

**INSTRUCTIONS FOR INSTALLING 178387 MODIFICATION KIT
TO PROVIDE A CHAPMAN STATIC ELIMINATOR TO NEUTRALIZE
THE ELECTROSTATIC CHARGE ON THE PAGE COPY OF MODEL 15,
MODEL 28, OR MODEL 35 SET**

1. GENERAL

a. The 178387 modification kit, when installed on a Model 15, Model 28, or Model 35 set eliminates electrostatic charge on the page copy.

b. The 178387 modification kit can be installed on a Model 15 cover, Model 28 cover or console cabinet, or Model 35 console cabinet. Successful operation of the 178387 modification kit is dependent upon particular style parts being present in the different models. Following is a list showing these prerequisite parts.

<u>Model</u>	<u>Area</u>	<u>Prerequisite Part</u>
Model 15	Typing Unit	110352 Ribbon Reverse Arms
Model 28	Typing Unit	New style thin type box
Model 28	Typing Unit with Sprocket Feed	159356 Modification Kit for new style paper fingers
Model 35	Cover	Two 194985 Window Retainer Clamps

These prerequisite parts must be ordered separately if a unit is not already so equipped.

On Model 15 covers, the 178387 modification kit is incompatible with the 115740 glare shield assembly mounted as an accessory.

c. Capacitors in series with the inductor bar discharge needles offer a high impedance and thus eliminate the danger of electric shock from the high voltage secondary output of the power unit. (Refer to Figures 1 & 2)

d. The 178387 modification kit neutralizes the electrostatic charge, accumulated on the paper during feeding and printing operations, by ionizing the air space between the typing unit and the glass copy window of the cabinet or cover. The air is ionized by a high AC voltage applied between the inductor bar needlepoint electrodes and nearby grounded members. Ions of polarity opposite to that of the electrostatic charge on the paper are attracted to the paper by electrostatic forces and these ions neutralize the charge.

e. The 178387 modification kit consists of:

8	7002	Flat Washer	1	178388	Ground Clip (Model 15 and 19 Covers)
1	121244	Cable Clamp			
1	121247	Cable Clamp	1	178389	Power Unit
4	151630	Screw	1	178390	Static Eliminator Inductor Bar
1	153442	Screw	1	178391	Inductor Bar Extension Cable
			1	178392	Secondary Outlet Plug

f. For part numbers referred to and for parts ordering information, refer to the following Bulletins:

<u>Model</u>	<u>Bulletin</u>
Model 15 and 19 Page Printers	1037B
Model 28 Receive-Only and Send-Receive Cabinets (LAC)	1149B
Model 28 Automatic Send-Receive Cabinet (LAAC)	1169B
Model 35 Receive-Only and Send-Receive Cabinets (LAC)	1187B
Model 35 Automatic Send-Receive Cabinet (LAAC)	1187B

g. For schematic diagrams of the 178389 power unit and 178390 inductor bar, refer to Figures 1 and 2 respectively.

h. References made to left or right, up or down, front or rear, apply to the unit in its normal operating position as viewed from the front.

2. INSTALLATION

a. POWER UNIT (Proper ground connections must be made)

(1) If space is available, place the 178389 power unit on the lower shelf of the Model 15, 28 or 35 cabinet or table.

(2) When space on the lower shelf is not available, mount power unit elsewhere inside or outside the cabinet. Mounting flanges and 1/4 inch holes on the power unit have been provided to facilitate other mounting arrangements. In all cases, place the power unit within reach of the inductor bar cable and a 115 volt AC power source. Select a dry position in which the power unit or its cables do not interfere with the operation or maintenance of other equipment. Lack of room in the Model 35 cabinet will require the power supply to be placed in an upright position in the rear left hand corner of the cabinet (Refer to Figure 13).

(3) Ground the case of the power unit by a connection to the ground lug or with the green lead in the power unit input cable. The green lead is connected internally to the ground lug.

(4) When the 115 volt power source is obtained from within the Model 15, 28 or 35 printer set; connect the power unit input as shown in the following table.

<u>Unit</u>	<u>Conductor Color</u>	<u>Terminal Strip</u>	<u>Terminal No.</u>
Model 15 Base	Black	#1	#22
	White	#1	#23
	Green	Base Ground Screw	
Model 28 LAC Cabinet	Black	C	C39
	White	C	C40
	Green	Cabinet Ground Screw	
Model 28 LAAC Cabinet	Black	C	C35
	White	C	C40
	Green	Cabinet Ground Screw	
Model 35 Call Control	Black	K	K3
	White	K	K2
	Green	K	K1

TABLE 1

NOTE

MAKE CERTAIN PRINTER SET POWER IS TURNED OFF BEFORE CONNECTING CABLE.

(5) If the power unit must be connected directly to a 115 volt AC outlet external to the printer set and a 2 wire connector plug is used, the green cable lead should be cut back to the sheath and a 14 gauge stranded wire should be connected from the ground lug on the power unit case to the printer cabinet or base ground screw. If a 3 wire connector plug is used, the green cable lead should be connected to the ground prong and a 14 gauge stranded wire should be connected from the ground lug on the power unit case to the printer cabinet or base ground screw.

(6) If only one of the power unit outlets is utilized, make certain the 178392 secondary outlet plug is inserted in the unused outlet before power is turned on.

b. 178390 static eliminator inductor bar (Figures 5 and 6)

(1) Model 28 receive-only, send-receive and automatic send-receive cabinets (LAC, LAAC).

(a) Adjust the 178390 inductor bar by means of the four bracket screws so the adjustable brackets at both ends of the inductor bar are at their minimum extension.

(b) Inspect the 178390 inductor bar to see that it is clean and free from defects that might obstruct vision. If the inductor bar must be cleaned; use only a damp tissue or a clean, soft, damp cloth. Also, clean both sides of the cabinet window, if necessary.

(c) For LAC cabinets loosen the four 153442 screws that retain the 151511 rubber window gasket, 153043 glass or 151510 plastic window and 151513 window retainers to the cabinet dome. For LAAC cabinets loosen the four 151722 screws that retain the 151511 rubber window gasket, 160339 window, and 154433 window retainers to the right front door of the cabinet.

NOTE

Handle the 178390 inductor bar carefully to avoid being scratched from the discharge wire points.

(d) Install the 178390 inductor bar underneath the window by sliding the inductor bar retaining brackets between the 151511 rubber gasket and the 151513 or 154433 window retainers. The inductor bar should be positioned so the needle points are facing the rear of the cabinet and the cable is extended from the right side of the bar as viewed from the front of the cabinet. Position the inductor bar as far away from the tearing edge of the window as possible. Tighten the four window retainer screws. Check window and paper guide adjustments.

NOTE

No grounded material should come within 1/4 inch of the exposed ends of the wire points. Check to make certain the inductor bar retaining brackets are located between the 151511 gasket and the window retainers. This is essential to provide ground return for the inductor bar.

(2) For Model 28 LAC cabinet only:

(a) Attach the 178391 inductor bar extension cable to the inductor bar coupling. If already attached, check to make certain the connection is tight.

(b) Remove the lower 151723 screw and 3639 lockwasher that mount the 152883 right counterbalance arm to the right 151530 dome hinge. Discard the screw but retain the lockwasher. If a copylight assembly bracket and copylight cable clamp are mounted to the right 151530 dome hinge, make certain the cable clamp is facing to the left side of the bracket. Insert the 121244 cable clamp on the inductor bar extension cable and fasten to the 152883 counterbalance arm with the retained 3639 lockwasher and the 153442 screw as shown in Figure 5. Take up the inductor bar cable slack so that the cable does not exert pressure on the margin indicator lamp or interfere with the Model 28 typing unit or closing of the cabinet dome. Tighten the 153442 screw.

(c) Route the inductor bar cable down through the opening in the right rear corner of the cabinet shelf and attach the inductor bar cable to the 178389 power unit. Make certain power is off before connecting cable. Check for secure connection without endplay by pulling the cable lightly. An insecure connection will cause arcing.

