide the tool off the stylus.

4. Turn the pickup over and replace the other stylus in the same manner.

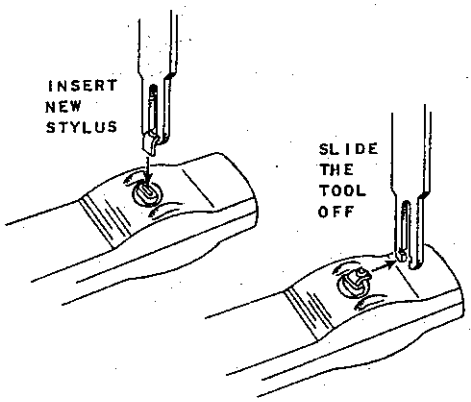


FIGURE 8. STYLUS REPLACEMENT

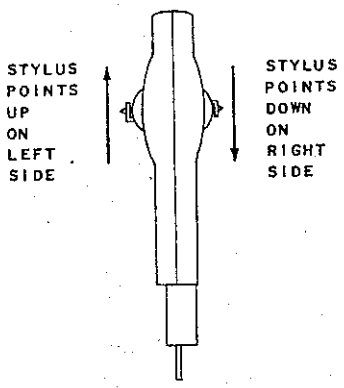


FIGURE 9. STYLUS POSITION

Install the pickup on the arm after checking that styluses are installed to point in direction shown in Figure 9. Tighten the holding screw firmly -- check landing adjustment. Also, check the stylus brushes to make sure that they wipe the styluses *lightly* to remove lint and dust.

RECORD CARE

To avoid accumulation of dust and dirt, keep oil off the records. Wipe your hands with a clean cloth before handling records and always handle records by edge and center hole, records that show signs of surface dust or dirt should be wiped with a slightly dampened cloth, using a circular motion. Use only water to dampen the cloth -- solvents will damage the records. Records not in use should be stored on edge in a cool place. Avoid exposing the records to excessive heat. Records become, overheated in a very short time if exposed to direct sunlight or if stored in a closed automobile or truck. Temperature above 120° F. should be avoided. See instructions on "Placing the Select-O-Matic "100".

LAMP REPLACEMENT

Access to the 25 watt (33 inch) fluorescent lamp or lamp starter is gained by first scanning the carriage to the left end. Remove the diffuser glass behind the program assembly and remove the right hand program holder. To remove the fluorescent lamp proceed as follows:

1. Rotate the lamp 90° in either direction and lift out of sockets.

2. Lower the left end of the lamp while raising the right end until the right end clears the diffuser glass block.

3. Lift the lamp out.

To replace the *"Selection Now Playing" lamp* proceed as follows:

1. Select F-2 and while this record is in play position turn off the phonograph at the main switch. Swing the popularity meter cover down exposing the lamp assembly.

2. Remove the screw which holds the light bracket to the top of the bakelite block. Slide the socket assembly to the right to clear the block. Lift out the lamp assembly.

3. Replace lamps and lightly fasten assembly in place with pigtail lug under screw head.

4. Turn on the main switch. Adjust the socket assembly by sliding the bracket to the left or right until a clean-cut rectangular window of light is centered on F-2. Tighten the screw and raise the cover to normal position.

To replace the lamp behind the carriage cover window proceed as follows:

1. Select an odd numbered selection (F-1) to get pickup to the left side.

2. Remove the top screw on the right hand brush holder and turn the holder until the brush is at the top.

3. Remove two oval head screws; one is on the top, and the other on the lower left side. Lift the cover straight up.

4. After replacing the lamp, carefully lower the cover over the carriage making sure the three notches at the bottom edge engage the three support studs on the carriage.

5. Fasten cover and brushes with their respective screws.

APPEARANCE

To maintain good appearance of the phonograph, and thus keep customer appeal at its maximum level, the various pieces of glass (such as the lid, side glass, diffuser glass, mirrors, color cradle and glass under animation "color" cradle) should be kept clean. The chrome plated parts also should be cleaned occasionally. These parts include grille bars, grille end reflectors, Electrical Selector, program holder, coil slot, and chrome plated parts in the mechanism compartment. (Note: The glass under the animation cradle can be removed for cleaning by loosening two clamp screws at rear edge of the glass. The two clamps should then be rotated 90 degrees by reaching up thru the opening above the speaker baffle. The rear edge of the glass can then be raised slightly and moved toward the rear enough to allow the front edge to become disengaged from the slot in the cabinet. The glass can then be lowered thru the opening above the speaker baffle.)

PREPARING INSTRUMENT FOR MOVING

1. Place paper tube over pickup cartridge and install Pickup Arm shipping support.

2. Remove all records from the magazine. Position carriage on base so that the selection indicator light is behind D-1. Put three pads under the carriage wheels; then bolt the carriage to the base by means of two 2-inch long thumb screws.

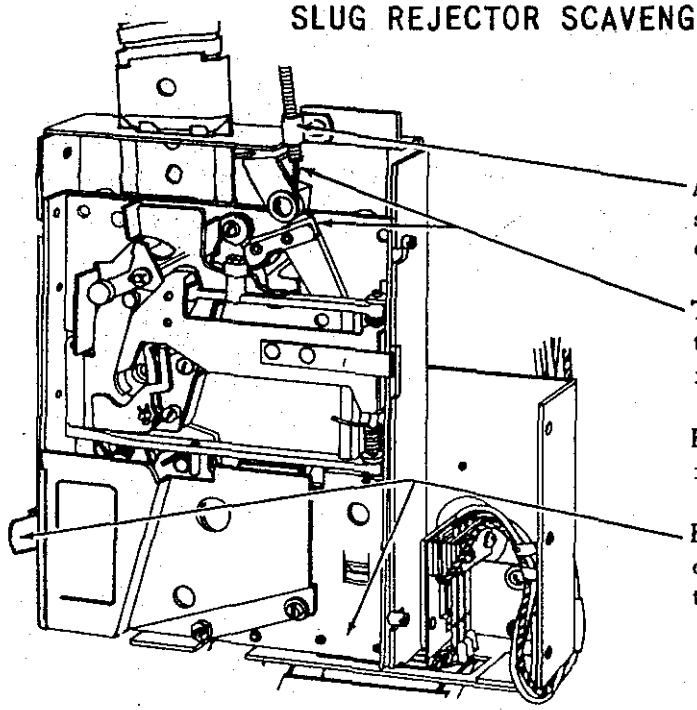
3. Put three wood 1/4" shims under the base at the mechanism hold-down bolts.

4. Tighten three mechanism hold-down nuts.

TO SHIP

If the instrument is to be shipped by way of a transportation company, it should be blocked and crated in the same manner in which it was received from the factory.

SLUG REJECTOR SCAVENGER CABLE



Adjust position of cable in clamp so plunger button at front of cabinet extends 3/4".

The clamp should be positioned so the wire does not bind in the flexible cable.

End of wire should not touch surface of bracket on wiper blade.

Rejector should be held by spring clip and in mounting bracket at this corner.

FIGURE 10. CABLE ADJUSTMENT

COIN SWITCHES

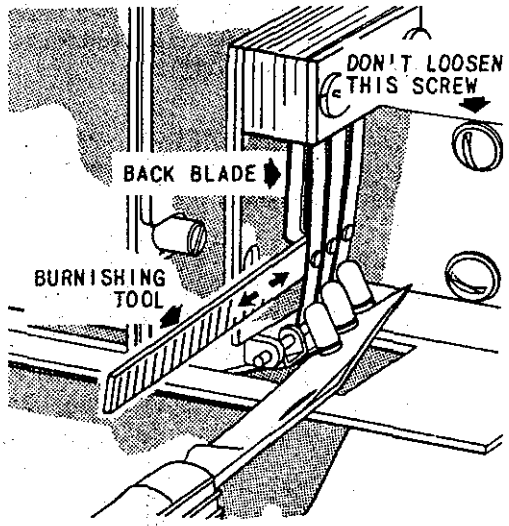


FIGURE 11. COIN SWITCH CLEANING

Clean the switch contacts carefully with carbon tetrachloride using a #2 camel hair brush.

Burnish by inserting a burnishing tool between the contacts, raising the switch lever with a knife blade as shown in Figure 11. *Never use a file or sandpaper for contact cleaning.*

DO NOT ATTEMPT ANY BENDING ADJUSTMENT IF THE SWITCH MEETS CONDITIONS OUTLINED ON FIGURES 12, 13 AND 14.

1. Insert a dime at top of the slug rejector while supporting the switch actuating lever with a knife blade. The coin rests on the lever as shown in Figure 12.

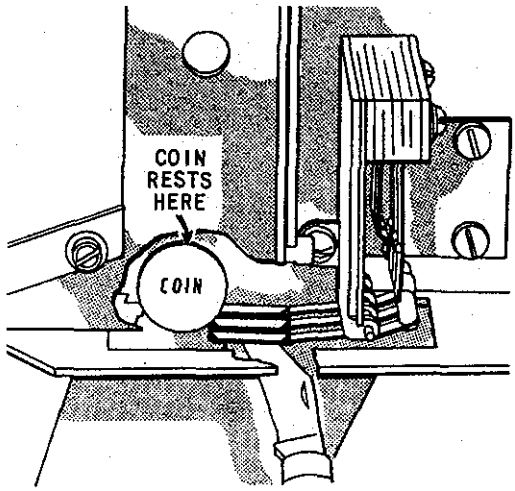


FIGURE 12. COIN POSITION

COIN SWITCHES (continued)

2. Move the knife blade *slowly* to the right to release the coin. The contacts must come together and the back blade should move approximately 1/64" just before the coin drops through of its own weight. (See Figure 13).

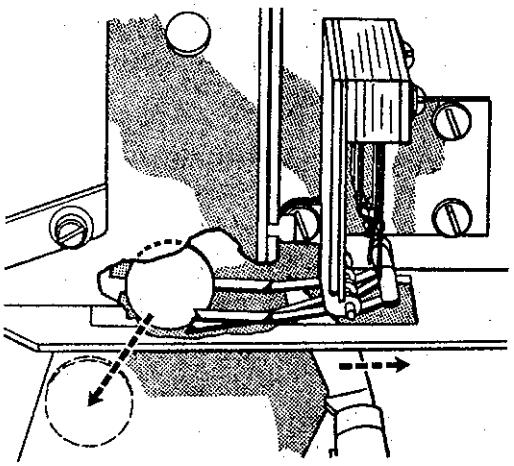


FIGURE 13. COIN TRAVEL

The coin switch levers should be parallel with the opening in the gage plate and the center lever (10¢) should center on the projection of the gage as shown in Figure 14. Lateral play of the lever should be taken into account when checking the position of the 10¢ switch lever.

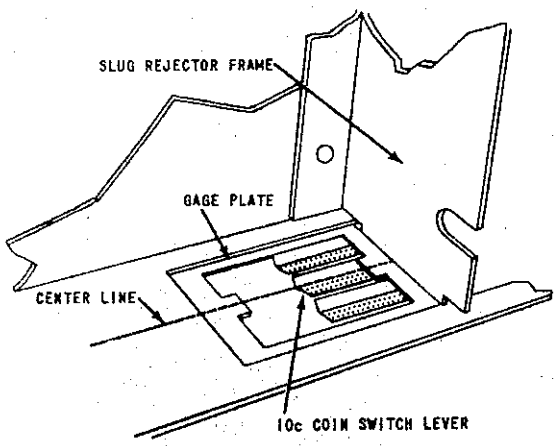


FIGURE 14. COIN SWITCH LEVER POSITION

If the proper contact is not made or the coin does not drop through of its own weight adjustment should be made as outlined below.

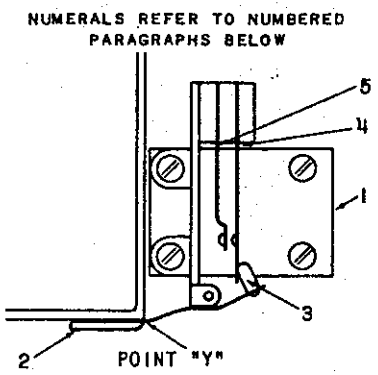


FIGURE 15. COIN SWITCH ADJUSTMENT

1. Adjust position of coin switch mounting so switch levers bear at point "Y".

2. Adjust levers to be parallel to and against bottom surface of frame.

3. Adjust switch actuating cams to be tilted approximately as shown and overlap the blade approximately 3/32".

4. Bend long blade at this point for 4 to 5 grams tension toward cam as measured at switch contact point.

5. Bend short blade at this point so it moves approximately 1/64" when coin is slowly released as in Figures 12 and 13.

NOTE: It is important that the ENDS of the bracer blades support the short contact blades as shown in Figure 16.

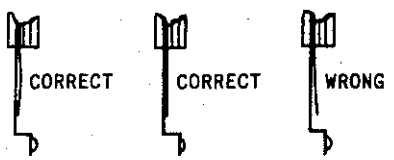


FIGURE 16. BRACER BLADE ADJUSTMENT

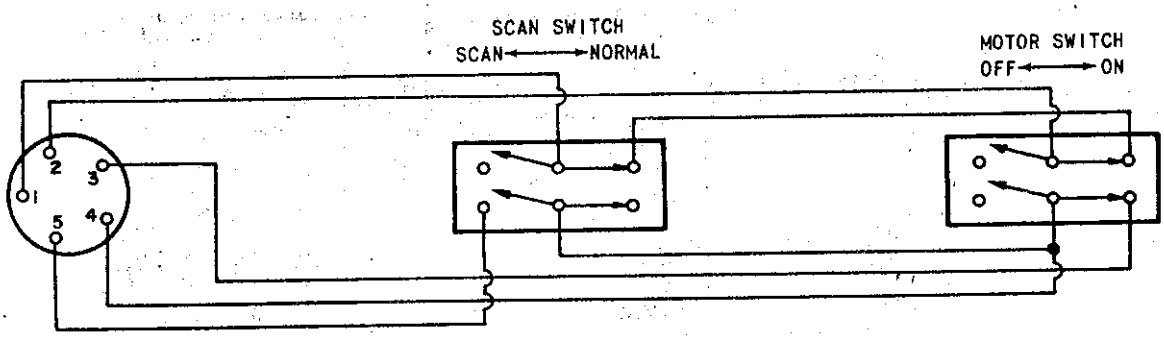


FIGURE 17. SCHEMATIC DIAGRAM - SERVICE SWITCHES

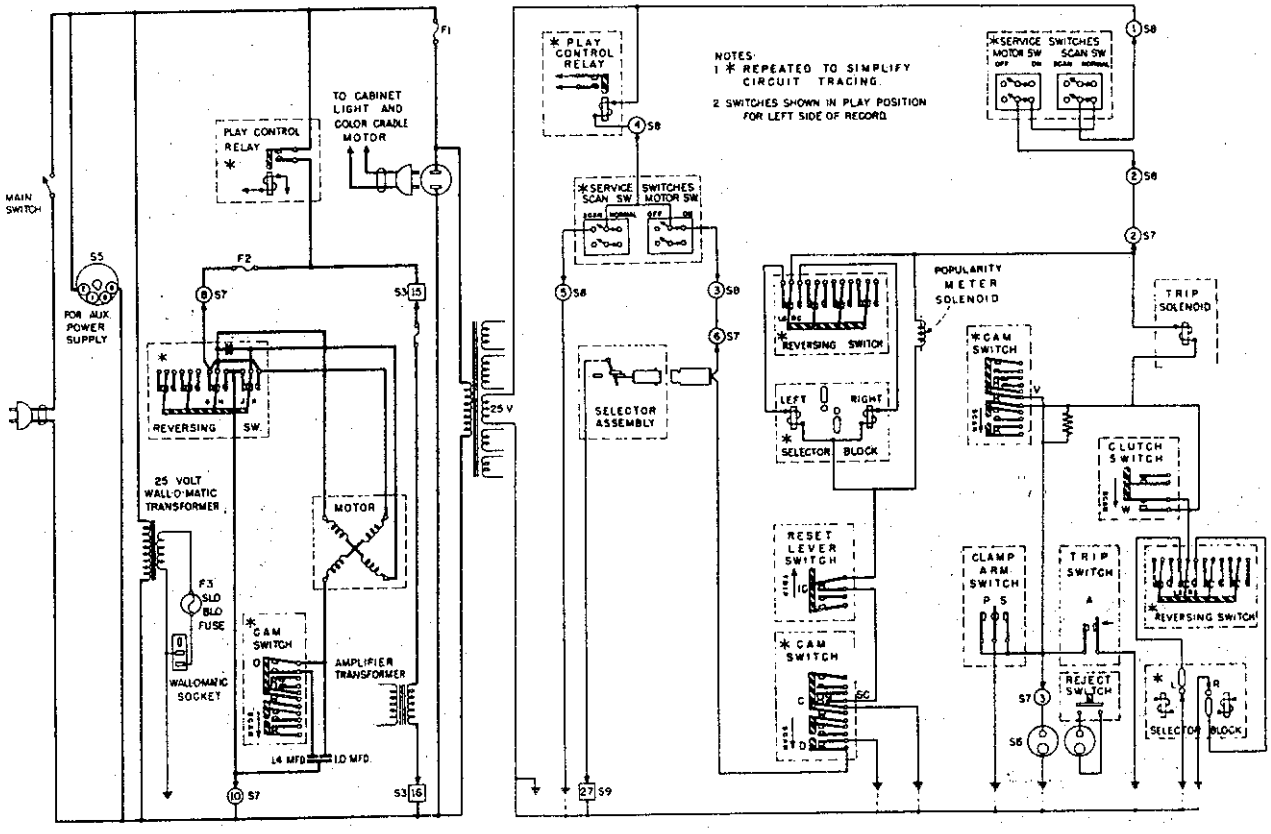


FIGURE 18. SCHEMATIC DIAGRAM - POWER & CONTROL WIRING.
145S2-L6 MECHANISM & WSR5-L6 SELECTION RECEIVER

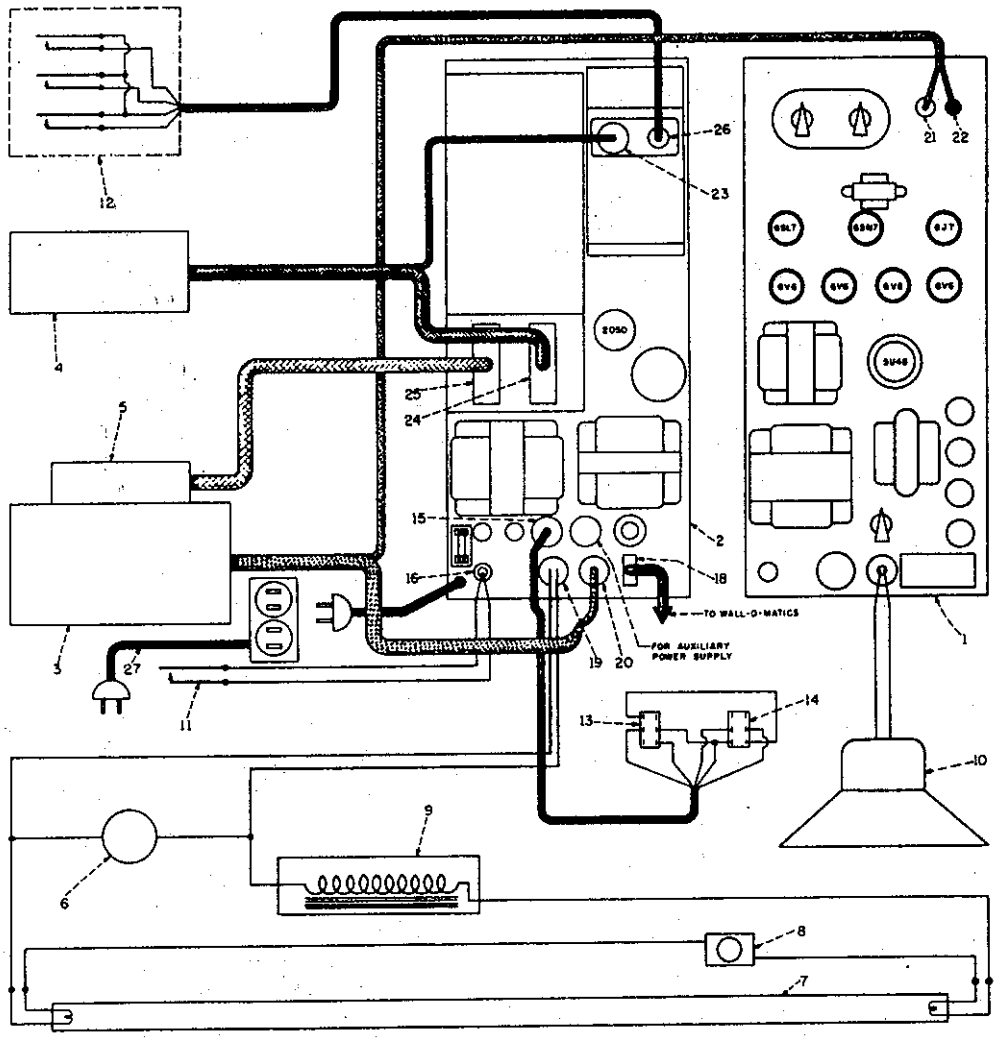


FIGURE 19. CABINET WIRING DIAGRAM

PARTS LIST

Item	Part No.	Description
1	305000	Master Remote Amplifier, Type MRAI-L6
2	303230	Wired Selection Receiver, Type WSR5-L6
3	245001	Select-O-Matic Mechanism, Type 145-S2-L6
4	410000	Elect. Selector Assembly, Type ES6-L6
5	304320	Selector Assembly, Type 100SA-3-L6
6	404326	Cradle Motor
7	405136	25 watt Fluorescent Lamp
8	405138	Starter
9	405101	Ballast
10	404550	Speaker
	404553	Speaker
11	402065	Record Reject Switch
12	504017	Coin Switches
13	404671	Scan Switch
14	23261	Motor Switch
15	200241	5-prong Plug
16	402066	2-prong Plug
18	12015	3-prong Plug
19	10895	A.C. Plug
20	250942	11-prong Plug
21	A250938	3-prong Plug
22	K228440	Single Prong Plug
23	12028	8-prong Plug
24	400844	27-prong Connector
25	F9461	27-prong Plug
26	401515	4-prong Plug, Small
27	402152	Line Cord & Outlet Assembly

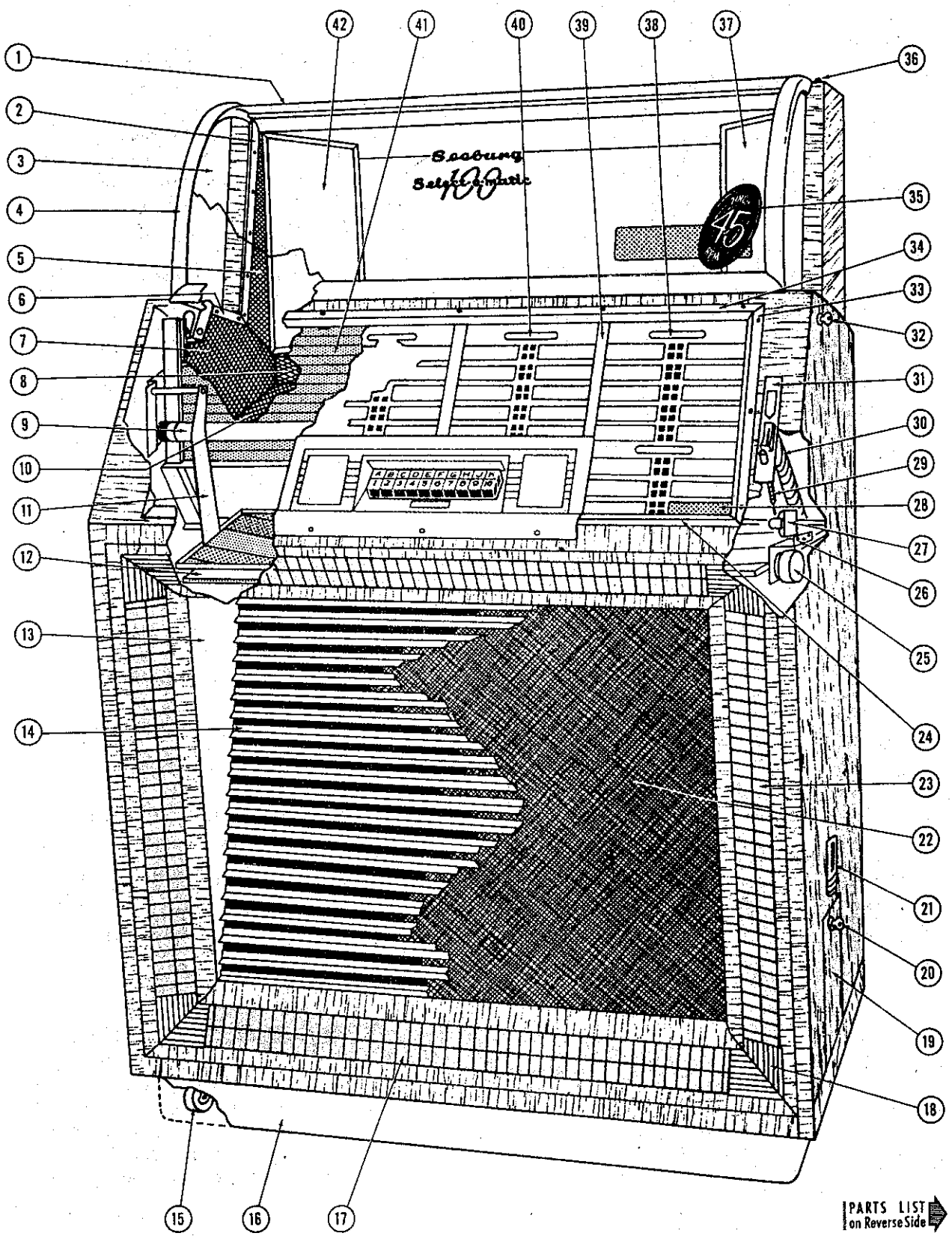


FIGURE 20. FRONT VIEW - M100B CABINET ASSEMBLY, #40 50 38

PARTS LIST - M100B Cabinet - Preceding Page

Item	Part No.	Description
1	405038	Cabinet Assembly - less Mechanism, Electronic Equip., Speaker, Elec. Selector & Coin Equipment
	405039	Cabinet Assembly, only
2	405090	Side Glass Retainer, long
	53405	Retainer Rubber
	77204	Retainer Screws
3	405089	Cabinet Side Glass
4	405092	Cabinet Lid Assem., complete
	405093	Cabinet Lid Glass, only
5	405142	Side Panel Covering, Upper, L.H.
	405141	Side Panel Covering, Upper, R.H.
6	405125	Side Glass Retainer, short
7	405079	Side Panel Covering, Lower, L.H.
	405078	Side Panel Covering, Lower, R.H.
8	405145	Rear Door Trim, long
	405146	Rear Door Trim, L.H.
	405224	Rear Door Trim, R.H.
9	405136	Fluorescent Lamp, 25 W.
	404645	Lamp Socket
10	405077	Floor Covering
11	405070	Cradle Assembly, complete
	405076	Plastic Color Sheet, only
12	405135	Cradle Glass
13	405053	Grille Reflector, L.H.
	405052	Grille Reflector, R.H.
14	405201	Grille Bar Reflector
	77203	Grille Bar Screw
15	402588	Caster
16	405043	Scuff Plate
17	405148	Flex. Mirror, Horiz.
18	405075	Grille Corner
	77204	Grille Corner Screw
19	405110	Cash Box Door Assembly
	405109	Cash Box Door, only
	404659	Cash Bag
20	401301	Cash Box Lock
21	4377	Coin Return Cup
22	405051	Grille Cloth
23	405147	Flex. Mirror, Vert.
24	405105	Prog. Glass Retainer, Lower, R.H.
	405106	Prog. Glass Retainer, Lower, L.H.
25	404326	Cradle Motor
	404636	Motor Con. Link Assem.
	404644	Cradle Drive Link
26	404546	Motor Mtg. Bracket, below Ser. #1850
	405221	Motor Mtg. Bracket, above Ser. #1849
27	405138	Fluorescent Starter
	404631	Starter Socket
28	405192	Price List Window
29	401509	Scav. Wire & Punger Assembly
	401223	Plunger Retain Spring
	401511	Scavenger Wire Housing
30	401507	Coin Chute
31	401512	Coin Slot
	401503	Coin Slot Window
32	405181	Lid Lock, R.H.
	405182	Lid Lock, L.H.
33	405062	Prog. Glass Retainer, Side
	77204	Retainer Screw
	405060	Prog. Holder Guide, Side
34	405061	Prog. Glass Retainer, Top
	70514	Retainer Screw
35	405215	Lid Decal, R.H.
	405216	Lid Decal, L.H.
36	404730	Rubber Bumper
37	405185	Mirror Assembly, R.H.
38	405114	Program Glass, Large
	405190	Prog. Holder Assem., G, H, & K
	405191	Prog. Holder Assem., A, B & J
	405235	Number Strip, G & H
	405150	Number Strip, K
	405232	Number Strip, A & B
	405149	Number Strip, J
	404669	Program Titles, complete set
39	405120	Prog. Holder Guide, Long
	405121	Prog. Holder Guide, Short
40	405115	Program Glass, Small
	404577	Prog. Holder Assem., E & F
	404576	Prog. Holder Assem., C & D
	405234	Number Strip, E & F
	405233	Number Strip, C & D
41	405137	Diffuser Glass
42	405184	Mirror Assembly, L.H.

Cabinet Decalcomania Transfers

405250	Top, 8 1/2 x 34, Light
405251	Upper Side, L.H., Light
405252	Upper Side, R.H., Light
405253	Band, 3 x 33-3/4, Light
405254	Sheet, 49 x 34-1/4, Dark
403267	Concentrated Cement, quart

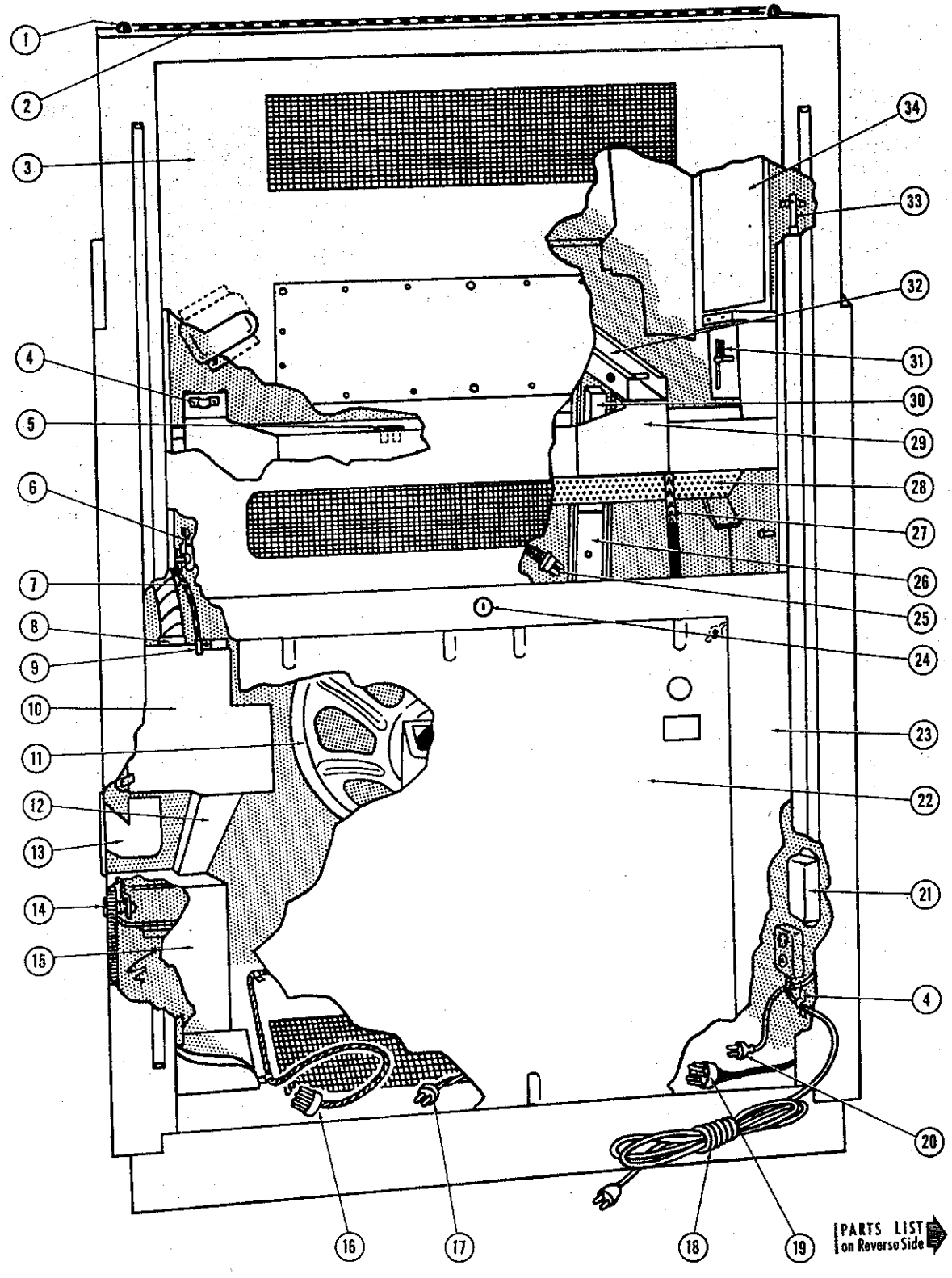


FIGURE 21. REAR VIEW - M100B CABINET ASSEMBLY, #40 50 38

PARTS LIST - M100B Cabinet - Preceding Page

Item	Part No.	Description
1	404730	Rubber Bumper
2	405099	Lid Hinge
3	405049	Upper Rear Door Assem.
	405011	Upper Rear Door, only
4	15037	Cable Clamp
5	405204	Rubber Grommet
6	404619	Rear Door Lock Clamp, R.H.
	404620	Rear Door Lock Clamp, L.H.
7	401511	Scavenger Wire Housing
8	401229	Coin Chute Ret. Clip, R.H.
	401230	Coin Chute Ret. Clip, L.H.
9	402098	Cable Clamp
10	401516	Slug Rej. Mtg. Frame
	404731	Slug Rejector, only
	401506	Coin Sw. & Cable Assem.
	401314	Coin Switch, only
11	404550	Speaker Assembly
	404551	Cone & Voice Coil
	404553	Speaker Assembly
	404554	Cone & Voice Coil
	404556	Speaker Assembly
	404557	Cone & Voice Coil
12	401298	Lower Coin Chute Assem.
13	4377	Coin Return Cup
14	401301	Cash Box Lock
15	401504	Cash Box Housing
16	402430	6-prong Speaker Plug
17	10895	2-prong Plug
18	402152	Line Cord & Plug, only
19	200241	5-prong Plug
20	402066	2-prong Min. Plug
21	405101	Fluorescent Ballast
22	404517	Cover Plate Assembly
	70025	3/16-24 Wing Nut
23	405044	Lower Rear Door Assem.
	405045	Lower Rear Door, only
24	404655	Rear Door Lock
25	401515	4-prong Plug
26	405036	Chassis Support Post, R.H.
	405037	Chassis Support Post, L.H.
27	404672	Chain Assembly
28	405069	Front Vent Screen
29	405107	Chassis Support Bracket, R.H.
	405108	Chassis Support Bracket, L.H.
30	405124	Service Switch Cover
	404671	Scan Switch
	23261	Motor Switch
31	405219	Stylus Brush
	405220	Brush Holder
32	405185	Channel & Pin Assembly
33	402065	Reject Switch
	402064	Reject Switch Pin
34	405183	Mirror Assembly, R.H.
	405184	Mirror Assembly, L.H.

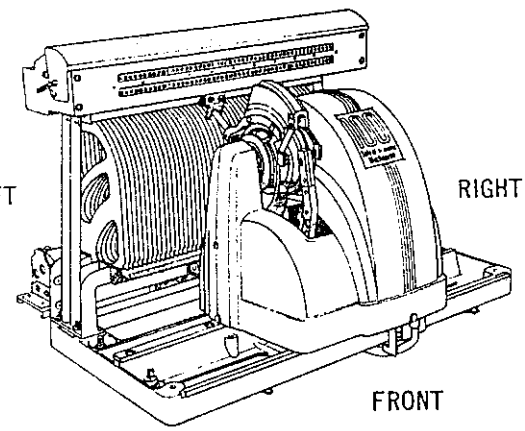
ADJUSTMENT INDEX

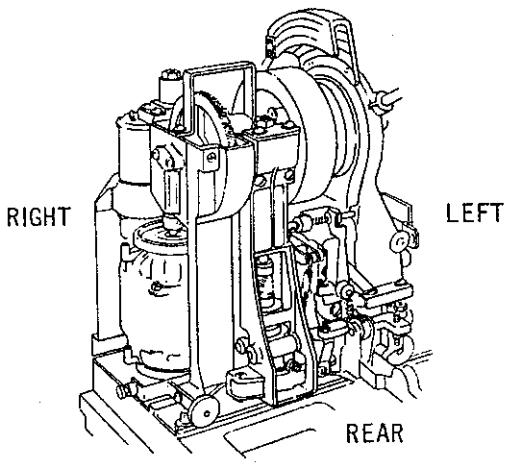
45 r.p.m.
Select-O-Matic "100" Mechanism
Type 145S2-L6

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.

