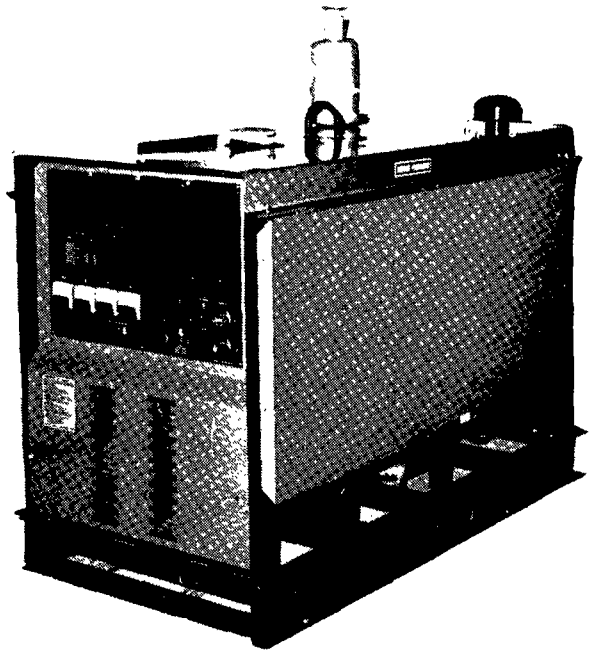
January 1983 FORM: OM-468

Effective With Serial No. JC654458

WARNING: Read and understand the entire contents of this manual before installing, operating, or maintaining this equipment.

MODEL
TRAILPOWER 25DA1
TRAILPOWER 25DA3



OWNER'S MANUAL

MILLER ELECTRIC MFG. CO.
718 S. BOUNDS ST, P.O. Box 1079
APPLETON, WI 54912 USA

ADDITIONAL COPY PRICE 75 CENTS

NWSA CODE NO. 4579
PRINTED IN U.S.A.

LIMITED WARRANTY

EFFECTIVE: JUNE 1, 1979

This warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions hereof, Miller Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by Miller is free from defect in workmanship and material as of the time and place of delivery by Miller. No warranty is made by Miller with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any . All engines are warranted by their manufacturer for one year from date of original purchase.

Except as specified below, Miller's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

Miller shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources and components . . 1 year
2. Original main power rectifiers . . . . . 3 years (labor - 1 year only)
3. All welding guns and feeder/guns . . . . . 90 days
4. All other Millermatic Feeders . . . . . 1 year
5. Replacement or repair parts, exclusive of labor . 60 days
6. Batteries . . . . . 6 months

provided that Miller is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, Miller may honor claims submitted by the original user within the foregoing periods.

In the case of Miller's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at Miller's option (1) repair or (2) replacement or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at Customer's risk and expense. Upon receipt of notice of apparent defect or failure, Miller shall instruct the claimant on the warranty claim procedures to be followed.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND *NOT* FOR CONSUMERS OR CONSUMER USE. MILLER' WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

ERRATA SHEET

July 8, 1983 **FORM: OM-468**

After this manual was printed, refinements in equipment design occurred. This sheet lists exceptions to data appearing later in this manual.

AMENDMENT TO SECTION 3 - INSTALLATION

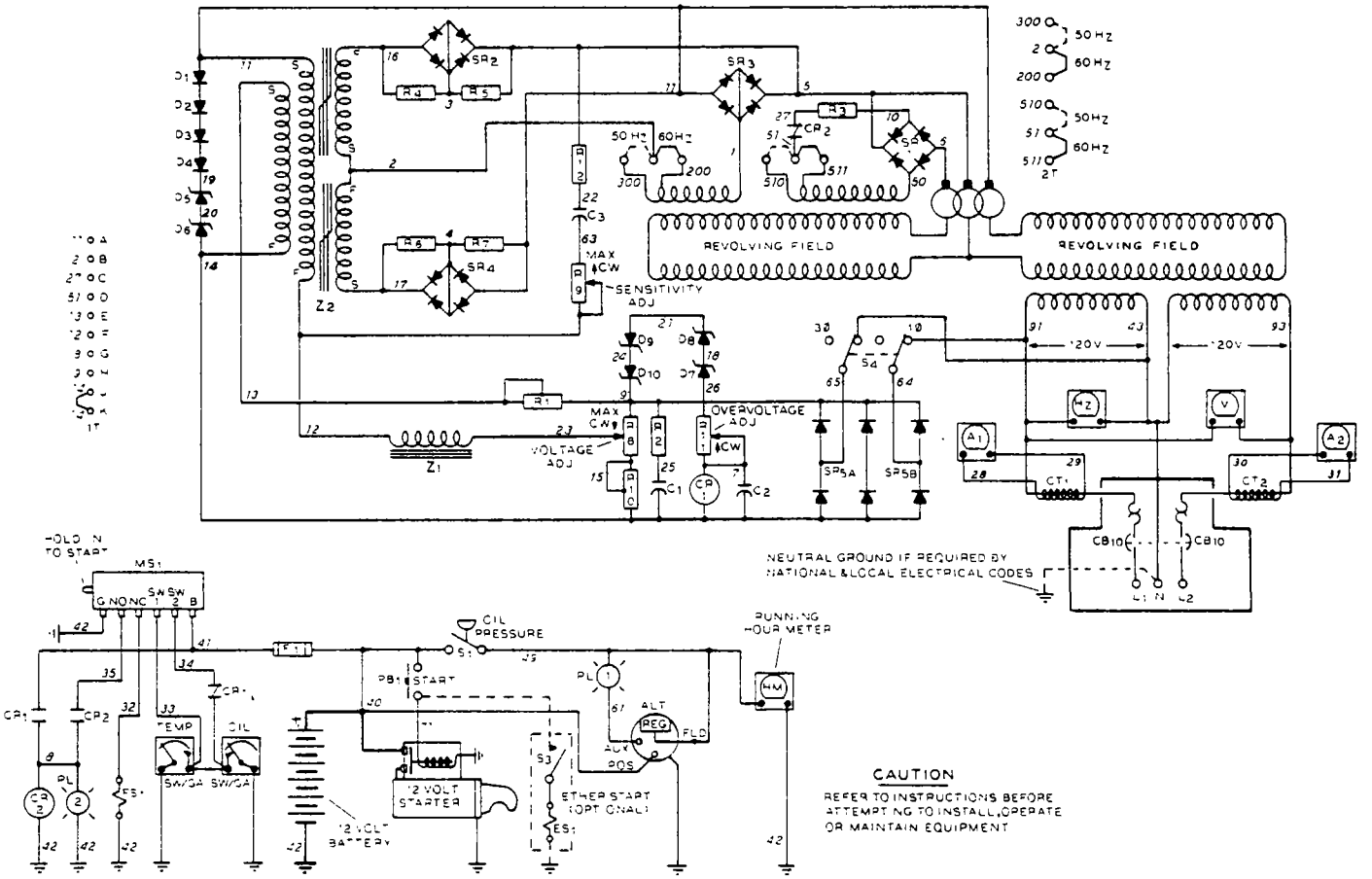
Amend Section 3-4. PHASE SENSING SWITCH

Add the IMPORTANT block at the beginning of the Section.

IMPORTANT: *The Phase SENSING switch on this unit is locked in the 1 PHASE position.*

AMENDMENT TO SECTION 6 - TROUBLESHOOTING

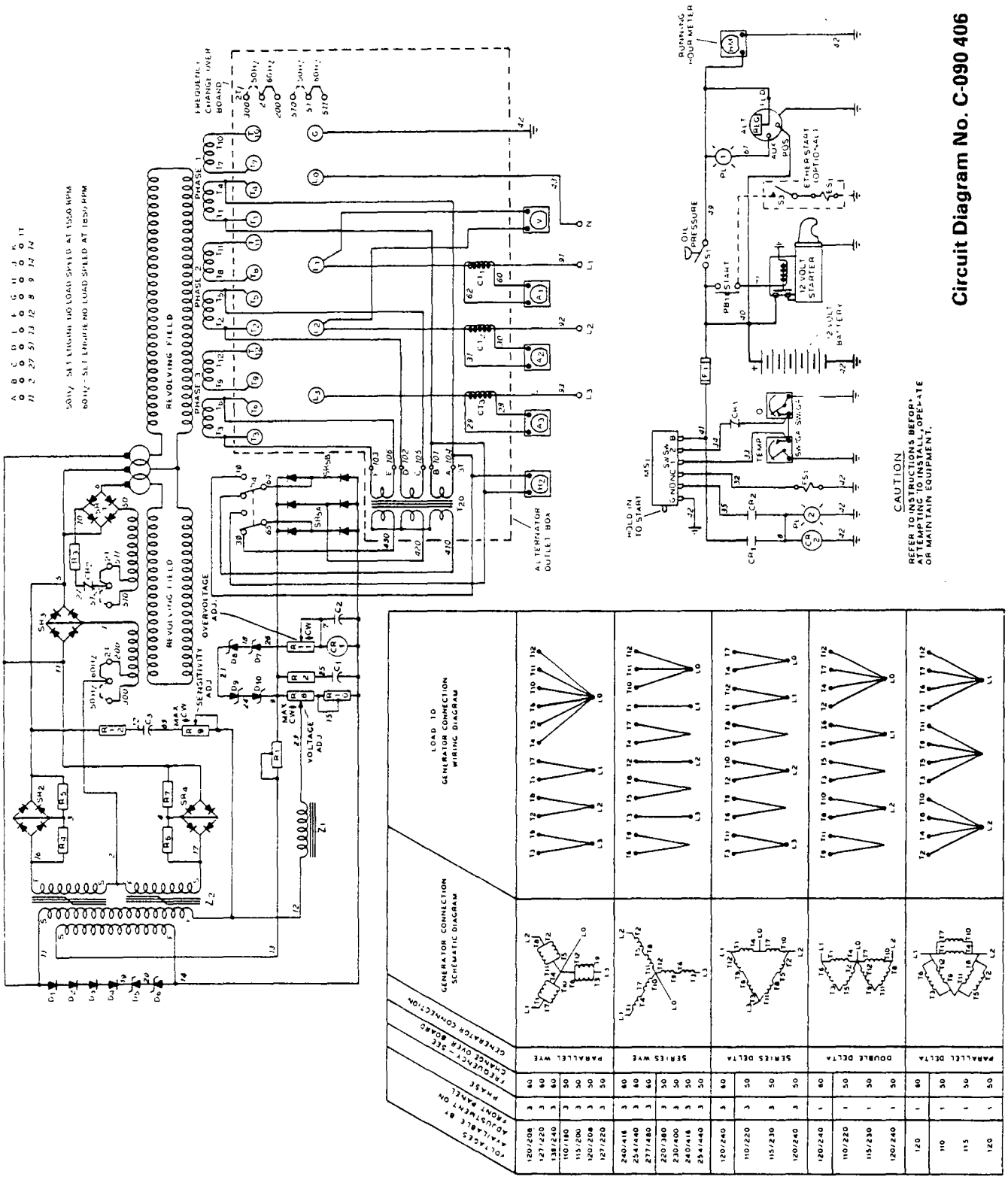
Amend Figure 6-1. Circuit Diagram For Single Phase Units



Circuit Diagram No. B-090 359

Figure 6-1. Circuit Diagram For Single Phase Units

Amend Figure 6 - 2. Circuit Diagram For Single-Three Phase Units



VOLTAGES AVAILABLE BY ADJUSTMENT ON FRONT PANEL	PHASE	FREQUENCY - SEE CHANGE OVER BOARD	GENERATOR CONNECTION SCHEMATIC DIAGRAM	LOAD TO GENERATOR CONNECTION WIRING DIAGRAM
120/208	3	60	PARALLEL WYE	
127/220	3	60		
138/240	3	60		
110/190	3	50		
115/200	3	50		
120/208	3	50		
127/220	3	50		
240/416	3	60	SERIES WYE	
254/440	3	60		
277/480	3	60		
220/380	3	50		
230/400	3	50		
240/416	3	50		
254/440	3	50		
120/240	3	60	SERIES DELTA	
110/220	3	50		
115/230	3	50		
120/240	3	50		
120/240	1	60	DOUBLE DELTA	
110/220	1	50		
115/230	1	50		
120/240	1	50		
120	1	60	PARALLEL DELTA	
110	1	50		
115	1	50		
120	1	50		

Figure 6 - 2. Circuit Diagram For Single-Three Phase Units Effective With Serial No. JD693136 And Following

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		Single Phase Output	Single-Three Phase Output
60 Hertz	KVA	25 @ .8 power factor	25 @ .8 power factor
	KW	20	20
	Volts	120/240	120/240
		3 Wire	4 Wire*
	Amperes	104	60
	Duty Cycle	100%	100%
	Max RPM No Load	1850	1850
50 Hertz	KVA	20	20
	KW	16	16
	Volts	115/230	115/230
		3 Wire	4 Wire*
	Amperes	87	50
	Duty Cycle	100%	100%
	Max RPM No Load	1550	1550
Dimensions	Heigth		
	Width		
	Depth		
Weight	Net		
	Shipping		

*Single-Three phase units are reconnectable for other voltages listed in Figure 1-2.