(d) Manually select a character located in the lower row of the Model 28 typing unit type box. Rotate the typing unit main shaft until the typing unit is in position to print the character (type box in uppermost position). Close the cabinet dome and check for clearance between the type box and/or type box latch and the bottom of the 178390 inductor bar. Check for inductor bar and type box clearance while typing unit is running under power, also, if the typing unit type box or type box latch interferes with the 178390 inductor bar, loosen the 1113 and 74567 screws that fasten the 151524 front and rear cradle rails to the side cradle rails and position the keyboard base slightly to the rear of the cabinet. Tighten the screws.

(3) For Model 28 LAAC cabinets only:

(a) Attach the 178391 inductor bar extension cable to the inductor bar coupling. If already attached, check to make certain the connection is tight.

(b) Insert the 121244 cable clamp on the inductor bar extension cable. Remove the 125231 nut and 3639 lockwasher from the 71699 shoulder screw on the 151576 stop arm (old style) or the 112626 nut and 2669 lockwasher from the 49644 shoulder screw on the 160974 stop arm (new style) and insert the 121244 inductor bar cable clamp on the 71699 or 49644 shoulder screw as illustrated in Figure 6. Take up the cable slack so that the cable will not interfere with the Model 28 typing unit and fasten the cable clamp to the shoulder screw with the lockwasher and nut. An alternate method of securing the inductor bar extension cable in LAAC cabinets containing the new style 160974 stop arm and 49644 shoulder screw is to route the cable between the 154481 torsion bar and the cabinet dome and tie the cable to the right side of the cabinet rear cross member. Check for interference between the cable and 160974 cabinet stop arm or Model 28 typing unit.

(c) Route the inductor bar cable down through the opening in the right rear corner of the cabinet shelf and attach the inductor bar cable to the 178389 power unit. Make certain power is off before connecting cable. Check for secure connection without endplay by pulling the cable lightly. An insecure connection will cause arcing.

(d) Manually select a character located in the lower row of the Model 28 typing unit type box and rotate the typing unit main shaft until the typing unit is in position to print the character (type box in uppermost position). Close the cabinet dome and check for clearance between the type box and/or type box latch and the bottom of the 178390 inductor bar. Check for inductor bar and type box clearance while the typing unit is operating under power, also, should the type box or type box latch interfere with the 178390 inductor bar, make the cradle height adjustment. Refer to Figure 3.

NOTE

If the cradle height is readjusted, it may also be necessary to readjust the Model 28 character counter scale by means of the 153799 screws located at the rear of the 158019 counter baffle to recenter the scale in the cabinet window. The character counter adjustments should then be rechecked.

(4) Model 15 and Model 19 receive-only and send-receive cabinets

(a) Adjust the 178390 inductor bar by means of the four bracket screws so the adjustable brackets at both ends of the inductor bar are at their maximum extension.

NOTE

Handle the inductor bar carefully to avoid becoming scratched from the wire discharge points.

(b) Inspect the inductor bar to see that it is clean and free from defects that might obstruct vision. If the inductor bar must be cleaned; use only a damp tissue or a damp, clean, soft cloth. Also, clean both sides of the cover window, if necessary.

(c) On the Model 15 page printer, remove the 80466 platen crank from the platen and remove the cover from the page printer and base.

(d) Loosen the four 1162 or 151637 screws and 3640 lockwashers that mount the 103975 or 104990 cover window to the 93743 front cover lid by means of the 74759 felt strips, 80869 and 80870 window retaining rails, and 80876 mounting straps. If 74759 felt strips are present, install the 178390 static eliminator inductor bar by sliding the inductor bar retaining brackets between the 93743 front cover lid and the felt strips. If the felt strips are not present, slide the inductor bar retaining brackets between the 93743 front cover lid and the 103975 or 104990 cover window. Position the inductor bar so that the needle points are facing the rear of the cover and the cable is extended from the right side of the bar as viewed from the front of the cabinet. Position the inductor bar as far away from the tearing edge of the window as possible. Tighten the four window retainer screws. Refer to Figure 7.

NOTE

Do not allow any grounded material to come within 1/4 inch of the exposed ends of the wire points. Make certain that the inductor bar retaining brackets are located between the 74759 felt strips and the 93743 front cover lid and not between the felt strips and the window. When installation is complete, if difficulties caused by static charge are not eliminated, remove the inductor bar and scrape away some of the paint from the inside surface of the 153513 window retainers. Replace the inductor bar.

(e) Remove and retain the 83885 nut, 2191 lockwasher, and 7002 flat washer from the right stud that secures the right front 82415 detent spring. Insert the 121244 cable clamp on the inductor bar cable and secure the clamp to the stud with the retained flat washer, lockwasher, and nut. Take up cable slack so the cable does not interfere with opening or closing of the 93743 cover lid or with the Model 15 page printer mechanism.

(f) Remove the Model 15 page printer from the base and turn the base on its side. Remove and retain the left rear 6745 or 153442 screw and 2669 lockwasher that mount the base plate. Install the 178388 cover ground clip using the retained screw and lockwasher. Refer to Figure 8.

(g) Disconnect the 178391 inductor bar extension cable from the inductor bar. Remove and retain the 74592 cable retaining rod or 99818 cable clamp from the Model 15 printer base. Route the inductor bar extension cable along side of the power unit input cable to the power unit. Make certain that the Model 15 printer set power is turned off. Connect the inductor bar cable to the 179389 power unit. Make certain connection is secure without end play by pulling lightly on the cable. Fasten the inductor bar and power unit cables to the base by means of the retained 74592 cable retaining rod or 99818 cable clamp. If there is insufficient room to route both cables between the 74592 cable retaining rod or 99818 clamp and the 71672, 80460, 90273 or 99959 base cable clamp, route the inductor bar cable down between the Model 15 printer base and the Model 15 cover adjacent to the 74425 base auxiliary receptacle. Refer to Figure 9.

(h) Replace the Model 15 page printer and cover on the Model 15 printer base. With Model 15 printer set power turned off, connect the 178391 inductor bar extension cable to the inductor bar cable by means of its coupling and check for interference with the Model 15 page printer mechanism.

(i) The 178391 inductor bar extension cable must be removed from the inductor bar cable through means of its coupling before the Model 15 printer cover may be removed from the printer set for maintenance purposes. The Model 15 page printer set power should be turned off before disconnecting the cables to prevent arcing.

(5) Model 35 receive-only, send-receive, and automatic send-receive cabinets

(a) Adjust the 178390 inductor bar by means of the four bracket screws so the adjustable brackets at both ends of the inductor bar are at their minimum extension.

NOTE

Handle the inductor bar carefully to avoid becoming scratched from the wire discharge points.

(b) Inspect the inductor bar to see that it is clean and free from defects that might obstruct vision. If the inductor bar must be cleaned; use only a damp tissue or a damp, clean, soft cloth. Also, clean both sides of the cover window, if necessary.

(c) Remove the four 151722 screws and 2191 lockwashers that mount the 192073 window to the front cover lid. Discard the screws but retain the lockwashers. Position the 194985 clamps as shown in Figure 10. Fasten loosely the clamps using four 151630 screws, four 2191 lockwashers, and eight 7002 flat washers. Refer to Figure 11. Install the 178390 static eliminator inductor bar by sliding it between the 194985 clamps and the window gasket. Position the inductor bar so that the needle points are facing the rear of the cover and the cable is extended from the right side of the bar as viewed from the front of the cabinet. Position the inductor bar as far away from the tearing edge of the window as possible. Tighten the four window retainer screws. Refer to Figure 10.

NOTE

No grounded material shall come within 1/4 inch of the exposed ends of the wire points. Check to make certain the inductor bar retaining brackets (located on the ends of the inductor bar) are located between the window gasket and the 194985 clamps, and not between the gasket and the window. This is essential to provide ground return for the inductor bar.

(d) Connect the 178391 inductor bar extension cable to the inductor bar coupling. If already connected, check to make sure connection is secure.

