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Revised 062284
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Revised 031385
Revised 042485
Revised 062885
Revised 071585
Revised 082285

# OPERATION AND MAINTENANCE MANUAL

with

# ILLUSTRATED PARTS LIST

for

# JET-EX 3

## GENERATOR SETS

SPECIFICATION SERIES NO. 6272-1 thru 4

HOBART BROTHERS COMPANY
POWER SYSTEMS DIVISION
TROY, OHIO 45373
U.S.A.

HOBART®
GROUND POWER

# Safety Warnings and Cautions

**WARNING**

**CALIFORNIA PROPOSITION 65 - GASOLINE ENGINES.** The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**WARNING**

**CALIFORNIA PROPOSITION 65 - DIESEL ENGINES.** Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

**WARNING**

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

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

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

**IMPORTANT**

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

## 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.

## 3. Service and Maintenance

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

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

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

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

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

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

## 4. 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.

## 5. 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.

## 6. 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.

## 7. 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.**

## 8. Equipment Precautionary Labels

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

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# INTRODUCTION

This manual contains operation and service information for 28.5 V DC Generator sets identified as Jet Ex 3. These units are available as stationary, skid-mounted units, or they may be trailer-mounted for portability. Both versions are available with 14 V DC output capability.

Most information in the manual applies to the 28.5 V Jet Ex in general. Information which applies to options and special equipment is identified as such.

The primary purpose of the manual is to provide information and instructions to experienced operators, electricians, and mechanics who are not familiar with this equipment. The intent of the manual is to guide and assist operators and maintenance personnel in the proper use and care of the equipment.

Read the instructions before starting the unit. Learn to use the manual and to locate information contained in it.

The Table of Contents, which follows this Introduction, lists all Chapters, Sections, and the 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 locations, follows the Table of Contents.

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

The material within each Section is divided into main subjects with applicable paragraph headings and subheadings as required. For example, a portion of the Description Section might logically follow this arrangement and paragraphing:

1. Control

    A. Interior Panel

        (1) Protective devices

            (a) Overload relay

        (2) Contactors

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

All tables, charts and diagrams, as well as illustrations, are identified by Figure numbers to avoid confusion.

The general location of any particular information can be found quickly by running through the Table of Contents. For example: to locate any adjustment information, a quick look at the Table of Contents shows that "Adjustment/Test" is located in Chapter 2, Section 3 (shown as 2-3).

Portions of the text are referred to by identifying the paragraph in which the referenced material may be found. When referenced material is located in the same Chapter/Section as the reference, only the paragraph identification is given, for example: (Ref. Para. 1, A) means that the material is to be found in paragraph 1, A, of the same Section.

When referenced material is located in another Chapter/Section, both the Chapter and Section numbers and the paragraph identification are given, for example: (Ref. 1-2, Para. 1, A) means that the referenced material is located in Chapter/Section 1-2, and paragraph 1, A within that Chapter/Section.

Components shown in illustrations, and the illustrations themselves, are referenced in a similar manner. When this type of reference is made, the item number of the part and the Figure number in which it appears are given, for example: (2, Fig. 3) refer to item number 2 in illustration Figure 3 of the same Chapter/Section.

When a referenced figure appears in another Chapter/Section, the reference will include the Chapter/Section number, for example: (2-3; 1, Fig. 4) tells the user that the information is in Chapter/Section 2-3, and to refer to item 1 in Figure 4.

Once a Figure number reference has been established, the Figure number is not repeated and only the item numbers of the parts involved are referenced, for example: "Loosen screw (2, Fig. 6), slide out connector (4), and remove brush (6)."

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

A collection of manufacturer's literature is supplied as part of the information package.

If you have any questions concerning your Hobart Power Systems Division equipment, you are invited to contact our Service Department by mail, telephone, or TWX.

Write: Hobart Brothers Company
Power Systems Division
Service Department
Troy, Ohio 45373
U.S.A.

Call: Area Code (513) 339-6000
Extension 4276

TWX: 810-456-2907

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# CHAPTER 1. DESCRIPTION/OPERATION

## SECTION 1. DESCRIPTION

### 1. General

The Jet-Ex 3 units covered in this manual (Figure 1) are gasoline engine-driven, self-contained generator sets manufactured by Hobart Brothers Company, Power Systems Division, Troy, Ohio U.S.A. The basic units are identified by a Specification Number 6272, plus a dash number which defines a specific configuration. The Series number, plus the dash number, make up the Specification Number.

Specification No. 6272-1 covers a stationary, skid mounted unit rated at 28.5 Volts DC output. It is equipped with a sheet metal canopy and hinged doors. The 6272-2 unit is the same as the 6272-1 unit, but it is equipped with lift-off doors. This allows it to be mounted in confined areas. The 6272-3 unit is the same as the 6272-1 unit, but it is equipped with a mechanical governor instead of an electronic governor. The 6272-4 unit is the same as a 6272-2 unit but it is equipped with a mechanical governor. Various options are available for use with the two basic units. These options are listed in paragraph 2. B. below.

The basic generator set is designed to generate and deliver 28.5 volts DC power to an aircraft when its on-board generators are shut down. In addition to providing continuous, regulated power to the aircraft, the unit is designed for starting any fixed-wing aircraft or helicopter which is equipped with an external 28.5-volt DC power receptacle. Refer to Figure 2 for complete Specifications and Capabilities.

### 2. Special Features

A. Standard

The "Soft-Start" current limiting feature, recommended by most engine manufacturers, provides the operator with a control which limits the inrush current to the aircraft engine's starter. When the operator presets this control, the generator will provide constant voltage up to the preset current value, at which point the voltage drops, but the preset current limit is maintained. Limiting inrush current is recommended by most engine manufacturers to protect the aircraft engine's starter shear section. The current limiting control is continuously adjustable from 300 amperes, which is recommended for helicopter and small turbine starting, to 1500 amperes, required for starting larger aircraft engines. With the control turned fully clockwise, 1600 amperes can be achieved.

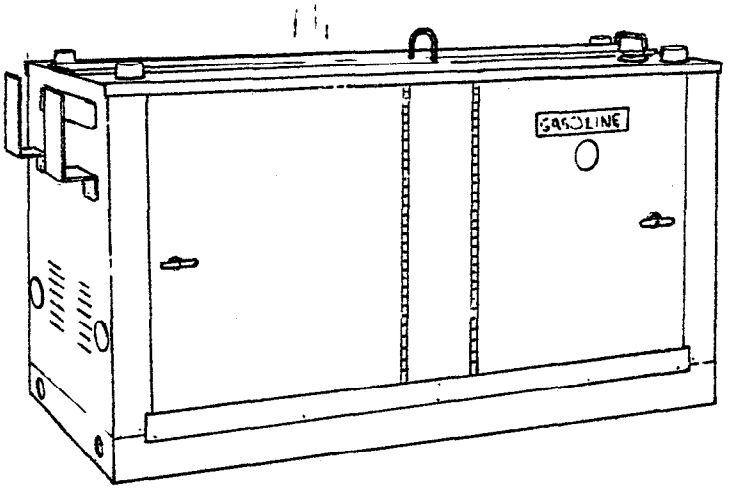
Additional features include an all-electronic governor which maintains the engine speed at 2400 RPM, and an all-electronic engine overspeed protection device which shuts down the engine by opening the ignition circuit if the engine speed reaches 2900 RPM.

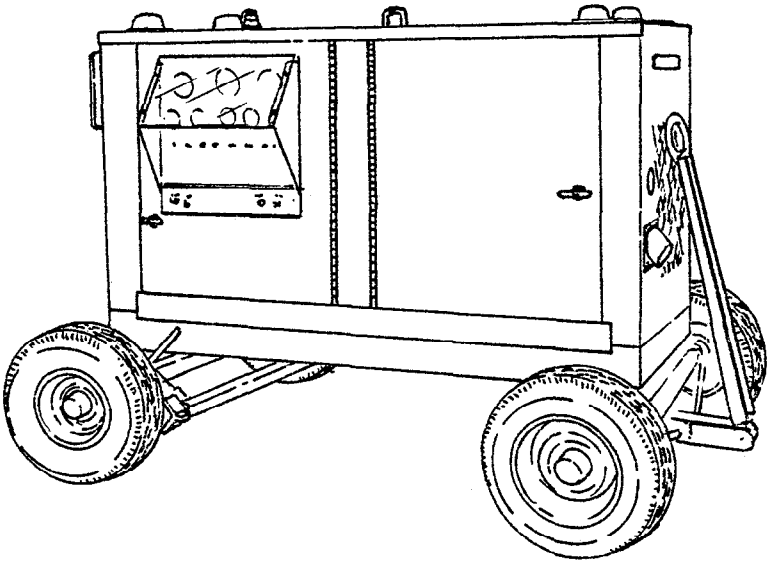
Units with serial numbers 82PS01305 and higher are equipped at the factory with a Zenith carburetor, specially designed for engine governor type applications. This improved carburetor also eliminates dieseling when the engine is shut down.

B. Options

(1) A four-wheel trailer is available to add mobility to the generator set. It is equipped with pneumatic rubber tires, a drawbar for towing, and a hand-operated parking brake. This option is available from Hobart Brothers as Part No. 484331.

(2) A kit is available which provides 14.25 volt DC output capability in addition to the 28.5 volt DC standard output. This option is available from Hobart Brothers as Part No. 485910.



PSD-0284

Jet-Ex 3 Generator Set
Figure 1

| | |
|---|---|
| **STATIONARY UNIT** | |
| Length | 74 inches (1880 mm) |
| Width | 43 inches (1092 mm) |
| Height | 43 inches (1092 mm) |
| Weight (dry fuel tank) | 1860 pounds (844 kg) |
| **TRAILER-MOUNTED UNIT** | |
| Length | 91 inches (2311 mm) |
| Width | 66 inches (1676 mm) |
| Height | 55 inches (1397 mm) |
| Weight (dry fuel tank) | 2240 pounds (1016 kg) |
| **TRAILER** | |
| Tread | 58 inches (1473 mm) |
| Wheelbase | 50.5 inches (1283 mm) |
| Ground Clearance | 7 inches (178 mm) |
| Tires | 6.90/6.00 X 9 (6 ply) |
| Tire Pressure | 60 PSI (414 kPa) |
| **GENERATOR** | |
| Output Power Rating | 21.4 kW |
| Voltage | 28.5 volts DC |
| Rated Load Capacity | 750 amperes at 50% duty cycle (5 minutes on, 5 minutes off)<br>530 amperes continuous at 28.5 volts DC<br>1600 amperes maximum |
| Current Limiting Capability | 300 to 1500 amperes continuously adjustable |
| Operating Speed | 2400 RPM |
| **ENGINE** | |
| Manufacturer | Ford Motor Company |
| Model | CSG-649I-6005-A (with Special Options: S0-2800C) |
| Type | Overhead valve, in-line, 6 cylinder |
| Fuel | Gasoline, leaded, regular |
| Displacement | 300 cubic inches (4.92 liters) |
| Rated Power at 2400 RPM | 92 Horsepower |
| Oil Capacity (with filter change) | 7 quarts (7 liters) |
| Coolant Capacity | 5.5 U.S. gallons (21 liters) |
| Ignition System (Distributor-coil type) | 12 volt DC, negative ground |
| Governed Speed | 2400 ± 25 RPM |
| Idle Speed | 600 to 650 RPM |
| Fuel Tank Capacity | 30 U.S. gallons (114 liters) |

Specifications and Capabilities
Figure 2 (Sheet 1 of 2)

PROTECTIVE DEVICES

GENERATOR

28.5 volt overvoltage module trips at 32 to 34 volts in 2 to 10 seconds.
Overload relays trip at 1000 amperes in 1 minute.
14 volt overvoltage module trips at 18 to 20 volts in 2 to 10 seconds.

ENGINE

Overspeed device trips at 2850 to 2900 RPM.
Low oil pressure switch opens at 10 PSI (69 kPa).

Specifications and Capabilities
Figure 2 (Sheet 2 of 2)

(3) An air heater kit is available which helps prevent carburetor icing when the engine is operated in a low ambient temperature. Heated air passing over the exhaust manifold is collected and conducted to the carburetor's air cleaner intake. A thermostatically controlled valve in the duct regulates the temperature of the air delivered. This option is available from Hobart Brothers as Part No. 486113.

(4) A spark arrester muffler kit is available which prevents the discharge of sparks from the engine's exhaust. The manufacturer recommends this muffler for use on engines which operate in areas where this type of exhaust protection is required by local codes or company restrictions. The muffler exceeds the performance standards set by DOD Specification MIL-A-27302A and U.S. Forest Service Standard 5100-1. This option is available from Hobart Brothers as Part No. 486114.

3. Orientation

The radiator end of the Jet-Ex 3 is the front. Right and left are determined by standing at the rear of the unit, facing it. The control box and engine control panel are located on the right side.

4. Identification

The Jet-Ex 3 units are identified by Specification numbers as described in paragraph 1, above. There may be any number of generator sets with the same Specification number. Individual machines are identified by a Serial number, assigned to one machine only.

Each generator set has an Identification plate attached inside the front panel of the control box. This nameplate lists the machine's Model No. (Jet-Ex 3), Specification No., Serial No., and electrical rating.

If any of the options described in paragraph 2. B. are included, they will be listed by name and part number on a separate Option nameplate located next to the Identification plate.

5. Canopy

The standard canopy, used on Specification No. 6272-1, is a sheet metal enclosure which protects the engine, generator, and electrical controls. It has two large, hinged doors on each side to provide access for service and maintenance. A large panel at the rear provides access to the generator. A Plexiglass window is mounted in the right rear door to allow observation of the instruments without opening the door. The window is mounted at an angle and is open at the bottom to allow access to the controls without opening the door. The left rear door has a round hole in it to permit viewing the fuel gage mounted in the fuel tank.

The canopy used on Specification 6272-2 is identical to the one above, except for the doors, which are not hinged. Each door may be lifted off after unlatching its fasteners.

6. Engine, Generator, and Controls

A. General

Refer to Figure 3. The engine (3) and generator (16) are mounted on a welded steel frame (11). A sub-frame (18) located at the rear of the unit supports the control box (1) and fuel tank (15) and provides a mounting frame for the engine control panel (10). The radiator (13) is mounted on the main frame at the front of the unit. A heavy U-bolt is attached to the centrally located lifting yoke (14) for moving the generator set with a crane or hoist.

B. Engine

(1) General

The in-line six cylinder engine is a modified Ford Model CSG-6491-6005-A. It has 300 cubic inch (4.92 liters) cylinder displacement and uses leaded, regular gasoline.

The ignition distributor is mounted on the left side of the engine and is driven by a gear on the camshaft. The distributor, in turn, drives the oil pump through a short intermediate drive shaft.

Oil pressure is maintained in the lubrication system by a rotary oil pump located in the crankcase. A spring-loaded relief valve in the pump limits maximum pressure in the system. A full-flow oil filter cleans the entire output of the pump before it enters the oil distributing system. A valve in the filter provides a bypass to an oil gallery in case the filter becomes clogged. A low oil pressure switch (21, Figure 3) is mounted on the engine block as a protective device. The primary ignition circuit is wired through the contacts of this switch, which close at 10 PSI (69 kPa). This prevents the engine from starting if oil pressure will not build up, and also shuts down the engine if oil pressure drops radically during operation.

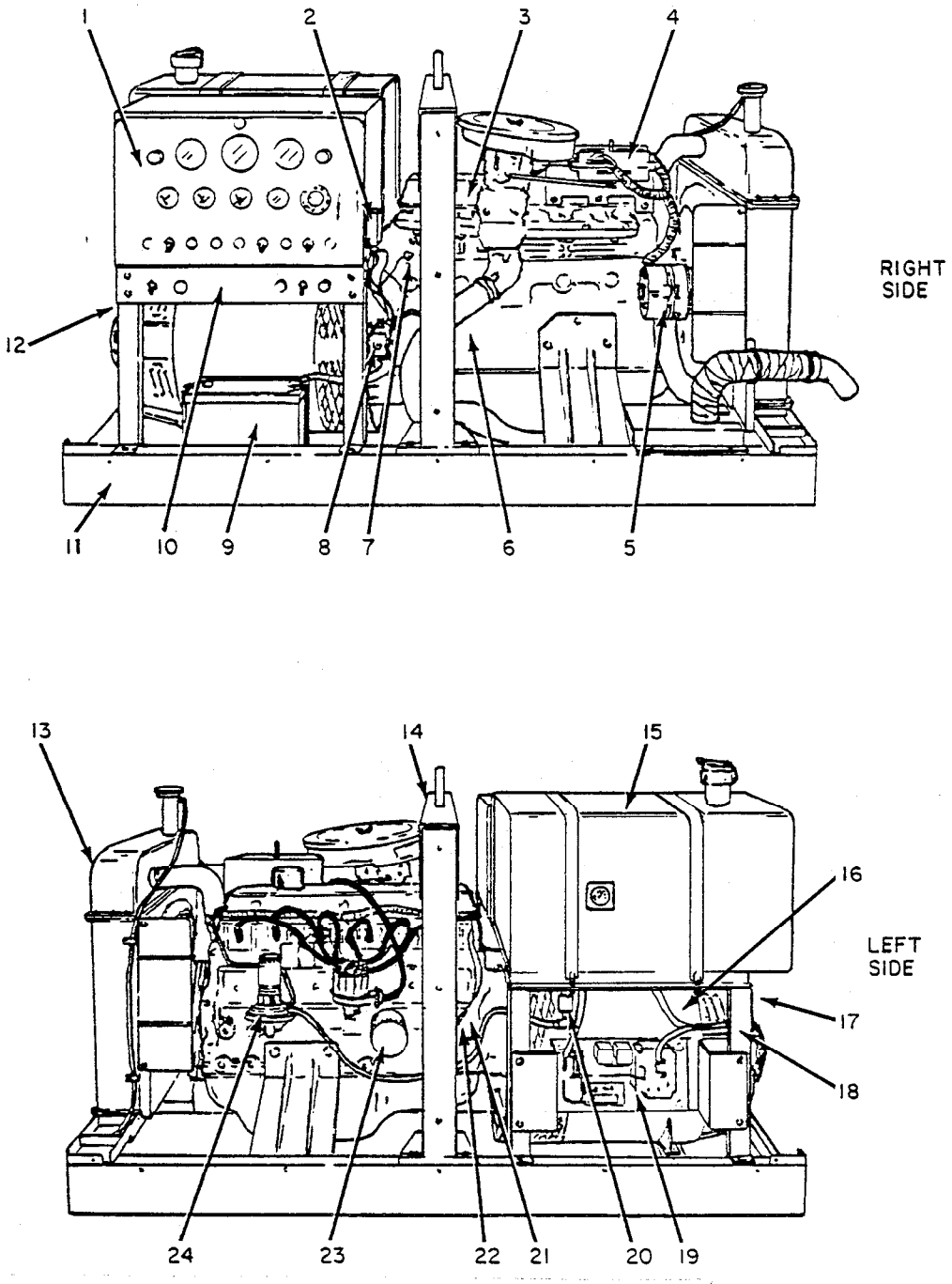
See Figure 2 and the engine operator's manual for engine specifications.

(2) Cooling fan

The cooling fan on the engine is designed to blow air out through the radiator rather than to draw it in. This prevents hot air, heated by the engine, from entering the generator.

(3) Engine speed governor

The engine speed governor (4, Figure 3) is a sealed, solid-state unit which is controlled by pulses from the engine's distributor circuit. Its actuator arm is linked to the carburetor fuel control lever by a rod with ball joints threaded on both ends. This governor maintains the engine speed at approximately 2400 RPM when the generator is in operation.




1. Control Box
2. Alternator Regulator
3. Engine
4. Governor
5. Alternator
6. Drain Cock
7. Coolant Temperature Sender
8. Starter Relay
9. Battery
10. Engine Control Panel
11. Frame
12. 28 Volt Output Terminal Panel
13. Radiator
14. Lifting Yoke
15. Fuel Tank
16. Generator
17. 14 Volt Output Panel (When Used)
18. Sub-frame Support
19. 14 Volt Contactor Panel (When Used)
20. Fuel Shutoff Solenoid Valve
21. Low Oil Pressure Switch
22. Oil Pressure Sender
23. Oil Filter
24. Fuel Pump and Fuel Filter

Generator Set Components
Figure 3

(4) Engine overspeed device

The engine and generator are protected against the danger of overspeed by an overspeed governor (9, Figure 5). This unit is a sealed, solid-state device which is wired into the primary ignition circuit. It senses the distributor pulses, and when they reach a frequency which indicates an engine speed of approximately 2900 RPM, an internal relay opens the primary ignition circuit and shuts down the engine.

(5) Crankcase ventilation

This engine is equipped with an open crankcase ventilation system. This open ventilation system consists of two breather caps on the rocker arm cover.

(6) Fuel system

The fuel system consists of a 30 gallon (114 liters) tank (15, Figure 3) and a diaphragm type fuel pump (24) with all necessary fittings and hoses. A 12 volt, solenoid operated shutoff valve (20) is mounted in the fuel line under the tank. It shuts off the fuel supply to the engine when the ENGINE (ignition) switch on the control box is in the STOP position (ignition OFF). This keeps the engine from flooding due to gravity flow or siphoning from the tank when the engine is not running.

Power to open the solenoid valve is supplied when the ENGINE switch is in the START and RUN positions.

(7) Alternator and regulator

The battery charging alternator (5, Figure 3) is rated at 40 amperes. Its voltage regulator (2) is mounted on the side of the control box.

(8) Starter relay

The starter relay (8, Figure 3) is mounted on the control box support below the alternator regulator.

(9) Special carburetor

The carburetor, specially designed for engine governor type applications, is mounted on the engine and adjusted at the Hobart factory. Replacement carburetor, spare parts, and repair kits are available from Hobart Brothers only. Refer to the Illustrated Parts List in Section 4-3 for part numbers.

C. Generator

The 28.5-V DC generator (16, Fig. 3) is a self-excited, shunt-wound type with interpoles to improve commutation. Excitation voltage is taken from the main generator output at the brushes and is controlled at the option of the operator either by a manual voltage control rheostat (7, Figure 5) or by an automatic voltage regulator (1). Sixteen brushes, mounted in four stacks of four brushes each, conduct the 28.5 volt DC generator output from the armature commutator to the two output cables (one positive, one negative). A two-piece cover protects the brushholder assembly and allows access for brush service.

The armature is supported at the rear, commutator end by a single-row ball bearing. The front (drive) end is connected to the engine flywheel by a flexible disc and hub coupling assembly and is supported by the engine main bearings. A radial-blade fan of spot-welded construction is mounted on the coupling hub and draws cooling air over all of the generator windings.

Air enters through louvers in the rear (brushholder) cover and is discharged through openings in the flywheel housing. An expanded-metal cover surrounds the flywheel housing. The generator housing assembly contains a set of main shunt coils, and a set of interpole coils which are mounted alternately between the shunt coils. The generator housing is bolted directly to the engine flywheel housing.

D. Control Box Assembly

(1) General

The control box (1, Figure 3) is a sheet metal enclosure which houses and provides mounting facilities for controls and monitoring instruments. The box is mounted on the support frame over the generator. Its controls are accessible through the opening provided in the right rear canopy door. The hinged front panel (Figure 4) provides mounting for monitoring instruments and controls, and also provides access to the rear panel assembly (Figure 5) which is inside the control box. A quick-release latch (5, Figure 4) secures the front panel in the closed position.

(2) Lights

Two lights (2, Figure 4) provide illumination for instruments and controls. One green pilot light (8) glows when the output load contactor is closed, and another one (19) glows green when the engine is running.

(3) Monitoring instruments

The voltmeter (3, Figure 4) indicates generator output voltage, and the ammeter (6) displays generator current.

A tachometer (4) displays the engine speed in RPM. This instrument is operated by pulses from the distributor.

A water temperature gauge (1) indicates the engine coolant temperature and is actuated by a temperature sender (7, Figure 3) mounted in the engine's water jacket.

An oil pressure gauge (16, Figure 4) displays the pressure in the engine's lubrication system. It is operated by a sender (22, Figure 3) mounted on the engine block.

The ammeter (14, Figure 4) indicates the rate of charge or discharge in the engine's 12 volt DC electrical system.

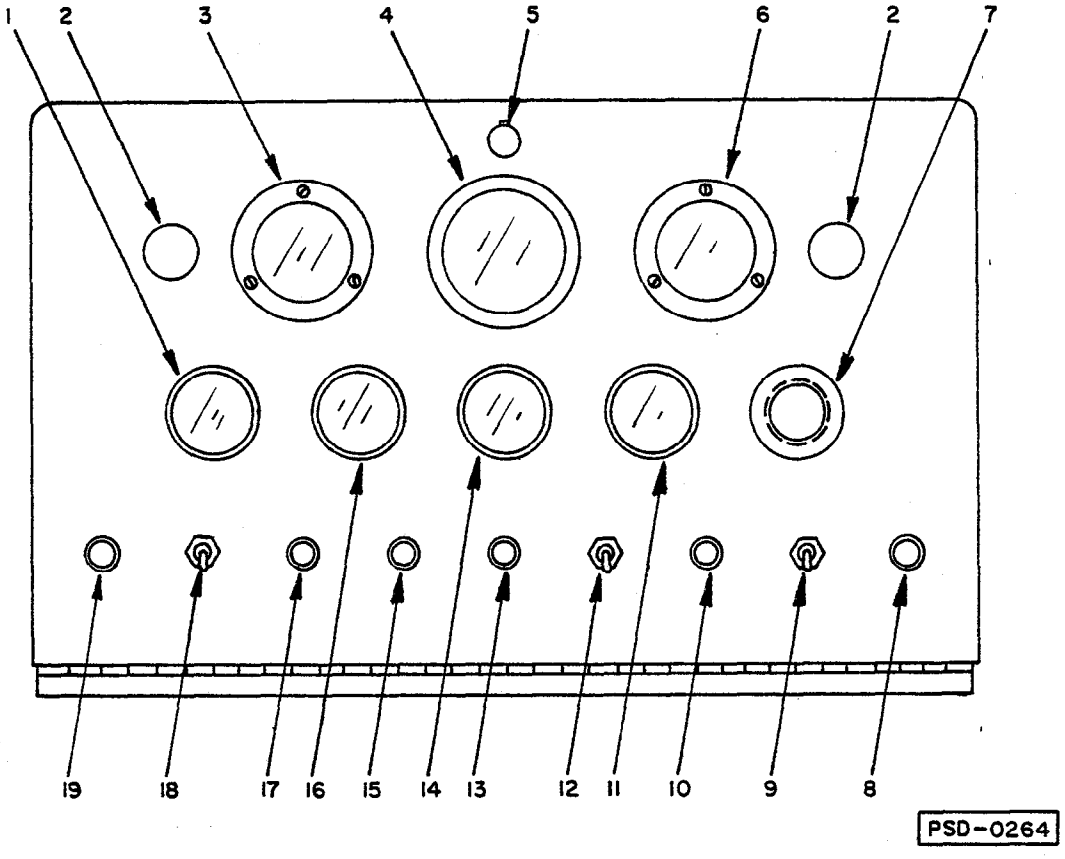
The hourmeter (11) records the total hours of engine operation for scheduling maintenance.

(4) Potentiometer

The current limiting potentiometer (7) is used to select the starting current recommended for various aircraft. The current limit setting is continuously adjustable from 300 to 1600 amperes.

(5) Switches

The contactor control switch (9, Figure 4) is a three-position toggle switch used to close and open the output load contactor. The top CLOSE position is spring-loaded and is held momentarily until the contactor closed light (8) glows, then is released to the center ON position. In this position the switch provides holding current to the load contactor to keep it closed. Protective devices in the holding circuit provide protection against overload and overvoltage by opening the load contactor if either fault occurs. In the bottom OFF position, the contactor is opened.




1. Water Temperature Gauge
2. Panel Light
3. Voltmeter
4. Tachometer
5. Latch
6. Ammeter (Generator)
7. Current Limit Control
8. Contactor Closed Light
9. Contactor Control Switch
10. Push-To-Build-Up-Voltage Switch
11. Hourmeter
12. Panel Lights Switch
13. Panel Lights Fuse
14. Ammeter (Engine)
15. Engine Circuit Fuse
16. Oil Pressure Gauge
17. Engine Start Switch
18. Engine Ignition Switch
19. Engine On Light

Control Box Front Panel
Figure 4

The push-to-build-up-voltage switch (10) is a momentary contact pushbutton switch which flashes the generator fields with 12 volts DC at initial startup. Use this switch at startup only if the generator fails to build up voltage by itself. A diode is wired into this switch to prevent 28.5 volts DC generator output from entering the 12 volt engine circuit when flashing the fields.

The panel lights switch (12, Figure 4) turns the lights (2) on and off. The engine start switch (17) is a momentary contact pushbutton which closes the starter relay (8, Figure 3) and cranks the engine. This switch is operable only when the engine (ignition) switch (18) is held in its top spring-loaded START position.

The engine (ignition) switch (18), when released from its top START position after the engine starts, will return to its center RUN position. The engine on light (19) will glow as long as the switch is in RUN position. In the bottom STOP position, the switch will stop the engine and the light (19) will go out.

(6) Fuses

Two cartridge-type fuses protect the engine ignition circuit and the panel lights circuit. The engine circuit fuse (15, Figure 4) is rated at 20 amperes and the panel lights fuse (13) is rated at 10 amperes.

E. Rear Panel Assembly (Control Box)

The rear panel assembly provides a mounting place for various control and protection components of the generator set. It also serves as the back enclosure panel for the control box. Components mounted on this panel are accessible when the front panel on the control box is opened.

(1) Voltage regulator

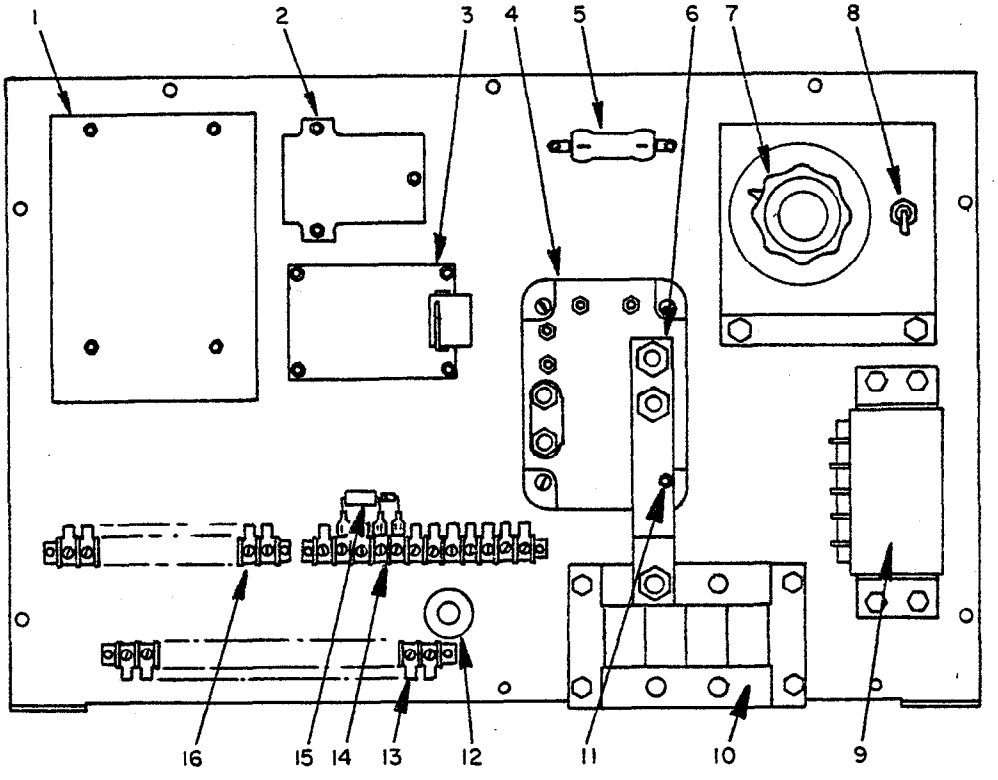
Refer to Figure 5. The voltage regulator (1) is a solid-state device which regulates the 28.5 volt DC generator output when the switch (8) is in the AUTOMATIC position.

(2) Overvoltage module

The overvoltage module (2) is a solid-state protective device on a printed circuit board. A normally closed relay in the circuit is wired into the load contactor closing and holding circuit. An overvoltage condition causes the relay contacts to open, which in turn prevents the contactor from closing or opens the load contactor and discontinues the power delivery. The overvoltage module is adjusted to trip at 32 to 34 volts DC in 2 to 10 seconds.

(3) Overload module

The overload module (3) is a solid-state protective device on a printed circuit board which protects the generator and output circuit against overload. Its circuitry includes a relay with normally closed contacts which are wired into the load contactor holding circuit. An overload condition at the generator's output terminals will open the relay contacts, which in turn opens the load contactor holding circuit and discontinues power delivery. The module is adjusted to trip at 1000 amperes in 1 minute. A larger load will trip it in a much shorter time.




1. Voltage Regulator
2. Overvoltage Module
3. Overload Module
4. Load Contactor
5. Resistor
6. Contactor-To-Shunt Bus
7. Field Rheostat Control
8. Automatic/Manual Switch
9. Overspeed Governor
10. Ammeter Shunt
11. Diode
12. Rubber Grommet
13. Terminal Block (18 T)
14. Terminal Block (12 T)
15. Resistor and Diode Assembly
16. Terminal Block (12 T)

Rear Panel Assembly (Control Box)
Figure 5

(4) Load contactor

The load contactor (4) provides a safe and convenient means of connecting and disconnecting the generator from the load. Initial power for closing the load contactor is supplied by the generator through the spring-loaded momentary contacts of the contactor control switch (9, Figure 4). Holding power to keep the contactor closed passes through the contacts of the control switch in the ON position and also through the normally closed relays in the overvoltage and overload modules. If an overvoltage or overload fault occurs, the holding circuit is broken, the load contactor opens, and power delivery is discontinued.

A resistor (5, Figure 5) provides a light load across the generator's output terminals which is required to close the differential relay contacts in the load contactor.

(5) Ammeter shunt

The ammeter shunt (10) is connected in the generator's positive output circuit. It supplies a voltage proportional to current for operation of the generator ammeter (6, Figure 4). A diode (11, Figure 5) is mounted in the bus bar (6) to prevent 12 volt field-flashing power from entering any part of the generator circuit and building up reverse polarity.

(6) Automatic/manual switch

The automatic/manual switch (8, Figure 5) is a two-position toggle switch which selects the mode of excitation to the generator fields. In AUTOMATIC position, controlled excitation to the fields is provided by the voltage regulator (1). In the MANUAL position, excitation is controlled manually with the field rheostat (7). Manual operation is to be used temporarily, for emergency operation, if a voltage regulator malfunction should occur. Manual operation is also used in troubleshooting.

(7) Overspeed governor

The overspeed governor (9, Figure 5) is a sealed, solid-state protection device which receives pulses from the engine's distributor. When the pulses reach a frequency which indicates an engine speed of 2900 RPM, a relay in this unit opens the primary ignition circuit and shuts down the engine.

(8) Resistor and diode assembly

This network (15, Figure 5) protects the overload and overvoltage modules against reverse current when the generator is delivering power.

F. Engine Control Panel

The engine control panel (10, Figure 3) is mounted on the support frame below the control box. It provides mounting for the GENERATE/IDLE (engine speed) switch and the engine CHOKE control knob.

(1) Generate/idle switch

Refer to Figure 6. The generate/idle switch is a two-position toggle switch wired directly into the engine's speed control governor (4, Figure 3). In the IDLE position, used for starting, the engine speed is controlled to approximately 600-650 PRM. In the GENERATE position, engine speed is controlled to approximately 2400 RPM.


Engine Control Panel
Figure 6

(2) Choke control

The choke control is connected to the carburetor choke butterfly with a flexible control cable. Pulling it out closes and enriches the fuel mixture. Pushing it in closes the choke.

(3) Throttle control (6272-3 & 4)

The throttle control is connected to the carburetor throttle lever with a flexible control cable. Pulling it out decreases the fuel flow to the carburetor. Pushing it in increases the fuel flow.

G. Output Terminals

The output terminal panel (12, Figure 3) is mounted at the rear of the control box support. Two capacitors on this panel help suppress radio frequency interference at the output.

7. Optional Equipment

The two options most frequently used with the basic Jet-Ex 3 generator set are the trailer and the 14 volt output. These two options are included in the Illustrated Parts List, Chapter 4 of this manual and are described here in detail because of their frequent use.

Other available options are covered in separate manuals which are included in Chapter 5 of this manual when they are ordered with the generator set.

A. Trailer

The portable Jet-Ex 3 is mounted on an optional four-wheel trailer (see Figure 1) which consists of front and rear axle assemblies. The axles are mounted directly to the main frame of the generator set.

The front axle is a solid beam type. Front wheels are mounted on spindles which are operated by tie rods connected to the hitch and drawbar assembly. Any side-to-side movement of the drawbar turns the wheels in the direction of travel. The drawbar can be folded upward and locked in the vertical position when the trailer is parked.

The rear axle is also a solid beam type. The parking brake consists of a bar mounted across the underside of the frame ahead of the rear wheels. Metal pads are located on each end of the bar just ahead of each tire. When the bar is actuated by a hand lever and brake operating rods, the pads are pulled against the tire tread with sufficient pressure to prevent wheel rotation. The actuating mechanism works on an over-center locking principle which will not unlock until the hand lever is pushed to release position.

B. 14 Volt DC Output

All Jet-Ex 3 units are available with optional 14 volt DC output capability. The 14 volt DC output kit consists of a contactor panel (Figure 7), a control panel (Figure 8), an output terminal panel (Figure 9), and miscellaneous cables, wiring, and hardware.

(1) 14 volt contactor panel

The 14 volt contactor panel (Figure 7) is located on the left side of the machine below the fuel tank (19, Figure 3). Its function in the 14 volt DC output circuit is similar to that of the rear panel assembly (Figure 5) in the 28.5 volt DC output circuit.

(a) Overload relay

This solenoid-operated, dashpot-type relay (8, Figure 7) opens the load contactor (4) if a load of 1000 amperes continues for 1 minute. A larger load will trip the relay in a shorter time.

(b) Control relays

The two control relays (1 and 3, Figure 7) are identical. They are identified as 14 volt and 28.5 volt relays because of the voltage values of their coil circuits. Their function is to prevent operation of both output circuits (14 volt and 28.5 volt) at the same time. They also prevent closing of the 14 volt circuit while the 28.5 volt circuit is in operation. When the 14 volt system is in operation, they allow the 28.5 volt system to be closed by the operator and at the same time automatically open the 14 volt circuit. The 14 volt relay (1) energizes the 14 volt control circuit when the 14 volt load contactor is closed.

(c) Load contactor

The 14 volt load contactor (4, Figure 7) performs the same function as the one in the 28.5 volt output circuit. See para. 6. E. (4) for description.

(d) Overvoltage module

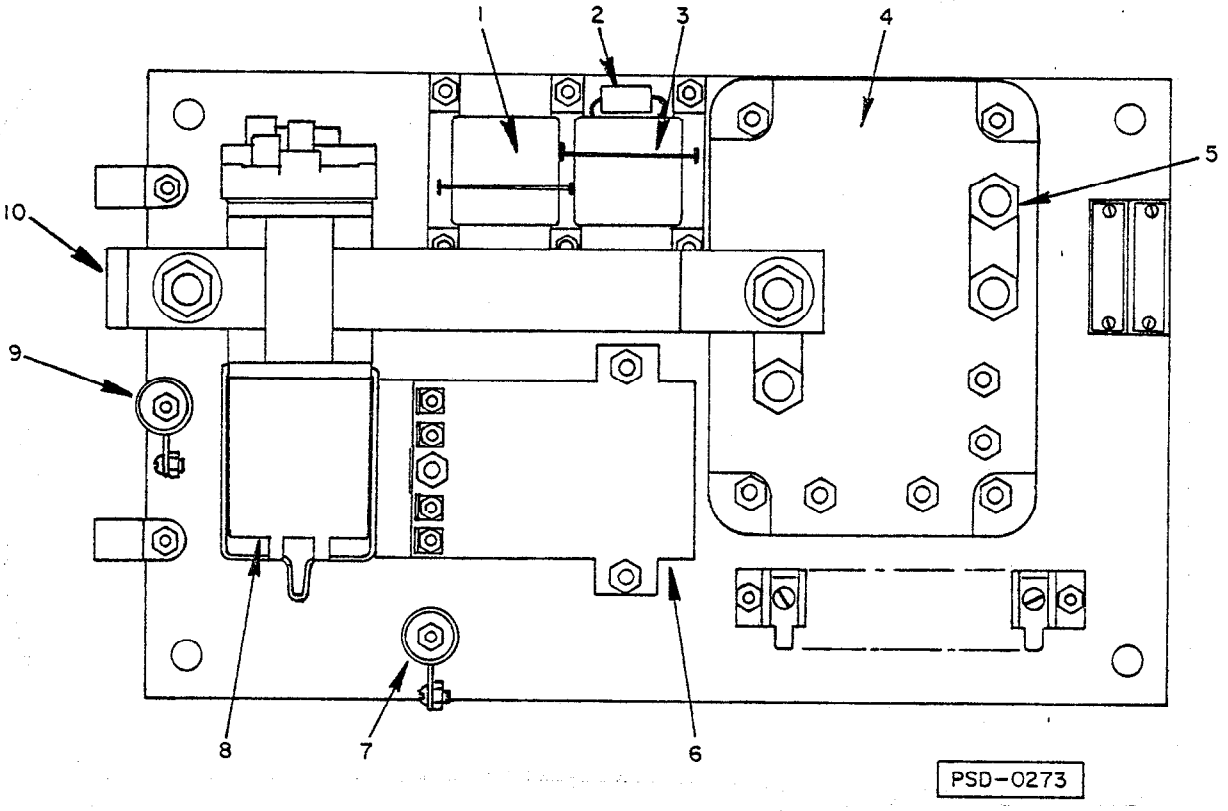
The 14 volt, overvoltage module (6, Figure 7) is similar to the module used on the rear panel assembly of the control box. See Para. 6, E, (2) for description. The 14 volt module is adjusted by a resistor (9) to trip at 18 to 20 volts DC in 2 to 10 seconds. The relay resets at 14.5 to 15.5 volts DC.