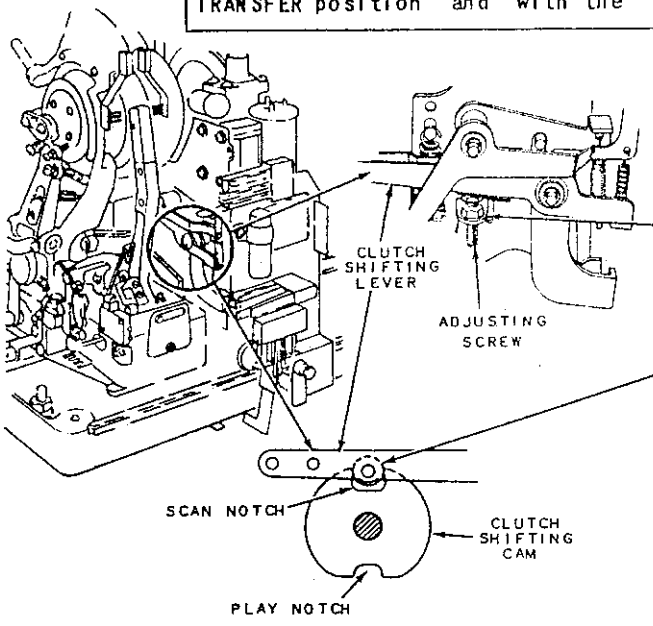
TRANSFER - - in which the record is transferred from the magazine to the playing position or from the playing position to the magazine.

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 I" - - 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

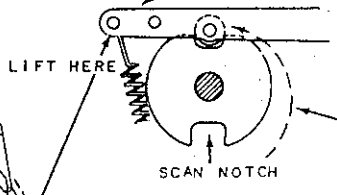


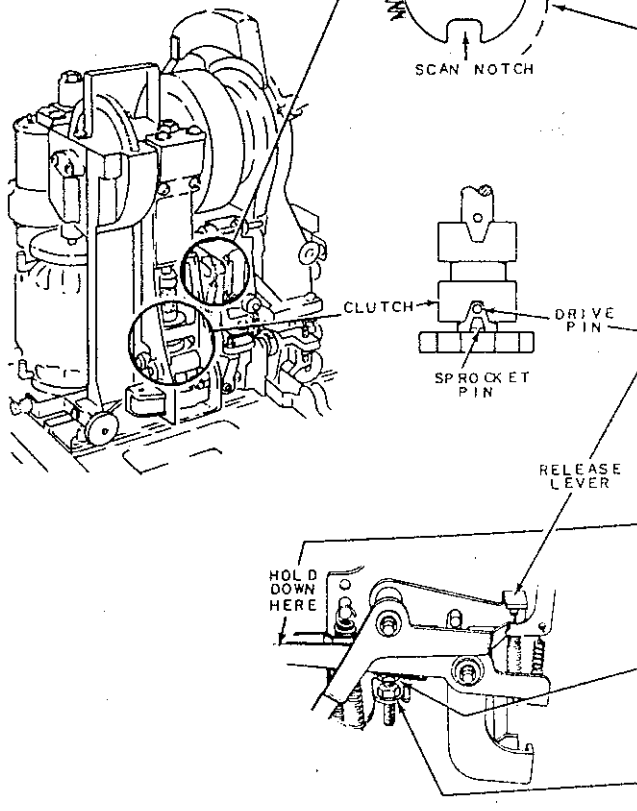
(A) Scan Carriage to front of K9-K10 record space. Leave it in SCAN position.

(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.

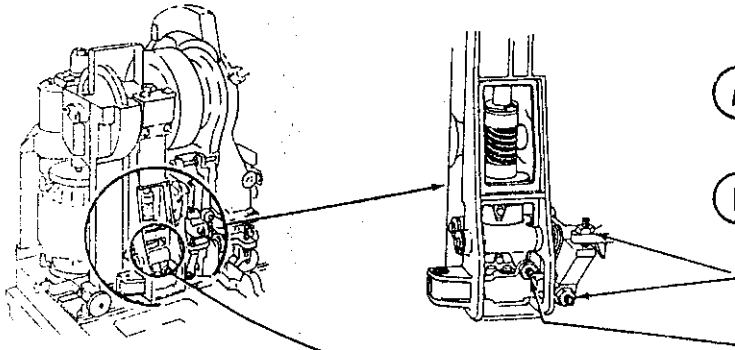
(G) Tighten Lock Nut.

"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.

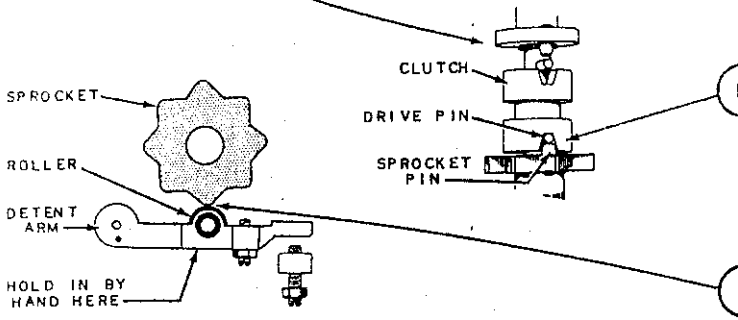
NOTE 2: - If "Clutch 2" adjustment is changed in any way, "Clutch 3 and 4" should be re-adjusted. "Clutch 2, 3 and 4" are related to an extent that a change of "Clutch 2" can cause damaging strains at adjusting screws for "Clutch 3 and 4".



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

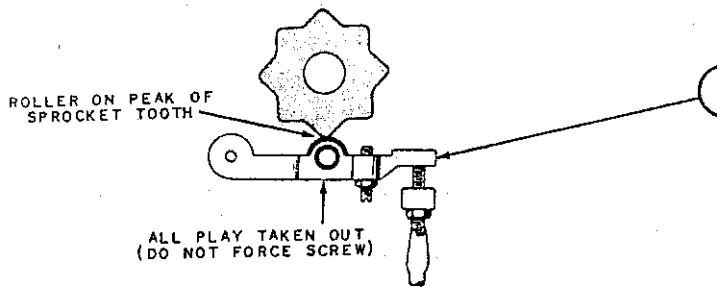
(B) Loosen lock nuts and turn these adjusting screws out to the limit;

"Clutch 2"
"Clutch 3"
"Clutch 4"

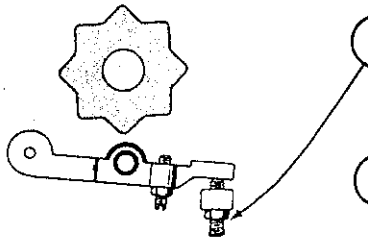


(C) Mechanism should still be in SCAN position, beyond K10, with Clutch all the way down (against lower Drive Pin) and engaged with Sprocket Pin.

(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.)

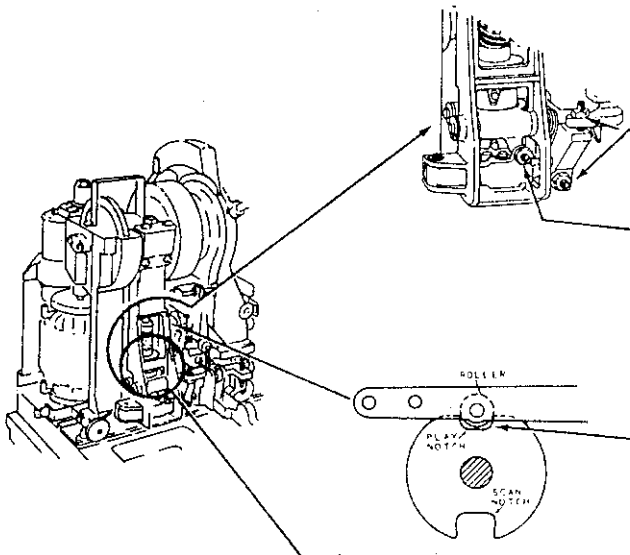


(F) Now, back out, the screw 2 turns and tighten the lock nut. This establishes correct clearance.

(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.

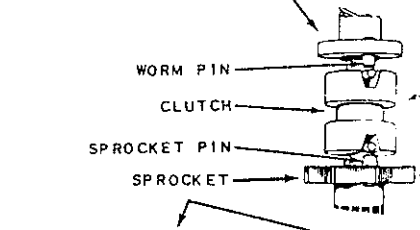
(A) Loosen Lock Nuts and turn these adjusting screws out to the limit:

"Clutch 3"

"Clutch 4"

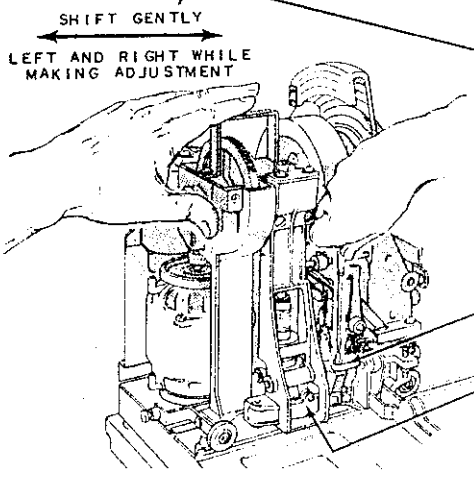
(B) Place mechanism in K10 PLAY position. Be sure mechanism is fully in PLAY position.

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.

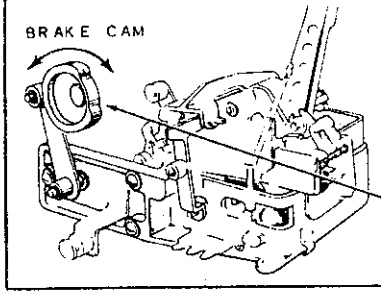


(C) While gently shifting Carriage to Left and Right by hand, - - -

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.

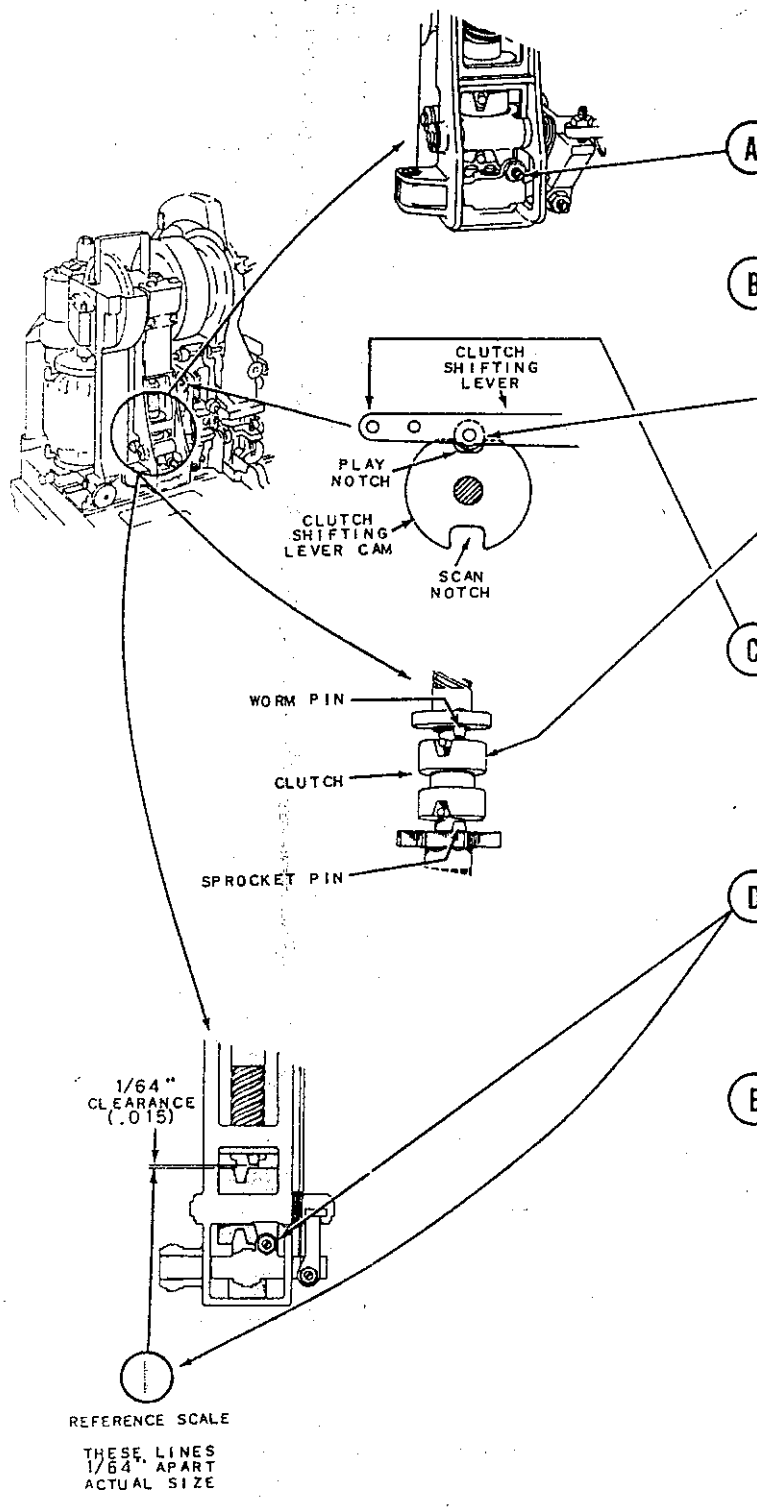
Do not force adjusting screw.

Turning the screw down too far will set up 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.

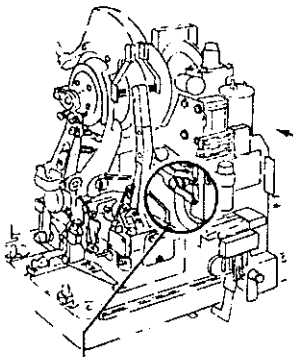
NOTE: - Clutch should drop freely, (to 1/64" clearance) every time mechanism enters PLAY position. If Clutch does not drop freely into full PLAY position it may hit Worm Pin as it rotates. This can be caused by "Clutch 3" being too tight or by binds in the Clutch and the Clutch Shifting Lever.

RESET LEVER STOP ADJUSTMENT*

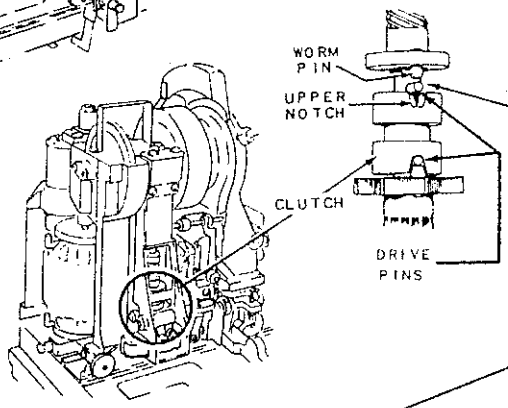
This adjustment positions the Rubber Stop so it minimizes and absorbs mechanical shock at the Reset Lever when the mechanism is tripped. It results in 1/32" clearance between the Limit Pin and the Reset Lever in the tripped position of the mechanism.

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.

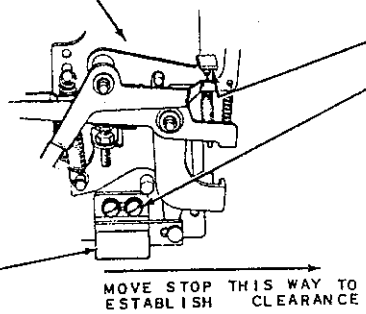


(A) Place mechanism in SCAN position in front of K9-K10 record space.

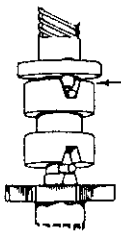


(B) Turn motor shaft manually until upper notch in Clutch is lined up with Worm Pin.

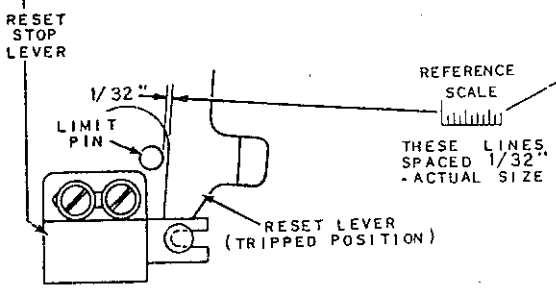
(C) Trip the mechanism by manually lifting the Release Lever.



(D) Loosen screws holding Reset Lever Stop.

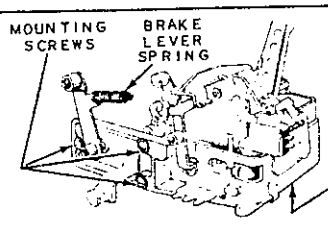


(E) Check Clutch position. Clutch should now be up to limit and engaged with Worm Pin.



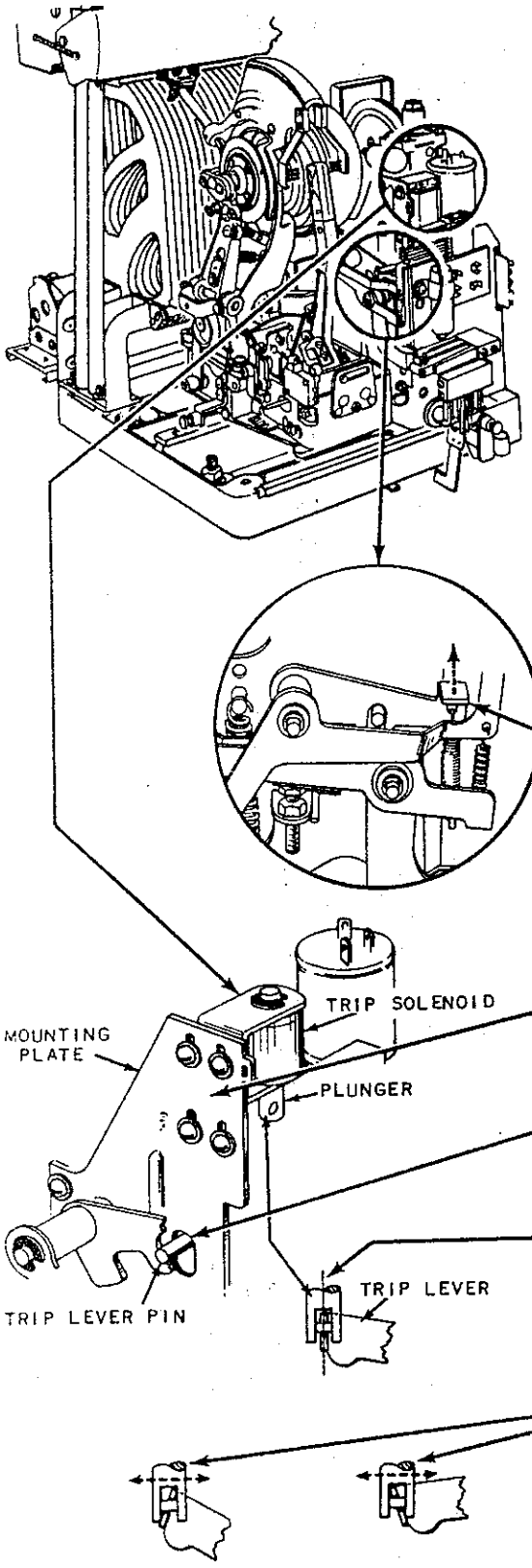
(F) With Clutch engaged with Worm Pin, as shown above, move Reset Lever Stop toward front until Reset Lever clears Limit Pin by 1/32 inch. Tighten screws.

(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.

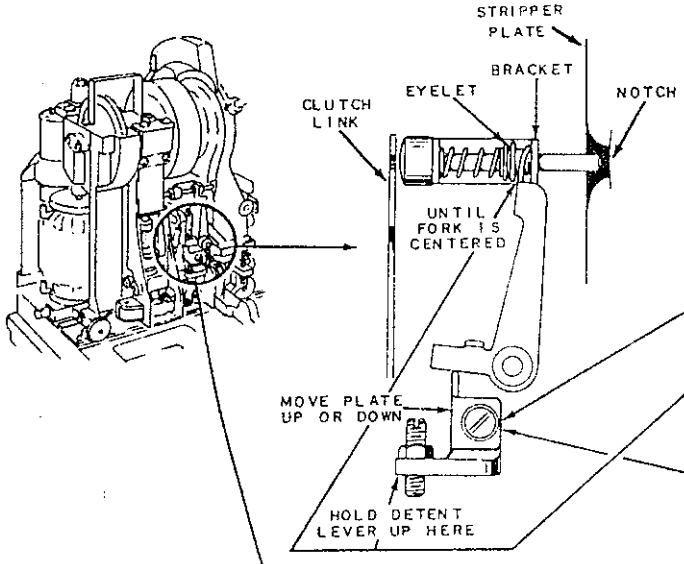
(D) To avoid binds the Plunger must have horizontal play when the Trip Lever is in either extreme up or down position.

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

"SAFETY LEVER I" - - SAFETY LEVER POSITION

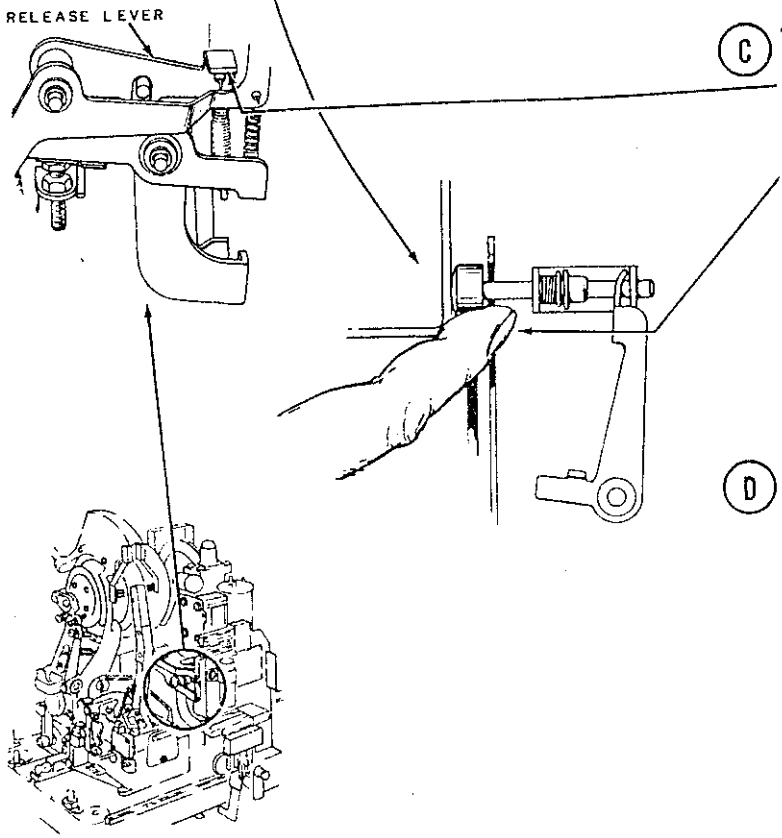
This adjustment establishes the correct position of the Safety Lever and results in proper travel of the Safety Plunger when the mechanism is entering PLAY or SCAN position.

(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.



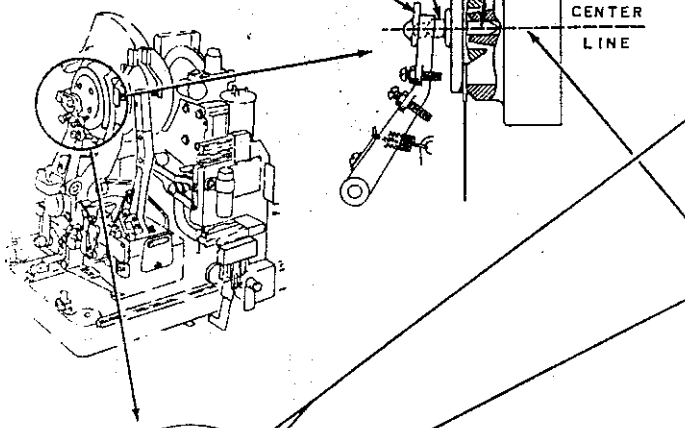
(C) To check Safety Assembly for binds,

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.



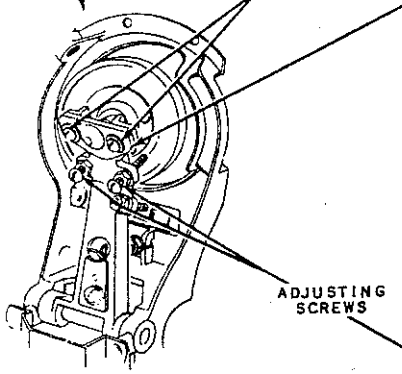
(A) Place mechanism in PLAY position with a record clamped on the Flywheel.

(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.

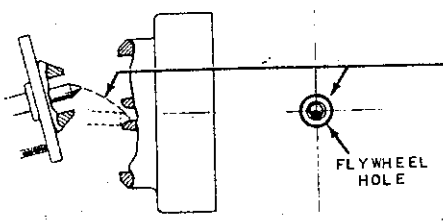
"CLAMP ARM 2" - - CENTERING PIN POSITION

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 - - -

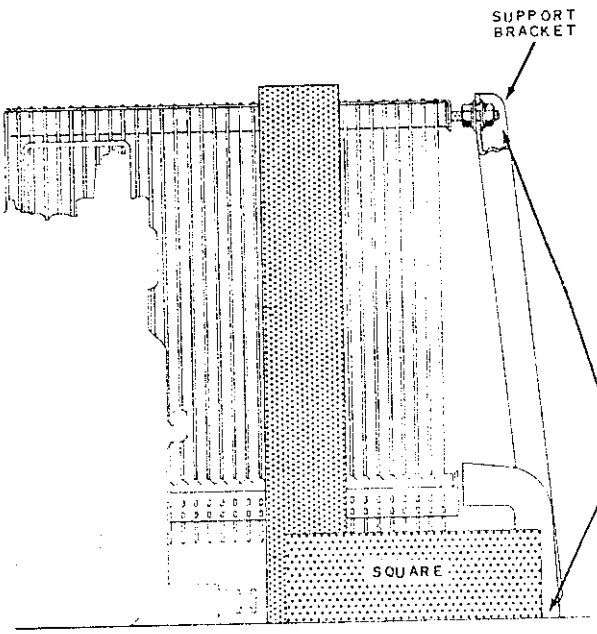


(B) Tip of Centering Pin enters Flywheel hole as shown.

(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.



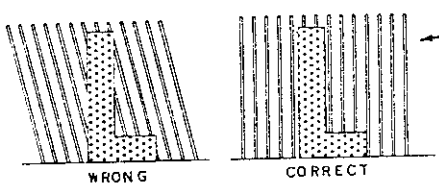
(A) To check Magazine for squareness -

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.



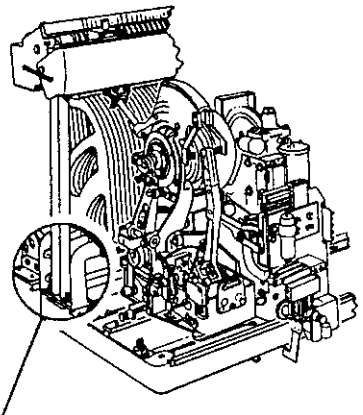
2. Adjust proper nut, on either side, which will align the Separators with the edge of the square.

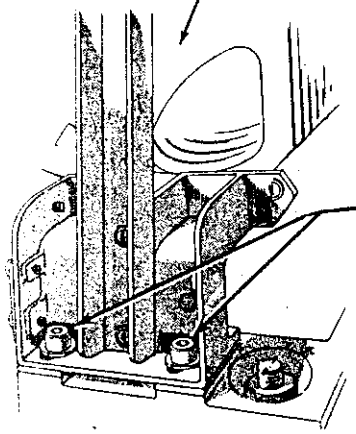
3. Bring other nuts up to their Support Brackets and tighten.

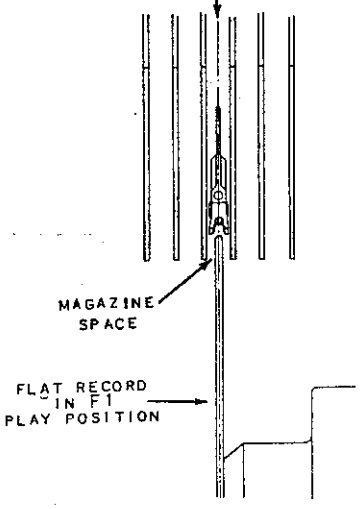
NOTE: - Check the spacing of the Magazine Separators. All the Separators should be straight and equally spaced.

"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.

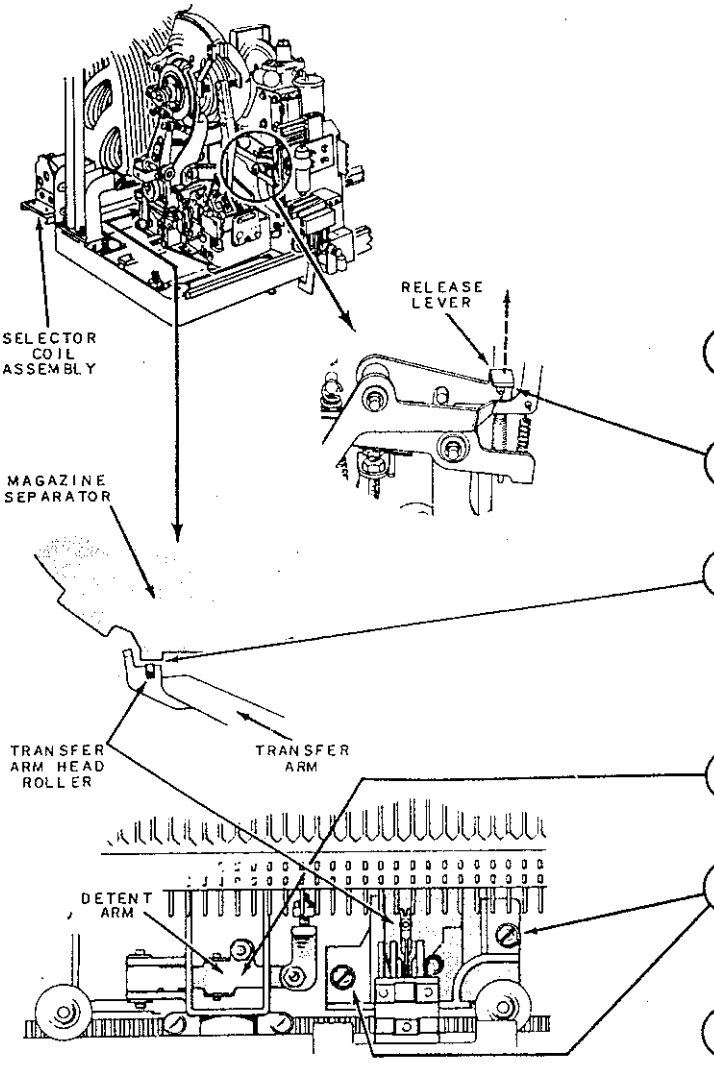
"Transfer Arm 1"

"Contact Block 1"

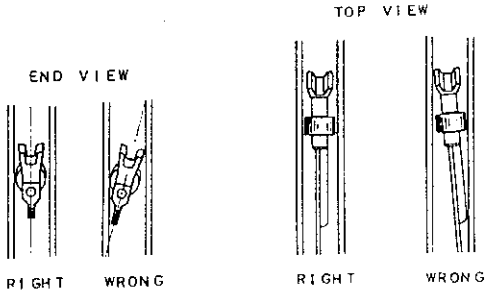
"Selection Playing Indicator 2"

"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 - - -

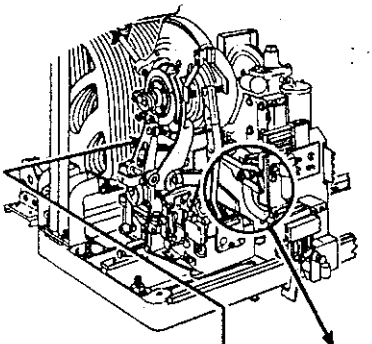
(F) Shift Contact Arm Casting to left or right until Transfer Arm Head is centered in the space. Tighten screws.

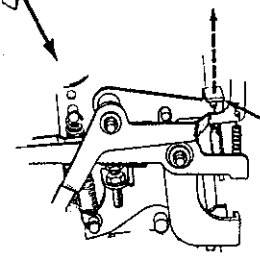
(G) When the Transfer Arm enters the space, the Transfer Arm Head should be parallel to the Magazine Separators as shown. Straighten Arm if necessary to correct Transfer Arm Head alignment.

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

"TRANSFER ARM 2" - - PLAY POSITION CLEARANCE

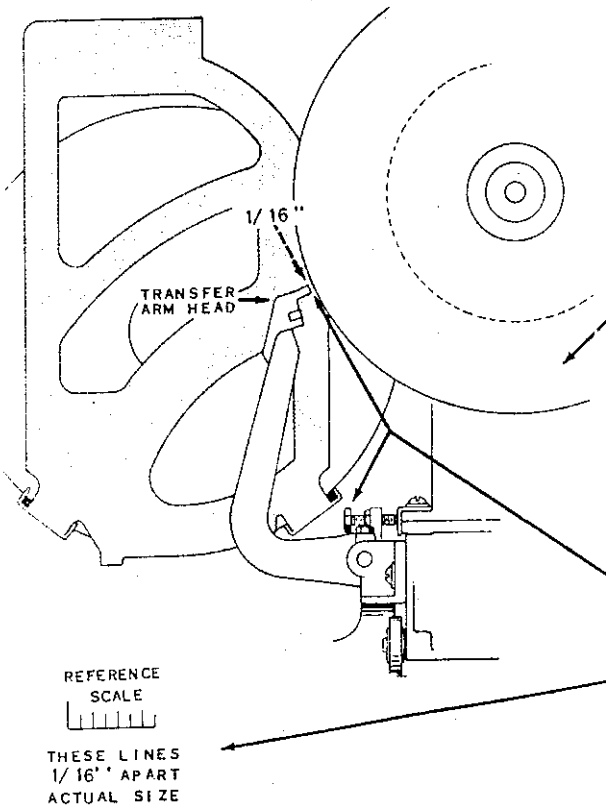
This adjustment establishes the upper limit of travel of the Transfer Arm so that records will be brought up high enough to be properly clamped to the Flywheel by the Clamp Arm.





(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.



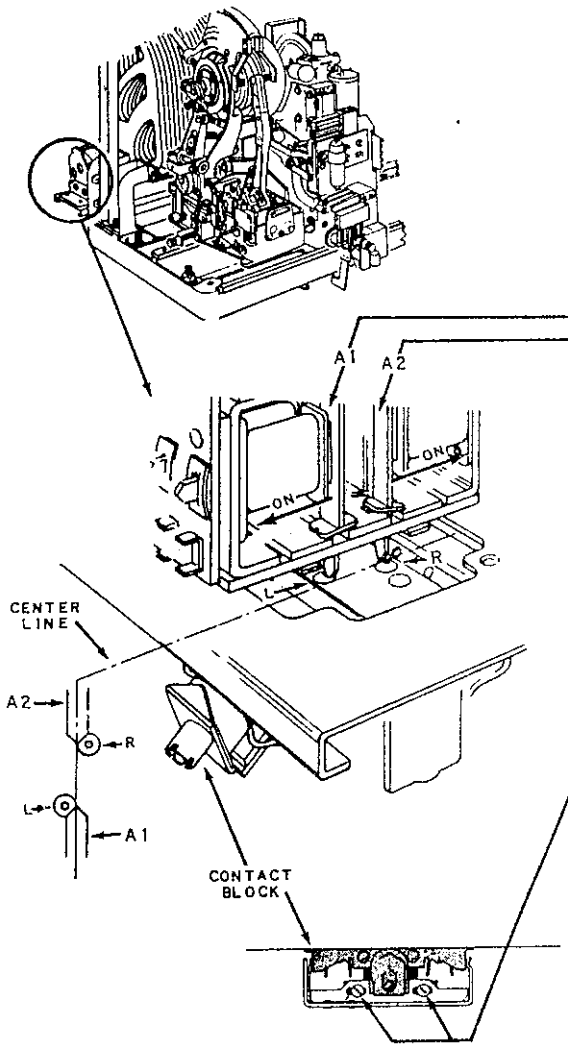
(C) Place a normal size *record in position on the Transfer Arm Head. Turn motor shaft until record is brought up and clamped in PLAY position. (Transfer Arm and record should come up just outside of the Magazine one position to the left of A1.)

(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 I" - - 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.

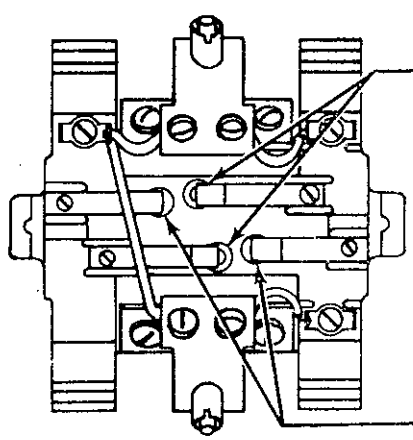
(A) Place mechanism in A1 PLAY position and turn off power.

(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.



