

Diablo Systems Incorporated

**Model 429 Power Supply
Maintenance Manual**

PREFACE

The purpose of this manual is to provide the prospective user of the Diablo Systems, Inc., Model 429 Power Supply with the unit's characteristics and capabilities and to enable the power supply's user to properly operate and maintain the unit.

Comments on this manual or its use are invited.

WARRANTY

The Model 429 Power Supply is warranted against defective materials and workmanship for 1 year from the date of shipment. Any questions with respect to the warranty should be taken up with your Diablo Sales Representative.

All requests for repairs should be directed to the Diablo Repair Depot in your area. This will assure you of the fastest possible service.

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Section 1

INTRODUCTION

1.1 GENERAL DESCRIPTION AND USE

This manual describes the installation, operation, and maintenance of the Diablo Systems, Inc., Model 429 Power Supply, which is shown in Figure 1-1. The power supply is designed specifically to provide the power required by one Diablo Series 40 Disk Drive; circuit configuration and component values were selected to accommodate the peculiarities of the dynamic load presented by the Series 40 Disk Drive, including the flyback current spikes. The Model 429 may be used, however, for supplying power to any equipment having the appropriate power requirements. Nominal output voltages of the Model 429 are +24 Vdc, -24 Vdc, and +5 Vdc.

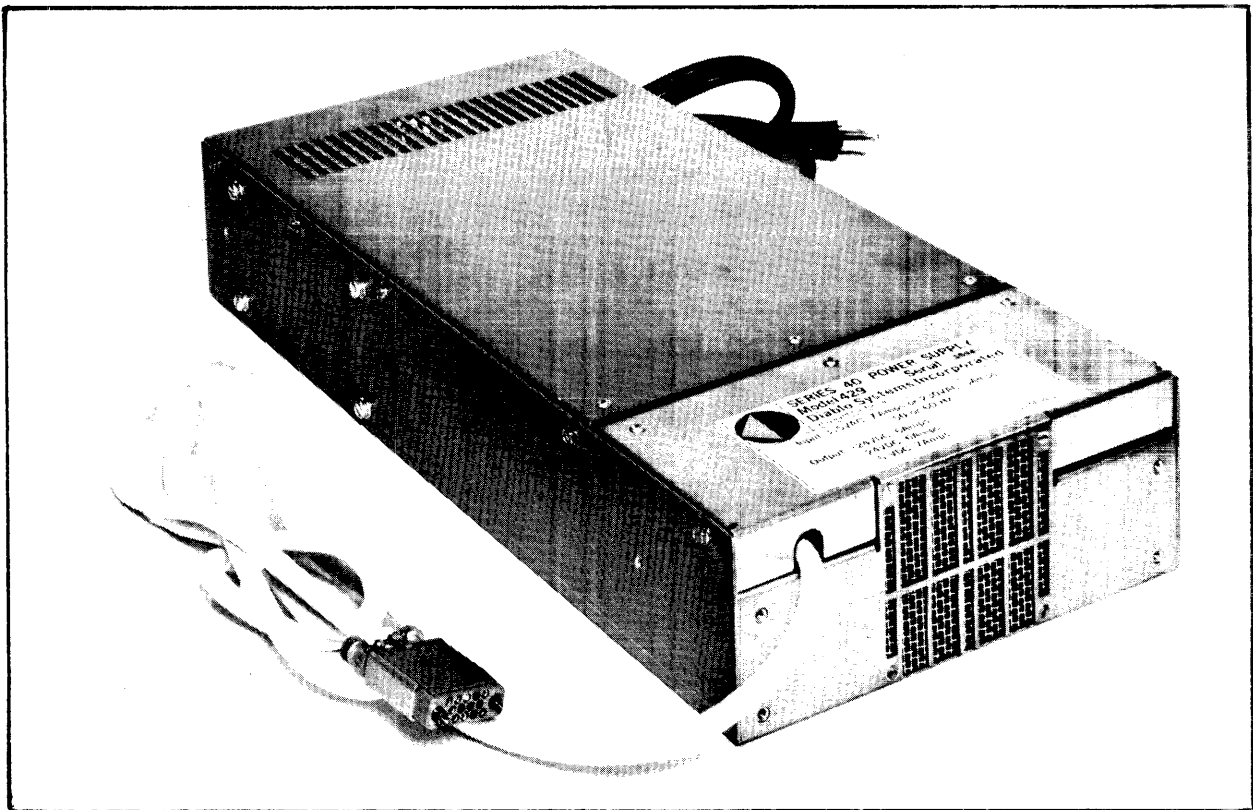


Figure 1-1. DIABLO SYSTEMS, INC., POWER SUPPLY MODEL 429

Combined static and dynamic output voltage variation does not exceed $\pm 8\%$ for the 24-volt outputs, and $\pm 3\%$ for the 5-volt output, under worst case conditions of temperature, input voltage and frequency, and load.

The use of a ferroresonant constant-voltage transformer results in minimum complexity for the performance achieved. Adequate component derating and quality workmanship have been used throughout the Model 429, resulting in maximum reliability and service life.

The power supply operates from a primary power source of either 115 Vac or 220 Vac, selectable by taps on the power transformer windings. Taps also allow the use of either 60 Hz or 50 Hz primary power. Line voltage and frequency variations of $\pm 10\%$ and ± 1 Hz, respectively, can be tolerated without degradation of power supply performance.

Although the DC output voltages are available at terminal posts with clamp screws, the power supply comes with a six-foot DC power cable assembly using a Winchester MRAC 14 SJTCH connector assembly with 100-0919S socket contacts.

The 5 Vdc circuit has an overvoltage protection feature which operates if the output exceeds approximately 6 Vdc. Current limiting is at a nominal 7 amperes for the 5-volt output. Each output is fused, as is the input line.

An optional Rack Adaptor Kit is available for mounting one or two power supplies in a standard 19-inch rack. The kit will accommodate cabinets with any mounting rail spacing between 22 and 28 inches.

1.2 SPECIFICATIONS

Table 1-1 shows the specifications for the Model 429 Power Supply. The specifications are for operation at rated load unless otherwise indicated.

TABLE 1-1

Specifications - Diablo Systems, Inc., Model 429 Power Supply

| Parameter | Specification |
|----------------|---|
| Input Voltage | 115 Vac or 220 Vac, $\pm 10\%$ 50 Hz or 60 Hz, ± 1 Hz (tapped transformer windings allow selection) |
| Input current: | |
| 115v 60 Hz | 5.2A $\pm 10\%$ |
| 115v 50 Hz | 5.6A $\pm 10\%$ |
| 220v 60 Hz | 2.6A $\pm 10\%$ |
| 220v 50 Hz | 2.8A $\pm 10\%$ |
| Rated Load | +24 Vdc - 5.5A total -24 Vdc - 5.5A total +5 Vdc - 4A |

| | |
|--|---|
| Output: | |
| Nominal Output | +24 Vdc -24 Vdc +5 Vdc |
| Combined Ripple & voltage variation caused by dynamic load | $\pm 8\%$ peak-to-peak for ± 24 Vdc $\pm 3\%$ peak-to-peak for + 5 Vdc |
| Peak Current | 17A total on +24 Vdc and -24 Vdc |
| Overvoltage Protection Level, 5 volt supply | 6 Vdc \pm 0.5V |
| Foldback Current Limit, 5 volt supply | Nominal 7A |
| Output impedance of 5 Vdc supply @ 2.5 MHz | <0.01 Ω |
| Power Consumption | <420W |
| Efficiency | >65% |
| 24 Vdc Decay Ratio ⁽¹⁾ | >1.1 |
| Environmental: | |
| Operating Ambient Temperature | 25° C \pm 15° |
| Storage Temperature | -55° C to + 85° C |
| Relative Humidity | 10% to 90% |
| Physical | |
| Height | 3.27 inches |
| Width | 8.156 inches |
| Depth | 18.0 inches |
| Weight | 31 pounds |

- (1) Decay Ratio is equal to $+t/-t$ where $+t$ is the +24 Vdc decay, and $-t$ is the -24 Vdc decay. As used herein, decay is defined as the time required for the output to drop from 23.5V to 1.0V, absolute values, after primary power to the unit has been removed, with equal loads on the two outputs. This characteristic is required so that the read/write heads on the disk drive will retract toward the home position.

