SEEBURG

TORMAT ELECTRICAL SELECTOR

TYPE TES1-L6

Seeburg

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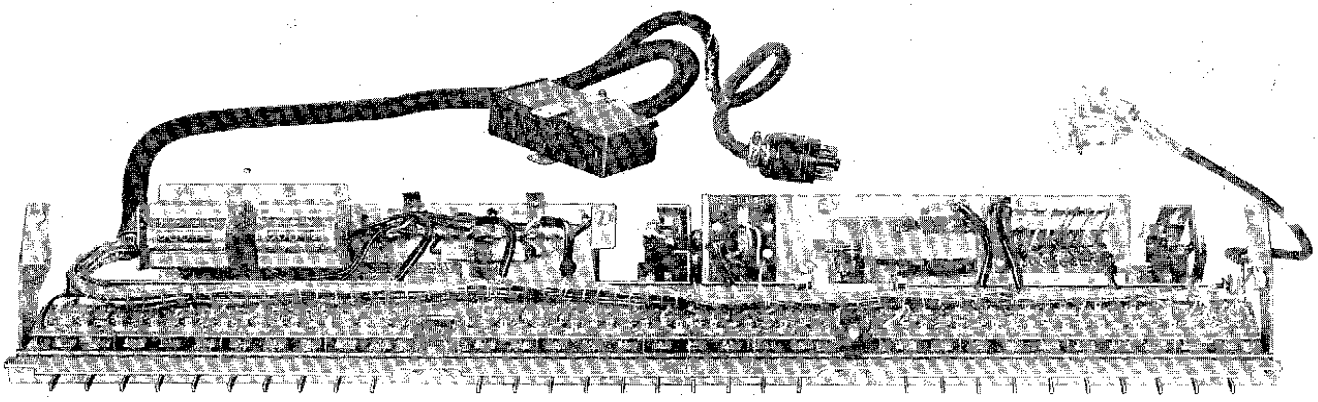


The Tormat Electrical Selector, Type TES1-L6, is an assembly with three in-line selector switch assemblies of ten switches each. It is designed for use with the Select-O-Matic "200" Model V-200 and is operated from a selector key panel having a row of twenty lettered keys and a row of ten numbered keys. The selector panel is not a part of the Tormat Electrical Selector but is part of the phonograph cabinet assembly.

The Selector is a part of the Seeburg Tormat Selection Memory System and Dual Credit System which includes the Tormat Memory Unit on the Select-O-Matic Mechanism and the Tormat Selection Receiver. Its principal functions are to connect a letter and a number circuit of the Tormat Memory Unit into a selection write-in circuit and to complete a circuit that initiates the operational sequence of the system. These functions are performed when two of the selection switches are operated by pressing a lettered selector key and a numbered key. The keys may be operated in either sequence – first a numbered key, then a lettered key or a lettered key followed by a numbered key.

The component parts of the Selector are assembled on a steel frame and are protected by a steel cover. The complete Selector may be easily removed from the cabinet; however, all switch contacts and adjustments are accessible without doing so. All electrical connections to the associated Tormat Memory Unit and to the Selection Receiver are made with a 12-prong plug and a 33-prong plug that connect to sockets in the Receiver.

The principal component parts of the Selector include, in addition to the three selection switch assemblies, a latch bar operating solenoid, three credit indicating lights, a selection pricing terminal board and two switch groups each of which has two pairs of contacts. There are also two counters one of which totals the number of selections made at the two-credit-unit rate and one that totals the number of selections made at the three-credit-unit rate. The counter totals include selections made with remote control Wall-O-Matics as well as those made with the Electrical Selector.

The credit indicating lights are extended on their connecting leads so they illuminate the selection and credit information windows that are in the cabinet frame casting at the right of the selector key panel. They are 6-volt lamps operated at 25 volts through resistors and connect to an add-and-subtract credit switch that is part of the Dual Credit Unit in the selection receiver. One of the lights is turned on only when the credit switch is in one-credit position. A different light is turned on only when there are two credit units available for selection and the third light is lighted when there are three or more credit units available for selection. The credit window light switchboard identified in *Figure 2* may be arranged to change this one-two-three pattern so the first light indicates when only one credit unit is set up, the second light referred to does not operate at any time and the third light is turned on when two or more credit units are available.

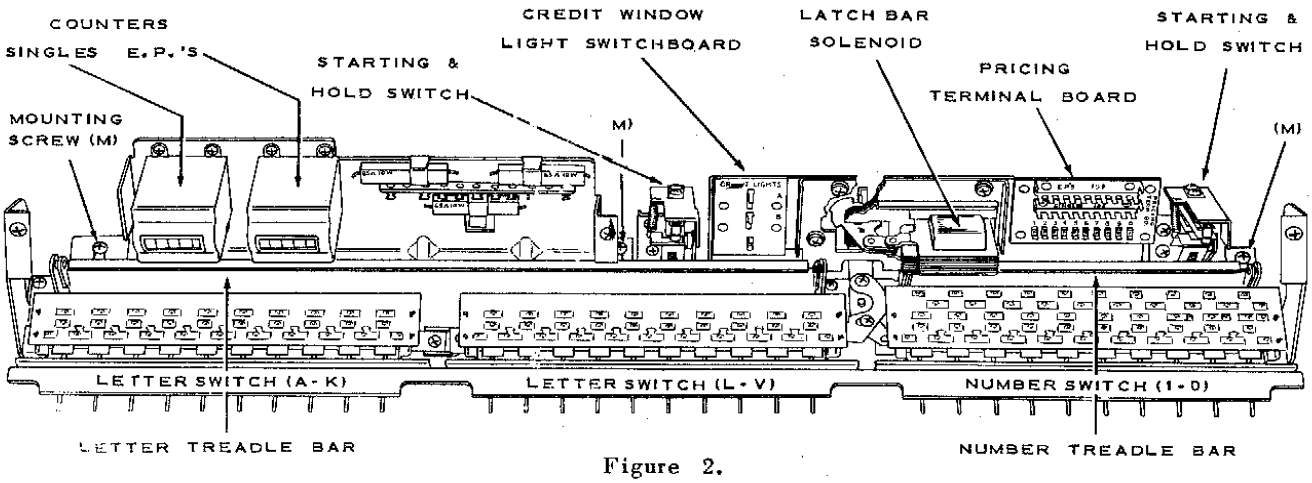


Figure 2.

