HOBART®
GROUND POWER

121585
Revised 121691
031893

OPERATION AND MAINTENANCE MANUAL

with

ILLUSTRATED PARTS LIST

for

GPU-600

SOLID STATE TRANSFORMER-RECTIFIER

RATED OUTPUT: 28 V-DC, 600 A

SPECIFICATION	INPUT VOLTAGE	FREQUENCY	MODEL NUMBER
S6883-1	208/230/460 V, 3-PHASE	60-Hz	6T28-600CL
S6883-2	220/380 V, 3-PHASE	50-Hz	5T28-600CL
S6883A-1	208/230/460 V, 3-PHASE	60-Hz	6T28-600CL
S6883A-2	220/380 V, 3-PHASE	50-Hz	5T28-600CL
S6883A-3	230/460/575 V, 3-PHASE	60-Hz	6T28-600CL

Manufactured by
HOBART BROTHERS COMPANY
POWER SYSTEMS GROUP
GROUND POWER EQUIPMENT
TROY, OHIO 45373
U.S.A.

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SAFETY INSTRUCTIONS AND WARNINGS FOR ELECTRICAL POWER EQUIPMENT

WARNING

ELECTRIC SHOCK can **KILL**. Do not touch live electrical parts.

ELECTRIC ARC FLASH can injure eyes, burn skin, cause equipment damage, and ignite combustible material. **DO NOT** use power cables to break load and prevent tools from causing short circuits.

IMPROPER PHASE CONNECTION, PARALLELING, OR USE can damage this and attached equipment.

Important: - Protect all operating personnel. Read, understand, and follow all instructions in the Operating/Instruction Manual before installing, operating, or servicing the equipment. Keep the manual available for future use by all operators.

A. GENERAL

Equipment that supplies electrical power can cause serious injury or death, or damage to other equipment or property. The operator must strictly observe all safety rules and take precautionary actions. Safe practices have been developed from past experience in the use of power source equipment. While certain practices below apply only to electrically-powered equipment, other practices apply to engine-driven equipment, and some practices to both.

B. SHOCK PREVENTION

Bare conductors, or terminals in the output circuit, or ungrounded, electrically-live equipment can fatally shock a person. Have a certified electrician verify that the equipment is adequately grounded and learn what terminals and parts are electrically **HOT**. Avoid hot spots on machine. Use proper safety clothing, procedures, and test equipment.

The electrical resistance of the body is decreased when wet, permitting dangerous currents to flow through it. When inspecting or servicing equipment, do not work in damp areas. Stand on a dry rubber mat or dry wood, use insulating gloves when dampness or sweat cannot be avoided. Keep clothing dry, and never work alone

1. Installation and Grounding of Electrically Powered Equipment

Equipment driven by electric motors (rather than by diesel or gasoline engines) must be installed and maintained in accordance with the National Electrical Code, ANSI/NFPA 70, or other applicable codes. A power disconnect switch or circuit breaker must be located at the equipment. Check the nameplate for voltage, frequency, and phase requirements. If only 3-phase power is available, connect any single-phase rated equipment to only two wires of the 3-phase line. **DO NOT CONNECT** the equipment grounding conductor (lead) to the third live wire of the 3-phase line, as this makes the equipment frame electrically **HOT**, which can cause a fatal shock.

Always connect the grounding lead, if supplied in a power line cable, to the grounded switch box or building ground. If not provided, use a separate grounding lead. Ensure that the current (amperage) capacity of the grounding lead will be adequate for the worst fault current situation. Refer to the National Electrical Code ANSI/NFPA 70 for details. Do not remove plug ground prongs. Use correctly mating receptacles.

2. Output Cables and Terminals

Inspect cables frequently for damage to the insulation and the connectors. Replace or repair cracked or worn cables immediately. Do not overload cables. Do not touch output terminal while equipment is energized.

3. Service and Maintenance

This equipment must be maintained in good electrical and mechanical condition to avoid hazards stemming from disrepair. Report any equipment defect or safety hazard to the supervisor and discontinue use of the equipment until its safety has been assured. Repairs should be made by qualified personnel only.

Before inspecting or servicing electrically-powered equipment, take the following precautions:

a. Shut **OFF** all power at the disconnecting switch or line breaker before inspecting or servicing the equipment.

b. Lock switch **OPEN** (or remove line fuses) so that power cannot be turned on accidentally.

c. Disconnect power to equipment if it is out of service.

d. If troubleshooting must be done with the unit energized, have another person present who is trained in turning off the equipment and providing or calling for first aid.

C . FIRE AND EXPLOSION PREVENTION

Fire and explosion are caused by electrical short circuits, combustible material near engine exhaust piping, misuse of batteries and fuel, or unsafe operating or fueling conditions.

1. Electrical Short Circuits and Overloads

Overloaded or shorted equipment can become hot enough to cause fires by self destruction or by causing nearby combustibles to ignite. For electrically-powered equipment, provide primary input protection to remove short circuited or heavily overloaded equipment from the line.

2. Batteries

Batteries may explode and/or give off flammable hydrogen gas. Acid and arcing from a ruptured battery can cause fires and additional failures. When servicing,do not smoke, cause sparking, or use open flame near the battery.

3. Engine Fuel

Use only approved fuel container or fueling system. Fires and explosions can occur if the fuel tank is not grounded prior to or during fuel transfer. Shut unit **DOWN** before removing fuel tank cap. **DO NOT** completely fill tank, because heat from the equipment may cause fuel expansion overflow. Remove all spilled fuel **IMMEDIATELY**, including any that penetrates the unit. After clean-up, open equipment doors and blow fumes away with compressed air.

D. TOXIC FUME PREVENTION

Carbon monoxide - Engine exhaust fumes can kill and cause health problems. Pipe or vent the exhaust fumes to a suitable exhaust duct or outdoors. Never locate engine exhausts near intake ducts of air conditioners.

E. BODILY INJURY PREVENTION

Serious injury can result from contact with fans inside some equipment. Shut **DOWN** such equipment for inspection and routine maintenance. When equipment is in operation, use extreme care in doing necessary trouble-shooting and adjustment. Do not remove guards while equipment is operating.

F. MEDICAL AND FIRST AID TREATMENT

First aid facilities and a qualified first aid person should be available for each shift for immediate treatment of all injury victims. Electric shock victims should be checked by a physician and taken to a hospital immediately if any abnormal signs are observed.

EMERGENCY FIRST AID

Call physician immediately. Seek additional assistance. Use First Aid techniques recommended by American Red Cross until medical help arrives.

IF BREATHING IS DIFFICULT, give oxygen, if available, and have victim lie down. FOR ELECTRICAL SHOCK, turn off power. Remove victim; if not breathing, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin external heart massage. CALL EMERGENCY RESCUE SQUAD IMMEDIATELY.

G. EQUIPMENT PRECAUTIONARY LABELS

Inspect all precautionary labels on the equipment monthly. Order and inspect all labels that cannot be easily read.

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INTRODUCTION

1. General

This Introduction is intended to give the reader a better understanding of how to use the manual properly. The manual can be very helpful to you if you will **READ THIS INTRODUCTION FIRST. READ AND UNDERSTAND THE MANUAL BEFORE ATTEMPTING TO OPERATE, INSTALL, OR REPAIR THIS EQUIPMENT.**

2. Scope

The manual covers a solid state controlled transformer-rectifier, 600 A DC ground power unit having the Specification Numbers listed. It gives a detailed description of the equipment and includes information covering operation, installation, troubleshooting and repair.

3. Purpose

The manual's purpose is to provide information and instructions to experienced operators, electricians, and repairmen who have never seen or operated this equipment. It is the intent of the manual to guide and assist operators and maintenance personnel in the proper use and maintenance of the equipment.

4. Contents

Immediately following the Introduction is a List of Effective Pages which lists each page in the manual by its Chapter/Section, and page number. Directly opposite each page number listing is a date which indicates whether the page is original or revised.

A complete Table of Contents appears next in sequence. It contains a list of all Chapters, Sections, and the principal paragraph titles within each Section. The location of each listing is identified by Chapter/Section and page number. A complete list of illustrations with their location is located at the end of the Table of Contents.

The main text of the manual is divided into five Chapters as follows:

Chapter 1. Receipt and Installation Instructions

Chapter 2. Description and Operation

Chapter 3. Servicing

Chapter 4. Illustrated Parts List with Index

Chapter 5. Optional Equipment

Chapter 6. Manufacturer's Literature

Each Chapter is divided into as many Sections as necessary. Sections are always referred to by a combination Chapter/Section number. Example, 2-3 refers to Chapter 2, Section 3.

5. Format

A. Paragraphing and Outlining

The material within each Section is divided into main subjects with applicable paragraph headings and sub-headings as required. This method not only helps keep information closely knit, but provides a means of identifying material for reference purposes. For example, a portion of the Description Section might logically follow this arrangement and paragraphing:

1. Control A. Interior Panel

(1) Protective devices

(a) Overload relay

(2) Contactors

B. Page Numbering

Page numbers do not run consecutively throughout the manual. Each page is identified by the Chapter/Section number in which it appears, and by a page number within the Chapter/Section. Therefore, the first page in each Section is page 1. These identifying numbers appear in the lower, outside corner of each page. Each page also bears a date located in the corner opposite the page number. This date is either that of original issue, or of the latest revision. Any revision to the original text is identified by a heavy black line in the left-hand margin. Illustrations follow a numbering system similar to page numbering. The first Figure in each Section is Figure 1.

6. How to Use the Manual

A. General

This manual follows the format, rules and style proposed by, and generally accepted by members of the Air Transport Association. Insofar as possible, information is grouped to help the user locate it quickly. All tables, charts, diagrams, etc., as well as illustrations, are identified by Figure Number *(i.e., Fig. 2)* to avoid confusion.

B.How to Locate Information

Even if you have read the manual completely and thoroughly, the easiest and quickest way to locate information is by using the Table of Contents. Look for new and added information at the end of the section in which it is normally found.

(1) Table of Contents

The complete Table of Contents is relatively short. Even if the user has no idea where a certain bit of information is located, the general location can be quickly found by running through the Table of Contents. For example, some adjustment information is needed. A quick look at the Table of Contents indicates that Adjustment/Test information is located in 3-3 *(Chapter 3, Section 3).*

(2) List of Illustrations

A complete list of Illustrations follows the Table of Contents and includes the title, figure number, and Chapter/Section, with page number location of all illustrations contained in the manual. Locate the appropriate title in the List of Illustrations, then turn to the Chapter/Section and page number indicated. A complete set of electrical schematic and connection diagrams is included in Chapter 5.

(3) References

To avoid repetition and lengthy explanations, references to other material are used throughout the manual. Both material in the text and illustrations may be referred to in order to clarify or expand information and instructions. Portions of the text are referred to by identifying the paragraph in which referenced material may be found. A reference to other material would be in order here by referring to paragraphing information contained in paragraph 5, A above. When referenced material is located in the same Chapter/Section as the reference, only the paragraph identification is given.

Example:

(Ref. Para. 1, A) means the material is to be found in paragraph 1, A, of the same Chapter/Section.

When referenced material is located in another Chapter/Section, both the Chapter/Section number and the paragraph identification are given.

Example:

(Ref. 1-2, Para. 1, A) means that the referenced material is located in Chapter/Section 1-2, and identified by paragraph 1, A.

Components shown in illustrations and illustrations themselves are referenced in a similar manner. When this type reference is made, the item number of the part and the Figure number in which it appears are given.

Example:

(Ref. 2, Fig. 3) refers to item number 2 which appears in illustration Figure 3 of the same Chapter/Section.

When the referenced Figure appears in another Chapter/Section, the reference will include the Chapter/Section number.

Example:

(Ref. 2-3; 1, Fig. 4) tells the user to refer to Chapter/Section 2-3, and to see item 1, in Figure 4.

Once a Figure number reference has been established for a series of instructional steps, the Figure number is not repeated. Only the item numbers of parts involved are referenced.

For example, an instruction might appear like this: “Loosen screw *(2, Fig. 6),* slide out connector *(4),* and remove brush *(6)”.*

When an item is referenced without a figure number, it will always apply to the last preceding Figure number mentioned in the text.

NOTE 1: The word See may appear in some references, as (See Fig. 2). It means exactly the same thing as Ref., however, its usage seems a little more direct and definite.

NOTE 2: When an “output cable” is mentioned in the manual, it refers to a large cable used to carry output current. A special connector for the two output leads and the ground lead may be required when delivering power directly to an aircraft.

7. SERVICE

If you have any questions concerning your **Hobart Power Systems Division** equipment, please contact our Service Department by mail, telephone or FAX.

Write:	**Hobart Brothers Company** **Power Systems Group** **Service Department** **Troy, Ohio 45373** **U.S.A.**
Call:	**Area Code (513) 339-5060**
FAX:	**513-339-4219**

CHAPTER 1. RECEIPT OF EQUIPMENT AND INSTALLATION

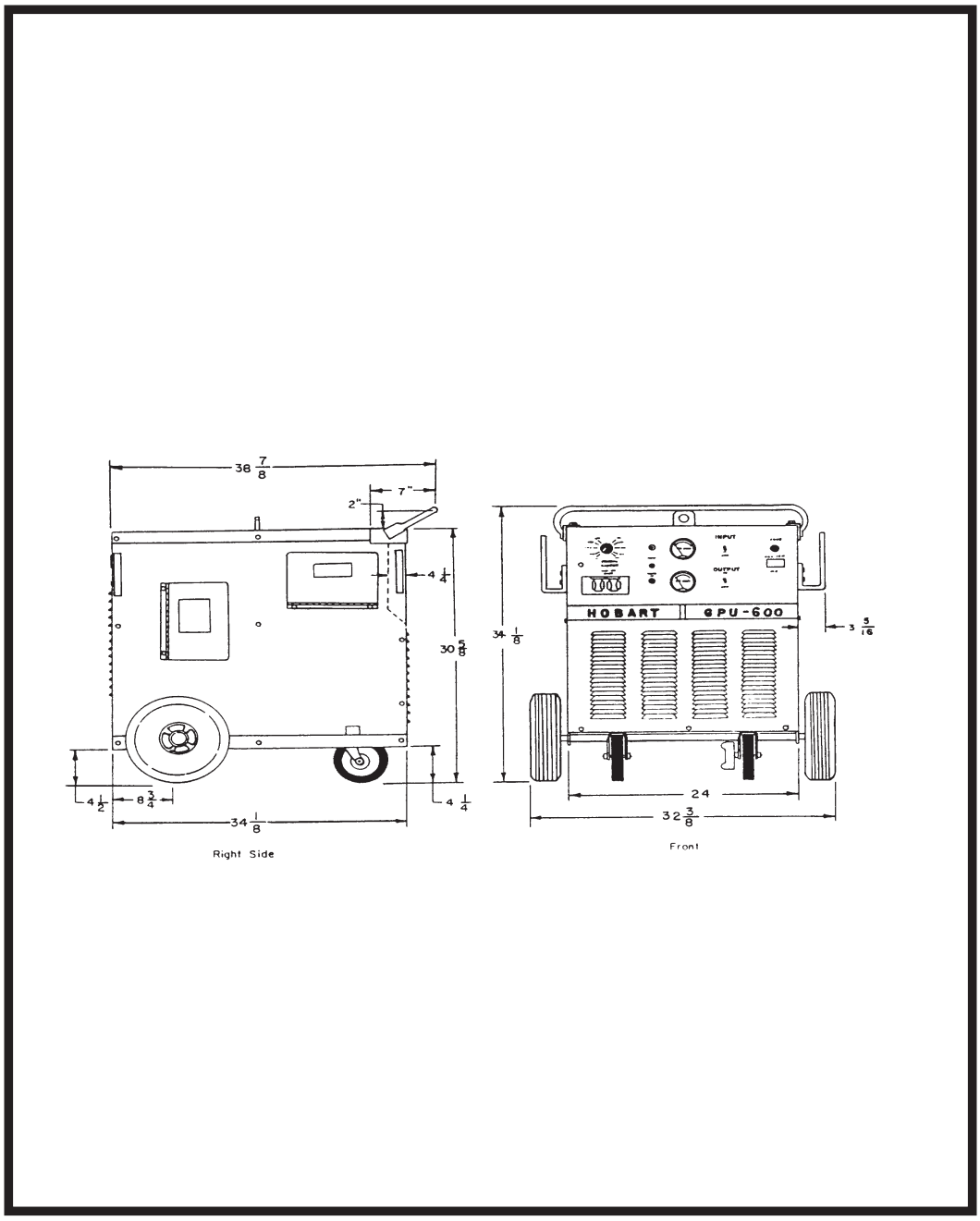
SECTION 1. RECEIPT OF EQUIPMENT

Check the equipment received against the **Hobart Brothers Company** invoice to make certain that the shipment is complete and undamaged. If the equipment has been damaged in transit, notify the carrier *(railroad, trucking company, etc.)* at once and file a claim for damages. If you require assistance with a damage claim, furnish **Hobart Brothers Company** with full information about the claim. If the shipment is in error, contact Order Department, **Hobart Brothers Company, Power Systems Division, Troy, Ohio 45373.**

Give the **MODEL, SPECIFICATION**, and **SERIAL** numbers of the equipment, and a full description of the parts in error. Refer to the title of this manual for a listing of the specification numbers this manual describes. An identification and rating nameplate is normally located on the power supply front panel for your convenience. If the rated input or output voltages do not agree with your requirements, contact the order department for instructions or corrective action.

Generally, it is good practice to move the equipment to the site of installation before uncrating or unpacking . Take care to avoid damage to the equipment if bars, hammers, etc., are used. Lifting eyes which extend through the top of the cabinet have been provided to facilitate handling with a crane or hoist. Be certain the crane or hoist is adequate for the task.

Best results will be obtained with this equipment **ONLY** if the responsible operating personnel have access to this manual, and are familiar with these instructions. Additional copies may be obtained at a small cost per copy by writing to: **Hobart Brothers Company, Power Systems Division, Troy, Ohio** Supply the owner's manual no. *(OM-2010)* plus the model, specification, and serial numbers of your equipment.



installation Dimension Drawing

Figure 1

SECTION 2. INSTALLATION

A. Location

For best operating characteristics and longest unit life, select an installation site that is not exposed to high humidity, dust, high ambient temperature, flooding, or corrosive agents. Moisture can condense on electrical components, causing corrosion or shorting of circuits. Dirt on components helps retain this moisture in addition to providing a conducting material.

Adequate air circulation is needed at all times in order to assure proper operation. Provide a minimum of 12 inches *(305mm)* of free air space at both front and rear of the unit. Make sure that the ventilator openings are not obstructed.

B. Internal Wiring check

Refer to the product identification plate *(nameplate)* on the machine's control panel to determine the power input voltages and frequency at which it will be operated.

WARNING: ELECTRIC SHOCK CAN KILL. OPEN THE DISCONNECT SWITCH, OR BREAKER, AND DETERMINE THAT NO VOLTAGE IS PRESENT, BEFORE CONNECTING WIRES BETWEEN THE INPUT SERVICE AND POWER SUPPLY OR WORKING ON THE POWER SUPPLY.

CAUTION: RECONNECTION OF CONTROL TRANSFORMER AS WELL AS MAIN INPUT CONNECTION PANEL MUST BE MADE WHEN CHANGING RATED INPUT VOLTAGE. SEE CHANGE-OVER DIAGRAM.

Remove cabinet top for access to **LINE VOLTAGE MAIN CHANGEOVER** circuitry. Check line voltage connections against instructions on the **VOLTAGE CHANGEOVER DIAGRAM** supplied with this manual. If necessary, rearrange internal wiring and/or link connections to agree with the requirements for your input.

C. Connecting the Machine to Line Voltage

The input power should be connected to the input terminals on the lifting baffle via a suitable disconnecting means furnished by the user. Select the proper sized knock-out hole provided in the rear panel of the machine to allow for the entry of the input conductors. Be certain the cable inside the power supply will not contact the fan or hot parts. The lower holes may give a bit less weather leakage.

CAUTION: THE METHOD OF INSTALLATION, CONDUCTOR SIZE, AND OVERCURRENT PROTECTION SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL ELECTRICAL CODE, THE NATIONAL ELECTRICAL CODE, OR OTHER NATIONAL CODES, AS APPLICABLE. ALL INSTALLATION WIRING AND MACHINE RECONNECTION SHALL BE DONE BY QUALIFIED PERSONS.

Figure 1 provides minimal information for selection of line conductors, overcurrent protection, and the equipment grounding conductor. This information is from the National Electrical Code NFPA 70-1981 Edition. Install this equipment per the latest edition, available from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

Connect the three-phase line leads to terminals L1, L2, and L3 on the line contactor (top end) located on the rear of the lifting baffle inside the power supply cabinet.

NOTE: After connecting the input cables, it is recommended that Hobart #904021 urethane coating be sprayed on the connections at the line contactor to protect these connections from corrosion, fungus, and contamination. Spraying these connections will also reduce the potential for arcing from dirt and condensation.

Line Volts	Rated Amps	Copper Line Wire Size *		Copper Grounding Conductor Min. Size
		In Conduit	Flexible Cable	
208	86	No. 3	No. 3	No. 3
230	78	No. 4	No. 4	No. 4
460	39	No. 8	No. 8	No. 8
220	82	No. 4	No. 4	No. 4
380	47	No. 8	No. 8	No. 8
230	79	No. 4	No. 4	No. 4
460	39	No. 8	No. 8	No. 8
575	32	No. 8	No. 8	No. 8

Recommended Wire Size Table

Figure 1

* Conductor sizes listed are for 30 feet or less of each conductor in conduit and for conductors having 90C insulation, such as type **FEP, FEPB, RHH,** and **THHN.** For conductors having other insulation, or for conductors longer than 30 feet, consult Hobart Brothers Company as to size required.

D. Grounding

The frame of this ground power unit should be grounded for personnel safety, and to assure operation of the overcurrent protection. The grounding method, and the equipment grounding conductor size and type shall conform to local and national codes. For the National Electrical Code, the equipment grounding conductor shall be green, green with a yellow stripe, or bare. If flexible power cable is used, use a cable assembly which includes the equipment grounding conductor. If metallic armored cable or conduit is used, the metal sheathing or conduit must be effectively grounded per local and national codes.

Rubber-tire mounted equipment shall be grounded to conform to local national codes. The grounding assists in providing protection against line voltage electrical shock and static shock. The grounding serves to discharge the static electric charge which tends to build up on rubber-tire mounted equipment. This static charge can cause painful shock and lead to the erroneous conclusion that an electrical fault exists in the equipment. An ungrounded cabinet can be at a lethal potential if a component fails electrically to the case.

If a system ground is not available, consult the electrical code enforcement body for instructions. The ground power unit should be connected per your electrical code to an adequate driven ground rod or to a water pipe that enters the ground not more than 10 feet *(3 meters)* from the machine.

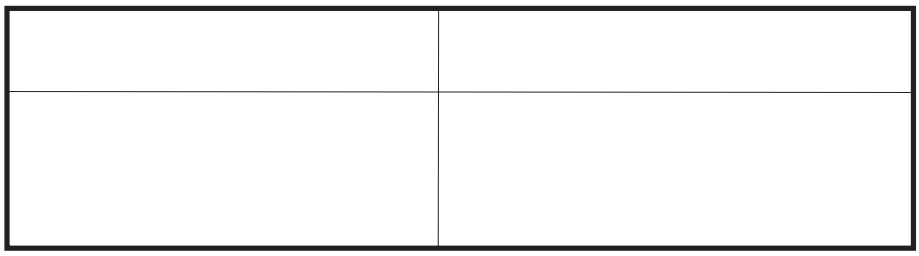
The equipment grounding conductor size listed in Fig. 1 is a guide if no local or national code is applicable.

Attach the equipment grounding block conductor to the stud provided adjacent to the fuse block. Determine that the ground wire size is adequate before the machine is used.

CAUTION: FOR SAFETY AND TO ASSURE ADEQUATE VENTILATION, BE SURE TO REPLACE CABINET TOP.

E. Output Leads

Use your applicable electrical code to determine the minimum size output cable you need. If the cable voltage drop is too large with the minimum size cable, use a larger size cable. For example, the 90 C rated insulation, 4/0 cable in a 40 C ambient needed for 400 A DC may have to be larger for carrying that amperage over 200 feet with less than 4.5 Volts cable drop.



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CHAPTER 2. DESCRIPTION AND OPERATION

SECTION 1. DESCRIPTION

1. General

This manual describes a portable, *(see Fig. 1)* Solid State controlled, transformer-rectifier DC power supply rated at a continuous output of 28-V, 600-A DC to an aircraft load or a battery load. The rated input voltages, currents, and frequency along with weights and dimensions are given in the Specifications and Capabilities Table in Figure 2. This book will generally refer to this equipment as a GPU-600 power supply or power supply. See Figure 1 for a descriptive drawing showing the major components or sub-assemblies generally present in the design. A detailed description of each design variation is given later.