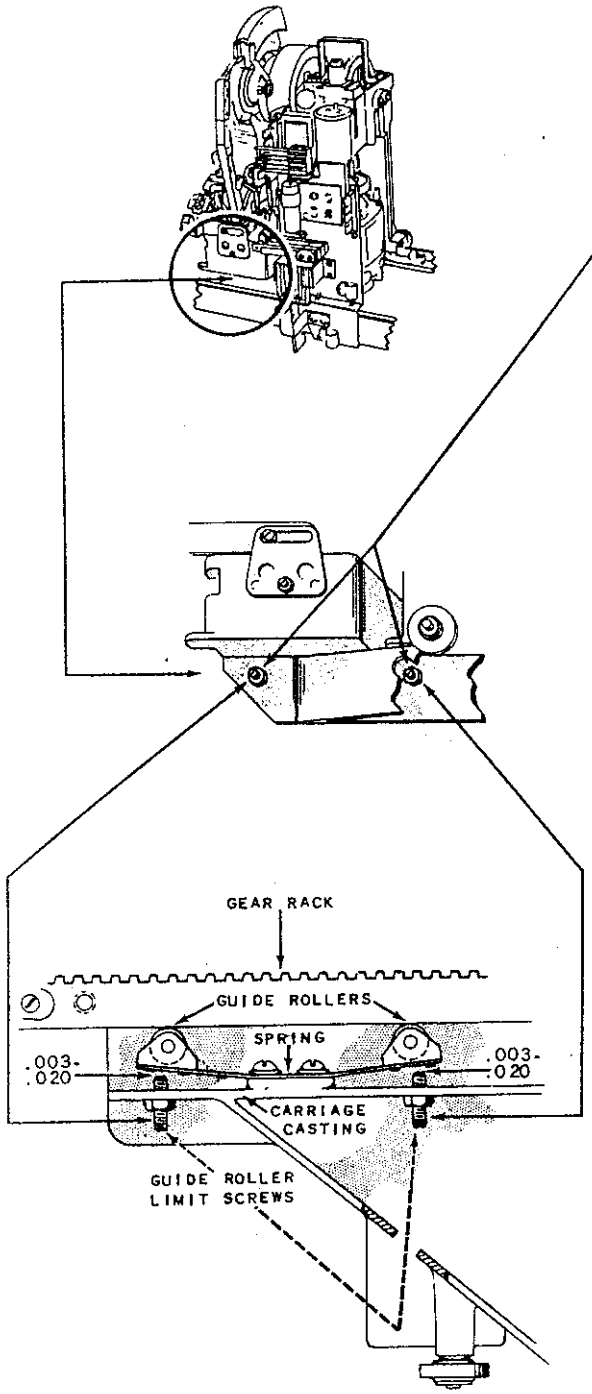
Adjust spring pressure so a 1/2 to 3/4 oz. force is required to move selector contacts.

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 - - -

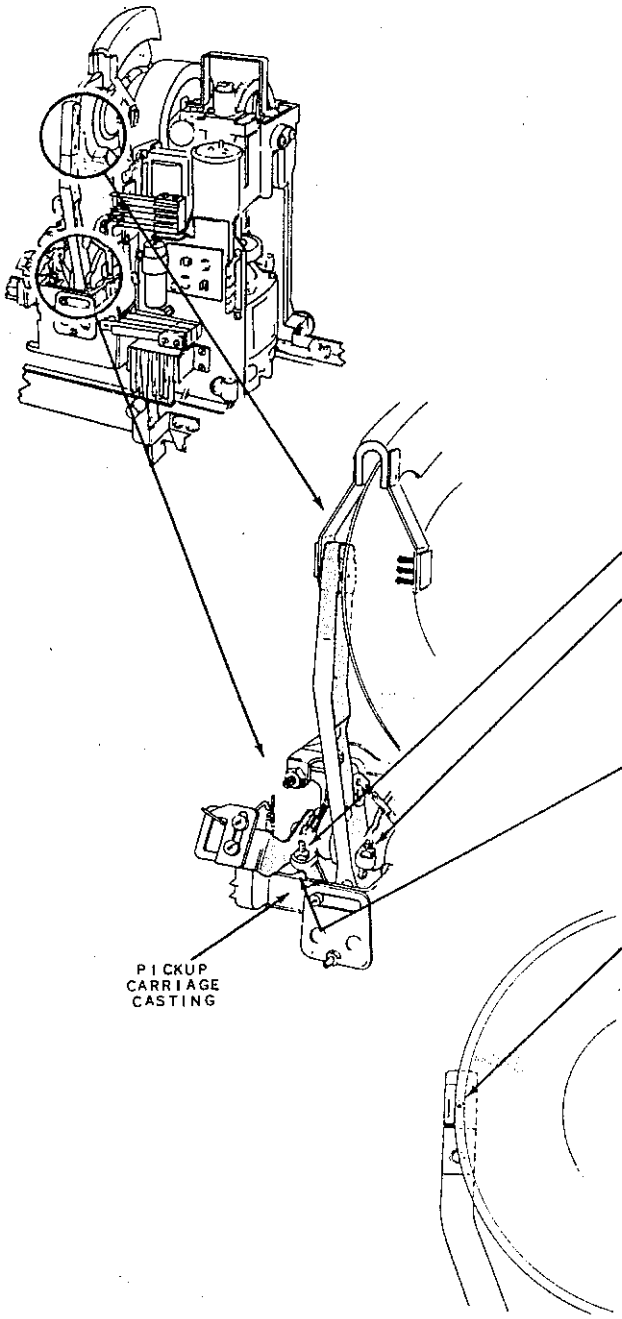
1. Loosen Lock Nuts.
2. Carefully turn screws in, all the way, until all front and back play of Carriage is taken out. (DO NOT FORCE SCREWS)
3. When all front and back play is taken out, back out each screw 1/2 turn. (This will result in approximately .015 clearance.)
4. Tighten Lock Nuts.

(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 half way 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.

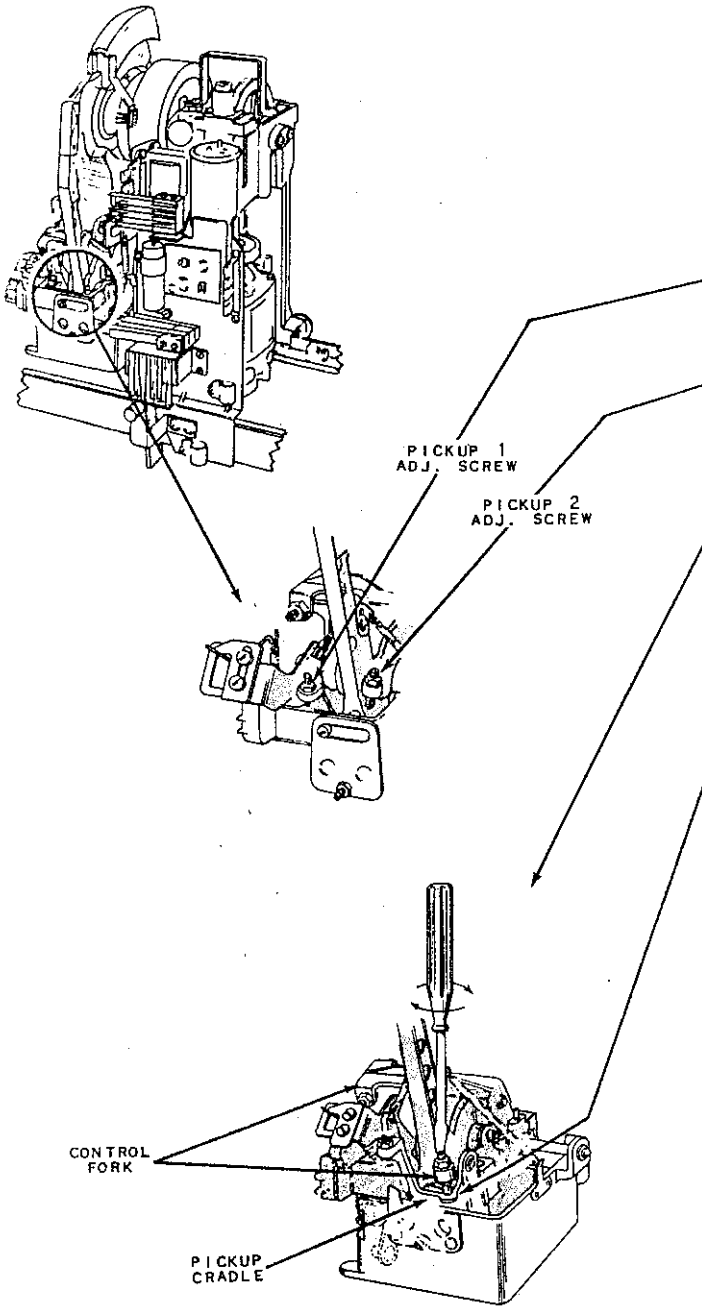
(F) Select the Right side of the same record and check for proper needle landing at the beginning of Right Side PLAY.

(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.

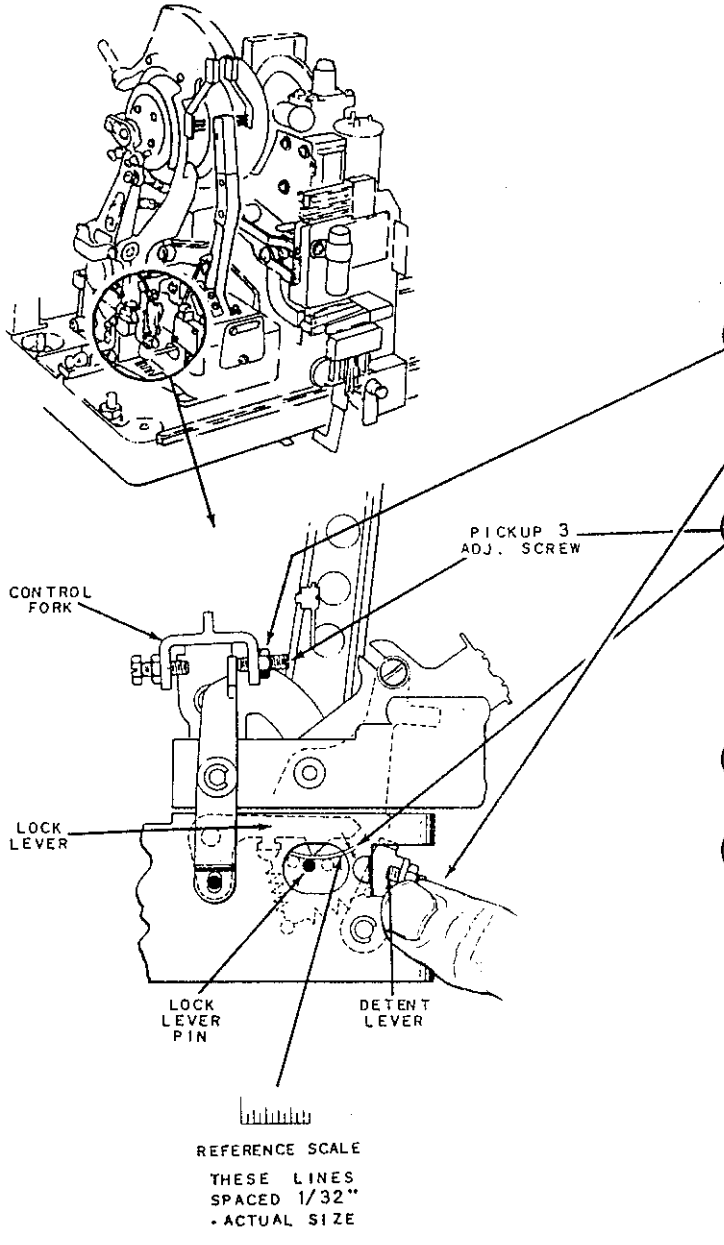
(E) Back out screw 1/4 turn from the above position and tighten Lock Nut. (This allows a small amount of clearance under the screw and a slight amount of up and down play in the Control Fork.)

(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. .030

(D) Tighten Lock Nut.

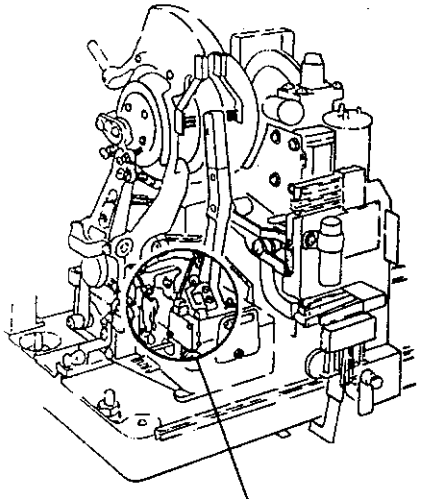
(E) Place mechanism in Right side PLAY position. While holding Detent Lever away from Lock Lever, move Pickup Arm in along record and again check for required 1/32" clearance.

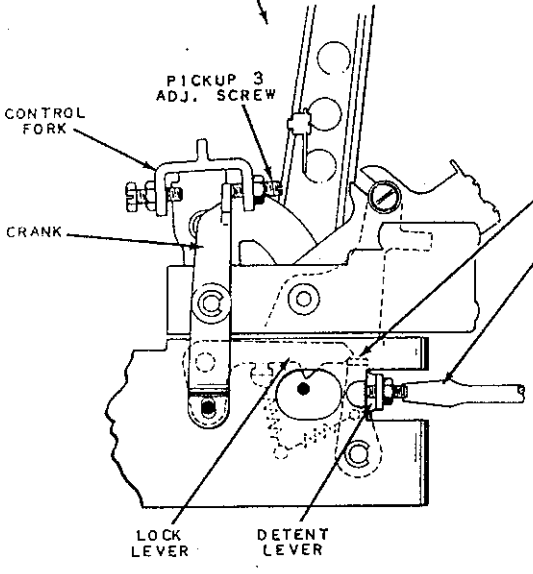
If clearance is not approximately the same in both Right and Left side PLAY positions, check Lock Lever Pin alignment. Straighten Pin, if necessary.

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.

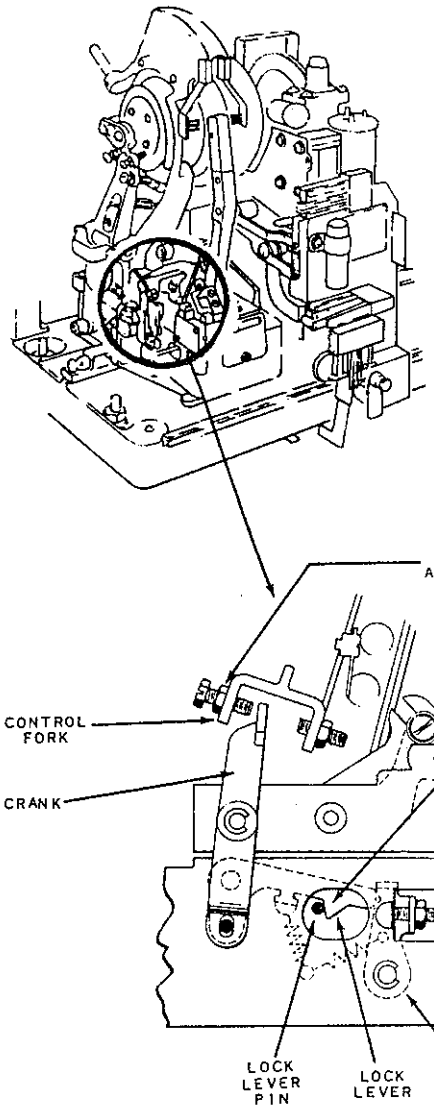
(B) Loosen Lock Nut and adjust the screw until Detent Lever just touches lower slope of Lock Lever, as shown. *The Detent Lever should meet the Lock Lever approximately half way along the lower slope. If the edge of the Detent Lever is above or below the lower slope of the Lock Lever, check "Pickup 3"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

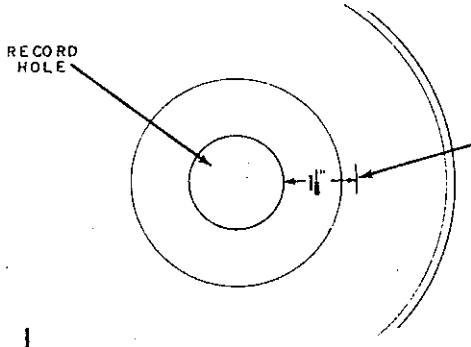
(D) Tighten Lock Nut.

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

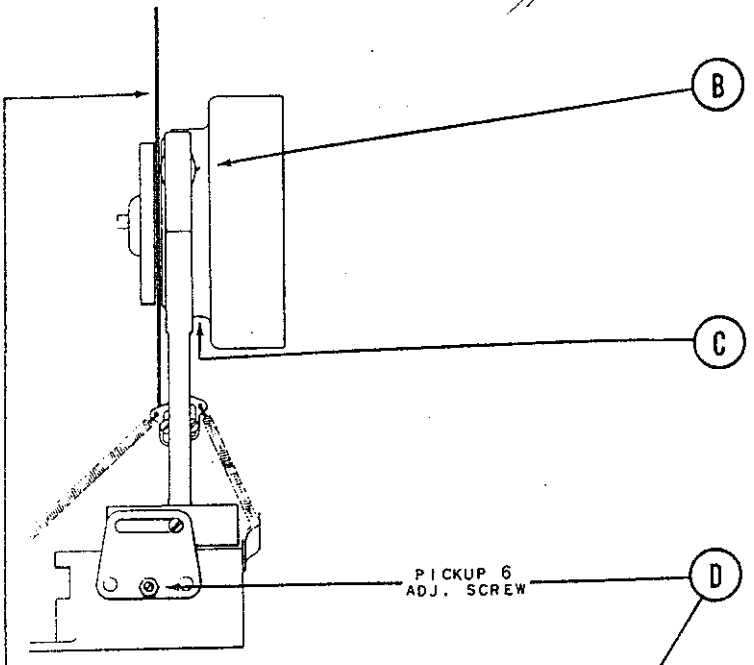
(F) Check resetting action - - by returning mechanism to Right side SCAN position. Lock Lever should be returned to Lock position against Pin and clearance between screw tip and Crank should be 1/32".

"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.



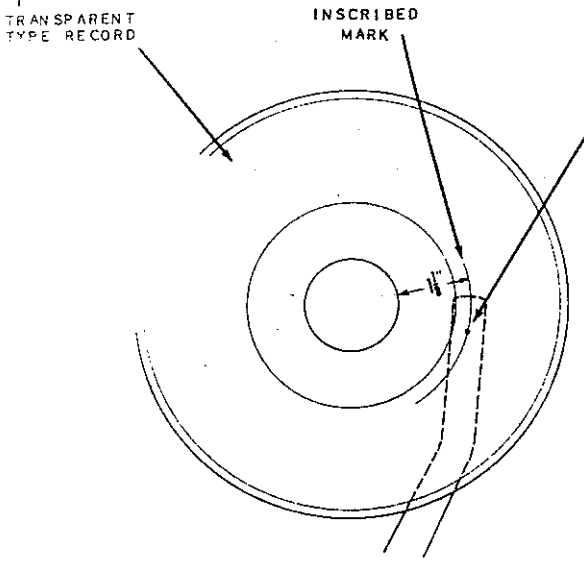
(A) Inscribe a mark on a record 1-1/8" away from the edge of hole. Use a transparent type record if available.



(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.

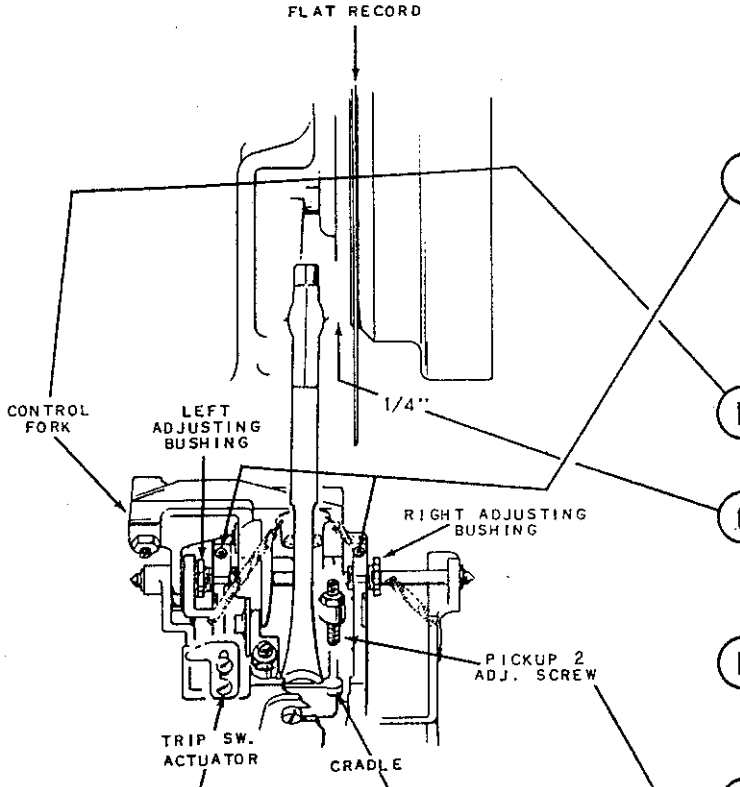
(D) Loosen Lock Nut and adjust screw so that needle cannot move in toward Flywheel any farther than the inscribed mark, as shown.

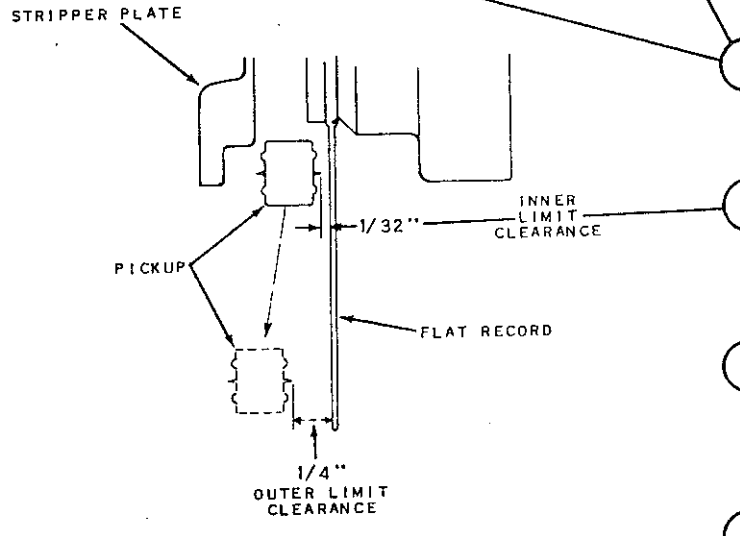


(E) Tighten Lock Nut.

"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 Pick-up 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.

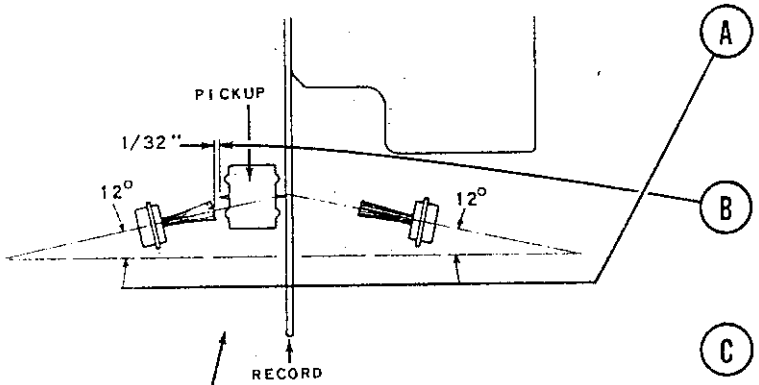
(G) In this position of the Pickup Arm and Control Fork the needle should be a minimum of 1/32" from the record.

(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.



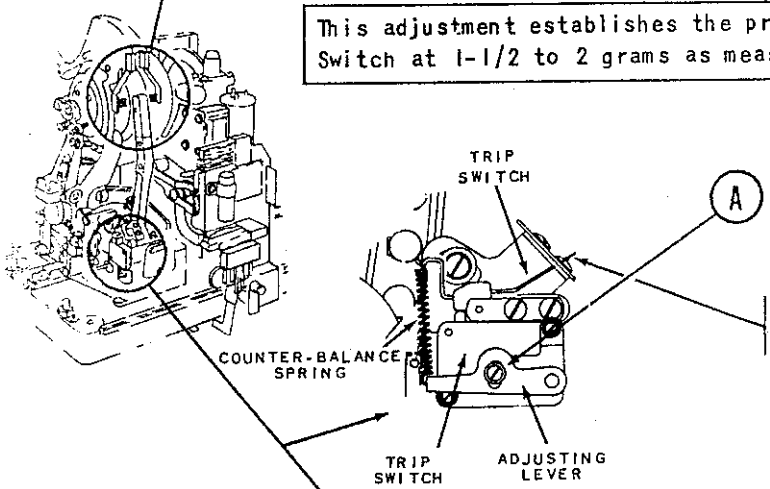
(A) The Brush Mounting Brackets are set so the bristles "point" approximately 12 degrees toward record center.

(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.

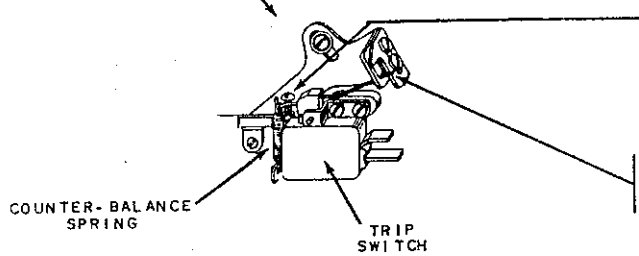
"PICKUP 9" - - TRIP SWITCH PRESSURE ADJUSTMENT

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.

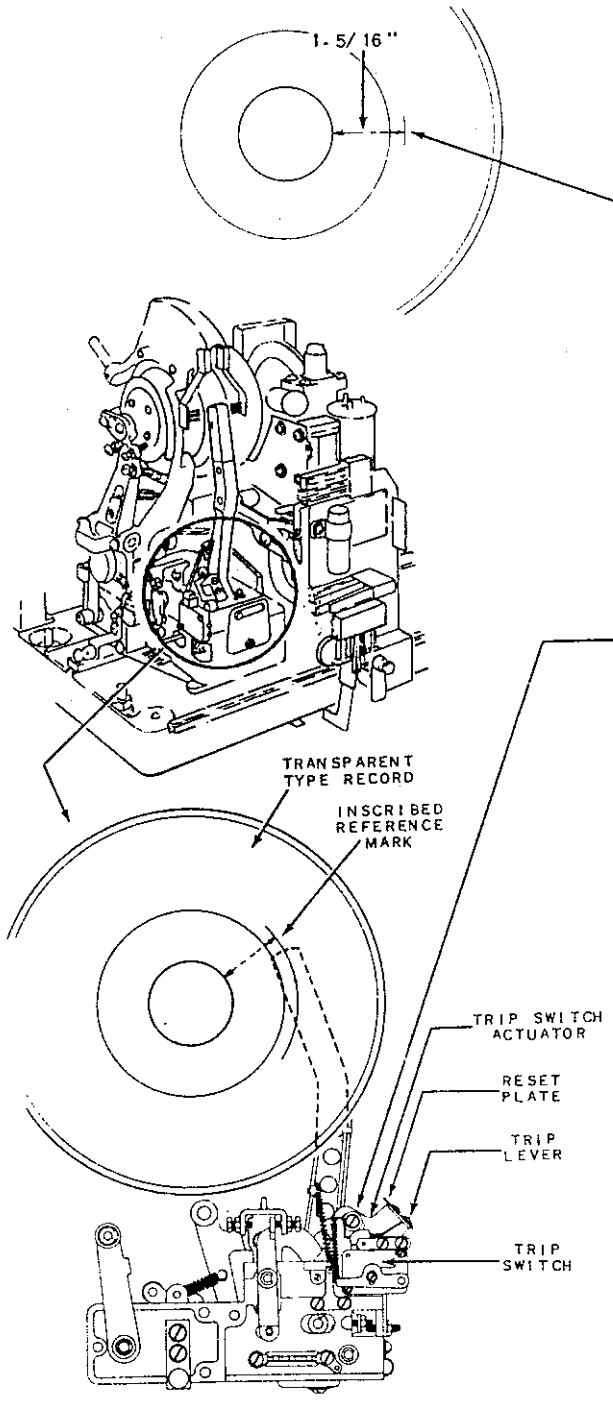


NOTE: - On 145-S2 mechanisms below Serial #2952 the Counter-balance Spring adjustment is made by means of an Adjusting Screw.

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.)

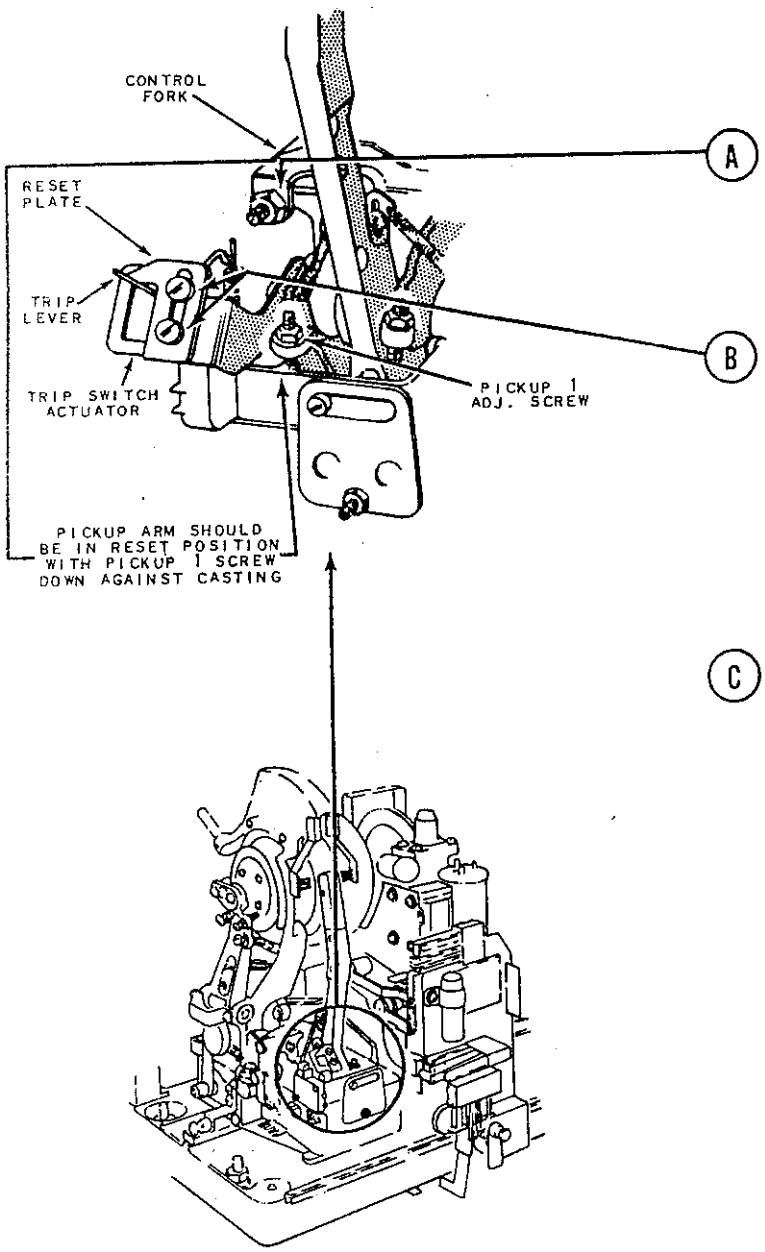
(D) Tighten screw and check for normal operation by playing several Left and Right sides of records.

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.

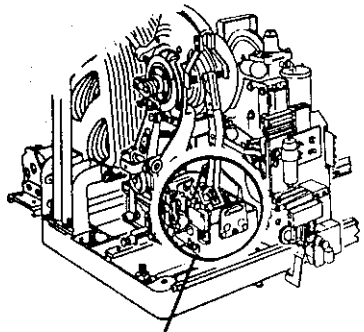
(B) In this position loosen screws and adjust Reset Plate so Trip Switch is fully reset.

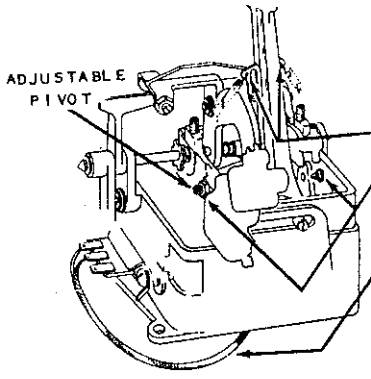
When adjusted correctly the Trip Switch should be reset but the Trip Lever should not apply any upward pressure against the reset plate.

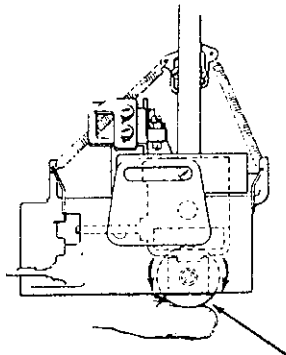
(C) Check by releasing Control Fork. Needle should land properly on record without "Booster" action from Trip Lever.

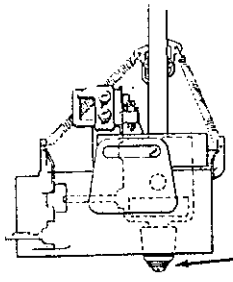
"PICKUP 12" - - PICKUP BALANCE ADJUSTMENT

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.

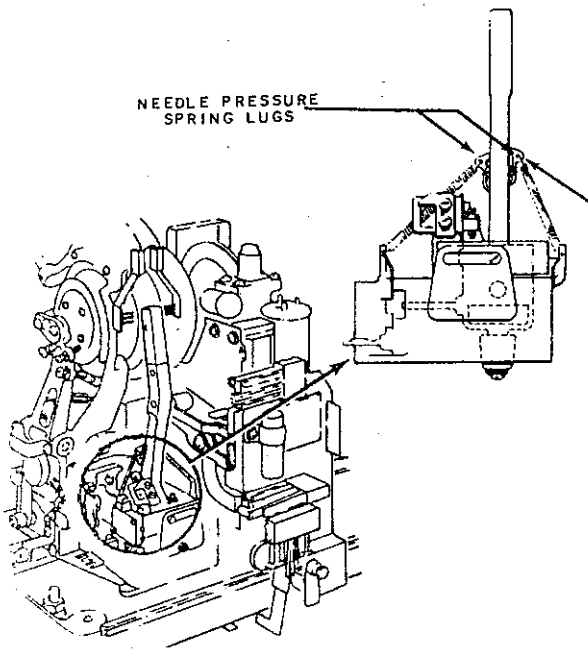
*There are two types of Counter-weights.

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 at 7 to 8 grams for either Right or Left sides. Correct pressures result in proper tracking and in a minimum of needle and record wear.

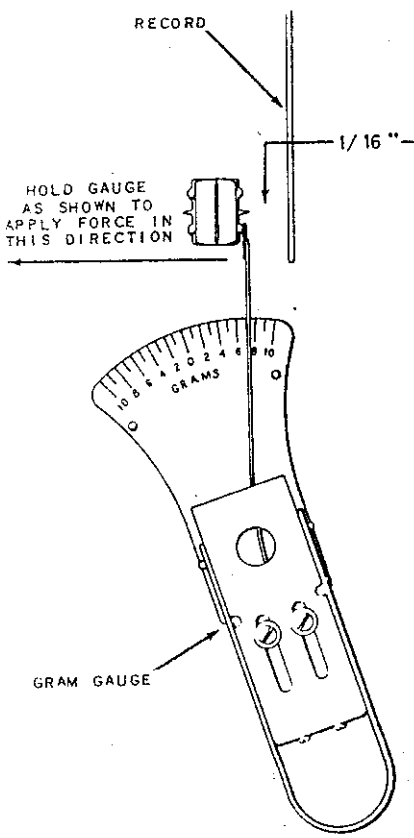


(A) Place mechanism in Left side PLAY position with a flat record clamped on the Flywheel.

(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.

(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 grams needle pressure.



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

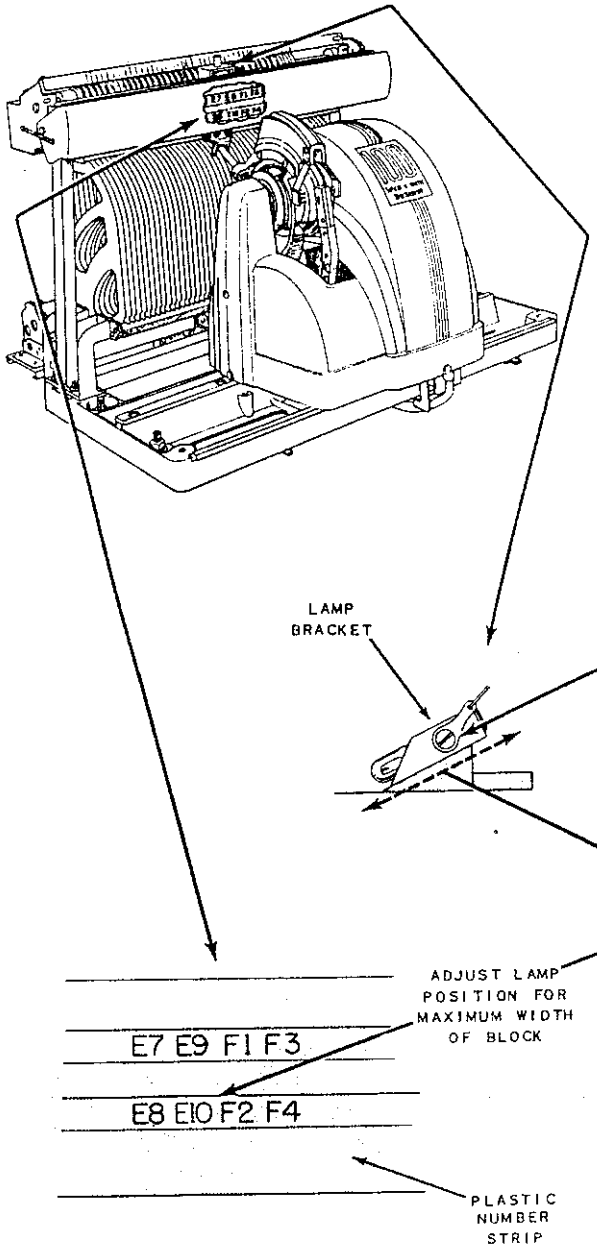
1. Place the tip of the gauge spring against the Pickup case at the "Bump" next to the needle tip and lift the Pickup so the needle is about 1/4" from the record.

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. Pressure should be between 7 and 8 grams.

"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.