Figure 1-1. Specifications

1 - 1. GENERAL INFORMATION AND SAFETY

A. General

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

B. Safety

The installation, operation, maintenance, and troubleshooting of power generating equipment requires practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes.

Safety instructions specifically pertaining to this unit appear throughout this manual highlighted by the signal words **WARNING** and **CAUTION** which identify different levels of hazard.

WARNING statements include installation, operating, and maintenance procedures or practices which if not carefully followed could result in serious personal injury or loss of life.

CAUTION statements include installation, operating, and maintenance procedures or practices which if not carefully followed could result in minor personal injury or damage to this equipment.

A third signal word, **IMPORTANT**, highlights instructions which need special emphasis to obtain the most efficient operation of this equipment.

1 - 2. RECEIVING-HANDLING - Prior to installing this equipment, clean all packing material from around the unit and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed **by the purchaser with the carrier.** A copy of the bill of lading will be furnished by the manufacturer on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and Serial (or Style) Numbers of the equipment be supplied.

1 - 3. DESCRIPTION - This generator is designed to supply 25 kva, 60 Hz. or 20 kva, 50 Hz. ac power primarily for use where no utility power is available. If this unit is used on a standby or emergency basis, always consult the local electrical utility, local or state codes, and the latest issue of the National Electrical Code for proper installation procedures.

WARNING: ELECTRIC SHOCK can kill.

- *Do not connect to any electrical distribution system normally supplied by utility power unless a proper transfer switch and grounding procedure are employed.*

All units are shipped set up to provide the type of power output specified by the customer. If no specific output request is made, single phase units are shipped set up to supply 60 Hz. single phase output and single-three phase units are shipped set up to supply 120/240 volts, 60 Hz., three phase output (Series Delta generator connection). Both single phase and single-three phase generators are driven by a three cylinder, air-cooled, Deutz diesel engine.

Single-three phase generators are reconnectable in parallel or series wye, or parallel, series, or double delta connection with available voltages listed on Figure 1-2.

Equipment that must be operated on an electrical supply that has precise frequency tolerance or a pure sinisoidal wave form should not be connected to the output of this generator.

Equipment that is sensitive to low frequency or voltage must be disconnected from this generator when the generator is started or stopped.

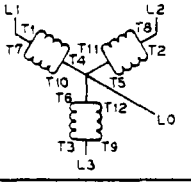
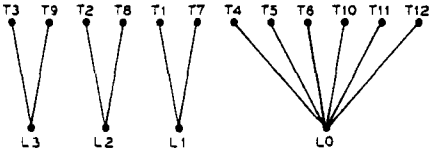
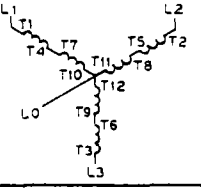
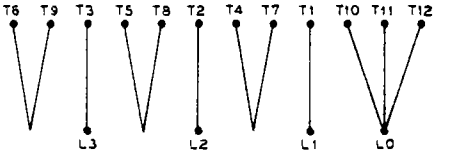
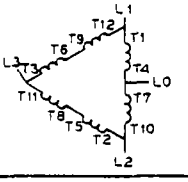
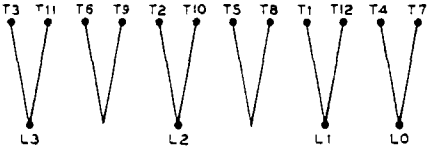
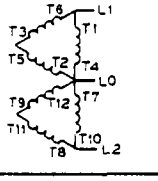
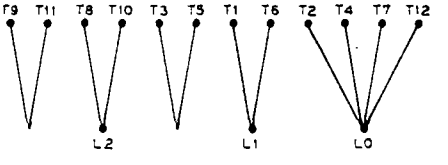
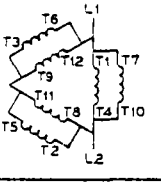
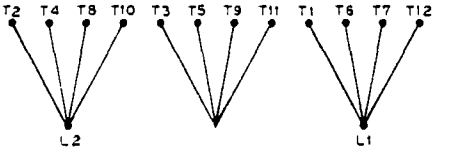
RATED CURRENT IN AMPERES	VOLTAGES AVAILABLE BY ADJUSTMENT ON FRONT PANEL	PHASE	FREQUENCY - SEE CHANGE OVER BOARD	GENERATOR CONNECTION	GENERATOR CONNECTION SCHEMATIC DIAGRAM	LOAD TO GENERATOR CONNECTION WIRING DIAGRAM
69	120/208	3	60	PARALLEL WYE		
66	127/220	3	60			
60	139/240	3	60			
61	110/190	3	50			
58	115/200	3	50			
56	120/208	3	50			
53	127/220	3	50			
35	240/416	3	60	SERIES WYE		
33	254/440	3	60			
30	277/480	3	60			
30	220/380	3	50			
29	230/400	3	50			
28	240/416	3	50			
26	254/440	3	50			
60	120/240	3	60	SERIES DELTA		
53	110/220	3	50			
50	115/230	3	50			
48	120/240	3	50			
104	120/240	1	60	DOUBLE DELTA		
91	110/220	1	50			
87	115/230	1	50			
83	120/240	1	50			
208	120	1	50	PARALLEL DELTA		
182	110	1	50			
174	115	1	50			
167	120	1	50			

Figure 1-2. Generator Connection Diagrams And Output Specifications

Figure 2-1. Dimensional Drawing And Base Mounting Hole Layout

2 - 1. LOCATION (Figure 2-1)

WARNING: ENGINE EXHAUST GASES can kill.

- *Operate in open well ventilated areas or if operated indoors vent engine exhaust outside the building.*
- *Keep engine exhaust vent outlet away from building air intakes.*

ENGINE EXHAUST SPARKS can cause fire.

- *Exhaust spark arrestor must be installed in accordance with local, state, and federal regulations.*

The engine exhaust system on this generator is equipped with a combination spark arrestor/muffler as standard equipment. This device carries U.S.D.A. Forest Service Approval. A spark arrestor, maintained in effective working order, is mandatory if this generator is to be operated in a National Forest or on California Grasslands, brush, or forest covered land (see Section 4442 of California Public Resources Code). For other areas, check your state and local laws.

IMPROPER LIFTING OF EQUIPMENT can result in personal injury and equipment damage.

- *Use equipment of adequate capacity to lift the unit.*
- *If using lift forks to handle this unit, be sure the lift forks are long enough to extend out of the opposite side of the base.*

Using lift forks too short will expose internal components to damage should the tips of the lift forks penetrate the bottom of the unit.

OPERATION ON UNLEVEL SURFACE can cause improper lubrication and result in severe engine damage.

- *Operate unit in an approximately level position.*
- *See Figure 2-2 for maximum allowable tilt for proper operation.*
- *Check crankcase oil level with unit on a level surface.*

Exceeding these limits can cause severe engine damage.

RESTRICTED AIR FLOW causes overheating and possible damage to internal parts.

- *Maintain at least 24 inches (610 mm) of unrestricted space on all sides of unit and keep underside free of obstructions.*
- *Do not place any filtering device over the intake air passages of this generator.*
- *Do not install this unit in a permanent indoor location.*

Warranty is void if any type of filtering device is used.

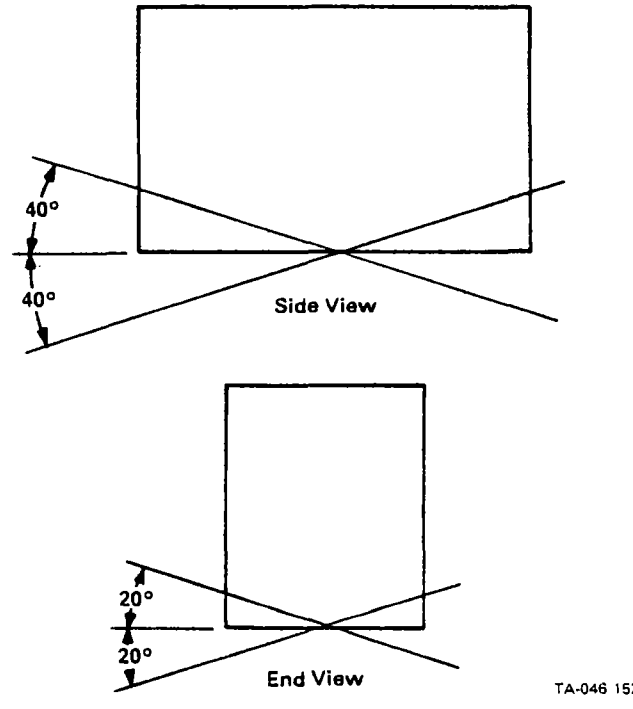


Figure 2-2. Allowable Tilt Angles

This genertor is provided with a lifting eye for moving the unit and mounting holes in the base rails for securing the unit in a permanent location, or to a trailer, or transport vehicle. Figure 2-1 gives overall dimensions and base mounting hole layout.

The mounting location should allow sufficient room to open the side doors and remove the cover and panels for maintenance and repair functions.

The service life and operating efficiency of this unit are reduced when the unit is subjected to high levels of dust, dirt, moisture, corrosive vapors, and extreme heat.

2 - 2. SPARK ARRESTOR/MUFFLER INSTALLATION

1. Raise the left side door and secure open.
2. Install the exhaust pipe in the exhaust flange on the manifold.
3. Close the side door.
4. Install the spark arrestor/muffler onto the exhaust pipe and secure with the muffler clamp.
5. Install weather cap onto spark arrestor/muffler so that exhaust is discharged toward side of unit as shown in Figure 2-1.

2 - 3. PREPARING NEW BATTERY FOR SERVICE - This unit may be equipped with a maintenance-free battery, a conventional wet charged battery, or a dry charged battery. Maintenance-free batteries do not have conventional vent caps since they do not require the addition of water during normal service. Once the battery type is determined, read the following WARNING and proceed to the appropriate section: A. Maintenance-Free Battery; B. Wet Charged Battery; C. Dry Charged Battery.

WARNING: BATTERY ACID can burn eyes and skin and destroy clothing and other material.

- *Wear correct eye and body protection when working with batteries.*

ABNORMAL VOLTAGE can cause damage to engine electrical components.

- *Do not operate engine without the battery connected.*
- *Do not disconnect the battery while the engine is running.*

A. Maintenance-Free Battery

To place this battery in service connect the negative (-) battery cable to the negative battery terminal. No other preparation should be required.

B. Wet Charged Battery

Connect the negative (-) battery cable to the negative terminal on the battery. If the battery has enough power to start the engine, it will charge up while the engine is running. However, if the battery fails to supply enough power to crank the engine, the battery will require recharging.

WARNING: CHARGING A FROZEN BATTERY can cause the battery to explode and result in serious personal injury or damage to equipment.

- *Check the state of the elctrolyte solution and allow battery to warm up to 60°F (16°C) before charging if electrolyte is frozen or slushy.*

Remove vent caps and refer to Section 2-3C, Steps 7-9 for charging instructions.

C. Dry Charged Battery

1. Obtain battery grade (1.265 specific gravity) electrolyte solution.
2. Remove battery from unit and place on a level worktable or other suitable surface.
3. Remove vent caps.

WARNING: BATTERY ACID can burns eyes and skin and destroy clothing and other materials; BATTERY GASES can explode and shatter the battery.

- *Wear correct eye and body protection.*
- *Do not spill or splash battery fluid.*
- *Do not apply pressure to walls of filled battery-use battery carrier or place hands on opposite corners when lifting battery.*
- *Keep sparks, flames, cigarettes, and other ignition sources away from batteries.*
- *Use enough ventilation to keep battery gases from building up during activation.*

4. Fill battery cells to top of separators with electrolyte.
5. Allow battery to stand for 20 minutes.
6. Recheck electrolyte level and add if necessary to fill to top of separators.
7. Check electrolyte temperature in one of the center cells with a battery thermometer. For each 10°F (6°C) increment above 80°F (27°C), a correction factor of 0.004 specific gravity must be added to the specific gravity reading taken in Step 8. For each 10°F (6°C) increment below 80°F (27°C), 0.004 must be subtracted from the reading taken in Step 8.
8. Check the specific gravity of each cell with a hydrometer. (Draw in and expel the electrolyte two or three times from the first cell to be tested to adjust the temperature of the hydrometer to that of the electrolyte.)

WARNING: Follow the precautionary steps below in addition to those given in the previous WARNING statements.