The power supplies are usually identical or nearly so in appearance. The specification numbers relate to different rated input power requirements, possible output rating changes, or limited component specification changes. The specification number consists of the number S *(for specification)* 6683 or 6883A with a dash number added for each specification change, i.e., S6683-1 or 6883A-1 is the first design specification made in the series.

The phase angle control method for obtaining the DC output voltage is the use of silicon controlled rectifiers to select the desired portion of the voltage that has been stepped down by the main transformer to produce the DC voltage. As shown in Figure 1, the power supply consists of:

A. A punched and formed steel base *(1, Fig. 1)* with 10 inch *(254 mm)* diameter wheels *(2)* near the rear and steerable castor wheels *(3)* at the front.

B. A formed and louvered steel front panel *(4)* for mounting most of the accessible controls and meters.

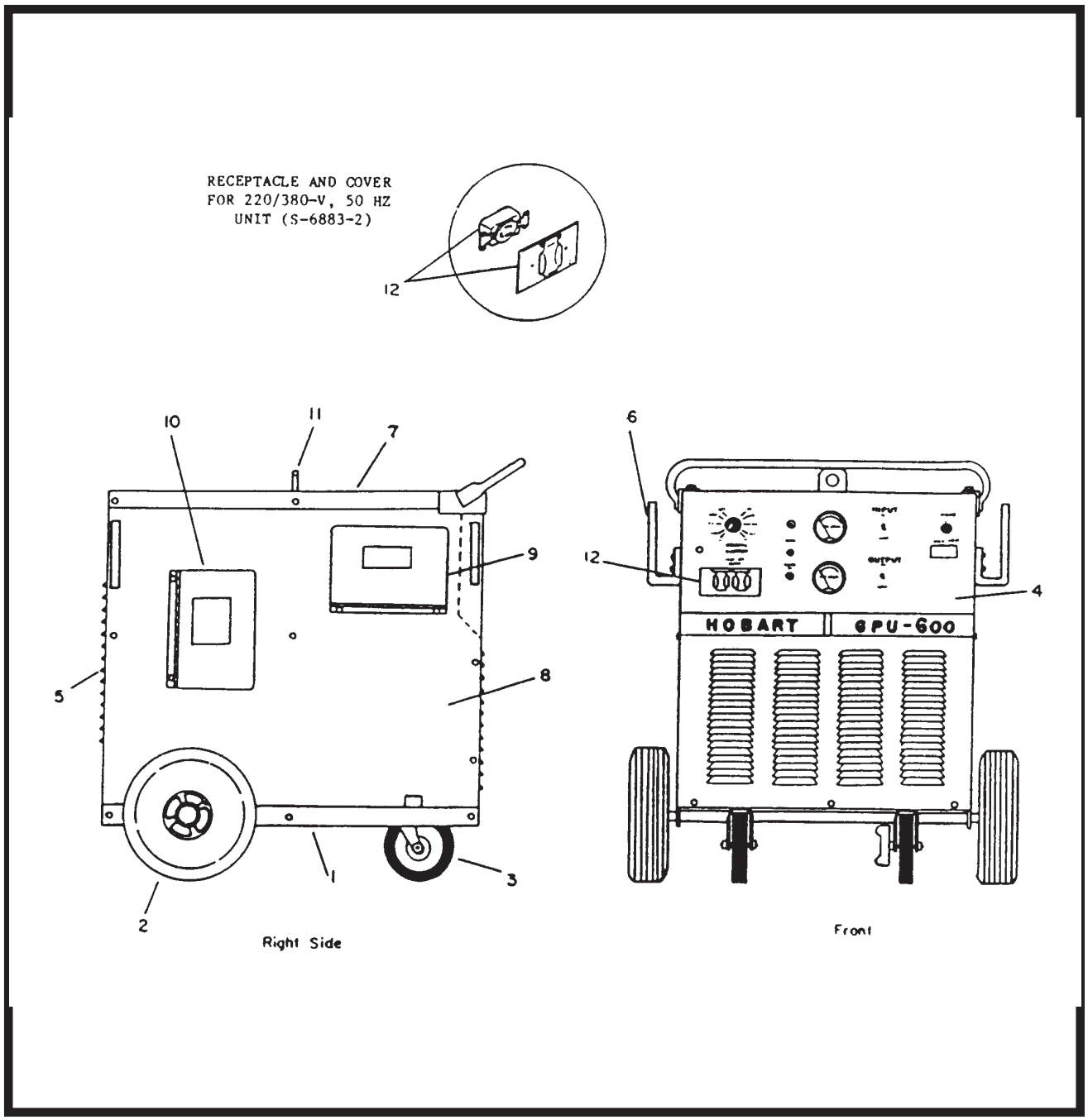
C. A formed and louvered sheet steel rear panel *(5, Fig. 1)* to which the fan assembly *(18, 19, Fig. 3)* and the SCR assembly *(17, Fig. 3)* are mounted inside the power supply.

D. A sheet steel top panel *(7, Fig. 1 and 15, Fig. 3)* removable for access to the input fuses, main input terminal board *(16, Fig. 3),* snubber board *(1, Fig. 5)* and control transformer connections when the input power is off.

E. A sheet steel left side panel *(11, Fig. 3),* to which two cable hangers are mounted. A door in this panel permits output cable connections.

F. A sheet steel right side panel *(8, Fig. 1)* with access doors to the solid state control printed circuit board *(9, Fig. 1)* and to the fuse block on the silicon controlled rectifier assembly *(10, Fig. 1)*. Two cable hangers also mount to this panel.

G. A steel vertical lifting yoke *(3, Fig. 3)* with baffle assembly attached to the base between the front and rear panels.



1. Mounting Base
2. Wheel
3. Caster
4. Front Panel
5. Rear Panel
6. Cable Hanger
7. Top Panel
8. Side Panel (Right Side Illustrated)
9. Front Access Door
10. Rear Access Door
11. Lifting Yoke
12. Power Receptacle

General Assembly of GPU-600 Power Supply

Figure 1

H. Various internal components such as the preload resistors *(6, Fig. 3),* main transformer *(1, Fig. 3),* filter capacitors *(4, Fig. 3)* with the bus bar *(5, Fig. 3)* at the front, filter reactor *(7, Fig. 3),* two *(8, 9, Fig. 3)* output contactor, control transformer *(10, Fig. 3),* and printed circuit control board *(13, Fig. 3),* input contactor *(14, Fig. 3),* etc.

CAUTION: CAPACITOR CHARGE CAN INJURE! ALLOW CAPACITORS TO DISCHARGE AND VERIFY CAPACITOR DISCHARGE WITH VOLTMETER BEFORE TOUCHING THE CAPACITOR CIRCUITRY.

2. Special Features

This DC ground power supply has the following special features which may be described more fully, if required, in the detailed description:

A. Output Ammeter, M1, *(2, Fig. 4)* with a 0-2000 A DC scale for reading the DC output amperes. The signal is provided by R11 meter shunt *(20, Fig. 3).*

B. Output Voltmeter, M2, *(3, Fig. 4)* having a 0 to 50 V DC scale reading the DC output voltage.

C. Input contactor, *(14, Fig. 3)* with amber input contactor on-off light *(12, Fig. 4)*

D. 28-V DC contactor *(8, 9, Fig. 3)* with green output contactor on-off light *(13, Fig. 4).*

E. Solid state closed loop feedback output voltage control to compensate for brown-outs and load related power supply voltage droop.

F. Output overvoltage *(31.5 V DC)* and overcurrent turn off circuitry and turn on DS2 trip light.

G. Adjustable solid state output limit circuitry. The customer selects the momentary output limit in the 250 to 2000 A DC range by adjusting the R13 starting current potentiometer *(8, Fig. 4).* A preset voltage slope circuit causes a 25 percent drop in output voltage from 600 A DC to 1600 A DC output current.

CAUTION: EXCESSIVE CHARGING CURRENT CAN DAMAGE SOME TYPES OF BATTERIES AND SOME OTHER LOADS. IF THE 250 A DC "STARTING SURGE" LEVEL IS TOO HIGH FOR YOUR PARTICULAR LOAD, CONTACT THE MANUFACTURER FOR RECOMMENDATIONS.

H. Auxiliary power receptacle *(5, Fig. 4)* with weather protection cover *(7, Fig. 4)* On the 60-Hz model, this is a duplex receptacle rated at 115 V AC, 9-amperes, single phase. On the 50-Hz model, this is a single output rated at 220 V AC, 15-amperes, single phase.

J. Thermal overload thermostat *(3, Fig. 5)* which turns off the output voltage when the SCR heatsink overheats.

PHYSICAL			
Weight (approximately)	**650 pounds (295 kg)**		
Length	**38 1/8 inches (968 mm)**		
Width	**32 3/4 inches (832 mm)**		
Height (overall)	**34 1/8 inches (867 mm)**		
ELECTRICAL	**SPECIFICATION NUMBER**		
INPUT	**S6883-1 S6883A-1 ***	**S6883-2 S6883A-1 ***	**S6883A-1 ***
Cycles per second	**60**	**50**	**60**
Phase	**3**	**3**	**3**
Volts	**208/230/460**	**220/380**	**230/460/575**
Amperes	**86/78/39**	**82/47**	**79/39/32**
Power Factor at 28-V DC output	**.68**	**.68**	**.68**
Ground cable size	**See 1-2 Fig. 2**	**See 1-2 Fig. 2**	**See 1-2 Fig 2**
OUTPUT			
Output Power Rating (max.)	**17.1 KW**	**17.1 KW**	**17.1 KW**
Volts	**28.5 V DC**	**28.5 V DC**	**28.5 VDC**
Amperes (rated load)	**600 A DC**	**600 A DC**	**600A DC**
Duty cycle	**100 %**	**100%**	**100%**
Overload Capacity	**125% of rated load for 7 minutes.**	**125% of rated load for 7 minutes.**	**125% of rated load for 7 minutes.**

*** Series S6683A units are identical to corresponding Series 6683 units except for the PC control board assemblies. PC control board No. 180294 is used in Series S6683 units, and PC control board No. 180294A is used in Series S6683A units.**

K. Input contactor coil fuse F8, *(20, Fig. 3),* auxiliary power and fan fuse F1 *(9, Fig. 4).* Fuse, 10 amp *(F9)* for auxiliary power on 50 Hz.

L. Running gear consisting of two 10" *(254 mm)* diameter wheels *(2, Fig. 1)* on the axle near the rear and two swivel mounted 6" *(152.4 mm)* diameter casters *(3, Fig. 1),* one with a manual brake, mounted near the front. A handle for pulling or guiding is fastened to the top front of the power supply.

3. Detailed Description

A. General

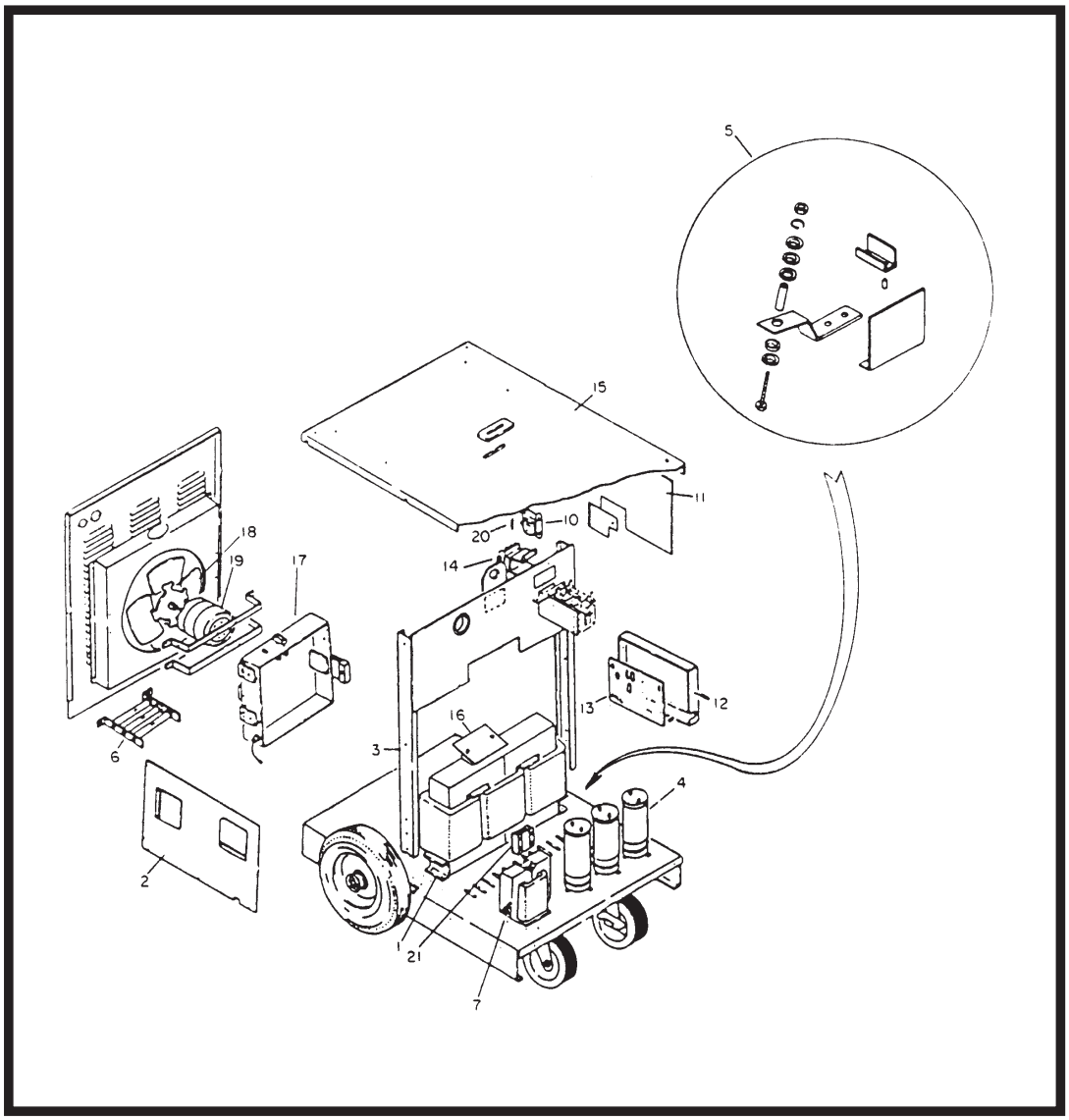
A detailed description of the parts used to build the power supply is given below. If a description applies only to power supplies having a particular specification number, reference to that specification will be made. The specification number and equipment rating information is provided on the nameplate located on the power supply front panel just above the manufacturers name. Be certain that the specification number and rating is proper for your input power rating. Also be sure that your output voltage setting is properly rated for your load. Refer also to Figure 2 of this chapter for the tabulation of rated values for the specifications listed.

This power supply utilizes solid state devices to control the output of the main transformer by delaying the turn on time of the main siliconcontrolled rectifier to that required to give the desired power supply output voltage. This control method is called SCR phase angle control.

The turn on delay after the voltage input to the SCR devices is quite similar to a phase shift. Generally, the longer the turn-on delay *(i.e., lower output voltage)* the lower the power supply input power factor. The printed circuit board has various data sent to it from sensors and/or points in the power supply. These data are compared with the commands that the user has established so that instructions to correct any abnormality in output can be automatically provided.

B. Main Transformer (1, Fig. 3)

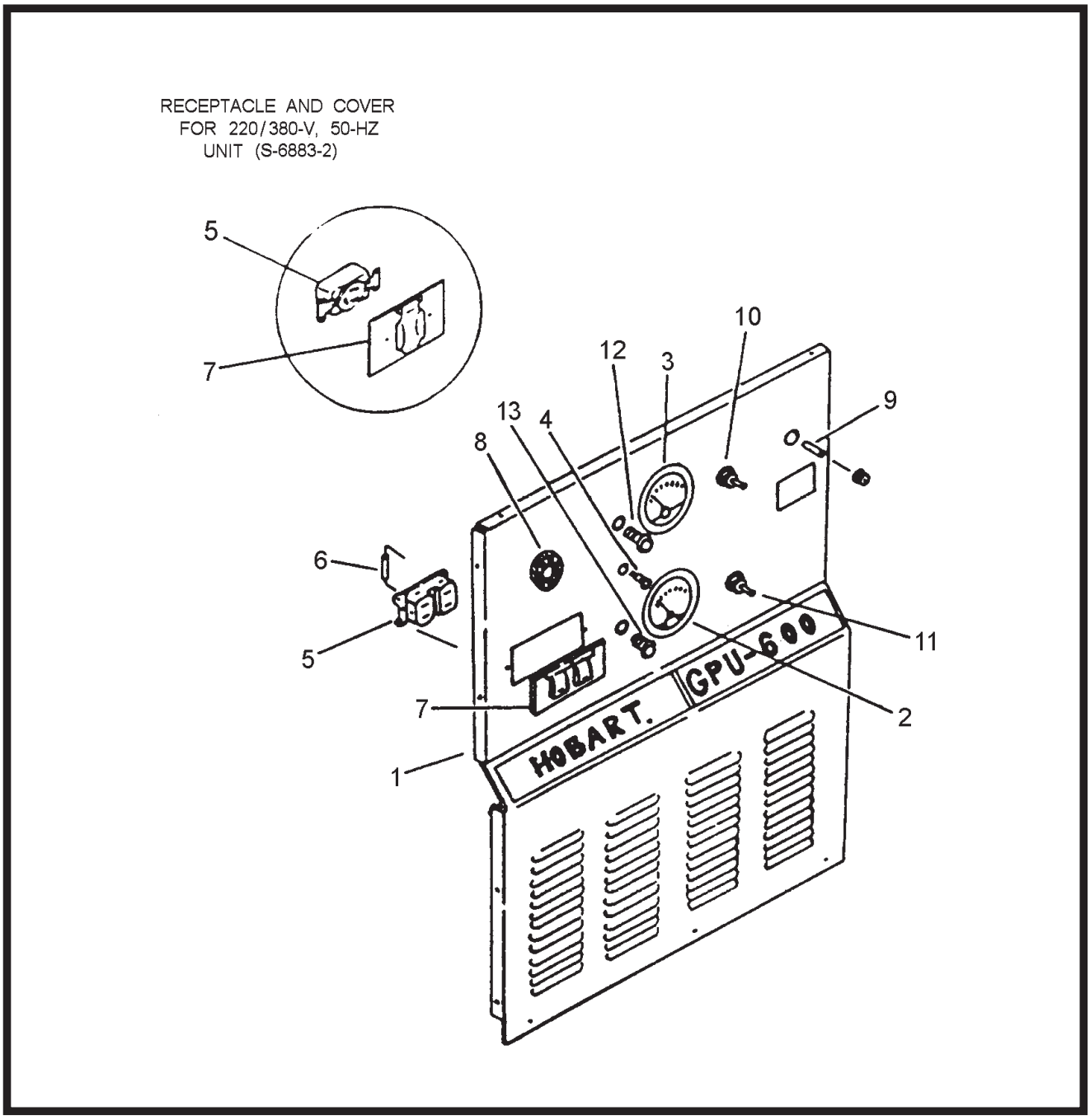
The main power transformer is a forced air cooled, core-type, 3 phase unit that reduces the rated input voltage or voltages to a voltage somewhat higher than the maximum rated output voltage. The extra voltage for the output provides a reserve capability to compensate for undervoltage on the input circuit, for the higher IR voltage drop found as the transformer, cables and other components heat up with load and ambient temperature rises.



1. Power Transformer
2. Left Side Panel
3. Lifting Yoke
4. Capacitor
5. Terminal Output Assembly
6. Resistor Assembly
7. Choke
8. (Deleted)
9. 28 V-DC Contactor
10. Control Transformer
11. Right Side Panel
12. PC Mounting Panel
13. Printed Circuit Board
14. Line Contactor
15. Top Panel
16. Voltage Changeover Board
17. SCR Heat Sink Assembly
18. Fan Blade
19. Fan Motor
20. Control Transformer Fuse
21. Ammeter Shunt

Internal Components for GPU-600

Figure 3



1. Front Panel
2. M1 DC Ammeter
3. M2 DC Voltmeter
4. DS2 Overload Light
5. 115 VAC Receptacle
6. MOV Surge Suppressor
7. 115 VAC Weather Cover
8. R13 Start Level Control
9. F1 Fuse
10. S1 Input On-Off Switch
11. S2 Output On-Off Switch
12. Input Power Light (amber)
13. Output Contactor Light (green)

Front Panel Assembly, GPU-600

Figure 4

The main transformer of the 208/230/460-V power supply *(Spec 6683-1 or 6883A-1)* has a winding to provide the 115-V AC for the auxiliary power receptacle and fan motor. The main transformer has a center tapped coil on each phase that provides six sensing or synchronizing voltage signals to the solid state printed circuit control board *(13, Fig. 3).*

The main transformer for the 220/380-V power supply *(Spec 6683-2 or 6883A -2)* has a 220-V AC winding for its auxiliary power receptacle and a 110-V AC winding for the fan motor. Be certain to follow the changeover diagram for both the main transformer and the control transformer *(10, Fig. 3)* for the input voltage you have available.

CAUTION: IMPROPER CONNECTIONS WILL CAUSE DAMAGE. CONTACT FACTORY IF YOUR EQUIPMENT SPECIFICATION INFORMATION AND/OR VOLTAGE CHANGEOVER DIAGRAM DOES NOT AGREE WITH YOUR RATED 3 PHASE INPUT VOLTAGE.

C. Control Transformer (10, Fig. 3)

The small control transformer located on the rear of the inside baffle *(3, Fig. 3)* or lifting eye plate provides 115 V AC to the K1 *(14, Fig. 3)* input contactor coil, input contactor light A *(12, Fig. 4),* and S1 *(11, Fig. 4)* input contactor switch via the half amp F8 contactor fuse *(20, Fig. 3)* on the control transformer. This transformer does not provide the 9A, 115 V AC auxiliary power.

WARNING: ELECTRIC SHOCK CAN KILL! DISCONNECT INPUT POWER AT SOURCE TO REMOVE VOLTAGE TO CONTROL TRANSFORMER AND INPUT FUSES AND CONTACTOR.

D. Auxiliary Power Circuitry

The 115 V AC single phase auxiliary power receptacle *(5, Fig. 4)* has the same frequency as the primary input voltage. It is protected by the F1 fuse *(9, Fig. 4)* located on the power supply front panel, typically, 15 Amperes. The auxiliary power circuitry is turned off whenever the primary contactor is open or off. The auxiliary power winding is typically located on the middle leg *(B phase)* of the main transformer. It provides power to the duplex 115 V AC receptacle *(5, Fig. 4)* and to the fan motor.

A “MOV” voltage surge suppressor, RV *(6, Fig. 4),* is installed across the 115 V AC receptacle terminals to reduce voltage surge problems to the load equipment and the power source.

E. Output Contactor Circuitry

Output contactor K2 *(9, Fig. 3)* is operated by the output contactor **ON-OFF** switch S2 *(11, Fig. 4).* Placing this switch momentarily in the UP (spring-loaded) position turns the output contactor **ON,** and placing it in the **DOWN** position turns the output contactor **OFF.**

The positive output lead is to be connected to the positive output terminal of the K2 contactor. The negative output lead is to be connected to the negative bus bar *(5, Fig. 3)* of the C15-C17 output filter capacitor bank *(4, Fig. 3)*. A small notch has been made in the bottom of the right and left side panels to allow for the output cable assembly to pass out either side.

F. Output Filter Circuitry

The DC output voltage is smoothed *(filtered)* by an L-C filter made up of L1 iron core reactor *(7, Fig. 3)* carrying the output current to the load and the ripple current to the C15, C16, C17 ripple bypass capacitors *(4, Fig. 3)* in parallel with the load terminals. The R2, R3, R4 bypass resistors *(6, Fig. 3)* provide both a preload to the SCR devices *(2, Fig. 5)* and a safety discharge circuit for quickly discharging the filter capacitors whenever the power supply is turned off.

CAUTION: CAPACITOR CHARGE CAN INJURE. BE SURE CAPACITORS ARE DISCHARGED BEFORE TOUCHING.

The CR7 flyback diode *(6, Fig. 5)* acts to facilitate discharge of the output filter circuitry as well as to protect the main SCR rectifier assembly from damaging reverse voltage spikes.

