

OPERATION MANUAL



ULTRASILENT™ SERIES MODEL DCA45USI 60Hz GENERATOR


(PARTS LIST NO. M187140000B)

Revision #4 (03/19/24)


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or associated parts manual, visit our website
at: www.mqpower.com



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.



WARNING



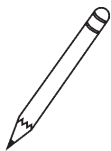
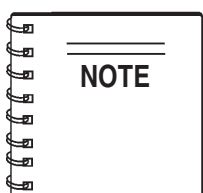
CALIFORNIA — Proposition 65 Warning

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

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MQ POWER DCA-45USI AC GENERATOR

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Specification and part number
are subject to change without
notice.

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Table 1. Generator Specifications

Model	DCA-45USI	
Type	Revolving field, self ventilated, open protected type synchronous generator	
Armature Connection	Star with Neutral	Zig Zag
Phase	3	Single
Standby Output	47.3 KVA (37.8 KW)	27.3 KW
Prime Output	45 KVA (36 KW)	26 KW
Voltage	240V or 480V	240/120V
Frequency	60 Hz	
Speed	1,800 rpm	
Power Factor	0.8	1
Aux. AC Power	Single Phase, 60 Hz	
Voltage	120 VAC	
Output	4.8 KW (2.4 KW x 2)	
Engine Specifications		
Model	ISUZU BB-4JG1T	
Type	4 Cycle, water-cooled, direct injection, turbocharged	
No. of Cylinders	4 cylinders	
Bore x Stroke	3.76 in. x 4.21 in. (95.4 mm x 107 mm)	
Rated Output	55.3 HP/1,800 rpm	
Displacement	187 cu. in. (3,059 cc)	
Starting	Electric	
Coolant Capacity	3.6 gal. (13.7 liters)	
Lube Oil Capacity	2.64 gal. (10.0 liters)	
Fuel Consumption	2.6 gal. (9.84 L)/hr at full load	1.97 gal. (7.47 L)/hr at 3/4 load
	1.43 gal. (5.42 L)/hr at 1/2 load	0.87 gal. (3.3 L)/hr at 1/4 load
Battery	12V - BCI Group 27	
Fuel	#2 Diesel Fuel	

DCA-45USI — DIMENSIONS (SIDE AND FRONT)

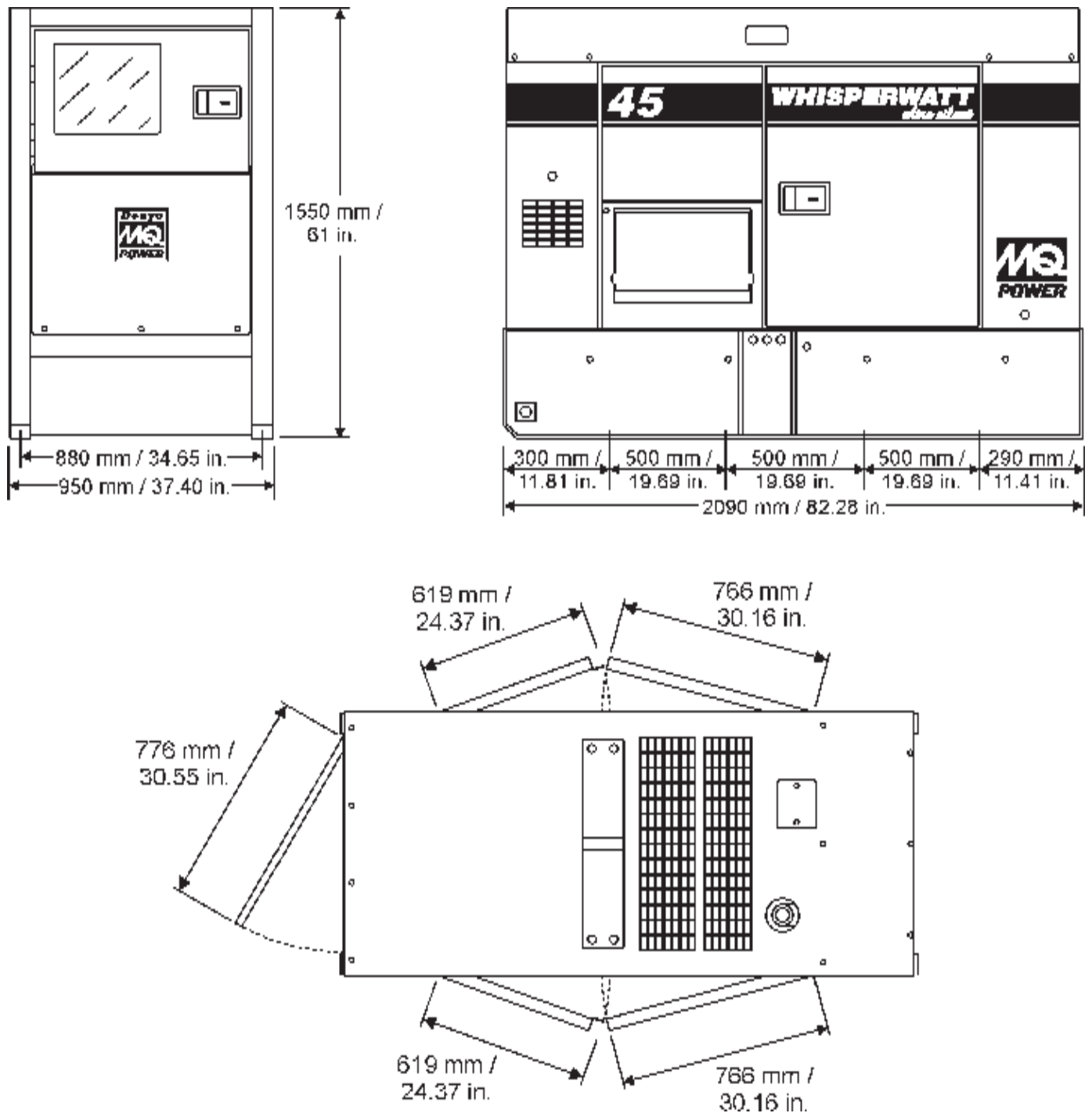
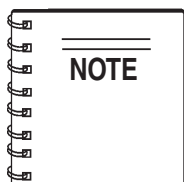


Figure 1. Dimensions

DCA-45USI — 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 DCA45USI ULTRA-SILENT™ 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.

DCA-45USI — 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.



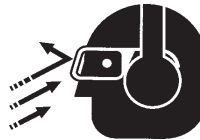
Over Speed Conditions



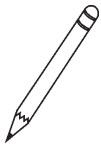
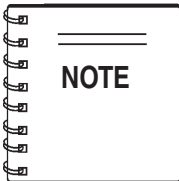
NEVER tamper with the factory settings of the engine governor or settings. Personal injury and damage to the engine or equipment can result if operating in speed ranges above maximum allowable.



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.

DCA-45USI — RULES FOR SAFE OPERATION

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-45USI 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.

