

SEEBURG

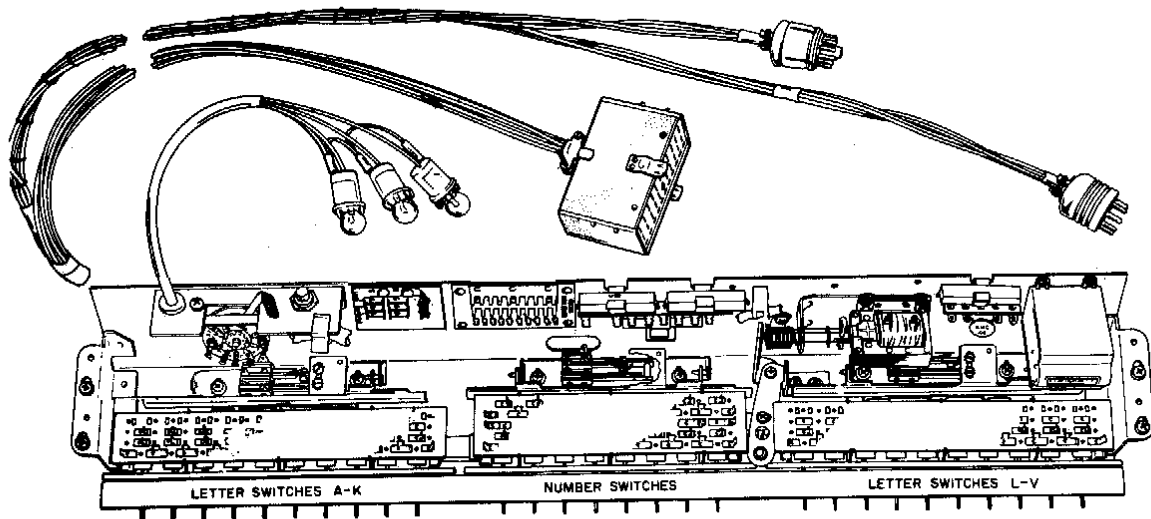
TORMAT ELECTRICAL SELECTOR

TYPE TES161/221 & TES162

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TORMAT ELECTRICAL SELECTOR

TYPE TES162

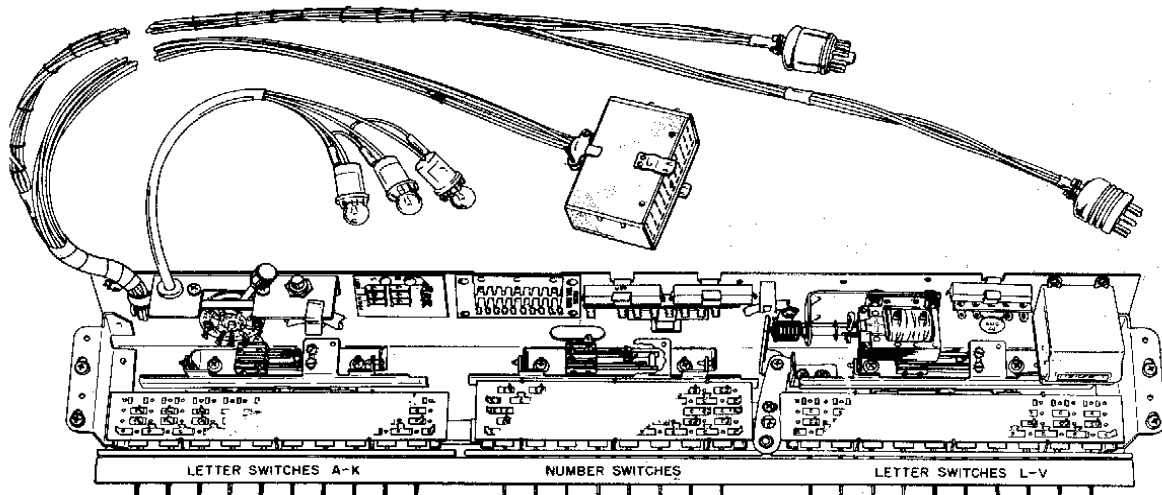


This Electrical Selector is the same as the Type TES161 except in the shape of the operating lever of the service switch and direction of cable entry to the frame. All service data and adjustments for the Type TES161, pages 3115 to 3122 inclusive, apply to this Selector.

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TORMAT ELECTRICAL SELECTOR

TYPE TES161 and TES221



The Tormat Electrical Selectors, Types TES161 and TES221, are part of the Seeburg Tormat Selection System and Credit System which includes the Tormat Memory Unit on the Select-O-Matic Mechanism and the Tormat Selection Receiver. They are designed for use with the Select-O-Matic Models 161 and 201 respectively. The two types differ only in their Number Selection Switches and the connections made to terminals in the 33-contact plugs with which selection circuits are connected to the complete selection system. All adjustments and service data on the following pages applies to both types.

The principal functions of the Selector is 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 component parts of the Selector are assembled on a steel frame and are protected by a steel cover. All electrical connections to the associated Tormat Memory Unit and to the Selection Receiver are made with a 12-contact plug, a 7-contact plug, and a 33-contact plug that connect to sockets in the units with which it is associated.

The principal component parts of the Selector include the service switch, three selection switch assemblies, a latch bar operating solenoid, three credit indicating lights, a selection pricing terminal board, a pricing unit board and three switch groups each of which has two pairs of contacts. There is also a counter which totals the number of 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 Selection Pricing Unit in the phonograph. A different light is turned on to indicate when selections can be made in accordance with the selections pricing unit being used.