G. Front Panel Control Components (See Fig. 4)

(1) Output Meter

The power supply is typically supplied with a 0 to 2000 Amp scale DC ammeter M1 *(21, Fig. 4)* which measures the millivolt drop across the R11 meter shunt *(20, Fig. 3)* that corresponds to the scale calibration. The scale range is so much more than the rated output because the R13 starting current potentiometer *(8, Fig. 4)* can select any initial or starting current from 250 amperes to a maximum of 2000 amperes. The M2 output voltmeter *(16, Fig. 4)* measures the DC output voltage across the main filter capacitors.

The scale typically has a 50 V DC maximum reading. It should be emphasized that the R12 control feedback shunt *(21, Fig. 3)* is not to be used for the meter shunt. This separation provides better control integrity.

(2) Input Contactor Switch with Light

The S1 input contactor switch *(10, Fig. 4)* controls the 115 V AC contactor pickup voltage supplied by the control transformer via the F8 fuse. The amber input contactor light *(12, Fig. 4)* glows whenever voltage is applied to the input contactor coil. The input contactor applies the rated input voltage to main changeover board *(16, Fig. 3).*

WARNING: ELECTRIC SHOCK CAN KILL! DISCONNECT THE INPUT POWER FROM THE POWER SUPPLY BEFORE TOUCHING INTERNAL PARTS. THE INPUT CONTACTOR DOES NOT REMOVE ALL INPUT POWER FROM THE UNIT. BE SURE ALL CAPACITORS HAVE DISCHARGED BEFORE TOUCHING THE COMPONENTS.

(3) Output Contactor Switch and Light

The S2 output contactor close on-off switch *(11, Fig. 4)* has a spring loaded up position for the close mode, a middle position for “on” mode, and a bottom position for the “off” mode. The green output contactor “on” light *(13, Fig. 4)* glows for all the positions except “off”.

(4) Overload Trip Light (4, Fig. 4)

The overload trip light glows whenever the solid state printed circuit board turns off the power supply output due to output voltage exceeding 31.5 V DC, output current surge exceeding 2200-A DC.

H.Main SCR Heat Sink Assembly (See Fig. 5)

The main SCR heat sink assembly is mounted on the front of the rear panel. It surrounds the 115 V AC cooling fan assembly for optimum cooling efficiency. The SCR heat sink *(2, Fig. 5)* consists of a formed aluminum heat sink with 6 “hockey puck” silicon controlled rectifiers held by 6 insulated compression spring assemblies held against it by 6 U-shaped aluminum heat sinks for the “hockey puck” device cooling, two snubber pc board assemblies for SCR gate signal control and protection *(1, Fig. 5),* the associated insulators, thermostats and hardware.

The solid state printed circuit board *(13, Fig. 3)* described later provides a properly timed and sequenced turn on signal to the silicon controlled rectifiers that must conduct to provide the desired output. If the output voltage is too high or if the output current is above the limit set by controls such as the R13 starting potentiometer, the “pcb” control delays the SCR turn-on signal to allow less SCR device conduction time for a correspondly lower output. Conversely, if the output voltage is too low, the SCR turn-on signal is delivered earlier in the possible conduction time for each SCR thereby allowing more power to be supplied because of the longer conduction time. Proper operation of the SCR devices requires phase sequence and presence of all 6 voltage sensing signals, proper phase sequence and presence of the output voltage to the SCR devices and the proper magnitude and sequence of the SCR turn-on signal to the SCR gate leads.

J. Solid State Printed Circuit Control Board (13, Fig. 3)

The printed circuit board is located in a steel box behind the front access door on the power supply right side panel *(2, Fig. 3).* This large printed circuit board is the “brains” or electronic control for the following functions:

(1) Electronic Overvoltage/Overload Trip Circuit

The “pc board” trips the power supply off and turns on DS-2 red overload trip light *(4, Fig. 4)* on the front panel if more than 31.5 V DC or 2200 A overload exists. To reset, correct the cause of the condition and then turn the input switch off and back on.

(2) Electronically Controlled Current Limit

The starting current or output surge current is selected by adjusting R13 starting current control *(8, Fig. 4)* on the front panel from the minimum 250 A DC to the maximum 2000 A DC.

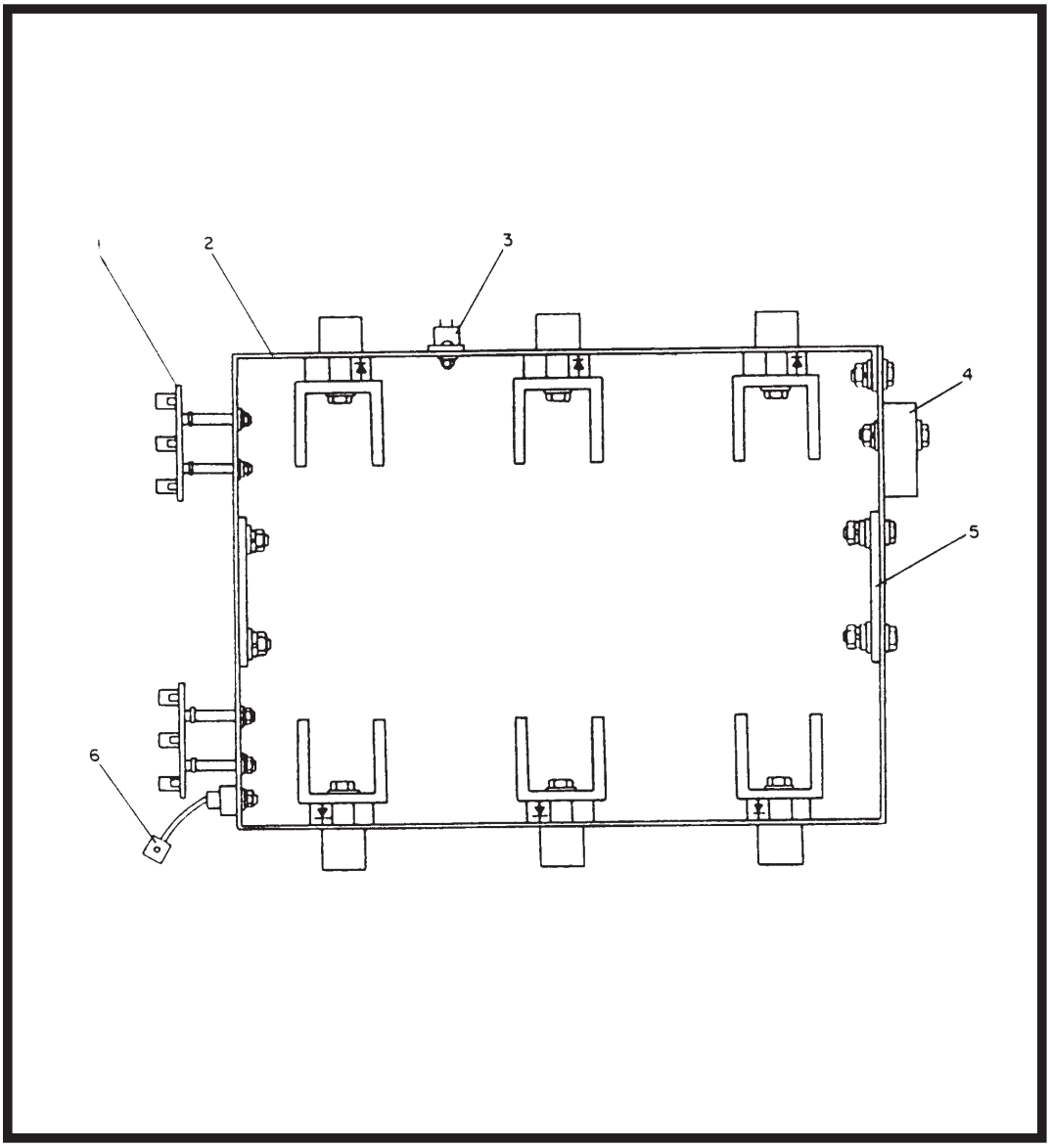
CAUTION: EXCESS STARTING CURRENT MAY CAUSE DAMAGE TO LOAD, BLOW FUSES OR DAMAGE POWER SUPPLY. CONTACT FACTORY IF YOU REQUIRE A CURRENT LIMIT LOWER THAN THE 250 A DC STANDARD MINIMUM LIMIT.

(3) Regulated DC Output Voltage

The voltage value is continuously compared to the actual output. If adequate input voltage exists, deviation from the desired voltage output is corrected by the change in SCR conduction time set by the printed circuit board firing pulse output. This corrective action is done quickly because the control is done electronically with only limited stored energy in the circuitry. Typical response time is about 25 milliseconds.

(4) Thermal Overload Trip

The printed circuit board turns off the SCR firing or gate pulses and turns on the trip light when S5 overload thermostat *(3, Fig. 5)* opens. The power supply can not produce any DC output until the S5 thermostat cools enough to automatically reset *(close).*



1. Surge Suppressor (2)
2. SCR Heat Sink Assembly
3. Overload Thermostat, S5
4. Metering Shunt, R12
5. Heat Sink Insulator (2)
6. Flyback Diode, CR7

SCR Heat Sink Assembly

Figure 5

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CHAPTER 2. DESCRIPTION AND OPERATION

SECTION 2. OPERATION

1. General

This section contains information for safe and efficient operation of the equipment. Operating instructions are presented in step-by-step sequence of procedures to be followed in supplying 28 V DC to an aircraft or similar load.

WARNING: ELECTRIC SHOCK AND FIRE CAN KILL! READ AND UNDERSTAND ALL OPERATING INSTRUCTIONS BEFORE ATTEMPTING TO OPERATE THE EQUIPMENT. OPERATION ATTEMPTS BY UNTRAINED PERSONNEL CAN ENDANGER PEOPLE, THIS EQUIPMENT, AND THE LOAD. DO NOT ATTEMPT TO OPERATE THE EQUIPMENT FOR USES NOT APPROVED BY THE MANUFACTURER, OR AT INPUT AND OUTPUT RATINGS NOT LISTED IN THE SPECIFICATION TABLE LOCATED IN 2-1, FIGURE 2.

The repeated opening of input fuses or repeated functioning of the overload trip circuitry indicates a misapplication, a faulty main component, or an improper connection or load. Correct the problem by following the instructions in Chapter 3 before attempting to operate the power supply. Be certain that an input disconnect means is readily accessible between the power input source and this DC power supply. You may need to quickly isolate the DC power source from all power during an emergency, fire, or equipment malfunction.

2. Preparation for Operation

A. Verify input power is disconnected at source.

B. Verify that the supply input connections agree with the input voltage available by comparison to the voltage changeover diagram.

C. Connect your output cable between your load and the proper connection points in the DC power supply.

D. When all covers or panels are in place, turn on the source of input power.

E. Set R13 start level control knob *(9, Fig. 1)* to the output surge limit required for your load.

3. Operation Procedure

A. Input Control Functions

(1) Turn on S1 input contactor switch *(4, Fig. 1).*

(2) Verify that only the amber input power light *(7, Fig. 1)* glows. If the light glows, no problem exists requiring service.

B. Output Control Functions

(1) Hold the S2 output contactor switch *(4, Fig. 1)* in the up **"CLOSE"** position long enough for the green output contactor light *(10, Fig. 1)* to glow.

(2) Release S2 switch to the middle "ON" position.

(3) Verify that M1 DC ammeter *(5, Fig. 1)* does not read an excessive amperage. Release S2 switch.

(4) The DC power supply should continue to deliver power until the S2 switch is placed in the down **"OFF"** position or one of the other control means functions to turn the unit **"OFF".**

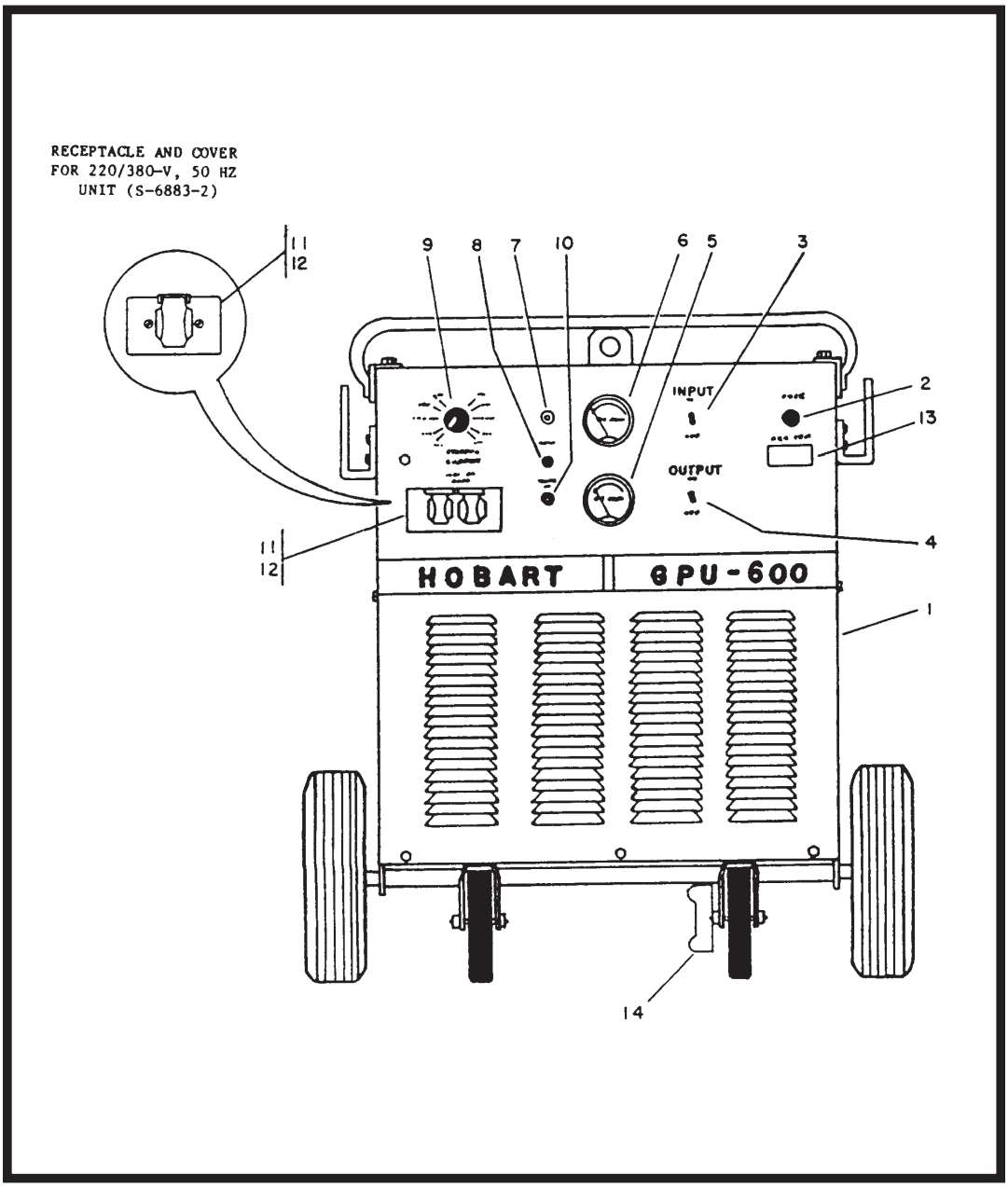
C. Voltmeter

(1) Verify on the M2 DC voltmeter *(6, Fig. 1)* that the DC output voltage level is correct. If not, turn off power supply, disconnect your load, and refer to Service, Chapter 3 for instructions.

D. Output Current Limit

(1) If the DC ammeter continuously reads more than 600 A DC after start-up, immediately turn R13 current limit control *(9, Fig. 1)* down to continuous operation current point, normally 600 A DC. This may prevent automatic overload trip out or blowing of fuses or tripping of circuit breakers at the source of input power.

(2) If R13 has no effect or if the output current cannot be decreased to about 250 A DC at the R13 minimum position, a faulty SCR device or control circuit malfunction is indicated requiring power supply repair. Refer to Chapter 3 for service instructions.



1. Front Panel
2. Control Fuse, F1 (15A)
3. Input ON-OFF switch, S1
4. Output Contactor Switch, S2
5. Ammeter, 0-2000 A DC, M1
6. Voltmeter, 0-50V DC, M2
7. Amber Input Power Light, DS1
8. Red Overload Trip Light, DS2
9. Start Current Potentiometer, R13
10. Green Output Contactor Light, DS3
11. Auxiliary Power Receptacle, 115V-AC
12. Auxiliary Power Receptacle Cover
13. Rating and Specification Nameplate
14. Caster Wheel Brake

Controls and Instruments

Figure 1

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CHAPTER 3. SERVICING

SECTION 1. MAINTENANCE

1. General

To be certain the DC power supply set is ready for operation at all times, it must be inspected and maintained systematically so that defects may be discovered and corrected before they result in serious damage or failure of the equipment. Defects discovered during operation of the unit should be noted for correction to be made as soon as operation has ceased.

WARNING: HIGH VOLTAGE - ELECTRIC SHOCK CAN KILL! BE CERTAIN THE INPUT POWER SOURCE IS TURNED OFF BEFORE PROCEEDING WITH ANY INSPECTION OR MAINTENANCE OPERATION WHICH COULD BRING PERSONNEL IN CONTACT WITH HIGH VOLTAGE OR REVOLVING EQUIPMENT. STOP OPERATION IMMEDIATELY IF A POSSIBLE DANGEROUS FAULT IS DISCOVERED. THE FRONT PANEL INPUT CONTACTOR SWITCH DOES NOT REMOVE INPUT POWER FROM ALL COMPONENTS. BE SURE CAPACITORS ARE DISCHARGED BEFORE YOU TOUCH.

The power supply is designed to be as maintenance free as possible, therefore, there are few inspection and maintenance requirements.

2. Inspection

A periodic inspection schedule should be established and maintained. A suggested inspection/check schedule is provided in Section 3-2, Figure 1; however, it may be changed as required to meet varying operating conditions and environment. See Section 2, Inspection/Check for inspection and check procedures to be used in conjunction with Section 3-2, Figure 1 schedule.

3. Lubrication

The subject of lubrication is mentioned here mostly to inform maintenance personnel that it has not been overlooked. Except for sleeve bearings in the fan motor, no lubrication is required. Refer to Section 1-2, Para. F for fan motor lubrication instructions.

NOTE: The fan motor is designed for 10,000 hours between bearing lubrications. Relubrication for even longer life at 10,000 hours requires fan motor removal and dissassembly, possible but not normally recommended.

A good silicone spray lubricant is recommended for hinges if exposure to weather should make them difficult to operate.

4. Parts Replacement

A. Minor electrical components

(1) Lamps and fuses are mortality type items which require simple periodic replacement.

(2) Switches, meters, contactors and fan motor in the power supply fall into the category of parts which can be expected to fail at infrequent, irregular intervals. Instructions for repair and replacement of these parts are obvious. Be certain the input power is turned off. Obtain the replacement part specified in the parts list. Replace the part by substituting the new part for the old taking care not to mix up the leads. See Sections 2 and 3.

(3) The user-supplied disconnecting means must be of proper capacity for the rated input voltage. See the rating for your input as listed for your use in 1-2, Figure 1, recommended wire size table. Be certain your specification number is designed for your input voltage. No visible inspection is possible, except for the marked rating if the input power source is off. The use of the wrong input voltage could be the cause for equipment damage.

B. Major Electrical Components

(1) Major electrical components such as the power transformer, filter choke, and SCR devices on the SCR heat sink assembly should be replaced or repaired at an overhaul type facility.

(2) The firing circuit board can be easily replaced as a “plug-in” assembly. Minor calibration adjustment may be required for optimum performance. It is recommended, however, that this adjustment be made only by factory authorized personnel.

(3) The flyback rectifier diode located on the main SCR heat sink assembly rarely fails from normal use. If replacement is ever required, be sure to connect the replacement exactly as the original after torque wrench tightening the nut to the stud at 4.2 to 5.2 foot pounds *(5.70 to 7.05 newton meters).*

(4) SCR device replacement requires extreme care, special tools, and the exact replacement part and technique for optimum performance. The replacement of the SCR should be done at the factory or an authorized repair facility. A replacement SCR bridge subassembly can be obtained from the factory which would allow the customer to install so long as he was certain to exactly replace all leads and components in the same position with the same hardware. This task would still require considerable care and time.

Section 2. INSPECTION CHECK AND REPAIR

1. General

This section describes inspections and checks to be performed in conjunction with Inspection/Check Schedule, Figure 1. For satisfactory service, keep the power supply clean, dry, and well ventilated. At the prescribed intervals or more often as necessary, disconnect the power supply from the input power source and wipe and blow out all dirt and other foreign materials from the internal components, including the fan blades. Air pressure should not exceed 25 ps; *(172 kPA).*

2. Exterior Cables and Connections

A. Input and Output Cables

Observe general condition of power input cables and equipment output cables. Inspect for cuts and abrasions in the insulation which could cause a short circuit. Visually inspect the output cable plug connector for physical damage and evidence of overheating.

B. Cable Connections

Check all input and output cable connections for tightness and security.

WARNING: HIGH VOLTAGE - ELECTRIC SHOCK CAN KILL! TURN THE SOURCE OF INPUT POWER OFF WHEN CHECKING THESE CONNECTIONS. BE CERTAIN CAPACITORS ARE DISCHARGED BEFORE TOUCHING THE CIRCUITRY.

3. Controls and Instruments

A. Voltmeter, Ammeter and Control Switches

These components can be damaged by abuse, shipping, and type of use. Observe these instruments at each “start-up” to verify they are operating. If one of the meters is suspected of being inaccurate, check it against a master, or test instrument. Replace any faulty or intermittently faulty switches immediately.

B. Indicating Lights

(1) Power input and output lights

Life of incandescent bulbs varies with the magnitude of voltage and vibration. Check the lamps *(bulbs)* in these lights by substituting a known good replacement lamp. If the lights do not glow after the replacement, the circuitry is defective and should be repaired. If the proper voltage reaches the base terminals, replace the base; if not correct the wiring fault.

(2) Overload trip indicating light

More than 31.5 V DC output or overcurrent trips overload trip light DS2. The light emitting diode circuit resets when S1 power on switch is cycled off and back on after the cause of the trip has been removed. The LED light does not fail in normal use. Applying reverse voltage or overvoltage to it during a test would be a more probable cause for failure, therefore applying a direct test is not recommended. A bad light does not come on during a trip.

C. Overload Thermostat

The S5 overload thermostat must be closed in order for the DS2 overload light not to be on during equipment turn-on. If AC power input is disconnected, verify continuity exists between the two S5 terminals with the leads to one of the terminals disconnected. Replace the S5 thermostat if the wiring terminals on the S5 thermostat are not shorted.

D. Starting Current Limit Potentiometer

If the R13 starting current control has no effect on the output current above 250 A DC, check the integrity of the R13 potentiometer before replacing the solid state control board. With input power off and the R13 potentiometer slider terminal disconnected from the wiring, the resistance to the slider terminal from each end of the potentiometer should change smoothly as the knob is turned. If not, replace the potentiometer and retest. If retesting shows no change, the printed circuit control board is probably faulty also.

	AS REQ'D	DAILY 8 HRS.	1 MONTH 200 HRS.	3 MONTH 600 HRS.	6 MONTH 1200 HRS.
*** EXTERIOR CABLES**					
Inspect equipment output cables		**X**			
Inspect AC input cables		**X**			
Check cable connections (internal)			**X**		
*** CONTROLS AND INSTRUMENTS**					
Check voltmeter functioning	**X**				
Check ammeter functioning	**X**				
Check fan thermostat operation		**X**			
Check indicating lights		**X**			
Check starting current limit functioning				**X**	
Check overload thermostat					**X**
Check printed circuit control board					**X**
Check all output contactor contacts					**X**
Check power input contactor contacts					**X**
Check voltmeter & ammeter accuracy				**X**	
Check all wiring and connections					**X**
Inspect and clean general (light duty)					**X**
Inspect and clean general (severe duty)				**X**	
*** Suspicious performance occurrence overrides timetable given.**					

Inspection/Check Schedule

Figure 1

E. Contactors

(1) Output Contactor, K2

The output contactor has contacts that can be visually inspected whenever the input power is removed from the power supply. If the contacts are badly burned the contactor should be replaced as soon as possible. Slightly pitted and burned contacts can be cleaned up with a commercial contact cleaner and very fine grained emery cloth or equivalent. If application of 28 V DC to the coil of the K2 contactor does not make the normally open contacts close completely or the normally open contacts open completely, the contactor should be replaced if the contact mechanism can't be mechanically adjusted for proper operation.