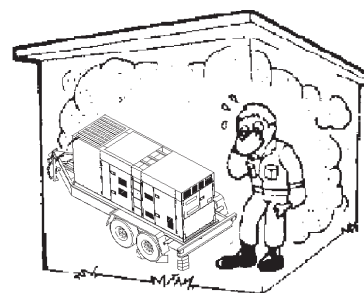
- **NEVER** operate the generator in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death**.

- **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 5.

- 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-45USI — 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

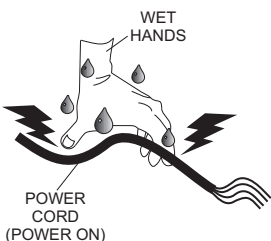
securely connected to the generator's output terminals, insufficient tightening of the terminal connections may cause damage to the generator and electrical shock.



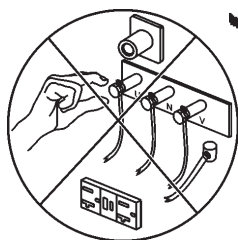
DANGER:



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

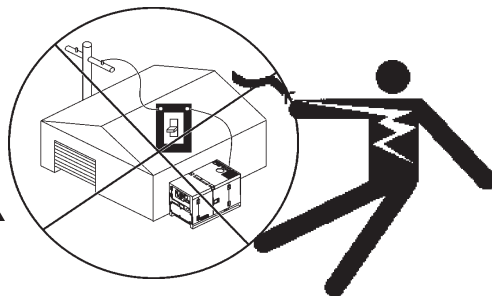


DANGER:



■ **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:



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.

Radiator

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.

DCA-45USI — 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 **Isuzu Engine Owner's 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

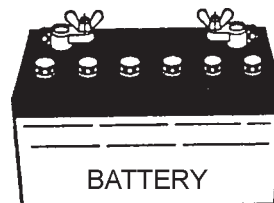
To guard against electrical shock and possible damage to the equipment, it is important to provide a good **EARTH** ground.

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.

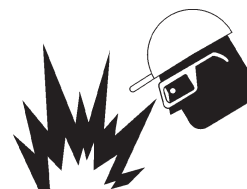
ALWAYS be sure to use the ground terminal (green wire) when connecting a load to the UVWO output terminals.

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.



Transporting

- **ALWAYS** shutdown engine before transporting.
- Tighten both fuel tank caps securely.
- If generator is mounted on a trailer, make sure trailer complies with all local and state safety transportation laws. See next page "**Towing Safety Precautions**" for basic towing techniques.

Towing Safety Precautions

CAUTION:



Conform to **Department of Transportation (DOT) Safety Towing Regulations** before towing generator.

To reduce the possibility of an accident while transporting the generator on public roads, always make sure the trailer that supports the generator and the towing vehicle are in good operating condition and both units are mechanically sound.

The following list of suggestions should be used when towing your generator:

- Make sure the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer "gross vehicle weight rating" (GVWR) of 6,000 lbs.
- **ALWAYS** inspect the hitch and coupling for wear. **NEVER** tow a trailer with defective hitches, couplings, chains etc.
- Check the tire air pressure on both towing vehicle and trailer. **Trailer tires should be inflated to 50 psi cold.** Also check the tire tread wear on both vehicles.
- **ALWAYS** make sure the trailer is equipped with a "Safety Chain".
- **ALWAYS** attach trailer's safety chains to towing vehicle properly.
- **ALWAYS** make sure the vehicle and trailer directional, backup, brake, and trailer lights are connected and working properly.
- The maximum speed for highway towing is **55 MPH** unless posted otherwise. Recommended off-road towing is not to exceed **15 MPH** or less depending on type of terrain.
- Place **chock blocks** underneath wheel to prevent **rolling**, while parked.
- Use the trailer's swivel jack to adjust the trailer height to a level position while parked.
- Avoid sudden stops and starts. This can cause skidding, or jack-knifing. Smooth, gradual starts and stops will improve towing.
- Avoid sharp turns.
- Trailer should be adjusted to a level position at all times when towing.
- Raise and lock trailer wheel stand in up position when transporting.
- DOT Requirements include the following:
 - Connect and test electric brake operation.
 - Secure portable power cables in cable tray with tie wraps.

Emergencies

- **ALWAYS** know the location of the nearest **fire extinguisher**.



- **ALWAYS** know the location of the nearest 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.



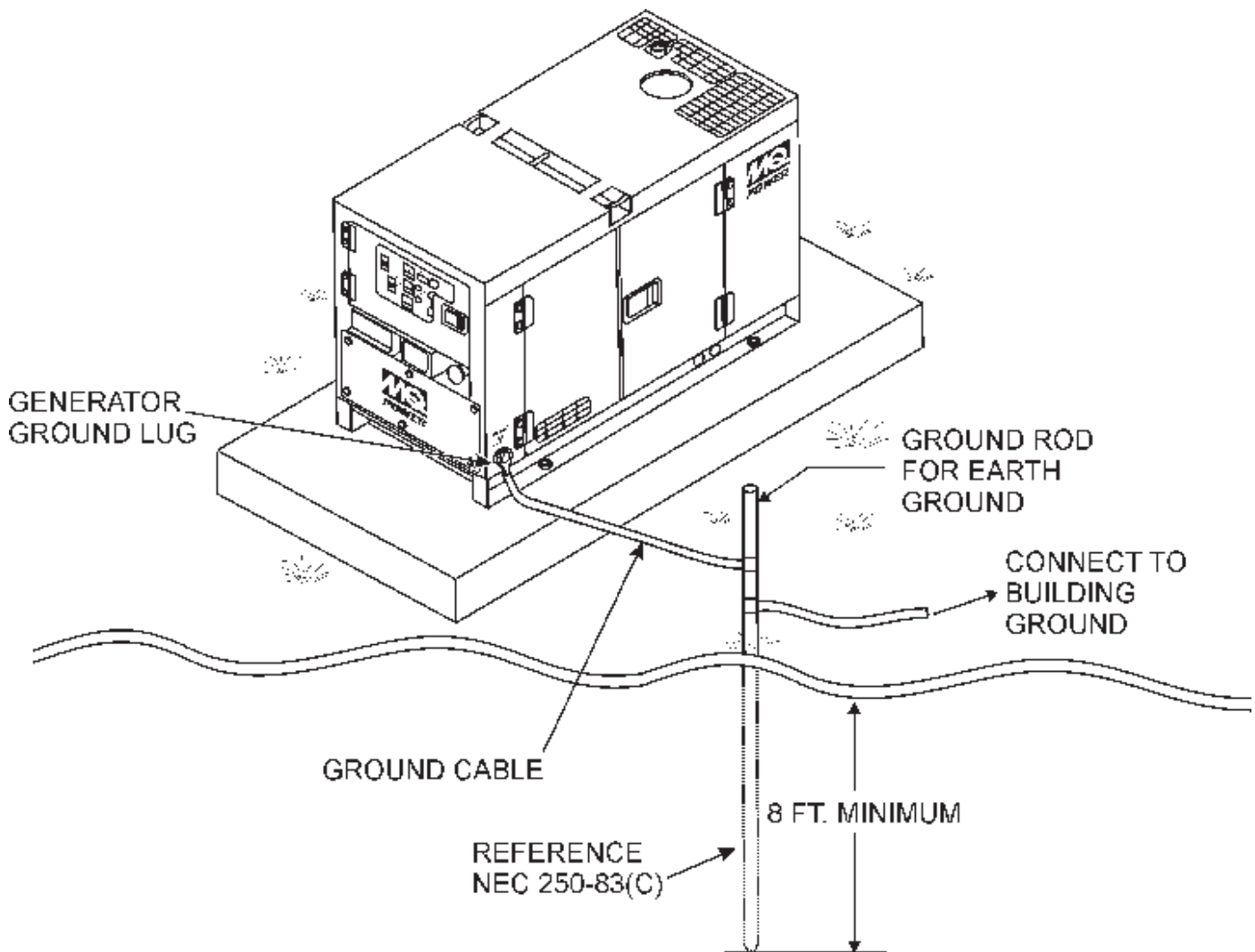


Figure 2. Typical Generator Grounding Application

Outdoor Installation

Install the generator in a clear area. 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.