The three selection switches in the Type TES221 Selector 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 dimensions but their latch bars are not the same. The switch assembly associated with the numbered keys and circuits differs from the

TORMAT ELECTRICAL SELECTOR, TYPE TES161 and TES221

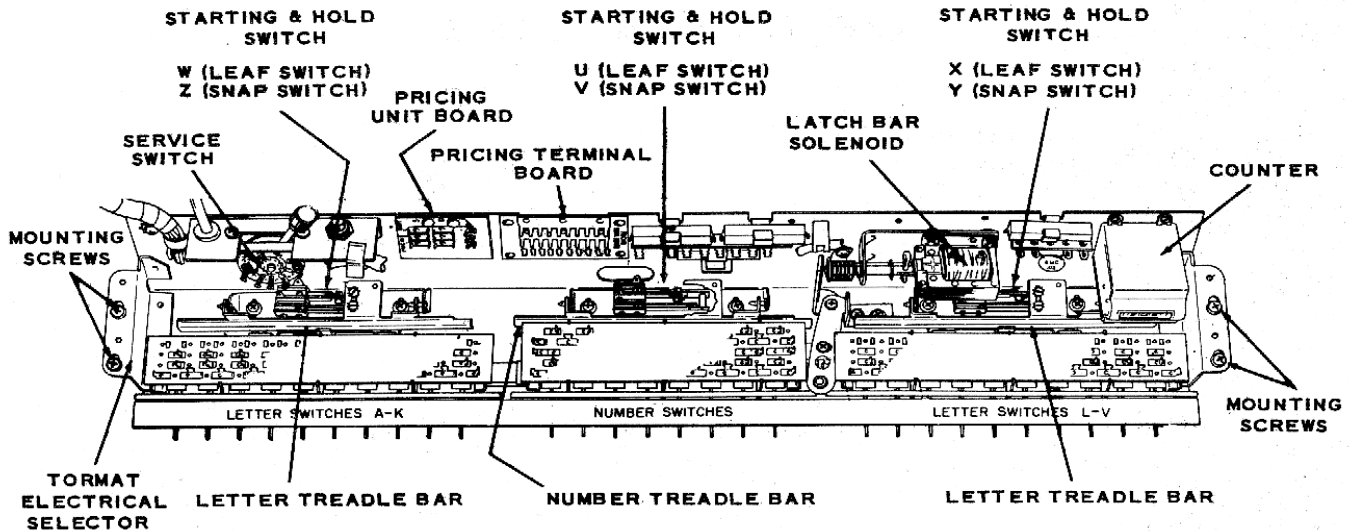


Figure 2.

"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 A-K and L-V Letter Selection Switches in the Type TES161 are, respectively, the same as the A-K and L-V used in the Type TES221. The Number Selection Switch in the Type TES161 has eight individual selector switches instead of ten as in the Type TES221.

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 credits are set up in the phonograph Pricing 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 three switch groups is associated with each of the three selection switches and operates when a selector key is pressed. The three 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 selector keys is pressed. These switches are the Hold Switches, contacts U, X and W.

The snap-action switches are the Starting Switches, contacts V, Y and Z. The Y and Z contacts are operated by the Letter Selection switches and are parallel connected so one or the other closes whenever a Letter selector key is pressed. The Z contact is closed by pressing any Number selector key and is in series with the parallel-connected Y and Z contacts. These contacts are part of a circuit that includes a Subtract Solenoid in a Dual Pricing Unit or, with a Single Pricing Unit, a Cancel Solenoid. When a letter key and a number key are pressed, the starting switches complete the circuit to the solenoid which, when energized, closes switch contacts that control the power to the Tormat Memory Unit, the selection counter and the timing relay. They also close, momentarily, the circuit for a play control add solenoid that, in turn, controls, through a play control unit, the power to the phonograph amplifier and the mechanism motor.

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 push-on terminal for easy and simple connection to either of the two terminal strips marked "EP" and "Singles". By choice of terminal strip connection any group of twenty record selections can be "sold" for either two prices when a Dual Pricing Unit is in use. If a Single Pricing Unit is being used, the leads are connected to the "Singles" strip.

The credit light and "starting" circuits of the selection system are not the same for Dual and Single Pricing Units. These circuits are terminated at the pricing unit board and are connected to suit the Pricing Unit with which the phonograph is equipped.

REMOVAL OF SELECTOR

All adjustments of the mechanical linkage except Adjustment No. 2, 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, be

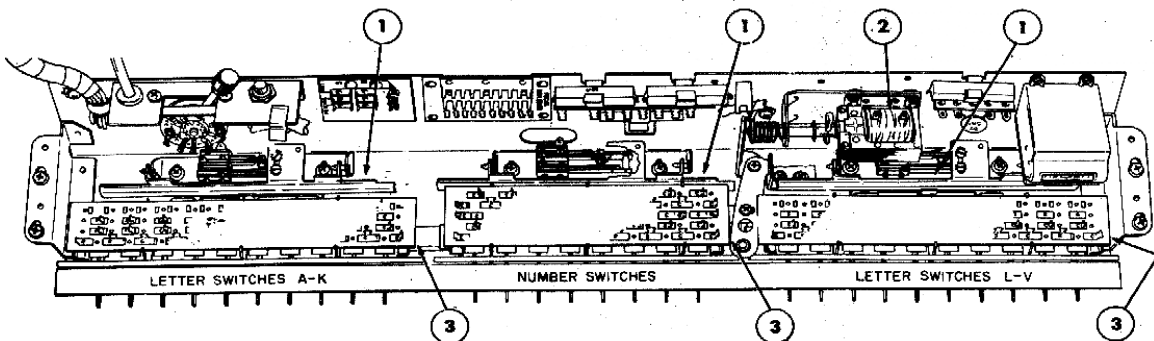
removed for any service and for Adjustment No. 2 by pulling out the connecting plugs at the ends of the cable and taking out the screws that are back of the selector key panel at each end of the Selector frame.