Section 2

INSTALLATION

CAUTION

The transformer is connected at the factory for operation from a 115 Vac 60 Hz line with one side connected to earth ground. If operation from a different power source is desired, or if earth ground is not on the proper side of the line, the transformer connections and/or fusing must be changed as described in Paragraph 2.3 prior to applying any power to the unit. It is advisable that any changes to the connections be made prior to installation of the unit in a cabinet.

2.1 GENERAL INSTALLATION CONSIDERATIONS

Figure 2-1 shows the principal dimensions of the Model 429 Power Supply. The unit can be either bench mounted or installed in a standard 19-inch rack. Although there is no restriction as to which end of the power supply faces the rear of the cabinet, it is normal for the end with the DC power cord to face the rear, since the DC input of the Series 40 Disk Drives is at the rear. Installation instructions are based on this orientation. Therefore, the DC power cord end is referred to in this manual as the rear end.

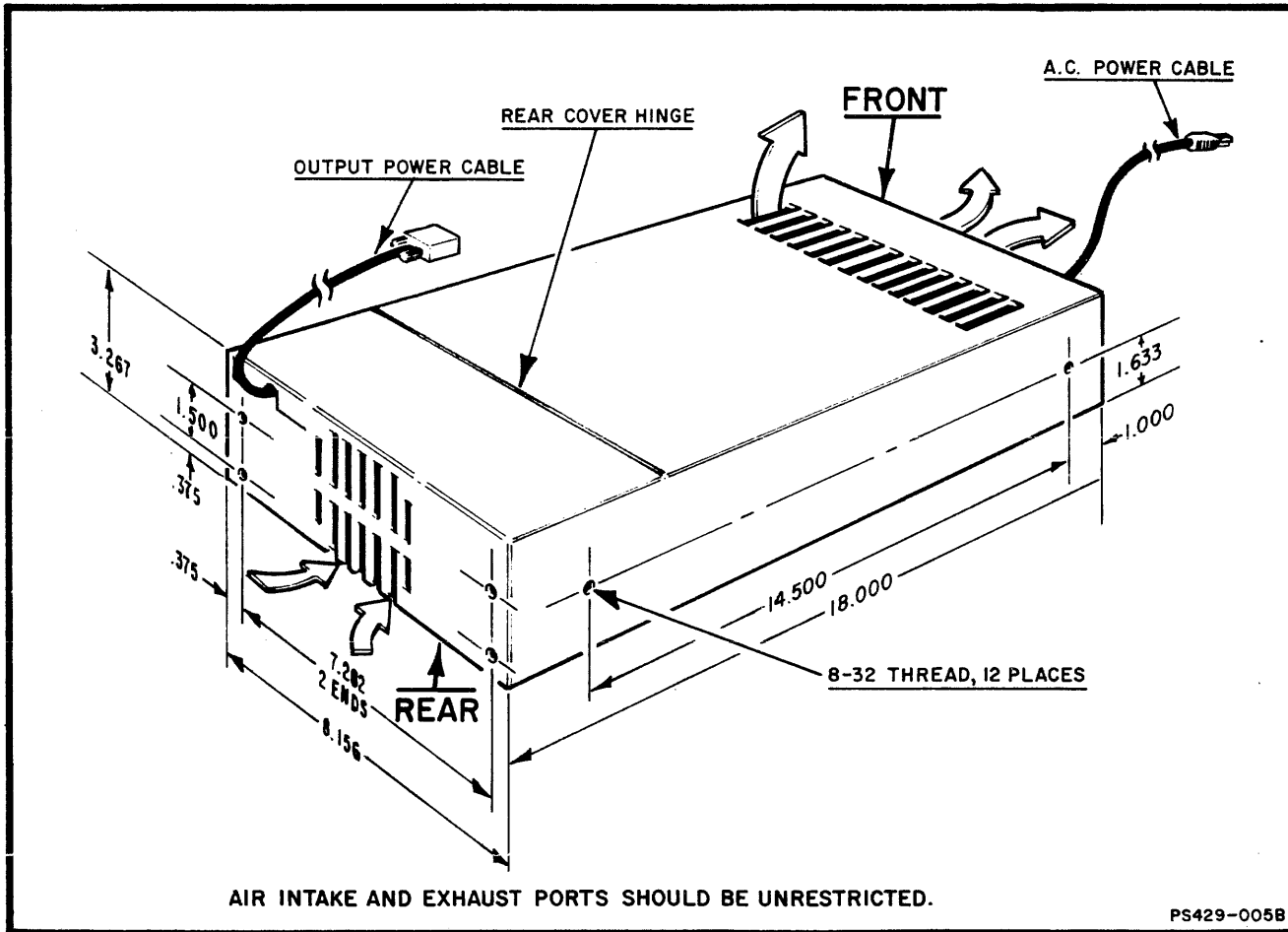
Maximum ventilation is obtained if all three (front, top and bottom) air exhaust ports are unrestricted. As a minimum, both the rear intake port and one exhaust port (See Figure 2-1) must have a clearance of at least 3 inches from the closest obstruction.

If the unit is bench mounted, it is advisable to mount adhesive rubber feet on the bottom surface, so that the bottom air exhaust port will not be covered. Clearance between the bench and the power supply should be at least one-fourth inch. Numerous satisfactory types of such rubber feet are readily available on the market.

2.2 RACK MOUNTING

By use of the optional Rack Adaptor Kit, one or two power supplies may be installed in a standard 19-inch rack. Depending on the way in which the kit is

Figure 2-1. OUTLINE DIMENSIONS, MODEL 429 POWER SUPPLY



PS429-005B

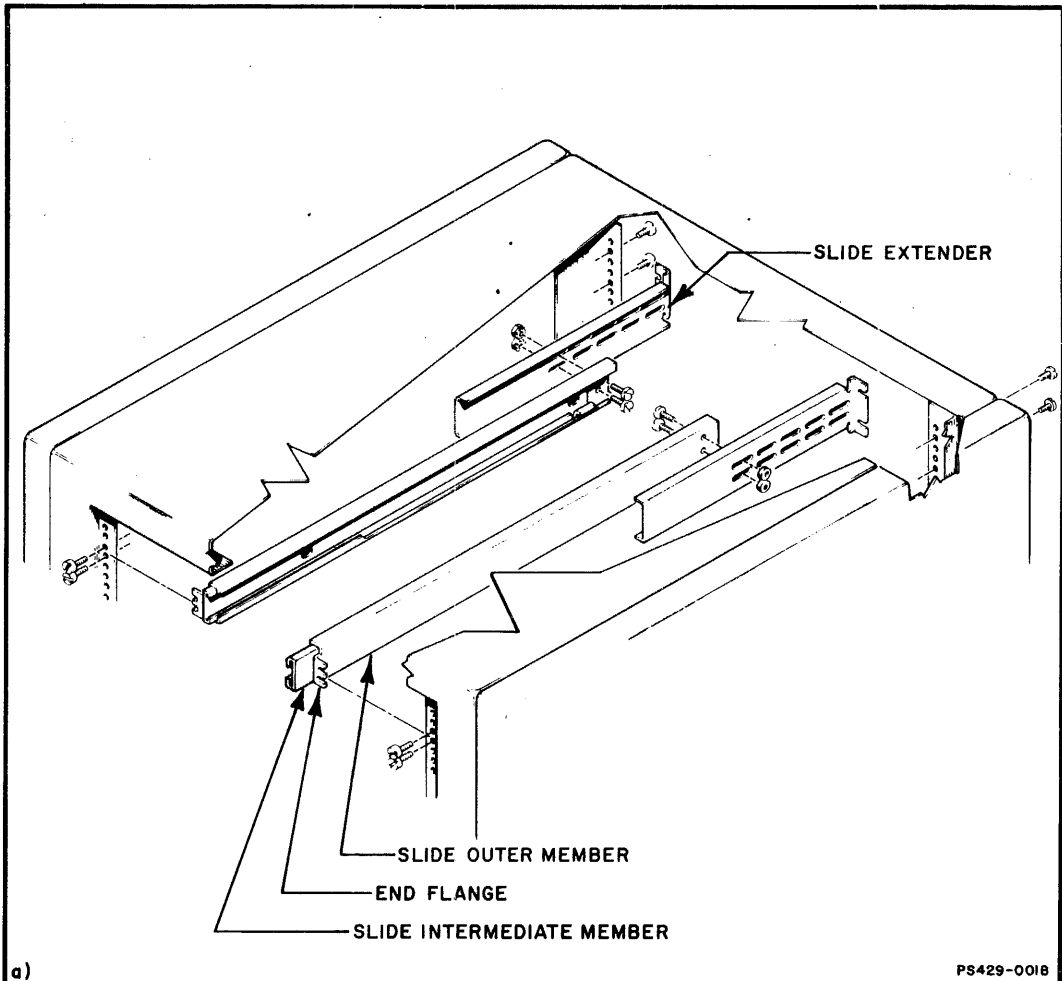
installed, the power supply slides out to either the front or the rear of the rack, but not both. Although all normally serviced parts are accessible regardless of the power supply mounting, rear opening facilitates access to the DC output terminal posts and the output-line fuses, and is the recommended method of mounting. Front opening facilitates access to the line fuses and the transformer tap terminals.