(e) Resistors

The 300 ohm, 25 watt variable resistor (9, Figure 7) is used to adjust the trip point of the overvoltage module (6). Adjust the resistor to give 20 volts at the overvoltage module input.

The 100 ohm, 25 watt resistor (7) is not adjustable. It is connected across the 14 volt output leads to provide a small load required to close the differential relay contacts in the load contactor to make the contactor closing circuit functional and allow the main contacts to be closed when desired.

The 120 ohm, 2 watt resistor (2) is connected in series with the 28.5 volt control relay coil to reduce power to the coil and protect it when the 28.5 volt output circuit is in operation.




1. Control Relay, 14 Volt
2. Resistor
3. Control Relay, 28 Volt
4. Load Contactor
5. Positive Output Terminal
6. Overvoltage Module
7. Resistor
8. Overload Relay
9. Resistor
10. Negative Output Terminal

14 Volt Contactor Panel
Figure 7

(2) 14 volt control panel

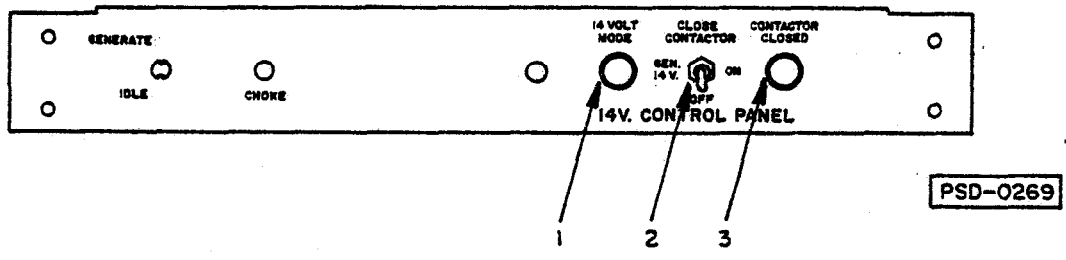
NOTE: When the 14 volt output kit is ordered with the generator set, it is completely installed, wired, and tested at the factory. Installation instructions for the control panel below apply ONLY to kits furnished separately, for installation on existing generator sets already in use.

When the optional 14 volt output kit is installed, the engine control panel illustrated in Figure 6 must be replaced with the panel shown in Figure 8. When the new panel is installed, use the existing hardware from the old panel, and reinstall the GENERATE/IDLE switch and the CHOKE control in the same positions that they occupied before. The replacement panel has 14 volt output controls grouped together at the right side over the label: 14 V. CONTROL PANEL.

A wire harness is connected to the switch and lights at the rear of the panel to provide proper connections for the added 14 volt controls. Refer to the schematic and connection diagrams in Chapter 6 to make the proper connections.

(a) Mode indicating light

This light (1, Figure 8) glows AMBER if and when the 14 volt output circuit is functional. If the light does not come on when the switch (2) is placed in ON position, it indicates to the operator that the 14 volt circuit is not functional and the 14 volt contactor cannot be closed.




1. Circuit On Light
2. Circuit Control Switch
3. Contactor Closed Light

14 Volt Control Panel
Figure 8

(b) Contactor closed light

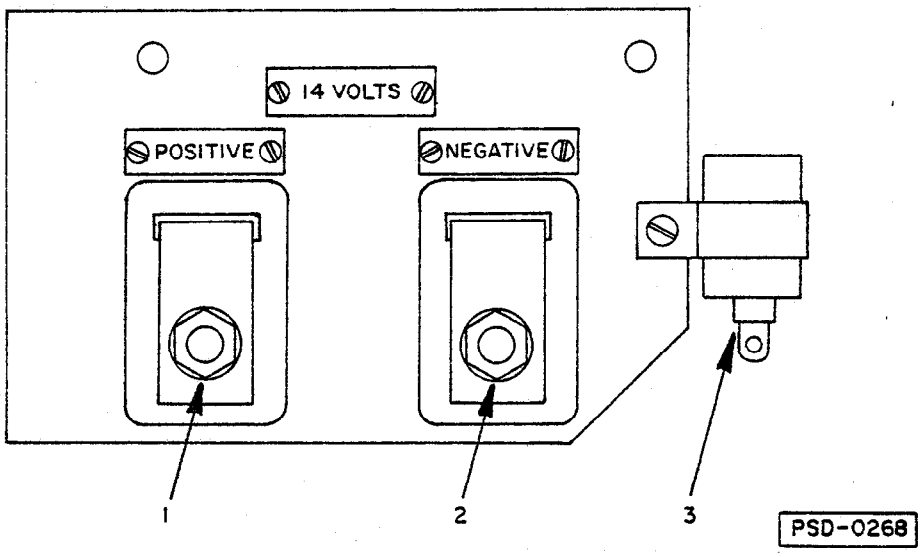
This GREEN light (3) glows when the 14 volt contactor is closed and power is available at the 14 volt output terminal panel.

(c) Control switch

In the ON position, this three-position toggle switch (2) connects power to the 14 volt control relay and to the amber mode indicating light. In the CLOSE CONTACTOR position, it connects power to the load contactor coil for initial closing of the contactor. When released from the CLOSE CONTACTOR position, it returns automatically to ON and maintains power to the 14 volt control relay. Power to the load contactor coil is maintained through contacts in the 14 volt control relay, the 28 volt control relay, the overload relay, and the overvoltage module. Placing the control switch in OFF position opens the load contactor by disconnecting power to the 14 volt control relay, which opens the contactor coil holding circuit.

(3) 14 volt output terminal panel

The output terminal panel is located at the rear of the unit on the left side (17, Figure 3). Refer to Figure 9. Two capacitors, and one on the back of the panel, are wired into the output terminals to help suppress radio frequency interference at the output.




1. Positive Output Terminal
2. Negative Output Terminal
3. RFI Suppression Capacitor

14 Volt Output Terminal Panel
Figure 9

## SECTION 2. PREPARATION FOR USE , STORAGE, OR SHIPPING

1. Preparation for Use

A. General

The generator set is shipped in operating condition and is ready for use after inspection and check.

CAUTION: READ OPERATING INSTRUCTIONS IN SECTION 1-3 BEFORE OPERATING THE UNIT.

B. Inspection/Check

Inspect the unit completely prior to operation.

(1) Remove crating, blocking, banding, ties, and other securing and protective material.

(2) Inspect exterior for shipping damage such as broken glass, damaged sheet metal, etc.

(3) Open all canopy doors and inspect interior for foreign material such as rags, tools, shipping papers, etc.

(4) Check fuel, coolant, and oil hoses and connections for visible leaks. Check the ground surface under the unit for evidence of leaks. If leaks are discovered, correct by tightening hose clamps, tube fittings, etc., as required.

(5) Check security of attaching and retaining hardware.

(6) Check the following for sufficient quantity.

(a) Fuel

Fuel tank capacity is 30 gallons. Use leaded, regular gasoline.

(b) Engine coolant

The radiator cap is accessible by opening the hinged access cover on the front canopy housing. Twist the cover fastener one-half turn to unlock. Coolant level should be approximately one inch below the filler neck. Allow a sufficient capacity for coolant expansion.

CAUTION: BE SURE THE COOLING SYSTEM ANTIFREEZE SOLUTION IS ADEQUATE TO PROTECT BELOW LOWEST TEMPERATURE EXPECTED.

(c) Engine lubricating oil

The oil level dipstick is located on the left side of the engine. Refer to Ford Maintenance and Operator's Manual for oil recommendations.

(7) Air cleaner

Make sure air cleaner element is installed. Recommended replacement element is Motorcraft No. FA-52 or Ford part number C8TF-9601-A.

(8) Battery

Check fluid level in 12 volt battery. Fluid should cover plates.

C. Output Cable Installation

Units are normally supplied without a generator-to-aircraft cable.

(1) Cable requirements

Cable length is determined by the customer's requirements. It is recommended that the cable be no longer than 30 feet (9 m). The cable should be two conductor with lug-type terminals on one end and an AN-2551 plug connector on the other.

The recommended single conductor sizes for 28.5 volt DC, continuous rated amperage and 90°C (194°F) rise is as follows:

for 285 amperes use 2/0 size
for 385 amperes use 4/0 size
for 530 amperes use 350 MCM size

NOTE: Some operators may wish to add a second cable assembly with MS-25019 plug connector for starting aircraft such as Jetstar and Sabre liner.

(2) Cable connector

(a) Connect 28 volt conductors to output terminals on output terminal panel (Figure 1). Connect 14 volt conductors to output terminals on the 14 volt contactor panel (see 1-1, Figure 9). Terminals are identified POSITIVE and NEGATIVE. Tighten terminal nuts securely.

(b) Store cables on hangers provided at the rear of canopy.

2. Preparation for Storage

When a generator set is to be stored or removed from operation, special precautions should be taken to protect the internal and external parts from rust and corrosion.

A. General

(1) The unit should be prepared for storage as soon as possible after being removed from service.

(2) Storage should be in a building which is dry and which may be heated during winter months.

(3) Moisture absorbing chemicals are available for use where excessive dampness is a problem, however the unit must be completely packaged and sealed if moisture absorbing chemicals are to be effective.

B. Temporary Storage

When storing the unit for one month, prepare as follows:

(1) Lubricate the unit completely in accordance with instructions in Section 2-2. This will include changing engine oil, and filter elements.

(2) Make certain the cooling system antifreeze solution is adequate to protect below the lowest temperatures expected during the storage period.

(3) Start the engine and operate at idle speed. With air cleaner removed, spray an engine preservative oil into the carburetor air intake for about two minutes. This oil should be SAE No. 10, formulated for anti-rust and anti-corrosion protection. It should also be a high detergent-type that meets requirements for most severe (M.S.) service and Ford Specification M-4834-A.

(4) Manually override the governor control linkage at the carburetor for a short burst of speed, then turn the ignition switch off and allow the engine to come to a stop while continuing to spray oil into the carburetor air intake.

(5) Clean the exterior of the engine with fuel oil and dry with clean cloths and compressed air.

(6) Seal all engine openings. Use a waterproof, vaporproof material which is strong enough to resist puncture damage from air pressure.

C. Long Time Storage

(1) Engine operation method

The unit may be stored for long periods with no special preparation if it is possible to operate the engine once each week.

(a) Make certain that the cooling system is adequately protected.

(b) Start the engine once each week and operate at idle speed until coolant temperature has reached at least 140 deg F (60 deg C). Operating time should be sufficiently long to keep the battery in a fully charged condition.

WARNING: MAKE CERTAIN OF ADEQUATE VENTILATION BEFORE STARTING ENGINE.

(c) Operate normal operating controls.

(2) If weekly operation is not possible, nor convenient, prepare the unit for storage as follows:

(a) Lubricate the unit in accordance with instructions in Section 2-1. Drain the crankcase completely and refill with engine preservative oil Ford Specification M-4834-A.

(b) Drain the fuel tank and run the engine until the carburetor is empty. Pour about a gallon of unleaded, undyed gasoline in the fuel tank and operate the engine for at least 10 minutes. With the engine running at idle speed and the air cleaner removed, treat the upper cylinders, valves, etc., by spraying an engine preservative oil into the carburetor air intake for about two minutes. Manually override the governor control linkage at the carburetor for a short burst of speed, turn the ignition off, and continue to spray oil into the carburetor until the engine stops.

(c) Drain engine oil. Drain fuel tank, carburetor and fuel lines. Drain cooling system at bottom of radiator and left side of engine block. Remove radiator cap so coolant will drain completely.

(d) Remove all grease and oil from exterior surfaces of engine.

(e) Seal all engine openings and accessories with water resistant adhesive tape.

(f) Remove battery and store in a cool dry place. Store the battery on wood rather than directly on cement or metal.

(g) To protect the generator and other electrical components, the complete unit should be packaged, using moisture proof packaging and sealing materials. Place packages of moisture absorbing chemicals, such as silica-gel, in the unit before packaging.

WARNING: PLACE WARNING TAGS IN SEVERAL PLACES TO MAKE CERTAIN THAT THE INDIVIDUAL WHO TAKES THE UNIT OUT OF STORAGE IS WARNED THAT ENGINE OIL AND COOLANT HAVE BEEN DRAINED.

3. Preparation for Shipping

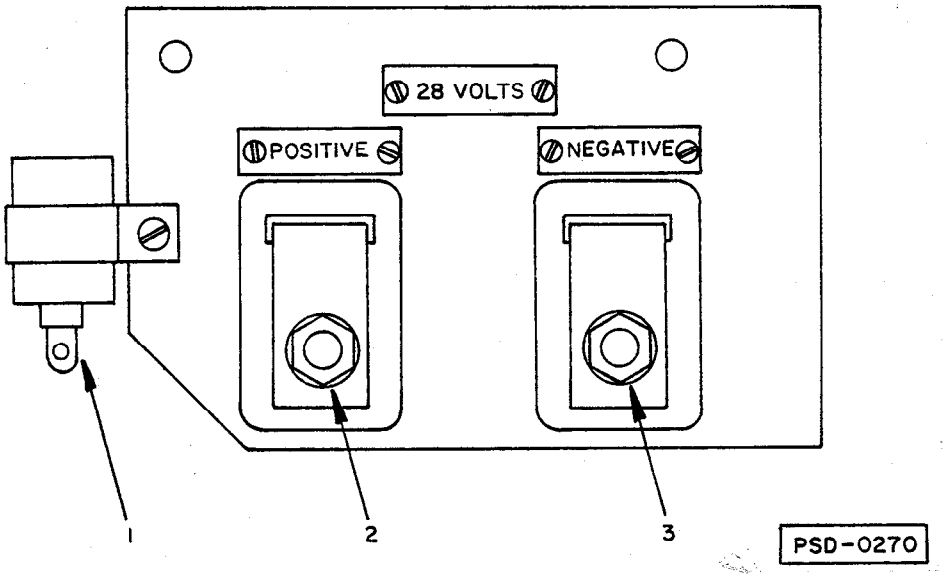
Prepare the unit for shipping as follows:

A. Seal all engine openings to prevent the entrance of water, dirt, and dust.

B. Disconnect battery cables.

C. Drain all fuel from tank, carburetor, and fuel lines as required by carrier rules.

D. Crate the unit solidly to prevent damage to instruments, glass, and sheet metal.

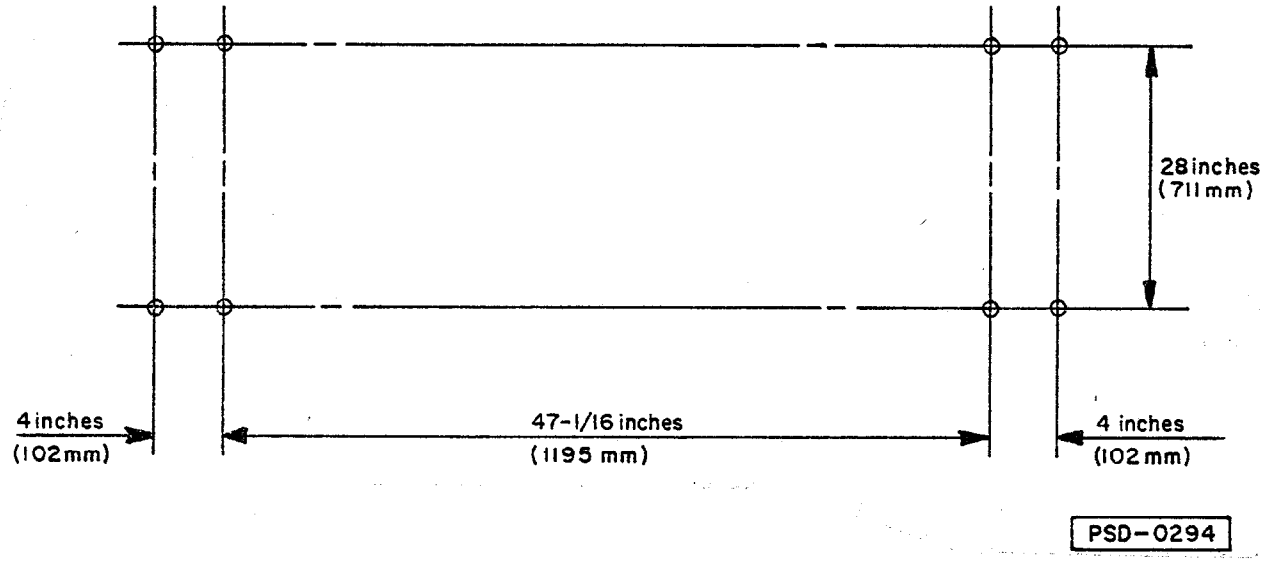



1. RFI Capacitor
2. Positive Output Terminal
3. Negative Output Terminal

28 Volt Output Terminal Panel
Figure 1

4. Stationary Unit Mounting

Figure 2 illustrates the mounting hole pattern in the base of the stationary Jet-Ex 3 generator set. Each of the eight holes is 5/8 inch (16 mm) in diameter.




Stationary Unit Mounting Holes
Figure 2

# SECTION 3. OPERATION

## 1. General

This section contains information and instructions for the safe and efficient operation of the generator set. Operating instructions are presented in a step-by-step sequence of procedures to be followed in supplying power to an aircraft.

NOTE: Read ALL of the operating instructions before attempting to operate the equipment.

WARNING: EAR PROTECTION MAY BE NECESSARY WHEN WORKING CLOSE TO THIS EQUIPMENT.

## 2. Operating the Generator Set

### A. Pre-start Inspection

(1) Always be sure there is sufficient oil and coolant in the engine.

(2) Be sure the fuel shutoff valve is open. The valve is located at the fuel tank outlet. Observe fuel gage. Make certain of sufficient fuel to complete the job to be done.

(3) If the unit is trailer mounted and is not connected to a tow vehicle, be sure the parking brake is applied and that the drawbar is raised and locked in the vertical position. The brake lever operates on an over-center locking principle. Pull the lever backward until it snaps into locked position. To unlock, push the lever forward to full off position.

(4) Open doors and inspect interior for rags, tools, and foreign material.

### B. Operating Generator with Electronic Governor

(1) Start-up Procedure

(a) Connect the output cable between the generator and the aircraft receptacle connector.

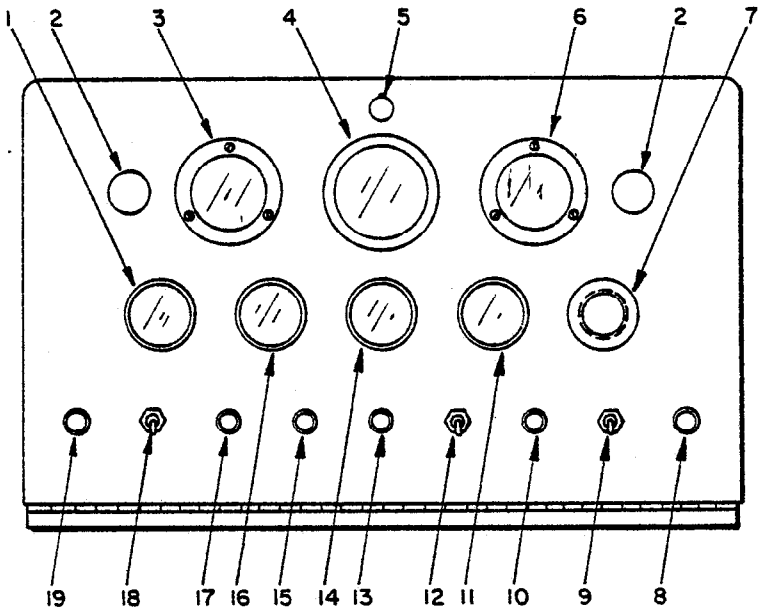
(b) If the engine is cold, pull the CHOKE control (Ref Fig. 1, Item 2) out to choke position. The amount of choking required for a particular engine will become apparent to the operator after a few starts.

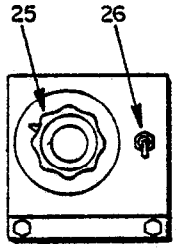
NOTE: Do not choke a hot engine.

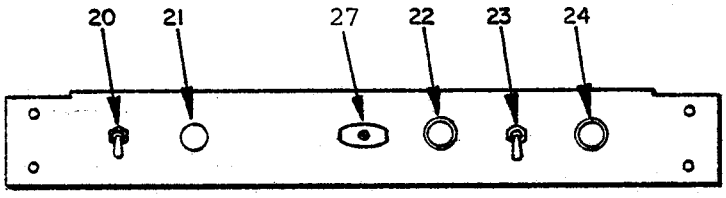
(c) Make sure GENERATE/IDLE switch (20) is in IDLE position.

(d) Place the ENGINE (ignition) switch (18) in START position, hold until the engine starts and the ENGINE ON light (19) glows, then release to RUN position.

(e) Press and hold the ENGINE START pushbutton (17) to crank the engine. Release the switch as soon as the engine starts.




PSD-0266

NOTE: Items marked * are used with 14 Volt Option only.

**: Used with mechanical governor only.

***: Used with electronic governor only.

1. Water Temperature Gauge
2. Panel Light
3. Voltmeter
4. Tachometer
5. Latch
6. Ammeter (Generator)
7. Current Limit Control
8. Contactor Closed Light
9. Contactor Control Switch
10. Push-To-Build-Up-Voltage Switch
11. Hourmeter
12. Panel Lights Switch
13. Panel Lights Fuse
14. Ammeter (Engine)
15. Engine Circuit Fuse
16. Oil Pressure Gauge
17. Engine Start Switch
18. Engine Ignition Switch
19. Engine On Light
*** 20. Generate/Idle Switch
21. Choke Control
* 22. 14 Volt Mode Light
* 23. 14 Volt Contactor Control Switch
* 24. 14 Volt Contactor Closed Light
25. Field Rheostat Control
26. Automatic/Manual Switch
** 27 Throttle Control

Operating Controls and Indicators
Figure 1

CAUTION: IF THE ENGINE STALLS OR FALTERS IN STARTING, WAIT THREE OR FOUR SECONDS BEFORE RE-ENGAGING STARTER. THIS WILL PREVENT POSSIBLE DAMAGE TO STARTER OR ENGINE.

DO NOT OPERATE THE STARTER FOR PERIODS LONGER THAN 15 SECONDS AT A TIME. AN INTERVAL OF AT LEAST TWO MINUTES SHOULD BE ALLOWED BETWEEN SUCH CRANKING PERIODS TO PROTECT THE STARTER FROM OVERHEATING.

(f) Push the CHOKE control in if the engine does not start after being cranked a few revolutions.

(g) If engine flooding is suspected, push the CHOKE control in and crank the engine again, observing the CAUTION above.

(h) When the engine starts, it should be allowed to idle and warm before applying a load.

WARNING: THE ENGINE'S ENTIRE EXHAUST SYSTEM WILL GET VERY HOT AND CAUSE SEVERE BURNS IF TOUCHED.

NOTE: Be sure that the CHOKE control is pushed all the way in before operating the engine under load.

(2) 28.5 volt power delivery with automatic voltage control

(a) If lighting is required, position PANEL LIGHTS switch (12, Figure 1) to ON.

(b) AUTOMATIC/MANUAL switch (26) should be in AUTOMATIC position.

(c) Push throttle control (27) in to generate speed and twist to lock in place. Tachometer (4) should read 2400 RPM when engine reaches operating speed.

(d) Check engine gages.

Ammeter should indicate a slight charge. It may be near zero if the battery is fully charged.

Normal oil pressure is 35 to 60 PSI (240 to 414 kPa) hot.

Normal coolant temperature is 180 to 200 deg F (82 to 93 deg C) depending on ambient temperature, load, etc.

(e) Press the push-to-build-up-voltage switch (10) to flash the generator field coils.

NOTE: It is necessary to press this switch only when the generator will not build up voltage by itself.

A voltage value of approximately 28.5 volt DC should be observed on the voltmeter (3). If value is other than 28.5 volt DC, adjust voltage regulator according to instructions in the voltage regulator manual in Chapter 6.

(f) Check to be certain that the aircraft is in condition to receive power.

(g) If current limiting is required, adjust current limiting rheostat (7) to maximum current desired.

(h) To apply power to the aircraft, close the load contactor by holding the contactor control switch (9) in top CLOSE position momentarily until indicating light (8) glows green. Release switch and allow it to position to center ON position. Light (8) should continue to glow, indicating that the load contactor is closed and power is available at the aircraft.

Voltage will be automatically regulated at approximately 28.5 volts DC by the voltage regulator (1-1; 1, Figure 4).

(3) 28.5 volt power delivery with manual voltage control

This mode of operation is recommended for generator testing, or for emergency use in case of voltage regulator trouble only. For manual control of generator output voltage, use normal operating procedures except:

(a) Place AUTOMATIC/MANUAL switch (26) in MANUAL position.

(b) Use the rheostat (25) to manually regulate voltage at 28.5 volts DC. Turn knob clockwise to INCREASE voltage.

C. Operating Generator with Mechanical Governor

(1) Start-up procedure

(a) Connect the output cable between the generator and the aircraft receptacle connector.

(b) If the engine is cold, pull the CHOKE control (21) out to choke position. The amount of choking required for a particular engine will become apparent to the operator after a few starts.

NOTE: Do not choke a hot engine.

(c) Pull throttle control (27) out to idle position and twist to lock into place.

(d) Place the ENGINE (ignition) switch (18) in START position, hold until the engine starts and the ENGINE ON light (19) glows, then release to RUN position.

(e) Press and hold the ENGINE START pushbutton (17) to crank the engine. Release the switch as soon as the engine starts.

CAUTION: IF THE ENGINE STALLS OR FALTERS IN STARTING, WAIT THREE OR FOUR SECONDS BEFORE RE-ENGAGING STARTER. THIS WILL PREVENT POSSIBLE DAMAGE TO STARTER OR ENGINE.

DO NOT OPERATE THE STARTER FOR PERIODS LONGER THAN 15 SECONDS AT A TIME. AN INTERVAL OF AT LEAST TWO MINUTES SHOULD BE ALLOWED BETWEEN SUCH CRANKING PERIODS TO PROTECT THE STARTER FROM OVERHEATING.

(f) Push the CHOKE control in if the engine does not start after being cranked a few revolutions.

(g) If engine flooding is suspected, push the CHOKE control in and crank the engine again, observing the CAUTION above.

(h) When the engine starts, it should be allowed to idle and warm before applying a load.

WARNING: THE ENGINE'S ENTIRE EXHAUST SYSTEM WILL GET VERY HOT AND CAUSE SEVERE BURNS IF TOUCHED.

NOTE: Be sure that the CHOKE control is pushed all the way in before operating the engine under load.

D. Discontinue Power Delivery: Electronic Governor

(1) Place load contactor control switch (9) in OFF position.

Light (8) should go off to indicate load contactor has opened and power is no longer available at the aircraft.

(2) Position GENERATE/IDLE switch (20) to IDLE position.

(3) Disconnect cable plug from aircraft receptacle and store cable on hangers at the rear of canopy.

(4) Stop engine by placing ignition switch to OFF position.

NOTE: If the engine has been under heavy load for a long period, allow it to idle and cool for a few minutes before stopping.

E. Discontinue Power Delivery: Mechanical Governor

(1) Place load contactor control switch (9) in OFF position.

Light (8) should go off to indicate load contactor has opened and power is no longer available at the aircraft.

(2) Pull throttle control (27) out to IDLE position.

(3) Disconnect cable plug from aircraft receptacle and store cable on hangers at the rear of canopy.

(4) Stop engine by placing ignition switch to OFF position.

NOTE: If the engine has been under heavy load for a long period, allow it to idle and cool for a few minutes before stopping.

3. Operation of 14 Volt DC Output Circuit

Instructions above apply to 28.5 volt DC operation. The following instructions are for 14 volt DC power delivery.

A. Preparation for Power Delivery

(1) Prepare the unit for 14 volt DC operation the same as for 28.5 volt DC. See Para. 2, A and B.

(2) Remove 14 volt DC output cable from its stored position.

(3) Connect cable plug to aircraft (or other) receptacle connector.

NOTE: Both 14 volt DC and 28.5 volt DC cables may be connected to aircraft (or loads) at the same time, but 14 volt and 28.5 volt DC power CANNOT BE DELIVERED AT THE SAME TIME.

B. Power Delivery

All of the 28.5 volt power delivery methods including normal automatic voltage control, manual voltage control, and limited current engine starting, apply to the 14 volt system. Each method is covered below. For each method it is assumed that the engine has been started and warmed, and is running at IDLE speed.

(1) Normal 14 volt power delivery with automatic voltage control

(a) If lighting is required, place light switch (12, Figure 1) in ON position.

(b) Place AUTOMATIC/MANUAL switch (26) in AUTOMATIC position.

(c) Place GENERATE/IDLE switch (20) in GENERATE position. Tachometer (4) should indicate approximately 2400 RPM.

(d) Check engine gages

Ammeter should indicate a slight charge. It may be near zero if the battery is fully charged.

Normal oil pressure is 35 to 60 PSI (240 to 414 kPa) hot.

Normal coolant temperature is 180 to 200 deg F (82 to 93 deg C) depending on ambient temperature, load, etc.

(e) Press the push-to-build-up-voltage switch (10, Figure 1) to flash the generator field coils.

NOTE: 1. It is necessary to press this switch only when the generator will not build up voltage by itself.

2. The voltmeter will indicate 28.5 volts until the unit is switched to 14 volt mode.

(f) Check to be certain that the aircraft is in condition to receive power.

(g) Adjust current limiting rheostat (7) to maximum current desired.

(h) Make certain that the 28.5 volt control switch (9) is OFF. (The 14 volt circuit will not operate if the 28.5 volt load contactor is closed.)

(j) To switch to 14 volt power mode, place the control switch (23) in center ON position. Amber light (22) should glow immediately and voltage indicated on voltmeter should decrease from 28.5 volts to 14 volts within 1 second.

If indicated voltage is not exactly 14 volts, adjust voltage regulator (1-1; 1, Fig. 5) according to instructions in the voltage regulator manual in Chapter 6.

(k) To deliver 14 volt power, hold control switch (23, Figure 1) in top CLOSE CONTACTOR position. Green contactor closed light (24) should glow at once to indicate that the load contactor is closed, and power is being delivered to the 14 volt output cable. Release control switch. It will return to center ON position. Voltage regulator will regulate output voltage at 14 volts automatically.

(2) 14 volt power delivery with manual voltage control

This mode of operation is recommended for generator testing, or for emergency use in case of voltage regulator trouble only. For manual control of generator output voltage, use normal 14 volt operating procedures (see Para. 3, B, [1] ) except:

(a) Place AUTOMATIC/MANUAL switch (26, Fig. 1) in MANUAL position.

(b) Use the rheostat (25) to manually regulate voltage at 14 volts DC. Turn knob clockwise to INCREASE voltage.

C. Discontinue 14 Volt Power Delivery

(1) Place 14 volt control switch (23, Figure 1) in OFF position.

Green light (24) will go off to indicate the load contactor is open.

Amber light (22) will go off to indicate that the 14 volt DC circuit is not operational.

(2) Position GENERATE/IDLE switch (20) to IDLE position.

(3) Disconnect cable plug from aircraft receptacle and store cable on hangers at the rear of canopy.

(4) Stop engine by placing ignition switch in OFF position.

NOTE: If the engine has been under heavy load for a long period, allow it to idle and cool for a few minutes before stopping.

D. Switching Power from Mode-to-Mode

Power delivery can be switched from one mode to the other without stopping the machine and without making major control changes.

(1) Switch from 14 volt to 28.5 volt delivery

For this change, place 28.5 volt DC load contactor control switch (9, Figure 1) in top CLOSE position momentarily, then release to center ON position. The 28.5 volt DC load contactor will close and the 14 volt DC load contactor will be automatically opened.

(2) Switch from 28.5 volt to 14 volt delivery

(a) Place 28.5 volt DC load contactor control switch (9, Figure 1) in OFF position.

(b) Hold 14 volt DC control switch (23) in top CLOSE CONTACTOR position until both indicating lights (22 and 24) are on. Release switch to center ON position.

NOTE: Switching from 14 volt DC to 28.5 volt DC can be made simply by operating the 28.5 volt DC contactor switch (9); however, the 28.5 volt DC switch must be turned off first to change from 28.5 volt to 14 volt power.

4. Trailer Operation

A. Towing

Observe the following rules when towing the trailer.

(1) Be sure all output cables are disconnected and properly stowed.

(2) Be sure parking brake is released.

(3) Avoid turns which are shorter than the steering linkage will freely allow.

(4) Avoid dangerous speed and sudden turns.

B. Parking

Observe the following rules when parking the trailer.

(1) Apply parking brake before disconnecting tow vehicle.

(2) Always place drawbar in an upright, vertical position and lock it when trailer is parked.

# CHAPTER 2. SERVICING

## SECTION 1. MAINTENANCE INSPECTION/CHECK

### 1. General

To make certain that generator set is always in good operating condition, it must be inspected, maintained, and lubricated regularly and systematically.

WARNING: STOP OPERATIONS AT ONCE IF A SERIOUS OR POSSIBLY DANGEROUS FAULT IS DISCOVERED.

### 2. Maintenance Schedule

A. General

Figure 1 provides a suggested schedule for periodic checks and services. Refer to Section 2-2 for lubrication requirements.

B. Maintenance Schedule Check Sheet

It is strongly recommended that the customer use a maintenance schedule check sheet. The check sheet will provide a record of maintenance operations performed and may also serve to improve scheduling for a specific operation.

C. Time Intervals

The schedule is based on both hours of operation and calendar intervals. These two intervals are not necessarily the same. The calendar period is included to make certain services are performed regularly when equipment is being operated infrequently, or at irregular intervals. Hourly time intervals agree with the engine manufacturer's recommendations. Perform all services on a "whichever comes first" basis.

NOTE: Refer to the Ford Maintenance and Operator's Manual for detailed engine maintenance information.

| | A/R | 10 HRS. OR DAILY | 100 HRS. OR 2 WEEKS | 200 HRS. OR 1 MONTH | 400 HRS. OR 2 MONTHS | 800 HRS. OR 6 MONTHS |
|---|---|---|---|---|---|---|
| ENGINE | | | | | | |
| Check oil level | | X | | | | |
| Check coolant level | | X | | | | |
| Check governor oil | | | X | | | |
| Check fuel quantity | | X | | | | |
| Check gages and instruments for proper operation | | X | | | | |
| Clean or replace dry-type carburetor air cleaner element | X | | X | | | |
| Lubricate distributor | | | X | | | |
| Clean crankcase ventilation system | X | | X | | | |
| Change engine oil | | | X | | | |
| Change engine oil filter | | | X | | | |
| Change governor oil | | | | | | X |
| Lubricate choke linkage | | | | X | | |
| Check and tighten drive belts | X | | | X | | |
| Clean and inspect exterior of radiator | | | | X | | |
| Check exhaust system | | | | X | | |
| Check cooling system | | | | | X | |
| Check and adjust idle speed and mixture | X | | | | X | |
| Check and refill cooling system | | (Twice yearly, summer and winter) | | | | |
| Replace fuel filter | X | | | | | X |
| Clean engine | | | | | | X |
| ELECTRICAL SYSTEM (12-V DC) | | | | | | |
| Check lights | | X | | | | |
| Check charging rate | | X | | | | |
| Check battery water level | | | X | | | |
| Check battery state of charge | | | | X | | |
| Charge wiring and connections | | | | X | | |
| Check all instruments and gages | | | | | X | |
| Check battery terminals and connectors | | | | | X | |

Inspection/Check/Maintenance Schedule
Figure 1 (Sheet 1 of 2)

| | A/R | 10 HRS. OR DAILY | 100 HRS. OR 2 WEEKS | 200 HRS. OR 1 MONTH | 400 HRS. OR 2 MONTHS | 800 HRS. OR 6 MONTHS |
|---|---|---|---|---|---|---|
| ELECTRICAL SYSTEM (28.5-V DC) | | | | | | |
| Check indicating light | | X | | | | |
| Check operation of all instruments, meters, etc. | | X | | | | |
| Check generator brushes for length, cleanliness, and free operation | | | | | X | |
| Check commutator for smoothness and cleanliness | | | | | X | |
| Check the entire unit | | | | | | X |
| Check overload protection | | | | | | X |
| Check overvoltage protection | | | X | | | |
| Check all wiring connections | | | | | | X |
| TRAILER | | | | | | |
| Lubricate | | | | | X | |
| Check tire inflation | | | | | X | |
| Check and adjust wheel bearings | | | | | | X |
| Lubricate wheel bearings | | | | | | X |

Inspection/Check/Maintenance Schedule
Figure 1 (Sheet 2 of 2)

## SECTION 2. MAINTENANCE PROCEDURES

### 1. General

A suggested Maintenance Schedule is provided in Section 1 of this Chapter. Each step of the schedule is also covered in general in Section 1. This Section covers maintenance in more detail where necessary.

WARNING: STOP OPERATION IMMEDIATELY IF A SERIOUS OR POSSIBLY DANGEROUS FAULT IS DISCOVERED.

### 2. Lubrication

A. General

Proper lubrication is one of the most important steps in good maintenance procedure. Proper lubrication means the use of correct lubricants and adherence to a proper time schedule. Lubrication points, frequency of lubrication, and recommended lubricants are indicated in Figure 1.

B. Lubrication Chart

Lubrication points are illustrated and identified by name on Lubrication Chart, Figure 1.

Number symbols used to designate the kind of lubricant required and the specification recommended are identified in Figure 2.

Letter symbols used to designate the normal lubrication period are identified in Figure 3.

C. Generator

The 28.5 volt DC generator requires NO lubrication. The armature is supported at the rear by a single, ball bearing which is lubricated and sealed at the factory for lifetime, maintenance free operation. The front end of the armature is supported by the engine main bearings.

D. Generator Controls

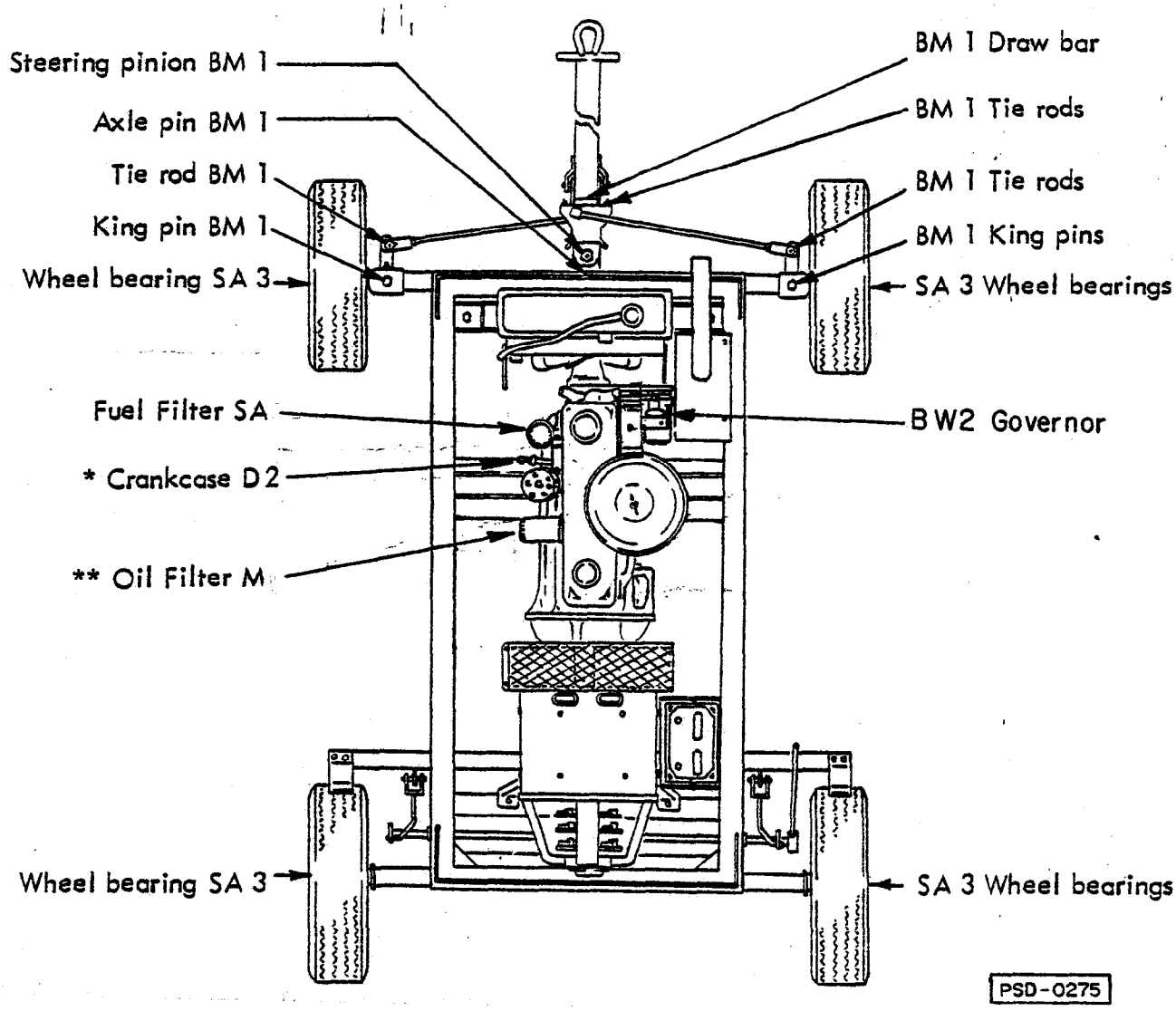
Generator controls and instruments require no periodic lubrication. A few drops of oil may be required on door hinges occasionally to insure free and quiet operation.

E. Engine

Although the engine and its accessories require no more attention than any other similar installation, they still inherently require a major portion of the generator set lubrication and maintenance. Recommendations regarding engine lubrication have been taken from the engine manufacturer's "Maintenance and Operator's Manual".

