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HOBART®
GROUND POWER

Operation and Maintenance Manual

for
3-phase
Solid State Transformer-Rectifiers

Series 6732A, 6732B, 6732C and 7011A

SPECIFICATION	INPUT VOLTAGE	FREQUENCY	MODEL
S6732A-1	230 OR 460-V	60 Hz	6T28-400CL
S6732A-2	220 OR 380 V	50 Hz	5T28-400CL
S6732A-3	208/230/460-V	60 Hz	6T28-400CL
S6732A-4	230/460/575-V	60 Hz	6T28-400CL
S6732A-5	220 OR 380-V	60 Hz	6T28-400CL
S6732B-1	230 OR 460-V	60 Hz	6T28-400CL
S6732B-2	220 OR 380 V	50 Hz	5T28-400CL
S6732B-3	208/230/460-V	60 Hz	6T28-400CL
S6732B-4	230/460/575-V	60 Hz	6T28-400CL
S6732B-5	220 OR 380-V	60 Hz	6T28-400CL
S6732B-6	208/230/460-V	60 Hz	6T28-400CL
S7011-2	208/230/460-V	60 Hz	6T28-400CL
S6732C-1	230 OR 460-V	60 Hz	6T28-400CL
S6732C-2	220 OR 380 V	50 Hz	5T28-400CL
S6732C-3	208/230/460-V	60 Hz	6T28-400CL
S6732C-4	230/460/575-V	60 Hz	6T28-400CL
S6732C-5	220 OR 380-V	60 Hz	6T28-400CL
S6732C-6	208/230/460-V	60 Hz	6T28-400CL

Hobart Brothers Company
Ground Power Division
Troy, Ohio 45373
U.S.A.

WARRANTY

HOBART BROTHERS COMPANY, TROY, OHIO, U.S.A.
GROUND POWER DIVISION

1. Hobart Brothers Company (hereinafter called **HOBART) warrants that each new and unused Hobart Ground Power Equipment, (hereinafter called the PRODUCT) is of good workmanship and is free from mechanical defects, provided that (1) the PRODUCT** is installed and operated in accordance with the printed instructions of **HOBART,** (2) the **PRODUCT** is used under the normal operating conditions for which it is designed, (3) the **PRODUCT** is not subjected to misuse, negligence or accident, and (4) the **PRODUCT** receives proper care, lubrication, protection, and maintenance under the supervision of trained personnel.
2. This warranty expires 15 months after shipment by **HOBART** to the first user, or 12 months after installation, whichever first occurs.
3. This warranty does not apply to: primary and secondary switch contacts, cable connectors, carbon brushes, fuses, bulbs, and filters unless found to be defective prior to use.
4. Hobart **DOES NOT WARRANT THE FOLLOWING COMPONENTS:** Engines (gasoline or diesel),storage batteries, engine starters generators, alternators, regulators, governors, tires, axles,transmissions, and cable retrieving devices. Many of the foregoing components are warranted directly by the manufacturer to the first user and serviced by a worldwide network of distributors and others authorized to handle claims for component manufacturers. A first user's claim should be presented directly to such an authorized component service outlet. In the event any component manufacturer has warranted its component to **HOBART** and will not deal directly with a first user then **HOBART** will cooperate with the first user in the presentation of a claim to such manufacturer. Under **NO** circumstances does **HOBART** assume any liability for any warranty claim against or warranty work done by or in behalf of any manufacturer of the foregoing components.
5. This warranty is extended by **HOBART** only to the purchaser of new **PRODUCTS** from **HOBART** or one of its authorized distributors. The **PRODUCTS** purchased under this warranty are intended for use exclusively by the buyer and his employees and by no other persons and, therefore, there shall be no third party beneficiary to this warranty.
6. A claim of defects in any **PRODUCT** covered by this warranty is subject to **HOBART** factory inspection and judgment. **HOBART'S** liability is limited to repair of any defects found by **HOBART** to exist, or at **HOBART'S** option the replacement of the defective product, F.O.B. factory, after the defective product has been returned by the purchaser at its expense to **HOBART'S** shipping place. Replacement and exchange parts will be warranted for the remainder of the original Warranty, or for a period of ninety (90) days, whichever is greater.
7. **UNDER NO CIRCUMSTANCES** whatsoever shall **HOBART** and its authorized distributors be liable for any special or consequential damages, whether based on lost goodwill, lost resale profits, work stoppage impairment of other goods or otherwise, and whether arising out of breach of any express or implied warranty, breach of contract, negligence or otherwise, except only in the case of personal injury as may be required by applicable law.
8. Continued use of the **PRODUCT(S)** after discovery of a defect **VOIDS ALL WARRANTIES.**
9. Except as authorized in writing, this warranty does not cover any equipment that has been altered by any party other than **HOBART.**
10. **THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HERE OF. HOBART MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, OF ERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**
11. **HOBART** neither assumes nor authorizes any person to assume for **HOBART** any liability in connection with the **PRODUCTS** sold, and there are no oral agreements or warranties collateral to or affecting this written Warranty. This warranty and all undertakings of **HOBART** thereunder shall be governed by the laws of the State of Ohio, United States of America.

WARNING
AT ALL TIMES, SAFETY MUST BE CONSIDERED AN IMPORTANT FACTOR IN THE INSTALLATION, SERVICING AND OPERATION OF THE PRODUCT, AND SKILLED, TECHNICALLY QUALIFIED PERSONNEL SHOULD ALWAYS BE EMPLOYED FOR SUCH TASKS.

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 attache 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.**

1. 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.

2. 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

a. 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.

b. 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.

c. Service and Maintenance

(1) 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.

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

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

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

(5) Disconnect power to equipment if it is out of service.

(6) 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.

3. 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.

a. 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.

b. 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.

c. 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.

4. 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.

5. 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.

6. 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.

7. 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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Table of Contents

Chapter 2. Description And Operation

Chapter 3. Servicing

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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, 400 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.

b. Page Numbering

Page numbers do not run consecutively throughout the manual. Each page is identified by the Chapter/Section number in which is 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 6.

(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 : 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 : 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 Ground Power Division equipment, you are invited to contact our service department by mail, telephone, or FAX.

Write:	Hobart Brothers Company Airport Systems Group Ground Power Division 1177 Trade Road East Troy, Ohio 45373, U.S.A.
Telephone:	(513) 332-5060 (Service Assistance) (513) 332-5050 (Parts Replacement)
FAX:	(513) 332-5121

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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.

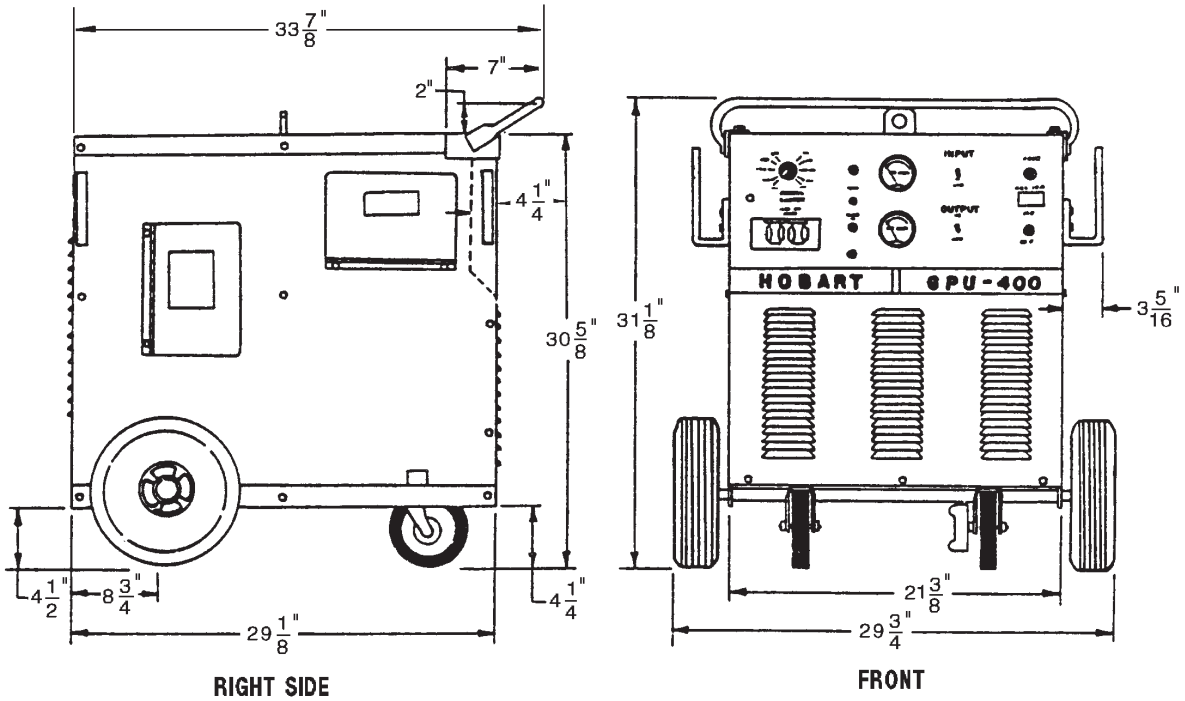
If the shipment is in error, contact Order Department, **Hobart Brothers Company, Power Systems Group, Troy, Ohio 45373.**

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.

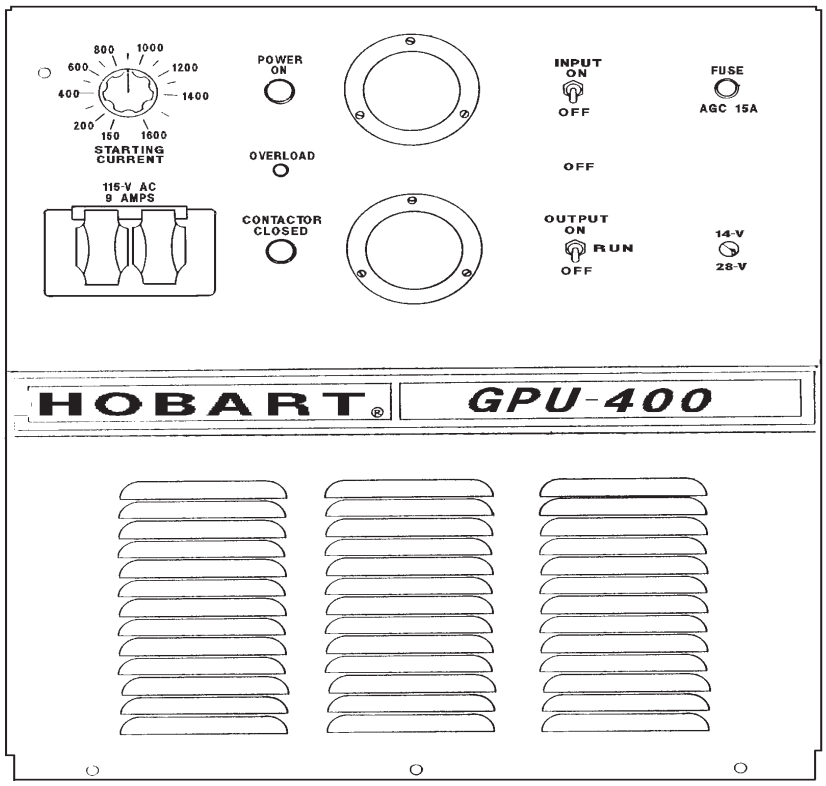
Generally, it is good practice to move the equipment to the site of installation before uncrating or unpacking . Take care to avoid damage to the equipment if bars, hammers, etc., are used. Lifting eyes which extend through the top of the cabinet have been provided to facilitate handling with a crane 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 Group, Troy, Ohio Supply the owner's manual no. *(OM-2003)* plus the model, specification, a serial numbers of your equipment.

NOTE: Specification 6732C series units have a new enclosure to accomodate easier operation for the user. One feature: after receiving your unit, unbolt the (4) mounting brackets than are securing the unit to the skid. These brackets are also your cable hangers. Unbolt hangers from unit and turn around and reinstall mounting bolts in the upper portion of the unit.



Installation Dimension Drawing
(6732A/6732B Shown)
Figure 1



Front Panel of GPU-400
Figure 2

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Section 2. installation

1. 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.

2. 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 changeover 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.

3. Connecting the Machine to Line Voltage

The input power should be connected to the input contactor 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, fuses, 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 input 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 fuse block 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	Approx. Line Fuse Size	Copper Line Wire Size *		Copper Grounding Conductor Min. Size
			In Conduit	In Flexible Cable	
208	56	60	No. 6	No. 6	No. 6
220	56	60	No. 6	No. 6	No. 8
230	54	60	No. 6	No. 6	No. 8
380	32	40	No. 8	No. 8	No. 8
440					
460	27	35	No. 10	No. 10	No. 10
500					
575					

* 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.

Recommended Wire and Fuse Size Table
Figure 1

4. 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 contactor. 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.

5. 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.

6. Lubrication

The fan motor incorporates a sleeve bearing, and therefore will need periodic lubrication. The following table will furnish a recommended guide as to the frequency of this lubrication.

TYPE OF DUTY	LUBRICATION INTERVAL
Light (up to 6 hrs./day)	Every 12 months
Moderate (7 to 15 hrs./day)	Every 6 months
Heavy (16 to 24 hrs./day)	Every 3 months

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Chapter 2. Description and Operation

Section 1. Description

1. General

This manual describes a series of portable, *(see Fig. 1)* Solid State controlled, transformer-rectifier DC power supplies rated at a continuous output of 28-V, 400 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. Unless a definite specification design or group of designs is to be described, this book will generally refer to this equipment as a GPU-400 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 virtually identical 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 letter S *(for specification),* the series number 6732A, 6732B or 6732C, and a dash number added for each specification change, i.e., S6732A-1 is the first design specification made in series 6732A.

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.

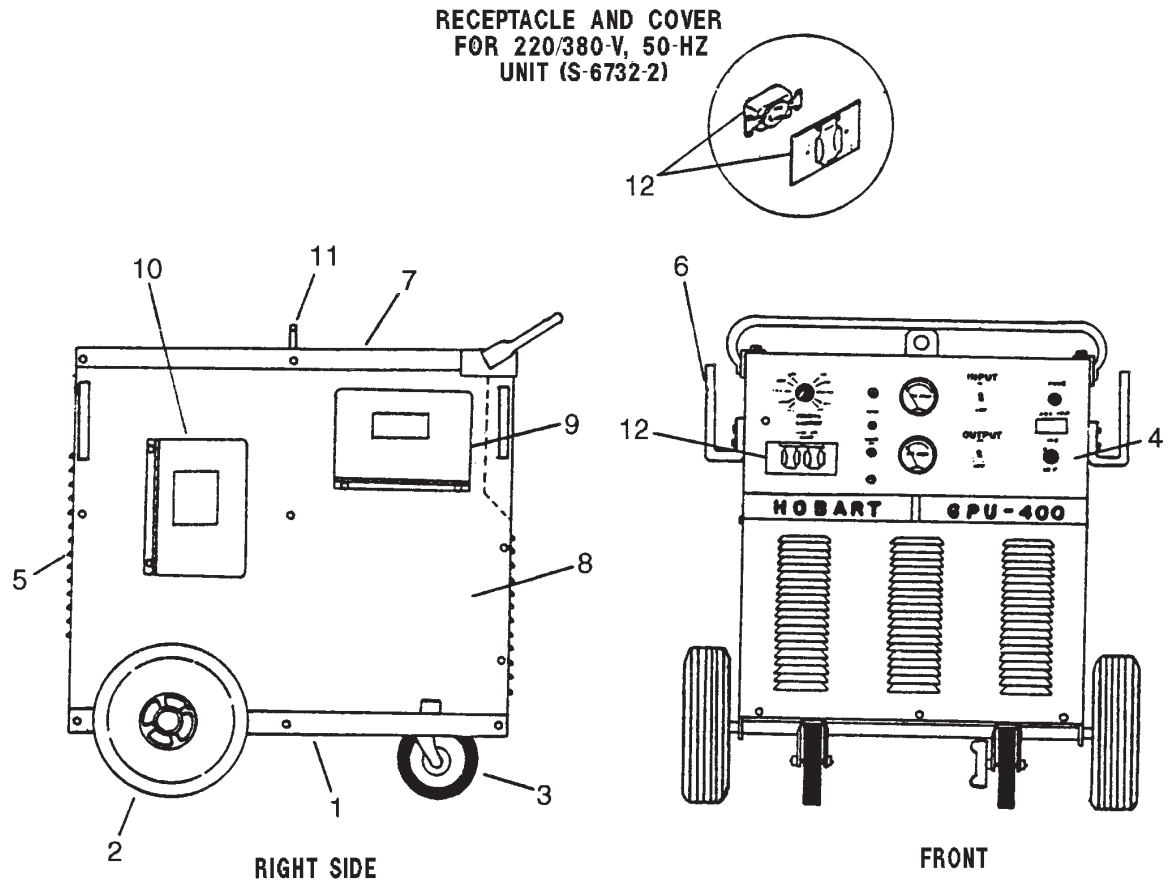
c. A formed and louvered sheet steel rear panel *(5, Fig. 1)* to which the fan assembly *(18, 19, Fig. 3)* and the SCR assembly *(17, Fig. 3)* are mounted inside the power supply.

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 plain sheet steel left side panel *(11, Fig. 3)*, to which a cable hanger is mounted.

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).* A cable hanger mounts to this panel also.

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 (Left Side Illustrated)
9. Front Access Panel
10. Rear Access Door
11. Lifting Yoke
12. Power Receptacle

General Assembly of GPU-400 Power Supply (6732A/6732B Shown)
Figure 1

h. Various internal components such as the main primary input fuses *(12, Fig. 3),* 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 contactors, control transformer *(10, Fig. 3),* and 1A control fuse block *(15, Fig. 5),* printed circuit control board *(13, Fig. 3),* input contactor *(14, Fig. 3),* etc. By design, only one of the output voltages can be supplied at one time. It is recommended that different types of output connector plugs be used for the two voltages for additional protection against the use of the wrong voltage in cases where both 14 V DC and 28 V DC equipment is used. Note that the 31.5 V DC overload trip for both the 14 V DC and 28 V DC output circuits allows a higher percentage overvoltage to a 14 V DC load that to a 28 V DC load.

CAUTION

Capacitor charge can injure! Allow capacitors to discharge and verify capacitor discharge with voltmeter before touching the capacitor circuitry.

2. Special Features

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

b. Output Ammeter, M1, *(2, Fig. 4)* with a 0-1600 A DC scale for reading the DC output amperes. The signal is provided by R11 meter shunt *(20, Fig. 3).*

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

d. 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.

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

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

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

h. Output overvoltage *(31.5 V DC for both outputs)* and overcurrent turn off circuitry with DS2 trip light *(4, Fig. 4).*

i. Adjustable solid state output limit circuitry. The customer selects the momentary output limit in the 150 to 1600 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 400 A DC to 1600 A DC output current.

j. Thermal overload thermostat *(4, Fig. 5)* which turns off output voltage when SCR heatsink overheats.

k. Thermostat *(3, Fig. 5)* controlled fan *(18, Fig. 3)* with overload thermostat *(4, Fig. 5)* to turn off power supply output.

l. Input contactor coil fuse F8, *(20, Fig. 3),* auxiliary power and fan fuse F1 *(9, Fig. 4),* and 1A printed circuit voltage sensing fuses F2-F7 *(16, Fig. 5)* are provided for increased protection. Fuse, F9 for auxiliary power on 50 Hz Model.

m. 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.

CAUTION

Excessive charging current can damage some types of batteries and some other loads. If the 150 a dc “starting surge” level is too high for your particular load, contact the manufacturer for recommendations.

