

*PAVIC*

**INSTRUCTIONS FOR INSTALLING THE 179724 MODIFICATION KIT TO PROVIDE TWO COLOR PRINTING ON A MODEL 28 OR 35 TYPING UNIT AND THE 312711 MODIFICATION KIT TO MAKE THE 179724 KIT USE-ABLE ON LP805, LP809, AND LP821, OR TYPING UNITS HAVING THE 192486 VERTICAL TAB AND FORMOUT MECHANISM**

**1. GENERAL**

a. The 179724 modification kit when installed on a Model 28 Typing Unit provides a two color ribbon mechanism. Additional parts to control this mechanism are ordered separately, as follows:

<u>Mode</u>	<u>Qty.</u>	<u>Parts Required</u>	<u>Description</u>
Sequentially thru Stunt Box Contact	2	153440	Function Bar, Universal
	2	4703	Spring
	2	152653	Pawl
Typical parts needed are listed, other parts needed should also be ordered.	2	157240	Spring
	1	152298	Lever
	1	152299	Lever
	2	152089	Latch
	1	152660	Spring Plate
	2	90517	Spring
	1	172506	Contact Assembly (Normally Open Contact)
	2	151689	Screws
	2	110743	Lockwashers
	1	152357	Stud
	1	110743	Lockwasher
	1	3599	Nut

Upper case in red                      Same as above except use 152665 and 152666 function bars  
Lower case in black

b. The 312711 kit makes the 179724 kit useable on LP805, LP809, and LP821 or Typing Units having the 192486 vertical tab and formout mechanism.

**NOTE**

The two color printing mechanism is not compatible with units using the 198462 space suppression parts or the 198500 kit for print or function suppression.

**RTTY ELECTRONICS**  
TELETYPE=Sales-Service-Parts  
PO Box 20101 El Sobrante, Ca.  
94820. (510)222-3102  
mr\_rtty@pacbell.net

Printed in U. S. A.

c The 179724 modification kit consists of:

2	243M	Magnet Assembly	2	161346	Washer, Felt
8	2191	Lockwasher	2	165027	Arc Suppressor
2	3599	Nut	4	173940	Plug
10	3640	Lockwasher	4	173941	Plug
5	7002	Washer, Flat	1	179675	Bracket, Assembly
2	8330	Washer, Flat	1	179676	Lever, Guide
2	42661	Spring	2	179677	Shaft Assembly
2	45024	Spring	2	179678	Lever, Reversing
2	55669	Spring	1	179680	Bail, Lifter
4	90361	Washer, Flat	4	179681	Post
6	93117	Lockwasher	1	179682	Bail, Roller
2	93899	Spring	2	179684	Lever, Oscillating
1	97117	Ribbon (Red-Black)	1	179686	Bracket Assembly
2	110743	Lockwasher	1	179687	Lever, Guide
6	112627	Nut	1	179689	Bracket Assembly
4	119648	Retainer	1	179690	Plate
12	119649	Retainer	1	179691	Bracket Assembly
3	119651	Retainer	3	179692	Spacer
4	119652	Retainer	1	179693	Bail, Lifter
2	119653	Retainer	1	179694	Bail, Roller
2	121243	Clamp, Cable	1	179695	Bracket
1	121245	Clamp, Cable	1	179696	Bracket, Hinge
4	125011	Washer	1	179697	Lever, Stop
2	126815	Screw	2	179698	Armature
1	150040	Screw	2	179699	Shaft
2	150089	Screw	1	179700	Bracket, Hinge
1	150432	Spacer	1	179701	Lever, Stop
4	151152	Screw	1	179702	Bracket, Magnet
2	151630	Screw	1	179703	Bracket Assembly
2	151631	Screw	1	179704	Shaft
2	152629	Washer, Felt	1	179708	Plate, Adjusting
2	151657	Screw	1	179718	Cable
6	152893	Screw	1	192997	Bracket
2	153538	Screw	1	195150	Lever
8	155751	Tubing	4	197996	Roller
8	156558	Washer, Felt			

d. The 312711 kit consists of:

1	2191	Washer	1	199408	Bracket
2	151152	Screw	1	312755	Post
1	151631	Screw	1	312756	Bracket
1	192618	Plate	1	312757	Plate

e. For part numbers referred to and for parts ordering information see Teletype Model 28 Parts Bulletins 1149B and 1187B.