(1) Lubrication schedule

Time schedules indicated on the Lubrication Chart, Figure 1, are approximate. They are based on average operating conditions. It may be necessary to lubricate more frequently under severe operating conditions such as: low engine temperature, high oil temperature, intermittent operation, or dusty conditions. However, time intervals should not exceed those indicated in the chart without careful evaluation.




* Check crankcase oil daily; change 200 hours.
** Change oil filter 200 hours.

Lubrication Chart
Figure 1

| SYMBOL | NAME | SPECIFICATION | NOTES |
|---|---|---|---|
| 1 | Grease, Automotive and Industrial | Federal VV-G-632 | Sinclair Litholene Industrial No. 2; Mobil-Mobilplex 47, or equivalent. |
| 2 | Oil, Engine, Heavy Duty | Ford spec. ESE-M2C101-C | Ford Motorcraft, or equivalent. Refer to Figure 4 for recommended oil viscosity. |
| 3 | Grease, Automotive | Military MIL-G-10924B | Wheel bearings |

Lubricants
Figure 2

| SYMBOL | TIME INTERVAL |
|---|---|
| D | 10 hours or Daily |
| BW | 100 hours or Biweekly |
| M | 200 hours or Monthly |
| BM | 400 hours or Bimonthly |
| SA | 800 hours or Semiannually |

Symbols and Time Intervals
Figure 3

(2) Oil specification

Engine lubricating oil recommended by the engine manufacturer must meet Ford Specification No. ESE-M2C101-C. Oil that meets this specification is normally marked so on the can and meets API (American Petroleum Institute) classification designation SD/SE. The manufacturer recommends Ford or Motorcraft oils, which meet all specifications for Ford Industrial Engines.

The use of quality lubricating oil, combined with proper oil drain and filter change intervals are important factors in extending engine life.

(3) Oil viscosity

When you change or add oil, you should select oil with the proper specifications and with the viscosity, selected from the following table, which most closely matches temperature range you expect to encounter for the next 100 hours of operation.

SINGLE VISCOSITY OILS

| When Outside Temperature is Consistently | Use SAE Viscosity Number |
|---|---|
| −10°F to +32°F | (*) 10W |
| +10°F to +60°F | 20W-20 |
| +32°F to +90°F | 30 |
| Above 60°F | 40 |

MULTI-VISCOSITY OILS

| When Outside Temperature is Consistently | Use SAE Viscosity Number |
|---|---|
| Below +32°F | (*) 5W-30 |
| −10°F to +90°F | 10W-30 |
| −10°F to +90°F (or above) | 10W-40 |
| Above +10°F | 20W-40 |

(*) Where sustained high RPM operation is anticipated, use 20W20.

Temperature and Oil Viscosity Chart
Figure 4

(4) Change engine oil (100 hours)

Oil should be changed after each 100 hours of engine operation. The generator set is equipped with an hourmeter which records actual engine operating time. The ideal time to change oil is soon after a power delivery run when the engine is at operating temperature.

NOTE: If lubricating oil is drained immediately after the unit has been run for some time, most of the sediment will be in suspension and oil will drain readily without clinging to internal surfaces.

CAUTION: DO NOT USE SOLVENTS AS FLUSHING OILS IN RUNNING ENGINES.

Change the oil filter each time the oil is changed.

Change oil as follows:

(a) Provide a container for catching used oil. Capacity should be greater than 2 gallons.

(b) Remove drain plug located in oil pan. Allow sufficient time for oil to drain from valve train, timing gear case, etc., before reinstalling plug.

(c) Change oil filter while oil is draining [see Para. 2, E, (5) below].

(d) Clean drain plug and reinstall. Do not over-tighten.

(e) Remove filler cap on valve cover and refill crankcase with new, clean oil of proper specification and viscosity [see Para. 2, E, (2) and Figure 4]. 7 quarts are required when oil filter is changed.

(f) Start engine and allow it to idle. Oil pressure should come up to normal quickly. Check for oil leaks at filter and drain plug.

(g) Stop engine. Allow several minutes for oil to drain to crankcase, then check oil level. It should be at FULL mark on dipstick.

(h) Check hourmeter and record time of oil change.

(5) Change engine oil filter (100 hours)

(a) Place a container under the oil filter (1-1; 23, Figure 3) to catch oil

(b) Loosen filter with a special oil filter removal wrench. Several types are available. Discard oil filter.

(c) It is recommended that a Motorcraft No. FL-1A or a Ford No. D9AZ-6731A replacement be used.

(d) Coat the gasket on the new filter with oil.

(e) Place the new filter in position on the cylinder block and spin on until the gasket contacts the adapter face; then hand tighten another 1/2 turn. Do not over-tighten.

(f) Start engine and check filter gasket for leaks.

F. Engine Accessories

(1) Distributor

Place a few drops of SAE 10W engine oil in the oil cap on the distributor housing each 100 hours operation.

(2) Governor linkage

Lubricate all wear points with one or two drops of SAE 30 engine oil each 200 hours.

(3) Mechanical Governor

Change governor oil each 800 hours. Add SAE 40 oil to governor.

G. Trailer

(1) Front axle assembly

The front axle assembly, drawbar, and steering linkage are equipped with high pressure lubrication fittings. Lubricate the trailer each 400 hours. Use a good quality chassis lubricant (See Figure 2). Clean lube fittings before applying grease.

(2) Wheel Bearings

Lubricate and check wheel bearing adjustment each 800 hours or semiannually. Use a good quality bearing lubricant (See Fig. 2).

3. Servicing the Air Cleaner and Crankcase Ventilation System

A. General

It is important that the air cleaner be cleaned and serviced regularly after each 100 hours of engine operation. Service the air cleaner more often under severe dust conditions. Failure to service the cleaner can cause damage to the cylinder walls and rings, excessive oil consumption, and excessive fuel consumption.

B. Clean and Service Air Cleaner

(1) Remove thumb nut and remove air cleaner assembly.

(2) Disassemble air cleaner and discard dry filter element.

(3) Wash all components with solvent and blow dry with compressed air.

(4) Replace air cleaner body on carburetor.

(5) Install a new filter element Motorcraft No. FA-52 or Ford Part No. C8TF-9601-A.

(6) Replace air filter cover.

(7) Reinstall thumb nut and tighten securely.

C. Clean Crankcase Ventilation System

Clean both breather caps at each oil change (100 hours).

(1) Remove both breather caps from the rocker cover and clean them in a petroleum solvent.

(2) Replace both breather caps.

4. Servicing the Fuel Filter

The fuel filter is a replaceable cartridge type and is mounted on the fuel pump (1-1; 24, Figure 3) on the left side of the engine. The recommended filter element for replacement is Motorcraft No. FG-1 or Ford No. C4AZ-9365A, and should be changed every 800 hours.

A. Unscrew the filter housing from the pump body, and remove the filter element and gasket. Discard the element and gasket.

B. Clean the filter housing in a petroleum cleaning solvent.

C. Place a new filter element over the spout in the pump body.

D. Coat the new gasket with light engine oil and position it on the pump body. (New gasket is packaged with the replacement element.)

E. Screw the filter housing on to the body and hand tighten it until it contacts the gasket. Then tighten it an additional 1/8 turn.

F. Start the engine and check for leaks.

5. Drive Belt Service

Check all drive belts and adjust if necessary each 200 hours. Refer to Ford Maintenance and Operator's Manual in

6. Engine Cooling System

A. General

NOTE: Refer to the Ford Maintenance and Operator's Manual in Chapter 6 for detailed instructions on servicing the engine's cooling system.

During warm weather operation, when plain water is used as a coolant, the cooling system MUST be protected against rust by a rust inhibitor additive. During cold weather operation the system MUST be protected against freezing. The system should NEVER be operated on plain water, without a rust inhibitor or antifreeze.

WARNING: WHEN REMOVING THE CAP FROM A VERY HOT RADIATOR, COVER THE CAP WITH A THICK CLOTH AND TURN IT SLOWLY COUNTERCLOCKWISE TO THE FIRST STOP. WHEN PRESSURE IS COMPLETELY RELEASED, PRESS DOWNWARD AND FINISH REMOVING CAP.

CAUTION: DO NOT ADD COOLANT TO AN EXTREMELY HOT ENGINE. THIS CAN RESULT IN A CRACKED BLOCK OR CYLINDER HEAD.

B. Rust Inhibitor

The recommended rust inhibitor to use in this engine is Ford Rotunda 8A-19546-C.

C. Antifreeze

The recommended antifreeze for use in this engine is Ford Rotunda 8A19549-A. The coolant, when mixed as equal parts of water and the recommended antifreeze, will provide protection to –35 degrees F (–37 degrees C). If another coolant is used, it must meet Ford Specification M-97B18-C.

7. Battery Service

Refer to the Ford Maintenance and Operator's Manual in Chapter 6 for battery service instructions.

8. Generator Maintenance

A. General

The only maintenance service required for the generator will be brush replacement, commutator cleaning, etc.

B. Brush Service

(1) Cleaning

If inspection reveals that brushes are gummy or sticking in the brushholders, they should be removed and cleaned. Clean both the brushes and brushholders. Use a good, SAFE, commercial cleaner. DRY ALL PARTS THOROUGHLY. Be sure brushes can move freely in brushholders.

WARNING: DO NOT USE A FLAMMABLE SOLVENT. DO NOT USE STEAM CLEANER, OR SOAPS AND DETERGENTS UNDER PRESSURE.

(2) Replacement

Brushes for this application are 1-3/4 inches long when new. They should be replaced when worn to one-half their original length, or 7/8 inch. Replacement brushes are available from Hobart Brothers as Part No. AW-1470. Replace all 16 brushes at the same time.

(a) Remove pigtail attaching screw.

(b) Move brush spring (1, Figure 6) aside and remove old brush (3).

(c) Check new brushes before installation. Size must be 3/4 x 1 x 1-3/4 inch long.

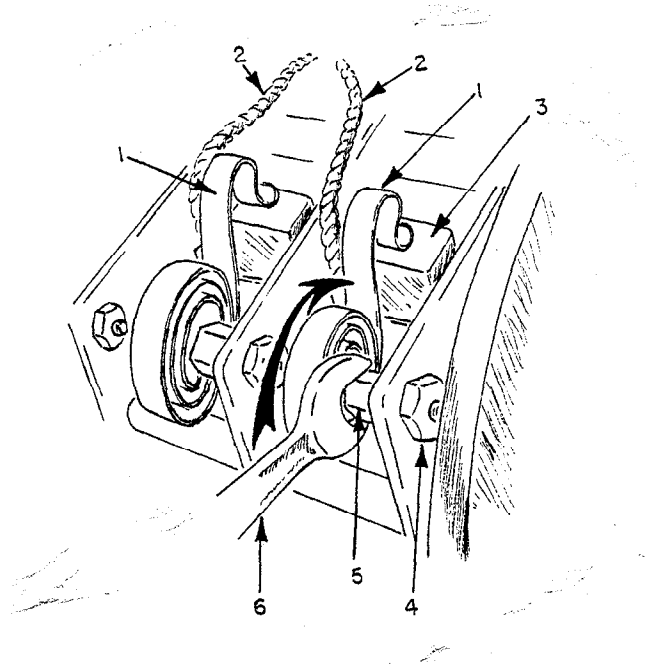
(d) Move brush spring aside and install new brush.

NOTE: Check position of brush pigtail and install so that pigtail is on the forward side of the brush.

(e) Check the clearance between brush and brushholder. The brush should move up and down freely in the holder, yet without excessive side-to-side or fore-and-aft movement.

(f) Connect the pigtail. A single screw attaches two brush pigtails.

(g) Repeat steps (a) through (f) for other brushes.




1. Spring
2. Pigtail
3. Brush
4. Nut
5. Spring mounting adapter
6. Wrench

Generator Brush Installation
Figure 6

(3) Brush seating

When replacing brushes, it is important that they be carefully fitted to the commutator ring. The seating stone method of brush seating is recommended for this installation. Brush seating stones are available from Hobart Brothers as Part No. 410117.

Seating stones are fine-grain, abrasive blocks made especially for brush seating. When applied to the commutator, fine particles from the stone drift under the brush and shape its face to the same curve as the commutator.

(a) Start the engine and operate the generator with no power output.

(b) Hold the stone against the commutator immediately behind the brushholder so that stone particles will be carried directly under the brush. Steady the stone by holding it against the brushholder.

(c) Seating may be speeded up by applying extra pressure on the brush.

WARNING: EXERCISE CARE TO AVOID INJURY BY THE ROTATING EQUIPMENT OR ELECTRICAL SHOCK.

(d) Use dry compressed air to blow out any grit or foreign material.

CAUTION: DO NOT APPLY A FULL LOAD UNTIL BRUSHES HAVE RUN-IN FOR APPROXIMATELY ONE HOUR AT 300 TO 400 A LOAD.

(4) Brush springs

Refer to Section 2-3, Para. 3, A, (3) for brush spring adjustment instructions.

(5) Commutator cleaning

The most effective method of cleaning and smoothing the commutator is the use of a flexible abrasive block especially manufactured for commutator cleaning. When held against the revolving commutator, the block will quickly remove deposits of dirt and grease. Commutator cleaning blocks are available from Hobart Brothers as Part No. AW-817.

Operate the generator at 300 to 400 A load for approximately one hour to allow a film to form on the commutator after cleaning.

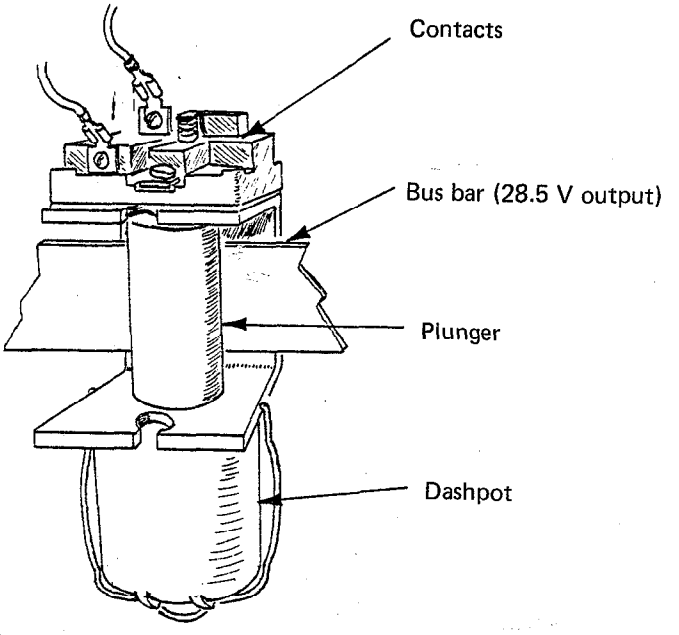
9. Generator Controls Maintenance (14 Volt Output Option Only)

A. General

The overload relay dashpot (Figure 7) is the only component of the control system which requires periodic inspection and maintenance.

B. Overload Relay

The entrance of water into the dashpot or the use of improper fluid may cause operating troubles requiring disassembly and repair of the dashpot assembly. The following instructions include repair procedures in the recommended sequence of steps.




Overload Relay Installation
Figure 7

(1) Disassemble

(a) Hold the dashpot and unlatch the spring clamp (4, Figure 8) by prying with a screwdriver to swing the clamp forward. Lower and remove the complete dashpot assembly.

(b) Lift the core (1), cover (2), and valve plate (6) out of the dashpot (3) as an assembly.

(c) Pour the dashpot fluid into a clean glass container and inspect for signs of water.

NOTE: Moisture may condense in the dashpot to form water which will cause corrosion of the valve plate and dashpot.

(2) Inspection

Inspect the valve plate (6, Figure 8) and the dashpot (3) for evidence of corrosion. Discard, if corroded, and replace with new parts. Observe the position of the two valve plate covers. One is diamond shaped and retains two steel balls (5). This cover should not be disturbed. The other plate serves to cover the valve plate bypass holes, and MUST be positioned to completely COVER and CLOSE the holes.

(3) Assemble

(a) Pour a sufficient quantity of new fluid into the dashpot to cover the circular ridges in the bottom. Use a silicon fluid with a viscosity rating of 100 centistokes at 25°C.

Approved fluids are:

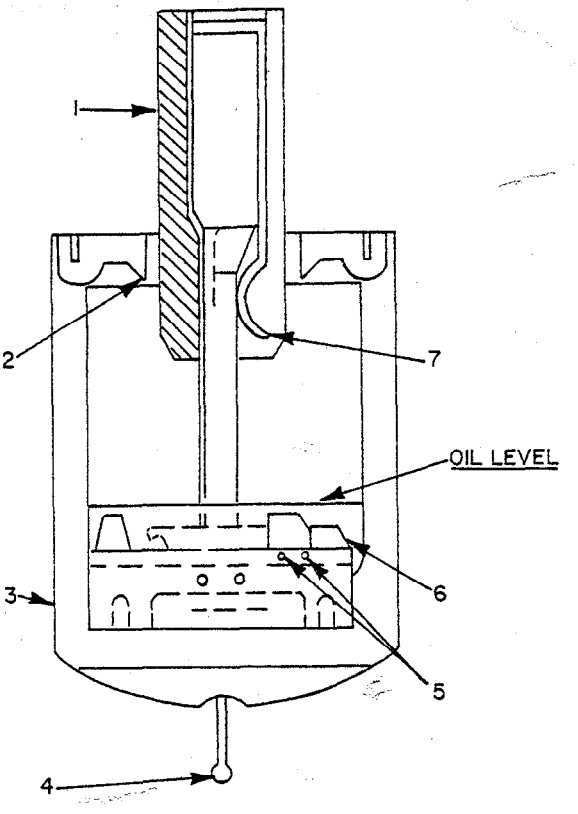
Dow-Corning No. 200 (100 centistokes)
Allen-Bradley No. 810-N9B, Series A
Allen-Bradley No. X-106518

NOTE: Allen-Bradley numbers indicate different container sizes.

(b) Install the valve plate (6) and core (1) as an assembly. Make certain that the valve plate bottoms in the dashpot.

(c) Add fluid until the surface of the fluid is level with the tops of the three cylindrical projections on top of the valve plate. Actuate the piston a short distance up and down to expel any air trapped below the plate. Recheck the fluid level and add fluid if required.

1. Core (plunger)
2. Cover
3. Dashpot
4. Spring clamp
5. Steel balls
6. Valve plate
7. Lock spring




Overload Relay Dashpot Assembly
Figure 8

(d) Install the dashpot cover (2).

(e) Make certain the valve plate (6) is bottomed in the dashpot and measure the height that the core extends above the rim of the dashpot. Adjust core (1) so that it extends 1-1/8 inch above the dashpot rim. This adjustment should cause the overload relay to trip at 1000 ampere load in 1 minute. Increase the height by turning the core in a counterclockwise direction. Decrease the height by turning the core in a clockwise direction. Turn the core a full turn at a time and be sure the lock spring (7) is seated in the valve plate stud groove when the adjustment is completed.

(f) Position the dashpot assembly in the overload relay and lock in place with the spring clamp (4).

## SECTION 3. ADJUSTMENT/TEST

1. General

The adjustments and test procedures presented below are required after major repairs, parts replacement, or long storage.

2. Testing the Generator Set

Test values listed below will result when the generator set is operating properly. If your test results are not within the limits shown, perform the applicable troubleshooting procedures given in Chapter 3.

If major repairs have been made or if critical components have been replaced, make sure that the applicable adjustments have been made before testing the generator set. Adjustment procedures are descirbed in Para. 3 of this Section.

A. Preoperational Test Procedures

(1) Open all access doors and inspect the interior for rags, tools, and other foreign materials.

(2) Check engine oil level.

(3) Check coolant level.

(4) Check battery water level.

(5) Check for sufficient fuel.

(6) Check drive belts. Each belt should have approximately 1/2 inch (13 mm) slack.

(7) Inspect all wiring for possible trouble spots such as loose wires or terminals, frayed insulation, obvious shorts, etc.

(8) Check panel lights, panel light switch, and fuse.

(9) Check governor linkage for freedom of travel. Proper control rod length is approximately 11-1/2 inches (292 mm) center-to-center of ball joints.

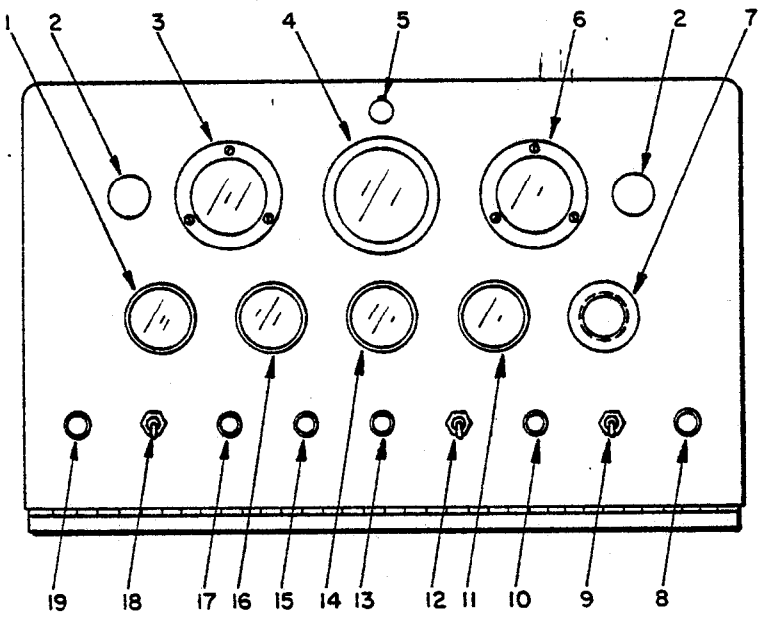
CAUTION: IF GOVERNOR WAS REPLACED OR LINKAGE WAS DISCONNECTED FOR ANY REASON, REFER TO ADJUSTMENT PROCEDURES IN PARA. 3 BEFORE TESTING GENERATOR.

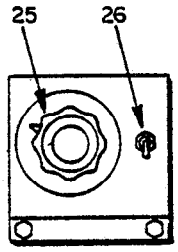
(10) Connect cables from generator output terminals to a load bank. Use cables of the same size and length as those used in service, preferably No. 2/0, not more than 30 feet (9 m) long.

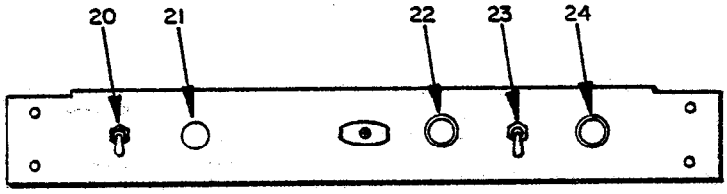
(11) Set AUTOMATIC/MANUAL switch (26, Figure 1) to MANUAL.

(12) Turn field rheostat (25) to minimum.

(13) Set GENERATE/IDLE switch (20) to IDLE.

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NOTE: Items marked * are used with 14 Volt Option only.

**: Used with mechanical governor only.

***: Used with electronic governor only.

1. Water Temperature Gauge
2. Panel Light
3. Voltmeter
4. Tachometer
5. Latch
6. Ammeter (Generator)
7. Current Limit Control
8. Contactor Closed Light
9. Contactor Control Switch
10. Push-To-Build-Up-Voltage Switch
11. Hourmeter
12. Panel Lights Switch
13. Panel Lights Fuse
14. Ammeter (Engine)
15. Engine Circuit Fuse
16. Oil Pressure Gauge
17. Engine Start Switch
18. Engine Ignition Switch
19. Engine On Light
*** 20. Generate/Idle Switch
21. Choke Control
* 22. 14 Volt Mode Light
* 23. 14 Volt Contactor Control Switch
* 24. 14 Volt Contactor Closed Light
25. Field Rheostat Control
26. Automatic/Manual Switch
** 27 Throttle Control

Operating Controls and Indicators
Figure 1

B. Operational Tests

(1) Start the engine as described in 1-3; Para. 2, B, and let it warm at idle speed.

(2) Inspect for oil, fuel, and coolant leaks.

(3) Check the engine ammeter (14, Figure 1) for a slight charge. Check oil pressure gauge (16). It should display 35 to 60 PSI (240 to 414 kPa). Check coolant temperature gauge (1). It should show 180 to 200 deg. F (82 to 93 deg. C).

(4) Idle speed displayed on the tachometer (4) should be 600 to 650 RPM.

(5) Check engine rpm's at operating speed:

(a) Electronic governor. Switch GENERATE/IDLE switch (20) to GENERATE. Tachometer (4) should show a 2400 rpm no load speed.

(b) Mechanical governor. Push throttle control (27) all the way in. Tachometer (4) should show a 2400 rpm no load speed.

(6) Check voltage range of manual voltage control rheostat (25). Voltage range should be approximately 2 to 49 volts DC displayed on the voltmeter (3).

(7) Manually set voltage at 28.5 volts.

(8) Adjust the load bank for a load of 750 amperes.

(9) Place the contactor control switch (9) in the CLOSE position. CONTACTOR CLOSED light (8) will glow and the contactor will close. Release the switch to the center ON position. The tachometer (4) will indicate 2400 $\pm$ 25 RPM.

(10) Disconnect the load bank and check the overvoltage protection by increasing voltage manually. The overvoltage relay will trip and open the load contactor at 32 to 34 volts in 2 to 10 seconds.

(11) Reset voltage to 28.5 volts, connect the load bank set at 750 amperes, and close the contactor.

(12) Check overload protection by increasing the load to 1000 amperes. The overload relay will trip and open the load contactor in approximately 1 minute.

(13) Set AUTOMATIC/MANUAL switch (26) to AUTOMATIC. Voltmeter (3) will display 28.5 $\pm$ 1 volts.

NOTE: It may be necessary to adjust potentiometer R33 on Voltage Regulator (1-1; 1, Figure 5) to get voltage within tolerance.

(14) Set current limit control (7, Figure 1) to maximum, full clockwise, position.

(15) Remove load bank and check voltage regulation at no load. Voltage will be 28.5 volts. Reconnect load bank and check voltage regulation with load bank set at 187, 375, 562, 750, and 900 amperes and check voltage at each setting. Voltage will be 28.5 $\pm$ 1 volts at each different load.

(16) Apply 800 to 900 amperes load to the generator and set the current limit control (7) to 400. Current displayed on ammeter (6) will be 400 $\pm$ 25 amperes.

NOTE: Voltage will not drop below 12 volts.

(17) Set current limit control to 1000. Apply 1200 amperes load. Current displayed on ammeter will be 1000 $\pm$ 25 amperes and voltage will not drop below 12 volts.

(18) To check the overspeed governor, manually override the governor linkage at the carburetor to increase engine speed. The overspeed governor will open the ignition circuit and shut down the engine at 2850 to 2900 RPM.

(19) Restart the engine, check the instruments as directed in step (3), and check the entire generator set for unusual vibration and noises.

C. 14 Volt Output Option Test

(1) With generator operating normally at 28.5 volts DC, place both 28.5 volt and 14 volt contactor control switches (9 and 22, Figure 1) in OFF position.

(2) Place 14 volt contactor control switch (22) in ON position. 14 volt MODE light (22) will glow amber.

(3) Check voltage on voltmeter (3). It should be 14 volts DC. If not, adjust voltage regulator for 14 volt output as directed in the Voltage Regulator Manual in Chapter 6.

(4) Close the 14 volt load contactor. The CONTACTOR CLOSED light (24) will glow green.

(5) Close the 28.5 volt load contactor. The 14 volt contactor will open at once and the green light (24) will go out. Open the 28.5 volt contactor.

(6) Close the 14 volt contactor. Place the AUTOMATIC/MANUAL switch (26) in MANUAL position. With the manual control rheostat (25) lower the voltage below 14 volts, then gradually increase the voltage one volt at a time, pausing at least 10 seconds between settings. The overvoltage relay will trip and open the load contactor at 18 to 20 volts, in 2 to 10 seconds. Lower the voltage gradually. The overvoltage relay will reset at 15.5 to 14.5 volts. Return the switch (26) to AUTOMATIC position.

(7) Close the 28.5 volt contactor. Attempt to close the 14 volt contactor. It should not close and the 28.5 volt contactor should remain closed.

(8) Operate the generator at 28.5 volts with both contactors open. Hold the 14 volt contactor control switch (23) in the top CLOSE CONTACTOR position. Voltage indicated on voltmeter (3) will drop from 28.5 to 14 volts in 1 second. Contactor should not close until 14 volts is indicated.

(9) Use a load bank to test the overload relay adjustment. The 14 volt overload relay (1-1; 8, Figure 7) should trip in 1 minute at 1000 amperes load. If adjustment is required, refer to 2-2; Para. 9, B, (3), (e).

3. Adjusting the Generator Set

If brushes have been replaced, follow the brush seating instructions given in 2-2; Para. 8, B, (3).

WARNING: DO NOT MAKE ADJUSTMENTS WHEN THE GENERATOR IS RUNNING. LETHAL ELECTRICAL SHOCK HAZARD EXISTS.

A. Brushholder Adjustment

The brushholder assembly is mounted in a machined, circular seat in the rear of the generator housing. The brushholder mounting ring is held in the seat by clamps and the entire brushholder assembly may be rotated when the clamps are loosened. To adjust, proceed as follows:

(1) With generator running at no load and AUTOMATIC/MANUAL switch (26, Figure 1) in MANUAL position, use manual control rheostat (25) to adjust voltage to 28.5 volts.

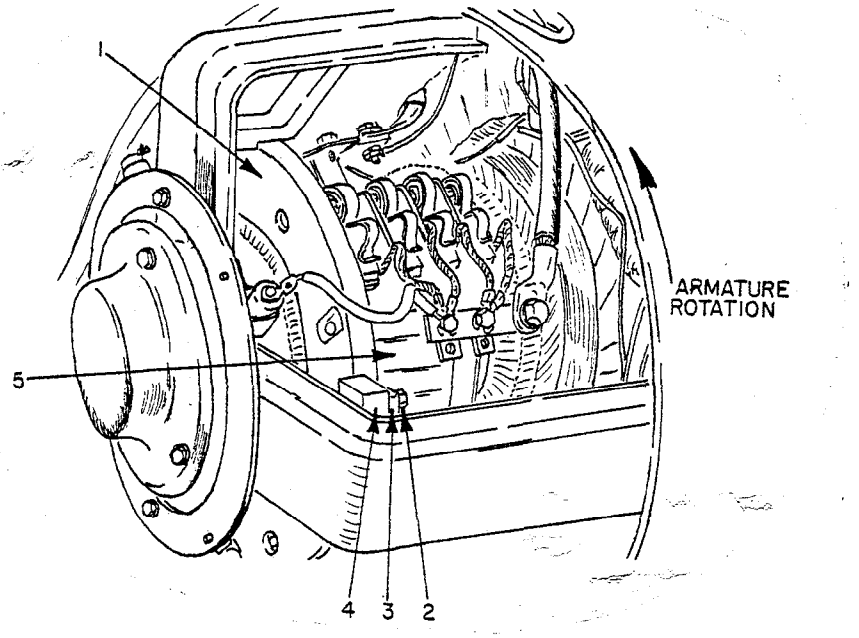
(2) Apply a load of 750 amperes and check output voltage. If voltage is 27.5 to 28.5 volts, the brushholder is properly adjusted. If voltage is below 27.5, or above 28.5 volts, adjustment is required.

(3) Stop generator and scribe a mark on the brushholder mounting ring, and on one of the seat bars to determine a starting point for adjustment.

(4) Loosen brushholder clamping screws (2, Figure 2) and rotate the brushholder (1) in the direction of armature rotation to REDUCE voltage, or opposite the direction of rotation to INCREASE voltage. Do not rotate the brushholder more than 1/8 inch (3 mm) without rechecking voltage. Tighten clamping screws (2) before starting generator.

(5) Start generator and repeat steps (1), (2), (3), and (4) as required until a satisfactory adjustment has been made.

(6) Be sure clamping screws (2) are securely tightened at conclusion of adjustment.




1. Brushholder mounting ring
2. Clamp screw
3. Clamp
4. Seat bar
5. Commutator segment

Brushholder Assembly
Figure 2

B. Initial Adjustment of Brushholder

In the event that the generator is disassembled and the brushholder assembly is removed, locate the brushholder as follows:

(1) Rotate armature so that an armature slot is directly under an interpole piece. Carefully observe and trace the wires which lead from the winding in the slot to a commutator segment (5, Figure 2). Rotate the brushholder ring (1) so that a row of 4 brushes is directly over this segment. Tighten brushholder clamping screws (2).

NOTE: Exercise care in tracing the armature to commutator wire because the wires run at an angle and not directly to a commutator segment. It may be possible to detect yellow paint marks on the armature slot and the commutator riser which were used to position the brushholder originally. If these marks can be found, it will make brushholder adjustment easier.

(2) Make final adjustment in accordance with Para. 3, A, above

C. Brush Spring Adjustment

Recommended spring pressure is 18 to 30 ounces (510 to 850 grams) measured along an imaginary line which passes through the center of the brush and the center of the commutator.

Spring pressure is critical to long brush life and generator performance in that it must be sufficiently strong to maintain stable brush-commutator contact, yet not strong enough to cause mechanical wear. Insufficient spring pressure can cause excessive surface film buildup on the commutator, arcing, heat, and more rapid brush wear than excessive brush pressure. For these and other reasons it is best to use the higher recommended brush pressures.

It is difficult to measure brush pressure accurately. Take the following precautions to reduce chances of error.

1. Be sure brush can move freely in brush box.

2. Be sure brush finger and spring are not corroded or sticking.

3. Make certain the scale to be used is accurate.

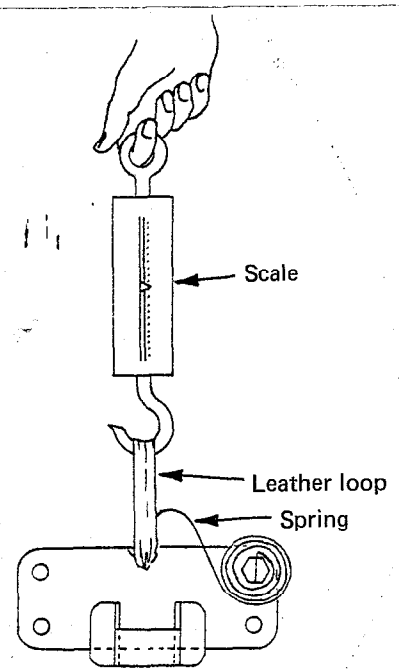
The following is a suggested method of measuring brush pressure.

(1) A leather loop and an ordinary tension scale which is graduated in ounces or grams are required. The leather loop gives firmer contact with the brush spring or finger than the scale hook (see Figure 3).

(2) Place a strip of paper between the brush and commutator.

(3) Place a leather loop over the brush spring (or finger) and position it under the point where the spring (or finger) touches the brush. Attach scale to leather loop.

(4) Pull lightly outward on scale ring. The direction of pull must be parallel to the brush length. At the same time, pull gently on the paper strip.




Measuring Speed Pressure
Figure 3

(5) Increase pull on the scale until paper strip slips free. Read scale to the nearest ounce.

(6) Pressure should be within recommended range, preferably at, or near, the high limit.

(7) Adjust pressure as required.

To adjust spring pressure, loosen nut (4, Figure 4) and turn spring adapter (5) toward the brush (arrow direction) to increase pressure. Turn the opposite direction to decrease pressure. Tighten nut (4).

NOTE: The adapter must be held in its new adjusted position while tightening nut.

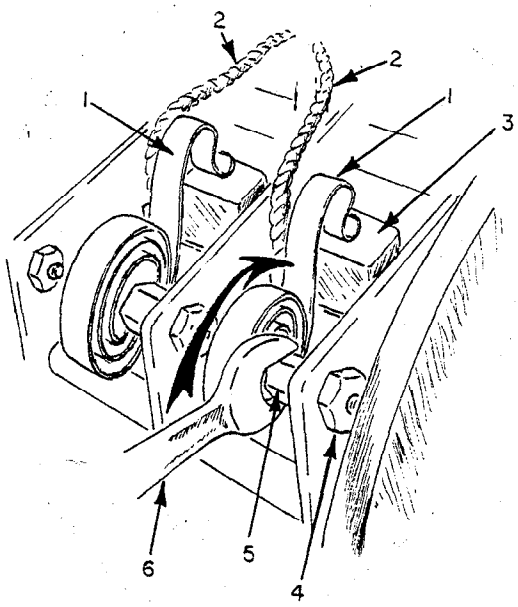
## D. Engine Electronic Governor Adjustments

If the governor has been replaced, the new governor will have to be adjusted according to the procedures listed below.

(1) Set the GENERATE/IDLE switch (20, Figure 1) to IDLE, start the engine, and check the idle speed. It should be 600 to 650 RPM. If it is not, adjust the idle speed as described below.

(2) Push choke control knob in as far as it will go.

(3) Refer to Figure 5. Turn idle speed adjusting screw until the engine speed is 600 to 650 RPM.




1. Spring
2. Pigtail
3. Brush
4. Nut
5. Spring mounting adapter
6. Wrench

Generator Brushes
Figure 4

(4) Turn the idle fuel adjusting screw in (clockwise) until the engine RPM begins to drop from the lean mixture, then turn it out (counterclockwise) until the RPM increases and just begins to drop from the rich mixture. Then turn it in (clockwise) for maximum engine RPM and smoothness.

NOTE: Always favor a rich mixture rather than a lean mixture for final adjustment. A lean mixture puts an unnecessary heat load on the valves and may cause premature valve failure.

(5) After verifying the idle speed, shut down the engine.

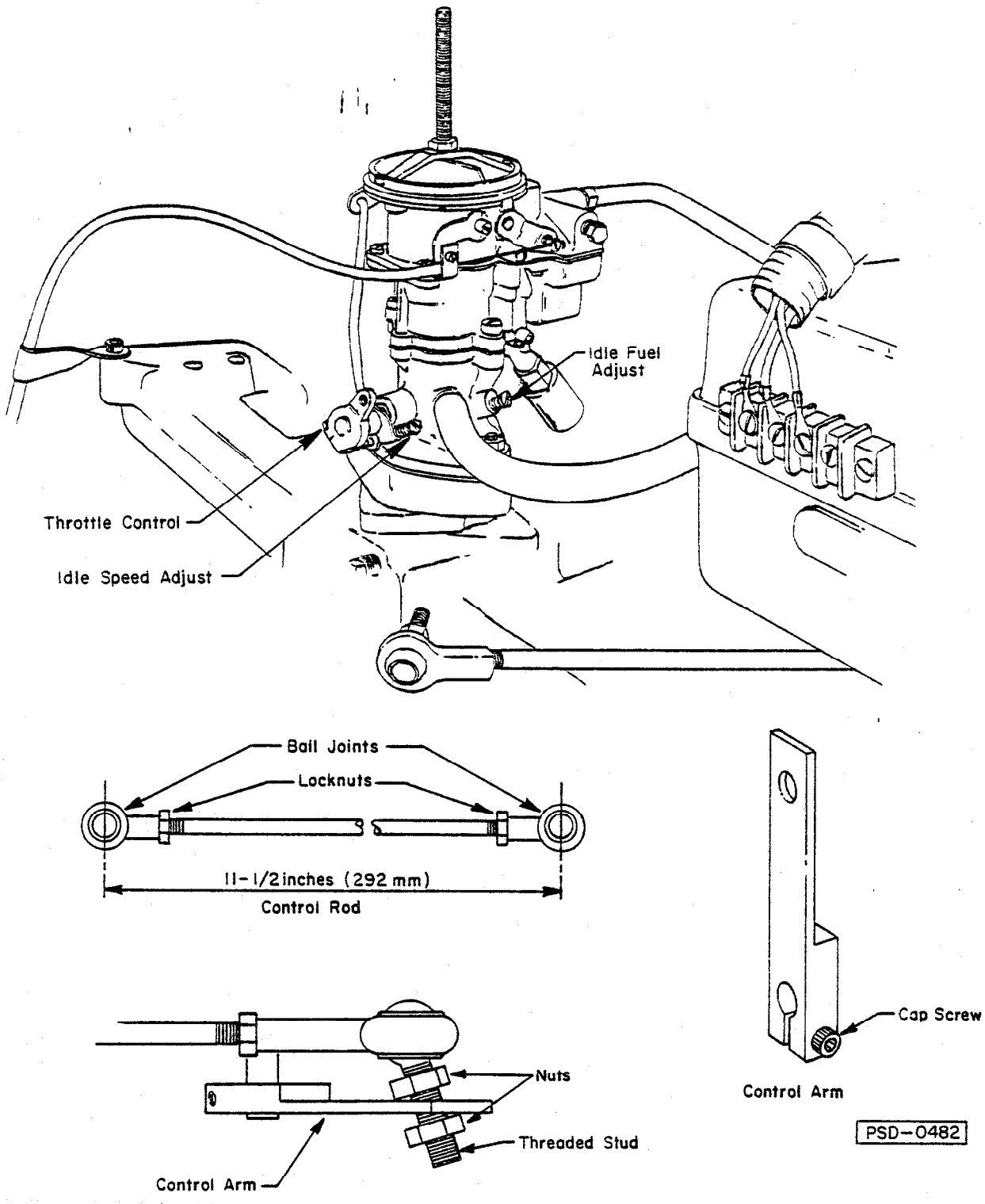
(6) Make sure that the electrical connections to the governor have been made as shown on the connection and schematic diagrams in Chapter 6.

(7) Refer to Figure 5. Check the length of the governor control rod. It should be 11-1/2 inches (292 mm) from center to center of the ball joints. Loosen the locknuts and adjust if necessary.

(8) Attach the ball joint on one end of the rod to the throttle control lever on the carburetor and secure it with the nuts provided.

(9) Remove one nut from the threaded stud on the other ball joint and thread the remaining nut approximately halfway up the stud.

(10) Loosen the cap screw which secures the control arm to the governor shaft and rotate the control arm to a position where the ball joint stud will pass through the hole in the arm. Make sure that the governor shaft does not rotate with the arm. Thread the second nut on the stud just far enough to insure thread engagement.