(2) Input Contactor, K1

If input power has been turned off at the source of power, the K1 input contactor contacts can be visually inspected by removing the two screws holding the contact cover in place. If the contacts are badly eroded, burned, or stuck, the replacement contacts and spring for each pole can be ordered with the number given in the applicable replacement parts list. If the contactor with DS1 light on has failed to pick up before the inspection, and no mechanical obstruction has been found, the contactor should be replaced or repaired with the replacement coil and contacts specified in the parts list. Many customers prefer to replace the whole contactor, especially for the condition showing bad coil and contacts. If DS1 light is good but does not glow and the F8 fuse checks good, the problem is in the control transformer circuit.

F. Control Transformer

The control transformer is located on the rear of the lifting baffle. The F8 fuse *(.5A)* is normally mounted on top of the control transformer. The voltage input connection on the control transformer must also be changed whenever the input voltage changes.

Not changing the input connection when going from a lower to higher input voltage will result in a burned out control transformer. The same result occurs if a larger than 1/2 ampere fuse is substituted for F8, especially if the input contactor is faulty. The only sure way for checking the control transformer to verify what the input voltage and output voltages are. If there is no proper output with proper input voltage, replace the control transformer.

4. Major Components Check and Repair

A. Main Power Transformer

No replacement parts are available for the main transformer. The replacment power transformer part number for your specification number is given in the replacement parts list in Chapter 4. This part and most of the major component parts can best be replaced at the factory or a factory authorized repair facility. However, replacement can be done by the customer if he exercises care to reconnect everything to the same points and in the same manner as the original part.

WARNING: HIGH VOLTAGE - ELECTRIC SHOCK CAN KILL! TURN THE SOURCE OF INPUT POWER OFF WHEN CHECKING THESE CONNECTIONS. BE CERTAIN CAPACITORS ARE DISCHARGED BEFORE TOUCHING THE CIRCUITRY.

Normally, a visual inspection will not find a transformer problem until the failure is very severe. The typical inspection is a voltage measurement test for rated primary input voltage and for 6 rated and balanced line to neutral AC voltages at the transformer secondary terminals. Refer to the applicable voltage changeover diagram for the input voltage test points and to the applicable connection diagram for the transformer secondary test connection points. The normal transformer line to neutral secondary voltage is approximately 33 V AC with no output amperage. Line to line voltage on the secondary is 66 V. If the fuses blow or circuit breakers trip immediately in the user-supplied disconnect switch and no evidence of lead shorting exists at the input contactor, or the primary connection terminal board, both the main transformer and the SCR control assembly are suspect. Open the input disconnect switch external to the power supply, label all the transformer leads going to the six U-shaped SCR heat sinks before disconnecting and insulating the leads. Also disconnect the flyback diode “pigtail” lead 105 and L1 filter lead 104. These connection changes enables you to check the transformer only.

After verifying that input power can be turned on from the power source safely, turn the rated input power on. After the S1 input contactor switch is closed carefully measure the output line to neutral voltages if the primary input is still on. If the input power source voltage trips out when the unit is turned on, the main transformer has probably failed. To verify failure, disconnect the input power at the power source and then remove the copper links *(jumpers)* on the main voltage changeover board. If turning the primary input voltage on, after input breakers at the power source have been reset, results in no high input current, the main transformer is bad.

If the problem still exists, the problem is not in the main transformer. Check the main connection terminal board for faulty connections and check the control transformer and input contactor. Go to 4.B if no problem existed with all the SCR devices disconnected.

B. Silicon Controlled Rectifier Assembly and Flyback Diode

(1) Visual

No visual failure capability is possible with the SCR assembly, except for faulty leads or misconnections which we assume have been found and corrected. The input power at the power source should be turned off at the start of the SCR check out.

(2) Voltohmmeter

To check with voltohmmeter, set the meter to the RX1 scale and check for a shorted SCR by measuring between each of the 6 U-shaped heat sink and the main heat sink. No reading should be possible with either polarity of lead connection. The flyback diode should read 4 to 14 ohms in one direction and a very high reading with the leads from the voltohmmeter reversed. If the flyback diode is shorted, *(a rare occurrence)* replace it with the same type of device *(see Chapter 4 - Replacement Parts)* taking care to torque the nut to the stud with 4.2 to 5.2 foot. pounds *(5.7 to 7.05 newton meters).* If the SCR bridge has one or more SCR devices showing a short circuit or low ohmmeter reading, it is recommended that the GPU-600 power supply be sent to the factory or an authorized repair station for repair. A replacement SCR bridge subassembly can be obtained from the factory which would allow the customer to replace the faulty SCR bridge assembly without special tools and techniques. He must still be careful to exactly replace all the mounted subassemblies and the connection leads exactly as they were on the faulty heat sink assembly. Special tools, parts, and techniques are required to replace single SCR devices on the heat sink assembly.

If the SCR heat sink and diode assembly checks good with the voltohmmeter, the components could still be failing due to voltage breakdown at voltages above that of the voltohmmeter. Go to 4. B. *(3)* Voltage test.

(3) Voltage Test for SCR Assembly

With input power turned off, reconnect one SCR device at a time and apply power until the input power is interrupted by a fault condition or all the SCR devices are connected. The last SCR device to be connected before interruption is faulty. If no fault occurred, the SCR's are all good. The input power should be turned off and the flyback diode mounted on the SCR heat sink should have the pigtail lead reconnected to lead 105. If reapplication of power causes a trip-out, replace the faulty flyback diode. The diode nut must be torqued to 4.2 to 5.2 foot pounds *(5.7 to 7.05 newton-meters).* If no failure occurred, go to 4. C. after turning input power off.

C. Filter Choke and Capacitor Voltage Test

Reconnect L1 Filter Choke lead 104 to the proper point as shown in the connection diagram. Visually check the C15, C16, and C17 capacitors for indication of a faulty connection which could cause the problem.

WARNING: CAPACITOR CHARGE CAN INJURE! BE SURE CAPACITORS ARE DISCHARGED BEFORE TOUCHING OUTPUT CIRCUITRY. STAY CLEAR OF CAPACITORS DURING TESTING. THEY CAN BURST.

Reapply input voltage. If trip out occurs, either the C15, C16, or C17 capacitors, or the connecting wiring between them, are shorted. Disconnect the input voltage at once, allow the capacitors time to discharge, and disconnect the positive and negative wiring from the capacitor assembly. Replace any shorted or bad capacitors *(having case deformation caused by high shorting amperage),* or bad connecting wiring. If the problem is found to be the L1 filter choke breaking down to ground, another grounded component must be present on the *(+)* side for the high current output to cause the trip out to occur. Check for the second grounded component also.

D. Printed Circuit Control Board

The best, most quick way to verify condition of a suspected printed circuit board is to exchange it for a known good one. This plug-in substitution method using a known good board also allows the equipment to go back on line immediately while the faulty board is sent back to the factory for repair or replacement. Field repair is not recommended.

Before assuming the board is faulty when you have no spare board perform the following checks:

(a) Check for blown fuses F2 thru F7 and replace bad ones for a retest under power. If unit now works, the problem may be solved or an intermittently present one. Keep record of which fuse blew for later assistance.

(b) Check for broken or shorted leads on or to plugs J1, J2, and J3 plugged into the printed circuit control board. Use the applicable schematic and connection diagrams for instructions and lead locations.

(c) Check snubber printed circuit boards on the right side of the SCR heatsink assembly for shorted or broken leads and for signs of overheating.

(d) Check the SCR gate leads for breaks or short circuits and correct any problems found before retesting.

(e) If the reason the pc control board is being checked, and no substitute board exists, is insufficiency of output voltage with proper AC secondary voltage at the main transformer, check for proper pc board voltages *(See 3-3),* if no oscilloscope is available. If the readings are good, the problem may be one or more open SCR devices. The best test equipment is an oscilloscope but the use of a crude SCR tester with the input power off can verify open SCR devices but not hard to fire ones. One type of SCR turn-on tester is a battery power circuit tester with a light bulb in series with the battery and two leads. With input power off, the positive lead is connected to the anode of the SCR under test and the negative lead is connected to the cathode of the same SCR device. The light should stay off until the gate lead of the same SCR has the positive voltage applied to it. If the light turns on and remains on after the gate lead voltage is removed so long as the anode and cathode leads stay connected, the SCR is probably good. If the SCR stops conducting as soon as the gate lead is removed, an anode to cathode open or very hard to drive faulty SCR is probable. If any SCR devices are found to be faulty, the printed circuit board may not be faulty unless the voltages in 3.3 of the pc board test aren't achievable. Then both components may be faulty.

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SECTION 3. CALIBRATION AND TEST OF PC CONTROL BOARD

1. General

This section describes the test points, test values, and adjustment locations for testing and adjusting the printed circuit control board which is the “brains” of the GPU-600 DC power supply. As a minimum the following equipment and tools are required.

A. High impedance, high accuracy DC voltmeter;

B. Small, standard blade screwdriver;

C. Small, insulated clip leads;

D. A resistance load bank or equivalent that can safely dissipate 2200 ADC at 20-V DC if the overcurrent trip point is to be checked or adjusted.

Faulty control boards should be returned to the manufacturer for repair.

2. Printed Circuit Board Test Values and Adjustments

A. Refer to Figure 1 for the location of test points and adjustment potentiometers for possible field adjustment.

B. Test point values and comments about the measurements and testing conditions are tabulated in Figure 2.

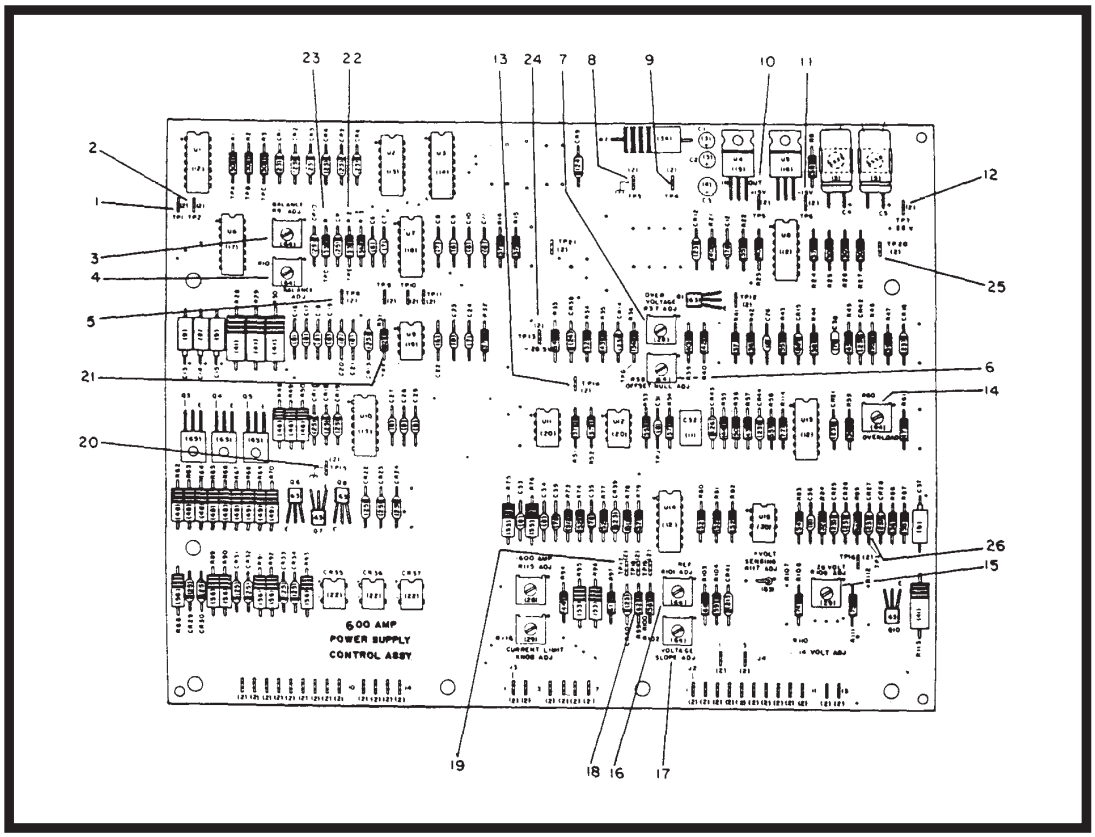
WARNING: ELECTRIC SHOCK AND ARCS CAN KILL OR INJURE! USE ACCESS DOORS TO INSPECT, OR TEST THE PRINTED CIRCUIT CONTROL BOARD WHILE THE EQUIPMENT IS RUNNING. THE VOLTAGES ON THE PRINTED CIRCUIT BOARD ARE SAFE; HOWEVER, REMOVING THE RIGHT SIDE PANEL EXPOSES PEOPLE TO DANGEROUS VOLTAGES.

C. Test and Calibration Procedure

Follow Figures 1 and 2 to verify that the PC board is functioning to the standard. If the voltage readings to the PC board common are not within specification, attempt to correct the reading by adjusting the applicable control. Be certain the operating conditions are exactly as stated in Figure 2. If the board does not adjust and the leads, fuses *(F2-F7)*, and connectors to the PC control board are good and proper, the PC control board is faulty. Replace it with a known good board after the input power has been turned off. The PC board is held in place by six *(6)* self tapping screws. After unplugging the three polarized connection plugs, remove the screws and keep for the new board. Reverse the procedure when the new PC board is mounted in the exact orientation of the old board. Recheck the voltages. In some cases a minor adjustment may be required for optimum calibration. If the same magnitude of error and lack of adjustment control is encountered, it is possible that the control board is not at fault.

Consideration should be given to returning the GPU-600 DC power supply to the factory or an authorized repair facility if your recheck of the GPU-600 does not find the cause of the difficulty. Field repair of the PC control board is not recommended.

CAUTION: IMPROPER TEST EQUIPMENT CAN DAMAGE! USE ONLY RECOMMENDED TEST EQUIPMENT AND TOOLS. NEVER APPLY TEST VOLTAGE DIRECTLY TO COMPONENTS ON THE BOARD. THIS SOLID STATE CONTROL USES LOW CURRENT DEVICES THAT QUICKLY BURN OUT IF A LOW IMPEDANCE VOLTAGE SOURCE IS APPLIED DIRECTLY TO THE COMPONENT. THE DEVICE MAY NOT FAIL UNTIL LATER FROM THE TEST.



1. *TP1* SCR Gate Pulse from R10 Adjust.
2. *TP2* SCR Gate Pulse from R9 Adjust.
3. *R9* Balance Adjust. Phase 2, (TP2)
4. *R10* Balance Adjust. Phase 3, (TP1)
5. *TP8* Balanced SCR Gate Pulse, Phase 1
6. *R38* No Load Amp OFF Set Null, (TP14)*
7. *R37* Overvoltage Trip Point
8. *TP3* PC Board Common
9. *TP4* + 9.1 V DC Timer Voltage
10. *TP5* + 15 V Regulated Voltage
11. *TP6* - 15 V Regulated Voltage
12. *TP7* + 24 V Nonregulated Voltage
13 *TP14* Null at 0 A DC TP, (R38) *
14. *R60* Overload Limit, (TP20)
15. *R109* 28 V DC Output Cal., (TP13)
16. *R101* 5 V Ref Volt Adjust., (TP19)
17. *R102* Voltage Slope Adjust.,(TP17)
18. *TP19* Reference Volt Test Point, (R101)
19. *TP17* Voltage Slope Test Point, (R102)
20. *TP15* Common, PC Board Volts
21. *TPF* SCR Gate Pulse Timer
22. *TPE* Gate Timer Output, Phase 2
23. *TPD* Gate Timer Output, Phase 3
24. *TP13* Actual Output Volts (28.5 or 14.25)
25. *TP20* Overload Limit (R60) Adjust
26. *TPL* Overload Trip Summing Point

*** Note: TP14 provides amplified load Amp reading for comparison with overload limit (TP20) and starting amperage limit (TP21) set by R13 control on front panel.**

Printed Circuit Control Board Test Points

Figure 1

TEST	TEST POINTS	VOLTAGE	CONDITIONS	DESCRIPTION REMARKS
1	TP5 (10) TO TP3 (8) *	+ 15 VDC + 5%	OPEN CIRCUIT (NO LOAD)	CHECKS (+) VOLTAGE REGULATOR OUTPUT SET BY U4
2	TP6 (11) TO TP3 (8)	- 15 VDC + 5%	OPEN CIRCUIT (NO LOAD)	CHECKS (-) VOLTAGE REGULATOR OUTPUT SET BY U5
3	TP7 (12) TO TP3 (8)	+ 22 VDC + 10%	OPEN CIRCUIT (NO LOAD)	CHECKS UNREGULATED CONTROL VOLTAGE NEEDED FOR 1 AND 2
4	TP4 (9) TO TP3 (8)	+ 10 VDC + 5%	OPEN CIRCUIT (NO LOAD)	CHECKS GATE PULSE TIMER VOLTS SUPPLY SET BY CR 9
5	TPD (23) TO TP3 (8)	+ 3.3 VDC + 10%	OPEN CIRCUIT	CHECKS GATE PULSE TIMER OPERATION BEFORE PHASE BALANCING AND AMPLIFICATION
	TPE (22) TO TP3 (8)	+ 3.3 VDC + 10%	OPEN CIRCUIT	
	TPF (21) TO TP3 (8)	+ 3.3 VDC + 10%	OPEN CIRCUIT	
6	TP1 (1) TO TP3 (8)	- 9.2 VDC + 10%	OPEN CIRCUIT	CHECKS GATE PULSE TIMER OPERATION AND BALANCE ADJUSTMENT. WITH A 100-A LOAD, ADJUST R9 AND R10 CAREFULLY FOR LOWEST RIPPLE VOLTAGE (TYPICALLY 100 - 160 mv.)
	TP2 (2) TO TP3 (8)	- 9.2 VDC + 10%	OPEN CIRCUIT	
	TP8 (5) TO TP3 (8)	- 9.2 VDC + 10%	OPEN CIRCUIT	
7	TP14 (13) TO TP3 (8)	0 VDC + .01V	OPEN CIRCUIT	FOR NULL (0) BY R38 (6) FOR THE NO LOAD CURRENT SIGNAL
8	TP17 (19) TO TP3 (8)	+ 1.25 VDC + 10%	OPEN CIRCUIT	CHECKS VOLTAGE SLOPE CALIBRATED WITH R102 (17)
9	TP19 (18) TO TP3 (8)	- 5 VDC + 1%	OPEN CIRCUIT	CHECKS REFERENCE VOLTAGE ADJUSTED BY R101 (16)
10	TP13 (24) TO TP3 (8)	- 28.5 VDC + 1%	OPEN CIRCUIT	CHECKS OUTPUT VOLTS SET BY R109 (15) IN 28 VDC MODE
11	TP20 (25) TO TP3 (8)	+ 4.5 VDC + .5	OPEN CIRCUIT	CHECKS R60 (14) OVERLOAD CURRENT TRIP-OUT SETTING
12	TPL (26) TO TP3 (8)	.002V	OPEN CIRCUIT NOT TRIPPED	CHECKS TRIP-OUT LIGHT (Q10) AND CIRCUIT FUNCTIONING
		12 TO 13 VDC	TRIPPED	

* TP3 (8) and TP15 (20) are the same common point of the supply.

Test Value and Comment Tabulation

(For PC Board No. 180294A)

Figure 2 (Sht. 1 of 2)

TEST	TEST POINTS	VOLTAGE	CONDITIONS	DESCRIPTION REMARKS
1	TP5 (10) TO TP3 (8) *	+ 15 VDC ± 5%	OPEN CIRCUIT (NO LOAD)	CHECKS (+) VOLTAGE REGULATOR OUTPUT SET BY U4
2	TP6 (11) TO TP3 (8)	- 15 VDC ± 5%	OPEN CIRCUIT (NO LOAD)	CHECKS (-) VOLTAGE REGULATOR OUTPUT SET BY U5
3	TP7 (12) TO TP3 (8)	+ 22 VDC ± 10%	OPEN CIRCUIT (NO LOAD)	CHECKS UNREGULATED CONTROL VOLTAGE NEEDED FOR 1 AND 2
4	TP4 (9) TO TP3 (8)	+ 10 VDC ± 10%	OPEN CIRCUIT (NO LOAD)	CHECKS GATE PULSE TIMER VOLTS SUPPLY SET BY CR 9
5	TPD (23) TO TP3 (8)	+ 3.3 VDC ± 10%	OPEN CIRCUIT	CHECKS GATE PULSE TIMER OPERATION BEFORE PHASE BALANCING AND AMPLIFICATION
	TPE (22) TO TP3 (8)	+ 3.3 VDC ± 10%	OPEN CIRCUIT	
	TPF (21) TO TP3 (8)	+ 3.3 VDC ± 10%	OPEN CIRCUIT	
6	TP1 (1) TO TP3 (8)	- 8.2 VDC ± 10%	OPEN CIRCUIT	CHECKS GATE PULSE TIMER OPERATION AND BALANCE ADJUSTMENT. WITH A 100-A LOAD, ADJUST R9 AND R10 CAREFULLY FOR LOWEST RIPPLE VOLTAGE (TYPICALLY 100 - 160 mv.)
	TP2 (2) TO TP3 (8)	- 8.2 VDC ± 10%	OPEN CIRCUIT	
	TP8 (5) TO TP3 (8)	- 8.2 VDC ± 10%	OPEN CIRCUIT	
7	TP14 (13) TO TP3 (8)	0 VDC ± .01V	OPEN CIRCUIT	FOR NULL (0) BY R38 (6) FOR THE NO LOAD CURRENT SIGNAL
8	TP17 (20) TO TP3 (8)	+ 1.25 VDC ± 10%	OPEN CIRCUIT	CHECKS VOLTAGE SLOPE CALIBRATED WITH R102 (17)
9	TP19 (18) TO TP3 (8)	- 5 VDC ± 1%	OPEN CIRCUIT	CHECKS REFERENCE VOLTAGE ADJUSTED BY R101 (16)
10	TP13 (24) TO TP3 (8)	- 28.5 VDC ± 1%	OPEN CIRCUIT	CHECKS OUTPUT VOLTS SET BY R109 (15) IN 28 VDC MODE
11	TP20 (25) TO TP3 (8)	+ 4.5 VDC ± .5	OPEN CIRCUIT	CHECKS R60 (14) OVERLOAD CURRENT TRIP-OUT SETTING
12	TPL (26) TO TP3 (8)	.002V	OPEN CIRCUIT NOT TRIPPED	CHECKS TRIP-OUT LIGHT (Q10) AND CIRCUIT FUNCTIONING
		12 TO 13 VDC	TRIPPED	

* TP3 (8) and TP15 (20) are the same common point of the supply.

Test Value and Comment Tabulation

(For PC Board No. 180294)

Figure 2 (Sht. 2 of 2)

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SECTION 4. TROUBLESHOOTING

1. General

A. Troubleshooting is an orderly process of checking and eliminating possible causes of trouble until the exact cause of a trouble is found. As a rule, the best place to start looking for the cause of a trouble in a circuit is at the source of power. Continue testing and checking the circuit, step-by-step, in an orderly manner, until the cause of trouble is located. See applicable connection diagrams and schematic diagrams. Do not overlook the obvious. Loose connections are the primary cause of malfunctions, both internal and external to the machine. Do not overlook bad grounds, wrong settings, or worn out contactors.

Test points are identified on schematic diagrams listed in Chapter 5. P.C. Board test points are identified and test point values are given in Section 3-3, Figures 1 and 2. The minimum equipment needed to troubleshoot this machine is a simple voltohmmeter. An oscilloscope is the best device to find and correct difficult problems.

B. This section provides information useful in diagnosing and correcting certain troubles which cause unsatisfactory operation or failure of the equipment.

C. Minor troubles may be remedied by the operator; however, major repairs must be undertaken by experienced mechanics and electricians only. Replacement of SCR devices are to be performed at the factory or an authorized service center.

2. Troubleshooting (See Figure 1)

A. Description The troubleshooting chart lists information under three headings:

(1) Trouble, symptom, and condition

(2) Probable cause

(3) Test, check, and remedy

B. Use of the Troubleshooting Chart

The troubleshooting chart is designed to provide maintenance and repair personnel with a time-saving guide for locating the source of a trouble.

(1) Terminal points *(Ref. applicable schematic and connection diagrams),* installed on the power supply at several locations, provide easily accessible and identifiable test points for checking circuits and electrical components.

(2) Test points are located throughout the circuitry in such a manner that input and output power may be used for test purposes. Because of these test points and their location, a complete check of circuitry may be completed very quickly. Therefore, “probable causes” and “remedies” are listed in a step-by-step sequence which will insure power for testing in all instances where input or output power may be used with proper safety practices, test equipment, and training experience.