Figure 2-2 shows the method of installing the kit for rear opening. The kit is installed as follows:

- (1) Insert the slide intermediate members into the slide outer members. Ensure that the intermediate member is inserted into the end opposite the end flange on the outer member.

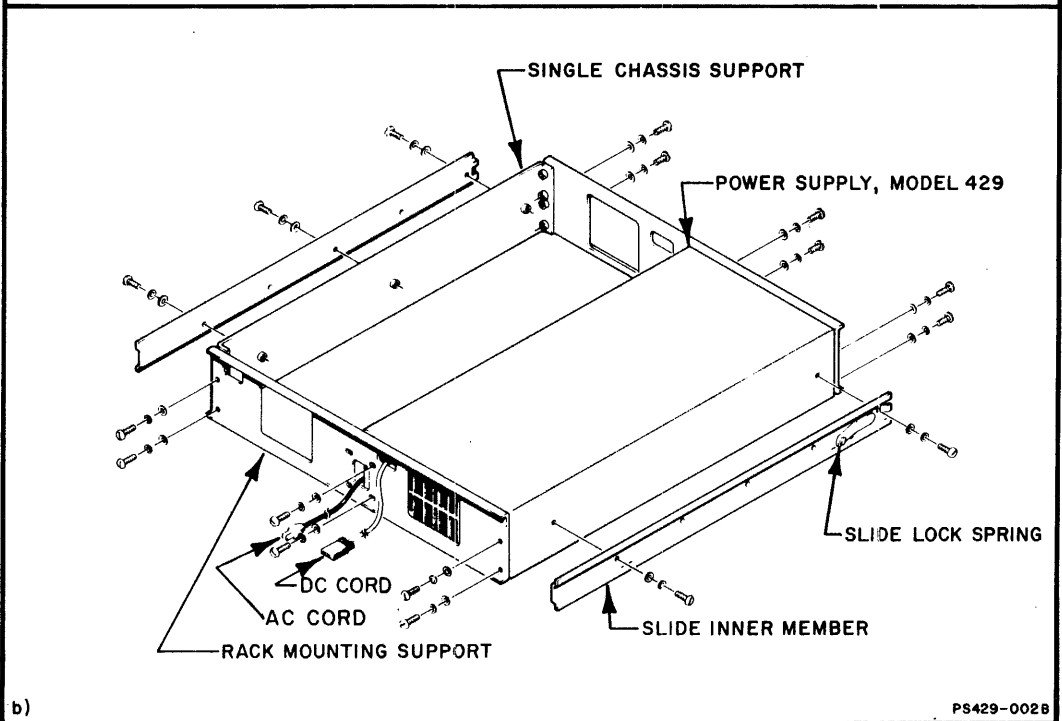
Position the slide outer member in the channel of the slide extender so that their combined length is proper for mounting in the cabinet. See Figure 2.2a.

- (2) Using 10-32 pan-head screws and keps nuts, loosely attach the slide extenders to the slide outer members as shown in Figure 2-2a. Ensure that the screws are inserted from the proper side, and that the end flange on the slide extender points in the same direction as the end flange on the slide outer member.
- (3) Loosely mount the assembled slide extenders and slide outer and intermediate members in the cabinet. If the cabinet includes a blank front panel, it is also mounted at this time, since it will use the same screws that fasten the slide extender to the cabinet rails. First tighten the screws holding the slide extender and slide outer members to the cabinet. Then tighten the screws holding the slide extenders to the slide outer members.
- (4) Position a rack mounting support near the front end of the power supply, in the approximate position it will assume when assembled. See Figure 2-2b.
- (5) Feed the black AC power cord out through the large cut-out in the rack mounting support, back in through the smaller central cut-out, and along the side of the power supply to the rear.
- (6) If two power supplies are being mounted, repeat step (5) for the second power supply.
- (7) Using 8-32 x 7/16 pan-head screws, lock washers, and plain washers, attach the rack mounting support to the front of the power supply (or both power supplies if two are being installed). See Figure 2-2b.



a)

PS429-0018



b)

PS429-0028

Figure 2-2. RACK ADAPTOR KIT INSTALLATION

NOTE: To prevent internal interference, do not use screws longer than 9/16" as substitutes for the 7/16" screws furnished with the kit.

- (8) Position the other rack mounting support near the rear of the power supply(s), in the approximate position it will assume when assembled. Ensure that the support is oriented so that the two small cut-outs are at the top. See Figure 2-2b.
- (9) Pass the AC power cord (s) through the small central cut-out. Pass the DC power cable(s) through the small cut-out(s) at the top of the rack mounting support.
- (10) Repeat step (7) for the rear rack mounting support.
- (11) If only one power supply is being mounted, attach the single chassis support to the rack mounting supports, using 8-32 x 7/16 pan-head screws, lock washers, and plain washers. The single chassis support is not symmetrical, and must be properly mounted. The end which goes toward the front has a side-hole closer to it than the rear end has.
- (12) Using 8-32 x 7/16 pan-head screws, lock washers, and plain washers, mount the slide inner members to the sides of the power supplies. If only one power supply is being mounted, one of the slide inner members will be screwed to the single chassis support, rather than to a power supply. Ensure that the lips on the slide inner members face outward, and that the slide lock springs are at the front end of the power supply.
- (13) Pull the slide intermediate members to the rear until they lock in the full extended position.
- (14) Insert the slide inner members into the slide intermediate members, ensuring that the white DC power cord is toward the rear of the cabinet.
- (15) Dress the AC power cords so that they run between the two power supplies (or alongside the power supply if only one is used). See Figure 2-2b. Release the slide locks and slide the power supply completely into the cabinet.
- (16) Test the assembly for proper operation of the Rack Adapter Kit.

2.3 ADJUSTMENTS FOR INPUT POWER

There are two alterations which may have to be made to the Model 429 to match it to the primary power source being used. The first involves earth ground, and

the second involves input voltage and frequency. Prior to use of the Model 429, a voltmeter should be used to verify which contact on the AC power receptacle is at earth ground. It should then be determined if the white AC lead coming from the power plug will be connected to earth ground when the unit is plugged in. If not, that side of the line must be fused. Fusing the line is accomplished by removing a jumper on the AC Filter PCB and inserting a fuse in the fuse holder. Figure 2-3 shows the AC Filter PCB. Remove the power supply cover to expose the PCB on the AC power cord end of the unit. Clip the jumper and insert a fuse of the proper size for the primary power being used -- 3AG7A for 115Vac and 3AG5A for 220Vac.