- *Use enough ventilation to keep battery gases from building up during and for several hours after battery charging.*

- *Turn battery charger off before making connection to battery.*
- *Do not touch or move connections on battery while battery charger is on.*
- *Do not lean over battery when charging.*
- *Be sure battery charger connections to battery are clean and tight.*
- *Keep vent caps in place and cover top of battery with damp cloth.*
- *Be sure battery charger output matches battery voltage.*

9. If a corrected specific gravity reading of 1.260 at 80°F (27°C) is not obained, replace the vent caps and recharge the battery following the battery charger manufacturer's instructions.

WARNING: BATTERY GASES can explode and shatter the battery.
- *Turn the battery charger off before disconnecting the charger from the battery.*

10. Recheck electrolyte level and add if necessary.

CAUTION: BATTERY ACID is corrosive to metals.
- *Do not pour electrolyte into a metal sink or drain.*

11. Thoroughly rinse with water and mutilate empty electrolyte containers before discarding.

12. Reinstall battery in generator.

13. Replace battery holddown and tighten securely. Do not overtighten.

14. Connect positive (+) battery cable to positive (+) battery terminal.

15. Connect negative (-) battery cable to negative (-) battery terminal.

2 - 4. FUEL (Figure 2-3)

WARNING: ENGINE FUEL can cause fire or explosion.
- *Do not spill fuel; if spilled, wipe up.*
- *Do not fill fuel tank if engine is hot or running.*
- *Do not refuel near sparks or open flame.*
- *Do not smoke while refueling.*
- *Do not fill fuel tank to top; allow 3/4 inch (19 mm) from fuel to tank top for expansion.*

USE OF GASOLINE will damage engine.
- *Do not use gasoline to fuel a diesel engine.*

Lack of lubrication in the fuel will damage the injector pump and injectors.

This generator is shipped with a small amount of fuel in the fuel tank, and fuel shut-off valve, located under the fuel tank, in the open position. See the Engine Manufacturer's Manual for fuel recommendations. The capacity of the fuel tank is 23 gallons (87 liters).

IMPORTANT: *Fill fuel tank up to 3/4 in (19 mm) from top with fresh fuel before starting engine the first time. Rust and corrosion preventative was added to inside of fuel tank and engine at the factory and could cause rough engine running if not properly diluted with a full tank of fresh fuel.*

Keep the fuel tank filled to ensure that the injector system receives an adequate supply of fuel. If the fuel tank is allowed to empty, air will enter the system causing starting problems. The Engine Manufacturer's Manual outlines procedures for air venting the fuel system.

Figure 2-3 illustrates typical fuel consumption under specific load conditions. Fuel consumption will vary from one engine to another. Different brands of fuel, operating conditions, condition of the engine, etc., will affect the fuel consumption of this engine.

Figure 2-3. Fuel Consumption Chart

2 - 5. ENGINE PRE-START CHECKS

A. Oil Level

The engine is shipped with its crankcase filled with break-in oil. If the oil level is not up to the full mark on the dipstick, add oil according to the recommendations in the Engine Manufacturer's Manual before starting the engine.

B. Cooling System

Perform the following checks on the air cooling system before operating the engine:

1. Check the engine air intake and exhaust openings to ensure no blockage exists.

2. Check the blower belt for proper tension (see the Engine Manufacturer's Manual).

3. Check the blower impeller for obstructions and free movement.

4. Ensure that all sheet metal cowlings, shrouds, and panels are properly in place and secure.

2 - 6. ETHER STARTING AID (Optional) - This unit is shipped without the ether cylinder. Before this device is operational, an ether cylinder must be obtained and installed.

WARNING: IMPROPER HANDLING OR EXPOSURE TO ETHER can seriously harm your health.

- *Follow the manufacturer's safety instructions on the cylinder when handling ether components.*

IMPORTANT: *Prior to installing the ether cylinder, ensure that the nozzle on the ether cylinder and the fitting into which the ether cylinder is inserted are both clean. If dirt is present in either of these areas, the system may be rendered inoperative.*

To install ether cylinder, proceed as follows:

1. Open right side panel and secure open. Identify ether start components on center frame upright.
2. Remove protective cap from ether valve.
3. Loosen cylinder clamp.
4. Place new cylinder onto valve fitting, and rotate clockwise until secure.
5. Secure cylinder with clamp.
6. Using a liquid soap solution, check all ether start system connections for leaks. If a leak exists, escaping gas will produce bubbles in the soap solution.

IMPORTANT: *After installing or replacing ether cylinder, do not use or test ether start system for at least 10 to 15 minutes to allow particles in fuel to settle to prevent atomizer plugging.*

2 - 7. EQUIPMENT GROUNDING TERMINAL - This unit is equipped with a grounding terminal, located on the left base rail, for frame and case grounding. For detailed grounding instructions consult your local or state codes or the latest issue of the National Electrical Code. If additional information regarding your particular operating circumstances and/or grounding requirements is needed, consult a qualified electrician or your dealer. After determining the extent to which any grounding requirements apply to your particular situation, follow them explicitly.

2 - 8. FREQUENCY CHANGEOVER

CAUTION: EXCESSIVELY HIGH EXCITATION CURRENT can damage generator.

- *Be sure engine speed for 50 Hz. operation is 1550 rpm.*

This unit is equipped with a frequency changeover terminal strip 2T, located in the connection box on the stator frame behind the right side door. If it becomes necessary to change the output frequency of the generator proceed as follows:

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down engine and disconnect negative (-) battery cable from battery before attempting frequency changeover.*

1. Open and secure right side door.
2. Reposition jumper links on 2T to match desired frequency.
3. Readjust engine speed as instructed in Steps 2-11, Section 5-9.
4. Close right side door.
5. Reconnect negative battery cable.

IMPORTANT: *After changing output frequency, it may be necessary to readjust the VOLTAGE ADJUSTMENT control (see Section 3-3) to obtain the desired output voltage.*

2 - 9. GENERATOR RECONNECTION (Single-Three Phase Generators Only) - Single-Three Phase generators can be operated in series or parallel wye or series, parallel, or double delta connections. The voltages available for each generator connection and output frequency (see Figure 6-2) and set by the VOLTAGE ADJUSTMENT control. To reconnect the generator, proceed as follows:

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down engine and disconnect negative (-) battery cable from battery before attempting generator reconnection.*
- *Ground in accordance with NEC, state, or local codes; connect grounding lead to appropriate generator leads depending on output load lead connection. Be sure that a proper ground is connected to the equipment grounding terminal on the generator frame.*

1. Open and secure right side door.
2. Locate "T" and "L" leads in connection box on stator barrel.
3. Reconnect "T" and "L" leads to obtain the desired generator output. Refer to Figure 1-2. If the generator reconnection results in a phase change, the position of the Phase SENSING switch may also have to be changed (see Section 3-4).
4. Reinsulate all connections.
5. Close side door.
6. Reconnect negative battery cable.

2-10. AUXILIARY POWER CONNECTION

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down engine and disconnect negative (-) battery cable from battery before attempting to connect the load circuit to the generator.*
- *Do not connect to any electrical distribution system normally supplied by utility power unless a proper transfer switch and grounding procedure are employed.*

1. Select desired lead entry location, and remove knockout blank from junction box.

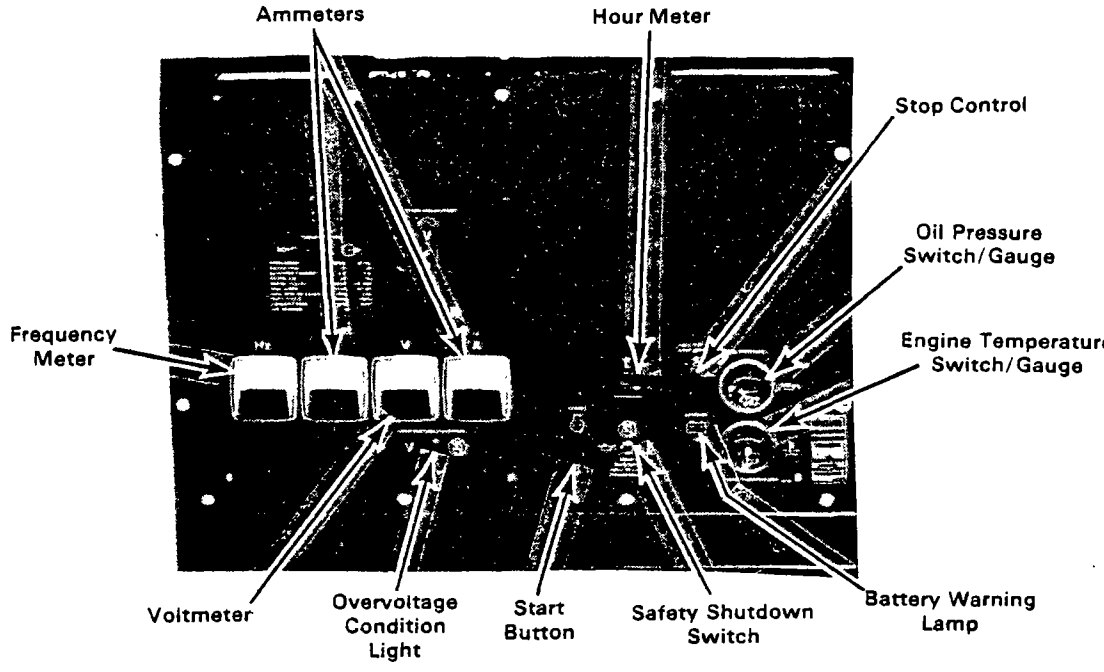
2. Install proper connector (not supplied) into opening and route load leads through connector into junction box.

3. Connect the load leads to the 100 ampere circuit breaker in the junction box.

On Single-Three phase units, the generator output leads are located behind the left side door. Connect the load leads directly to the generator output leads or install desired customer supplied junction box or panel for connecting the generator output leads and the load circuit.

Reconnect negative battery cable.

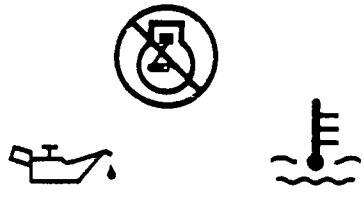
SECTION 3 - OPERATOR CONTROLS



Single Phase Model Shown

Figure 3-1. Front Panel Controls

3 - 1. SAFETY SHUTDOWN SYSTEM (Figure 3-1)



The SAFETY SHUTDOWN switch must be depressed and held closed until the engine starts. If oil pressure or oil temperature reach unsafe levels, or if the overvoltage device is actuated, the Safety Shutdown System stops the engine. Do not attempt to operate the engine until the trouble is remedied.

IMPORTANT: *The shut-off time for the engine is 1 to 1-1/2 minutes. The engine will falter before coming to a complete stop.*

This switch is protected by an in-line fuse. Should this fuse open, the engine would not start.

A. Oil Pressure Switch/Gauge

The OIL PRESSURE switch/gauge indicates lubrication system pressure. If oil pressure drops to an unsafe level the switch/gauge shuts down the engine.

B. Engine Temperature Switch/Gauge

The ENGINE TEMPERATURE switch/gauge indicates crankcase oil temperature. If oil temperature rises to an unsafe level the switch/gauge shuts down the engine.

C. Overvoltage Condition Light

The OVERVOLTAGE CONDITION light lites up indicating an immediate interruption of generator output caused by an overvoltage condition. The light remains on until the SAFETY SHUTDOWN switch is depressed.

3 - 2. START PUSH BUTTON (Figure 3-1)

A START push button is provided on the front panel for starting the engine. Pressing the START push button will engage the starter motor and start the engine. Once the engine has started, release the START button.

CAUTION: REENGAGING STARTER MOTOR while flywheel is rotating can damage starting components.

- *Do not reengage starter motor until starter pinion and flywheel have stopped rotating.*

3 - 3. VOLTAGE ADJUSTMENT CONTROL (Figure 3-1)

The VOLTAGE ADJUSTMENT control fine adjusts output voltage. Loosen the control brake and rotate the control shaft clockwise to increase output voltage/load voltage. Accurate voltage adjustment can be made by reading the ac voltmeter. Retighten brake.

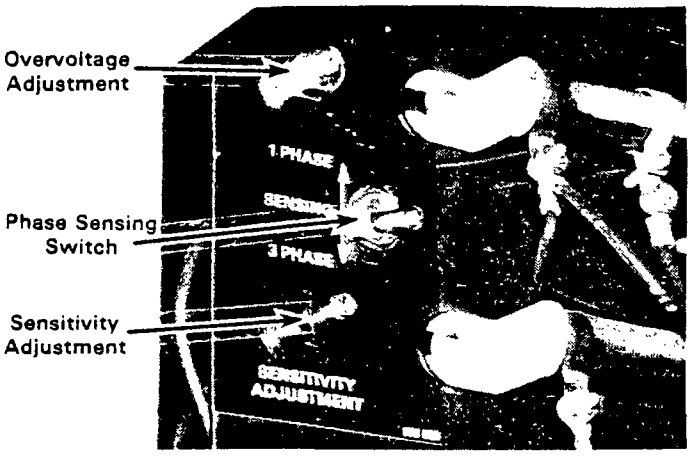


Figure 3-2. Voltage Regulator Panel

3 - 4. PHASE SENSING SWITCH (Figure 3-2) - The Phase SENSING switch is located on the voltage regulator panel behind the left side door. The Phase SENSING switch must be placed in the 1 PHASE position when single phase power is used and in the 3 PHASE position when three phase or a combination of three phase and single phase power is used. Changing switch positions may require readjustment of the VOLTAGE ADJUSTMENT control.

