

OPERATION AND PARTS MANUAL

MQ POWER DCA-150SSVU WHISPERWATT™ GENERATOR (FEMA)



PARTS LIST NO. M3870300504
Revision #2 (06/03/03)



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WARNING



CALIFORNIA — Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

HERE'S HOW TO GET HELP

*PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON-HAND WHEN CALLING*

PARTS DEPARTMENT

800-427-1244 or 310-537-3700

FAX: 800-672-7877 or 310-637-3284

SERVICE DEPARTMENT

800-421-1244

FAX: 310- 537-4259

TECHNICAL ASSISTANCE

800-478-1244

FAX: 310- 631-5032

WARRANTY DEPARTMENT

888-661-4279, or 310-661-4279

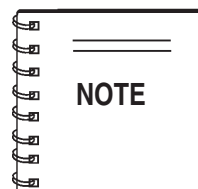
FAX: 310- 537-1173

MQ POWER DCA-150SSSVU AC GENERATOR (FEMA)

Here's How To Get Help	3
Table Of Contents	4
Parts Ordering Procedures	5
Specifications	6
Dimensions	7
Safety Message Alert Symbols	8
Rules for Safe Operation	9-11
Installation	12-13
Generator Decals	14-15
General Information	16
Major Components	17
Generator Control Panel	18
Engine Operating Panel	20-21
Output Terminal Panel Familiarization	22-24
Load Application	25
Generator Outputs	26
Generator Outputs/Gauge Reading	27
Output Terminal Panel Connections	28-29
Pre-Setup	30-33
Generator Start-up Procedure (Manual)	34-36
Generator Start-up Procedure (Auto)	37
Maintenance	39-41
Generator Wiring Diagram	42
Engine Wiring Diagram (MPEC)	43
Engine Troubleshooting	44-45
Generator Troubleshooting	46
Engine Controller Troubleshooting (MPEC)	47
Explanation of Code in Remarks Column	48
Suggested Spare Parts	49

COMPONENT DRAWINGS

Generator Assembly	50-51
Control Box Assembly	52-55
Engine & Radiator Assembly	56-59
Engine Operating Panel Assembly	60-61
Output Terminal Assembly	62-63
Battery Assembly	64-65
Muffler Assembly	66-67
Enclosure Assembly	68-71
Rubber Seal Assembly	72-73
Fuel Tank Assembly	74-75
Battery Charger Assembly	76-77
Camlock Panel Assembly	78-79
Nameplate and Decals	80-83
Terms and Condition of Sale — Parts	84



Specification and part number are subject to change without notice.

PARTS ORDERING PROCEDURES

When ordering parts, please supply the following information:

- ☐ Dealer account number
- ☐ Dealer name and address
- ☐ Shipping address (if different than billing address)
- ☐ Return fax number
- ☐ Applicable model number
- ☐ Quantity, part number and description of each part
- ☐ Specify preferred method of shipment:
 - ✓ FedEx or UPS Ground
 - ✓ FedEx or UPS Second Day or Third Day
 - ✓ FedEx or UPS Next Day
 - ✓ Federal Express Priority One
 - ✓ DHL
 - ✓ Truck

Note: Unless otherwise indicated by customer, all orders are treated as "Standard Orders", and will ship within 24 hours. We will make every effort to ship "Air Shipments" the same day that the order is received, if prior to 2PM west coast time. "Stock Orders" must be so noted on fax or web forms.



Here's how to get help...

Please have the model and serial number on hand when calling.

Parts Department

800-427-1244 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Mayco Parts

800-306-2926 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Service Department

800-478-1244 Fax: 310-537-4259
310-537-3700

MQ Power Service Department

800-835-2551 Fax: 310-638-8046
310-537-3700

Warranty Department

800-421-1244, Ext. 279 Fax: 310-537-1173
310-537-3700, Ext. 279

Multiquip's Main Phone Numbers

800-421-1244 Fax: 310-537-3927
310-537-3700

Place Your Parts Order Via Web or Fax For Even More Savings!

Extra Discounts!

All parts orders which include complete part numbers and are received by our automated web parts order system, or by fax qualify for the following extra discounts:

Ordered via	Standard orders	Stock orders (\$750 list and above)
Fax	3%	10%
Web	5%	10%

Special freight allowances when you order 10 or more line items via Web or Fax! **

FedEx Ground Service **at no charge for freight**
No other allowances on freight shipped by any other carrier.

NOTE: DISCOUNTS ARE SUBJECT TO CHANGE



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WWW: multiquip.com

Direct TOLL-FREE access to our Parts Department:

Toll-free nationwide — 800-427-1244

DCA150SSVU — SPECIFICATIONS

Table 1. Generator Specifications

Model	DCA-150SSVU	
Type	Revolving field, self ventilated, open protected type synchronous generator	
Armature Connection	Star with Neutral	Zig Zag
Phase	3	Single
Standby Output	165 KVA (132 KW)	96 KW
Prime Output	150 KVA (120 KW)	87 KW
Voltage	240V or 480V	240/120V
Frequency	60 Hz	
Speed	1800 rpm	
Power Factor	0.8	1
Aux. AC Power	Single Phase, 60 Hz	
Voltage	120 V	
Output	4.8 KW (2.4 KW x 2)	
Engine Specifications		
Model	VOLVO PENTA TAD720GE	
Type	4 Cycle, water-cooled, direct injection, turbo-charged	
No. of Cylinders	6 cylinders	
Bore x Stroke	4.25 in. x 5.12 in. (108 mm x 130 mm)	
Rated Output	191 HP/1800 rpm	
Displacement	436 cu. in. (7.15 Liters)	
Starting	Electric	
Coolant Capacity	6.3 gal. (23.8 Lters)	
Lube Oil Capacity	5.3 gal. (20 Liters)	
Fuel Consumption	8.5 gal. (32.2 liters)/hr at full load	6.5 gal. (24.5 liters)/hr at 3/4 load
	4.9 gal. (18.5 liters)/hr at 1/2 load	3.3 gal. (12.4 liters)/hr at 1/4 load
Battery	12V- 225AH	
Fuel	#2 Diesel Fuel	

DCA-150SSVU — DIMENSIONS (TOP, SIDE AND FRONT)

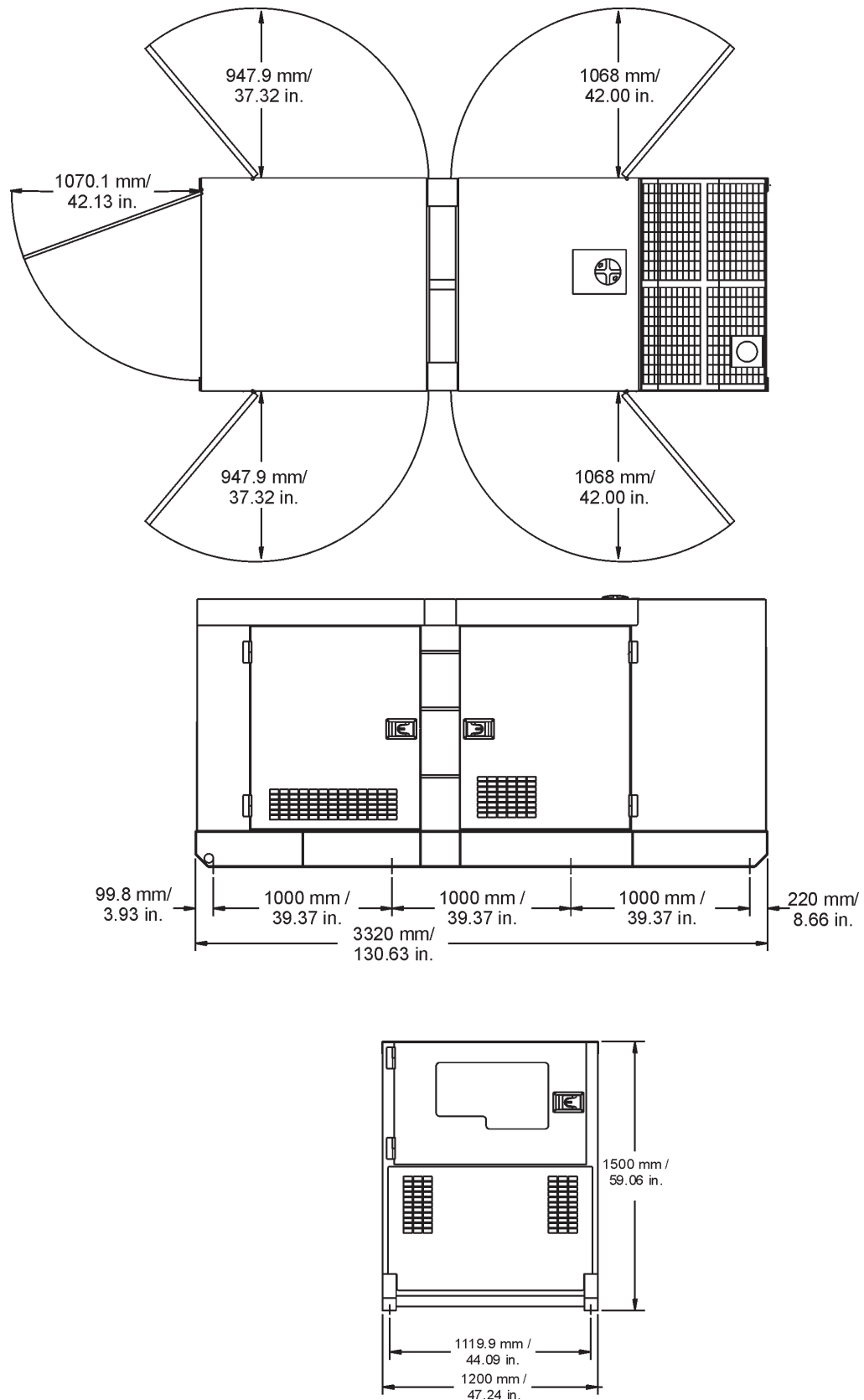


Figure 1. Dimensions

DCA150SSVU — SAFETY MESSAGE ALERT SYMBOLS

FOR YOUR SAFETY AND THE SAFETY OF OTHERS!

Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the Safety Messages and Operating Instructions could result in injury to yourself and others.



This Owner's Manual has been developed to provide complete instructions for the safe and efficient operation of the MQ Power **Model DCA150SSVU WHISPERWATT™ GENERATOR**.

Before using this GENERATOR, ensure that the operating individual has read and understands all instructions in this manual.

SAFETY MESSAGE ALERT SYMBOLS

The three (3) Safety Messages shown below will inform you about potential hazards that could injure you or others. The Safety Messages specifically address the level of exposure to the operator, and are preceded by one of three words: **DANGER**, **WARNING**, or **CAUTION**.



DANGER: You **WILL** be **KILLED** or **SERIOUSLY** injured if you **DO NOT** follow directions.



WARNING: You **CAN** be **KILLED** or **SERIOUSLY** injured if you **DO NOT** follow directions.



CAUTION: You **CAN** be injured if you **DO NOT** follow directions.

Potential hazards associated with trowel operation will be referenced with "**Hazard Symbols**" which appear throughout this manual, and will be referenced in conjunction with Safety "**Message Alert Symbols**".

HAZARD SYMBOLS



Lethal Exhaust Gases



Engine exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled. **NEVER** operate this equipment in a confined area or enclosed structure that does not provide ample free flow air.



Explosive Fuel



Diesel fuel is extremely flammable, and its vapors can cause an explosion if ignited. **DO NOT** start the engine near spilled fuel or combustible fluids. **DO NOT** fill the fuel tank while the engine is running or hot. **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system. Store fuel in approved containers, in well-ventilated areas and away from sparks and flames. **NEVER** use fuel as a cleaning agent.



Burn Hazards



Engine components can generate extreme heat. To prevent burns, **DO NOT** touch these areas while the engine is running or immediately after operations. **NEVER** operate the engine with heat shields or heat guards removed.



Rotating Parts



NEVER operate equipment with covers, or guards removed. Keep **fingers, hands, hair** and **clothing** away from all moving parts to prevent injury.

DCA150SSVU — SAFETY MESSAGE ALERT SYMBOLS



Accidental Starting



OFF **ALWAYS** place the engine ON/OFF switch in the **OFF** position, when the trowel is not in use.



Respiratory Hazard



ALWAYS wear approved respiratory protection.



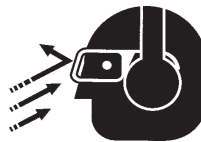
Over Speed Conditions



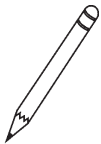
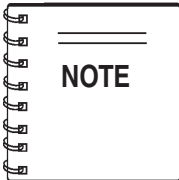
NEVER tamper with the factory settings of the engine governor or settings. Personal injury and damage to the engine or equipment can result if operating in speed ranges above maximum allowable.



Sight and Hearing hazard



ALWAYS wear approved eye and hearing protection.



This **generator**, other property, or the surrounding environment could be damaged if you do not follow instructions.



Equipment Damage Messages

Other important messages are provided throughout this manual to help prevent damage to your trowel, other property, or the surrounding environment.

CAUTION:



Failure to follow instructions in this manual may lead to serious injury or even death! This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

The following safety guidelines should always be used when operating the **DCA-150SSVU Generator**:

GENERAL SAFETY

- **DO NOT** operate or service this equipment before reading this entire manual.



- This equipment should not be operated by persons under 18 years of age.

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job.



- **NEVER** operate this equipment when not feeling well due to fatigue, illness or taking medicine.



- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **NEVER** use accessories or attachments, which are not recommended by MQ Power for this equipment. Damage to the equipment and/or injury to user may result.

- Manufacture does not assume responsibility for any accident due to equipment modifications.

- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.

- **ALWAYS** check the machine for loosened threads or bolts before starting.

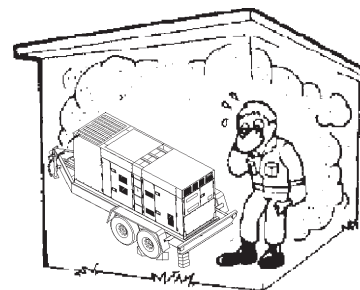
- **NEVER** operate the generator in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death**.

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing engine or generator.



- **High Temperatures** – Allow the engine to cool before performing service and maintenance functions. Contact with **hot!** components can cause serious burns.

- The engine of this generator requires an adequate free flow of cooling air. **NEVER** operate the generator in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause serious damage to the generator or engine and may cause injury to people. The generator engine gives off **DEADLY** carbon monoxide gas.



- **ALWAYS** make sure generator is properly grounded.

- **NEVER** use gas piping as an electrical ground.

- **DO NOT** place hands or fingers inside generator engine compartment when engine is running.

- **ALWAYS** make sure generator installation is accordance with **national and local electrical codes**.

- **ALWAYS** have a qualified electrician perform the generator wiring installation.

- **NEVER** power cables or cords **lay in water**.

- **NEVER stand in water** while AC power from the generator is being transfer to a load.

- **NEVER** use a defective or frayed power cable. Check the cable for cuts in the insulation.

- **NEVER** use a extension cord that is frayed or damaged where the insulation has been cut.

- **ALWAYS** make certain that proper extension cord has been selected for the job See Table 4.

- The electrical voltage required to operate the generator can cause severe injury or even death through physical contact with live circuits. Turn all circuit breakers **OFF** before performing maintenance on the generator.

DCA-150SSVU — RULES FOR SAFE OPERATION

■ **ALWAYS** make sure that electrical circuits are properly **grounded** per the **National Electrical Code (NEC)** and local codes before operating generator. Severe ***injury or death!*** by electrocution can result from operating an ungrounded generator.

■ **ALWAYS** be sure the operator is familiar with proper safety precautions and operations techniques before using generator.

■ **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children.

■ **ALWAYS** read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.



DANGER:



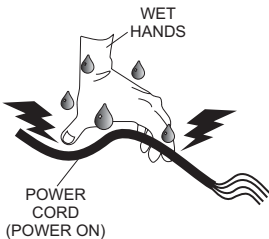
Never use damaged or worn cables when connecting equipment to the generator. Make sure power connecting cables are securely connected to the generator's output terminals, insufficient tightening of the terminal connections may cause damage to the generator and electrical shock.



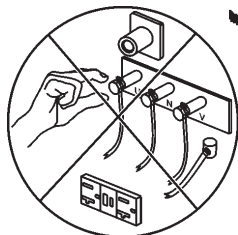
DANGER:



NEVER grab or touch a live power cord with wet hands, the possibility exists of electrical shock, electrocution, and even ***death!***

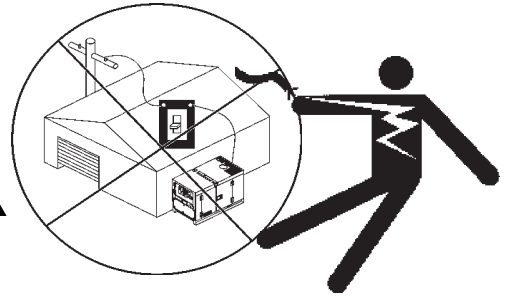
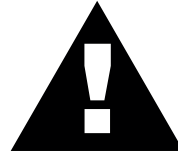


DANGER:



■ **NEVER** touch output terminals during operation. This is extremely dangerous. **ALWAYS** stop the machine and place the circuit breaker in the "**OFF**" position when contact with the output terminals is required. There exists the possibility of ***electrocution, electrical shock or burn, which can cause severe bodily harm or even death!***

DANGER:



■ Backfeed to a utility system can cause ***electrocution*** and or property damage. **DO NOT** connect to any building's electrical system except through an approved device or after building main switch is opened. **ALWAYS** have a licensed electrician perform the installation

CAUTION:



Radiator

DO NOT touch or open any of the below mentioned components while the generator is running. Always allow sufficient time for the engine and generator to cool before performing maintenance.

1. **Radiator Cap** - Removing the radiator cap while the engine is hot will result in high pressurized, boiling water to gush out of the radiator, causing severe scalding to any persons in the general area of the generator.
2. **Coolant Drain Plug** - Removing the coolant drain plug while the engine is hot will result in hot coolant to gush out of the coolant drain plug, therefore causing severe scalding to any persons in the general area of the generator.
3. **Engine Oil Drain Plug** - Removing the engine oil drain plug while the engine is hot will result in hot oil to gush out of the oil drain plug, therefore causing severe scalding to any persons in the general area of the generator.

Maintenance Safety

■ **NEVER** lubricate components or attempt service on a running machine.

■ **ALWAYS** allow the machine a proper amount of time to cool before servicing.



■ Keep the machinery in proper running condition.

■ Fix damage to the machine immediately and always replace broken parts.

DCA150SSVU — RULES FOR SAFE OPERATION

- **NEVER** Run engine without air filter. Severe engine damage may occur.
- **ALWAYS** service air cleaner frequently to prevent engine malfunction.
- **ALWAYS** disconnect the **negative battery terminal** before performing service on the generator.
- **ALWAYS** be sure the operator is familiar with proper safety precautions when operating the generator set.
- **ALWAYS** store equipment properly when not in use.
- **DO NOT** leave the generator running in the **manual mode** unattended.
- **DO NOT** allow unauthorized people to operate this equipment.
- **ALWAYS** read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.
- Refer to the **Volvo Engine Manual** for engine technical questions or information.

DANGER:



Pay close attention to ventilation when operating the generator inside tunnels and caves. The engine exhaust contains noxious elements. Engine exhaust must be routed to a ventilated area.



Generator Grounding

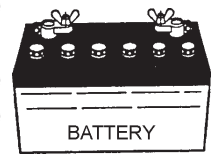
To guard against electrical shock and possible damage to the equipment, it is important to provide a good **EARTH** ground.

Article 250 (Grounding) of the **National Electrical Code** (NEC) provides guide lines for proper grounding and specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

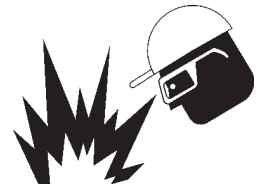
ALWAYS be sure to use the ground terminal (green wire) when connecting a load to the UVWO output terminals.

Battery

The battery contains acids that can cause injury to the eyes and skin. To avoid eye irritation, **always** wear safety glasses. Use well insulated gloves when picking up the battery. Use the following guidelines when handling the battery:



1. **DO NOT** drop the battery. There is the possibility of risk that the battery may explode.
2. **DO NOT** expose the battery to open flames, sparks, cigarettes etc. The battery contains combustible gases and liquids. If these gases and liquids come in contact with a flame or spark, an explosion could occur.
3. **ALWAYS** keep the battery charged. If the battery is not charged a buildup of combustible gas will occur.
4. **ALWAYS** keep battery charging and cables in good working condition. Repair or replace all worn cables.
5. **ALWAYS** recharge the battery in an vented air environment, to avoid risk of a dangerous concentration of combustible gases.
6. In case the battery liquid (dilute sulfuric acid) comes in contact with **clothing or skin**, rinse skin or clothing immediately with plenty of water.
7. In case the battery liquid (dilute sulfuric acid) comes in contact with your **eyes**, rinse eyes immediately with plenty of water, then contact the nearest doctor or hospital, and seek medical attention.



Emergencies

- **ALWAYS** know the location of the nearest **fire extinguisher** and **first aid kit**.



- In emergencies **always** know the location of the nearest phone or **keep a phone on the job site**. Also know the phone numbers of the nearest **ambulance**, **doctor** and **fire department**. This information will be invaluable in the case of an emergency.



[illegible]

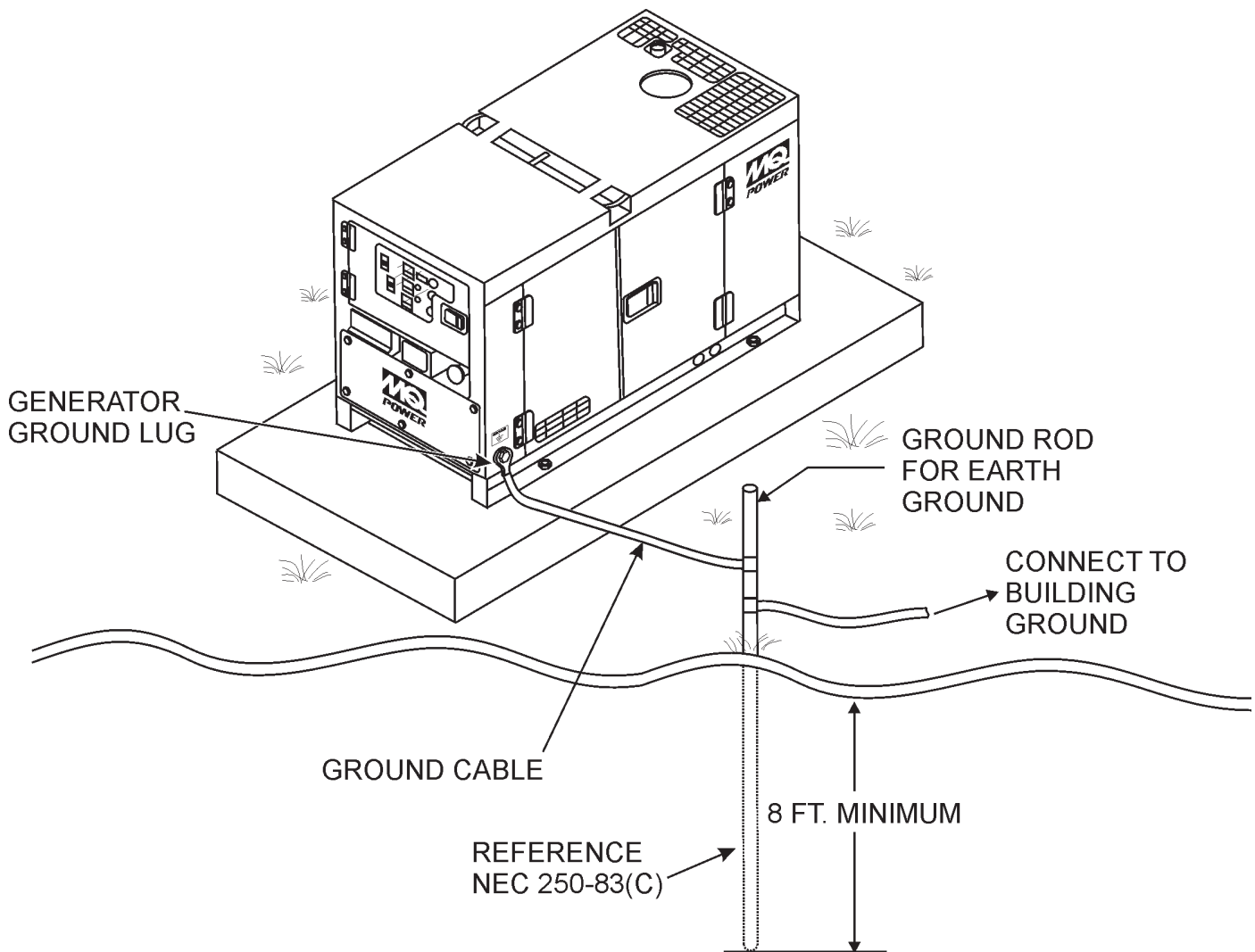


Figure 2. Typical Generator Grounding Application

Outdoor Installation

Install the generator in a area that is free of debris, bystanders, and overhead obstructions. Make sure the generator is on secure level ground so that it cannot slide or shift around. Also install the generator in a manner so that the exhaust will not be discharged in the direction of nearby homes.

The installation site must be relatively free from moisture and dust. All electrical equipment should be protected from excessive moisture. Failure to do will result in deterioration of the insulation and will result in short circuits and grounding.

Foreign materials such as dust, sand, lint and abrasive materials have a tendency to cause excessive wear to engine and alternator parts.

CAUTION:



Pay close attention to ventilation when operating the generator inside tunnels and caves. The engine exhaust contains noxious elements. Engine exhaust must be routed to a ventilated area.

Indoor Installation

Exhaust gases from diesel engines are extremely poisonous. Whenever an engine is installed indoors the exhaust fumes must be vented to the outside. The engine should be installed at least two feet from any outside wall. Using an exhaust pipe which is too long or too small can cause excessive back pressure which will cause the engine to heat excessively and possibly burn the valves.

Mounting

The generator must be mounted on a solid foundation (such as concrete) and set firmly on the foundation to isolate vibration of the generator when it is running. The generator must set at least 6 inches above the floor or grade level (in accordance to NFPA 110, Chapter 5-4.1). **DO NOT** remove the metal skids on the bottom of the generator. They are to resist damage to the bottom of the generator and to maintain alignment.

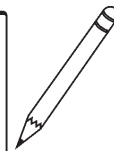
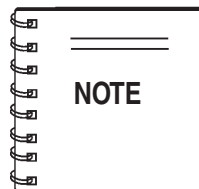
Generator Grounding

To guard against electrical shock and possible damage to the equipment, it is important to provide a good **EARTH** ground.

Article 250 (Grounding) of the National Electrical Code (NEC) provides guide lines for proper grounding and specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

NEC articles 250-64(b) and 250-66 set the following grounding requirements:

1. Use one of the following wire types to connect the generator to earth ground.
 - a. Copper - 10 AWG (5.3 mm²) or larger.
 - b. Aluminum - 8 AWG (8.4 mm²) or larger.
2. When grounding the generator (Figure 2) connect the ground cable between the lock washer and the nut on the generator and tighten the nut fully. Connect the other end of the ground cable to earth ground.
3. NEC article 250-52(c) specifies that the earth ground rod should be buried a minimum of 8 ft. into the ground.



When connecting the generator to any buildings electrical system **ALWAYS** consult with a licensed electrician.

DCA150SSVU — GENERATOR DECALS

The DCA-150SSVU generator is equipped with a number of safety decals (Figure 3). These decals are provided for operator safety and maintenance information. The illustration below and on the preceding page show the decals as they appear on the machine. Should any of these decals become unreadable, replacements can be obtained from your dealer.