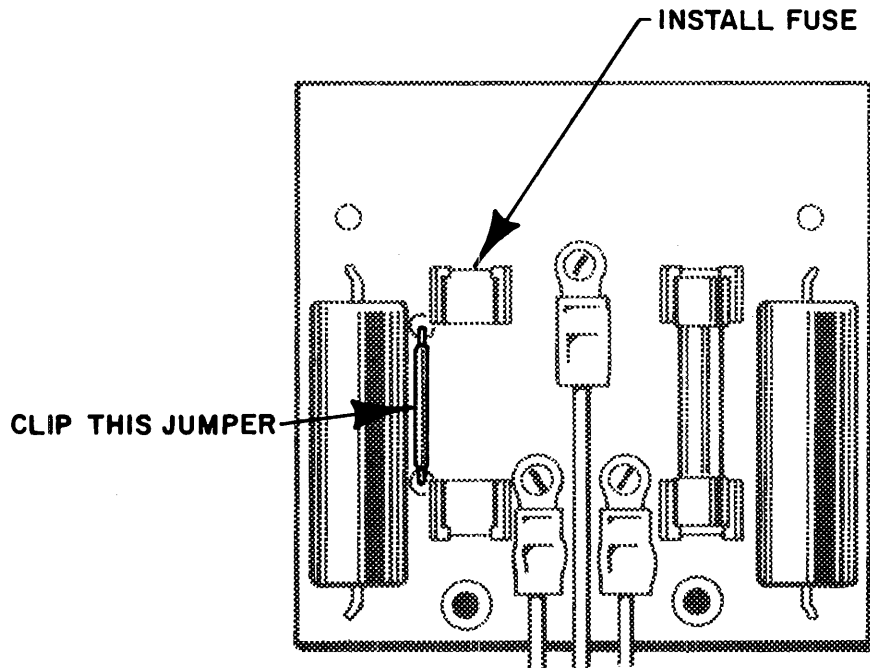


Figure 2-3. AC FILTER PCB

To allow the Model 429 to operate from either 115Vac or 220Vac, at either 50 Hz or 60 Hz, both the primary and secondary windings of the power transformer are

tapped. The unit is connected at the factory for an input of 115V 60 Hz. If operation from a different power source is desired, it will be necessary to remove the cover and change the transformer connections.

CAUTION

Transformer leads are not identification coded other than by their location on the terminal strips. When changing connections, ensure that the transformer leads remain on the proper terminal.

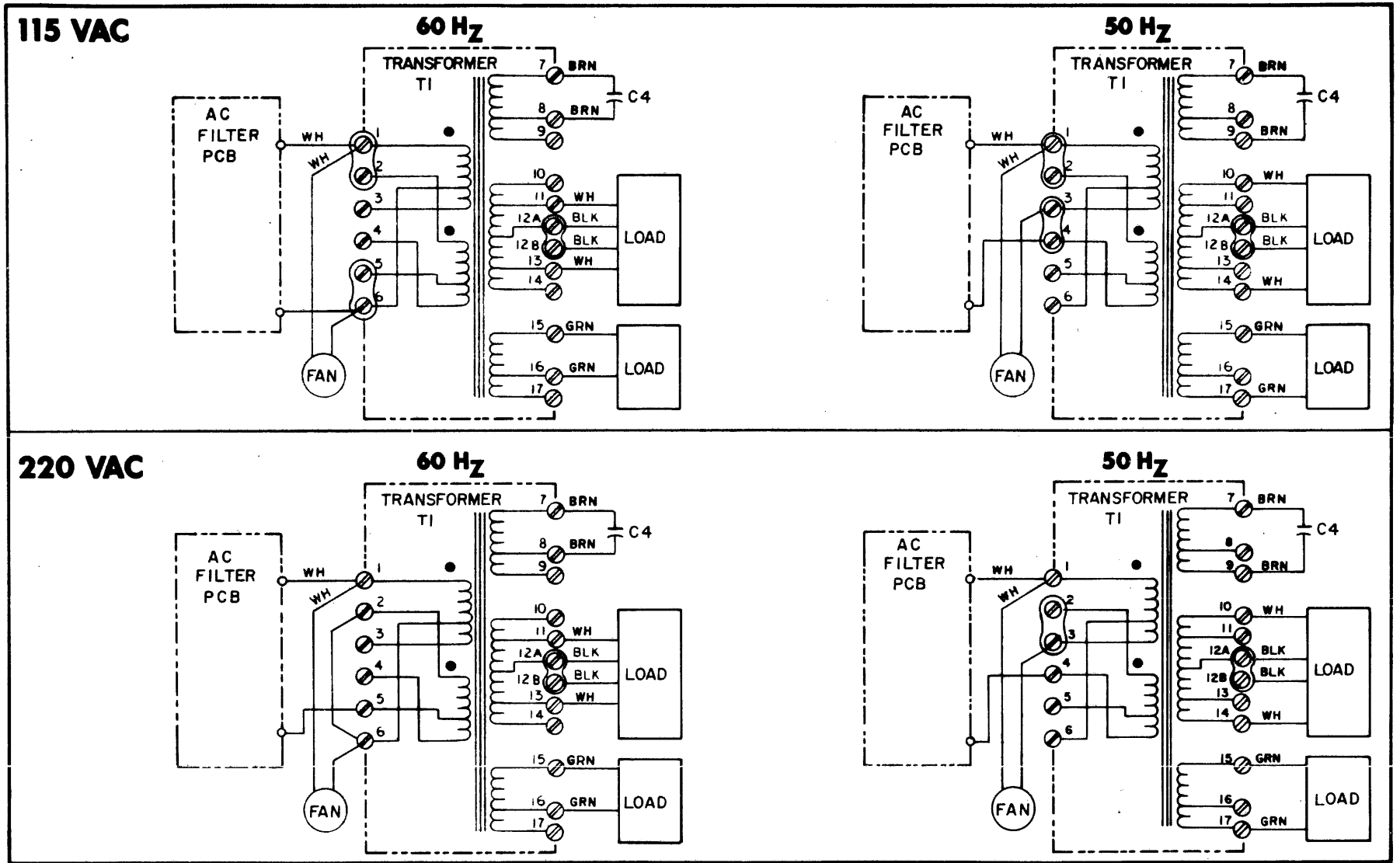
Figure 2-4 shows the connections for the four possible input power sources. As shown in the figure, 220V 60 Hz operation requires a jumper between terminals 2 and 6 of the transformer. This jumper is stored on a clip attached to the inside of the power supply cover. Other jumpers are of the metal barrier-strip type, and are already on the terminal strips.

2.4 VOLTAGE ADJUSTMENT AND OUTPUT CONNECTIONS

To facilitate use and handling, the DC power cable assembly furnished with the Model 429 has been made very thin and flexible. As a result, the voltage drop in the cable under nominal load is larger than would normally be encountered in similar applications. In the case of the 24-volt outputs, the drop is still a negligible percentage of the output voltage. In the case of the 5-volt output, however, the drop is 0.3 volts. The power supply is factory adjusted so that the voltage present at the output connector is 5 volts under nominal load. If the cable assembly furnished with the Model 429 is shortened or if a different cable is used, the 5-volt output may have to be adjusted. This is accomplished by means of a 500 Ω potentiometer at B62 on the regulator PC assembly. Access to this control is by loosening the two screws holding the DC output end of the power supply cover, and lifting the cover. An adjustment range of approximately 4.8V to 6.4V is available at the terminal posts on the PCB. The adjustment should be made under conditions simulating the expected nominal load.

The cable assembly furnished with the Model 429 provides separate ground conductors for the 24-volt and 5-volt outputs. If a different cable is used, care must be exercised to maintain these separate ground systems. Failure to maintain this separation may cause large ground currents which can damage a disk drive connected to the power supply. The DC power cable is removed by unscrewing the terminal post clamps and the cable clamp. Connector pin assignments are as shown in Figure 2-5. DC ground should not be tied to chassis ground.