(3) Printed circuit board output troubles should be pinpointed only to determine if the problem is a board calibration problem or a PC board failure problem. Failure of PC board requires replacement of the board. Field repair attempts are not recommended. See 3-3 for calibration instructions.

(4) Always check circuit fuses, circuit breakers and the position of switches first in troubleshooting. The incorrect positioning of a switch may cause a condition which could be misinterpreted as a fault.

(5) Electrical component symbols, which are used on schematic diagrams, and their legends to identify components, may be used in the troubleshooting chart *(in parentheses after the item name)* to help maintenance personnel identify parts on the schematic diagrams.

3. Equipment for Troubleshooting

A good quality multi-scale voltohmmeter is the only instrument required for troubleshooting. However, for checking certain erratic, intermittent, or phase relationship problems, a good oscilloscope is strongly recommended.

4. Safety

WARNING: HIGH VOLTAGE - ELECTRIC SHOCK AND FIRE CAN KILL! EXERCISE EXTREME CARE TO AVOID CONTACT WITH HIGH VOLTAGE LEADS AND COMPONENTS WHICH COULD CAUSE SERIOUS SHOCK AND INJURY IF TOUCHED WHEN TROUBLESHOOTING OR OPERATING THE EQUIPMENT. STAY CLEAR OF MOVING PARTS. LOCATE EQUIPMENT IN A SAFE ENVIRONMENT. HAVE PROPER SAFETY EQUIPMENT AVAILABLE. DO NOT ATTEMPT OPERATION OR REPAIR WITHOUT ADEQUATE TRAINING.

5. Voltages of Interest

A. Across the secondary on all 3 phases - 66 VAC $\pm$ 10% *

B. To secondary coil center tap on all phases - 33 VAC $\pm$ 10% *

* The $\pm$ 10% refers to the possibility of input voltage being out of balance or not at the nominal value.

C. Across the 115 VAC receptacle - 115 VAC $\pm$ 10% *

D. Between X1 and X3 on Fuse Block - 37 VAC $\pm$ 10% *

E. Test Point Values for PC board

A control board malfunction will probably result in *(a)* a loss of output voltage, *(b)* inability to produce full load current, or *(c)* output voltage too high or too low. See Section 3-3, Figure 2 for nominal test values between a few selected test points shown in Section 3-3, Figure 1.

NOTE: All potentiometer operating values are preset at the factory, and normally should not have to be reset in the field. If a need arises that would indicate the need for field adjustments, please contact the factory at Troy, Ohio. Typically, R109, (28 V output) is the only factory set value which the customer's use might dictate a minor change in setting. For example, long cables might need a few tenths of a volt higher set values to compensate for the cable drop.

6. SCR Malfunction Instructions

A. Normal SCR Malfunction Conditions

(1) Blown line fuses as the result of a shorted SCR *(similar to a shorted diode)*. A shorted flyback diode will also produce this situation. This is a severe malfunction. See 6B.

(2) If one SCR does not turn on *[(either it is open or the gate signal is not being received by the SCR (gate circuit open)],* a very small change will occur at the output which will be difficult to notice. The ripple voltage at the output will increase.

(3) If two SCRs do not turn on, the ripple current will increase and can cause other problems. *(Consult troubleshooting procedure)*

B. Severe SCR Malfunction Conditions

(1) In the case of a severe malfunction, such as a shorted SCR or diode, do not turn on the unit. Disconnect the leads from the transformer to the heat sink assembly and check with a VOM for shorted SCRs or a shorted flyback diode.

(2) To eliminate the possibility of a control malfunction, go inside the unit and check the control circuit board. See the instructions provided for this test. It is important to run through the tests in the order they are listed. Note that the SCR devices and flyback diode are still disconnected.

C. SCR tests or checks

(1) If nothing is found defective on the board the next step is to go to the SCRs. First of all an open gate or an open SCR cannot be checked with a VOM. If an SCR is not firing, the AC ripple current will increase across the filter capacitors, but no fuses blow. Also, the ripple voltage will increase at the output.

(2) The best way of checking for a SCR device or flyback diode which breaks down into a shorted condition because of inadequate voltage withstand capability is to add one component at a time and then turn on the input power for a short time. When the faulty component gets connected, excessive input current will flow.

WARNING: ELECTRIC SHOCK AND FIRE CAN KILL! DO NOT TOUCH ENERGIZED PARTS. DO NOT LEAVE POWER SUPPLY ON LONG ENOUGH TO OVERHEAT OR FAIL IN THE FAULTY CONDITION.

(3) The best way to check that all SCR devices are firing and conducting correctly is to connect the probe of an oscilloscope to the heat sink and the isolated neutral of the oscilloscope to the braid of the flyback diode. The SCR pulses will show as 6 evenly spaced pulses of about the same height. If one of the pulses appears to be part of a malfunction SCR device circuit, the gate lead for that device may be disconnected from the applicable suppressor board point. The lead disconnection which does not affect the trace is the lead for the SCR device and suppressor circuit in question. However, if every third pulse is low or missing, check the balance adjustments, R9 and R10, before attributing the problem to faulty components.

TROUBLE, SYMPTOM AND CONDITION PROBABLE CAUSE TEST, CHECK, AND/OR REMEDY
MACHINE WILL NOT OPERATE
1. Machine will not start. **Step 1. Input power turned OFF at Remote Disconnect Switch.** **Turn power ON at Remote Disconnect Switch.** **Step 2. Blown fuse in Remote Disconnect Switch.** **Replace blown fuse. If fuse blows frequently, determine and remedy the cause.** **Step 3. Incorrect input power connections at machine.** **Check input power connections against appropriate connection diagram in Chapter 8.** **Step 4. Incorrect power input (frequency and voltage).** **Check that voltage and frequency of power input are proper for this generator unit, according to the rating on its nameplate.** **Step 5. Broken input cable.** **Repair cable as necessary.**
2. Line contactor fails to close. **Step 1. Fuse blown or breaker tripped at input disconnect switch.** **Replace fuse or reset circuit breaker. Check for cause if this malfunction happens frequently.** **Step 2. Mechanical obstruction on contactor.** **Remove obstruction.** **Step 3. Defective line contactor switch.** **Replace line contactor switch.**

Electrical Troubleshooting Chart

Figure 1 (Sheet 1 of 7)

TROUBLE, SYMPTOM AND CONDITION PROBABLE CAUSE TEST, CHECK, AND/OR REMEDY
MACHINE WILL NOT OPERATE (CONTINUED)
2. Line contactor fails to close (continued) **Step 4. Defective coil in line contactor.** **Replace contactor if coil is open or shorted.** **Step 5. Cable broken at line contactor.** **Repair broken cable as necessary.**
3. Line contactor chatters. **Step 1. Input cables too small or too long.** **Use input cables of sufficient capacity for proper operation of the machine. Refer to Section 1-2, Fig. 1 for proper cable size to be used.** **Step 2. Faulty contactor coil.** **Check coil voltage. If correct, replace contactor.** **Step 3. Low line voltage.** **Check line voltage. Correct problem as necessary.**
4. Contactor operates and blows line fuses. **Step 1. Wrong line voltage.** **Check nameplate of machine for line voltage to be used. Then measure line voltage. If line voltage is of improper value, correct this condition as is necessary to provide proper voltage input to the machine.**

Electrical Troubleshooting Chart Figure 1
(Sheet 2 of 7 Sheets)

TROUBLE, SYMPTOM AND CONDITION PROBABLE CAUSE TEST, CHECK, AND/OR REMEDY
MACHINE WILL NOT OPERATE (CONTINUED)
4. Contactor operates and blows line fuses. (Continued) **Step 2. Line fuses too small.** **Install fuses of proper amperage rating. Refer to Section 1-2, Fig. 1 for proper fuse size.** **Step 3. Links on voltage changeover board incorrectly connected.** **Check appropriate voltage changeover diagram in Chapter 8 for proper link positions. Make correction as necessary.** **Step 4. SCR failure or shorted flyback diode.** **Refer to detailed troubleshooting instructions.** **Step 5. Short circuit in primary connections.** **Remove short circuit.**
UNIT TRIPS OUT AFTER STARTING.
1. Unit delivers power but soon shuts down. **(Thermal overload, electronic overload or overvoltage circuit trips).** **Step 1. Power supply overloaded.** **Reduce load, overload can be carried only for a short time.** **Step 2. Duty cycle too high.** **Do not operate continually at overload currents.**

Electrical Troubleshooting Chart

Figure 1 (Sheet 3 of 7 Sheets)

TROUBLE, SYMPTOM AND CONDITION PROBABLE CAUSE TEST, CHECK, AND/OR REMEDY
UNIT TRIPS OUT AFTER STARTING (CONTINUED)
Step 3. Ambient temperature too high. **Operate at reduced loads when temperature exceeds 104F (40C) or improve cooling ambient.** **Step 4. Ventilation blocked.** **Check that air intake and exhaust openings are not obstructed.** **Step 5. Fan not operating.** **Check fuse F1 on front panel. If it is good, disconnect the fan motor leads and apply 115-VAC directly to fan motor. Replace fan motor if it fails to operate or if its bearings are defective.** **Step 6. Shorted output.** **Reset electronic overload.**
2. Overvoltage/Overload trip. Malfunction is in units internal circuitry. **Step 1. Control circuit board failure.** **Refer to detailed troubleshooting instructions.** **Step 2. Loose connections in voltage control circuit** **Check for loose connections. Tighten and secure as required.** **Step 3. Starting current potentiometer (R13) burned out.** **Replace potentiometer.**

Electrical Troubleshooting Chart

Figure 1 (Sheet 4 of 7 Sheets)

TROUBLE, SYMPTOM AND CONDITION PROBABLE CAUSE TEST, CHECK, AND/OR REMEDY
UNIT TRIPS OUT AFTER STARTING. (CONTINUED)
3. Fan not operating (also see causes and remedies under "Machine will not start"). **Step 1. Blown fuse (F1) on front panel of machine.** **Replace fuse. See that power receptacle is not overloaded.** **Step 2. Broken lead or connection to fan motor.** **Repair wiring as necessary.** **Step 3. Fan motor defective.** **Disconnect fan motor leads and apply 115-V AC directly to fan motor. If it fails to operate, replace it.**
POWER SUPPLY CASE HAS VOLTAGE POTENTIAL ON IT.
1. Operator gets shock when machine case is touched. **Step 1. Case of machine not grounded.** **Ground machine case to an earth-type ground if utility ground is already connected; connect the normal safety ground and recheck if "utility" ground had not been connected.**
POWER SUPPLY OUTPUT CURRENT VARIES WITHOUT VOLTAGE CHANGE
1. Abnormal current fluctuation, voltage nearly constant. **Step 1. Loose cable connections at output.** **Check for overheated connections and tighten.**

Electrical Troubleshooting Chart

Figure 1 (Sheet 5 of 7 Sheets)

TROUBLE, SYMPTOM AND CONDITION PROBABLE CAUSE TEST, CHECK, AND/OR REMEDY
POWER SUPPLY WILL NOT TURN OFF
1. Contactor fails to open. **Step 1. Contacts sticking in contactor.** **Clean contacts or replace contactor, whichever is needed.**
POWER SUPPLY ON: NO VOLTAGE OUTPUT
Step 1. Protective circuit tripped. **Determine and correct cause of trip. Then reset and restart unit.** **Step 2. Component failure in protective circuit.** **Find the defective component and replace it.** **Step 3. Control circuit board failure.** **Check board per Section 3-3 and replace it if faulty.** **Step 4. Output contactor failed or OFF.** **Replace contactor, selector switch or output ON-OFF switch, whichever of these is defective.**

Electrical Troubleshooting Chart

Figure 1 (Sheet 6 of 7 Sheets)

TROUBLE, SYMPTOM AND CONDITION PROBABLE CAUSE TEST, CHECK, AND/OR REMEDY
OUTPUT VOLTAGE NOT PROPER LEVEL
1. Poor voltage regulation. **Step 1. Loose connection of voltage sensing lead.** **Check connection at output contactor and control circuit board. Tighten connection as necessary.**
2. Output voltage too high (above 32 Volts). **Step 1. Voltage calibration off.** **Attempt calibration per Section 3-3. If calibration isn't possible, replace PC control board.** **Step 2. Voltage sensing lead open.** **Repair or replace voltage sensing lead.**
3. Unstable voltage. **Step 1. Open filter capacitor.** **Find and replace defective capacitor.** **Step 2. One or more SCRs not firing properly.** **Adjust balance control or replace defective SCR heat sink assembly if oscilloscope shows faulty SCR devices. Replace PC control board if oscilloscope shows no gate pulse and the PC control board inputs and controls are proper except for output.**

Electrical Troubleshooting Chart

Figure 1 (Sheet 7 of 7 Sheets)

CHAPTER 4. ILLUSTRATED PARTS LIST

SECTION 1. INTRODUCTION

1. General

The Illustrated Parts List identifies, describes, and illustrates main assemblies, subassemblies, and detail parts of the GPU-600 Series, SCR Phase controlled, DC power supply manufactured by Ground Power Group, Hobart Brothers Company, Troy, Ohio, and identified as Specification No. S6683 or 6883A with applicable dash number. Any options will have its own descriptive literature when required.

2. Purpose

The purpose of this list is to provide parts identification and descriptive information to maintenance and provisioning personnel for use in provisioning, requisitioning, purchasing, storing, and issuing of spare parts.

3. Arrangement

Chapter 4 is arranged as follows:

4. Explanation of Parts List

A. Contents

The parts list contains a breakdown of the equipment into assemblies, subassemblies, and detail parts. All parts of the equipment are listed except:

(1) Standard hardware items *(attaching parts)* such as nuts, screws, washers, etc., which are available commercially.

(2) Bulk items such as wire, cable, sleeving, tubing, etc., which are also commercially available.

(3) Permanently attached parts which lose their identity by being welded, soldered, riveted, etc., to other parts, weldments, or assemblies.

B. Parts List Form

This form is divided into five columns. Beginning at the left side of the form and proceeding to the right, columns are identified as follows:

(1) "FIGURE-ITEM NO." Column

This column lists the figure number of the illustration applicable to a particular parts list and also identifies each part in the list by an item number. These item numbers also appear on the illustration. Each item number on an illustration is connected to the part to which it pertains by a leader line. Thus the figure and item numbering system ties the parts lists to the illustrations and vice versa. The figure and index numbers are also used in the numerical index to assist the user in finding the illustration of a part when the part number is known

(2) "HOBART PART NUMBER" Column

ALL part numbers appearing in this column are Hobart numbers. In all instances where the part is a purchased item, the vendor's identifying fivedigit code and his part number will appear in the "NOMENCLATURE" column.

Vendor parts which are modified by Hobart will be identified as such in the "NOMENCLATURE" column. In case Hobart does not have an identifying part number for a purchased part, the "HOBART PART NUMBER" column will reflect "No Number" and the vendor's number will be shown in the "NOMENCLATURE" column. Parts manufactured by Hobart reflect no vendor code or part number in the "NOMENCLATURE" column.

(3) "NOMENCLATURE" Column

The item identifying name appears in this column. The indenture method is used to indicate item relationship. Thus, components of an assembly are listed directly below the assembly and indented one space. Vendor codes and part numbers for purchased parts are shown in this column. Hobart modification to vendor items is also noted in this column.

(4) "EFF" (Effective) Column

This column is used to indicate the applicability of parts to different models of equipment. When more than one model of equipment is covered by a parts list, there are some parts which are used on only one model. This column is used for insertion of a code letter "A", "B", etc., to indicate these parts and to identify the particular model they are used on.

Parts in this manual are coded as follows:

Parts coded "A" are usable on Specs 6883-1 only.

Parts coded "B" are usable on Specs 6883-2 only.

Parts coded "C" are usable on Specs 6883A-1 only.

Parts coded "D" are usable on Specs 6883A-2 only.

Parts coded "E" are usable on Specs 6883A-3 only.

(5) "UNITS PER ASSEMBLY" Column

This column indicates the quantity of parts required for an assembly or subassembly in which the part appears. This column does not necessarily reflect the total used in the complete end item.

SECTION 2. MANUFACTURER'S CODES

1. Explanation of Manufacturer's (Vendor) Code List

The following list is a compilation of vendor codes with names and addresses for suppliers of purchased parts listed in this publication. The codes are in accordance with the Federal Supply Codes for Manufacturer's Cataloging Handbook H4-1, and are arranged in numerical order. Vendor codes are inserted in the nomenclature column of the parts list directly following the item name and description. In case a manufacturer does not have a vendor code, the full name of the manufacturer will be listed in the nomenclature column.

CODE	VENDOR'S NAME AND ADDRESS
00779	AMP Inc., P.O. Box 3608, Harrisburg, Pennsylvania 17105
01121	Allen-Bradley Company, 1201 South 2nd Street, Milwaukee, Wisconsin 53204
02231	Anchor Rubber Company, 840 South Patterson Boulevard, P.O. Box 832, Dayton, Ohio 45401
02768	Illinois Tool Works Inc., Fastex Division, 19 S. Algonguin Rd., Des Plaines, Illinois 60016
05277	Westinghouse Electric Corp., SemiConductor Division, Hill Street, Youngwood, PA 15697
11702	Syracuse Rubber Products, Inc., 1135 South Sycamore St., Syracuse, Indiana 46567
14604	Elmwood Sensors, Inc., Subsidiary Fasco Ind., 1655 Elmwood Avenue, P.O. Box 2821, Cranston, Rhode Island 02907
23826	Furnas Electric Co., 1004 McKee St., Batavia, Illinois 60510
26794	Connectron Inc., 12 Industrial Drive, Laurence Harbor, N.J. 08879
27191	Cutler-Hammer Inc., Power Distribution and Control Division, 4201 North 27th St., Milwaukee, WI 53216
28520	Heyco Molded Products, 1750 Blvd., P.O. Box 160, Kenilworth, NJ 07033
35197	LAU Division, Phillips Ind. Inc., 2027 Home Avenue, P.O. Box 1388, Dayton, Ohio 45407
44655	Ohmite Mfg. Co., 3601 West Howard St., Skokie, Illinois 60076
50603	HB Electrical Mfg. Company, Inc., Division of Prestolite, 1125 National Parkway, P.O. Box 1466, Mansfield, Ohio 44901

CODE	VENDOR'S NAME AND ADDRESS
51285	Woodrow Mfg. Company, 4300 River Rd., P.O. Box 1567, Springfield, Ohio 45501
56289	Sprague Electric Company, 87 Marshall St., North Adams, Mass. 01247
60741	Triplett Electrical Instrument Company, Harmon Road, Bluffton, Ohio 45817
62119	Universal Electric Company, 300 E. Main St., Owosso, Michigan 48867
70485	Atlantic India Rubber Works Inc., 571 West Polk St., Chicago, Illinois 60607
71400	Bussman Manufacturing, Division of McGraw-Edison Company, 114 Old State Road, P.O. Box 14460, St. Louis, Missouri 63178
71774	General Instrument Corp., Lamp Division, 4433 N. Ravenswood Ave., Chicago, Illinois 60640
72619	Amperex Electronic Corporation, Dialight Div., 203 Harrison Place, Brooklyn, New York 11237
74545	Hubbell Harvey Inc., 584 Derby Milford Rd., Orange, CT 06477
74559	Carlingswitch Inc., 505 New Park Avenue, West Hartford, CT 06110
77166	Pass and Seymour, P.O. Box 4822, Syracuse, NY 13221
81483	International Rectifier, 9220 Sunset Blvd., Los Angeles, CA 90069
81703	Mulberry Metal Products Inc., 2199 Stanley Terrace, Union, NJ 07083
90201	Emhart Ind. Inc., Mallory Capacitor Co., 4760 Kentucky Ave., P.O. Box 372, Indianapolis, Indiana 46206
91929	Honeywell Inc., Microswitch Division, 11 W. Spring St., Freeport, Illinois 61032
97520	Basler Electric Company, Rt. 143, P.O. Box 269, Highland, Illinois 62249
No Number	Material Handling Association, 1199 West Goodale Blvd., Columbus, Ohio 43212
No Number	Pioneer, Dayton Electronics Div., 4433 Interpoint Drive, Dayton, Ohio 45424 HB Part No. 83B-1100-1 83B-1100-2 83B-1101

SECTION 3. PARTS LIST

1. Explanation of Parts List Arrangement

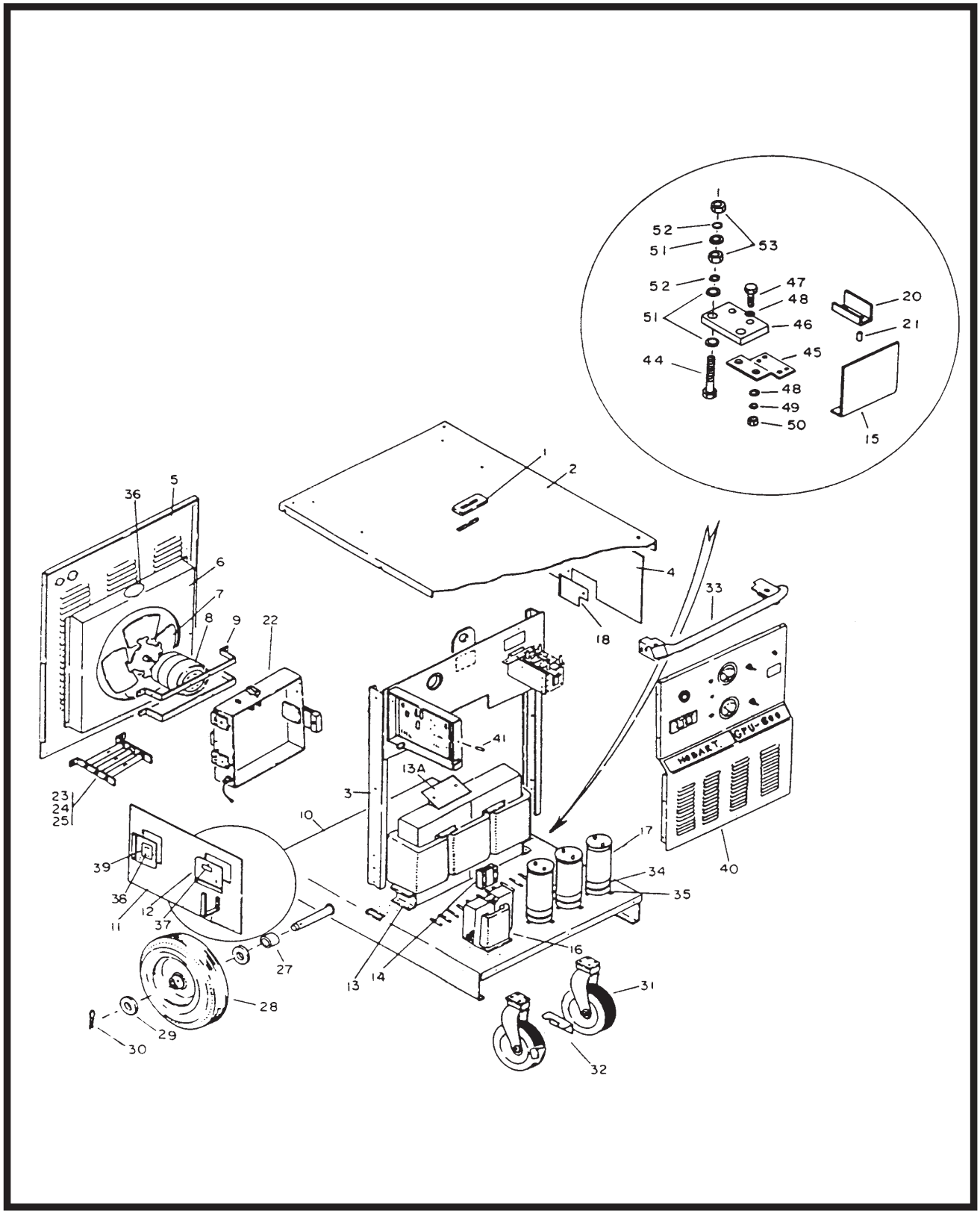
The parts list is arranged so that the illustration will appear on a left-hand page and the applicable parts list will appear on the opposite right-hand page. Unless the list is unusually long, the user will be able to look at the illustartion and read the parts list without turning a page.

2. Symbols and abbreviations

The folllowing is a list of symbols and abbreviations used in the parts list.