(e) Remove and discard the cable clamp (located in the middle of the cover on the right hand side) used for fastening the copy light wiring to the cover. Attach the 121247 cable clamp to the inductor bar cable and the copy light wires. Take up the cable slack so that the cable will not interfere with the Model 35 typing unit and fasten the cable clamp to the cabinet with the washer and nut.

(f) Route the inductor bar cable down through the opening in the right rear corner of the cabinet shelf and connect the cable to the 178389 power unit. Make certain power is off before connecting cable. Check for secure connection without endplay by pulling the cable lightly. An insecure connection will cause arcing. Refer to Figure 12 or 13.

(g) The Model 35 cover may be removed from the cabinet by disconnecting the 178391 inductor bar extension cable from the inductor bar through its coupling and by disconnecting the copylight plug from the electrical service unit. Make certain power is turned off before disconnecting cables to prevent arcing.

3. ADJUSTMENTS (Bell System refer to standardized information)

a. For Model 28 LAC receive-only and send-receive cabinets, refer to Bulletin 217B. Make the window and paper guide adjustments.

b. For Model 28 LAAC send-receive cabinet:

(1) Refer to Bulletin 250B. Make the following adjustments:

- (a) Paper Guide
- (b) Window
- (c) Character Counter

(2) Make the cradle height adjustment (refer to Figure 3 of this specification).

c. For Model 15 or 19 printer cabinets, refer to Bulletin 138B. Make the cover gap adjustment.

d. For Model 35 LAC receive-only and send-receive cabinets, refer to Bulletin 281B. Make the final window adjustment.

e. For Model 35 LAAC send-receive cabinet, refer to Bulletin 280B. Make the final window adjustment.

4. SERVICE

Note: All power must be turned off during servicing.

a. In order for the static eliminator to function at maximum efficiency, the inductor points should be free from dirt, lint, or paper dust. The points should be cleaned using a stiff brush or air jet at the regular maintenance intervals. Use of solvents is not recommended.

b. The plastic portion of the inductor bar should be cleaned with a damp tissue or damp clean cloth.

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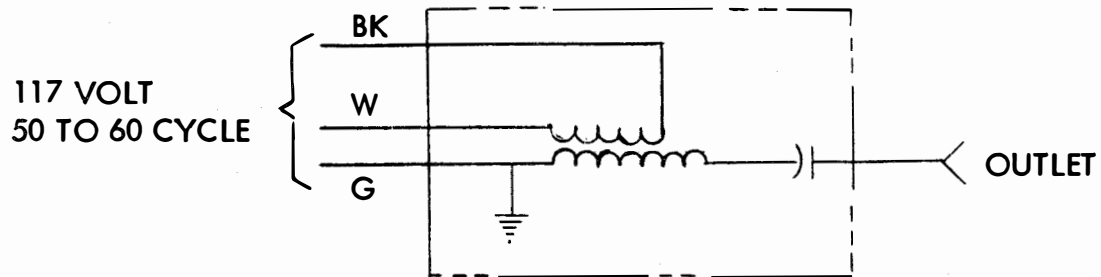


FIGURE 1. SCHEMATIC WIRING DIAGRAM OF 178389 POWER UNIT.

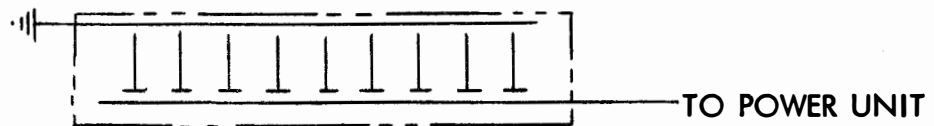
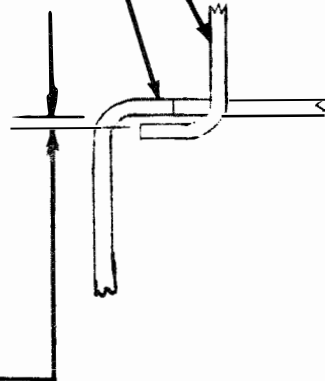


FIGURE 2. SCHEMATIC WIRING DIAGRAM OF 178390 INDUCTOR BAR

TRANSMITTER - DISTRIBUTOR PLATE
 TRANSMITTER - DISTRIBUTOR COVER

NOTE

AFTER CRADLE HEIGHT IS ADJUSTED, THE CHARACTER COUNTER MUST BE CENTERED IN THE CABINET WINDOW. TO ADJUST, LOOSEN THE 153799 MOUNTING SCREWS.



(2) REQUIREMENT
 IF CABINET CONTAINS THE 161868, 161869 OR 164108 NOISE SILENCER MODIFICATION KIT, CLEARANCE BETWEEN TRANSMITTER DISTRIBUTOR COVER AND THE PLATE WITH STUDS MOUNTED ON THE FRONT OF THE TRANSMITTER DISTRIBUTOR MIN. .030 INCH

(1) TO CHECK

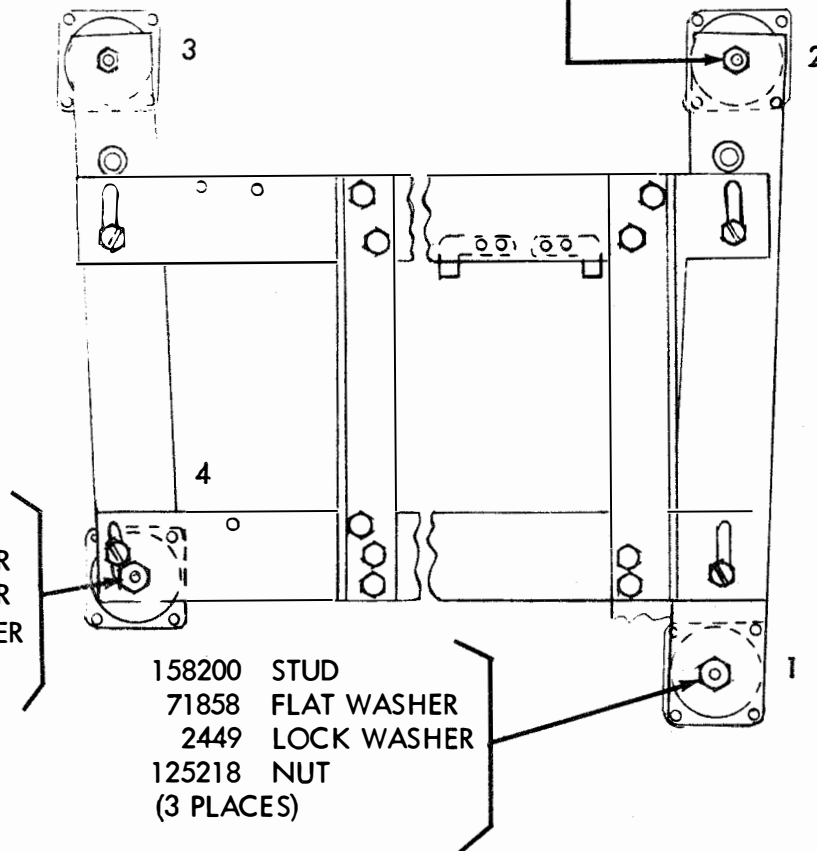
SELECT A CHARACTER IN LOWER ROW OF TYPE BOX. ROTATE MAIN SHAFT UNTIL TYPE BOX IS IN UPPERMOST POSITION.

REQUIREMENT

CLEARANCE BETWEEN TYPE BOX AND/OR TYPE BOX LATCH AND BOTTOM OF INDUCTOR BAR MIN. .060 INCH

TO ADJUST

LOOSEN LOCK NUTS ON MOUNTS NUMBERED 1, 2, AND 3 ON TOP LEFT AND RIGHT RAILS. LOOSEN NUT ON LOWER END OF STUD IN MOUNT NUMBER 4. RAISE OR LOWER CRADLE BY TURNING STUDS IN MOUNTS. TIGHTEN NUTS.