PHYSICAL

Weight (approx.)	400 pounds (181.6 kg)
Length	36 1/4 inches (920.8 mm)
Width	29 3/4 inches (755.6 mm)
Height (overall)	33 1/8 inches (841.4 mm)

ELECTRICAL	SPECIFICATION NUMBER					
INPUT	S6732A-1 S6732B-1 S6732C-1	S6732A-2 S6732B-2 S6732C-2	S6732A-3 S6732B-3 S6732C-3	S6732A-4 S6732B-4 S6732C-4	S6732A-5 S6732B-5 S6732C-5	S6732A-6 S6732B-6 S6732C-6
Cycles per sec.	60	50	60	60	50	60
Phase	3	3	3	3	3	3
Volts	230/460	220/380	208/230/460	230/460/575	220/380	208/230/460
Amperes	54/27	54/32	56/52/26	52/26/22	54/32	56/52/26
Power Factor at 28 V DC	.68	.68	.68	.68	.68	.68
Input fuse size (maximum)	60A@230V 35A@ 60V	60A@220V 40A@380V	60A@208V 60A@230V	60A@230V 35A@460V 35A@75V	60A@220V 40A@380V	60A@208V 60A@230V

For ground cable size See Section 1-2, Fig. 2

OUTPUT

Output Power Rating (max.)	11.2 KW	11.2 KW	11.2 KW	11.2 KW	11.2 KW	11.2 KW
Volts	28-V DC	28-V DC	28-V DC	28-V DC	28-V DC	28.5-V DC
Amperes (rated load)	400A DC	400A DC	400A DC	400A DC	400A DC	400A DC
Kilowatts at highest volts	11.2	11.2	11.2	11.2	11.2	11.2
Kilowatts at lowest volts	5.6	5.6	5.6	5.6	5.6	5.6
Duty cycle	100 %	100 %	100 %	100 %	100 %	100%
Overload Capacity (% of rated load)	125% for 7 minutes	125% for 7 minutes	125% for 7 minutes	125% for 7 minutes	125% for 7 minutes	125% for 7 minutes

Specifications and Capabilities
Figure 2

3. Optional Equipment

The GPU-400 unit can be used to provide a 14-V DC output by installing a 14-V DC Option Kit *(Part* No. *489017)* and an additional set of output cables. Also available is a Snow Shield Option Kit *(Part No. 489518).* This kit permits the GPU-400 unit to be used outdoors and in cold or inclement weather. The option kits are available from Power Systems Division, Hobart Brothers Company.

4. 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.

The main transformer of the 230/460-V power supply *(Spec 6732A-1 or 6732B-1)* has a winding to provide the 115-V AC for the auxiliary power receptacle and fan motor.

The main transformer of the 220/380-V power supply *(Spec. 6732A-2 or 6732B-2)* has a 220-V AC winding for its auxiliary power receptacle and a 110-V AC winding for the fan motor.

The main transformer of the 208/230/460 V power supply *(Spec. 6732A-3 or 6732B-3)* 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 fused (F2-F7) sensing or synchronizing voltage signals to the solid state printed circuit control board *(13, Fig. 3).* 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.

The 1 amp, F2 thru F7 fuses *(15, Fig. 5)* are located on the main SCR rectifier heat sink at the right side of the power supply. These fuses are accessible by opening the rear, hinged access door on the right side panel.

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 via the S4 fan turn-on *(4, Fig. 5)* thermostat. The fan thermostat saves energy and reduces internal dust accumulation by allowing the fan to run only when necessary to prevent overheating.

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.

The S5 normally-closed overload thermostat *(3, Fig. 5)* mounted on the main SCR rectifier heatsink is designed to remove the output command signal whenever the heatsink temperature rise becomes too high from overload, loss of cooling air flow, etc. The thermostat automatically resets on cool down.

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.

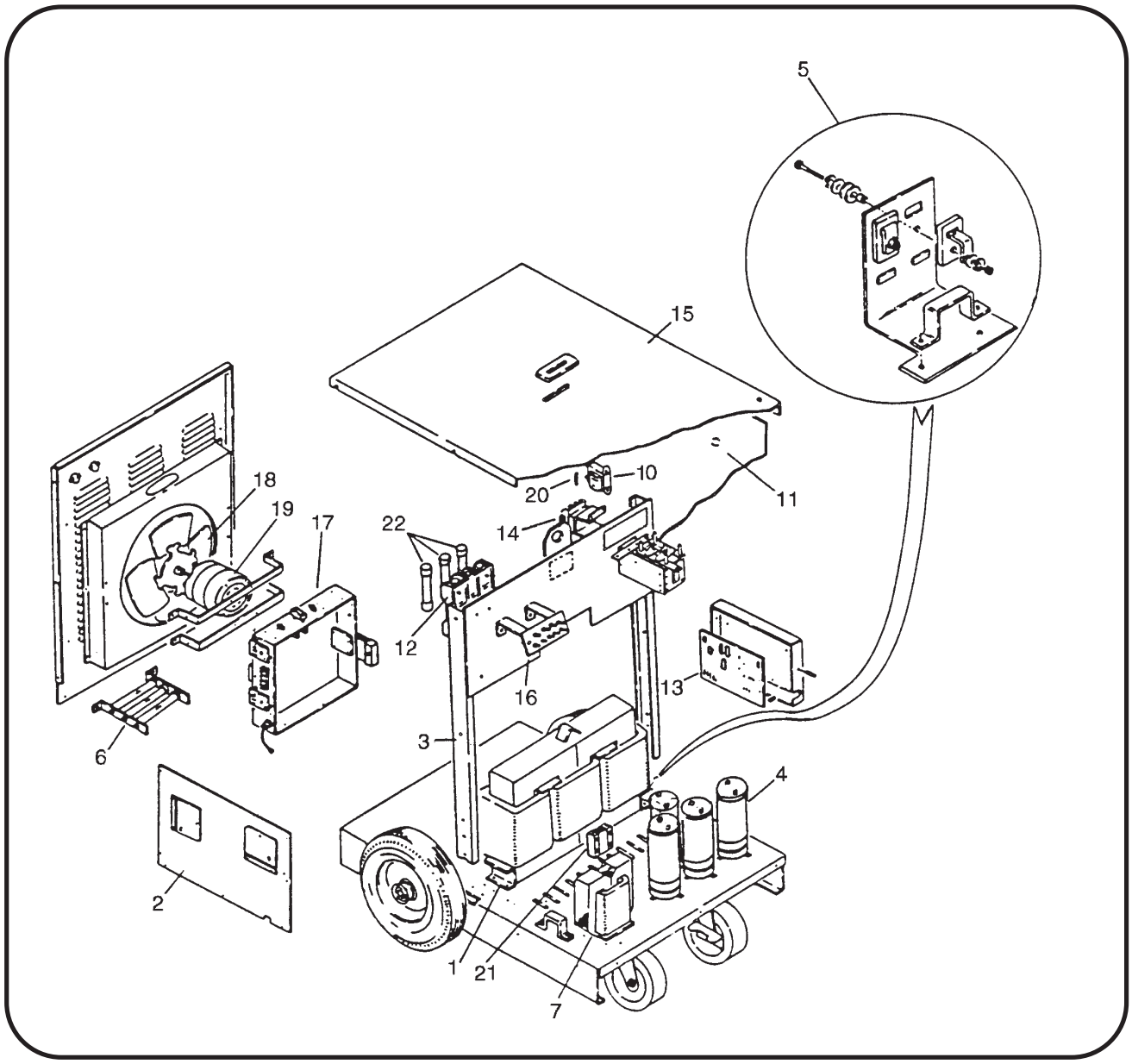
CAUTION

Capacitor charge can injure. Be sure capacitors are discharged before touching.

The CR7 flyback diode *(11, 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



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. Input Fuse Block
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
22. Main Input Fuses

Internal Components for GPU-400 (6732A/6732B Shown)
Figure 3

The power supply is typically supplied with a 0 to 1600 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 150 amperes to a maximum of 1600 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 from the input fuse block *(12, Fig. 3)* 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.

CAUTION

Incorrect usage can damage this equipment! Do not switch from one output voltage mode to the other while load current is flowing.

(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”.

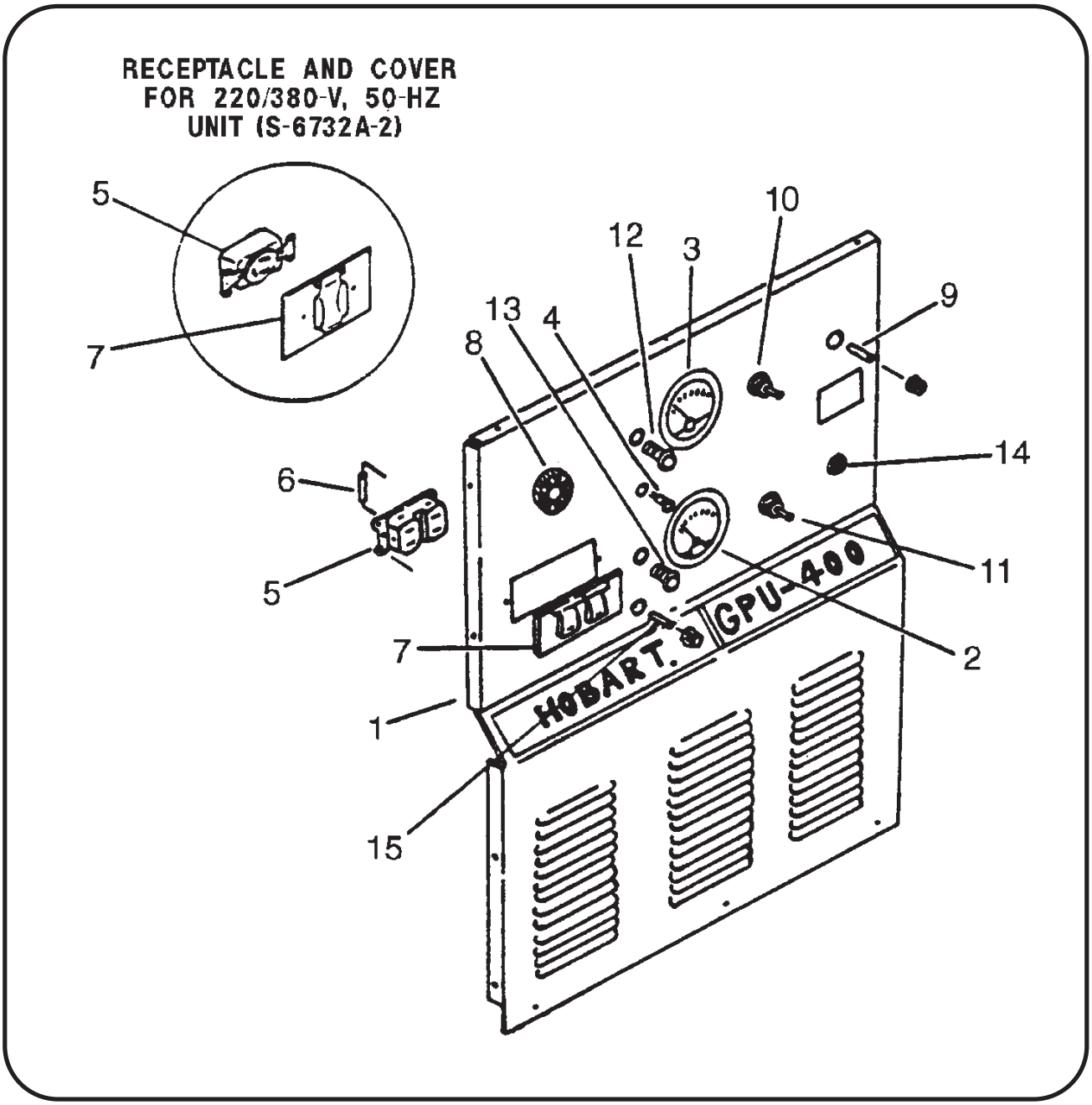
(4) Overload Trip Light (4, Fig. 4)

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 1600 A DC, or whenever the S5 overload thermostat *(3, Fig. 5)* on the SCR heat sink *(2, Fig. 5)* opens because the temperature setting has been exceeded.

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 6 voltage sensing signal fuses *(8, Fig. 5),* and 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.



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)
14. Hole Plug
15. F9 Fuse

Front Panel Assembly, GPU-400
Figure 4

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.

i. 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 1800 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 150 A DC to the maximum 1600 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 150 a dc standard minimum limit.

(3) Regulated DC Output Voltages

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

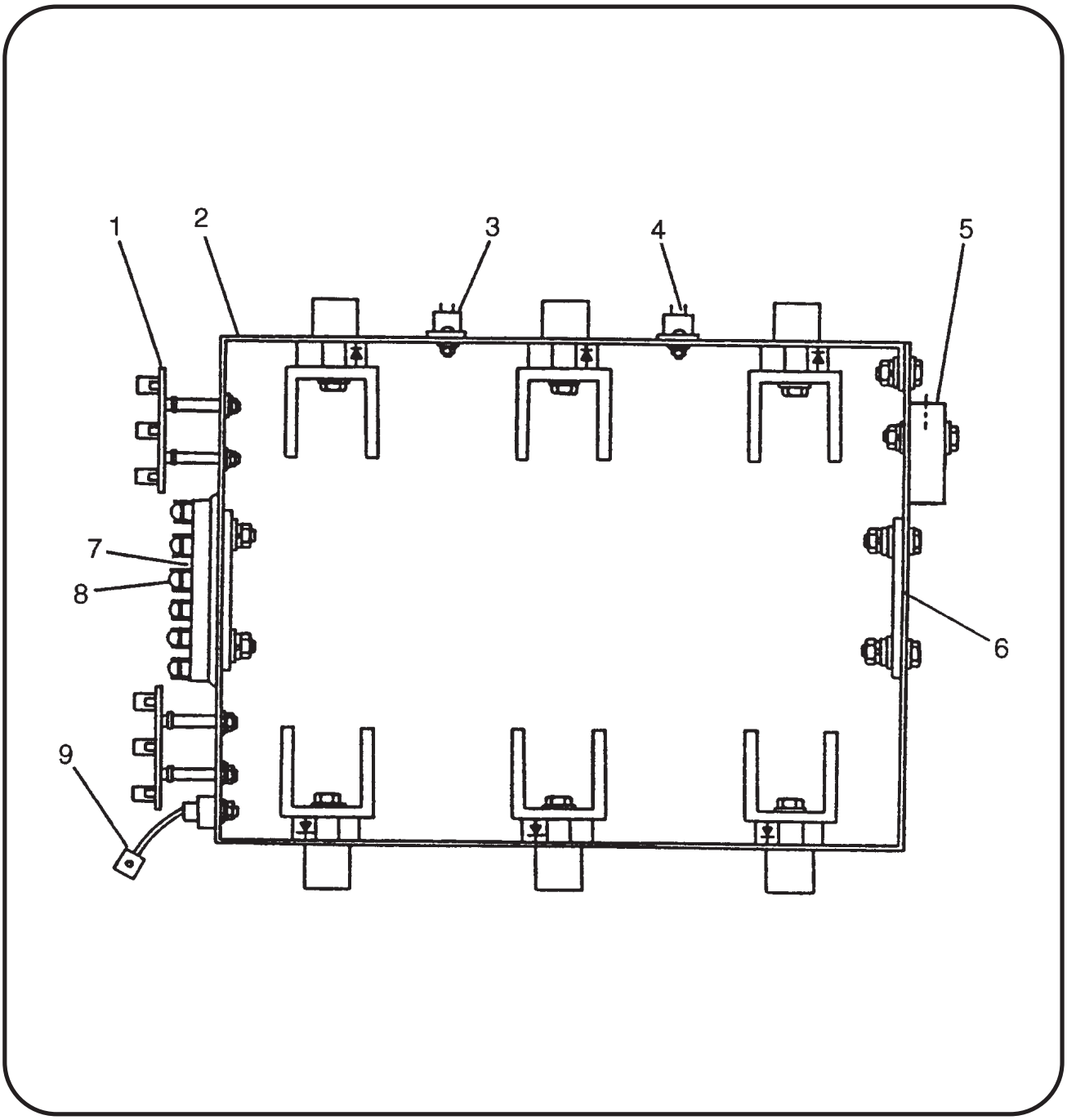
The printed circuit board turns off the SCR firing or gate pulses and turns on the trip light when S5 overload thermostat *(3 Fig. 5)* opens. The power supply can not produce any DC output until the S5 thermostat cools enough to automatically reset *(close).*

j. Thermostatically Controlled Fan (See Fig. 5)

The 115 V AC fan motor *(19, Fig. 3)* does not run until the SCR heat sink gets hot enough to turn on the S4 thermostat *(4, Fig. 5).* This feature can reduce the need for internal power supply cleaning and the use of electricity.

k. Primary Input Fuses (12, Fig. 3)

The three phase input voltage leads are connected to the top of the 3 input fuseholders. The fuse ratings are given in Fig. 2, 1-2 and Specifications *(Fig. 2, 2-1).* The disconnect switch for these fuses is to be provided by the customer between the source of power and this DC power supply.



1. Surge Suppressor (2)
2. SCR Heat Sink Assembly
3. Overtemperature Thermostat, S5
4. Fan Control Thermostat, S4
5. Metering Shunt, R12
6. Heat Sink Insulator (2)
7. Fuse Block, PC Board, Input
8. Control Fuses, F2-F7
9. Flyback Diode, CR7

SCR Heat Sink Assembly
Figure 5

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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. Operation Preparation

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 output cable between 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 *(10, Fig. 1)* to the output surge limit required for your load.

3. Operation Procedure

a. A. Input Control Functions

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

(2) Verify that only the amber input power light *(8, Fig. 1)* glows. If the light glows, no problem exists requiring service.

b. B. Output Control Functions

(1) Hold the S2 output contactor switch *(5, Fig. 1)* in the up **"CLOSE"** position long enough for the green output contactor light *(11, Fig. 1)* to glow.

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

(3) Verify that M1 DC ammeter *(6, 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".**

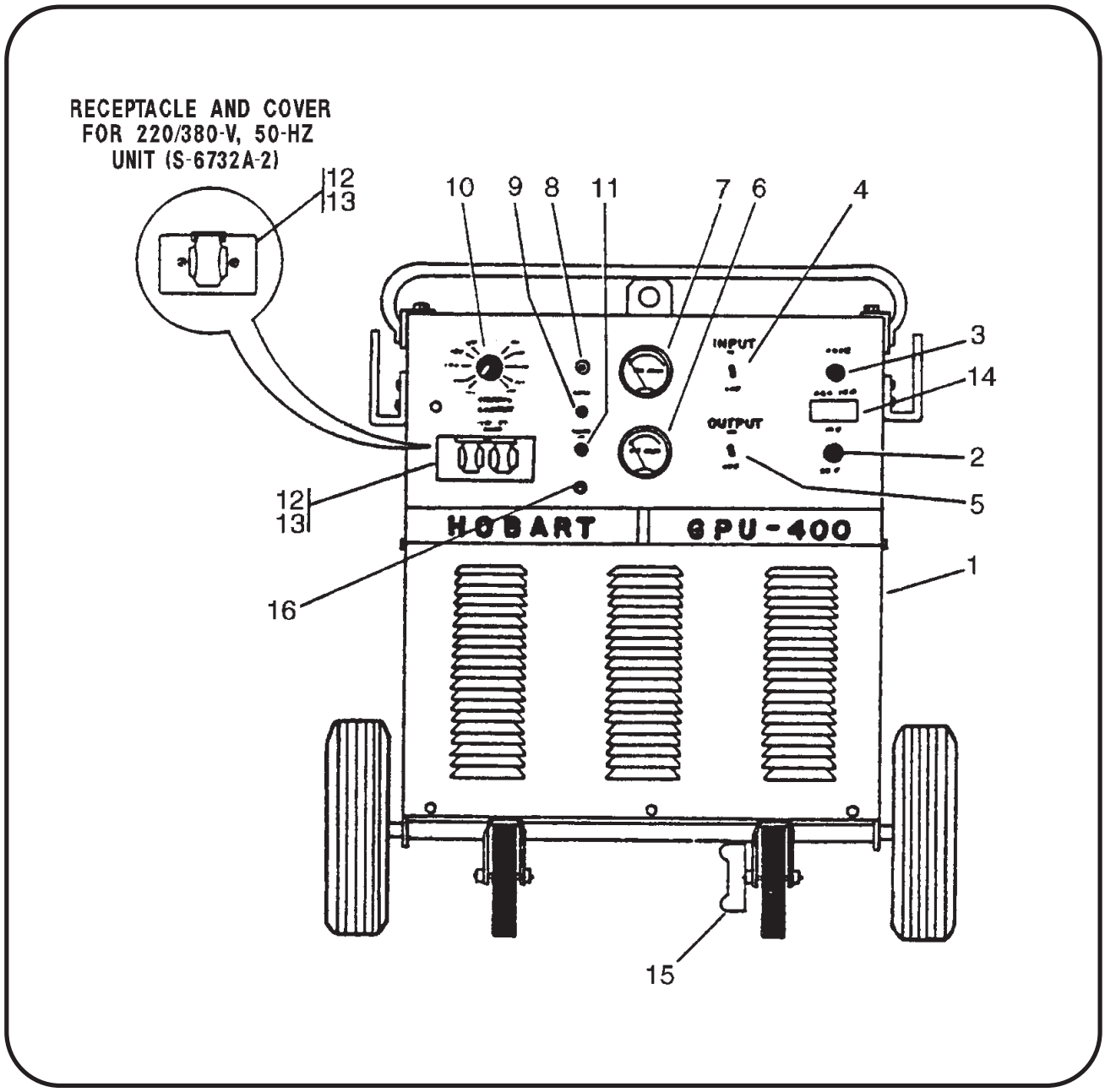
4. Voltmeter

a. Verify on the M2 DC voltmeter *(7, 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.