When replacing the Selector in the cabinet it should be fastened securely with the mounting screws. It should be positioned so there is a minimum of clearance between the ends of the selection switch shafts and the back of the selector keys. If, however, 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 that is operated by the Hold Switches. If it is too far from the keys, the keys will be loose and may settle.

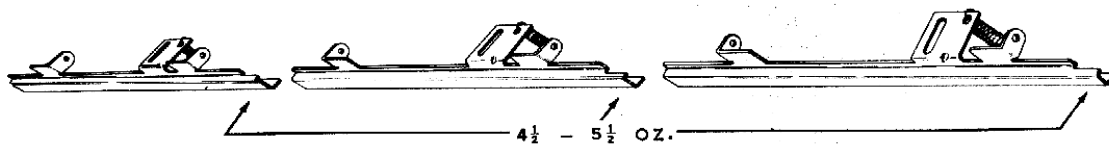
LUBRICATION

Oil all pivots with one drop of Seeburg No. 53014 Select-O-Matic Special Purpose Oil. Use Aero Lubriplate sparingly on the surfaces of the latch levers where they bear on solenoid plunger and the latch bars. (*Aero Lubriplate and No. 53014 Oil is available from your Seeburg Distributor.*)

SPRING ADJUSTMENTS

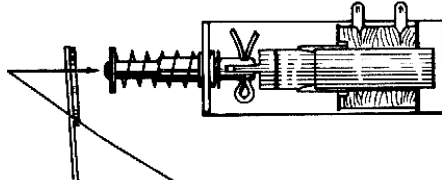


1 TREADLE BAR SPRINGS



FORCE TO MOVE TREADLE BARS FROM NORMAL REST POSITION (AGAINST RUBBER STOPS).

2 LATCH RELEASE LEVER SPRING



RESTRAIN MOVEMENT OF NUMBER RELEASE LEVER - FORCE TO START MOVEMENT OF SOLENOID ARMATURE IS THEN 5 TO 7 OZ.

3 LATCH BAR SPRING

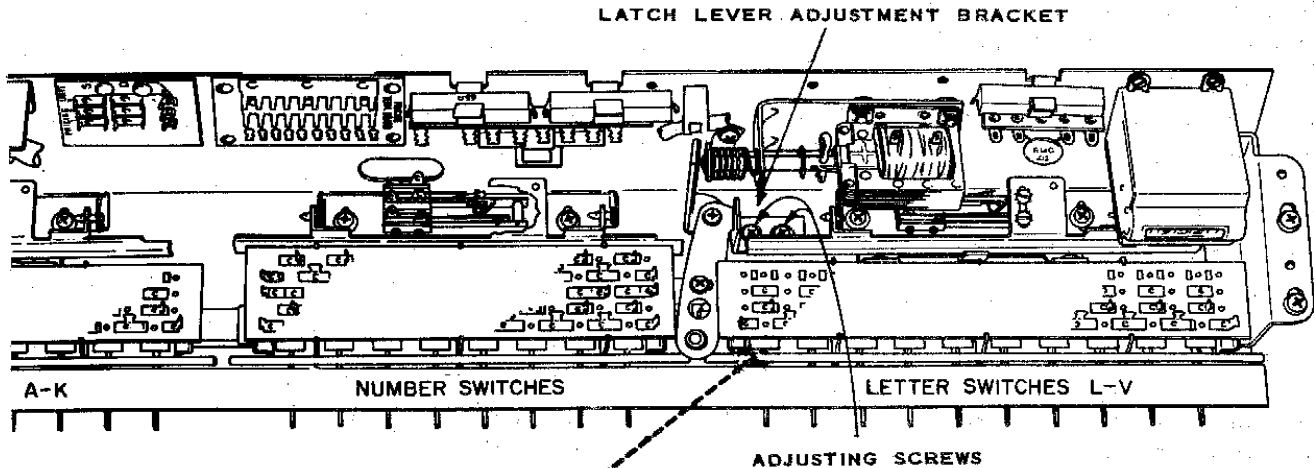


6 TO 7 OUNCES HERE TO START MOVEMENT.

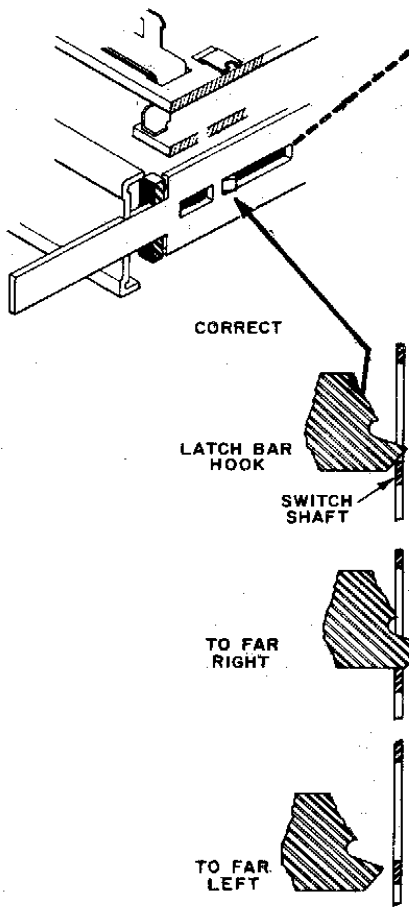
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ADJUSTMENT NO. 1 - LETTER SWITCH L-V

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



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 gap between the latch release lever and the end of the latch bar solenoid plunger rod.