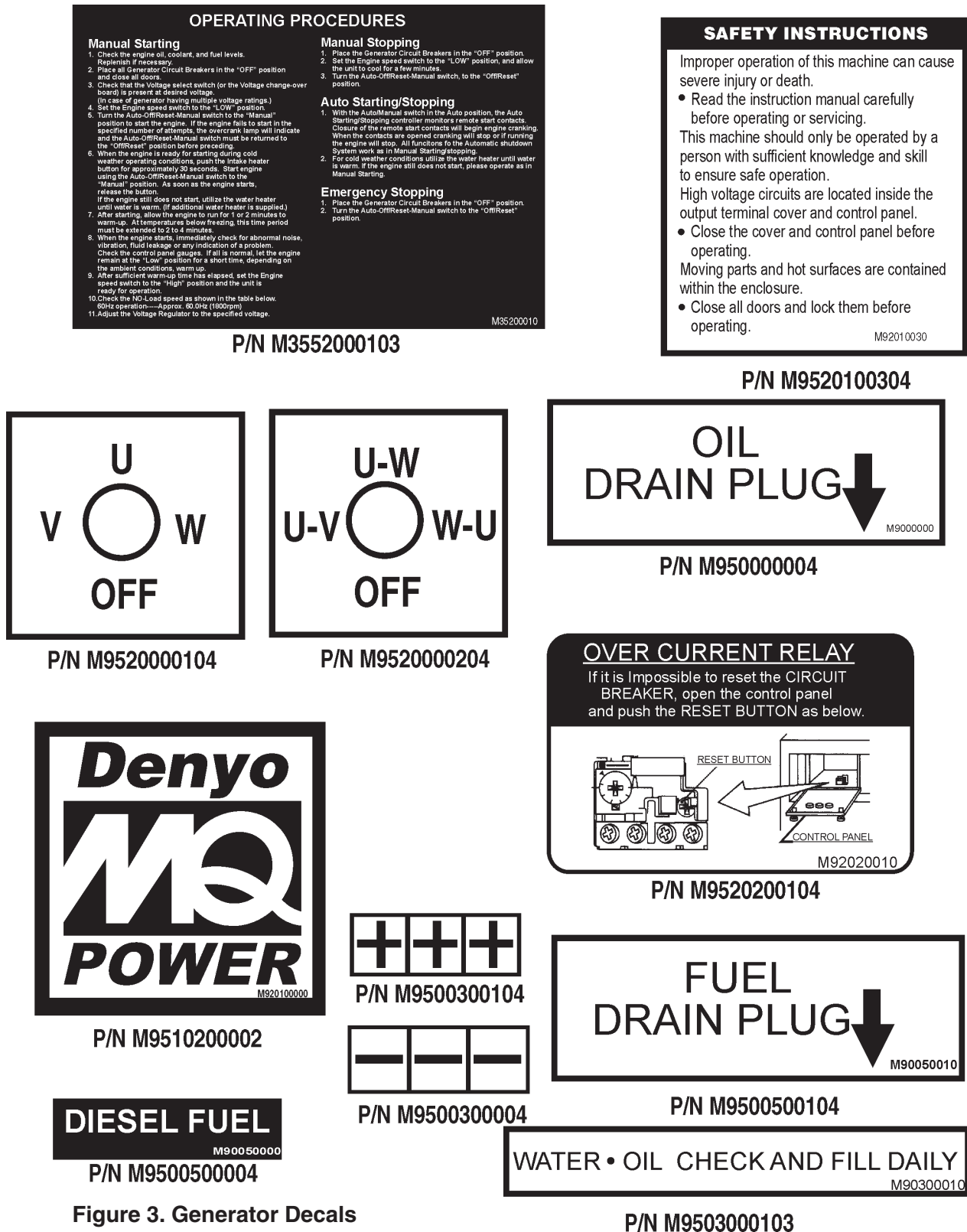
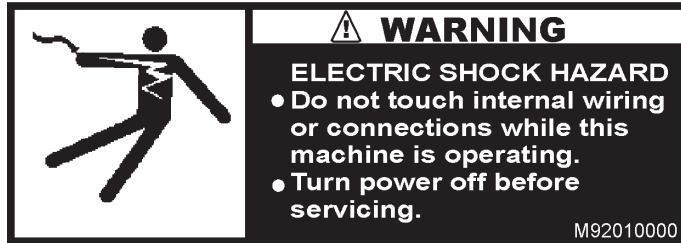
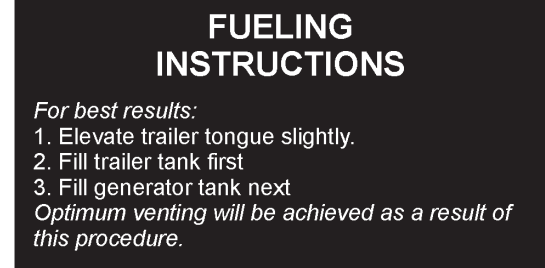


Figure 3. Generator Decals

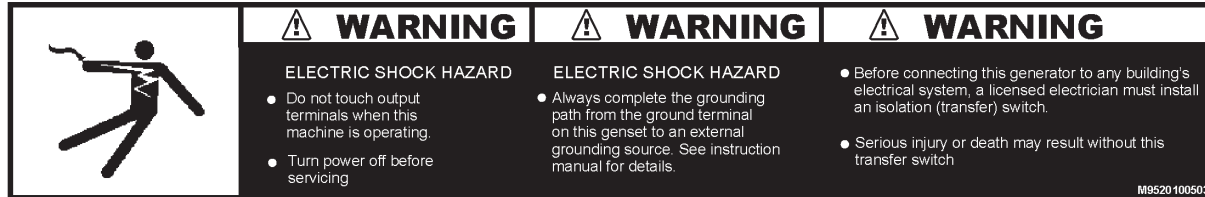
DCA150SSVU — GENERATOR DECALS



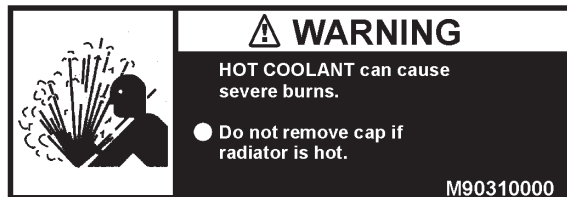
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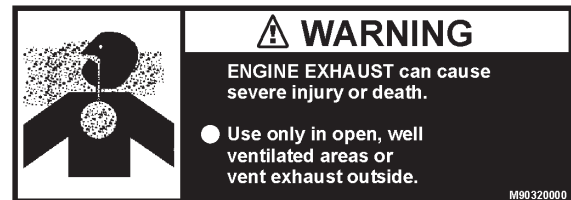
P/N TBD



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P/N M9503100004



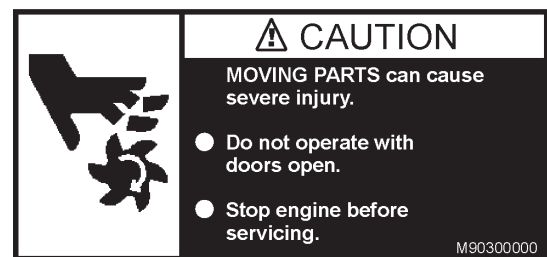
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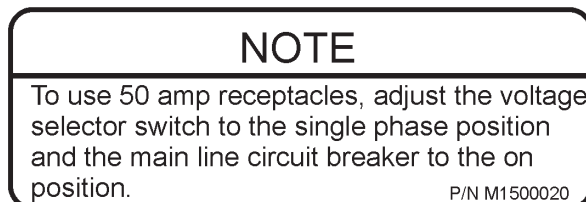
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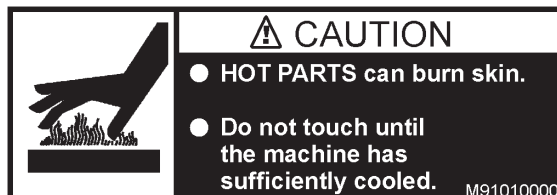
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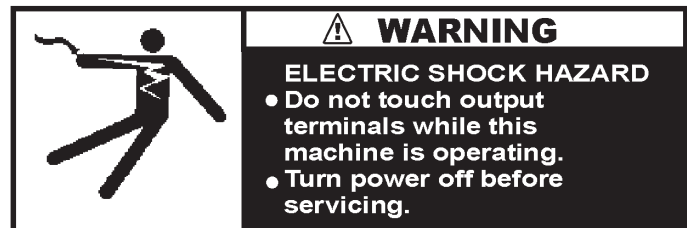
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P/N M1550000204



P/N M9510100004



P/N M9520100503

Figure 3. Generator Decals (Continued)

DCA-150SSVU Familiarization

Generator

The MQ Power Model **DCA-150SSVU** is a 96 kW **generator** (Figure 4) that is designed as a high quality portable (requires a trailer for transport) power source for telecom sites, lighting facilities, power tools, submersible pumps and other industrial and construction machinery.

Engine Operating Panel

The "Engine Operating Panel" is provided with the following:

- Tachometer
- Water Temperature Gauge
- Oil Pressure Gauge
- Charging Ammeter Gauge
- Fuel Level Gauge
- Engine Speed Switch
- Coolant Level Alarm Lamp
- Panel Light
- Panel Light Switch
- Auto ON/OFF Engine Controller

Generator Control Panel

The "Generator Control Panel" is provided with the following:

- Output Voltage Adjustment Knob
- Frequency Meter (Hz)
- AC Ammeter (Amps)
- AC Voltmeter (Volts)
- Ammeter Change-Over Switch
- Voltmeter Change-Over Switch
- Voltage Regulator
- Over-Current Relay

Output Terminal Panel

The "Output Terminal Panel" is provided with the following:

- Three 250 VAC output receptacles (CS-6369), 50 amps
- Three auxiliary circuit breakers, 250V @ 50 amps
- Two 125 VAC output receptacles, (GFCI), 20 amps
- Two GFCI circuit breakers, 120V @ 20amps
- Five output terminal lugs (3Ø power)

Control Box

The "Control Box" is provided with the following:

- 3-Pole, 400 amp Main Circuit Breaker
- Automatic Voltage Regulator
- Current Transformer
- Emergency Relay

Open Delta Excitation System

The **DCA-150SSVU** generator is equipped with the state of the art "**Open-Delta**" excitation system. The open delta system consist of an electrically independent winding wound among stationary windings of the AC output section.

There are four connections of the open delta A, B, C and D. During steady state loads, the power from the voltage regulator is supplied from the parallel connections of A to B, A to D, and C to D. These three phases of the voltage input to the voltage regulator are then rectified and are the excitation current for the exciter section.

When a heavy load, such as a motor starting or a short circuit occurs, the automatic voltage regulator (AVR) switches the configuration of the open delta to the series connection of B to C. This has the effect of adding the voltages of each phase to provide higher excitation to the exciter section and thus better voltage response during the application of heavy loads.

The connections of the AVR to the AC output windings are for sensing only. No power is required from these windings.

The open-delta design provides virtually unlimited excitation current, offering maximum motor starting capabilities. The excitation does not have a "**fixed ceiling**" and responds according the demands of the required load.

Engine

The **DCA-150SSVU** is powered by a 4 cycle, water cooled, turbocharged Volvo Model TAD720GE **diesel** engine. This engine is designed to meet every performance requirement for the generator. Reference Table 1 for engine specifications.

In keeping with MQ Power's policy of constantly improving its products, the specifications quoted herein are subject to change without prior notice.

Mechanical Governor System

The mechanical governor system control the RPM of the engine. When the engine demands increase or decrease, the mechanical governor system regulates the frequency variation to $\pm 5\%$. The electronic governor option increases frequency variation to $\pm 0.25\%$.

Extension Cables

When electric power is to be provided to various tools or loads at some distance from the generator, extension cords are normally used. Cables should be sized to allow for distance in length and amperage so that the voltage drop between the generator and point of use (load) is held to a minimum. Use the cable selection chart (Table 5) as a guide for selecting proper extension cable size.

DCA150SSVU — MAJOR COMPONENTS

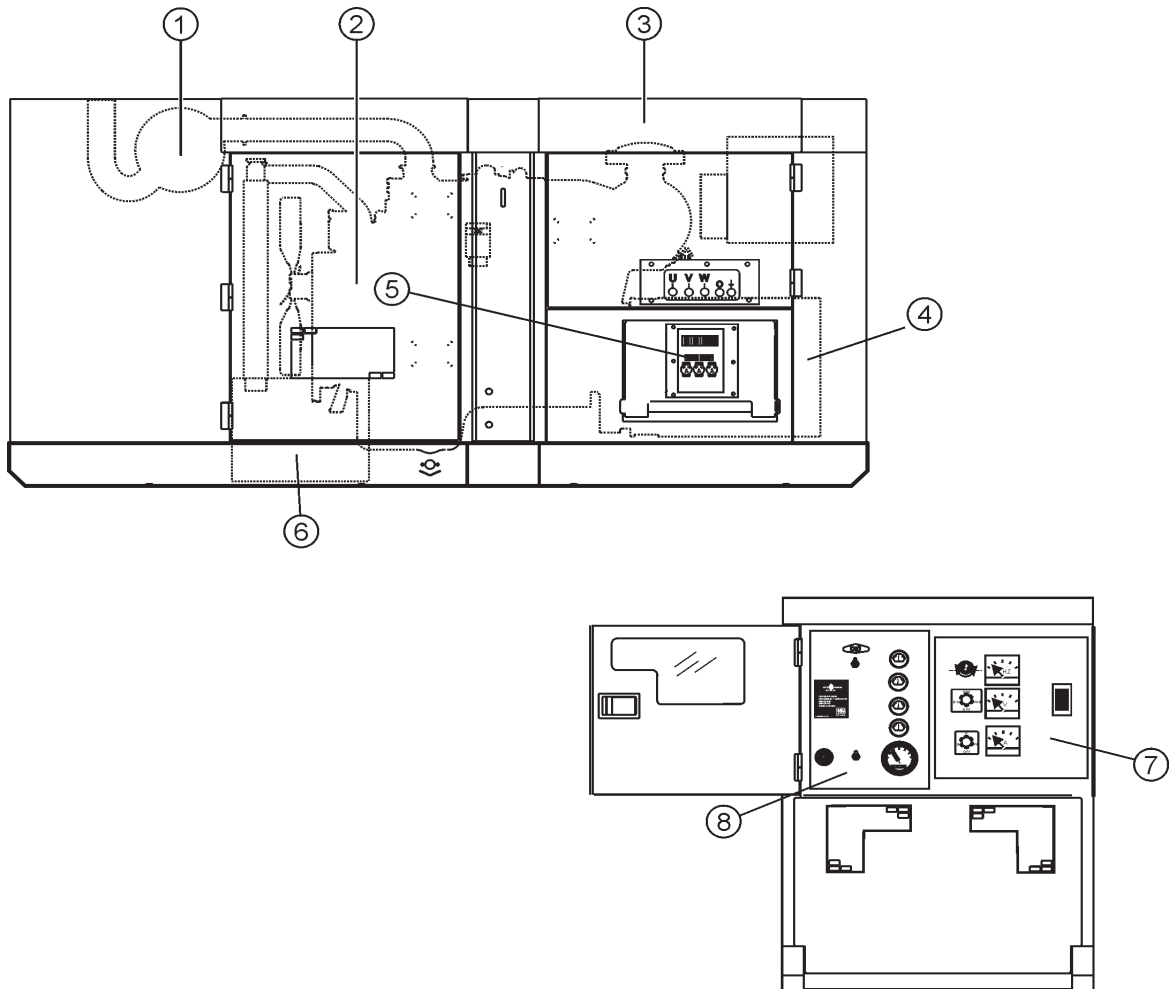


Figure 4. Major Components

Table 2. Generator Major Components	
ITEM NO.	DESCRIPTION
1	Muffler Assembly
2	Engine Assembly
3	Enclosure Assembly
4	Generator Assembly
5	Output Terminal Assembly
6	Battery Assembly
7	Generator Control Panel Assembly
8	Engine Operating Panel Assembly

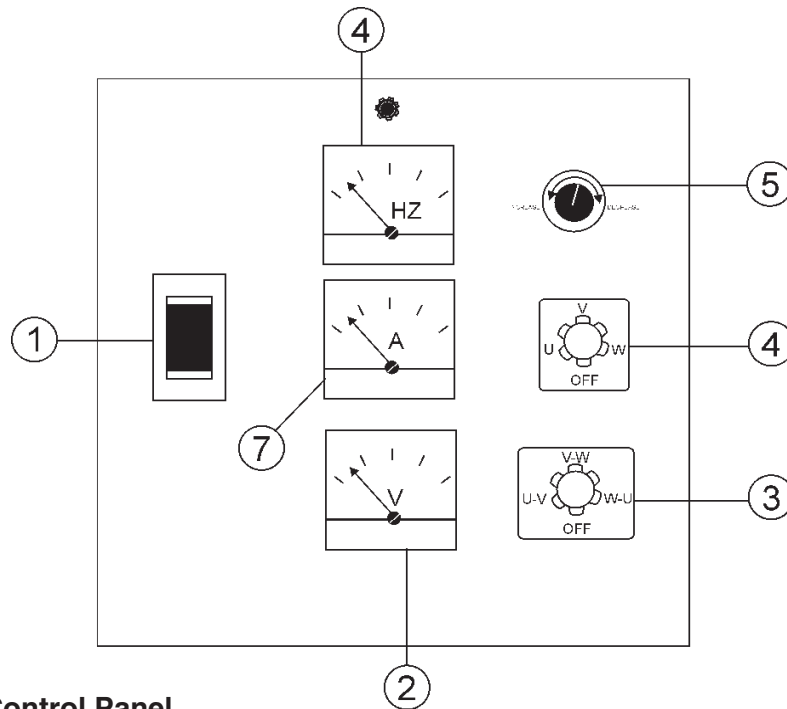


Figure 5. Generator Control Panel

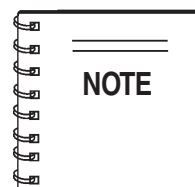
The definitions below describe the controls and functions of the DCA-150SSVU "Generator Control Panel" (Figure 5).

1. **Main Circuit Breaker** – This three-pole, 400 amp main breaker is provided to protect the **UVWO** output terminals from overload.
2. **AC Ammeter** – Indicates the amount of current the load is drawing from the generator per leg selected by the ammeter phase-selector switch.
3. **Ammeter Change-Over Switch** – This switch allows the AC ammeter to indicate the current flowing to the load connected to any phase of the output terminals, or to be switched off. This switch does not effect the generator output in any fashion, it is for current reading only.
4. **Voltmeter Change-Over Switch** – This switch allows the AC voltmeter to indicate phase to phase voltage between any two phases of the output terminals or to be switched off.
5. **Voltage Regulator Control** – Allows $\pm 15\%$ manual adjustment of the generator's output voltage.
6. **Frequency Meter** – Indicates the output frequency in hertz (Hz). Normally 60 Hz ± 1 Hz .
7. **AC Voltmeter** – Indicates the output voltage present at the **UVWO** terminals.

Located behind the generator control panel is the **Generator Control Box**. This box contains some of the necessary electronic components required to make the genertator function.

The "**Control Box**" is equipped with the following major components:

- Over-Current Relay
- Voltage Rectifier
- Starter Relay
- Engine Controller (Computer Controlled)
- Current Transformer
- Voltage Selector Switch



Remember the **overcurrent relay** monitors the current flowing from the **UVWO** output terminals to the load.

In the event of a short circuit or over current condition, it will automatically trip the main 400 amp breaker.

To restore power to the **UVWO** output terminals, press the **reset** button on the overcurrent relay and place the **main** circuit breaker in the **closed** position (**ON**).

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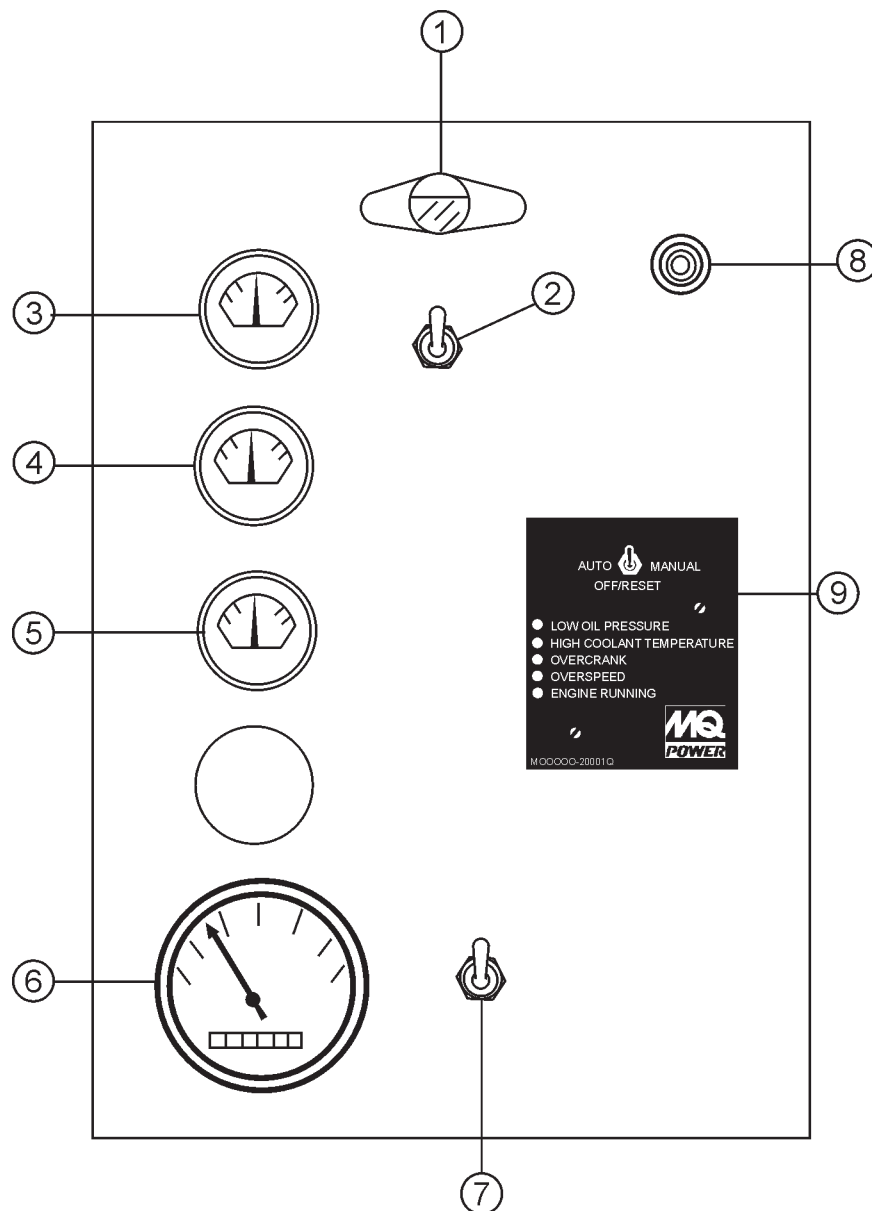


Figure 6. Engine Operating Panel

DCA-150SSVU — ENGINE OPERATING PANEL

The definitions below describe the controls and functions of the DCA-150SSVU "**Engine Operating Panel**" (Figure 6).

1. **Panel Light** – Normally used in dark areas or at night time. When activated, panel lights will illuminate. When the generator is not in use be sure to turn the panel light switch to the **OFF** position.
2. **Panel Light Switch** – When activated will turn on control panel light.
3. **Oil Pressure Gauge** – During normal operation this gauge should read between 44 to 73 psi. When starting the generator the oil pressure may read a little bit higher, but after the engine warms up the oil pressure should return to the green zone.
4. **Water Temperature Gauge** – During normal operation this gauge should read between 165° and 203°F.
5. **Charging Ammeter Gauge** – Indicates the current being supplied by the engine's alternator which provides current for generator's control circuits and battery charging system.
6. **Tachometer** – Indicates engine speed in RPM's for 60 Hz operation. This meter should indicate 1800 RPM's when the rated load is applied. In addition a built in hour meter will record the number of operational hours that the generator has been in use.
7. **Engine Speed Switch** - This switch controls the speed of the engine (low or high).
8. **Coolant Level Alarm Lamp** – Is lit (ON) when the coolant level is lower than the fixed amount and will cause the engine to stop. If the generator is not placed on **level** ground the coolant level switch may not function correctly.



9. **Auto On/Off Engine Controller** – This controller has a vertical row of status LED's (inset), that when lit, indicate that an engine malfunction (fault), has been detected. When a fault has been detected the engine controller will evaluate the fault. Any **major** fault will cause the controller to shutdown the generator.



During **cranking cycle**, The MPEC will attempt to crank the engine for 10 seconds before disengaging. If the engine does not engage (start) by the third attempt, the engine will be shutdown by the engine controller's "Over Crank Protection" mode. If the engine engages at a speed (RPM's) that is not safe, the controller will shutdown the engine by initializing the "**Over Speed Protection**" mode.

Also the engine controller will shutdown the generator in the event of low oil pressure, high coolant temperature, low coolant level, and loss of magnetic pickup. These conditions can be observed by monitoring the **LED** status indicators on the front of the controller module.

- A. **Off/Manual/Auto Switch** – This switch controls the running of the generator. If this switch is left in the "**OFF**" position, the generator will not run. When this switch is set to the **manual** position, the generator will start immediately.

If the generator is to be connected to a building's AC power source via a transfer switch (isolation), place the switch in the **auto** position. In this position the generator will monitor the AC line output from the building's power source.

- B. **Low Oil Pressure** – Indicates the engine pressure has fallen below 29 psi. The oil pressure is detected using variable resistive values from the oil pressure sending unit. This is considered a **major** fault.
- C. **High Coolant Temperature** – Indicates the engine temperature has exceeded 235° F. The engine temperature is detected using variable resistive values from the temperature sending unit. This is considered a **major** fault.
- D. **Overcrank Shutdown** – Indicates the unit has attempted to start a pre-programmed number of times, and has failed to start. The number of cycles and duration are programmable. It is pre-set at 3 cycles with a 10 second duration. This is considered a **major** fault.
- E. **Overspeed Shutdown** – Indicates the engine is running at an unsafe speed. This is considered a **major** fault.
- F. **Engine Running** – Indicates that engine is running at a safe operating speed.

DCA-150SSVU — OUTPUT TERMINAL PANEL FAMILIARIZATION

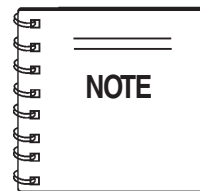
Output Terminal Familiarization

The “**Output Terminal Panel**” (Figure 7) is provided with the following:

- Three (3) 240V Output Receptacles, 50 amp
- Three (3) Circuit Breakers 240V @50 amps
- Two (2) 120V GFCI receptacles, 20 amp
- Two (2) GFCI Circuit Breakers 120V@ 20 amps
- One 400 Amp Main Circuit Breaker
- Five (5) Output Terminal Lugs

Output Terminal Panel

The **Output Terminal Panel** (Figure 7) shown below is located on the right-hand side (left from control panel) of the generator. Lift up on the cover to gain access to receptacles and terminal lugs.



Terminal legs “O” and “Ground” are considered **bonded grounds**.