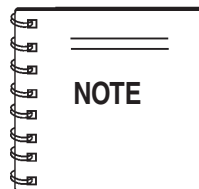
Generator Grounding

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.

DCA-45USI — TOWING SAFETY PRECAUTIONS

Towing Safety Precautions

CAUTION:



Check with your local county or state safety towing regulations before towing your generator.

To reduce the possibility of an accident while transporting the generator on public roads, always make sure the trailer (Figure 3) that supports the generator and the towing vehicle are in good operating condition and both units are mechanically sound.

The following list of suggestions should be used when towing your generator:

- Make sure the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer "gross vehicle weight rating" (GVWR).
- **ALWAYS** inspect the hitch and coupling for wear. **NEVER** tow a trailer with defective hitches, couplings, chains etc.
- Check the tire air pressure on both towing vehicle and trailer. Also check the tire tread wear on both vehicles.
- **ALWAYS** make sure the trailer is equipped with a "Safety Chain".
- **ALWAYS** attach trailer's safety chain to bumper of towing vehicle.
- **ALWAYS** make sure the vehicle and trailer directional, backup, brake, and trailer lights are connected and working properly.
- The maximum speed for highway towing is **55 MPH** unless posted otherwise. Recommended off-road towing is not to exceed **15 MPH** or less depending on type of terrain.
- Place *chocked blocks* underneath wheel to prevent **rolling**, while parked.
- Place *support blocks* underneath the trailer's bumper to prevent **tipping**, while parked.
- Use the trailer's hand winch to adjust the height of the trailer, then insert locking pin to lock wheel stand in place, while parked.
- Avoid sudden stops and starts. This can cause skidding, or jackknifing. Smooth, gradual starts and stops will improve gas mileage.
- Avoid sharp turns to prevent rolling.
- Remove wheel stand when transporting.
- **DO NOT** transport generator with fuel in tank.

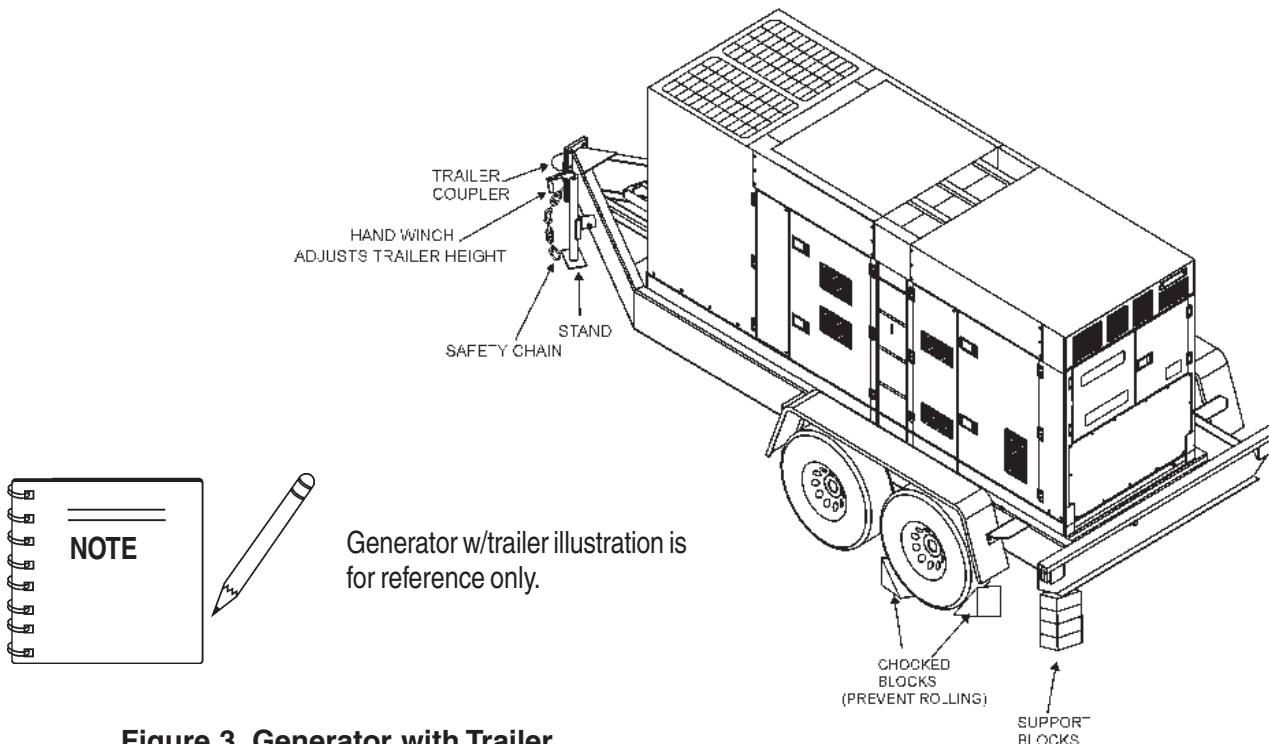


Figure 3. Generator with Trailer

CAUTION:



ALWAYS make sure the trailer is in good operating condition. Check the tires for proper inflation and wear. Also check the wheel lug nuts for proper tightness.

Explanation of Chart:

This section is to provide the user with trailer service and maintenance information. The service and maintenance guidelines referenced in this section apply a wide range of trailers. Remember periodic inspection of the trailer will ensure safe towing of the equipment and will prevent damage to the equipment and personal injury.

It is the purpose of this section to cover the major maintenance components of the trailer. The following trailer components will be discussed in this section:

- Brakes
- Tires
- Lug Nut Torquing
- Suspension
- Electrical
- Brake Troubleshooting Tables

Use the following definitions when reading Table 2.