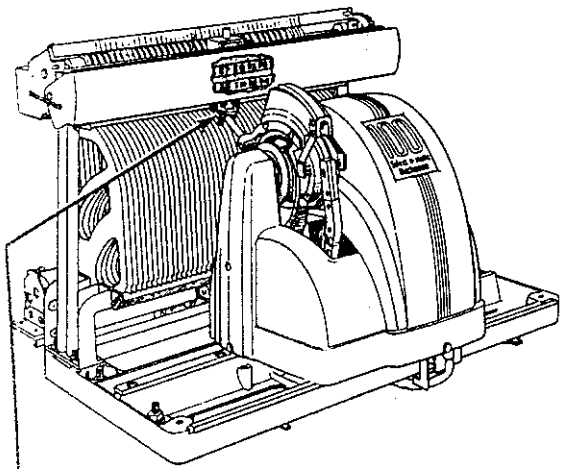
The Selection Playing Indicator illuminates the number of the selection being played. It contains two #47 lamps which are operated alternately through a sliding bar type switch. The lamps shine through windowlike openings in a Slide, projecting a block of light on a Numbered Plastic Strip.

(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.

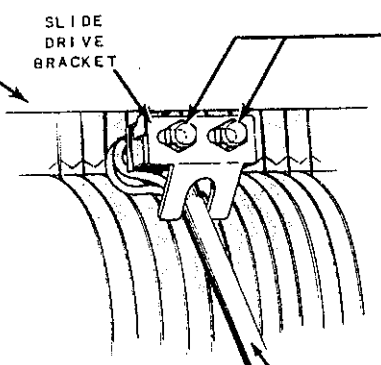
"SELECTION PLAYING INDICATOR 2" - - SLIDE POSITION

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



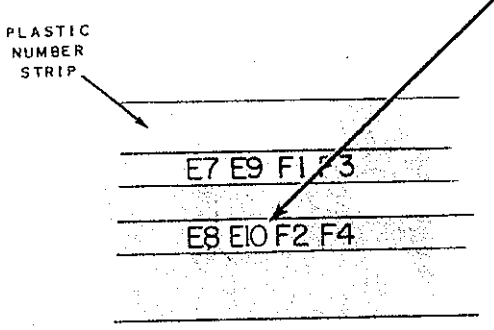
NOTE: "Selection Playing Indicator 1" should be correct before making this adjustment.

(A) Place mechanism in E10 PLAY position.



(B) Loosen Cap Nuts.

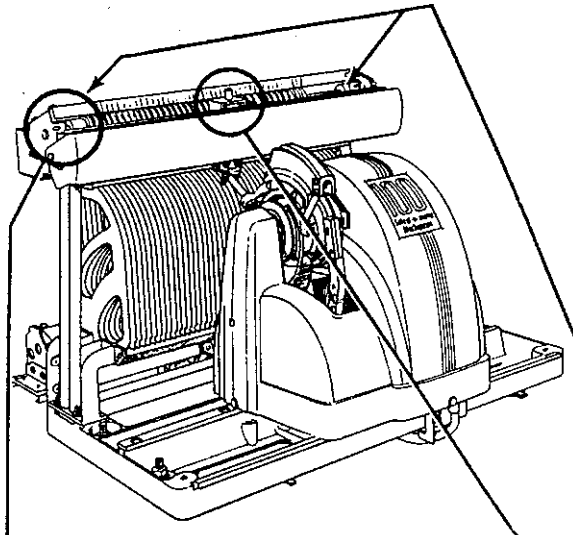
(C) Position Slide Drive Bracket so that block of light from Indicator Lamp is centered with E10 on the Number Strip. Tighten Cap Nuts.

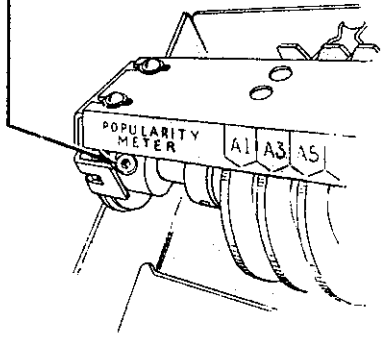


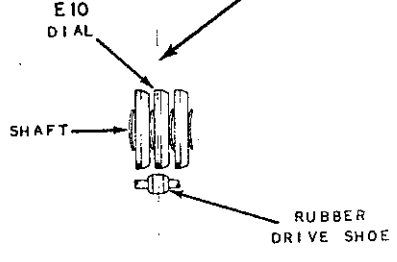
Note that moving the Slide position for this adjustment also changes the position of the rubber Drive Shoe which operates the Popularity Meter Dials. If above adjustment is changed, check "Popularity Meter 1" adjustment.

"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.

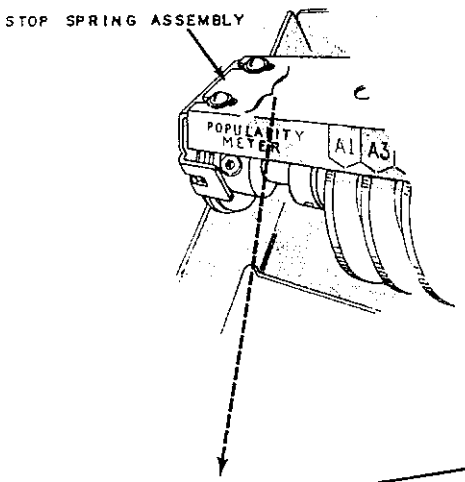
(C) Move Shaft and Dial Assembly to left or right until knurled driving surface of Dial E10 is centered with the Rubber Drive Shoe.

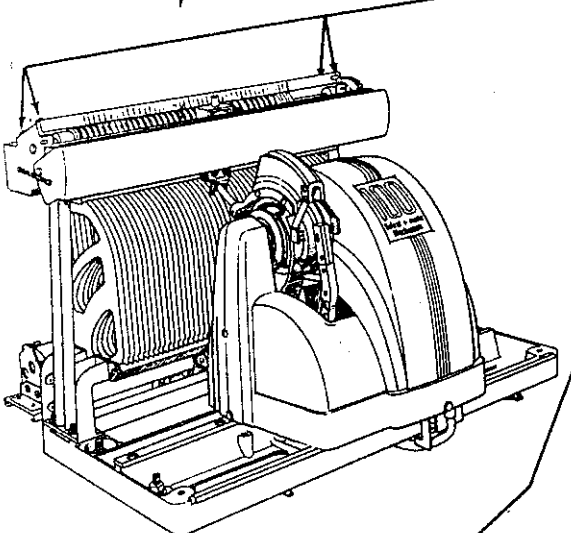
(D) Lock collars in place with set screws allowing about 1/64" end play in shaft to prevent binding.

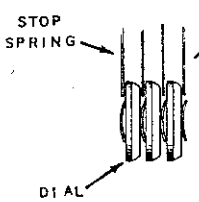
NOTE: If the Dial Assembly position is changed be sure to check "Popularity Meter 2" adjustment.

"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.

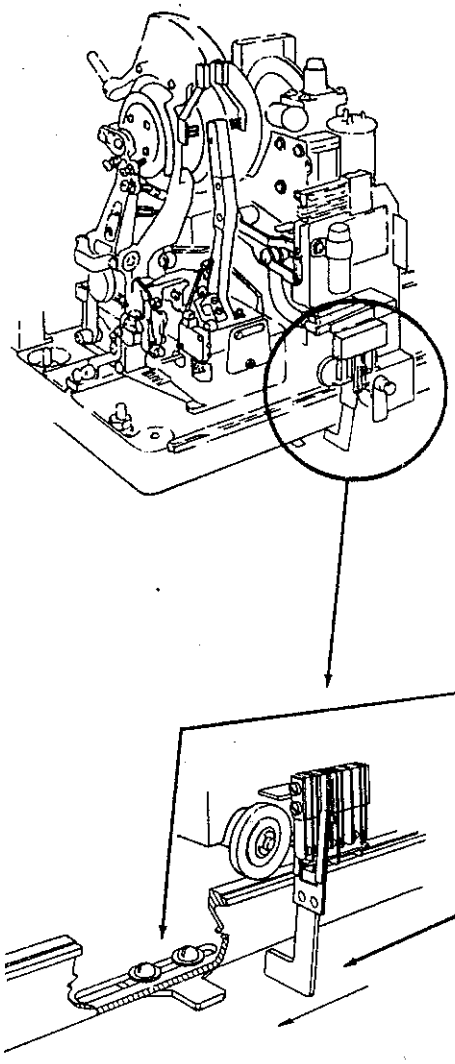
(B) Move Stop Spring Assembly to left or right until all springs are approximately centered between Dials.

(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.

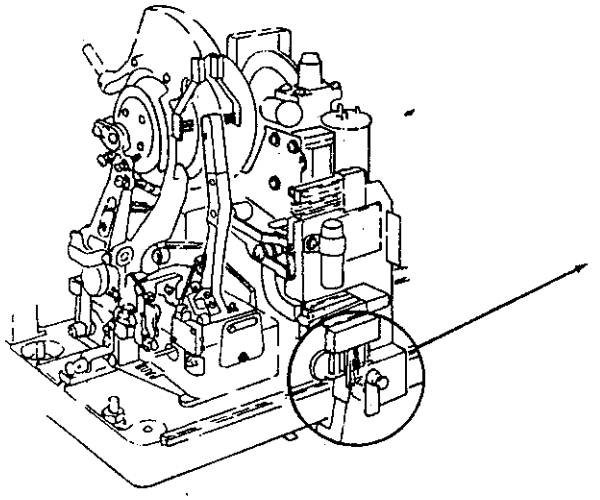
(E) Move the Bracket slowly and carefully to the right until it is at the point where the reversing switch operates.

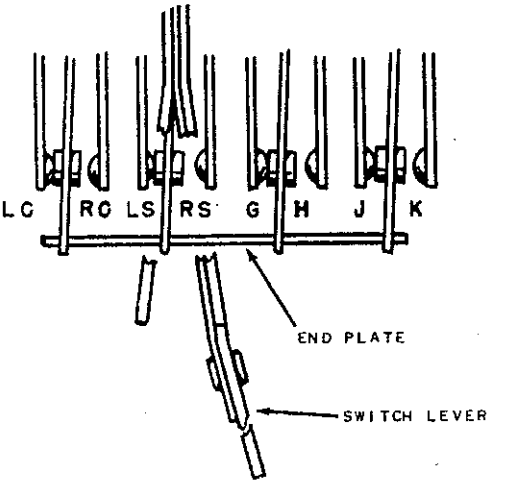
(F) Scan the carriage out of the way to the right, being careful not to move the Bracket, and tighten the bracket holding screws.

(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.

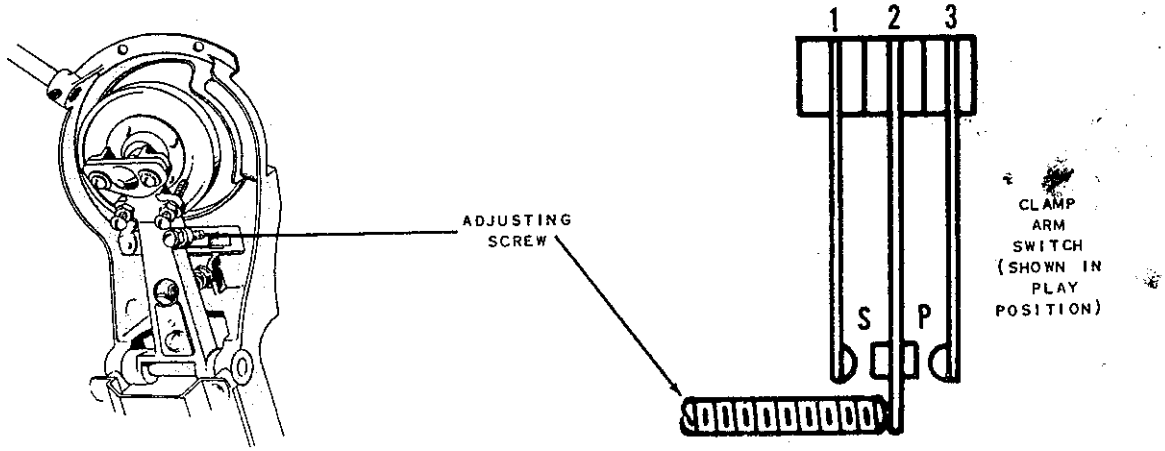
D Move Switch Lever to Right.

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

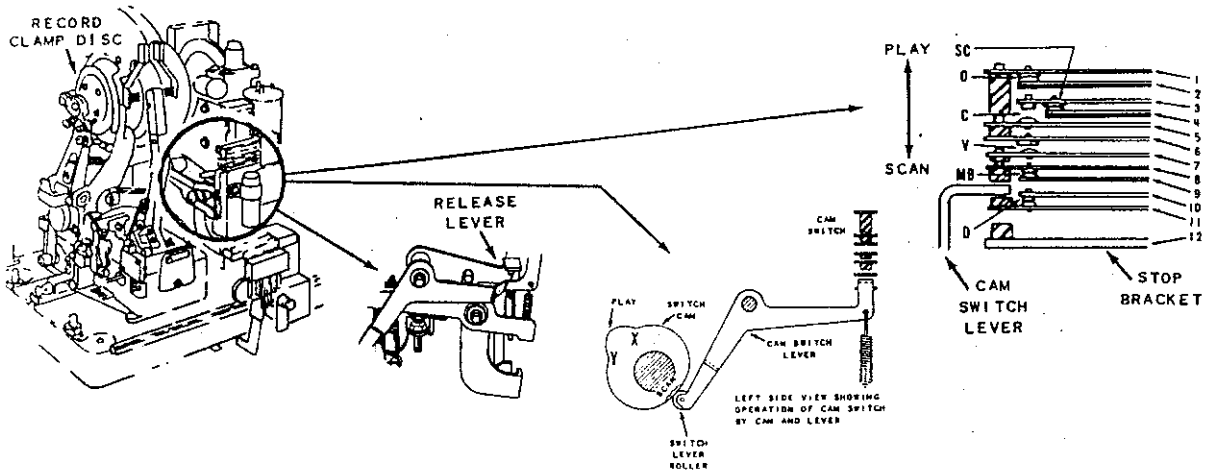
A With mechanism in SCAN, bias center blade (#2) tightly against "S" contact.

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*
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 7 and 8 down tight against Switch Lever with MB closed. (1½ oz. pressure).
- B Bias blade 5 against blade 6 and adjust for 1/32" gap in V Contacts.
- C Bias blade 1 down so fiber lift touches blade 5 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 2 for 3/64" gap in O Contacts.

B Adjust blade 4 for 1/64" gap in SC Contacts.

C Adjust blade 9 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 7 and 8 bear against Switch Lever.

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

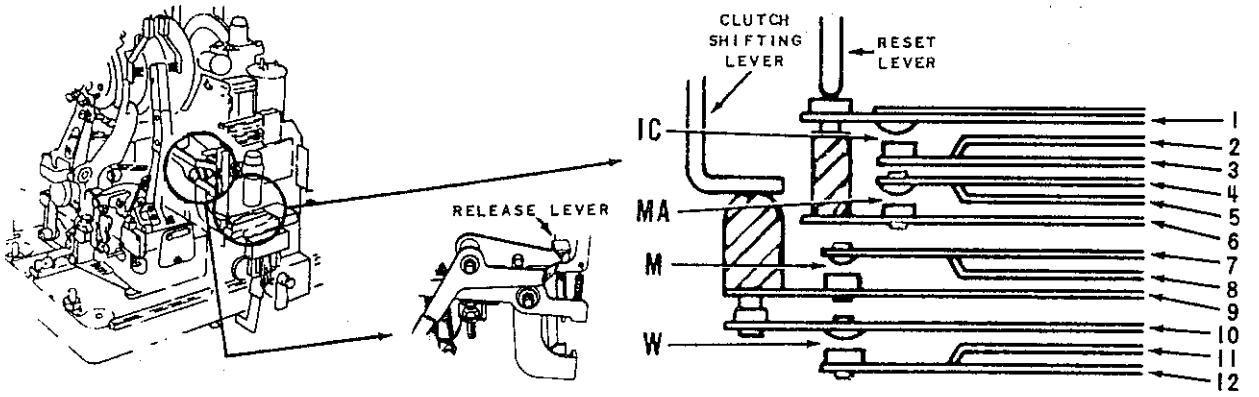
D Bias blade 11 against Switch Lever with D Contacts closed (1½ to 3 oz. pressure). Fiber stop on the Stop Bracket (12) must clear blade 11 by 3/64".

E Adjust blade 10 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.)

D With mechanism in Scan Position, adjust position of Stop Bracket (blade 12) for 1/64" to 1/16" gap between D Contacts.

Select-O-Matic "100" Mechanism, Type 145S2-L6

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.

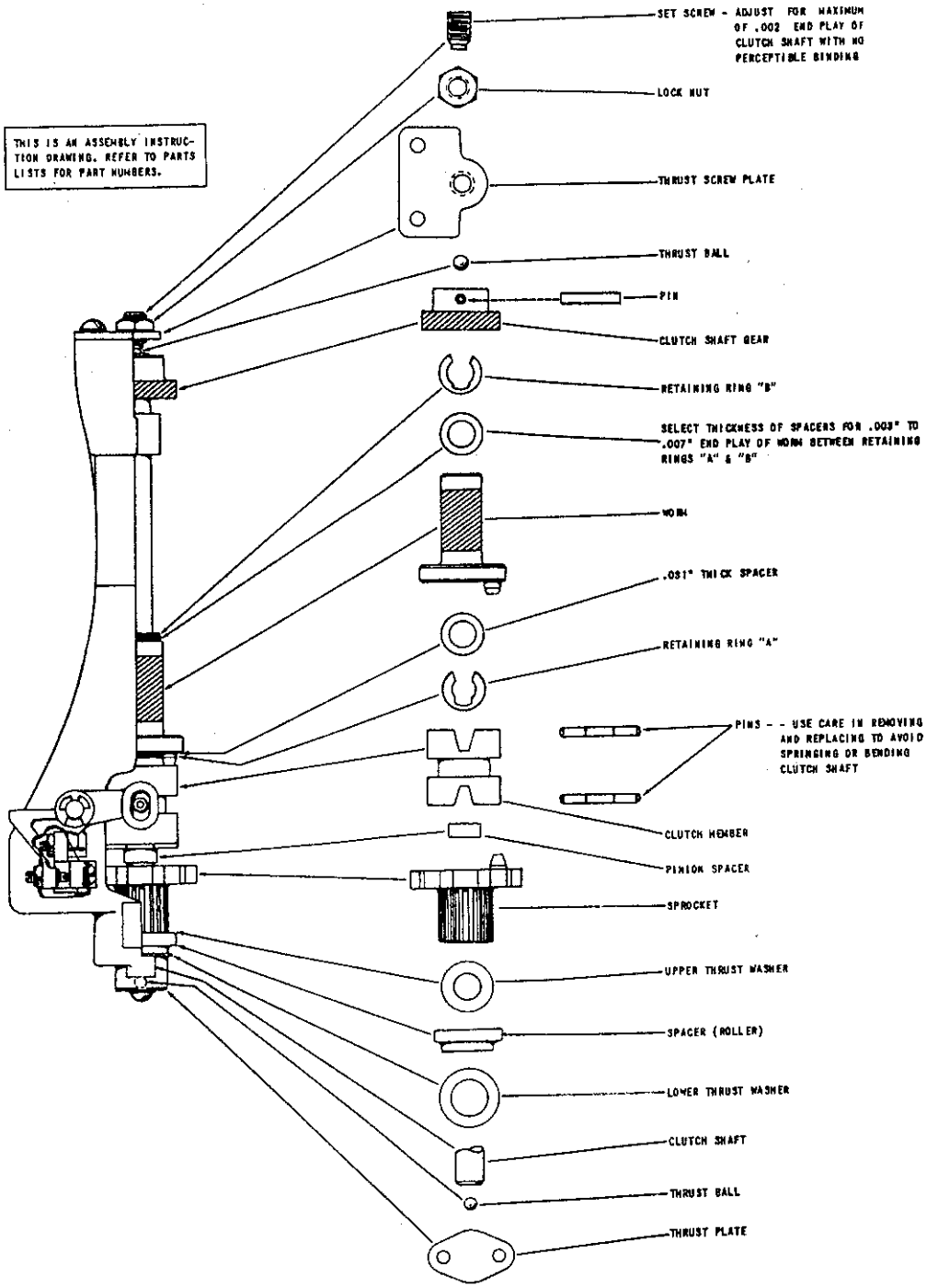
3 Reset mechanism by pressing down on Release Lever.

- 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.

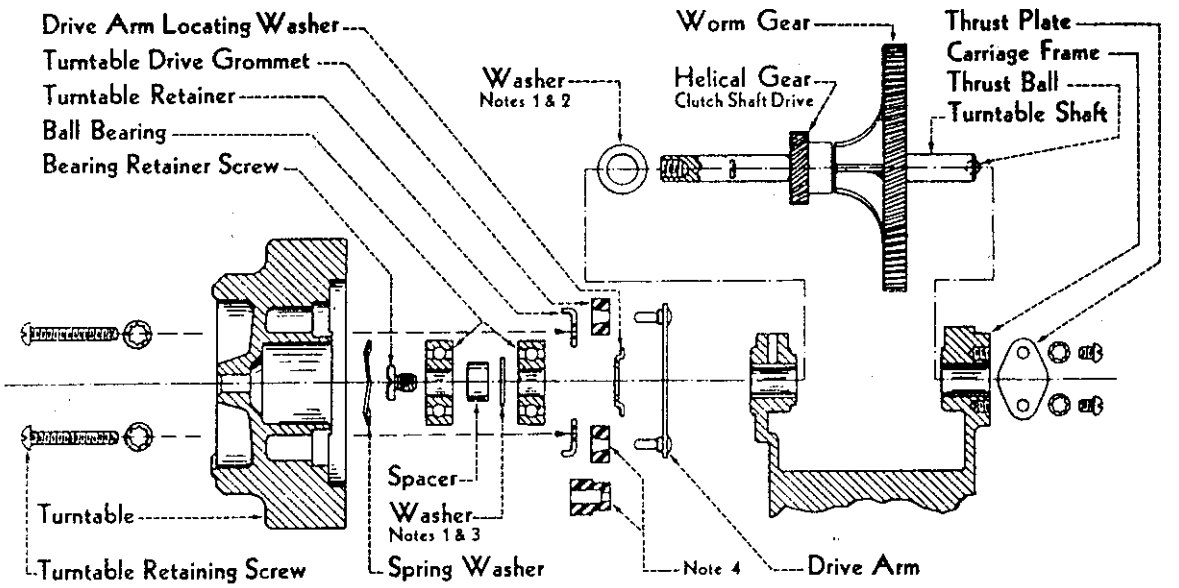
- A Bias blade 7 against bracer blade 8 and adjust blade 8 for 1/64" gap between M Contacts.
- B Bias blade 12 against bracer blade 11 and adjust blade 11 for 1/32" gap between W Contacts.

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".

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.

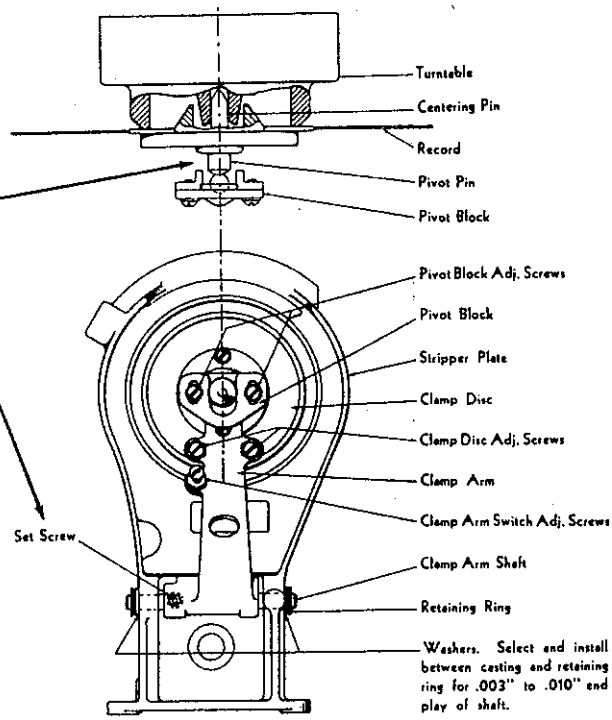
Drive Grommets with "step" should be installed with the small diameter end toward the Drive Arm.

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

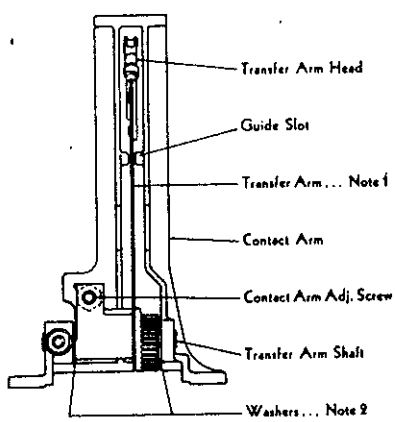
With the Set Screw loose and a Record clamped on the Turntable, adjust the horizontal position of the Clamp Arm so the Center Line through the Pivot Pin forms a right angle with the Clamp Disc and Record.

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

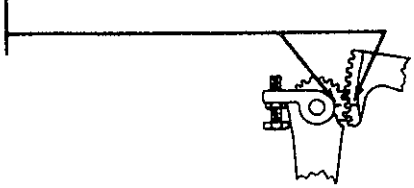


Note 1: Transfer Arm should be straight and should form a right angle with the Transfer Arm Shaft.

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.

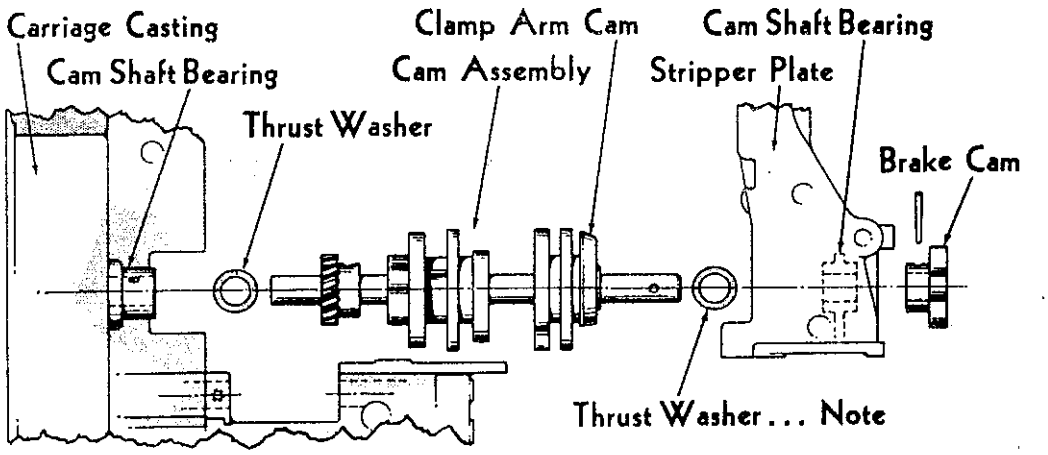


Note 3: When installing assembly on carriage, mechanism and Transfer Arm should be in SCAN position with reference marks aligned as shown.



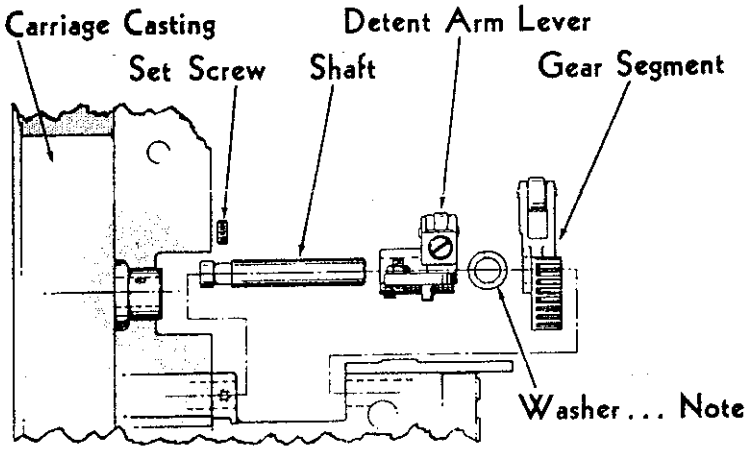
When installation is complete, readjust Transfer Arm. *Refer to Pages 2149 and 2150.*

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".

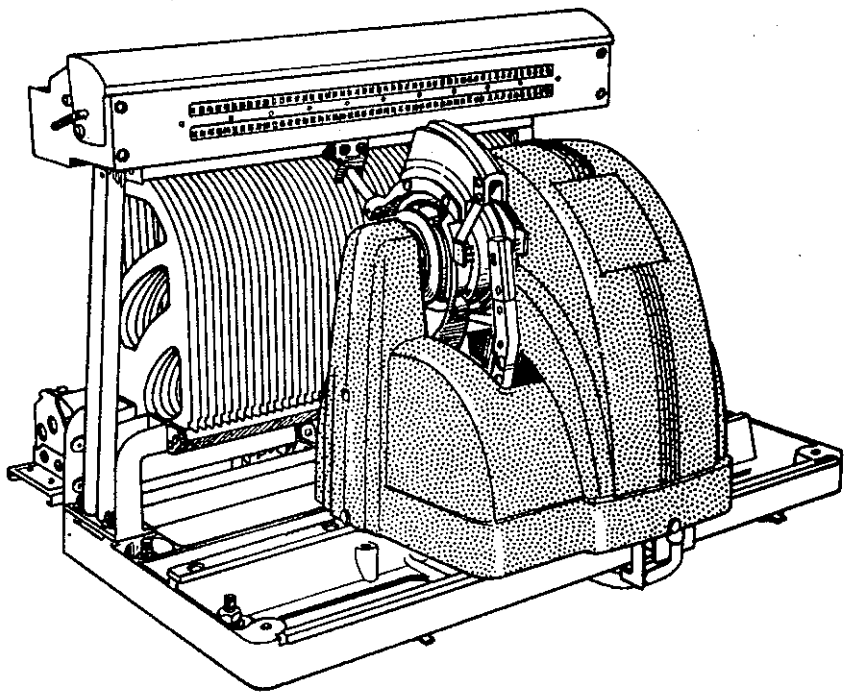
After the proper washers have been installed, the cam assembly should be checked by manual rotation, a full turn in either direction without evidence of binds.



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".

SEEBURG SELECT-O-MATIC "100" MECHANISM

Type 145S3-L6



The Select-O-Matic "100" Mechanism, Type 145S3-L6, is designed for use with the Select-O-Matic "100" R.C. Special, Type HM100B. All information and adjustments of this mechanism are the same as given for the Type 145S2-L6 Mechanism on pages 2119 to 2180, inclusive.

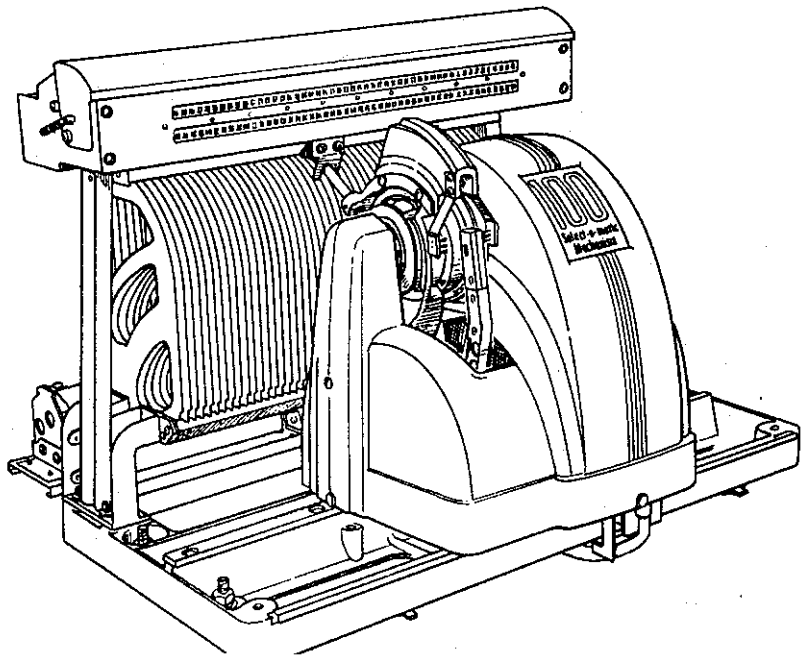
Parts lists for the 145S2-L6 Mechanism, pages 2181 to 2200, apply to the Type 145S3-L6 except the switch plate assembly cable shown as item 14 on page 2196 and an additional 2-prong socket. Both items are listed below.

The cables for the 145S3-L6 and 145S2-L6 mechanism are not interchangeable. The lengths of the cables as well as the locations are different. The cable for the 145S3-L6 also includes a 2-wire tap and socket for a pilot light. The pilot light is a part of the HM100B Cabinet Assembly used to indicate when the main switch is turned on.

PARTS LIST

ITEM	PART NO.	PART NAME
14 (page 2196)	245951	Cable Assembly, complete with plugs
	245952	Control Cable, only
(not shown)	251751	2-prong Socket, (for pilot light circuit)

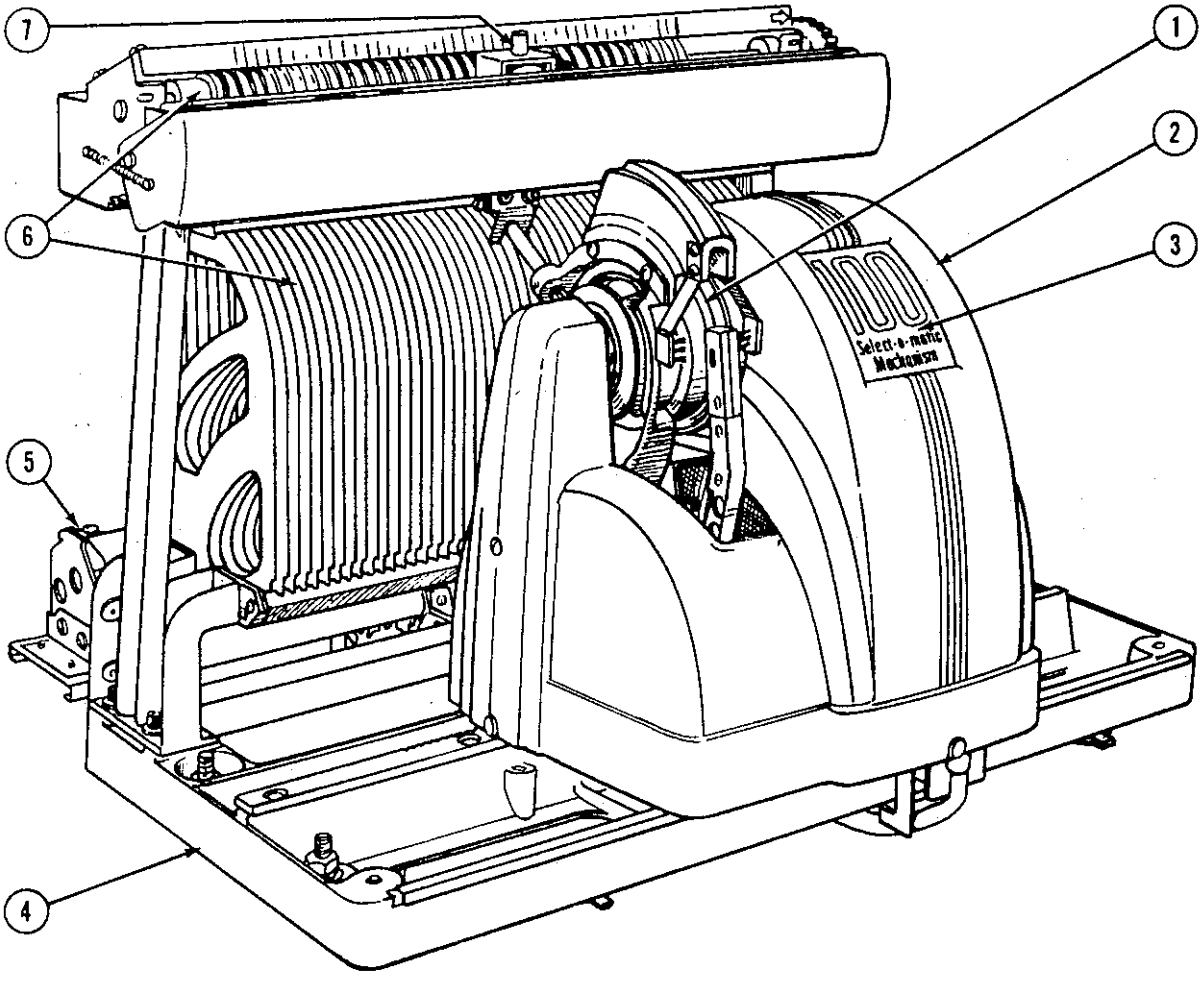
SEEBURG
SELECT-O-MATIC "100" MECHANISM
Type 145S6-L6



The Type 145S6-L6 Select-O-Matic "100" Mechanism is the same as the Type 145S2-L6 except the color and finish of some of the exposed parts. It is designed for use as a part of the Select-O-Matic "100" Model M100BL.

All installation and service data for the Type 145S2-L6 Mechanism, pages 2119 to 2180, inclusive, apply to the Type 145S6-L6 Mechanism. The component parts for the two mechanisms have the same physical dimentions and, except for color or finish, are interchangeable. Those parts having different color or finish are identified by different part numbers which are given in the complete parts lists on the following pages.