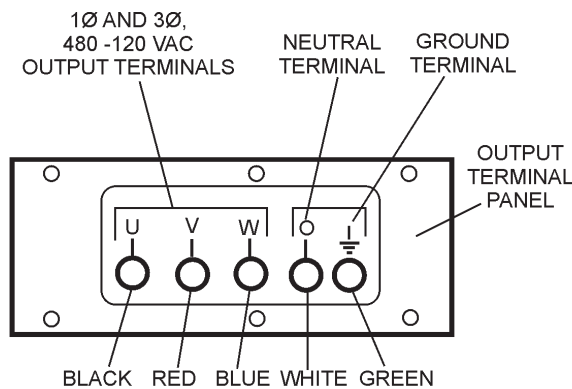
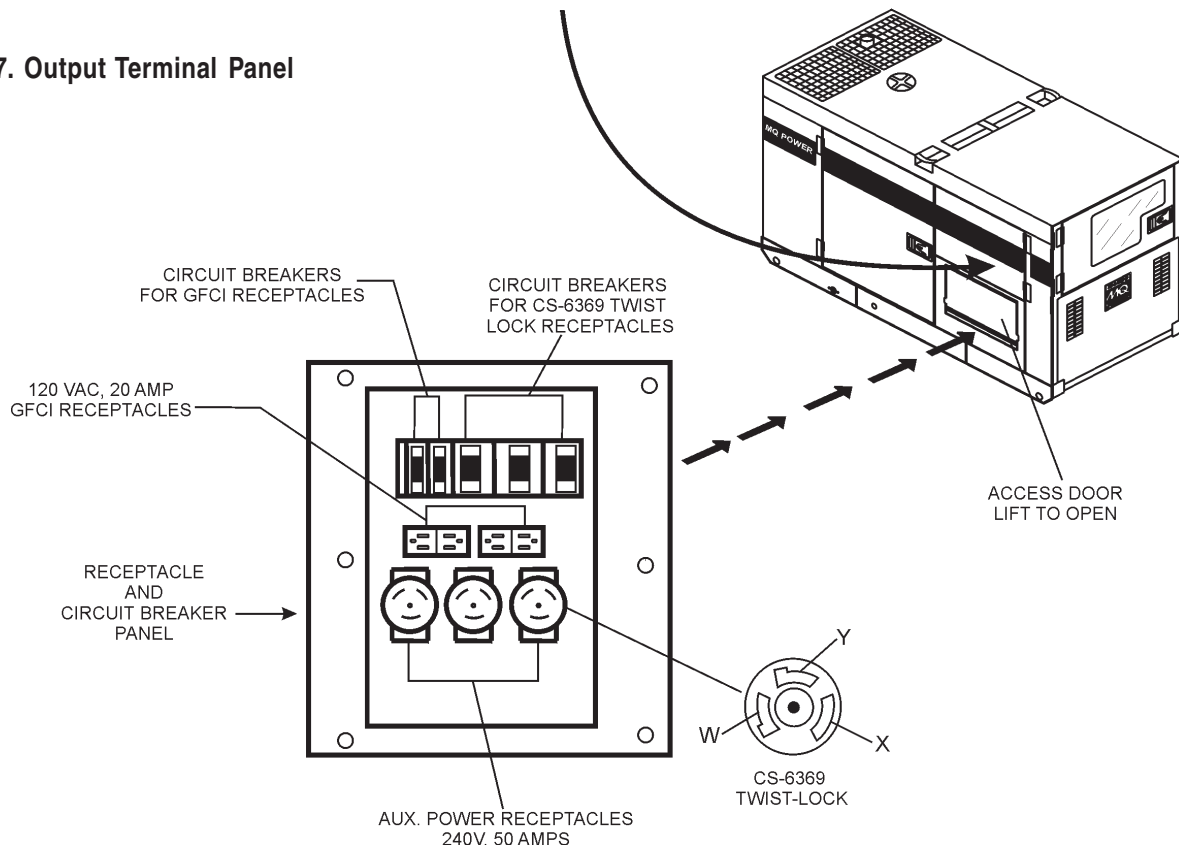


Figure 7. Output Terminal Panel



DCA-150SSVU — OUTPUT TERMINAL PANEL FAMILIARIZATION

120 VAC GFCI Receptacles

There are two 120 VAC, 20 amp GFCI (Duplex Nema 5-20R) receptacles provided on the output terminal panel. These receptacles can be accessed in **any voltage selector switch** position. Each receptacle is protected by a 20 amp circuit breaker. These breakers are located directly above the GFCI receptacles. Remember the load output (current) of both GFCI receptacles is dependent on the load requirements of the UVWO terminals.

Pressing the **reset** button resets the GFCI receptacle after being tripped. Pressing the "**Test Button**" (See Figure 8) in the center of the receptacle will check the GFCI function. Both receptacles should be tested at least once a month.

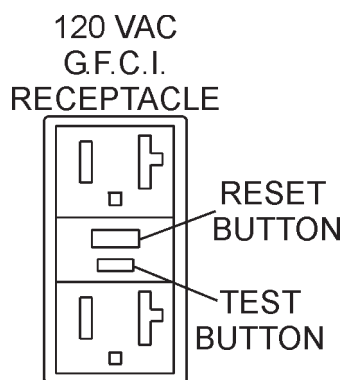


Figure 8. G.F.C.I. Receptacle

Twist Lock Dual Voltage 120/240 VAC Receptacles

There are three 240 VAC, 50 amp auxiliary twist-lock (CS-6369) receptacles (Figure 9) provided on the output terminal panel. These receptacles can **only** be accessed when the voltage selector switch is placed in the **single-phase 240/120 position**.

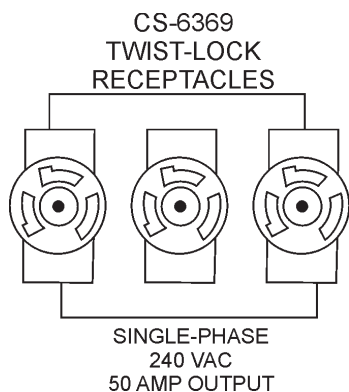


Figure 9. 240 VAC Twist-Lock Auxiliary Receptacles

Each auxiliary receptacle is protected by a 50 amp circuit breaker. These breakers are located directly above the GFCI receptacles. Remember the load output (current) on all three receptacles is dependent on the load requirements of the UVWO terminals.

Turn the **voltage regulator control knob** (Figure 10) on the control panel to obtain the desired voltage. Turning the knob clockwise will **increase** the voltage, turning the knob counter-clockwise will **decrease** the voltage.



Figure 10. Voltage Regulator Control Knob

Removing the Plastic Face Plate (UVWO Terminals)

The UVWO terminal lugs are protected by a plastic face plate cover (Figure 11). Un-lock the locking latch, and lift the terminal cover to gain access to the plastic face plate. Remove the screws securing the face plate to the terminal enclosure, then lift the plastic hinged face plate.

After the load wires have been securely attached to the UVWO terminals, reinstall the plastic face plate. Place the terminal cover in the down position and secure the locking latch.

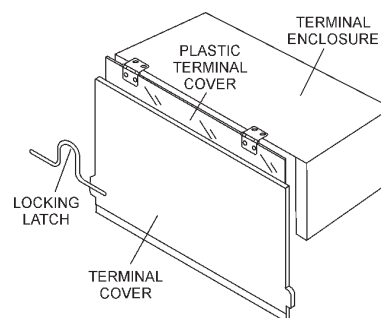


Figure 11. Plastic Face Plate (UVWO Terminals)

DCA-150SSVU — OUTPUT TERMINAL PANEL FAMILIARIZATION

Connecting Loads

Loads can be connected to the generator by the **UVWO** terminal lugs or the convenience receptacles. (See Figure 12). Make sure to read the operation manual before attempting to connect a load to the generator.

To protect the UVWO output terminals from overload, a 3-pole, 400 amp, **main** circuit breaker is provided. Make sure to switch **ALL** circuit breakers to the "OFF" position prior to starting the engine.

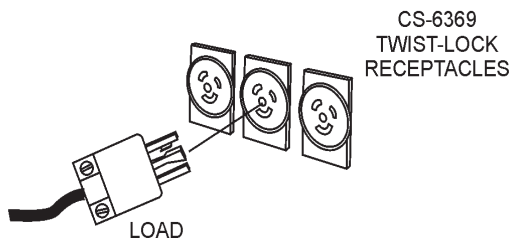
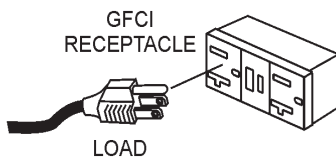
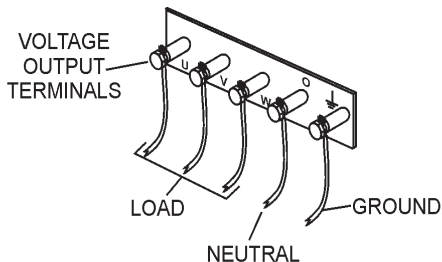


Figure 12. Connecting Loads

Over Current Relay

An **over current relay** (Figure 13) is connected to the main circuit breaker. In the event of an overload, both the circuit breaker and the over current relay may trip. If the circuit breaker can not be reset, the **reset button** on the over current relay must be pressed. The over current relay is located in the control box.

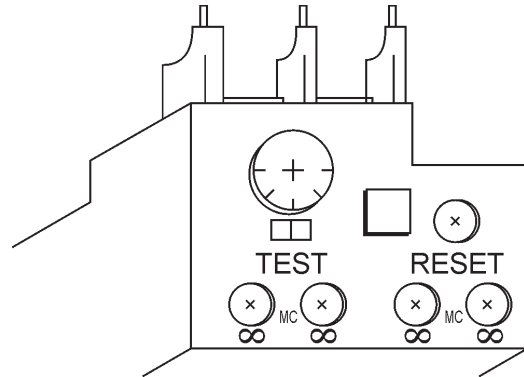


Figure 13. Over Current Relay

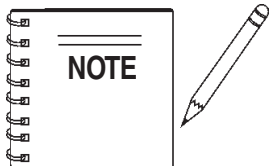
Maximum Output

The entire load connected to the UVWO terminal lugs, duplex and auxiliary receptacles must not exceed 132 kw in standby or 120 kw in prime output.

Single Phase Load

Always be sure to check the nameplate on the generator and equipment to insure the wattage, amperage and frequency requirements are satisfactorily supplied by the generator for operating the equipment.

Generally, the wattage listed on the nameplate of the equipment is its rated output. Equipment may require 130—150% more wattage than the rating on the nameplate, as the wattage is influenced by the efficiency, power factor and starting system of the equipment.



If wattage is not given on the equipment's name plate, approximate wattage may be determined by multiplying nameplate voltage by the nameplate amperage.

$$\text{WATTS} = \text{VOLTAGE} \times \text{AMPERAGE}$$

The power factor of this generator is 0.8. See Table 3 below when connecting loads.

Table 3. Power Factor By Load

Type Of Load	Power Factor
Single-phase induction motors	0.4 - 0.75
Electric heaters, incandescent lamps	1.0
Fluorescent lamps, mercury lamps	0.4 - 0.9
Electronic devices, communication equipment	1.0
Common power tools	0.8

Table 4. Cable Selection (60 Hz, Single Phase Operation)

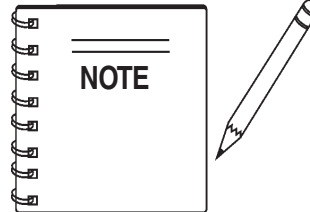
Current in Amperes	Load In Watts		Maximum Allowable Cable Length			
	At 120 Volts	At 240 Volts	#10 Wire	#12 Wire	#14 Wire	#16 Wire
2.5	300	600	1000 ft.	600 ft.	375 ft.	250 ft.
5	600	1200	500 ft.	300 ft.	200 ft.	125 ft.
7.5	900	1800	350 ft.	200 ft.	125 ft.	100 ft.
10	1200	2400	250 ft.	150 ft.	100 ft.	
15	1800	3600	150 ft.	100 ft.	65 ft.	
20	2400	4800	125 ft.	75 ft.	50 ft.	

CAUTION: Equipment damage can result from low voltage.

Three Phase Load

When calculating the power requirements for 3-phase power use the following equation:

$$\text{KVA} = \frac{\text{VOLTAGE} \times \text{AMPERAGE} \times 1.732}{1000}$$



Motors and motor-driven equipment draw much greater current for starting than during operation.

An inadequate size connecting cable which cannot carry the required load can cause a voltage drop which can burn out the appliance or tool and overheat the cable. See Table 5.

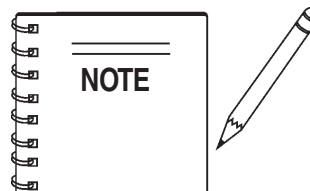
- When connecting a resistance load such as an incandescent lamp or electric heater, a capacity of up to the generating set's rated output (kW) can be used.
- When connecting a fluorescent or mercury lamp, a capacity of up to the generating set's rated output (kW) multiplied by 0.6 can be used.
- When connecting an electric drill or other power tools, pay close attention to the required starting current capacity.

When connecting ordinary power tools, a capacity of up to the generating set's rated output (kW) multiplied by 0.8 can be used.

CAUTION:



Before connecting this generator to any building's electrical system, a **licensed electrician** must install an **isolation (transfer) switch**. Serious injury or death may result without this transfer switch.



If 3Ø load (kVA) is not given on the equipment nameplate, approximate 3Ø load output may be determined by multiplying voltage by amperage by 1.732.

DCA-150SSVU — GENERATOR OUTPUTS

Generator Output Voltages

A wide range of voltages are available to supply voltage for many different applications. Voltages are selected by using the **voltage selector** switch (Figure 14). To obtain some of the voltages as listed in Table 5 (see below) will require a fine adjustment using the **voltage regulator (VR) control knob** located on the control panel.

Voltage Selector Switch

The **voltage selector** switch (Figure 14) is located above the UVWO Hard Wire Hook-up Panel. It has been provided for ease of voltage selection.

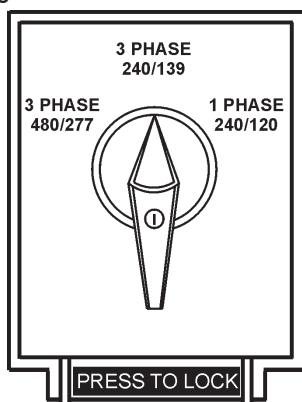


Figure 14. Voltage Selector Switch

Voltage Selector Switch Locking Button

The voltage selector switch has a locking button to protect the generator and load from being switched while the engine is running. To lock the voltage selector switch, **press** and **hold** the **red button** located at the bottom of the switch.

CAUTION:



NEVER change the position of the **voltage selector switch** while the engine is running. **ALWAYS** place circuit breaker in the open position before selecting voltage.

Generator Amperage

Tables 6 and 7 describe the generator's current output capability for both 1Ø-phase and 3Ø phase applications.

Table 6. Generator Ampere Ratings — 1Ø

kW	240V	120V
20	83	166
25	104	208
30	225	250
35	145	291
40	166	333
45	187	375
50	208	417
60 (Max)	250	500

Table 7. Generator Ampere Ratings — 3Ø

kW	208V	240V	480V
20	59	60	30
25	87	75	38
30	104	90	45
35	121	105	53
40	139	120	60
45	156	136	68
50	174	152	76
60	208	181	99

Table 5. Voltages Available

Three Phase (Switchable)	208 VOLT	220 VOLT	240 VOLT	416 VOLT	440 VOLT	480 VOLT
Single Phase (Switchable)	120 VOLT	127 VOLT	139 VOLT	240 VOLT	254 VOLT	277 VOLT

DCA-150SSVU — GENERATOR OUTPUTS/GAUGE READING

GFCI Receptacle Load Capability

The load capability of the GFCI receptacles is directly related to the voltage being supplied at either the UVWO terminals or the 3 twist lock auxiliary receptacles.

Tables 8 and 9 show what amount of current is available at the GFCI receptacles when the UVWO terminals and twist lock receptacles are in use. Be careful that your load does not to exceed the available current capability at the receptacles.

Table 8. GFCI Receptacle Load Capability

KVA in Use (UVWO Terminals)	Available Load Current (AMPS)
3Ø 240/480V	GFCI Duplex NEMA 5-20R 120V
82	0
77.8	5 amps per receptacle
73.7	10 amps per receptacle
69.5	15 amps per receptacle
65.4	20 amps per receptacle

Table 9. GFCI Receptacle Load Capability

KW in Use Twist-Lock (CS6369)	Available Load Current (AMPS)
1Ø 240/120V	GFCI Duplex NEMA 5-20R 120V
60	0
58.8	5 amps per receptacle
57.6	10 amps per receptacle
56.4	15 amps per receptacle
55.2	20 amps per receptacle

How to Read the Output Terminal Gauge.

The gauge and selector switch on the control panel **DO NOT** effect the generator output. They are provided to help observe how much power is being supplied, produced at the UVWO terminals lugs.

When the Voltage selector switch is in the 3Ø,240/139V position (See Figure 15), place the **AC Voltmeter Change-Over Switch** (Figure 16) to the W-U position and the **AC Ammeter Change-Over Switch** (Figure 18) to the U or W position to read the output on the selected leg.

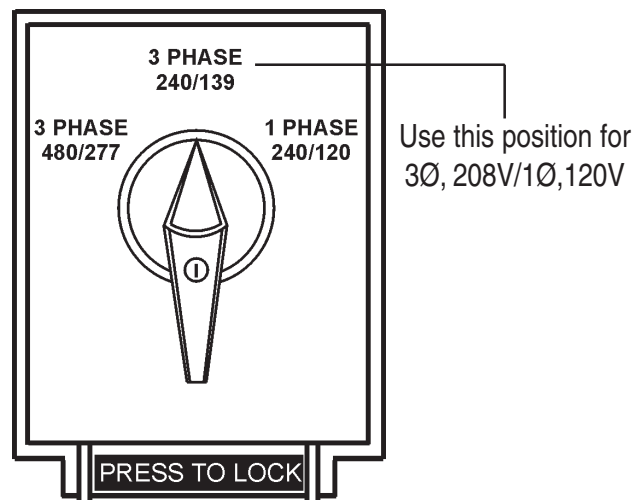


Figure 15. Voltage Selector Switch 240/139V Three Phase Position (for 3Ø, 208V, 120V voltage)

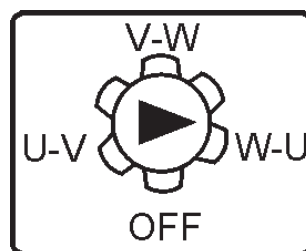


Figure 16. AC Voltmeter Change-Over Switch

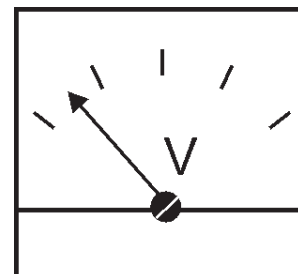


Figure 17. AC Voltmeter Gauge (Volt reading on W-U Lug)

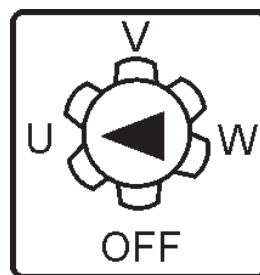


Figure 18. AC Ammeter Change-Over Switch

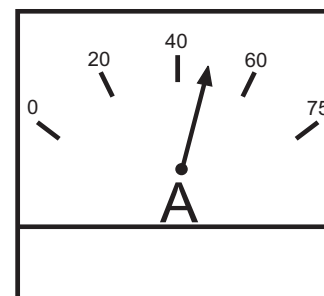
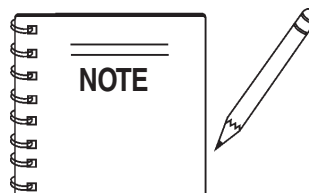


Figure 19. AC Ammeter Gauge (Amp reading on U lug)



The **ammeter** and **voltmeter** gauges are only active when the UVWO terminals are in use.

DCA-150SSVU — OUTPUT TERMINAL PANEL CONNECTIONS

UVWO Terminal Output Voltages

Various output voltages can be obtained using the UVWO output terminal lugs. The voltages at the terminals are dependent on the position of the **Voltage Selector Switch** and the adjustment of the **Voltage Regulator Control Knob**.

Remember the voltage selector switch determines the **range** of the output voltage. The voltage regulator (VR) allows the user to increase or decrease the selected voltage.

3Ø 240/139 UVWO Terminal Output Voltages

1. Place the voltage selector switch in the 3Ø 240/139 position as shown in Figure 20.

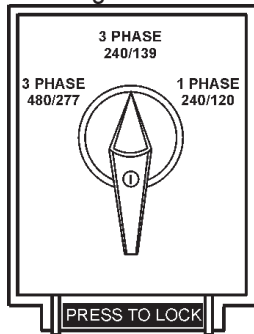


Figure 20. Voltage Selector Switch 240/139V Three-Phase Position

2. Connect the load wires to the UVWO terminals as shown in Figure 21.

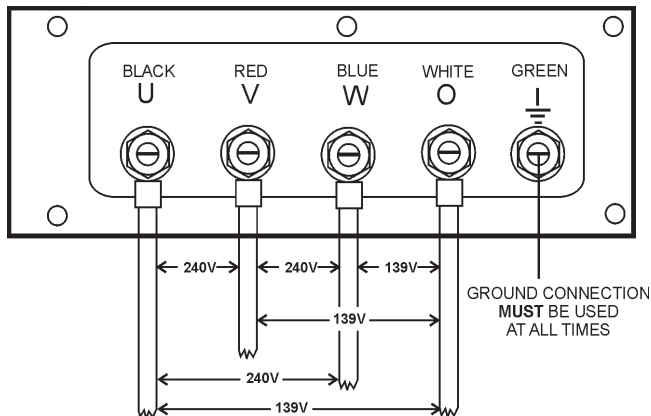


Figure 21. UVWO Terminal Lugs 240/139V Three Phase Connections

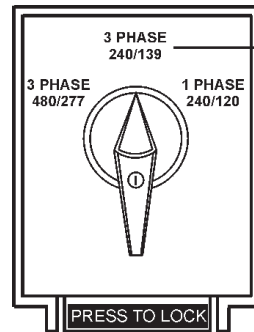
3. Turn the voltage regulator knob (Figure 22) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.



Figure 22. Voltage Regulator Knob (3Ø-139V/240V)

3Ø 208V/1Ø120V UVWO Terminal Output Voltages

1. Place the voltage selector switch in the 3Ø 240/139 position as shown in Figure 23.



Use this position for 3Ø-208 or 1Ø120V.

Figure 23. Voltage Selector Switch 3Ø-208V/1Ø-120V Three-Phase Position

2. Connect the load wires to the UVWO terminals as shown in Figure 24.

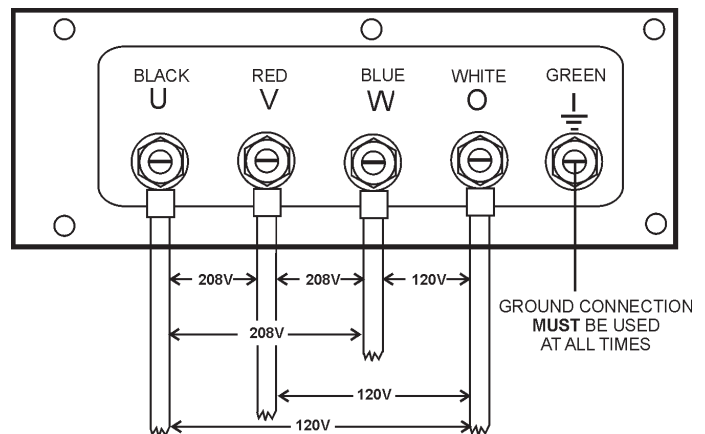
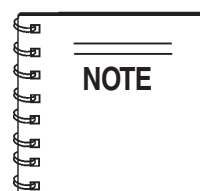


Figure 24. UVWO Terminal Lugs 3Ø-208V/120V Connections

3. Turn the voltage regulator knob (Figure 25) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.



Figure 25. Voltage Regulator Knob (3Ø-208V)



To achieve a 3Ø 208V output the voltage selector switch must be in the 3Ø-240/139 position and the voltage regulator must be adjusted to 208V.

DCA-150SSVU — OUTPUT TERMINAL PANEL CONNECTIONS

3Ø 480/277 UVWO Terminal Output Voltages

1. Place the voltage selector switch in the 3Ø 480/277 position as shown in Figure 26.

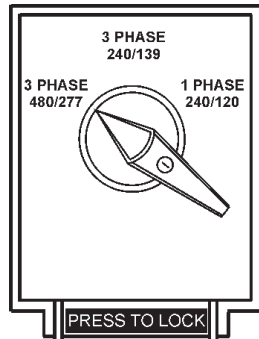


Figure 26. Voltage Selector Switch 480/277V Three-Phase Position

2. Connect the load wires to the UVWO terminals as shown in Figure 27.

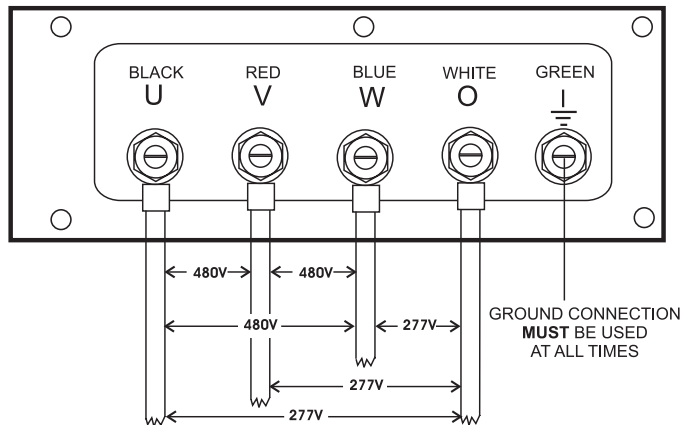


Figure 27. UVWO Terminal Lugs 480/277 Three Phase Connections

3. Turn the voltage regulator knob (Figure 28) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.



Figure 28. Voltage Regulator Knob (3Ø-480V/277V)

1Ø 240V/120V UVWO Terminal Output Voltages

1. Place the voltage selector switch in the 1Ø 240/120 position as shown in Figure 29.

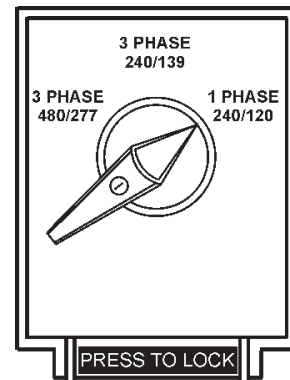


Figure 29. Voltage Selector Switch 240/120V Single-Phase Position

2. Connect the load wires to the UVWO terminals as shown in Figure 30.

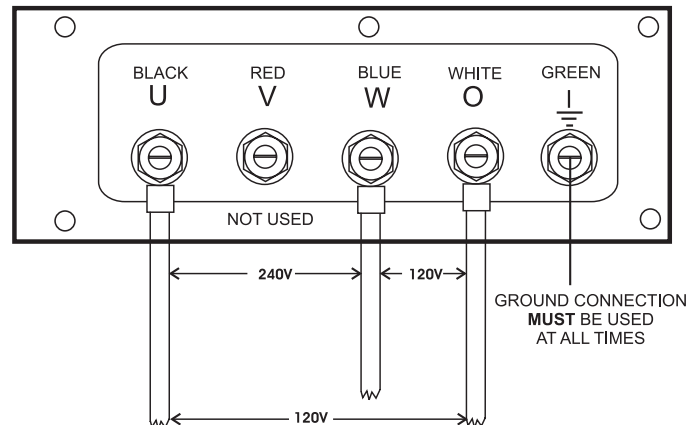


Figure 30. UVWO Terminal Lugs 1Ø-240V/120V Connections

3. Turn the voltage regulator knob (Figure 31) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.



Figure 31. Voltage Regulator Knob (1Ø-240V/120V)

Circuit Breakers

To protect the generator from an overload, a 3-pole, 400 amp, **main** circuit breaker is provided to protect the UVW output terminals from overload. In addition two single-pole, 20 amp **GFCI** circuit breakers are provided to protect the GFCI receptacles from overload. Three 50 amp **load** circuit breakers have also been provided to protect the auxiliary receptacles from overload. Make sure to switch **ALL** circuit breakers to the "OFF" position prior to starting the engine.