CAUTION: PHASE VOLTAGE IMBALANCES could result in equipment damage.

- *Do not attempt to draw unbalanced three phase power with the Phase SENSING switch in the 1 PHASE position.*

3 - 5. AMMETERS (Figure 3-1)

A Single Phase Units

This unit is equipped with two ammeters, labeled L1 and L2, which enables the operator to read the current through two separate 120 volts loads; or either meter can be read for a 240 volts load.

If a 120/240 volt load is connected the ammeter indicating the lower current is reading the 240 volt current. The ammeter indicating the high current is reading the combined 120 and 240 volt currents. The difference between the two ammeter readings is the 120 volt current. For example: if ammeter L1 reads 80 amperes and L2 reads 30 amperes, the 240 volt load is drawing 30 amperes, the combined 120 and 240 volt load is drawing 80 amperes, and the difference between the two meter readings (80-30 = 50) is the 120 volt load current.

B. Single-Three Phase Units

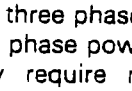
This unit is equipped with three ammeters, labeled L1, L2, and L3.

Ammeters, L1 and L2, enable the operator to read the current through two separate 120 volts single phase loads; or either meter can be read for a 240 volts single phase load.

If a 120/240 volt load is connected the ammeter indicating the lower current is reading the 240 volt current. The ammeter indicating the higher current is reading the combined 120 and 240 volt currents. The difference between the two ammeter readings is the 120 volt current. For example: if ammeter L1 reads 80 amperes and L2 reads 30 amperes, the 240 volt load is drawing 30 amperes, the combined 120 and 240 volt load is drawing 80 amperes, and the difference between the two meter readings (80-30 = 50) is the 120 volt load current.

240 volts ac three-phase current can be read on any of the three ammeters. Under balanced three-phase loading, all ammeters will read the same value. If one ammeter indicates a current reading different from the others, one phase is loaded differently causing the imbalance.

3 - 6. VOLTMETER (Figure 3-1)



The voltmeter indicates the regulated ac voltage output of the generator and the load voltage. If two separate 120 volts loads are connected to the generator, read half of the voltmeter indication for each load.

IMPORTANT: *On single phase units, the voltmeter is connected across two series-connected 120 volt power windings. If a load is connected across one of the 120 volt windings the voltmeter still reads the series-connected voltage (240 volts). To obtain the voltage across the single load read one-half the voltmeter indication. On single-three phase units, the voltmeter reads the voltage across one phase (L1-L2). The voltage across the other two phases is ±2% of the L1-L2 voltage if the Phase SENSING switch is in the 3 PHASE position.*

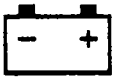
3 - 7. FREQUENCY METER (Figure 3-1)

Hz

The Frequency Meter indicates the output frequency from 45 to 65 Hertz.

3 - 8. STOP CONTROL (Figure 3-1) - The PULL OUT TO STOP ENGINE control, when pulled fully out, cuts off the flow of fuel at the fuel injection pump, thereby stopping the engine. This control is spring-loaded and must be held fully out until the engine is completely stopped.

3 - 9. BATTERY CHARGE INDICATOR LAMP (Figure 3-1)



The AMPS warning lamp will be illuminated when the engine battery charge current is not flowing.

3-10. HOUR METER (Figure 3-1)

t

This unit is equipped with an hour meter. The meter registers the total hours of engine operation. This information is useful for routine maintenance on the engine.

3-11. ETHER STARTING AID (Optionai) - The cold weather starting components which are incorporated into this generator provide a means of supplying a premeasured portion of ether into the manifold. The amount of ether supplied should be sufficient to permit easy engine starting under cold weather conditions.

Actuating the ETHER STARTING AID switch, located to the left of the START push button, for 1 second while cranking the engine will provide the proper amount of ether to the manifold. This control will function only while cranking the engine.

IMPORTANT: *The measured quantity of ether is sprayed into the engine when this switch is released. Depressing the switch does not spray the ether into the engine but rather fills the valve chamber.*

3-12. SENSITIVITY ADJUSTMENT (Figure 3-2) - A SENSITIVITY ADJUSTMENT control is provided on the voltage regulator panel behind the left side door to eliminate voltmeter instability when the VOLTAGE ADJUSTMENT control is set at low voltage adjustment conditions. Loosen the control brake and rotate the SENSITIVITY ADJUSTMENT control only enough to eliminate meter instability. Over adjustment can adversely affect voltage regulation. Retighten brake.

3-13. OVERVOLTAGE ADJUSTMENT CONTROL (Figure 3-2)

IMPORTANT: *The OVERVOLTAGE ADJUSTMENT control located on the voltage regulator panel behind the left side door, is factory set and requires readjustment only after component failure on the voltage regulator board.*

The overvoltage circuitry actuates the Safety Shutdown system if the upper limit for load circuit voltage is exceeded by the generator. To make overvoltage circuit adjustment proceed as follows:

1. Start the engine (see Section 4-1).
2. Loosen the brake and rotate the OVERVOLTAGE ADJUSTMENT control fully counterclockwise.
3. Loosen the brake and rotate the VOLTAGE ADJUSTMENT control to a 15% value above desired operating voltage level upper limit for the load circuit.
4. Rotate the OVERVOLTAGE ADJUSTMENT control until the OVERVOLTAGE CONDITION light comes on and the engine shuts down. Tighten brake.
5. Start the engine and readjust Voltage Adjustment control for desired output voltage.

SECTION 4 - SEQUENCE OF OPERATION

WARNING: MOVING PARTS can cause serious injury; IMPROPER AIR FLOW can result in damage to internal parts; EXPOSURE TO WEATHER can shorten the life of internal components.

- *Keep all covers and panels in place while operating.*
- *Keep clear of moving parts.*

Warranty is void if the generator is operated with any portion of the outer enclosure open or removed.

IMPORTANT: *Be sure the unit has been installed and prepared as instructed in Section 2 before attempting to start the engine.*

4 - 1. STARTING THE ENGINE

1. Press the START push button (see SECTION 3-1) and the SAFETY SHUTDOWN switch (see Section 3-2) and actuate the ETHER STARTING AID switch, if applicable, for 1 second and release (see Section 3-11).
2. As soon as the engine starts, release the START push button and allow the engine to warm up for approximately three minutes with no power load applied.

3. Loosen the brake and rotate the VOLTAGE ADJUSTMENT control to obtain the desired voltage (see Section 3-5). Tighten brake.

4 - 2. ENGINE SHUTDOWN

1. Remove the power load from the unit.
2. Allow the engine to run for a few minutes to permit the internal engine temperature to equalize. Increase the time if the engine has been operating for an extended period or at full load.
3. Pull the STOP control fully out and hold it in this position until the engine stops completely.

SECTION 5 - MAINTENANCE

WARNING: HOT ENGINE PARTS can cause severe burns.

- *Wear protective gloves and clothing when working on a hot engine.*

MOVING PARTS can cause serious injury.

- *Keep clear of moving parts.*
- *Shut down the engine and disconnect negative (-) battery cable from battery before internally inspecting or servicing.*

5 - 1. GENERAL - The service life of this generator can be prolonged and operating efficiency maintained under normal conditions by following the routine service and workshop maintenance procedures outlined in this section and in the Engine Manufacturer's Manual (F3L912 Engine). Where operating conditions are severe, more frequent attention must be given to all routine service categories; however a special effort must be made to maintain clean internal and external engine surfaces.

5 - 2. PERIODIC CLEANING AND INSPECITON - A schedule for cleaning and inspection should be set up, based on the type and conditions of service, to include the following:

Keep the inside of the unit clean by blowing out the unit with clean, dry compressed air.

Examine all intake and discharge air openings, and ensure that they are not blocked in any manner and are free of foreign matter.

Examine blower impeller to be sure that the blades do not have an obstruction of any kind lodged between them. The blower must be able to turn freely.

Check for fluid leaks indicating loose oil or fuel connections. Tighten loose connections and clean oil or fuel spills or leaks off of engine surfaces.

IMPORTANT: *Periodically inspect the labels on this unit for legibility. All precautionary labels must be maintained in a clearly readable state and replaced when necessary. See the Parts List for part number of precautionary labels.*

5 - 3. FUEL/WATER SEPARATOR AND SLUDGE DRAIN PLUG

WARNING: ENGINE FUEL can cause fire or explosion.

- *Do not drain fuel tank while engine is running.*
- *Do not smoke while handling fuel.*
- *Do not allow fuel to drain onto the engine or other components.*
- *Do not spill fuel; if spilled, wipe up.*

The fuel/water separator, located below the fuel tank on the right side of the generator, provided to drain off water from the fuel tank. Before starting the engine for the first time each day, open the petcock on the bottom of the separator and drain the water into a metal container. Close the petcock at the first signs of fuel.

The fuel/water separator should be changed every 125 hours of operation or 4 months, whichever occurs first.

A sludge drain plug is provided on the bottom of the fuel tank to drain off sediment from the fuel tank. Once a week, drain the sludge into a metal container. If extremely dirty fuel is encountered, a more frequent draining will be necessary.

5 - 4. AIR CLEANER SERVICE (Figure 5-1) - The air cleaner is one of the most important parts of the engine from the standpoint of engine life. An engine consumes several thousand cubic feet of air per hour when operating. If dirty air gets into the engine, it can wear out a set of piston rings within a few operating hours. Every 50 hours or less depending on conditions, empty the dust cup and inspect the element.

IMPORTANT: *A dirty air cleaner element is usually accompanied by a loss of power and black smoke in the engine exhaust.*

When it becomes necessary to service the air cleaner in the field, follow the steps in Figure 5-1. It is recommended that a spare element always be kept on hand for replacement. New elements are available from your distributor.

CAUTION: DIRTY AIR can damage engine.

- *Do not operate engine with dirty air cleaner element in place.*
- *Do not operate engine without air cleaner element in place.*

5 - 5. ELECTRICAL SYSTEM

A. Cables And Wiring

Check interconnecting wiring and connections for tightness and flaws. Check the insulation for breaks or other signs of damage. Repair or replace cables or wiring as necessary.

B. Battery

WARNING: BATTERY ACID can burn eyes and skin and destroy clothing and other material.

- *Wear correct eye and body protection.*

Periodically inspect the battery for loose connections, defective cables, corrosion, cracked case or cover, loose holddowns, and loose or deformed terminal posts.

On units with conventional batteries frequently check the electrolyte level. Add clean mineral-free or distilled water to bring the elctrolyte in each cell up to the level indicator.

5 - 6. SERVICING THE SPARK ARRESTOR - Internal combustion engines operating in a highly combustible environment are a common fire hazard. Glowing carbon particles blown out with the exhaust can retain sufficient heat to ignite materials. While no practical spark arresting device will stop all sparks, this device will minimize fire hazards by removing and trapping most solid particles provided that it is properly maintained.

The carbon trap should be serviced weekly or every 50 operating hours, whichever occurs first. The entire spark arrestor should be inspected every 1000 operating hours or three times per season.

<table>
<tr><td>Follow These Easy Steps:</td><td>1. Stop engine.

2. Wipe off cover before opening air cleaner.

3. Remove cover.

4. Remove element.</td><td>5. Wipe out element chamber with clean, damp cloth.

6. Inspect new element and all gaskets for shipping damage before use.</td><td>7. Reinstall element.

8. Replace cover.</td></tr>
<tr><td>Important</td><td>1. Don't attempt to service air cleaner with engine running.

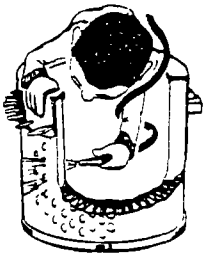
2. Don't blow out the inside of the air cleaner with compressed air.</td><td>3. Don't leave open air cleaner exposed to blowing dust while you clean element. Replace cover.

4. If air cleaner is horizontally mounted, be sure that dust cup is positioned so arrows point up.</td><td>5. For Donaclone air cleaners - don't blow out Donaclone tube section without element, cover and inner cover (if any) correctly installed or you will blow dust into the engine.</td></tr>
<tr><td>How To Clean Elements For Re-Use</td><td>Clean element by one of the following methods:

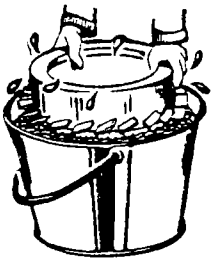
Compressed Air or Washing.