The three selection switches each incorporate a latch bar and ten selector switches. These switch assemblies are not interchangeable. The two associated with the lettered keys and circuits are identical in contact arrangement and dimension but their latch bars are not the same. The switch assembly associated with the numbered keys and circuits differs from the "letter switches" in that it includes contacts and circuits for starting the operation sequence as well as control of circuits of the Tormat Memory Unit

The latch bar function is to hold a selection switch (and selector key) in the pressed-in position when a selection is being made and to release it when the selection operation sequence is completed. The bars in the two letter switch assemblies are coupled end-to-end so they operate as a single continuous bar. The latch bar of the number switch is independent of the letter switches but the bars in both letter and number switches are linked to and controlled by the latch bar solenoid. The linkage between the solenoid and the bars is spring biased so the bar position permits free in-and-out movement of the selection switches when the solenoid is not energized. When the solenoid is energized, the bars move to a position in which they will hold a pressed-in switch in the operated position however, the bars are designed so a latched-in switch will be released if another switch in same number or letter switch group is pressed in. The solenoid is energized when there are two or more credits set up in the Dual Credit Unit.

The shafts or stems of the selector switches extend through the switch frame. They operate a treadle bar when a selector key is pressed and the treadle bar, in turn, operates a switch group consisting of a spring-leaf switch and a snap-action, over-center switch. One of the two switch groups is associated with the numbered switches and operates when any numbered selector key is pressed. The other operates when any lettered key is pressed.

The two spring-leaf switches in the two switch groups are parallel connected and are part of a timing relay holding circuit that is completed through interlocking contacts on the relay when any one of the thirty selector keys is pressed. These switches are the Hold Switches, contacts U and W.

The snap-action switches are the Starting Switches, contacts V and Z. They are series connected and, together, are part of a circuit that includes a Subtract Solenoid in the Dual Credit Unit of the Selection Receiver. When a letter key and a number key are pressed, the starting switches complete the circuit to the subtract solenoid which, when energized, closes switch contacts that control the power to the Tormat Memory Unit, the selection counters and the timing relay. They also close, momentarily, the circuit for a scan control solenoid that, in turn, controls, through a play control relay, the power to the phonograph amplifier and the mechanism motor.

There are two subtract solenoids in the Dual Credit Unit. One, when energized, moves the add-and-subtract credit switch two credit units toward the no-credit or zero position. The other solenoid subtracts three credit units when energized. The connections that are pre-set at the selection pricing terminal board in the Selector determines which subtract solenoid will be energized when selection is made.

The pricing terminal board consists of two ten-point terminal strips and ten flexible leads. One end of each of the leads connects to the start switches through one of the ten numbered selector switches and has at its other end a

TORMAT ELECTRICAL SELECTOR, TYPE TES1-L6

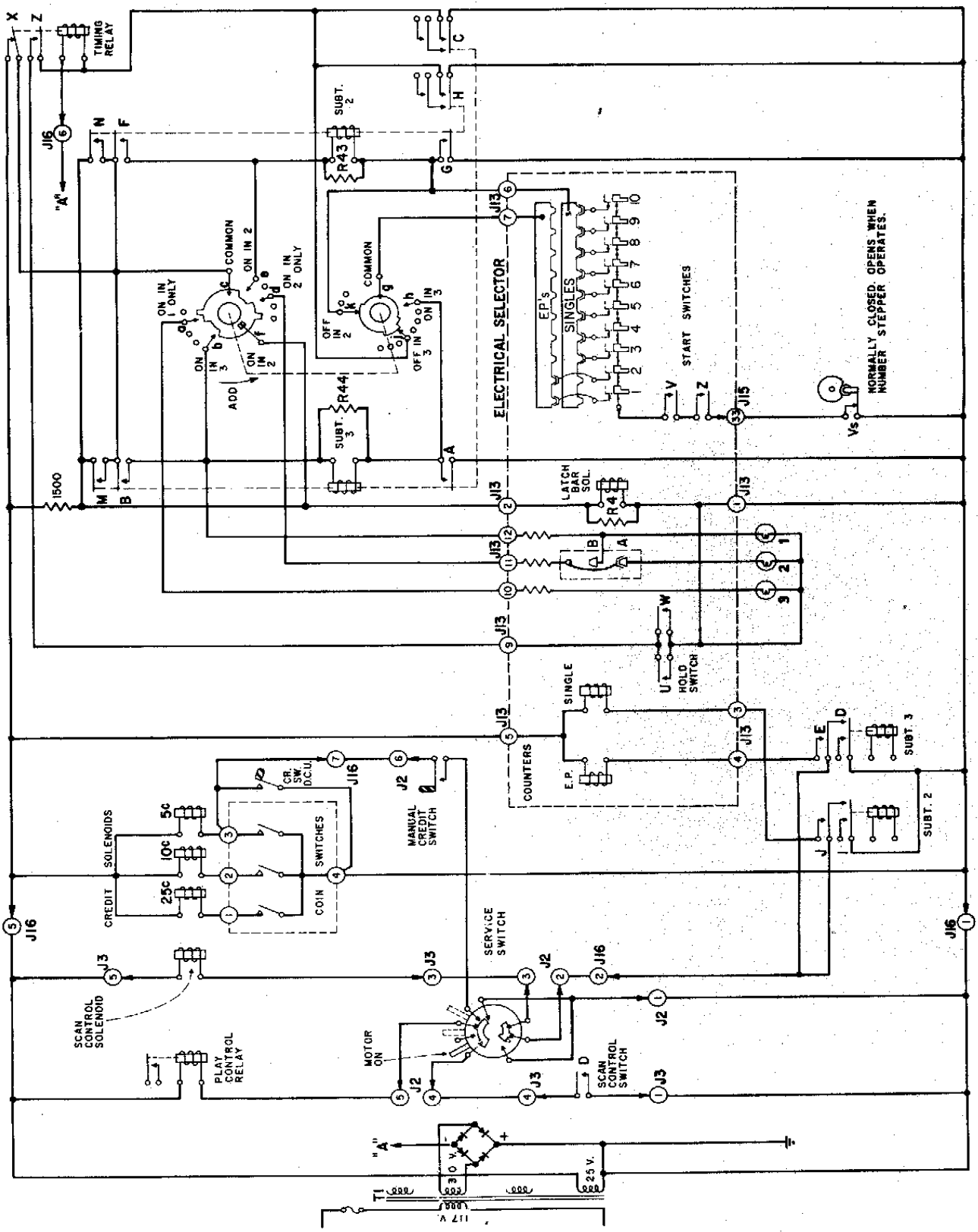


Figure 3.

push-on terminal for easy and simple connection to either of the two terminal strips. One terminal strip is marked "EP" and connects to the subtract-3 solenoid; the other strip, marked, "Singles", connects to the subtract-2 solenoid. When a selection is made by pressing a letter and a number key, the subtract-2 solenoid will operate and two credit units subtracted if the lead associated with the selected number switch is connected to the "Singles" terminal strip. There will be three credit units subtracted by the subtract-3 solenoid if the lead is connected to the "EP" strip. By choice of terminal strip connection any group of twenty record selections can be "sold" for either two or three credit units.