1. **Fuel Cell** - Provides an adequate amount of fuel for the equipment in use. Fuel cells must be empty when transporting equipment.
2. **Braking System** - System employed in stopping the trailer. Typical braking systems are electric, surge, hydraulic, hydraulic-surge and air.
3. **GVWR**- Gross Vehicle Weight Rating (GVWR), is the maximum number of pounds the trailer can carry, including the fuel cell (empty).
4. **Frame Length** - Measurement is from the ball hitch to the rear bumper (reflector).
5. **Frame Width** - Measurement is from fender to fender
6. **Jack Stand** - Trailer support device with maximum pound requirement from the tongue of the trailer.
7. **Coupler** - Type of hitch used on the trailer for towing.
8. **Tire Size** - Indicates the diameter of the tire in inches (10,12,14, etc.), and the width in millimeters (175,185,205, etc.). The tire diameter must match the diameter of the tire rim.
9. **Tire Ply** - The tire ply (layers) number is rated in letters; 2-ply,4-ply,6-ply, etc.
10. **Wheel Hub** - The wheel hub is connected to the trailer's axle.
11. **Tire Rim** - Tires mounted on a tire rim. The tire rim must match the size of the tire.
12. **Lug Nuts** - Used to secure the wheel to the wheel hub. Always use a torque wrench to tighten down the lug nuts. See Table 17 and Figure 67 or lug nut tightening and sequence.
13. **Axle** - Indicates the maximum weight the axle can support in pounds, and the diameter of the axle expressed in inches (see Table 2). Please note that some trailers have a double axle. This will be shown as 2-6000 lbs., meaning two axles with a total weight capacity of 6000 pounds.
14. **Suspension** - Protects the trailer chassis from shocks transmitted through the wheels. Types of suspension used are leaf, Q-flex, and air ride.
15. **Electrical** - Electrical connectors (looms) are provided with the trailer so the brake lights and turn signals can be connected to the towing vehicle.
16. **Application** - Indicates which units can be employed on a particular trailer.

DCA-45USI — GENERATOR DECALS

The DCA-45USI generator is equipped with a number of safety decals. 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.

OPERATING PROCEDURES

Manual Starting

1. Check the fuel tank, oil level, and battery.
2. Make sure the generator is in the "OFF" position and the engine is stopped.
3. Check the battery charge condition. Recharge the battery if necessary.
4. Check the engine oil level. Recharge the oil if necessary.
5. Turn the generator switch to the "ON" position. The engine will start.
6. When the engine starts, the generator will produce power. The output voltage will be 120V AC.
7. When the engine stops, the generator will stop producing power.
8. When the engine starts, the generator will produce power. The output voltage will be 120V AC.
9. When the engine stops, the generator will stop producing power.
10. When the engine starts, the generator will produce power. The output voltage will be 120V AC.

Manual Stopping

1. Turn the generator switch to the "OFF" position.
2. When the engine stops, the generator will stop producing power.
3. When the engine starts, the generator will produce power. The output voltage will be 120V AC.
4. When the engine stops, the generator will stop producing power.
5. When the engine starts, the generator will produce power. The output voltage will be 120V AC.

Auto Starting/Stopping

1. When the generator switch is in the "ON" position, the generator will start automatically.
2. When the generator switch is in the "OFF" position, the generator will stop automatically.
3. When the generator switch is in the "ON" position, the generator will start automatically.
4. When the generator switch is in the "OFF" position, the generator will stop automatically.
5. When the generator switch is in the "ON" position, the generator will start automatically.

Emergency Stopping

1. Turn the generator switch to the "OFF" position.
2. When the engine stops, the generator will stop producing power.
3. When the engine starts, the generator will produce power. The output voltage will be 120V AC.
4. When the engine stops, the generator will stop producing power.
5. When the engine starts, the generator will produce power. The output voltage will be 120V AC.

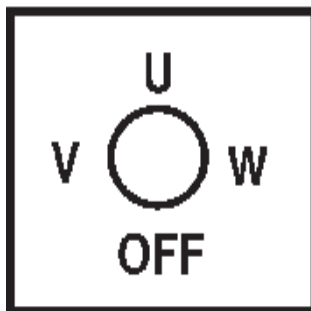
P/N M3552000103

SAFETY INSTRUCTIONS

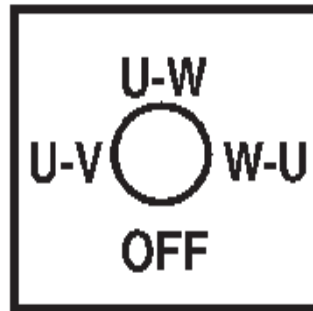
Improper operation of this machine can cause severe injury or death.

- Read the instruction manual carefully before operating or servicing.
- This machine should only be operated by a person with sufficient knowledge and skill to ensure safe operation.
- High voltage circuits are located inside the output terminal cover and control panel.
- Close the cover and control panel before operating.
- Moving parts and hot surfaces are contained within the enclosure.
- Close all doors and lock them before operating.

P/N M9520100304



P/N M9520000104



P/N M9520000204



P/N M950000004



P/N M9510200002

OVER CURRENT RELAY

If it is impossible to reset the CIRCUIT BREAKER, open the control panel and push the RESET BUTTON as below.

P/N M9520200104



P/N M9500300104



P/N M9500300004

DIESEL FUEL


M95050400

P/N M9500500004

WATER • OIL CHECK AND FILL DAILY

M950300010


P/N M9503000103

	<p>⚠ WARNING</p> <p>ELECTRIC SHOCK HAZARD</p> <ul style="list-style-type: none"> Do not touch any terminals while this machine is operating. Turn power off before servicing. 	<p>⚠ WARNING</p> <p>ELECTRIC SHOCK HAZARD</p> <ul style="list-style-type: none"> Always complete the grounding path from the ground terminal on this generator to an external grounding point. See maintenance manual for details. 	<p>⚠ WARNING</p> <ul style="list-style-type: none"> Before removal of this generator from a building's electrical system, a licensed electrician must take the generator (for safety) offline. Severe injury or death may result without proper installation. <p style="text-align: right;">M9520100503</p>
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P/N M9520100503

	<p>⚠ WARNING</p> <p>HOT COOLANT can cause severe burns.</p> <ul style="list-style-type: none"> Do not remove cap if radiator is hot. <p style="text-align: right;">M903100000</p>
---	--

P/N M9503100004

	<p>⚠ WARNING</p> <p>ENGINE EXHAUST can cause severe injury or death.</p> <ul style="list-style-type: none"> Use only in open, well ventilated areas or vent exhaust outside. <p style="text-align: right;">M9503000000</p>
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P/N M9503200004

<p>DANGER</p> <p>HIGH VOLTAGE</p> <p style="text-align: right;">M9520100404</p>

P/N M9520100404

<p>⚠ CAUTION</p> <p>Stop engine before servicing.</p> <p style="text-align: right;">M9520100204</p>
--

P/N M9520100204

	<p>⚠ CAUTION</p> <p>MOVING PARTS can cause severe injury.</p> <ul style="list-style-type: none"> Do not operate with doors open. Stop engine before servicing. <p style="text-align: right;">M9503000000</p>
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P/N M9503000004

<p>NOTE</p> <p>To use 50 amp receptacles, adjust the voltage selector switch to the single phase position and the main line circuit breaker to the on position.</p> <p style="text-align: right;">P/N M1550000204</p>
--


P/N M1550000204

	<p>⚠ CAUTION</p> <ul style="list-style-type: none"> HOT PARTS can burn skin. Do not touch until the machine has sufficiently cooled. <p style="text-align: right;">M9510100004</p>
---	--