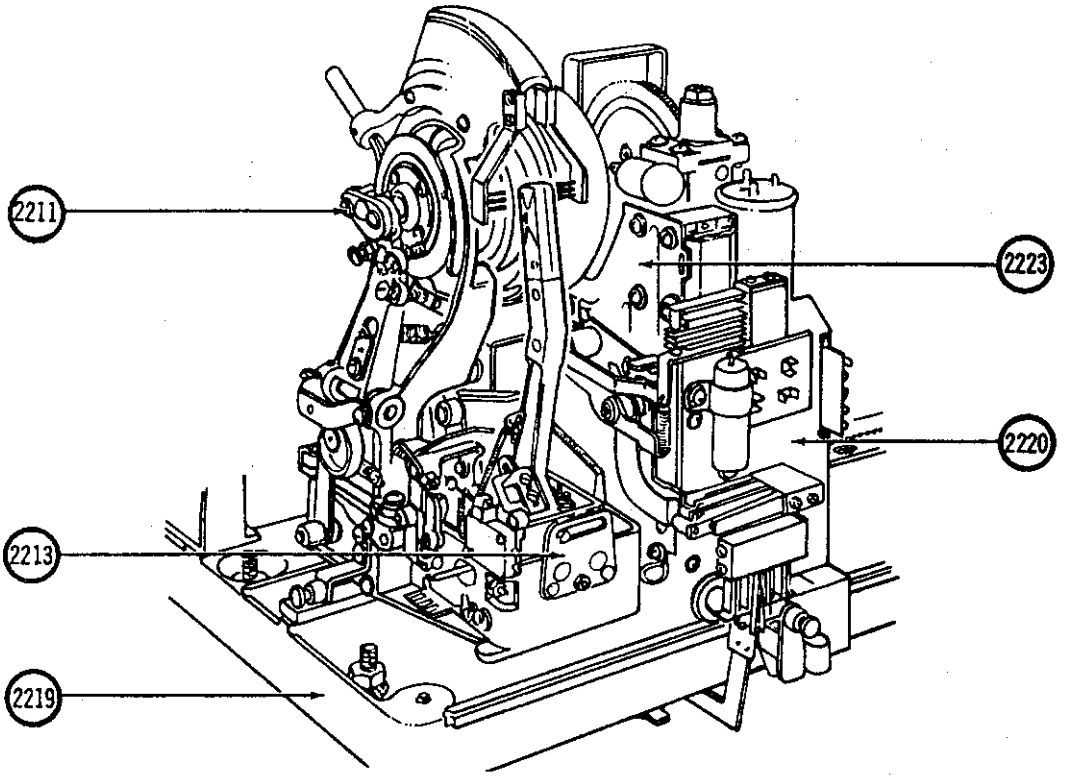
MECHANISM ASSEMBLY - PARTS INDEX & PARTS LIST

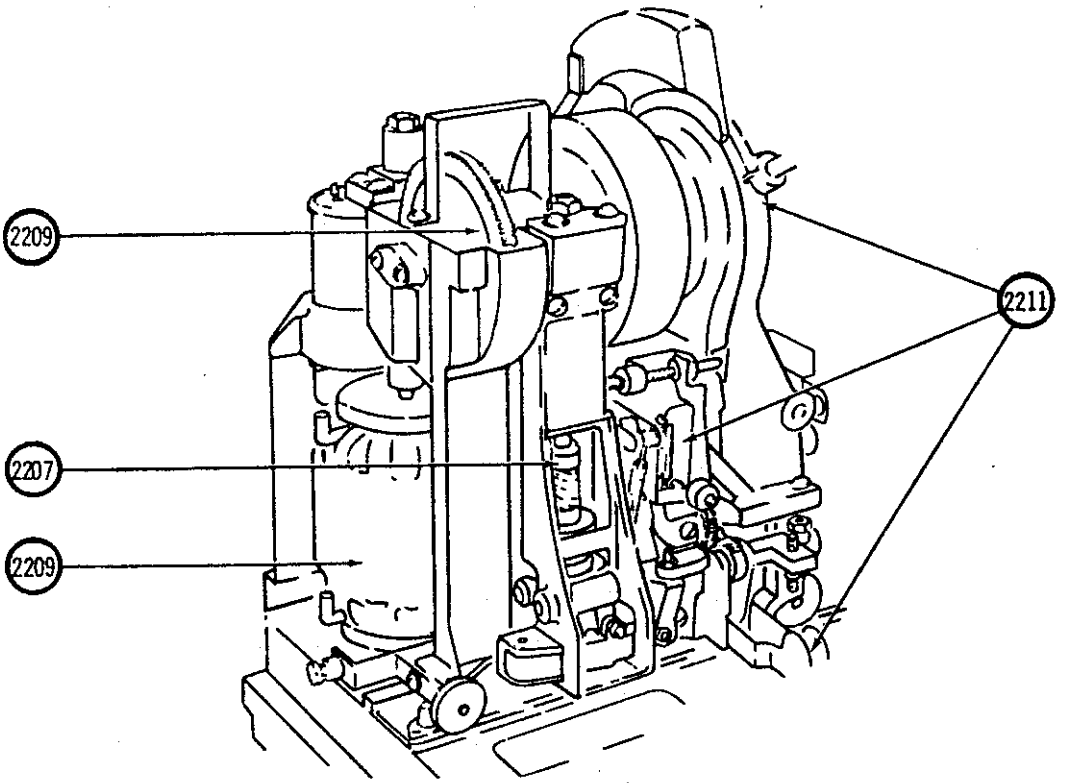


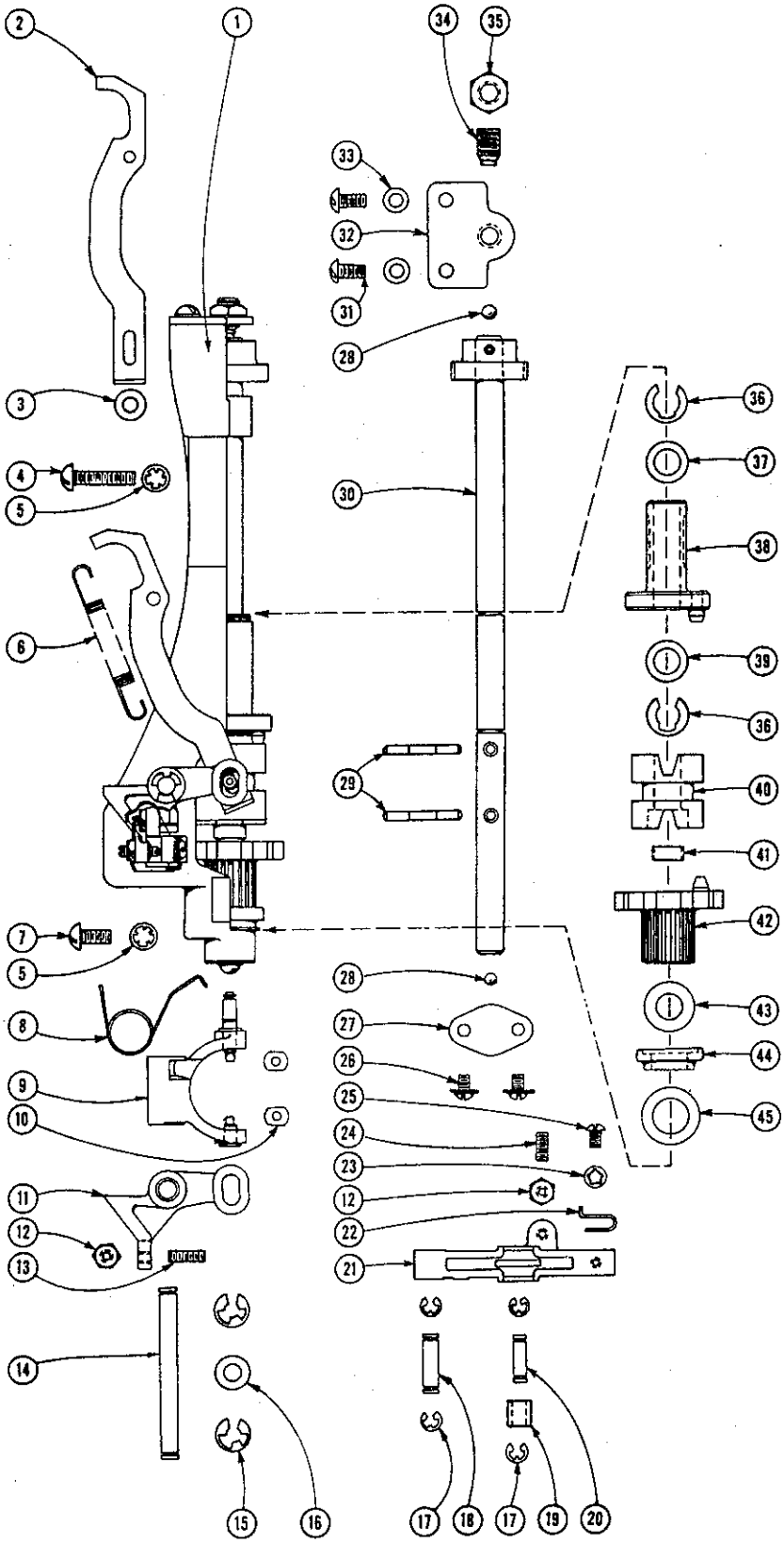
ITEM	PART NO.	PART NAME
1		Carriage Assembly, page 2206
2	245668	Cover
	71543	1/2" Cover Mounting Screw
	71127	5/16" Cover Mounting Screw
3	245380	Escutcheon Window
4		Base Assembly, page 2219
5	304323	Selector Assembly, Type 100SA5-L6, page 2221
6		Magazine and Popularity Meter, page 2215
7		Popularity Meter Slide, page 2217

CARRIAGE ASSEMBLY PARTS INDEX

Circled numerals indicate page numbers







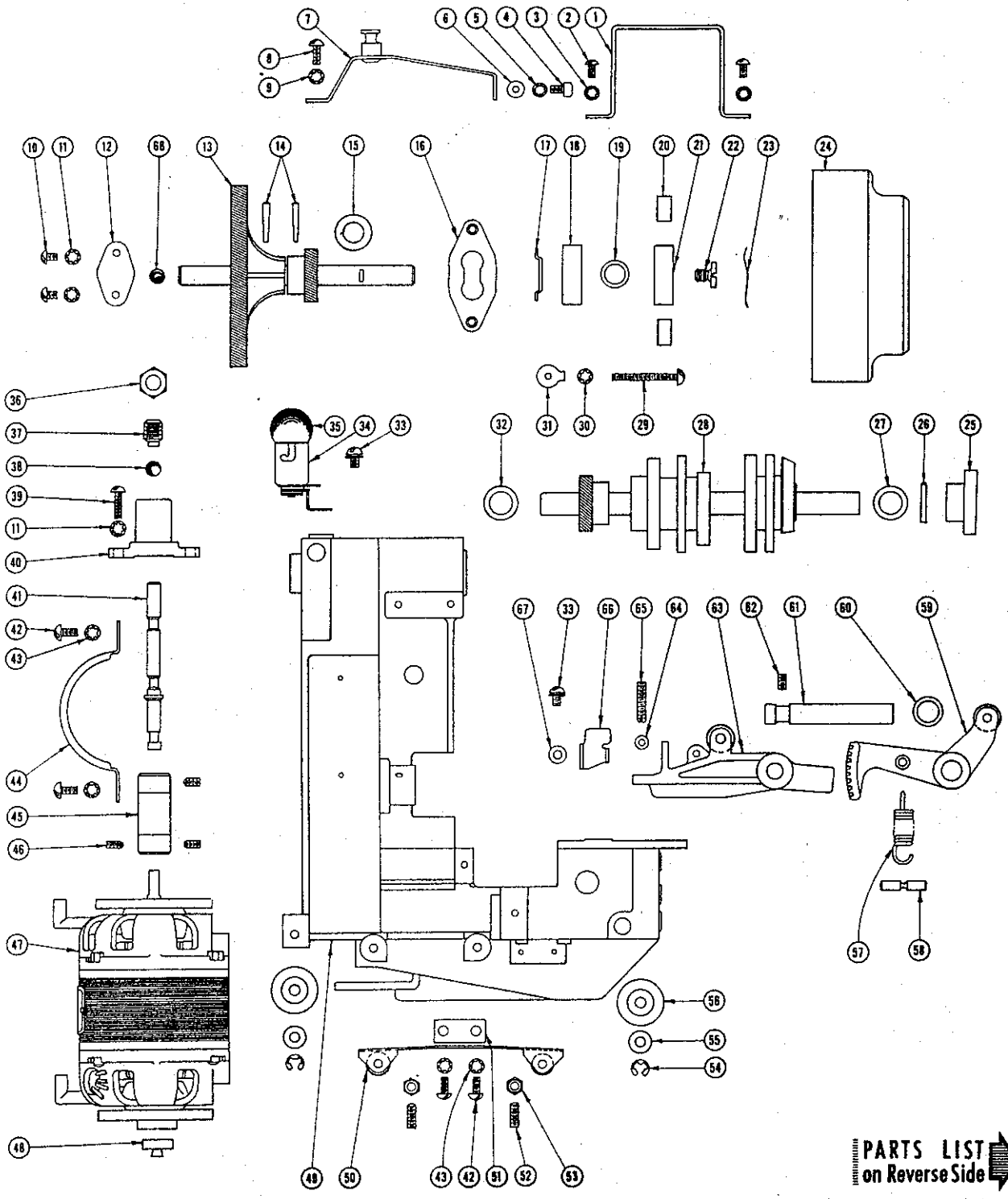
PARTS LIST on Reverse Side

CLUTCH ASSEMBLY

PARTS LIST for CLUTCH ASSEMBLY

(Preceding Page)

Item	Part No.	Description
1	245400	Complete Assembly
	245406	Clutch Housing Casting
2	245426	Connecting Link
3	72223	Flat Washer, Bronze
4	71488	10 x 7/8 R.H. Machine Screw
5	73138	Lock Washer
6	245248	Clutch Spring
7	71474	10 x 1/2 R.H. Machine Screw
8	A250141	Detent Arm Retarding Spring
9	245408	Clutch Yoke Assembly
10	A250529	Bearing Block
11	245427	Clutch Yoke Lever
12	70153	8-32 Hexagon Nut
13	75071	8-32 x 1/2 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	A250508	Clutch Detent Arm Spring
23	73082	Lock Washer
24	75094	8-32 x 5/8 Set Screw
25	71041	8-32 x 3/16 R.H. Machine Screw
26	71757	8-32 x 1/4 Sems Fastener
27	245424	Thrust Plate
28	A250125	Steel Ball
29	A250523	Pin
30	245410	Shaft & Gear Assembly
	245411	Shaft, only
	245442	Gear, only
	80108	Pin
31	71061	10-32 x 1/2 R.H. Machine Screw
32	245425	Thrust Screw Plate
33	73119	Lock Washer
34	75070	Socket Head Set Screw
35	70105	5/16-24 Hexagon Nut
36	A250507	Snap Washer
37	72175	Spring Steel Flat Washer .031 Thick
	72216	Spring Steel Flat Washer .015 Thick
	72217	Spring Steel Flat Washer .010 Thick
38	245415	Clutch Worm
39	72175	Spring Steel Flat Washer .031 Thick
40	245417	Clutch Member
41	245418	Pinion Spacer
42	245438	Pinion Assembly
43	245421	Upper Thrust Washer
44	245422	Clutch Shaft Spacer
45	245423	Lower Thrust Washer



FRAME ASSEMBLY

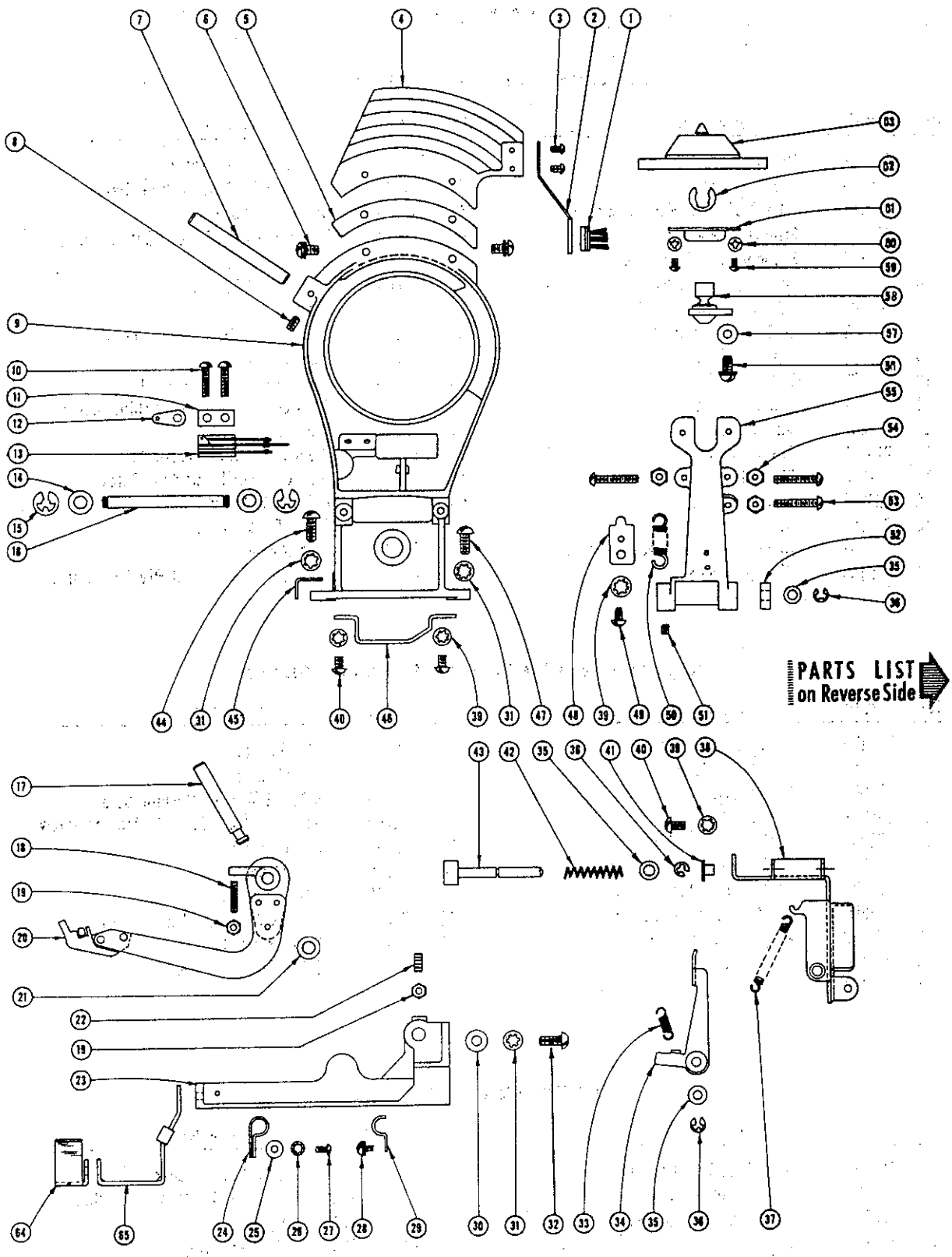
PARTS LIST for FRAME ASSEMBLY

(Preceding Page)

Item	Part No.	Description
1	245120	Carriage Cover Bracket
2	71962	8-32 x 5/16 R.H. Machine Screw
3	73137	Lock Washer
4	70546	8-32 x 1/2 Socket Head Cap Screw
5	73137	Lock Washer
6	72113	Flat Washer
7	245349	Guide Stud & Bracket
8	71948	8-32 x 3/8 R.H. Machine Screw
9	72113	Flat Washer
10	71041	8-32 x 3/16 R.H. Machine Screw
11	73137	Lock Washer
12	245424	Thrust Plate
13	245045	Turntable Shaft & Gear Assembly
14	80036	Taper Pin, 3/0 x 3/4
15	72277	Spring Steel Flat Washer .010 Thick
	72278	Spring Steel Flat Washer .015 Thick
	72287	Spring Steel Flat Washer .005 Thick
16	245467	Drive Arm Assembly
17	245055	Drive Arm Locating Washer
18	245056	Ball Bearing
19	245057	Ball Bearing Spacer
20	*Note	Turntable Drive Grommet
21	245056	Ball Bearing
22	245058	Bearing Retainer Screw
23	72288	Spring Washer, Bronze
24	245060	Turntable
25	245016	Brake Cam
26	80108	Roll Pin, 1/8 Dia. x 3/4
27	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
28	245062	Cam & Gear Assembly
29	71169	6-32 x 1-1/4 R.H. Machine Screw
30	73088	Lock Washer
31	245061	Turntable Retainer
32	250064	Thrust Washer - Cam Shaft
33	71757	8-32 x 1/4 Sems Fastener
34	245250	Lamp Socket
35	F7817	#81 Mazda Lamp
36	70105	5/16-24 Hexagon Nut
37	75097	Set Screw
38	245180	Steel Ball
39	71961	8-32 x 1/2 R.H. Machine Screw
40	245026	Bearing Bracket Assembly
41	245044	Turntable Shaft Worm
42	71962	8-32 x 5/16 R.H. Machine Screw
43	73137	Lock Washer
44	250111	Clamp Bracket
45	245083	Motor Coupling Assembly
46	75009	8-32 x 3/16" Socket Head Set Screw
47	250251	Motor
48	245086	Motor Support Plug
49	245021	Carriage Frame Assembly, Includes Item 40
50	245031	Guide Roller & Spring Assembly
51	245299	Spacer, Guide Roller Spring
52	75064	8-32 x 1/2 Set Screw
53	70153	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 Steel Flat Washer .010 Thick
	72254	Steel-Blue Flat Washer .005 Thick
61	245043	Shaft
62	75055	10-32 x 1/4 Allen Head Set Screw
63	245037	Detent Arm Lever Assembly
64	70003	10-32 Hexagon Nut
65	75103	10-32 x 3/4 Set Screw
66	245040	Adjustment Plate
67	72201	Flat Washer .031 Thick
68	250125	Steel Ball

Note: 245059 

245464 



CARRIAGE FRAME

PARTS LIST for CARRIAGE FRAME ASSEMBLY

(Preceding Page)

STRIPPER PLATE ASSEMBLY

Item	Part No.	Description
1	251684	Brush
2	245295	Brush Holder
3	70541	#4 x 3/16 B.H. Machine Screw
4	245110	Stripper Plate Top
5	245135	Stripper Plate Top Shim
6	71810	Sem 8-32 x 5/16 #1208 Lock Washer
7	245183	Sel. Indicator Drive Tube
8	75093	8-32 x 1/4 Set Screw
9	245681	Stripper Plate
10	71233	5-40 x 5/8 Fil. H. Machine Screw
11	400597	Tension Plate
12	74006	Solder Lug
13	245065	Clamp Arm Switch
14	72280	Flat Washer
15	S229220	Retaining Ring
16	245354	Shaft
44	71061	10-32 x 1/2 R.H. Machine Screw
45	245134	Transfer Arm Stop

Item	Part No.	Description
46	245121	Carriage Cover Bracket
47	71474	10-32 x 7-16 R.H. Machine Screw
48	245070	Clamp Arm Spring Plate
49	76054	8-32 x 1/4 R.H. Thread Cutting Screw
50	245079	Clamp Arm Spring
51	75009	8-32 x 3/16 Set Screw
52	245038	Roller
53	70500	8-32 x 7/8 R.H. Machine Screw
54	70153	8-32 Hexagon Nut
55	245683	Clamp Arm & Pin Assembly
56	71755	Sems 8-32 x 3/8 R.H. Machine Screw
57	72240	Flat Washer
58	245686	Pivot Pin & Block Assembly
59	71271	4-40 x 3/16 R.H. Machine Screw
60	73136	1204 Lock Washer
61	250235	Clamp Disc. Cover
62	250507	Snap Washer
63	245071	Record Clamp Disc. & Pivot Assembly

CONTACT & TRANSFER ARM ASSEMBLIES

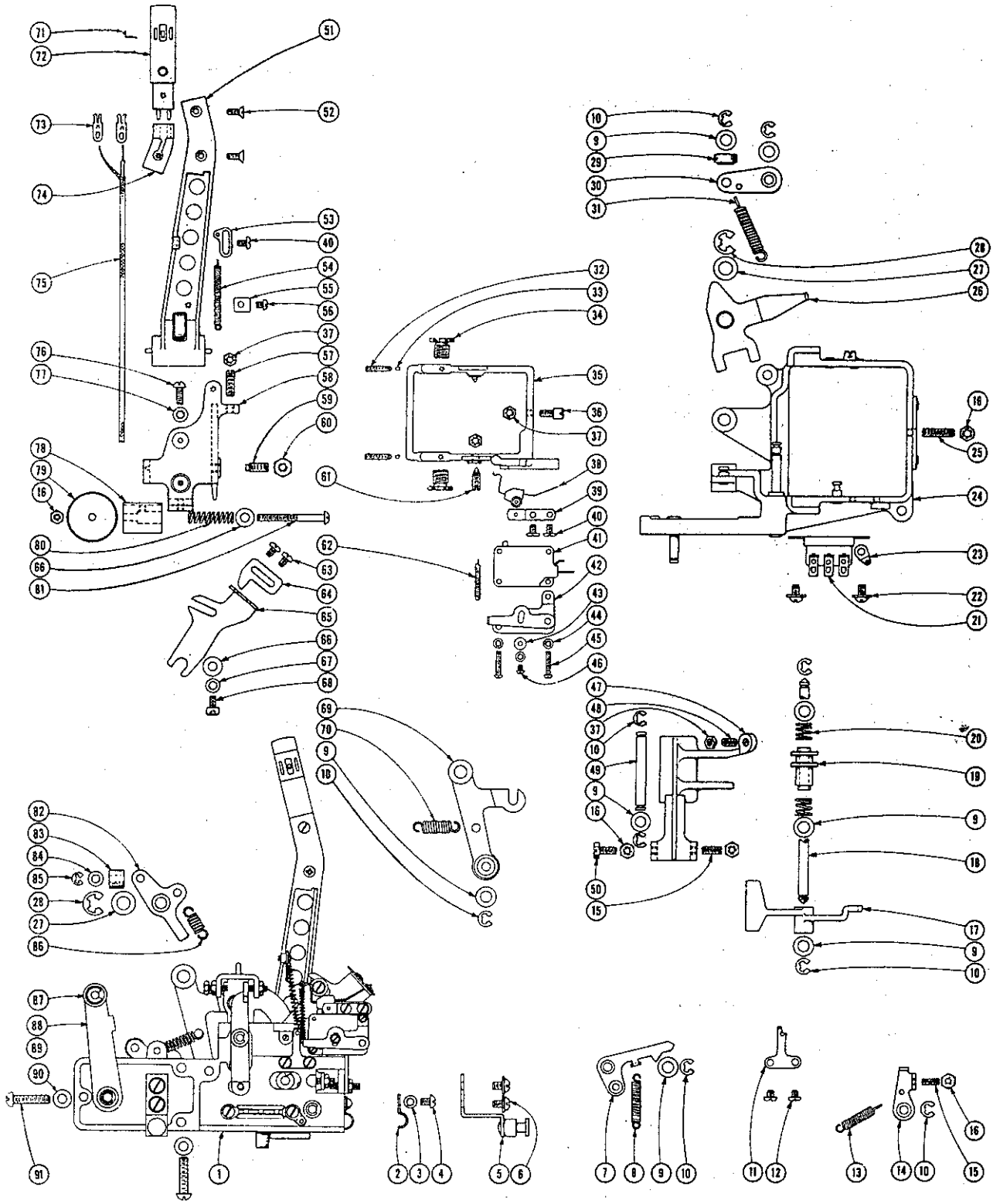
Item	Part No.	Description
17	245109	Transfer Arm Shaft
18	245557	Adjustment Screw
19	70008	8-32 Hexagon Nut
20	245239	Transfer Arm
21	72282	.031" Thick Steel Washer
	72281	.020" Thick Steel Washer
	72174	.015" Thick Steel Washer
	72280	.010" Thick Steel Washer
22	75052	8-32 x 7/16 Set Screw
23	245108	Contact Arm
24	602190	Clamp

Item	Part No.	Description
25	72230	Flat Washer
26	73088	Lock Washer
27	71479	6-32 x 1/4 R. H. Machine Screw
28	71750	Sems 6-32 x 3/16 R.H. Machine Screw
29	402098	Cable Clamp
30	72135	Flat Washer
31	73138	1210 Lock Washer
32	71090	10-32 x 7/16 R.H. Mach. Screw
64	245230	Drive Bracket
65	245136	Drive Bracket Support

SAFETY TRIP ASSEMBLY

Item	Part No.	Description
33	245103	Safety Trip Lever Spring
34	245094	Lever & Hub Assembly
35	72177	Flat Washer Spring Steel
36	R231163	Snap Washer
37	245102	Detent Arm Spring
38	245088	Safety Trip Bracket Assembly

Item	Part No.	Description
39	73137	1208 Lock Washer
40	71963	8-32 x 1/4 R.H. Machine Screw
41	245101	Eyelet
42	245100	Plunger Spring
43	245098	Plunger



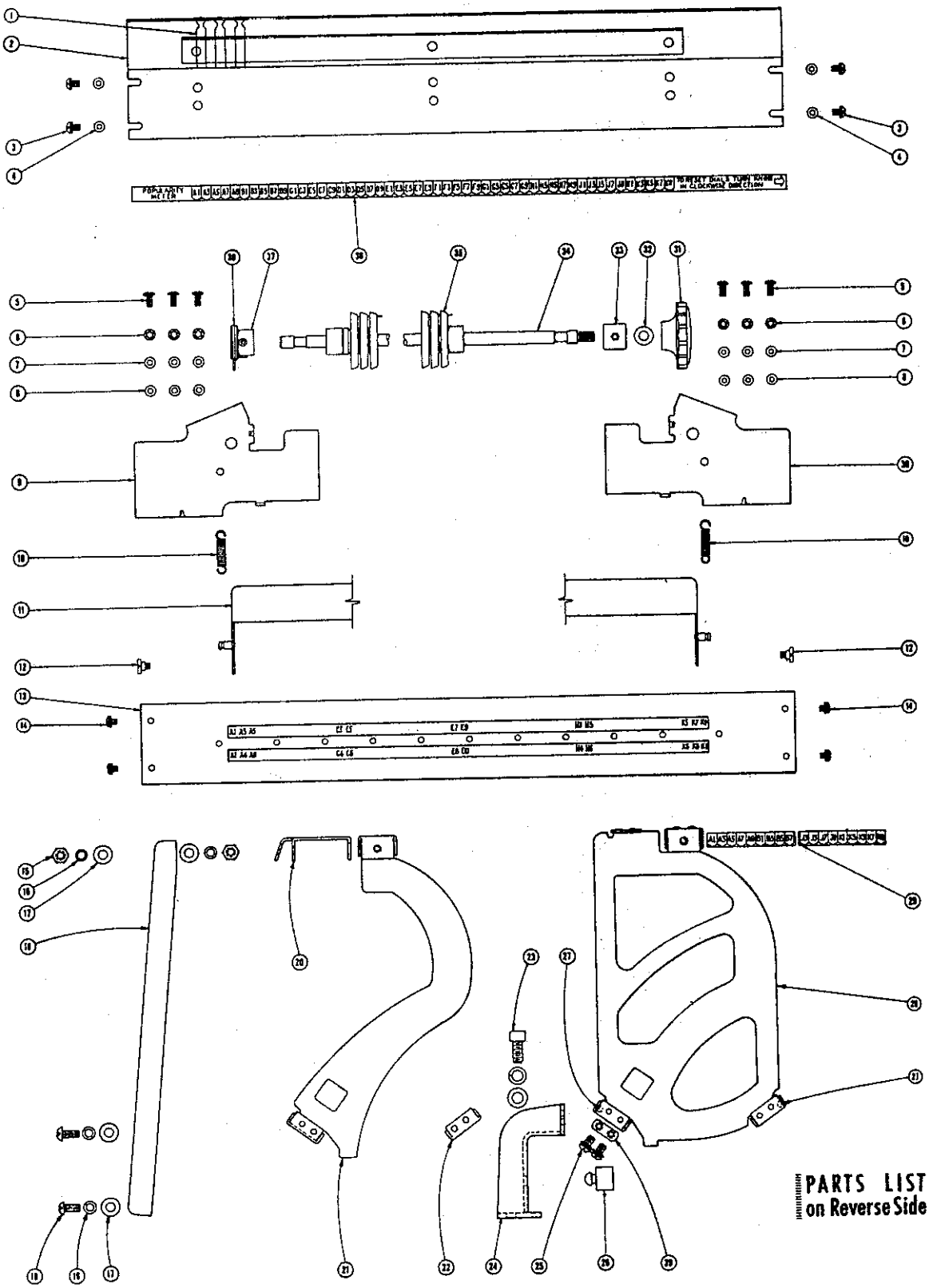
PICKUP ARM FRAME ASSEMBLY

PARTS LIST on Reverse Side

PARTS LIST for PICKUP ARM FRAME ASSEMBLY

(Preceding Page)

Item	Part No.	Description
1	245702	Pickup Arm & Frame Assembly
2	402098	Cable Clamp
3	73083	Lock Washer
4	71004	6-32 x 1/4 R.H. Mach. Screw
5	245127	Guide Stud
6	71757	8-32 x 1/4 Sems Fastener
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	70509	5-40 x 1/8 B.H. Mach. Screw
13	245773	Lock Lever Detent Spring
14	245800	Lock Lever Detent
15	75091	6-32 x 3/8 Slotted Head Set Screw
16	70152	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	71754	6-32 x 1/4 Sems Fastener
23	74007	Solder Lug
24	245753	Pickup Arm Frame Assembly
25	75095	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	75088	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	70008	8-32 Hexagon Nut
38	245714	Trip Switch Lever
39	245724	Support Lug
40	71917	4-40 x 3/16 B.H. Mach. Screw
41	245816	Trip Switch
42	245818	Adjusting Lever & Plate
43	72005	Flat Washer
44	73141	Lock Washer
45	71040	2-56 x 1/2 R.H. Mach. Screw
46	70549	2-56 x 1/8 R.H. Mach. Screw
47	245709	Control Fork
48	75092	8-32 x 3/4 Slotted Head Set Screw
49	245732	Cradle Pressure Pin
50	70504	Slotted Hexagon Head Mach. Screw
51	245842	Pickup Arm & Roller Assem.
52	70502	4-36 x 5/16 Phil. Flat Head Mach. Screw
53	245715	Pickup Arm Spring Clip
54	245793	Pickup Arm Spring
55	245823	Wire Retainer
56	71272	4-40 x 1/8 R.H. Mach. Screw
57	75064	8-32 x 1/2 Slotted Head Set Screw
58	245779	Pickup Arm Cradle & Pin Assem.
59	245805	P.U. Arm Shaft Set Screw
60	70003	10-32 Hexagon Nut
61	245777	Pivot Screw
62	245817	Trip Switch Balance Spring
63	71996	4-40 x 1/8 B.H. Mach. Screw
64	245783	Trip Switch Actuator Plate
65	245723	Trip Switch Actuator
66	72064	Flat Washer
67	73088	Lock Washer
68	70547	6-32 x 1/4 Socket Head Cap Screw
69	245766	Control Lever & Roller
70	245769	Control Lever Spring
71	245795	Styli, Sapphire
72	245789	Pickup Cartridge Assembly
73	74108	Solder Lugs
74	245713	Pickup Cartridge Socket
75	245788	Pickup Lead
76	71016	6-32 x 3/8 R.H. Mach. Screw
77	73088	Lock Washer
78	245819	Pickup Arm Weight
79	245820	Pickup Arm Counterweight
80	245821	Lock Spring
81	71631	6-32 x 1-3/8 R.H. Mach. 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
89	245243	Brake Lever Spring
90	73138	Lock Washer
91	71047	10-32 x 3/4 R.H. Mach. Screw



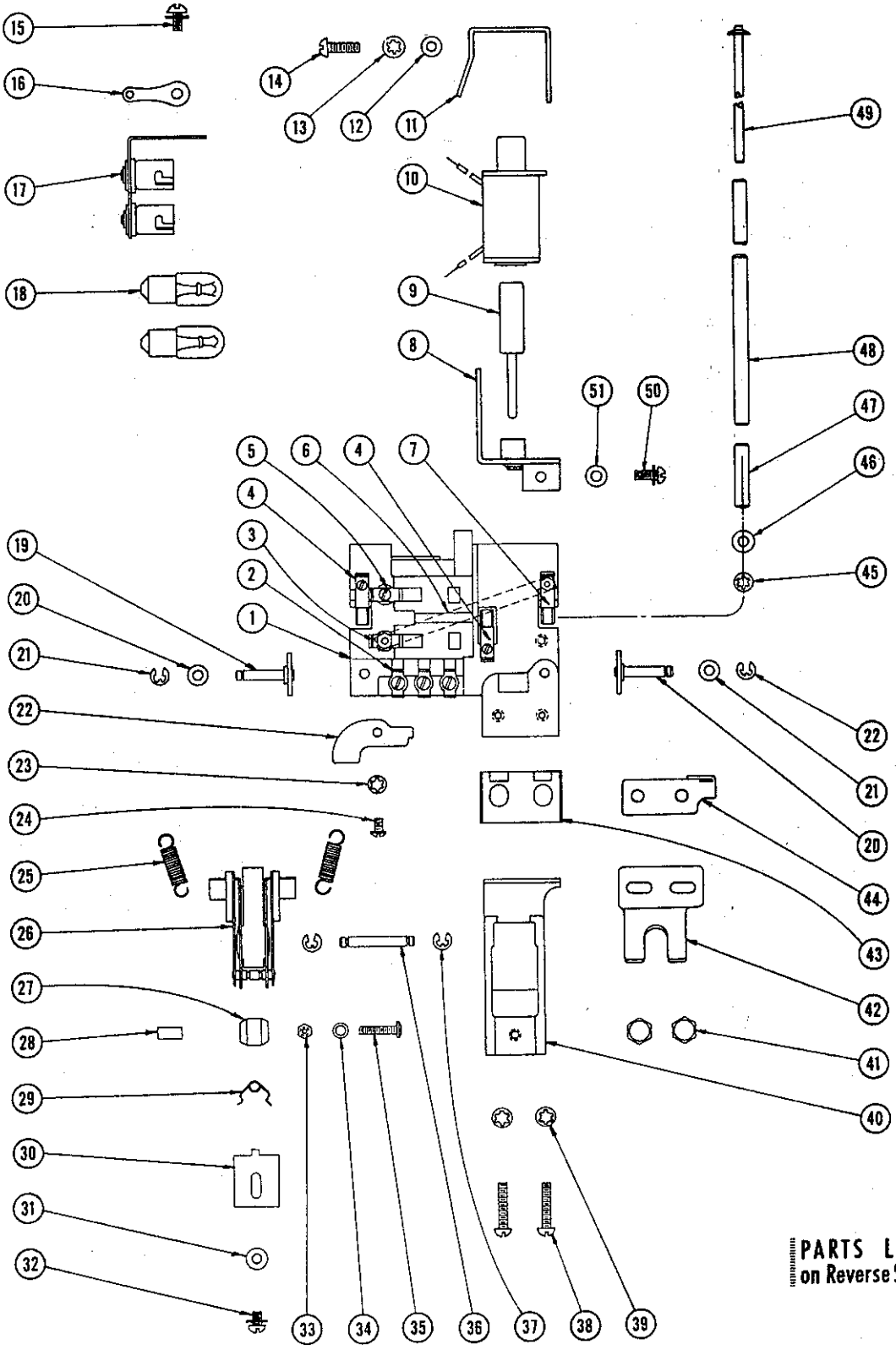
PARTS LIST on Reverse Side

POPULARITY METER & MAGAZINE ASSEMBLY

PARTS LIST for
POPULARITY METER & MAGAZINE ASSEMBLY

(Preceding Page)