Compressed air is recommended when element will be re-used immediately because a washed element must be dried before re-use. However, washing does a better job and must be used when exhaust soot has lodged in fine pores of the filter media. Use Donaldson D-1400 detergent which contains a special additive for removing soot and carbon.

Replace element after 6 cleanings or annually, whichever occurs first.

Compressed Air

Direct air through element in the direction opposite to normal air flow through the element. Move nozzle up and down while rotating element. Keep nozzle at least one inch from pleated paper. Maximum air pressure - 100 P.S.I.</td><td> 

Washing

1. Soak element 15 minutes or more in Donaldson D-1400 and water solution. See carton for full instructions.

2. Rinse until water is clear (Maximum water pressure 40 P.S.I.)

3. Air-dry or use warm flowing air, max. 160°F. Do not use compressed air or light bulbs.</td><td>(When cleaning Cyclopac elements, do not remove plastic fin assembly - back-flowing with compressed air or washing will remove dust from beneath the fin assembly.)

Inspection

Place bright light inside element and rotate element slowly. If any rupture, holes or damaged gaskets are discovered - replace.</td></tr>
</table>

Figure 5-1. Air Cleaner Service

A. Inspection

1. Visually examine the outside of the device for holes, cracks, or metal corrosion.

2. With the engine stopped, look inside the spark arrestor outlet tube with a flashlight or other light source. Visually examine the vanes and the outlet tube for metal or weld failure. The vanes must be firmly attached to the inlet tube and the outlet tube must be completely intact (this is an important factor in maintaining spark arresting efficiency).

3. Check the mounting clamp to ensure that the spark arrestor is securely mounted. Replace the spark arrestor if inspection reveals any signs of failure.

B. Servicing The Carbon Trap

WARNING: EXHAUST SPARKS can cause fire.
- *Clean spark arrestor/muffler in a non-combustible environment.*

1. Stop the engine and allow the exhaust system to cool.

2. Remove the cleanout plug from the side of the spark arrestor with a wrench. If a crust has formed over the hole, break it loose with a screwdriver or similar tool.

CAUTION: HOT EXHAUST can cause severe burns; HOT CARBON PARTICLES DISCHARGED FROM CLEANOUT HOLE can burn eyes and skin.
- *Wear correct eye and body protection.*

3. Start the engine to blow collected particles out the cleanout hole. If particles are slow to discharge, momentarily cover the end of the exhaust stack.

4. Stop the engine. Replace and secure the cleanout plug.

5 - 7. BRUSHES AND SLIP RINGS - Brush life is very good under normal operating conditions. The brushes and slip rings should be inspected every six months or whenever excitation voltage is lost. Check for cleanliness of the slip rings and freedom of motion of the brushes. If the generator has been operating under extremely dusty or dirty conditions, increase the frequency of inspection.

If the generator has not been used for an extended period of time, oxidation may form on the slip rings causing excitation voltage to be lost. This can usually be remedied by simply spraying the slip rings with an antioxidant type contact cleaner and running the engine.

Under normal use the slip rings will discolor to a dark brown. If a build up of brush material is noted, it may be necessary to clean the slip rings. Use a 3/0 or finer sandpaper followed by a crocus cloth. Never use emery cloth as part of the emery will embed itself into the rings and in turn destroy the carbon brushes.

Replace the brushes if they become chipped or broken or if less than 1/2 inch (12.7 mm) of brush material is left.

5 - 8. ETHER STARTING AID (Optional) - The ether used in the cold weather starting aid system is contained in a replaceable cylinder located behind the right side access door on the center portion of the frame. No indicator is provided to show the amount of ether left in the cylinder; therefore it is recommended that a spare cylinder be kept on hand. Generally, the ether cylinder is empty when the engine fails to start in cold weather while utilizing the cold weather starting system. To check if the cylinder is empty, remove the cylinder and shake it. If a slushing sound is not heard, the ether cylinder is empty. The ether cylinder can also be weighed to check for contents, 33 ounces is the weight of the cylinder when empty. To replace the ether cylinder, loosen the clamp which secures the cylinder to the mounting bracket, and rotate the ether cylinder in a counterclockwise direction.

IMPORTANT: *Prior to installing the new ether cylinder, ensure that the nozzle on the ether cylinder and the fitting into which the ether cylinder is inserted are both clean. If dirt is present in either of these areas the system may be rendered inoperative. Also check for damage to the valve gasket which is located on the inside of the fitting into which the ether cylinder is inserted. Replace the valve gasket if worn or damaged.*

IMPORTANT: *After installing or replacing ether cylinder, do not use or test ether start system for at least 10 to 15 minutes to allow particles in fuel to settle to prevent atomizer plugging.*

See the manufacturer's instruction sheet for maintenance and troublehsooting procedures.

5 - 9. ENGINE SPEED ADJUSTMENT (Figure 5-2) - This engine was shipped fully adjusted and ready for operation. If an engine speed adjustment becomes necessary, proceed as follows:

CAUTION: *Keep body limbs clear of belts and moving parts, and wear heat-protective gloves when making this adjustment.*

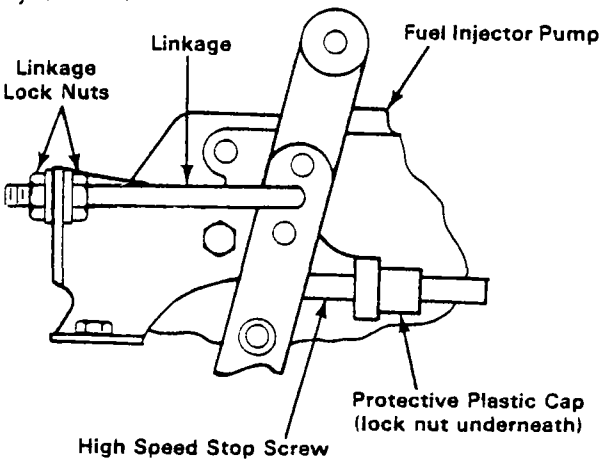


Figure 5-2. Engine Speed Adjustment

1. Shut down the engine.

2. Remove lead seal and protective plastic cap from high speed stop screw.

3. Loosen high speed stop screw lock nut, and back high speed stop screw out (toward front of engine) several turns.

4. Tighten high speed stop screw lock nut.

5. Loosen linkage lock nuts.

6. Start engine.

7. Adjust engine speeds (no load) as follows:

A. For 60 Hz. Operation

Adjust linkage until 61.5 Hz. is indicated on Frequency Meter on front panel. If setting engine speed with a tachometer, adjust linkage for 1850 rpm.

B. For 50 Hz. Operation

Adjust linkage until 51.5 Hz. is indicated on Frequency Meter on front panel. If setting engine speed with a tachometer, adjust linkage for 1550 rpm.

8. Tighten linkage lock nuts.

9. Be sure linkage lock nuts are completely tightened, and then recheck rpm.

10. Stop the engine.

11. Completely tighten high speed stop screw lock nut, and reinstall protective plastic cap onto high speed stop screw. Reseal cap/stop screw.

SECTION 6 - TROUBLESHOOTING

6 - 1. GENERAL - It is assumed that proper installation has been made, according to Section 2 of this manual, and that the generator has been functioning properly until this trouble developed.

6 - 2. TROUBLESHOOTING CHART

WARNING: ELECTRIC SHOCK can kill.
- *Do not touch live electrical parts.*
- *Shut down engine and disconnect negative (-) battery cable from battery before internally inspecting or servicing.*

MOVING PARTS can cause serious injury.
- *Keep clear of moving parts.*

HOT ENGINE PARTS can cause severe burns.
- *Wear protective gloves and clothing when working on a hot engine.*

Troubleshooting of internal parts to be performed only by qualified persons.

The following chart and the chart provided in the Engine Manufacturer's Manual are designed to diagnose and provide remedies for some of the troubles that may develop in this welding generator.

Use these charts in conjunction with the circuit diagram while performing troubleshooting procedures. If the trouble is not remedied after performing these procedures, the nearest Factory Authorized Service Station should be contacted. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly followed.

6 - 3. BOOSTER BATTERY JUMP STARTING - If jump starting is attempted, employ the safety precautions below and the following step by step procedures in order of appearance.

WARNING: BATTERY GASES OR A DAMAGED BATTERY can explode thereby shattering the battery; BATTERY ACID can burn eyes, skin, destroy clothing, and damage other material; MOVING PARTS and IMPROPER CONNECTIONS can cause serious personal injury and damage equipment.
- *Keep sparks, flames, cigarettes, and other ignition sources away from batteries.*
- *Ensure that all personnel are a safe distance from batteries and clear of moving parts while starting.*
- *Do not jump start a frozen or comletely discharged battery.*
- *Do not jump start a battery which has loose terminals or one having evidence of damage such as cracked case or cover.*
- *Be sure that vent caps are tight and level on both batteries and cover both batteries with a damp cloth.*
- *Wear correct eye and body protection.*
- *Keep jumper cables clear of moving parts.*
- *Ensure that both batteries are the same voltage.*
- *Do not jump start a trailer mounted generator with the towing vehicle battery unless the trailer is completely disconnected from the towing vehicle.*
- *Do not jump start a vehicle mounted generator from the vehicle battery.*
- *If booster battery is installed in a vehicle, do not allow vehicle to make contact with generator case or frame.*

1. Use properly insulated jumper cables of adequate size.

2. Connect end of one cable to positive (+) terminals of each battery.

3. Connect one end of other cable to negative (-) terminal or booster battery.

4. Connect remaining end of cable to generator engine block (do not connect to generator case, frame, or equipment grounding terminal as damage to equipment can result).

5. Wait at least one minute after connecting cables before starting engine.

6. Start engine following procedures outlined in Section 4 (Sequence of Operation) of this manual. If the unit does not start after cranking for thirty seconds, stop the jump starting procedure. More than thirty seconds seldom starts the engine unless some mechanical adjustment is made.

7. Remove jumper cable from engine block.

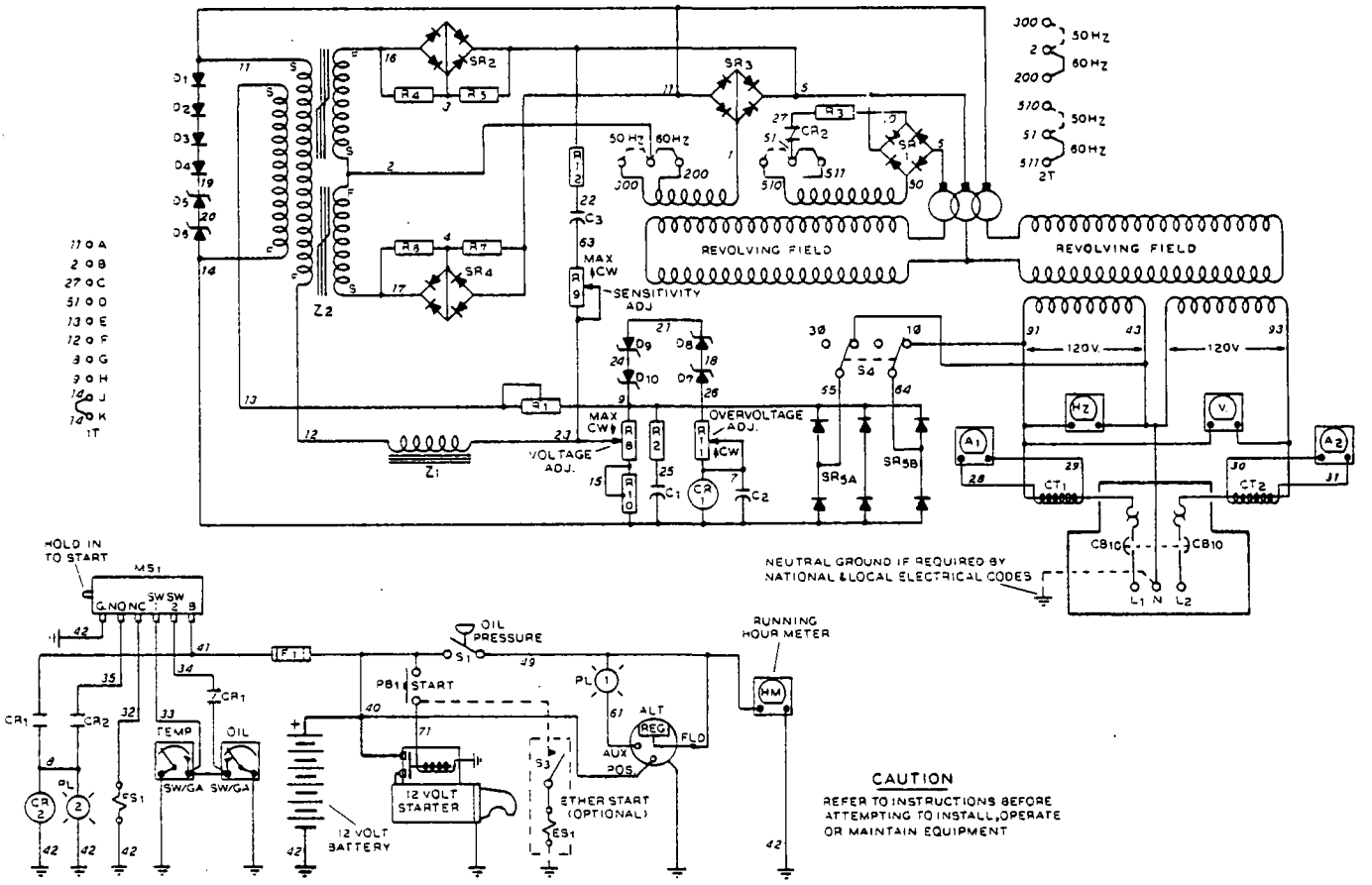
8. Remove other end of same cable from booster battery negative (-) terminal.