Lubrication Oil

Fill the engine crankcase with lubricating oil through the filler hole, but **DO NOT** overfill. Make sure the generator is level. and verify that the oil level is maintained between the two notches (Figure 32) on the dipstick. See Table 10 for proper selection of engine oil.

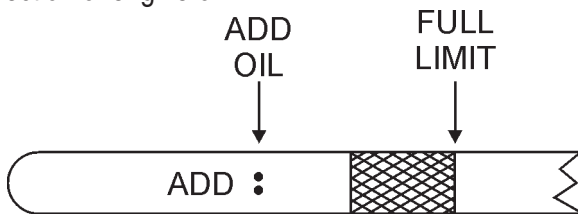


Figure 32. Engine Oil Dipstick

When checking the engine oil, be sure to check if the oil is clean. If the oil is not clean, drain the oil by removing the oil drain plug, and refill with the specified amount of oil as outlined in the **Volvo Engine Owner's Manual**. Oil should be warm before draining.

Other types of motor oils may be substituted if they meet the following requirements:

- API Service Classification CH-4
- API Service Classification CG-4
- API Service Classification CF-4
- ACEA Specification E3
- ACEA Specification E2

Table 10. Recommended Motor Oil

Temperature Range	Type Oil
77°F and greater (25°C and greater)	SAE15W-40 or SAE40
32°F to 77°F (0°C to 25°C)	SAE 10W-30 or SAE30
-22°F to -32°F (-30°C to 0°C)	SAE10W-30 or SAE10

Fuel Check

DANGER:



Fuel spillage on a **hot!** engine can cause a **fire** or **explosion**. If fuel spillage occurs, wipe up the spilled fuel completely to prevent fire hazards. **NEVER!** smoke around or near the generator.



Refilling the Fuel System

The DCA150SSVU (FEMA) is equipped with a **skid mounted** fuel tank (Figure 33). The skid type fuel system does not use the internal generator fuel tank.

ALWAYS fill the fuel tank with clean and fresh **#2 diesel fuel**. **DO NOT** fill the fuel tank beyond their capacities.

Pay attention to the fuel tank capacity when replenishing fuel. The fuel tank cap must be closed tightly after filling. Handle fuel in a safety container. If the container does not have a spout, use a funnel. Wipe up any spilled fuel immediately.

WARNING:



ONLY properly trained personel who have read and understand this section should refill the fuel tank system.

Refueling Procedure:

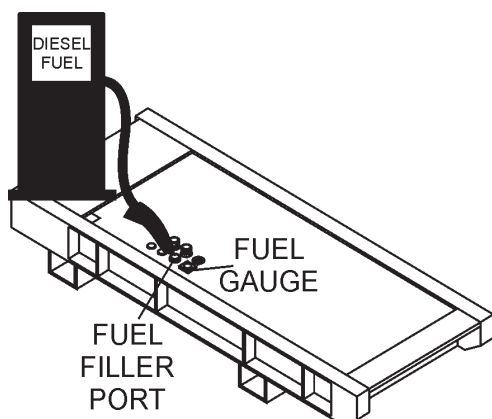


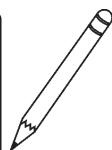
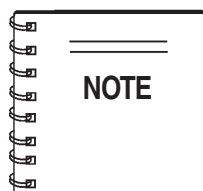
Figure 33. Skid Type Fuel Tank System

DANGER:

Diesel fuel and its vapors are dangerous to your health and the surrounding environment. Avoid skin contact and/or inhaling fumes.



1. **Level Tanks** – make sure fuel cells are level with the ground. Failure to do so will cause fuel to spill from the tank before reaching full capacity.



ONLY! use **#2 diesel fuel** when refueling.

WARNING:

DO NOT OVER-FILL fuel system. Leave room for fuel expansion. Fuel expands when heated.

Coolant (Ethylene Glycol [Green] / Water — 50/50 mix)

Use only drinkable tap water. If hard water or water with many impurities is used, the inside of the engine and radiator may become coated with deposits and cooling efficiency will be reduced.

An anticorrosion additive added to the water will help prevent deposits and corrosion in the cooling system. See the engine manual for further details.

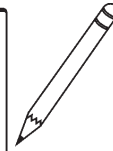
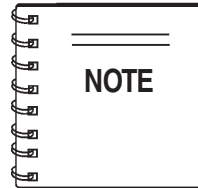
CAUTION:



If adding coolant/antifreeze mix to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. The

possibility of **hot!** coolant exists which can cause severe burns.

Day-to-day addition of coolant is done from the recovery tank. When adding coolant to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. See Table 11 for engine, radiator, and recovery tank coolant capacities. Make sure the coolant level in the recovery tank is always between the "H" and the "L" markings.



When the antifreeze is mixed with water, the antifreeze mixing ratio **must be** less than 50%.

Cleaning the Radiator

The engine may overheat if the radiator fins become overloaded with dust or debris. Periodically clean the radiator fins with compressed air. Cleaning inside the machine is dangerous, so clean only with the engine turned off and the **negative** battery terminal disconnected.

Air Cleaner

Periodic cleaning/replacement is necessary. Inspect it in accordance with the **Volvo Engine Owner's Manual**.

Fan Belt Tension

A slack fan belt may contribute to overheating, or to insufficient charging of the battery. Inspect the fan belt for damage and wear and adjust it in accordance with the **Volvo Engine Owner's Manual**.

The fan belt tension is proper if the fan belt bends 10 to 15 mm (Figure 34) when depressed with the thumb as shown below.

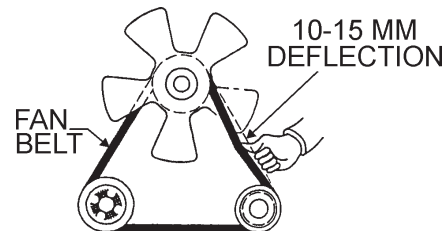


Figure 34. Fan Belt Tension

Table 11. Coolant Capacity

Engine and Radiator	6.9 Gal. (26 liters)
Reserve Tank	2 Quarts (1.9 liters)

Operation Freezing Weather

When operating in freezing weather, be certain the proper amount of antifreeze (Table 12) has been added.

Table 12. Anti-Freeze Operating Temperatures

Vol % Anti-Freeze	Freezing Point		Boiling Point	
	°C	°F	°C	°F
40	-24	-12	106	222
50	-37	-34	108	226

CAUTION:



NEVER! place hands near the belts or fan while the generator set is running.



Battery

This unit is of negative ground **DO NOT** connect in reverse. Always maintain battery fluid level between the specified marks. Battery life will be shortened, if the fluid level are not properly maintained. Add only distilled water when replenishment is necessary.

DO NOT over fill. Check to see whether the battery cables are loose. Poor contact may result in poor starting or malfunctions. **Always** keep the terminals firmly tightened. Coating the terminals with an approved battery terminal treatment compound. Replace battery with only recommended type battery. The battery type used in this generator is BCI Group 27.

The battery is sufficiently charged if the specific gravity of the battery fluid is 1.28 (at 68° F). If the specific gravity should fall to 1.245 or lower, it indicates that the battery is dead and needs to be recharged or replaced.

Battery Cable Installation

ALWAYS be sure the battery cables (Figure 35) are properly connected to the battery terminals as shown below. The **RED** cable is connected to the positive terminal of the battery, and the **BLACK** cable is connected to the negative terminal of the battery.

CAUTION:



ALWAYS disconnect the negative terminal **FIRST** and reconnect negative terminal **LAST**.

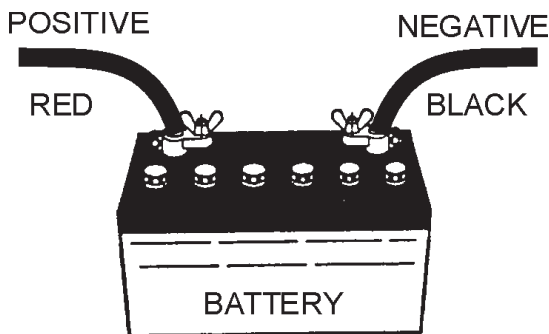
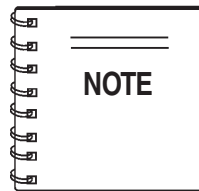


Figure 35. Battery Connections

When connecting battery do the following:

1. **NEVER** connect the battery cables to the battery terminals when the **ignition** switch is in either the **Pre-Heat, RUN, or START** position. **ALWAYS** make sure that the ignition switch is in the **STOP** position when connecting the battery.
2. Place a small amount of battery terminal treatment compound around both battery terminals. This will ensure a good connection and will help prevent corrosion around the battery terminals.



If the battery cable is connected incorrectly, electrical damage to the generator will occur. Pay close attention to the polarity of the battery when connecting the battery.

CAUTION:



Inadequate battery connections may cause poor starting of the generator, and create other malfunctions.

Alternator

The polarity of the alternator is negative grounding type. When an inverted circuit connection takes place, the circuit will be in short circuit instantaneously resulting the alternator failure.

DO NOT put water directly on the alternator. Entry of water into the alternator leads an electrolyte corrosion causing an alternator failure.

Before charging the battery with an external electric source, be sure to disconnect the battery cables.

Wiring

Inspect the entire generator for bad or worn electrical wiring or connections. If any wiring or connections are exposed (insulation missing) replace wiring immediately.

Piping and Hose Connection

Inspect all piping, oil hose, and fuel hose connections for wear and tightness. Tighten all hose clamps and check hoses for leaks.

If any hose (**fuel** or **oil**) lines are defective replace them immediately.

DCA-150SSVU — GENERATOR START-UP PROCEDURE (MANUAL)

WARNING:



The engine's exhaust contains harmful emissions. **ALWAYS have adequate ventilation when operating.** Direct exhaust away from nearby personnel.

BEFORE STARTING

Generator and Control Panel

CAUTION:



NEVER! manually start the engine with the **main**, **GFCI** or **auxiliary** circuit breakers in the **ON** (closed) position.

1. Be sure and place the **main**, **G.F.C.I.** and **aux.** circuit breakers (Figure 36) in the “**OFF**” position prior to starting the engine.

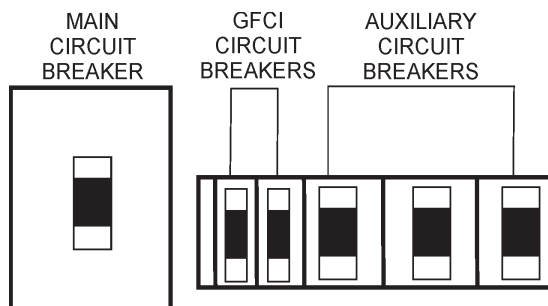


Figure 36. Main, Aux. and GFCI Circuit Breakers

2. Connect the load to the **UVWO** terminals or **auxiliary receptacles** as shown in Figure 37. These load connection points can be found on the output terminal panel. To gain access to the UVWO terminals or other power receptacles, unlock the access cover and lift the door.

The UVWO terminals are protected by a plastic cover, remove this cover to gain access to the terminals. Tighten terminal nuts securely to prevent load wires from slipping out.

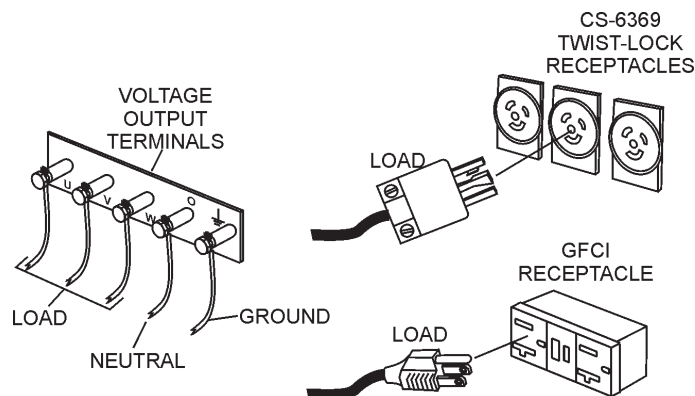


Figure 37. Load Connections

3. Close all engine enclosure doors (Figure 38).

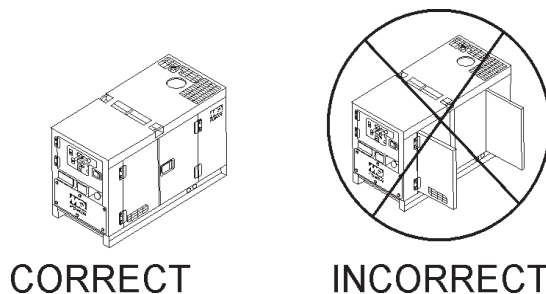


Figure 38. Engine Enclosure Doors

4. Verify that the coolant alarm lamp is **OFF** (Figure 39), and the generator is placed on a **flat level** surface.



Figure 39. Coolant Alarm Lamp

5. Place the voltage selector switch in the desired voltage position (Figure 40).

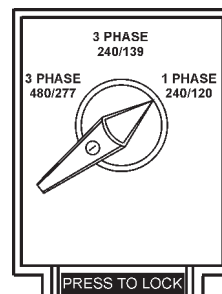


Figure 40. Voltage Selector Switch

DCA-150SSVU — GENERATOR START-UP PROCEDURE (MANUAL)

6. Set engine speed switch to "**LOW**" (Figure 41).

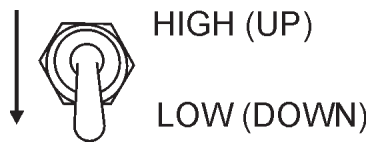


Figure 41. Engine Speed Switch (Low)

7. Place the Auto-Off/Reset-Manual switch in the "**MANUAL**" position to start the engine (Figure 42). Once the engine starts, let the engine run for 1-2 minutes. Listen for any abnormal noises.

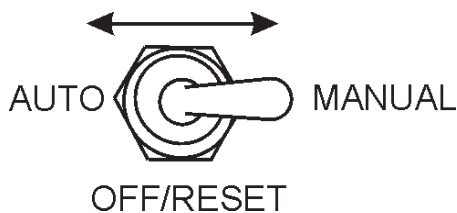


Figure 42. Auto-Off/Reset-Manual Switch

8. Once the engine is warm and the engine is running properly, set the engine speed switch to "**HIGH**" (Figure 43).

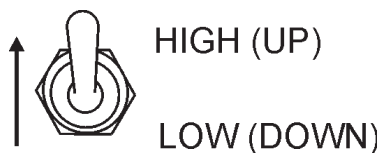


Figure 43. Engine Speed Switch (High)

9. Verify that the "**Engine Running**" status LED on the MPEC unit (Figure 44) is "**ON**" (lit) after the engine has been started.



Figure 44. Engine Running LED (ON)

10. The generator's frequency meter (Figure 45) displays the 60 cycle output frequency in **HERTZ**.

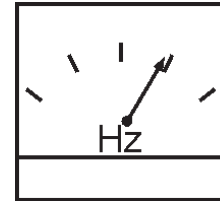


Figure 45. Frequency Meter (Hz)

11. The generator's voltage meter (Figure 46) displays the 120 VAC in **VOLTS**. If the voltage is not within the specified frequency tolerance,

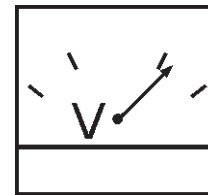


Figure 46. Voltmeter

12. Use the voltage adjustment control knob (Figure 47) to increase or decrease the desired voltage.



Figure 47. Voltage Adjust Control Knob

13. The ammeter (Figure 48) will indicate zero amps with no load applied. When a load is applied, this meter will indicate the amount of current that the load is drawing from the generator.

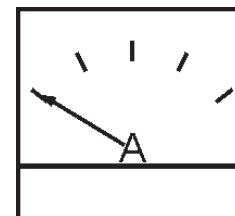


Figure 48. Ammeter (No Load)

DCA-150SSVU — GENERATOR START-UP PROCEDURE (MANUAL)

14. The engine oil pressure gauge (Figure 49) will indicate the oil pressure (kg/ cm²) of the engine. Under normal operating conditions the oil pressure is approximately

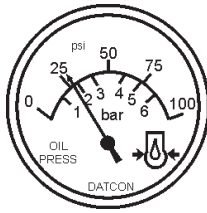


Figure 49. Oil Pressure Gauge

15. The coolant temperature gauge (Figure 50) will indicate the coolant temperature. Under normal operating conditions the coolant temperature is between 165 and 215 degrees fahrenheit.

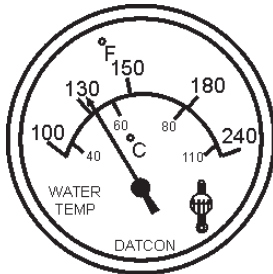


Figure 50. Coolant Temperature Gauge

16. The tachometer (Figure 51) will indicate the speed of the engine when the generator is operating. Under normal operating conditions this speed is approximately 1800 RPM's.

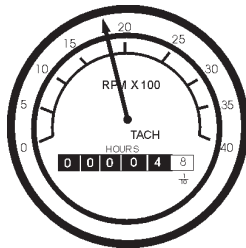


Figure 51. Engine Tachometer

17. Turn the **main**, **GFCI**, and **aux.** circuit breakers to the "ON" position (Figure 52).

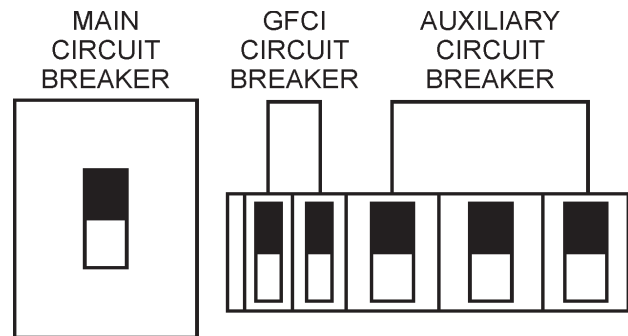


Figure 52. Main, AUX. and GFCI Circuit Breakers (ON)

18. Observe the generator's ammeter (Figure 53) and verify it reads the anticipated amount of current with respect to the load. The ammeter will only display a current reading if the load is in use.

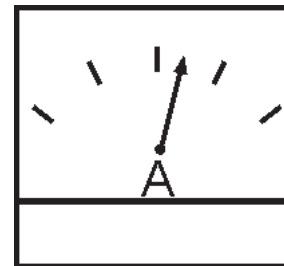


Figure 53. Ammeter (Load)

19. The generator will run until manually stopped or an abnormal condition occurs.

DCA-150SSVU — GENERATOR START-UP PROCEDURE (AUTO MODE)

DANGER:



Before connecting this generator to any building's electrical system, a **licensed electrician** must install an **isolation** (transfer) switch. Serious **injury** or **death** may result without this transfer switch.



CAUTION:

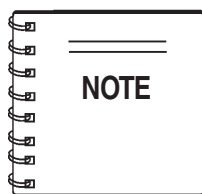


The **Engine Speed Switch** must be set to the **"HIGH"** position when running in the **Auto-Start** mode. Failing to set the switch in the proper position can result in damage to your generator when it turns on.

CAUTION:



When connecting the generator to a isolation (transfer) switch, **ALWAYS** have power applied to the generator's internal battery charger. This will ensure that the engine will not fail due to a dead battery.



When the generator is set in the **"AUTO"** mode, the generator will **automatically start** in the event of commercial power falling below a prescribed level by means of a contact closure that is generated automatically by a transfer switch.

3. Place the Off/Manual/Auto switch (Figure 55) in the **"AUTO"** position .



Figure 55. Off/Manual Auto Switch (AUTO)

4. Continue to follow the steps outlined in the **"Manual Start-up"** procedure (start at step 9, page 37).

WARNING:



When running the generator in the **"AUTO"** mode, remember the generator can start up at any time without warning. **NEVER** attempt to perform any maintenance when the generator is in the auto mode.

1. Perform steps 1 through 5 in the **Before Starting** section (page 36) as outlined in the **Manual Starting Procedure**.
2. Set the engine speed switch (Figure 54) to the **"HIGH"** position.

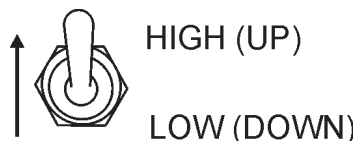


Figure 54. Engine Speed Switch (High)

DCA-150SSVU — GENERATOR SHUT-DOWN PROCEDURE

Shutdown Procedure - Engine Controller

To shutdown the generator use the following procedure:

1. Place both the **MAIN**, **GFCI** and **LOAD** circuit breakers as shown in Figure 36 to the "OFF" position".
2. Place the engine speed switch in the "LOW" position (Figure 56).

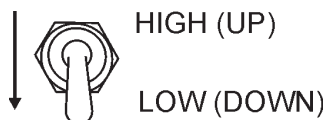


Figure 56. Engine Speed Switch (Low)

3. Let the engine cool by running it for 3-5 minutes with no load applied.
4. Place the Auto-Off/Reset-Manual switch (Figure 57) to the **OFF/Reset** position.



Figure 57. Off/Manual Auto Switch (Off)

5. Verify that the all status LED on the MPEC display (Figure 44) are "OFF" (not lit).
6. Remove all loads from the generator.

Emergency Shutdown Procedure - Engine Controller

1. To shut-down the engine in the event of an emergency, switch the **MAIN**, **GFCI** and **LOAD** (Figure 36) circuit breakers to "OFF" position.
2. Place the Auto-Off/Reset-Manual switch (Figure 57) to the "OFF/Reset" position.

CAUTION:



NEVER stop the engine suddenly except in an emergency. **DO NOT** use the emergency stop switch as a method of shutting down the generator. This switch is **ONLY** to be used in the event of an emergency.

TABLE 13. INSPECTION / MAINTENANCE		10 Hrs DAILY	250 Hrs	500 Hrs	1000 Hrs
ENGINE	Check Engine Fluid Levels	X			
	Check Fuel Filter/Water Separator	X			
	Check Air Cleaner Dust Unloader	X			
	Check for Leaks/Visual Walk Around	X			
	Check for Loosening of Parts	X			
	Replace Engine Oil and Filter * ¹		X		
	Service Battery		X		
	Clean Unit, Inside and Outside		X		
	Change Fuel Filter * ²			X	
	Clean Radiator and Check Coolant Protection Level			X	
	Replace Air Filter Element				X
	Test Thermostats				X
	Check all Hoses and Clamps/Flush Radiator				X
	Clean Inside of Fuel Tank				X
GENERATOR	Measure Insulation Resistance Over 3M ohms		X		

*¹ Replace engine oil and filter at 100 hours, first time only.

*² Replace fuel filter at 250 Hours, first time only.

General Inspection

Prior to each use, the generator should be cleaned and inspected for deficiencies. Check for loose, missing or damaged nuts, bolts or other fasteners. Also check for fuel, oil, and coolant leaks.

Engine Side (Refer to the Engine Instruction Manual)

Air Cleaner

Every 50 hours: Remove air cleaner element and clean the heavy duty paper element with kerosene, or foam element with liquid detergent and hot water. Wrap foam element in a cloth and squeeze dry. For heavy duty paper element, wipe excess kerosene with towel.

Air Cleaner with Dust Indicator

This indicator is attached to the air cleaner. When the air cleaner element is clogged, air intake restriction becomes greater and the dust indicator signal shows “**RED**” meaning the element needs changing. After changing the air element, press the dust indicator button to reset the indicator.

Service Daily

If the engine is operating in very **dusty** or **dry grass** conditions, a clogged air cleaner will result. This can lead to a loss of power, excessive carbon buildup in the combustion chamber and high fuel consumption. Change air cleaner more **frequently** if these conditions exist.

Fuel Addition

Add diesel fuel (the grade may vary according to season and locations). Always pour through the mesh filter.

Removing Water from the Fuel Tank

After prolonged use, water and other impurities accumulate in the bottom of the tank. Occasionally remove the drain cock and drain the contents. During cold weather, the more empty volume inside the tank, the easier it is for water to condense. This can be reduced by keeping the tank full with diesel fuel.

Air Removal

If air enters the fuel injection system of a diesel engine, starting becomes impossible. After running out of fuel, or after disassembling the fuel system, bleed the system according to the following procedure.

To restart after running out of fuel, turn the switch to the “ON” position for 15-30 seconds. Try again, if needed. This unit is equipped with an automatic air bleeding system.

Cleaning the Fuel Strainer

Clean the fuel strainer if it contains dust or water. Remove dust or water in the strainer cap and wash it in gasoline. Securely fasten the fuel strainer cap so that fuel will not leak. Check the fuel strainer every 200 hours of operation or once a month.

Check Oil Level

Check the crankcase oil level prior to each use, or when the fuel tank is filled. Insufficient oil may cause severe damage to the engine. Make sure the generator is level. The oil level must be between the two notches on the dipstick as shown in Figure 33.

Replacing Oil Filter

- Detach the oil filter by loosening center bolt and remove the element together with the filter body.
- Apply a film of oil to the gasket for the cartridge.
- Install the filter body together with the element and fix them by tightening the center bolt.
- After the oil cartridge has been replaced, the engine oil will drop slightly. Run the engine for a while and check for leaks before adding more oil if needed. Clean excessive oil from engine.

Replacing Fuel Filter

- Replace the fuel filter cartridge with new one every 400 hours or so.
- Loosen the drain plug at the lower top of the fuel filter. Drain the fuel in the fuel body together with the mixed water. **DO NOT** spill the fuel during disassembly.
- Vent any air.

Feed Pump Strainer Cleaning

The strainer is incorporated in the feed pump inlet side joint bolt. Clean the strainer with compressed air and rinse it in the fuel oil.

Flushing Out Radiator and Replacing Coolant

- Open both cocks located at the crankcase side and at the lower part of the radiator and drain coolant. Open the radiator cap while draining. Remove the overflow tank and drain.
- Check hoses for softening and kinks. Check clamps for signs of leakage.
- Flush the radiator by running clean tap water through radiator until signs of rust and dirt are removed. **DO NOT** clean radiator core with any objects, such as a screwdriver.
- Tighten both cocks and replace the overflow tank.
- Replace with coolant (Table 12 for correct mixture).
- Close radiator cap tightly.

CAUTION:



Allow engine to cool when flushing out radiator. Flushing the radiator while **hot!** will damage radiator.

Generator Storage

For long term storage of the generator the following is recommended:

- Fill the fuel tank completely. Treat with a fuel stabilizer if necessary.
- Completely drain the oil from the crankcase and refill if necessary with fresh oil.
- Clean the entire generator, internal and external.
- Cover the generating set and store in a clean, dry place.
- Disconnect the battery.
- Make sure engine coolant is at proper level.
- If generator is mounted on a trailer, jack trailer up and place on block so tires do touch the ground or remove tires.

Jacket Water Heater and Internal Battery Charger 120 VAC Input Receptacles (OPTIONAL)

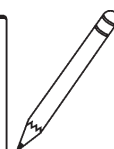
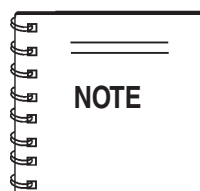
This generator is equipped with two 120 VAC, 20 amp input receptacles located on the output terminal panel.

The purpose of these receptacles is to provide power via commercial power to the **jacket water heater** and **internal battery charger**.

These receptacles will **ONLY** function when commercial power has been supplied to them (Figure 58). To apply commercial power to these receptacles, a power cord of adequate size will be required (See Table 4).

When using the generator in **hot** climates there is no reason to apply power to jacket water heater. However, if the generator will be used in **cold** climates it is always a good idea to apply power to the jacket water heater at all times. To apply power to the jacket water heater simply apply power to the jacket water heater receptacle via commercial power using an power cord of adequate size.