P/N M9510100004

	<p>⚠ WARNING</p> <p>ELECTRIC SHOCK HAZARD</p> <ul style="list-style-type: none"> Do not touch output terminals while this machine is operating. Turn power off before servicing.
--	--

P/N M9520100503

	<p>⚠ WARNING</p> <p>ELECTRIC SHOCK HAZARD</p> <ul style="list-style-type: none"> Do not touch internal wiring or connections while this machine is operating. Turn power off before servicing. <p style="text-align: right;">M9520100000</p>
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P/N M9520100004

DCA-45USI FAMILIARIZATION

Generator

The MQ Power Model DCA-45USI (Figure 4) is a 36 kW **generator** 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/ Alarm Lamp
- Oil Pressure Gauge/ Alarm Lamp
- Charging Ammeter Gauge
- Pre-Heat Lamp
- Panel Light
- Panel Light Switch
- Ignition/Preheat Switch
- Fuel Gauge
- Fuel Filter Water Level Alarm Lamp

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
- 3-Pole, 110 amp Main Circuit Breaker

Output Terminal Panel

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

- Three 120/240V output receptacles (CS-6369), 50 amps
- Three auxiliary circuit breakers, @50 amps
- Two 125 VAC output receptacles, (GFCI), 20 amps
- Two GFCI circuit breakers @ 20amps
- Five output terminal lugs (3Ø power)

Control Box

The "Control Box" is provided with the following:

- Automatic Voltage Regulator
- Current Transformer
- Emergency Relay
- Over-Current Relay

Open Delta Excitation System

The DCA-45USI 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-45USI** is powered by a 4 cycle, water cooled, turbocharged Isuzu BB-4JG1T **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.

The basic controls and indicators for the DCA-45USI generator are addressed on the following pages.

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 within $\pm 5\%$. The electronic governor option decreases the frequency variation to within $\pm 0.25\%$.

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.

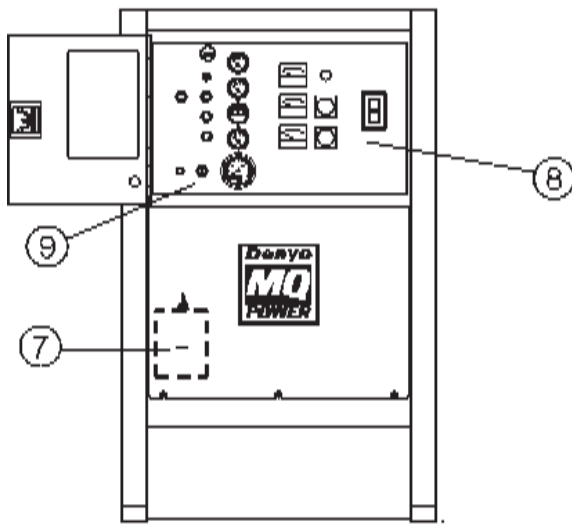
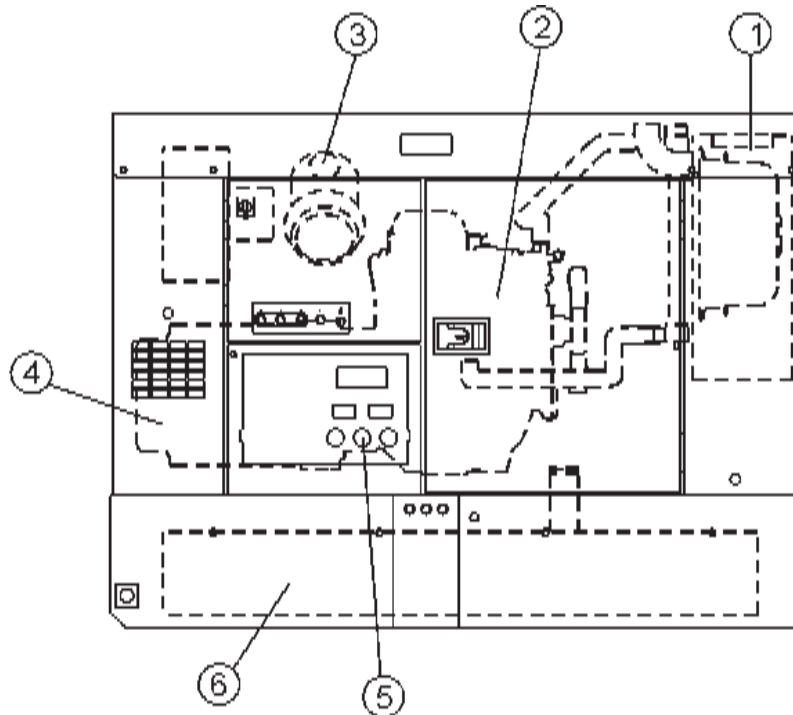


Figure 4. Major Components

Table 3. Generator Major Components

ITEM NO.	DESCRIPTION
1	Muffler Assembly
2	Engine Assembly
3	Air Cleaner Assembly
4	Generator Assembly
5	Output Terminal Assembly
6	Fuel Tank Assembly
7	Battery Assembly
8	Generator Control Panel Assembly
9	Engine Operating Panel Assembly

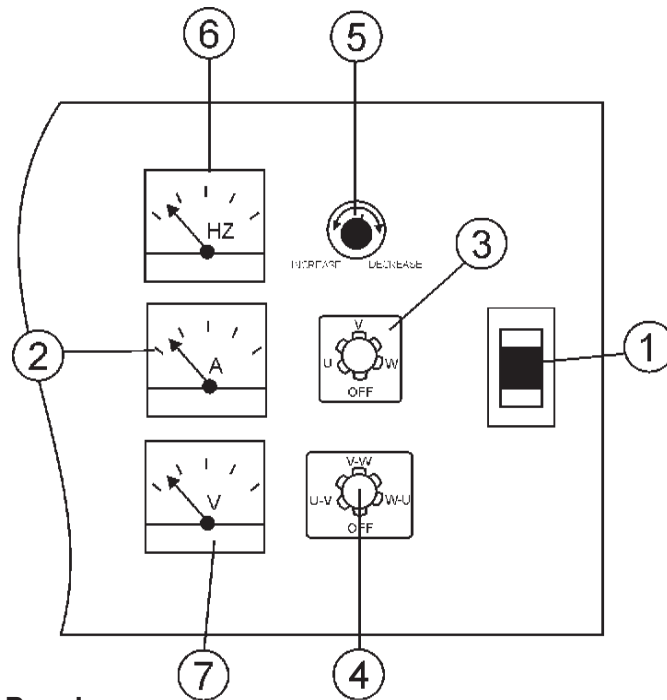


Figure 5. Generator Control Panel

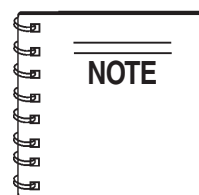
The definitions below describe the controls and functions of the DCA-45USI "**Generator Control Panel**" (Figure 5).

1. **Main Circuit Breaker** – This three-pole, 110 amp main breaker is provided to protect the **U,V, and W Output Terminal Lugs** 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 **U,V, and W Output Terminal Lugs**.