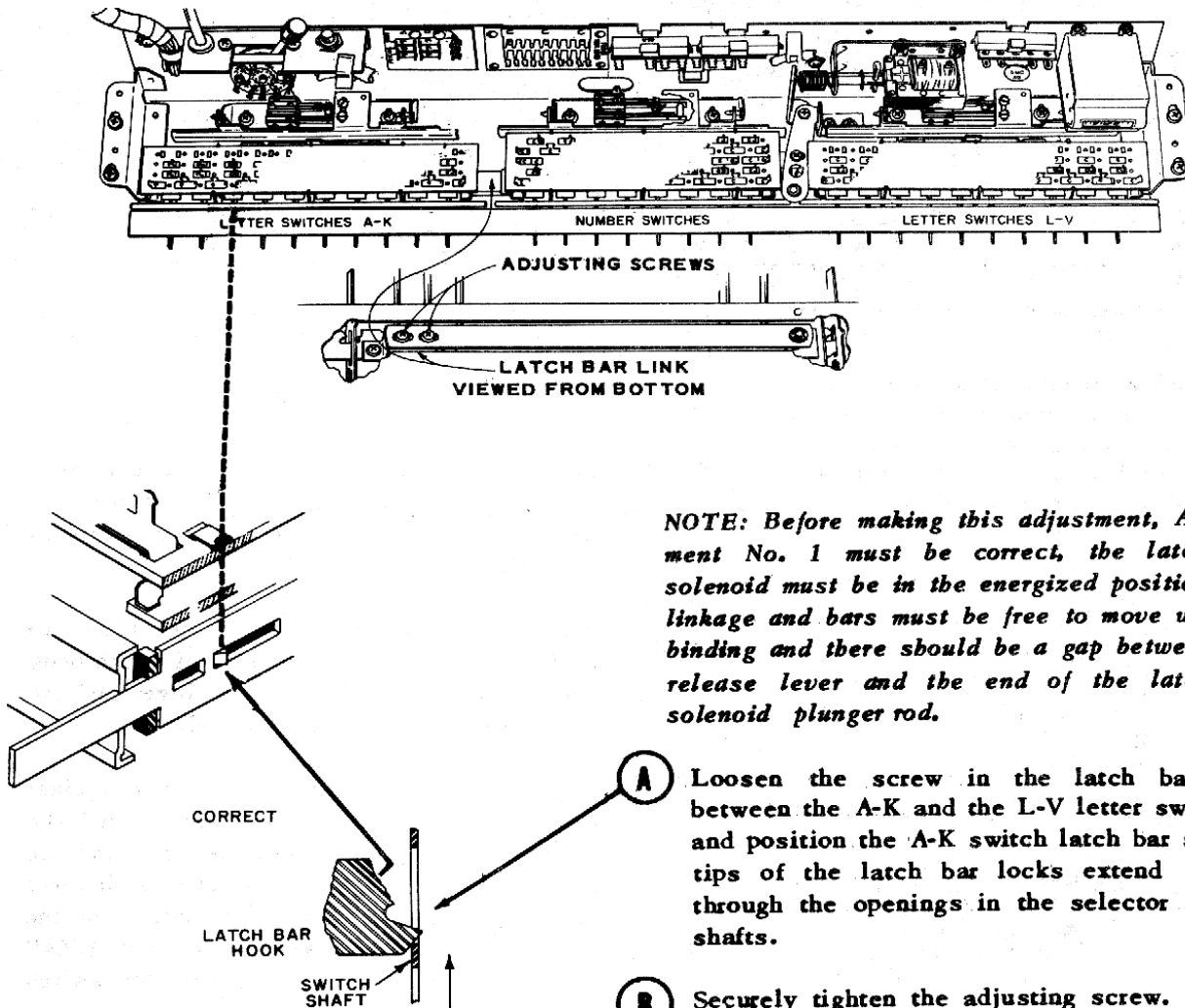


- (A)** Loosen the two screws holding the latch lever adjustment bracket and position the bracket so the tips of the latch bar hooks extend 1/64" through the openings in the selector switch shafts. The bars and shafts may be seen through openings in the bottom of the Selector frame.
- (B)** If the bracket is too far to the right, the selector keys will be locked out. If the bracket is too far to the left, the selector keys will not latch or the latching will be erratic.
- (C)** After the correct position of the bracket has been made, the bracket holding screws must be securely tightened.

TORMAT ELECTRICAL SELECTOR, TYPE TES161 and TES221

ADJUSTMENT NO. 2 - 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. 1. The adjusting link is accessible through a hole in the bottom of the Selector frame.