The 1500 ohm resistor shown adjacent to to contact M of the subtract-3 switch group in *Figure 3* passes a charging current of low value through the latch bar solenoid so residual magnetism will not hold the solenoid plunger in the energized position when the full-current circuit to the solenoid is opened.

The 100 ohm resistor connected across the latch bar solenoid coil minimizes contact arcing.

The circuits of the Selector are shown in the schematic, *Figure 5*. *Figure 3* shows these circuits in simplified form and in association with other parts of the system.

REMOVAL OF SELECTOR

All adjustments of the mechanical linkage, all switch adjustments and all circuits of the Selector are accessible for inspection and service without removing it from the cabinet. The entire unit may, however, be removed by pulling out the two connecting plugs at the end of the cable and taking out three screws that are at the back edge of the selector frame. These screws are identified at (M) in *Figure 2.*

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

LUBRICATION

Oil all pivots with one drop of Seeburg No. 53014 Select-O-Matic Special Purpose Oil. Use Aero Lubriplate sparingly as indicated in *Figure 4. (Aero Lubriplate and No. 53014 Oil is available from your Seeburg Distributor.)*

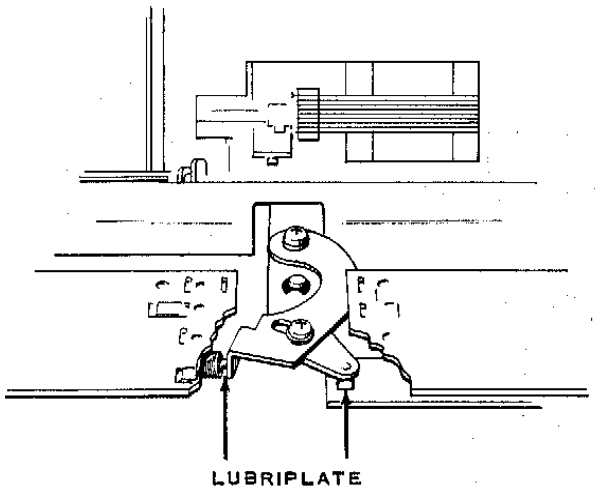


Figure 4.

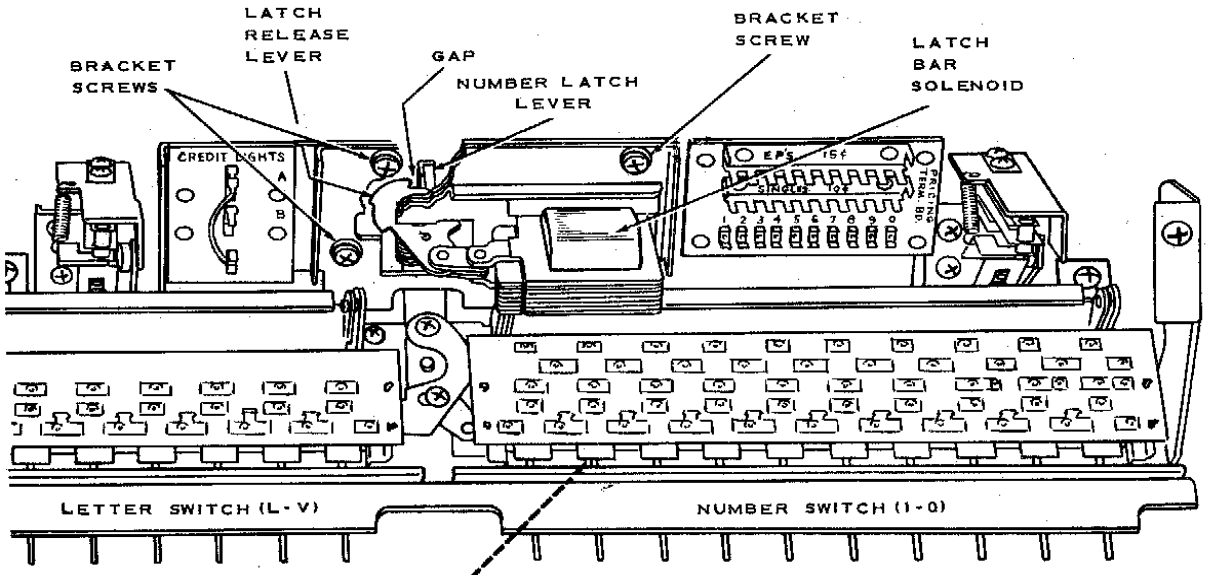
SELECTOR KEYS

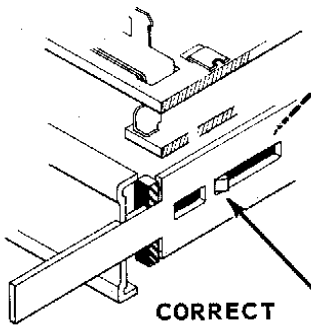
The individual selector keys pivot, at the upper end, on a projection in the key frame. They may be removed by swinging inward at the bottom after loosening the key bearing strip. The upper end of the keys are prevented from rattling by spring clips that extend under adjacent keys. The clips will be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

TORMAT ELECTRICAL SELECTOR, TYPE TES1-L6

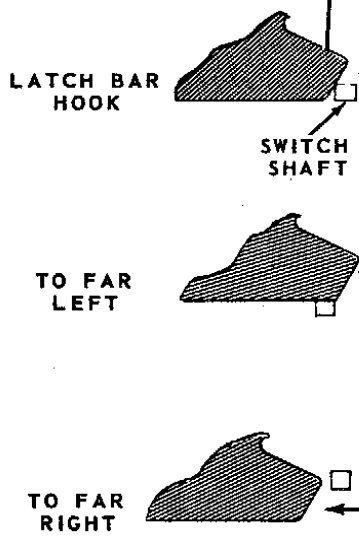
ADJUSTMENT NO. 1 – NUMBER SWITCH

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





NOTE: When making this adjustment the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be a 1/64" to 1/16" gap between the latch release lever and the number latch lever.