5. Output Current Limit

(1) If the DC ammeter continuously reads more than 400 A DC after start-up, immediately turn R13 current limit control *(10, Fig. 1)* down to continuous operation current point, normally 400 A DC. This may prevent input fuse blowing and automatic overload trip out.

(2) If R13 has no effect or if the output current cannot be decreased to about 150 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. Hole Plug
3. Control Fuse, F1 (15A)
4. Input ON-OFF Switch, S1
5. Output Contactor Switch, S2
6. Ammeter, 0-1600 A DC, M1
7. Voltmeter, 0-50V DC, M2
8. Amber Input Power Lights, DS1
9. Red Overload Trip Light, DS2
10. Start Current Potentiometer, R13
11. Green Output Contactor Light, DS3
12. Auxiliary Power Receptacle, 115V AC
13. Auxiliary Power Receptacle Cover
14. Rating and Specification Nameplate
15. Caster Wheel Brake
16. Receptacle Fuse, F1 (10A)

Controls and Instruments (6732A/6732B Shown)
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. No lubrication is required.

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) Power input fuses, located on baffle rear, must be the proper amperage for the input voltage. See the fuse rating for your input as listed for your use in 1-2, Figure 2, recommended wire and fuse 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 fuse or the wrong input voltage could be the cause for input fuse failure or equipment damage. Other causes of the input fuse failure can be a faulty main transformer, shorted SCR devices, shorted filter capacitor, shorted or grounded components or leads in the power circuit, or abuse of the equipment caused by excessive load or use with a too small sagging input power supply.

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 us. 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, overcurrent, or overheated heat sink 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. Control Thermostats

The fan thermostat is open until operating temperature is reached. If the fan comes on immediately on a cold unit, the thermostat is probably shorted. If the fan fails to come on before the S5 overload thermostat trips open, the fan thermostat is faulty or the wiring is opened. If 115 V AC is provided at both terminals of the thermostat, the fan is bad if it doesn't run.

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. If a severe overload causes excessive heating without overload trip-out of the DS2 overload light, 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 150 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.

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. Power Input Fuses

Located on baffle rear, the power input fuses must be the proper amperage for the input voltage. See the fuse rating for your input as listed for your use in 1-2, Figure 2, recommended wire and fuse 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 fuse or the wrong input voltage could be the cause for input fuse failure or equipment damage. Other causes of the input fuse failure can be a faulty main transformer, shorted SCR devices, shorted filter capacitor, shorted or grounded components or leads in the power circuit, or abuse of the equipment caused by excessive load or use with a too small sagging input power supply.

	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

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 line input fuses blow immediately and no evidence of lead shorting exists at the fuse block, 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 fuses blow on turn on or the input power source voltage trips out before the input fuses blow, 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 the fuses have been verified good and any 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, input contactor, and the leads connecting them to the power input fuse holders for short circuits. 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 GPU400 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 are shorted or the bus bars are shorted. Disconnect at once the input voltage, allow the capacitors time to discharge, and disconnect the positive and negative bus bars from the capacitor assembly. Replace any shorted or bad capacitors *(having case deformation caused by high shorting amperage).* If the capacitors don't check shorted or have signs of excess heating, check the *(+)* and *(-)* bus bars for low resistance between them. If low, a wiring fault exists between the bus bars and the output terminals. Repair as required. 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:

(1) 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.

(2) 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.

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

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

(5) 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.

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 GPU400 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 1600 ADC at 21 V DC if 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.

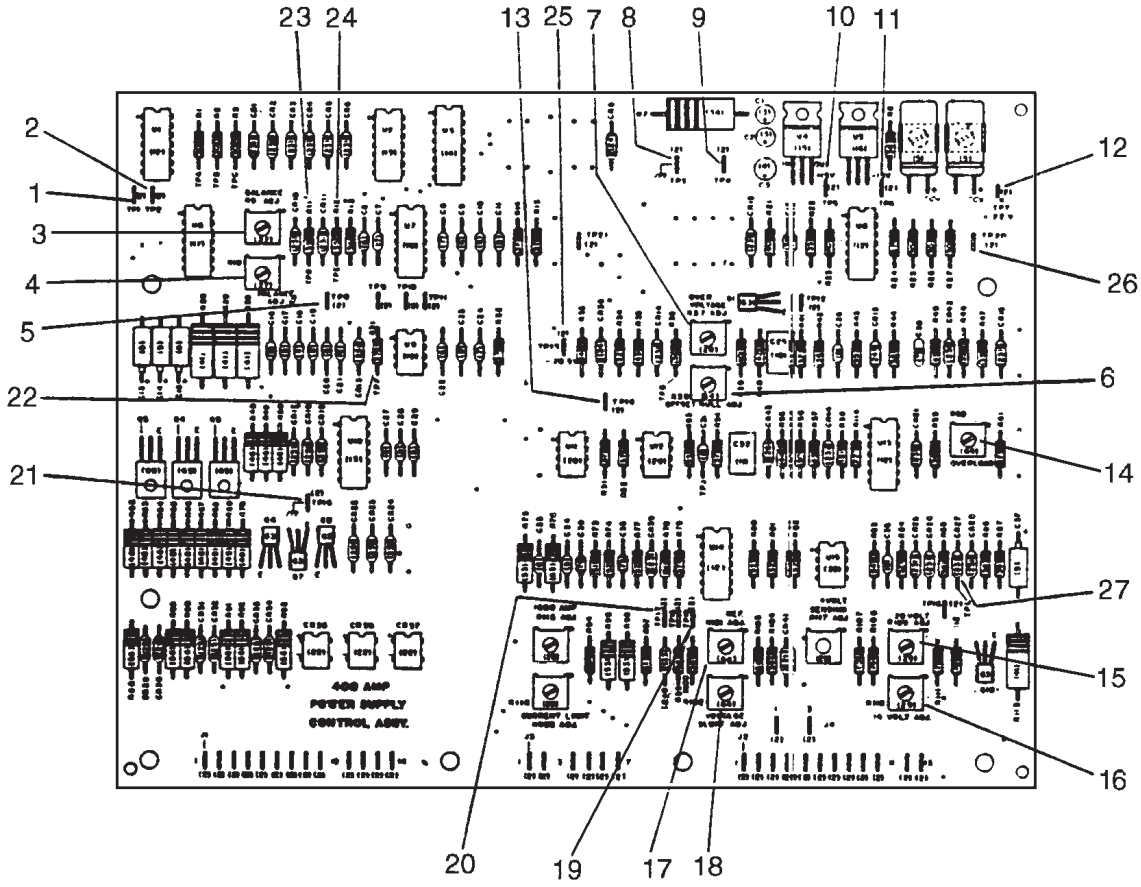
c. Test and Calibration Procedure

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-400 DC power supply to the factory or an authorized repair facility if your recheck of the GPU-400 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. *R110* 14 V DC Output Cal., (TP13)
17. *R101* 5 V Ref Volt Adjust., (TP19)
18. *R102* Voltage Slope Adjust.,(TP17)
19. *TP19* Reference Volt Test Point, (R101)
20. *TP17* Voltage Slope Test Point, (R102)
21. *TP15* Common, PC Board Volts
22. *TPF* SCR Gate Pulse Timer
23. *TPE* Gate Timer Output, Phase 2
24. *TPD* Gate Timer Output, Phase 3
25. *TP13* Actual Output Volt (28.5 or 14.25)
26. *TP20* Overload Limit (R60) Adjust
27. *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 POINTS	VOLTAGE & CIRCUIT CONDITIONS	DESCRIPTION OF TEST
1. TP5 (10) to TP3 (8).*	**a.** + 15 VDC +/- 5% . Test performed with open circuit and no load.	Checks (+) voltage regulator output set by u4.
2. TP6 (11) to TP3 (8)	**a.** - 15 VDC +/- 5% . Test performed with open circuit and no load.	Checks (-) voltage regulator output set by U5.
3. TP7 (12) to TP3 (8)	**a.** + 24 VDC +/- 10% . Test performed with open circuit and no load.	Checks unregulated control voltage needed for 1 and 2.
4. TP4 (9) to TP3(8)	**a.** + 10 VDC +/- 10%. Test performed with open circuit and no load.	Checks gate pulse timer volts supply set by CR 9.
5. TPD (24) to TP3 (8)	**a.** + 3.3 VDC + /-10%	**
TPE (23) to TP3 (8)	**b.** + 3.3 VDC + /-10%	**
TPF (22) to TP3 (8)	**c.** + 3.3 VDC + /-10%	**
** Checks gate pulse timer operation before phase balancing and amplification.Tests performed with open circuit.		
6. TP1 (1) t0 TP3 (8)	**a.** - 8.2 VDC + /-10%	***
TP2 (2) to TP3 (8)	**b.** - 8.2 VDC + /-10%	***
TP8 (5) to TP3 (8)	**c.** - 8.2 VDC + /-10%	***
*** 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). Test performed with open circuit.		
7. TP14 (13) to TP3 (8)	**a.** 0 VDC +/- .01V. Test performed with open circuit.	Checks for null (0) by R38 (6) for the no load current signal. Test performed with open circuit.
8. TP17 (20) to TP3 (8) VDC	**a.** + 1.25 +/- 10% . Test performed with open circuit.	Checks voltage slope calibrated with R102 (18).
9. TP19 (19) to TP3 (8)	**a.** - 5 VDC+ /-1%. Test performed with open circuit.	Checks reference voltage adjusted by R101 (17).
10. TP13 (25) to TP3 (8)	**a.** - 28.5 VDC +/- 1%. Test performed with open circuit.	Checks output volts set by R109 (15) in 28 VDC mode
TP13 (25) to TP3 (8)	**b.** - 14.3 VDC +/- 1%. Test performed with open circuit.	Checks output volts set by R109 (16) in 14 VDC mode
* TP3 (8) and TP15 (21) are the same common point of the supply.		

Test Value And Comment Tabulation
(For PC Board Numbers 180893 and 180893A)
Figure 2, Sheet

TEST POINTS	VOLTAGE & CIRCUIT CONDITIONS	DESCRIPTION OF TEST
11. TP20 (26) to TP3 (8)	**a.** 6 +/- .5 VDC. Test performed with open circuit.	Checks R60 (14) overload current trip-out setting
12. TPL (27) to TP3 (8)	**a.** .002V. Test performed with open circuit, not tripped.	Checks trip-out light (Q10) and circuit functioning.
	b. 12 to13 VDC. Test performed with open circuit,tripped.	Checks trip-out light (Q10) and circuit functioning.

Test Value And Comment Tabulation
(For PC Board Numbers 180893 and 180893A)
Figure 2, Sheet 2

Section 4. Troubleshooting

1. General

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, blown fuses, 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.

This section provides information useful in diagnosing and correcting certain troubles which cause unsatisfactory operation or failure of the equipment. 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 10% *

b. To secondary coil center tap on all phases - 33 VAC 10% *

* The +/- 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 10% *

d. Between X1 and X3 on Fuse Block - 37 VAC 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, only R109 and R110, 28 V and 14 V outputs respectively, are the only factory set values 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.

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Machine Will Not Operate

Trouble, Symptom, Condition	Probable Cause	Test, Check, And/or Remedy
1. Machine will not start.	**a.** Input power turned OFF at Remote Disconnect Switch.	Turn power ON at Remote Disconnect Switch.
	b. Blown fuse in Remote Disconnect Switch.	Replace blown fuse. If fuse blows frequently, determineand remedy the cause.
	c. Incorrect input power connections at machine.	Check input power connections against appropriateconnection diagram in Chapter 8.
	d. 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.
	e. Broken input cable.	Repair cable as necessary.
2. Line contactor fails to close.	**a.** Line contactor fuse blown.	Replace fuse. Check for cause if fuse blows frequently.
	b. Mechanical obstruction on contactor.	Remove obstruction.
	c. Defective line contactor switch.	Replace line contactor switch.
	d. Defective coil in line contactor.	Replace contactor if coil is open or shorted.
	e. Cable broken at line contactor.	Repair broken cable as necessary.
3. Line contactor chatters.	**a.** Input cables too small or too long.	Use input cables of sufficient ampacity for proper operation of the machine. Refer to Section 1-2, Fig. 1 for proper cable size to be used.
	b. Faulty contactor coil.	Check coil voltage. If correct, replace contactor.
	c. Low line voltage.	Check line voltage. Correct problem as necessary.
4. Contactor operates and blows line fuses.	**a.** 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.
	b. Line fuses too small.	Install fuses of proper amperage rating. Refer to Section 1-2, Fig. 1 for proper fuse size.

Trouble, Symptom, Condition	Probable Cause	Test, Check, And/or Remedy
Machine Will Not Operate (Continued)		
Contactor operates and blows line fuses.	**c.** Links on voltage changeover board incorrectly connected.	Check appropriate voltage changeover diagram in Chapter 8 for proper link positions. Make correction as necessary.
	d. SCR failure or shorted flyback diode.	Refer to detailed troubleshooting instructions.
	e. 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).	**a.** Power supply overloaded.	Reduce load, overload can be carried only for a short time.
	b. Duty cycle too high.	Do not operate continually at overload currents.
	c. Ambient temperature too high.	Operate at reduced loads when temperature exceeds 104F (40C) or improve cooling ambient.
	d. Ventilation blocked.	Check that air intake and exhaust openings are not obstructed.
	e. 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.
	f. Shorted output.	Reset electronic overload.
2. Overvoltage/Overload trip. Malfunction is in units internal circuitry.	**a.** Control circuit board failure.	Refer to detailed troubleshooting instructions.
	b. Loose connections in voltage control circuit	Check for loose connections. Tighten and secure as required.
	c. Starting current potentiometer (R13) burned out.	Replace potentiometer.

Trouble, Symptom, Condition	Probable Cause	Test, Check, And/or Remedy
Unit Trips Out After Starting (Continued)		
1. Fan not operating (also see causes and remedies under "Machine will not start").	**a.** Blown fuse (F1) on front panel of machine.	Replace fuse. See that power receptacle is not overloaded.
	b. Fan control thermostat defective.	Place a jumper wire across the overheated thermostat. If fan then runs, replace thermostat.
Note: A properly operating fan thermostat will keep the fan until 100 F is reached at heatsink.		
	c. Broken lead or connection to fan motor.	Repair wiring as necessary.
	d. 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.		
Operator gets shock when machine case is touched.	**a.** 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		
Abnormal current fluctuation, voltage nearly constant.	**a.** Loose cable connections at output.	Check for overheated connections and tighten.
Power Supply Will Not Turn Off		
Contactor fails to open.	**a.** Contacts sticking in contactor.	Clean contacts or replace contactor, whichever is needed.

Trouble, Symptom, Condition	Probable Cause	Test, Check, And/or Remedy
Power Supply On: No Voltage Output		
Unit on, but no output voltage.	**a.** Protective circuit tripped.	Determine and correct cause of trip. Then reset and restart unit.
	b. Component failure in protective circuit.	Find the defective component and replace it.
	c. Control circuit board failure.	Check board per Section 3-3 and replace it if faulty.
	d. Output contactor failed or OFF.	Replace contactor, selector switch or output ON-OFF switch, whichever of these is defective.
Output Voltage Not Proper Level		
1. Poor voltage regulation.	**a.** 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).	**a.** Voltage calibration off.	Attempt calibration per Section 3-3. If calibration isn't possible, replace PC control board.
	b. Voltage sensing lead open.	Repair or replace voltage sensing lead.
3. Unstable voltage.	**a.** Open filter capacitor.	Find and replace defective capacitor.
	b. 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.

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 two Series of GPU-400 SCR Phase controlled, DC power supplies manufactured by **Ground Power Group, Hobart Brothers Company, Troy, Ohio.** These power supplies are identified as Series 6732A, 6732B and 6732C. Within each Series are various Specification numbers, which are formed by adding a dash number *(-1, -2, -3, etc.)* to the series number. Any option 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:

Table of Contents

Section 1 - Introduction

Section 2 - Manufacturer's Codes

Section 3 - Parts List

Section 4 - Numerical Index

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 five digit 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 S6732A-1 only.
Parts coded “B” are usable on Specs S6732A-2 only.
Parts coded “C” are usable on Specs S6732A-3 only.
Parts coded “D” are usable on Specs S6732A-4 only.
Parts coded “E” are usable on Specs S6732A-5 only.
Parts coded “F” are usable on Specs S6732B-1 only.
Parts coded “G” are usable on Specs S6732B-2 only.
Parts coded “H” are usable on Specs S6732B-3 only.
Parts coded “J” are usable on Specs S6732B-4 only.
Parts coded “K” are usable on Specs S6732B-5 only.
Parts coded “L” are usable on Specs S6732B-6 only.
Parts coded “M” are usable on Specs S7001-2 only.
Parts coded “N” are usable on Specs S6732C-1 only.
Parts coded “O” are usable on Specs S6732C-2 only.
Parts coded “P” are usable on Specs S6732C-3 only.
Parts coded “Q” are usable on Specs S6732C-4 only.
Parts coded “R” are usable on Specs S6732C-5 only.
Parts coded “S” are usable on Specs S6732C-6 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
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

Code	Vendor's Name And Address
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

Section 3. Parts List

1. Explanation of Parts List Arrangement

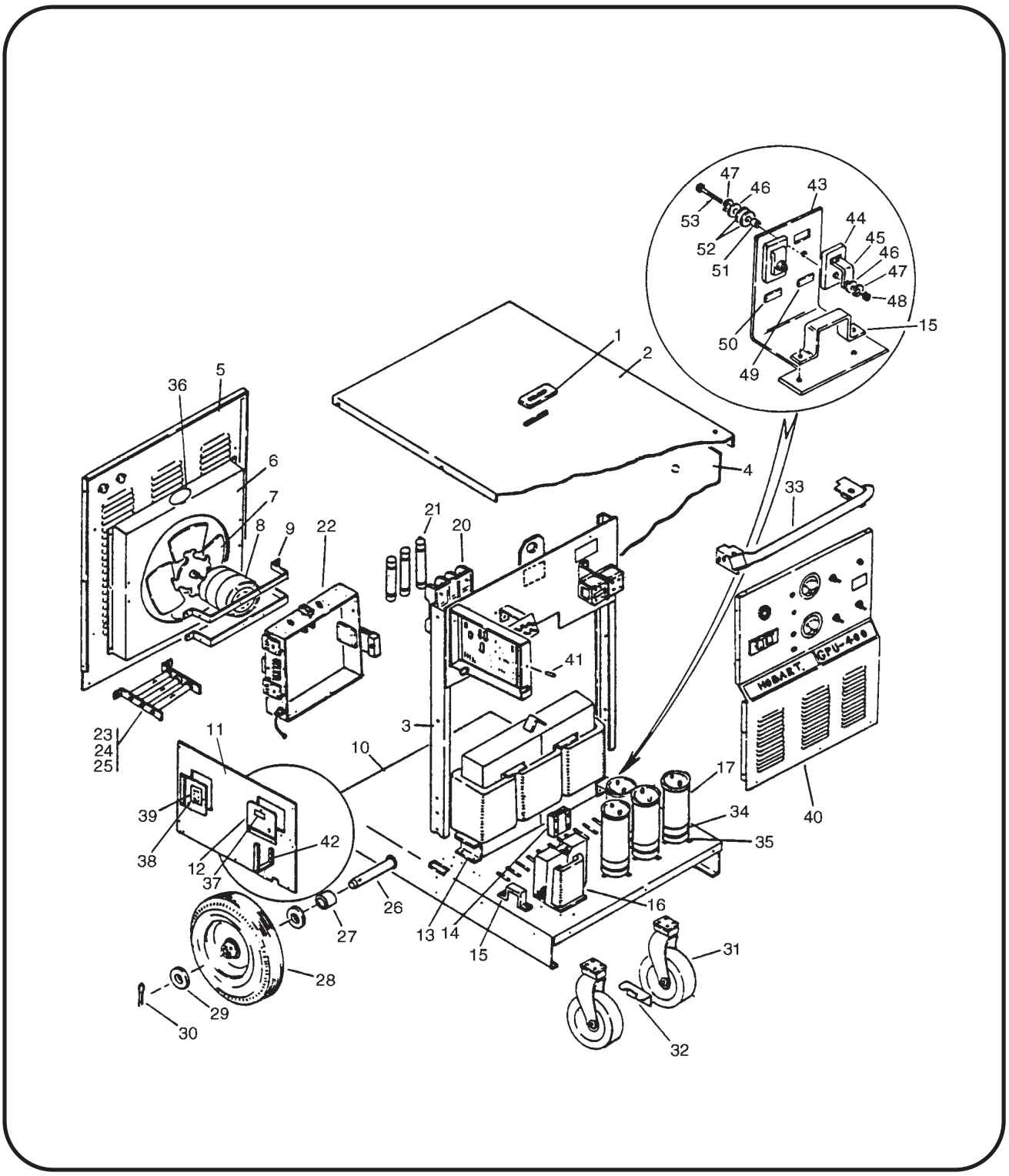
The parts list is arranged so that the illustration will appear on a lefthand page and the applicable parts list will appear on the opposite righthand page. Unless the list is unusually long, the user will be able to look at the illustration and read the parts list without turning a page.