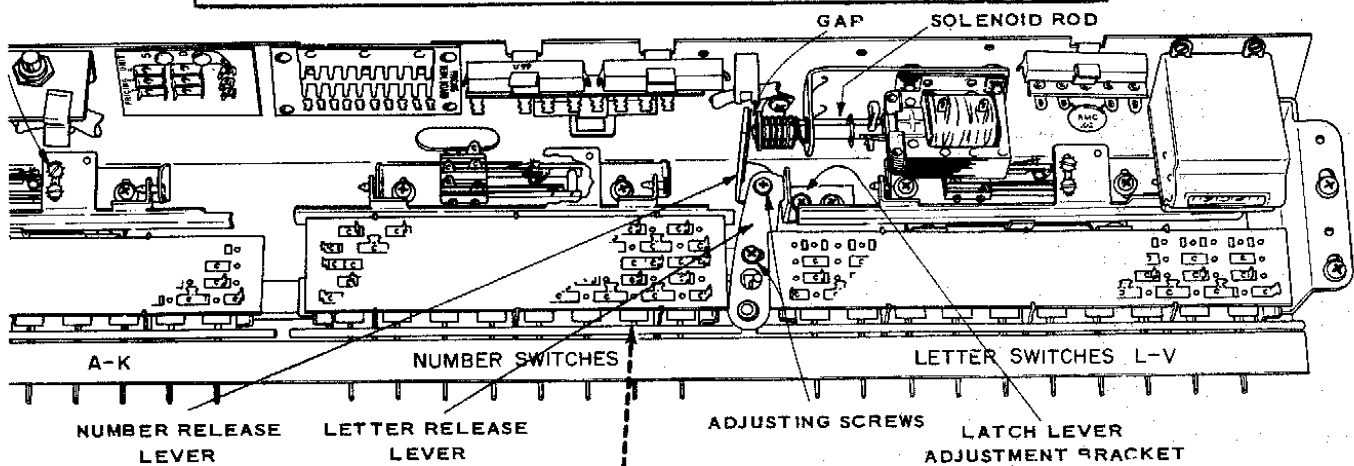


NOTE: Before making this adjustment, Adjustment No. 1 must be correct, the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be a gap between the release lever and the end of the latch bar solenoid plunger rod.

- 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 tips of the latch bar locks extend 1/64" through the openings in the selector switch shafts.
- 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.

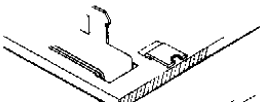
ADJUSTMENT NO. 3 - NUMBER SWITCH

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.



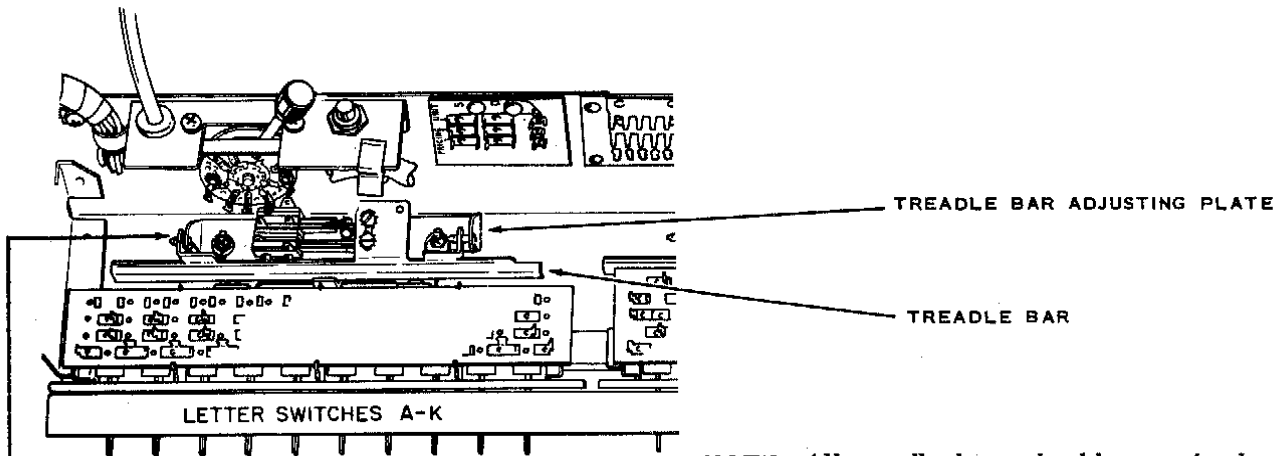
NOTE: When making this adjustment the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and adjustments No. 1 and No. 2 must be correct.

- A** The two screws that hold the number latch lever to the letter latch lever should be loosened just enough to permit the levers to be shifted.
- B** Insert and hold in place a shim 1/64" to 1/16" thick (a single thickness of match book

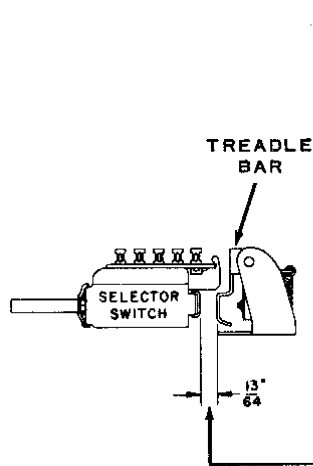


FORMAT ELECTRICAL SELECTOR, TYPE TES161 and TES221

TREADLE BAR AND SWITCH ADJUSTMENTS

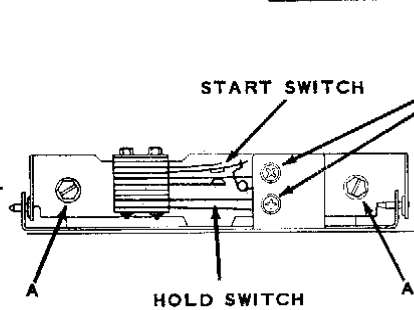


NOTE: All treadle bars should move freely on their pivots to rest against the rubber bumpers and should have a small amount of end play.