## 2. THEORY OF OPERATION

a. Sequence of Operation

The attraction of the selector magnet trips the printer shaft which in turn trips the type box clutch. The cycling of the type box clutch operates the ribbon feed linkage plus ribbon spool bracket. The two color ribbon magnets mounted directly behind the ribbon spool bracket assembly (left and right) operate (through attractions and release) a magnet armature extension. While the armature is attracted, the armature extension blocks the 179684 oscillating lever. This lever is mechanically linked to the 179680 and 179693 lifter bails. By limiting the travel of the 179684 oscillating lever the lifter bail and its lifter roller are raised to the uppermost or extended position. The ribbon guide that is assembled to the lifter roller elevates the position of the ribbon to the "red" printing field in line with the type pallet to be printed.

If the two color ribbon magnet armatures are not attracted (de-energized) then the 179684 oscillating lever is allowed to pass freely under the magnet armature extension. This reduces the ribbon guide movement and positions the ribbon to the black field in line with the type pallet to be printed.

Each revolution of the printer mainshaft returns the ribbon lifter bail and ribbon guides to their normal unoperated or lowest position.

#### NOTE

The foregoing theory of operation is based on the condition that the Two Color Ribbon is inserted into the printer with the red field on the bottom and the black field on the top.

b. Depending on whether a 48 V DC or 115 V DC supply is used the magnet must be connected either in parallel or series respectively.

### 3. INSTALLATION

a. 179724 modification kit (Figures 1 and 2)

#### RIGHT RIBBON MECHANISM

(1) Remove and discard the 7835 and 71681 ribbon and spool plus the 119652 retainer that connects the 150387 link to the ribbon spool bracket.

(2) Remove and retain the 82463 spring from the 152828 ribbon spool bracket.

(3) Remove and discard the 119652 retainer from the 152648 shaft.

(4) Remove the 152828 right ribbon bracket and 161346 felt washer from the right side frame. Disassemble the following parts from the 152828 bracket assembly:

119651	Retainer	discard	119651	Retainer	discard
150327	Roller or	discard	42661	Spring	retain
(154333)			152524	Bracket	retain
112634	Spring	discard	119653	Retainer	discard
151637	Screw	retain	152526	Plate	retain
110743	Lockwasher	retain	152523	Spring	retain
150336	Spacer	retain	152529	Ratchet	retain
150311	Ribbon Lever	discard	152629	Felt Washer	discard
119649	Retainers (2)	discard	152630	Shaft or	
152826	Shaft	retain	(154332)		discard
152834	Spring	retain	152525	Hub	retain
152819	Detent Lever	retain			

(5) Remove the following parts from the right side frame.

151346	Screw	retain	90361	Felt Washer	discard
2191	Lockwasher	retain	152648	Shaft	discard
150932	Bushing	retain	152647	Lever	retain
150344	Lever	retain	151658	Screw	retain
150821	Spacer	retain	2191	Lockwasher	retain
151630	Screw	retain	125015	Washer	retain
2191	Lockwasher	retain	121243	Cable Clamp	discard

(6) Assemble the 179703 bracket plus 179704 shaft to the right side frame using 151631 screw and 2191 lockwasher plus 151630 screw and 2191 lockwasher. Apply film of grease to shaft.

(7) Assemble the 150821 spacer, 152647 lever and 150344 lever to the right side frame using 151346 screw, 2191 lockwasher and 150932 bushing. The 152647 lever also mounts on the 179704 shaft with the lower opening engaged with the 150335 gear. Assemble (2) 90361 felt washers to the 179704 shaft. Assemble two 179692 spacers to the 179703 bracket.

(8) Assemble the following parts to the 179686 bracket:

#### NOTE

Refer to Figure 1, Bulletins 1149B and 1187B, for parts location.

152629	Felt	42661	Spring
152525	Hub	152819	Lever
179677	Shaft	152834	Spring
152529	Ratchet	152826	Shaft
152523	Spring	119649	Retainer (2)
152526	Plate	126815	Screw
119653	Retainer	93117	Lockwasher
152524	Bracket	112627	Nut
119651	Retainer		

(9) Assemble the 179678 reversing lever to the 179686 ribbon spool bracket using 151637 screw, 110743 lockwasher and 150336 spacer.

(10) Mount the 179686 bracket assembly to the right side frame. The 152819 lever must engage the 152821 feed lever. The 161346 felt washer should be placed on the 179704 shaft between two vertical mounting holes of the 179686 bracket. Secure the bracket to the shaft using 119652 retainer.

(11) Connect the 150387 link to the 179686 bracket and secure using 119652 retainer.

(12) Connect the 82643 spring between the 152821 feed lever and the 179686 ribbon spool bracket.