2. Symbols and Abbreviations

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

*****	- item not illustrated
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
NHA	- next higher assembly
OM	- Owners Manual
PRV	- peak reverse voltage
PSI	- pounds per square inch
Ref	- reference *(the item has been listed previously)*
T-R	- transformer-rectifier
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 illustrated.



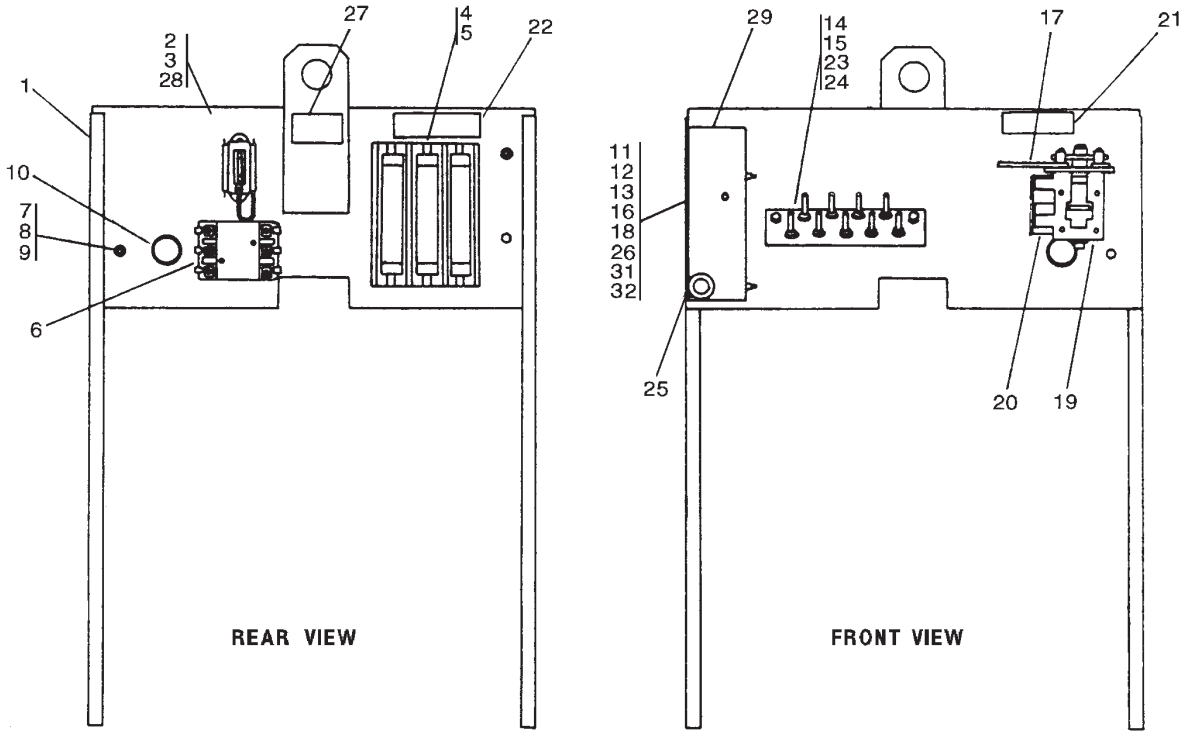
General Assembly: GPU-400 (6732A/6732B Shown)
Figure 1

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
1-	**S-6732A-1**	**GPU 400, 60-Hz, 230/460 VAC**	**A**	**1**
	S-6732A-2	**GPU 400, 50-Hz, 220/380 VAC**	**B**	**1**
	S-6732A-3	**GPU 400, 60-Hz, 208/230/460 VAC**	**C**	**1**
	S-6732A-4	**GPU 400, 60-Hz, 230/460/575 VAC**	**D**	**1**
	S-6732A-5	**GPU 400, 50-Hz, 220/380 VAC**	**E**	**1**
	S-6732B-1	**GPU 400, 60-Hz, 230/460 VAC**	**F**	**1**
	S-6732B-2	**GPU 400, 50-Hz, 220/380 VAC**	**G**	**1**
	S-6732B-3	**GPU 400, 60-Hz, 208/230/460 VAC**	**H**	**1**
	S-6732B-4	**GPU 400, 60-Hz, 230/460/575 VAC**	**J**	**1**
	S-6732B-5	**GPU 400, 50-Hz, 220/380 VAC**	**K**	**1**
	S-6732B-6	**GPU 400, 60-Hz, 208/230/460 VAC**	**L**	**1**
	S-7011-2	**GPU 400, 60Hz, 208/230/460 VAC**	**M**	**1**
	S-6732C-1	**GPU 400,60Hz, 230/460 VAC**	**N**	**1**
	S-6732C-2	**GPU 400,50Hz, 220/380 VAC**	**O**	**1**
	S-6732C-3	**GPU 400,60Hz, 208/230/460 VAC**	**P**	**1**
	S-6732C-4	**GPU 400,60Hz, 230/460/575 VAC**	**Q**	**1**
	S-6732C-5	**GPU 400,60Hz, 220/380 VAC**	**R**	**1**
	S-6732C-6	**GPU 400,60Hz, 208/230/460 VAC**	**S**	**1**
1	12CW-2170	. GROMMET, TOP		1
2	487807	. PANEL, TOP		1
3	489055	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	A	1
	489058	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	BEGK	1
	489054	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	CLM	1
	489523	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	DJ	1
	283511	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	N	1
	283513	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	OQR	1
	283510	. YOKE, LIFTING ASSY, *(For Details See Fig. 2)*	PS	1
4	487808	. PANEL, SIDE, LEFT	A-M	1
	283256	. PANEL, SIDE, LEFT	N-S	1
5	488025	. PANEL, REAR, ASSEMBLY	A-M	1
	283486	. PANEL, REAR, ASSEMBLY	N-S	1
	283255	. . PANEL, REAR	N-S	1
6	404880-3	. SHROUD, FAN		1
7	8RT-609	. BLADE, FAN, V35197, NO. 603S72		1
8	12TW-595-1	. MOTOR, FAN, V62119, NO. CAZJ192		1
9	487811	. BRACKET, MOTOR		2
10	487923	. BASE, MTG., ASSY.	A-L	1
	181602	. BASE, MTG., ASSY.	M	1
	283385	. BASE, MTG., ASSY.	N-S	1
11	487812	. PANEL, SIDE, RIGHT	A-M	1
	283250	. PANEL, SIDE, RIGHT	N-S	1
12	487813	. DOOR, ACCESS ASSY.	A-M	2
	283260	. DOOR, ACCESS ASSY.	N-S	1

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
1-	(CONTINUED)			
13	487972	. TRANSFORMER, POWER	AFN	1
	488078	. TRANSFORMER, POWER	BEGKOR	1
	488389	. TRANSFORMER, POWER	CHLMP,S	1
	489517	. TRANSFORMER, POWER	DJQ	1
14	180068	. SHUNT, 1600A		1
15	60GHP-424	. CLAMP, OUTPUT CABLE	A-L	1
16	487952	. CHOKE, ASSY.		1
17	405278-7	. CAPACITORS, V56289,		
		NO. 36DX772F200DF2A	ACD,L-N,P-S	3
	405278-7	. CAPACITORS, V56289,		
		NO. 36DX772F200DF2A	BGO	4
18		Delete		
19		Delete		
20	404605-5	. BLOCK, FUSE, 600V, V26794,		
		NO. 66311, REF. FIG. 2		1
21	W-10386-13	. FUSE, 60 A, V71400, NO. N0S-60		
		(Used on 208, 220, and 230-V Units)		3
	W-10386-9	. FUSE, 35 A, V71400, NO. N0S-35		
		(Used on 460 and 575-V Units)		3
	W-10386-10	. FUSE, 40 A, V71400, NO. N0S-40		
		(Used on 380-V Units)		3
22	487930-1	. HEAT SINK, SCR ASSY,		
		(For Details see Fig. 3)		1
	487050-2	. RESISTOR ASSY.		1
23	AAW-1199	. . BRACKET, MTG, RESISTOR		2
24	16DA-3493	. . WASHER INSULATING		6
25	403765-2	. . RESISTOR, FIXED, V44655, NO. 0600B		3
26	487901	. AXLE		1
27	486143-2	. SPACER, WHEEL		2
28	83B-1101	. WHEEL 10", MATERIAL HANDLING		
		ASSOC, NO. 3875-10		2
29	W-11242-14	. WASHER, FLAT		4
31	83B-1100-1	. CASTER MATERIAL HANDLING		
		ASSOC, NO. 6-43-126-7		1
32	83B-1100-2	. CASTER WITH BRAKE, NO. 6-43-126-7		
		MATERIAL HANDLING ASSOC.		1
33	910225-2	. HANDLING ASSY.		1
34	350488-94	. INSULATION, CAPACITOR	AC,D-L,MN,P-S	3
35	350488-94	. INSULATION, CAPACITOR	BGO	4
35	361052-9	. CLAMP, CAPACITOR, V90201,		
		NO. VR12	AC,D-L,MN,P-S	3
	361052-9	. CLAMP, CAPACITOR, V90201, NO. VR12	BGO	4
36	35154	. LABEL, CAUTION FAN		1

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
1-	(CONTINUED)			
37	81B-1061	. LABEL, RECTIFIER SHOCK		1
38	83B-1079	. LABEL, ELECTRIC SHOCK		1
39	83A-1105	. LABEL, FUSES		1
40	489053	. PANEL, FRONT, ASSY.		
		(For Details See Fig. 4)	ACEFHKNPR	1
	489056	. PANEL, FRONT, ASSY.		
		(For Details See Fig. 4)	BGO	1
	489522-1	. PANEL, FRONT, ASSY.		
		(For Details See Fig. 4)	DJQ	1
	181418	. PANEL, FRONT, ASSY.		
		(For Details See Fig. 4)	LS	1
	181598	. PANEL, FRONT, ASSY.	M	1
41	487979	. SPACER, PC PANEL		1
42	397752-1	. CABLE HANGER	A-M	4
	283323	. CABLE, HANGER	N-S	4
	488796	. TERMINAL, OUTPUT, ASSY.	A-L	1
43	488797	. . PANEL- TERMINAL	A-L	1
44	5CW-975	. . BUSHING - INSULATOR	A-L	2
45	100GH-112	. . TERMINAL - OUTPUT	A-L	2
46	No Number	. . WASHER - FL, 3/8 ST. *(STD.)*	A-L	4
47	No Number	. . WASHER - LK, 3/8 ST. *(STD.)*	A-L	4
48	No Number	. . NUT - 3/8-16, HEX, ST. *(STD.)*	A-L	2
49	A-897-1	. . NAMEPLATE - NEGATIVE	A-L	1
50	400435	. . NAMEPLATE - 28 VOLTS	A-L	1
51	5CW-2127	. . BUSHING	A-L	2
52	5CW-976A	. . WASHER - INSULATOR	A-L	4
53	No Number	. . SCREW - 3/8-16 X 2 HHC ST. *(STD.)*	A-L	2
* 54	180599-1	. PANEL & PC CONTROL BOARD ASSY.	A-C,E	1
	180599-2	. PANEL & PC CONTROL BOARD ASSY.	D	1
	180599A-1	. PANEL & PC CONTROL BOARD ASSY.	F-H,KL	1
	180599A-2	. PANEL & PC CONTROL BOARD ASSY.	J	1
	180599A-4	. PANEL & PC CONTROL BOARD ASSY.	M	1
	283248-1	. PANEL & PC CONTROL BOARD ASSY.	NOPRS	1
	283248-2	. PANEL & PC CONTROL BOARD ASSY	Q	1
* 55	283257	. FENDER, REAR	M-S	2
* 56	367228-3	. BOARD, VOLTAGE CHANGEOVER ASSY	ACFH,L-N,PS	1
	367228-4	. BOARD, VOLTAGE CHANGEOVER ASSY	DJQ	REF
	488071	. BOARD, VOLTAGE CHANGEOVER ASSY	BEGKO	1
* 57	180293	. BOARD, PC CONTROL	A-E	1
	180293A	. BOARD, PC CONTROL	F-L,N-S	1
	181589	. BOARD, PC CONTROL	M	1

*** NOT ILLUSTRATED**



Lifting Yoke Assembly
Figure 2

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
2 -	**489055**	**YOKE, LIFTING ASSY, (For NHA See Fig. 1)**	**A,F**	**1**
	489058	**YOKE, LIFTING ASSY, (For NHA See Fig. 1)**	**BEGK**	**1**
	489054	**YOKE, LIFTING ASSY,(For NHA See Fig. 1)**	**CLM**	**1**
	489523	**YOKE, LIFTING ASSY, (For NHA See Fig. 1)**	**DJ**	**1**
	283511	**YOKE, LIFTING ASSY, (For NHA See Fig. 1)**	**N**	**1**
	283513	**YOKE, LIFTING ASSY, (For NHA See Fig. 1)**	**OQR**	**1**
	283510	**YOKE, LIFTING ASSY, (For NHA See Fig. 1)**	**PS**	**1**
1	487904	. . YOKE LIFTING	A-M	1
	283530	. . YOKE LIFTING	N-S	1
2	406392-1	. . TRANSFORMER, CONTROL, V97520, NO. 18608001	ACFH,L-N,P-S	1
	406392-2	. . TRANSFORMER, CONTROL, V97520, NO. 18608001	BDEGJKO	1
3	W-11166-11	. . FUSE, FAST BLOW, AGC, V71400, NO. AGC-1/2		1
4	404605-5	. . BLOCK, FUSE, 600V LINE, V26794, NO. 48467		1
5	W-10386-13	. . FUSE, 60A, V71400, NO. N0S-60**		3
	W-10386-9	. . FUSE, 35A, V71400, NO. NOS-35**		3
	W-10386-10	. . FUSE, 40A, V71400, NO. NOS-40**		3
6	400663	. . CONTACTOR, V23826, NO. 42EE35AF-263		1
	406587	. . MICRO SWITCH *(SUPPLY ITEM)*		1
7	W-11114-5	. . SCREW, 1/4-20 X 1, RD HD, MH.ST		2
8	W-11263-4	. . WASHER, LK, IET, Y4		4
9	50MS-732-0	. . NUT, 1/4-20, HEX, KEPS, ST.		6
	50MS-732-0	. . NUT, 1/4-20, HEX, KEPS, ST.		15
10	402037-23	. . GROMMET, RUBBER, V70485, NO. 4242		1
11	487815	. . PANEL, MTG, PC BOARD		1
* 12	180293	. . BOARD, PC CONTROL	A-E	REF
	180293A	. . BOARD, PC CONTROL	F-L,N-S	REF
	181589	. . BOARD, PC CONTROL	M	REF
13	404915-1	. . SPACER, PC BOARD, V02768, NO. 217-200-502-06-0101		6
14	367228-3	. BOARD, VOLTAGE CHANGEOVER ASSY	ACFH,L-N,PS	REF
	367228-4	. BOARD, VOLTAGE CHANGEOVER ASSY	DJQ	REF
	488071	. BOARD, VOLTAGE CHANGEOVER ASSY	BEGKOR	1REF
15	W-11242-5	. . WASHER, ST. 1/4, FL.		9

** To determine where these fuses are to be used, refer to Section 1-2, Figure 1.

*** Not Illustrated**

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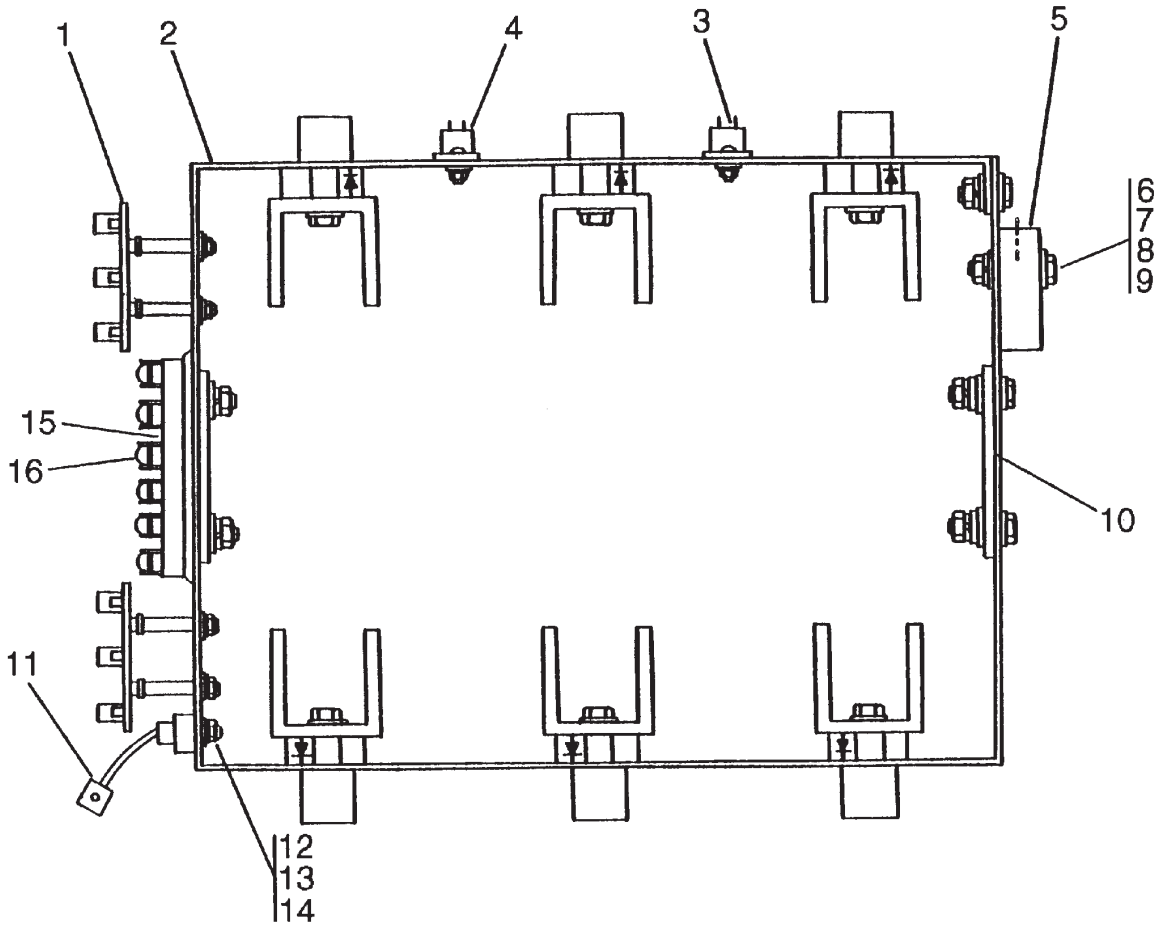
FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
2 -		**YOKE, LIFTING ASSY. (CONTINUED)**		
16	489504	. . LABEL, STARTING CURRENT	DJQ	1
17	487897	. . BAR, BUS CONTACTOR		1
18	405117-2	. . SCREW, #8-18 X 3/4, SF-TAP	DJQ	6
19	286810-1	. . CONTACTOR, 28V		1
20	487898	. . BRACKET, CONTACTORS		1
21	83B-1108	. . LABEL, CONTACTORS		1
22	84B-1005	. . LABEL, INPUT FUSE	BEGK	1
	84B-1032	. . LABEL, INPUT FUSE	ACFHLM	1
	408451	. . LABEL, INPUT FUSE	DJ	1
23	487899	. . BRACKET, MTG, CHANGEOVER BOARD		2
24	487917	. . LINK, CHANGEOVER		3
25	402037-8	. . GROMMET, PANEL MTG, V02231		1
26	402037-13	. . GROMMET, PANEL MTG, V11702, NO. 3312A		1
27	81B-1061	. . LABEL, WARNING, ELECTRIC SHOCK		1
28	406484	. . LABEL, FUSE, R-400S, 0.5 AMP, 250V		1
29	82B-1023	. . LABEL, WARNING, TRANSFORMER-RECTIFIER		1
* 30	81626	. . WIRE, #56		40"
31	401428-1	. . POTENTIOMETER, 10 K, V01121, NO. JA1N056S103UA	A-C,E-H,K-P,R-S	1
32	406807-1	. . KNOB	A-C,E-H,K-P,R-S	1