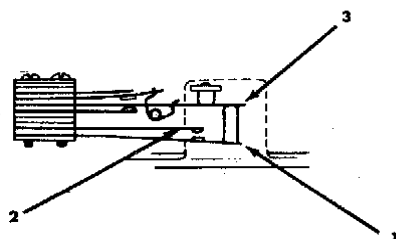
A With the treadle bar against the rubber bumper in the treadle bar adjusting plate, position the plate (Screws A) so there is $\frac{13}{64}$ " (.203") separation between the treadle bar and the frame of the selector switch. Use the shank of a No. 6 (.204") or No. 7 (.201") or a $\frac{13}{64}$ " twist drill for a spacing gage.

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.**



B Loosen the bracket holding screws, B, and position the switches so the Start Switch contacts close when the selector switches have approximately $\frac{1}{32}$ " more travel before latching by latch bars.

With all selector switches released:



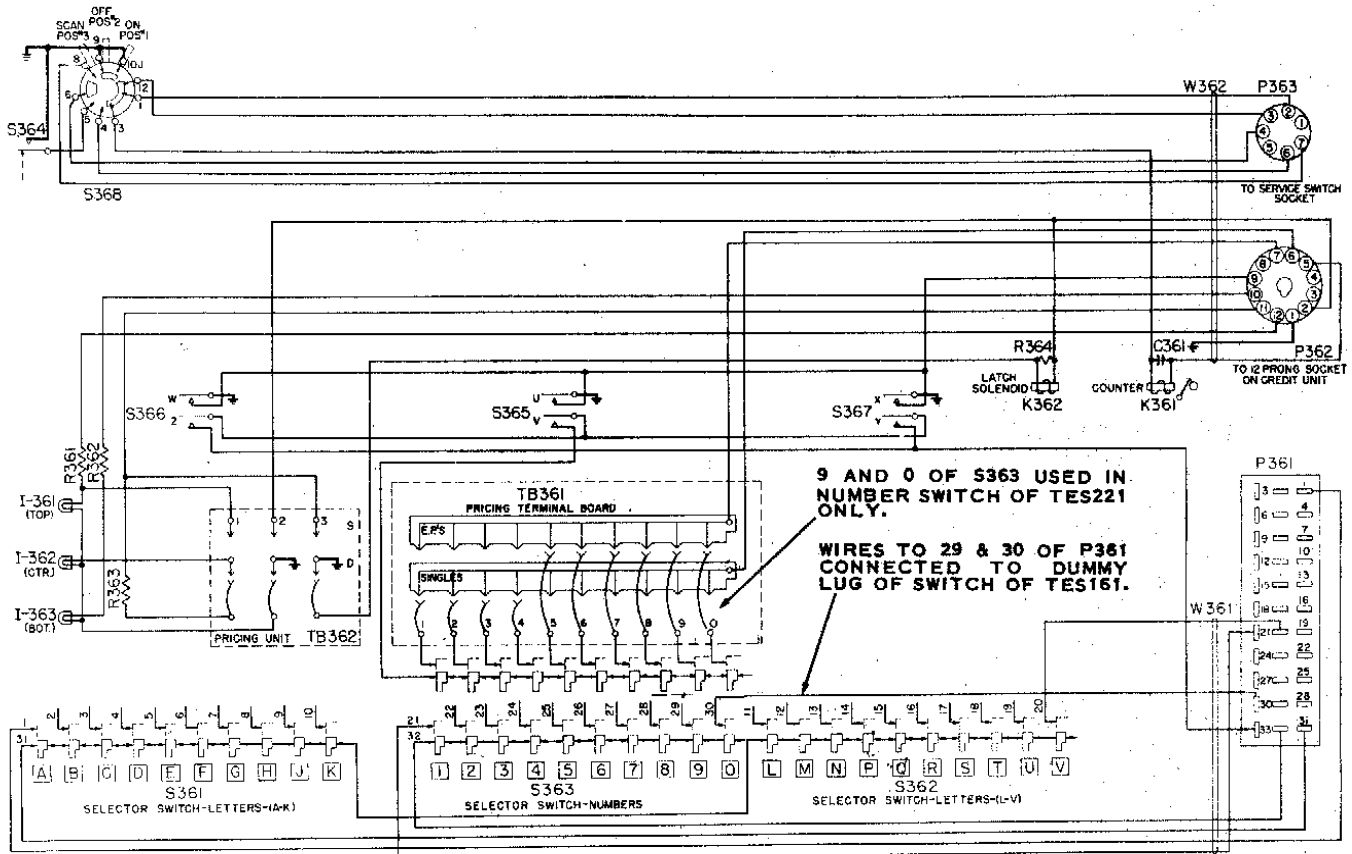
C Adjust Blade No. 1 so its fibre lift bears against Blade No. 3 approximately 2 oz. (50 grams).

D Adjust Blade No. 2 for $\frac{1}{64}$ " to $\frac{1}{32}$ " contact gap.

E Readjust force of Blade No. 1 against Blade No. 3 so Blade No. 2 moves approximately blade thickness ($\frac{1}{64}$ ") when contacts close.