Item	Part No.	Part Name
1	245185	Dial Stop Spring
2	245666	Tie Plate & Angle Assembly
3	71754	Sems Fastener
4	72230	Flat Washer
5	71257	6-32 x 5/16 B.H. Machine Screw
6	73088	1206 Lock Washer
7	72230	Flat Washer
8	245182	Spacer
9	245656	Indicator Bracket & Stud Assembly, R.H.
10	245229	Popularity Meter Cover Spring
11	245667	Cover & Stud Assembly
12	245228	Meter Cover Pivot
13	245662	Selector Indicator Channel Assembly
14	71809	Sems Fastener
15	70163	10-32 Hexagon Nut
16	73119	#10 Kantlink ,Lock Washer
17	72019	Flat Washer
18	245486	Brace
19	71741	10-32 x 3/8 R.H. Machine Screw
20	245660	Dust Shield Bracket, R.H.
	245661	Dust Shield Bracket, L.H.
21	245481	Separator & Channel Assembly
22	245482	Magazine Channel Assembly
	245468	Record Cushion
23	71596	1/4-20 x 9/16 Socket Hd. Cap Screw
	73087	1/4 Kantlink Lock Washer
	72171	Flat Washer
24	245484	Magazine Support Bracket, R.H.
	245485	Magazine Support Bracket, L.H.
25	71796	Sems Fastener
26	245291	Rubber Bumper
27	245334	Record Cushion
28	245306	Separator & Channel Assembly
29	245487	Number Strip
30	245657	Indicator Bracket & Stud Assembly, L.H.
31	245671	Knob
32	72171	Flat Washer
33	245222	Thrust Collar
34	245214	Popularity Meter Dial & Shaft Assembly
35	245119	Popularity Dial
36	245226	Number Strip
37	245220	Clutch Collar
38	245221	Clutch Spring
39	245313	Tapping Plate
	245670	Magazine Dust Shield



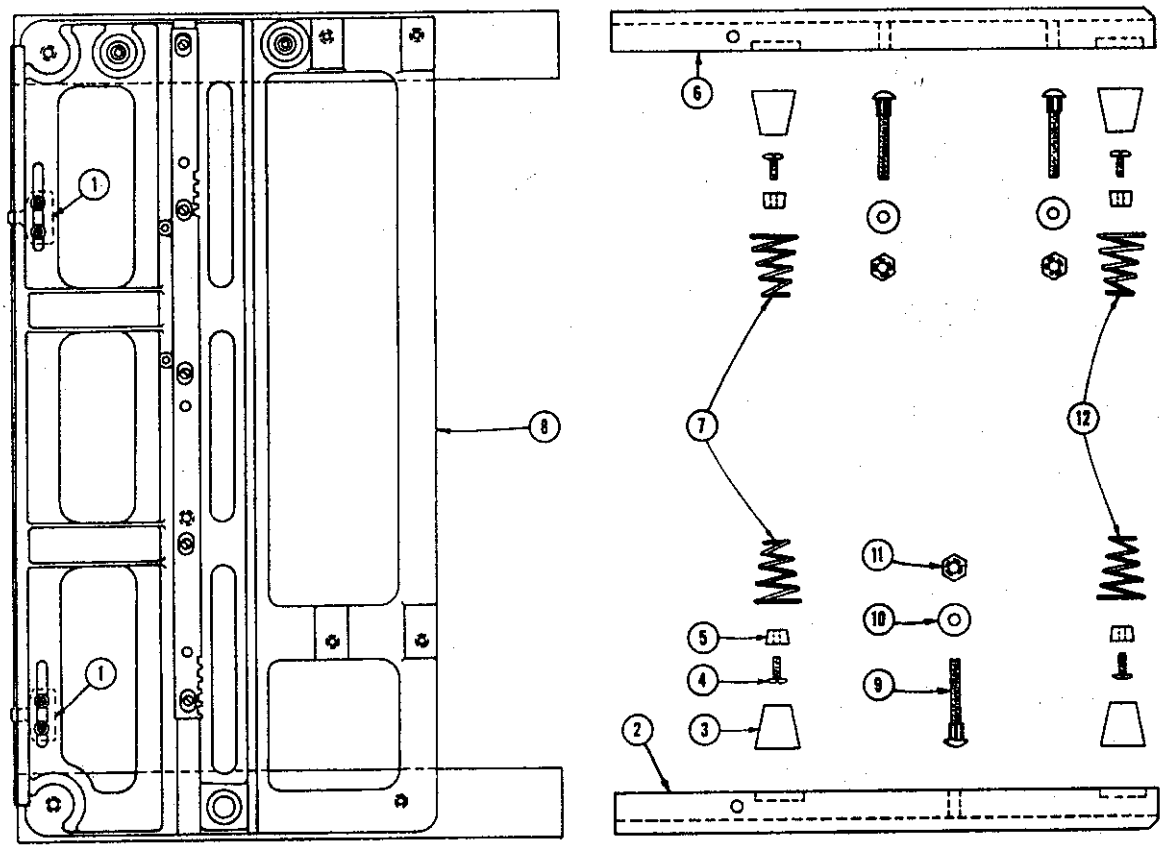
PARTS LIST on Reverse Side

POPULARITY METER SLIDE ASSEMBLY

PARTS LIST for SLIDE ASSEMBLY

(Preceding Page)

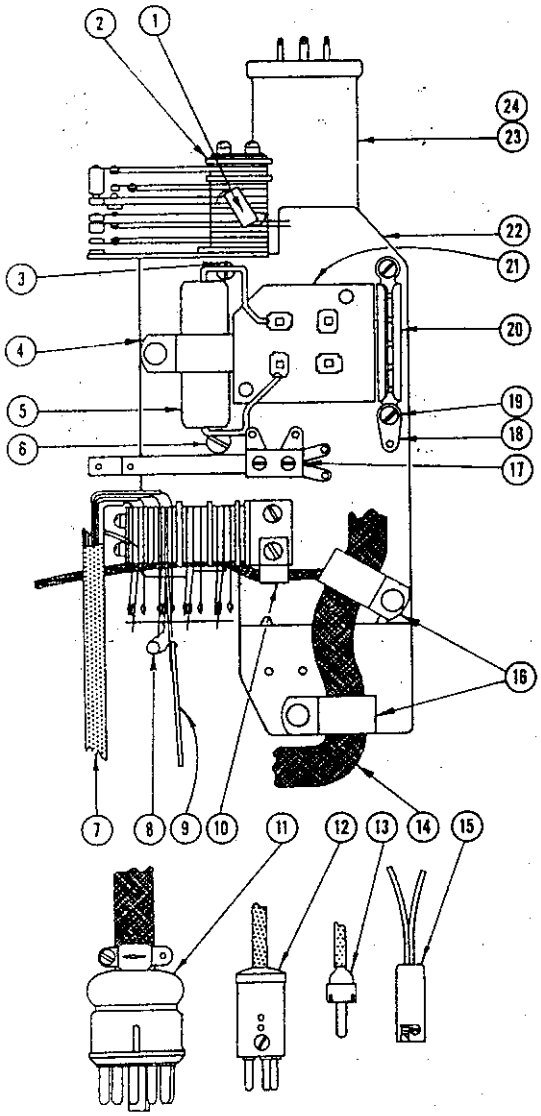
Item	Part No.	Description
1	245128	Selection Indicator Slide
2	74104	Solder Lug
	76055	#4 x 1/4 R.H. Self Tapping Screw
3	245156	Lamp Socket Contact Spring
	71040	2-56 x 1/2 R.H. Mach. Screw
	73141	1202 Lock Washer
	70011	2-56 Hexagon Nut
4	245143	Indicator Slide Contact Spring
	76003	2-56 x 3/16 R.H. Self Tap Screw
5	245156	Lamp Socket Contact Spring
	76003	2-56 x 3/16 R.H. Self Tap Screw
6	245155	Conductor Strip
7	245143	Indicator Slide Contact Spring
	71040	2-56 x 1/2 R.H. Mach. Screw
	73141	1202 Lock Washer
	70011	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	73088	1206 Lock Washer
14	71103	6-32 x 7/16 R.H. Mach. Screw
15	71754	Sems Fastener
16	74003	Solder Lug
17	245142	Dual Lamp Socket Assembly
18	302141	#47 Mazda Lamp
19	245191	Roller & Shaft Assembly
20	72272	Flat Washer
21	125448	Retaining Ring
22	245346	Right End Guide
23	73136	1204 Lock Washer
24	70541	#4-40 x 3/16 B.H. Mach. 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	71750	Sems Fastener
33	70119	4-40 Hexagon Nut
34	73026	#4 Kantlink Lock Washer
35	70505	#4-40 x 1/2 B.H. Mach. Screw
36	245211	Rocker Arm Shaft
37	125448	Retaining Ring
38	71262	#6-32 x 5/8 R.H. Mach. Screw
39	73088	1206 Lock Washer
40	245153	Rocker Arm Bracket
41	70019	#6-32 Hexagon Cap Nut
42	245664	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 Assem.
50	71796	Sems Fastener
51	72230	Flat Washer



BASE ASSEMBLY

PARTS LIST

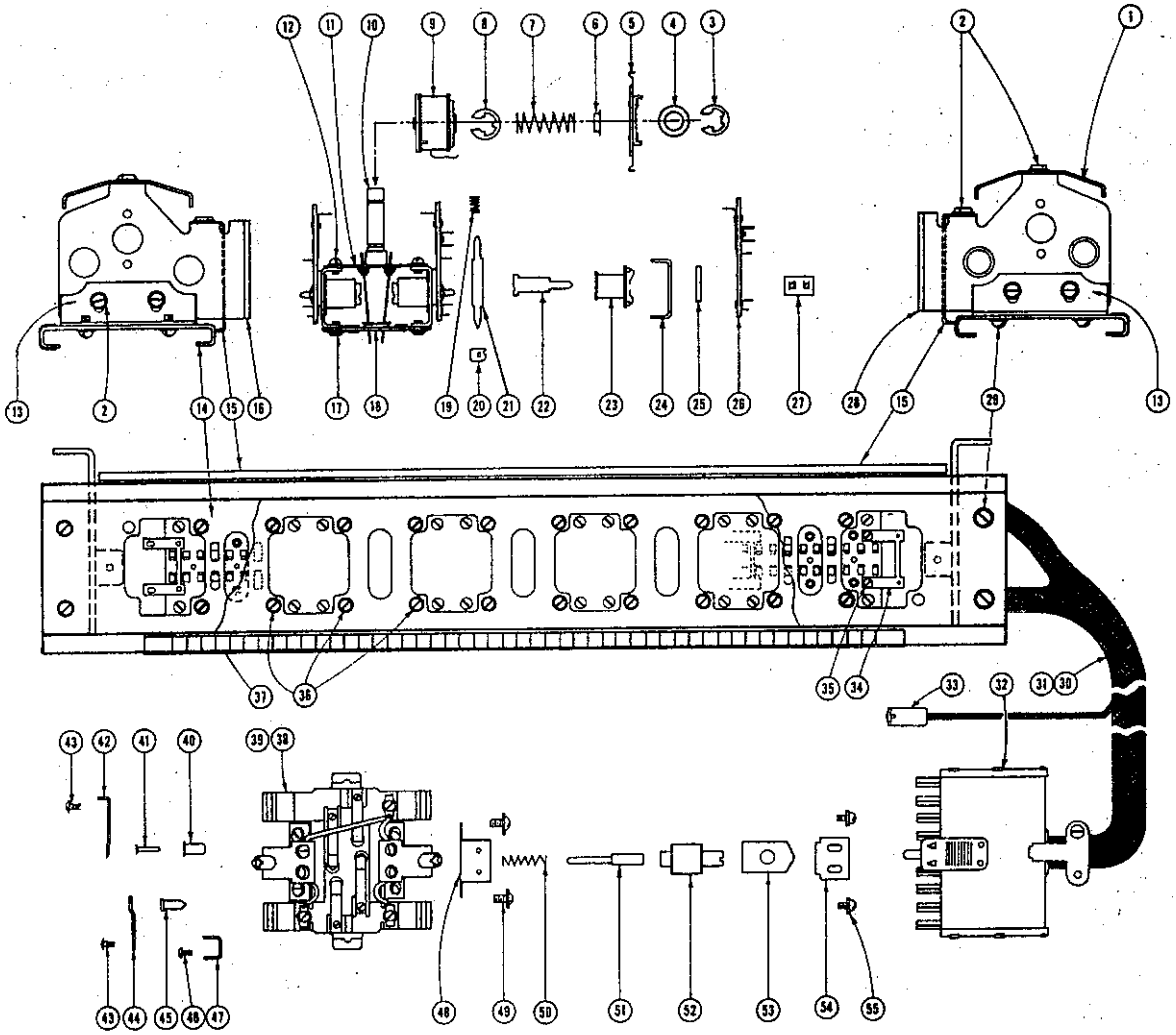
Item	Part No.	Part Name
1	245658	Rev. Switch Stop
	70185	Twin Speed Nut
2	245652	Chassis Mtg. Cleat Assem. R.H.
3	245268	Chassis Mtg. Spring Plug
4	71637	8-32 x 9/16 B.H. Mach. Screw
5	245117	Spring Retainer
6	245653	Chassis Mtg. Cleat Assem. L.H.
7	245116	Chassis Mtg. Spring
8	245457	Base
9	245184	Shipping Bolt
10	72034	Flat Washer 7/8 x3/8 x5/64
11	70126	5/16-18 Hex. Nut, 9/16 A.F.
12	245267	Chassis Mtg. Spring, Rear



SWITCH PLATE ASSEMBLY

PARTS LIST

Item	Part No.	Description
1	82704	1500 ohm 10% 1 w. Resistor
2	245911	Cam Switch
	245944	Switch Stop Plate &Lifter Assem.
	400597	Tension Plate
	71902	5-40 x 1-1/2 Fil. H. Mach. Screw, Steel-Cad
3	71479	6-32 x 1/4 R.H. Machine Screw
	73088	#1206 Lock Washer
4	600158	Plastic Clamp
5	86155	.1 mfd. 600 v. Tub. Condenser
6		Switch Plate Mounting Hardware
	71248	8-32 x 1/4 Allen Soc. Hd. Cap Screw
	70546	8-32 x 1/2 Allen Socket Head Cap Screw
	73137	#1208 Lock Washer
	72113	Flat Washer 3/8 O.D. x 11/64 I.D. x 1/32 Thk.
7	245915	Internal Cable
8	245948	Spring
9	245907	Reversing Switch Assembly, Complete
	245908	Reversing Switch Bracket
	71750	6-32 x 3/16 Sems Fastener
	245946	Actuator Assembly
	245947	Tie Plate
10	F402098	Cable Clamp
	71754	6-32 x 1/4 Sems Fastener
11	250942	11-prong Plug Assembly
12	250938	3-prong Plug Assembly
13	K228440	Single Prong Plug
14	245920	Cable Assembly, complete with Plugs
	245921	Control Cable, cable only
15	250707	Connector
16	602377	Plastic Clamp
17	245912	Clutch & Reset Lever Sw.
	71733	5-40 x 1-3/8 Fil. H. Mach. Screw
	400597	Tension Plate
18	74023	Solder Lug
19	71501	6-32 x 3/16 R.H. Mach. 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 100SA3 SELECTOR COIL & ARMATURE ASSEMBLY

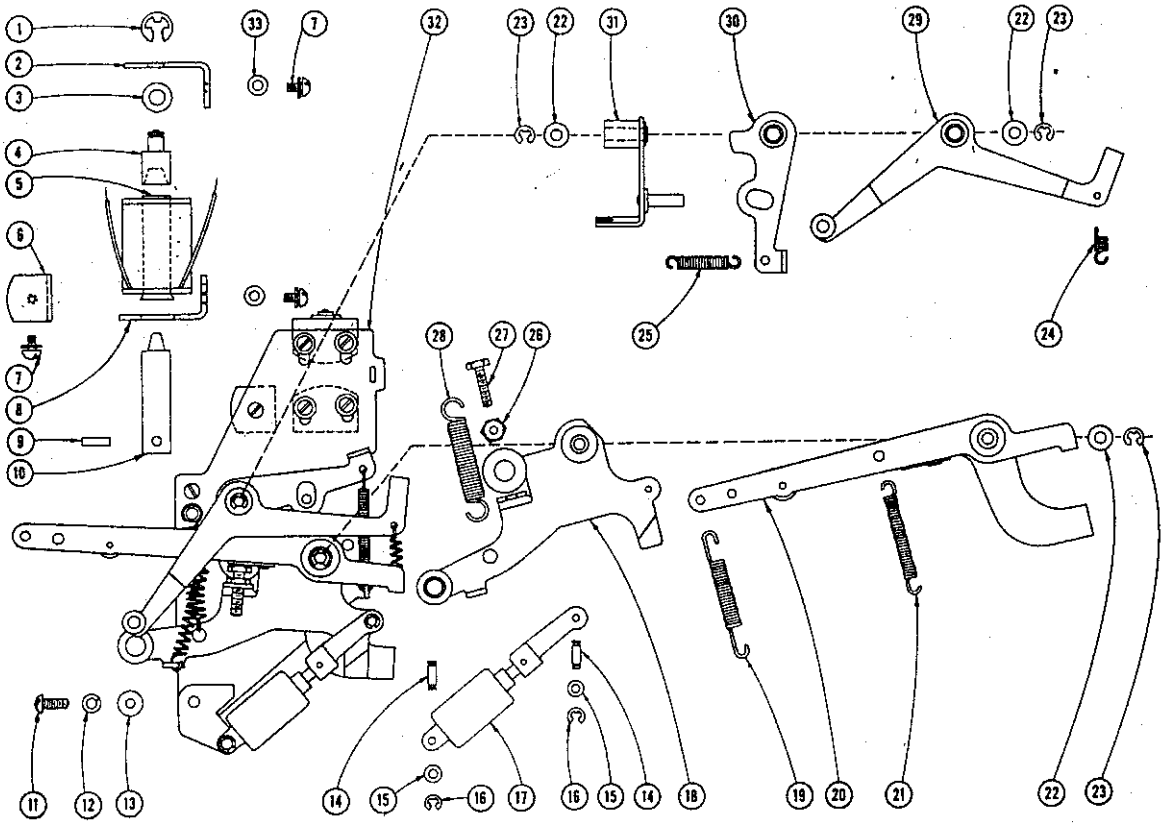
PARTS LIST on Reverse Side

PARTS LIST for SELECTOR COIL & ARMATURE ASSEMBLY

(Preceding Page)

Item	Part No.	Description
1	304357	Cover Plate
2	71760	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	71793	Sems Fastener
13	304358	Rail End Bracket
14	304326	Selector Block Guide Rail
15	304417	Shield Panel
16	304362	Selector Support Bracket, L
17	72035	Flat Washer
	71917	4-40 x 3/16 B.H. Machine Screw
	73026	#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	70160	Twin Hole Speed Nut
28	304355	Right End Bracket Assembly
29	71750	Sems Fastener

Item	Part No.	Description
30	304398	Cable & Plug Assembly (Items 32,31,&33)
31	304399	Cable
32	F9461	27-prong Plug
33	250706	Connector
34	304377	Terminal Lug
35	70548	2-56 x 1/4 B.H. Machine Screw
	73095	Lock Washer
36	71807	Sems Fastener
37	304397	Selector Lever Number Strip
38	304363	Contact Block Assembly, complete
39	304364	Contact Block
40) 41	304411	Selection Contact Assembly
42	251268	Contact Spring
43	76003	2-56 x 3/16 R.H. S.T. Screw
44	304369	Dressing Spring
45	304365	Dressing Contact
46	76055	4 x 1/4 R.H.S.T. Screw
47	74104	Solder Lug
48	304371	Cancel Coil Mtg. Bracket
49	71754	Sems Fastener
50	304248	Plunger Return Spring (use with #304373)
	304413	Plunger Return Spring (use with #304415)
51	304373	Pin & Plunger Assembly
	304415	Spring & Plunger Assembly
52	304370	Cancel Coil Assembly
53	304396	Pointer
54	304372	Cancel Coil End Bracket
55	71793	Sems Fastener
	72000	Flat Washer

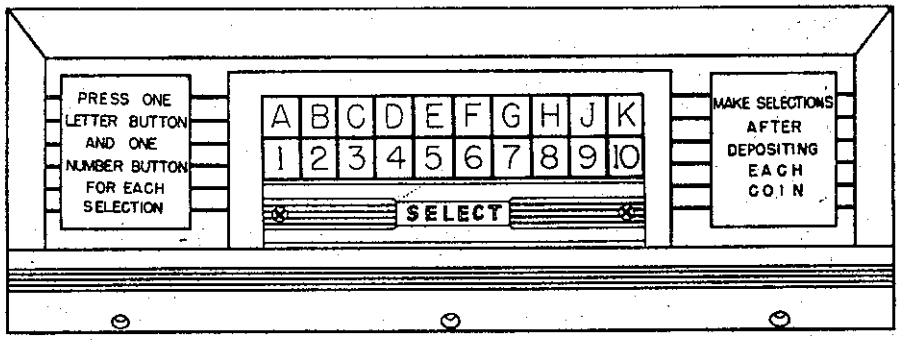


No. 245502 TRIP MECHANISM ASSEMBLY

PARTS LIST

Item	Part No.	Description
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	71794	8-32 x 1/4 Sems Fastener
8	245579	Solenoid Bracket - Bottom
9	80116	5/32 x 7/16 Roll Pin
10	245581	Plunger
11	71014	8-32 x 3/8 R.H. Machine Screw
12	73108	#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 Assem.
21	245551	Clutch Shifting Lever Spring
22	72177	Flat Washer
23	R231163	Snap Washer
24	A250091	Switch Lever Spring
25	245552	Latch Lever Spring
26	70153	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

ELECTRICAL SELECTOR, TYPE ES6-L6



The Electrical Selector, Type ES6-L6, is an assembly with two rows of ten selector buttons for selecting any of the one hundred selections in the Select-O-Matic "100", Model M100B. It is part of an electrical selector system which includes the Type CCU-2 Credit and Cancel Unit in the Selection Receiver. Its principle functions are to connect a selector coil circuit and a group magnet of the 100SA-3 Selector Assembly to current supply circuits and to complete a circuit which initiates the operating sequence of the system. These functions are performed when two buttons--one in each of the two rows of ten--are pressed. Included in the Electrical Selector assembly is a selection counter. The counter registers the total number of selections made with the Selector and with Wall-O-Matics which are used for remote selection.

The Electrical Selector has two selector switch assemblies, two snap-action switches, two spring-leaf switches, a latch bar solenoid, and a credit indicating light. These are connected through an octal plug and cable to the Credit and Cancel Unit and a 27-prong plug and cable to the selector coil and group magnet circuits of the Selector Assembly.

The two selector switch assemblies are not identical but are similar except in the letter and numeral marking of the operating buttons. Each incorporates ten selection switches the shafts of which operate a treadle bar. The treadle bar, in turn, operates a snap-action switch and a spring-leaf switch so these switches are closed when any one of the ten buttons of the switch assembly is pressed.

The two snap-action switches are connected in series and, together, are part of a cancel circuit of the electrical selector system. Completion of the cancel circuit requires that both switches be closed by operating two selection switches--one lettered switch and one numbered switch. These snap-action switches are indicated as the Starting Switches in the simplified schematic diagram of the system, Figure 1. Closing them starts the operating sequence of the system that results in selection of a record and cancel of a credit.

The two spring leaf switches indicated as Hold Switches, Figure 1, are parallel connected and are part of a holding circuit of the system. This hold circuit is completed (as far as the electrical selector switch assembly is concerned) if any of the twenty buttons are pressed.

The latch bars of the two selector switch assemblies are spring biased to a position that permits free in-and-out movement of the selector buttons. The latch bar solenoid is linked to the bars so the selector buttons will remain in the pressed position when the solenoid is energized. The solenoid is energized when the credit switch in the Credit and Cancel Unit is closed and is controlled by Contact "Y" for release of the selection switches each time a selection is made.

The principle elements of the Credit and Cancel Unit are a credit switch and three credit solenoids, a cancel solenoid, two cam operated switch groups, and a timing relay.

The credit switch is a rotating element supporting six equally spaced snap-action

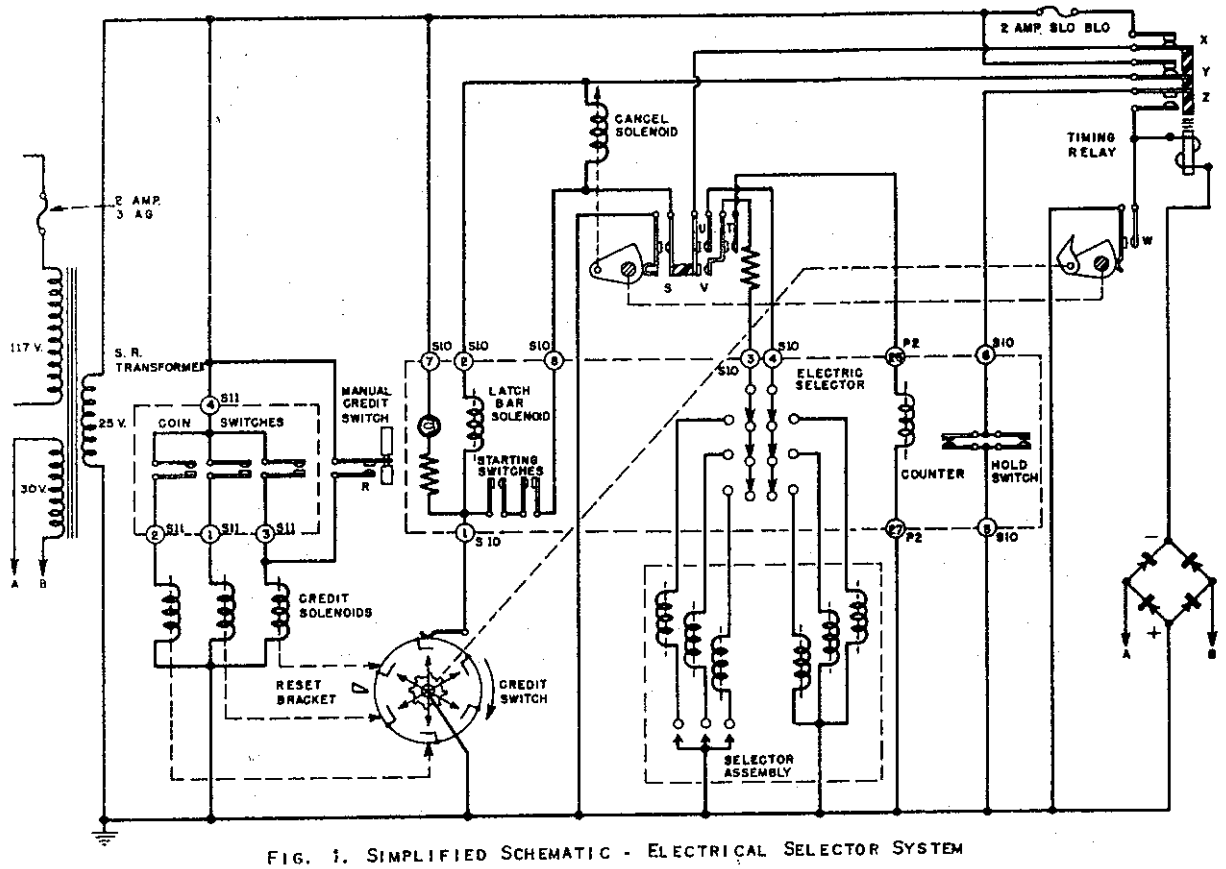


FIG. 1. SIMPLIFIED SCHEMATIC - ELECTRICAL SELECTOR SYSTEM

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 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 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 lock 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 cancel solenoid is energized through the starting switches and the credit switch.

The "S", "T", "U", "V", and "W" contacts of the two switches 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.

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 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 selection buttons are released for return to their normal position.

REMOVAL OF ELECTRICAL SELECTOR

The electrical selector may be removed

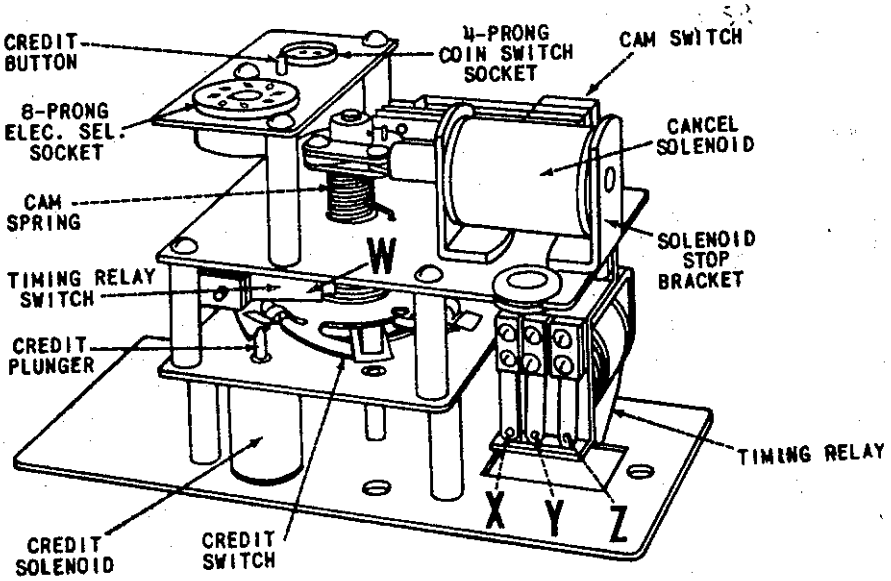


FIG. 2. PARTS IDENTIFICATION - CREDIT & CANCEL UNIT

for inspection and service by taking out the three screws above the selector buttons and four screws at the back of the selector escutcheon. These latter are readily accessible from inside the cabinet when the cabinet light diffusing glass is removed.

REPLACING CREDIT LIGHTS

Access to the Mazda #47 credit lights may be had by removing the section of the escutcheon in which the credit indicator window is mounted. The section is held by two screws.

LATCH BAR SOLENOID

The space between the ends of the latch bars and the solenoid plunger head should be 1/64" to 3/64" when the plunger is fully seated. Adjust for clearance by positioning the solenoid.

SNAP-ACTION SWITCHES

The snap-action switches must close at, or just before, the point of the latch-in of the selector buttons. It should not be possible to latch in any button on either switch without closing the corresponding snap-action switch. Adjust by positioning the switch mounting brackets.

SPRING LEAF SWITCHES

With the snap-action switches properly adjusted, the long blade of the spring leaf switches should rest lightly against the rectangular piece of bakelite insulator on the snap-action switches. The contact gap of the spring leaf switches should then be adjusted to approximately 1/32" by bending the short blade.

CREDIT AND CANCEL UNIT

MECHANICAL ADJUSTMENTS

1. Set the Pawl Arm Stop so the credit switch is rotated far enough to allow the Lock Pawl to fall into the Ratchet. The over-travel should be approximately 1/64". This must be checked on all six positions of the ratchet. After adjustment, set locknut tight.

2. Adjust Solenoid Stop Bracket so the Solenoid Plunger bottoms against the Stop and advances the pawl for 1/32" over-travel. After adjustment, set Stop Bracket mounting screws firmly.

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

4. The pressure of the collector ring contact should be approximately 2-1/2 oz. Excessive pressure (3 or more oz.) of

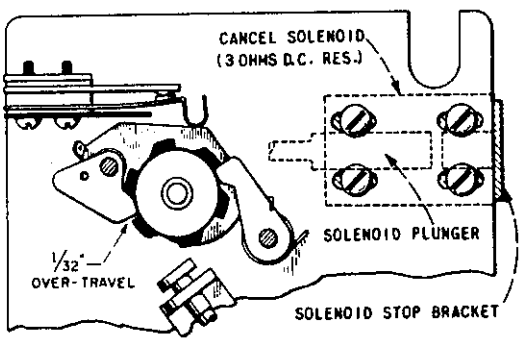


FIGURE 3.

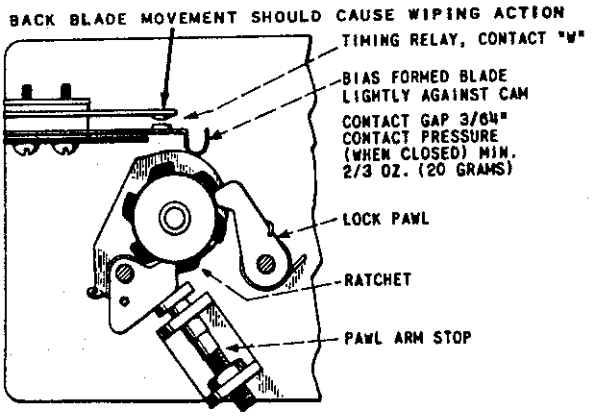


FIGURE 4.

this contact will result in excessive contact wear and sluggish rotary action of the credit switch.

5. Check credit solenoid plungers. Their weight should move them freely in the pin guides through a full stroke.

CAM SWITCH, #400960

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 3/4 oz. pressure.

3. Adjust contact "S" for 1/32" gap after setting center blade against fiber lift. .036

4. Adjust contacts "T", "U" and "V" for 1/64" gap. .015

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 = 1-1/4 oz. min.
V = 1 oz. min.
U = 1-1/4 oz. min.
S = more than 3-1/2 oz.

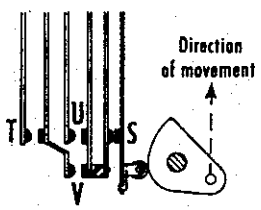


FIGURE 5.

TIMING RELAY, #400571

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

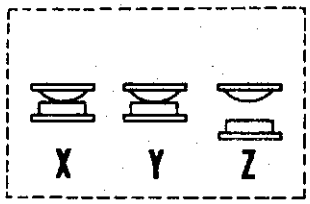
D.C. Coil Resistance - 400 ohms.

Contact Functions:

"X" - Selection Circuit.

"Y" - Cancel and coin switch circuits.

"Z" - Timing Relay hold circuit.



PRESSURE REQUIRED TO START FROM REST POSITION IS MEASURED AT THIS POINT, 65 GRAMS. MINIMUM

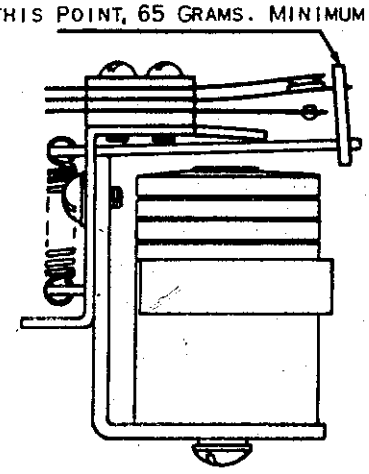
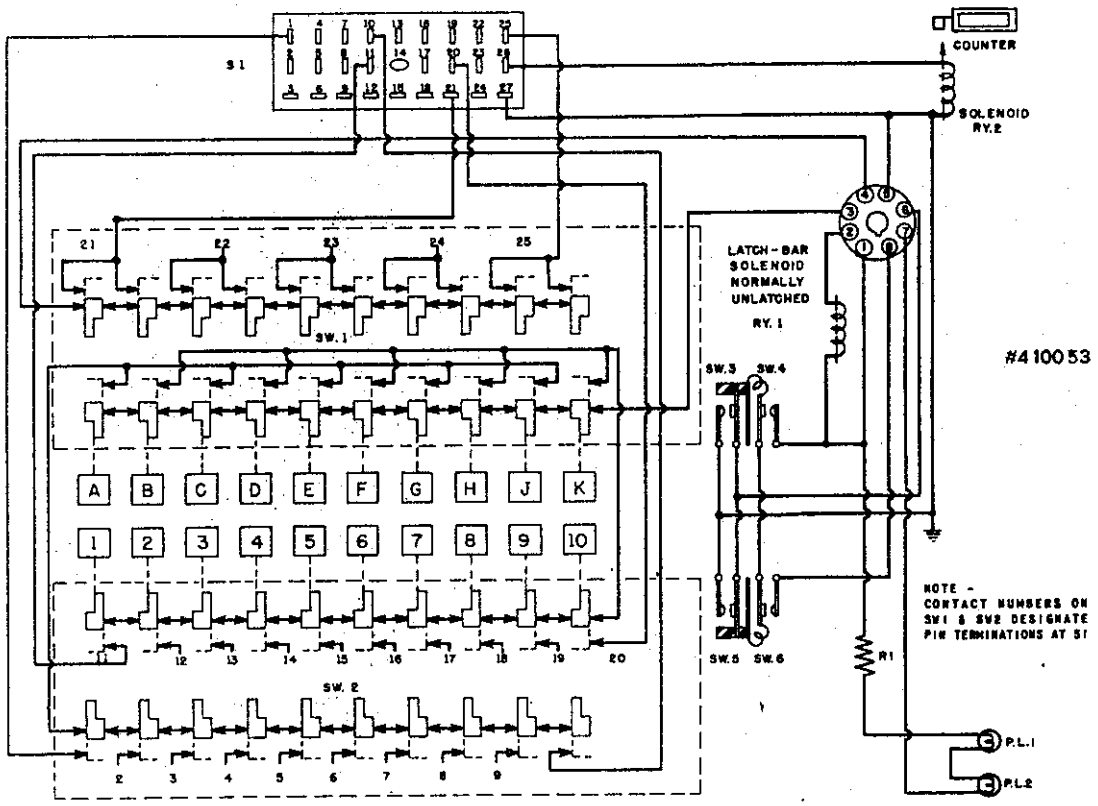


FIGURE 6.