Governor Linkage
Figure 5

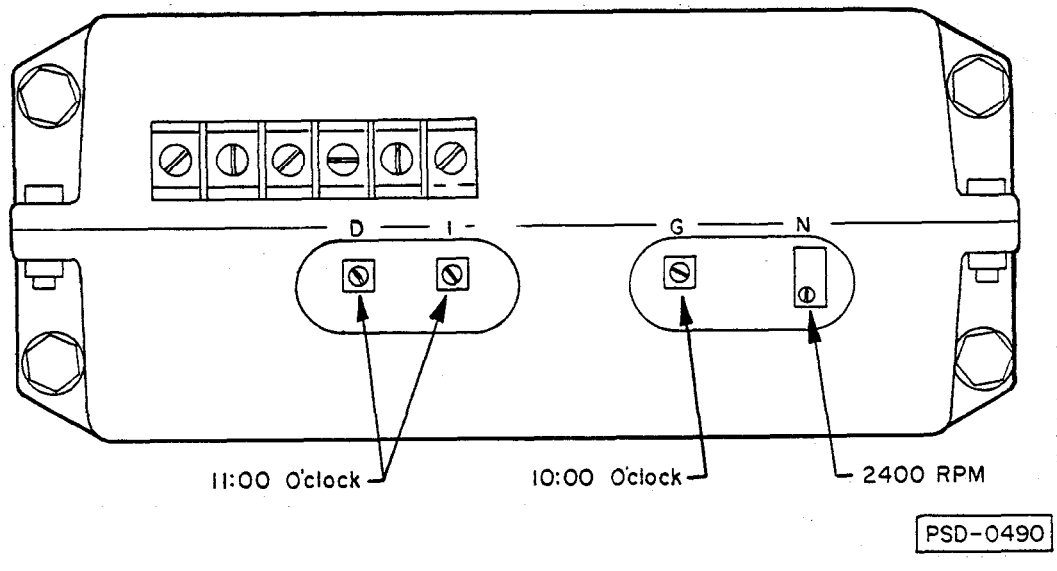
(11) Rotate the control arm slightly to the right and tighten the cap screw to secure the control arm to the governor shaft. Refer to the detail in Figure 5. When the bottom nut is tightened against the control arm, the control arm should be preloaded toward the carburetor approximately 1/16 inch (1.6 mm). Repeat this step if necessary to get the proper preload.

(12) Refer to Figure 6. Turn speed control N counterclockwise 4 or 5 turns to insure control of the engine when it is started.

(13) Make sure that switch (20, Figure 1) is in IDLE position. Start the engine and let it run at idle speed until it reaches operating temperature of 180 to 200 deg F (82 to 93 deg C).

(14) Set the switch (20) to GENERATE position and turn the speed control pot N (Figure 6) slowly clockwise until 2400 ± 25 RPM is indicated on the tachometer. If the engine surges, adjust the gain control G counterclockwise until the surging stops. This setting is approximately at 10 o'clock position.

NOTE: Adjust the gain control G in very small increments, no more than 10 degrees at a time.

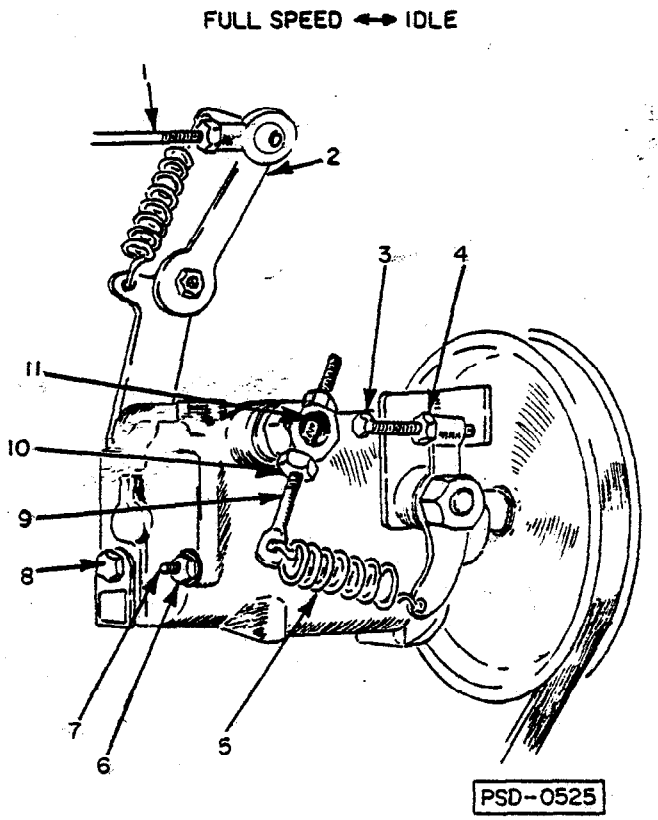



Internal Governor Adjustments
Figure 6

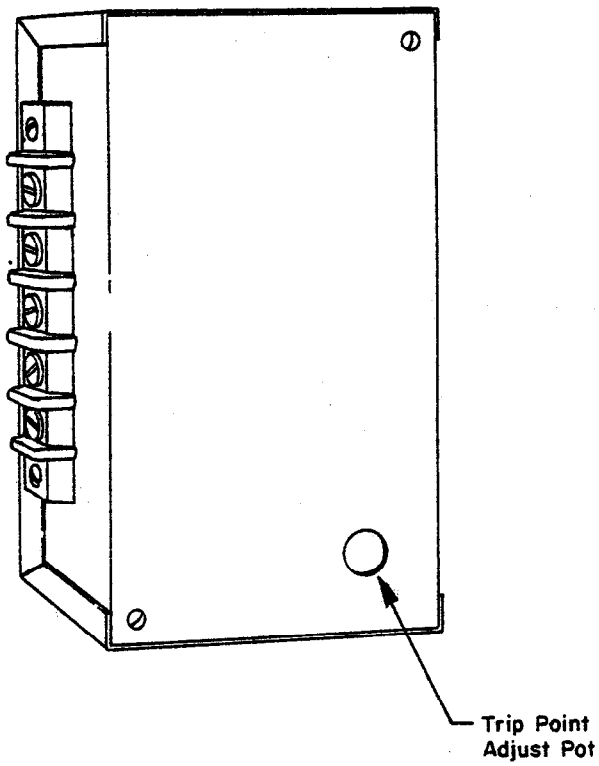
(15) Attach a load bank to the generator output terminals, set it for 750 amperes load, and close the load contactor.

If the engine will not pick up the load, adjust the gain control G clockwise until the engine recovers quickly when the load is applied.

NOTE: Optimum setting for this control is at approximately 10 to 11 o'clock position.




Mechanical Governor Adjustments
Figure 7




Overspeed Governor
Figure 8

E. Engine Mechanical Governor Adjustment

(1) Connect the generator output to a load bank capable of applying 750 amperes load.

(2) Refer to Figure 7. Back out the bumper screw (7) until only 3 or 4 threads are engaged and secure it with the locknut (6).

(3) Pull the throttle control T handle all the way out and start the engine. Let it run at fast idle until warmed to operating temperature, then push the throttle control all the way in.

(4) Adjust the screw (3) to obtain a no load speed of 2450 RPM, then lock the screw with the lockout (4).

(5) Apply a load of 750 amperes with the load bank. Check speed regulation by alternately closing and opening the load contactor. Droop should be no more than 100 RPM (governed speed should not drop lower than 2350 RPM).

(6) If droop is more than 100 RPM, loosen nuts (10) and adjust screw (9) to draw the spring (5) CLOSER to the lever hub (11). If the engine surges under load, adjust the screw (9) to move the spring (5) AWAY from hub (11).

NOTE: Recheck engine speed after each adjustment of screw (9). Readjust speed with screw (3) if necessary.

Tighten 2 locknuts (10) on regulation screw (9) after a satisfactory droop, without surging, has been achieved.

(7) If surging occurs at no load, loosen locknut (6) and turn bumper screw (7) IN (clockwise) a turn at a time until surging stops, then tighten locknut (6).

CAUTION: DO NOT TURN BUMPER SCREW IN FAR ENOUGH TO INCREASE NO LOAD SPEED.

F. Overspeed Governor Adjustment

If the overspeed governor has been replaced, the new unit may require adjustment as described below.

(1) Make sure that the electrical connections to the new overspeed governor have been made as shown in the connection and schematic diagrams in Chapter 6.

(2) Make sure that switch (20, Figure 1) is in IDLE position. Start the engine and let it run at idle speed until it reaches operating temperature of 180 to 200 deg F (82 to 93 deg C).

(3) Manually override the control linkage at the carburetor to increase the engine speed. The overspeed governor should shut down the engine at 2850 to 2900 RPM. If the engine shuts down below 2850 RPM or if it does not shut down at 2900 RPM, adjustment is required.

(4) Refer to Figure 8. The overspeed governor is located inside the control box on the rear panel.

Adjust the screwdriver adjustable pot at the point shown in the illustration. Turn it clockwise to increase the speed at which the engine will shutdown. Turn it counterclockwise to decrease the shutdown RPM.

G. Voltage Regulator Adjustment (14 volt and 28.5 volt)

Refer to Voltage Regulator Manual in Chapter 6 for adjustment procedures.

H. 14 Volt Option Circuit Adjustments

(1) Adjust overvoltage relay trip point

The trip point of the overvoltage relay is adjusted by a variable resistor (1-1; 9, Figure 7) on the 14 volt contactor panel.

(a) Operate generator at normal 28.5 volts with both load contactor switches in OFF position.

(b) Adjust variable resistor (9) to give 20 volt input at overvoltage module (6).

(c) Relay should trip at 18 to 20 volts in 2 to 10 seconds.

(2) Adjust 14 volt output voltage

Refer to Voltage Regulator Manual in Chapter 6 for voltage regulator adjustment.

## SECTION 4. REPAIR

### 1. General

Repairs to this generator set are limited to the replacement of parts. In general, removal and installation procedures for parts replacement is obvious and is not covered in this manual. However, separating the engine and generator to replace internal generator parts, or to repair the engine, requires some special precautions and disassembly/assembly procedures which are outlined below.

### 2. Disassembly

Most mechanics prefer to remove the engine and generator as an assembly, and then separate them. Some prefer to remove the engine or generator separately to gain access to internal parts. However, separating the engine and generator while they are installed in the unit is very difficult because of the limited working space.

DO NOT CUT any cables or wires during disassembly. Disconnect and tag them for reassembly.

A. Separate Engine and Generator

(1) Install a lifting eye with 1/2-13 threads in the tapped hole on top of the generator frame and attach a hoist to it.

Suitable lifting eyes are available from Hobart Brothers as Part No. CTW-116A.

(2) Install wooden blocks under the rear (flywheel) end of the engine to support it when the generator is removed.

(3) Remove the expanded metal screen from the flywheel housing.

(4) Remove 2 setscrews which secure the coupling hub to the generator shaft.

(5) Inspect the fan for the location of balance weights. When used, one or more balance weights are secured to the fan by the screws which secure the fan to the coupling hub.

CAUTION: MARK THE LOCATION OF BALANCE WEIGHTS WITH CHALK OR PENCIL BEFORE REMOVING SCREWS WHICH SECURE THEM. FAN BALANCE AT REASSEMBLY IS VERY CRITICAL.

(6) Remove 8 screws and lockwashers which secure the fan to the coupling hub. Retain any balance weights released by these screws for use at reassembly.

(7) Slide the fan away from the coupling to provide access to coupling-to-flywheel screws.

(8) Remove 6 screws which secure the flexible coupling disk to the flywheel.

(9) Remove 4 screws and lockwashers which secure the generator housing to the flywheel housing.

(10) Use the hoist to separate the generator from the engine and move it to a clear working area.

B. Remove Coupling Assembly

(1) Refer to Figure 1. Apply penetrating oil to the generator shaft and coupling hub.

(2) Use chalk or a felt-tip pen and make a mark across the coupling hub and disk. Make another mark across the outside edge of the 3 coupling disks. This will insure that the assembly is reassembled in balance. This balance is VERY CRITICAL. Remove the 8 screws which attach the disks to the hub and discard the screws.

NOTE: Replacement screws for reassembly are: Grade 5, self-locking, hex-head, steel, 5/16-18, 5/8 inch long. These screws are available from Hobart Brothers as Part No. DW-3146A.

(3) Attach a puller to the coupling hub and pull the coupling hub off the shaft. If driving is required, use a brass driving rod. Reassemble the disks to the hub immediately, lining up the marks made in step (2) above, and using ONLY the Grade 5 screws as specified in the NOTE.

3. Cleaning

Clean the generator shaft and the bore of the coupling hub with a nonflammable solvent to remove all dirt and gum. Use fine emery cloth to remove any rust or compacted dirt from the governor shaft, coupling hub bore, and the machine key. Then remove all grit from the mating surfaces of the shaft, keyway, key, and hub.

4. Assembly

A. Check

Before starting assembly, make sure that the coupling hub will slip onto the generator shaft easily by trying it as follows:

(1) Apply anti-seize lubricant such as LPS-2 to the shaft and the coupling hub bore.

(2) Slide the coupling hub onto the shaft to make sure that it slides on and off, and turns easily. If it does not, repeat the cleaning procedures in Para. 3 above until it does. Then remove the coupling from the shaft.

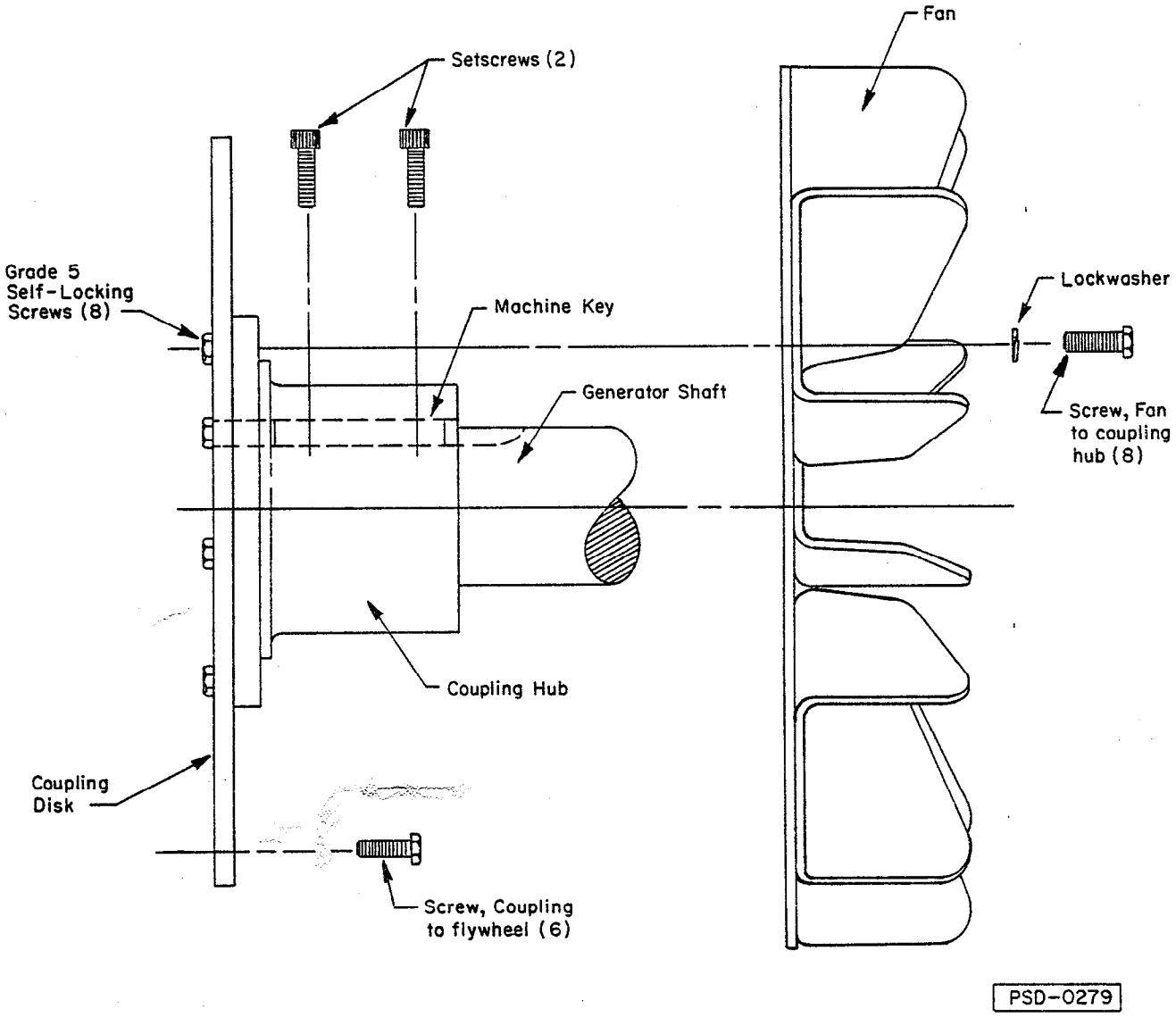
B. Assembly Procedures

(1) Refer to Figure 2. Attach the coupling to the engine flywheel with the 6 screws removed at disassembly, and tighten the screws securely.

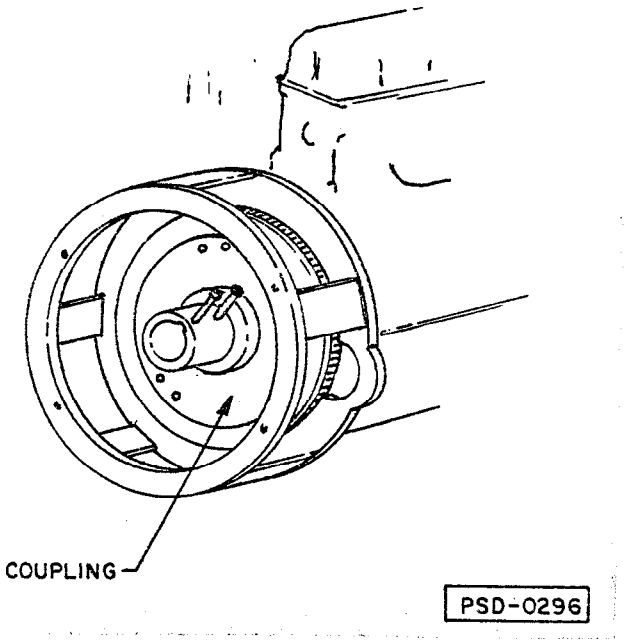
(2) Slide the fan onto the coupling hub. Setscrews in hub must be removed. Replace any balance weights removed at disassembly. The EXACT location of EACH WEIGHT, marked at disassembly, is VERY CRITICAL. Then secure the fan to the coupling hub with the 8 screws and lockwashers removed at disassembly. Install 2 setscrews in the coupling hub just far enough to insure thread engagement.

(3) Install the machine key in the shaft keyway, apply more anti-seize lubricant to the shaft and key, and move the generator to the engine with the hoist.

(4) Align the generator with the engine and carefully start the generator shaft into the bore of the coupling hub. Use careful alignment rather than force to work the shaft into the hub.




Coupling and Fan Assembly
Figure 1

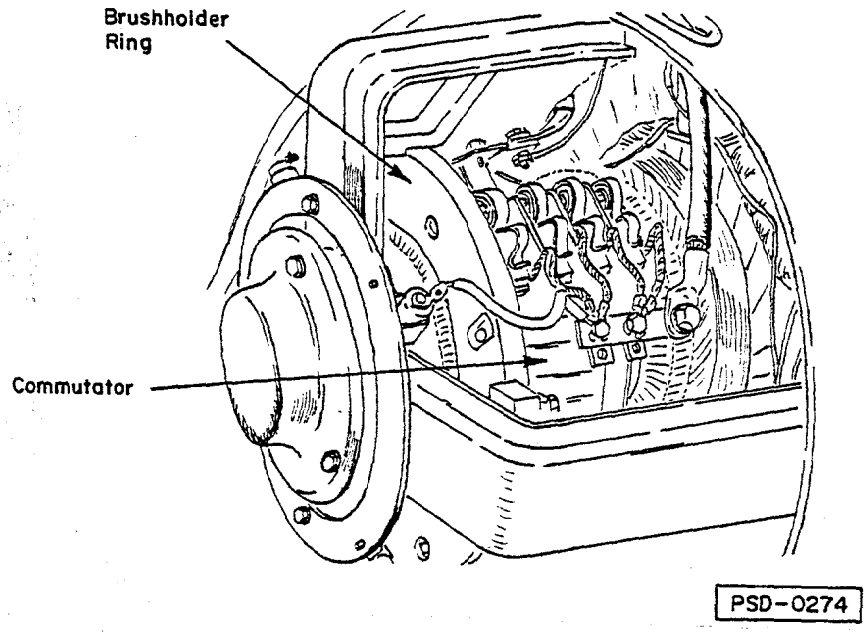



Coupling Attached to Flywheel
Figure 2

(5) Install 4 screws and lockwashers through the flywheel housing and into the generator frame. Install all 4 screws finger tight, then tighten securely with a wrench.

(6) Refer to Figure 3. Carefully slide the generator armature axially until the back edge of the commutator is aligned visually with the front face of the brushholder ring. Then tighten the 2 setscrews in the hub securely. This adjustment insures the proper location of the generator brushes on the commutator.

(7) Replace the expanded metal screen around the flywheel housing.




Armature Position
Figure 3

# CHAPTER 3. TROUBLESHOOTING

## SECTION 1. INTRODUCTION

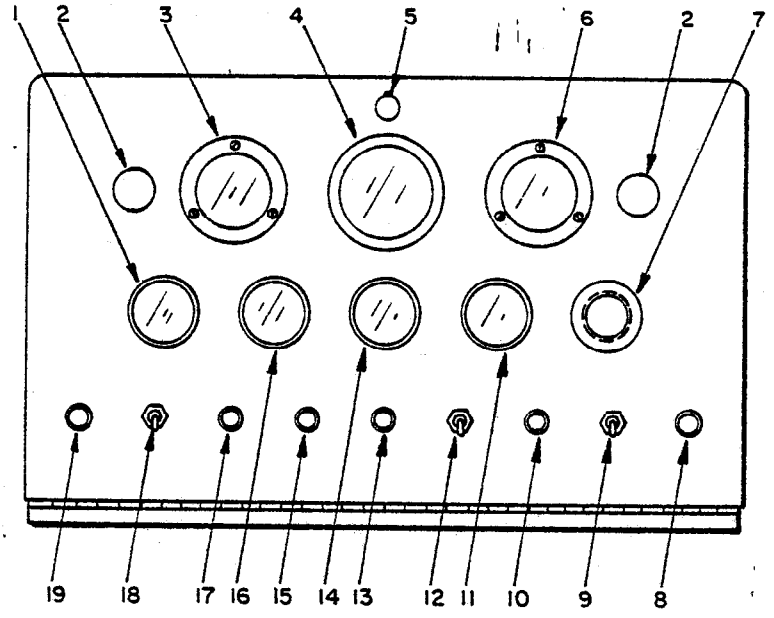
### 1. General

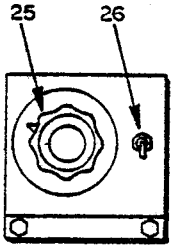
The Troubleshooting Chart, Figure 2, covers the common malfunctions which you may find during operation or maintenance of this equipment. It cannot list all malfunctions that may occur. If a malfunction is not listed in the chart, start looking for the cause at the source of power in the affected circuit. Refer to the schematic and connection diagrams in Chapter 6 and test the circuit, step by step, until the source of the malfunction is isolated.

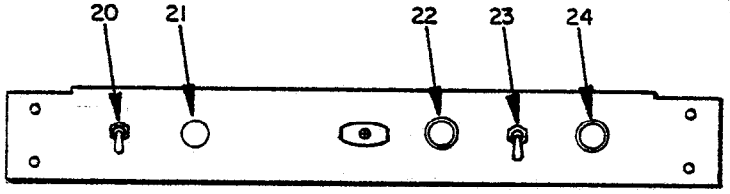
The Troubleshooting Chart is arranged under 3 headings: Malfunction, Test or Inspection, and Corrective Action.

Malfunctions are described and numbered. Tests and Inspections are indented to the right and listed in numbered steps below Malfunctions. Corrective Action provides instructions for correcting the malfunction, and is listed below each Test or Inspection procedure.

Tests and inspections called for in the Troubleshooting Chart are to be performed as described in Section 2-3 of this manual.




PSD-0266

NOTE: Items marked * are used with 14 Volt Option only.

**: Used with mechanical governor only.

***: Used with electronic governor only.

1. Water Temperature Gauge
2. Panel Light
3. Voltmeter
4. Tachometer
5. Latch
6. Ammeter (Generator)
7. Current Limit Control
8. Contactor Closed Light
9. Contactor Control Switch
10. Push-To-Build-Up-Voltage Switch
11. Hourmeter
12. Panel Lights Switch
13. Panel Lights Fuse
14. Ammeter (Engine)
15. Engine Circuit Fuse
16. Oil Pressure Gauge
17. Engine Start Switch
18. Engine Ignition Switch
19. Engine On Light
*** 20. Generate/Idle Switch
21. Choke Control
* 22. 14 Volt Mode Light
* 23. 14 Volt Contactor Control Switch
* 24. 14 Volt Contactor Closed Light
25. Field Rheostat Control
26. Automatic/Manual Switch
** 27 Throttle Control

Operating Controls and Indicators
Figure 1

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE AND CONTROLS

1. STARTER WILL NOT CRANK ENGINE.

Step 1. Momentarily connect a jumper lead between the hot side of starter solenoid (L402) and start switch terminal on the solenoid (yellow-red wire). If the starter operates, check ignition switch (S401) and pushbutton start switch (S402).

Replace faulty switch.

Step 2. Check voltage across battery for 13.5 volts DC.

Recharge or replace battery if defective.

Step 3. Momentarily connect a large capacity jumper cable between hot side of starter solenoid (L402) and starter input terminal.

If starter operates, replace starter solenoid. If starter does not operate, replace starter.

Step 4. Turn engine by hand, using a socket wrench on the front crankshaft pulley nut.

If the engine will not turn, replace or repair engine.

2. STARTER CRANKS ENGINE. ENGINE WILL NOT START.

Step 1. Check engine circuit fuse (15, Figure 1)

Replace fuse (F402) if blown.

Step 2. Connect a jumper between terminals 3 and 4 on the overspeed governor (inside control box).

If engine will start, replace overspeed governor (E404).

Step 3. Connect a jumper between the positive battery terminal and the positive terminal on the ignition coil.

If engine will start, check the ignition resistor (R401) mounted on the engine block for continuity. Also check wiring from ignition coil (L405) to starter solenoid (L402).

Step 4. Connect a jumper between terminals 3 and 4 on the overspeed governor and check the ignition coil (L405) and distributor contacts (E402).

Replace defective parts.

Troubleshooting Chart
Figure 2
(Sheet 1 of 8)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE AND CONTROLS

2. STARTER CRANKS ENGINE. ENGINE WILL NOT START (CONTINUED)

Step 5. Hold ignition switch in START position and check voltage at fuel solenoid valve (in fuel line below fuel tank).

If voltage is not approximately 12 volts DC, check wiring and battery.

Step 6. Place a jumper across terminals 3 and 4 on the overspeed governor (inside control box).

If solenoid valve (L401) operates, replace overspeed governor (E404).

Step 7. Disconnect fuel line from output end of fuel solenoid valve. Connect 12 volts DC to solenoid. Fuel will flow if valve is good.

Replace defective fuel solenoid valve (L401).

Step 8. Disconnect fuel line from fuel pump output and crank the engine. Fuel will flow from a good pump when engine is cranked.

Replace faulty fuel pump.

3. ENGINE STARTS, THEN STOPS WHEN IGNITION SWITCH RETURNS TO RUN POSITION.

Step 1. Check ignition switch contacts in RUN position.

Replace defective switch (S401).

Step 2. Connect a jumper across low oil pressure switch terminals (on engine block). Start engine and check oil pressure. If it is below 10 PSI (69 kPa), shut down the engine and check lubrication system for leaks and check oil pump. If oil pressure comes up to normal, the oil pressure switch is defective.

Replace faulty oil pressure switch (S404).

Step 3. Connect a jumper between the positive battery terminal and the positive terminal on the ignition coil.

If engine will run, check the ignition resistor (R401) for continuity.

4. ENGINE RUNS ROUGHLY, THEN STALLS.

Step 1. Check cables from distributor to spark plugs. Firing order is 1-5-3-6-2-4.

Correct connections or replace damaged cables.

Troubleshooting Chart
Figure 2
(Sheet 2 of 8)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE AND CONTROLS

4. ENGINE RUNS ROUGHLY, THEN STALLS. (CONTINUED)

Step 2. Remove distributor cap and check for moisture or damaged components.

Remove moisture or replace damaged components.

Step 3. Check distributor timing (Ford Manual)

Set timing as outlined in Ford Manual.

5. ENGINE WILL NOT RUN AT RATED SPEED (2400 RPM).

NOTE: Steps 1 thru 3 only apply to an electronic governor.

Step 1. Check GENERATE/IDLE switch (20, Figure 1).

Set switch (S409) to GENERATE position.

Step 2. Place GENERATE/IDLE switch (20, Figure 1) in GENERATE position. Check voltage at terminals (+) and (-) on governor (mounted on engine block).

Voltage should be 12 volts DC. If voltage is zero, check switch (S409) and wiring, and repair or replace as necessary.

Step 3. Apply 12 volts DC to terminals (+) and (-) on governor (mounted on engine block).

If governor does not actuate, replace governor (E403).

Step 4. Check governor control linkage for freedom of movement.

Readjust linkage or lubricate.

Step 5. Check governor adjustment.

Adjust governor as outlined in Section 2-3, Para. 3, D and 3, E.

6. ENGINE WILL NOT PICK UP LOAD WHEN CONTACTOR IS CLOSED.

Step 1. Check governor adjustment.

Adjust governor as outlined in Section 2-3, Para. 3, D and 3, E.

Step 2. Check engine timing.

Set engine timing as outlined in Ford Manual.

Troubleshooting Chart (Sheet 3 of 8)

| MALFUNCTION<br>TEST OR INSPECTION<br>CORRECTIVE ACTION |
|---|
| ENGINE AND CONTROLS |

7. ENGINE GOVERNED SPEED TOO LOW OR TOO HIGH.

Step 1. Check governor adjustment.

Adjust governor as outlined in Section 2-3, Para. 3, D and 3 E.

8. ENGINE SURGES UNDER LOAD

Step 1. Check governor adjustment.

Adjust governor as outlined in Section 2-3, Para. 3, D and 3 E.

Step 2. Check fuel mixture at carburetor.

Adjust carburetor fuel mixture (see Ford Manual).

Step 3. Check engine timing.

Set timing as outlined in Ford Manual.

Step 4. Check complete ignition system.

Repair and adjust as required.

9. ENGINE SURGES AS NO LOAD.

Step 1. Check governor adjustment.

Adjust governor as outlined in Section 2-3, Para. 3, D and 3 E.

10. ENGINE RESPONDS SLOWLY.

Step 1. Check ignition timing.

Set ignition timing per Ford Manual.

Step 2. Check governor adjustment.

Adjust governor as outlined in Section 2-3, Para. 3, D and 3 E.

Troubleshooting Chart (Sheet 4 of 8)
Figure 2

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE AND CONTROLS

11. ENGINE OVERHEATS.

Step 1. Check coolant for dirt and sludge.

Drain coolant, flush, and replace. Refer to Section 2-2, Para. 6.

Step 2. Check radiator core for debris and dirt.

Clean radiator core carefully.

GENERATOR AND CONTROLS

1. GENERATOR WILL NOT BUILD UP VOLTAGE WHEN BUILD-UP-VOLTAGE SWITCH IS PUSHED.

Step 1. Momentarily connect a jumper across terminals of switch (10, Figure 1).

Replace switch (S406) if voltage builds up.

Step 2. Check diode on back of switch (10, Figure 1).

Replace defective diode (CR403).

Step 3. Check AUTOMATIC/MANUAL switch (inside control box).

Replace faulty switch (S408).

Step 4. Check Voltage Regulator (inside control box). Refer to Voltage Regulator Manual in Chapter 6.

Replace defective Voltage Regulator.

2. GENERATOR WILL NOT BUILD UP VOLTAGE IN MANUAL MODE.

Step 1. Connect a jumper across the manual control FIELD RHEOSTAT (inside control box), and flash the fields using the PUSH-TO-BUILD-UP-VOLTAGE switch (10, Figure 1).

If voltage builds up, replace defective rheostat (R450).

Step 2. Check generator shunt fields for open circuit.

Replace shunt fields as required.

Troubleshooting Chart
Figure 2
(Sheet 5 of 8)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

GENERATOR AND CONTROLS

3. LOAD CONTACTOR WILL NOT CLOSE AT NO LOAD.

Step 1. Check contactor switch (9, Figure 1).

Replace defective switch (S407).

Step 2. Apply 28 volts DC to terminals marked SW (+) and GD (–) on load contactor (1-1; 4, Figure 5).

If contactor does not close, replace faulty contactor (K404).

4. LOAD CONTACTOR WILL CLOSE, BUT OPENS WHEN CONTROL SWITCH RETURNS TO ON POSITION.

Step 1. Check control switch (9, Figure 1).

Replace defective switch (S407).

Step 2. Check overload module (1-1; 3, Figure 5).

Replace faulty module (K403). (Contacts normally closed.)

Step 3. Check overvoltage module (1-1; 2, Figure 5).

Replace faulty module (K402). (Contacts normally closed.)

Step 4. Check the load contactor (1-1; 4, Figure 5).

Replace defective load contactor (K404).

Step 5. Check 100 ohm, 25 watt resistor (1-1; 5, Figure 5).

Replace faulty resistor (R402).

5. LOAD CONTACTOR OPENS DURING POWER DELIVERY.

Step 1. Check overload module (1-1; 3, Figure 5).

Replace faulty module (K403).

Step 2. Check overvoltage module (1-1; 2, Figure 5).

Replace faulty module (K402).

Step 3. Check load contactor (1-1; 4, Figure 5).

Replace faulty load contactor (K404).

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

GENERATOR AND CONTROLS

6. GENERATOR WILL NOT BUILD UP VOLTAGE PROPERLY IN AUTOMATIC MODE.

Step 1. If 14 volt output option is used, make sure that switch (23, Figure 1) is in OFF position. Set AUTOMATIC/MANUAL switch (inside control box) to MANUAL position and control voltage to 28.5 volts with FIELD RHEOSTAT.

If voltage can be controlled to 28.5 volts manually, readjust Voltage Regulator (1-1; 1, Figure 5) (VR401). Refer to the Voltage Regulator Manual in Chapter 6. If unable to obtain proper output voltage, replace the Voltage Regulator.

7. OUTPUT CURRENT CANNOT BE CONTROLLED PROPERLY.

Step 1. Check current limit control (7, Figure 1).

Replace faulty rheostat (R451).

Step 2. Check Voltage Regulator (1-1; 1, Figure 5).

Adjust or replace the Voltage Regulator (VR401). Refer to the Voltage Regulator Manual in Chapter 6.

14 VOLT OUTPUT (OPTION)

1. 14 VOLT LOAD CONTACTOR WILL NOT CLOSE.

Step 1. Check resistor (1-1; 7, Figure 7).

Replace defective resistor (R406).

Step 2. Check position of 28.5 volt load contactor control (9, Figure 1).

Place control switch to OFF position.

Step 3. Check 28.5 volt control relay (1-1; 3, Figure 7).

Replace defective relay (K405).

Step 4. Check 14 volt control relay (1-1; 1, Figure 7).

Replace defective relay (K406).

Step 5. Check overvoltage module (1-1; 6, Figure 7).

Replace defective module (K409).

Troubleshooting Chart
Figure 2
(Sheet 7 of 8)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

14 VOLT OUTPUT (OPTION)

1. 14 VOLT LOAD CONTACTOR WILL NOT CLOSE. (CONTINUED)

Step 6. Check overload relay (1-1; 8, Figure 7).

Replace faulty relay (K408).

Step 7. Check contactor control switch (23, Figure 1).

Replace faulty switch (S410).

Step 8. Check load contactor (1-1; 4, Figure 7).

Replace defective load contactor (K407).

2. LOAD CONTACTOR CLOSES, BUT OPENS WHEN CONTROL SWITCH RETURNS TO ON POSITION.

Step 1. Check 14 volt control relay (1-1; 1, Figure 7).

Replace faulty relay (K406).

3. LOAD CONTACTOR OPENS DURING POWER DELIVERY.

Step 1. Check overload relay (1-1; 8, Figure 7).

Replace defective relay (K408).

Step 2. Check overvoltage module (1-1; 6, Figure 7).

Replace faulty module (K409).

Step 3. Check adjustment of resistor (1-1; 9, Figure 7).

Adjust or replace resistor (R407).

Step 4. Check control relays (1-1; 1 and 3, Figure 7).

Replace defective relay (K405 or K406).

Step 5. Check load contactor (1-1; 4, Figure 7).

Replace defective load contactor (K407).

Troubleshooting Chart
Figure 2
(Sheet 8 of 8)

# CHAPTER 4. ILLUSTRATED PARTS LIST

## SECTION 1. INTRODUCTION

### 1. General

The Illustrated Parts List identifies, describes, and illustrates main assemblies, subassemblies, and detail parts of the Jet-Ex 3 Generator Sets manufactured by Hobart Brothers Company, Power Systems Division, Troy, Ohio.

### 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:

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 six 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. 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, componenents 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.

(4) REC. SPARES Column

When there is an entry in this column, it shows the quantity of that item recommended for spares to support ONE end item.

(5) 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 list are coded as follows:

Uncoded parts are used on all units.

Parts coded A are used on 6272-1 only.
Parts coded B are used on 6272-2 only.
Parts coded C are used on 6272-3 only.
Parts coded D are used on 6272-4 only.

(6) "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.