(13) Assemble two 156558 felt washers and 179693 lifter bail to the stud of the 179686 bracket and secure using 119649 retainer.

(14) Assemble 179687 guide lever to the 179694 roller bail rear mounting hole, using 179681 post, 93117 lockwasher, and 112627 nut. Assemble the 179681 post to the 179694 roller bail, front mounting hole, using a 93117 lockwasher and 112627 nut.

(15) Assemble 179684 oscillating lever and 8330 flat washer to the 179704 shaft. Assemble the 179694 roller bail with 179687 guide lever plus two 156558 felt washers to the 179704 shaft. Secure with 119649 retainer.

(16) Assemble one each of the 197996 rollers to the rear and front 179681 posts. Secure with 119648 retainers (2).

(17) Connect 42661 spring to the 179687 guide lever and 179686 bracket. Connect 45024 spring to the 179678 lever and 179686 bracket. Connect 93899 spring to the 179693 lifter bail and 179694 roller bail.

(18) Assemble the magnet assembly (right) using the following:

NOTE

Refer to Figure 1 for parts location.

179702	Magnet Bracket	179698	Armature
243M	Magnet Assembly	151152	Screw (2)
152893	Screw	3640	Lockwasher (2)
3640	Lockwasher	179700	Hinge Bracket
179701	Stop Lever	152893	Screw (2)

3640	Lockwasher (2)	150089	Screw
125011	Washer (2)	110743	Lockwasher
179699	Shaft	3599	Nut
119649	Retainer (2)	55669	Spring

(19) Mount the magnet bracket assembly to the 179692 spacers using two 153538 screws, two 2191 lockwashers, two 7002 washers and one 179708 adjusting plate.

### LEFT RIBBON MECHANISM

(20) Remove and discard the 119652 retainer that holds the 150386 link to the 152827 bracket assembly. Remove and retain 82463 spring from the 152827 bracket assembly and remove bracket assembly plus 161346 felt washer.

(21) Disassemble the 152827 bracket assembly as follows:

119649	Retainer (2)	discard	152524	Bracket	retain
152826	Shaft	retain	42661	Spring	retain
152834	Spring	retain	119653	Retainer	discard
152818	Detent	retain	152527	Plate	retain
151637	Screw	retain	152523	Spring	retain
110743	Lockwasher	retain	152528	Ratchet	retain
150336	Spacer	retain	152629	Felt	discard
150310	Lever	discard	152630 or (154332)	Shaft	discard
112634	Spring	discard	152525	Hub	retain
119651	Retainer	discard			

(22) Remove and discard 90361 felt washer from the shaft of the 152644 bracket.

(23) Remove and discard the 119651 retainer from the 152823 feed lever bracket. Remove and retain 152820 feed lever. Remove the 192618 contact plate with the two contact assemblies. Discard the 192619 eccentric post when using the modification kit 312711. Retain the mounting hardware and the 104807 spacers.

(24) Remove the 152644 bracket with associated parts from left side frame by removing and retaining the following: two 151659 screws, three 152571 spacers, one 3599 nut, one 110743 lockwasher and one 150335 gear. Remove and discard one 151693 screw.

(25) Remove and retain the following parts from the 152644 bracket assembly: 151657 screw, 2191 lockwasher, 150932 bushing, and 150343 lever. Discard the 152644 bracket, 152646 lever, and 152823 bracket.

(26) Assemble the following parts to the 179689 bracket: 195150 lever, 150343 lever, 150932 bushing, 2191 lockwasher, 151657 screw, 179692 spacer, or (+199408 bracket, +151631 screw, +2191 lockwasher) 179691 bracket assembly, 192997 bracket, 151631 screw, 2191 lockwasher, and 7002 flat washer. (Refer to Figure 2.) Apply film of grease on shaft.

+ Indicates part of 312711 modification kit. (See Figure 4).

(27) Assemble the 179689 bracket assembly to the left side frame using the following: three 152571 spacers, two 151659 screws, one 150040 screw, three 2191 lockwashers, and one 150432 spacer. The 150432 spacer is inserted between the 192997 bracket and 179689 bracket. (Refer to Figure 2.)

(28) Assemble the 152820 feed lever and 82463 spring on the stud of the 179691 bracket. Secure by means of 119651 retainer. Assemble the 150335 gear, 110743 lockwasher, and 3599 nut to the 152582 shaft protruding through the 179689 bracket.

(29) Assemble two 90361 felt washers to the shaft of the 179689 bracket.