- 158201 STUD
- 71858 FLAT WASHER
- 111516 FLAT WASHER
- 2669 LOCK WASHER
- 12626 NUT (1 PLACE)

- 158200 STUD
- 71858 FLAT WASHER
- 2449 LOCK WASHER
- 125218 NUT (3 PLACES)

FIGURE 3. CRADLE HEIGHT ADJUSTMENT

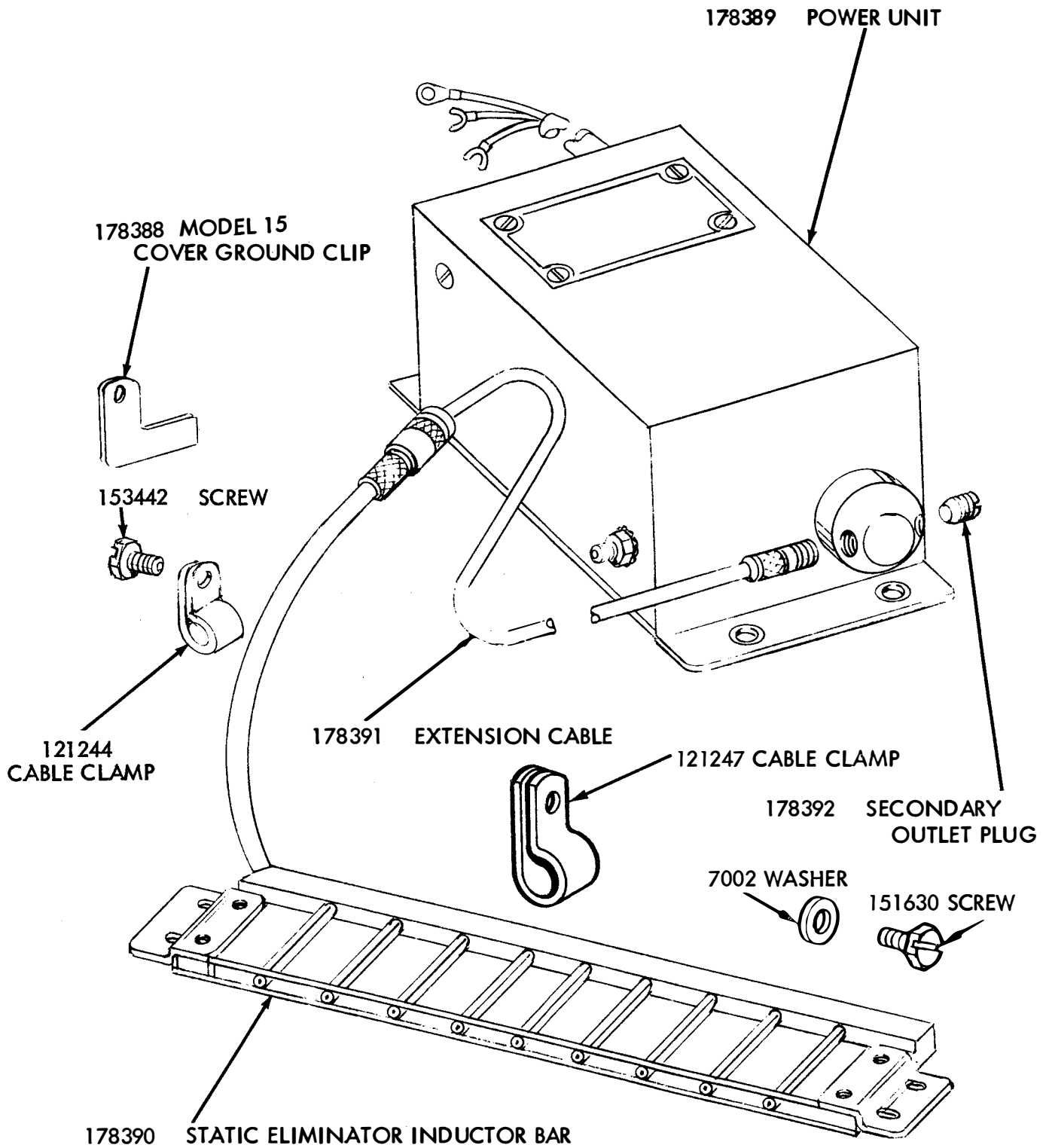


FIGURE 4. PARTS FOR 178387 STATIC ELIMINATOR MODIFICATION KIT