5. Reference Designator Index

The reference designators listed in Figure 1 are the same as those used on the connection and schematic diagrams furnished in Chapter 6. Each reference designator is cross-referenced to the Figure and Item number of that item in the Illustrated Parts List, Section 4-3.

| REF. DES. | LOCATION ITEM | FIG. | REF. DES. | LOCATION ITEM | FIG. | REF. DES. | LOCATION ITEM | FIG. |
|---|---|---|---|---|---|---|---|---|
| A404 | 18 | 13 | K407 | 14 | 17 | | | |
| | | | K408 | 17 | 17 | | | |
| B401 | 10 | 4 | K409 | 14 | 17 | | | |
| | | | | | | | | |
| BT401 | 7 | 10 | L401 | 5 | 11 | | | |
| | | | L403 | 14 | 13 | | | |
| C401 | 19 | 5 | L404 | 12 | 13 | | | |
| C402 | 6 | 7 | L406 | | 19 | | | |
| C403 | 19 | 5 | M401 | 11 | 5 | | | |
| C404 | Not Shown | 13 | M402 | 7 | 5 | | | |
| C405 | 9 | 4 | M403 | 6 | 5 | | | |
| C406 | 3 | 13 | M404 | 3 | 5 | | | |
| C407 | 3 | 13 | M405 | 10 | 5 | | | |
| C408 | 3 | 13 | M406 | 9 | 5 | | | |
| C409 | 3 | 13 | M407 | 5 | 5 | | | |
| C410 | 6 | 18 | | | | | | |
| C411 | 6 | 18 | R402 | 7 | 6 | | | |
| | | | R405 | 7 | 16 | | | |
| CR401 | 18 | 5 | R406 | 15 | 16 | | | |
| CR402 | 18 | 5 | R407 | 19 | 17 | | | |
| CR403 | 18 | 6 | R409 | 21 | 6 | | | |
| CR404 | 21 | 6 | R450 | 10 | 6 | | | |
| | | | R451 | 13 | 5 | | | |
| DS401 | 4 | 5 | R490 | 17 | 6 | | | |
| DS402 | 4 | 5 | | | | | | |
| DS420 | 19, 17 | 2, 3 | S401 | 17 | 5 | | | |
| DS421 | 19, 17 | 2, 3 | S402 | 18 | 5 | | | |
| DS422 | 19, 17 | 2, 3 | S403 | 21 | 5 | | | |
| DS423 | 19, 17 | 2, 3 | S404 | 17 | 4 | | | |
| DS440 | 25, 26 | 5 | S406 | 18 | 5 | | | |
| DS441 | 15 | 5 | S407 | 17 | 5 | | | |
| DS442 | 6, 7, 8 | 6 | S408 | 12 | 6 | | | |
| DS460 | 2, 3, 4 | 16 | S409 | 2 | 8 | | | |
| | | | S410 | 5 | 16 | | | |
| E403 | 2 | 9 | | | | | | |
| E404 | 19 | 6 | VR401 | 2 | 6 | | | |
| | | | | | | | | |
| F401 | 22, 23 | 5 | | | | | | |
| F402 | 22, 24 | 5 | | | | | | |
| | | | | | | | | |
| K402 | 4 | 6 | | | | | | |
| K403 | 5 | 5 | | | | | | |
| K404 | 6 | 5 | | | | | | |
| K405 | 5 | 17 | | | | | | |
| K406 | 5 | 17 | | | | | | |

Reference Designator Index
Figure 1

## 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 or 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 |
|---|---|
| No Number | Precision Governors Inc.<br>10524 Product Drive<br>Rockford, Illinois 61111 |
| 01121 | Allen-Bradley Company<br>1201 South 2nd Street<br>Milwaukee, Wisconsin 53204 |
| 08108 | Lamp Industry Designations<br>and Abbreviations for Lamps |
| 14655 | Cornell & Dubilier Electric Corporation<br>50 Paris Street<br>Newark, New Jersey 07101 |
| 16476 | Datcon Instrument Company<br>P.O. Box 128<br>East Petersburg, Pennsylvania 17520 |
| 20796 | Dayco Corp.<br>Rubber Products Division<br>P.O. Box 3258<br>Springfield, MO 65808 |
| 22938 | Prototype Development Inc.<br>7750 Hub Parkway<br>Cleveland, Ohio 44125 |
| 24248 | South Chester Corporation<br>South Company Division<br>3rd Street & Governor Printz Boulevard<br>Lester, Pennsylvania 19113 |
| 28520 | Heyco Molded Products<br>Kenilworth, NJ 07033 |
| 30327 | Imperial-Eastman Corporation<br>6300 W. Howard St.<br>Chicago, Illinois 60648 |

| CODE | VENDOR'S NAME AND ADDRESS |
|---|---|
| 34383 | General Radiator Company<br>410 S. 12th Street<br>P.O. Box 948<br>Mount Vernon, Illinois 62864 |
| 44655 | Ohmite Manufacturing Company<br>3601 W. Howard Street<br>Skokie, Illinois 60076 |
| 49234 | Protectoseal Company<br>1920 S. Western<br>Chicago, Illinois 60608 |
| 57448 | Stephens & Adamson Manufacturing Company<br>275 Ridgeway Avenue<br>Aurora, Illinois 60507 |
| 58849 | Syntron Company<br>1938 Black Street<br>Homer City, Pennsylvania 15748 |
| 60741 | Triplett Electrical Instrument Company<br>Harmon Road<br>Bluffton, Ohio 45817 |
| 66295 | Wittek Manufacturing Company<br>4309 W. 24th<br>Chicago, Illinois 60623 |
| 72619 | Amperex Electronics Corp.<br>Dialight Division<br>203 Harrison Place<br>Brooklyn, NY 11237 |
| 73559 | Carling Electric Inc.<br>505 New Park Avenue<br>West Hartford, Connecticut 06110 |
| 74063 | Hartman Electrical Manufacturing Company<br>P.O. Box 8<br>Mansfield, Ohio 44901 |
| 75175 | The Duplan Corporation<br>KD Lamp Division<br>1910 Elm Street<br>Cincinnati, Ohio 45210 |
| 75418 | Kysor Industrial Corporation<br>1100 W. Wright Street<br>Cadillac, Michigan 49601 |

| CODE | VENDOR'S NAME AND ADDRESS |
|---|---|
| 76700 | Nelson Muffler Corporation<br>P.O. Box 189<br>Stoughton, Wisconsin 53589 |
| 77342 | American Machine & Foundry Company<br>Potter & Brumfield Division<br>1200 E. Broadway<br>P.O. Box 522<br>Princeton, Indiana 47570 |
| 77574 | Richland Auto Parts Company, Inc.<br>151 Distl. Avenue<br>Mansfield, Ohio 44903 |
| 79260 | Walker Manufacturing Company<br>1201 Michigan Blvd.<br>Racine, Wisconsin 53402 |
| 79470 | The Weatherhead Company<br>300 East 131st Street<br>Cleveland, Ohio 44108 |
| 79497 | Western Rubber Company<br>620 East Douglas<br>Goshen, Indiana 46526 |
| 89373 | United States Rubber Company<br>Detroit, Michigan |
| 89616 | Uniroyal Inc.<br>Consumer Industrial and Plastic Products<br>312 N. Hill Street<br>Mishawaka, Indiana 46544 |
| 90201 | Mallory Capacitor Company<br>3029 E. Washington Street<br>P.O. Box 372<br>Indianapolis, Indiana 46206 |
| 90927 | Ford Motor Company<br>Industrial Engine Operations<br>300 Renaissance Center<br>P.O. Box 43338<br>Detroit, Michigan 48243 |
| 91929 | Honeywell Inc.<br>Building Controls and Components Group<br>Micro Switch Division<br>Freeport, Illinois 61032 |

| CODE | VENDOR'S NAME AND ADDRESS |
|---|---|
| 92701 | Harry Davies Company<br>700 N. 27th<br>Camden, New Jersey |
| 98293 | Pierle Co. Inc.<br>P.O. Box 2000<br>Upland, IN 46989 |
| 98410 | E.T.C. Inc.<br>990 E. 67th Street<br>Cleveland, Ohio 44103 |

# SECTION 3. PARTS LIST

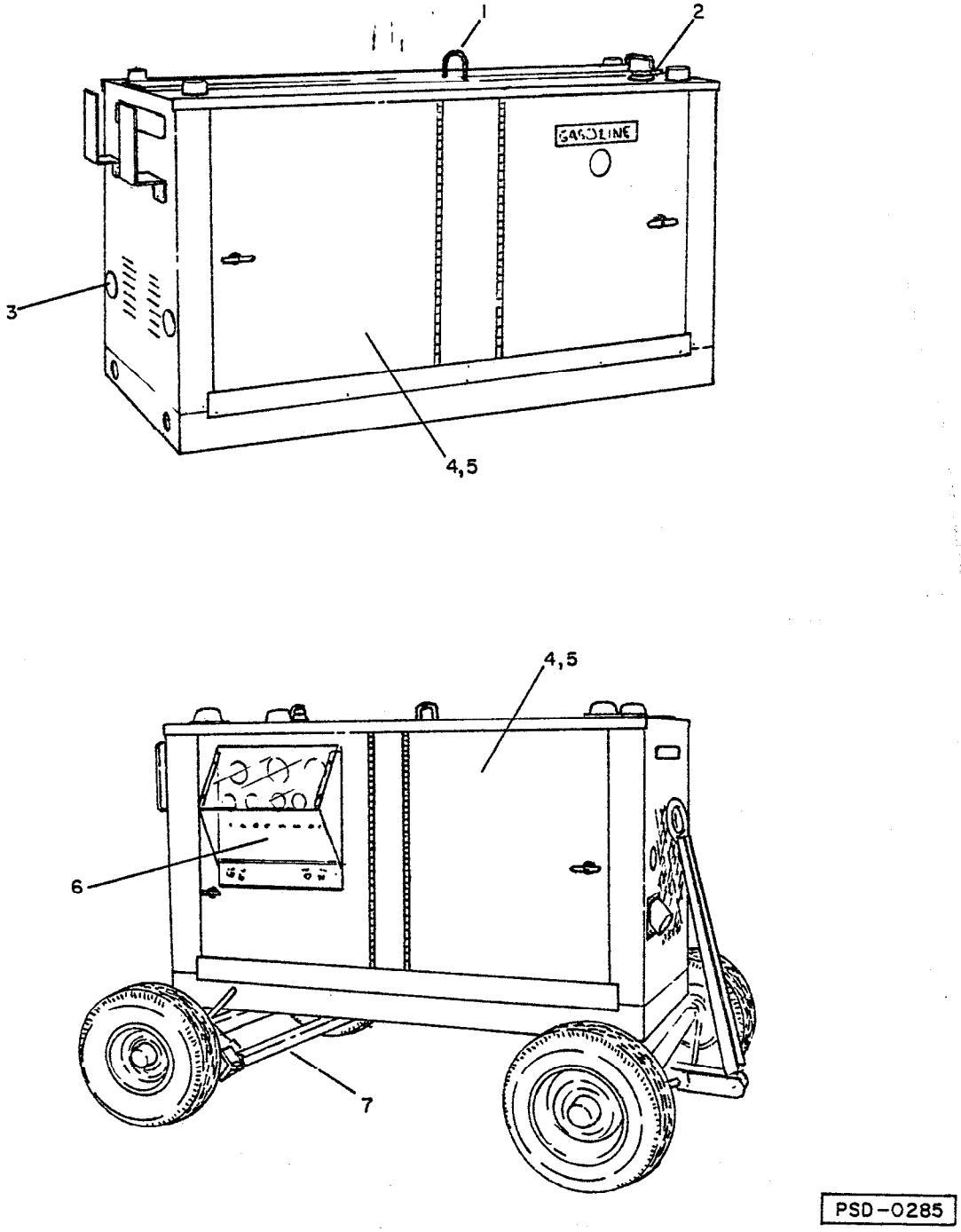
## 1. Explanation of Parts List Arrangement

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

## 2. Symbols and Abbreviations

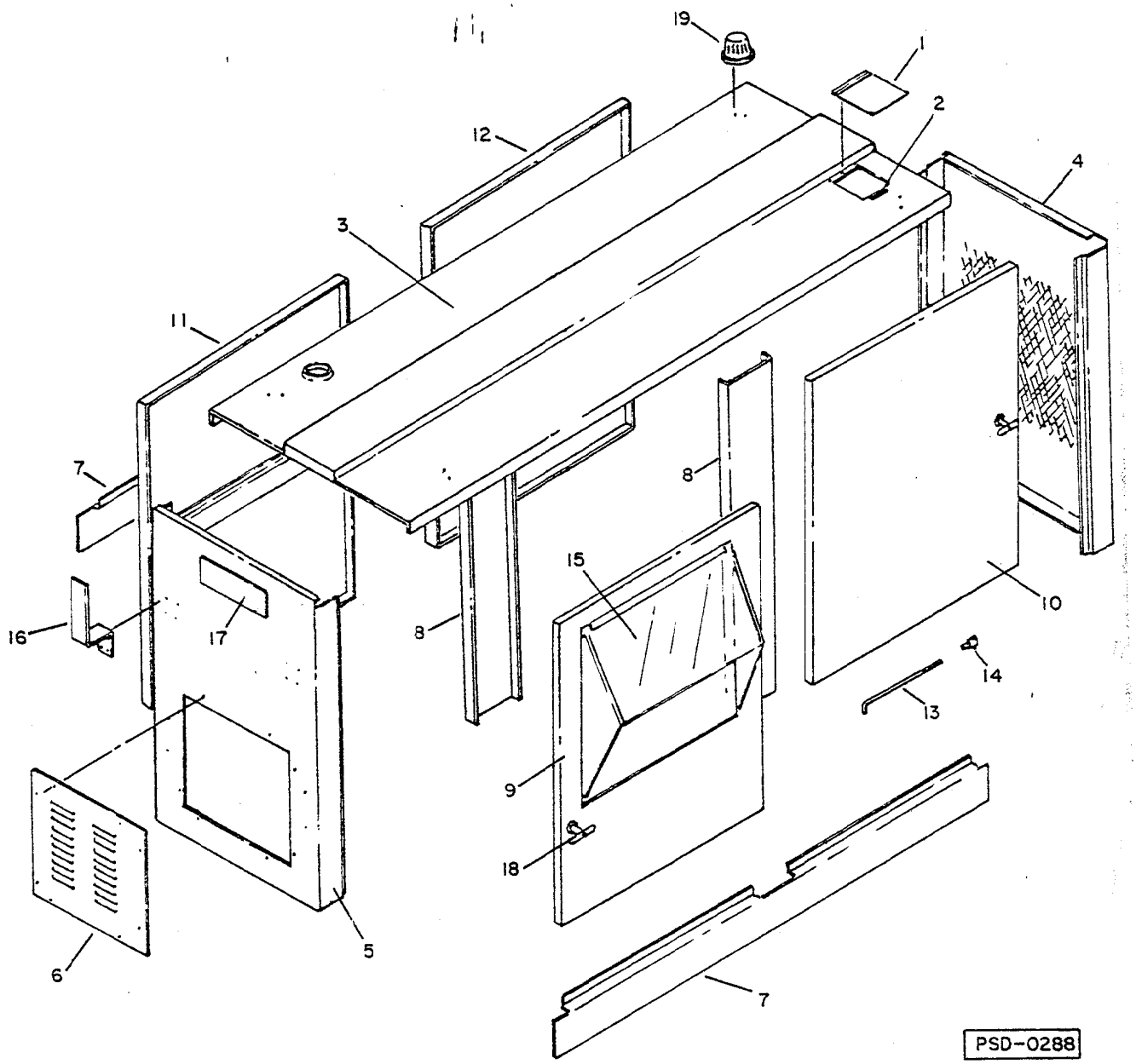
The following is a list of symbols and abbreviations used in the parts list.

* – 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
$\mu$F – microfarad
No. – number
NHA – next higher assembly
PRV – peak reverse voltage
PSI – pounds per square inch
Ref – reference (the item has been listed previously)
TM – Technical Manual
OM – Owner's Manual
T-R – transformer-rectifier
v – volt (when used as a prefix to a five-digit number, indicates vendor code)



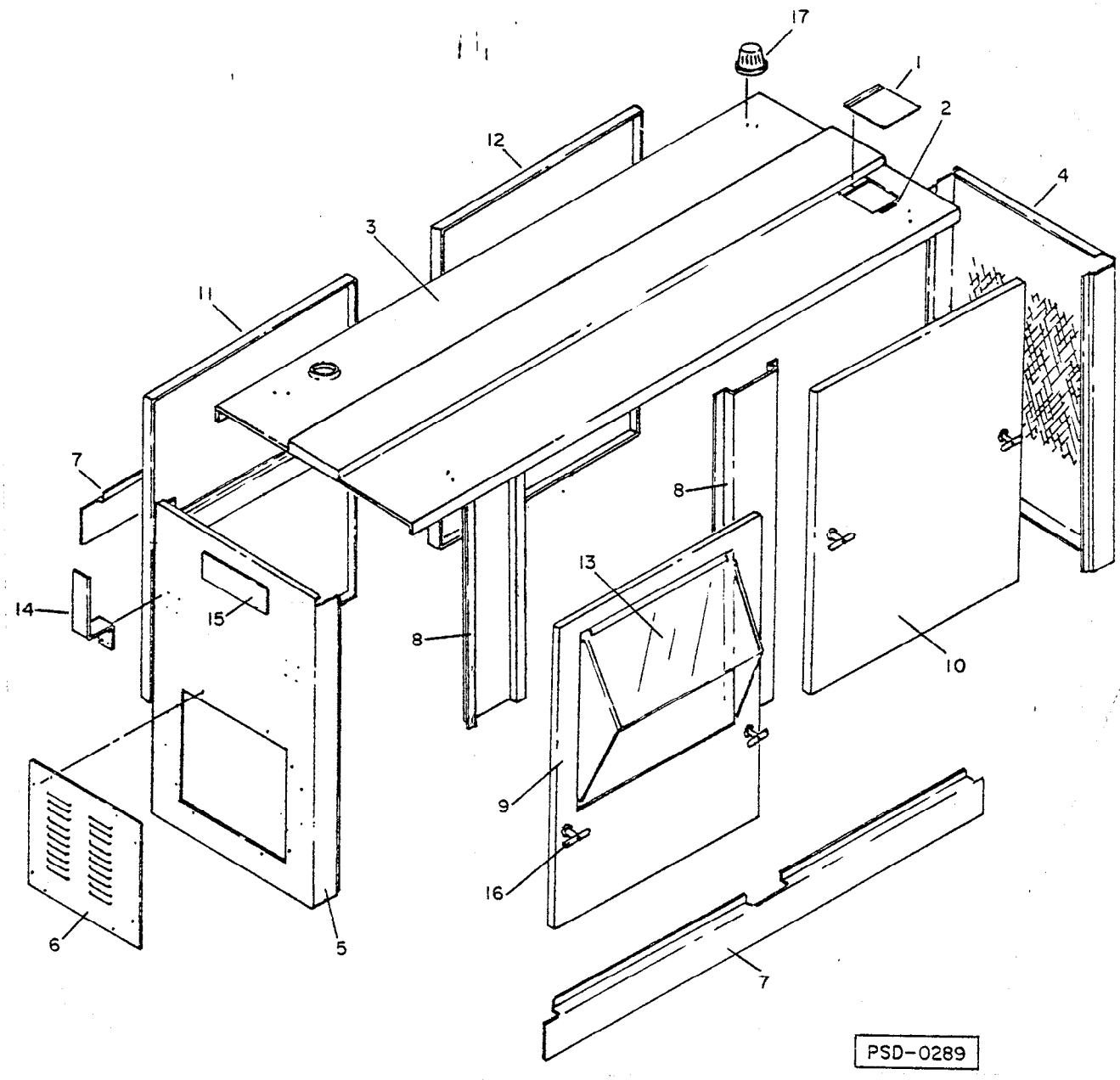

Generator Set
Figure 1

| ITEM NO. | PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 1- | 6272-1 | GENERATOR SET, JET-EX, STATIONARY UNIT, ELECTRONIC GOVERNOR | | A | 1 |
| | 6272-2 | GENERATOR SET, JET-EX, STATIONARY UNIT WITH LIFT OFF DOORS, ELECTRONIC GOVERNOR | | B | 1 |
| | 6272-3 | GENERATOR SET, JET-EX, STATIONARY UNIT, MECHANICAL GOVERNOR | | C | 1 |
| | 6272-4 | GENERATOR SET, JET-EX, STATIONARY UNIT WITH LIFT OFF DOORS, MECHANICAL GOVERNOR | | D | 1 |
| 1 | 30GH-872 | . U-BOLT, LIFTING | | | 1 |
| 2 | 79A-1127-1 | . GUARD, FILLER NECK | | | 1 |
| 3 | DWP-1804-1 | . REFLECTOR, RED, V75175, NO. KD-333 | 4 | | 4 |
| 4 | 485714-1 | . CANOPY ASSEMBLY (For Details See Fig. 2) | | A | 1 |
| 5 | 485714-2 | . CANOPY ASSEMBLY (For Details See Fig. 3) | | B | 1 |
| 6 | No Number | . GENERATOR SET WITHOUT CANOPY (For Details See Figure 4) | | | 1 |
| 7 | 483331 | . TRAILER ASSEMBLY (OPTION) (For Details See Figure 15) | | | 1 |



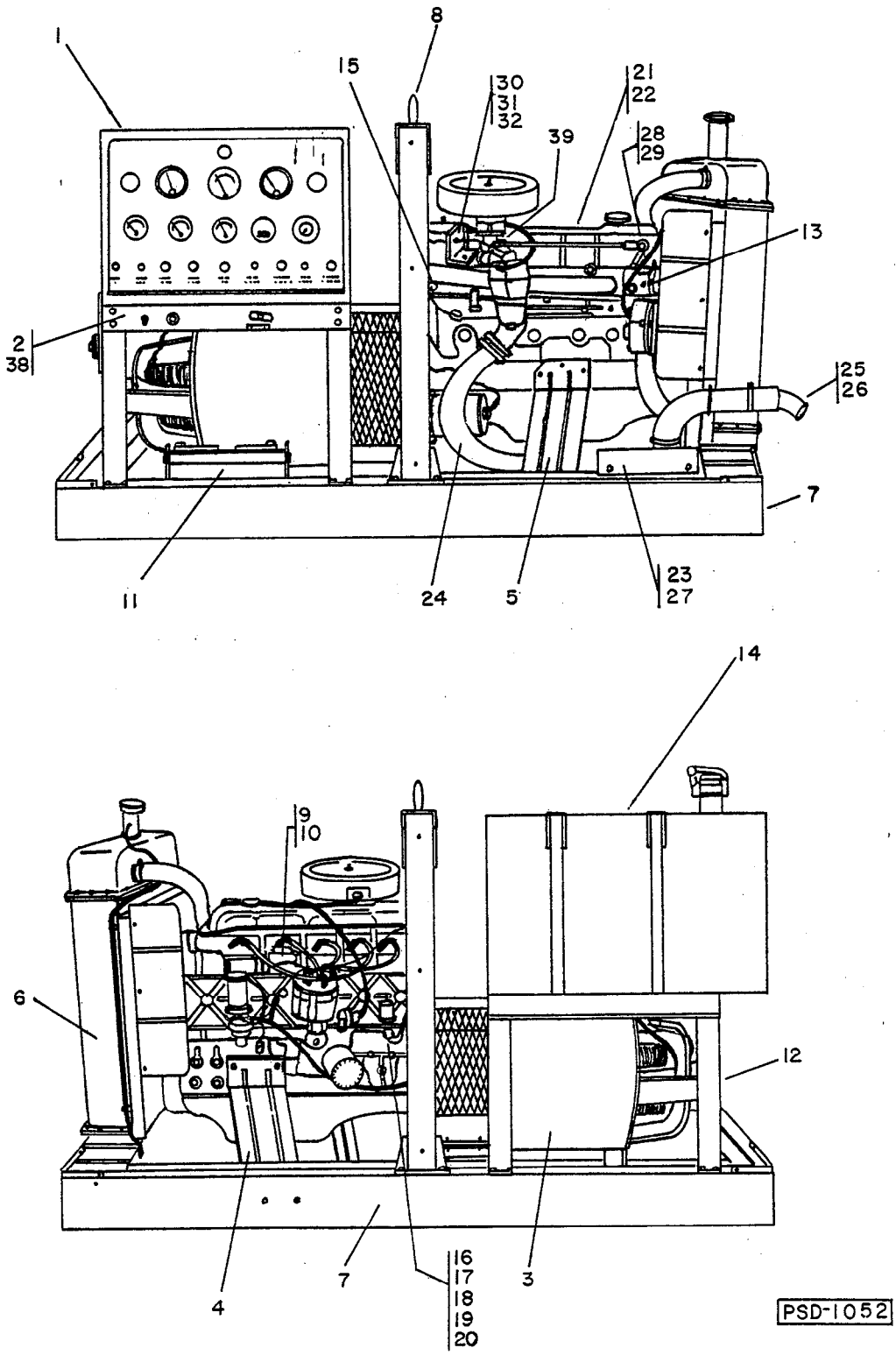

Canopy Assembly
Figure 2

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 2– | 485714-1 | CANOPY ASSEMBLY (For NHA See Figure 1) | | A | REF |
| 1 | 387438 | . PANEL, COVER, RADIATOR OPENING, ASSEMBLY | | A | 1 |
| 2 | 403127 | . CATCH, MAGNETIC V24248, No. 02-10-201-10 | | A | 1 |
| 3 | 485719 | . TOP, CANOPY, ASSEMBLY | | A | 1 |
| 4 | 485741 | . PANEL, END, FRONT CANOPY ASSEMBLY | | A | 1 |
| 5 | 485747 | . PANEL, END, REAR CANOPY ASSEMBLY | | A | 1 |
| 6 | 485772 | . PANEL, ACCESS, REAR CANOPY | | A | 1 |
| 7 | 485761 | . PANEL, SIDE, CANOPY | | A | 2 |
| 8 | 485732 | . PANEL, CENTER, CANOPY | | A | 2 |
| 9 | 485810 | . DOOR, RIGHT, REAR CANOPY, ASSEMBLY | | A | 1 |
| 10 | 485795 | . DOOR, RIGHT, FRONT CANOPY, ASSEMBLY | | A | 1 |
| 11 | 485796 | . DOOR, LEFT, REAR CANOPY, ASSEMBLY | | A | 1 |
| 12 | 485777 | . DOOR, LEFT, FRONT CANOPY, ASSEMBLY | | A | 1 |
| 13 | 387859 | . ROD, HOOK, DOOR | | A | 4 |
| 14 | HJ-129A | . JOINT, BALL, DOOR ROD V01428, No. SPS1002CP | 2 | A | 4 |
| 15 | 485908 | . COVER, PLEXIGLASS, RIGHT DOOR | | A | 1 |
| 16 | DWP-982 | . BRACKET, CABLE | | A | 2 |
| * | 50NH-622 | . PLATE, REINFORCING CABLE BRACKET | | A | 2 |
| 17 | 402987 | . NAMEPLATE, HOBART | | A | 2 |
| 18 | 81B-1019 | . LATCH, T-HANDLE V24248, No. 68-10-101-10 | 2 | A | 4 |
| * | 40201 | . STRIP, NEOPRENE, RUBBER | | A | 112" |
| * | 400435 | . NAMEPLATE, 28 VOLT | | A | 1 |
| 19 | 404101-1 | LIGHTS, CLEARANCE V75175, No. 514-0168 | 2 | A | 4 |
| * | 400613-10 | . LAMP, CLEARANCE LIGHT, 12 V | 4 | A | 1 |
| * | W-10051-3 | CLAMP, WIRING, LIGHT | | A | 4 |
| * | 486207-7 | . LABEL, WARNING, COMP | | A | 6 |




Canopy Assembly
Figure 3

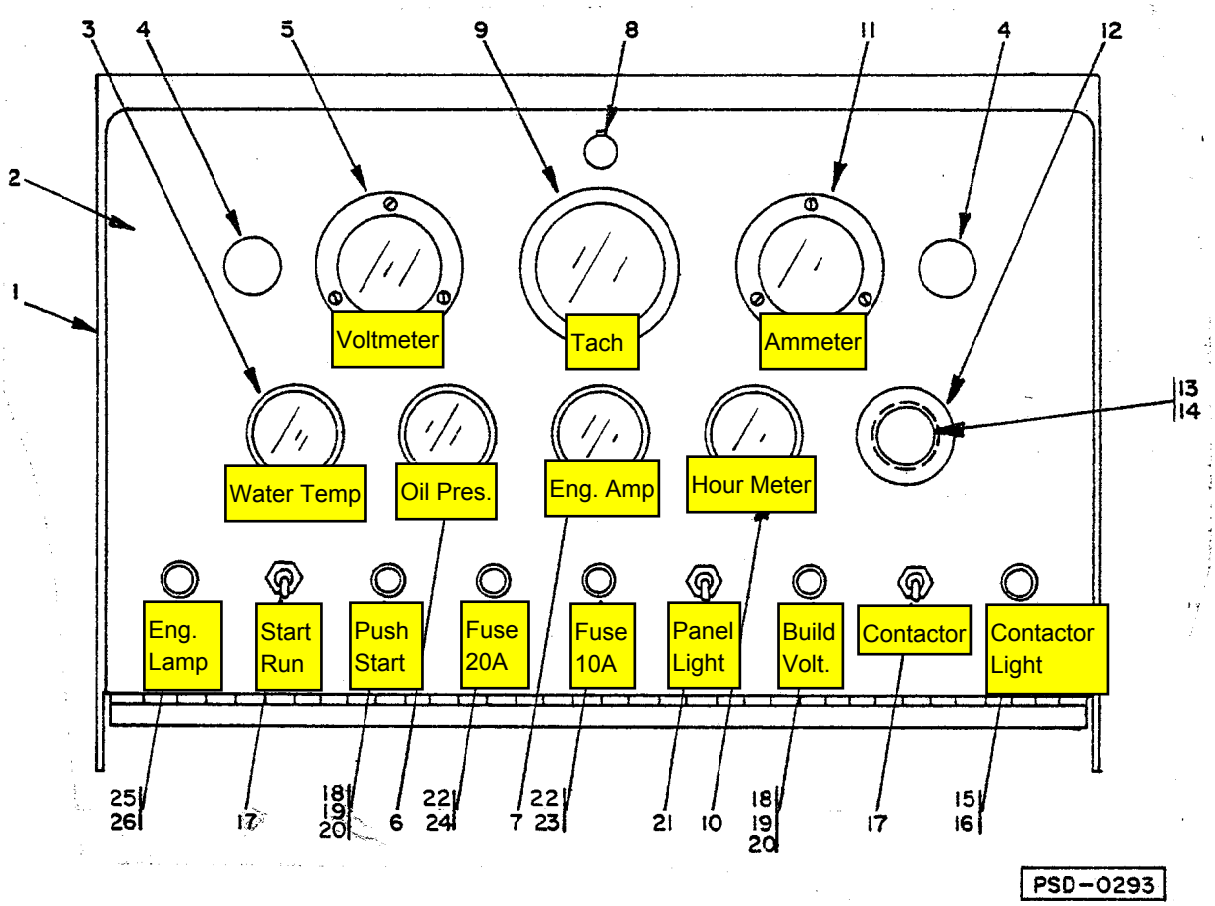
| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 3– | 485714-2 | CANOPY ASSEMBLY (For NHA See Figure 1) | | B | REF |
| 1 | 387438 | . PANEL, COVER, RADIATOR OPENING, ASSEMBLY | | | 1 |
| 2 | 403127 | . CATCH, MAGNETIC V24248, No. 02-10-201-10 | | | 1 |
| 3 | 485719 | . TOP, CANOPY, ASSEMBLY | | | 1 |
| 4 | 485741 | . PANEL, END, FRONT CANOPY ASSEMBLY | | | 1 |
| 5 | 485747 | . PANEL, END, REAR CANOPY ASSEMBLY | | | 1 |
| 6 | 485772 | . PANEL, ACCESS, REAR CANOPY | | | 1 |
| 7 | 485761 | . PANEL, SIDE, CANOPY | | | 2 |
| 8 | 485897 | . PANEL, CENTER, CANOPY | | | 2 |
| 9 | 485905 | . DOOR, RIGHT, REAR CANOPY, ASSEMBLY | | | 1 |
| 10 | 485904 | . DOOR, RIGHT, FRONT CANOPY, ASSEMBLY | | | 1 |
| 11 | 485907 | . DOOR, LEFT, REAR CANOPY, ASSEMBLY | | | 1 |
| 12 | 485904 | . DOOR, LEFT, FRONT CANOPY, ASSEMBLY | | | 1 |
| 13 | 485908 | . COVER, PLEXIGLASS, RIGHT DOOR | | | 1 |
| 14 | DWP-982 | . BRACKET, CABLE | | | 2 |
| * | 50NH-622 | . PLATE, REINFORCING CABLE BRACKET | | | 2 |
| 15 | 402987 | . NAMEPLATE, HOBART | | | 2 |
| 16 | 81B-1019 | . LATCH, T-HANDLE V24248, No. 68-10-101-10 | 2 | | 8 |
| * | 40201 | . STRIP, NEOPRENE, RUBBER | | | 225" |
| * | 400435 | . NAMEPLATE, 28 VOLT | | | 1 |
| 17 | 404101-1 | LIGHTS, CLEARANCE V75175, No. 514-0168 | 2 | | 4 |
| * | 400613-10 | . LAMP, CLEARANCE LIGHT, 12 V | 4 | | 1 |
| * | W-10051-3 | CLAMP, WIRING, LIGHT | | | 4 |
| * | 486270-7 | . LABEL, WARNING, COMP. | | | 1 |




Generator Set Without Canopy
Figure 4

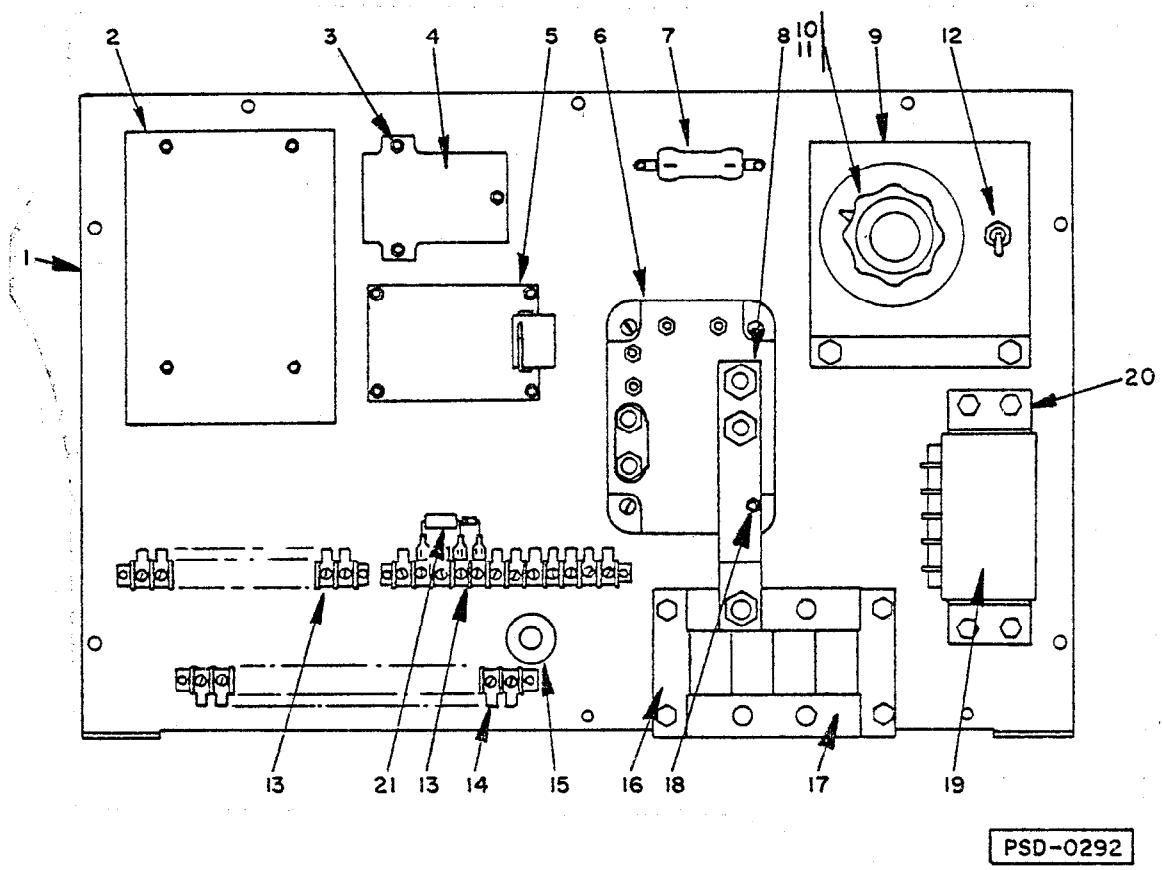
| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | UNITS per EFF ASSY |
|---|---|---|---|---|
| 4- | NO NUMBER | GENERATOR SET WITHOUT CANOPY (For NHA see Fig. 1) | | REF |
| 1 | 485678-1 | . BOX ASSEMBLY, CONTROL (For Details See Figure 5) | | 1 |
| | 485678-2 | . BOX ASSEMBLY, CONTROL (For Details See Figure 5) | | 1 |
| 2 | 485831-1 | . PANEL, ENGINE CONTROL ASSEMBLY (For Details See Figure 8) | | 1 |
| | 485831-2 | . PANEL, ENGINE CONTROL ASSEMBLY (For Details See Figure 8) | | 1 |
| 3 | NO NUMBER | . GENERATOR AND DRIVE GROUP (For Details See Figure 13) | | 1 |
| 4 | 485660 | . SUPPORT, ENGINE, LEFT | | |
| 5 | 485657 | . SUPPORT, ENGINE, RIGHT | | 1 |
| 6 | NO NUMBER | . COOLING SYSTEM (For Details See Figure 12) | | 1 |
| 7 | 485818 | . FRAME, MOUNTING, ASSEMBLY | | 1 |
| 8 | 485664 | . YOKE, LIFTING, ASSEMBLY | | 1 |
| 9 | W-10853-4 | . CAPACITOR, 0.5 µF, 100 V. DC V90201, No. B-206020 | 1 | 1 |
| 10 | 402461-1 | . CAPACITOR, IGNITION COIL, V14655, NO. BR-250-50 | 1 | 1 |
| 11 | NO NUMBER | . BATTERY INSTALLATION (For Details See Figure 10) | | 1 |
| * | 485829 | . TERMINAL, OUTPUT, ASSEMBLY (For Details See Figure 7) | | 1 |
| 12 | 489300 | . SUPPORT, FUEL TANK | | 2 |
| 13 | NO NUMBER | . SPEED CONTROL GROUP (For Details See Figure 9) | | 1 |
| 14 | NO NUMBER | . FUEL SYSTEM (For Details See Figure 11) | | 1 |
| 15 | 78B-1119-1 | . SENDER, TEMP., V16476, NO. 02019 | 1 | 1 |
| 16 | 78B-1118-1 | . SENDER, OIL PRESS, V16476, NO. 02500 | 1 | 1 |
| 17 | 403809 | . SWITCH, OIL PRESS, V75418, NO. C-25900-10 | 1 | 1 |
| 18 | W-7814-0 | . FITTING, PIPE, BSHG | | 1 |
| 19 | W-10750-1 | . FITTING, PIPE, NIPPLE | | 1 |
| 20 | W-10910-0 | . FITTING, PIPE, TEE | | 1 |
| 21 | 81A-1044 | . ENGINE, FORD 300, V90927, NO. CSG-6491-6005-A | | 1 |
| 22 | 81A-1045 | . KIT, ENGINE, PARTS, FORD SPECIAL OPTIONS, V90927, NO. SO-2800C | | 1 |
| * | 485819 | . HARNESS, ENGINE | | 1 |
| * | 60GHP-424 | . CLAMP, OUTPUT CABLE | | |
| 23 | 81C-1013 | . MUFFLER, ASSY, V76700, NO. 18546-N | 1 | 1 |
| 24 | 487933 | . PIPE, MAN. TO MUFF. | | 1 |
| 25 | 486028 | . PIPE, EXHAUST | | 1 |
| 26 | 486003 | . BRACKET, SUPPORT, TAILPIPE | | 1 |
| 27 | 486004 | . SHIELD, MUFFLER | | 1 |

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | UNITS per EFF ASSY |
|---|---|---|---|---|
| * 4- | 486001 | . CLAMP, MUFFLER | | 1 |
| * | 486002 | . STRIP, MTG. MUFFLER | | 1 |
| * | 404154-8 | . CLAMP, MUFFLER, 2", V79260, NO. 35408 | | 3 |
| * | 486011 | . COVER, EXH. OUTLET ASSEMBLY | | 1 |
| * | 79A-1110 | . NAMEPLATE, OPTION | | 1 |
| * | 78A-1000 | . NAMEPLATE, RATING | | 1 |
| * | 7J-422-0 | . CLAMP, CABLE, OUTPUT | | 1 |
| * | W-9218-123 | . CABLE #134 | | 1 |
| * | 486115 | . KIT, SPACERS, STATIONARY MTG. (OPTION) | | 1 |
| * | 485910 | . KIT, 14 VOLT OUTPUT ASSEMBLY (OPTION) | | 1 |
| 28 | 82A-1056 | . PULLEY, 3 GROOVE | | 1 |
| 29 | 82A-1057 | . BELT, GOVERNOR DRIVE, (V20796), L324 | | 1 |
| 30 | 487092 | . BRACKET, CONTROL, THROTTLE MOUNTING 6272-3 AND 4 ONLY | | |
| | | ATTACHING PARTS | | 1 |
| 31 | NO NUMBER | . SCREW, CAP, HEX HD, 5/16-18 X 3/4 | | 2 |
| 32 | NO NUMBER | . WASHER, LOCK 5/16 | | 2 |
| | | *** | | |
| * 33 | 487532 | . HARNESS, WIRE, ENGINE, 6272-1 & 2 ONLY | | 1 |
| * 34 | 487533 | . HARNESS, WIRE, ENGINE, 6272-3 & 4 ONLY | | 1 |
| * 35 | 485915 | . . PANEL, CONTACTOR, 14 V. ASSY. (For Details See Figure 17) | | 1 |
| * 36 | 485909 | . . BRACKET, MOUNTING CONTACTOR | | 2 |
| * 37 | 485921 | . . SHIELD, CONTACTOR, PLEXIGLASS | | 1 |
| 38 | 485925 | . . PANEL, CONTROL, ENGINE ASSY. (For Details See Figure 16) | | 1 |
| * | 485830 | . . TERMINAL, OUTPUT, 14 V. ASSY. (For Details See Figure 18) | | 1 |
| * | 7J-422-0 | . . CLAMP, OUTPUT, CABLE | | 1 |
| * | 400434 | . . NAMEPLATE, 14 VOLT | | 1 |
| * | 485927 | . . BAR, BUS, SHUNT | | 1 |
| * | 485928 | . . BAR, BUS, OUTPUT (28 V.) | | 1 |
| * | W-9218-36 | . . CABLE, POS. 4/0 (CONTACTOR TO OUTPUT PANEL) | | 1 |
| * | W-9218-41 | . . CABLE, NEG. 4/0 (28.5 V. PANEL TO 14 V. PANEL) | | 1 |
| * | W-9218-128 | . . CABLE, POS. 4/0 (SHUNT TO 14 V. PANEL) | | 1 |
| 39 | 487084 | . KIT, ZENITH CARBURETOR (For Details See Figure 19) | | 1 |