(30) Assemble the following parts to the 179675 bracket: (Refer to Figure 2, Bulletins 1149B and 1187B).

152629	Washer, Felt	152834	Spring
152525	Hub	119649	Retainer (2)
179677	Shaft Assembly	179678	Lever
152528	Ratchet	151637	Screw
152523	Spring	110743	Lockwasher
152527	Plate	150336	Bushing
119653	Retainer	179680	Lifter Bail
152524	Bracket	156558	Felt Washer (2)
119651	Retainer	119649	Retainer
42661	Spring	126815	Screw
152818	Lever	93117	Lockwasher
152826	Shaft	112627	Nut

(31) Assemble the 179675 bracket assembly to the 179689 bracket with shaft. Insert 161346 felt washer on the shaft between the mounting holes of the 179675 bracket. Secure using 119652 retainer. Connect the 150386 link to the 179675 bracket using 119652 retainer. Connect the 82463 spring to the 179675 bracket.

(32) Assemble the 179681 post to the 179682 roller bail (front mounting hole) using 112627 nut and 93117 lockwasher.

(33) Assemble the 179676 guide lever to the 179682 roller bail (rear mounting holes) using 179681 post, 112627 nut, and 93117 lockwasher. Assemble two 197996 rollers to the 179681 posts and secure with two 119648 retainers.

(34) Assemble the 179684 oscillating lever and 8330 washer to the shaft of the 179689 bracket. Assemble the 179682 roller bail with guide lever and posts plus two 156558 felt washers to the shaft of the 179689 bracket assembly. Secure using 119649 retainer.

(35) Connect 45024 spring to the 179678 lever and 179675 bracket. Connect 42661 spring to the 179676 guide lever and 179675 bracket. Connect 93899 spring to the 179680 lifter bail and 179682 roller bail.

(36) Assemble the left magnet assembly using the following:  
(Refer to Figure 2.)

179695	Bracket	179698	Armature
243M	Magnet Assembly	151152	Screw (2)
15289	Screw	3640	Lockwasher (2)
3640	Lockwasher	179699	Shaft
179696	Hinge Bracket	119649	Retainer (2)
152893	Screw (2)	150089	Screw
3640	Lockwasher (2)	110743	Lockwasher
12511	Washer (2)	3599	Nut
179697	Stop Lever	55669	Spring

(37) Assemble the 179690 (+312757) plate to the 179692 mounting spacer (+199408 mounting bracket) and 192997 bracket using two 151657 screws and two 2191 lockwashers.

(38) Mount the magnet assembly to the 179690 (+312757) plate using two 151630 screws, two 2191 lockwashers and two 7002 washers.



(39) Mount 192618 bracket w/contact using hardware previously retained in Paragraph 23. When using modification kit 312711 remove the 192620 contact bracket w/contact from the 192618 bracket which was previously retained in Paragraph 23. Transfer the contact assembly from the 192620 bracket to the +312756 bracket and install on the +192618 bracket, using two +151152 screws and the retained two 110743 lockwashers and one 104807 flat washer. Transfer the 192438 contact assembly from the 192618 bracket to the +192618 bracket. Mount the +312755 eccentric post to the +192618 bracket using the 2191 lockwasher and 3598 nut. Remount the +192618 bracket w/contacts using the mounting hardware retained in Paragraph 23. The 192619 or +312755 eccentric post must be positioned above the 192614 lever (vert. tab).

(40) Route the 179718 cable assembly from the "R" connector through the right side frame along the handle of the stunt box around the left side frame to the ribbon magnet. Assemble the 165027 arc suppressor across each of the magnet terminals and secure the suppressor to the magnet bracket using lacing twine. Wire per Figure 3.

#### NOTE

LP826 only - omit assembly of 179718 cable to ribbon magnets. For all other Model 35 printers a 173940 terminal plug must be installed on the 179718 cable assembly. Four terminal plugs are provided, but only two are used. Discard the spares when the above is completed. The 173941 terminal receptacle is used for customer wiring.

(41) Form the selector magnet cable and 179718 cable so that it does not interfere with the ribbon magnet bracket assembly. Secure the two cables to the 179703 bracket using 151658 screw, 2191 lockwasher, 125015 washer and 121245 cable clamp.

(42) Install 97117 ribbon.

#### 4. ADJUSTMENTS AND LUBRICATION

##### a. Adjustments

For standard adjustment and lubrication procedure refer to standardized information, for other than Bell System see Teletype Bulletin 217B. Make the Two Color Ribbon Adjustments.

b. If the 179724 and 312711 kits are used with the vertical tabulating mechanism, make the Vertical Tabulating Adjustments as given in the standardized information.