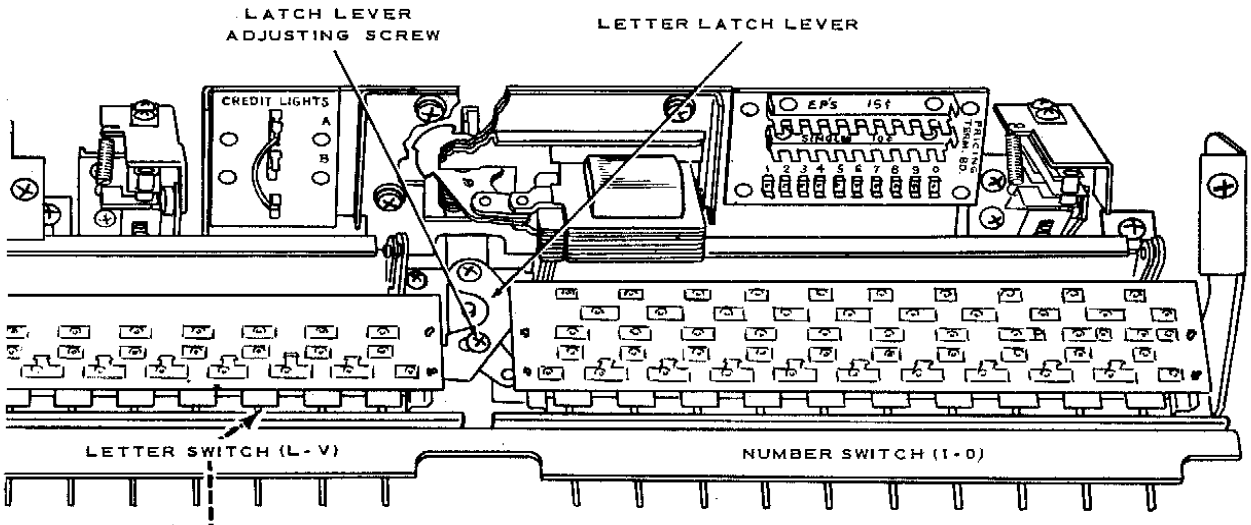
(A) Loosen the three screws holding the Latch Bar Solenoid Bracket and position the Solenoid so the shaft of a number selector switch, when pressed in will engage the latch bar at the mid-point of the sloping edge of the latch bar hook.

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

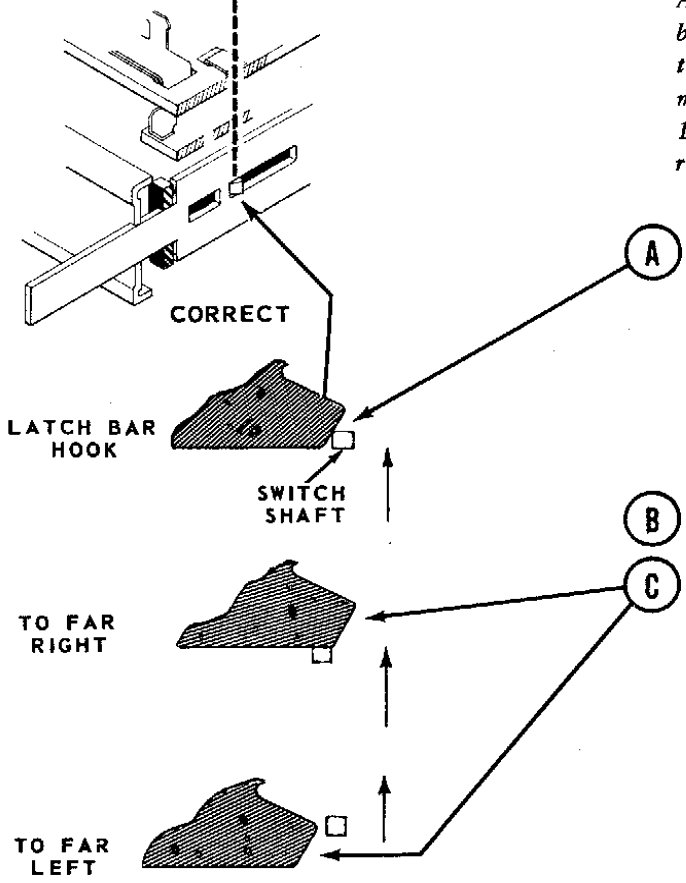
(C) After the correct position of the Latch Bar Solenoid has been made, the bracket holding screws must be securely tightened.

ADJUSTMENT NO. 2 – LETTER SWITCH L-V

This adjustment positions the latch bar of the L-V LETTER SWITCH so the lettered selector switches will operate in the same manner provided for the numbered switches in Adjustment No. 1.



NOTE: Before making this adjustment, Adjustment No. 1 must be correct, the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be 1/64" to 1/16" gap between the latch release lever and the number latch lever.



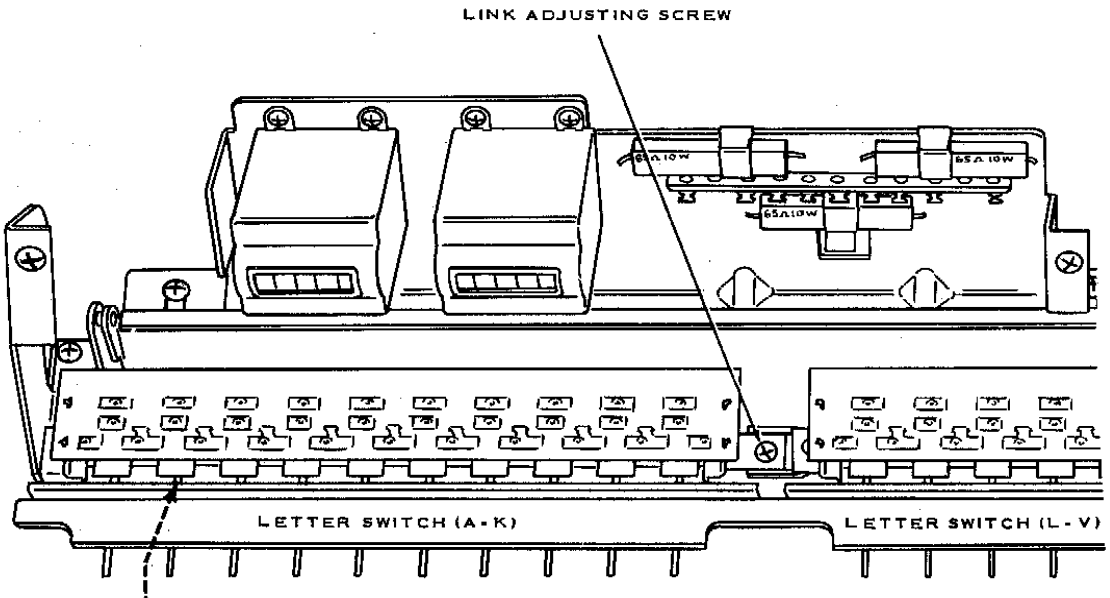
A Loosen the screw in the latch lever at the right-hand end of the L-V Letter Switch and, holding the latch bar at the left of the switch, position it so the lettered switch shafts (L to V), when pressed in, engage the latch bar at the mid-point of the latch bar hook.