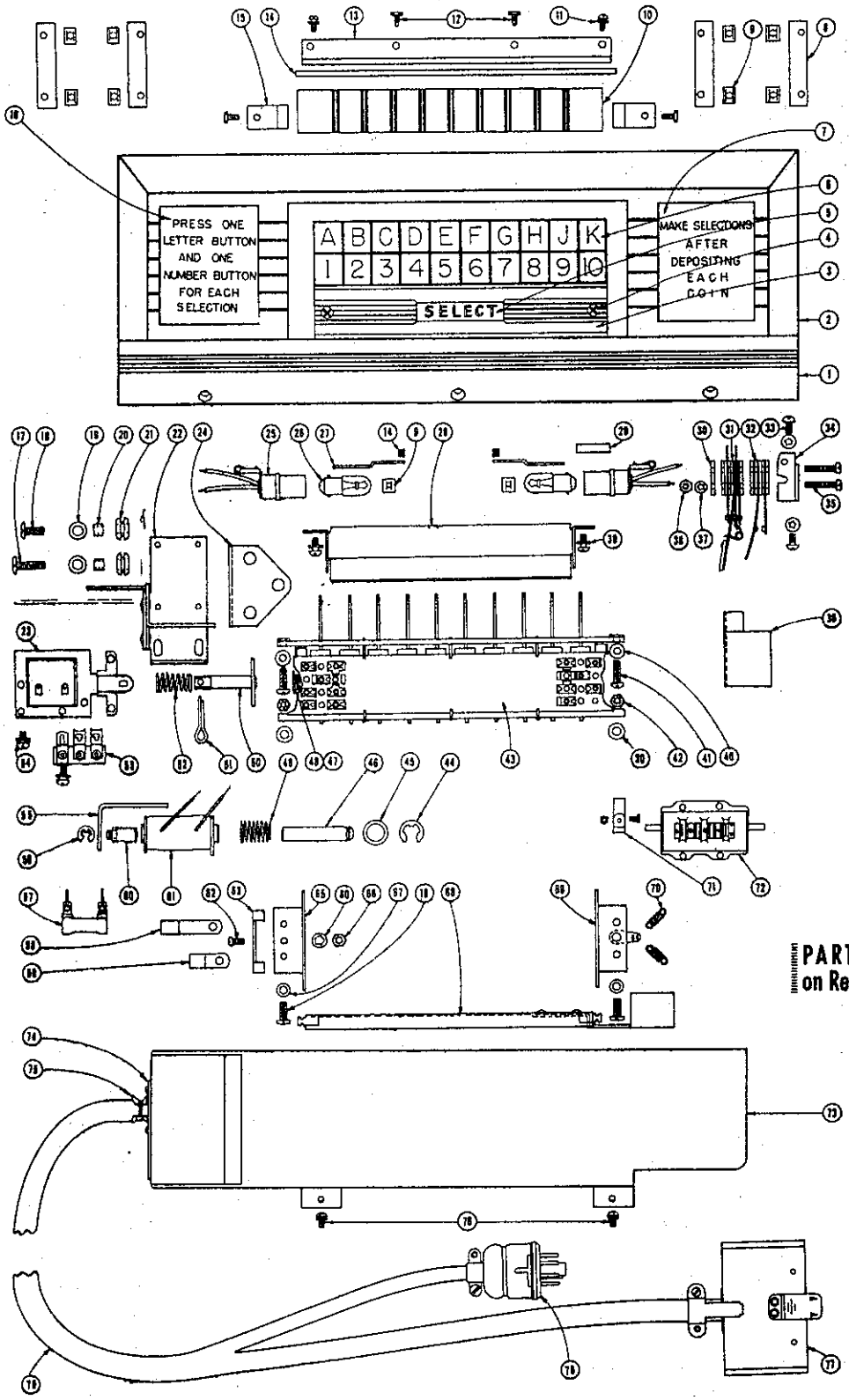


SCHEMATIC DIAGRAM - ELECTRICAL SELECTOR, TYPE ES6-L6

PARTS LIST

Item	Part No.	Description
P1	12028	8-prong Plug
PL1	302141	#47 Panel Lamp
PL2	302141	#47 Panel Lamp
R1	81125	100 Ohm 5 w. W.W. Resistor
RY1	410081	26 V.A.C. Solenoid
RY2	410083	Counter Solenoid

Item	Part No.	Description
S1	400844	27-prong Socket
SW1	400808	Push Button Switch
SW2	400807	Push Button Switch
SW3	400830	Leaf Switch
SW4	400846	Snap Action Switch
SW5	400829	Leaf Switch
SW6	400845	Snap Action Switch



PARTS LIST on Reverse Side

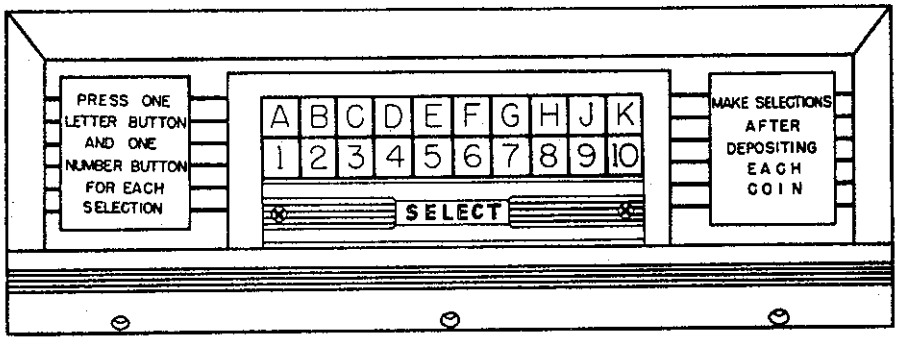
FIG. 8. ELECTRICAL SELECTOR ASSEMBLY

PARTS LIST FOR TYPE "ES6-L6" ELECTRICAL SELECTOR

(PRECEDING PAGE)

Item	Part No.	Description
1	410000	Type ES6-L6 Elec. Selector
2	410040	Selector Frame
3	400802	Credit Plate
4	71958	6-32 x 5/16 Phillips Screw
5	400832	Credit Window
	400894	Credit Window Diffuser
6	505005	Push Buttons (20 to Set)
7	410097	Instruction Window, R.H.
8	401297	Window Retainer Strip
9	70146	Tinnerman Speed Nut
10	400805	Button Window Glass
11	71790	4-36 x 1/4 Sems Fastner
12	76046	6-32 x 1/4 H.H.S.T. Screw
13	410089	Retainer Strip
14	53501	1/8 x 1/8 Corxfelt
15	400806	Retainer Clip
16	410098	Instruction Window, L.H.
17	71463	6-32 x 3/8 B.H. Mach. Screw
18	71502	6-32 x 5/8 B.H. Mach. Screw
19	72064	Flat Washer
20	400854	Spacer
21	78031	Rubber Grommet
22	410044	Solenoid Mtg. Bracket Assem.
23	410081	Solenoid
24	410090	Solenoid Assem. Mtg. Bracket
25	400843	Panel Lamp Socket
26	302141	Panel Lamp #47
27	400833	Credit Window Retainer
28	400840	Switch Shield
29	400847	Solderless Connector
30	F200028	Switch Cap
31	400846	Snap Switch (Letter)
	400845	Snap Switch (Number)
32	400830	Leaf Switch (Letter)
	400829	Leaf Switch (Number)
33	71480	4-36 x 5/16 R.H. Mach. Screw
	73085	Lock Washer
34	410086	Switch Bracket (Letter)
	410088	Switch Bracket (Number)
35	71500	5-40 x 11/16 Fil. H.Mach.Screw
36	400851	Switch Guard - Upper
	400852	Switch Guard - Lower
37	73116	Lock Washer
38	70043	5-40 Hexagon Nut
39	71759	6-32 x 1/4 Sems Fastener
40	73108	Lock Washer
41	71025	8-32 x 1/2 R.H.Mach. Screw
42	70000	Hexagon Nut
43	400807	Push Button Switch Assem. (Number)
	400808	Push Button Switch Assem. (Letter)
44	301367	Retainer Washer
45	72031	Flat Washer
46	410082	Plunger
47	400865	Latch Bar Spring
48	400864	Spring Retainer
49	400529	Spring
50	400821	Plunger Assembly
51	80103	Cotter Pin
52	400824	Plunger Spring
53	410055	Terminal Strip
54	76006	6-32 x 1/4 R.H.S.T.Screw
55	410047	Counter Solenoid Angle
56	301374	Retainer Washer
57	81125	100 ohm 5 w. W.W. Resistor
58	410096	Cable Clamp
59	410095	Cable Clamp
60	410100	Plunger Stop Assembly
	72252	Rubber Washer
61	410083	Counter Solenoid
62	71095	4-36 x 1/4 R.H. Mach.Screw
63	400816	Tredle Bar Retainer
65	400809	Tredle Bar Hinge Bracket
66	70009	4-36 Hexagon Nut
67	72064	Flat Washer
68	400810	Tredle Bar Assem. (Letter)
	400811	Tredle Bar Assem. (Number)
69	400848	Hinge Bracket & Lug Assem.
70	400842	Tredle Return Spring
71	301013	Counter Arm
	71560	4-36 x 3/16 Fil. H. Mach. Screw
	70094	4-36 Hexagon Nut
72	400526	Counter
	71560	Mtg. Screws
73	410049	Cover Assembly
74	301026	Counter Window
	79024	Rivet, 1/8 Diam. x 5/32
75	304149	Cable Clamp
	71014	8-32 x 3/8 R.H.Mach. Screw
76	71759	6-32 x 1/4 Sems Fastener
77	400844	27-prong Socket
78	12028	8-prong Plug
79	410048	Cable, only
80	73085	Lock Washer

ELECTRICAL SELECTOR, TYPE ES7-L6



The Electrical Selector, Type ES7-L6, is designed for selecting any of the 100 selections in the 45 rpm in Select-O-Matic "100", Model M100BL (light colored cabinet).

The Type ES7-L6 and the Type ES6-L6 are the same in all respects except in the color of the credit window.

The part number for this window is given below. The item number refers to the parts illustration, page 3045. All other parts and the service data for the Type ES6-L6, pages 3039 to 3046, apply to the Type ES7-L6.

PARTS LIST

ITEM	PART NO.	PART NAME
1	410005	Type ES7-L6 Electrical Selector
2	410134	Plastic Selector Frame
5	410133	Credit Window

MASTER-REMOTE AMPLIFIER, TYPE MRA1-L6

The Master-Remote Amplifier, Type MRA1-L6, is a constant voltage type designed for use in the Select-O-Matic 100. It has eight tubes, four of which are 6V6's in a push-pull-parallel output stage to supply 25 watts of audio power for operation of the Select-O-Matic speaker and remote speakers.

The output of the low impedance magnetic pickup of the Select-O-Matic 100 is connected through a single contact socket to a 6J7 voltage amplifier. The 6J7 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 6SL7. The second section of the 6SL7 is a phase inverter and drives the 6V6 output tubes.

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 6SL7.

The output transformer has two secondaries. One of these is for the Select-O-Matic speaker and is tapped for switch control of the power to the speaker. The other is for remote speakers and has taps to a terminal strip to accommodate constant voltage speakers or Seeburg type RS 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

(Continued on page 4040)

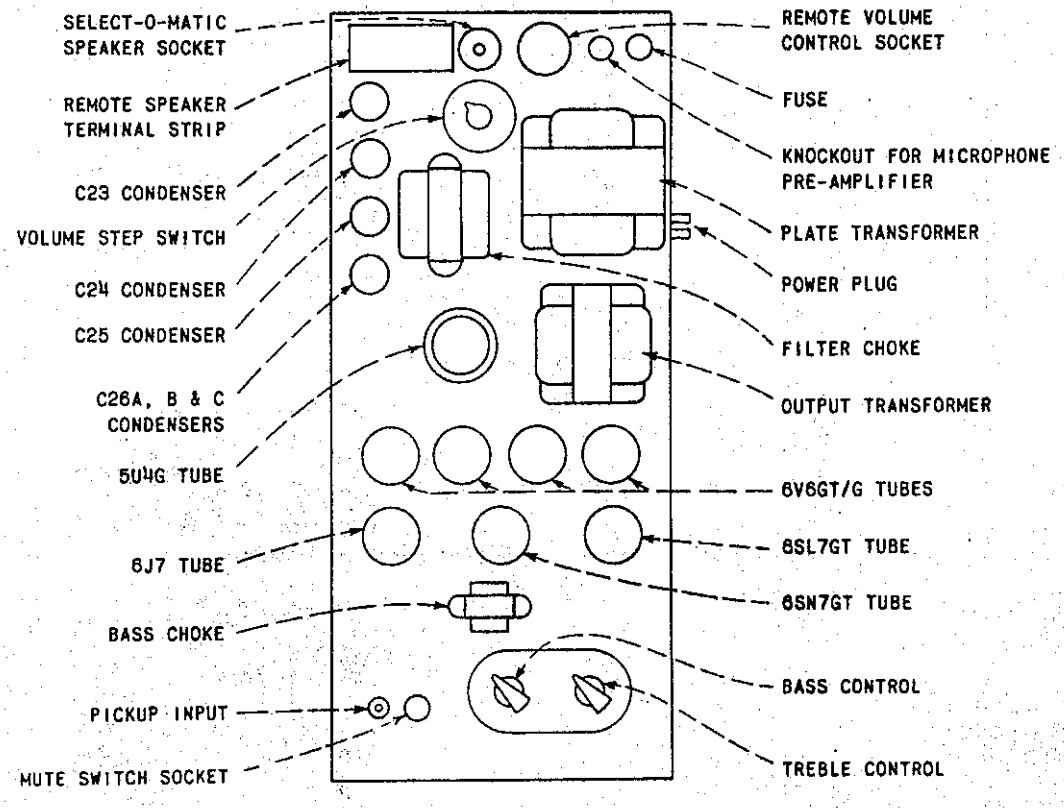


FIGURE 1. TOP VIEW - MASTER REMOTE AMPLIFIER, TYPE MRA1-L6

SCHEMATIC DIAGRAM - Master Remote Amplifier, Type MRAI-L6

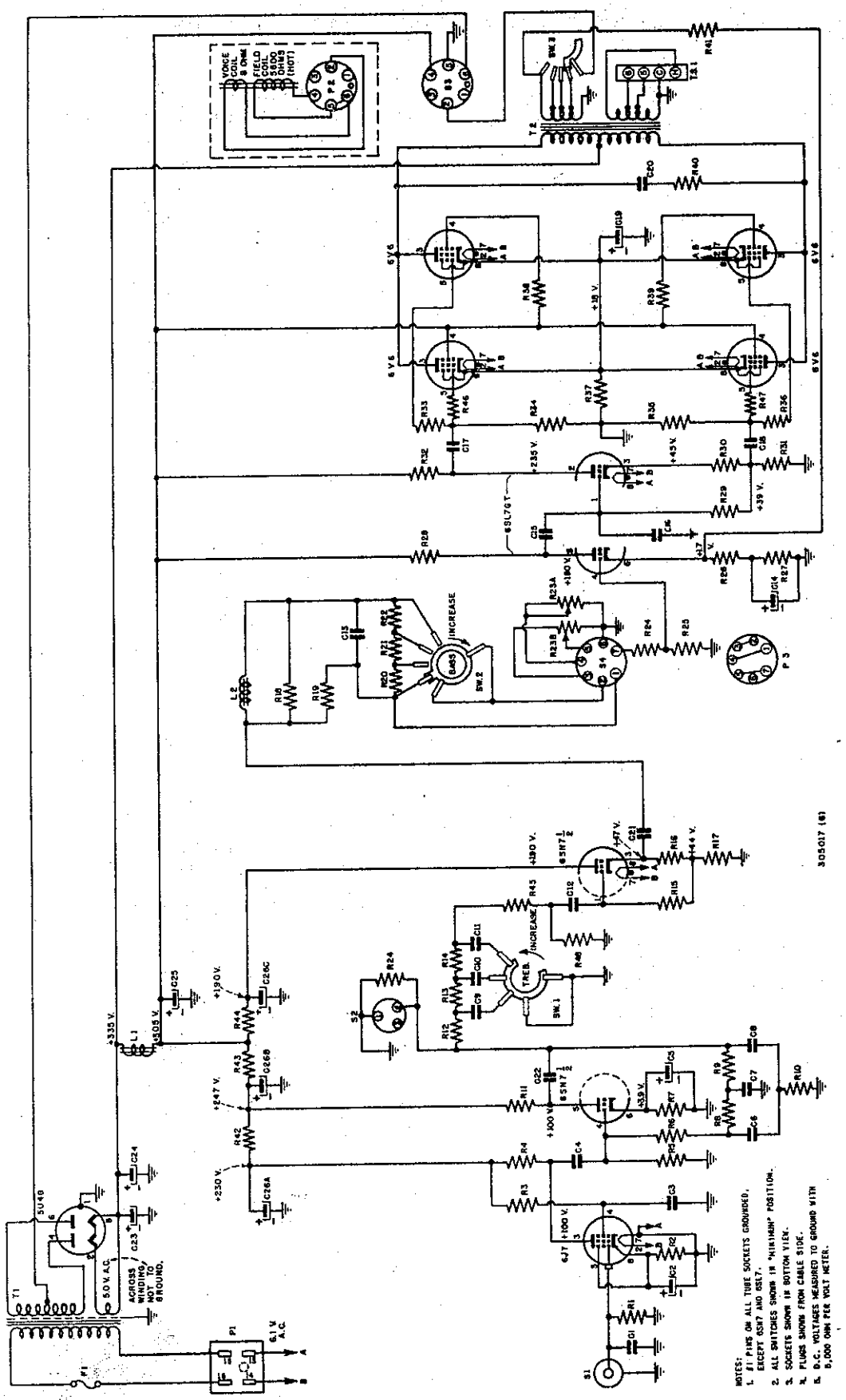


FIGURE 1.

PARTS LIST

Item	Part No.	Description
C1	86042	.005 mfd. 400 v. Condenser
C2	87585	100 mfd. 25 v. Electrolytic (Note)
C3	86140	.05 mfd. 400 v. Condenser
C4	86135	.02 mfd. 400 v. Condenser
C5	87564	20 mfd. 25 v. Electrolytic
C6	86159	.01 mfd. 200 v. Condenser
C7	86158	.02 mfd. 200 v. Condenser
C8	86159	.01 mfd. 200 v. Condenser
C9	86116	.001 mfd. 100 v. Condenser
C10	86116	.001 mfd. 100 v. Condenser
C11	86116	.001 mfd. 100 v. Condenser
C12	86149	.05 mfd. 200 v. Condenser
C13	86115	.5 mfd. 100 v. Condenser
C14	87564	20 mfd. 25 v. Electrolytic
C15	86154	.02 mfd. 600 v. Condenser
C16	85003	50 mmf. 400 v. Mica Condenser
C17	86154	.02 mfd. 600 v. Condenser
C18	86154	.02 mfd. 600 v. Condenser
C19	87564	20 mfd. 25 v. Electrolytic
C20	86069	.005 mfd. 1000 v. Condenser
C21	86170	.5 mfd. 100 v. Condenser
C22	86140	.05 mfd. 400 v. Condenser
C23	87523	15 mfd. 450 v. Electrolytic
C24	87523	15 mfd. 450 v. Electrolytic
C25	87582	40 mfd. 450 v. Electrolytic
C26a)		(15 mfd. 350 v. Electrolytic
C26b)	87581	(15 mfd. 350 v. Electrolytic
C26c)		(15 mfd. 350 v. Electrolytic
F1	300103	2 amp. Fuse
L1	305023	Filter Choke
L2	305013	Bass Choke
P1	300007	Power Plug
P2	402430	Speaker Plug
P3	305019	Dummy Plug
R1	82436	10,000 ohm ** 1/2 w. Resistor
R2	82424	1000 ohm ** 1/2 w. Resistor
R3	82457	.56 meg ** 1/2 w. Resistor
R4	82666	.1 meg * 1/2 w. Resistor
R5	82460	.1 meg ** 1/2 w. Resistor
R6	82456	.47 meg ** 1/2 w. Resistor
R7	82425	1200 ohm ** 1/2 w. Resistor
R8	82452	.22 meg ** 1/2 w. Resistor
R9	82452	.22 meg ** 1/2 w. Resistor
R10	82448	.1 meg ** 1/2 w. Resistor
R11	82678	47,000 ohm * 1/2 w. Resistor
R12	82442	33,000 ohm ** 1/2 w. Resistor
R13	82443	39,000 ohm ** 1/2 w. Resistor
R14	82445	56,000 ohm ** 1/2 w. Resistor
R15	82453	.27 meg ** 1/2 w. Resistor
R16	82418	330 ohm ** 1/2 w. Resistor
R17	82432	4700 ohm ** 1/2 w. Resistor
R18	82442	33,000 ohm ** 1/2 w. Resistor
R19	82432	4700 ohm ** 1/2 w. Resistor
R20	82427	1800 ohm ** 1/2 w. Resistor
R21	82427	1800 ohm ** 1/2 w. Resistor
R22	82427	1800 ohm ** 1/2 w. Resistor
R23a)	302007	(5000 ohm Volume Control
R23b)		(16,000 ohm Volume Control
R24	82445	56,000 ohm ** 1/2 w. Resistor
R25	82666	.1 meg * 1/2 w. Resistor
R26	82690	470 ohm * 1/2 w. Resistor
R27	82428	2200 ohm ** 1/2 w. Resistor
R28	82666	.1 meg * 1/2 w. Resistor
R29	82457	.56 meg ** 1/2 w. Resistor
R30	82432	4700 ohm ** 1/2 w. Resistor
R31	82666	.1 meg * 1/2 w. Resistor
R32	82666	.1 meg * 1/2 w. Resistor
R33	82424	1000 ohm ** 1/2 w. Resistor
R34	82453	.27 meg ** 1/2 w. Resistor
R35	82453	.27 meg ** 1/2 w. Resistor
R36	82424	1000 ohm ** 1/2 w. Resistor
R37	81122	135 ohm W.W. Resistor
R38	82412	100 ohm ** 1/2 w. Resistor
R39	82412	100 ohm ** 1/2 w. Resistor
R40	82412	100 ohm ** 1/2 w. Resistor
R41	82629	5600 ohm * 1/2 w. Resistor
R42	82448	.1 meg ** 1/2 w. Resistor (Note)
R43	82712	10,000 ohm ** 1 w. Resistor
R44	82813	10,000 ohm ** 2 w. Resistor
R45	82453	.27 meg ** 1/2 w. Resistor
R46	82424	1000 ohm ** 1/2 w. Resistor
R47	82424	1000 ohm ** 1/2 w. Resistor
R48	82456	.47 meg ** 1/2 w. Resistor (Note)
S1	300152	P.U. Socket
S2	12034	Mute Socket
S3	84201	Speaker Socket
S4	84265	Volume Control Socket
SW1	305025	Treble Switch
SW2	305026	Bass Switch
SW3	305015	Speaker Switch
T1	305010	Power Transformer
T2	305012	Output Transformer
TS1	305009	Remote Speaker Terminal Strip

Resistor Tolerance: * = 5% ** = 10%

NOTE: Below Serial No. 9025 — —

C2 was 87564 20 mfd. 25 v. Electrolytic
R42 was 82712 10,000 ** 1 w. Resistor
R48 was 82453 .27 meg ** 1/2 w. Resistor

ADDITIONAL PARTS LIST

Part No.	Description
305008	Escutcheon (Vol. Steps)
305027	Knob (Vol. Steps)
300074	Escutcheon (Tone Control)
300076	Bar Knob
300085	Grid Clip
10876	Grid Cap Shield
84220	Octal Socket
602046	Tube Clamp (5U4G)
301162	Bass Choke Shield

Part No.	Description
300061	Fuse Receptacle
10832	Electrolytic Mtg. Plate
305002	Vol. Control Bracket
302047	Vol. Control Key
10062	1 Lug Terminal Strip
10079	2 Lug Terminal Strip
10082	4 Lug Terminal Strip
10080	5 Lug Terminal Strip

(Continued from page 4037)

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.

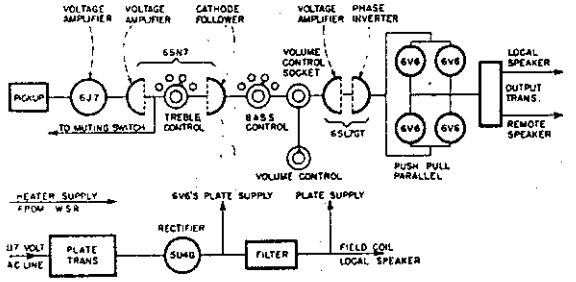


FIG. 3. BLOCK DIAGRAM, TYPE MRA1-L6

Bass and Treble controls are mounted on the amplifier. Each is a four-position switch.

Heater current for the amplifier tube 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 Voice coil impedance of the Select-O-Matic speaker is 8 ohms. Field coil d.c. resistance, measured when the field has attained normal operation temperature, is 5600 ohms.

A total of 25 watts of audio power is available from this amplifier. This power can be divided in various proportions between the Select-O-Matic Speaker and Remote Speakers.

1. *TYPE CV SPEAKERS*, if used, are connected to terminals *C* and *H*. The *VOLUME* (watts) of each *TYPE CV SPEAKER* is then set at the speakers.

2. *TYPE RS SPEAKERS*, if used, are connected to terminals *C* and *VOL. STEP* 5 (1.5 watts per speaker), or the terminals *C* and *VOL. STEP* 6 (4 watts per speaker), according to volume desired.

3. *THE SELECT-O-MATIC SPEAKER SWITCH* is set to *VOL. STEP* 4 (.5 watts), *VOL. STEP* 5 (1.5 watts), *VOL. STEP* 6 (4 watts), *VOL. STEP* 6.5 (8 watts) or *VOL. STEP* 7 (16 watts), according to volume desired. *IF NO REMOTE SPEAKERS ARE USED, THE SELECT-O-MATIC SPEAKER SWITCH MUST BE SET AT VOL. STEP* 7 (16 watts).

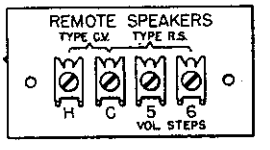


FIGURE 4.

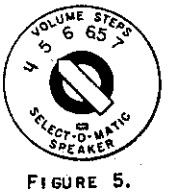


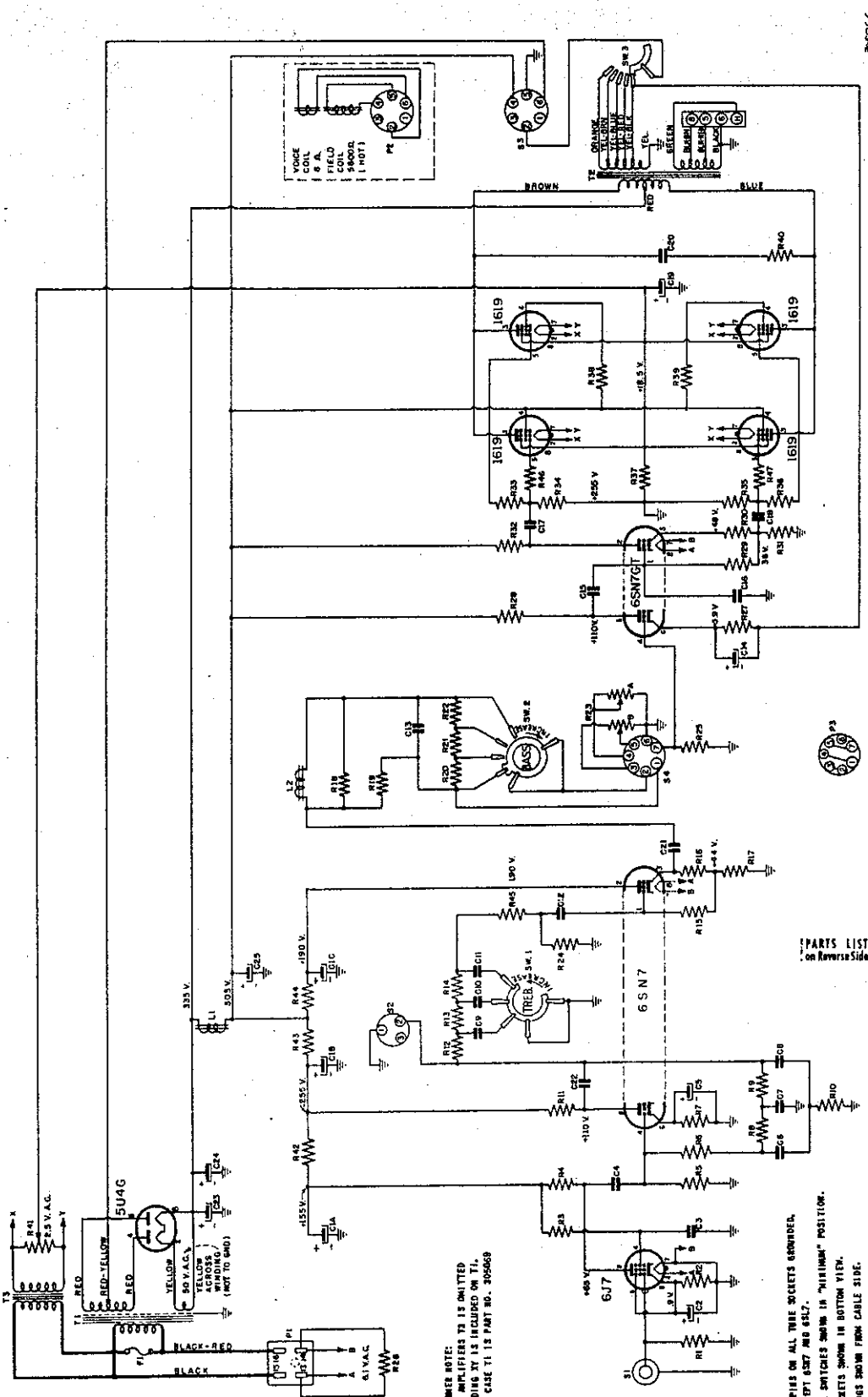
FIGURE 5.

4. *THE WATTS OF ALL SPEAKERS MUST BE ADDED (INCLUDING THE SELECT-O-MATIC SPEAKER) AND THIS TOTAL WATTAGE MUST NOT EXCEED 25 WATTS.* If the total watts exceed 25, an external power amplifier, Seeburg Type *ARA1-L6, may be used to supply part of the speaker load, or speakers may be removed, or lower volume steps may be used.

* To connect CV type speakers on an ARA1-L6 amplifier, set the matching plug on 2 and connect the speakers to the terminal strip. Total watts of speakers connected to the ARA1-L6 must not exceed 18. To connect RS type speakers, see instructions on matching plug escutcheon.

SEEBURG
MASTER-REMOTE AMPLIFIER, TYPE MRA2-L6

This Amplifier is a constant-voltage type of 25 watts output and is designed to be interchangeable with the type MRAI-L6 in the Select-O-Matic "100" Model M100A and M100B. Information regarding speaker connections of the type MRAI-L6 (page 4040) applies to the type MRA2-L6.



PARTS LIST - MRA2-L6 SCHEMATIC (Preceding page)

Item	Part No.	Description
C1a		15 mfd
C1b	87581	15 mfd 350 v. Electrolytic
C1c		15 mfd
C2	87585	100 mfd 25 v. Electrolytic
C3	86140	.05 mfd 400 v. Condenser
C4	86135	.02 mfd 400 v. Condenser
C5	87564	20 mfd 25 v. Electrolytic
C6	86159	.01 mfd 200 v. Condenser
C7	86158	.02 mfd 200 v. Condenser
C8	86159	.01 mfd 200 v. Condenser
C9	86116	.001 mfd 100 v. Condenser
C10	86116	.001 mfd 100 v. Condenser
C11	86116	.001 mfd 100 v. Condenser
C12	86149	.05 mfd 200 v. Condenser
C13	86115	.5 mfd 100 v. Condenser
C14	87564	20 mfd 25 v. Electrolytic
C15	86154	.02 mfd 600 v. Condenser
C16	85003	50 mmf 400 v. Mica Condenser
C17	86155	.1 mfd 600 v. Condenser
C18	86155	.1 mfd 600 v. Condenser
C19	87564	20 mfd 25 v. Electrolytic
C20	86069	.005 mfd 1000 v. Condenser
C21	86170	.5 mfd 100 v. Condenser
C22	86140	.05 mfd 400 v. Condenser
C23	87523	15 mfd 450 v. Electrolytic
C24	87523	15 mfd 450 v. Electrolytic
C25	87582	40 mfd 450 v. Electrolytic
F1	303087	2 amp Slo-Blo Fuse
L1	305023	Filter Choke
L2	305013	Bass Choke
P1	300007	Power Plug
P2	402430	Speaker Plug
P3	305019	Dummy Plug
R1	82436	10000 Ohm 1/2 w. Resistor
R2	82424	1000 Ohm 1/2 w. Resistor
R3	82457	.56 Megohm 1/2 w. Resistor
R4	82666	.1 Megohm 1/2 w. Resistor
R5	82460	1 Megohm 1/2 w. Resistor
R6	82456	.47 Megohm 1/2 w. Resistor
R7	82425	1200 Ohm 1/2 w. Resistor
R8	82452	.22 Megohm 1/2 w. Resistor
R9	82452	.22 Megohm 1/2 w. Resistor
R10	82448	.1 Megohm 1/2 w. Resistor
R11	82676	47000 Ohm 1/2 w. Resistor
R12	82442	33000 Ohm 1/2 w. Resistor
R13	82443	39000 Ohm 1/2 w. Resistor
R14	82445	56000 Ohm 1/2 w. Resistor
R15	82453	.27 Megohm 1/2 w. Resistor
R16	82418	330 Ohm 1/2 w. Resistor
R17	82432	4700 Ohm 1/2 w. Resistor
R18	82442	33000 Ohm 1/2 w. Resistor
R19	82432	4700 Ohm 1/2 w. Resistor
R20	82427	1800 Ohm 1/2 w. Resistor
R21	82427	1800 Ohm 1/2 w. Resistor
R22	82427	1800 Ohm 1/2 w. Resistor
R23a R23b	302007	Volume Control
R24	82458	.68 Megohm 1/2 w. Resistor
R25	82666	.1 Megohm 1/2 w. Resistor
R26	81140	5 Ohm W.W. 10 w. Resistor
R27	82428	2200 Ohm 1/2 w. Resistor
R28	82666	.1 Megohm 1/2 w. Resistor
R29	82457	.56 Megohm 1/2 w. Resistor
R30	82432	4700 Ohm 1/2 w. Resistor
R31	82638	18000 Ohm 1/2 w. Resistor
R32	82638	18000 Ohm 1/2 w. Resistor
R33	82424	1000 Ohm 1/2 w. Resistor
R34	82443	39000 Ohm 1/2 w. Resistor
R35	82443	39000 Ohm 1/2 w. Resistor
R36	82424	1000 Ohm 1/2 w. Resistor
R37	81122	135 Ohm W.W. Resistor
R38	82412	100 Ohm 1/2 w. Resistor
R39	82412	100 Ohm 1/2 w. Resistor
R40	82412	100 Ohm 1/2 w. Resistor
R41	305068	10 Ohm W.W. Potentiometer
R42	82448	.1 Megohm 1/2 w. Resistor
R43	82712	10000 Ohm 1 w. Resistor
R44	82813	10000 Ohm 2 w. Resistor
R45	82453	.27 Mehohm 1/2 w. Resistor
R46	82424	1000 Ohm 1/2 w. Resistor
R47	82424	1000 Ohm 1/2 w. Resistor
S1	300152	P.U. Socket
S2	12034	Mute Socket
S3	84201	Speaker Socket
S4	84265	Volume Control Socket
SW1	305025	Treble Switch
SW2	305026	Bass Switch
SW3	305030	Speaker Switch
T1	305010	Power Transformer
T2	305012	Output Transformer
T3	305064	Filament Transformer
TS1	305009	Remote Speaker Terminal Strip

ADDITIONAL PARTS LIST - ITEMS NOT SHOWN ON SCHEMATIC DIAGRAM

Part No.	Description
305029	Escutcheon (Vol. Steps)
305027	Knob (Vol. Steps)
300074	Escutcheon (Tone Control)
300076	Bar Knob
300085	Grid Clip
10876	Grid Cap Shield
84220	Octal Socket
602046	Tube Clamp (5U4G and 1619)
301162	Bass Choke Shield

Part No.	Description
300061	Fuse Receptacle
10832	Electrolytic Mtg. Plate
305002	Vol. Control Bracket
302047	Vol. Control Key
10062	1 Lug Terminal Strip
10079	2 Lug Terminal Strip
10082	4 Lug Terminal Strip
10080	5 Lug Terminal Strip

WIRED SELECTION RECEIVER
TYPE WSR5-L6

INDEX

SEEBURG

WIRED SELECTION RECEIVER

TYPE WSR5-L6

The Wired Selection Receiver, Type WSR5-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 M100B 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

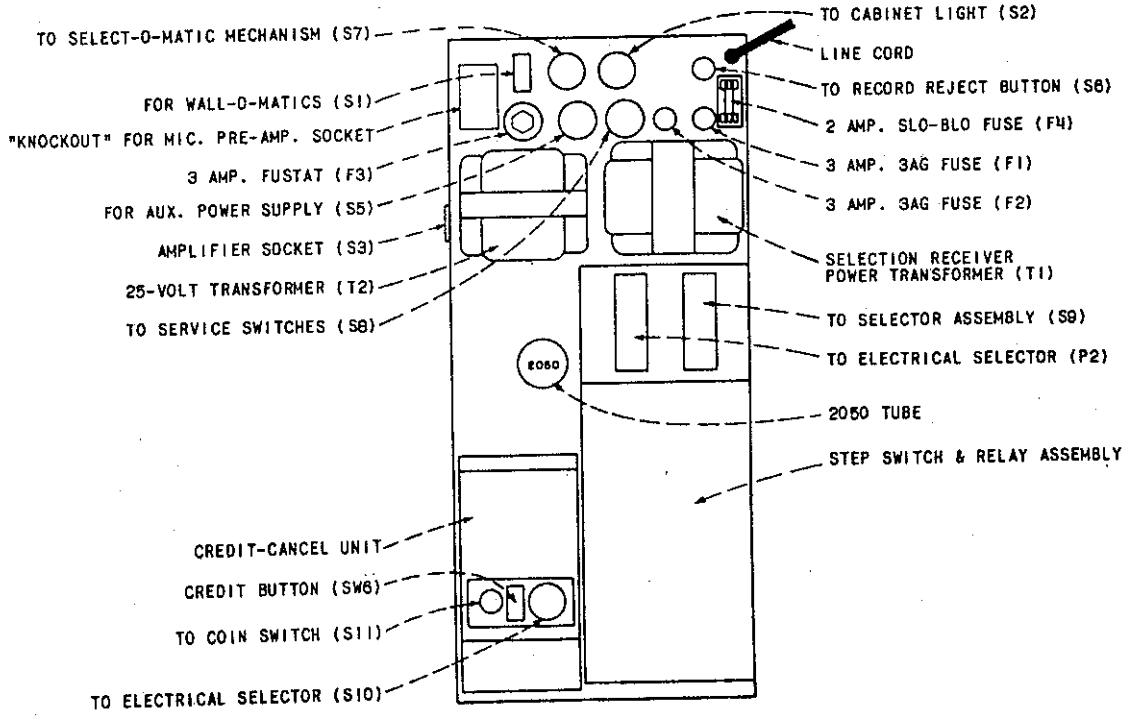


FIGURE 1. TOP VIEW OF SELECTION RECEIVER

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 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-2

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 "ES6-L6", beginning on page 3039.