##### c. Lubrication

Apply two drops of oil to the following parts on the left and right side frames.

- (1) Ribbon Drive Link - both ends.
- (2) Ribbon Ratchet Friction Felt Washer - saturate.
- (3) Ribbon Spool Bracket Shaft Felts - saturate, oscillating lever, roller bail.
- (4) Ribbon Reversing Levers - all engaging surfaces.
- (5) Ribbon Spool Bracket - all engaging surfaces.
- (6) Ribbon Magnet Bracket - hinge and stop lever.
- (7) Support Shaft (179704, 179689) - film of grease.

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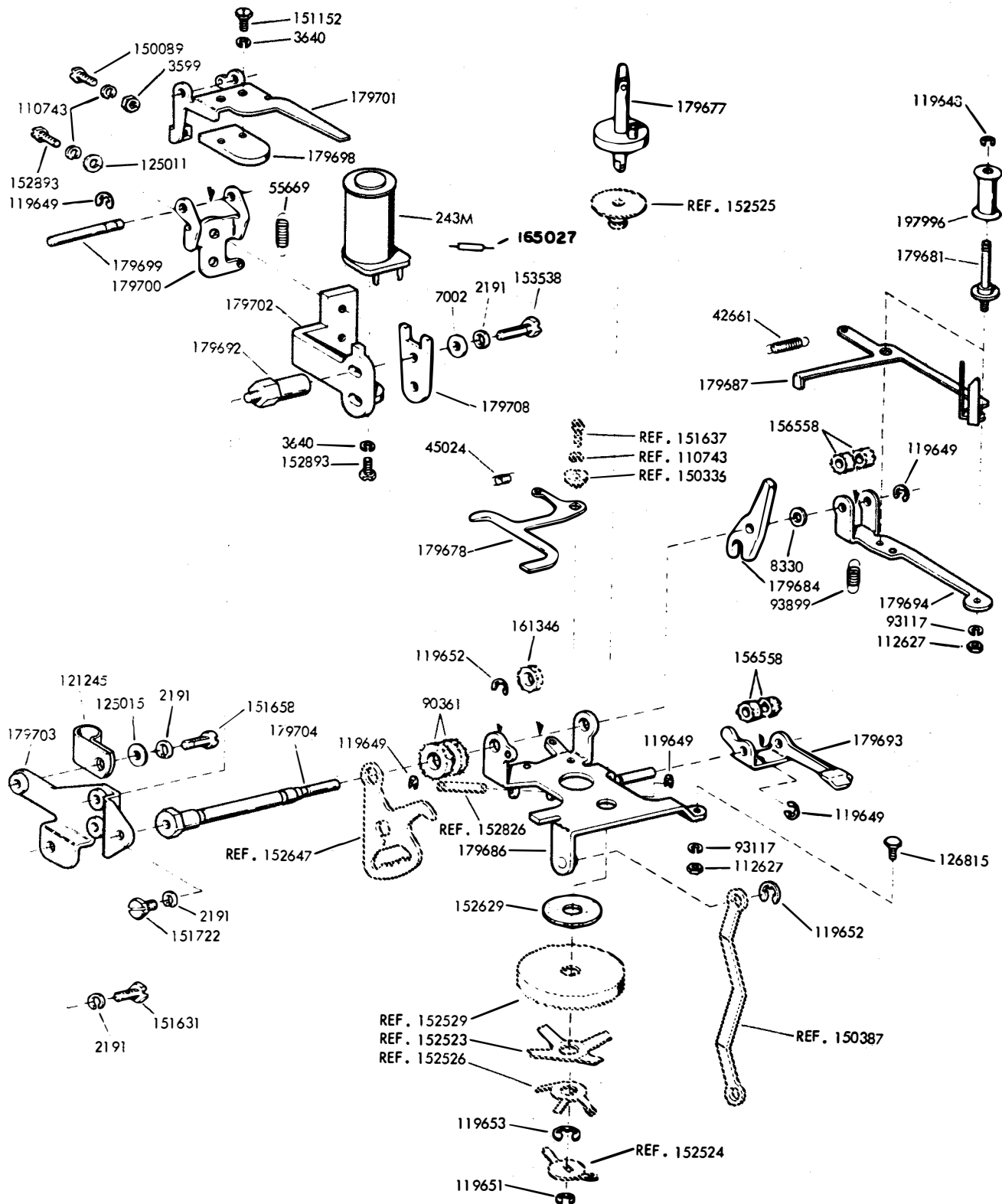