9. Remove other jumper cable from generator battery positive (+) terminal.

10. Remove remaining end of cable from booster battery positive (+) terminal.

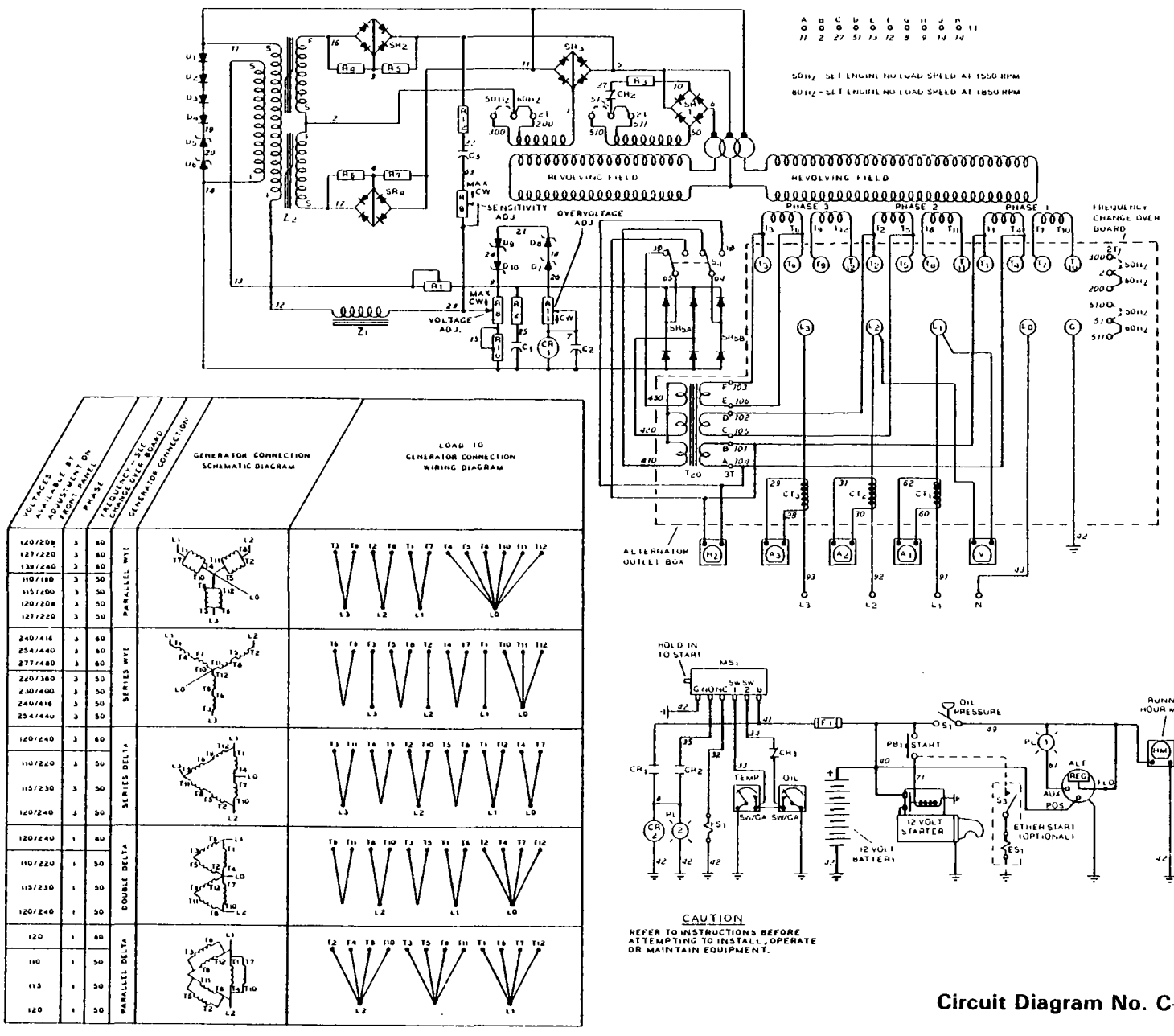
11. Discard damp cloth.

TROUBLE	PROBABLE CAUSE	REMEDY
Engine fails to start.	Battery.	Inspect the electrical system (see Section 5-5B). Test the battery and recharge it if necessary (see Section 2-3B). If the battery does not recharge, replace the battery.
		Jump start the engine employing approved safety practices and booster battery jump starting instructions provided in Section 6-3.
No ac output.	Main circuit breaker open (single phase units only).	Reset main circuit breaker.
	Poor contact between slip rings and brushes.	Clean the slip rings (see Section 5-7).
		Replace the brushes.
Engine suddenly shuts down.	Out of fuel.	Fill fuel tank and air vent fuel system (see Engine Manual).
	Cooling belt broken.	Replace blower belt (see Engine Manual).
	OIL PRESSURE switch/gauge actuated.	Add oil up to full mark on dipstick.
	Engine Temperature switch/gauge actuated.	Check for obstructed air intake or discharge opening; obstructed blower impeller; worn blower belt. Make sure all sheet metal cowlings, shrouds, panels, etc., are properly in place.
	Overvoltage condition.	Defect in voltage regulator circuit.
	Fuse on safety shutdown open.	Replace fuse.



Circuit Diagram No. B-088 323

Figure 6-1. Circuit Diagram For Single Phase Units



VOLTAGES AVAILABLE BY ADJUSTMENT ON FRONT PANEL	PHASE	FREQUENCY - SEE CHANGE OVER BOARD	GENERATOR CONNECTION	GENERATOR CONNECTION SCHEMATIC DIAGRAM	LOAD TO GENERATOR CONNECTION WIRING DIAGRAM
120/208	3	60	PARALLEL WYE		
127/220	3	60			
139/240	3	60			
110/190	3	50			
115/200	3	50			
120/208	3	50			
127/220	3	50			
240/416	3	60	SERIES WYE		
254/440	3	60			
277/480	3	60			
220/380	3	50			
240/400	3	50			
240/416	3	50			
254/440	3	50			
120/240	3	60	SERIES DELTA		
110/220	3	50			
115/230	3	50			
120/240	3	50			
120/240	1	60	DOUBLE DELTA		
110/220	1	50			
115/230	1	50			
120/240	1	50			
120	1	60	PARALLEL DELTA		
110	1	50			
115	1	50			
120	1	50			

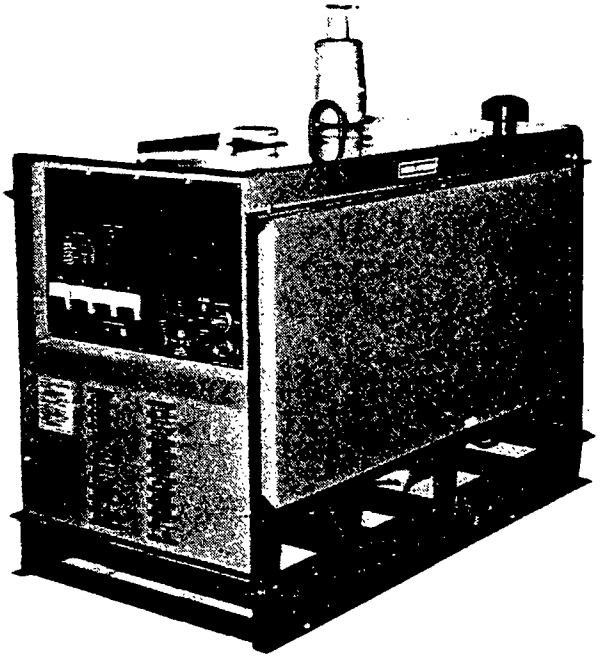
Circuit Diagram No. C-088 391

Figure 6-2. Circuit Diagram For Single-Three Phase Units.

January 1983 FORM: OM-46:

Effective With Serial No. JC654458

MODEL
TRAILPOWER 25DA1
TRAILPOWER 25DA3



PARTS LIST

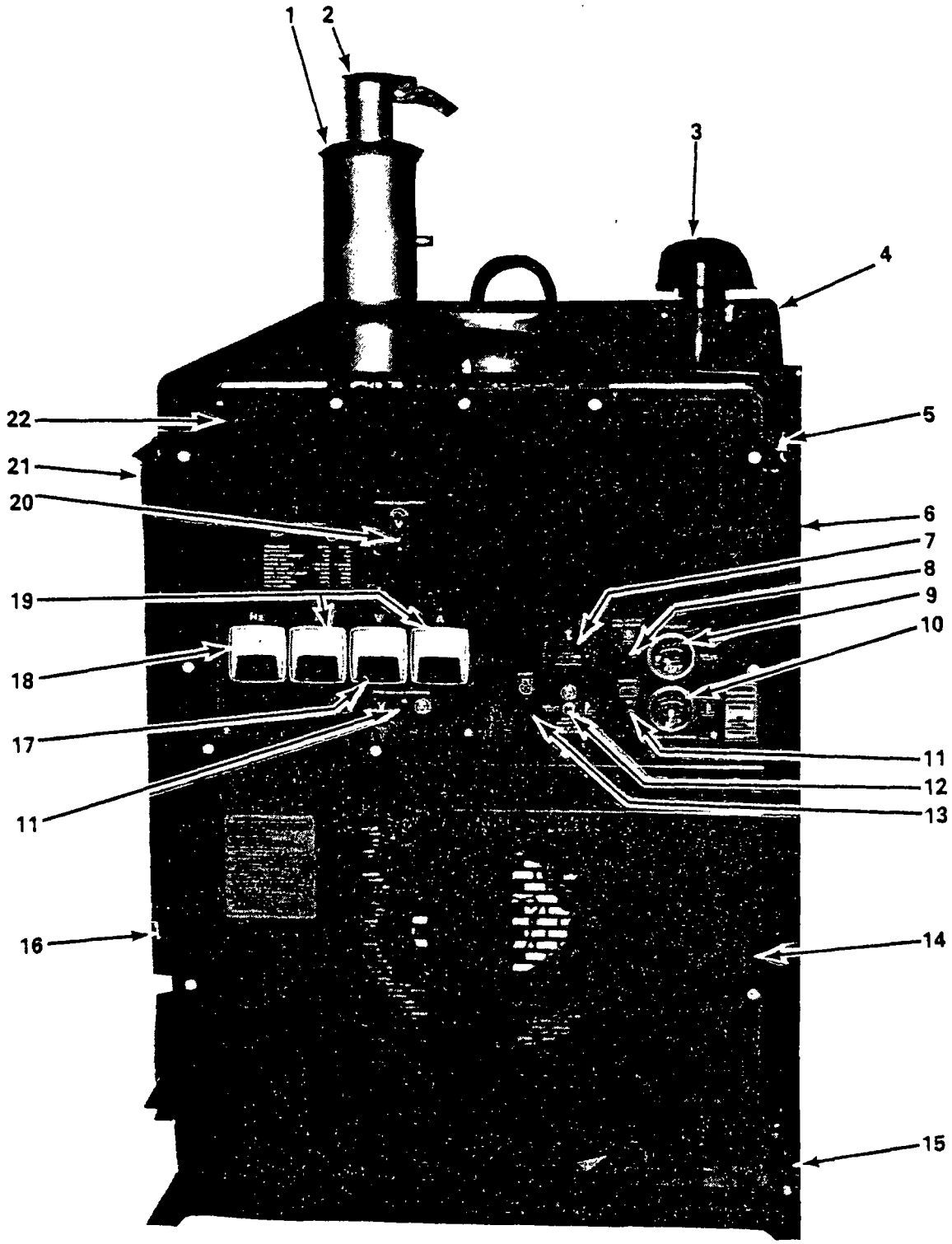


Figure A - Front View Of Generator

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model Single Phase	Quantity Model Three Phase
Figure A			**Front View Of Generator**		
1		072 873	MUFFLER, exhaust-spark arrestor	1	1
		046 376	FITTING, pipe-black nipple L 2NPT x 8	1	1
		034 392	CLAMP, muffler 2-1/2 clamp dia	1	1
2		047 159	CAP, weather-exhaust	1	1
3		019 994	AIR CLEANER (consisting of)	1	1
		021 114	. CLAMP ASSEMBLY	1	1
		*020 319	. ELEMENT	1	1
		020 115	. BAND, mtg-air cleaner	2	2
		020 117	. NUT, wing	1	1
		004 115	. BAFFLE, dust cap	1	1
		004 116	. CAP, dust	1	1
		021 113	. CAP, intake	1	1
		049 965	HOSE, air cleaner	1	1
		049 525	NUT, speed 5/16-18 mtg air cleaner	4	4
		010 863	CLAMP, hose 2-1/16 clamp dia	1	1
		023 313	CLAMP, hose 3-1/4 clamp dia	1	1
4		+046 034	COVER	1	1
		046 392	LABEL, general precautionary	1	1
		017 479	SEAL, weather-lift eye	1	1
5		010 515	BOLT, J 5/16-18	4	4
		604 433	NUT, self locking-hex 5/16-18	4	4
6		048 223	DOOR, side-right hand	1	1
		027 529	PIN, cotter 1/4 x 3-1/2	6	6
		049 685	CATCH, door	2	2
		087 341	BUMPER, door-rubber	6	6
7	HM	032 936	METER, hour 4-40 VDC	1	1
		604 784	SCREW, brass-rnd hd 6-32 x 1/2	2	2
		601 829	NUT, brass-hex 6-32	2	2
8		019 603	KNOB, round	1	1
		010 546	BUSHING, nylon 3/8 ID	1	1
		088 634	ROD, shutdown	1	1
		010 320	STOP, travel-throttle	1	1
		086 478	SWIVEL, cable-shutdown	1	1
9	SW/GA	085 766	GAUGE/SWITCH, oil pressure 0-100 PSI	1	1
10	SW/GA	085 765	GAUGE/SWITCH, temperature 0-240 degree	1	1
11	PL1,2	082 789	LENS, light-indicator red	2	2
		*048 155	BULB, incandescent 12 volt	2	2
		082 788	LIGHT, indicator holder	2	2
12	MSI	085 768	SWITCH, magnetic shutdown 12 volts dc	1	1
13	PB1	084 098	SWITCH, push button MC NO 36 volts dc	1	1
		084 246	CAP, switch-dust/weatherproof black	1	1
14		048 212	PANEL, front-lower	1	1
15		086 462	BASE	1	1
16		048 221	DOOR, side-left hand	1	1
17	V	086 806	METER, volt ac 0-300	1	1
18	HZ	086 807	METER, frequency 55-65 Hz 120 volts	1	1
19	A1,2	086 805	METER, amp ac 0-200	2	
19	A1-3	086 805	METER, amp ac 0-200		3
20	R8	073 933	RHEOSTAT, WW 50 watt 50 ohm	1	1
		072 590	LOCK, shaft-rheostat	1	1
21		087 926	PANEL, front-upper	1	1
22			NAMEPLATE (order by model and serial number)	1	1

*Recommended Spare Parts

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

BE SURE TO PROVIDE MODEL AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Part No.	Descriptions	Quantity Model Single Phase	Quantity Model Three Phase
Figure B			**Right Side View Of Generator**		
1		048 227	UPRIGHT, base-front	1	1
2	Z2	088 037	REACTOR, saturable	1	1
		087 831	PLUG, hardwood 2-3/8 x 1-1/2 x 2-1/2	1	1
		087 858	INSULATION, reactor-round fiber	1	1
		087 857	INSULATION, reactor-round paper	1	1
		087 918	BLOCK, support-reactor	1	1
		604 435	BOLT, carriage 5/16-18 x 7	1	1
3		088 072	GUARD, reactor	1	1
4		071 868	STRAP, mtg-fuel tank	2	2
		071 389	STRIP, rubber 1/8 x 1 x 34 (fuel tank strap)	2	2
		010 434	STRIP, rubber 1/2 x 2 x 2 (fuel tank)	4	4
5		049 169	TANK, fuel (consisting of)	1	1
		018 858	. CAP, fuel tank	1	1
		035 968	WASHER, neoprene 5-7/8 OD 3 x 5/8 ID (filler fuel tank)	1	1
		010 314	VALVE, shut-off fuel	1	1

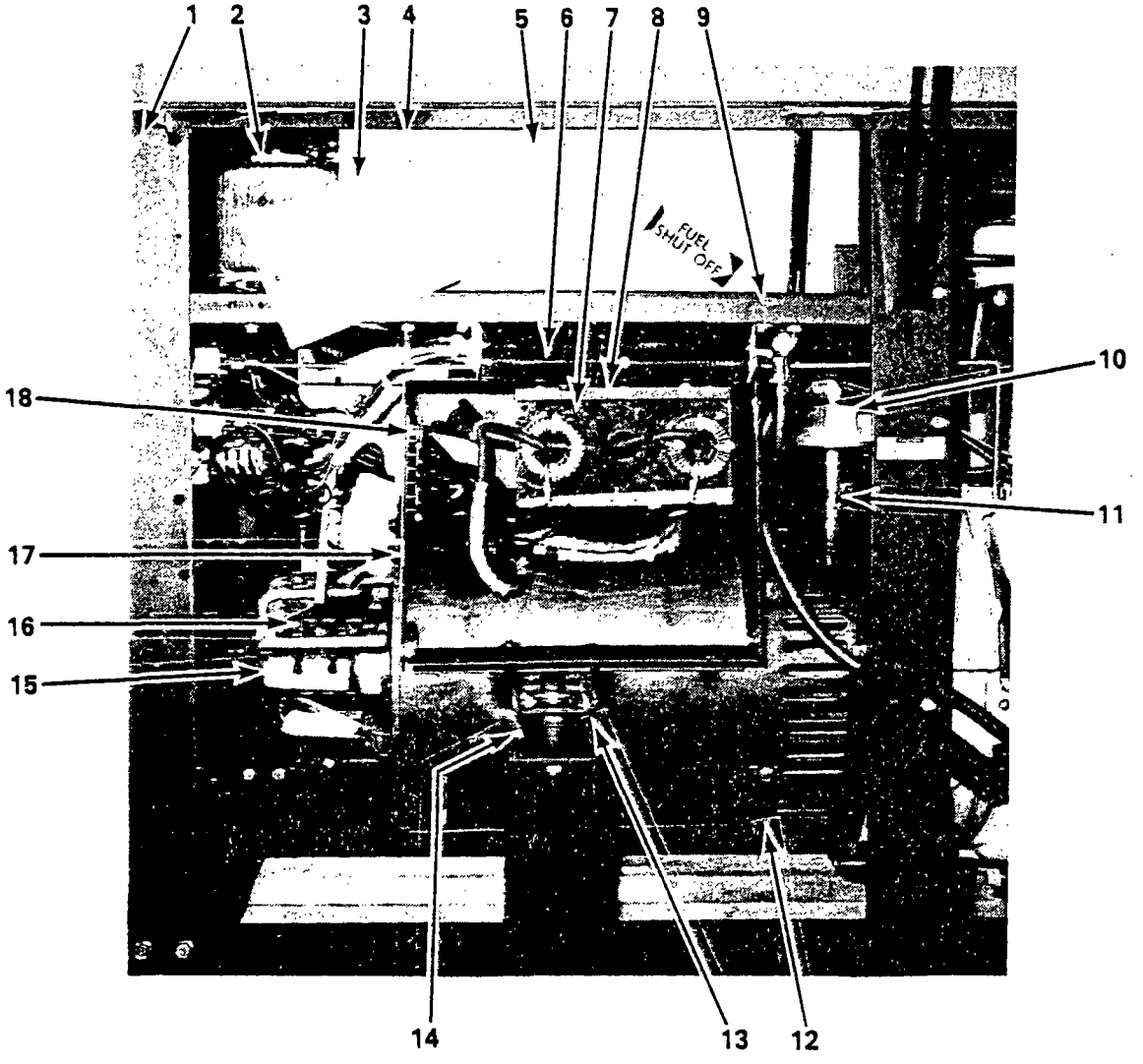


Figure B - Right Side View Of Generator

Item No.	Dia. Mkgs.	Part No.	Descriptions	Quantity Model Single Phase	Quantity Model Three Phase
Figure B			**Right Side View Of Generator (Cont'd.)**		
		605 288	FITTING, pipe-galv plug (fuel tank)	1	1
		020 185	FITTING, pipe-brass elbow st 1/8 NPT (fuel tank return line)	1	1
		073 432	FITTING, brass-barbed M 3/16 TBG x 1/8 NPT (1 engine 1 fuel tank)	2	2
		010 089	FITTING, pipe-brass coupling 1/8 NPT (non return valve)	1	1
		010 678	FITTING, pipe-brass elbow st 1/4 NPT (fuel filter)	1	1
		049 164	FITTING, brass-barbed M 3/8 TBG x 1/4 NPT (1 fuel tank 2 fuel filter)	3	3
		071 126	HOSE, fuel line 3/8 ID (order by ft)	4 ft	4 ft
		604 550	HOSE, fuel line 3/16 ID (order by ft)	2 ft	2 ft
6	R3	030 060	RESISTOR, WW adj 375 watt 20 ohm	1	1
7	CT1,2	088 599	TRANSFORMER ASSEMBLY, current	1	
7	CT1-3	089 019	TRANSFORMER ASSEMBLY, current		1
8		088 594	STRIP, support-transformer	1	1
		087 916	ANGLE, mtg-transformer 27 inches lg	1	1
		086 467	ANGLE, mtg-transformer 27 inches lg	1	1
		088 595	ANGLE, mtg-transformer 9 inches lg	1	1
9		087 923	FRAME, mtg-fuel tank	1	1
		089 020	TRANSFORMER, 3 phase (consisting of)		1
	3T	038 639	. BLOCK, terminal 30 amp 6 pole		1
10		083 553	BASE, filter w/adapter	1	1
11		062 342	SEPARATOR, fuel-filter & water	1	1
		083 859	BRACKET, mtg-separator	1	1
12		088 481	STATOR, generator	1	
12		089 023	STATOR, generator		1
		083 751	ROTOR, generator (consisting of)	1	1
		083 748	. FAN, rotor	1	1
		035 776	. KEY, 3/8 x 3/8 x 2	1	1
		024 617	. RING, retaining	1	1
		053 390	. BEARING, ball	1	1
		039 207	BAFFLE, air-generator	1	1
13		071 890	RETAINER, mount-stator	2	2
14		083 476	TUBING, neoprene 2-1/2 OD x 7/8 ID x 2 (stator mount)	2	2
		071 731	WASHER, flat 21/32 ID x 2-1/4 OD x 3/16 (stator mount)	2	2
		071 730	TUBING, steel 7/8 OD x 12 ga wall x 2-3/8 (stator mount)	2	2
		601 945	SCREW, cap-hex hd 5/8-18 x 4 (stator mount)	2	2
		601 851	NUT, self locking-hex 5/8-18 (stator mount)	2	2
15		049 235	ENDBELL, generator	1	1
		049 650	BRACKET, mtg-brushholder	1	1
		018 614	BRUSH SET (consisting of)	3	3
		*044 755	. BRUSH, contact	1	1
		600 270	. HOLDER, brush	1	1
		018 665	. CAP, holder	1	1
		035 080	SCREW, cap-socket hd 5/16-18 x 1 (adjusting brushes)	2	2
16		088 380	STATOR, exciter	1	1
17		088 524	ENCLOSURE, connection box	1	1
		088 523	COVER, connection box	1	1
		088 522	BRACKET, mtg-connection box cover	1	1
		044 426	CONNECTOR, clamp-cable 1 inch	1	1
		010 467	CONNECTOR, clamp-cable 1-1/4 inch		1
		010 907	NUT, locking 1 inch connection box	1	1
18	2T	038 639	BLOCK, terminal 30 amp 6 pole	1	1
		038 620	LINK, jumper 2T	2	2

*Recommended Spare Parts.

BE SURE TO PROVIDE MODEL AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.