Located behind the generator control panel is the **Generator Control Box**. This box contains some of the necessary electronic components required to make the generator 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 **U,V, and W Output Terminal Lugs** to the load.

In the event of a short circuit or over current condition, it will automatically trip the 60 amp main breaker.

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

DCA-45USI — ENGINE OPERATING PANEL

The definitions below describe the controls and functions of the DCA-45USI "**Engine Operating Panel**" (Figure 6).

1. **Panel Light** - Normally used in dark places or at night. When activated, panel will luminate. When the generator is not in use, turn the panel light switch to the **OFF** position.
2. **Panel Light Switch**- When activated, will turn on control panel light.
3. **Oil Pressure Lamp** - Indicates that the oil pressure is too low and will shut down the engine.
4. **Water Temperature Lamp** - Indicates that the water temperature is too hot and will shut down the engine.
5. **Fuel Filter Water Level Alarm Lamp** - This lamp turns on when water in the filter is detected. Drain the water in the fuel filter strainer to correct the problem.
6. **Pre-heat Lamp** - This indicates when the engine has been preheated and is ready for starting. In cold weather conditions, it may be several minutes before the lamp illuminates.
7. **Fuel Leak Detected Alarm** – This indicates that liquid is present in the fuel tank containment basin. Drain the containment basin and repair any leaks.
8. **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.
9. **Fuel Gauge** - Indicates amount of diesel fuel available.
10. **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.
11. **Water Temperature Gauge** – During normal operation this gauge be should read between 165° F to 203° F.
12. **Oil Pressure Gauge** – Normal operation should be about 28 to 71 psi. When starting the generator the oil pressure may read a bit higher, but after the engine warms up the oil pressure should return to normal.
13. **Starter Switch** – Three position switch, stop, preheat/run and start. Insert ignition key to start and stop engine.

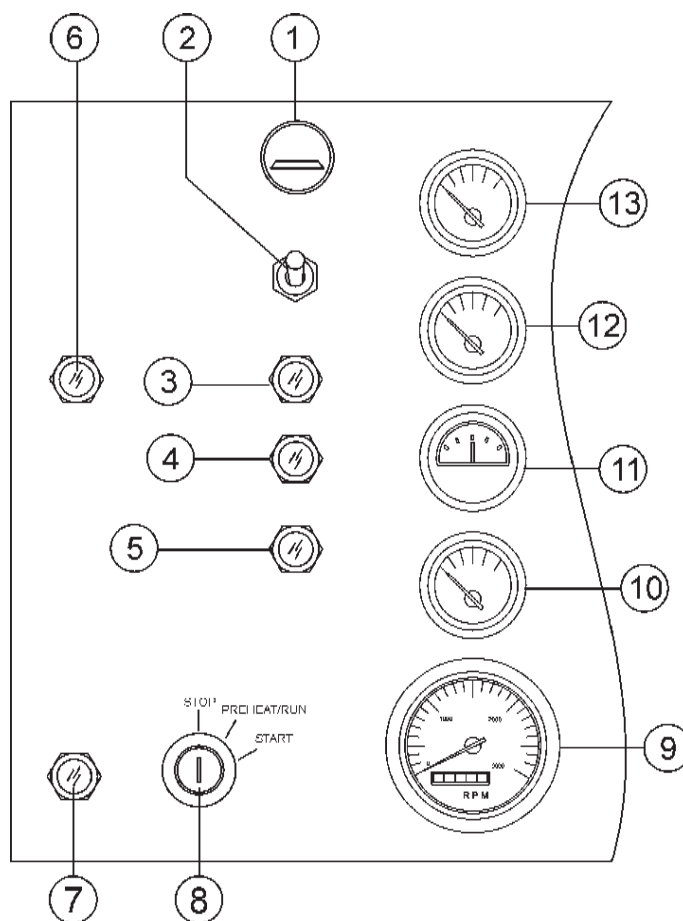
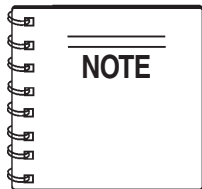


Figure 6. Engine Operating Panel

DCA-45USI — OUTPUT TERMINAL PANEL FAMILIARIZATION

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**.

Output Terminal Familiarization

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

- Three (3) 120/240V output receptacles, 50 amp
- Three (3) Circuit Breakers 240V @ 50 amps
- Two (2) 120V GFCI receptacles, 20 amp
- Two (2) GFCI Circuit Breakers @ 20 amps
- One Main Circuit Breaker @ 110 amps
- Five (5) Output Terminal Lugs (U, V, W, O, Ground)