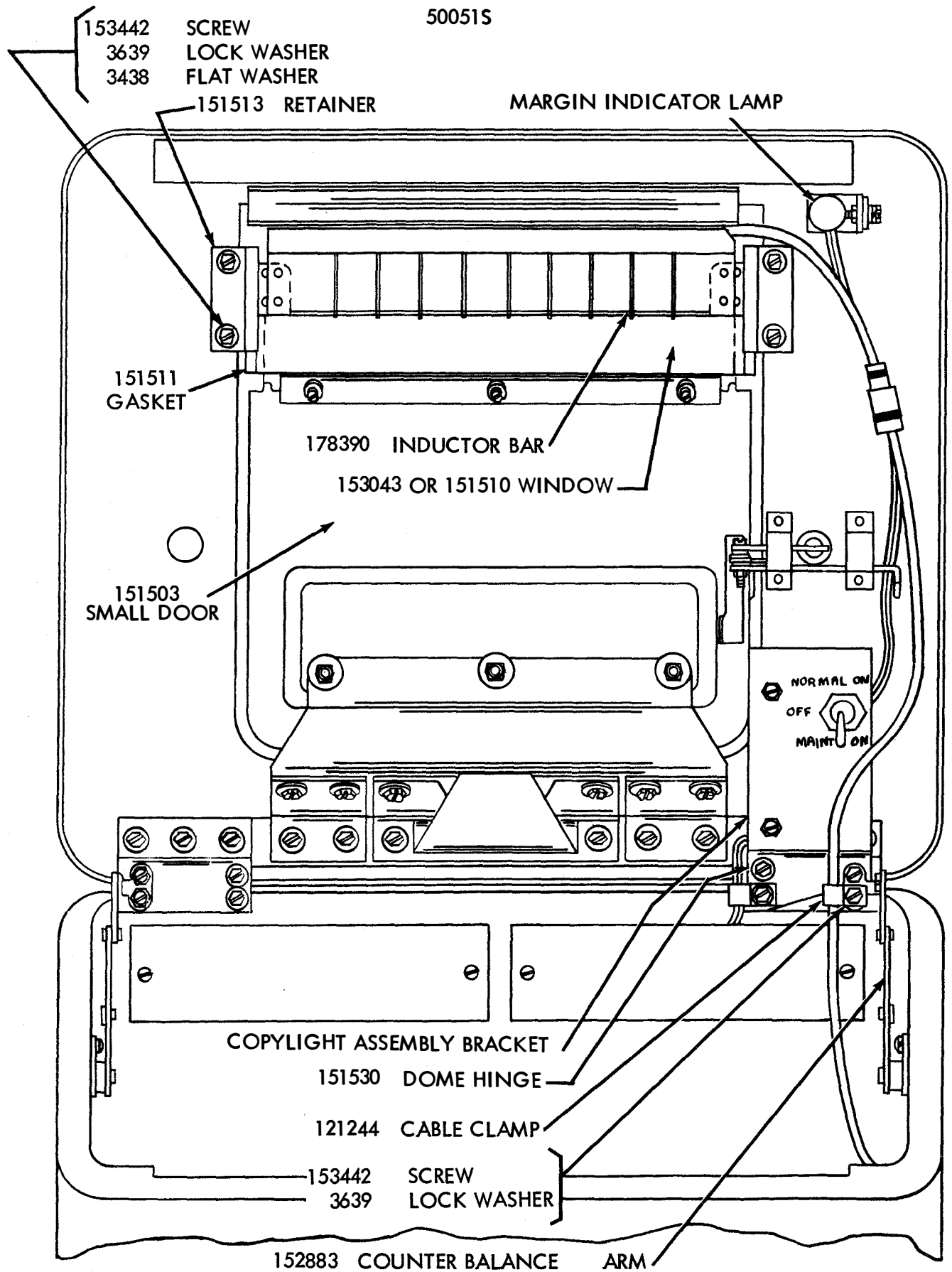


FIGURE 5. INDUCTOR BAR MOUNTING IN MODEL 28 LAC CABINET

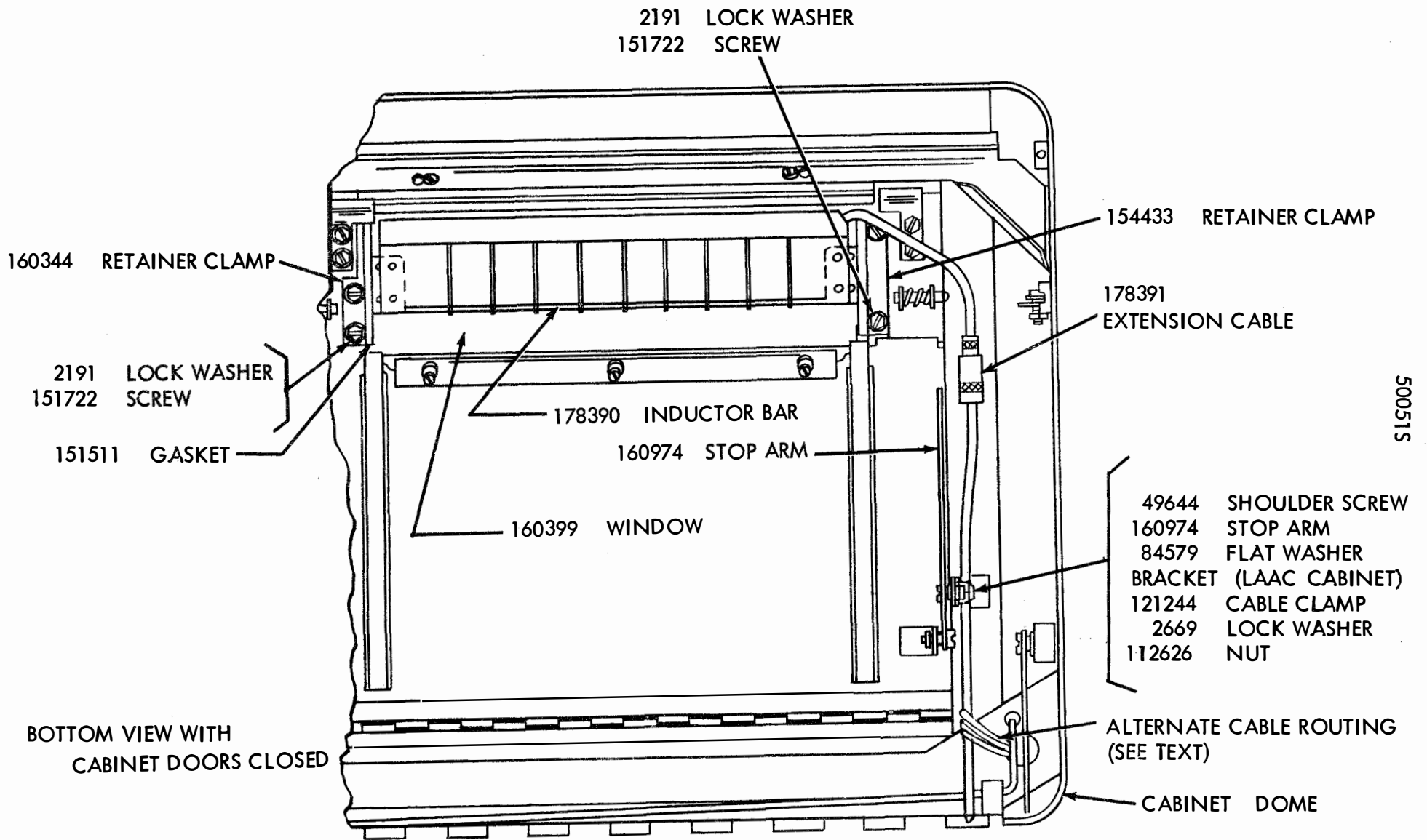


FIGURE 6. INDUCTOR BAR MOUNTING IN MODEL 28 LAAC CABINET

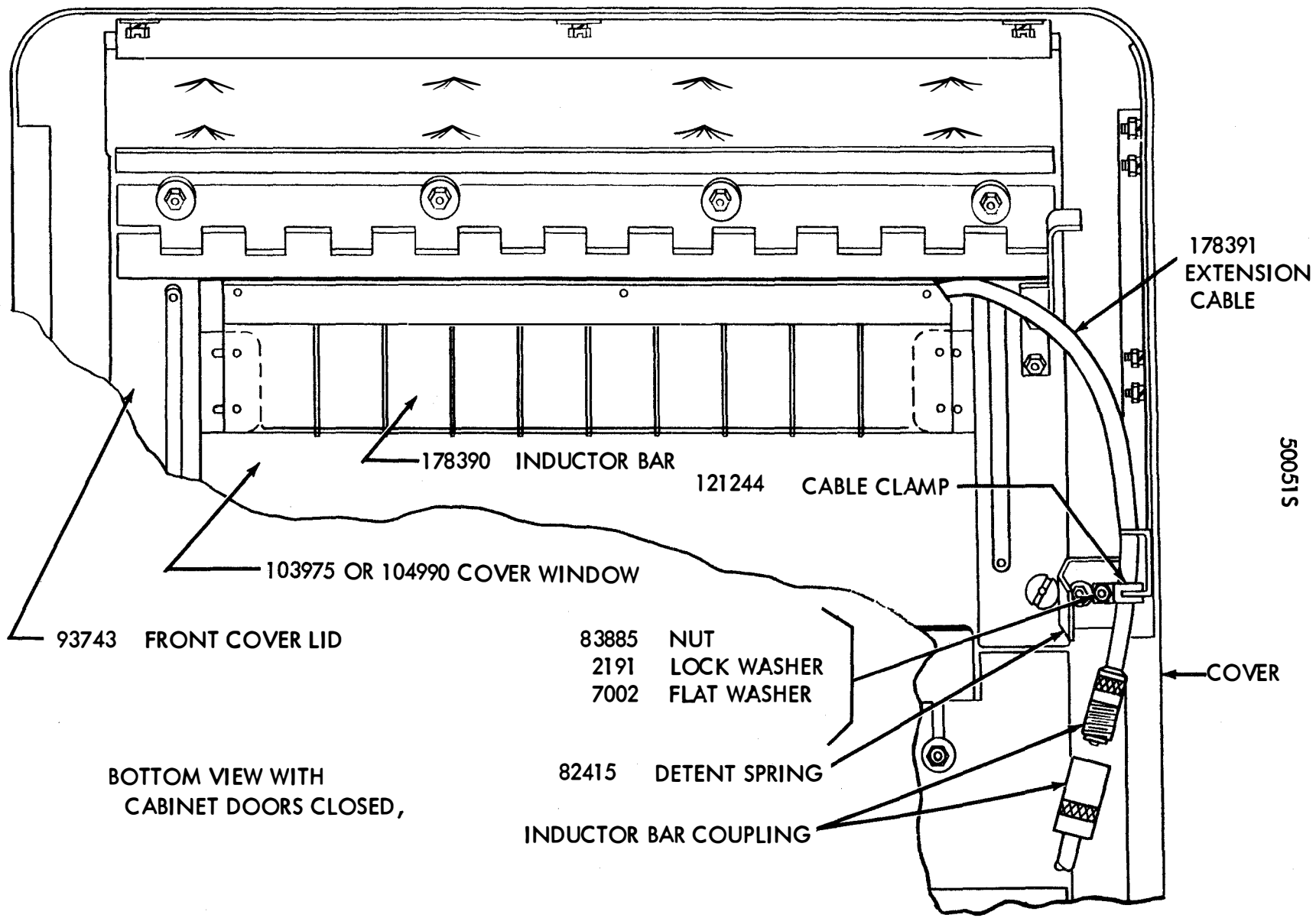