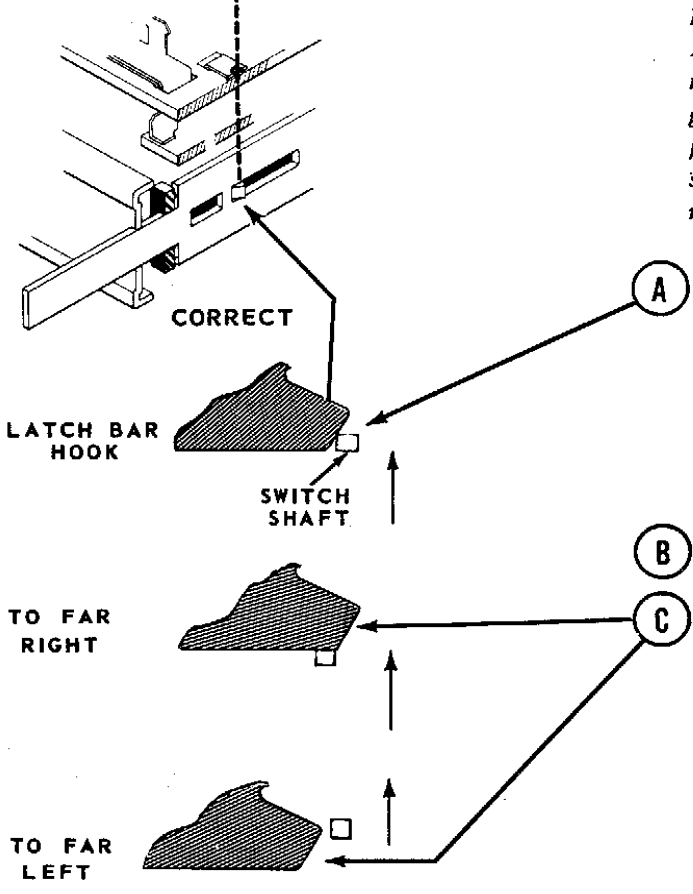
B Securely tighten the adjusting screw.

C Check this adjustment by pressing a number and letter (L to V) selector switch while manually holding the latch bar solenoid in the energized position, then slowly release the solenoid. The lettered and the numbered switches should release at the same time. If the letter latch lever is too far to the left, the lettered switch will release before the numbered switch; if the letter latch lever is too far to the right, the lettered switch will release after the numbered switch.

ADJUSTMENT NO. 3 – LETTER SWITCH A-K

This adjustment positions the latch bar of the A-K LETTER SWITCH so these lettered selector switches will operate in the same manner provided for the L-V LETTER SWITCH in Adjustment No. 2.





NOTE: Before making this adjustment, Adjustments No. 1 and 2 must be correct, the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be 1/64" to 1/16" gap between the release lever and the number latch lever.

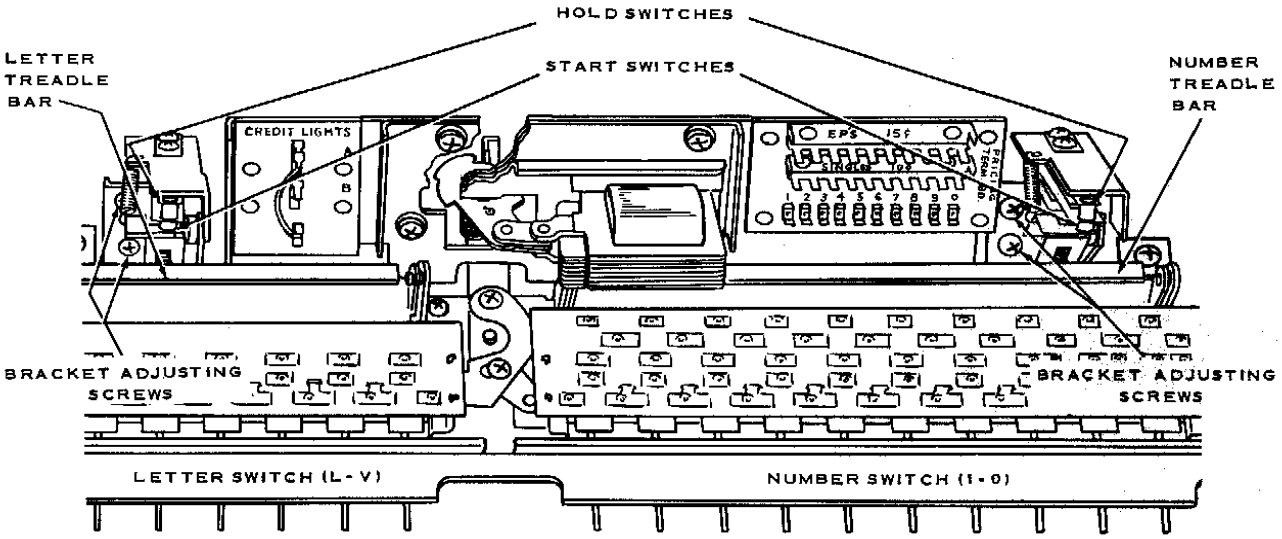
(A) Loosen the screw in the latch bar link between the A-K and the L-V letter switches and position the A-K switch latch bar so the A to K switch shafts, when pressed in, engage the latch bar at the mid-point of the latch bar hook.

(B) Securely tighten the adjusting screw.

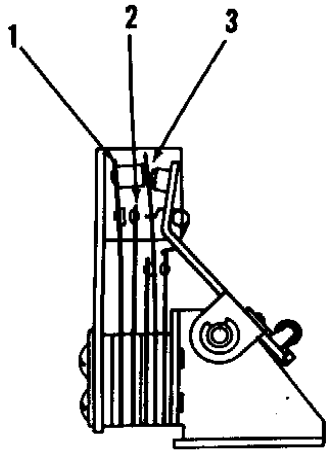
(C) Check this adjustment by pressing a lettered switch in the A to K group and one in the L to V group while manually holding the latch bar solenoid in the energized position, then slowly release the solenoid. Both lettered switches should release at the same time. If the A-K latch bar is too far to the left, the switch in the A-K group will release first; if the A-K latch bar is too far to the right, the switch in the L-V group will release first.

TORMAT ELECTRICAL SELECTOR, TYPE TES1-L6

START AND HOLD SWITCH ADJUSTMENT



NOTE: Check treadle bar operation before making adjustments. Rubber bumpers in bars should rest against selector switch frame when no selector key is pressed in.



The timing of operation of the snap action Start Switches is adjusted by positioning the brackets for the entire switch assembly. DO NOT ADJUST BY BENDING THE SNAP ACTION SWITCH BLADES.

A. Loosen the bracket holding screws and position the switches so the Start Switch contacts close when the selector switches have approximately 1/16'' more travel before latching by latch bars.

With all selector switches released and the treadle bar bumpers against the selector switches – –

B. Adjust Blade No. 1 so its fibre lift bears against Blade No. 3 approximately 2 oz. (50 grams).

C. Adjust Blade No. 2 for 1/32'' contact gap.

D. Readjust force of Blade No. 1 against Blade No. 3 so Blade No. 2 moves approximately blade thickness (1/64'') when contacts close.