FIGURE 1

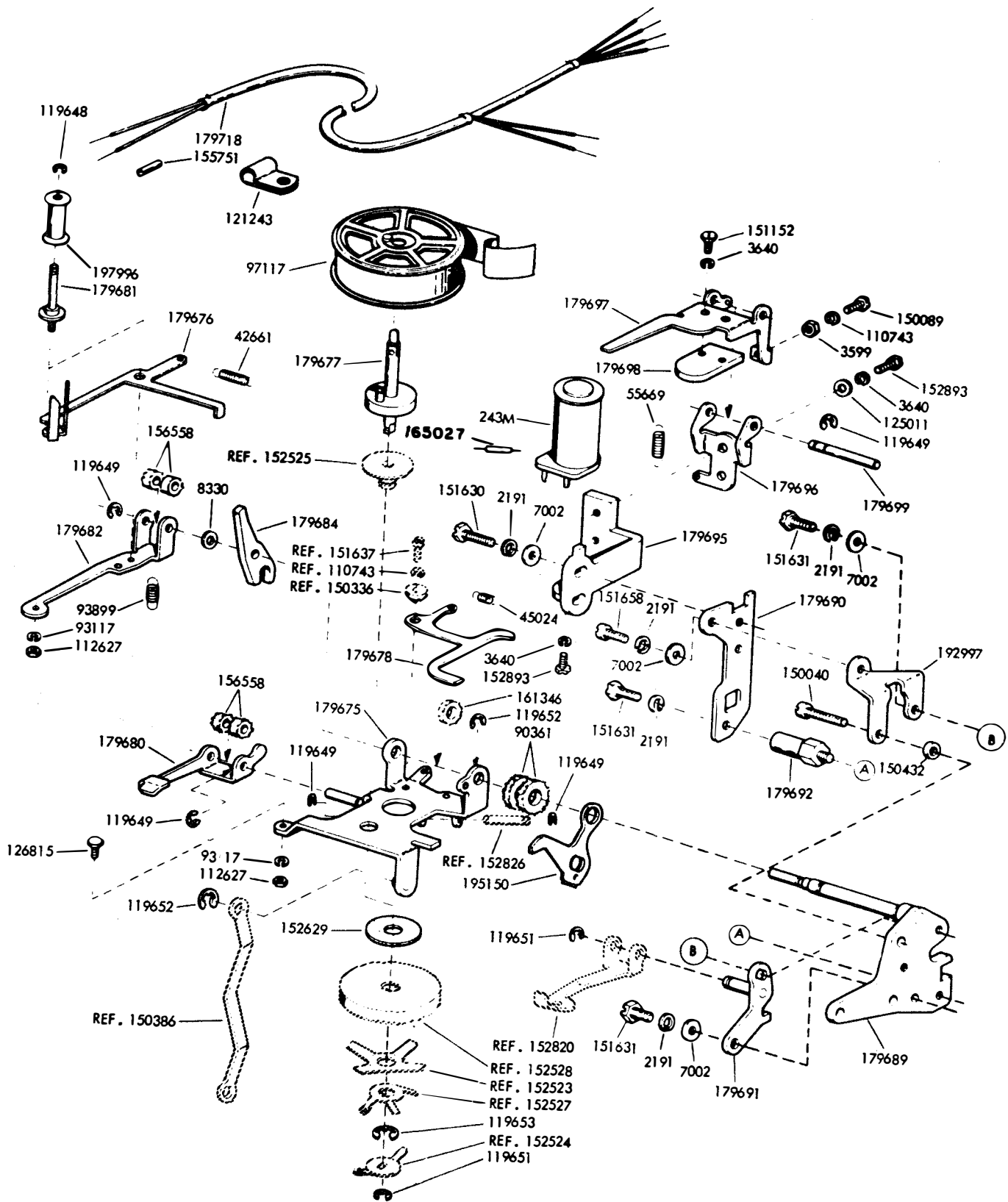