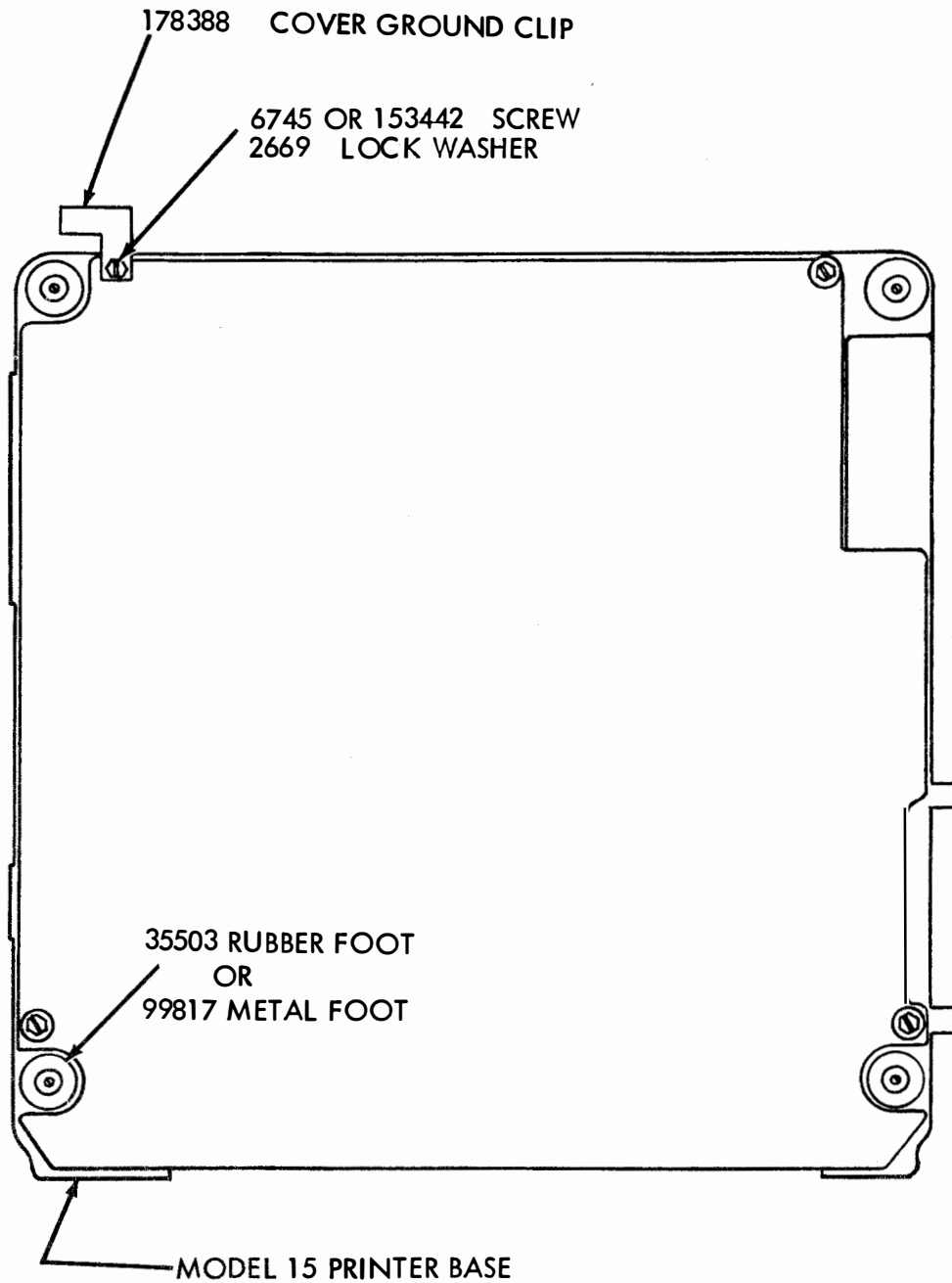
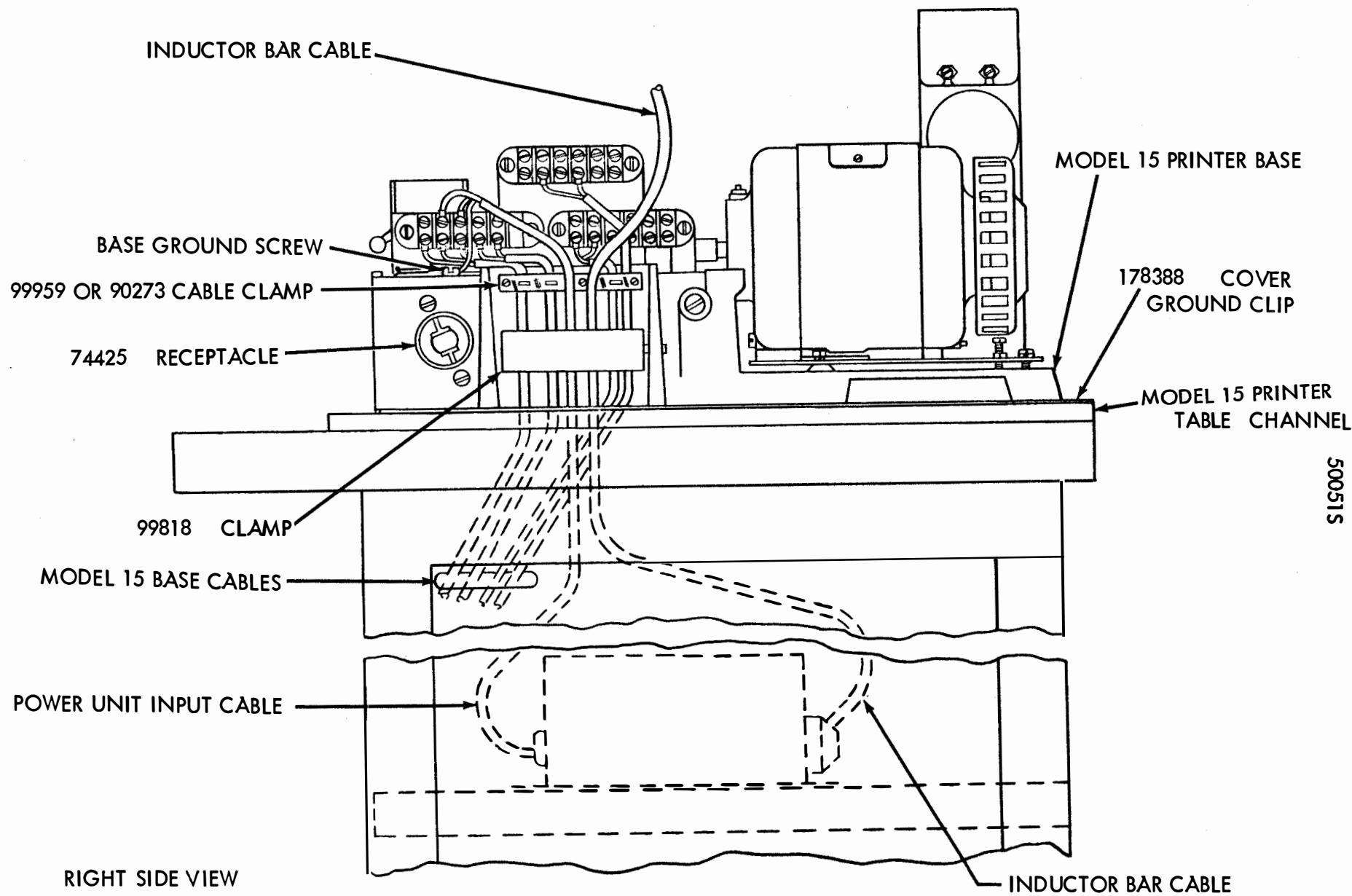


FIGURE 7. INDUCTOR BAR MOUNTING IN MODEL 15 OR MODEL 19 COVER



BOTTOM VIEW

FIGURE 8. BASE GROUND CONNECTION FOR MODEL 15 COVER



500515

FIGURE 9. STATIC ELIMINATOR CABLE ROUTING IN MODEL 15 AND MODEL 19 PRINTER SETS.