If the generator will be used daily, the battery should normally not require charging. If the generator will be idle (not used) for long periods of time, apply power to the battery charger receptacle via commercial power using an power cord of adequate size.



To ensure adequate starting capability, **always** have power applied to the generator's **internal battery charger**.

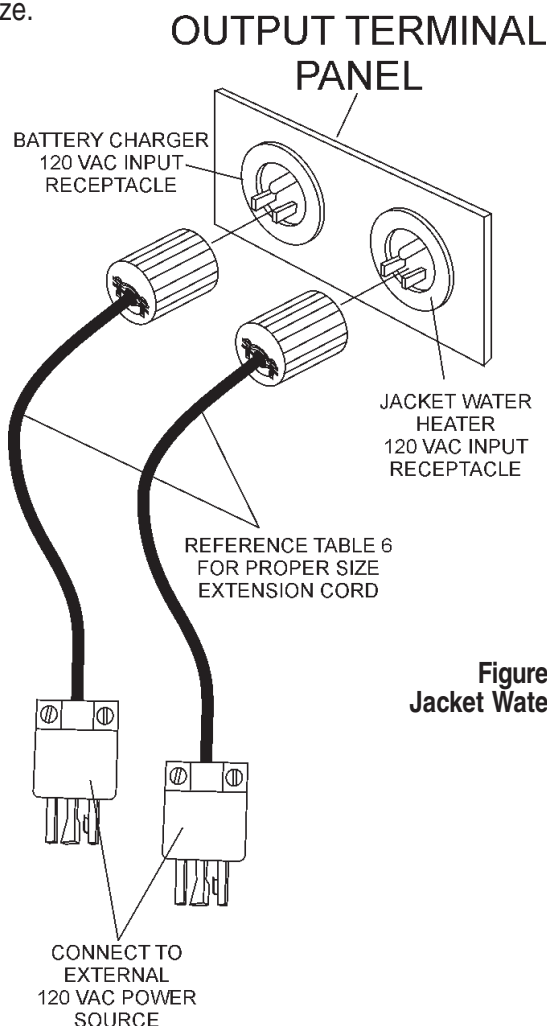


Figure 58. Battery Charger & Jacket Water Heater Power Connections

DCA-150SSVU — GENERATOR WIRING DIAGRAM

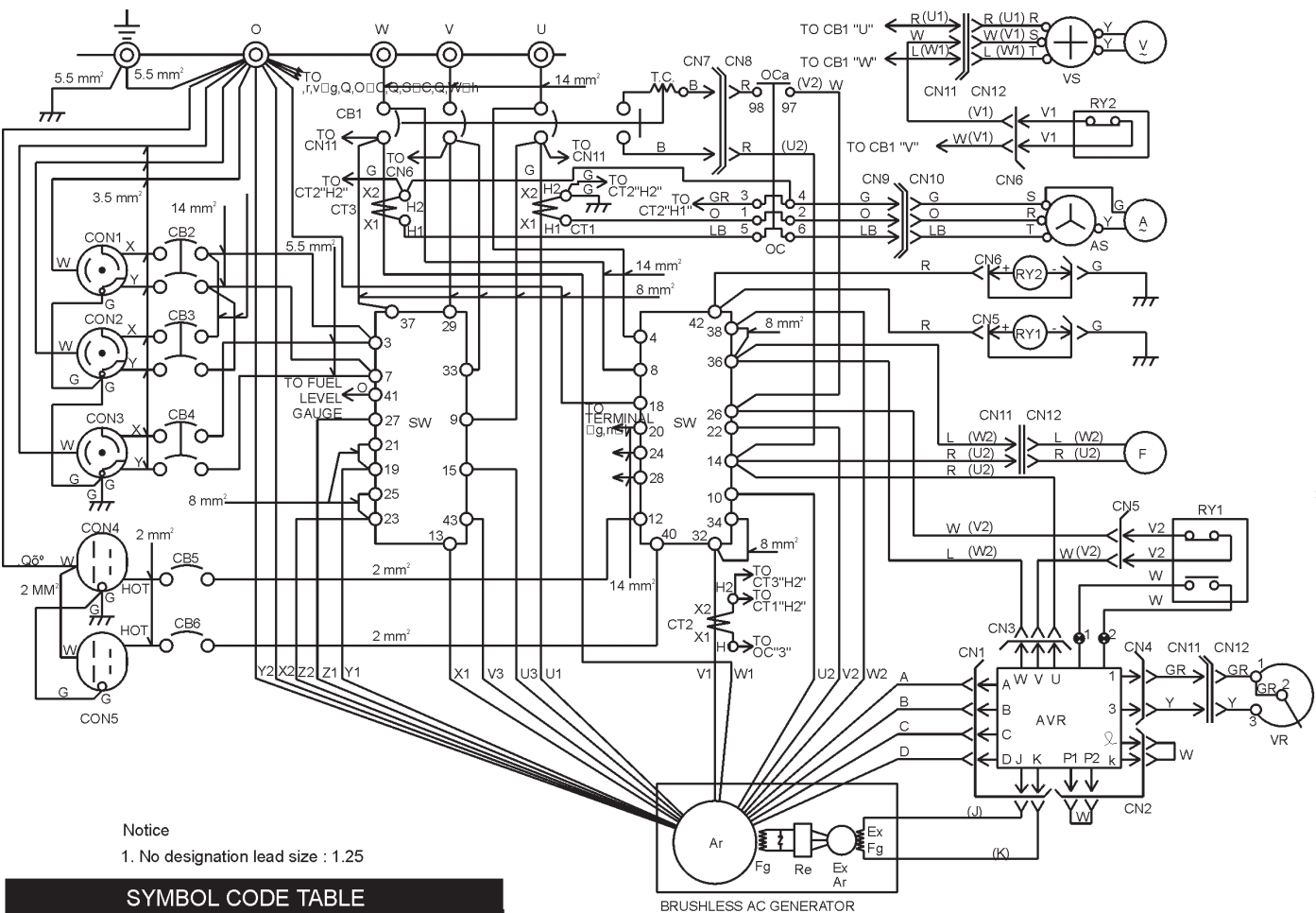


Figure 59. Generator Wiring Diagram

SYMBOL CODE TABLE	
SYMBOL	DESIGNATION
Ar	MAIN GENERATOR ARMATURE WINDING
Fg	MAIN GENERATOR FIELD WINDING
ExAr	EXCITER ARMATURE WINDING
ExFg	EXCITER FIELD WINDING
Re	RECTIFIER
AVR	AUTOMATIC VOLTAGE REGULATOR
VR	VOLTAGE REGULATOR (RHEOSTAT)
CT 1,2,3	CURRENT TRANSFORMER
AS	CHANGE-OVER SWITCH, AMMETER
$\bar{A}$	AC. AMMETER
VS	CHANGE-OVER SWITCH, VOLTMETER
$\bar{V}$	AC. VOLTMETER
F	FREQUENCY METER
Cb1	CIRCUIT BREAKER
CB 2,3,4	CIRCUIT BREAKER
CB 5,6	CIRCUIT BREAKER
CON 1,2,3	RECEPTACLE
CON 4,5	RECEPTACLE
OC	OVER CURRENT RELAY
SW	SELECTOR SWITCH
RY1,2	RELAY UNIT

CODE/ WIRE COLOR			
B	BLACK	R	RED
L	BLUE	W	WHITE
BR	BROWN	Y	YELLOW
G	GREEN	LB	LIGHT BLUE
GR	GRAY	LG	LIGHT GREEN
V	VIOLET	O	ORANGE
P	PINK		

CONNECTOR ARRANGEMENT (WIRING VIEW)

DCA-150SSVU — ENGINE WIRING DIAGRAM (MPEC)

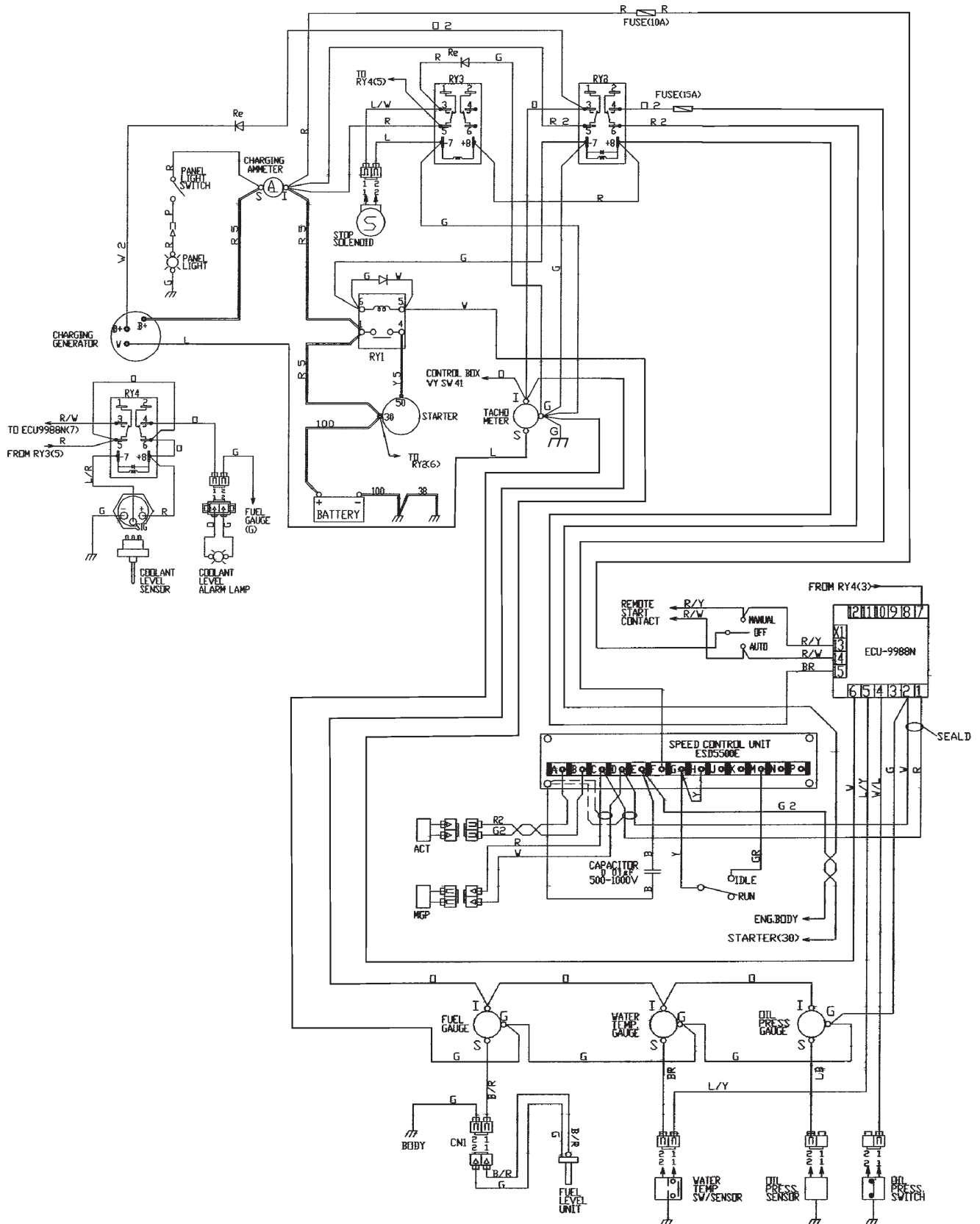


Figure 60. Engine Wiring Diagram (Controller)

DCA-150SSVU — TROUBLESHOOTING (ENGINE)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use the tables shown for diagnosis based on the Engine Troubleshooting (Table 14). If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 14. ENGINE TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine does not start.	No fuel?	Replenish fuel.
	Air in the fuel system?	Bleed system.
	Water in the fuel system?	Remove water from fuel tank.
	Fuel pipe clogged?	Clean fuel pipe.
	Fuel filter clogged?	Clean or change fuel filter.
	Excessively high viscosity of fuel or engine oil at low temperature?	Use the specified fuel or engine oil.
	Fuel with low cetane number?	Use the specified fuel.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Incorrect injection timing?	Adjust.
	Fuel cam shaft worn?	Replace.
	Injection nozzle clogged?	Clean injection nozzle.
	Injection pump malfunctioning?	Repair or replace.
	Seizure of crankshaft, camshaft, piston, cylinder liner or bearing?	Repair or replace.
	Compression leak from cylinder?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.
	Improper valve timing?	Correct or replace timing gear.
	Piston ring and liner worn?	Replace.
	Excessive valve clearance?	Adjust.
Starter does not run.	Starter malfunctioning?	Repair or replace.
	Wiring disconnected?	Connect wiring.

TABLE 14. ENGINE TROUBLESHOOTING (CONTINUED)

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine revolution is not smooth.	Fuel filter clogged or dirty?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Injection pump malfunctioning?	Repair or replace.
	Incorrect nozzle opening pressure?	Adjust.
	Injection nozzle stuck or clogged?	Repair or replace.
	Fuel over flow pipe clogged?	Clean.
	Governor malfunctioning?	Repair.
Either white or blue exhaust gas is observed.	Excessive engine oil?	Reduce to the specified level.
	Piston ring and liner worn or stuck?	Repair or replace.
	Incorrect injection timing?	Adjust.
	Deficient compression?	Adjust top clearance.
Either black or dark gray exhaust gas is observed.	Overload?	Lessen the load.
	Low grade fuel used?	Use the specified fuel.
	Fuel filter clogged?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Deficient nozzle injection?	Repair or replace the nozzle.
Deficient output.	Incorrect injection timing?	Adjust.
	Engine's moving parts seem to be seizing?	Repair or replace.
	Uneven fuel injection?	Repair or replace the injection pump.
	Deficient nozzle injection?	Repair or replace the nozzle.
	Compression leak?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.

DCA-150SSVU — TROUBLESHOOTING (GENERATOR/ENGINE)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use the tables shown for diagnosis based on the Generator Troubleshooting (Table 15) . If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 15. GENERATOR TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
No Voltage Output	AC Voltmeter defective?	Check output voltage using a voltmeter.
	Is wiring connection loose?	Check wiring and repair.
	Is AVR defective?	Replace if necessary.
	Defective Rotating Rectifier?	Check and replace.
Low Voltage Output	Is engine speed correct?	Turn engine throttle lever to "High".
	Is wiring connections loose?	Check wiring and repair.
	Defective AVR?	Replace if necessary.
High Voltage Output	Is wiring connections loose?	Check wiring and repair.
	Defective AVR?	Replace if necessary.
Circuit Breaker Tripped	Short Circuit in load?	Check load and repair.
	Over current?	Confirm load requirements and reduce.
	Defective circuit breaker?	Check and replace.
	Over current Relay actuated?	Confirm load requirement and replace.

DCA-150SSVU — TROUBLESHOOTING (ENGINE CONTROLLER)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use the table shown below for diagnosis based on the MPEC Troubleshooting (Table 16). If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 16. ENGINE CONTROLLER TROUBLESHOOTING

Sympton	Possible Cause	Solution
Low oil pressure light is on.	Low oil level?	Fill oil level.
	Oil pressure sending unit failure?	Replace oil pressure sending unit.
	Time delay malfunction in Controller?	Refer to dealer.
	Wire shorted?	Inspect/repair wire.
Low coolant level light is on.	Low coolant level?	Fill coolant level.
	Sending unit failure?	Replace sending unit.
	Low battery voltage?	Replace/charge battery.
High coolant temperture light is on.	Fan belt tension incorrect?	Tighten/replace fan belt.
	Air flow is not circulation through radiator?	Clean/repair radiator grill.
	Doors open?	Close doors.
	Exhaust leaking?	Replace/repair gaskets or faulty part.
	Generator being overloaded?	Check/reduce load.
	Thermostat failure?	Replace thermostat.
	Air intake blocked?	Clear all air intakes.
	Temperature switch failure?	Replace temperature switch.
Overcrank light is on.	No or low Fuel?	Fill fuel level.
	Controller needs to be calibrated?	Refer to dealer.
Overspeed light is on.	RPM engine speed too high?	Adjust RPM.
	Governor actuator needs to be adjusted?	Adjust governor actuator.
	Governor controller needs to be adjusted?	Adjust governor controller.
	Engine Controller needs to be calibrated?	Refer to dealer.
Loss of MPU light(s) or on.	Magnetic pick up out of adjustment?	Adjust magnetic pick up.
	Magnetic pick up dirty?	Clean magnetic pick up.

EXPLANATION OF CODE IN REMARKS COLUMN

How to read the marks and remarks used in this parts book.

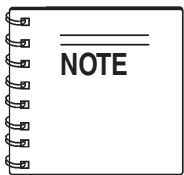
Items Found In the “Remarks” Column

Serial Numbers-Where indicated, this indicates a serial number range (inclusive) where a particular part is used.

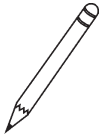
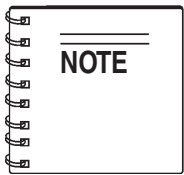
Model Number-Where indicated, this shows that the corresponding part is utilized only with this specific model number or model number variant.

Items Found In the “Items Number” Column

All parts with same symbol in the number column, *, #, +, %, or <, belong to the same assembly or kit



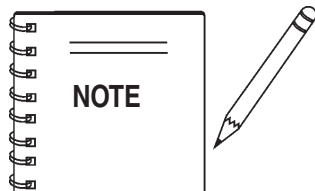
If more than one of the same reference number is listed, the last one listed indicates newest (or latest) part available.



The contents of this catalog are subject to change without notice.

DCA-150SSVU/VOLVO TAD720GE DIESEL ENGINE 1 TO 3 UNITS

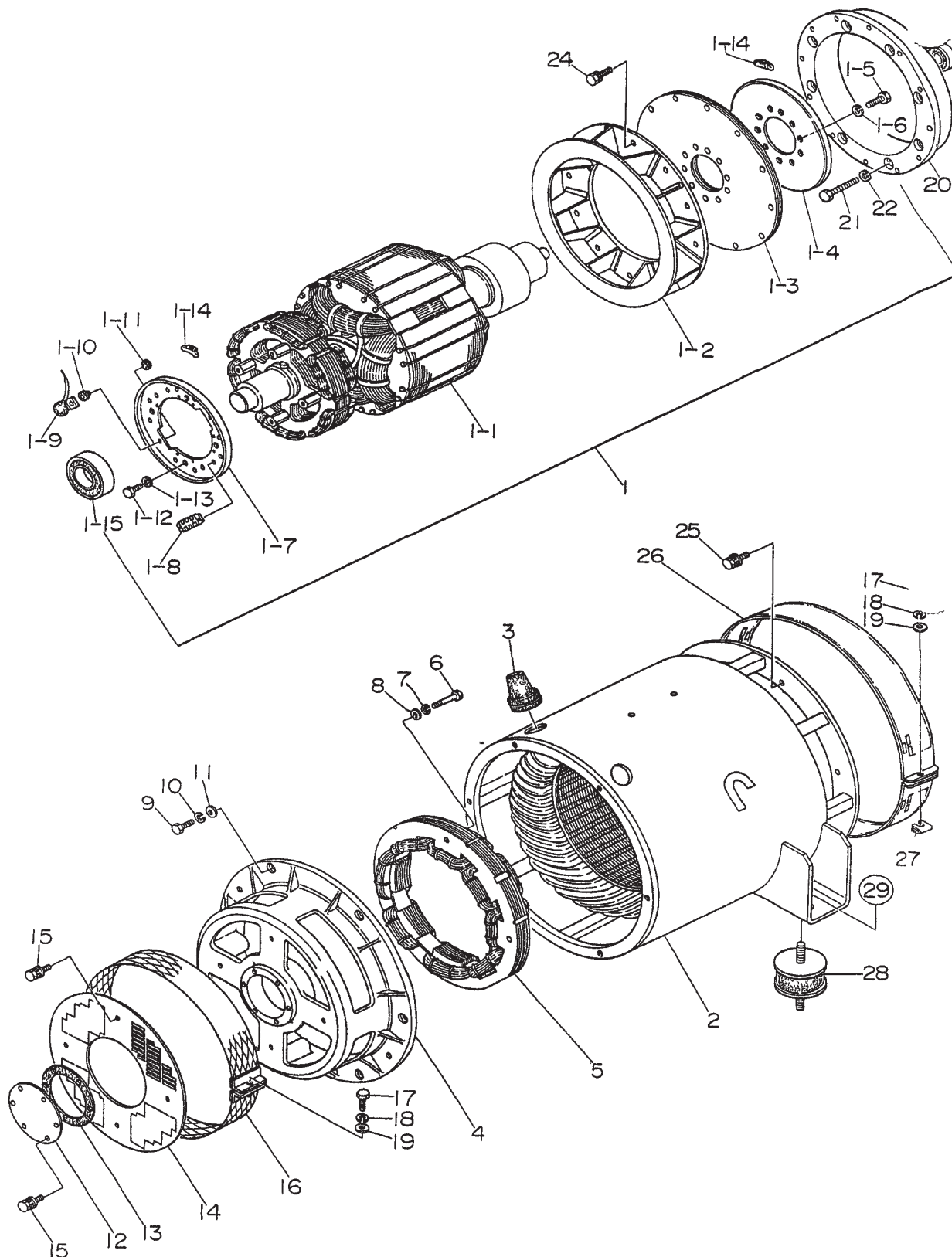
Qty.	P/N	Description
1	0601820671	AUTOMATIC VOLTAGE REGULATOR
1	47530102	KNOB, SELECTOR SWITCH
1	0601840073	RHEOSTAT, VOLTAGE REGULATOR
1	0601840121	KNOB, RHEOSTAT
3	978515	V-BELT, ALTERNATOR
3	978750	V-BELT, FAN
20	V3831236	OIL FILTER
20	V3825133	FUEL FILTER
10	V20405830	AIR ELEMENT
1	V20405972	RADIATOR HOSE, UPPER
1	V20405956	RADIATOR HOSE, LOWER
1	0602103092	LAMP, PILOT ALARM
1	0601810245	BULB, PILOT LAMP
1	0602123263	WATER TEMPERATURE UNIT
1	0602122272	OIL PRESSURE UNIT
1	0605505070	FUEL TANK CAP
1	M9310000103	ENCLOSURE CAP
1	M1483600204	ENCLOSURE CAP CHAIN ASSEMBLY
1	0602123261	WATER TEMPERATURE UNIT
2	0601808803	CIRCUIT BREAKER, QOU120B 20A
3	0601808804	CIRCUIT BREAKER, QOU250B 50A
3	V20430640	FILTER, WATER SEPARATOR
1	ECU9988N150V	CONTROLLER ECU



Part number on this Suggested Spare Parts list may supercede/replace the P/N shown in the text pages of this book.

DCA-150SSVU — GENERATOR ASSY.

GENERATOR ASSY.



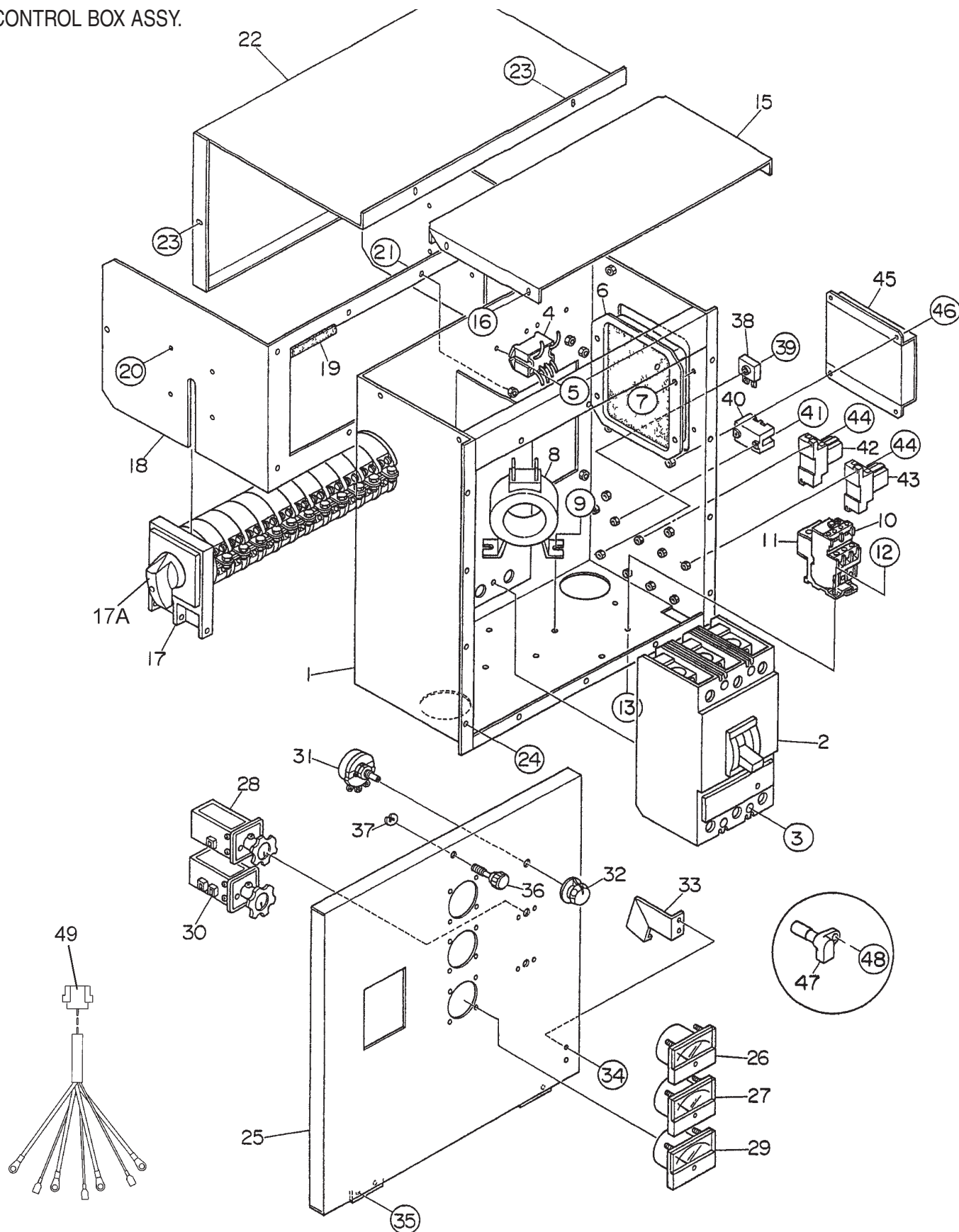
DCA-150SSVU — GENERATOR ASSY.

GENERATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	C0110000402	ROTOR ASSEMBLY	1	INCLUDES ITEM W/*
1-1*		FIELD ASSEMBLY	1	
1-2*	8131070013	FAN	1	
1-3*	B131611014	COUPLING DISK	8	
1-4*	8131015003	BALANCING PLATE	1	PURCHASE 1-14 AS A SET
1-5*	0012112035	HEX. HEAD BOLT	10	
1-6*	0042612000	SPRING WASHER	10	
1-7*	8101026013	SET PLATE, RECTIFIER	1	PURCHASE 1-14 AS A SET
1-8*	0601821349	RECTIFIER	2	PT 3610
1-9*	0601822601	SURGE ABSORBER	1	ERZ- M14JK621A
1-10*	8001020004	INSULATOR WASHER	1	
1-11*	8001020504	INSULATOR WASHER	1	
1-12*	0010110020	HEX. HEAD BOLT	4	
1-13*	0040010000	SPRING WASHER	4	
1-14*	0601000209	BALANCING WEIGHT KIT	1	
1-15*	0076506312	BEARING	1	6312SN34DDUC3
2	C0130000003	STATOR ASSEMBLY	1	C0134000304
3	0845041804	GROMMET	2	
4	8131315202	END BRACKET	1	
5	8101350013	FIELD ASSEMBLY EXCITER	1	
6	0012110060	HEX. HEAD BOLT	4	
7	0042610000	SPRING WASHER	4	
8	0041210000	PLAIN WASHER	4	
9	0010112035	HEX. HEAD BOLT	6	
10	0040012000	SPRING WASHER	6	
11	0041212000	PLAIN WASHER	6	
12	8131310104	COVER, BEARING	1	
13	8131312204	GASKET, BEARING	1	
14	8131331003	COVER, END BRACKET	1	
15	0017106012	HEX. HEAD BOLT	10	
16	8101333003	COVER, END BRACKET	1	
17	0010106030	HEX. HEAD BOLT	2	
18	0040006000	SPRING WASHER	2	
19	0041206000	PLAIN WASHER	2	
20	M3163400503	COUPLING RING	1	
21	0010310075	HEX. HEAD BOLT	8	
22	0042510000	SPRING WASHER	8	
23	0070506306	BEARING	1	6306ZZ
24	0012810030	HEX. HEAD BOLT	12	
25	0012810030	HEX. HEAD BOLT	12	
26	C0131300004	COVER, FAN	1	
27	0600815000	NUT	1	
28	060500013	RUBBER SUSPENSION	2	
29	0030016000	HEX. NUT	2	
29	0040016000	SPRING WASHER	2	

DCA-150SSVU — CONTROL BOX ASSY.

CONTROL BOX ASSY.



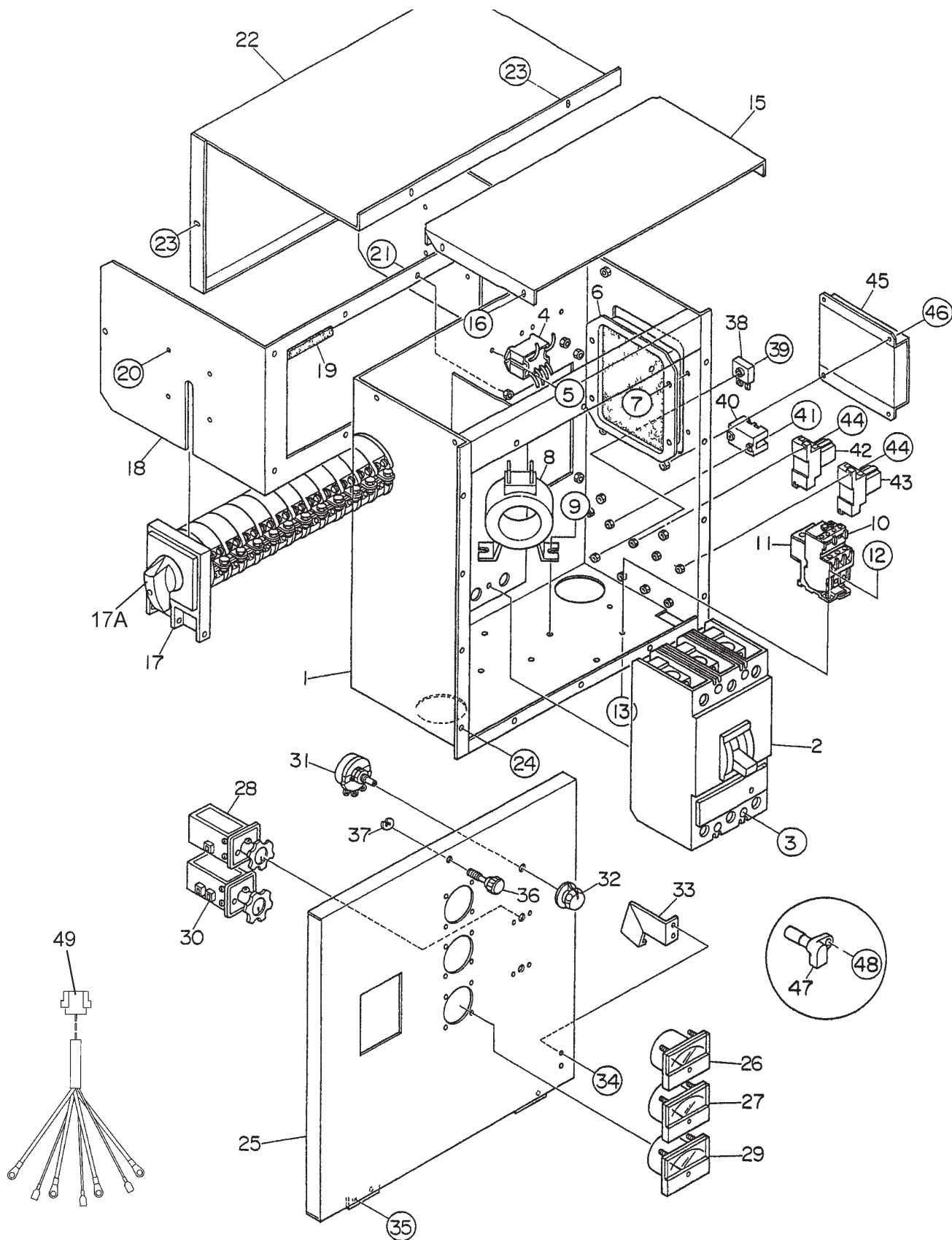
DCA-150SSVU — CONTROL BOX ASSY.

CONTROL BOX ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	M3213000502	CONTROL BOX	1	
2	0601808821	CIRCUIT BREAKER	1	LAF364001039 3P 400A
3	0021006080	MACHINE SCREW	4	
4	0601823863	RELAY UNIT	2	MSA9013A
5	0027104016	MACHINE SCREW	4	
6	0601820671	AUTOMATIC VOLTAGE REGULATOR	1	NTA- 5A- 2DB
7	0027105016	MACHINE SCREW	4	
8	0601806127	CURRENT TRANSFORMER	3	814- 943 300: 5A
9	0027106016	MACHINE SCREW	6	
10	0601820845	OVER CURRENT RELAY	1	LR2D1308
11	0601820846	OVER CURRENT RELAY	1	LA7D1064
12	0027104016	MACHINE SCREW	2	
13	0207004000	HEX. NUT	2	
15	M3213500013	CONTROL BOX COVER	1	
16	0016906016	HEX. HEAD BOLT	4	
17	M3923100014	SELECTOR SWITCH	1	VY- 200
17A	47530102	KNOB, SELECTOR SWITCH	1	
18	M3213600203	SWITCH BRACKET	1	
19	0330000370	EDGING	2	
20	0027104010	MACHINE SCREW	4	
21	0016906016	HEX. HEAD BOLT	8	
22	M3213600304	SWITCH COVER	1	
23	0016906016	HEX. HEAD BOLT	4	
24	0016906016	HEX. HEAD BOLT	13	
24	0040506000	TOOTHED WASHER	1	
25	M3223000303	CONTROL PANEL	1	
26	0601807641	FREQUENCY METER	1	FCF- 6 45~65HZ 240V
27	0601808989	AC AMMETER	1	ACF- 6 0~300A/600A
28	0601801040	CHANGE- OVER SWITCH, AMMETER	1	SL- 2AS
29	0601806859	AC VOLTMETER	1	SCF- 6 0~600V
30	0601801041	CHANGE- OVER SWITCH, VOLTMETER .	1	SL- 2VS
31	0601840073	RHEOSTAT (VOLTAGE REGULATOR)	1	RA20A2SE102BJ 2W 1K OHM.
32	0601840121	KNOB, RHEOSTAT	1	

DCA-150SSVU — CONTROL BOX ASSY.

CONTROL BOX ASSY.



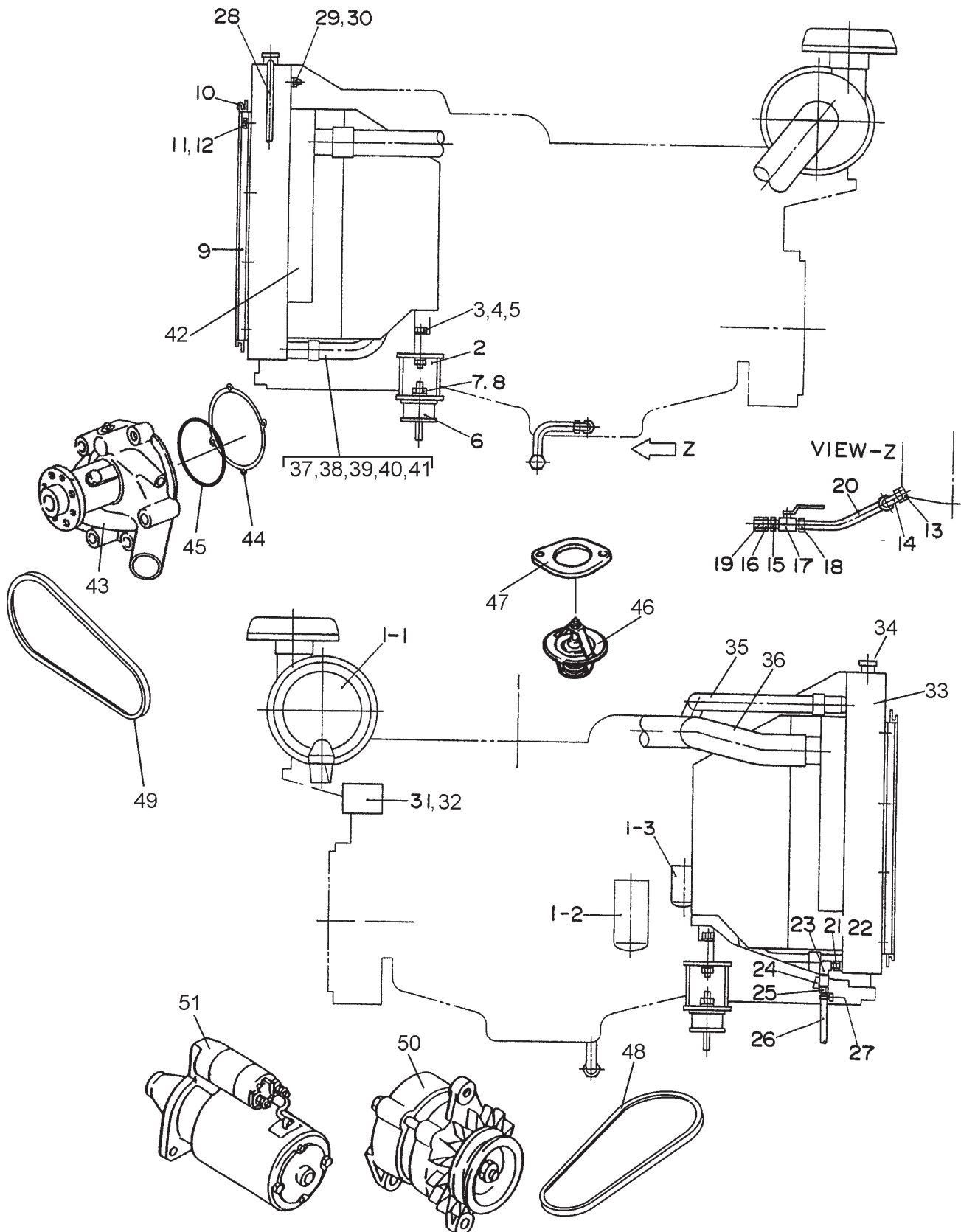
DCA-150SSVU — CONTROL BOX ASSY.

CONTROL BOX ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
33	M1223100004	STOPPER	1	
34	0027105016	MACHINE SCREW	2	
35	0027105016	MACHINE SCREW	4	
36	M9220100004	SET SCREW	1	
37	0080200007	SNAP RING	1	
38	0601823240	RECTIFIER	3	DE4503
39	0027104040	MACHINE SCREW	1	
40	0601826031	RELAY	1	AHE1231 DC12V
41	0027104016	MACHINE SCREW	2	
42	LY2DUS12VDC	RELAY	1	REPLACES 0601827656
42	PTF08A	RELAY BASE	1	REPLACES 0601823109
42	PYCA1	RELAY CLIP	2	REPLACES 0601824400
43	LY2DUS12DVC	RELAY	2	REPLACES 0601823768
43	PTF08- A	RELAY BASE	2	REPLACES 0601823109
43	PYCA1	RELAY CLIP	4	REPLACES 0601824400
44	0027104020	MACHINE SCREW	6	
45	0602202568	SPEED CONTROL UNIT	1	ESD5 500E
46	0027105016	MACHINE SCREW	4	
47	V150053623	SPEED SENSOR	1	REPLACES 0602120475
48	0016906020	HEX. HEAD BOLT	1	
49	M3246700824	WIRE HARNESS, GENERATOR	1	

DCA-150SSVU — ENGINE AND RADIATOR ASSY.

ENGINE & RADIATOR ASSY.



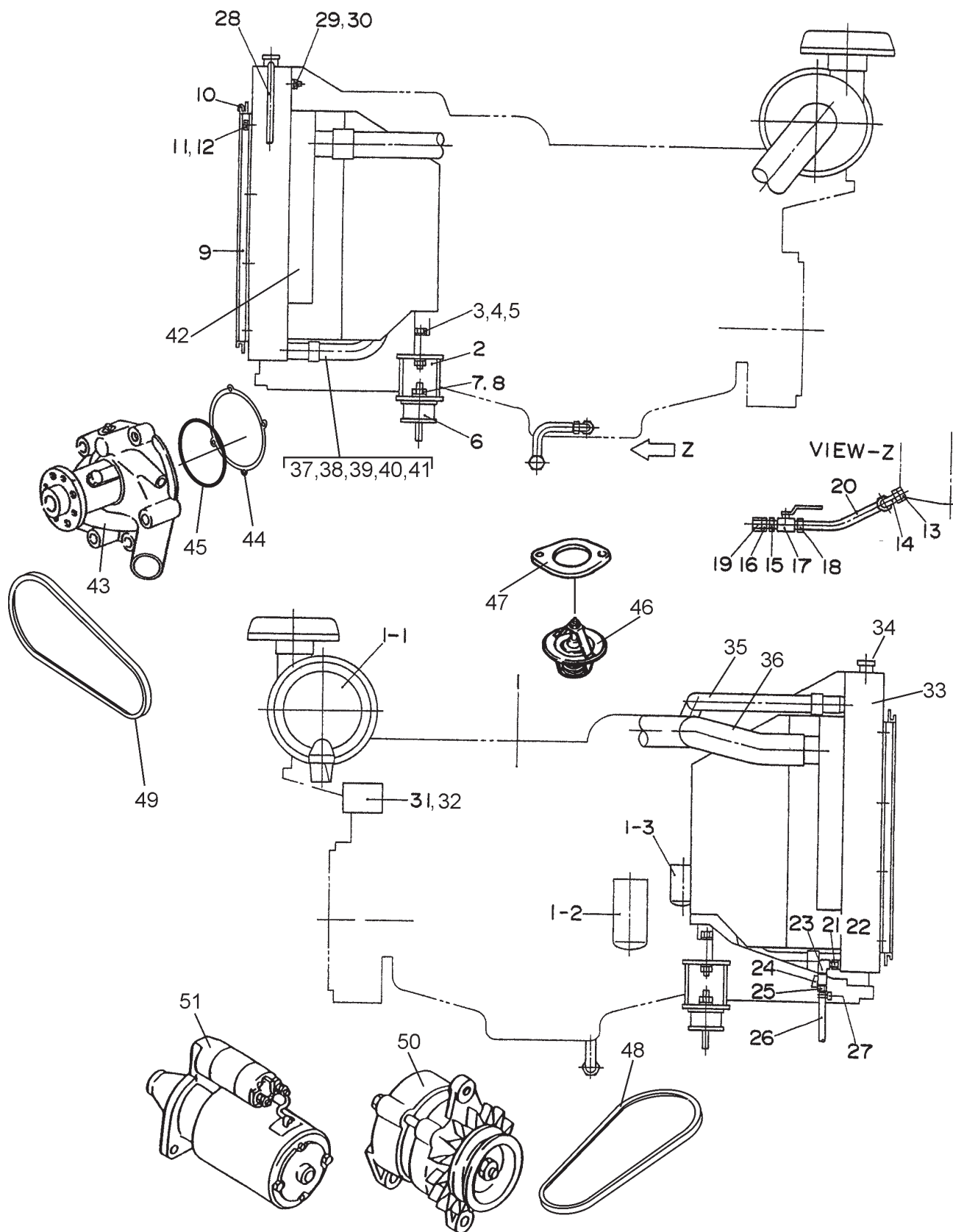
DCA-150SSVU — ENGINE AND RADIATOR ASSY.

ENGINE & RADIATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	M3923200034	ENGINE & RADIATOR SET	1	VOLVO TAD720GE
1-1	V20405830	ELEMENT, AIR CLEANER	1	REPLACES 0602046621
1-2	V3831236	CARTRIDGE, OIL FILTER	1	REPLACES 0602041277
1-3	V3825133	CARTRIDGE, FUEL FILTER	1	REPLACES 0602042560
2	M3303200104	ENGINE FOOT	2	
3	0010312100	HEX. HEAD BOLT	2	
4	0030312000	HEX. NUT	2	
5	0042512000	SPRING WASHER	4	
6	0605000011	RUBBER SUSPENSION	2	
7	0030016000	HEX. NUT	2	
8	0040016000	SPRING WASHER	2	
9	M3423500004	SEAL BRACKET	1	
10	0263202750	SEAL RUBBER	1	
11	0016908020	HEX. HEAD BOLT	8	
12	0207008000	HEX. NUT	8	
13	0602022563	ADAPTER	1	F80X- S
14	0602022561	90 DEG. ELBOW	1	33982-10-10+
15	0603306590	CONNECTOR	1	10WFTX- S
16	0603300285	ROCKNUT	1	10WLN
17	0605511395	VALVE	1	XV500P- 8
18	0603306395	HOSE JOINT	1	30182- 8- 10
19	0602021070	CAP	1	10FNTX- S
20	0269200406	DRAIN HOSE	1	
21	M4323500004	ADAPTER	1	
22	V969011	PACKING	1	REPLACES 0602012340
23	0603306487	STREET ELBOW	1	2102-6-6
24	0605511397	VALVE	1	MV608-6
25	0602022778	HOSE JOINT	1	102-06-06
26	0199100500	DRAIN HOSE	1	
27	0605515109	HOSE BAND	1	RS-8010
28	0199101600	OVER FLOW HOSE	1	
29	V20412270	COOLANT LEVEL SENSOR	1	REPLACES 0602211311
30	V969011	PACKING	1	REPLACES 0602012340
31	0602150070	ACTUATOR	1	ADD2255-12
32	0602211070	MOUNTING KIT	1	KT-1213B

DCA-150SSVU — ENGINE AND RADIATOR ASSY. (CONT.)

ENGINE & RADIATOR ASSY. (CONT.)



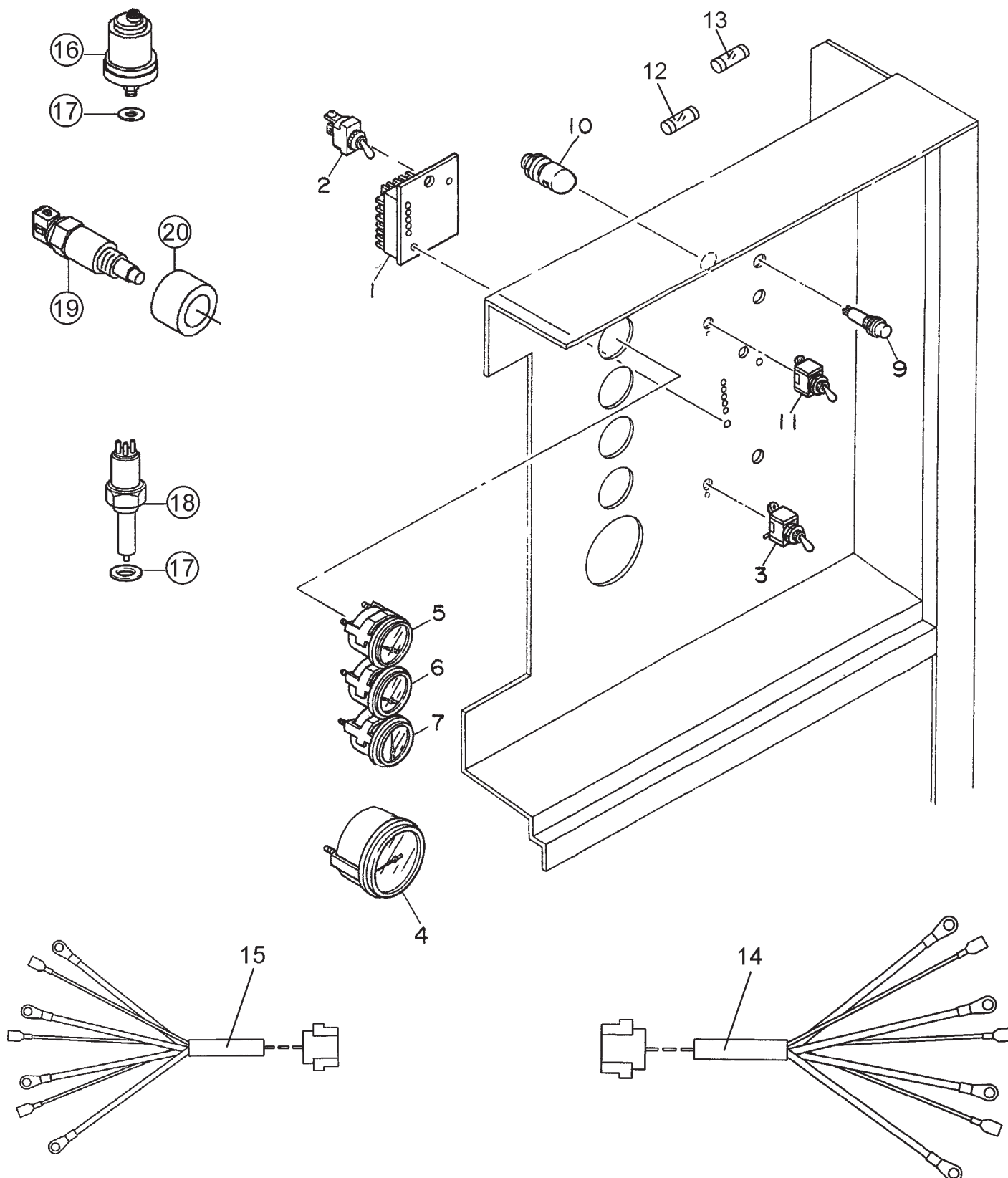
DCA-150SSVU — ENGINE AND RADIATOR ASSY. (CONT.)

ENGINE & RADIATOR ASSY. (CONT.)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
33	V20412362	RADIATOR	1	
34	V20412281	CAP, RADIATOR	1	
35	V20417379	UPPER WATER PIPE	1	
36	V20405972	UPPER HOSE RADIATOR	1	
37	V20405956	LOWER HOSE RADIATOR	1	
38	V20412342	LOWER WATER PIPE	1	
39	V20412341	LOWER WATER PIPE GASKET	1	
40	V947281	BOLT	1	
41	V947281	GASKET WATER PIPE SET	1	
42	V20405946	FAN	1	
43	V20405685	WATER PUMP	1	
44	V11700524	GASKET WATER PUMP	1	
45	V11700522	O-RING WATER PUMP1		
46	V20405689	THERMOSTAT	1	
47	V975678	GASKET THERMOSTAT	1	
48	V978515	V-BELT, ALTERNATOR	1	
49	V978750	V-BELT, FAN	1	
50	V20405794	ALTERNATOR 12 VOLT	1	
51	V20405828	STARTER 12 VOLT	1	
52	V20430640	WATER SEPARATOR FILTER	1	

DCA-150SSVU — ENGINE OPERATING PANEL ASSY.

ENGINE OPERATING PANEL ASSY.



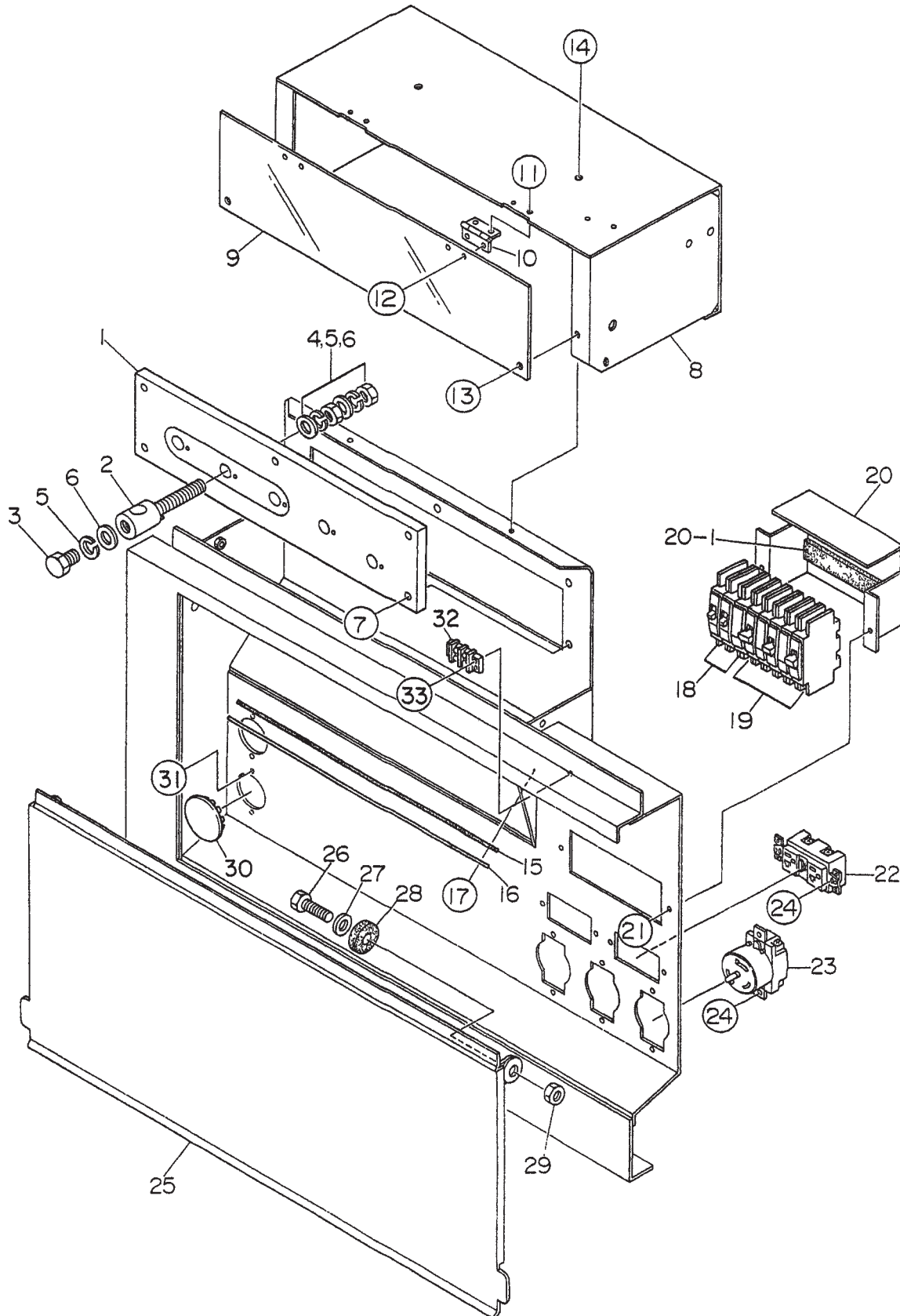
DCA-150SSVU — ENGINE OPERATING PANEL ASSY.