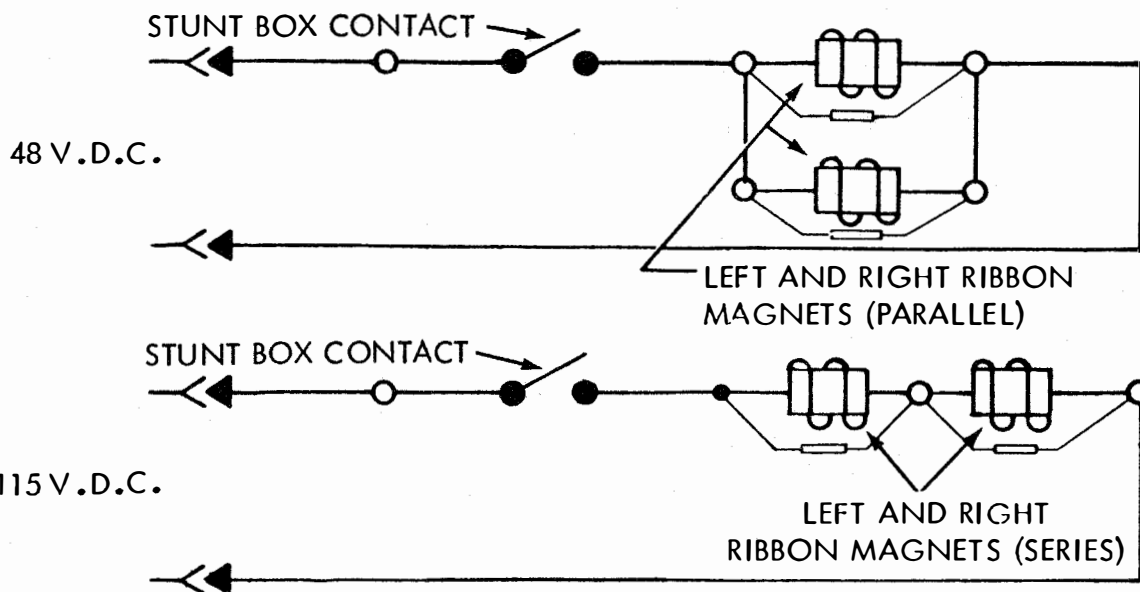
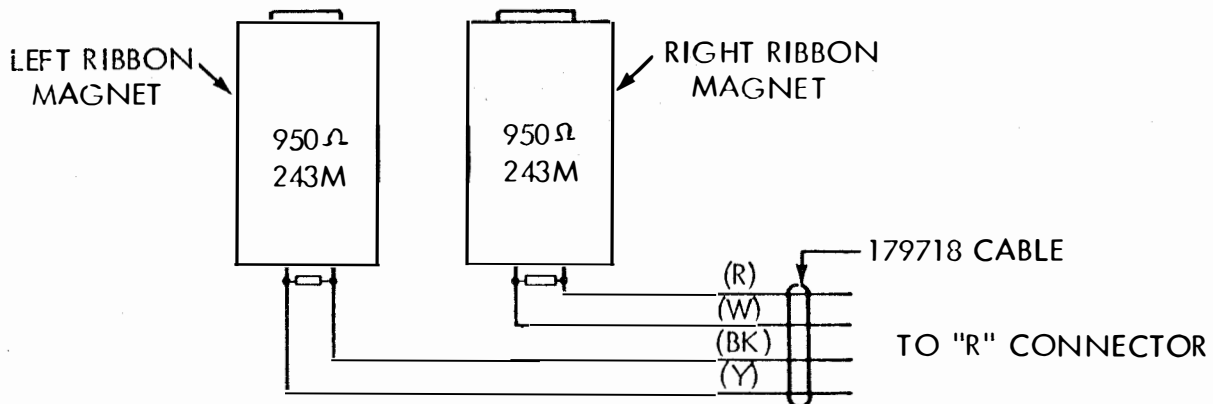