Figure 2-4. POWER TRANSFORMER CONNECTIONS



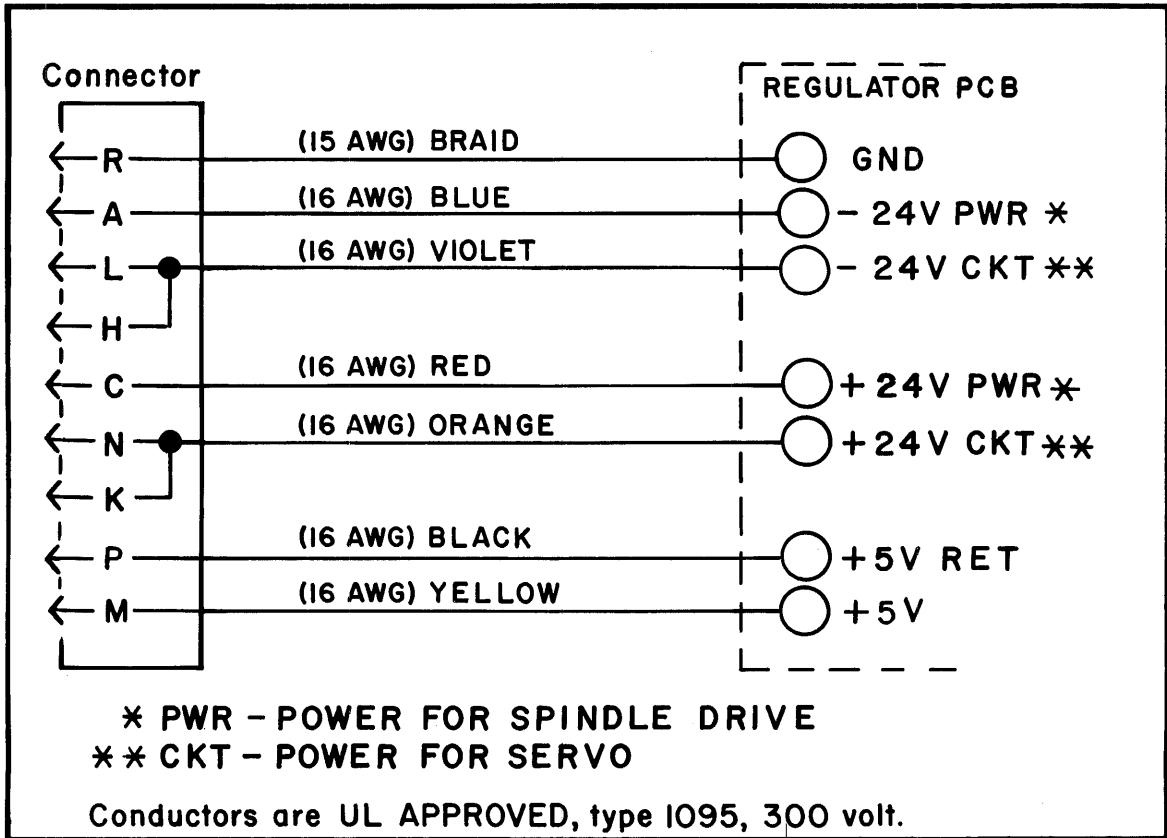


Figure 2-5. CONNECTOR PIN ASSIGNMENTS

Section 3

OPERATING INSTRUCTIONS

If the Model 429 Power Supply has been adjusted and installed properly in accordance with Section 2, operation of the power supply simply consists of first connecting it to the unit to which it supplies power, and then plugging it in to the line voltage source. There is no on-off switch or other front-panel control or indicator. Instructions for replacement of fuses, and other maintenance procedures, are found in Section 5.

CAUTION

When using the Model 429 with the Series 40 Disk Drive, always connect the power supply to the disk drive prior to application of AC power to the power supply. Similarly, ensure that AC power to the Model 429 is off prior to disconnecting the disk drive. Observe the caution notice at the beginning of Section 2.

Section 4

THEORY OF OPERATION

4.1 BASIC POWER SUPPLY OPERATION

The Model 429 is represented in block diagram form in Figure 4-1. A common bridge rectifier and filter circuit provides outputs of +24 Vdc and -24 Vdc. The 24-volt outputs are unregulated except for the regulation inherent in the ferro-resonant transformer. ⁽¹⁾ In the low-voltage section, the common bridge rectifier and filter circuit provides an output of approximately 9 volts to the regulator PCB, which contains circuitry to accomplish the following:

- overvoltage protection
- voltage regulation
- foldback current limiting

The overvoltage protection circuit opens the 5-volt-line fuse whenever the power supply output exceeds 6.5 Vdc. The voltage regulator compares a reference voltage with the power supply output, and increases or decreases the base drive to the series pass transistor as necessary to maintain the power supply output

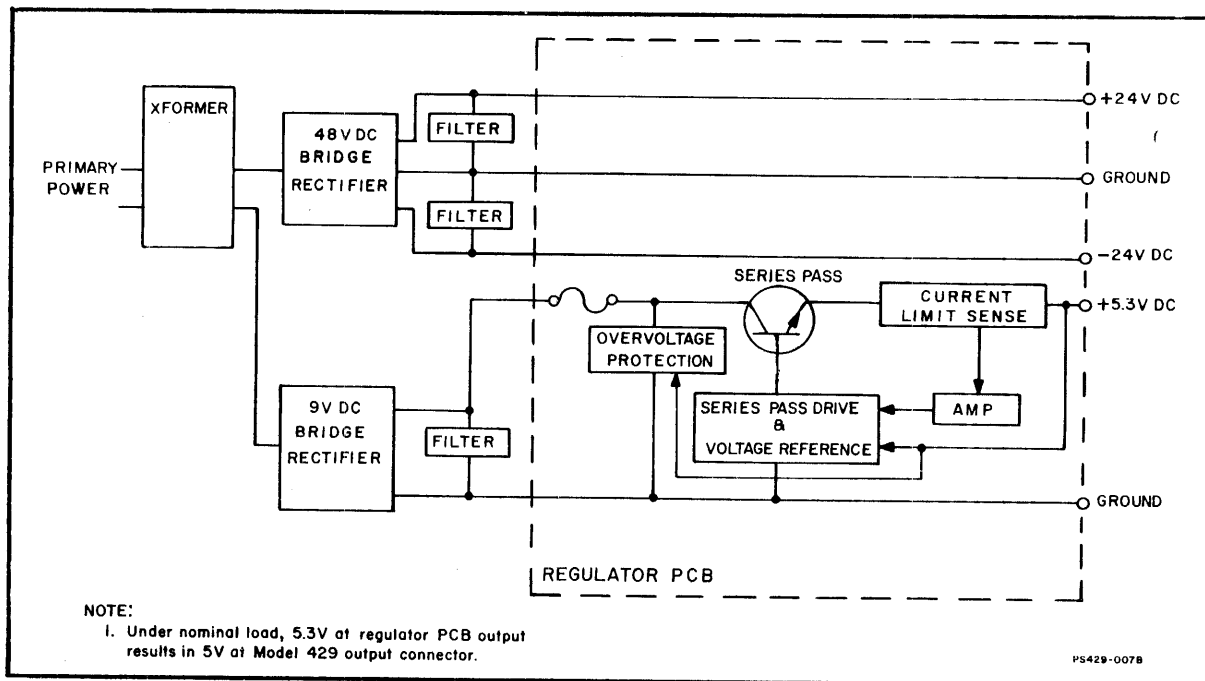


Figure 4-1. POWER SUPPLY BLOCK DIAGRAM

- (1) See "Power Supply Technical Information", published by North Electric, Galion, Ohio, 44833.

voltage within the specified limits. The reference voltage and, consequently, the output voltage are adjustable by means of a potentiometer. A current limit sensor and amplifier circuit removes the base drive from the series pass transistor whenever the load current exceeds approximately 7 amperes.

4.2 HIGH-VOLTAGE SECTION

Figure 4-2 shows the schematic of the Model 429. The circuit configuration of the 24-volt section is that of a standard bridge rectifier and filter with positive and negative outputs. The filter capacitors are large in order to accommodate the large peak current of 17A. Bleeder resistor R1 is smaller than R2 so that the -24 Vdc will decay faster than the +24 Vdc when the power supply is turned off. This requirement is imposed by the disk drive.

4.3 LOW-VOLTAGE SECTION

NOTE: In the following circuit descriptions only, the term "output" refers to the output at the regulator PCB, which is approximately 0.3V more than the actual output at the cable connector under nominal load.

4.3.1 Rectifier and Filter

The low-voltage rectifier and filter circuits are of common configuration. In addition, there is a 100 μ f capacitor at B50 across the 5-volt output. This capacitor provides a low impedance for any high frequency transients generated by the power supply's load. The 10 Ω resistor at B41 provides the required isolation between the 24V and 5V system grounds, while maintaining continuity when no load is connected to the power supply.

4.3.2 Overvoltage Protection

Overvoltage protection is provided by a silicon controlled rectifier (SCR) at E60. When overvoltage occurs, the SCR fires, shorting the output of the bridge rectifier and causing the 7A fuse near A3 to open.