Control Box Assembly
Figure 5

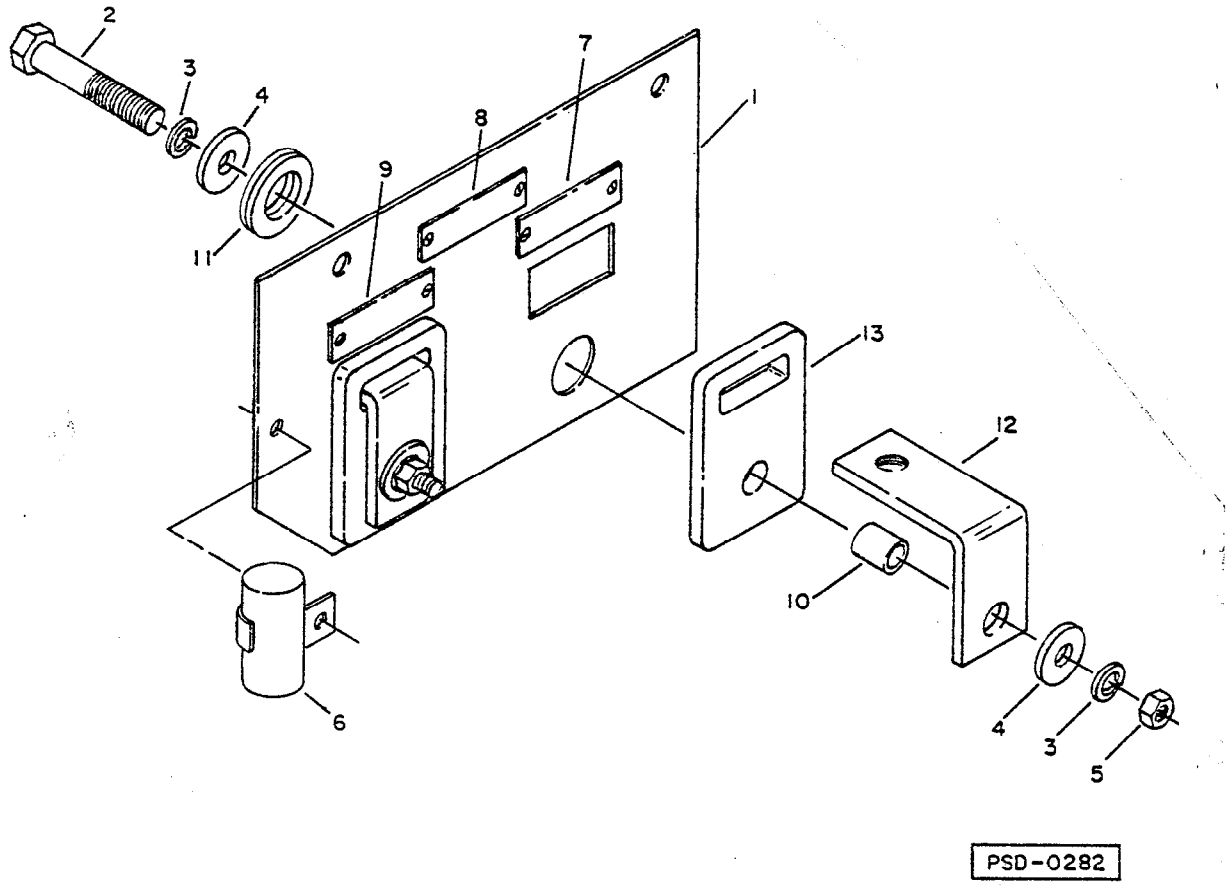
| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 5– | 485678-1 | BOX, CONTROL ASSEMBLY | | | REF |
| | 435678-2 | BOX, CONTROL ASSEMBLY | | | REF |
| 1 | 485710 | . WRAPPER, CONTROL BOX, ASSEMBLY | | | 1 |
| | 485679 | . PANEL, FRONT, ASSEMBLY | | | 1 |
| | 487515 | . PANEL FRONT ASSEMBLY | | | 1 |
| 2 | 485684 | . . PANEL, FRONT | | | 1 |
| 3 | 78A-1116-1 | . . GAUGE, WATER, TEMP V16476, No. 06343 | 1 | | 1 |
| 4 | 84B-1003 | . . LIGHT, PANEL V74400, No. MI-3216 | 1 | | 2 |
| * | 50GHP-206 | . . . BULB | 2 | | 1 |
| 5 | 400642-3 | . . VOLTMETER, 0 TO 50 V DC V60741 | 1 | | 1 |
| 6 | 78A-1117-1 | . . GAUGE, OIL PRESSURE V16476, No. 06340 | 1 | | 1 |
| 7 | 78A-1115-1 | . . GAUGE, AMMETER V16476, No. 06354 | 1 | | 1 |
| 8 | 80A-1134 | . . LATCH, ADJUSTABLE GRIP V24248, No. 16-10-311-14 | | | 1 |
| 9 | 78B-1121-1 | . . TACHOMETER V16476, No. 71000 | 1 | | 1 |
| 10 | 78A-1120-1 | . . GAUGE, HOURMETER V16476, No. S6288 | | | 1 |
| 11 | 400641-12 | . . AMMETER 2000 V60741 | 1 | | 1 |
| 12 | 81B-1030 | . . NAMEPLATE, STARTING CURRENT | | | 1 |
| 13 | 401428-1 | . . POTENTIOMETER 10,000 OHM 2 WATT V44655, No. CMU-1031 | | | 1 |
| 14 | 16DA-2162 | . . KNOB, CURRENT, RHEOSTAT | | | 1 |
| 15 | HF-2518-7 | . . LIGHT, PILOT, ASSEMBLY | 1 | | 1 |
| 16 | 400613-3 | . . . LAMP | 2 | | 1 |
| 17 | 403189 | . . SWITCH, TOGGLE V91929, No. 312TS1-59 | 1 | | 2 |
| 18 | DW-1777B | . . SWITCH, PUSHBUTTON | 1 | | 2 |
| 19 | 20RT-353-1 | . . DIODE | | | 2 |
| 20 | 25MS-156 | . . BUS | | | 2 |
| 21 | 402662 | . . SWITCH, TOGGLE V73559, No. 2GK71-73-DPST | 1 | | 1 |
| 22 | 402658 | . . HOLDER, FUSE V71400, TYPE HKP-HH | | | 2 |
| 23 | W-11166-3 | . . FUSE, AGC, 10 AMP | 5 | | 1 |
| 24 | W-11166-5 | . . FUSE, AGC, 20 AMP | 5 | | 1 |
| 25 | HF-2518-8 | . . LIGHT, PILOT, ENGINE, GREEN | 1 | | 1 |
| 26 | 400613-4 | . . . LAMP | 2 | | 1 |
| * | 485681 | . PANEL, REAR, ASSEMBLY (For Details See Figure 6) | | | 1 |
| * | 485682 | . HARNESS, CONTROL, PANEL ASSEMBLY | | | 1 |
| * | 485683 | . HARNESS, INTERIOR PANEL, ASSEMBLY | | | 1 |
| * | 389535-2 | . SUPPORT, HINGED PANEL | | | 2 |




Rear Panel Assembly
Figure 6

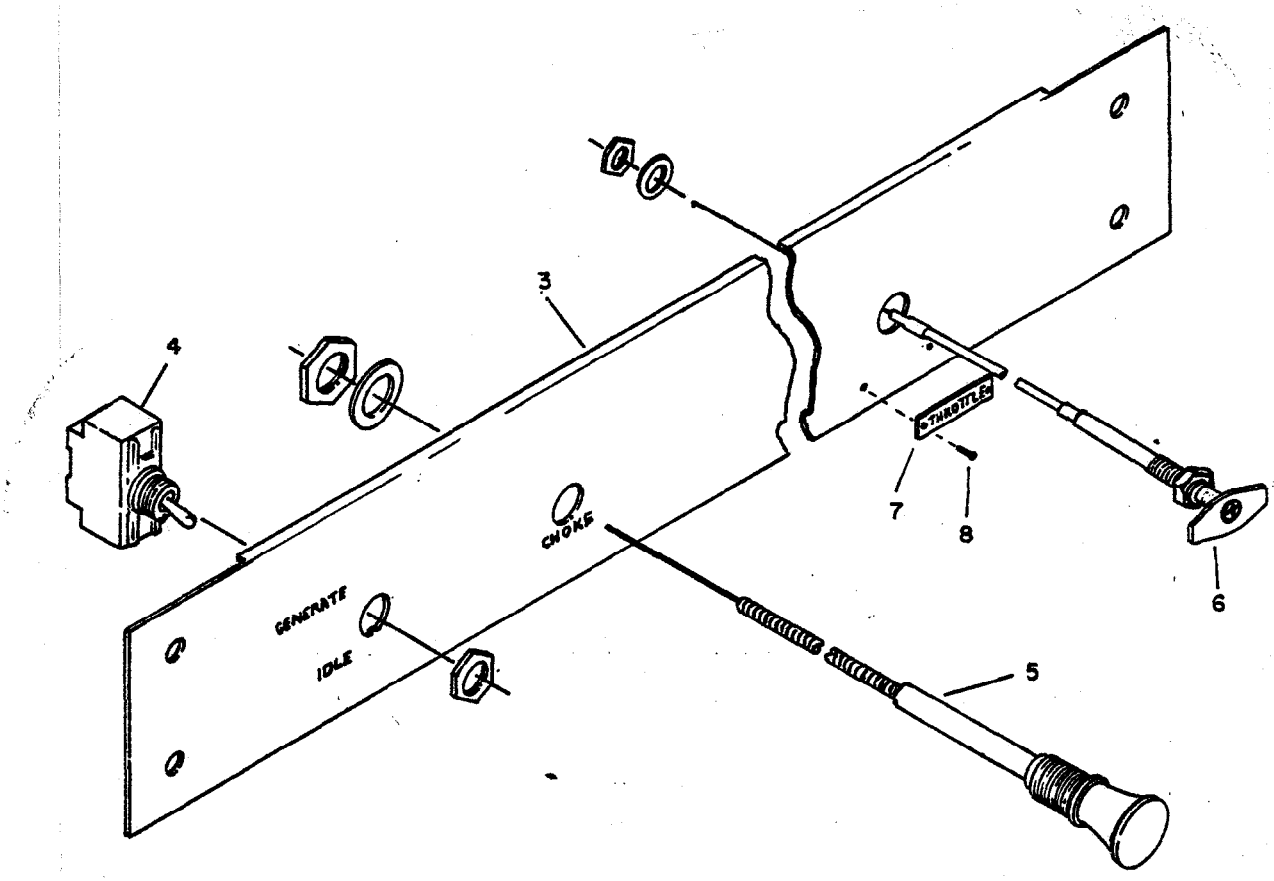
| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 6— | 485681 | PANEL, REAR, ASSEMBLY (For NHA See Figure 5) | | | REF |
| 1 | 485728 | . PANEL, REAR, CONTROL BOX | | | 1 |
| 2 | 485972 | . BOARD, PC, VOLTAGE REGULATOR, ASSEMBLY | 1 | | 1 |
| 3 | 401556 | . MOUNT, RUBBER, SHOCK, P.C. BOARD V89373, No. B-323 | | | 7 |
| 4 | 389522B | . BOARD, PC OVERVOLTAGE, ASSEMBLY | 1 | | 1 |
| 5 | 484567 | . BOARD, PC OVERLOAD, ASSEMBLY | 1 | | 1 |
| 6 | 6FW-2087A | . CONTACTOR V74063, No. A-791M | 1 | | 1 |
| 7 | W-4541D | . RESISTOR, VARIABLE, 100 OHM, 25 W | | | 1 |
| 8 | 485971 | . BUS, CONTACTOR TO SHUNT | | | 1 |
| 9 | 485970 | . BRACKET, MOUNTING, RHEOSTAT, SWITCH | | | 1 |
| 10 | 402159 | . RHEOSTAT, 150 WATT, 32 OHM V44655, MODEL L | | | 1 |
| 11 | AAW-835A | . KNOB, CURRENT, RHEOSTAT V92701, No. 4103AX | | | 1 |
| 12 | 400400 | . SWITCH, TOGGLE V73559, No. 26L61 | 1 | | 1 |
| 13 | 401937-3 | . BLOCK, TERMINAL, 20 AMP, 12 V98410, No. 35012-3526 | | | 2 |
| 14 | 401937-4 | . BLOCK, TERMINAL, 20 AMP, 18 V98410, No. 35018-3526 | | | 1 |
| 15 | 402037-29 | . GROMMET, RUBBER, 1/2 IN. I.D., 1-1/16 O.D. V79497 | | | 1 |
| 16 | 484294 | . INSULATOR, SHUNT | | | 1 |
| 17 | 60FC-405 | . SHUNT, 2000 AMP, 50 MV., ASSEMBLY | | | 1 |
| 18 | 20RT-353-1 | . DIODE, NEGATIVE, BASE V58849, No. R2025IH | 1 | | 1 |
| ⊙ 19 | 81B-1026 | . GOVERNOR, OVERSPEED, ASSEMBLY Precision Governors Inc. No. S-207A | 1 | | 1 |
| 20 | 485881 | . BRACKET, MOUNTING, OVERSPEED | | | 1 |
| 21 | 484987 | . RESISTOR AND DIODE ASSEMBLY | | | 1 |

⊙ Mfg's No. S-207 used before SN 83-PSO-1001 shipped 13 JAN 1983 requires kit 487467 to replace S-207 governor.



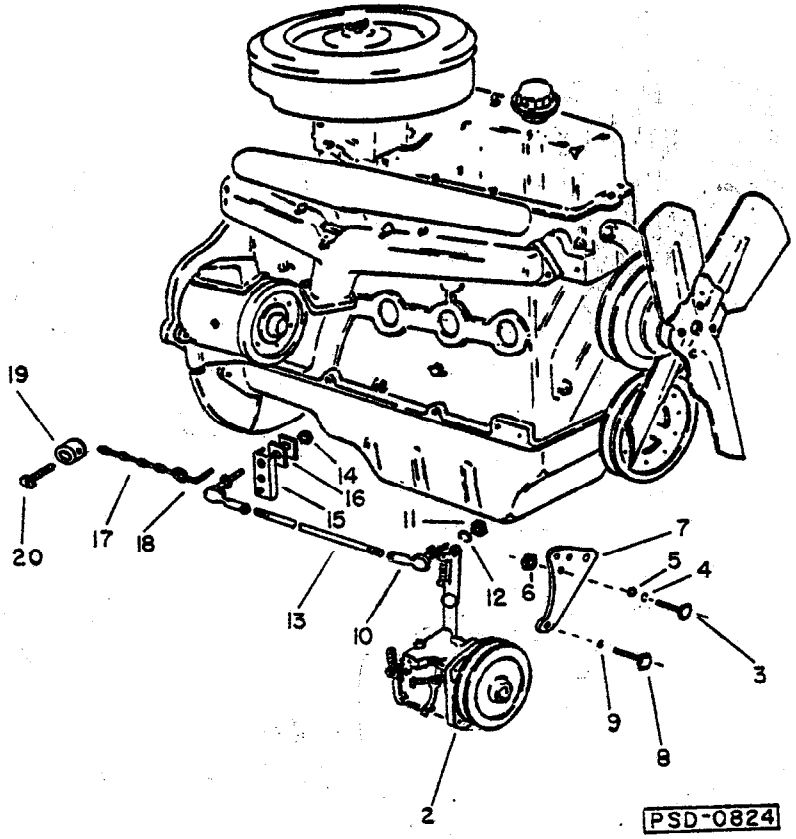

28.5 Volt Output Terminal Assembly
Figure 7

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 7– | 485829 | TERMINAL, OUTPUT, 28.5 V. ASSEMBLY (For NHA See Figure 4) | | | REF. |
| 1 | 485864 | . PANEL, TERMINAL, OUTPUT | | | 1 |
| 2 | W-11097-8 | . SCREW, 3/8-16 X 2 | | | 2 |
| 3 | W-11254-6 | . WASHER, LOCK, 3/8 | | | 4 |
| 4 | W-11242-10 | . WASHER, FLAT, 3/8 | | | 4 |
| 5 | W-11278-5 | . NUT, 3/8-16, HEX | | | 2 |
| 6 | W-10853-4 | . CAPACITOR, 0.5 μF, 100 V. DC V90201, No. B-206020 | 1 | | 2 |
| 7 | A-897-1 | . NAMEPLATE, NEGATIVE | | | 1 |
| 8 | 400435 | . NAMEPLATE, 28 VOLT | | | 1 |
| 9 | A-896-1 | . NAMEPLATE, POSITIVE | | | 1 |
| 10 | 5CW-2127 | . BUSHING | | | 2 |
| 11 | 5CW-976A | . WASHER, INSULATOR | | | 4 |
| 12 | 100GH-112 | . TERMINAL, OUTPUT | | | 2 |
| 13 | 5CW-975 | . BUSHING, INSULATOR | | | 2 |
| * | 485878 | . STRAP, MOUNTING, CAPACITOR | | | 1 |




Engine Control Panel Assembly
Figure 8

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 8- 1 | 485831-1 | PANEL, ENGINE, CONTROL (For NHA See Fig. 4) | | A | REF |
| 2 | 485831-2 | PANEL, ENGINE CONTROL (For NHA See Fig. 4) | | B | REF |
| 3 | 485865 | . PANEL, CONTROL | | AB | 1 |
| 4 | 402662 | . SWITCH, TOGGLE, 2GK71-73, (V73559) | 1 | AB | 1 |
| 5 | 385765 | . CONTROL, CHOKE, AN-0940-00, (V77574) | 1 | AB | 1 |
| 6 | 404603-3 | . CONTROL, THROTTLE, 43141-002-0042.0 | 1 | B | 2 |
| 7 | 5AW-989 | . NAMEPLATE, THROTTLE CONTROL | 1 | B | 2 |
| 8 | NO NUMBER | ATTACHING PARTS<br>. SCREW, PAN HD, SELF-TAPPING, # 4-40 X 1/4<br>*** | | B | 2 |
| 9 | 403091-2 | . PLUG, HOLE, DP-437, (V28520) | | A | 1 |

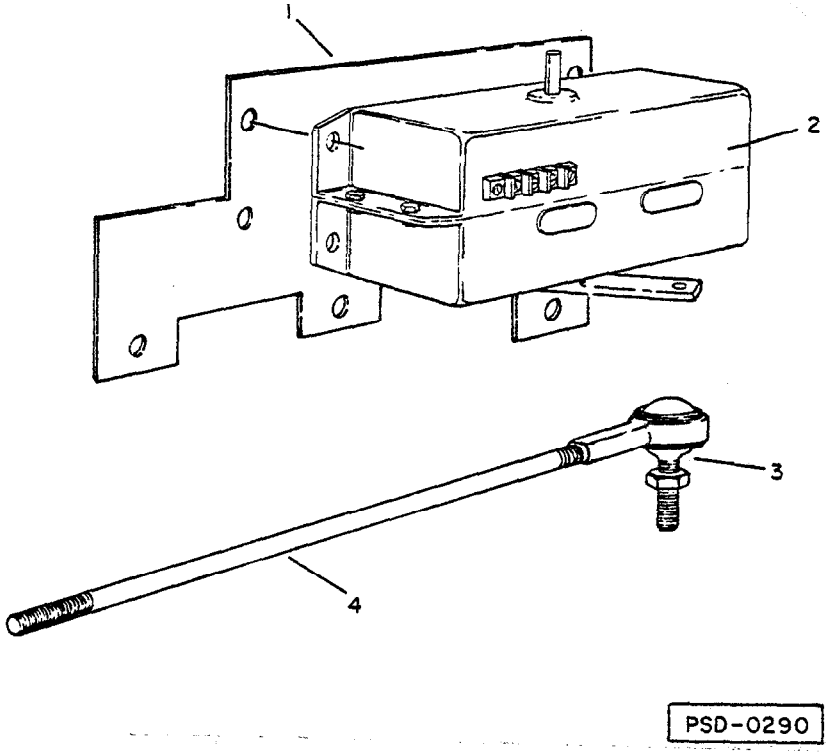



359754 Throttle Bracket

Mechanical Governor
Figure 9A

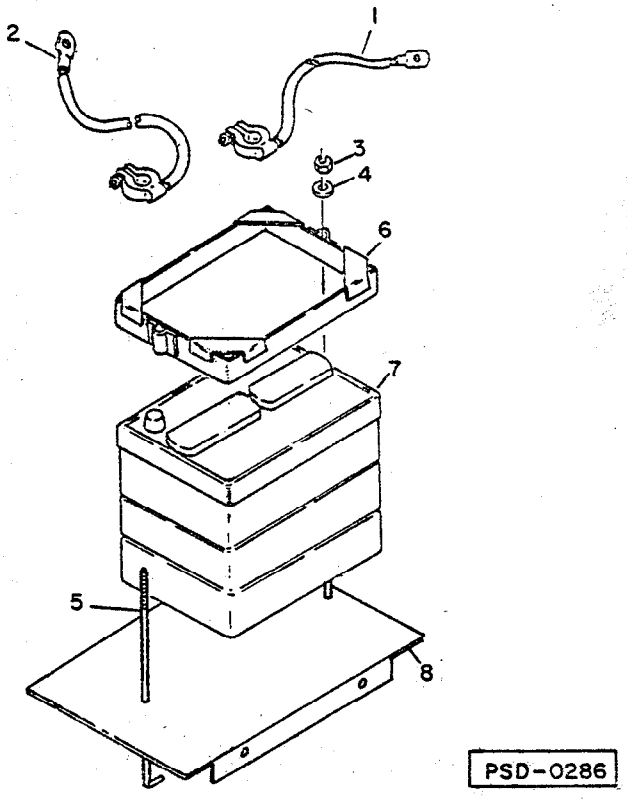
| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 9A- 1 | NO NUMBER | SPEED CONTROL GROUP (REF FIG. 4 FOR NHA) | | | REF |
| 2 | 83C-1003 | . GOVERNOR, MECHANICAL (V98293), GC-10965 | | | 1 |
| | | ATTACHING PARTS | | | |
| 3 | NO NUMBER | . SCREW, CAP, HEX HD, 3/8-24 X 1 1/4 | | | 3 |
| 4 | NO NUMBER | . WASHER, LOCK, 3/8 | | | 3 |
| 5 | NO NUMBER | . WASHER, 3/8 | | | 3 |
| 6 | NO NUMBER | . NUT, HEX, 3/8-24 | | | 3 |
| | | *** | | | |
| 7 | 487741 | . BRACKET, MOUNTING, GOVERNOR | | | 1 |
| | | ATTACHING PARTS | | | |
| 8 | NO NUMBER | . SCREW, CAP, HEX HD, 3/8-16 X 1 1/4 | | | 1 |
| 9 | NO NUMBER | . WASHER, LOCK 3/8 | | | 1 |
| | | *** | | | |
| 10 | 402908 | . JOINT, BALL | | | 2 |
| | | ATTACHING PARTS | | | |
| 11 | NO NUMBER | . NUT, HEX, 1/4-28 | | | 2 |
| 12 | NO NUMBER | . WASHER, LOCK | | | 2 |
| | | *** | | | |
| 13 | W-9476-6 | . ROD, CONTROL, GOVERNOR | | | 1 |
| 14 | NO NUMBER | . NUT, HEX, V4-28 | | | 2 |
| 15 | 487093 | . LEVER, ARM, CARBURETOR | | | 1 |
| 16 | 487094 | . SPACER, LEVER, CARBURETOR | | | 2 |
| 17 | 430506-10 | . CHAIN, SAFETY | | | 1 |
| 18 | 356354-1 | . CHAIN, JACK | | | 1 |
| 19 | HJ-200 | . CLAMP, WIRE, THROTTLE LINKAGE | | | 1 |
| 20 | NO NUMBER | . SCREW, HEX HD, #8-32 X 7/8 | | | 1 |

Precision Governor
Control Box 9016
Actuator 9025



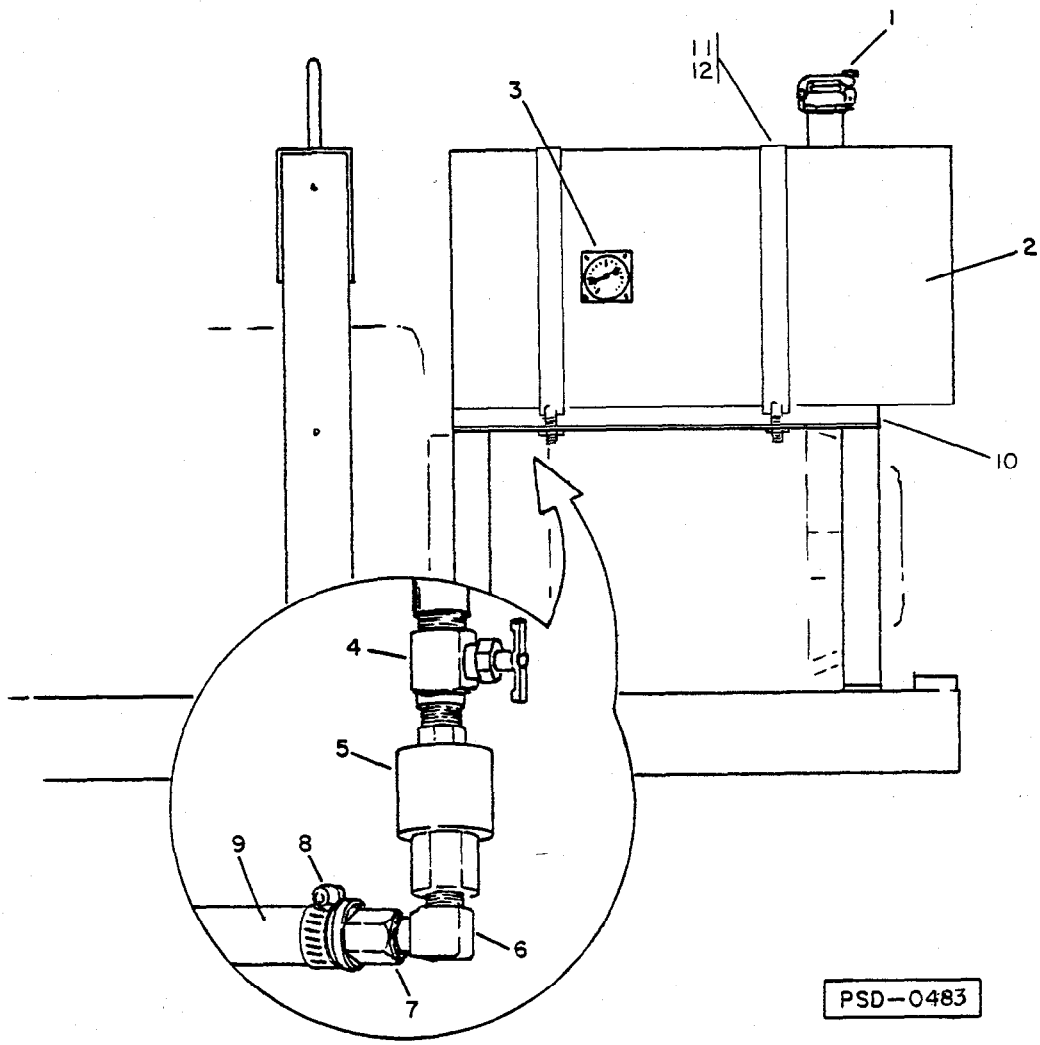

Speed Control Group
Figure 9

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 9— | No Number | SPEED CONTROL GROUP (For NHA See Figure 4) . | | | REF |
| 1 | 485838 | . BRACKET, MOUNTING GOVERNOR | | | 1 |
| 2 | 81C-1025 | . GOVERNOR Precision Governors Inc. No. SKA | 1 | | 1 |
| 3 | 402908 | . BALL, JOINT V57448, No. TF-4Y | 2 | | 2 |
| 4 | W-9476-4 | . ROD, THROTTLE CONTROL | | | 1 |



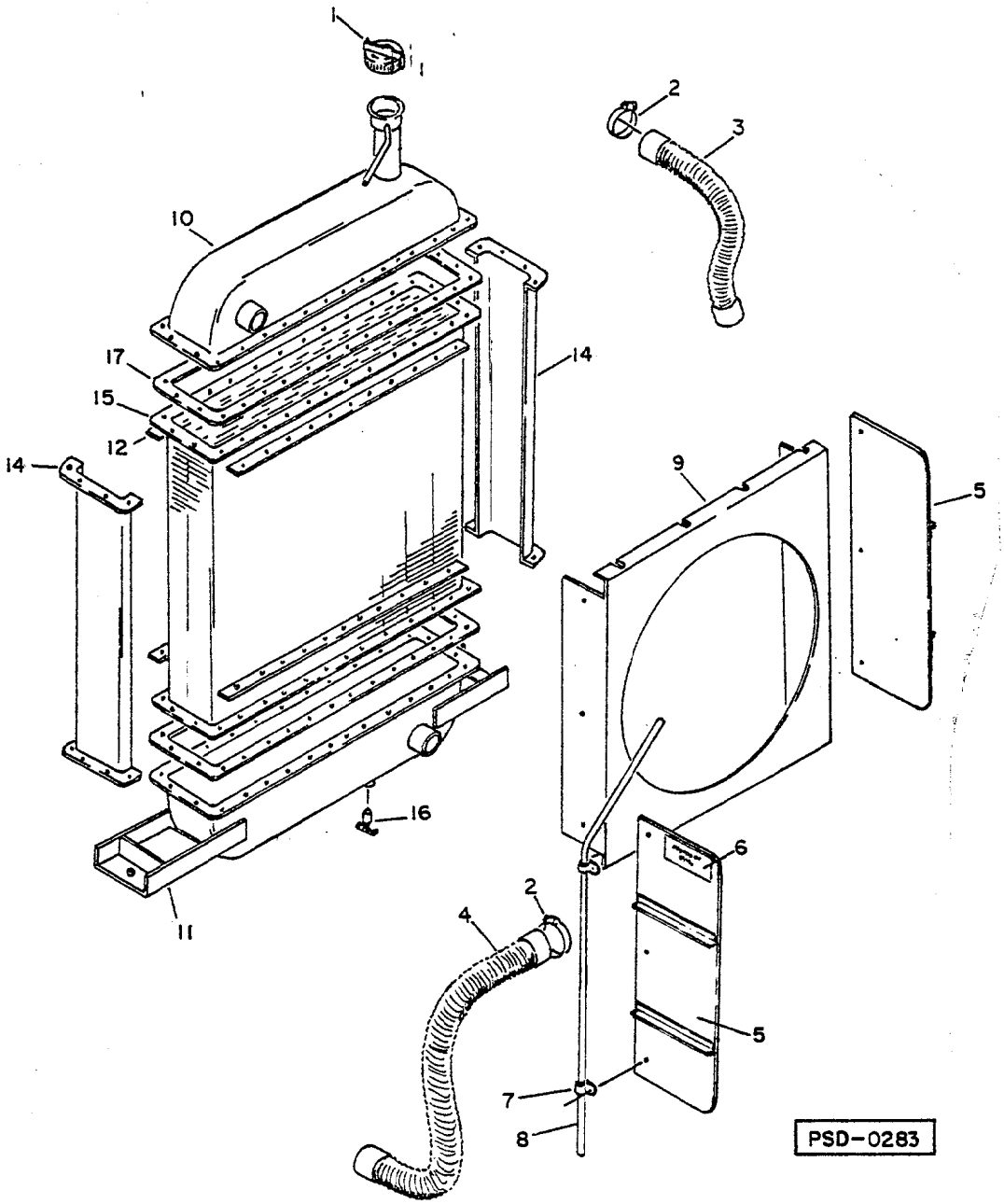

Battery Installation
Figure 10

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 10– | No Number | BATTERY INSTALLATION (For NHA See Figure 4) | | | REF |
| 1 | 12CW-1914-4 | . CABLE ASSEMBLY, BATTERY TO STARTER SWITCH | | | 1 |
| 2 | 12CW-1915-14 | . CABLE ASSEMBLY, BATTERY TO GROUND | | | 1 |
| 3 | No Number | . NUT, PLAIN, HEX, 5/16-18 | | | 2 |
| 4 | No Number | . WASHER, FLAT, 5/16 IN. | | | 4 |
| 5 | 5CW-2048 | . ROD, BATTERY CLAMP | | | 2 |
| 6 | 485793 | . CLAMP, BATTERY HOLD-DOWN | | | 1 |
| 7 | 402086-1 | . BATTERY, 12 V. | | | 1 |
| 8 | 485790 | . SUPPORT, BATTERY | | | 1 |
| * | W-9648-22 | . CABLE ASSEMBLY, STARTER SWITCH TO SOLENOID | | | 1 |



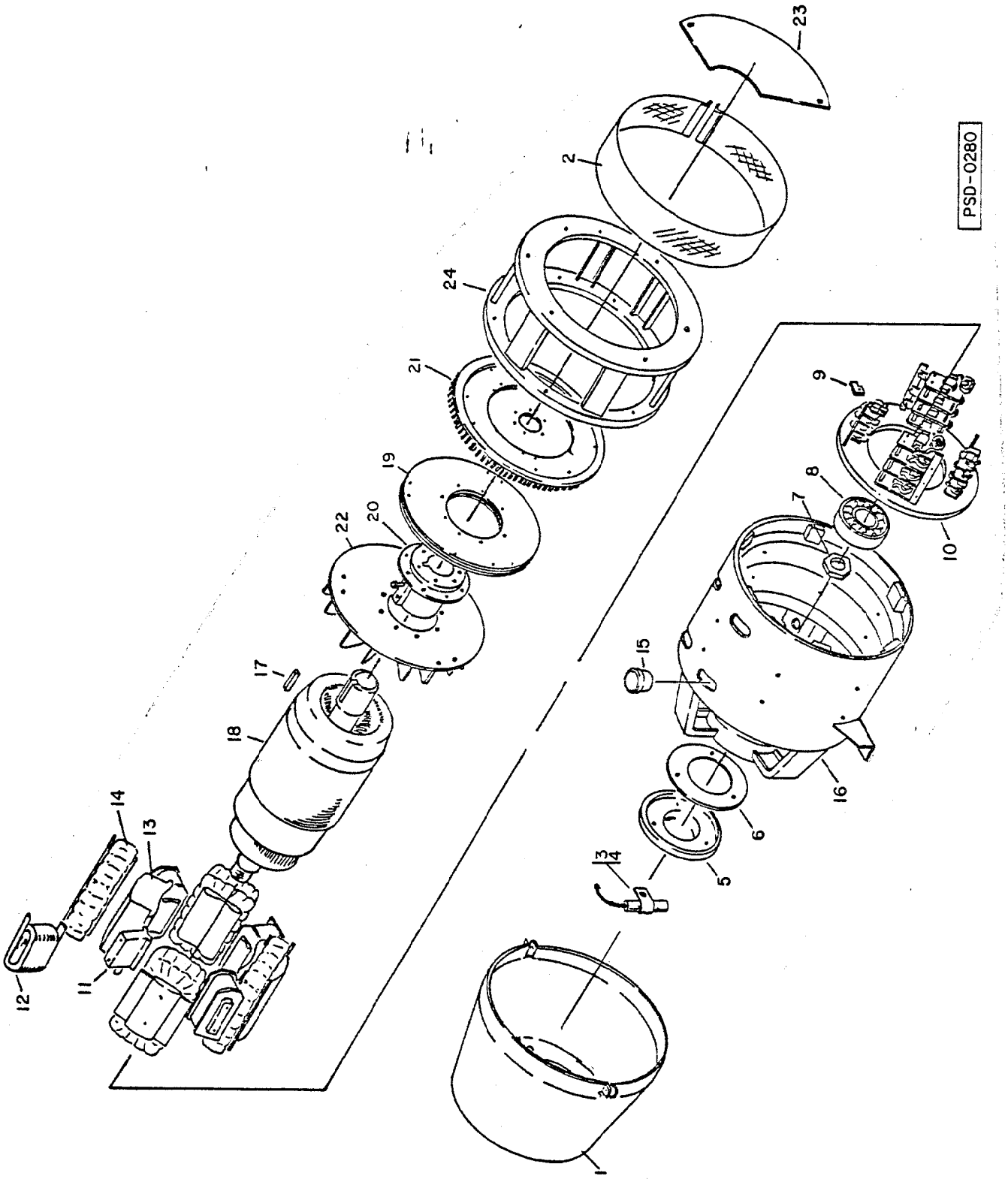

Fuel System
Figure 11

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 11— | No Number | FUEL SYSTEM, ENGINE (For NHA See Figure 4) | | | REF |
| 1 | 6FW-5072 | . CAP, FUEL TANK V49234, No. 1273 | | | 1 |
| 2 | 486562 | . TANK, FUEL, ASSEMBLY | | | 1 |
| 3 | 5CW-3420-1 | . . GAUGE, FUEL | | | 1 |
| | 485817 | . LINE, FUEL, ASSEMBLY | | | 1 |
| 4 | 81A-1017-1 | . . VALVE, SHUT-OFF | | | 1 |
| 5 | 403615 | . . VALVE, FUEL, SOLENOID V96152, No. 4-2314 | | | 1 |
| 6 | W-10891-7 | . . FITTING, ELBOW, MALE V79470, No. 49 x 4 | | | 1 |
| 7 | W-10893-0 | . . FITTING, HOSE, SWIVEL, FEMALE V30327, No. KA06-06NS | | | 1 |
| 8 | W-10869-14 | . . CLAMP, HOSE 7/32 TO 5/8 | | | 1 |
| 9 | 56544 | . . HOSE, LOW PRESSURE 5/16 I.D. | | | 34" |
| * | 482496-1 | . CLAMP, FUEL LINE | | | 2 |
| 10 | 486577 | . PAN, FUEL TANK | | | 1 |
| 11 | 486567-1 | . STRAP, FUEL TANK ASSEMBLY | | | 2 |
| 12 | 483630 | . INSULATION STRAP, FUEL TANK | | | 2 |



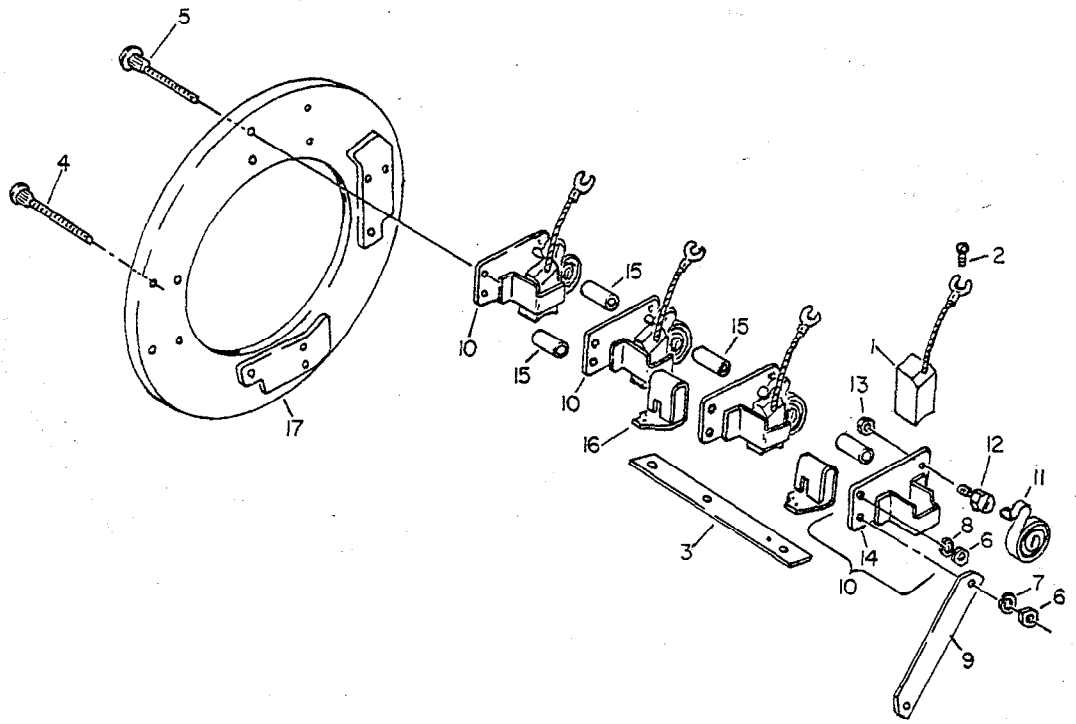

Cooling System
Figure 12

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 12– | No Number | COOLING SYSTEM (For NHA See Figure 4) | | | REF |
| 1 | FW-3449 | . CAP, RADIATOR | 1 | | 1 |
| 2 | W-10869-3 | . CLAMP, HOSE V66295, No. C32P | 2 | | 4 |
| 3 | 485827-1 | . HOSE, RADIATOR, TOP | 1 | | 1 |
| 4 | 56581 | . HOSE, RADIATOR, BOTTOM | 1 | | 18" |
| 5 | 389897 | . GUARD, FAN ASSEMBLY | | | 2 |
| 6 | 351541 | . LABEL, CAUTION FAN | | | 2 |
| | 485762 | . RADIATOR ASSEMBLY | | | 1 |
| 7 | W-10051-5 | . . CLAMP, PLASTIC | | | 2 |
| 8 | 56555 | . . HOSE, OVERFLOW | | | 45" |
| 9 | 485335 | . . SHROUD, FAN | | | 1 |
| 10 | 485334 | . . HEAD, RADIATOR | | | 1 |
| 11 | 485336 | . . BASE, RADIATOR | | | 1 |
| 12 | DW-3641 | . . STRIP, WASHER | | | 4 |
| 13 | DW-3590 | . . GASKET, TOP AND BASE | | | 2 |
| 14 | DW-3587 | . . SIDE, RADIATOR | | | 2 |
| 15 | 487305 | . . CORE, RADIATOR V34383, No. 122-4004 | | | 1 |
| 16 | 5CW-1932-0 | . . COCK, DRAIN RADIATOR V79470, No. 145 | | | 1 |