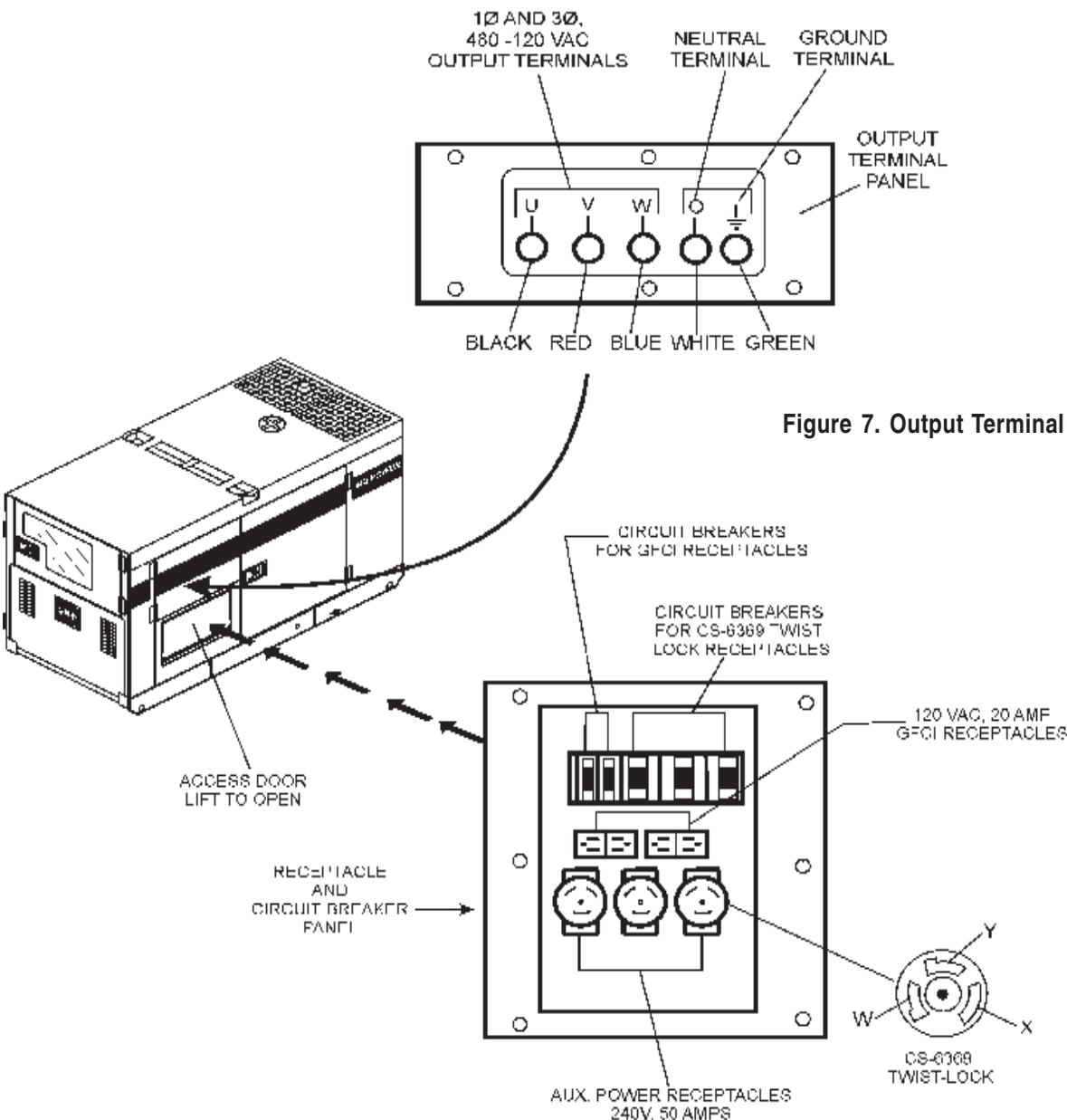


Figure 7. Output Terminal Panel

DCA-45USI — 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.

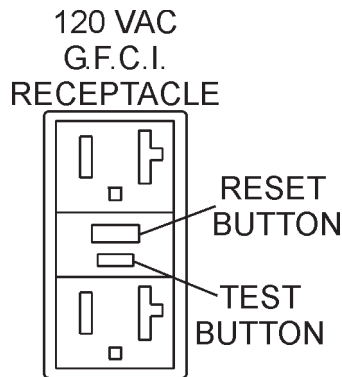


Figure 8. G.F.C.I. Receptacle

Twist Lock Dual Voltage 120/240 VAC Receptacles

There are three 120/240 VAC, 50 amp auxilliary 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**.

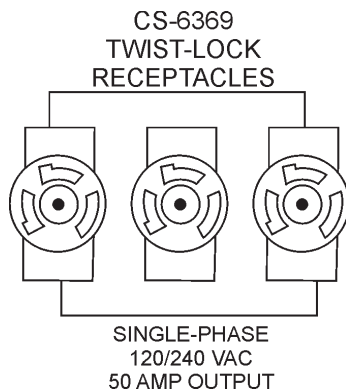


Figure 9. 240 VAC Twist-Lock Auxiliary Receptacles

Each auxilliary 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 **Output Terminal Lugs**.

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 (Output Terminal Lugs)

The **Output Terminal Lugs** are protected by a plastic face plate cover (Figure 11). Un-screw the securing bolts and lift the plastic terminal cover to gain access to the terminal enclosure.

After the load wires have been securely attached to the **Output Terminal Lugs**, reinstall the plastic face plate.

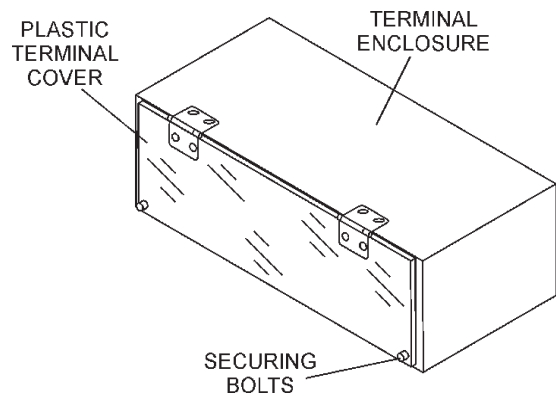


Figure 11. Plastic Face Plate (UVWO Terminals)

DCA-45USI — OUTPUT TERMINAL PANEL FAMILIARIZATION

Connecting Loads

Loads can be connected to the generator by using the **Output 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 **Output Terminal Lugs** from overload, a 3-pole, 110 amp, **main** circuit breaker is provided. Make sure to switch **ALL** circuit breakers to the **OFF** position prior to starting the engine.

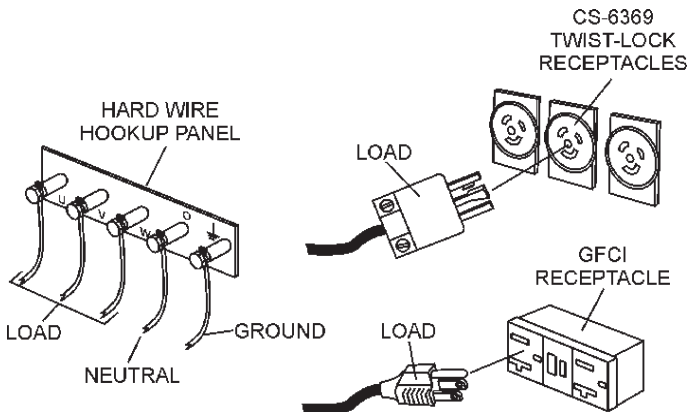


Figure 12. Connecting Loads

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.

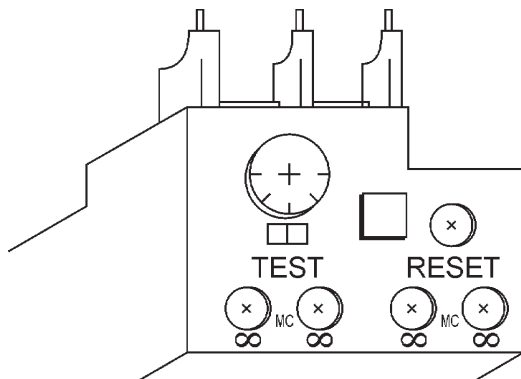


Figure 13. Over Current Relay

Blower Fan

This unit has an intake fan located at the rear of the machine to draw outside air into the cabinet to cool the engine. The fan has a 10 amp AC fuse located beneath the **Voltage Selector Switch** (Figure 14).

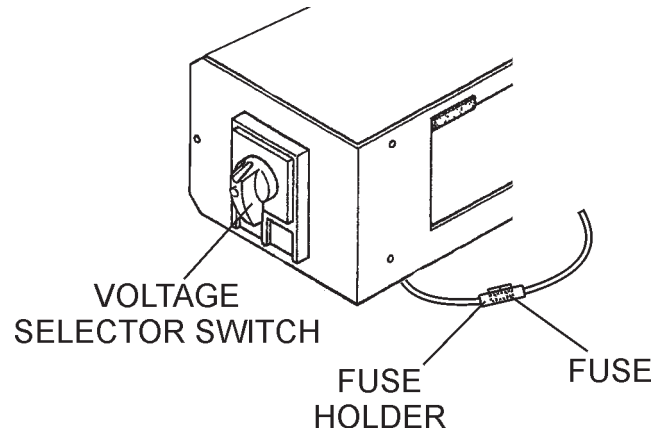


Figure 14. Blower Fan Fuse

DANGER:



This fuse has current running through it any time the engine is operating. **THIS FUSE IS NOT** connected to the main circuit breaker **OF** the generator. Attempting to replace the fuse with the engine and/or generator operating could result in **electrocution** and **severe bodily harm**. **ALWAYS** turn the unit completely off before attempting to replace or handle **THIS** fuse



Single Phase Load

Always be sure to check the nameplate on the generator and equipment to insure the wattage, amperage, frequency, and voltage 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.