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

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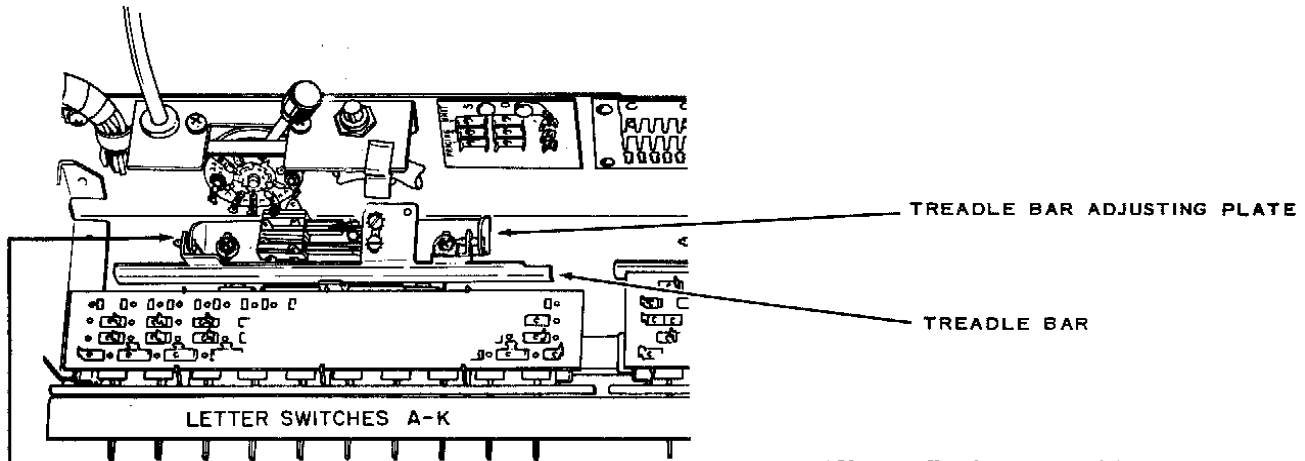


Schematic Diagram

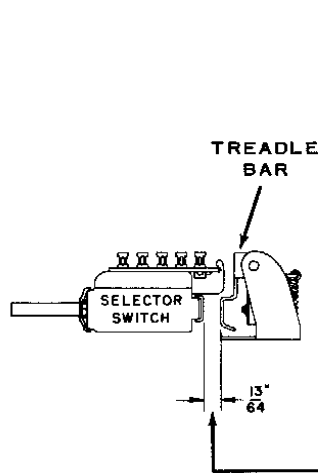
PARTS LIST

Item	Part No.	Part Name	Item	Part No.	Part Name
C361	86259	.02 Ceramic Condenser	S361	411066	Selector Switch (A-K)
I361	410823	Credit Lamp Socket Assembly	S362	411067	Selector Switch (L-V)
I362	410823	Credit Lamp Socket Assembly	S363	411155	Selector Switch (Number) (TES221)
I363	410823	Credit Lamp Socket Assembly	S363	411068	Selector Switch (Number) (TES161)
	505173	Panel Lamp No. 55	S364	410486	Credit Switch
K361	411082	Counter Assembly	S365	411073	Snap Switch
K362	410684	Latch Solenoid	S366	411073	Snap Switch
P361	410573	Socket Assembly	S367	411073	Snap Switch
P362	410708	Plug, 12 Prong	S368	411136	Service Switch
P363	408258	Plug, 7 Prong	T361	411134	Pricing Term. Bd. Assembly
R361	81178	Resistor 65 Ohm 10 W.	TB362	410938	Pricing Unit Term. Board Assembly
R362	81178	Resistor 65 Ohm 10 W.	W361	411099	Matrix Cable
R363	81178	Resistor 65 Ohm 10 W.	W362	411101	Control Cable
R364	81183	Resistor 100 Ohm 10 W.			

TREADLE BAR AND SWITCH ADJUSTMENTS

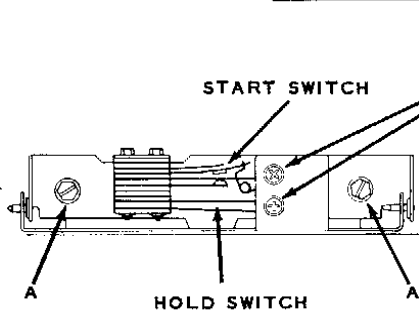


NOTE: All treadle bars should move freely on their pivots to rest against the rubber bumpers and should have a small amount of end play.



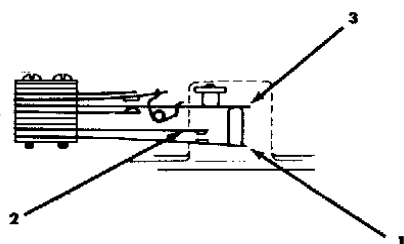
- A** With the treadle bar against the rubber bumper in the treadle bar adjusting plate, position the plate (Screws A) so there is $13/64''$ (.203'') separation between the treadle bar and the frame of the selector switch. Use the shank of a No. 6 (.204'') or No. 7 (.201'') or a $13/64''$ twist drill for a spacing gage.