50051S

+EITHER STYLE OF THE 194985
CLAMPS, POSITIONED AS
SHOWN, CAN BE USED TO
REPLACE THE 154433 CLAMPS

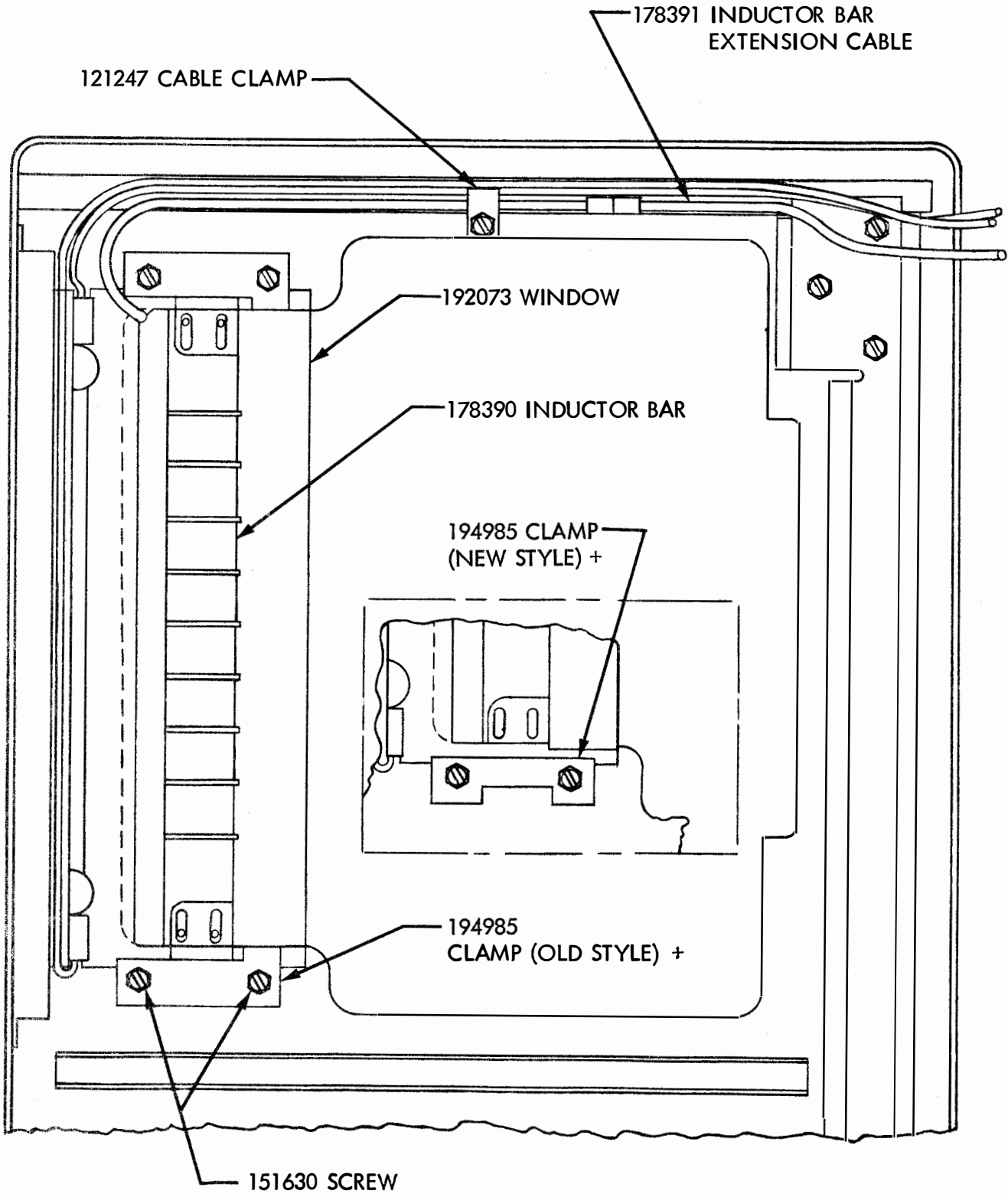


FIGURE 10. INDUCTOR BAR MOUNTING IN MODEL 35 CABINET

50051S

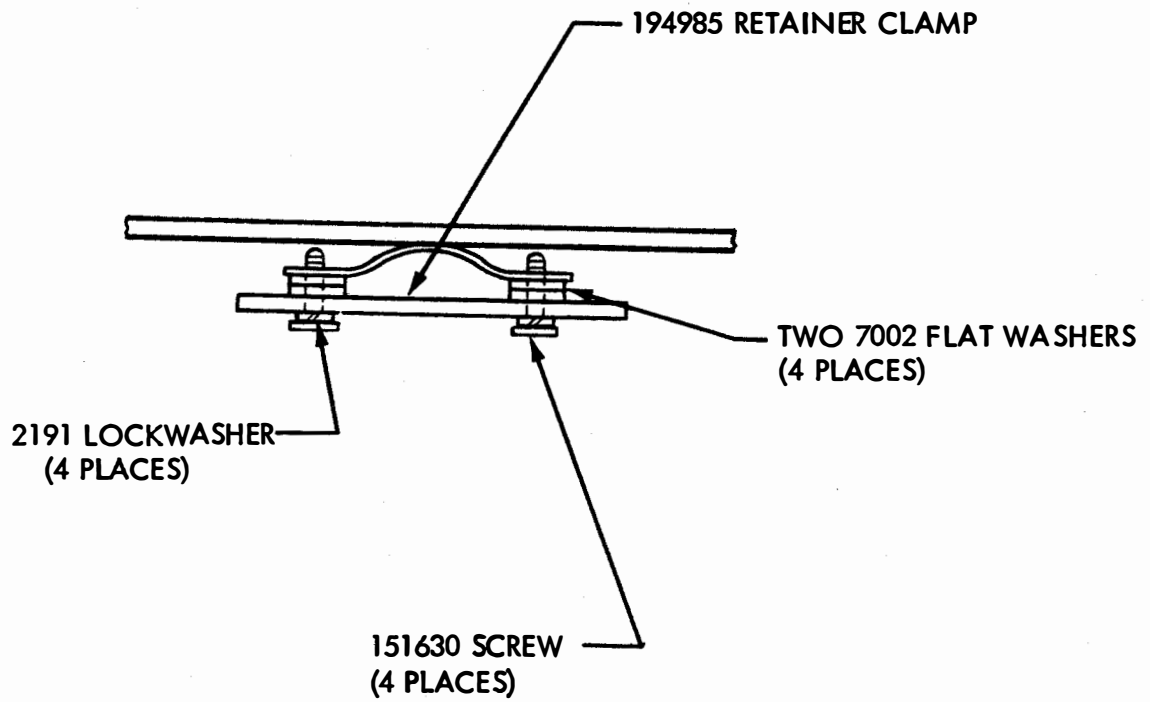
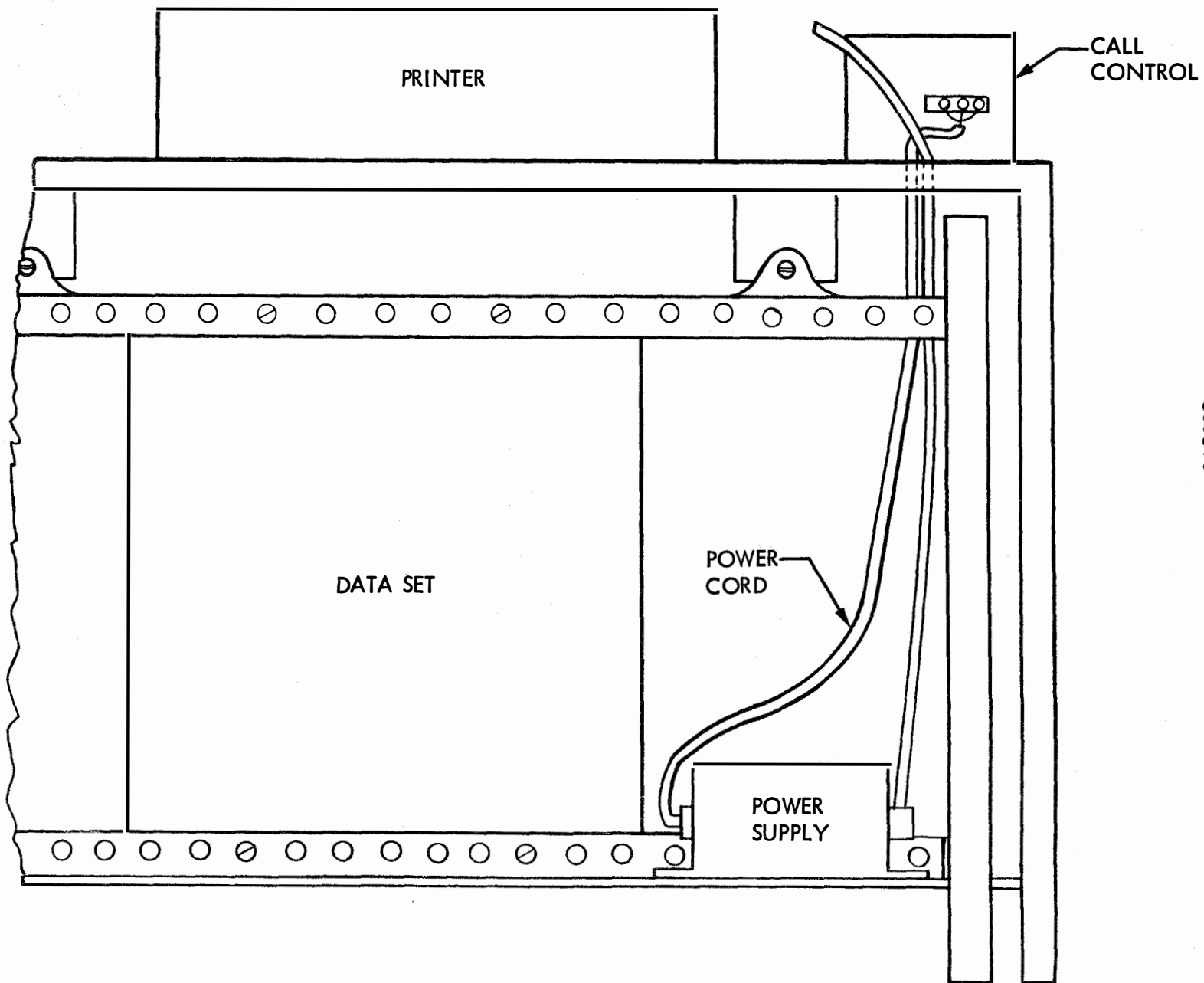