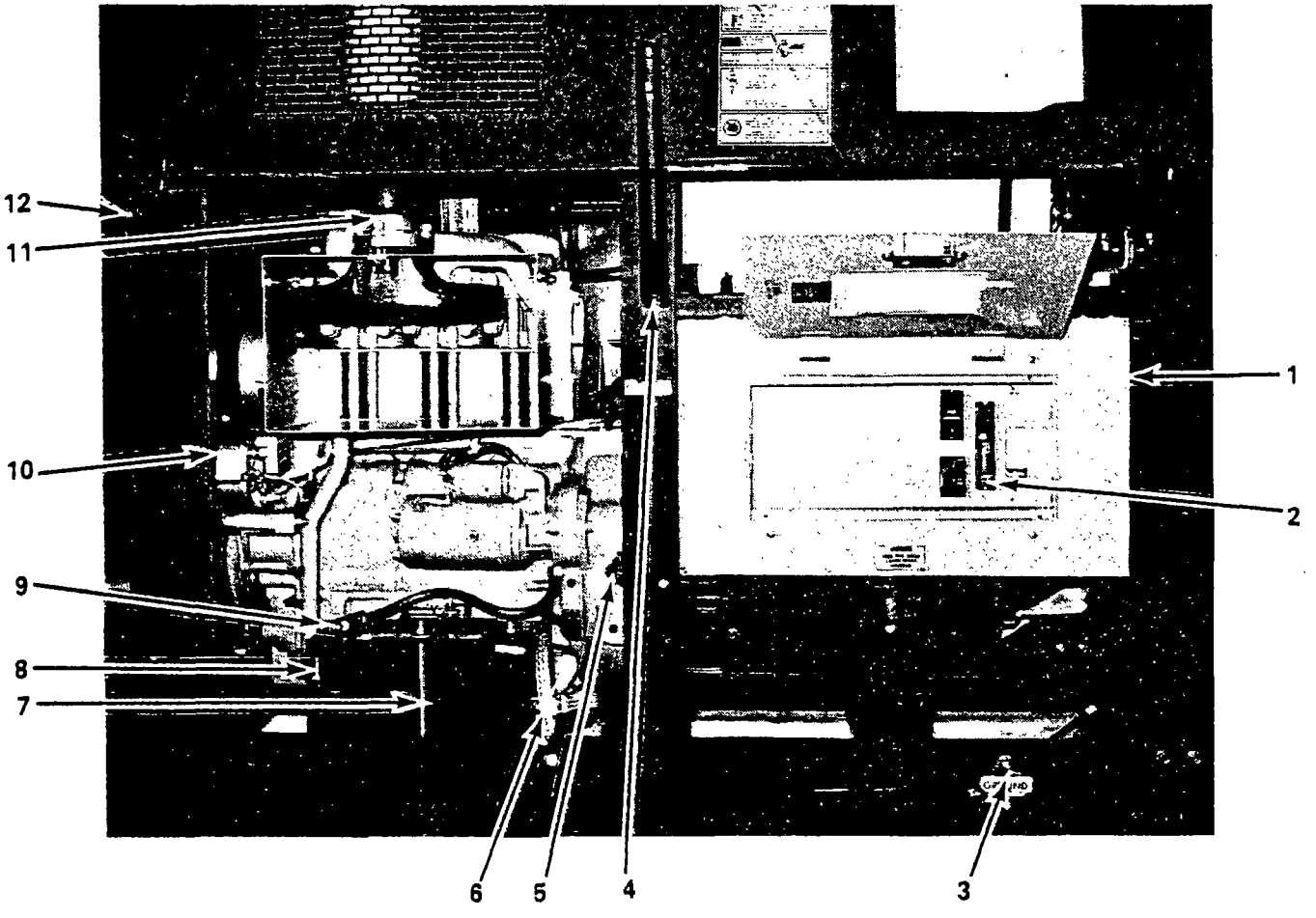
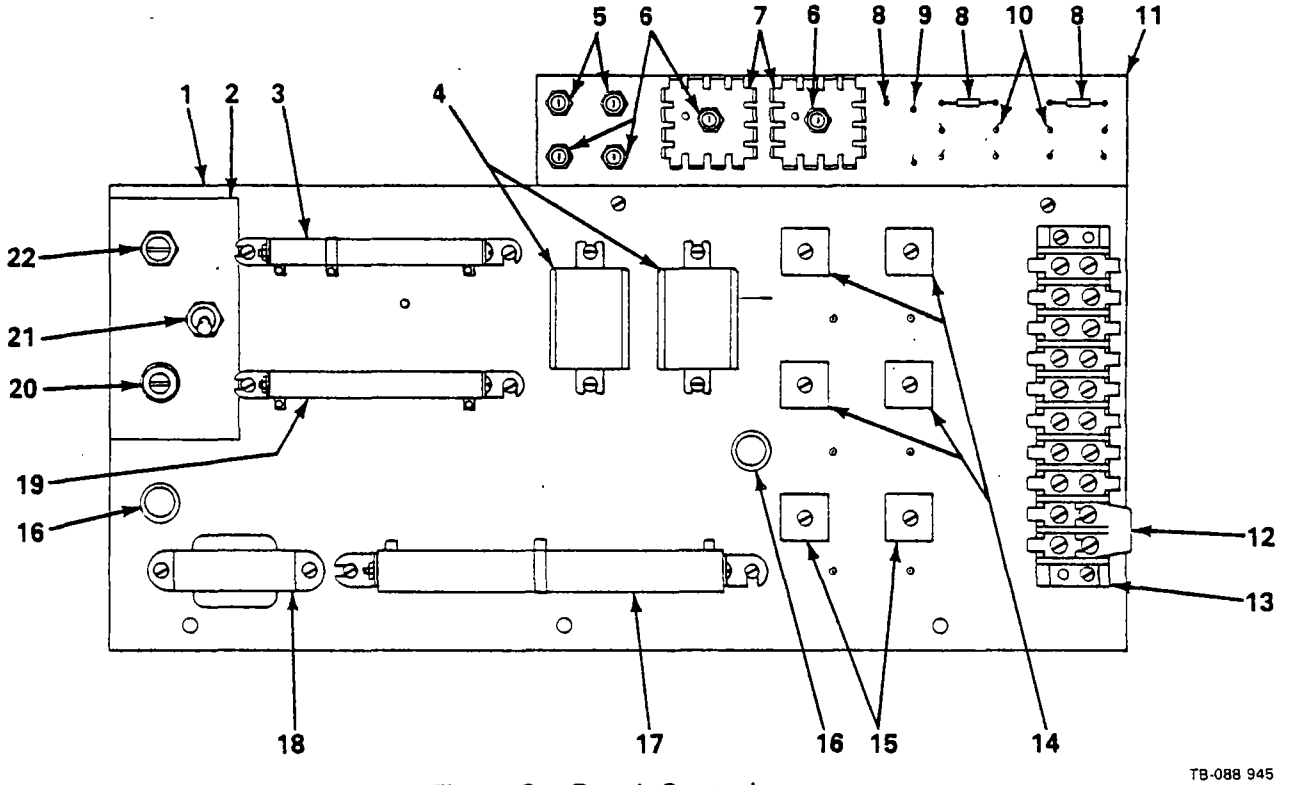


Figure C - Left Side View Of Generator

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model Single Phase	Quantity Model Three Phase
Figure C			**Left Side View Of Generator**		
1		088 526	CIRCUIT BREAKER BOX	1	
		087 057	COVER, enclosure-circuit breaker box	1	
		087 915	STRIP, mtg-circuit breaker box	1	
		010 610	CONNECTOR, clamp-cable 1/2 inch	1	
		088 473	CONNECTOR, conduit-squeeze type BX x 1/4	2	
		088 474	BUSHING, conduit-insulated 1-1/4	2	
		088 475	SLEEVE, conduit-insulating 1-1/4	2	
		088 597	CONDUIT, metallic-flexable 1-1/4 x 10	1	
2	CB10	086 433	CIRCUIT BREAKER, man reset 2P 100 amp 240 volts ac	1	
3		038 654	STUD, brass 1/2-13 x 2-5/8 (ground	1	1
		601 839	NUT, brass-hex 1/2-13 (ground)	4	4
4		004 130	BRACKET, support-door	2	2
5		017 420	LATCH, door	2	2
		010 266	SPRING, door latch	2	2
6		032 453	CABLE, battery-negative	1	1
7		082 672	BOLT, L 5/16-18 x 6-3/8 (battery holddown)	1	1
		010 640	STUD, steel 5/16-18 x 10 (battery holddown)	1	1
		082 673	HOLDDOWN, battery	1	1
8		012 724	BATTERY, 12 volts 95 amp hr	1	1
9		032 452	CABLE, battery-positive	1	1
		089 366	ENGINE (consisting of)	1	1
10	S1	011 917	. SWITCH, pressure 2P	1	1
		605 429	. ALTERNATOR, 35 amp 12 volts	1	1
		601 811	. BOLT, hex hd 3/8-16 x 6 mtg alternator	1	1
		601 872	. NUT, hex-full 3/8-16	5	5
		605 430	. PULLEY, single belt-alternator	1	1
		061 441	. STRAP, mtg-alternator	1	1
		010 150	. TUBING, steel 1/2 OD x 17 ga x 1 mtg alternator	1	1
		048 220	. SPACER, alternator	1	1
		049 158	. BELT, V	1	1
		085 767	. VALVE, non return-fuel	1	1
		086 016	. LINE, oil	1	1
		048 216	. BRACKET, mtg-breather	1	1
	FS1	065 005	. CONCORDIA FUEL VALVE	1	1
		065 006	. CONCORDIA SOCKET ADAPTER	1	1
		070 661	. ROD, speed control	1	1
		604 393	. NUT, speed 3/16 inch	1	1
		070 023	. WASHER, exhaust-manifold	1	1
11		044 941	. SCREW, cap-hex hd 1/2-13 x 2-1/2	3	3
		044 942	. NUT, locking 1/2-13	6	6
		071 890	. RETAINER, mount-stator	2	2
		072 848	. TUBING, neoprene 2-1/2 OD x 7/8 ID x 2 (engine mount)	2	2
		071 731	. WASHER, flat 21/32 ID x 2-1/4 OD x 3/16 (engine mount)	2	2
		071 730	. TUBING, steel 7/8 OD x 12 ga wall x 2-3/8 (engine mount)	2	2
		601 945	. SCREW, cap-hex hd 5/8-18 x 4 (engine mount)	2	2
		601 851	. NUT, self locking-hex 5/8-18 (engine mount)	2	2
		083 746	. SUPPORT, engine	1	1
		086 026	BLOCK, mtg-oil line	1	1
		048 207	BAFFLE, air outlet	1	1
		605 670	NUT, speed 10-24 screw (air outlet baffle)	4	4
		048 208	BRACKET, support-outlet air baffle	1	1
		048 213	BAFFLE, air-intake	1	1
12		048 206	PANEL, engine end	1	1
		087 371	. ROD, shutdown	1	1
		087 370	. BODY, oil filter	1	1
		088 687	. GASKET, copper 1/8	1	1
		048 209	. FLANGE, exhaust	1	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure D		**088 034**	**Panel, Control**	All Models
1		087 882	PANEL, mtg-components	1
2		088 025	PLATE, identification	1
3	R1	076 390	RESISTOR, WW adj 50 watt 5000 ohm	1
4	CR1,2	059 267	RELAY, enclosed 12 volts dc DPDT w/flange	2
5	D7,8	028 296	DIODE, zener 20 volts 10 watt	2
6	D5,6,9,10	037 577	DIODE, zener 47 volts 10 watt	4
7		087 919	HEAT SINK	2
8	D1-4	026 202	DIODE, rectifier 1 amp 400 volts SP	4
9	R12	088 023	RESISTOR, carbon 2 watt 6.8K ohm	1
10	R4-7	088 063	RESISTOR, carbon 2 watt 100K ohm	4
11		087 917	STRIP, mtg-diode	1
12		038 620	LINK, jumper-terminal block	1
13	1T	038 646	BLOCK, terminal 30 amp 10 pole	1
14	SR1-4	035 704	RECITFIER, integrated 30 amp 600 volts	4
15	SR5	035 704	RECTIFIER, integrated 30 amp 600 volts	2
16		073 344	GROMMET, rubber 1/2 ID 5/8 mtg hole	2
17	R10	030 752	RESISTOR, WW adj 100 watt 200 ohm	1
18	Z1	087 830	CHOKE, 2.3 HY 150 MA	1
19	R2	030 826	RESISTOR, WW adj 50 watt 75 ohm	1
20	R9	009 156	POTENTIOMETER, carbon 1 turn 2 watt 2.5K ohm	1
		072 590	LOCK, shaft-potentiometer	1
21	S4	011 611	SWITCH, toggle DPDT 15 amp 125 volts	1
22	R11	073 918	POTENTIOMETER, carbon 1 turn 2 watt 500 ohm	1
	C1,3	+059 887	CAPACITOR, metal film 10 uf 220 volts	4
		007 532	CLAMP, capacitor	8
	C2	085 694	CAPACITOR, electrolytic 2200 uf 16 volts dc	1
		010 146	CLAMP, 5/8 dia	1



TB-088 945

Figure D - Panel, Control

+C1 consists of 3 of 059 887

BE SURE TO PROVIDE MODEL AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.