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

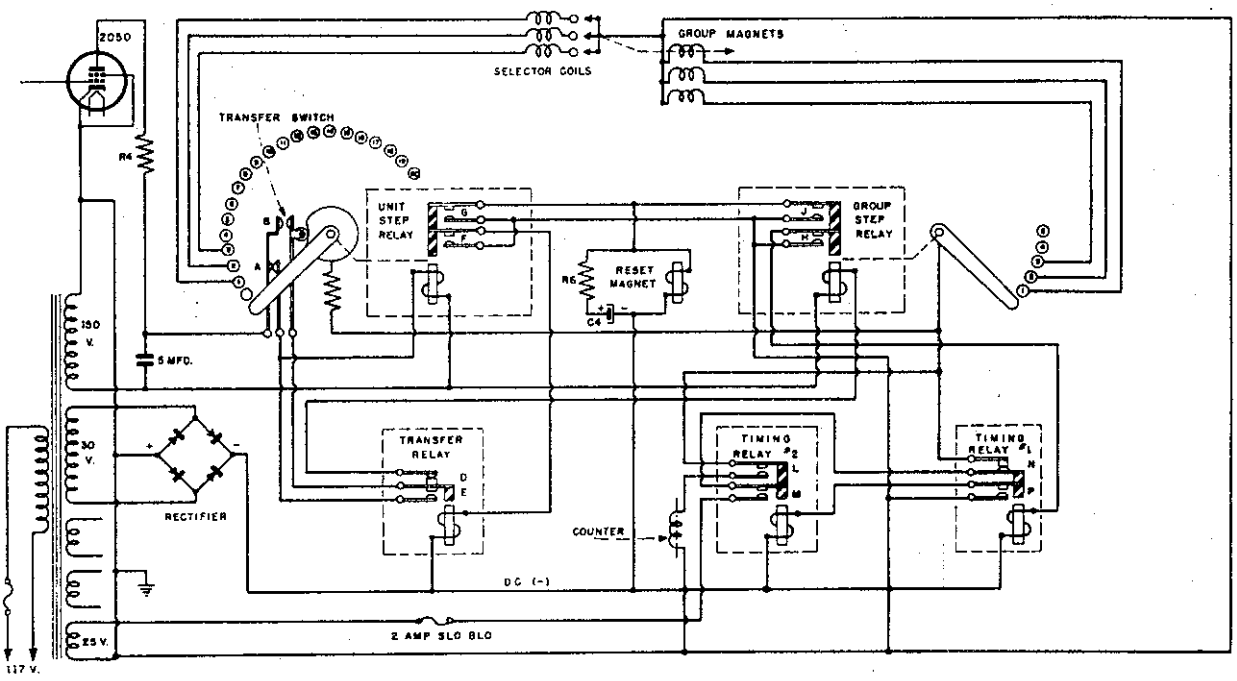


FIGURE 2. SIMPLIFIED SCHEMATIC DIAGRAM - STEP SWITCH ASSEMBLY

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.

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 #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 #1 Timing Relay is energized Contact "N" opens and Contact "P" closes. Contact "P" closes the d.c. circuit to the #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 advanced position; the Timing Relays #1 and #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 #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 #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 #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.

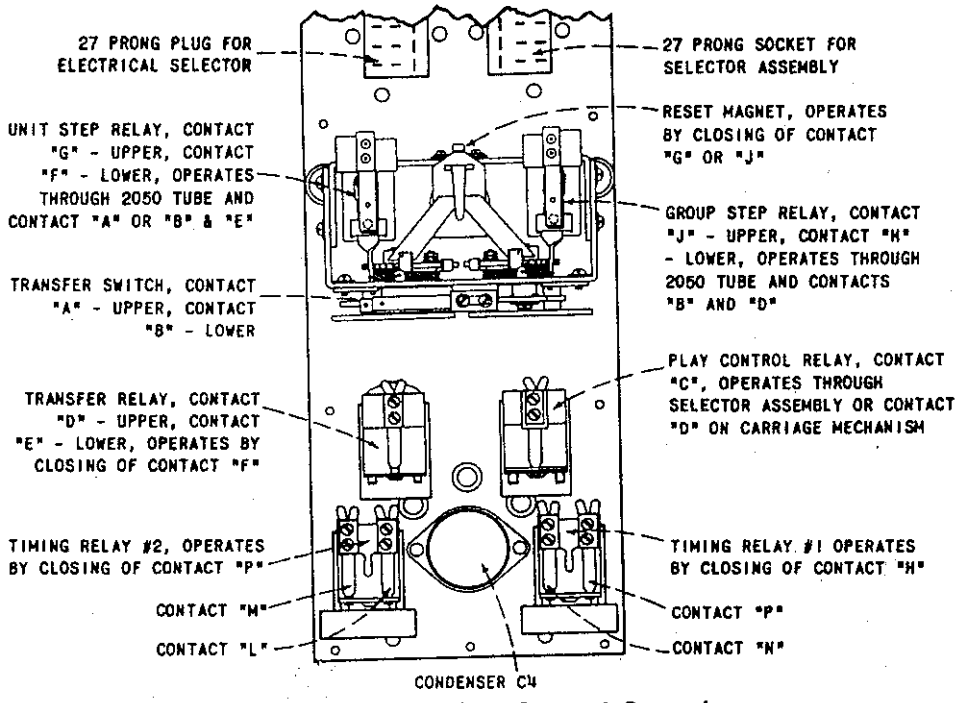


FIGURE 3. TOP VIEW OF STEP SWITCH & RELAY ASSEMBLY

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 5085			

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.

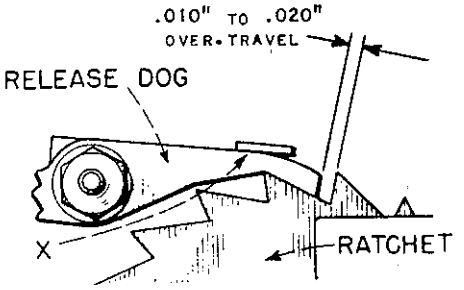


FIGURE 5. SIDE VIEW - RELEASE DOG & RATCHET

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".

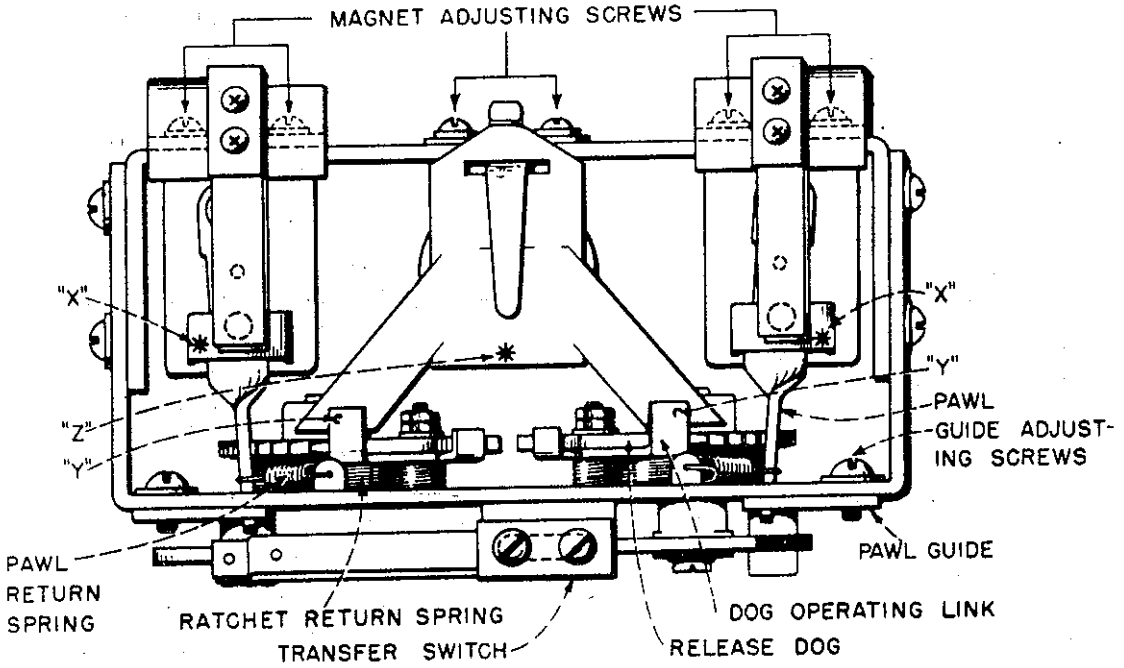


FIGURE 4. TOP VIEW OF STEP SWITCH ASSEMBLY

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.

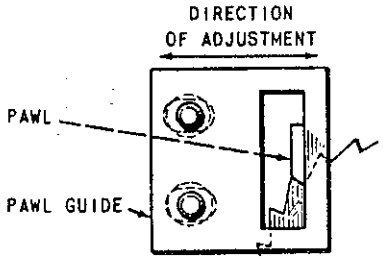


FIGURE 6. PAWL GUIDE POSITION

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.

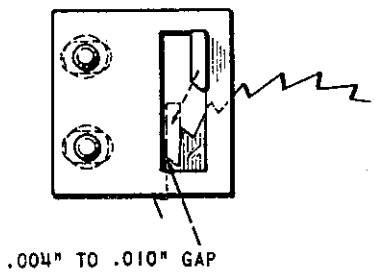


FIGURE 7. PAWL & GUIDE GAP

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.

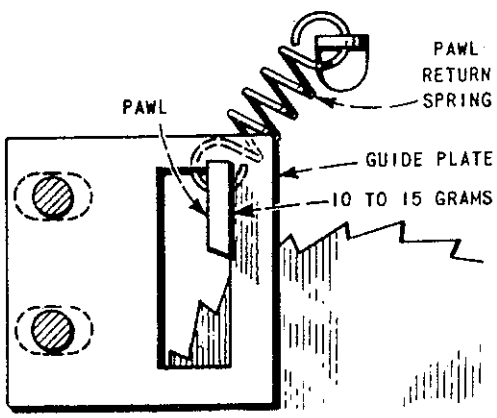


FIGURE 8. RETURN SPRING TENSION

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.

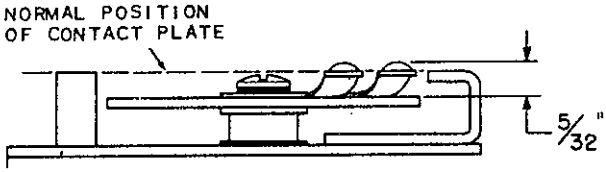


FIGURE 9. SWITCH BLADE POSITION

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.

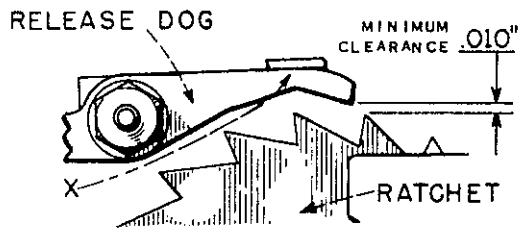


FIGURE 10. RELEASE DOG CLEARANCE

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.

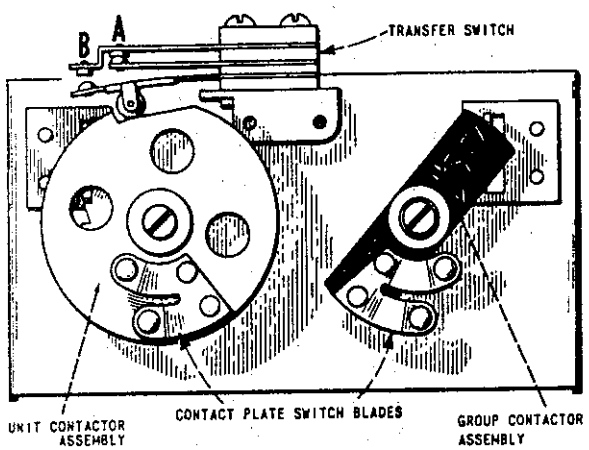


FIGURE 11. SIDE VIEW - TRANSFER SWITCH

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 SAE #10 oil. (Do not use a vegetable base 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.

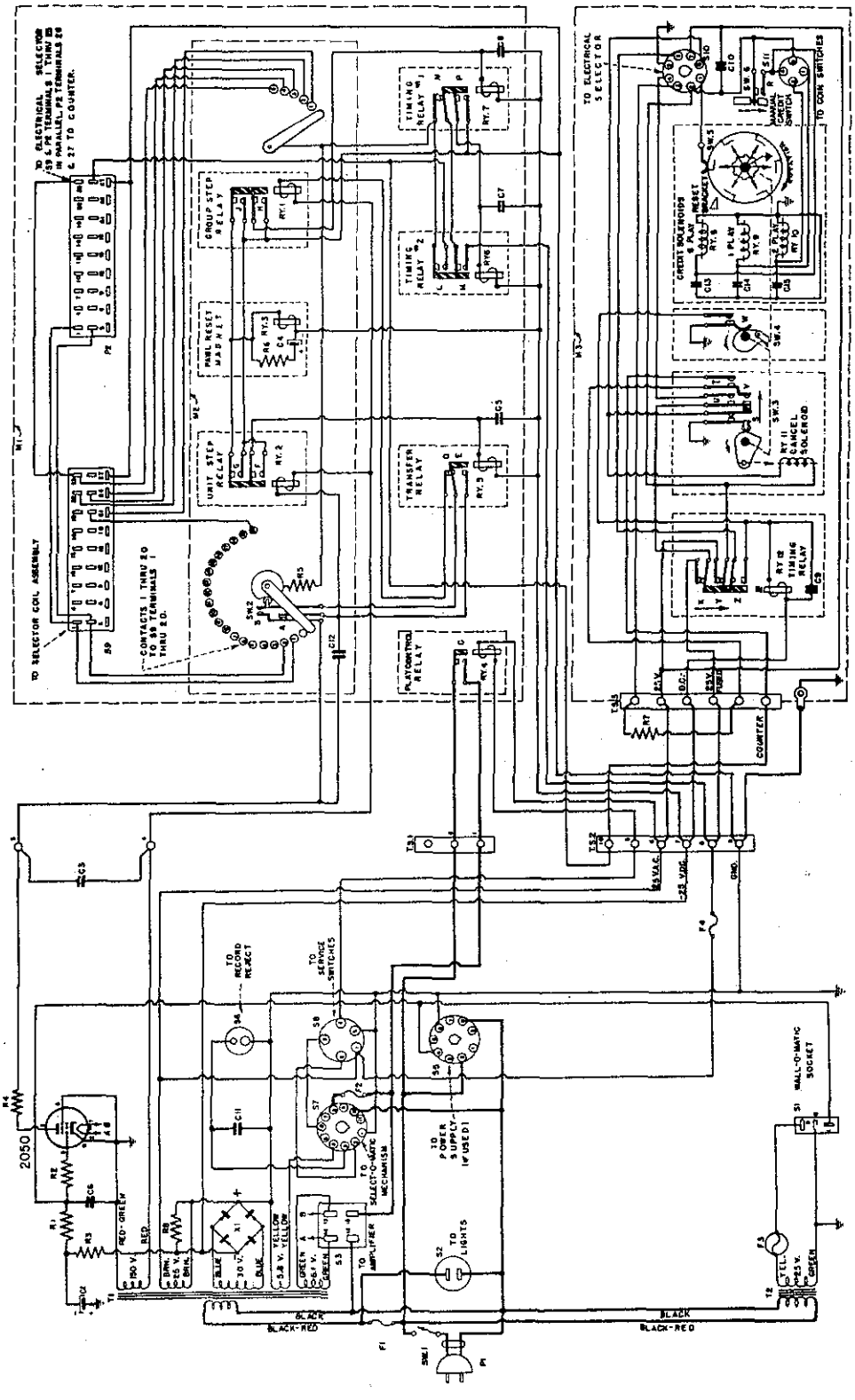


FIGURE 12. SCHEMATIC DIAGRAM

PARTS LIST on Reverse Side

PARTS LIST FOR FIGURE 12, PAGE 5087

Item	Part No.	Description
C1	87571	25 mfd. 50 v. Electrolytic
C3	11076	5.0 mfd. 300 v. Condenser
C4	87583	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
C11	86008	.1 mfd. 200 v. Condenser
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
F1	303257	3 amp. Fuse, 3AG
F2	303257	3 amp. Fuse, 3AG
F3	301205	3 amp. Fuse, Fustat
F4	303087	2 amp. Fuse, Slo-Blo
M1	303283	Step Switch & Relay Assembly
M2	303063	Step Switch Assembly
M3	400910	Credit & Cancel Assembly
P1	303089	Line Cord & Plug Assembly
P2	303080	27-Prong Plug
R1	82448	.1 meg 10% 1/2 w. Resistor
R2	82436	10,000 ohm 10% 1/2 w. Resistor
R3	82444	47,000 ohm 10% 1/2 w. Resistor
R4	82764	47 ohm 10% 1 w. Resistor
R5	81141	1 ohm W.W. 5 w. Resistor
R6	82403	18 ohm 10% 1/2 w. Resistor
R7	81141	1 ohm W.W. 5 w. Resistor
R8	82432	4700 ohm 10% 1/2 w. Resistor
RY1	303097	Group Step Relay
RY2	303098	Unit Step Relay
RY3	303065	Pawl Release Magnet
RY4	303077	Play Control Relay
RY5	303074	Transfer Relay
RY6	303255	Timing Relay #2
RY7	303075	Timing Relay #1
RY8	400509	Credit Solenoid
RY9	400509	Credit Solenoid
RY10	400509	Credit Solenoid
RY11	400567	Cancel Solenoid
RY12	400571	Relay Assembly
S1	12006	3 Contact Socket
S2	11401	A.C. Socket
S3	301020	4 Contact Socket
S5	84244	9 Contact Socket
S6	301019	2 Contact Socket
S7	303253	11 Contact Socket
S8	84283	5 Contact Socket
S9	11202	27 Contact Socket
S10	84220	Socket (Octal)
S11	400938	Socket (Small 4 Contact)
SW1	F1349	Toggle Switch
SW2	303099	Transfer Switch
SW3	400960	Cam Switch Assembly
SW4	400589	Timing Relay Switch
SW5	400924	Credit Switch
SW6	400572	Manual Credit Switch
T1	303083	Power Transformer
T2	301315	25 v. Transformer
TS1	11358	Terminal Strip
TS2	11041	Terminal Strip
TS3	400596	Terminal Strip
X1	400587	Selenium Rectifier

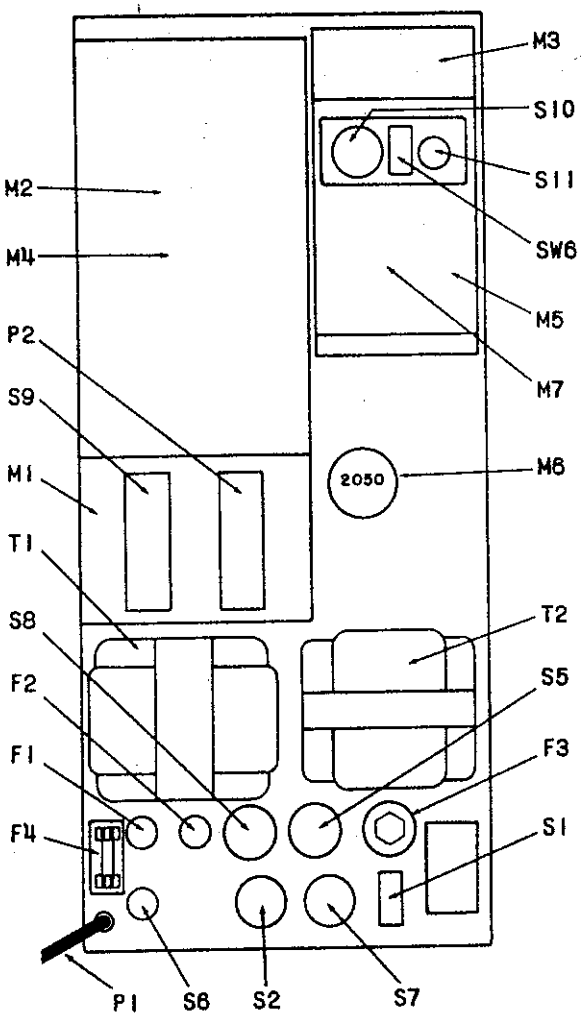


FIGURE 13.

PARTS LIST

Item	Part No.	Description
F1	303257	3 amp. 3AG Fuse
	300061	Fuse Receptacle
F2	303257	3 amp. 3AG Fuse
	300061	Fuse Receptacle
F3	301205	3 amp. Fustat
	303090	Fustat Receptacle
F4	303087	2 amp.3AG Slo-blo Fuse
	304141	Fuse Block
M1	303283	Step Switch & Relay Assembly
M2	303254	Adjustment Label
M3	400910	Credit & Cancel Assembly
M4	303256	Cover
M5	400580	Cover
M6	84220	Octal Socket, 2050
M7	400951	Adjustment Label
P1	303113	Line Cord & Plug
P2	303080	27-contact Plug
S1	12006	3-contact Socket
S2	11401	A.C. Socket
S5	84244	9-contact Socket
S6	301019	2-contact Socket
S7	303253	11-contact Socket
S8	84283	5-contact Socket
S9	11202	27-contact Socket
S10	84220	Octal Socket
S11	400938	Small 4-contact Socket
SW6	400572	Manual Credit Switch
	400536	Button
	10377	Shoulder Screw
	72236	Spring Tension Washer
T1	303083	Power Transformer
T2	301315	25-volt Transformer

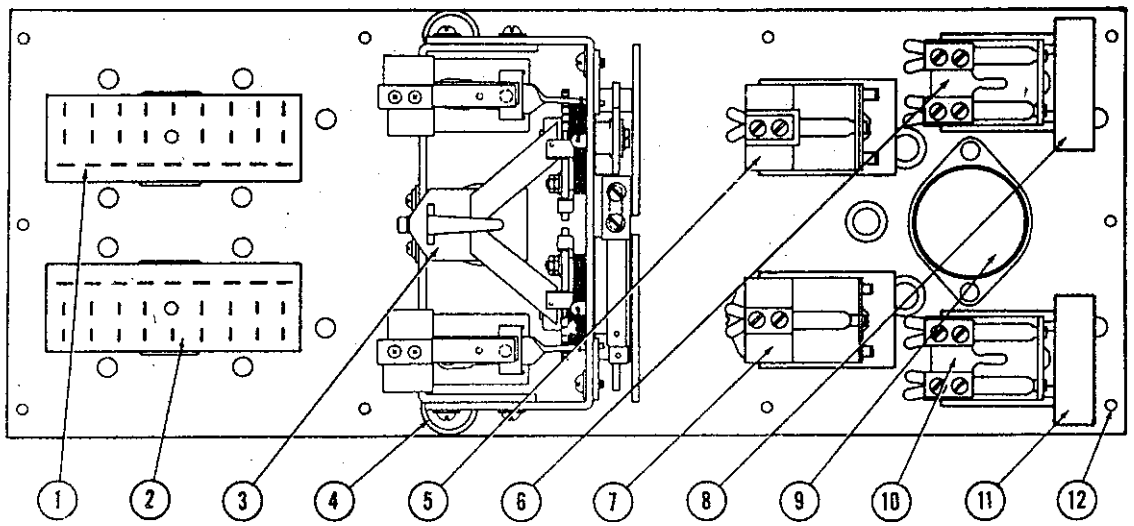


Figure 14. #303283 Step Switch & Relay Assembly

P A R T S L I S T

Item	Part No.	Description
1	11202	27-contact Socket (S9)
2	303080	27-contact Plug (P2)
3	303063	Step Switch Assembly (M2)
4	10848	Cup Washer
	78000	Grommet
5	303077	Play Control Relay (RY4)
	303128	Coil & Frame Assembly
	303127	Contact Assembly (C)
6	303075	Timing Relay #1 (RY7)
	303094	Coil & Frame Assembly
	303093	Contact Assembly (N)
	303092	Contact Assembly (P)
7	303074	Transfer Relay (RY5)
	303130	Coil & Frame Assembly
	303129	Contact Assembly (D & E)
8	86009	.05 mfd. 200 v. Condenser (C8)
9	87583	300 mfd. 50 v. Electrolytic (C4)
10	303255	Timing Relay #2 (RY6)
	303096	Coil & Frame Assembly
	303095	Contact Assembly (M)
	303095	Contact Assembly (L)
11	86009	.05 mfd. 200 v. Condenser (C7)
12	76046	#6 x 1/4" Slotted Hex. Head Self-tapping Screw, Type I

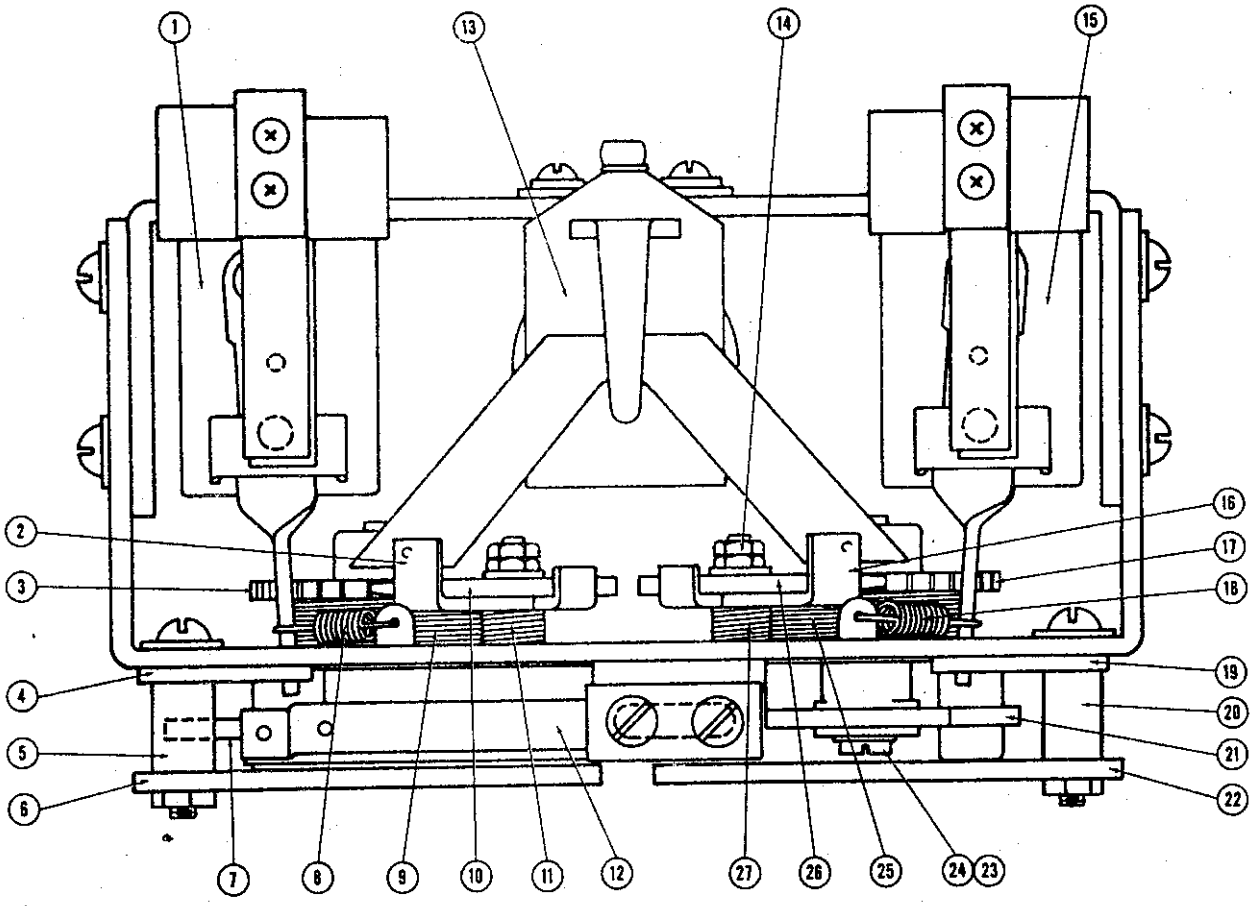
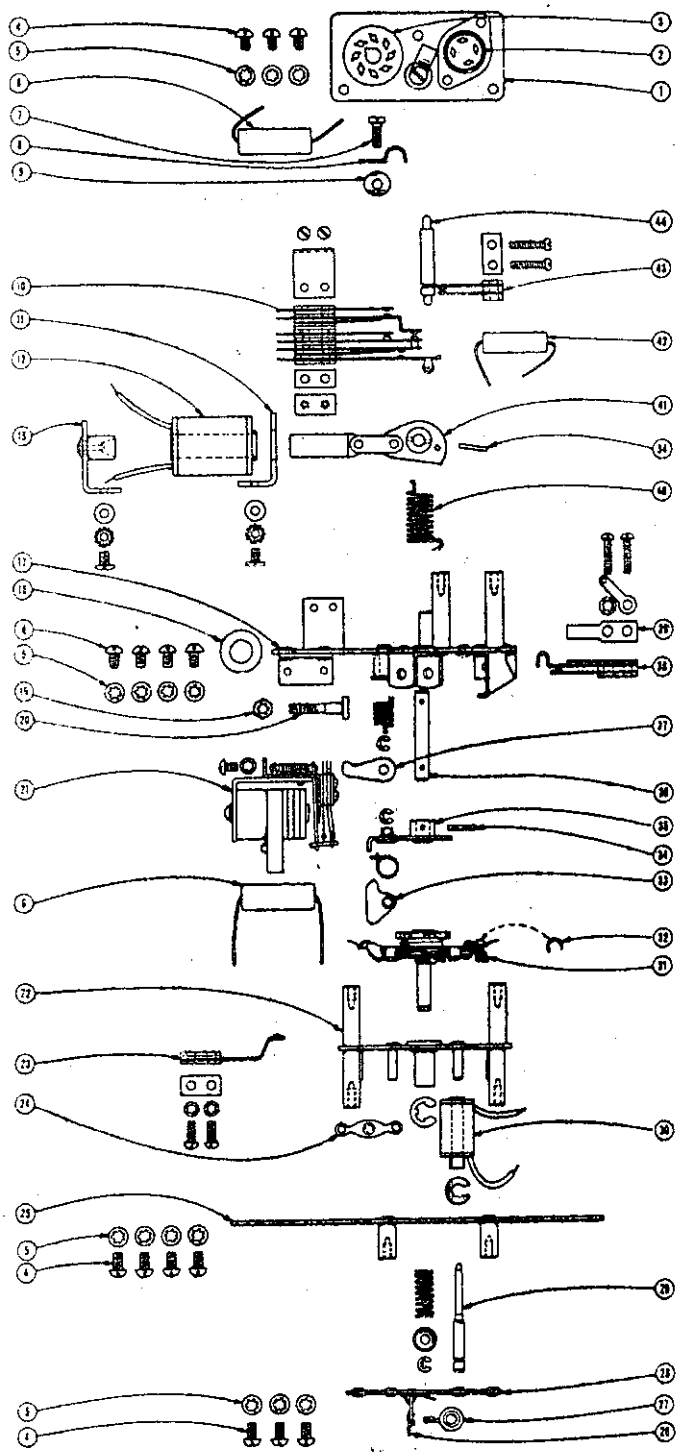


FIG. 15. #303063 STEPPER ASSEMBLY

PARTS LIST

Item	Part No.	Description
1	303098	Unit Stepper Relay (Includes 303064, 303100, 303102)
	303064	Magnet & Frame Assembly
	303100	Armature Assembly
	303102	Tail Spring
	303066	Switch Assembly (Contact G and F)
	303175	Switch Mounting Screws (3-48 x 15/16)
	303176	Switch Mounting Bracket
2	303177	Dog Operating Link
3	303179	Ratchet and Shaft
4	303187	Pawl Gate
5	303188	Contact Plate Spacer
6	303069	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	303065	Pawl Release Magnet, complete
	303103	Tail Spring, only
14	303185	2-56 Hex. Nuts
	303186	#2 Washers (under nuts)
15	303097	Group Stepper Relay (Includes 303067, 303101, 303102)
	303067	Magnet and Frame Assembly
	303101	Armature Assembly
	303102	Tail Spring
	303066	Switch Assembly (Contact J and H)
	303175	Switch Mounting Screws (3-48 x 15/16)
	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	303070	Contact Plate
23	303184	Contactor Mounting Washer
24	303183	Contactor Mounting Screw
25	303105	Return Spring
26	303181	Dog
27	303108	Dog Spring



Item	Part No.	Description
1	400936	Socket Mtg. Plate Assembly
2	400938	4-prong Socket
	400954	Socket Retainer
3	84220	8-prong Socket
4	71001	8-32 x 1/4 R.H. Mach. Screw
5	73082	Lock Washer
6	86009	.05 mfd. 200 v. Paper Condenser
7	10377	Shoulder Screw
8	A250952	Cable Clamp
9	72236	Spring Tension Washer
10	400960	Cam Switch
	71198	5-40 x 1-1/4 Screw
	400601	Spacer
	400597	Tension Plate
	F200028	Tapped Sw. Cap
11	400570	Solenoid Bracket
	71464	8-32 x 1/4 B.H. Mach. Screw
	73090	Lock Washer
	72191	Flat Washer
12	400567	Cancel Solenoid
15	400958	Solenoid Bracket & Stop Assem.
17	400955	Panel Assembly
18	78016	Rubber Grommet
19	70003	10-32 Hexagon Nut
20	400540	Pawl Arm Stop
21	400571	Timing Relay
	400614	Coil & Field Piece Assembly
	400613	Tail Spring
	400612	Contact & Armature Assem. (Contacts X, Y, Z)
22	400920	Coin Solenoid Panel Assem.
23	400507	Wiper Switch Assembly
	400597	Tension Plate
	71678	5-40 x 3/8 R.H. Mach. Screw
24	74019	Solder Lug
25	400511	Mtg. Panel & Spacer Assem.
26	400596	Terminal Strip
27	81141	1 ohm W.W. Resistor
28	400588	Retainer Plate Assembly
29	400959	Solenoid Plunger Assembly
	400518	Compression Spring
	400603	Cup Washer
	R231163	Retaining Ring
30	400509	Solenoids, Credit
	11445	"C" Washer
31	400924	Credit Switch
	125403	Retaining Ring
	72293	Phos. Bronze Spring Washer
32	504142	Credit Switch Spring
33	400553	Pawl Assembly
	400556	Pawl Spring
	R231163	Retaining Ring
34	80098	Pin
35	400549	Pawl Arm Assembly
36	400929	Shaft
37	400542	Lock Pawl
	400545	Lock Pawl Spring
	R231163	Retaining Ring
38	400589	Timing Relay Switch
	71676	5-40 x 7/16 R.H.Mach. Screw
	73116	Lock Washer
	74047	Solder Lug
39	400611	Buffer Blade, only
40	400557	Cam Spring
41	400931	Cam & Plunger Assembly
42	86173	.01 mfd. 200 v. Paper Condenser
43	400572	Manual Credit Switch
	400597	Tension Plate
	71233	5-40 x 5/8 F.H. Mach. Screw
44	400536	Manual Credit Button
	400580	Cover Assembly (Not Shown)
	400951	Contact Instruction Label (Not Shown)

FIG. 16. CREDIT & CANCEL ASSEMBLY