*****	- item not illustarted
A, or AMP	- ampere
AC	- alternating current
AR	- as required
DC	- direct current
Fig.	- figure
hd.	- head
hex	- hexagon
Hz	- Hertz (cycles-per-second)
I.D.	- inside diameter
IN	- inch
kVA	- kilovolt-ampere
uF	- microfarad
No.	- number
OM	- Owners Manual
PRV	- peak reverse
PSI	- pounds per square inch
Ref	- reference (the item has been listed previously)
TM	- Technical Manual
v	- volt (when used as a prefix to a five-digit number, indicates vendor code)

NOTE: An item which does not reflect an index number is an assembly which is not illustrated in its assembled state, or it is similar (right-hand, left-hand, top, etc.) to an item which is illustarted.



General Assembly GPU-600

Figure 1

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
1-	S-6883-1	GPU-600, 60-Hz, 208/230/460 VAC	A	1
	S-6883-2	GPU-600, 50-HZ, 220/380 VAC	B	1
	S-6883A-1	GPU-600, 60-Hz, 208/230/460 VAC	C	1
	S-6883A-2	GPU-600, 50-HZ, 220/380 VAC	D	1
	S-6883A-3	GPU-600, 60-Hz, 230/460/575 VAC	E	1
1	12CW-2170	. GROMMET, TOP		
2	489584	. PANEL, TOP		1
3	489591	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	AC	1
	180364	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	BDE	1
4	489586	. PANEL, SIDE, RIGHT		1
5	489603	. PANEL, REAR		1
6	201016	. SHROUD, FAN		1
7	406991	. BLADE, FAN, V35197, NO. 603S72		1
8	406992-1	. MOTOR, FAN, V62119, NO. CAZJ192		1
9	201015	. BRACKET, MOTOR		2
10	489573	. BASE, MTG., ASSY.		1
11	489590	. PANEL, SIDE, LEFT		1
12	487813	. DOOR, ACCESS ASSY.		2
13	489561	. TRANSFORMER, POWER	A-D	1
	181565	. TRANSFORMER, POWER	E	1
13A	367229-3	. BOARD, VOLTAGE CHANGEOVER, ASSY		1
14	180065	. SHUNT, 2000A		1
15	489608	. BARRIER, TERMINAL OUTPUT		1
16	180480	. CHOKE, ASSY.	A-D	1
	487952	. CHOKE, ASSEMBLY	E	1
17	405278-7	. CAPACITORS, V56289, NO. 36DX772F200DF2A	A-D	3
	405278-7	. CAPACITORS	E	3
18	489655	. DOOR, ACCESS, ASSY.		1
19	(Deleted)			
20	489610	. BRACKET, OUTPUT CABLE		1
21	489971	. SPACER, OUTPUT CABLE		2
22	489700	. RECTIFIER, OUTPUT *(For Details See Fig. 3)*		1
	487050-2	. RESISTOR AY		1
23	AAW-1199	. BRACKET, MTG, RESISTOR		2
24	16DA-3493	. WASHER INSULATING		6
25	403765-2	. RESISTOR, FIXED, V44655, NO. 0600B		3
26	397752-1	. BRACKET, CABLE HANGER		4
27	486143-2	. SPACER, WHEEL		2
28	83B-1101	. WHEEL 10", MATERIAL HANDLING ASSOC, NO. 3875-10		2

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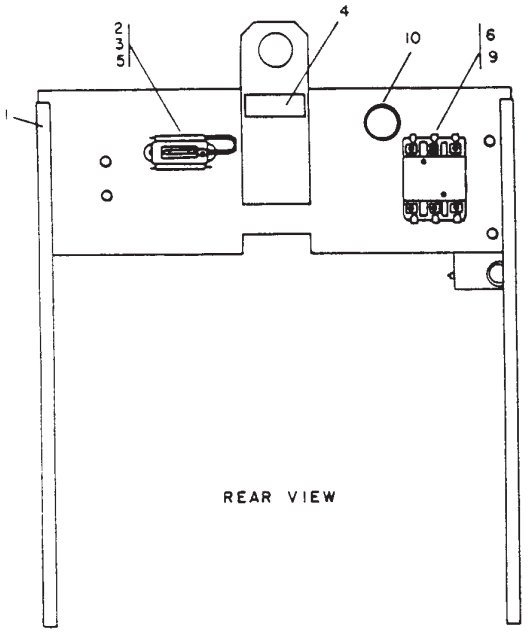
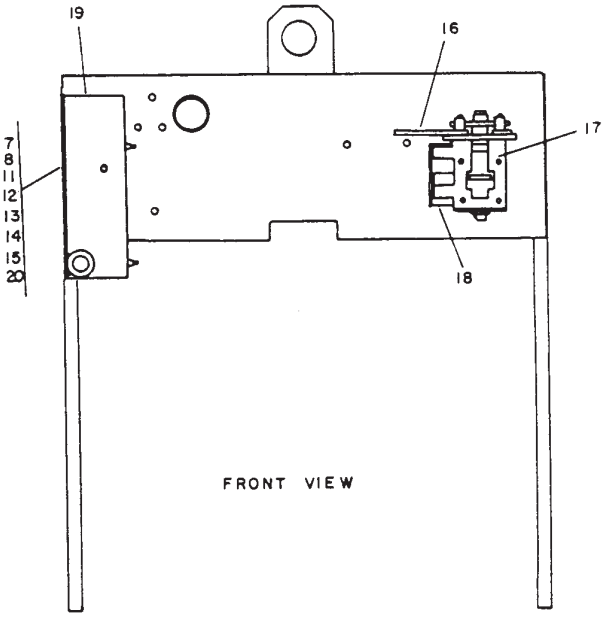
FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
1-		(Continued)		
29	W-11242-14	. WASHER, FLAT		4
30	W-11338-3	. COTTER PIN		2
31	83B-1100-1	. CASTER MATERIAL HANDLING ASSOC, NO. 6-43-126-7		1
32	83B-1100-2	. CASTOR WITH BRAKE, NO. 6-43-126-7		
		MATERIAL HANDLING ASSOC.		1
33	910225-1	. HANDLE ASSY.		1
34	350488-94	. . INSULATION, CAPACITOR		3
35	361052-9	. . CLAMP, CAPACITOR, V90201, NO. VR12		3
36	351541	. LABEL, CAUTION FAN		1
37	81B-1061	. LABEL, RECTIFIER SHOCK		1
38	83B-1079	. LABEL, ELECTRIC SHOCK		2
39	83A-1105	. LABEL, FUSES		1
40	489588-	. PANEL, FRONT ASSY. *(For Details See Fig. 4)*		1
	489588-2	. PANEL, FRONT ASSY. *(For Details See Fig. 4)*		1
41	487979	. SPACER, PC PANEL	A-D	1
	487979	. SPACER, PC PANEL	E	2
42	283323	. CABLE HANGER		4
	489974	. TERMINAL, OUTPUT, ASSY.		2
44	No Number	. . SCREW - 3/8-16 X 2-1/2 HHC ST. *(STD)*		2
46	489973	. . BOARD, MTG. TERMINAL OUTPUT		1
45	489972	. . SUPPORT, TERMINAL OUTPUT		1
47	No Number	. . SCREW 1/4 X 1-1/4 HHC *(STD)*		2
48	No Number	. . WASHER FL. ST 1/4		4
49	No Number	. . WASHER LK. ST 1/4		2
50	No Number	. . NUT, 1/4-20 HEX FULL ST.		2
51	No Number	. . WASHER FL. ST. 3/8		6
52	No Number	. . WASHER LK. ST. 3/8		4
53	No Number	. . NUT 3/8-16 HEX FULL ST.		4
* 54	402674-2	. . LABEL POSITIVE		1
* 55	402674-1	. . LABEL NEGATIVE		1
* 56	84A-1054	. REFLECTOR		4
* 57	80A-1133	. CABLE, STRAIN RELIEF		1
* 58	367579	. INSULATOR, FUSE BLOCK		1
*59	W-11166-9	. FUSE, FAST BLOW, AGC, 1 AMP		6

*** NOT ILLUSTRATED**



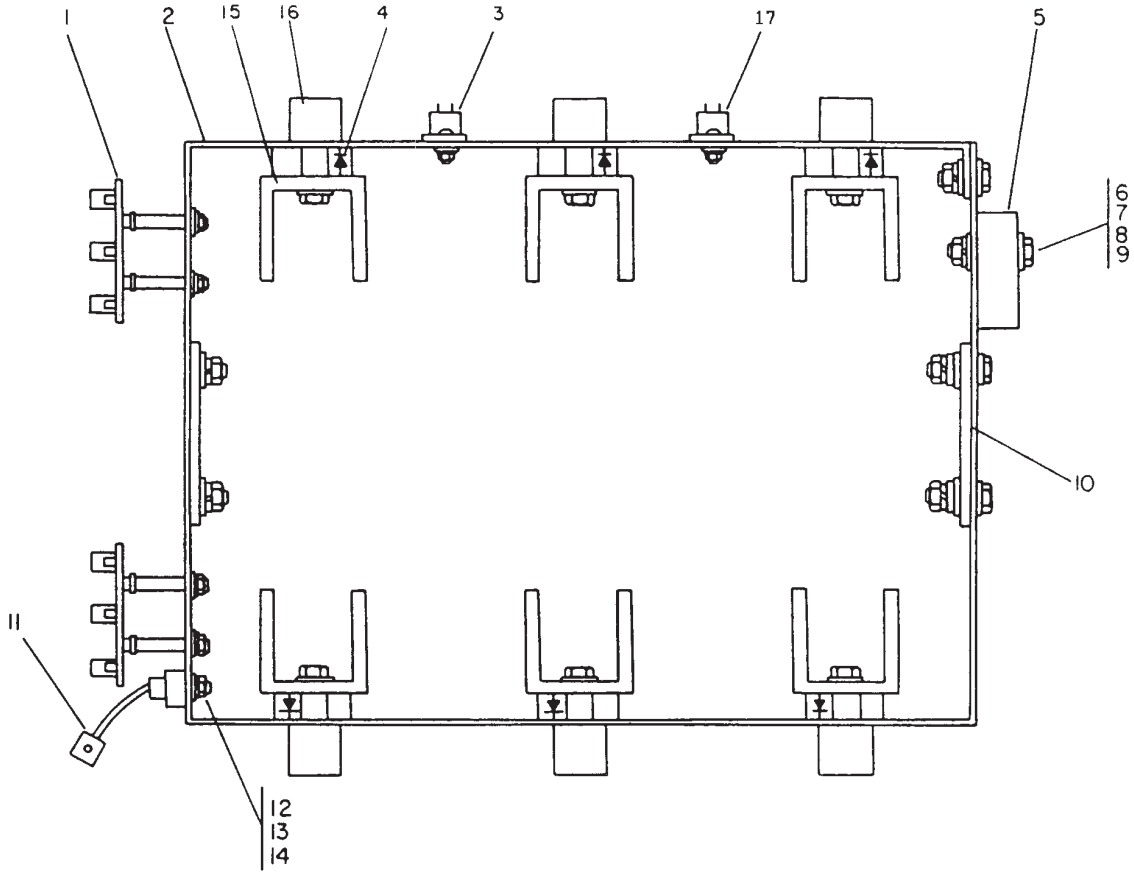


Lifting Yoke Assembly

Figure 2

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
2-	489591	YOKE, LIFTING ASSY. (For NHA See Fig. 1)	AC	1
	180364	YOKE, LIFTING ASSY. (For NHA See Fig. 1)	BDE	1
1	489582	. . YOKE LIFTING		1
2	406392-1	. . TRANSFORMER, CONTROL, V97520, NO. 18608001	AC	1
	406392-2	. . TRANSFORMER, CONTROL, V97520, NO. 18608001	BDE	1
3	W-11166-11	. . FUSE, FAST BLOW, AGC, V71400, NO. AGC-1/2		1
4	81B-1061	. . LABEL, WARNING, ELECTRIC SHOCK		1
5	406484	. . LABEL, FUSE, R-400S, 0.5 AMP, 250V		1
6	400663	. . CONTACTOR, V23826, NO. 42EE35AF-263		1
7	W-11114-5	. . SCREW, 1/4-20 X 1, RD HD, MH.ST		2
8	W-11263-4	. . WASHER, LK, IET, Y4		3
9	50MS-732-0	. . NUT, 1/4-20, HEX, KEPS, ST.		5
10	405362-2	. . BUSHING, SNAP		1
11	487815	. . PANEL, MTG. PC BOARD		1
* 12	180294	. . BOARD, PC	AB	1
	180294A	. . BOARD, PC, POWER SUPPLY	CDE	1
13	405915-1	. . SPACER, PC BOARD, VO2768, NO. 217-200-502-06-0101		6
14	487979	. . SPACER, PANEL, MOUNTING, PC		2
15	W-11242-5	. . WASHER, ST. 1/4, FL.		4
16	487897	. . BAR, BUS CONTACTOR		1
17	405042-1	. . CONTACTOR, 28V, V50603, NO. HB309AE		1
18	487898A	. . BRACKET, CONTACTORS		1
19	82B-1023	. . LABEL, WARNING, TRANSFORMER-RECTIFIER		1
20	489609	. . PANEL, MOUNTING, P-C		1

*** Not Illustrated**

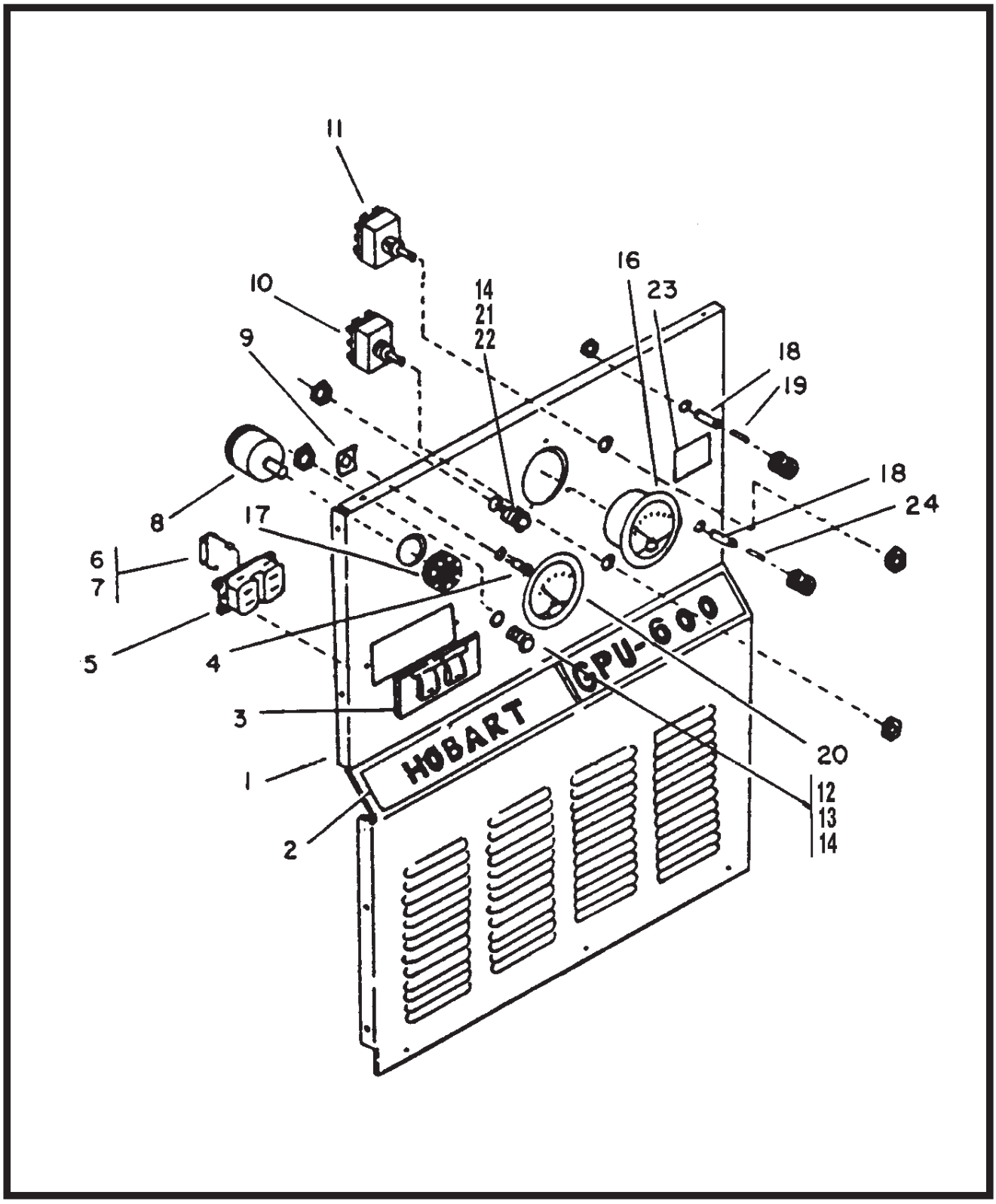


SCR Heat Sink Assembly

Figure 3

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF ASSY	UNITS PER
3-	489700	RECTIFIER, OUTPUT ASSEMBLY, (For NHA See Fig. 1)		REF
1	367634A-3	. . SUPPRESSOR, SURGE ASSY		2
2	200880	. . HEAT SINK, RECTIFIER		1
3	404044-3	. . THERMOSTAT, OVERLOAD, 02907, V14604, NO. 2450-82-175		1
4	406990	. . RECTIFIER, SILICON, CONT. V81483, NO. 550PB40		6
5	280023	. . SHUNT, 1200-AMP, 50 MV		1
6	W-11097-6	. . SCREW, 3/8-16 X 1-3/4, HHC. ST		1
7	W-11242-10	. . WASHER, FL. ST. 3/8		2
8	W-11254-6	. . WASHER, LK, ST. 3/8		1
9	W-11278-5	. . NUT, 3/8-16, HEX, FULL, ST.		1
10	369641	. . INSULATOR, MTG, RECTIFIER		2
11	W-10931-3	. . DIODE, SILICON, POS. BASE, V05277, NO. R6100328		1
12	W-11242-6	. . WASHER, FL. 5/16 ST.		1
13	W-11254-5	. . WASHER, LK. 5/16 ST.		1
14	W-11278-6	. . NUT, 5/16-18, HEX FULL ST.		1
15	201014	. . HEAT SINK, SCR		6
16	405140-2	. . CLAMP, MOUNTING		6
17	404044-6	. THERMOSTAT, FAN TURN-ON		1

*** Not Illustrated**



Front Panel Assembly

Figure 4

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
4-	489588-1	PANEL, FRONT ASSY (For NHA See Fig. 1)	ACE	REF
	489588-2	PANEL, FRONT ASSY (For NHA See Fig. 1)	BD	REF
1	489587	. . PANEL, FRONT	AC	1
	180373	. . PANEL, FRONT	BD	1
2	408446	. . LABEL		1
3	404277	. . COVER, RECEPTACLE, DUPLEX, V81703,		
		NO. WPDC	ACE	1
	404355	. . COVER, RECEPTACLE, DUPLEX, V91929, NO.		
		W-948A 1001	BD	1
4	405072-2	. . DIODE, LIGHT-EMITTING, V71744, NO.		
		TYPE 6080-002-304		1
5	402670	. . RECEPTACLE, 3-WIRE, 15A, 115V V74545,		
		NO. 5000-M9	ACE	1
	404336	. . RECEPTACLE, 3-WIRE, 15-A, 277-V,		
		TWIST-LOCK, V77166	BD	1
	366826-	. . SUPPRESSOR, ASSY.		1
6	401532-2	. . . SUPPRESSOR, THYRECTOR, DIODE,		
		V81483, NO. KZ4DTM	ACE	1
	403955-3	. . . SUPPRESSOR, THYRECTOR, DIODE,	BD	1
7	402197-1	. . . TERMINAL, RECEPTACLE, F-CRIMP,		
		18-14, V00779, NO. 61944-2	ACE	2
8	401428-1	. . POTENTIOMETER, 10K OHM, 2W, V01121,		
		NO. JAIN056S103UA		1
9	405734	. . CLIP RETAINER, LED V71744, NO. 217-907-19		1
10	403189	. . SWITCH, TOGGLE, 3 POSITION, V91929, NO. 312TS		1
11	400400	. . SWITCH, TOGGLE, V74559, NO. 2GL61TAB		1
12	404173	. . BASE, LIGHT PILOT, V72619, NO. 26-1310-11-301		2
13	404172-2	. . LENS, LIGHT PILOT, AMBER, V72619,		
		NO. 26-1193-300		1
14	400613-6	. . LAMP, 120V, V71774, NO. 120MB		1
* 15	403247	. . LABEL, ELECTRIC SHOCK *(on rear of panel)*		1
16	400642-3	. . VOLTMETER, DC, 0-50V, V60741, NO. PER		
		HB DRAWING		1
17	16DA-2162	. . KNOB, RHEOSTAT, V44655, NO. 5150		1
18	402658	. . HOLDER, FUSE, V71400, NO. HKP-HH	ACE	1
	402658	. . HOLDER, FUSE, V71400, NO. HKP-HH	BD	2
19	W-11166-4	. . FUSE, FAST BLOW, V71400, NO. AGC-15		1
20	400641-12	. . AMMETER, DC, 5O mV, V60741, NO. PER		
		HB DRAWING		1
21	404172-3	. . LENS, LIGHT, PILOT, GREEN, V72619,		
		NO. 26-1192-300		1
22	400613-6	LAMP, 28V, V71744, TYPE 757, STYLE T-3-1/4		1
23	489581	. . NAMEPLATE, IDENTIFICATION		1
24	400647-8	. . FUSE, FASTBLOW V71400	BD	1

*** NOT ILLUSTARTED**

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SECTION 4. NUMERICAL INDEX

1. Explanation of Numerical Index

The purpose of this index is to assist the user in finding the illustration and description of a part when the part number is known. Part numbers are arranged in alpha-numerical sequence. Thus, any part number beginning with the letter A would be located at or near the top of the index list. Likewise, a part number 9 would be listed near the end of the list and far below a part number 1000. The figure number and item number location of the part is directly opposite the part. If the part is used in more than one place, each location is listed commencing with the first location the part is listed.

NUMERICAL INDEX

NUMERICAL INDEX

PART NUMBER	FIGURE AND ITEM NUMBER
369639	1-22
369641	3-10
397752-1	1-26
400400	4-11
400613-3	4-22
400613-6	4-14
400641-11	4-20
400642-3	4-16
400647-8	4-24
400663	2-6
401428-1	4-8
401532-2	4-6
402197-1	4-7
402670	4-5
402658	4-18
403189	4-10
403247	4-15
403765-2	1-25
403870-3	2-8
403955-3	4-6
404044-3	3-3
404172-2	4-13
404172-3	4-21
404173	4-12
404336	4-5
404355	4-3
404605-5	1-20, 2-4
404915-1	2-13
405042-1	2-19
405072-2	4-3
405140-2	3-16
405157	3-17
405278-1	1-17
405362-2	2-10
405734	4-9
406392-1	2-2
406392-2	2-2
406484	2-28
406990	3-4
406991	1-7
406992-1	1-8
408446	4-2
408447	1-44
486143-2	1-27

NUMERICAL INDEX

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CHAPTER 5. OPTIONAL EQUIPMENT

Optional Equipment available for use with GPU-400 is listed below.