FIGURE 2



- ◁ "R" CONNECTOR, RECEPTACLE
- ◄ "R" CONNECTOR, PLUG
- "R" CONNECTOR, TERMINAL
- STUNT BOX TERMINAL

165027 ARC SUPPRESSOR  
 (eight places as shown)



48 V.D.C. CONNECT MAGNET COILS IN PARALLEL  
 115 V.D.C. CONNECT MAGNET COILS IN SERIES

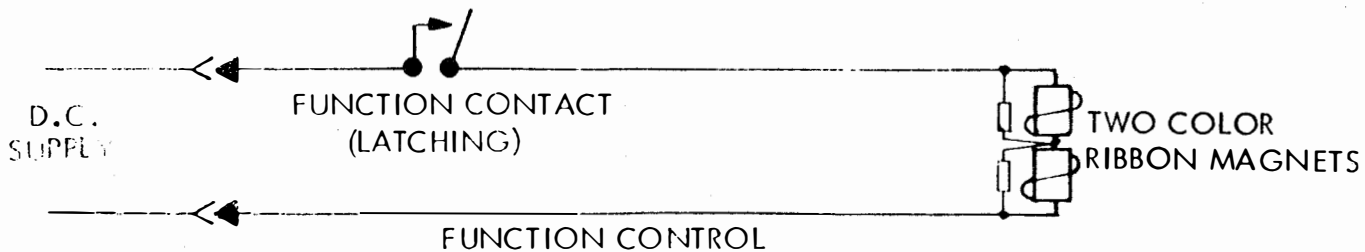
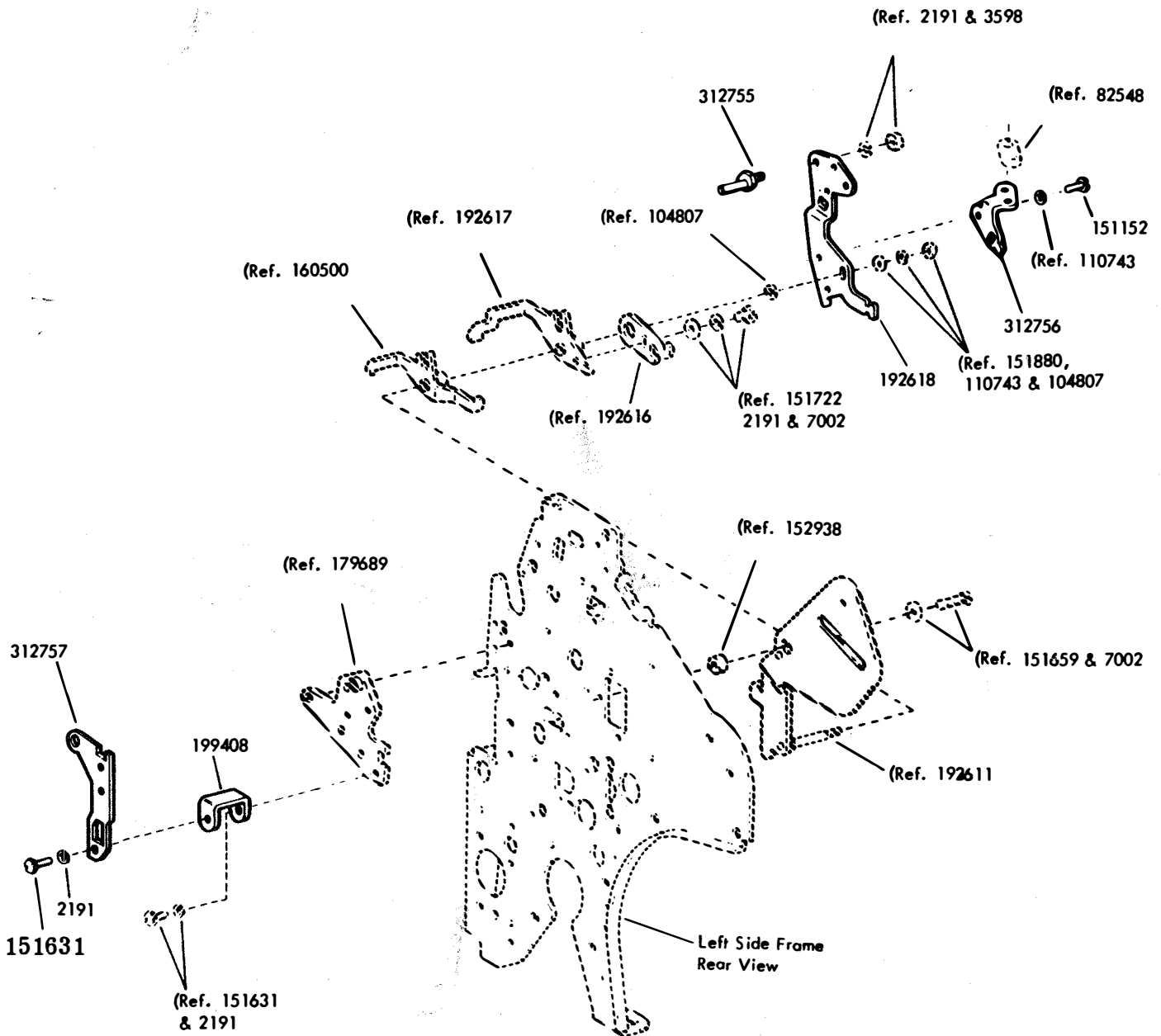


FIGURE 3

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KIT 312711

FIGURE 4