The overvoltage protection circuit consists of the SCR, capacitors at E75 and E74, a 100 Ω resistor at E72, a diode at E70, and a 5-volt zener diode at E67. The resistor, diode, and zener form a voltage divider network, with the positive end of the resistor tied to the SCR gate. As long as the output voltage remains below approximately 6.5V, the voltage across the resistor is less than 0.8V, since the voltage drop across the zener and A14F diode is constant at approximately 5.7V. Any increase in the power supply output appears across the 100 Ω resistor and is therefore applied to the SCR gate. If the gate voltage reaches the firing potential, about 1.25V, the SCR fires, drawing heavy current and opening the 7A fuse.

The capacitors at E74 and E75 prevent firing of the SCR by transients reflected by the load.

4.3.3 Voltage Regulation

Voltage regulation in the Model 429 is accomplished by an LM723C integrated voltage regulator, and associated circuitry, which varies the voltage drop across the 2N5885 series pass transistor to compensate for the changes in the output voltage.

The LM723C is connected as a positive voltage regulator with foldback current limiting. It compares the power supply output voltage, applied to pins 3 and 4, with an internal reference voltage. If the power supply output drops, the voltage applied to pins 3 and 4 drops, and the LM723C increases the drive to the base of the TIP31A transistor at D58. This transistor is connected in a conventional Darlington circuit with the series pass transistor. As the drive to the amplifier is increased, the voltage across the series pass transistor drops, compensating for the drop in output voltage. The amplitude of the regulated output is adjustable by means of the 500 Ω potentiometer at B62, which varies the LM723C internal reference voltage.

4.3.4 Foldback Current Limiting

The foldback current limiting circuit consists of a 0.01 Ω current sensing resistor at B59, a 72558 operational amplifier, the LM723C regulator, the series pass transistor, and associated circuitry.

The voltage across the current sensing resistor is applied to pins 2 and 3 of the op amplifier, which has an amplification factor of approximately 10. The output at pin 1 is applied to a voltage divider consisting of a 1.82 k Ω resistor at D72 and a 750 Ω resistor at B71. The top of the 1.82k Ω resistor is connected to pin 2, the current limit pin, of the regulator. When the voltage between pins 2 and 3 exceeds 0.65V, the regulator removes the drive to the Darlington amplifier, causing the series pass transistor to become a high impedance, and reducing the current to approximately 2.5A. This action occurs when the power supply load current reaches approximately 7A.

The four diodes at pin 4 of the op amplifier set the negative V_c at -2.8V.

NOTES

Section 5

MAINTENANCE

5.1 ROUTINE MAINTENANCE AND ADJUSTMENT

The only routine maintenance required by the power supply is a semi-annual cleaning to remove dust.

5.2 ADJUSTMENT OF INPUT AND OUTPUT VOLTAGES

For adjustment of the 5-volt output, see Paragraph 2.4. For a change in primary AC power source, see Paragraph 2.3

5.3 REPLACEMENT OF FUSES

The fuse complement of the Model 429 is shown in Table 5-1. The unit's cover is hinged near the rear for easy access to the five fuses in the DC output circuits. To replace any of these fuses, first remove AC power to the unit. Then loosen the two screws holding the hinged end of the cover to the chassis case, and lift the cover end. This exposes the regulator PCB, on which the DC output fuses are mounted. To replace fuses in the AC input lines, removal of the entire cover is necessary. The two hex-head screws holding the cover to the chassis, and the top two pan-head screws holding the rack mounting support to the cover, must be removed in order to take off the cover. See Figure 2-2b. It may also be necessary to loosen the bottom two pan-head screws.

The fuse holders are on the AC Filter PCB near the power cord connection. Ensure that fuses are replaced with fuses of the proper rating and type (see Table 5-1). If fuses continue to blow, the cause should be determined and corrected.

Table 5-1

Fuse Complement

| <u>Circuit</u> | <u>Fuse Type</u> |
|----------------|------------------|
| +24 Vdc Pwr | GBB 8 |
| +24 Vdc Ckt | GBB 8 |
| -24 Vdc Pwr | GBB 8 |
| -24 Vdc Ckt | GBB 8 |
| +5 Vdc | GBB 7 |
| 115 Vac line | 3AG7A |
| 220 Vac line | 3AG5A |

5.4 REPLACEMENT OF PARTS

Table 5-2 shows the location within this section of instructions for replacement of power supply components and assemblies.

Table 5-2

Replacement Instructions

| <u>Component or Assembly</u> | <u>Manual Paragraph</u> |
|------------------------------|-------------------------|
| 2N5885 Transistor | 5.4.4 |
| AC Filter PCB | 5.4.1 |
| Capacitors C1 through C4 | 5.4.4 |
| Fan | 5.4.4 |
| Fuses | 5.3 |
| Rectifier BR1 | (1) |
| Rectifier BR2 | 5.4.4 |
| Regulator PCB | 5.4.3 |
| Resistors R1 & R2 | (1) |
| Transformer Assembly | 5.4.2 |

(1) - Remove and replace directly; no other disassembly required.

5.4.1 AC Filter PCB

Replacement of the AC Filter PCB or parts mounted thereon is accomplished by removing the two flat-head screws which hold the PCB and the stand-offs to the front of the chassis.

5.4.2 Transformer Assembly

Removal of the transformer assembly is accomplished by sliding off the quick-disconnect lugs from the transformer assembly terminal strips and removing the eight screws which hold the transformer brackets to the power supply chassis sides. When installing a new transformer assembly, observe the caution notice given in Paragraph 2.3 if the transformer primary connections need to be changed to accommodate the primary AC power.

5.4.3 Regulator PCB

Access to the underside of the regulator PCB is accomplished by removing all eight screws labeled either "A" or "B" in Figure 5-1. To remove the screw at B25, it is necessary to first remove the black lead from the terminal post at that