E. Check operation: Hold Switch must close before Start Switch closes and open after Start Switch opens.

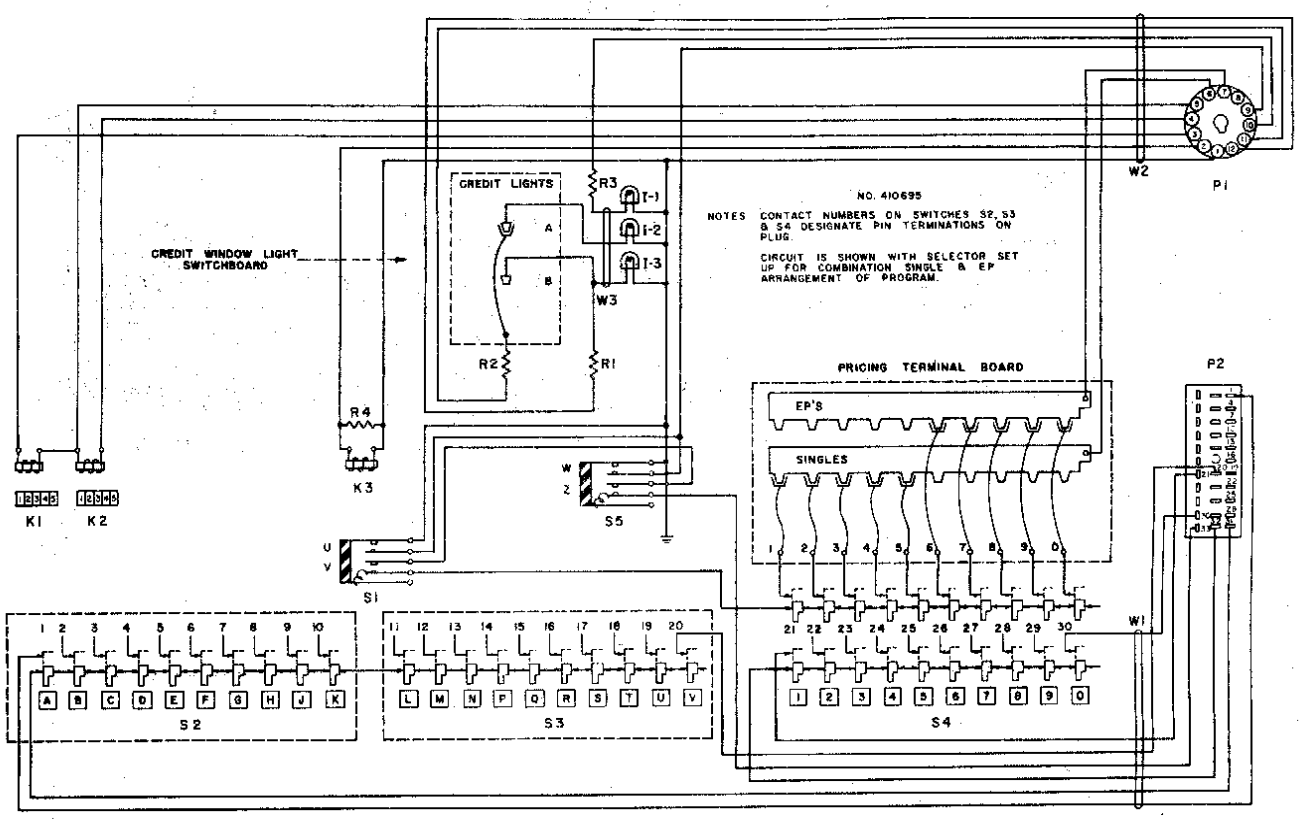
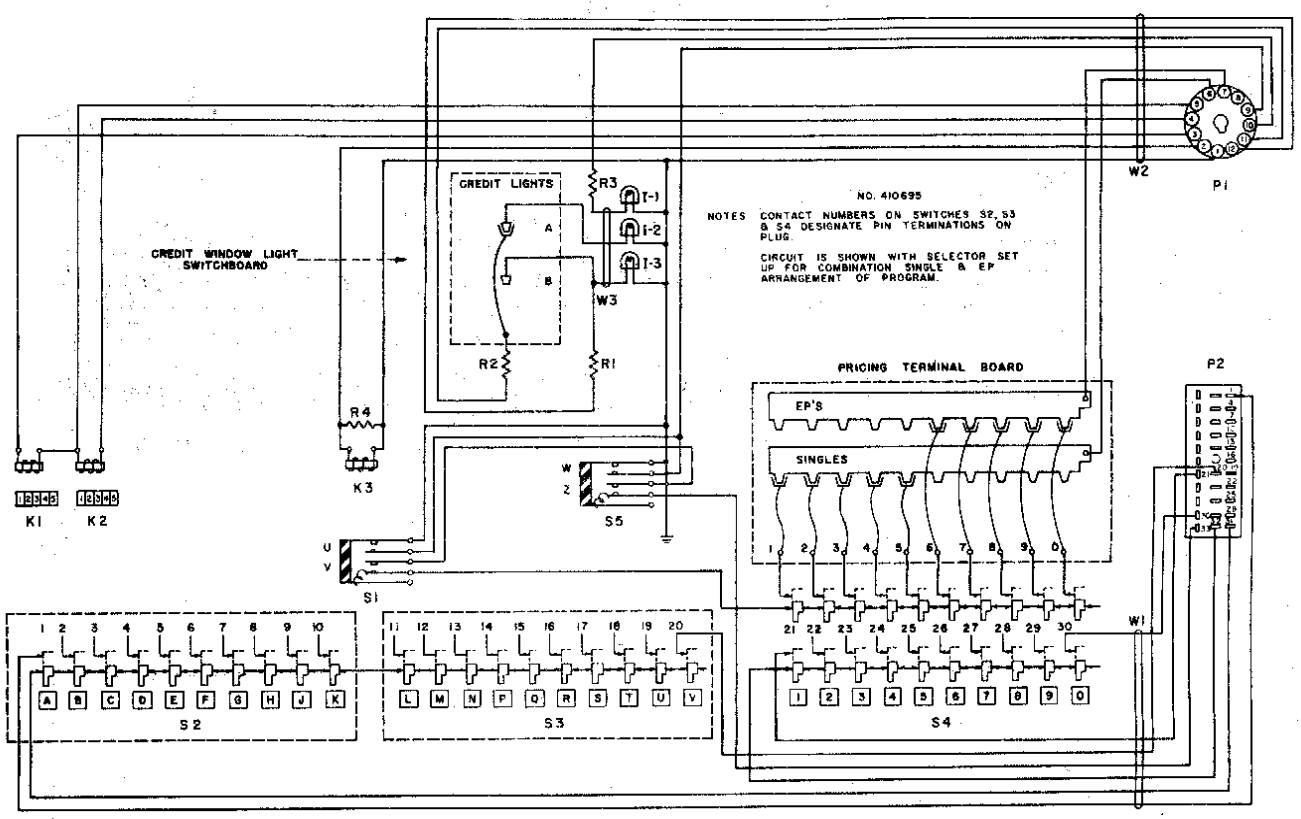


Figure 5.