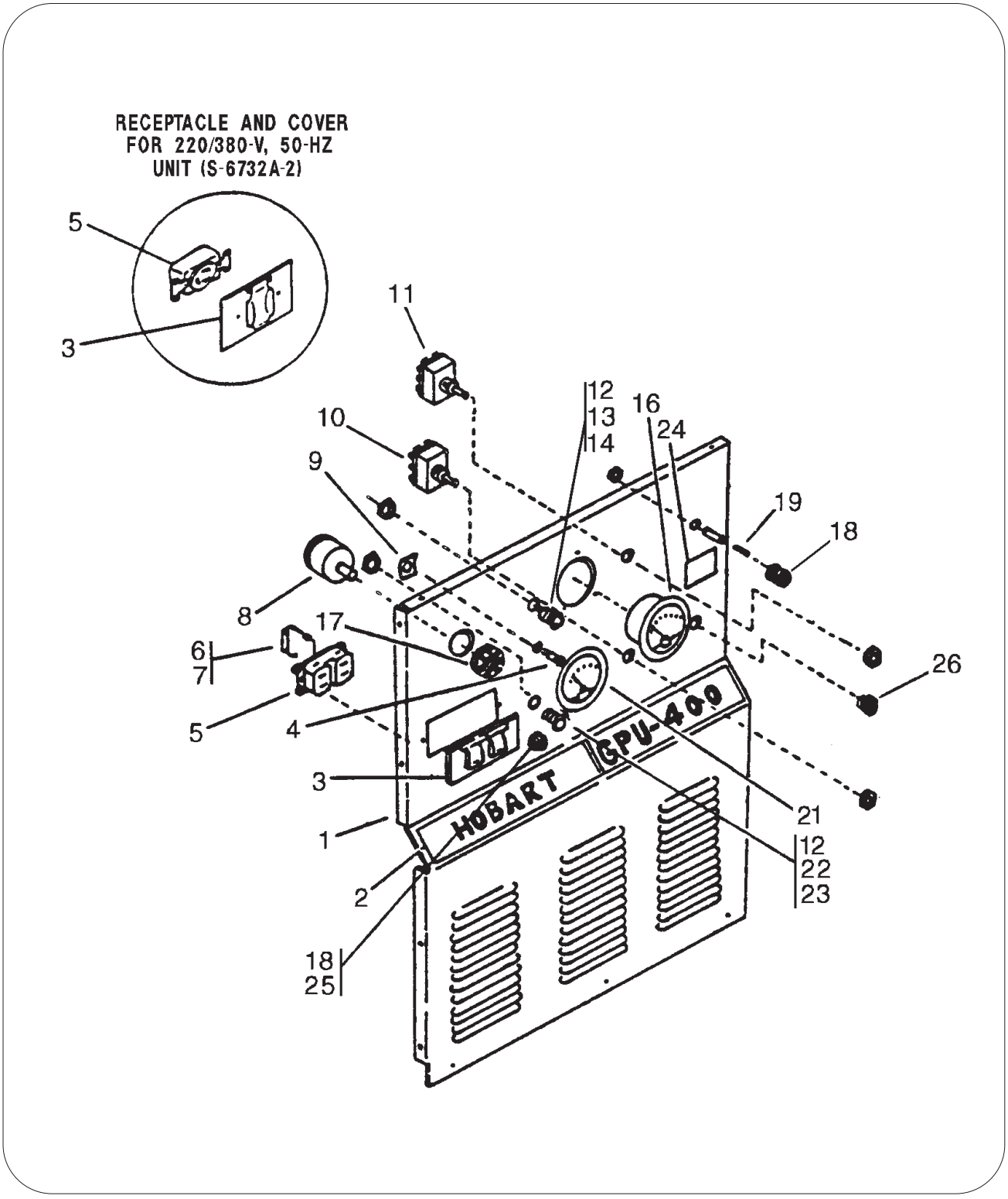
*** NOT ILLUSTRATED**



SCR Heat Sink Assembly
Figure 3

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
3-	**487930-1**	**RECTIFIER, SCR, ASSY. (For NHA See Fig. 1)**		**REF**
1	367634A-3	. . SUPPRESSOR, SURGE ASSY		2
2	487991	. .HEAT SINK, RECTIFIER WITH SCR DEVICES		1
3	404044-3	. . THERMOSTAT, OVERLOAD, 02907, V14604, NO. 2450-82-175		1
4	404044-6	. . THERMOSTAT FAN TURN ON, V14604, NO. 3455R-82-287		1
5	280022	. . SHUNT		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-11278-1	. . NUT, 1/2-13, HEX, JAM, ST.		1
10	369641	. . INSULATOR, MTG, RECTIFIER		2
11	402832-3	. . DIODE, SILICON, POS. BASE, V05277, NO. R5100315		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	405129-1	. . BLOCK, FUSE, V71400, NO. 2430-6		1
16	W-11166-9	. . FUSE, 1 AMP, V71400, NO. AGC		6

*** Not Illustrated**



Front Panel Assembly
Figure 4

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
4 -	**489053**	**PANEL, FRONT ASSY (For NHA See Fig. 1)**	**ACEFHKNPR**	**REF**
	489056	**PANEL, FRONT ASSY. (For NHA See Fig. 1)**	**BGO**	**REF**
	489522-1	**PANEL, FRONT ASSY. (For NHA See Fig. 1)**	**DJQ**	**REF**
	181598	**PANEL, FRONT ASSY. (For NHA See Fig. 1)**	**M**	**REF**
	181418	**PANEL, FRONT ASSY. (For NHA See Fig. 1)**	**S**	**REF**
1	487816	. . PANEL, FRONT	ACEFHKN,P-R	1
	488113	. . PANEL, FRONT	BDGJO	1
	181599	. . PANEL, FRONT	M	1
	181417	. . PANEL, FRONT	LS	1
2	83C-1085	. . LABEL, V51285, MAT. NO. 7921		1
3	404277	. . COVER, RECEPTACLE, DUPLEX,V81703, NO. WPDC	ACEFFHK MNPQRS	1
	404335	. . COVER, RECEPTACLE, SINGLE, V81703, NO. WPRC	BDGJO	1
4	405072-2	. . DIODE, LIGHT-EMITTING, V71744, NO. TYPE 6080-002-304		1
5	404336	. . RECEPTACLE, 3-WIRE, 15-A, 277-V, TWIST-LOCK, V77166	BGO	1
	402670	. . RECEPTACLE, 3-WIRE	MNPQRS	1
	401532-2	. . . SUPPRESSOR, THRYECTOR, DIODE, GENERAL ELECTRIC NO. KZ4DTM FROM PIONEER DAYTON ELECTRONICS DIV.	ABCEF GHK	1
	403955	. . . SUPPRESSOR, THRYECTOR, DIODE, G.E.	DJO	1
	402670	. . RECEPTACLE, 3-WIRE, 15A, 115V V74545, NO. 5000-M9		1
6	401532-2	. . . SUPPRESSOR, THYRECTOR, DIODE, V81483, NO. KZ4DTM	A-L	1
	366826-3	. . . SUPPRESSOR, THYRECTOR, DIODE	MNPQRS	1
7	402197-1	. . . TERMINAL, RECEPTACLE, V00779, NO. 61944-2	ABCEF GHK	2
	400647-5	. . . FUSE	DJO	1
	W-11166-4	. . . FUSE	NPQRS	1
8	401428-1	. . POTENTIOMETER, 10K OHM, 2W, V01121, NO. JAIN056S103UA	A-C,E-H,KM N-P,RS	1
9	405734	. . CLIP RETAINER, LEDV71744, 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

FIGURE ITEM NO.	HOBART PART NO.	NOMENCLATURE 1234567	EFF	UNITS PER ASSY
4-	**PANEL, FRONT ASSY (CONTINUED)**			
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		1
16	400642-3	. . VOLTMETER, DC, 0-50V, V60741, NO. PER HB DRAWING		1
17	16DA-2162	. . KNOB, RHEOSTAT, V44655, NO. 5150	A-C,E-H,K N-P,RS	1
	16DA-2162	. . KNOB, RHEOSTAT, V44655, NO. 5150	M	2
18	402658	. . HOLDER, FUSE, V71400, NO. HKP-HH		1
	402658	. . HOLDER, FUSE, V71400, NO. HKP-HH	BDGJO	2
19	W-11166-4	. . FUSE, FAST BLOW, V71400,NO. AGC-15		1
	400647-5	. . FUSE, 5A, 250V, V71400, NO. ABC-5	BDGJ	1
20	Delete			
21	400641-11	. . AMMETER, DC, 5O mV, V60741, NO. PER HB DRAWING		1
22	404172-3	. . LENS, LIGHT, PILOT, GREEN, V72619, NO. 26-1192-300		1
23	400613-3	. . LAMP, 28V, V71744, TYPE 757, STYLE T-3-1/4		1
24	489059	. . SERIAL NAMEPLATE	AFN	1
	489060	. . SERIAL NAMEPLATE	BGO	1
	489061	. . SERIAL NAMEPLATE	CEH,K-M	1
	489521	. . SERIAL NAMEPLATE	DJQ	1
25	400647-8	. . FUSE, 10-A, 250-V, V71400, NO. ABC-10	BGO	1
26	403091-2	. . PLUG, HOLE, V28520, NO. DP-500		1
* 27	403091-4	. . PLUG, HOLE, V28520, NO. DP-375DJ		1
* 28	401428-8	. POTENTIONMETER, 5K OHM, 2W	DJQ	1
* 29	406003-1	. STRIP, TERMINAL	S	1
* 30	181424	. LABEL, TERMINAL STRIP	S	1
* 31	403056-7	. RELAY, ENCLOSED	S	1

*** NOT ILLUSTRATED**

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.

PART NUMBER	FIGURE AND ITEM NUMBER	PART NUMBER	FIGURE AND ITEM NUMBER
1-45	100GH-112	1-3	283511
1-1	12CW-2170	1-3	283513
1-8	12TW-595-1	2-1	283530
4-17	16DA-2162	2-19	286810-1
4-17	16DA-2162	1-34	350488-94
1-24	16DA-3493	1-35	350488-94
1-14	180068	1-36	35154
1-57	180293	1-35	361052-9
2-12	180293	1-35	361052-9
1-57	180293A	4-6	366826-3
2-12	180293A	1-56	367228-3
1-54	180599-1	2-14	367228-3
1-54	180599-2	1-56	367228-4
1-54	180599A-1	2-14	367228-4
1-54	180599A-2	3-1	367634A-3
1-54	180599A-4	3-10	369641
4-1	181417	1-42	397752-1
1-40	181418	4-11	400400
4-	181418	1-50	400435
4-30	181424	4-23	400613-3
1-57	181589	4-14	400613-6
2-12	181589	4-21	400641-11
1-40	181598	4-16	400642-3
4-	181598	4-19	400647-5
4-1	181599	4-7	400647-5
1-10	181602	4-25	400647-8
3-5	280022	2-6	400663
1-54	283248-1	2-31	401428-1
1-54	283248-2	4-8	401428-1
1-11	283250	4-28	401428-8
1-5	283255	4-5	401532-2
1-4	283256	4-6	401532-2
1-55	283257	2-26	402037-13
1-12	283260	2-10	402037-23
1-42	283323	2-25	402037-8
1-10	283385	4-7	402197-1
1-5	283486	4-18	402658
1-3	283510	4-18	402658

PART NUMBER	FIGURE AND ITEM NUMBER	PART NUMBER	FIGURE AND ITEM NUMBER
4-5	402670	3-	487930-1
4-5	402670	1-16	487952
3-11	402832-3	1-13	487972
4-31	403056-7	1-41	487979
4-26	403091-2	3-2	487991
4-27	403091-4	1-5	488025
4-10	403189	1-56	488071
4-15	403247	2-14	488071
1-25	403765-2	1-13	488078
4-5	403955	4-1	488113
3-3	404044-3	1-13	488389
3-4	404044-6	1-42	488796
4-13	404172-2	1-43	488797
4-22	404172-3	1-40	489053
4-12	404173	4-	489053
4-3	404277	1-3	489054
4-3	404335	1-3	489055
4-5	404336	2 -	489055
1-20	404605-5	1-40	489056
2-4	404605-5	4-	489056
1-6	404880-3	1-3	489058
2-13	404915-1	4-24	489059
4-4	405072-2	4-24	489060
2-18	405117-2	4-24	489061
3-15	405129-1	2-16	489504
1-17	405278-7	1-13	489517
1-17	405278-7	4-24	489521
4-9	405734	1-40	489522-1
4-29	406003-1	4-	489522-1
2-2	406392-1	1-3	489523
2-2	406392-2	2-9	50MS-732-0
2-28	406484	2-9	50MS-732-0
2-6	406587	1-51	5CW-2127
2-32	406807-1	1-44	5CW-975
2-22	408451	1-52	5CW-976A
1-27	486143-2	1-15	60GHP-424
1-22	487050-2	2-30	81626
1-2	487807	1-37	81B-1061
1-4	487808	2-27	81B-1061
1-9	487811	2-29	82B-1023
1-11	487812	1-39	83A-1105
1-12	487813	1-28	83B-1079
2-11	487815	1-31	83B-1100-1
4-1	487816	1-32	83B-1100-2
2-17	487897	1-28	83B-1101
2-20	487898	2-21	83B-1108
2-23	487899	4-2	83C-1085
1-26	487901	2-22	84B-1005
2-1	487904	2-22	84B-1032
2-24	487917	1-7	8RT-609
1-10	487923	1-33	910225-2
1-22	487930-1	1-49	A-897-1

PART NUMBER	FIGURE AND ITEM NUMBER	PART NUMBER	FIGURE AND ITEM NUMBER
1-23	AAW-1199		
1-	S-6732A-1		
1-	S-6732A-2		
1-	S-6732A-3		
1-	S-6732A-4		
1-	S-6732A-5		
1-	S-6732B-1		
1-	S-6732B-2		
1-	S-6732B-3		
1-	S-6732B-4		
1-	S-6732B-5		
1-	S-6732B-6		
1-	S-6732C-1		
1-	S-6732C-2		
1-	S-6732C-3		
1-	S-6732C-4		
1-	S-6732C-5		
1-	S-6732C-6		
1-	S-7011-2		
1-21	W-10386-10		
2-5	W-10386-10		
1-21	W-10386-13		
2-5	W-10386-13		
1-21	W-10386-9		
2-5	W-10386-9		
3-6	W-11097-6		
2-7	W-11114-5		
2-3	W-11166-11		
4-19	W-11166-4		
4-7	W-11166-4		
3-16	W-11166-9		
3-7	W-11242-10		
1-29	W-11242-14		
2-15	W-11242-5		
3-12	W-11242-6		
3-13	W-11254-5		
3-8	W-11254-6		
2-8	W-11263-4		
3-9	W-11278-1		
3-14	W-11278-6		

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Chapter 5. Optional Equipment

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

OPTION	PART NO.	MANUAL
Kit, 14-V DC Option	283532	TO-156
Kit, Snow Shield Assembly	489518	TO-166
Kit, Riser	284389-1	TO-230

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Chapter 6. Manufacturer's Literature

	DIAGRAMS FOR 6732A-1/6732B-1/6732C-1	
489040	6732A-1/6732B-1/6732C-1	Schematic
489041	6732A-1/6732B-1	Connection
487987	6732A-1/6732B-1	Voltage Changeover
283528	6732C-1	Connection
283519	6732C-1	Voltage Changeover
	DIAGRAMS FOR 6732A-2/6732B-2/6732C-2	
489043	6732A-2/6732B-2/6732C-2	Schematic
489042	6732A-2/6732B-2	Connection
488070	6732A-2/6732B-2	Voltage Changeover
283529	6732C-2	Connection
283520	6732C-2	Voltage Changeover
	DIAGRAMS FOR 6732A-3/6732B-3/6732C-3	
489040	6732A-3/6732B-3/6732C-3	Schematic
489041	6732A-3/6732B-3	Connection
488388	6732A-3/6732B-3	Voltage Changeover
283528	6732C-3	Connection
283521	6732C-3	Voltage Changeover
	DIAGRAMS FOR 6732A-4/6732B-4/6732C-4	
489040	6732A-4/6732B-4/6732C-4	Schematic
489041	6732A-4/6732B-4	Connection
489531	6732A-4/6732B-4	Voltage Changeover
283528	6732C-4	Connection
283522	6732C-4	Voltage Changeover
	DIAGRAMS FOR 6732A-5/6732B-5/6732C-5	
489040	6732A-5/6732B-5/6732C-5	Schematic
489041	6732A-5/6732B-5	Connection
488070	6732A-5/6732B-5	Voltage Changeover
283528	6732C-5	Connection
283520	6732C-5	Voltage Changeover

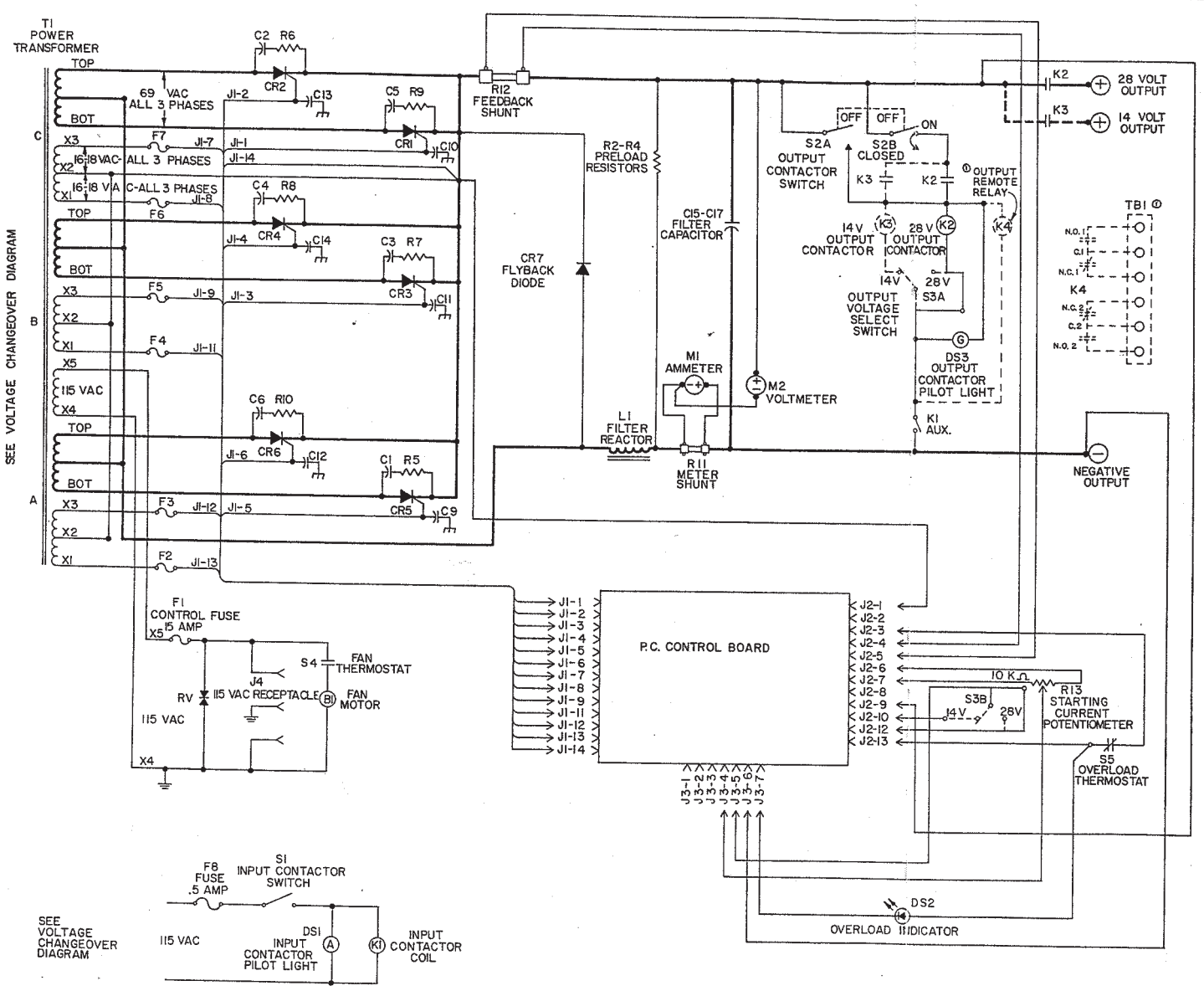
(Continued on Next Page)

DIAGRAMS FOR 6732B-6/6732C-6

489040	6732A-6/6732B-6/6732C-6	Schematic
489041	6732A-6/6732B-6	Connection
488388	6732A-6/6732B-6	Voltage Changeover
283528	6732C-6	Connection
283521	6732C-6	Voltage Changeover

DIAGRAMS FOR 7011A-1/7011A-2

181597	7011A-1/7011A-2	Schematic
283527	7011A-1/7011A-2	Connection
283521	7011A-1/7011A-2	Voltage Changeover



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
K3	CONTACTOR, 14 VOLT, OUTPUT (WHEN FURN.)
① K4	RELAY, REMOTE, OUTPUT (WHEN FURN.)
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
S3	SWITCH, OUTPUT VOLTAGE SELECT (WHEN FURN.)
S4	THERMOSTAT, FAN
S5	THERMOSTAT, OVERLOAD TEMPERATURE
T1	TRANSFORMER, POWER
① TB1	TERMINAL BLOCK, 6 STATION (WHEN FURN.)