OPTION	PART No.	MANUAL No.
Kit, Riser	284535	TO-231

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CHAPTER 6. MANUFACTURER'S LITERATURE

DIAGRAMS FOR 6883-1

489595	**Schematic**
489596	**Connection**
489594	**Voltage Changeover**

DIAGRAMS FOR 6883-2

180368	**Schematic**
180369	**Connection**
180367	**Voltage Changeover**

DIAGRAMS FOR 6883A

489595	**Schematic**
489596	**Connection**
181566	**Voltage Changeover**

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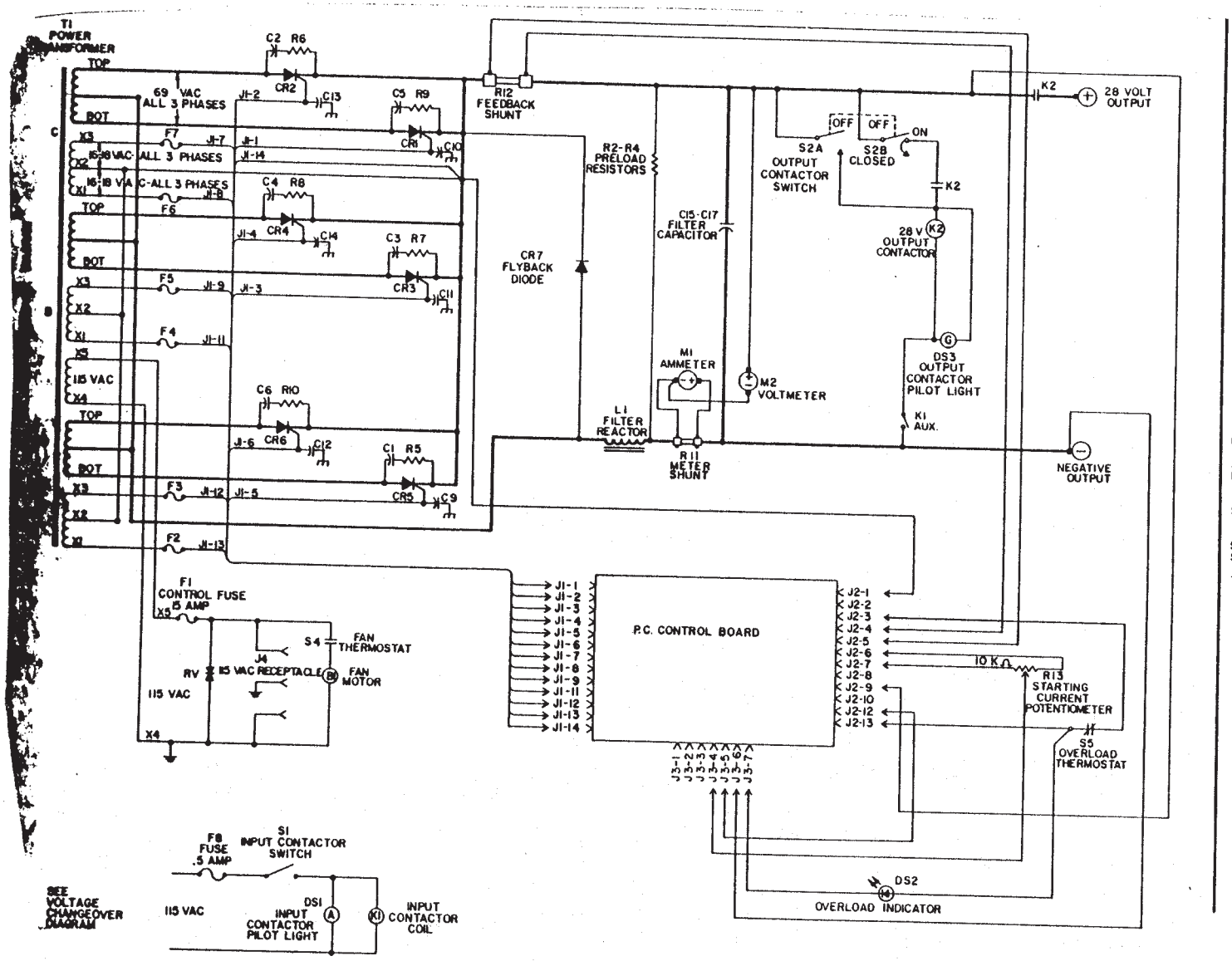


LEGEND

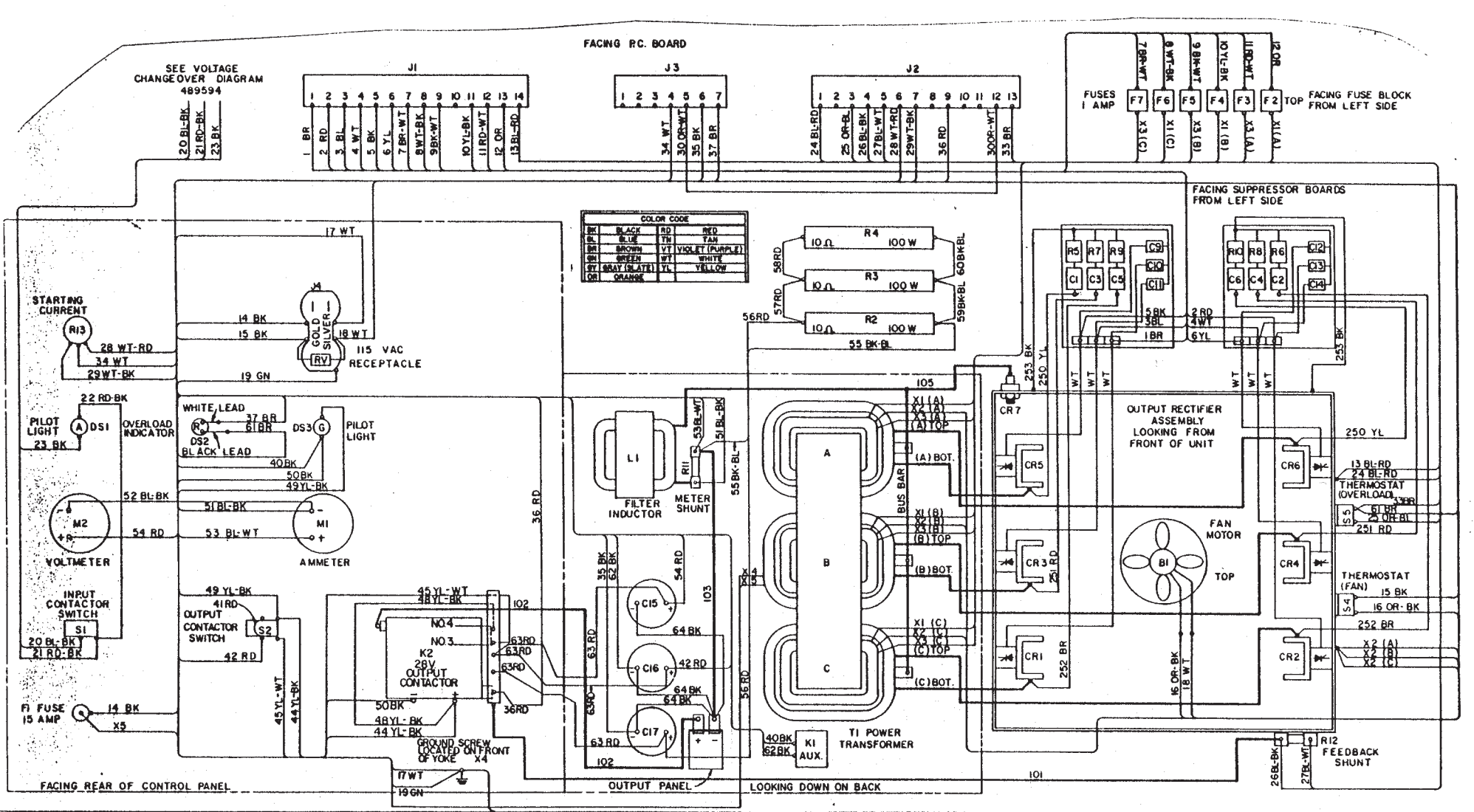
B1	FAN MOTOR
C1-C6	CAPACITOR, SUPPRESSION, .047 MFD, 400 WVDC
C9-C14	CAPACITOR, H.F. SUPPRESSION, .047 MFD, 250 VDC
C15-C17	CAPACITOR, FILTER, 115,000 MFD, 40 VDC
CR1-CR6	SILICON CONTROL RECTIFIERS
CR7	FLYBACK DIODE
DS1	PILOT LIGHT, AMBER, INPUT CONTACTOR
DS2	OVERLOAD INDICATOR, RED (LED)
DS3	PILOT LIGHT, GREEN, OUTPUT CONTACTOR
F1	FUSE, 15 AMP, CONTROL
F2-F7	FUSE, 1 AMP, PC BOARD CONTROL
F8	FUSE, .5 AMP, CONTROL TRANSFORMER
J1	14 PIN RECEPTACLE, PC BOARD
J2	13 PIN RECEPTACLE, PC BOARD
J3	7 PIN RECEPTACLE, PC BOARD
J4	115 VOLT AC RECEPTACLE
K1	CONTACTOR, INPUT
K2	CONTACTOR, 28 VOLT, OUTPUT
L1	FILTER REACTOR, CHOKE
M1	AMMETER, 0-1600 AMPS
M2	VOLTMETER, 0-50 VOLTS
R2-R4	PRELOAD RESISTORS
R5-R10	RESISTORS, SUPPRESSION, 50 OHMS, 5 WATT
R11	SHUNT, METER
R12	SHUNT, FEEDBACK
R13	POTENTIOMETER, STARTING CURRENT
RV	SUPPRESSOR, 115 VOLT CIRCUIT
S1	INPUT CONTACTOR, ON-OFF SWITCH
S2	SWITCH, OUTPUT CONTACTOR
S4	THERMOSTAT, FAN
S5	THERMOSTAT, OVERLOAD TEMPERATURE
T1	TRANSFORMER, POWER

HOBART BROTHERS CO.
TROY, OHIO 45373 U.S.A.

TITLE Diagram, Schematic

REV. —

DWG. NO. 489595



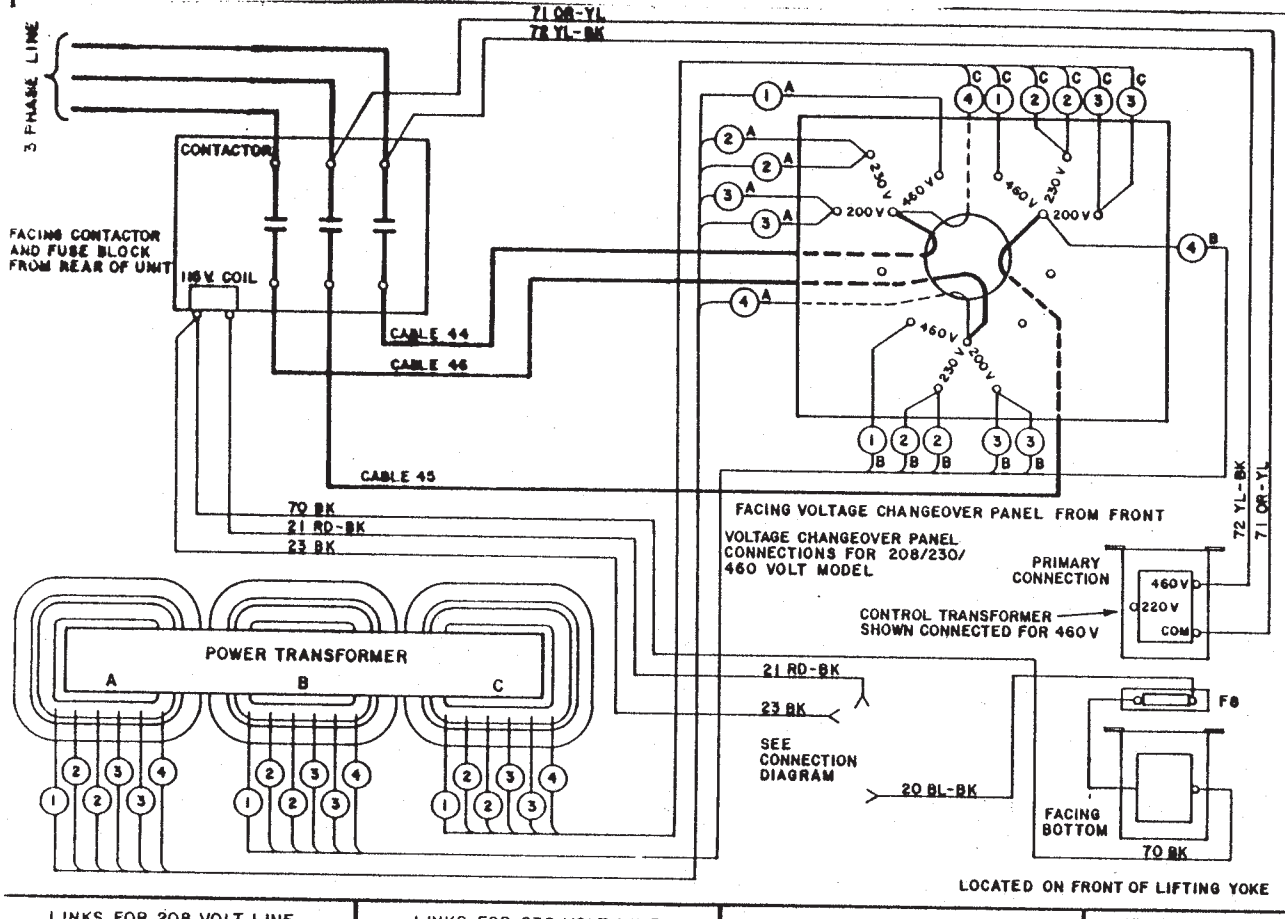
LEGEND					
	FAN MOTOR				
C6	CAPACITOR, SUPPRESSION, .047 MFD, 400 WVDC	F1	FUSE, 15 AMP, CONTROL	R2-R4	PRELOAD RESISTORS
C9-C14	CAPACITOR, H.F. SUPPRESSION, .047 MFD, 250 VDC	F2-F7	FUSE, 1 AMP, P.C. BOARD CONTROL	R5-R10	RESISTORS, SUPPRESSION, 50 OHMS, 5 WATT
C15-C17	CAPACITOR, FILTER, 115,000 MFD, 40 VDC	J1	14 PIN RECEPTACLE, P.C. BOARD	R11	SHUNT, METER
CR1-CR6	SILICON CONTROL RECTIFIER	J2	13 PIN RECEPTACLE, P.C. BOARD	R12	SHUNT, FEEDBACK
R7	FLYBACK DIODE	J3	7 PIN RECEPTACLE, P.C. BOARD	R13	POTENTIOMETER, STARTING CURRENT
		J4	115 VOLT AC RECEPTACLE	RV	SUPPRESSOR, 115 VOLT CIRCUIT
S1	PILOT LIGHT, AMBER, INPUT CONTACTOR	K1	CONTACTOR, INPUT	S1	INPUT CONTACTOR, ON-OFF SWITCH
S2	OVERLOAD INDICATOR, RED (LED)	K2	CONTACTOR, 28 VOLT, OUTPUT	S2	SWITCH, OUTPUT CONTACTOR
S3	PILOT LIGHT, GREEN, OUTPUT CONTACTOR			S4	THERMOSTAT, FAN
		L1	FILTER REACTOR, CHOKE	S5	THERMOSTAT, OVERLOAD TEMPERATURE
		M1	AMMETER, 0-2000 AMPS	T1	TRANSFORMER, POWER
		M2	VOLTMETER, 0-50 VOLTS		

HOBART BROTHERS CO.
TROY, OHIO 45373 U.S.A.

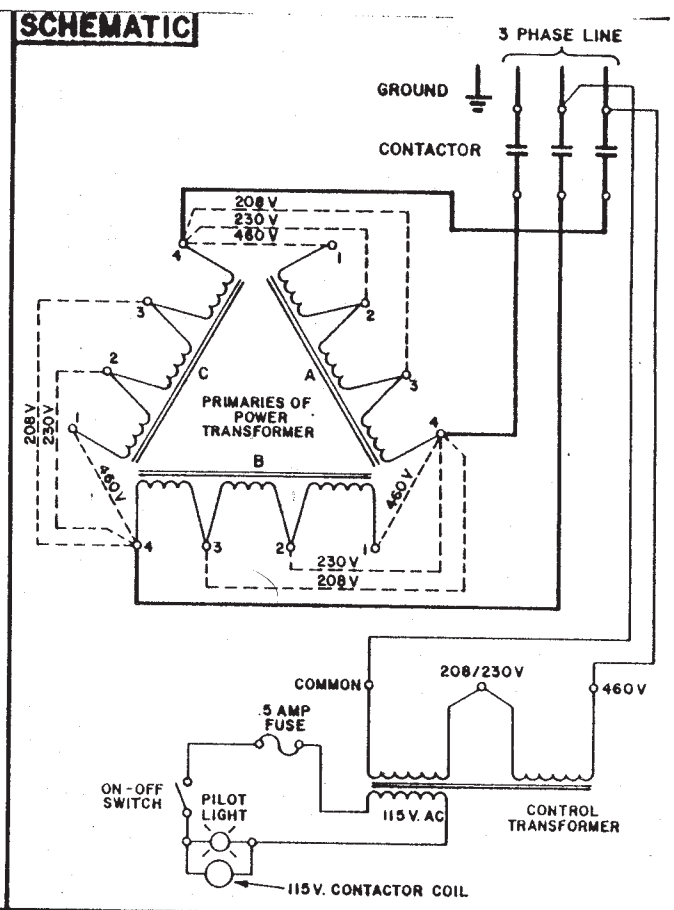
TITLE Diagram, Connection

REV. 1

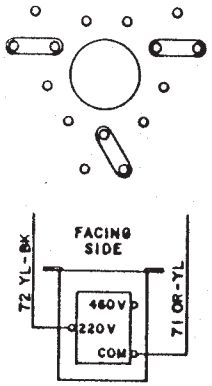
DWG. NO. 489596



SCHEMATIC



LINKS FOR 208 VOLT LINE

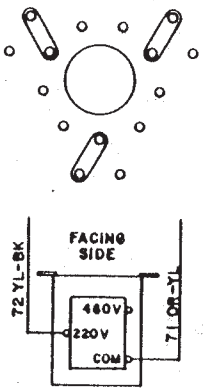


CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 220 V

FIG. 1

LINKS FOR 230 VOLT LINE

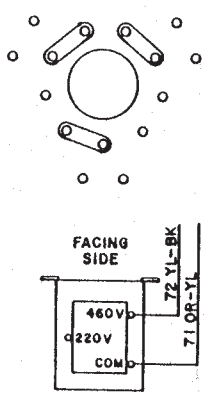


CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 220 V

FIG. 2

LINKS FOR 460 VOLT LINE



CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 460 V.

FIG. 3

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. CHECK NAMEPLATE OF THE UNIT TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIG'S. 1, 2 & 3 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE UNIT. IF NO CODES EXIST, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE FUSE BLOCK AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING THE LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

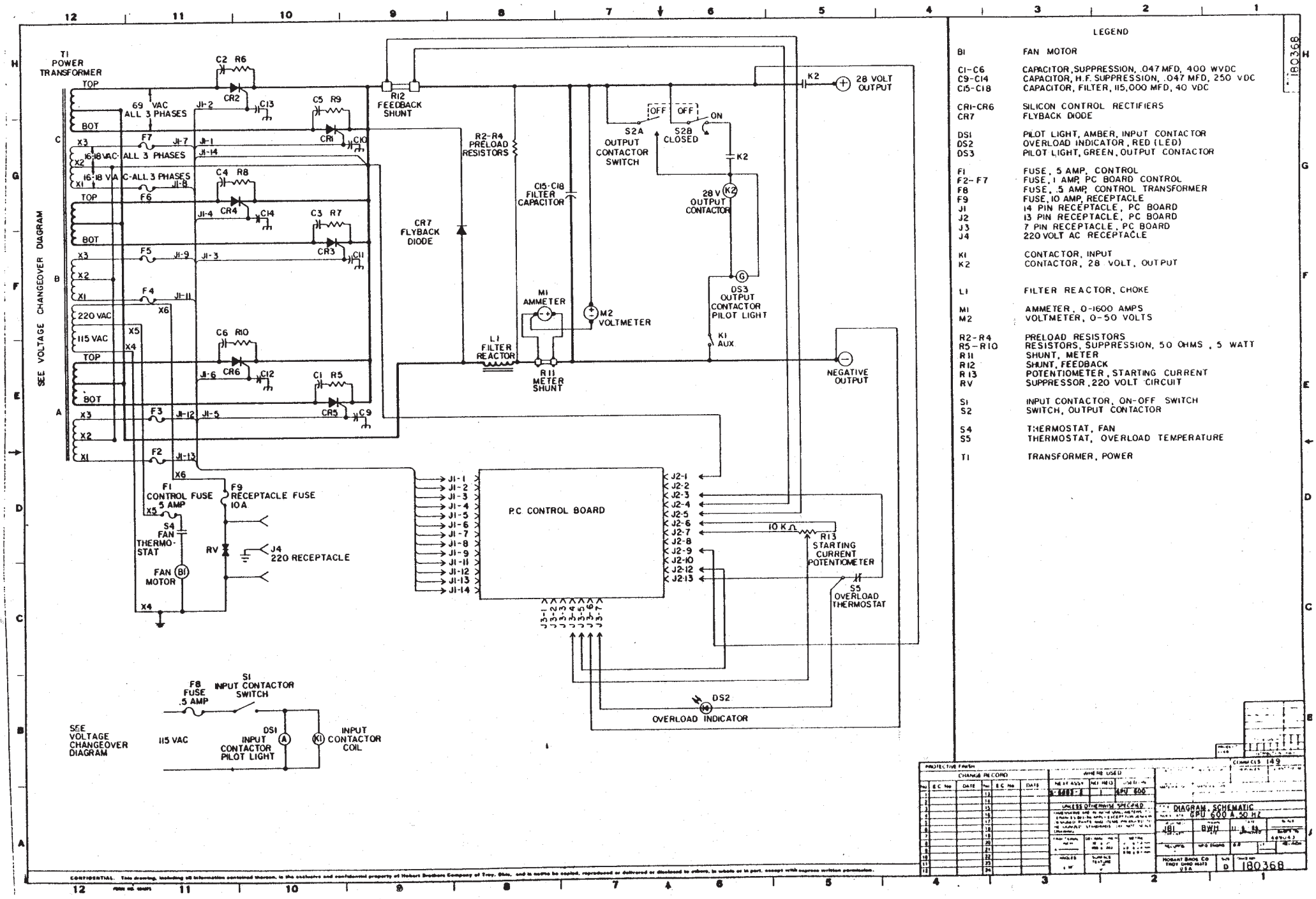
COLOR CODE

BK - BLACK	OR - ORANGE
BL - BLUE	RD - RED
BR - BROWN	WT - WHITE
GN - GREEN	YL - YELLOW

TITLE DIAGRAM, Voltage Changeover

REV. 1

DWG NO A29594



LEGEND

B1	FAN MOTOR
C1-C6	CAPACITOR, SUPPRESSION, .047 MFD, 400 WVDC
C9-C14	CAPACITOR, H.F. SUPPRESSION, .047 MFD, 250 VDC
C15-C18	CAPACITOR, FILTER, 115,000 MFD, 40 VDC
CR1-CR6	SILICON CONTROL RECTIFIERS
CR7	FLYBACK DIODE
DS1	PILOT LIGHT, AMBER, INPUT CONTACTOR
DS2	OVERLOAD INDICATOR, RED (LED)
DS3	PILOT LIGHT, GREEN, OUTPUT CONTACTOR
F1	FUSE, 5 AMP, CONTROL
F2-F7	FUSE, 1 AMP, PC BOARD CONTROL
F8	FUSE, .5 AMP, CONTROL TRANSFORMER
F9	FUSE, 10 AMP, RECEPTACLE
J1	14 PIN RECEPTACLE, PC BOARD
J2	13 PIN RECEPTACLE, PC BOARD
J3	7 PIN RECEPTACLE, PC BOARD
J4	220 VOLT AC RECEPTACLE
K1	CONTACTOR, INPUT
K2	CONTACTOR, 28 VOLT, OUTPUT
L1	FILTER REACTOR, CHOKE
M1	AMMETER, 0-1600 AMPS
M2	VOLTMETER, 0-50 VOLTS
R2-R4	PRELOAD RESISTORS
R5-R10	RESISTORS, SUPPRESSION, 50 OHMS, 5 WATT
R11	SHUNT, METER
R12	SHUNT, FEEDBACK
R13	POTENTIOMETER, STARTING CURRENT
RV	SUPPRESSOR, 220 VOLT CIRCUIT
S1	INPUT CONTACTOR, ON-OFF SWITCH
S2	SWITCH, OUTPUT CONTACTOR
S4	THERMOSTAT, FAN
S5	THERMOSTAT, OVERLOAD TEMPERATURE
T1	TRANSFORMER, POWER