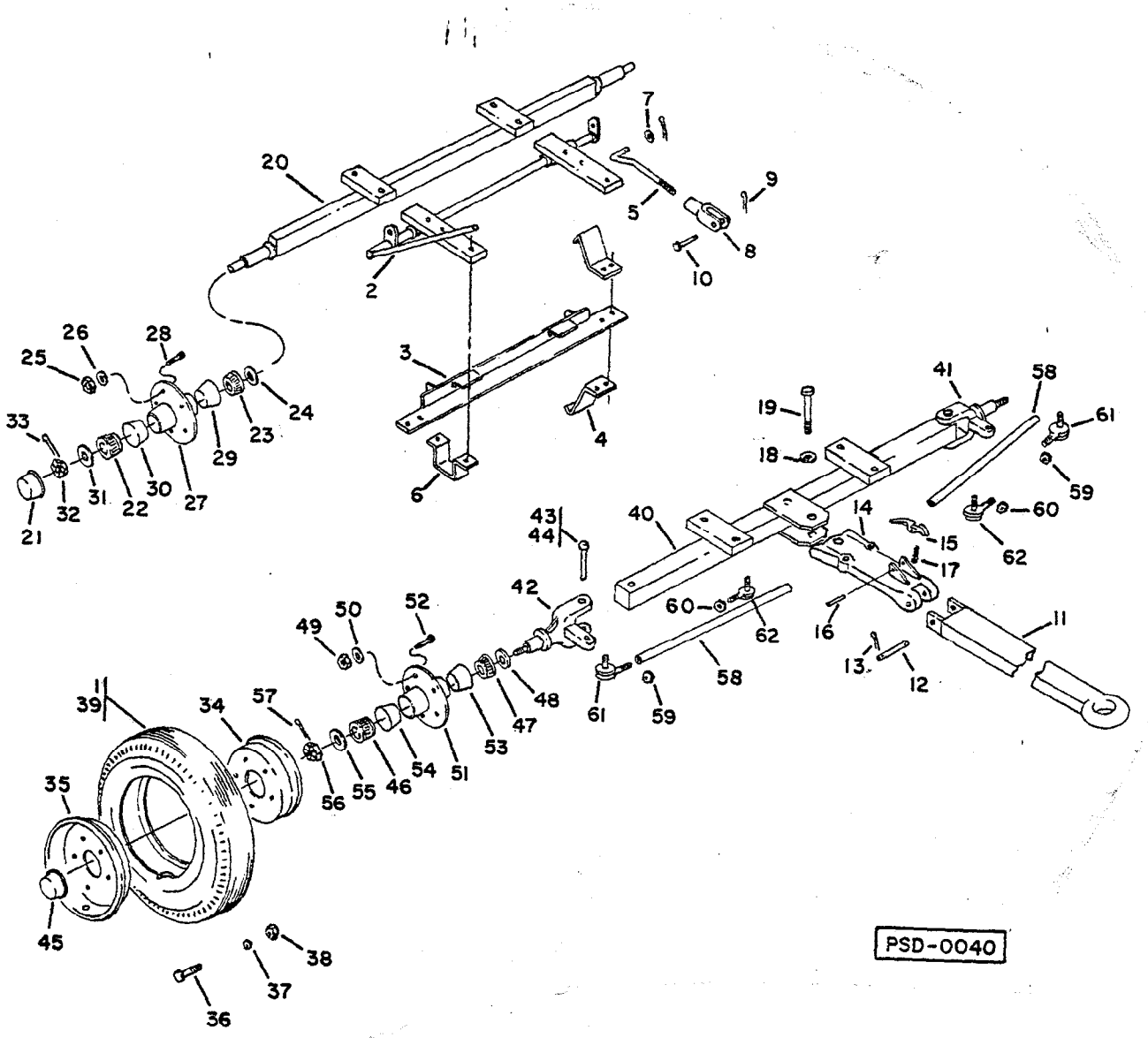

Generator and Drive Group
Figure 13

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 13– | No Number | GENERATOR AND DRIVE GROUP (For NHA See Figure 4) | | | REF |
| 1 | 484506 | . COVER, END | | | 1 |
| 2 | 485113 | . COVER, FLYWHEEL HOUSING | | | 1 |
| 3 | W-10855-4 | . CAPACITOR, 0.25 μF, 100 V DC V90201, No. B-206011 | | | 4 |
| 4 | 483798 | . LEAD, CAPACITOR | | | 4 |
| 5 | DW-882A | . CAP, BEARING | | | 1 |
| 6 | DW-883 | . GASKET, BEARING CAP | 2 | | 1 |
| 7 | FW-446 | . NUT, BEARING | | | 1 |
| 8 | W-10072-8 | . BEARING, BALL V21335, No. 310NP | 1 | | 1 |
| 9 | 16DW-967 | . CLAMP, BRUSHHOLDER | | | 2 |
| 10 | 358221-32 | . BRUSHHOLDER (For Details See Figure 14) | | | 1 |
| 11 | 358830-14 | . POLEPIECE, INTERPOLE | | | 4 |
| | No Number | . COIL SET, INTERPOLE | | | 1 SET |
| 12 | 380706 | . . COIL, INTERPOLE | | | 2 |
| | 380707 | . . COIL, INTERPOLE | | | 2 |
| 13 | DW-1045 | . POLEPIECE, PLUG HAT | | | 4 |
| 14 | 1361 | . COIL SET, SHUNT FIELD | | | 1 SET |
| 15 | 430278 | . GROMMET, GENERATOR HOUSING V89616, NO TPR-1812 | | | 8 |
| 16 | 484810-1 | . HOUSING, GENERATOR | | | 1 |
| 17 | C-30 | . KEY, MACHINE | | | 1 |
| 18 | 389839 | . ARMATURE | | | 1 |
| | 485887 | . COUPLING, HUB AND DISK ASSY | | | 1 |
| 19 | HJ-6 | . . DISC, COUPLING | | | 1 |
| 20 | 355897 | . . HUB, COUPLING | | | 1 |
| 21 | 485809-1 | . FLYWHEEL | | | 1 |
| 22 | 485893 | . FAN, GENERATOR | | | 1 |
| 23 | 357170 | . COVER, FRONT FLYWHEEL HOUSING | | | 1 |
| 24 | 356800-4 | . HOUSING, FLYWHEEL | | | 1 |
| * | W-9234-142 | . LEAD, BRUSHHOLDER | | | 1 |
| * | W-9234-60 | . LEAD, BRUSHHOLDER | | | 1 |
| * | 16DW-246 | . BUS, INTERPOLE | | | 1 |
| * | W-9234-81 | . LEAD, INTERPOLE | | | 1 |
| * | W-9234-167 | . LEAD, INTERPOLE | | | 1 |
| * | 350330-182 | . INSULATION | | | 4 |
| * | FW-339-0 | . INSULATION, TOE | | | 8 |
| * | 350330-131 | . FLUX, RING, INSULATION | | | 32 |
| * | W-10853-4 | . CAPACITOR, RFI V90201, No. B-206020 | 1 | | 1 |




Brushholder Assembly
Figure 14

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 14– | 358221-32 | BRUSHHOLDER IN BRUSHES, ASSEMBLY (For NHA See Figure 13) | | | REF |
| 1 | AW-1470 | . BRUSH | 32 | | 16 |
| | 16DW-148A | . BRUSHHOLDER (LESS BRUSHES) ASSY | | | 1 |
| 2 | W-11236-7 | . . SCREW, TAPPING, THREAD FORMING, 1/4-20 x 7/8 IN. TYPE F | | | 8 |
| 3 | 16DW-200 | . . BUS | | | 4 |
| 4 | 8BW-12-3 | . . BOLT, CARRIAGE, 1/4-20 x 4-1/2 IN. | | | 10 |
| 5 | 8BW-12-8 | . . BOLT, CARRIAGE, 1/4-20 x 4-3/4 IN. | | | 4 |
| 6 | W-11280-2 | . . NUT, HEX, 1/4-20 | | | 14 |
| 7 | W-11242-5 | . . WASHER, FLAT 1/4 IN. | | | 8 |
| 8 | W-11254-4 | . . WASHER, LOCK 1/4 IN. | | | 14 |
| 9 | 352413 | . . SPACER, BRUSH BOX | | | 4 |
| 10 | AW-1156B | . . PLATE ASSEMBLY, BRUSH GUIDE | | | 16 |
| 11 | W-799H-173 | . . . SPRING, BRUSH | 16 | | 1 |
| 12 | AW-1719 | . . . ADAPTER, SPRING | | | 1 |
| 13 | W-11280-2 | . . . NUT, HEX | | | 1 |
| 14 | AW-734 | . . . GUIDE | | | 1 |
| 15 | AW-740 | . . SPACER | | | 20 |
| 16 | AW-1683 | . . SPACER | | | 8 |
| 17 | 12CW-962 | . . RING, MOUNTING | | | 1 |

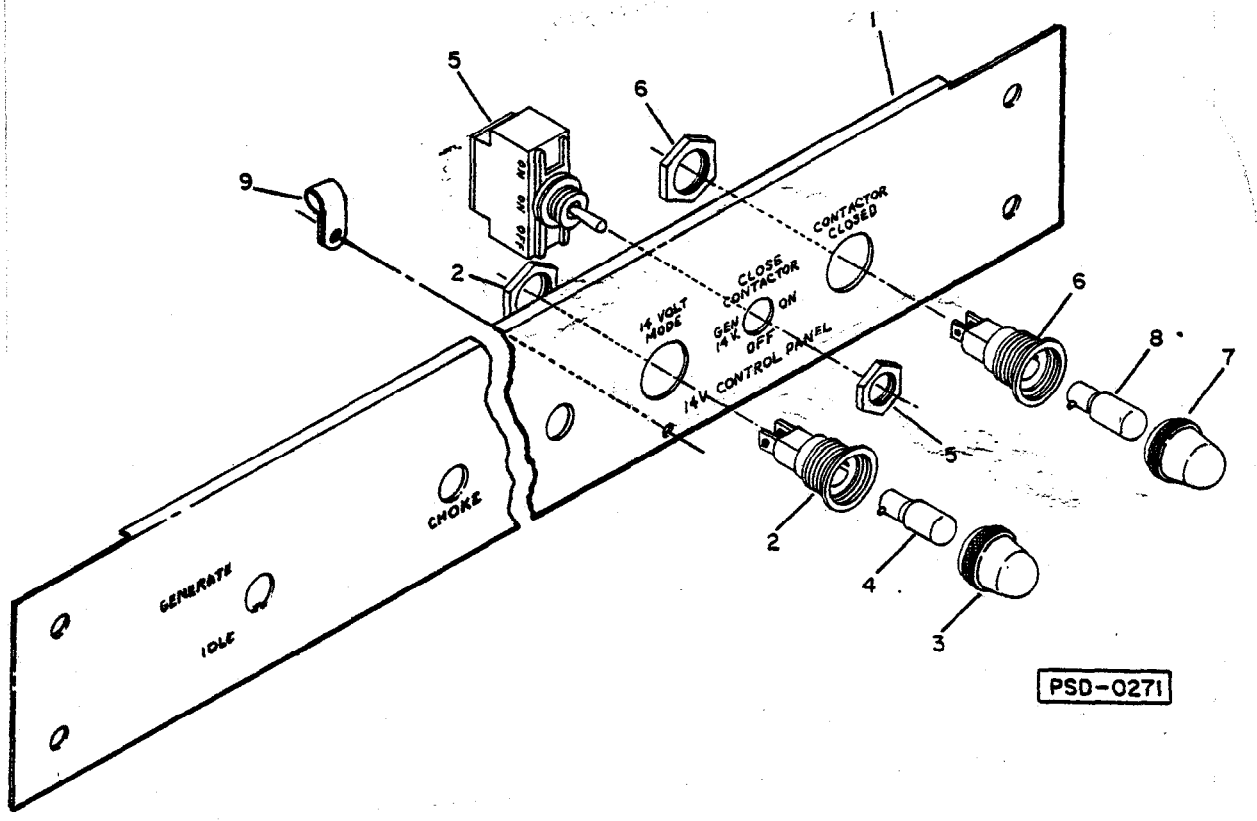



Trailer Assembly (Option)
Figure 15

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 15— | 484331 | TRAILER, WITH STANDARD 6.00 x 9 TIRES ASSY (For NHA See Figure 1) | | | REF. |
| 1 | 400238 | . TIRE, 6.00 x 9 6-PLY | | | 4 |
| | 484259 | . BRAKE, ASSEMBLY | | | 1 |
| 2 | 484255 | .. LEVER, BRAKE MOUNT ASSEMBLY | | | 1 |
| 3 | 484256 | .. BRAKE, SHOE ASSEMBLY | | | 1 |
| 4 | HF-1882 | .. SHOE, BRAKE ASSEMBLY | | | 4 |
| 5 | 484250 | .. ROD, ADJUSTING, BRAKE | | | 2 |
| 6 | 484254 | .. BRACKET, MTG., BRAKE SHOE ANGLE | | | 2 |
| 7 | W-11242-12 | .. WASHER, FLAT, 1/2" , STEEL | | | 2 |
| 8 | 400954 | .. CLEVIS, ADJUSTING, BRAKE | | | 2 |
| 9 | W-11338-5 | .. PIN, COTTER, 1/8 x 1, STEEL | | | 4 |
| 10 | 401468 | .. PIN, CLEVIS | | | 2 |
| | 78B-1123 | . TRAILER ASSEMBLY | | | 1 |
| 11 | 79A-1075 | .. DRAWBAR ASSEMBLY V22938 No. 6-3502 | 1 | | 1 |
| 12 | 79A-1057 | ... HINGE PIN V22938, No. 5416 | 1 | | 1 |
| 13 | 76A-1171 | ... COTTER PIN V22938, No. 4800-6 | | | 2 |
| | 79A-1045 | .. CENTER ARM ASSEMBLY V22938, No. 1-3854 | | | 1 |
| 14 | 79A-1046 | ... CENTER ARM V22938, No. 3854 | | | 1 |
| 15 | 404529 | ... LATCH PEDAL V22938, No. 3855 | 1 | | 1 |
| 16 | 404530 | ... ROLL PIN V22938, No. 5000-1 | | | 1 |
| 17 | 404528 | ... SPRING V22938, No. 4006 | | | 1 |
| 18 | 79A-1047 | .. FLAT WASHER V22938, No. 4701-3 | | | 1 |
| 19 | 79A-1048 | .. CENTER PIN V22938, No. 5400-5 | 1 | | 1 |
| | 79A-1074 | .. AXLE, REAR, ASSEMBLY V22938, No. 363-2006 | | | 1 |
| 20 | 79A-1078 | ... AXLE, REAR, BEAM WELDMENT V22938, No. 363-2006-3 | | | 1 |
| | 76A-1184 | ... HUB ASSEMBLY, REAR AXLE V22938, No. 1-3612 | | | 2 |
| 21 | 404539 | .... CAP, GREASE V22938, NO. 6312 | 1 | | 1 |
| 22 | 404540 | .... BEARING, CONE, OUTER V22938, No. 6058 | 2 | | 1 |
| 23 | 404541 | .... BEARING, CONE, INNER V22938, No. 6057 | 2 | | 1 |
| 24 | 404543 | .... SEAL, GREASE V22938, No. 6311 | 2 | | 1 |
| 25 | 404544 | .... NUT, STUD V22938, No. 4601-6 | | | 5 |
| 26 | 404545 | .... LOCKWASHER V22938, No. 4700-5 | | | 5 |
| | 76A-1185 | .... HUB, STUD AND CUP ASSEMBLY V22938, No. 3603-1 | | | 1 |
| 27 | 404551 | ..... HUB V22938, No. 3603 | 4 | | 1 |
| 28 | 404552 | ..... STUD, WHEEL V22938, No. 6251-10 | | | 5 |
| 29 | 404553 | ..... CUP, BEARING, INNER V22938, No. 6152 | 2 | | 1 |

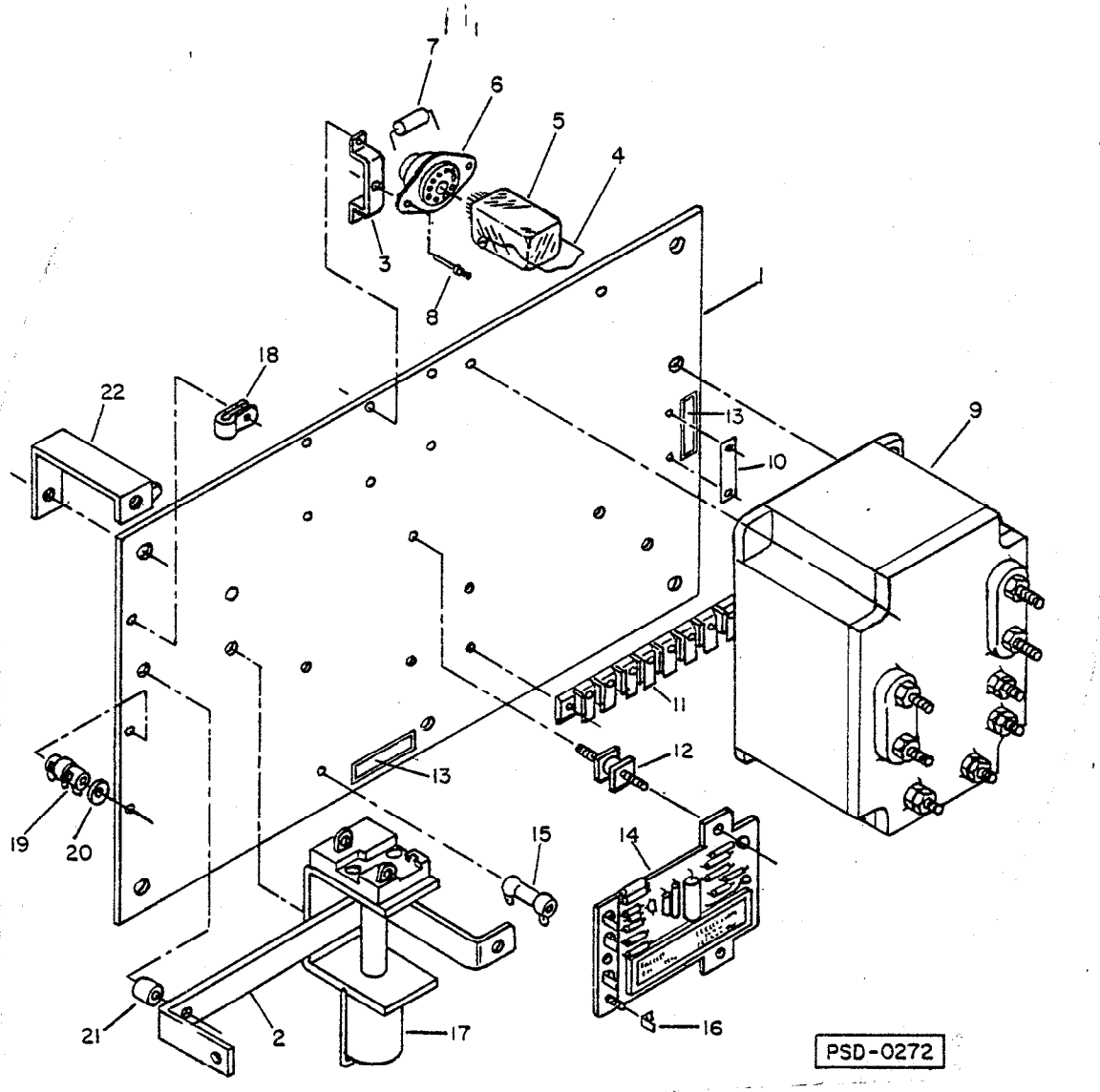
| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 15-30 | 404554 | ..... CUP, BEARING, OUTER V22938, No. 6151 | 2 | | 1 |
| 31 | 404537 | ... WASHER, SPINDLE V22938, No. 4702-2 | | | 2 |
| 32 | 404538 | ... NUT, SPINDLE V22938, No. 4600-2 | | | 2 |
| 33 | 76A-1182 | ... PIN, COTTER V22938, No. 4800-5 | | | 2 |
| | 404546 | .. WHEEL ASSEMBLY (For 6.00 x 9 in. 10 Ply Tire) V22938, No. 3712 | 1 | | 4 |
| 34 | 76A-1219 | ... DISC, WHEEL (Without valve hole) V22938, No. 3712-2 | | | 1 |
| 35 | 76A-1220 | ... DISC, WHEEL (With valve hole) V22938, No. 3712-1 | | | 1 |
| 36 | 76A-1221 | ... BOLT, 3/8 in. 24NF, 3/4 in. Lg. Hex Hd. V22938, No. 4901-8 | | | 8 |
| 37 | 76A-1223 | ... LOCKWASHER, 3/8 in. V22938, No. 4700-4 | | | 8 |
| 38 | 76A-1222 | ... NUT, 3/8 in. 24 UNFV22938, No. 4601-5 | | | 8 |
| 39 | 400599 | .. TUBE, INNER V22938, No. 3600-200 | | | 4 |
| | 79A-1073 | .. AXLE, FRONT ASSEMBLY V22938, No. 363-2056 | | | 1 |
| 40 | 79A-1076 | ... AXLE, FRONT BEAM ASSEMBLY V22938, No. 363-205X-1 | | | 1 |
| 41 | 404533 | ... SPINDLE & KNUCKLE ASSEMBLY (Left) V22938, No. 3-3806 | 1 | | 1 |
| 42 | 404534 | ... SPINDLE & KNUCKLE ASSEMBLY (Right) V22938, No. 4-3806 | 1 | | 1 |
| 43 | 404535 | ... PIN, KING V22938, No. 5401 | 2 | | 1 |
| 44 | 404536 | ... PIN, ROLL 3/16 x 1-3/4 in. V22938, No. 5000-6 | | | 1 |
| | 76A-1184 | ... HUB ASSEMBLY FRONT AXLE, V22938, No. 1-3612 | | | 2 |
| 45 | 404539 | .... CAP, GREASE V22938, No. 6312 | | | 1 |
| 46 | 404540 | .... BEARING, CONE, OUTER V22938, No. 6058 | | | 1 |
| 47 | 404541 | .... BEARING, CONE, INNER V22938, No. 6057 | | | 1 |
| 48 | 404543 | .... SEAL, GREASE V22938, No. 6311 | | | 1 |
| 49 | 404544 | .... NUT, STUD V22938, No. 4601-6 | | | 5 |
| 50 | 404545 | .... LOCKWASHER V22938, No. 4700-5 | | | 5 |
| | 76A-1185 | .... HUB, STUD & CUP ASSEMBLY V22938, No. 3603-1 | | | 1 |
| 51 | 404551 | ..... HUB V22938, No. 3603 | | | 1 |
| 52 | 404552 | ..... STUD, WHEEL V22938, No. 6251-10 | | | 5 |
| 53 | 404553 | ..... CUP, BEARING, INNER V22938, No. 6152 | | | 1 |

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 15–54 | 404554 | . . . CUP BEARING, OUTER V22938, No. 6151 | | | 1 |
| 55 | 404537 | . . . WASHER, SPINDLE V22938, No. 4702-2 | | | 2 |
| 56 | 404538 | . . . NUT, SPINDLE V22938, No. 4600-2 | | | 2 |
| 57 | 76A-1182 | . . . PIN, COTTER V22938, No. 4800-5 | | | 2 |
| | 79A-1049 | . . TIE, ROD ASSEMBLY V22938, No. 3906-235 | | | 1 |
| 58 | 79A-1077 | . . . TUBE V22938, No. 3900-200 | 2 | | 2 |
| 59 | 79A-1051 | . . . JAM NUT, R.H. V22938, No. 4602-1 | 1 | | 2 |
| 60 | 79A-1052 | . . . JAM NUT, L.H. V22938, No. 4602-2 | 1 | | 2 |
| 61 | 79A-1053 | . . . BALL JOINT, R.H. W/NUT V22938, No. 3950-1 | 1 | | 2 |
| 62 | 79A-1054 | . . . BALL JOINT, L.H. W/NUT V22938, No. 3950-2 | 1 | | 2 |
| * | 79A-1035 | . . LUBE FITTING V22938, No. 5801 | | | 4 |
| * | 79A-1183 | . . LUBE FITTING V22938, No. 5800 | | | 5 |



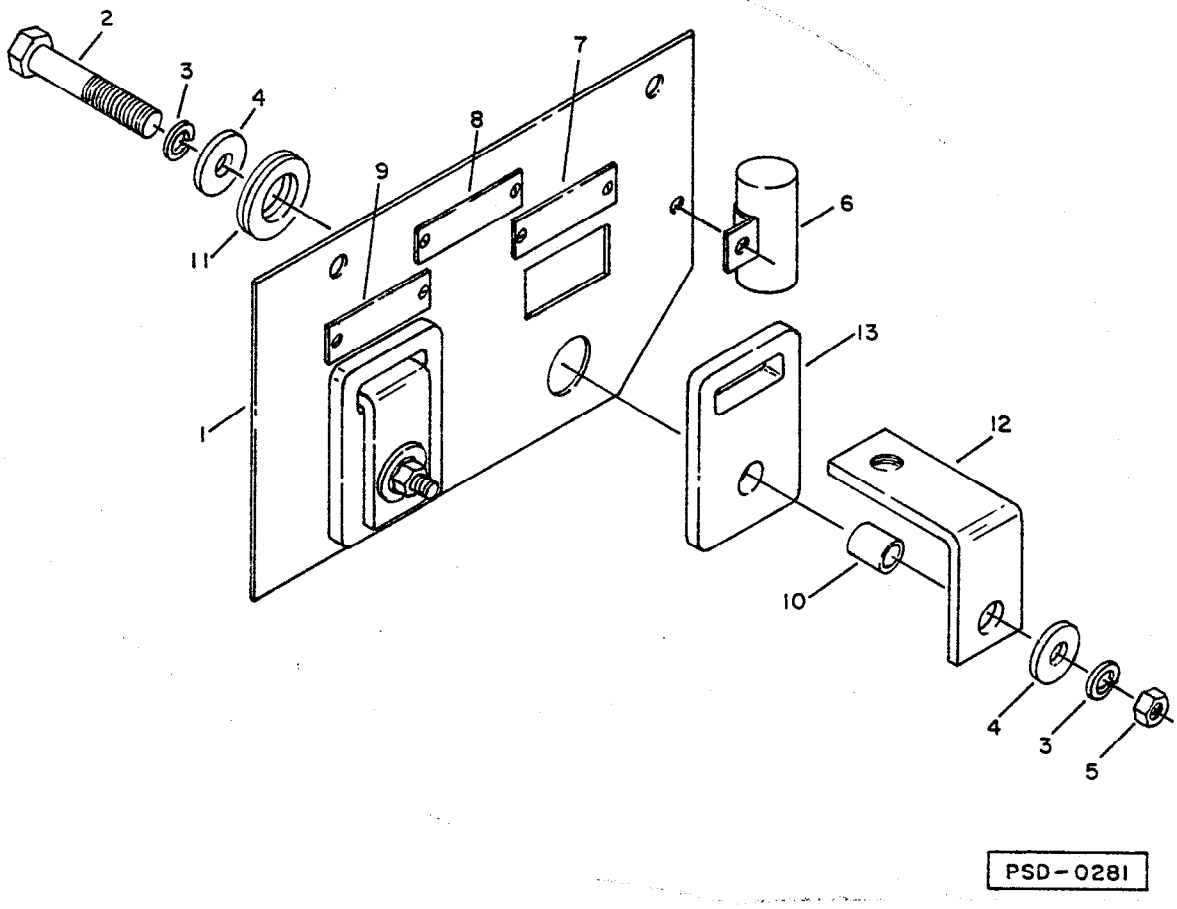

14 Volt Control Panel Assembly
Figure 16

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 16– | 485925 | PANEL, CONTROL, 14 VOLT ASSEMBLY (For NHA See Figure 4) | | | REF |
| 1 | 485919 | . PANEL, CONTROL, 14 V. | | | 1 |
| | HF-2518-4 | . LIGHT, PILOT, AMBER, 14 V., ASSEMBLY | 1 | | 1 |
| 2 | 404173 | . . BASE | | | 1 |
| 3 | 404172-2 | . . LENS (AMBER) | 2 | | 1 |
| 4 | 400613-3 | . . BULB | 6 | | 1 |
| 5 | 403189 | . SWITCH, TOGGLE, 3 POS., 2 POLE | 1 | | 1 |
| | HF-2518-8 | . LIGHT, PILOT, GREEN, 14 VOLT, ASSY | 1 | | 1 |
| 6 | 404173 | . . BASE | | | 1 |
| 7 | 404172-3 | . . LENS (GREEN) | 2 | | 1 |
| 8 | 400613-4 | . . BULB | 6 | | 1 |
| 9 | W-10051-5 | . CLAMP, WIRE, PLASTIC | | | 1 |
| * | 485918 | . HARNESS, WIRE, ASSEMBLY | | | 1 |



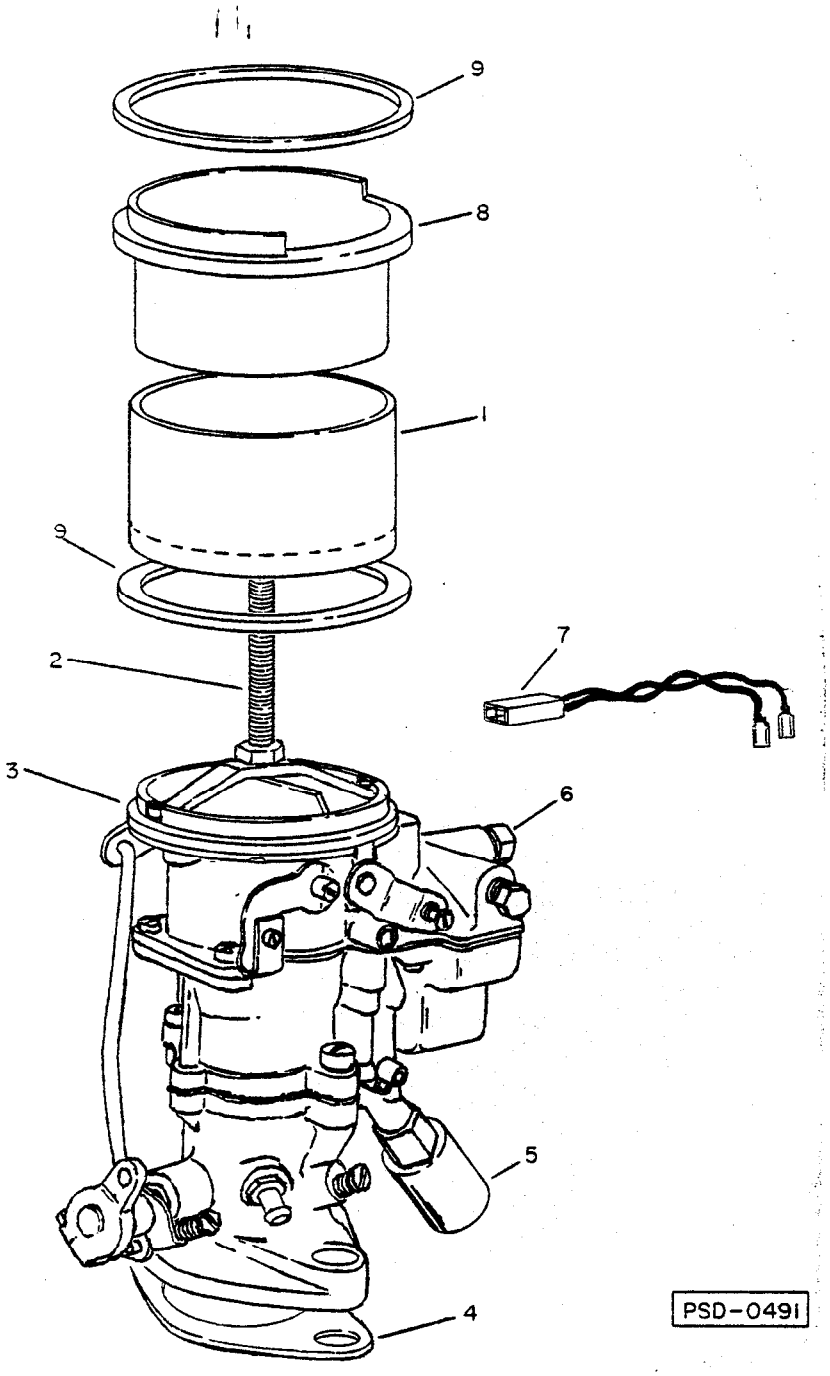

14 Volt Contactor Panel Assembly (Option)
Figure 17

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 17– | 485915 | PANEL, CONTACTOR, 14 VOLT ASSEMBLY (For NHA See Figure 4) | | | REF |
| 1 | 485916 | . PANEL, CONTACTOR, 14 VOLT | | | 1 |
| 2 | 485932 | . BUS, INPUT | | | 1 |
| 3 | 387725 | . BRACKET, MTG., SOCKET, RELAY | | | 3 |
| 4 | 16DA-4253-1 | . RETAINER, SPRING, RELAY V77342, No. 20C206 | | | 2 |
| 5 | 16DA-4004A-10 | . RELAY, PLUG-IN, 12 VOLT V77342, No. KAP-14DG | 1 | | 2 |
| 6 | 16DA-4052-0 | . SOCKET, RELAY V02660, No.77-MIP-11 | | | 2 |
| 7 | W-9714-22 | . RESISTOR, 120 OHM, 2 WATT | | | 1 |
| 8 | 400785-7 | . RIVET, BLIND, STEEL, DOMED HEAD | | | 3 |
| 9 | 6FW-6423A | . LOAD CONTACTOR, 14 VOLT V74063, No. A-791N | 1 | | 1 |
| 10 | A-896-1 | . NAMEPLATE, POSITIVE | | | 1 |
| 11 | 401937-2 | . STRIP, TERMINAL V98410, No. 35008-3526 | | | 1 |
| 12 | 401556 | . MOUNT, SHOCK, RUBBER | | | 3 |
| 13 | 400434 | . NAMEPLATE, 14 VOLTS | | | 2 |
| 14 | 481231 | . BOARD, P.C., OVERVOLTAGE, ASSY | 1 | | 1 |
| 15 | W-9746-3 | . RESISTOR, 100 OHM, 25 WATT | | | 1 |
| 16 | 400701 | . CONNECTOR, RIGHT ANGLE | | | 4 |
| 17 | FW-2131 | . RELAY, OVERLOAD V01121, No. X-10,000 | 1 | | 1 |
| 18 | W-10051-7 | . CLAMP, WIRE, PLASTIC | | | 2 |
| 19 | W-4541L | . RESISTOR, 300 OHM, 25 WATT | | | 1 |
| 20 | 1CZ-74 | . INSULATOR, TOP, RESISTOR | | | 2 |
| 21 | 484265-3 | . SPACER | | | 1 |
| 22 | 481227 | . BRACKET, MOUNTING, UPPER, ASSY | | | 2 |
| * | 400828-1 | . TIE, WIRE, PLASTIC | | | 22 |
| * | 484689-1 | . SLEEVING, PLASTIC, 1/8 I.D. | | | 12 |
| * | 484690-2 | . SLEEVING, PLASTIC, 3/16 I.D. | | | 2 |




14 Volt Output Terminal Assembly
Figure 18

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 18– | 485830 | TERMINAL, OUTPUT, 14 V. ASSEMBLY (For NHA See Figure 4) | | | REF |
| 1 | 485864 | . PANEL, TERMINAL, OUTPUT | | | 1 |
| 2 | W-11097-8 | . SCREW, 3/8-16 x 2 | | | 2 |
| 3 | W-11254-6 | . WASHER, LOCK 3/8 | | | 4 |
| 4 | W-11242-10 | . WASHER, FLAT 3/8 | | | 4 |
| 5 | W-11278-5 | . NUT, 3/8-16, HEX | | | 2 |
| 6 | W-10853-4 | . CAPACITOR, 0.5 μF, 100 V. DC V90201, No. B-206020 | 1 | | 2 |
| 7 | A-897-1 | . NAMEPLATE, NEGATIVE | | | 1 |
| 8 | 400434 | . NAMEPLATE, 14 VOLT | | | 1 |
| 9 | A-896-1 | . NAMEPLATE, POSITIVE | | | 1 |
| 10 | 5CW-2127 | . BUSHING | | | 2 |
| 11 | 5CW-976A | . WASHER, INSULATOR | | | 4 |
| 12 | 100GH-112 | . TERMINAL, OUTPUT | | | 2 |
| 13 | 5CW-975 | . BUSHING, INSULATOR | | | 2 |
| * | 485878 | . STRAP, MOUNTING, CAPACITOR | | | 1 |




Zenith Carburetor Kit
Figure 19

| FIGURE ITEM NO. | HOBART PART NO. | NOMENCLATURE 1234567 | REC. SPARES | EFF | UNITS per ASSY |
|---|---|---|---|---|---|
| 19– | 487084 | KIT, ZENITH, CARBURETOR (For NHA See Figure 4) | | | REF. |
| 1 | 486666 | . ADAPTER, AIR CLEANER | | | 1 |
| 2 | 486667 | . ROD, 1/4-20 AIR CLEANER MOUNTING | | | 1 |
| 3 | 82A-1027 | . ZENITH CARBURETOR | | | 1 |
| 4 | No Number | . GASKET, CARB. MTG. V90927, No. C5J2-9447A | | | 1 |
| 5 | No Number | . SOLENOID, ANTIDIESEL, VALVE V90927, No. B-75-16A | | | 1 |
| 6 | W-10887-5 | . FITTING, FUEL LINE | | | 1 |
| 7 | 486771 | . WIRE ASSEMBLY ANTIDIESEL SOLENOID | | | 1 |
| 8 | No Number | . ADAPTER, NYLON V90927, No. D3JL-9B663A | | | 1 |
| 9 | No Number | . GASKET, AIR CLEANER V90927, No. C8DF-9654A | | | 2 |
| * | 82A-1061 | GASKET KIT | | | REF. |
| * | 82A-1060 | CARBURETOR, OVERHAUL, KIT | | | REF. |

## 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.

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# CHAPTER 5. OPTIONAL EQUIPMENT

Optional equipment available for use with the Jet-Ex 3 Generator Set is listed below.

| OPTION | PART NUMBER | MANUAL |
|---|---|---|
| Trailer | 484331 | TO-139 |
| 14 Volt Output | 485910 | None |
| Spark Arrester Muffler Kit | 486114 | OM-203 |
| Air Heater Kit | 486113 | OM-204 |
| Mechanical Governor Kit | 487091 | I-127 + Assy Dwg |
| 115 Volt Power Generator Assy. | 489090 | TO-154 |
| Generator Replacement Kit | 281308 | TO-195 |

## CHAPTER 6. MANUFACTURER'S LITERATURE

Engine Maintenance and Operator's Manual No. IEO-194-127

Ford Motor Company
Industrial Engine Operations
300 Renaissance Center
P. O. Box 43338
Detroit, Michigan 48243

Voltage Regulator Manual No. OM-200

Hobart Brothers Company
Power Systems Division
Troy, Ohio 45373

Hobart Diagrams

485839 – Connection, Jet-Ex 3

485840 – Schematic, Jet-Ex 3

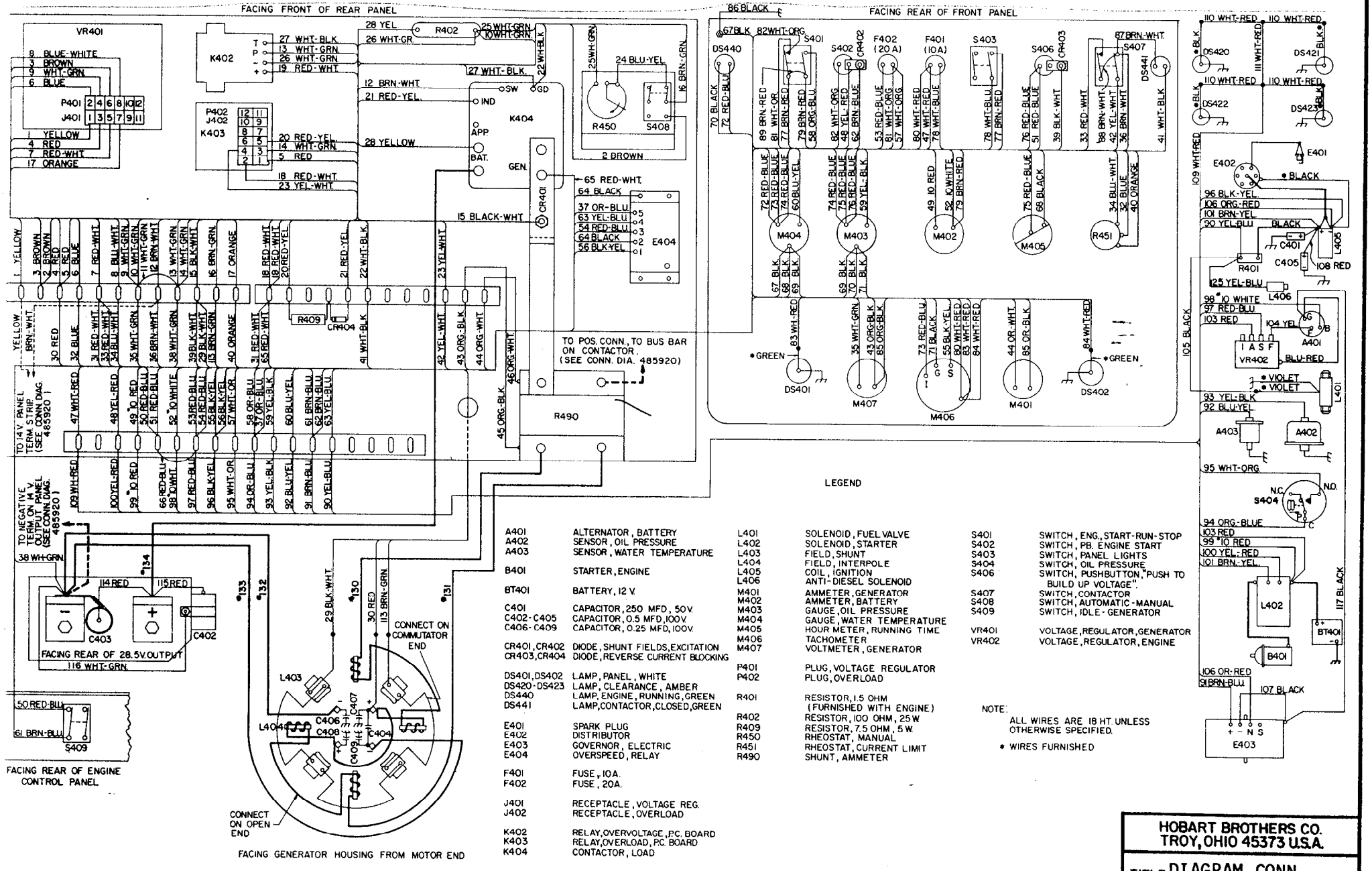
485920 – 14 Volt Unit Connection

Printed Circuit Boards

389522B – 28 Volt Overvoltage Module

484567 – 28 Volt Overload Module

481231 – 14 Volt Overvoltage Module




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A401 | ALTERNATOR, BATTERY | L401 | SOLENOID, FUEL VALVE | S401 | SWITCH, ENG., START-RUN-STOP |
| A402 | SENSOR, OIL PRESSURE | L402 | SOLENOID, STARTER | S402 | SWITCH, PB. ENGINE START |
| A403 | SENSOR, WATER TEMPERATURE | L403 | FIELD, SHUNT | S403 | SWITCH, PANEL LIGHTS |
| B401 | STARTER, ENGINE | L404 | FIELD, INTERPOLE | S404 | SWITCH, OIL PRESSURE |
| BT401 | BATTERY, 12 V. | L405 | COIL, IGNITION | S406 | SWITCH, PUSHBUTTON, "PUSH TO BUILD UP VOLTAGE" |
| C401 | CAPACITOR, 250 MFD, 50 V. | L406 | ANTI-DIESEL SOLENOID | S407 | SWITCH, CONTACTOR |
| C402-C405 | CAPACITOR, 0.5 MFD, 100 V. | M401 | AMMETER, GENERATOR | S408 | SWITCH, AUTOMATIC-MANUAL |
| C406-C409 | CAPACITOR, 0.25 MFD, 100 V. | M402 | AMMETER, BATTERY | S409 | SWITCH, IDLE-GENERATOR |
| CR401, CR402 | DIODE, SHUNT FIELDS, EXCITATION | M403 | GAUGE, OIL PRESSURE | | |
| CR403, CR404 | DIODE, REVERSE CURRENT BLOCKING | M404 | GAUGE, WATER TEMPERATURE | VR401 | VOLTAGE, REGULATOR, GENERATOR |
| DS401, DS402 | LAMP, PANEL, WHITE | M405 | HOUR METER, RUNNING TIME | VR402 | VOLTAGE, REGULATOR, ENGINE |
| DS420-DS423 | LAMP, CLEARANCE, AMBER | M406 | TACHOMETER | | |
| DS440 | LAMP, ENGINE, RUNNING, GREEN | M407 | VOLTMETER, GENERATOR | | |
| DS441 | LAMP, CONTACTOR, CLOSED, GREEN | P401 | PLUG, VOLTAGE REGULATOR | | |
| | | P402 | PLUG, OVERLOAD | | |
| E401 | SPARK PLUG | R401 | RESISTOR, 1.5 OHM (FURNISHED WITH ENGINE) | | |
| E402 | DISTRIBUTOR | R402 | RESISTOR, 100 OHM, 25 W. | | |
| E403 | GOVERNOR, ELECTRIC | R409 | RESISTOR, 7.5 OHM, 5 W. | | |
| E404 | OVERSPEED, RELAY | R450 | RHEOSTAT, MANUAL | | |
| F401 | FUSE, 10 A. | R451 | RHEOSTAT, CURRENT LIMIT | | |
| F402 | FUSE, 20 A. | R490 | SHUNT, AMMETER | | |
| J401 | RECEPTACLE, VOLTAGE REG. | | | | |
| J402 | RECEPTACLE, OVERLOAD | | | | |
| K402 | RELAY, OVERVOLTAGE, P.C. BOARD | | | | |
| K403 | RELAY, OVERLOAD, P.C. BOARD | | | | |
| K404 | CONTACTOR, LOAD | | | | |

NOTE:
ALL WIRES ARE 18 HT UNLESS OTHERWISE SPECIFIED.