① ADDED K4 & TB1 TO LEGEND & PICTORIALLY

489040

CHANGE RECORD						WHERE USED		
No.	E.C. No.	DATE	No.	E.C. No.	DATE	NEXT ASSY.	NO. REQ.	USED ON
1	11384	9-6-88	13			SPEC 6732A	1	GPU 400

PROTECTIVE FINISH

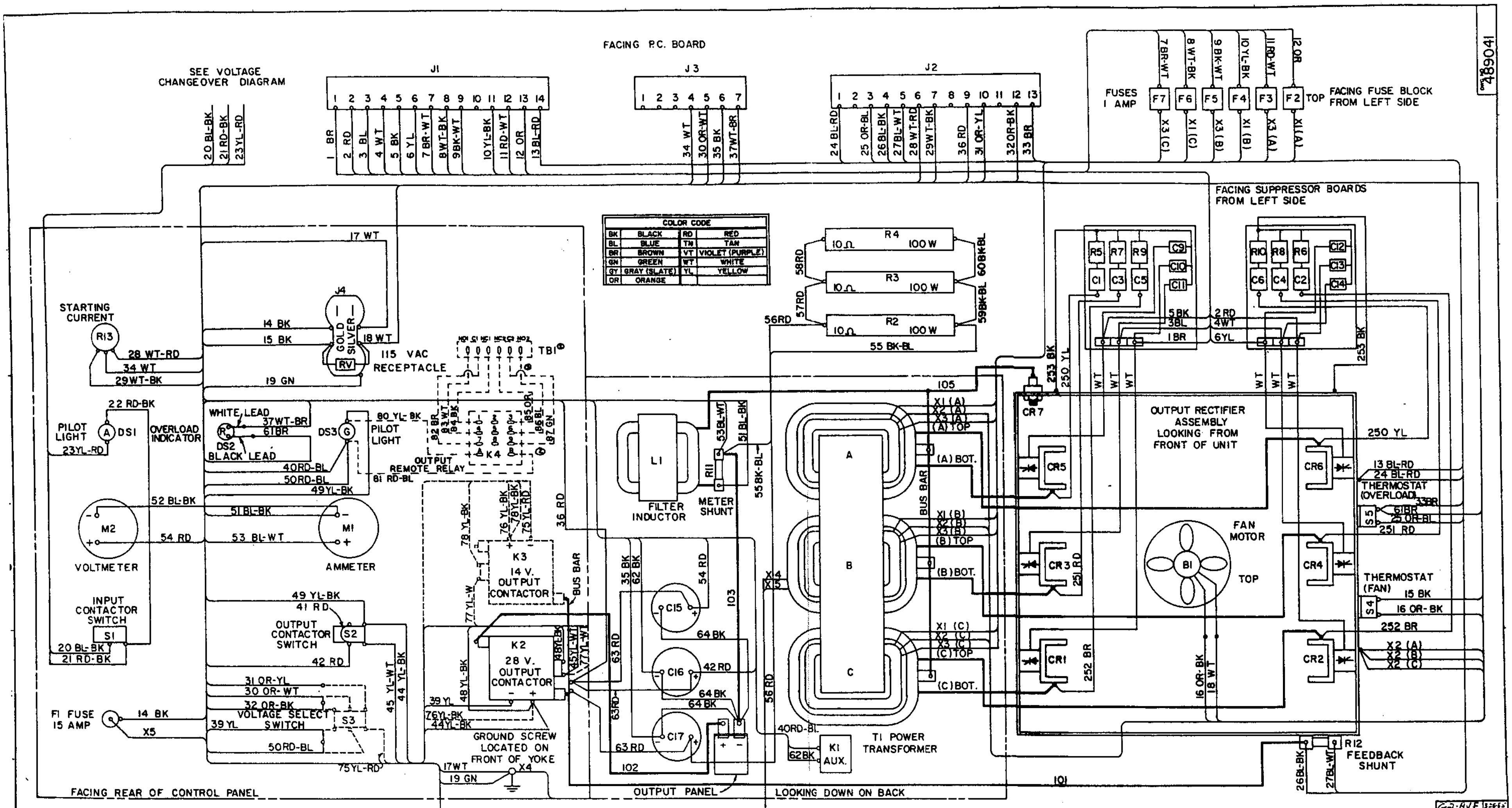
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES/MILLIMETERS TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DO NOT SCALE DRAWING
FRACTIONAL ± — INCH .00 ± .01 .000 ± .003 METRIC 0 ± 1.0 mm .0 ± 0.4 mm .00 ± 0.1 mm
ANGLES ± 30' SURFACE TEXTURE √

ACTIVITY | REPLACED BY | REPLACES | QUANTITY/U M | COMM.CLS.
MATERIAL NO. | MATERIAL SPEC.
TITLE DIAGRAM, SCHEMATIC
INDEX DATA GPU 400 A
DESIGNED DJB | DRAWN MLB | DATE 3-19-85 | SCALE
CHECKED JRH | DATE 3-20-85 | APPROVED | BASED ON 488960
RECEIPT | MFG. ENGRG. | M P | LT. | REVISION

HOBART BROS. CO. TROY, OHIO 45373 U.S.A.
SIZE D | DWG NO. 489040

82-TEST	2	
82-545	12-13	
SERVICE		

PRODUCT CODE | DISTRIBUTION TABLE | OUTSIDE DISTR



LEGEND

B1	FAN MOTOR
C1-C6	CAPACITOR, SUPPRESSION, .047 MFD, 400 WVDC
C9-C14	CAPACITOR, H.F. SUPPRESSION, .047 MFD, 250 V DC
C15-C17	CAPACITOR, FILTER, 115,000 MFD, 40 VDC
CR1-CR6	SILICON CONTROL RECTIFIER
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
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
K3	CONTACTOR, 14 VOLT, OUTPUT (WHEN FURN.)
K4 ②	RELAY, REMOTE, OUTPUT (WHEN FURN.)
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
S3	SWITCH, OUTPUT VOLTAGE SELECT (WHEN FURN.)
S4	THERMOSTAT, FAN
S5	THERMOSTAT, OVERLOAD TEMPERATURE
T1	TRANSFORMER, POWER
TB1 ②	TERMINAL BLOCK, 6 STATION (WHEN FURN.)

② ADDED K4 & TB1 PICTORIALLY & TO LEGEND, ALSO ADDED WIRES 80 YL-BK, 81 RD-BL, 82 BR, 83 WT, 84 GY, 85 OR, 86 BL, 87 GN

① "SEE VOLTAGE CHANGE OVER DIAGRAM" WAS "SEE VOLTAGE CHANGE OVER DIAGRAM 487967"; 23 YL-RD WAS 23 BL; 37 WT-BR WAS 37 WT; 40 RD-BL WAS 40 BK; 50 RD-BL WAS 50 BK.

TITLE DIAGRAM, CONNECTION

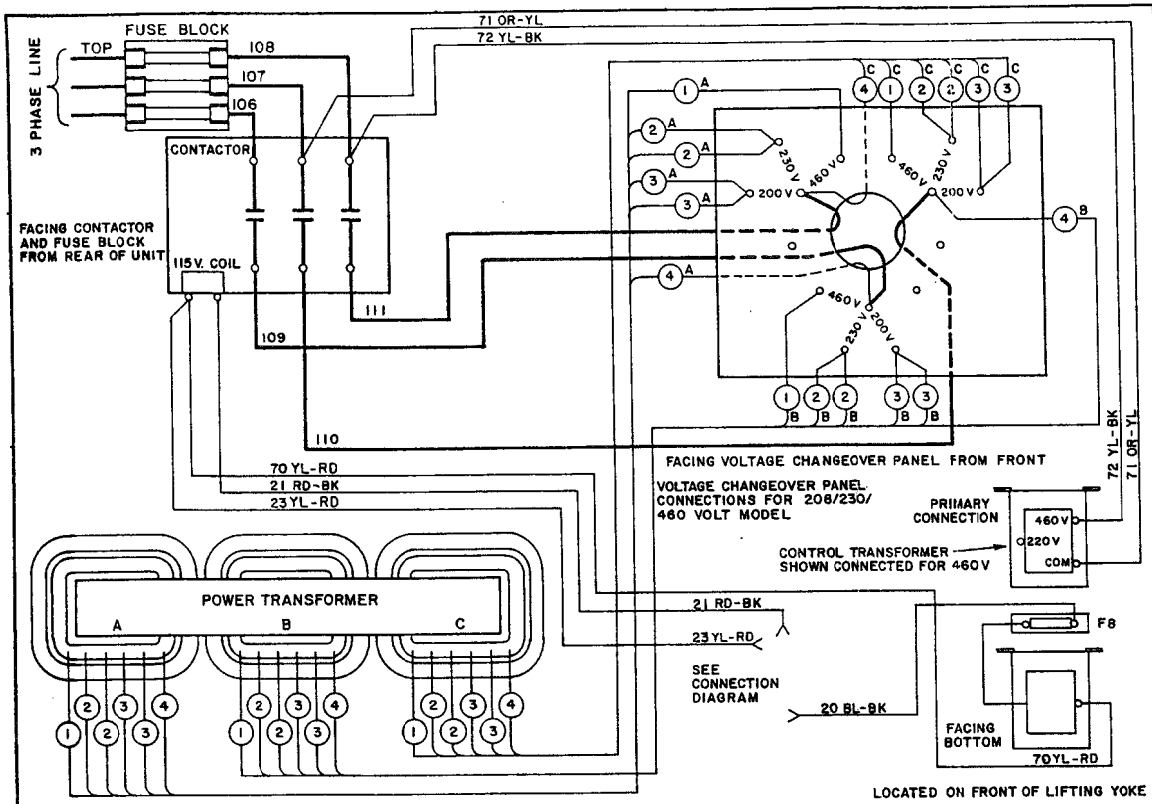
MODEL DATA GPU 400 A

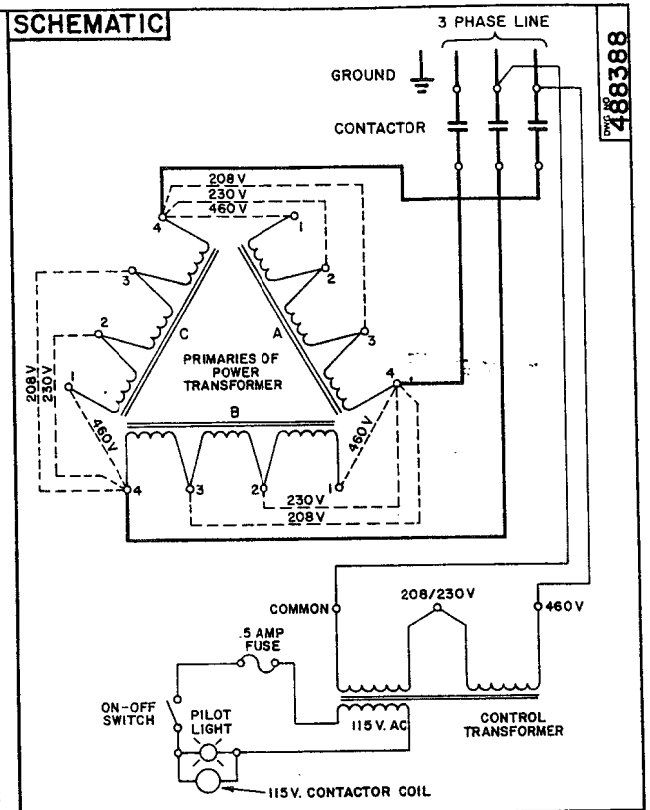
WHERE USED: NEXT ASSY SPEC 6732A — USED ON GPU 400

DRAWN MLB — DATE 3-19-85 — CHECKED DDB — DATE 3-21-85

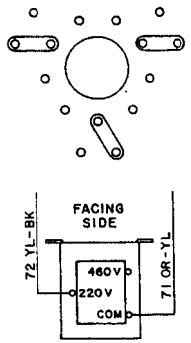
HOBART BROS. CO. TROY, OHIO 45373 U.S.A.

SIZE D — DWG NO 489041





LINKS FOR 208 VOLT LINE

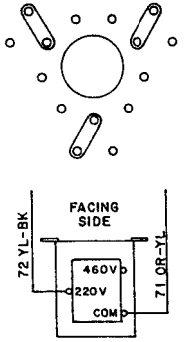


CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 220 V

FIG. 1

LINKS FOR 230 VOLT LINE

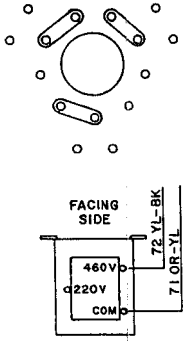


CONTROL TRANSFORMER CONNECTION

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

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

① 23YL-RD WAS 23BK; 70YL-RD WAS 70BK

GA-HUF	5-10-84	
GB-S	5-16-84	
GB-TEST	5-17-84	
02-545	12-18-84	
SERVICE		
OUTSIDE DISTR		

PRODUCT CODE

DISTRIBUTION TABLE

PROTECTIVE FINISH

CHANGE RECORD

No.	E.C. No.	DATE	No.	E.C. No.	DATE
1	02916	7-23-87	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-6732-3	1	

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 √

M | COMM.CLS.

ACTIVITY	REPLACED BY	REPLACES	QUANTITY/U.M.

MATERIAL NO. | MATERIAL SPEC.

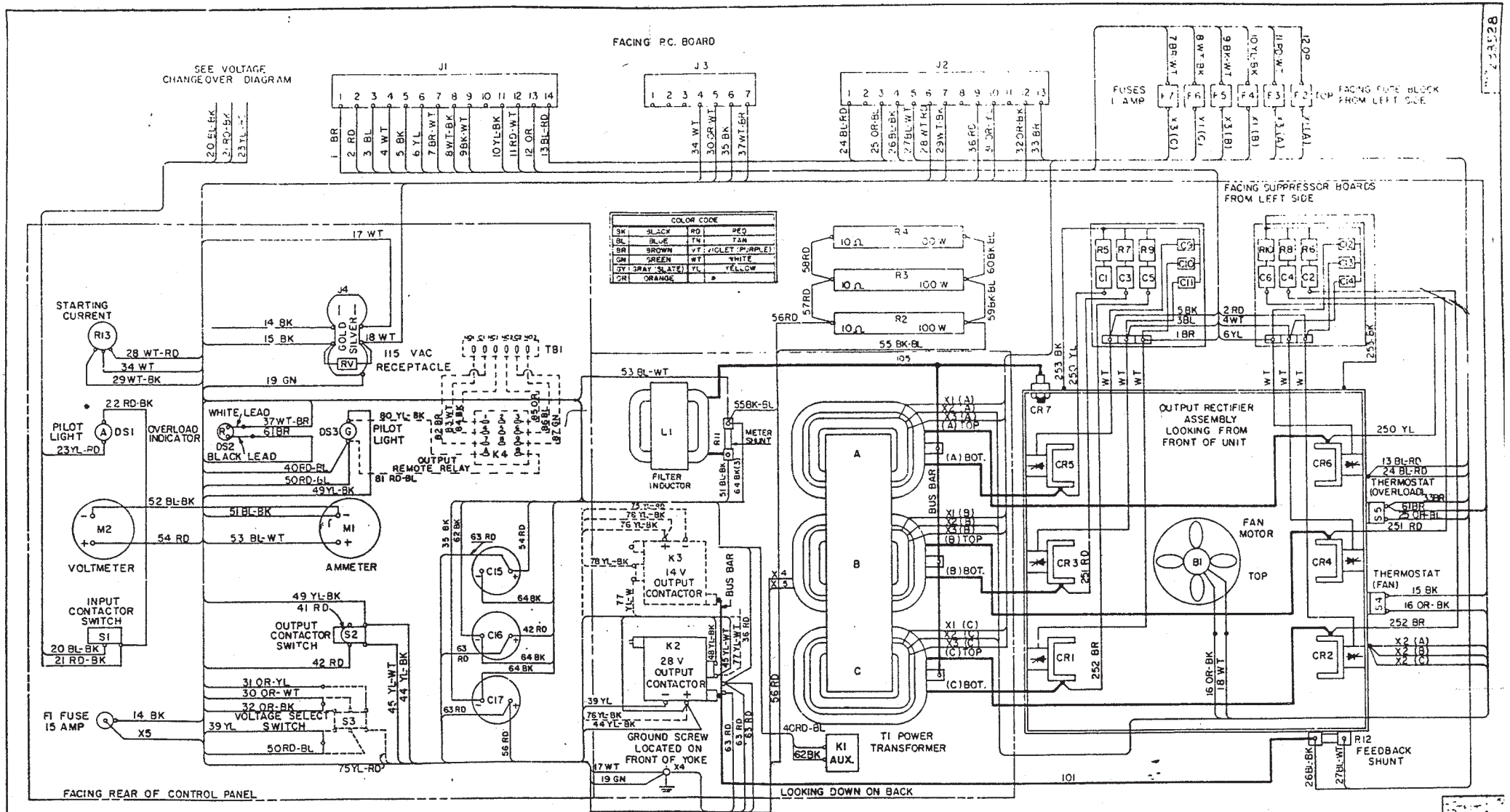
TITLE DIAGRAM, VOLTAGE CHANGEOVER

INDEX DATA GPU 400, 208/230/460V, 60HZ

DESIGNED	DRAWN	DATE	SCALE
JKC/JBI	JBI	5-9-84	—
CHECKED	DATE	APPROVED	BASED ON
JWB	5-10-84	JWB	
RECORDS	MFG. ENGRG.	M. F.	I.T.
AFS			REVISION

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

SIZE C | DWG. NO 488388



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 RECTIFIER
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
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
K3	CONTACTOR, 14 VOLT, OUTPUT (WHEN FURN.)
K4 ⊘	RELAY, REMOTE, OUTPUT (WHEN FURN.)
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
S3	SWITCH, OUTPUT VOLTAGE SELECT (WHEN FURN)
S4	THERMOSTAT, FAN
S5	THERMOSTAT, OVERLOAD TEMPERATURE
T1	TRANSFORMER, POWER
T81 ⊘	TERMINAL BLOCK, 6 STATION (WHEN FURN.)