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.**



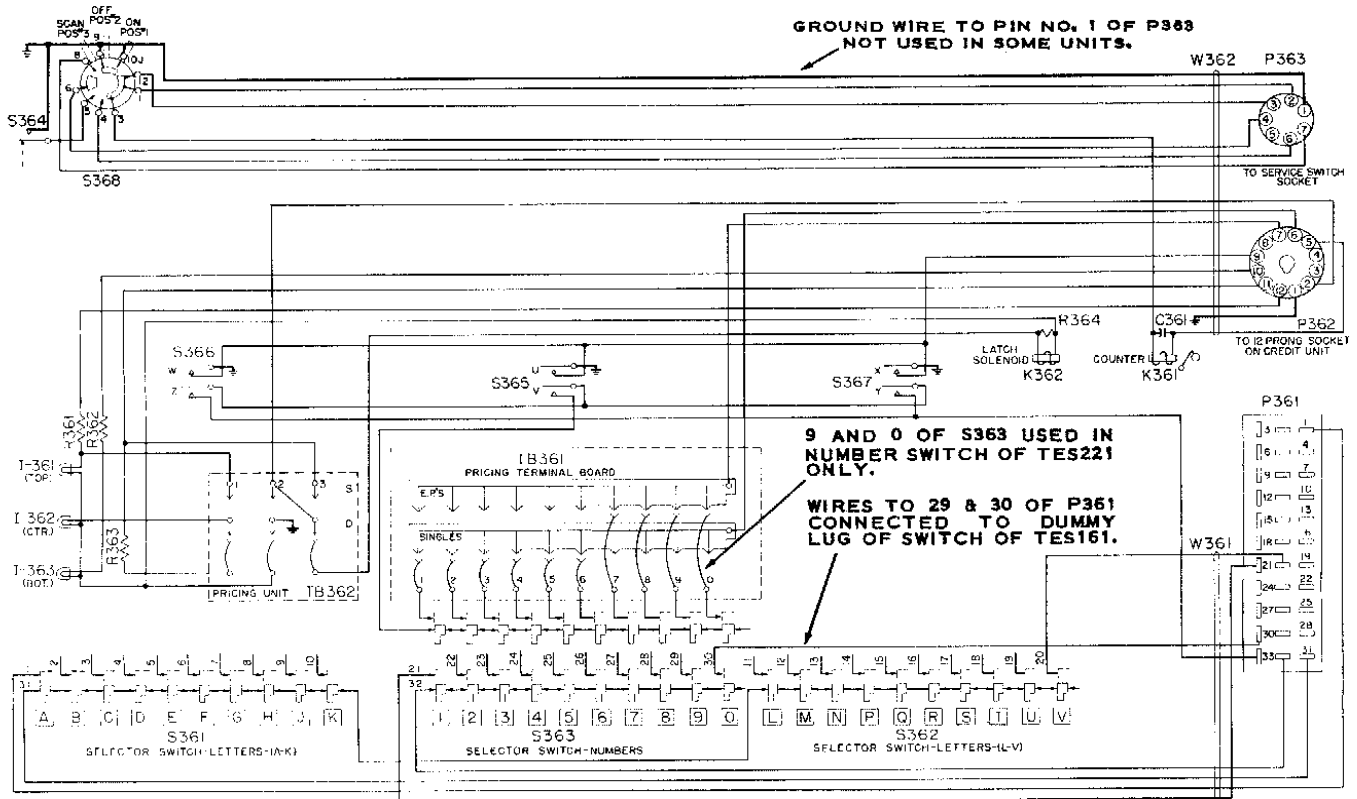
- B** Loosen the bracket holding screws, B, and position the switches so the Start Switch contacts close when the selector switches have approximately $1/32''$ more travel before latching by latch bars.

With all selector switches released:

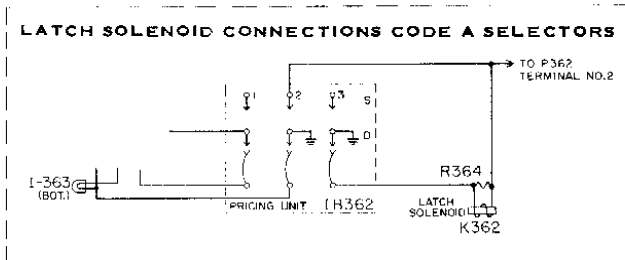


- C** Adjust Blade No. 1 so its fibre lift bears against Blade No. 3 approximately 2 oz. (50 grams).
- D** Adjust Blade No. 2 for $1/64''$ to $1/32''$ contact gap.
- E** Readjust force of Blade No. 1 against Blade No. 3 so Blade No. 2 moves approximately blade thickness ($1/64''$) when contacts close.
- F** Check operation: Hold Switch must close before Start Switch closes and open after Start Switch opens.

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Schematic Diagram – Code AB and B Selectors



PARTS LIST

Item	Part No.	Part Name	Item	Part No.	Part Name
C361	86259	.02 Ceramic Condenser	S361	411066	Selector Switch (A-K)
I361	410823	Credit Lamp Socket Assembly	S362	411067	Selector Switch (L-V)
I362	410823	Credit Lamp Socket Assembly	S363	411155	Selector Switch (Number) (TES221)
I363	410823	Credit Lamp Socket Assembly	S363	411068	Selector Switch (Number) (TES161)
	505173	Panel Lamp No. 55	S364	410486	Credit Switch
K361	411082	Counter Assembly	S365	411073	Snap Switch
K362	410684	Latch Solenoid	S366	411073	Snap Switch
P361	410573	Socket Assembly	S367	411073	Snap Switch
P362	410708	Plug, 12 Prong	S368	411136	Service Switch
P363	408258	Plug, 7 Prong	T361	411134	Pricing Term. Bd. Assembly
R361	81178	Resistor 65 Ohm 10 W.	TB362	410938	Pricing Unit Term. Board Assembly
R362	81178	Resistor 65 Ohm 10 W.	W361	411099	Matrix Cable
R363	81178	Resistor 65 Ohm 10 W.	W362	411101	Control Cable
R364	81183	Resistor 100 Ohm 10 W.			