PARTS LIST

Item	Part No.	Part Name
I-1, I-2, I-3	505173	Credit Lamp No. 55
K1	410593	Counter Assembly (Singles)
K2	410594	Counter Assembly (E.P.'s)
K3	410684	Latch Solenoid
P1	410707	12 Prong Octal Plug Assembly
P2	410573	33 Prong Plug Assembly y
R1, R2, R3	81178	Resistor, 65 Ohm, 10 Watt W.W.
R4	81183	Resistor, 100 Ohm, 10 Watt W.W.
S1	410650	Snap Switch & Actuator Bracket Assembly
S2	410616	Selector Switch (A- K)
S3	410617	Selector Switch (L- V)
S4	410618	Selector Switch (Number)
S5	410650	Snap Switch & Actuator Bracket Assembly
W1	410718	Matrix Cable
W2	410719	Control Cable
W3	410606	Credit Light Cable
	410716	Credit Window Light Switchboard Wired Assembly
	410706	Pricing Terminal Board Wired Assembly



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R1, R2, R3	81178	Resistor, 65 Ohm, 10 Watt W.W.
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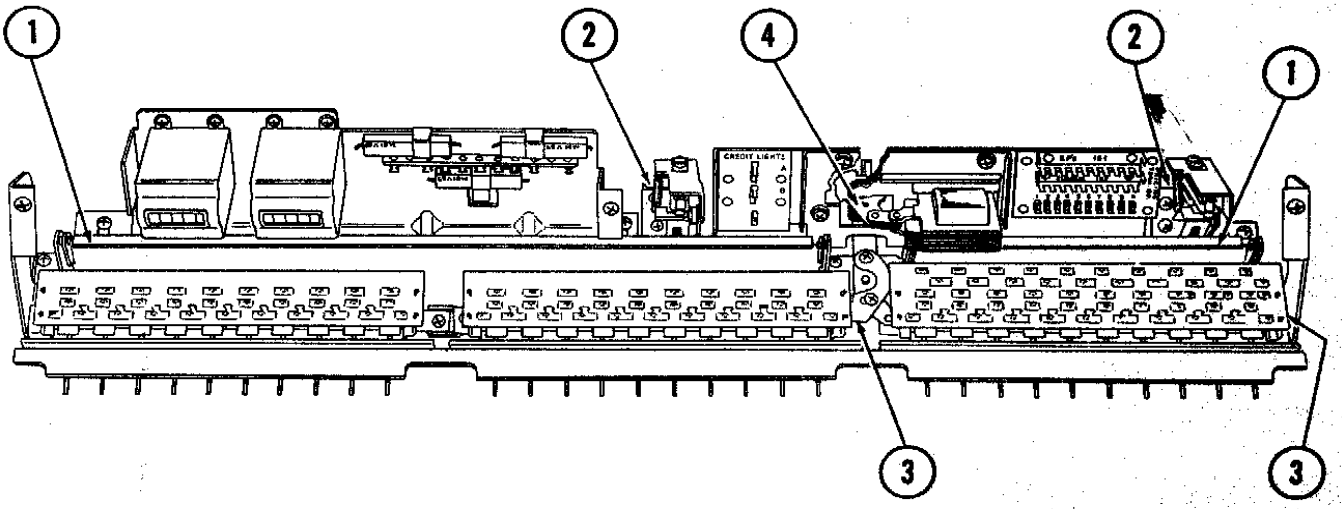
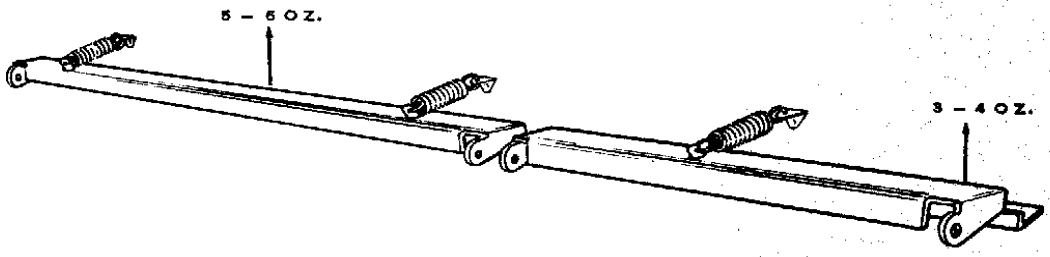
S5	410650	Snap Switch & Actuator Bracket Assembly
W1	410718	Matrix Cable
W2	410719	Control Cable
W3	410606	Credit Light Cable
	410716	Credit Window Light Switchboard Wired Assembly
	410706	Pricing Terminal Board Wired Assembly

SPRING ADJUSTMENTS

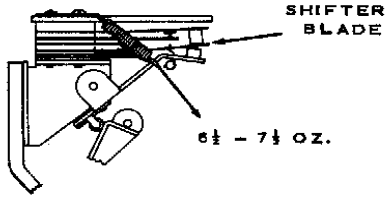


1 TREADLE BAR SPRINGS



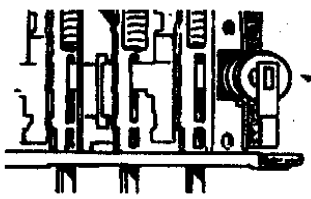
RETURN THE TREADLE BARS TO NORMAL REST POSITION AGAINST SELECTION SWITCHES.

2 ACTUATOR LEVER SPRING



HOLD SHIFTER BLADE – MEASURE FORCE AS INDICATED BY ARROW.

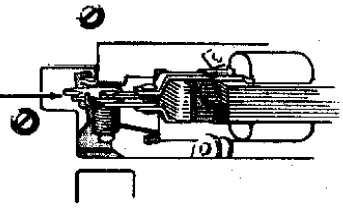
3 LATCH BAR SPRING



6 TO 7 OUNCES HERE TO START MOVEMENT.

4 LATCH RELEASE LEVER SPRING

RESTRAIN MOVEMENT OF NUMBER LATCH LEVER – FORCE TO START MOVEMENT OF SOLENOID ARMATURE IS THEN 1 LB.