ENGINE OPERATING PANEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	ECU9988N150V	CONTROLLER, ECU	1	REPLACES 0602202545
2	0601831340	SWITCH	1	7562K4
3	0601831395	ENGINE SPEED SWITCH	1	7302K36
4	0602120096	TACHOMETER	1	111812
5	0602122097	OIL PRESSURE GAUGE	1	100728
6	0602123094	WATER TEMPERATURE GAUGE	1	111930
7	0602121080	CHARGING AMMETER	1	100158
9	0602103092	ALARM LAMP	1	PL-05
9	0601810245	BULB	1	E-10 T-10 DC18V
10	0601810141	PANEL LIGHT	1	98268-00370
11	0601831330	SWITCH, PANEL LIGHT	1	90-001
12	0601802149	FUSE, 10A	1	
13	0601806671	FUSE, 15A	1	
14	M3357200712	WIRE HARNESS, ENGINE	1	
15	M3357200904	WIRE HARNESS, COOLANT LEVEL SENSOR	1	
16	V20405778	SENSOR, OIL PRESSURE	1	
17	V969011	GASKET, OIL SENSOR	1	
18	V20412270	UNIT, OIL LEVEL GUARD	1	
19	V20405787	SENSOR, WATER TEMP.	1	
20	V20405788	SLEEVE, INSULATING WATER TEMP.	1	

DCA-150SSVU — OUTPUT TERMINAL PANEL ASSY.

OUTPUT TERMINAL ASSY.

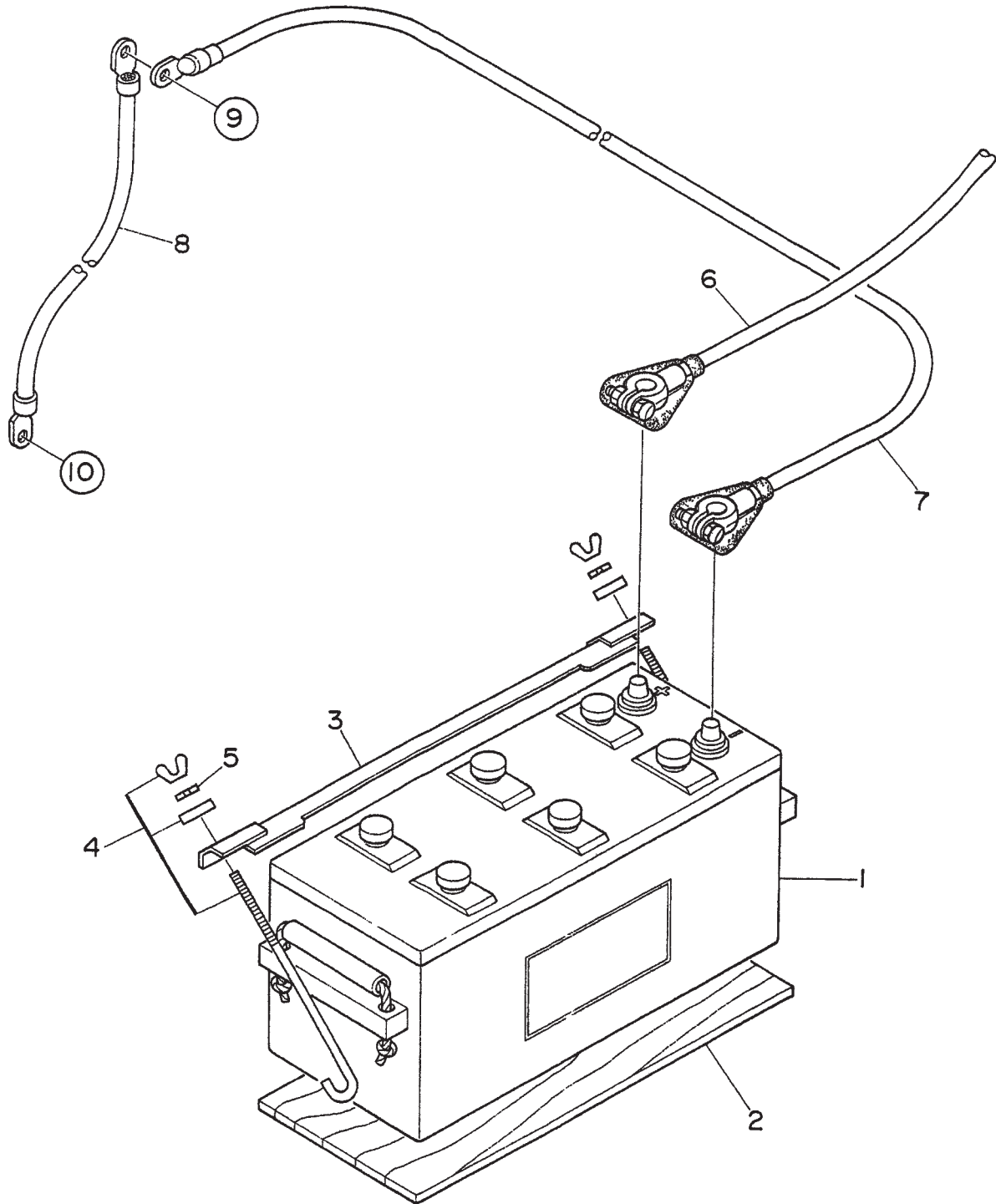


DCA-150SSVU — OUTPUTTERMINAL PANEL ASSY.

OUTPUT TERMINAL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	M3230700003	TERMINAL PANEL	1	
2	M9220100304	OUTPUT TERMINAL BOLT	5	
3	M9220100404	TIE BOLT	5	
4	0039316000	HEX. NUT	10	
5	0040016000	SPRING WASHER	15	
6	0041416000	PLAIN WASHER	20	
7	0016908035	HEX. HEAD BOLT	5	
8	M3238100103	TERMINAL COVER	1	
9	M3236100104	OUTPUT WINDOW	1	
10	0605010040	HINGE	2	
11	0027103010	MACHINE SCREW	4	
11	0030003000	HEX. NUT	4	
11	0041203000	PLAIN WASHER	4	
12	0027103010	MACHINE SCREW	4	
12	0030003000	HEX. NUT	4	
13	0016906020	HEX. HEAD BOLT	2	
14	0016906016	HEX. HEAD BOLT	4	
15	M3236400004	CABLE OUTLET COVER	1	
16	M3236300004	SUPPORTER, CABLE OUTLET COVER	1	
17	0016906020	HEX. HEAD BOLT	6	
18	0601808803	CIRCUIT BREAKER	2	QOU 120B 1P 20A
19	0601808804	CIRCUIT BREAKER	3	QUO 250B 2P 50A
20	M1260700304	BREAKER FITTING COVER	1	
20-1	0222100150	CUSHION RUBBER	1	
21	0016906020	HEX.HEAD BOLT	2	
22	0601812598	RECEPTACLE	2	GF530EM 125V 20AX2
23	0601812538	RECEPTACLE	3	CS63 69 250V 50A
24	0027104016	MACHINE SCREW	10	
24	0207004000	HEX. NUT	10	
25	M3236100213	TERMINAL COVER	1	
26	0010112045	HEX. HEAD BOLT	2	
27	0041212000	PLAIN WASHER	2	
28	M9310200004	STAY RUBBER	2	
29	0030012000	HEX. NUT	2	
30	0603306775	BLIND PLUG	2	
31	0027104016	MACHINE SCREW	4	
32	0601815194	TERMINAL	1	601-GP-02
33	0027104016	MACHINE SCREW	2	

BATTERY ASSY.

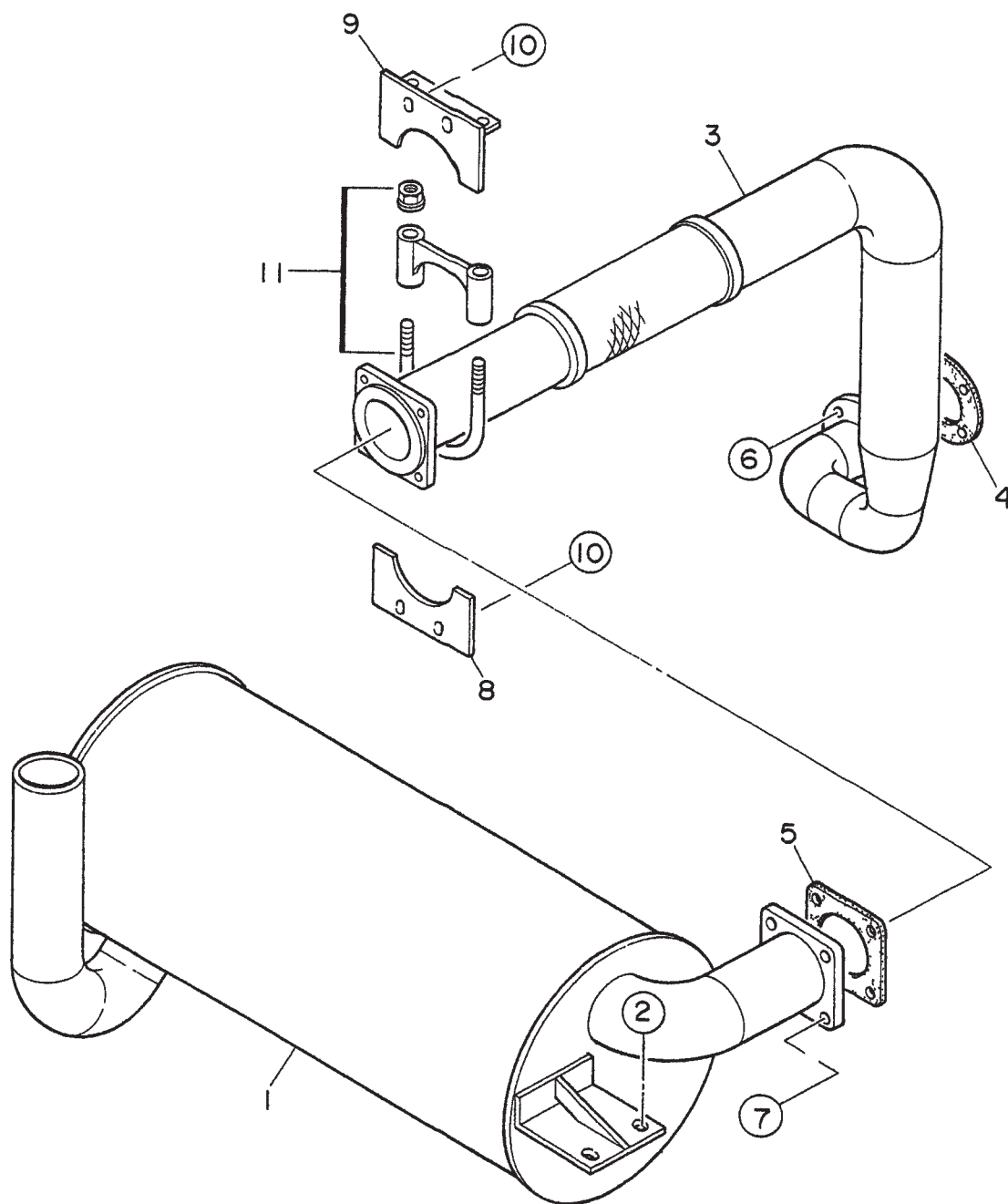


BATTERY ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	GPL-4DA	BATTERY	1	
2	M9310500404	BATTERY SHEET	1	
3	M9103000504	BATTERY BAND	1	
4	0602220921	BATTERY BOLT SET	2	
5	0040006000	SPRING WASHER	2	
6	M3346900704	BATTERY CABLE	1	
7	M3346900604	BATTERY CABLE	1	
8		CABLE	1	 MAKE LOCALLY
9	0017112025	HEX. HEAD BOLT	1	
9	0040512000	TOOTHED WASHER	1	
10	0017110020	HEX. HEAD BOLT	1	
10	0040510000	TOOTHED WASHER	1	

DCA-150SSVU — MUFFLER ASSY.

MUFFLER ASSY.

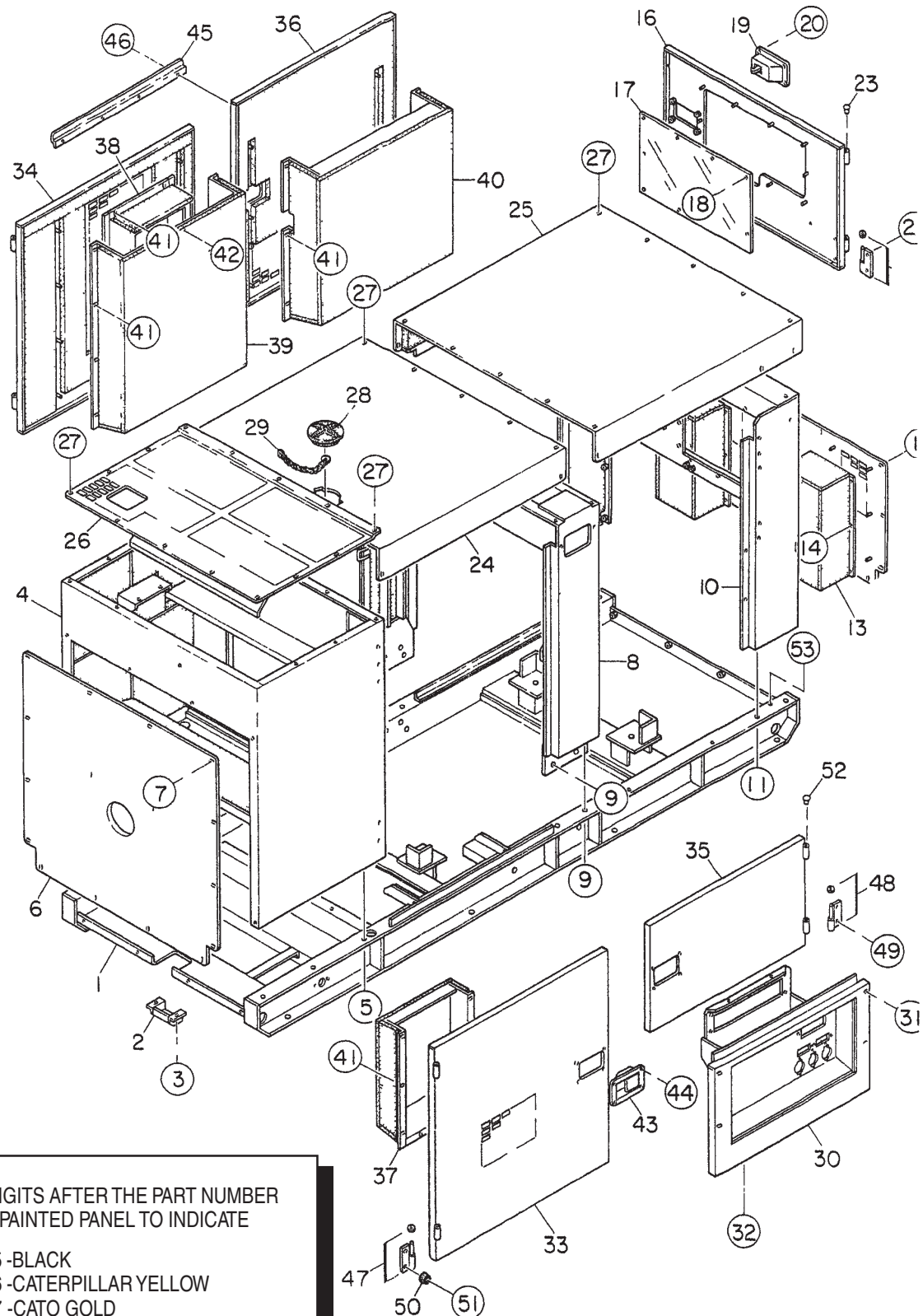


MUFFLER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	M3330100302	MUFFLER	1	
2	0016910025	HEX. HEAD BOLT	4	
3	M3333000603	EXHAUST PIPE	1	
4	V20405969	GASKET	1	REPLACES 0602320197
5	M3333200104	GASKET	1	
6	0017110030	HEX. HEAD BOLT	4	
7	0017110050	HEX. HEAD BOLT	4	
8	M3330400804	COVER	1	
9	M3330400903	BRACKET	1	
10	0016908020	HEX. HEAD BOLT	4	
11	0602326062	U BOLT SET	1	89548K

DCA-150SSVU — ENCLOSURE ASSY.

ENCLOSURE ASSY.



ADD THE FOLLOWING DIGITS AFTER THE PART NUMBER
WHEN ORDERING ANY PAINTED PANEL TO INDICATE
COLOR OF UNIT:

- | | |
|-----------------|----------------------|
| 1-ORANGE | 5-BLACK |
| 2-WHITE | 6-CATERPILLAR YELLOW |
| 3-SPECTRUM GRAY | 7-CATO GOLD |
| 4-SUNBELT GREEN | 8-RED |

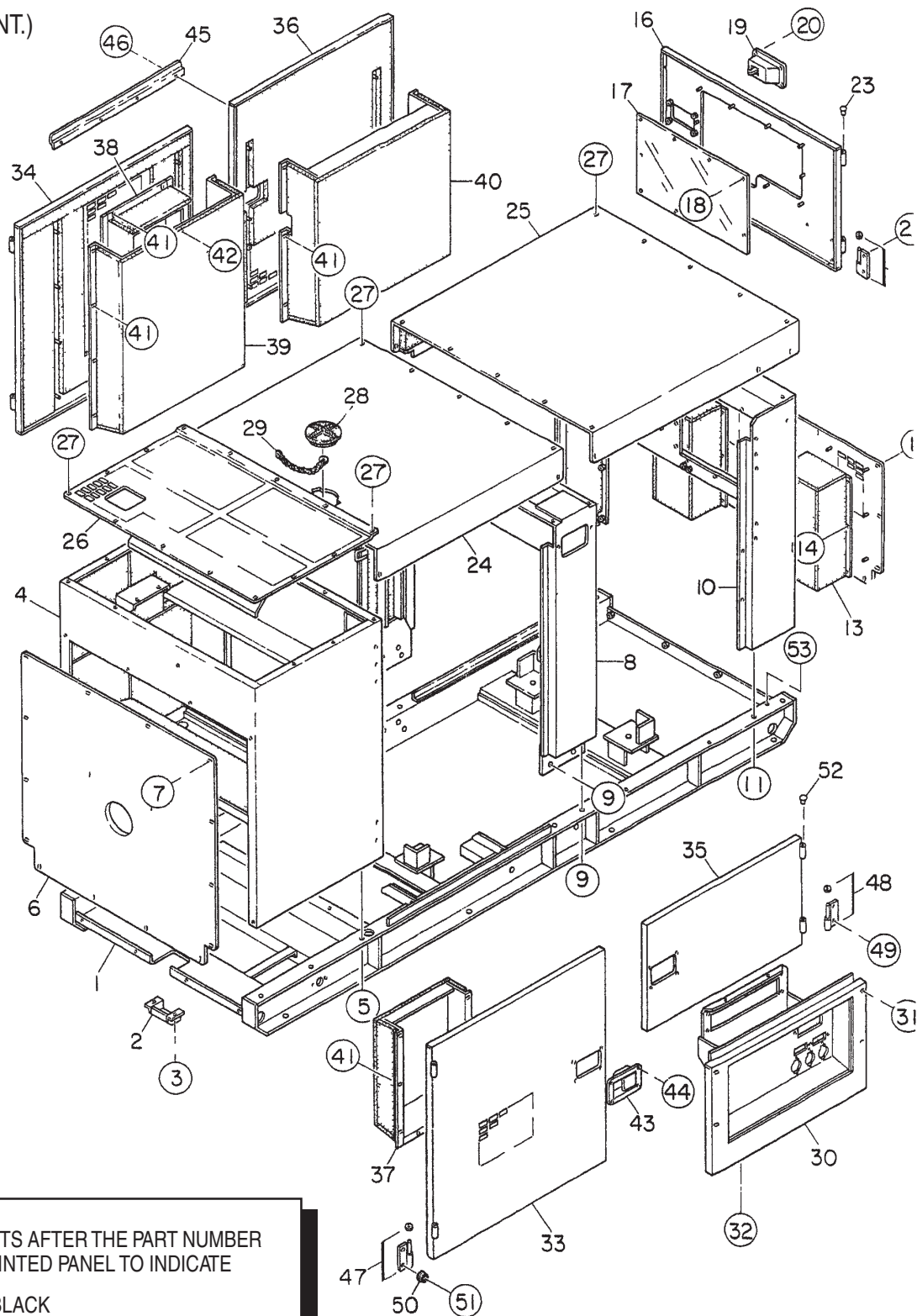
THE SERIAL NUMBER MAY BE REQUIRED.

ENCLOSURE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	M3413001502	BASE	1	
2	M141340004	UNDER COVER	1	
3	0016904020	HEX. HEAD BOLT	2	
4	M3423000902	FRONT FRAME	1	
4	M3493104913	ACOUSTIC SHEET	1	
5	0016910025	HEX. HEAD BOLT	6	
6	M3423200304	COVER, FRONT FRAME	1	
6	M3493103104	ACOUSTIC SHEET	1	
7	0016908020	HEX. HEAD BOLT	16	
8	M3433000602	CENTER FRAME	1	
8	M3493200304	ACOUSTIC SHEET	1	
9	0010114040	HEX. HEAD BOLT	12	
9	0030014000	HEX. NUT	12	
9	0040014000	SPRING WASHER	24	
9	0041214000	PLAIN WASHER	24	
10	M3443000412	REAR FRAME	1	
10	M3493301504	ACOUSTIC SHEET	1	
11	0016910025	HEX. HEAD BOLT	4	
11	0040510000	TOOTHED WASHER	1	
12	M3443300603	REAR COVER	1	
12	M3493302204	ACOUSTIC SHEET	1	
13	M3443300503	DUCT, REAR COVER	2	
13	M3493301804	ACOUSTIC SHEET	1	
14	0207006000	HEX. NUT	12	
15	0016908020	HEX. HEAD BOLT	12	
16	M3443200213	REAR DOOR	1	
17	M3443600104	WINDOW PLATE	1	
18	0207306000	HEX. NUT	10	
18	0041206000	PLAIN WASHER	10	
19	M9113000002	DOOR HANDLE ASSEMBLY	1	
20	0021806016	MACHINE SCREW	4	
20	0030006000	HEX. NUT	4	
21	M9110100204	HINGE	2	
21	M9116100004	WASHER	2	
22	0016908020	HEX. HEAD BOLT	3	
23	M9310000004	BLIND PLUG	2	
24	M3463100503	ROOF PANEL	1	
24	M3493502203	ACOUSTIC SHEET	1	
25	M3463200303	ROOF PANEL	1	
25	M3493502103	ACOUSTIC SHEET	1	
26	M3463500304	OVER COVER, FRONT FRAME	1	
27	0016908020	HEX. HEAD BOLT	39	
28	M9310000103	BONNET CAP	1	
29	M1483600204	CHAIN ASSEMBLY	2	
30	M3453200332	SPLASHER PANEL	1	

DCA-150SSVU — ENCLOSURE ASSY. (CONT.)

ENCLOSURE ASSY. (CONT.)



ADD THE FOLLOWING DIGITS AFTER THE PART NUMBER
WHEN ORDERING ANY PAINTED PANEL TO INDICATE
COLOR OF UNIT:

- | | |
|-----------------|----------------------|
| 1-ORANGE | 5-BLACK |
| 2-WHITE | 6-CATERPILLAR YELLOW |
| 3-SPECTRUM GRAY | 7-CATO GOLD |
| 4-SUNBELT GREEN | 8-RED |

THE SERIAL NUMBER MAY BE REQUIRED.

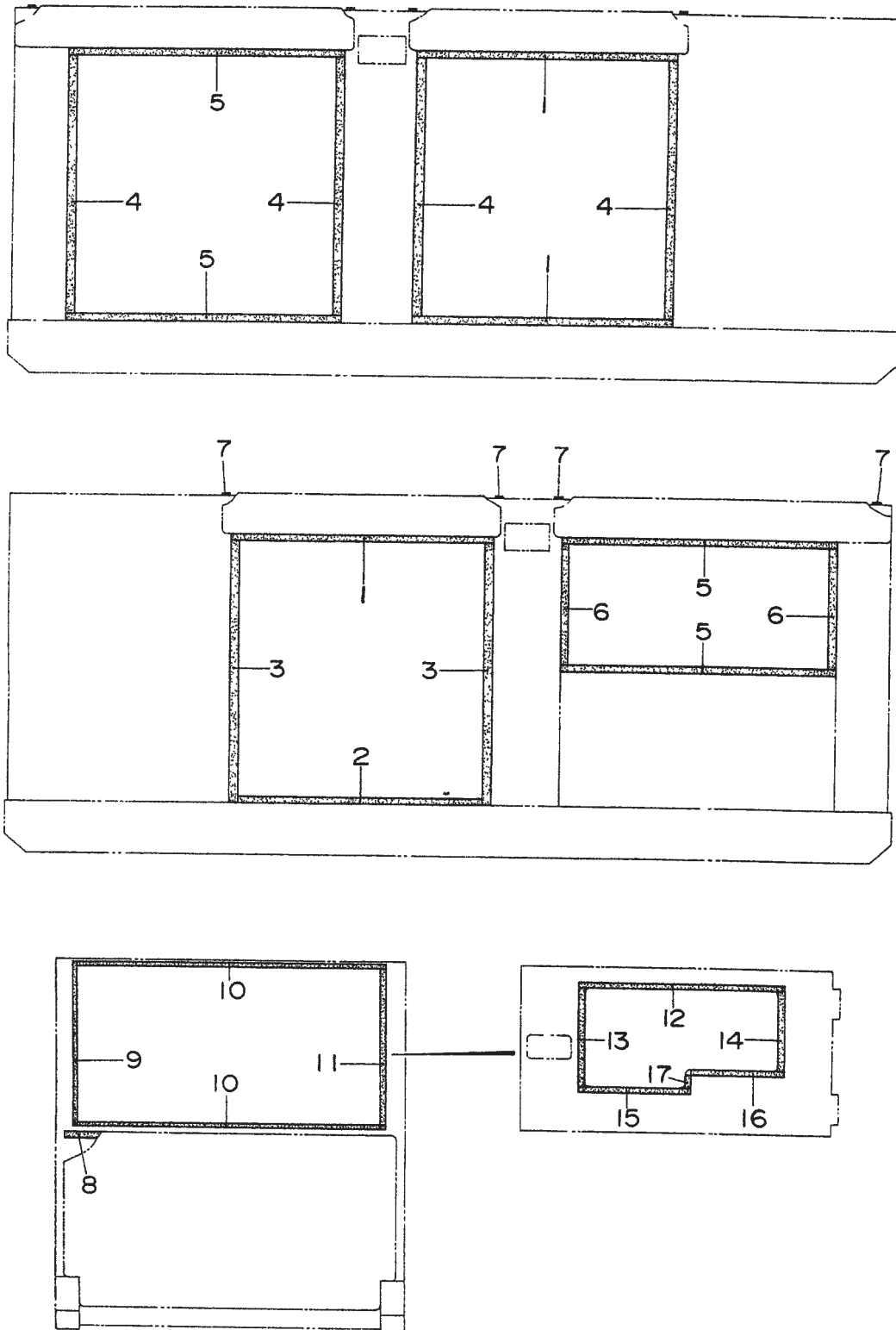
DCA-150SSVU — ENCLOSURE ASSY. (CONT.)