PROTECTIVE FINISH

CHANGE RECORD

No.	EC No.	DATE	No.	EC 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		

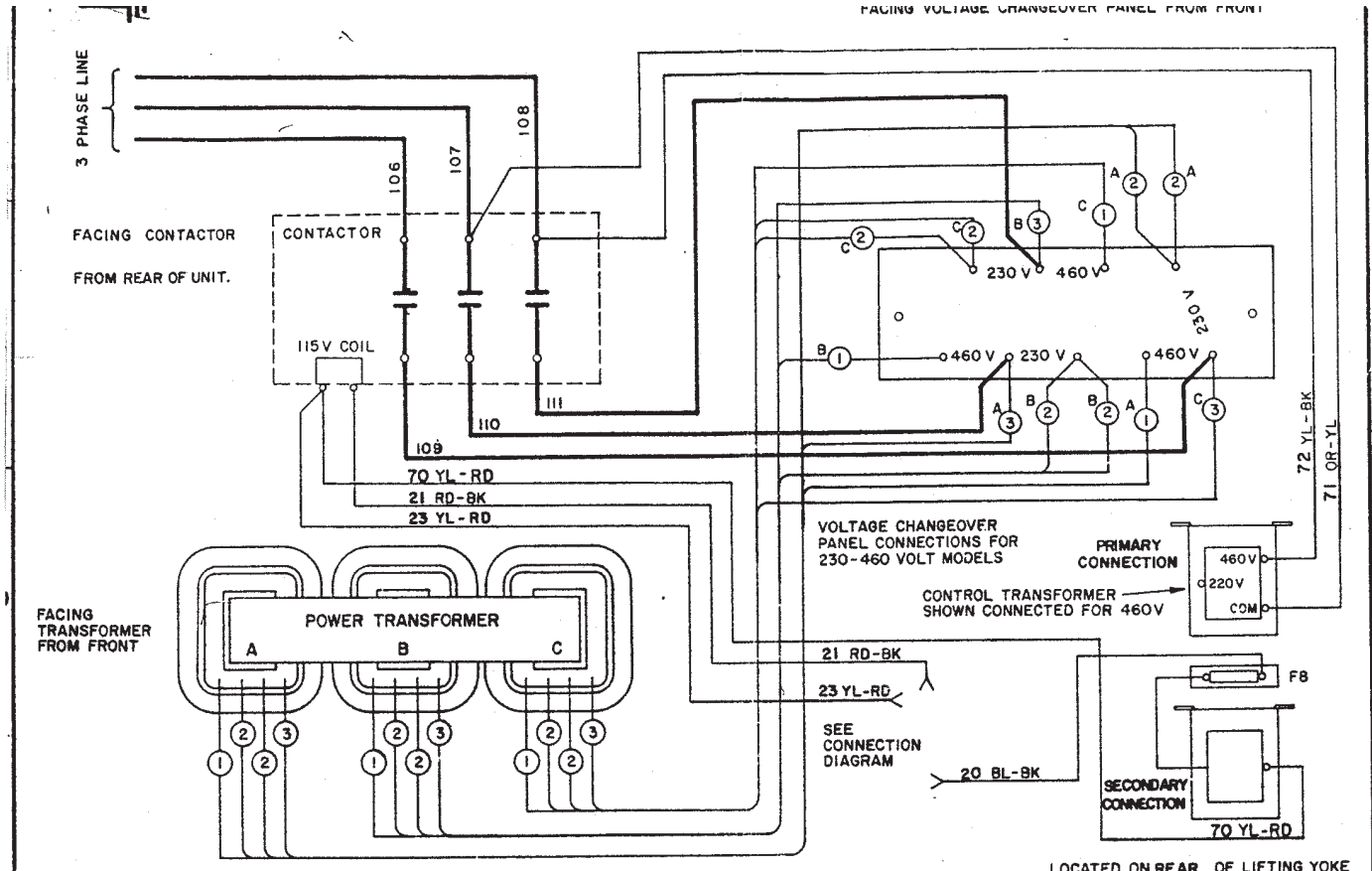
WHERE USED

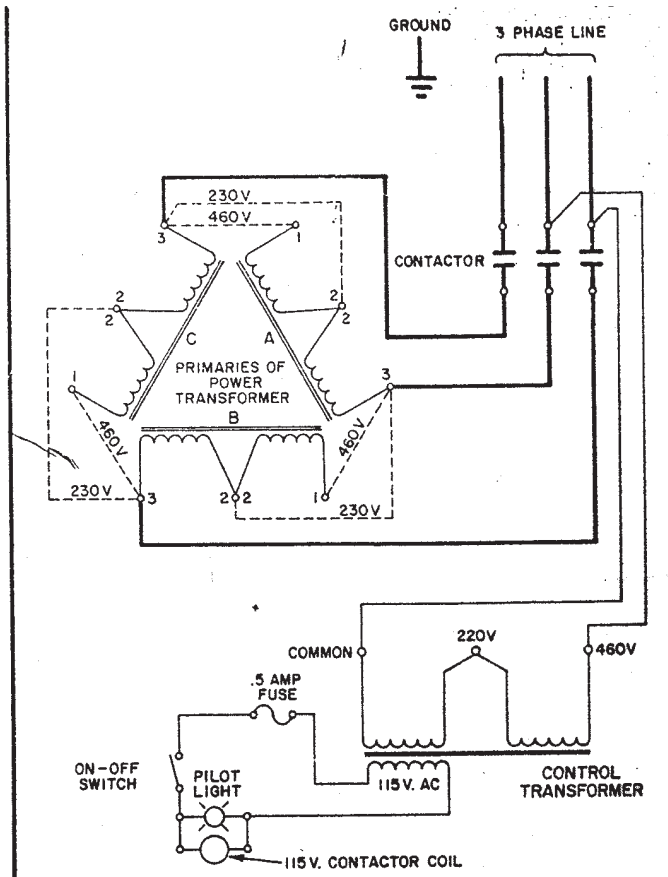
GPU 400

DIAGRAM, CONNECTION GPU 400 A

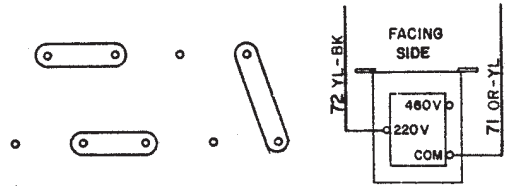
HOBART BROS. CO. TROY, OHIO 45373 U.S.A.

283528





LINKS FOR 230 VOLT LINE

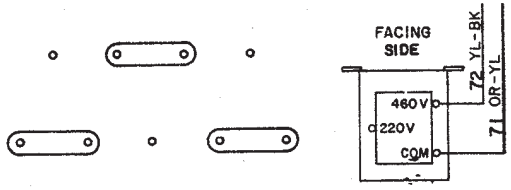


CONTROL TRANSFORMER CONNECTIONS

CONNECT 72 YL-BK TO TERMINAL MARKED 220V

FIG. 1

LINKS FOR 460 VOLT LINE



CONTROL TRANSFORMER CONNECTIONS

CONNECT 72 YL-BK TO TERMINAL MARKED 460V

FIG. 2

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 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

L-23 12-91
LATEST
CHANGE
SERVICE
OUTSIDE DISTR.
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
SPEC 6732C	1	GPU 400

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	

ACTIVITY: M | REPLACED BY | REPLACES | ACCESS NO. 1474

MATERIAL NO | MATERIAL SPEC

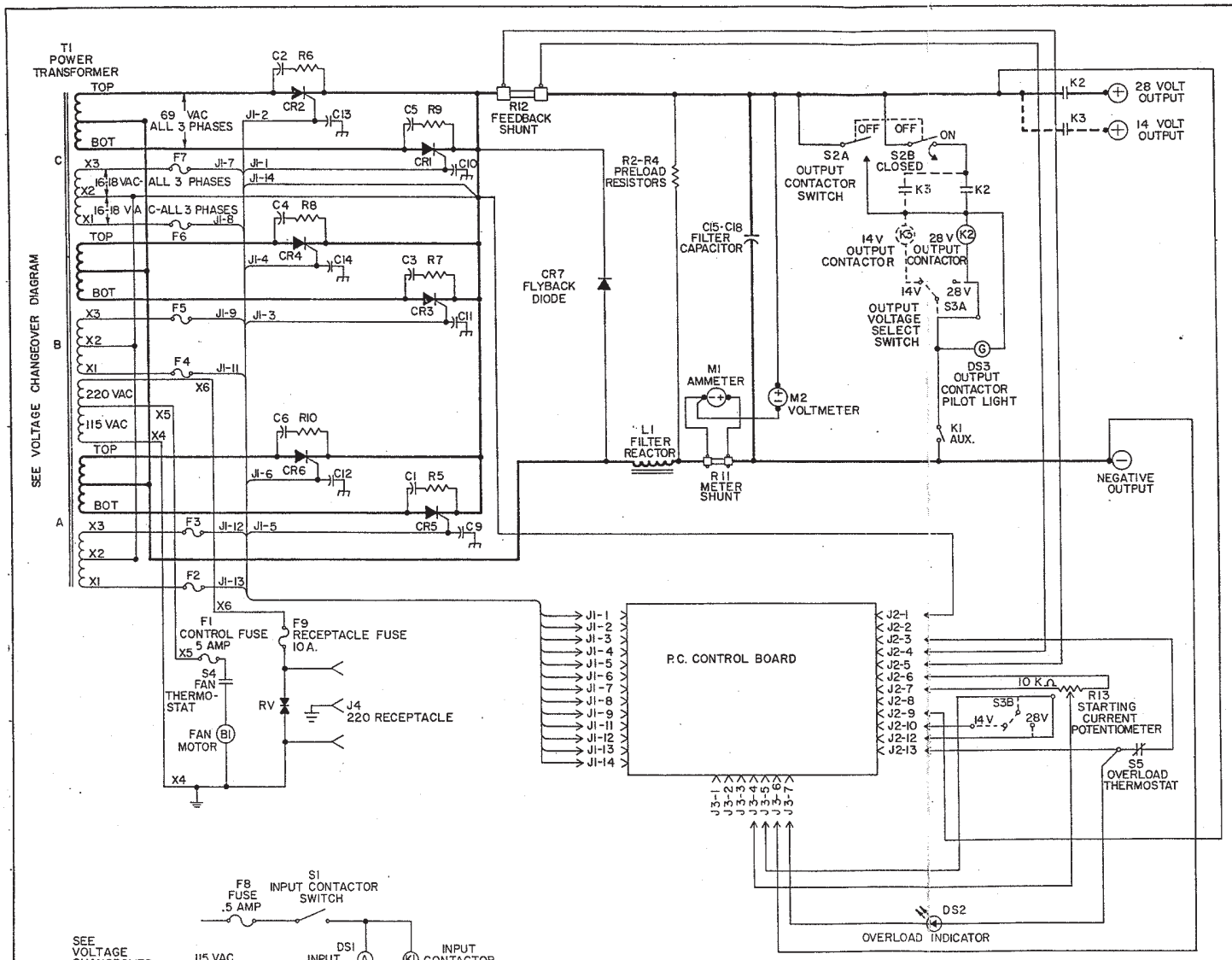
TITLE DIAGRAM, VOLTAGE CHANGEOVER

INDEX DATA GPU 400 A

DESIGNED	DRAWN	DATE	SCALE
DAS	DAS	9-1-91	
CHECKED	DATE	APPROVED	1487
RECORDS SLS	DATE	M. F.	PI

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

SIZE C | DWG. NO 283519



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
K3	CONTACTOR, 14 VOLT, OUTPUT (WHEN FURN.)
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
S3	SWITCH, OUTPUT VOLTAGE SELECT (WHEN FURN.)
S4	THERMOSTAT, FAN
S5	THERMOSTAT, OVERLOAD TEMPERATURE
T1	TRANSFORMER, POWER

DWG NO 489043

G2-TEST 12-86
02-247 12-88
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
SPEC 6732-2	1	GPU 400

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
A ———	.00 ± .01 .000 ± .002	0 ± 0.5 mm .00 ± 0.4 mm .000 ± 0.1 mm
ANGLES ± 30'	SURFACE TEXTURE √	

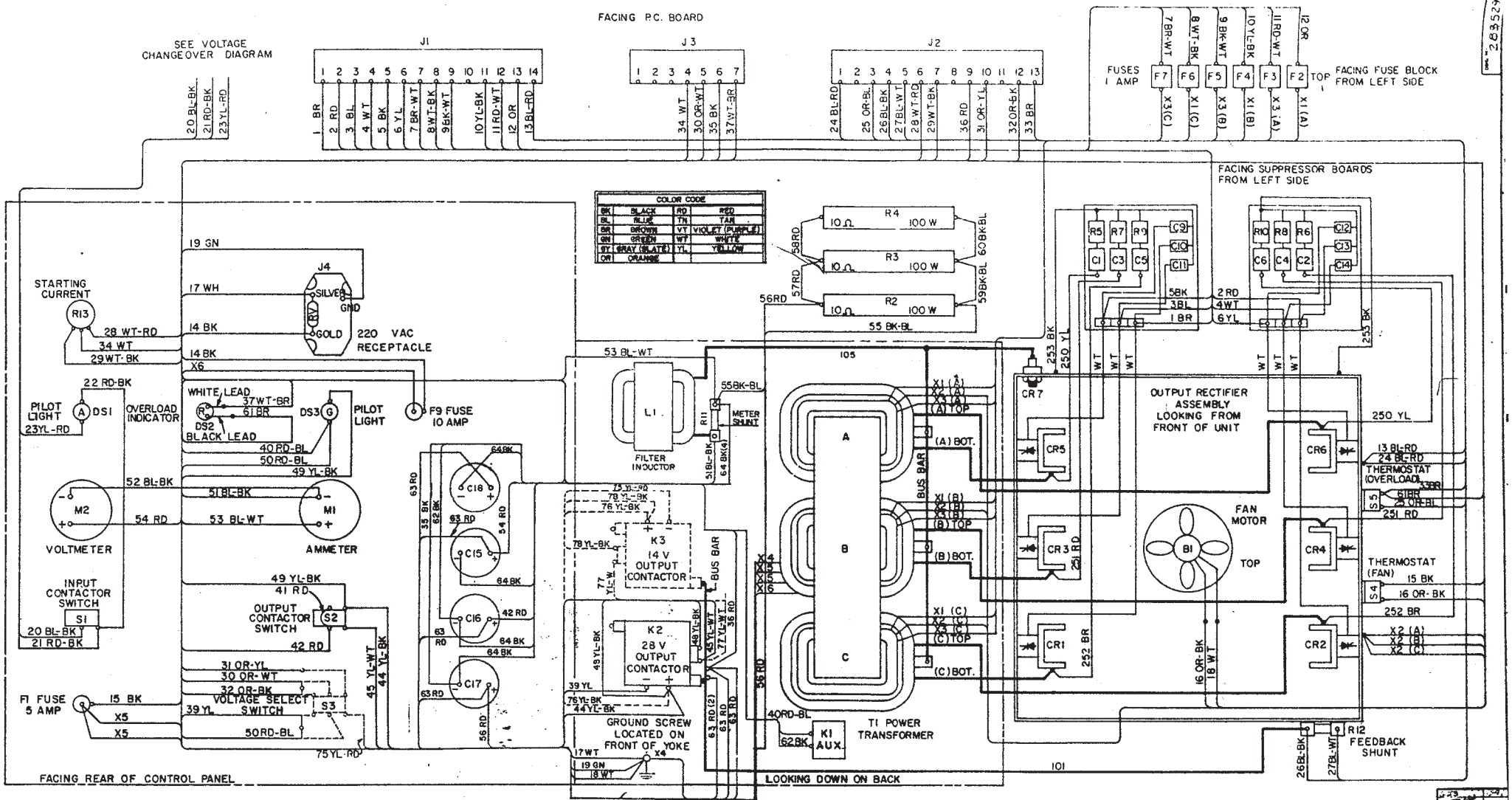
ACTIVITY | REPLACED BY | REPLACES | COMM.CLS. | QUANTITY/M

MATERIAL NO | MATERIAL SPEC

TITLE DIAGRAM, SCHEMATIC
INDEX DATA GPU 400 A, 50 HZ.

DESIGNED	DRAWN	DATE	SCALE
DDB	MLB	3-19-85	
CHECKED	APP'D	APPROVED	MASTER
JBM	3-20-85		489043
RECORDS	MFG ENGRG.	M.P.	I.T.	REVISION
HFS				

HOBART BROS. CO. TROY, OHIO 45373 U.S.A.
SIZE D DWG NO 489043



LEGEND

BI	FAN MOTOR	F1	FUSE, 5 AMP, CONTROL	R2-R4	PRELOAD RESISTORS
		F2-F7	FUSE, 1 AMP, PC BOARD CONTROL	R5-R10	RESISTORS, SUPPRESSION, 50 OHMS, 5 WATT
C1-C6	CAPACITOR, SUPPRESSION, .047 MFD, 400 WVDC	F9	FUSE, 10 AMP, RECEPTACLE	RII	SHUNT, METER
C9-C14	CAPACITOR, H.F. SUPPRESSION, .047 MFD, 250 V DC	J1	14 PIN RECEPTACLE, PC BOARD	R12	SHUNT, FEEDBACK
C15-C18	CAPACITOR, FILTER, 115,000 MFD, 40 VDC	J2	13 PIN RECEPTACLE, PC BOARD	R13	POTENTIOMETER, STARTING CURRENT
		J3	7 PIN RECEPTACLE, PC BOARD	RV	SUPPRESSOR, 220 VOLT CIRCUIT
CR1-CR6	SILICON CONTROL RECTIFIER	J4	220 VOLT AC RECEPTACLE		
CR7	FLYBACK DIODE	KI	CONTACTOR, INPUT	SI	INPUT CONTACTOR, ON-OFF SWITCH
		K2	CONTACTOR, 28 VOLT, OUTPUT	S2	SWITCH, OUTPUT CONTACTOR
DS1	PILOT LIGHT, AMBER, INPUT CONTACTOR	K3	CONTACTOR, 14 VOLT, OUTPUT (WHEN FURN.)	S3	SWITCH, OUTPUT VOLTAGE SELECT (WHEN FURN.)
DS2	OVERLOAD INDICATOR, RED (LED)			S4	THERMOSTAT, FAN
DS3	PILOT LIGHT, GREEN, OUTPUT CONTACTOR	LI	FILTER REACTOR, CHOKE	S5	THERMOSTAT, OVERLOAD TEMPERATURE
		MI	AMMETER, 0-1600 AMPS	TI	TRANSFORMER, POWER
		M2	VOLTMETER, 0-50 VOLTS		

PROTECTIVE FINISH

CHANGE RECORD

WHERE USED

NEXT ASSY SPEC 87326 | NO REQ 1 | USED ON GPU 400

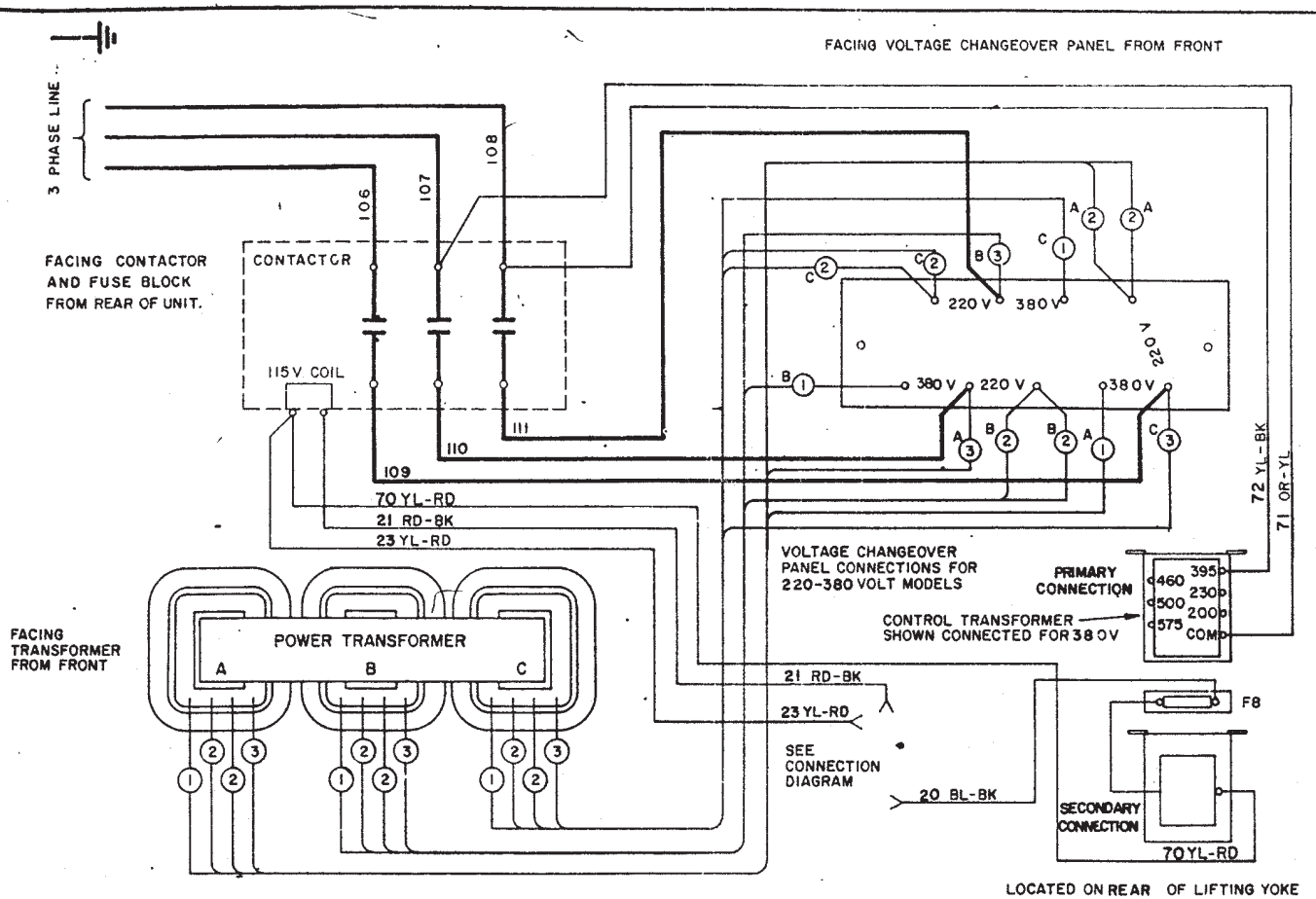
UNLESS OTHERWISE SPECIFIED

DIAGRAM, CONNECTION

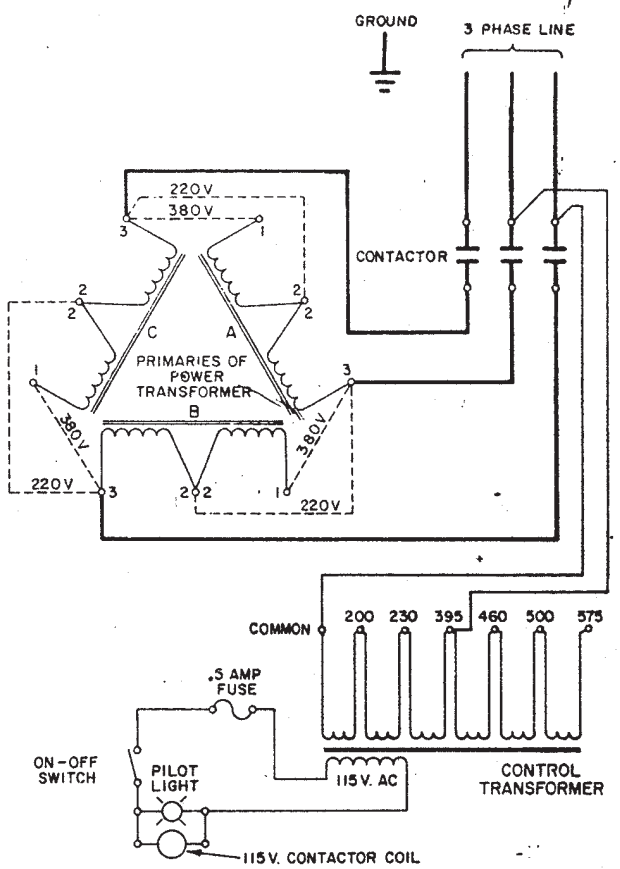
GPU 400 A-50 W.Z.