FIGURE 11. RETAINER CLAMP MOUNTING (MODEL 35 CABINET)



50051S

FIGURE 12. INDUCTOR BAR POWER SUPPLY MOUNTING IN MODEL 35 LAAC CABINET

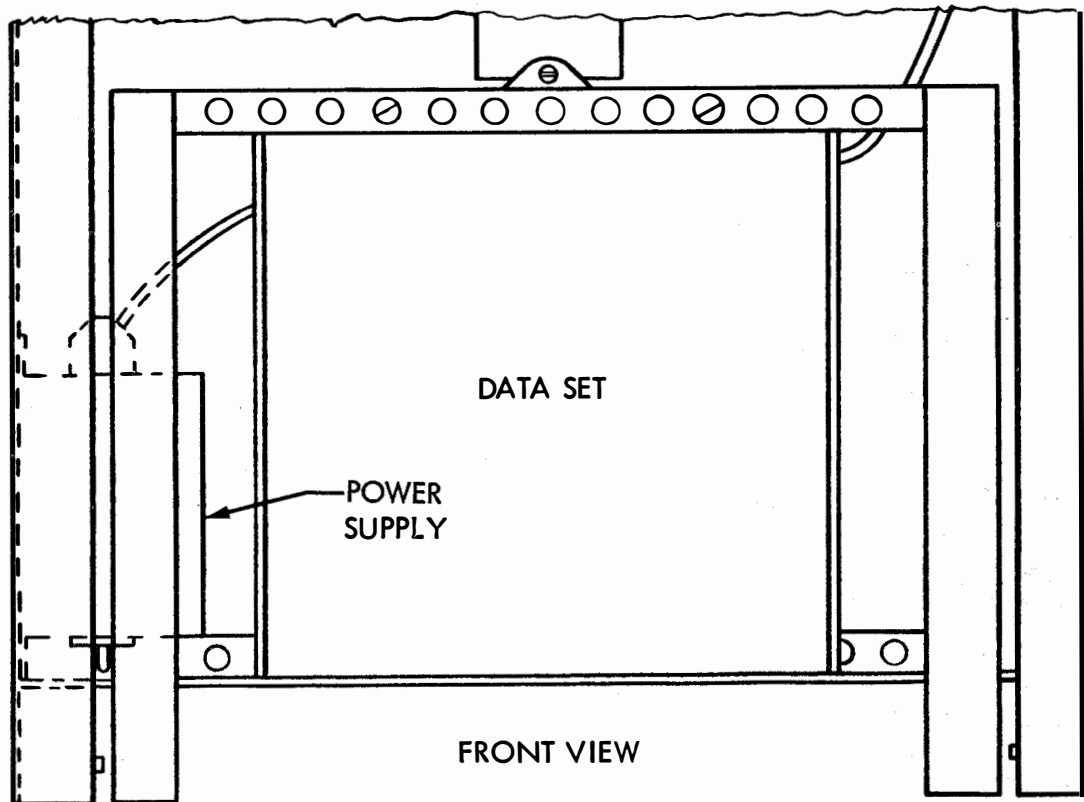
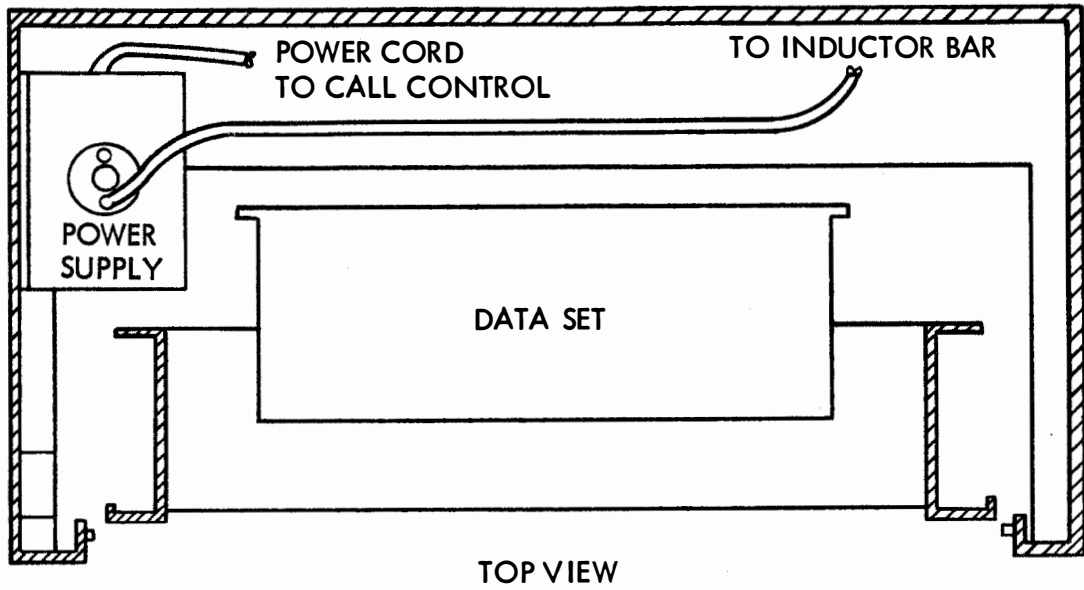


FIGURE 13. MODEL 35 LAC CABINET AND INDUCTOR BAR POWER SUPPLY