ENCLOSURE ASSY. (CONT.)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
30	M3493405514	ACOUSTIC SHEET	1	
31	0016908055	HEX. HEAD BOLT	4	
32	0016910025	HEX. HEAD BOLT	2	
33	M3453002203	SIDE DOOR	1	
33	M3493416704	ACOUSTIC SHEET	1	
34	M3453002303	SIDE DOOR	1	
34	M3493414404	ACOUSTIC SHEET	1	
35	M3453000903	SIDE DOOR	1	
35	M3493405204	ACOUSTIC SHEET	1	
36	M3453001413	SIDE DOOR	1	
36	M3493414204	ACOUSTIC SHEET	1	
37	M3453301403	DUCT	1	
37	M3493415204	ACOUSTIC SHEET	1	
38	M3453301803	DUCT	1	
38	M3493416604	ACOUSTIC SHEET	1	
39	M3453301703	DUCT	1	
39	M3493416104	ACOUSTIC SHEET	1	
40	M3453300713	DUCT	1	
40	M3493415704	ACOUSTIC SHEET	1	
41	0207005000	HEX. NUT	33	
42	0016906016	HEX. HEAD BOLT	5	
43	M9113000002	DOOR HANDLE ASSEMBLY	4	
44	0021806016	MACHINE SCREW	16	
44	0030006000	HEX. NUT	16	
45	M3453700004	GUTTER	1	
46	0016906016	HEX. HEAD BOLT	4	
47	M9110100204	HINGE	4	
47	M9116100004	WASHER	4	
48	M9110100304	HINGE	4	
48	M9116100004	WASHER	4	
49	0016908020	HEX. HEAD BOLT	9	
50	0601850097	STOPPER	8	
51	0027208025	MACHINE SCREW	8	
52	M9310000004	BLIND PLUG	8	
53	0016908020	HEX. HEAD BOLT	1	
53	0040508000	TOOTHED WASHER	1	

DCA-150SSVU — RUBBER SEALS ASSY.

RUBBER SEALS ASSY.

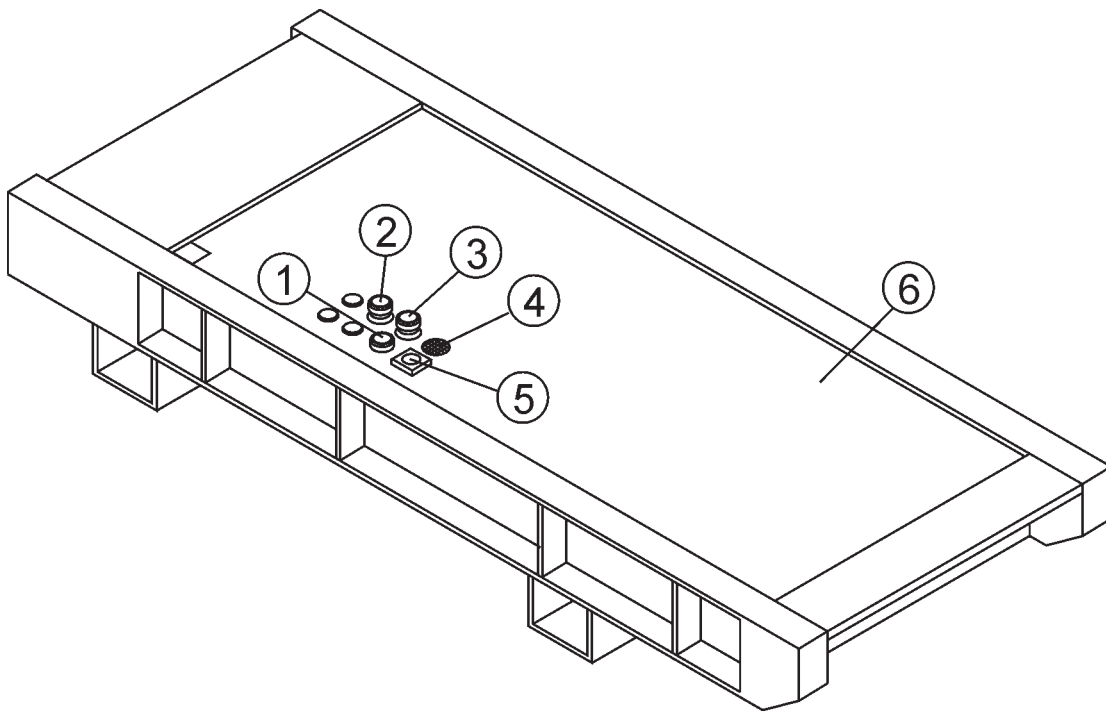


DCA-150SSVU — RUBBER SEALS ASSY.

RUBBER SEALS ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	0228901075	SEAL RUBBER	3	
2	0229200930	SEAL RUBBER	1	
3	0228901120	SEAL RUBBER	2	
4	0228901090	SEAL RUBBER	4	
5	0228900955	SEAL RUBBER	4	
6	0228900520	SEAL RUBBER	2	
7	0229201200	SEAL RUBBER	4	
8	0229201140	SEAL RUBBER	1	
9	0228800680	SEAL RUBBER	1	
10	0228801070	SEAL RUBBER	2	
11	0228800640	SEAL RUBBER	1	
12	0228100665	SEAL RUBBER	1	
13	0228100370	SEAL RUBBER	1	
14	0228100300	SEAL RUBBER	1	
15	0228100365	SEAL RUBBER	1	
16	0228100280	SEAL RUBBER	1	
17	0228100070	SEAL RUBBER	1	

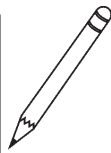
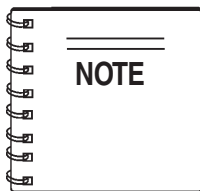
FUEL TANK ASSY.



DCA-150SSJU2 — FUEL TANK ASSY.

FUEL TANK ASSY.

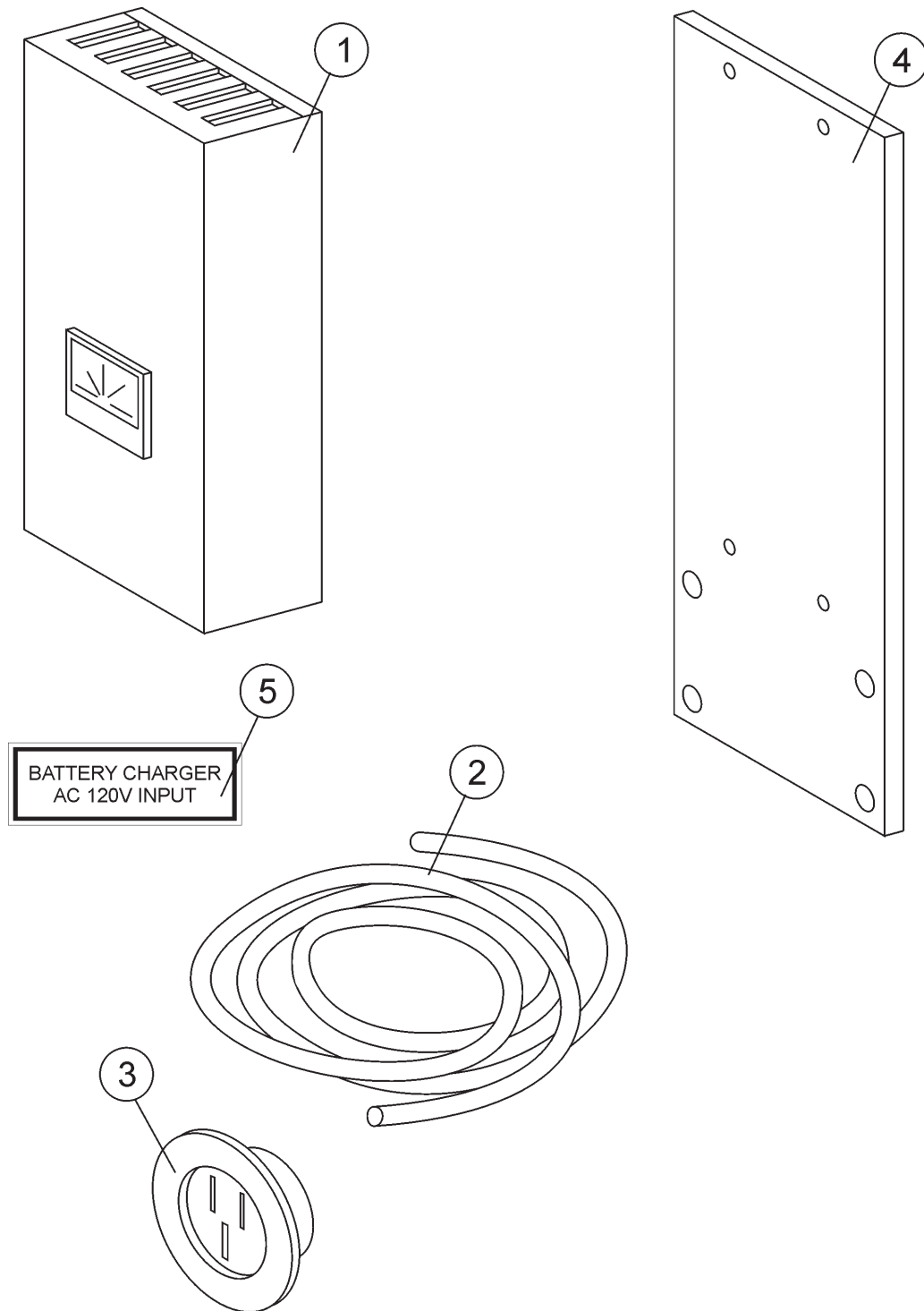
<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	3000	CAP, FUEL	1	
2		REDUCER, 1/2 to 3/8	1	OBTAIN LOCALLY
3		REDUCER, 1/2 to 3/8	1	OBTAIN LOCALLY
4	2130	VENT, EMERGENCY	1	
5	9070	GUAGE, FUEL LEVEL	1	
6	SBT150-12H	TANK, FUEL, LESS FORK POCKETS	1	SEE NOTE BELOW



Fork pockets must be added to the above part number when ordering a replacement fuel tank.

DCA-150SSJU2 — BATTERY CHARGER ASSY.

BATTERY CHARGER ASSY.



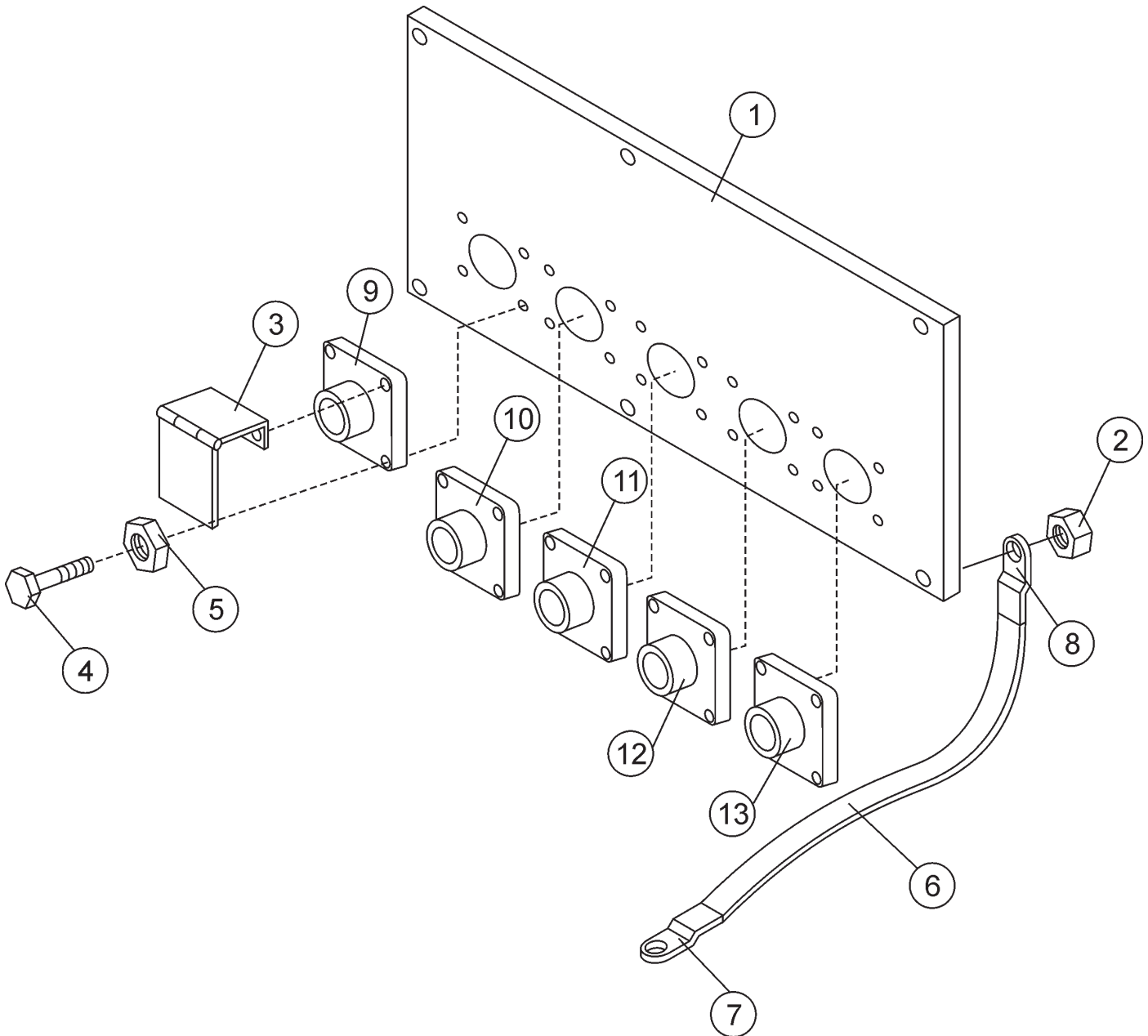
DCA-150SSJU2 — BATTERY CHARGER ASSY.

BATTERY CHARGER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	LC125002	CHARGER, BATTERY 12V 3A	1	
2		CABLE, 16/3 x 3'	1	MAKE LOCALLY
3	HBL2578C	RECEPTICLE, 15A	1	
4	34530	BRACKET, MOUNTING	1	
5	M1940011014Q	DECAL, BATTERY CHARGER	1	

DCA-150SSJU2 — CAMLOCK PANEL ASSY.

CAMLOCK PANEL ASSY.



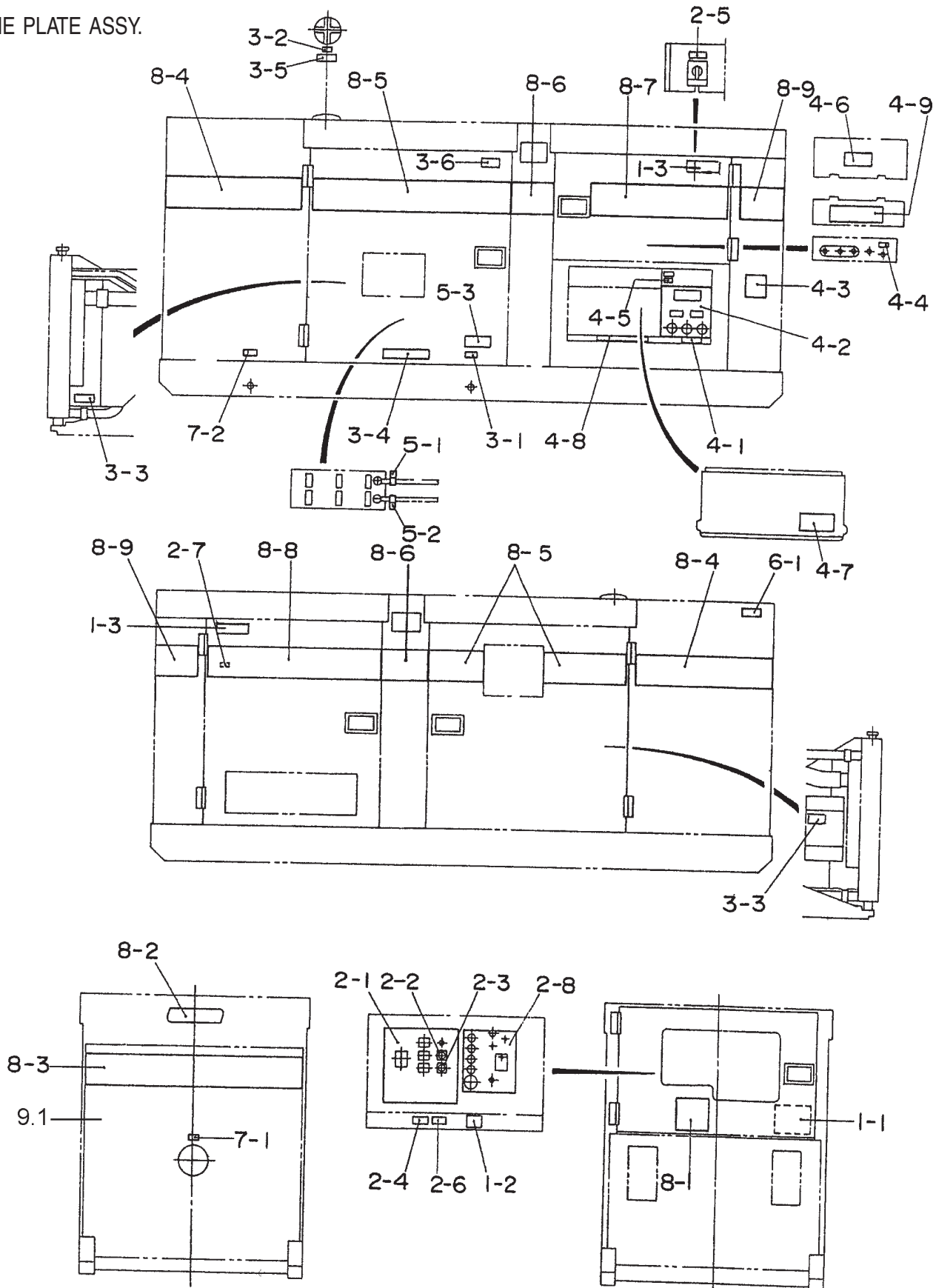
DCA-150SSJU2 — CAMLOCK PANEL ASSY.

CAMLOCK PANEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	CAM34553	CAM PANEL	1	
2		NUT, 1/2 x 13	10	OBTAIN LOCALLY
3	A100895-1	SNAP COVERS	5	
4		SCREW, 10/24 x 1-1/4"	20	OBTAIN LOCALLY
5		NUTS, KEP 10/24	20	OBTAIN LOCALLY
6		CABLE, 2OT x 15"	5	MAKE LOCALLY
7		TERMINALS, EYE 2OT x 1/2"	5	OBTAIN LOCALLY
8		TERMINALS, EYE 2OT x 3/8"	5	OBTAIN LOCALLY
9	E1016-1602S	CAMLOCK, RED	1	
10	E1016-1600S	CAMLOCK, BLACK	1	
11	E1016-1612S	CAMLOCK, BLUE	1	
12	E1016-1605S	CAMLOCK, WHITE	1	
13	E1016-1604S	CAMLOCK, GREEN	1	

DCA-150SSVU — NAMEPLATE AND DECASL

NAME PLATE ASSY.



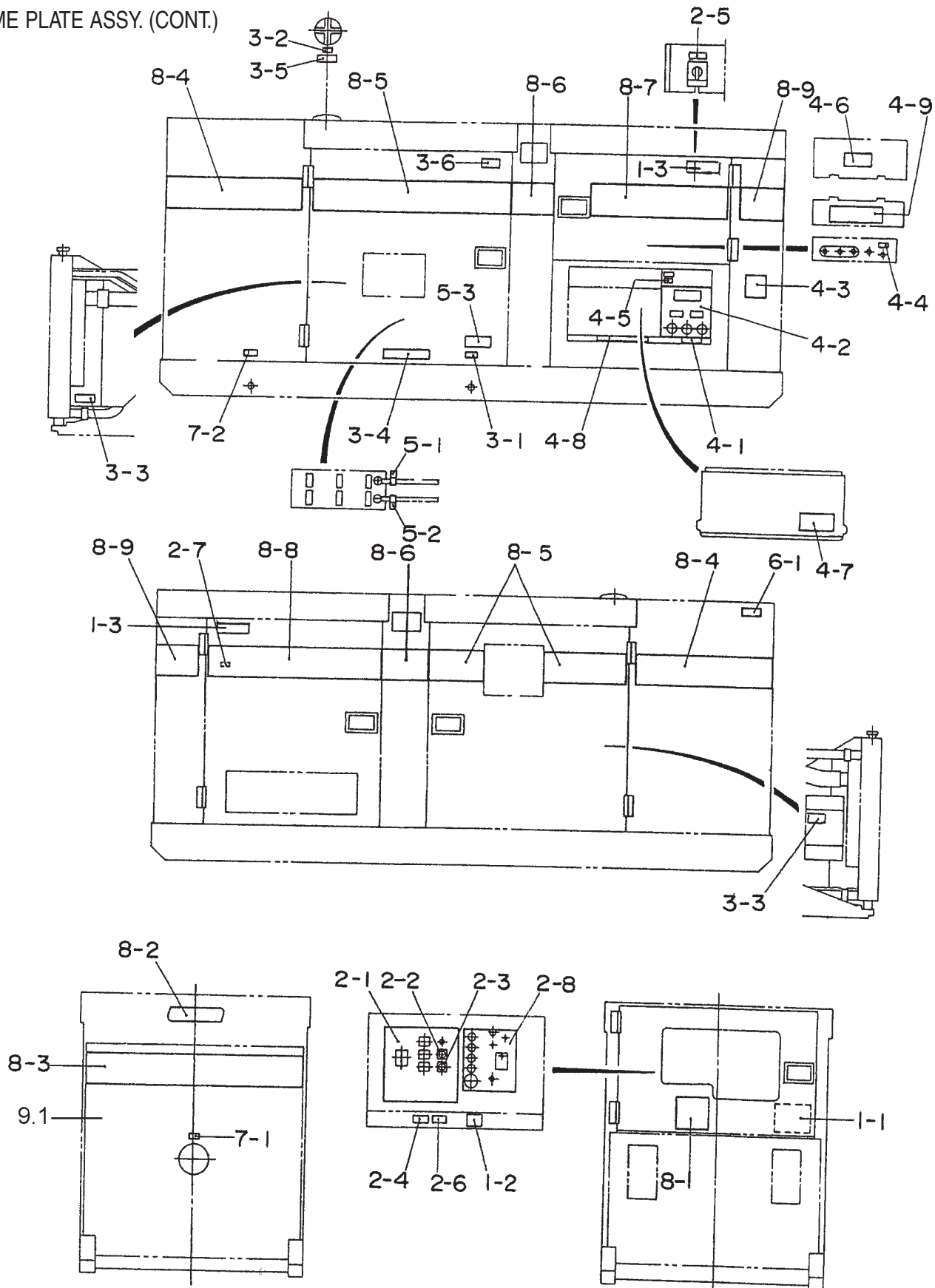
DCA-150SSVU — NAMEPLATE AND DECALS

NAME PLATE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1-1	M3552000403	DECAL, OPERATING PROCEDURES	1	M35200040
1-2	M9520100304	DECAL, SAFETY INSTRUCTIONS	1	M92010030
1-3	M9520100603	DECAL, CAUTION	2	M92010060
CONTROL PANEL, BOX & OPERATING PANEL GROUP				
2-1	M3550001303	DECAL, CONTROL PANEL	1	M35000130
2-2	M9520000104	PLATE, AMMETER CHANGE- OVER SWITCH	1	M92000010
2-3	M9520000204	PLATE, VOLTMETER CHANGE- OVER SWITCH	1	M92000020
2-4	M9520100004	DECAL, WARNING ELECTRIC SHOCK HAZARD	1	M92010000
2-5	M9520100204	DECAL, CAUTION	1	M92010020A
2-6	M9520200104	DECAL, OVER CURRENT RELAY	1	M92020010
2-7	M9522000204	DECAL, HIGH IDLE SPEED	1	M92200020
2-8	M3550001203	DECAL, OPERATING PANEL	1	M35000120
ENGINE & RADIATOR GROUP				
3-1	M9500000004	DECAL, OIL DRAIN PLUG	1	M90000000
3-2	M9500100004	DECAL, WATER	1	M90010000
3-3	M9503000004	DECAL, WARNING MOVING PARTS	2	M90300000
3-4	M9503000103	DECAL, WATER * OIL CHECK	1	M90300010
3-5	M9503100004	DECAL, WARNING HOT COOLANT	1	M90310000
3-6	M9510100004	DECAL, CAUTION HOT PARTS	1	M91010000
OUTPUT TERMINAL GROUP				
4-1	M1550000204	DECAL, NOTE	1	M15000020
4-2	M1550000703	DECAL, RECEPTACLE & CIRCUIT BREAKER	1	M15000070
4-3	M3550000804	DECAL, NOTE	1	M35000080
4-4	M9520000004	DECAL, GROUND	1	M92000000
4-5	M9520000504	DECAL, START CONTACT	1	M92000050
4-6	M9520100004	DECAL, WARNING ELECTRIC SHOCK HAZARD	1	M92010000
4-7	M9520100404	DECAL, DANGER HIGH VOLTAGE	1	M92010040
4-8	M9520100503	DECAL, WARNING	1	M92010050
4-9	M9520200003	DECAL, OUTPUT TERMINAL	1	M92020000
BATTERY GROUP				
5-1	M9500300004	DECAL, -	1	M90030000
5-2	M9500300104	DECAL, +	1	M90030010
5-3	M9510100403	DECAL, CAUTION	1	M91010040
MUFFLER GROUP				
6-1	M9503200004	DECAL, WARNING ENGINE EXHAUST	1	M90320000
FUEL TANK GROUP				
7-1	M9500500004	DECAL, DIESEL FUEL	1	M90050000
7-2	M9500500104	DECAL, FUEL DRAIN PLUG	1	M90050010

DCA-150SSVU — NAMEPLATE AND DECALS (CONT.)

NAME PLATE ASSY. (CONT.)



DCA-150SSVU — NAMEPLATE AND DECALS (CONT.)

NAME PLATE ASSY. (CONT.)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
		BONNET GROUP		
8-1	M9510200002	DECAL, MQ	1	M91020000
8-2	0600500090	EMBLEM	1	
8-2	0021106015	MACHINE SCREW	2	
8-3	M3560100903	STRIPE	1	
8-4	M3560101003	STRIPE	2	
8-5	M3560101604	STRIPE	2	
8-6	M3560101304	STRIPE	2	
8-7	M3560101203	STRIPE	1	
8-8	M3560101403	STRIPE	1	
8-9	M3560101504	STRIPE	2	
9-1	TBD	DECAL, FUELING PROCEDURE	1	

PAYMENT TERMS

Terms of payment for parts are net 10 days.

FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

MINIMUM ORDER

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the current parts price list.
 - b. The list must be typed or computer generated.
 - c. The list must state the reason(s) for the return.
 - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
 - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.

5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
 - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
 - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
 - c. Anyline item with an extended dealer net price of less than \$5.00.
 - d. Special order items.
 - e. Electrical components.
 - f. Paint, chemicals, and lubricants.
 - g. Decals and paper products.
 - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price.

Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

LIMITATIONS OF SELLER'S LIABILITY

Multiquip shall not be liable here under for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

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OPERATION AND PARTS MANUAL

HERE'S HOW TO GET HELP

*PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON-HAND WHEN CALLING*

PARTS DEPARTMENT

800-427-1244 or 310-537-3700

FAX: 800-672-7877 or 310-637-3284

SERVICE DEPARTMENT

800-421-1244

FAX: 310- 537-4259

TECHNICAL ASSISTANCE

800-478-1244

FAX: 310- 631-5032

WARRANTY DEPARTMENT

888-661-4279, or 310-661-4279

FAX: 310- 537-1173



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18910 WILMINGTON AVE.

CARSON, CALIFORNIA 90746

310-537-3700

800-421-1244

FAX: 310-537-3927

E-mail: mq@multiquip.com • www.multiquip.com

PARTS DEPARTMENT:

800-427-1244

FAX: 800-672-7877

SERVICE DEPARTMENT:

800-835-2551

FAX: 310-638-8046