* WIRES FURNISHED

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

TITLE DIAGRAM, CONN.
JET-EX3

REV. 1

DWG. NO. 485839

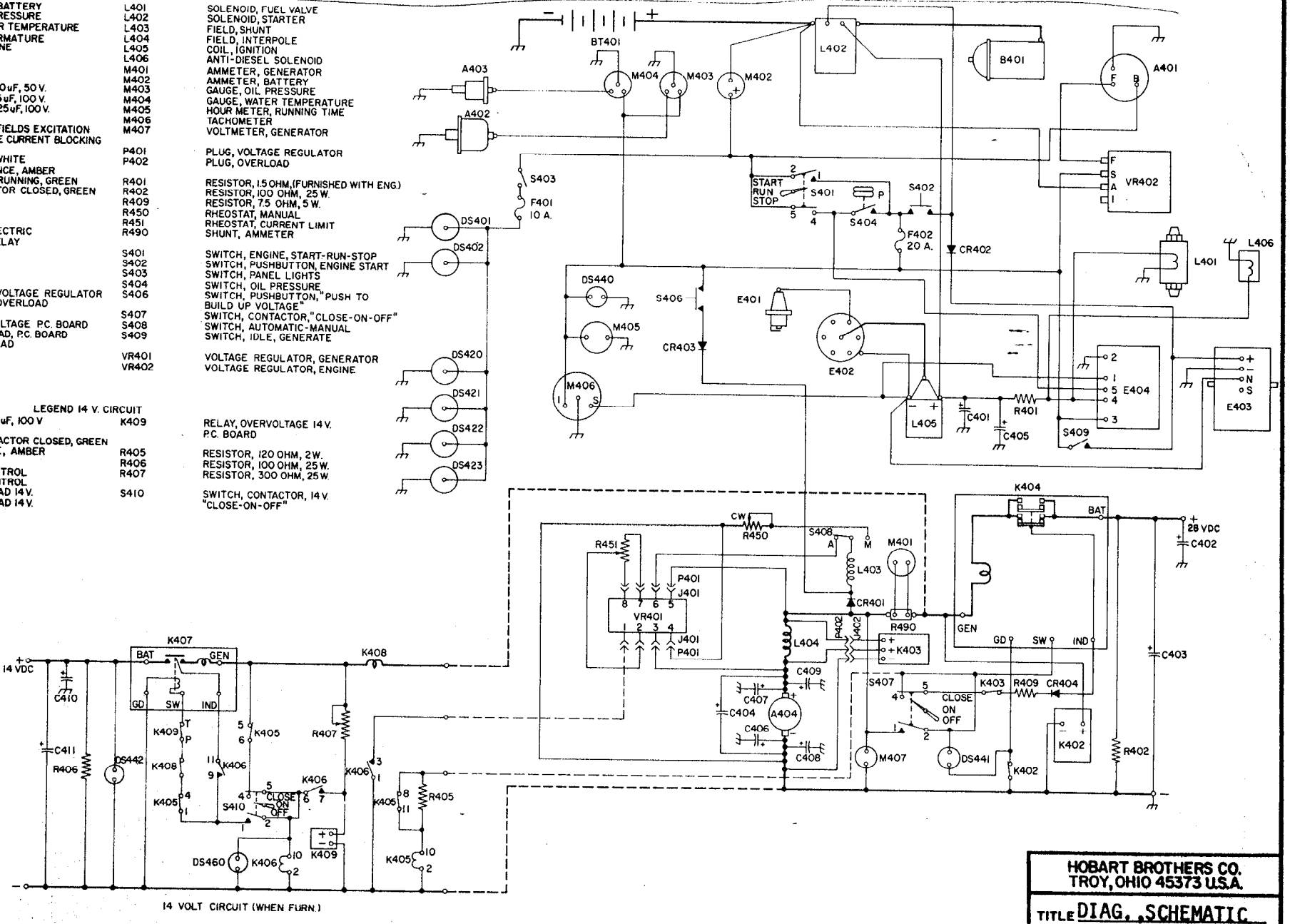
LEGEND

| | |
|---|---|
| A401 | ALTERNATOR, BATTERY |
| A402 | SENSOR, OIL PRESSURE |
| A403 | SENSOR, WATER TEMPERATURE |
| A404 | GENERATOR, ARMATURE |
| B401 | STARTER, ENGINE |
| BT401 | BATTERY, 12 V. |
| C401 | CAPACITOR, 250 uF, 50 V. |
| C402-C405 | CAPACITOR, 0.5 uF, 100 V. |
| C406-C409 | CAPACITOR, 0.25 uF, 100 V. |
| CR401, CR402 | DIODE, SHUNT FIELDS EXCITATION |
| CR403, CR404 | DIODE, REVERSE CURRENT BLOCKING |
| DS401, DS402 | LAMP, PANEL, WHITE |
| DS420-DS423 | LAMP, CLEARANCE, AMBER |
| DS440 | LAMP, ENGINE RUNNING, GREEN |
| DS441 | LAMP, CONTACTOR CLOSED, GREEN |
| E401 | SPARK PLUG |
| E402 | DISTRIBUTOR |
| E403 | GOVERNOR, ELECTRIC |
| E404 | OVERSPEED, RELAY |
| F401 | FUSE, 10 A. |
| F402 | FUSE, 20 A. |
| J401 | RECEPTACLE, VOLTAGE REGULATOR |
| J402 | RECEPTACLE, OVERLOAD |
| K402 | RELAY, OVERVOLTAGE P.C. BOARD |
| K403 | RELAY, OVERLOAD, P.C. BOARD |
| K404 | CONTACTOR, LOAD |

| | |
|---|---|
| L401 | SOLENOID, FUEL VALVE |
| L402 | SOLENOID, STARTER |
| L403 | FIELD, SHUNT |
| L404 | FIELD, INTERPOLE |
| L405 | COIL, IGNITION |
| L406 | ANTI-DIESEL SOLENOID |
| M401 | AMMETER, GENERATOR |
| M402 | AMMETER, BATTERY |
| M403 | GAUGE, OIL PRESSURE |
| M404 | GAUGE, WATER TEMPERATURE |
| M405 | HOUR METER, RUNNING TIME |
| M406 | TACHOMETER |
| M407 | VOLTMETER, GENERATOR |
| P401 | PLUG, VOLTAGE REGULATOR |
| P402 | PLUG, OVERLOAD |
| R401 | RESISTOR, 1.5 OHM, (FURNISHED WITH ENG.) |
| R402 | RESISTOR, 100 OHM, 25 W. |
| R409 | RESISTOR, 7.5 OHM, 5 W. |
| R450 | RHEOSTAT, MANUAL |
| R451 | RHEOSTAT, CURRENT LIMIT |
| R490 | SHUNT, AMMETER |
| S401 | SWITCH, ENGINE, START-RUN-STOP |
| S402 | SWITCH, PUSHBUTTON, ENGINE START |
| S403 | SWITCH, PANEL LIGHTS |
| S404 | SWITCH, OIL PRESSURE |
| S406 | SWITCH, PUSHBUTTON, "PUSH TO BUILD UP VOLTAGE" |
| S407 | SWITCH, CONTACTOR, "CLOSE-ON-OFF" |
| S408 | SWITCH, AUTOMATIC-MANUAL |
| S409 | SWITCH, IDLE, GENERATE |
| VR401 | VOLTAGE REGULATOR, GENERATOR |
| VR402 | VOLTAGE REGULATOR, ENGINE |

LEGEND 14 V. CIRCUIT

| | |
|---|---|
| C410-C411 | CAPACITOR, 0.5 uF, 100 V |
| DS442 | LAMP, 14 V. CONTACTOR CLOSED, GREEN |
| DS460 | LAMP, 14 V. MODE, AMBER |
| K405 | RELAY, 14 V. CONTROL |
| K406 | RELAY, 14 V. CONTROL |
| K407 | CONTACTOR LOAD 14 V. |
| K408 | RELAY, OVERLOAD 14 V. |
| K409 | RELAY, OVERVOLTAGE 14 V. P.C. BOARD |
| R405 | RESISTOR, 120 OHM, 2 W. |
| R406 | RESISTOR, 100 OHM, 25 W. |
| R407 | RESISTOR, 300 OHM, 25 W. |
| S410 | SWITCH, CONTACTOR, 14 V. "CLOSE-ON-OFF" |




14 VOLT CIRCUIT (WHEN FURN.)

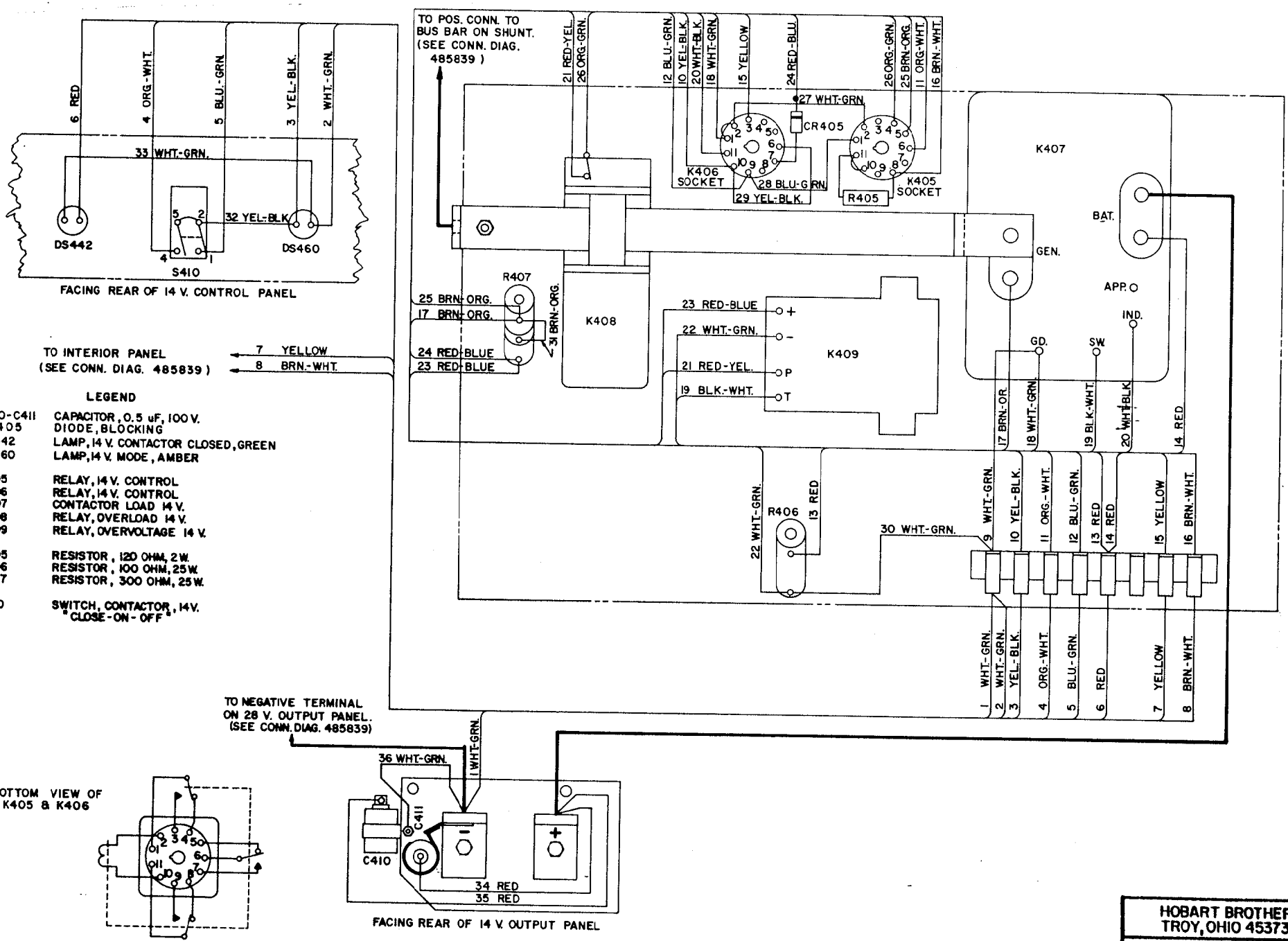
HOBART BROTHERS CO.
TROY, OHIO 45373 U.S.A.

TITLE DIAG., SCHEMATIC
JET-EX3



REV. 1

DWG. NO. 485840




LEGEND

| | |
|---|---|
| C410-C411 | CAPACITOR, 0.5 uF, 100 V. |
| CR405 | DIODE, BLOCKING |
| DS442 | LAMP, 14 V. CONTACTOR CLOSED, GREEN |
| DS460 | LAMP, 14 V. MODE, AMBER |
| K405 | RELAY, 14 V. CONTROL |
| K406 | RELAY, 14 V. CONTROL |
| K407 | CONTACTOR LOAD 14 V. |
| K408 | RELAY, OVERLOAD 14 V. |
| K409 | RELAY, OVERVOLTAGE 14 V. |
| R405 | RESISTOR, 120 OHM, 2 W. |
| R406 | RESISTOR, 100 OHM, 25 W. |
| R407 | RESISTOR, 300 OHM, 25 W. |
| S410 | SWITCH, CONTACTOR, 14 V. "CLOSE-ON-OFF" |

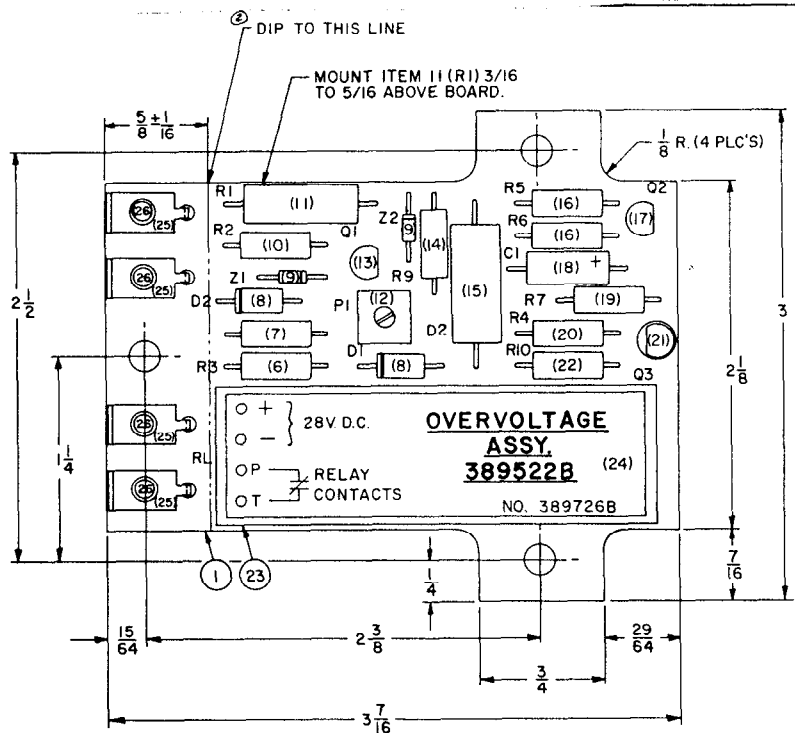
HOBART BROTHERS CO.
TROY, OHIO 45373 U.S.A.

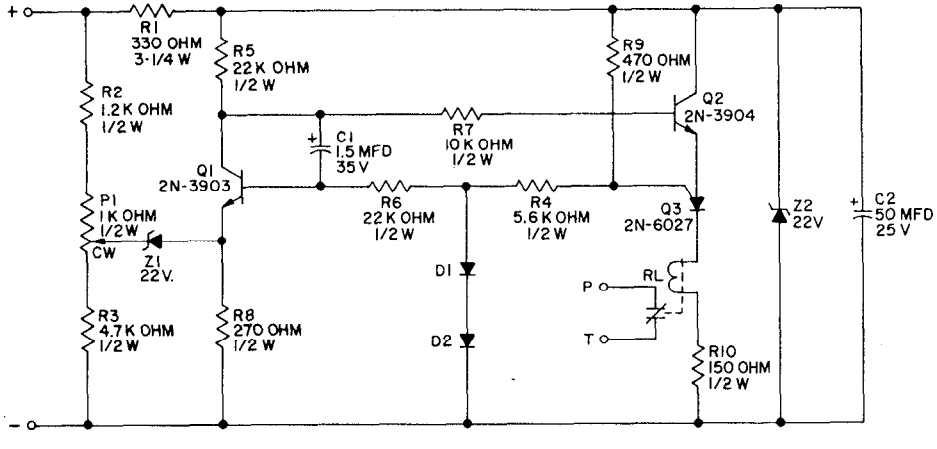
TITLE Diagram, Conn.



REV. 1

DWG. NO. 485920




| TITLE | | DRAWING NO. | |
|---|---|---|---|
| | BOARD, P.C., OVERVOLTAGE, AY. | 389522B | |
| ITEM | DESCRIPTION | DRAWING NO. | R |
| 1 | BOARD, P.C. OVERVOLTAGE | 403766B | 1 |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | RESISTOR, 4.7K OHM, 1/2 WATT | W-10827-12 | 1 |
| 7 | RESISTOR, 270 OHM, 1/2 WATT | W-10827-7 | 1 |
| 8 | DIODE, SILICON, 400 PRV, 1.5 A. | ICZ-93B | 2 |
| 9 | DIODE, ZENER, 22 V. | 401429-1 | 2 |
| 10 | RESISTOR, 1.2K OHM, 1/2 WATT | W-10827-1 | 1 |
| 11 | RESISTOR, 330 OHM, 3-1/4 WATT | 401435-3 | 1 |
| 12 | POTENTIOMETER, 1K OHM, 1/2 WATT | 402794-1 | 1 |
| 13 | TRANSISTOR, 2N-3903 | 400760-1 | 1 |
| 14 | RESISTOR, 470 OHM, 1/2 WATT | W-10827-8 | 1 |
| 15 | CAPACITOR, 50 MFD, 25 VOLTS | 406135-5 | 1 |
| 16 | RESISTOR, 22K OHM, 1/2 WATT | W-10827-18 | 2 |
| 17 | TRANSISTOR, 2N-3904 | 400760-2 | 1 |
| 18 | CAPACITOR, 1.5 MFD, 35 VOLTS | 400030-2 | 1 |
| 19 | RESISTOR, 10K OHM, 1/2 WATT | W-10827-17 | 1 |
| 20 | RESISTOR, 5.6K OHM, 1/2 WATT | W-10827-22 | 1 |
| 21 | TRANSISTOR, UNIJ, PROGRAMMABLE | 402462 | 1 |
| 22 | RESISTOR, 150 OHM, 1/2 WATT | W-10827-44 | 1 |
| 23 | RELAY, PROTECTIVE MONITOR, 12V. | 403198 | 1 |
| 24 | LABEL, IDENT. & INSTRUCTION | 389726B | 1 |
| 25 | CONNECTOR, FASTON, RIGHT ANGLE | 422640 | 4 |
| 26 | RIVET, BLIND, ALUM. | 403593-1 | 4 |

LEGEND

| | |
|---|---|
| C1 | CAPACITOR 1.5 MFD, 35 V. |
| C2 | CAPACITOR 50 MFD, 25 V. |
| D1, D2 | DIODE |
| P1 | POTENTIOMETER, 1K OHM, 1/2 WATT |
| Q1 | TRANSISTOR 2N-3903 |
| Q2 | TRANSISTOR 2N-3904 |
| Q3 | TRANSISTOR PROGRAMMABLE UNIJ-2N-6027 |
| R1 | RESISTOR 330 OHM, 3-1/4 WATT |
| R2 | RESISTOR 1.2 K OHM, 1/2 WATT |
| R3 | RESISTOR 4.7K OHM, 1/2 WATT |
| R4 | RESISTOR 5.6 K OHM, 1/2 WATT |
| R5, R6 | RESISTOR 22 K OHM, 1/2 WATT |
| R7 | RESISTOR 10K OHM, 1/2 WATT |
| R8 | RESISTOR 270 OHM, 1/2 WATT |
| R9 | RESISTOR 470 OHM, 1/2 WATT |
| R10 | RESISTOR 150 OHM, 1/2 WATT |
| RL | RELAY |
| Z1, Z2 | ZENER 22 VOLT |

TEST EQUIPMENT NEEDED

FILTERED AND FUSED DC POWER SUPPY 20 TO 40 VOLTS, STOP WATCH, AND VOLT AND OHMMETER.

TEST INSTRUCTIONS

1. CONNECT A 12 VOLT BULB IN SERIES WITH P & T, BULB WILL LIGHT.
2. CONNECT DC POWER SUPPLY TO PLUS AND MINUS OF THE P.C. BOARD.
3. ADJUST P1 TO TRIP (LIGHT WILL GO OUT). AT 32 VOLTS IN 2-10 SECONDS. RELAY IS NOT TO TRIP AT 31 VOLTS.
4. WITH 35 VOLT INPUT, CHECK FOR TRIP TIME TO BE APPROXIMATELY 1 SECOND.

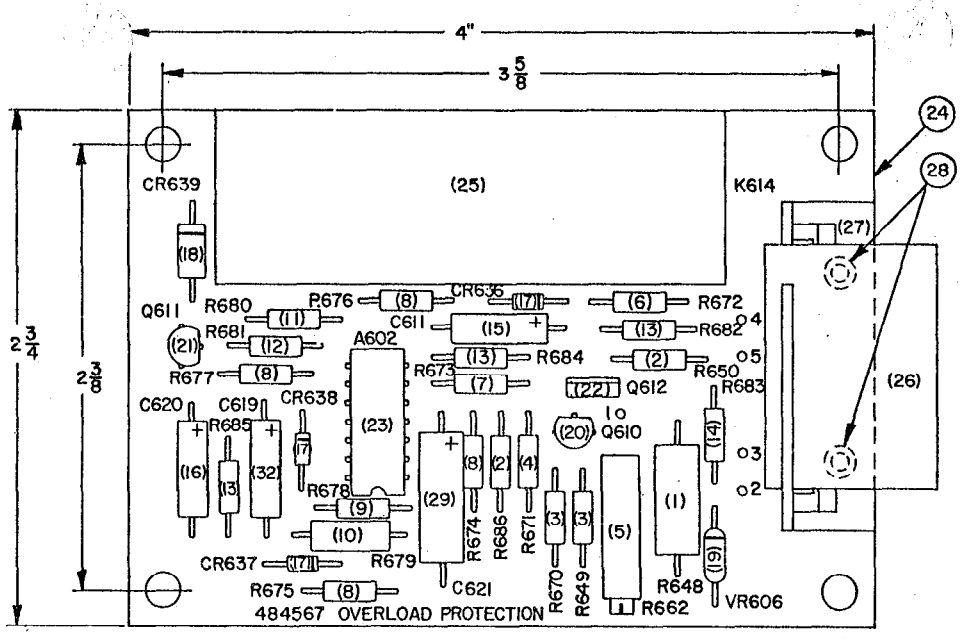


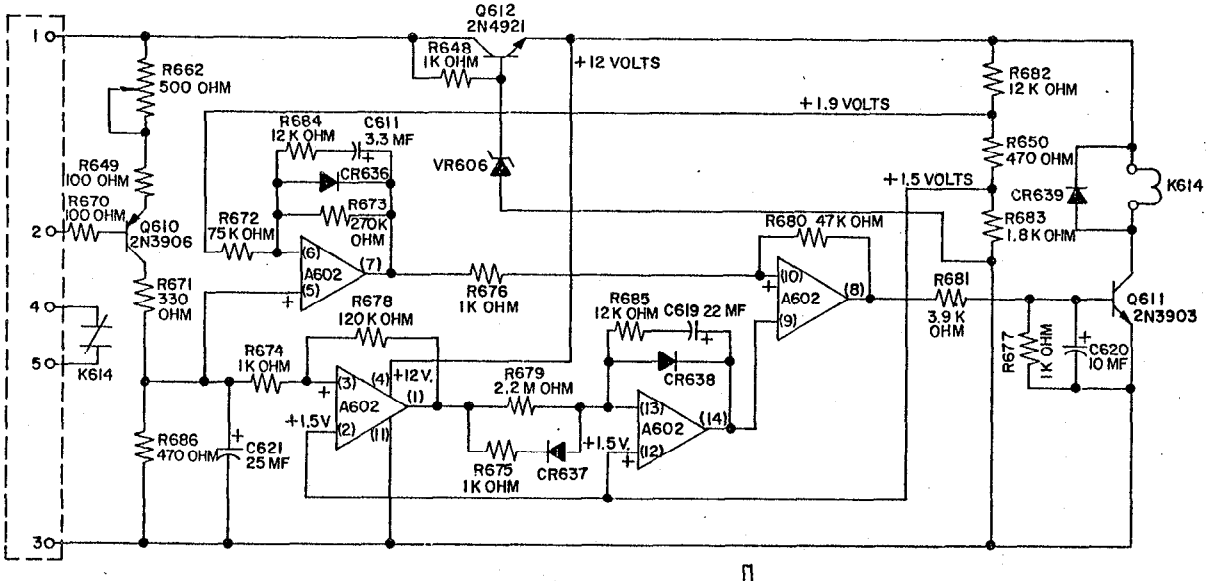
HOBART BROTHERS CO.
TROY, OHIO 45373 U.S.A.

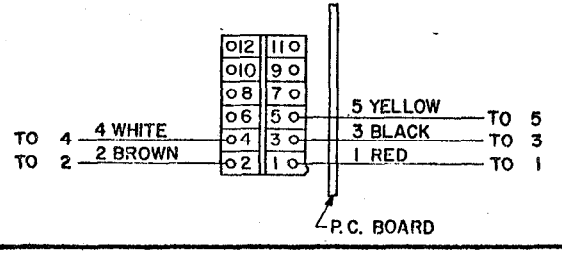
TITLE Board, P.C.

REV. 2

DWG NO. 389522B




| TITLE: BOARD, PC, OVERLOAD | | NO. 484567 | |
|---|---|---|---|
| ITEM | DESCRIPTION | G. NO. | R |
| 1 | RESISTOR, 1 K OHM, 1 W | 430409-3 | 1 |
| 2 | RESISTOR, 470 OHM, 1/4 W | 430410-29 | 2 |
| 3 | RESISTOR, 100 OHM, 1/4 W | 430410-18 | 2 |
| 4 | RESISTOR, 330 OHM, 1/4 W | 430410-34 | 1 |
| 5 | POTENTIOMETER, 500 OHM, 20 TURN | 403530-4 | 1 |
| 6 | RESISTOR, 75 K OHM, 1/4 W | 430410-9 | 1 |
| 7 | RESISTOR, 270 K OHM, 1/4 W | 430410-16 | 1 |
| 8 | RESISTOR, 1 K OHM, 1/4 W | 430410-1 | 4 |
| 9 | RESISTOR, 120 K OHM, 1/4 W | 430410-10 | 1 |
| 10 | RESISTOR, 2.2 M OHM, 1/2 W | 430412-33 | 1 |
| 11 | RESISTOR, 47 K OHM, 1/4 W | 430410-8 | 1 |
| 12 | RESISTOR, 3.9 K OHM, 1/4 W | 430410-23 | 1 |
| 13 | RESISTOR, 12 K OHM, 1/4 W | 430410-4 | 3 |
| 14 | RESISTOR, 1.8 K OHM, 1/4 W | 430410-35 | 1 |
| 15 | CAPACITOR, 3.3 MF, 35 VDC | 400030-3 | 1 |
| 16 | CAPACITOR, 10 MF, 20 VDC | 402798-3 | 1 |
| 17 | DIODE, SILICON, 75 PRV, 150 MA | 405266-1 | 3 |
| 18 | DIODE, SILICON | 430417 | 1 |
| 19 | DIODE, ZENER, 12 V | 402456-2 | 1 |
| 20 | TRANSISTOR, PNP, 2N3906 | 400760-4 | 1 |
| 21 | TRANSISTOR, NPN, 2N3903 | 400760-1 | 1 |
| 22 | TRANSISTOR, NPN, 2N4921 | 402455-1 | 1 |
| 23 | QUAD OP-AMP | 405314-1 | 1 |
| 24 | BOARD, PC, OVERLOAD | 79C-1068 | 1 |
| 25 | RELAY, REED, 12 V. | 403198 | 1 |
| 26 | HOUSING, PIN, CONNECTOR | 401563-4 | 1 |
| 27 | BRACKET, MTG., CONNECTOR | 386761 | 1 |
| 28 | RIVET, BLIND, DOMED HEAD | 400785-7 | 2 |
| 29 | CAPACITOR, 25 MF, 25 VDC | 406155-3 | 1 |
| 30 | CHART, WIRE ( NOT SHOWN ) | 484595 | 1 |
| 31 | INSTRUCTIONS, TEST ( NOT SHOWN ) | 485223 | - |
| 32 | CAPACITOR, TANT, 22 MF, 15 VDC | 400311-1 | 1 |

LEGEND

| | |
|---|---|
| A602 | QUAD, OP-AMP (324) |
| C611 | CAPACITOR, 3.3 MF, 35 VDC, TANT |
| C620 | CAPACITOR, 10 MF, 20 VDC, TANT |
| C621 | CAPACITOR, 25 MF, 25 VDC |
| C619 | CAPACITOR, 22 MF, 15 VDC, TANT |
| CR636-CR638 | DIODE, SILICON, (IN4148 ) |
| CR639 | DIODE, SILICON, ( IN4820 ) |
| K614 | RELAY, REED, 12 VDC |
| Q610 | TRANSISTOR, 2N3906, PNP |
| Q611 | TRANSISTOR, 2N3903, NPN |
| Q612 | TRANSISTOR, 2N4921, NPN |
| R648 | RESISTOR, 1 K OHM, 1 W |
| R649 | RESISTOR, 100 OHM, 1/4 W |
| R650 | RESISTOR, 470 OHM, 1/4 W |
| R662 | POTENTIOMETER, 500 OHM, 20 TURN |
| R670 | RESISTOR, 100 OHM, 1/4 W |
| R671 | RESISTOR, 330 OHM, 1/4 W |
| R672 | RESISTOR, 75 K OHM, 1/4 W |
| R673 | RESISTOR, 270 K OHM, 1/4 W |
| R674-R677 | RESISTOR, 1 K OHM, 1/4 W |
| R678 | RESISTOR, 120 K OHM, 1/4 W |
| R679 | RESISTOR, 2.2 M OHM, 1/2 W |
| R680 | RESISTOR, 47 K OHM, 1/4 W |
| R681 | RESISTOR, 3.9 K OHM, 1/4 W |
| R682 | RESISTOR, 12 K OHM, 1/4 W |
| R683 | RESISTOR, 1.8 K OHM, 1/4 W |
| R684, R685 | RESISTOR, 12 K OHM, 1/4 W |
| R686 | RESISTOR, 470 OHM, 1/4 W |
| VR606 | DIODE, ZENER, 12 VDC, ( IN5242A ) |

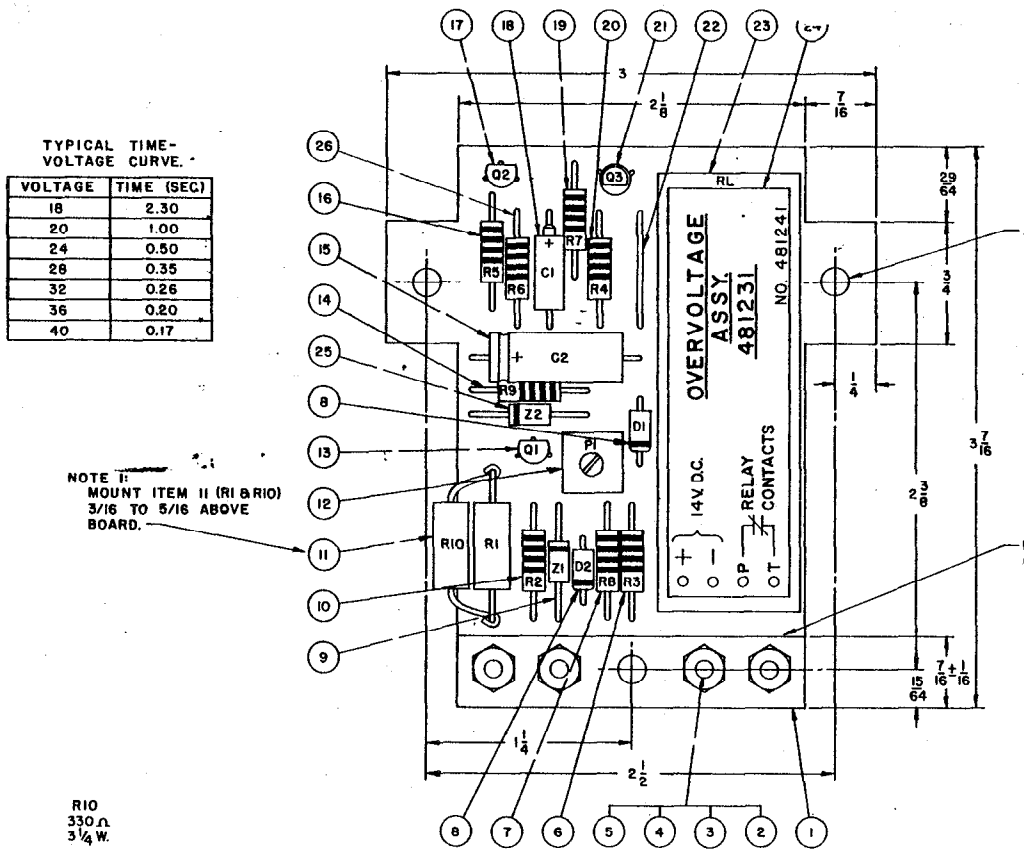
HOBART BROTHERS CO.
TROY, OHIO 45373 U.S.A.

TITLE BOARD, PC, OVERLOAD

REV. 3 | DWG. NO. 484567

TYPICAL TIME-VOLTAGE CURVE.

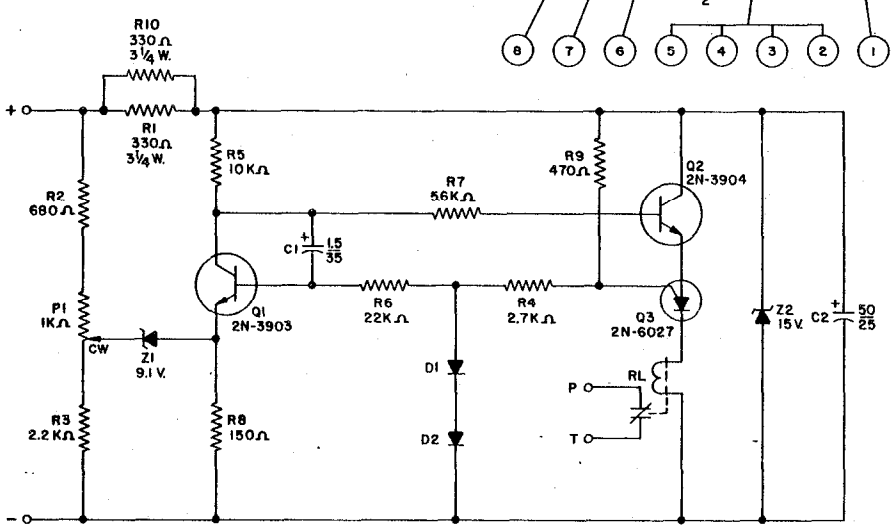
| VOLTAGE | TIME (SEC) |
|---|---|
| 18 | 2.30 |
| 20 | 1.00 |
| 24 | 0.50 |
| 28 | 0.35 |
| 32 | 0.26 |
| 36 | 0.20 |
| 40 | 0.17 |




| ITEM | DESCRIPTION | DRAWING NO. | R | PNP |
|---|---|---|---|---|
| TITLE | BOARD, P.C., OVERVOLTAGE, AY. | DRAWING NO. 481231 | | |
| 1 | BOARD, P.C., OVERVOLTAGE | 403766A | 1 | NP |
| 2 | SCREW, #4-40 X 5/8, RD. HD. MACH., ST. | W-11109-4 | 4 | NP |
| 3 | WASHER, #4, LK., IT., ST. | W-11160-0 | 4 | NP |
| 4 | WASHER, #4, LK., ST. | W-11254-13 | 4 | NP |
| 5 | NUT, #4-40, HEX, ST. | W-11287-1 | 4 | NP |
| 6 | RESISTOR, 2.2K OHM, 1/2 WATT | W-10827-28 | 1 | NP |
| 7 | RESISTOR, 150 OHM, 1/2 WATT | W-10827-44 | 1 | NP |
| 8 | DIODE, SILICON | 1CZ-938 | 2 | NP |
| 9 | DIODE, ZENER, 9.1V. | 401469-1 | 1 | NP |
| 10 | RESISTOR, 680 OHM, 1/2 WATT | W-10827-9 | 1 | NP |
| 11 | RESISTOR, 330 OHM, 3-1/4 WATT | 401435-3 | 2 | NP |
| 12 | POTENTIOMETER, 1K OHM, 1/2 WATT | 402794-1 | 1 | NP |
| 13 | TRANSISTOR, 2N-3903 | 400760-1 | 1 | NP |
| 14 | RESISTOR, 470 OHM, 1/2 WATT | W-10827-8 | 1 | NP |
| 15 | CAPACITOR, 50/25 | 400635-5 | 1 | NP |
| 16 | RESISTOR, 10K OHM, 1/2 WATT | W-10827-17 | 1 | NP |
| 17 | TRANSISTOR, 2N-3904 | 400760-2 | 1 | NP |
| 18 | CAPACITOR, 1.5/35 | 400030-2 | 1 | NP |
| 19 | RESISTOR, 5.6K OHM, 1/2 WATT | W-10827-22 | 1 | NP |
| 20 | RESISTOR, 2.7K OHM, 1/2 WATT | W-10827-24 | 1 | NP |
| 21 | TRANSISTOR, UNIJ, PROGRAMMABLE | 402462 | 1 | NP |
| 22 | WIRE, LEAD, COPPER, RD, #20, TINNED | 81471 | 1" | NP |
| 23 | RELAY, PROTECTIVE MONITOR, 12V. | 403198 | 1 | NP |
| 24 | LABEL, IDENT. & INSTRUCTION | 481241 | 1 | P |
| 25 | DIODE, ZENER, 15V. | 401429-5 | 1 | NP |
| 26 | RESISTOR, 22K OHM, 1/2 WATT | W-10827-18 | 1 | NP |

LEGEND

| | |
|---|---|
| C1 | CAPACITOR 1.5/35 |
| C2 | CAPACITOR 50/25 |
| D1, D2 | DIODE |
| P1 | POTENTIOMETER 1K OHM, 1/2 WATT |
| Q1 | TRANSISTOR 2N-3903 |
| Q2 | TRANSISTOR 2N-3904 |
| Q3 | TRANSISTOR PROGRAMMABLE UNIJ-2N-6027 |
| R1, R10 | RESISTOR 330 OHM, 3-1/4 WATT |
| R2 | RESISTOR 680 OHM, 1/2 WATT |
| R3 | RESISTOR 2200 OHM, 1/2 WATT |
| R4 | RESISTOR 2700 OHM, 1/2 WATT |
| R5 | RESISTOR 10K OHM, 1/2 WATT |
| R6 | RESISTOR 22K OHM, 1/2 WATT |
| R7 | RESISTOR 5600 OHM, 1/2 WATT |
| R8 | RESISTOR 150 OHM, 1/2 WATT |
| R9 | RESISTOR 470 OHM, 1/2 WATT |
| RL | RELAY |
| Z1 | ZENER 9.1 VOLT |
| Z2 | ZENER 15 VOLT |




TEST EQUIPMENT NEEDED

FILTERED AND FUSED DC POWER SUPPLY 10 TO 40 VOLTS. STOP WATCH, VOLT AND OHMMETER

TEST INSTRUCTIONS

1. CONNECT A 12 VOLT BULB IN SERIES WITH P & T. BULB WILL LIGHT.
2. CONNECT DC POWER SUPPLY TO PLUS AND MINUS OF THE P. C. BOARD.
3. ADJUST P1 FOR A TRIP AT 18 VOLTS IN 2-10 SECONDS. NO TRIP AT 16 VOLTS. ① MUST RESET AT 14.5 TO 15.5 VOLTS. LIGHT WILL GO OUT WITH A TRIP.
4. WITH 20 VOLT INPUT, CHECK FOR TRIP TIME TO BE APPROXIMATELY 1 SECOND.

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

TITLE BOARD, P.C.
OVERVOLTAGE, ASSY

REV. 3

DWG. NO. 481231