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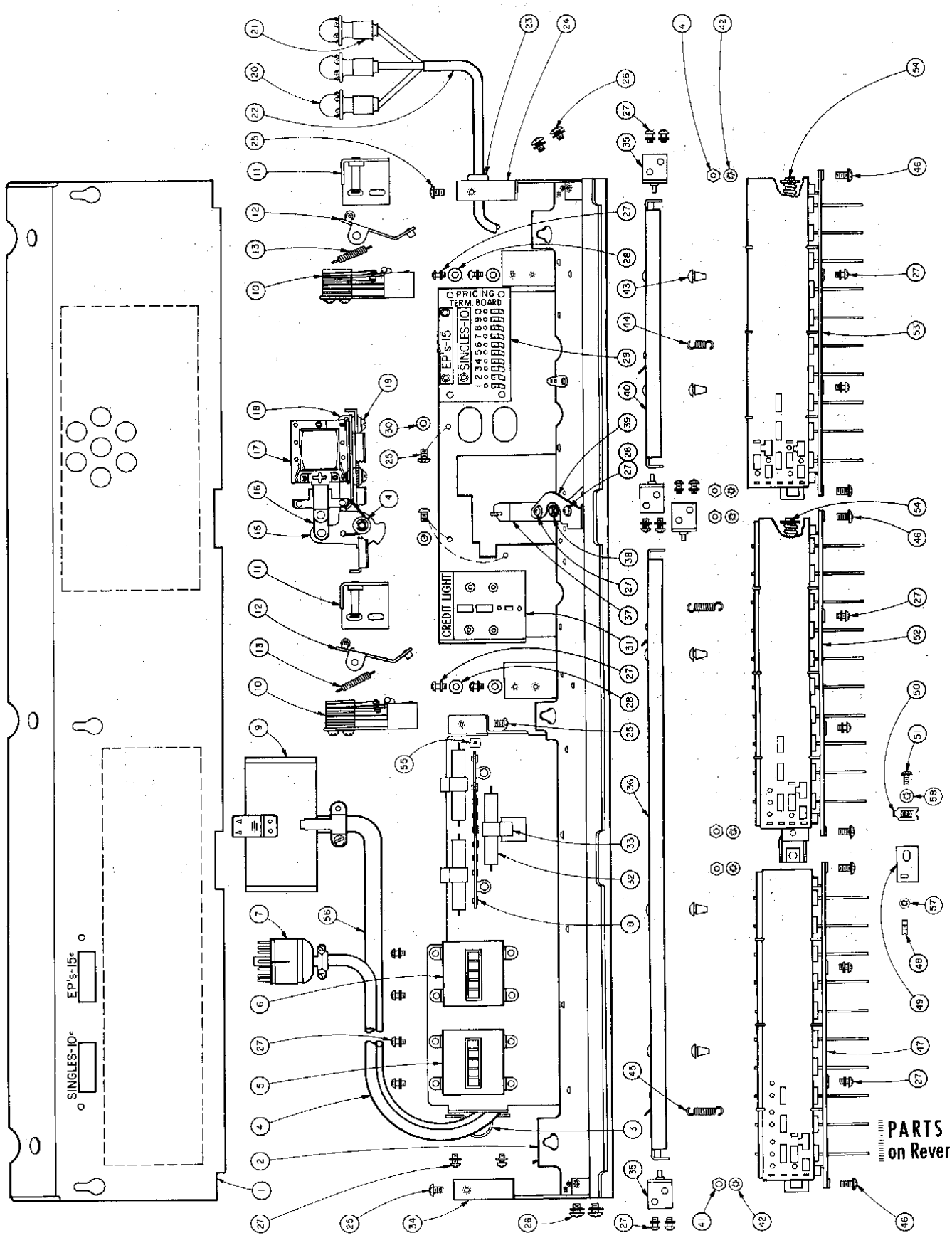

PARTS LIST

Item	Part No.	Part Name
1	410581	Cover Assembly
	410580	Label (Instruction)
	410582	Label (Adjustment)
	410694	Cover
2	410700	Selector Frame Riveted Assembly
3	410704	Cable Clamp
4	410721	Control Cable & Plug Assembly
	410719	Control Cable Only
5	410593	Counter Assembly (Single)
6	410594	Counter Assembly (EP)
7	410707	12 Prong Plug Assembly
8	410699	Terminal Strip
9	410573	33 Prong Socket Assembly
	410650	Snap Switch & Actuator Bracket Assembly
10	410654	Snap Switch
	410703	Switch Guard
	912631	5-40 x 7/8 Phillips R.H.M.S.
	400597	Tension Plate
11	410651	Actuator Bracket & Pivot Assembly
	301374	Retaining Ring
12	410655	Actuator Lever Assembly
13	410659	Actuator Lever Spring
14	410689	Latch Release Lever Spring
	986450	Eyelet
	410599	Retaining Ring
15	410686	Latch Release Lever Assembly
16	410685	Latch Solenoid Link
	980860	1/8 dia. x 3/8 Rivet
17	410684	Latch Solenoid Assembly
	410683	Latch Solenoid & Release Lever Assembly
18	410680	Latch Release Lever Bracket Assembly
19	913310	6-32 x ½ Phillips B.H.M.S.
	920661	Flat Washer
	988161	Grommet
	400854	Spacer
	900803	Speed Nut
20	505173	No. 55 Panel Light
21	410690	Credit Lamp Socket Assembly
22	410605	Credit Light Cable Assembly
	410606	Cable Only
23	302343	Strain Relief
24	410607	Cover Support Bracket, R. H. Assembly
25	914125	8-32 x ¼ B.H.M.S.
26	914145	Sems Fastener 8-32 x ¼
27	912964	Sems Fastener 6-32 x ¼
28	920661	Flat Washer
29	410706	Pricing Terminal Board Wired Assembly
30	920901	Flat Washer
31	410671	Credit Window Light Terminal Board Assembly
32	81178	Resistor
33	410705	Cable Clamp
34	410642	Cover Support Bracket, L.H.
35	410660	Hinge Assembly
36	410666	Treadle Bar Assembly (Letter)
37	410673	Latch Lever Assembly
38	301374	Retaining Ring
39	410677	Latch Lever
40	410663	Treadle Bar Assembly (Number)
41	901631	8-32 Hex Nut
42	925431	Lock Washer
43	410267	Bumper
44	410600	Treadle Bar Spring, Short
45	410668	Treadle Bar Spring
46	914240	8-32 x 5/16 Phillips B.H.M.S.
47	410616	Selector Switch Assembly (Letter A-K)
48	410647	Latch Bar Stud
49	410649	Latch Bar Link Adjustable
50	900809	Speed Nut
51	960651	No. 6 x 3/8 Phillips Truss Head Sheet Metal Screw
52	410617	Selector Switch Assembly (Letter L-V)
53	410618	Selector Switch Assembly (Number)
54	410349	Latch Bar Spring (Number Switch)
	410621	Latch Bar Spring (Letter Switch)
	400864	Spring Retainer
55	81183	Resistor
56	410720	Matrix Cable & Plug Assembly
	410718	Matrix Cable Only
57	410747	Hex Nut
58	925321	Lock Washer