180368

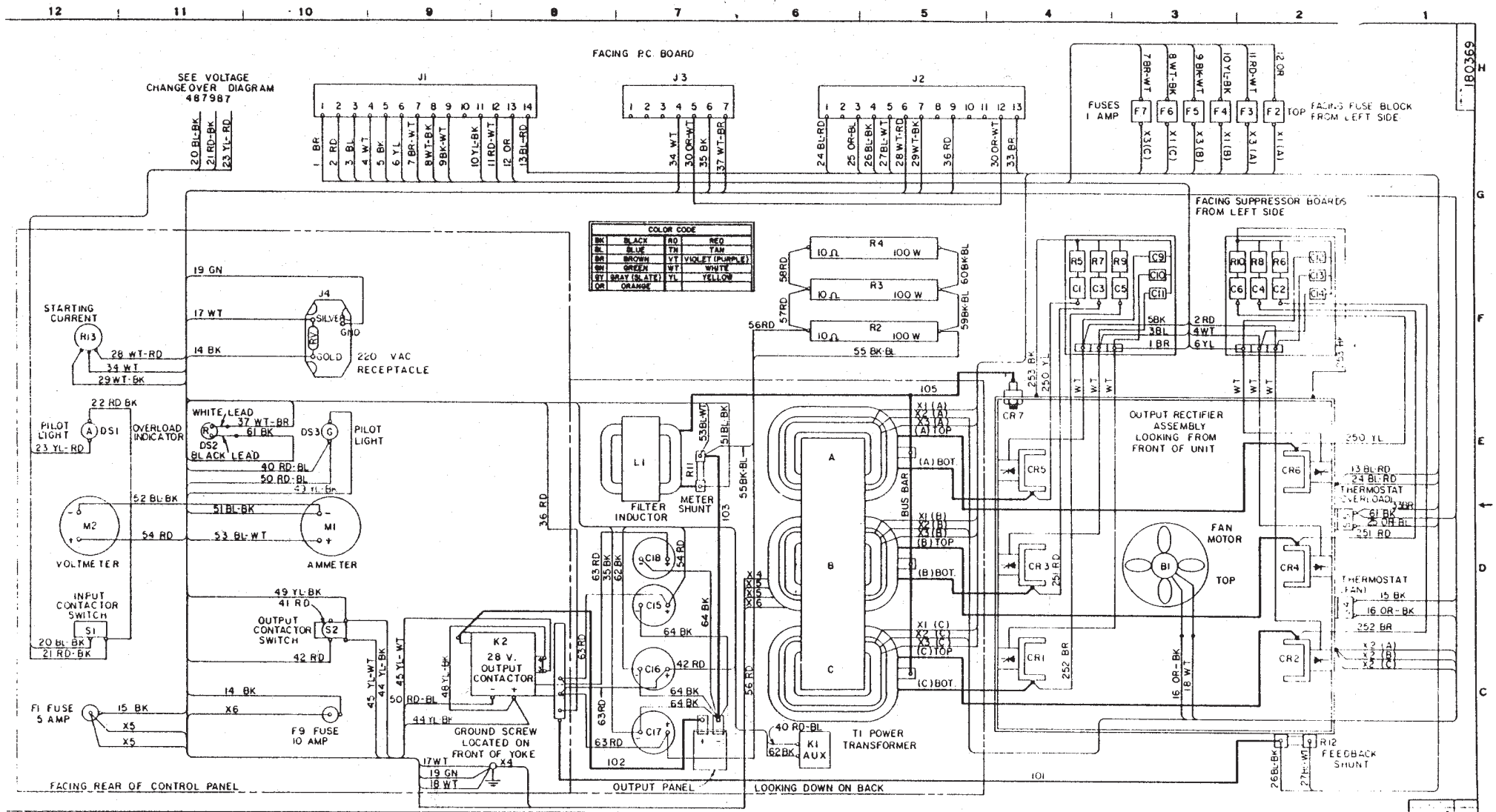
CHANGE RECORD

WHERE USED

DIAGRAM, SCHEMATIC GPU 600 A, 50 HZ

B1 BWD

D 180368



LEGEND

	FAN MOTOR	F1	FUSE, 5 AMP, CONTROL	R2-R4	PRELOAD RESISTORS
C6	CAPACITOR, SUPPRESSION, .047 MFD, 400 WVDC	F2-F7	FUSE, 1 AMP, PC BOARD CONTROL	R5-R10	RESISTORS, SUPPRESSION, 50 OHMS, 5 WATT
C14	CAPACITOR, H.F. SUPPRESSION, .047 MFD, 250 VDC	F9	FUSE, 10 AMP, RECEPTACLE	R11	SHUNT, METER
C15-C18	CAPACITOR, FILTER, 115,000 MFD, 40 VDC	J1	14 PIN RECEPTACLE, PC BOARD	R12	SHUNT, FEEDBACK
		J2	13 PIN RECEPTACLE, PC BOARD	R13	POTENTIOMETER, STARTING CURRENT
CR6	SILICON CONTROL RECTIFIER	J3	7 PIN RECEPTACLE, PC BOARD	RV	SUPPRESSOR, 220 VOLT CIRCUIT
R7	FLYBACK DIODE	J4	220 VOLT AC RECEPTACLE		
		K1	CONTACTOR, INPUT	S1	INPUT CONTACTOR, ON-OFF SWITCH
	PILOT LIGHT, AMBER, INPUT CONTACTOR	K2	CONTACTOR, 28 VOLT, OUTPUT	S2	SWITCH, OUTPUT CONTACTOR
	OVERLOAD INDICATOR, RED (LED)			S4	THERMOSTAT, FAN
	PILOT LIGHT, GREEN, OUTPUT CONTACTOR	L1	FILTER REACTOR, CHOKE	S5	THERMOSTAT, OVERLOAD TEMPERATURE
		MI	AMMETER, 0-1600 AMPS	T1	TRANSFORMER, POWER
		M2	VOLTMETER, 0-50 VOLTS		

PROTECTIVE FINISH

CHANGE RECORD

NO.	E.C. NO.	DATE	NO.	E.C. NO.	DATE
			13		
			14		
			15		
			16		
			17		
			18		
			19		
			20		
			21		
			22		
			23		
			24		

WHERE USED

NEXT ASSY	NO. REQ'D
S-6683-B	GPU 600

UNLESS OTHERWISE SPECIFIED

COMMENTS

DIAGRAM, CONNECTION GPU 600 A 50 HZ

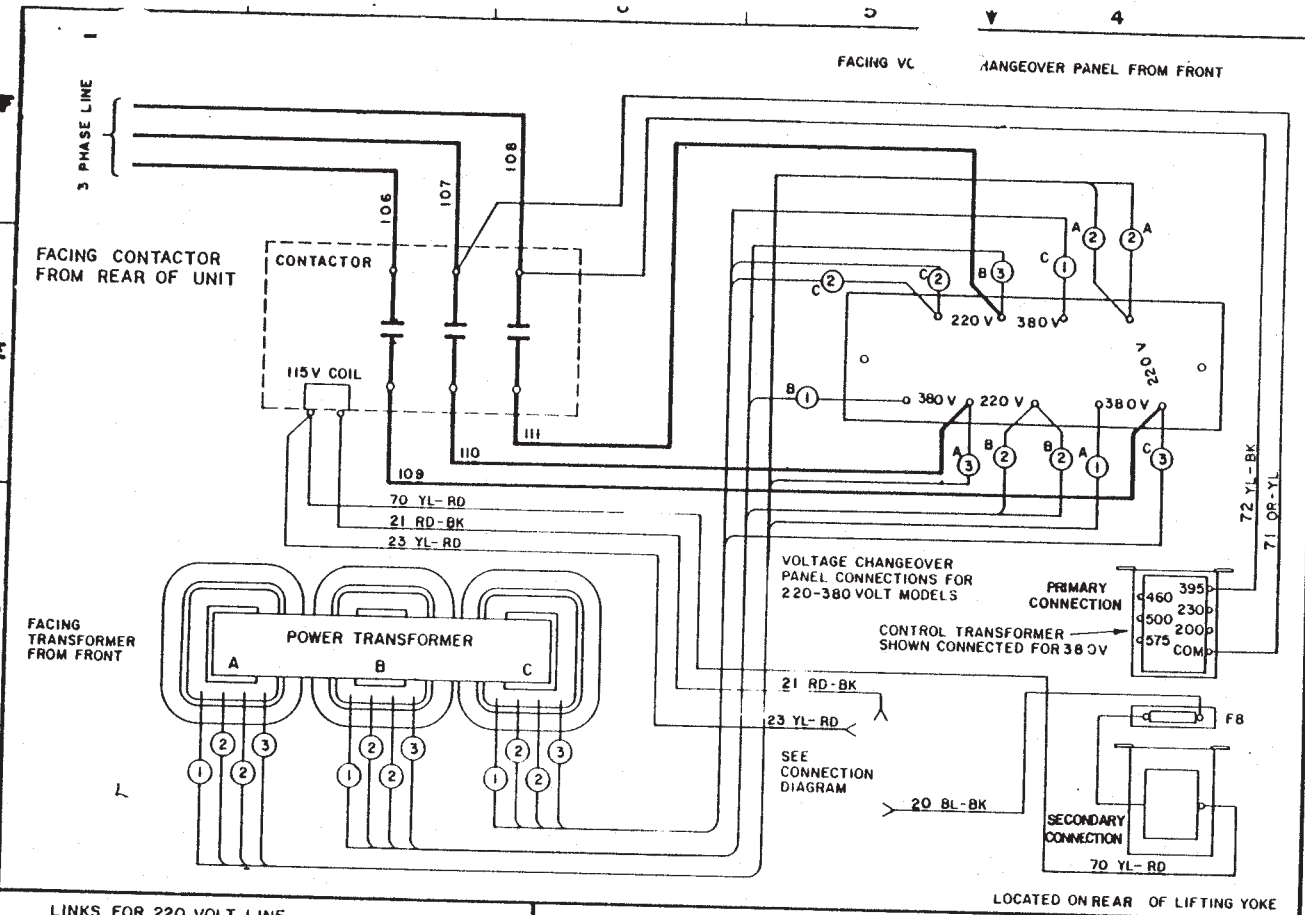
JBL	BWH	11-2-89

ROBERT BRUS. CO. TROY, OHIO 45373 U.S.A.

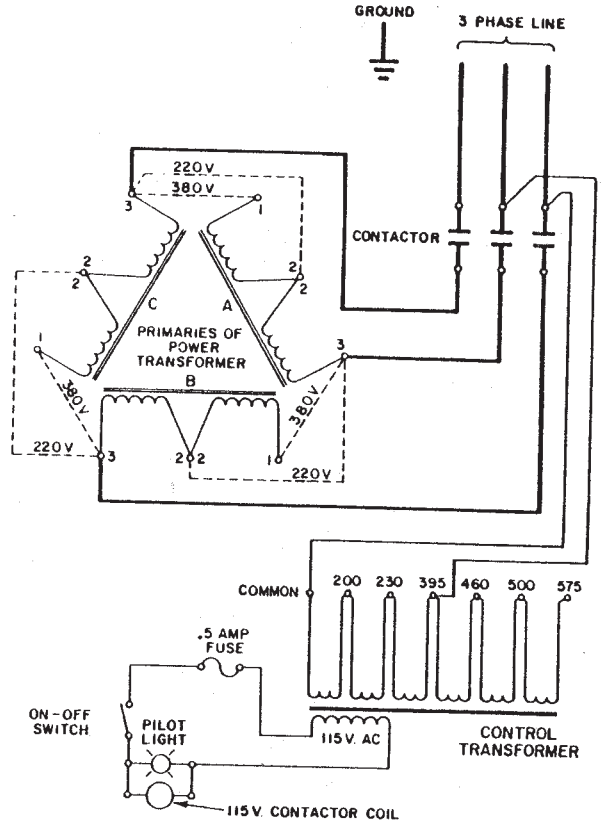
SIZE D

180369

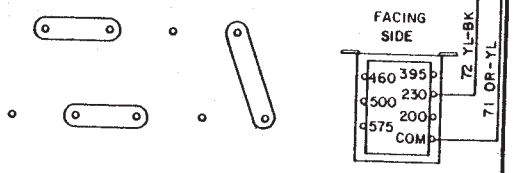
REV. A



SCHEMATIC



LINKS FOR 220 VOLT LINE

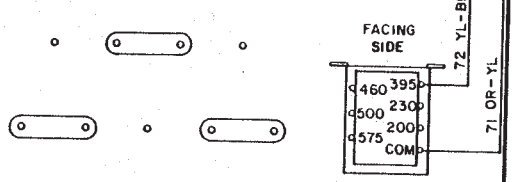


CONTROL TRANSFORMER CONNECTIONS

CONNECT 72 YL-BK TO TERMINAL MARKED 230V

FIG. 1

LINKS FOR 380 VOLT LINE



CONTROL TRANSFORMER CONNECTIONS

CONNECT 72 YL-BK TO TERMINAL MARKED 395V

FIG. 2

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. CHECK NAMEPLATE OF THE **UNIT** BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIGS. 1 AND 2 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE **UNIT**. IF NO CODES EXISTS, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE **FUSE BLOCK** AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

COLOR CODE

BK - BLACK	OR - ORANGE
BL - BLUE	RD - RED
BR - BROWN	WT - WHITE
GN - GREEN	YL - YELLOW

G2 AVF
G2 TEST
G2 J
SERVICE
OUTSIDE DIA'M
DISTRIBUTION TABLE

PROTECTIVE FINISH

CHANGE RECORD

No	INDEX	DATE	No	INDEX	DATE
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY	NO REQ	USED ON
S-6883-2	1	GPU 600

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES MILLIMETERS TO
TOLERANCES BELOW APPLY EXCEPT FOR VENDOR
DESIGNED PARTS AND ITEMS PRODUCED TO
RECOGNIZED STANDARDS DO NOT SCALE
DRAWING

FRACTIONAL INCH | DECIMAL - INCH .00 - .01 .000 - .005 | METRIC 0 - 1.0 mm 0.0 - 0.4 mm 0.00 - 0.1 mm
ANGLES 30° | SURFACE TEXTURE

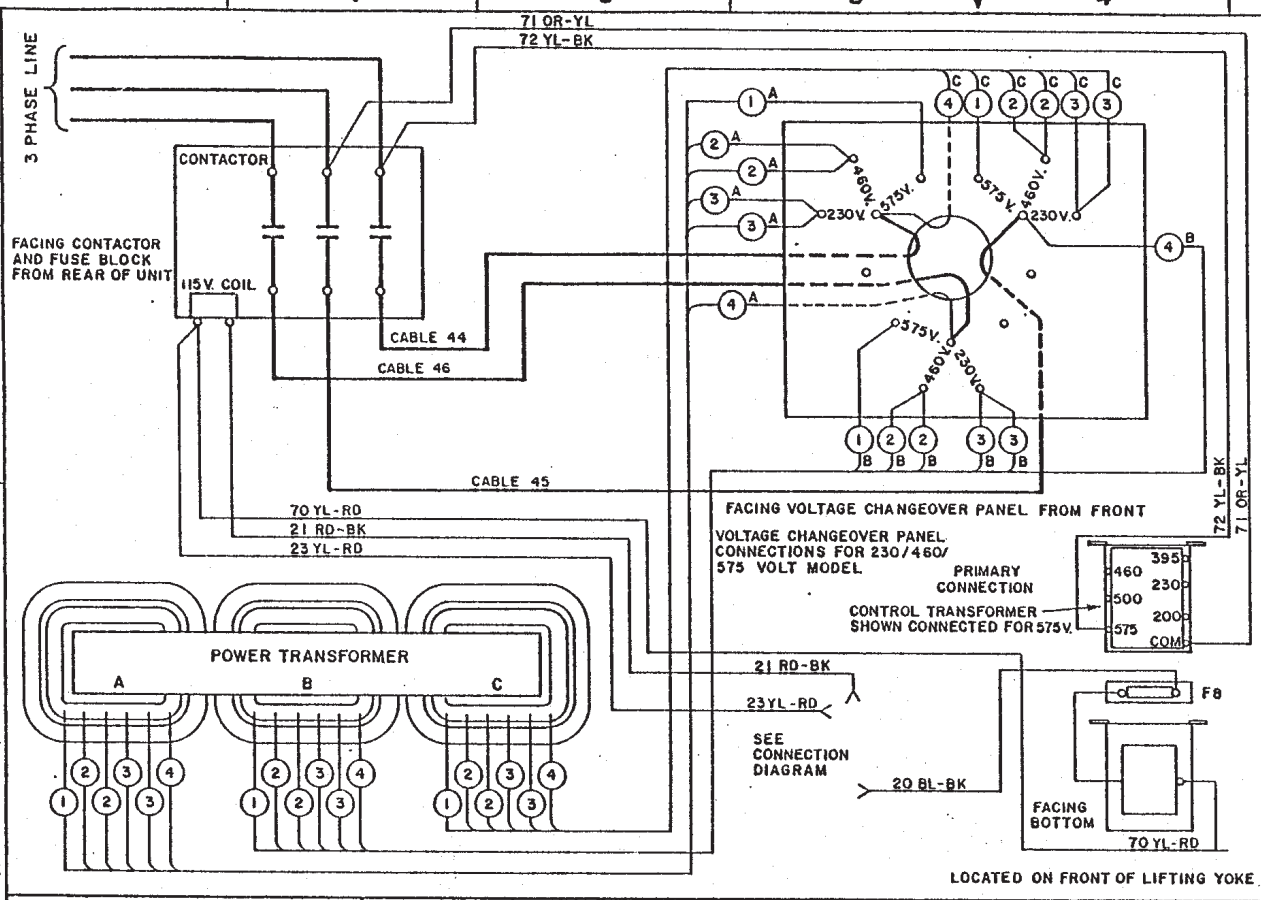
ACTIVITY | REPLACED BY | ACCESS NO 149H | REPLACES | QUANT USED
MATERIAL NO | MATERIAL SPEC

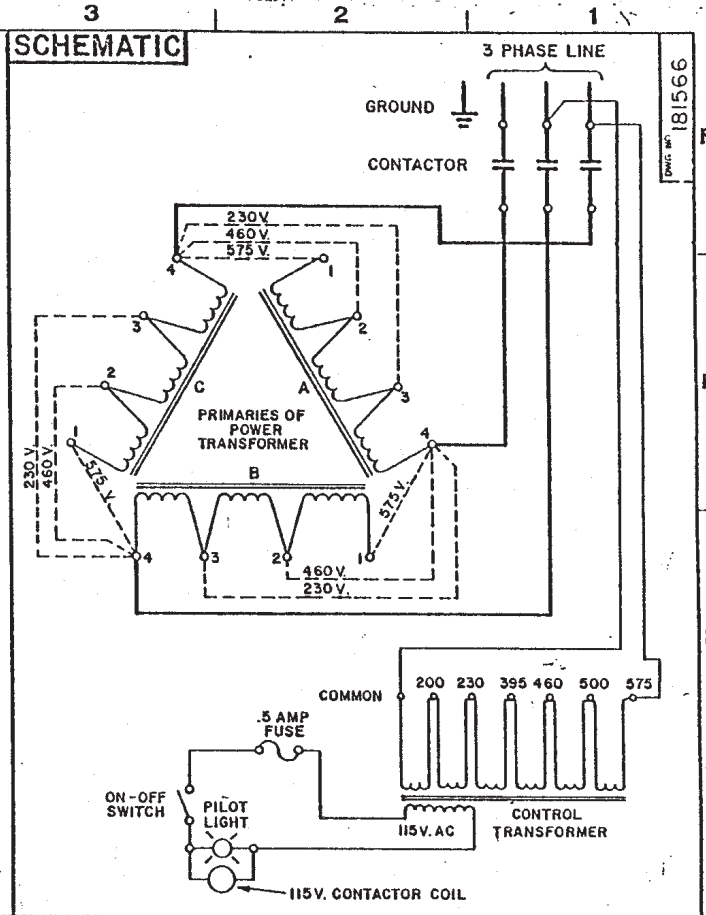
TITLE DIAGRAM, VOLTAGE CHANGEOVER
INDEX DATA GPU 600A, 50HZ

DESIGNED	DRAWN	DATE
JR	BWH	11-6-86
APPROVED	DATE	
JRH	3-16-87	
RELEASED	DATE	488070
SRS		

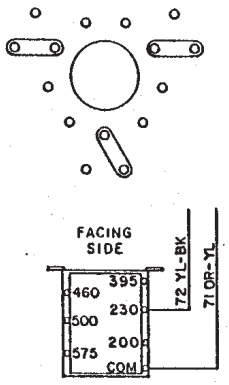
HOBART BROS. CO.
TROY, OHIO 45373
U.S.A.

SIZE C | CODE 180367





LINKS FOR 230 VOLT LINE

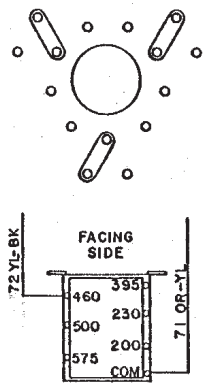


CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 230 V

FIG. 1

LINKS FOR 460 VOLT LINE

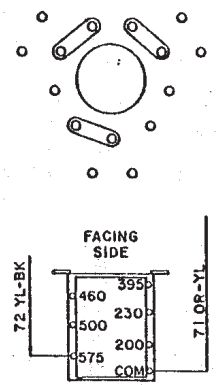


CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 460 V

FIG. 2

LINKS FOR 575 VOLT LINE



CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 575V.

FIG. 3

INSTRUCTIONS FOR SETTING VOLTAGE CHANGEOVER PANEL AND CONNECTING POWER LINE
(ALSO SEE INFORMATION IN INSTRUCTION MANUAL)

1. CHECK NAMEPLATE OF THE UNIT TO BE CERTAIN IT IS DESIGNED FOR THE LINE VOLTAGE TO WHICH YOU WISH TO CONNECT IT.
2. CONNECT THE LINKS AS SHOWN IN FIG'S. 1, 2 & 3 AT LEFT, AS APPLICABLE, FOR THE PROPER LINE VOLTAGE.
3. CHECK YOUR LOCAL CODES FOR THE PROPER LINE WIRE SIZE FOR THE LINE CURRENT SHOWN ON THE NAMEPLATE OF THE UNIT. IF NO CODES EXIST, USE THE CHART IN THE "INSTALLATION" SECTION OF THE MANUAL.
4. CONNECT THE 3 PHASE POWER LINE TO THE TOP OF THE FUSE BLOCK AS IN THE DIAGRAM ABOVE. (CAUTION - BE CERTAIN INPUT CIRCUIT IS OPEN BEFORE HANDLING THE LINE.)
5. CONNECT THE POWER SYSTEM GROUND TO THE SCREW ON THE INTERIOR PANEL MARKED "GROUND".

COLOR CODE

BK - BLACK	OR - ORANGE
BL - BLUE	RD - RED
BR - BROWN	WT - WHITE
GN - GREEN	YL - YELLOW

RAMF 12-88
G.P.S. TEST
G.P.S. SERVICE
OUTSIDE DISTR
PRODUCT CODE
DISTRIBUTION TABLE

PROTECTIVE FINISH

CHANGE RECORD

No.	E.C. No.	DATE	No.	E.C. No.	DATE
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

WHERE USED

NEXT ASSY.	NO. REQ.	USED ON
S-6883A-3	1	SPECS

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES/MILLIMETERS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DO NOT SCALE DRAWING.

FRACTIONAL - INCH	DECIMAL - INCH	METRIC
±	.00 ± .01 .000 ± .003	0. ± 1.0 mm 0.0 ± 0.4 mm 0.00 ± 0.1 mm
ANGLES ± 30'	SURFACE TEXTURE 125	

ACTIVITY	REPLACED BY	REPLACES	QUANTITY/U.M.
MATERIAL NO	MATERIAL SPEC.		

M COMM CLS. 149E

TITLE DIAGRAM, VOLTAGE CHANGEOVER

INDEX DATA GPU 600,230/460/575 V. 60HZ

DESIGNED	DRAWN	DATE	SCALE
JKC	KEIM	11-22-88	
CHECKED EXC.	DATE 11-29-88	APPROVED	BASED ON 489531
RECORDS SAS	MFG. ENGR.	M. F.	LT. J REVISION

HOBART BROS. CO. TROY, OHIO 45373 U.S.A.

SIZE C DWG. NO. 181566

FORM NO 424070

UNUSUAL SERVICE CONDITIONS

This information is a general guideline and cannot cover all possible conditions of equipment use. The specific local environments may be dependent upon conditions beyond the manufacturer's control. The manufacturer should be consulted if any unusual conditions of use exist which may affect the physical condition or operation of the equipment.

Among such conditions are:

1. Exposure to:

A. Combustible, explosive, abrasive or conducting dusts.

B. Environments where the accumulation of lint or excessive dirt will interfere with normal ventilation.

C. Chemical fumes, flammable or explosive gases.

D. Nuclear radiation.

E. Steam, salt-laden air, or oil vapor.

F. Damp or very dry locations, radiant heat, vermin infestation, or atmospheres conducive to fungus growth.

G. Abnormal shock, vibration or mechanical loading from external sources during equipment operation.

H. Abnormal axial or side thrust imposed on rotating equipment shafts.

I. Low and/or high ambient temperatures.

J. High electromagnetic fields.

2. Operation at:

A. Voltages above or below rated voltage.

B. Speeds other than rated speed.

C. Frequency other than rated frequency.

D. Standstill with rotating equipment windings energized.

E. Unbalanced voltages.

F. Operation at loads greater than rated.

3. Operation where low acoustical noise levels are required.

4. Operation with:

A. Improper fuel, lubricants or coolant.

B. Parts or elements unauthorized by the manufacturer.

C. Unauthorized modifications.

5. Operation in poorly ventilated areas.

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