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

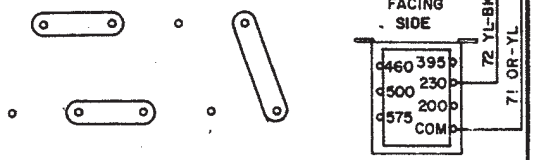
285529



SCHEMATIC



LINKS FOR 220 VOLT LINE

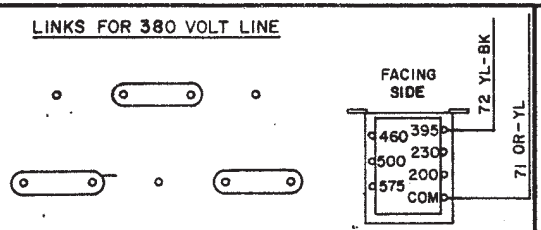


CONTROL TRANSFORMER CONNECTIONS

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** 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 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

G25 10-91
GATEST
GAGE
SERVICE

OUTSIDE DISTR.
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
SPEC 6732C	1	GPU 400

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	0 - 1.0 mm
	.000 - .003	0.0 - 0.4 mm
		0.00 - 0.1 mm

ANGLES ±30 | SURFACE TEXTURE

ACTIVITY	M	ACCESS NO.	1474
	REPLACED BY	REPLACES	QUANTITY/UM
MATERIAL NO	MATERIAL SPEC		

TITLE DIAGRAM, VOLTAGE CHANGEOVER

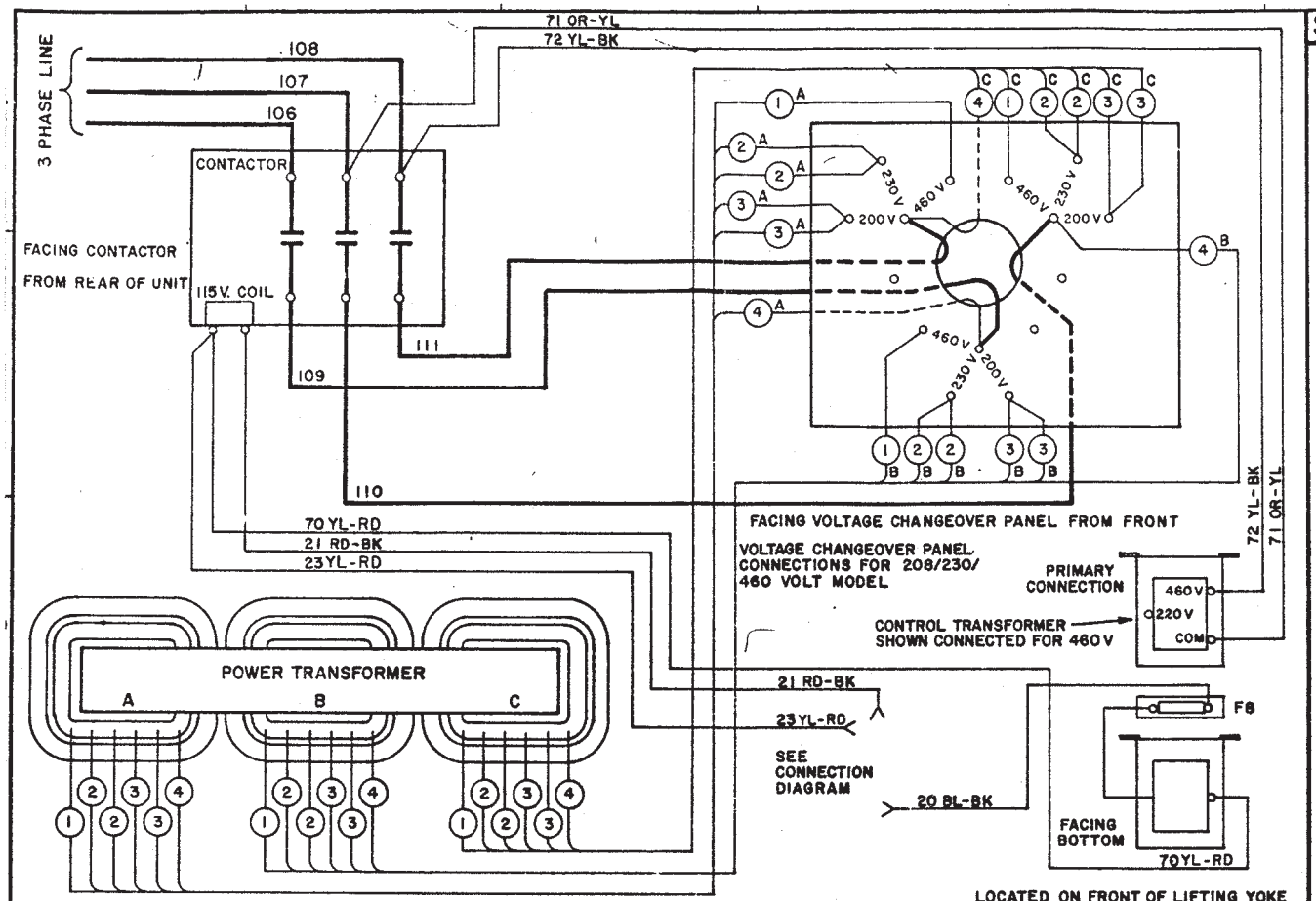
INDEX DATA GPU 400 A, 50 HZ.

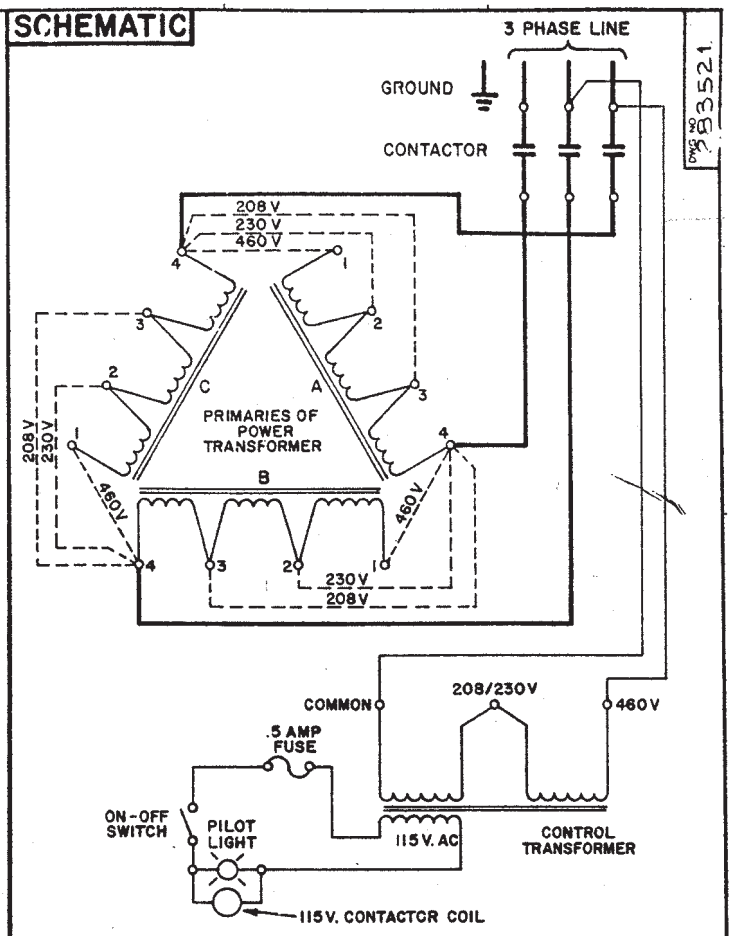
DESIGNED	DRAWN	DATE	SCALE
DAS	DAS	9-1-91	
CHECKED	DATE	APPROVED	
			488070
RECORDS	DATE		
525			

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

SIZE C

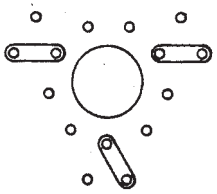
DWG NO 283520

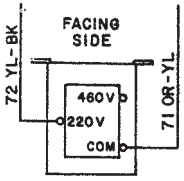




DWG NO 283521

LINKS FOR 208 VOLT LINE



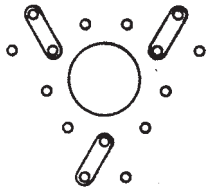


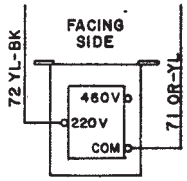
CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 220 V

FIG. 1

LINKS FOR 230 VOLT LINE



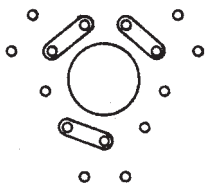


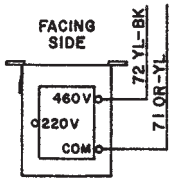
CONTROL TRANSFORMER CONNECTION

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

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

G25 10-91
G-2 EST
G-2 HP
SERVICE
OUTSIDE DISTR
PRODUCT CODE
DISTRIBUTION TABLE

PROTECTIVE FINISH — M — COMM.CLS. 149K

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-6732C	1	

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	

ACTIVITY	REPLACED BY	REPLACES	QUANTITY/U M

MATERIAL NO. — MATERIAL SPEC

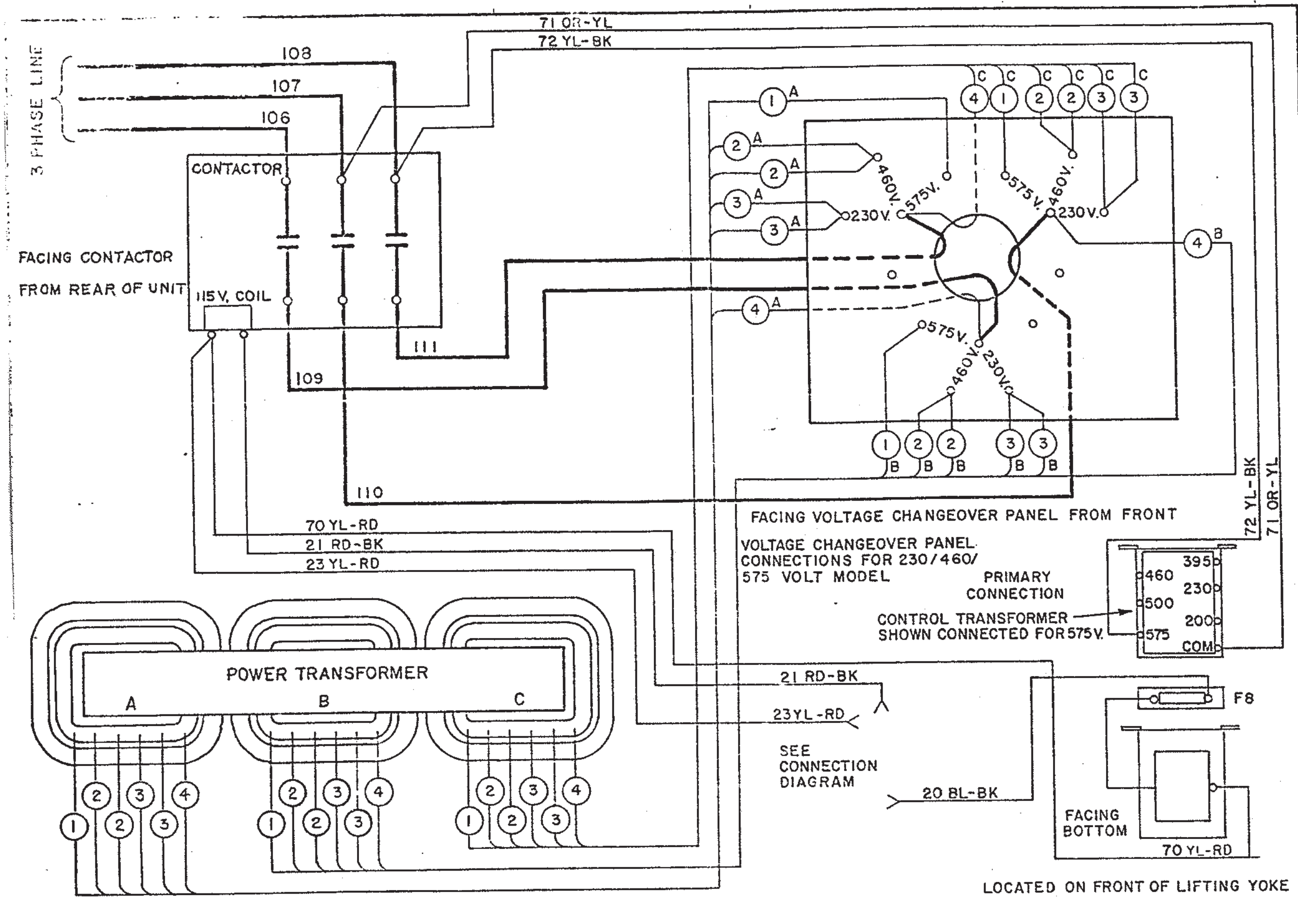
TITLE DIAGRAM, VOLTAGE CHANGEOVER
INDEX DATA GPU 400, 208/230/460V, 60 HZ

DESIGNED	DRAWN	DATE	SCALE
DAS	DAS	9-1-91	

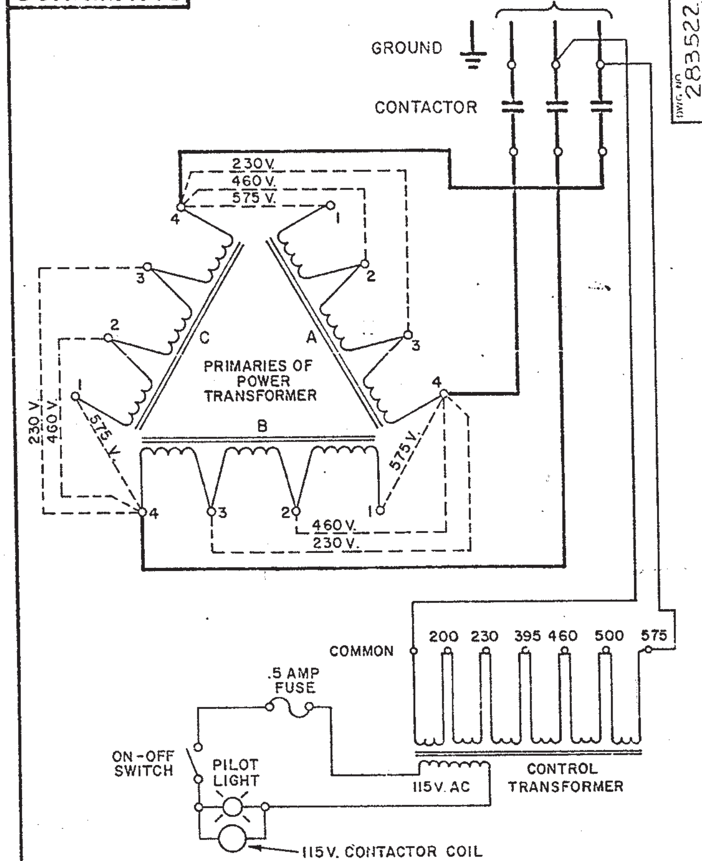
CHECKED — BASED ON 488388

RECORDS — MFG ENGRG. — M.F. — REVISION H

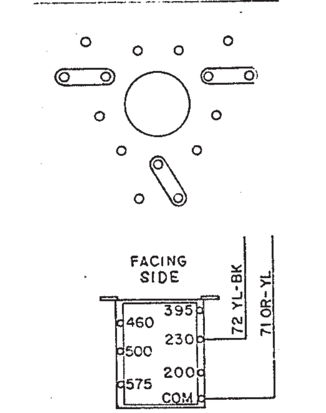
HOBART BROS. CO. TROY, OHIO 45373 U.S.A. — SIZE C — DWG NO 283521


3 PHASE LINE
108
107
106
CONTACTOR
FACING CONTACTOR
FROM REAR OF UNIT
115V. COIL
111
109
110
71 OR-YL
72 YL-BK
70 YL-RD
21 RD-BK
23 YL-RD
POWER TRANSFORMER
A
B
C
21 RD-BK
23 YL-RD
SEE CONNECTION DIAGRAM
20 BL-BK
FACING VOLTAGE CHANGEOVER PANEL FROM FRONT
VOLTAGE CHANGEOVER PANEL CONNECTIONS FOR 230/460/575 VOLT MODEL
PRIMARY CONNECTION
CONTROL TRANSFORMER SHOWN CONNECTED FOR 575V.
460V.
575V.
230V.
F8
FACING BOTTOM
70 YL-RD
LOCATED ON FRONT OF LIFTING YOKE

SCHEMATIC



LINKS FOR 230 VOLT LINE

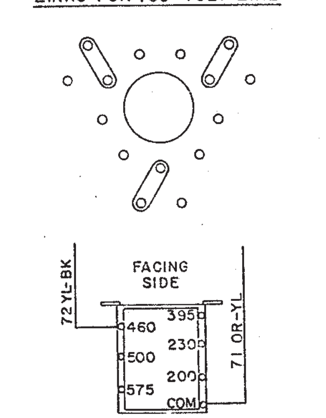


CONTROL TRANSFORMER CONNECTION

CONNECT 72 YL-BK TO TERMINAL MARKED 230 V

FIG. 1

LINKS FOR 460 VOLT LINE

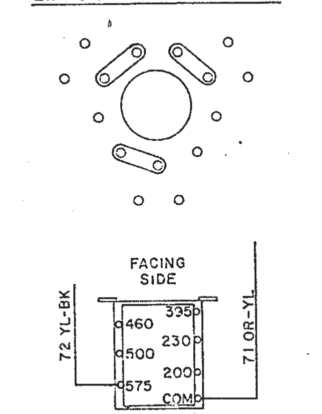


CONTROL TRANSFORMER CONNECTION

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

DIAGRAM, VOLTAGE CHANGEOVER
GPU 400, 230/460/575 V. 60 HZ

NEXT ASSY: S-6732C

DRAWN: DAS | CHECKED: DAS | DATE: 9-1-91 | 4E

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

C 283522

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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