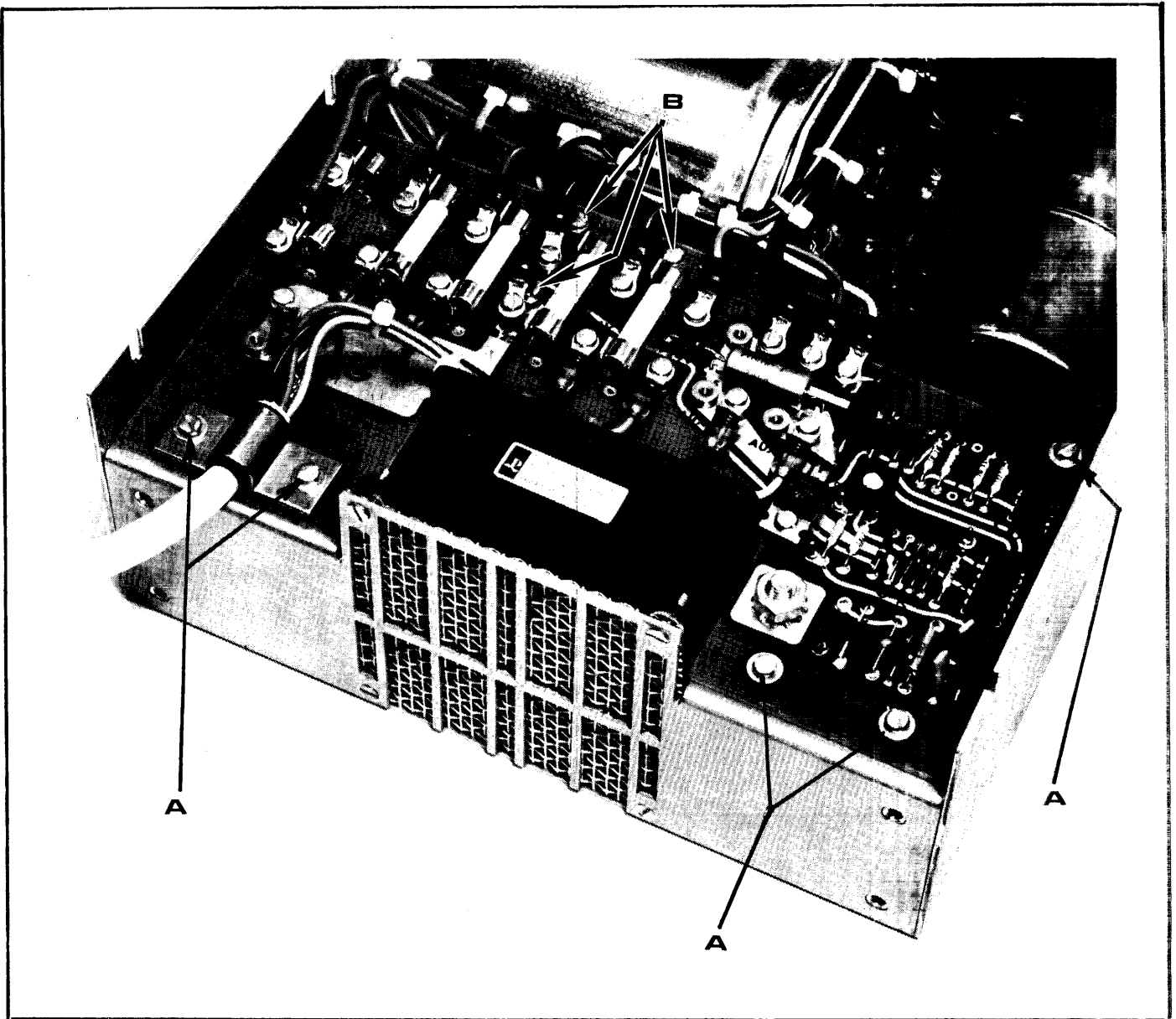


Figure 5-1. REGULATOR PCB REMOVAL

location. When replacing the screw at B25, ensure that the fiber shoulder washer is properly installed. Complete removal of the regulator PCB also requires that the leads from the rectifier filters be disconnected. When reconnecting these leads, observe the color code as shown on Figure 4-2.

5.4.4 Capacitor Bracket Assembly

Removal of the Capacitor Bracket Assembly is necessary to replace the power transistor, the filter and ferroresonant capacitors, the fan, or the 9-volt bridge rectifier. These parts are directly dismountable after removal of the Capacitor Bracket Assembly. To remove the assembly, slide off the quick-disconnect lugs on the transformer secondary terminal strip. Then remove the five screws marked "A" in Figure 5-1 and the four flat-head screws on the underside of the power supply chassis.

Lift the front end of the Capacitor Bracket Assembly (nearest the transformer), and slide the assembly forward.

To replace the Capacitor Bracket Assembly, tilt the PCB end down and insert it into the chassis, being careful to dress the fan leads so that they pass between the PCB and the ferroresonant capacitor C4, and along the top of C4 next to the chassis side. Slide the assembly to the rear, dropping the front end into place. Ensure proper reconnection to the transformer terminal strip. See Figure 2-4.

5.5 RECOMMENDED SPARES LEVEL

No special tools or test equipment are needed to perform normal maintenance and repair of the power supply. It is recommended that the following items be stocked as spares:

| <u>Item</u> | <u>Part No.</u> | <u>Quantity</u> |
|---------------------------------|-----------------|-----------------|
| Voltage Regulator LM723C | 10321 | 1 |
| Differential Amplifier 72558 | 10164 | 1 |
| Transistor 2N5885 | 10116-02 | 2 |
| Power Transistor T1P31A | 10177-02 | 2 |
| Bridge Rectifier MDA 990-2 | 10162-01 | 1 |
| SCR C230F | 10744-01 | 1 |
| Diode 1N4454 | 10160 | 4 |
| Diode - Zener, 5V | 10103-05 | 1 |
| Fuse GBB 8 | 10602-08 | 8 |
| Fuse GBB 7 | 10602-07 | 6 |
| Fuse 3A G 7A* | 10604-01 | 3 |
| Fuse 3A G 5A** | 10604-02 | 3 |
| Capacitor; 51,000 μ fd, 40V | 10069-51 | 1 |
| Capacitor; 15 μ fd, 440Vac | 11578-15 | 1 |

* - Only for 115 Vac operation.

** - Only for 220 Vac operation.

Section 6

PARTS LIST

6.1 RACK ADAPTOR KIT

Table 6-1 is the parts list for the Rack Adaptor Kit, Part 16759.

TABLE 6-1

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|----------------------------|-----------------|
| 16735 | Support-Rack Mounting | 2 |
| 16736 | Support-Single Chassis | 1 |
| 10615-01 | Slide Set | 1 |
| 11222 | Extender-Slide | 2 |
| 70031-07 | Screw-Pan Head 8-32 x 7/16 | 18 |
| 70168-08 | Lockwasher-Helical No. 8 | 18 |
| 70169-08 | Washer-Plain No. 8 | 18 |

6.2 POWER SUPPLY, MODEL 429

Tables 6-2 through 6-9 are the parts lists for the Power Supply, Model 429. Figure 6-1 shows level of assembly and applicable parts list table.

TABLE 6-2

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|------------------------|-----------------|
| 11580 | Power Cable Assembly | 1 |
| 16754 | Cover Assembly | 1 |
| 16755 | Chassis Assembly | 1 |
| 16751 | Clamp-Cable | 2 |
| 70029-06 | Screws 4-40 x 3/8 PH | 2 |
| 70168-04 | Lockwasher 4 CAD | 9 |
| 70169-04 | Flatwasher 4 CAD | 2 |
| 70426 | Screw-Slotted Hex W/HD | 12 |
| 70029-04 | Screws 4-40 x 1/4 PH | 7 |
| 10728-01 | Terminal Block | 2 |
| 10604-01 | Fuse 7A 125V | 1 |

Figure 6-1. PRODUCT STRUCTURE, POWER SUPPLY MODEL 429

6-2

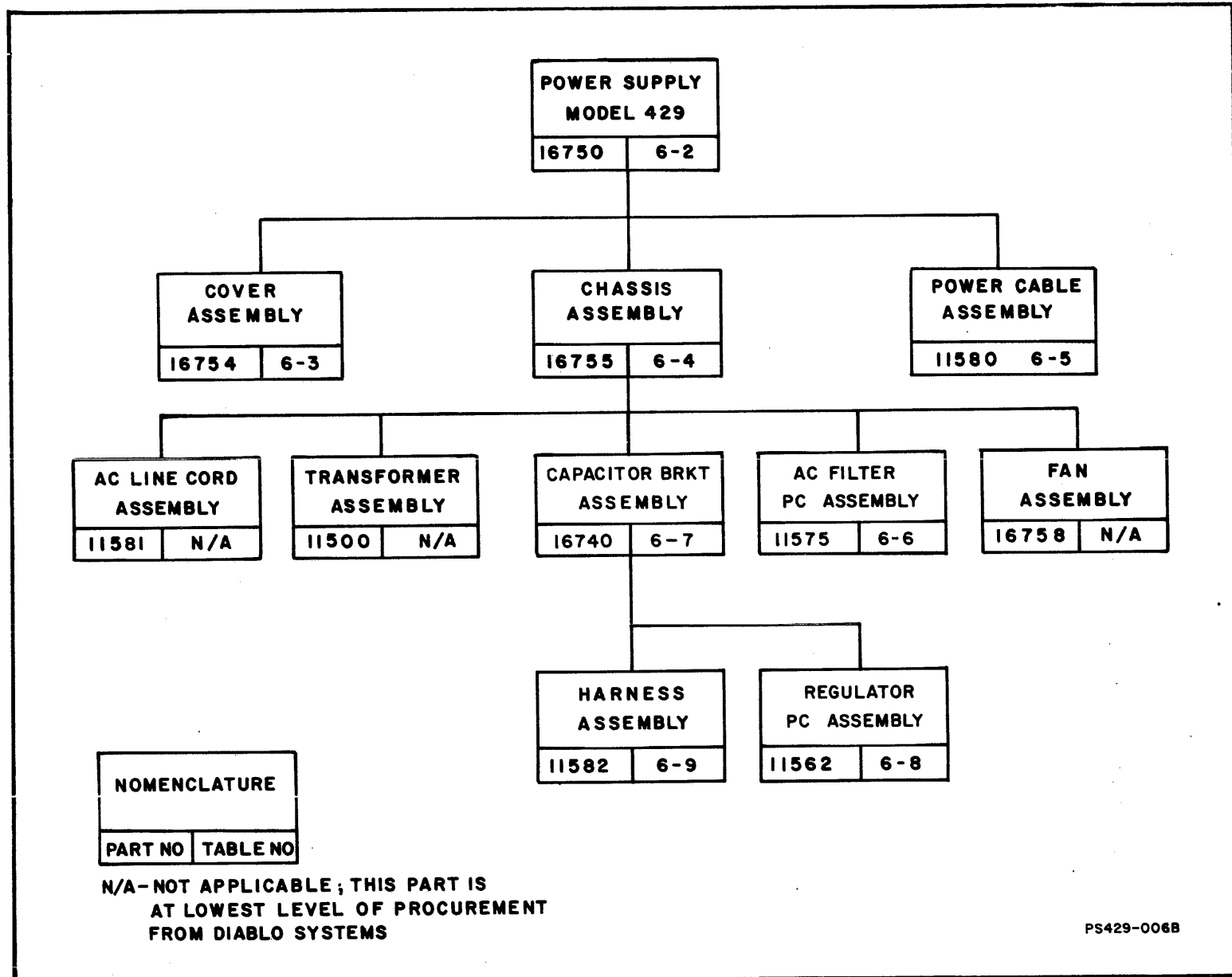


TABLE 6-3

COVER ASSEMBLY

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|------------------------|-----------------|
| 16734 | Cover-Power Supply | 1 |
| 16737 | Panel-Access | 1 |
| 16763 | Plate-Hinge Mounting | 2 |
| 16762 | Hinge-Access Panel | 1 |
| 70424-01 | Rivet Blind | 6 |
| 10649 | Tab-Quick Connect Dual | 1 |
| 11593 | Wire-Jumper | 1 |
| 70310-02 | Rivet | 1 |
| 10738 | Label-Wiring Option | 1 |

TABLE 6-4

CHASSIS ASSEMBLY

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|------------------------------|-----------------|
| 11581 | AC Line Cord Assembly | 1 |
| 11500 | Transformer Assembly | 1 |
| 11575 | PC Assembly-AC Filter | 1 |
| 16740 | Capacitor Bracket Assembly | 1 |
| 16758 | Fan Assembly | 1 |
| 16733 | Chassis-Power Supply | 1 |
| 70030-04 | Screw 6-32 x 1/4 PH | 5 |
| 70031-06 | Screws 8-32 x 3/8 PH | 8 |
| 70038-04 | Screws 4-40 x 1/4 FH | 6 |
| 70038-08 | Screw Flat Head 4-40 x 1/2 | 2 |
| 70029-04 | Screws 4-40 x 1/4 PH | 3 |
| 70168-04 | Lockwasher 4 Cad | 3 |
| 70168-06 | Lockwasher 6 Cad | 5 |
| 70168-08 | Lockwasher 8 Cad | 8 |
| 70169-08 | Flatwasher 8 Cad | 8 |
| 70639 | Speed Nut 4-40 | 4 |
| 70637 | Screw Flat Head 4.40 x 1.750 | 2 |
| 70169-04 | Flatwasher 4 Cad | 3 |
| 10608-01 | Grommet | 1 |

TABLE 6-5

POWER CABLE ASSEMBLY

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|--------------------|-----------------|
| 10722-01 | Cable-7 Conductor | A/R |
| 10534-10 | Connector Socket | 1 |
| 10514-10 | Terminal 4 Lug | 7 |
| 10525-11 | Connector Pin | 7 |
| 10538-01 | Strap | A/R |
| 10525-13 | Connector Pin | 2 |

TABLE 6-6

PC ASSEMBLY - AC FILTER

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|---------------------------------|-----------------|
| 11574 | PC Board - AC Filter | 1 |
| 10605 | Clip - Fuse | 4 |
| 10092-47 | Cap .047 MFD 1000V | 2 |
| 10514-11 | Terminal 6 Lug | 2 |
| 10613-11 | Tab - Receptacle | 2 |
| 70030-04 | Screw 6-32 x 1/4 PH | 1 |
| 70168-06 | Lockwasher 6 Cad | 1 |

TABLE 6-7

CAPACITOR BRACKET ASSEMBLY

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|-----------------------------|-----------------|
| 16738 | Capacitor Bracket | 1 |
| 16739 | Strap-Cap Mounting | 2 |
| 16742 | Bushing-Cap Mounting | 4 |
| 16748 | Strap-Buss | 1 |
| 10549 | Thermal Compound 12 | A/R |
| 11582 | Harness Assembly | 1 |
| 11562 | PC Assembly Regulator M 429 | 1 |
| 10069-51 | Cap 51,000 MFD 40V | 2 |
| 11578-15 | Cap 15 MFD 440 Vac | 1 |

TABLE 6-7 (Continued)

CAPACITOR BRACKET ASSEMBLY

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|----------------------------|-----------------|
| 10162-01 | Rectifier - Bridge | 2 |
| 10220-50 | Resistor 50Ω 3% .50W | 1 |
| 10221-10 | Resistor 100Ω 3% 50W | 1 |
| 10116-02 | Transistor-2N5885 +15V | 1 |
| 10726-01 | Socket-TO3 | 1 |
| 16769 | Heat Sink | 1 |
| 10612-01 | Insulator TO3 | 1 |
| 70029-04 | Screw 4-40 x 1/4 PH | 23 |
| 70030-06 | Screw 6-32 x 1/2 PH | 4 |
| 70038-08 | Screw Flat Head 4-40 x 1/2 | 1 |
| 70179-04 | Washer, Flat 4 | 3 |
| 70168-04 | Lockwasher 4 Cad | 25 |
| 70168-06 | Lockwasher 6 Cad | 4 |
| 70166-04 | Hex Nut 4-40 Cad | 1 |
| 16752 | Strap-Cap Mounting | 1 |
| 10440-18 | Cap 18,000 MFD 25V | 1 |
| 70169-10 | Washer-Flat No. 10 | 2 |
| 70638-04 | Washer-Fibre Shoulder | 1 |
| 70029-06 | Screws 4-40 x 3/8 PH | 1 |

TABLE 6-8

PC ASSEMBLY REGULATOR M 429

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|------------------------|-----------------|
| 11561 | PC Board Regulator | 1 |
| 10605 | Clip - Fuse | 10 |
| 70029-04 | Screw 4-40 x 1/4 PH | 1 |
| 70168-04 | Lockwasher 4 Cad | 1 |
| 10321 | IC 723 Volt Reg. | 1 |
| 10086-10 | Capacitor, .1 MFD, 50V | 2 |
| 10077-12 | Capacitor 12 MFD, 20V | 1 |
| 10101 | Diode A14F | 1 |
| 10103-05 | Diode - Zener, 5V | 1 |
| 10744-01 | SCR C230F | 1 |
| 10602-07 | Fuse 7 Amp | 1 |
| 10602-08 | Fuse 8 Amp | 4 |
| 10021-10 | Res. 10Ω 5% 1/4W | 1 |
| 10022-10 | Res. 100Ω 5% 1/4W | 3 |
| 10002-85 | Res. 750Ω, 1%, 1/8W | 2 |
| 10003-34 | Res. 2.21KΩ, 1%, 1/8W | 1 |

TABLE 6-8 (Continued)

PC ASSEMBLY REGULATOR M 429

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|----------------------------------|-----------------|
| 10177-02 | Transistor T1P-31A | 1 |
| 10228-50 | Pot 500 Ω 1/2W | 1 |
| 10217-10 | Res. .01 Ω 3% 2W | 1 |
| 10023-24 | Res. 2.4K Ω 5% 1/4W | 1 |
| 10032-10 | Res. 100 Ω 5% 1/2W | 1 |
| 10003-01 | Res. 1K Ω 1% 1/8W | 2 |
| 10003-26 | Resistor 1.82K Ω 1%, 1/8W | 1 |
| 10042-68 | Res. 680 Ω 5% 1W | 1 |
| 10004-51 | Res. 33.2K Ω 1% 1/8W | 1 |
| 10078-01 | Capacitor 100MFD, 20V | 1 |
| 10160 | Diode 1N4454 | 4 |
| 10164 | I. C. 1458-5558-72558 | 1 |
| 10506 | Pin | 3 |
| 10184-01 | Diode A15A | 4 |

TABLE 6-9

HARNESS ASSEMBLY

| <u>Part No.</u> | <u>Description</u> | <u>Quantity</u> |
|-----------------|--------------------|-----------------|
| 10735-02 | Ring Lug No. 10 | 8 |
| 10613-11 | Tab-Receptacle | 18 |
| 10514-10 | Terminal 4 Lug | 11 |
| 10514-12 | Lug-Ring 10 | 1 |