WATTS | VOLTAGE x AMPERAGE

The power factor of this generator is 0.8. See Table 4 below when connecting loads.

Table 4. 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 5. Cable Selection (60 Hz, Single Phase Operation)

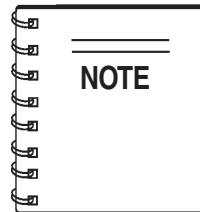
Current in Amperes	Load In Watts		Maximum Allowable Cable Length			
	At 120 Volts	At 240 Volts	#10 Wire	#12 Wire	#14 Wire	#16 Wire
2.5	300	600	1000 ft.	600 ft.	375 ft.	250 ft.
5	600	1200	500 ft.	300 ft.	200 ft.	125 ft.
7.5	900	1800	350 ft.	200 ft.	125 ft.	100 ft.
10	1200	2400	250 ft.	150 ft.	100 ft.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

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



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.

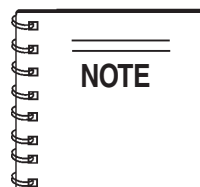
- When connecting a resistance load such as an incandescent lamp or electric heater, a capacity of up to the generating set's rated output (kW) can be used.
- When connecting a fluorescent or mercury lamp, a capacity of up to the generating set's rated output (kW) multiplied by 0.6 can be used.
- When 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 damage to the building's electrical system may occur without this transfer switch.



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

DCA-45USI — GENERATOR OUTPUTS

Voltage Selector Switch

The **voltage selector** switch (Figure 15) is located above the UVWO Hard Wire Hook-up Panel. It has been provided for ease of voltage selection.

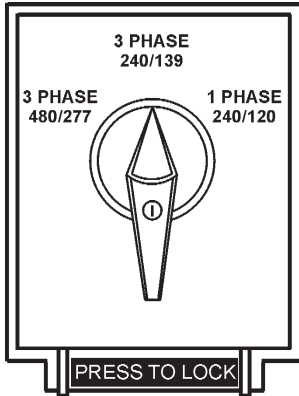


Figure 15. Voltage Selector Switch

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 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 6 (see below) will require a fine adjustment using the **voltage regulator (VR) control knob** located on the control panel.

Table 6. Voltages Available						
Three Phase (Switchable)	208V	220V	240V	416V	440V	480V
Single Phase (Switchable)	120V	127V	139V	240V	254V	277V

Generator Amperage

Table 7 describes the generator's current output capability for both 1Ø-phase and 3Ø phase applications.

Table 7. Generator Ampere Ratings						
DCA-45USJ	kW	kVA	120V	208V	240V	480V
Single Phase	26	N/A	108A x 2	N/A	108A	N/A
Three Phase*	36	45	N/A	125A	108A	54A

* Power Factor = 0.8

GFCI Receptacle Load Capability

The load capability of the GFCI receptacles is directly related to the voltage being supplied at either the output terminal lugs or the 3 twist lock auxilliary 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	
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

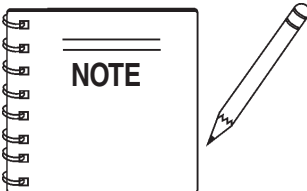
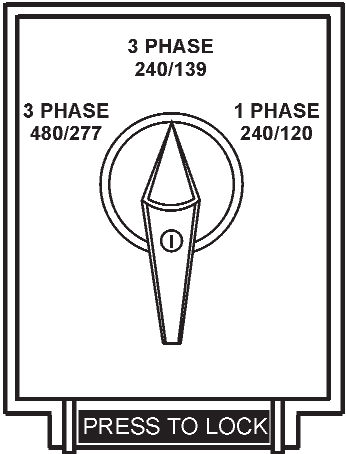
Table 8. GFCI Receptacle Load Capability	
KVA in Use (UVWO Terminals)	Available Load Current (AMPS)
3Ø 240/480V	GFCI Duplex NEMA 5-20R 120V
82	0
77.8	5 amps per receptacle
73.7	10 amps per receptacle
69.5	15 amps per receptacle
65.4	20 amps per receptacle

How to Read the Output Terminal Gauges.

The gauges and selector switches on the control panel **DO NOT** effect the generator output. They are provided to help observe how much power is being supplied at the **Output Terminal Lugs**.

Before taking a reading off either gauge, set the **Voltage Selector Switch** (Figure 16) to the position which produces the required voltage (For example, for 3Ø 240V, choose the center 3Ø 240/139V position on the voltage selector switch.)

Figure 16. Voltage Selector Switch 240/139V Three Phase Position



For 3Ø 208V/1Ø,120V, place the Voltage Selector Switch in the 3 Phase 340/139 position.

Reading Voltage

To determine the voltage between two terminal lugs, set the **AC Voltmeter Change-Over Switch** to the appropriate setting (Figure 17) to activate the **AC Voltmeter Gauge** (Figure 18) and read the available voltage between the two lugs.

For example, to measure the voltage between the W and U terminal lugs, set the **AC Voltmeter Change-Over Switch** to W-U and read the **AC Voltmeter Gauge**.

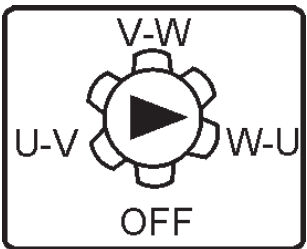


Figure 17. AC Voltmeter Change-Over Switch

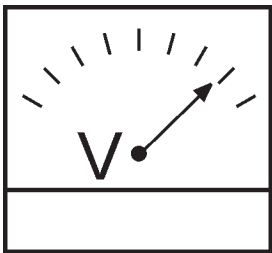


Figure 18. AC Voltmeter Gauge (Volt reading on W-U Lug)

Reading Amperage

To determine the amperage at a terminal lug, set the **AC Ammeter Change-Over Switch** to the appropriate setting (Figure 19) to activate the **AC Ammeter Gauge** (Figure 20) and read the available amperage at the terminal lug.

For example, to measure the amperage at the U terminal lug, set the **AC Ammeter Change-Over Switch** to U and read the **AC Ammeter Gauge**.

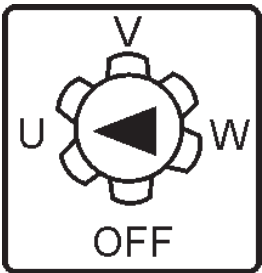


Figure 19. AC Ammeter Change-Over Switch

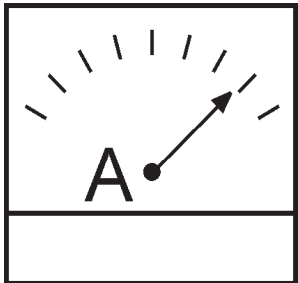
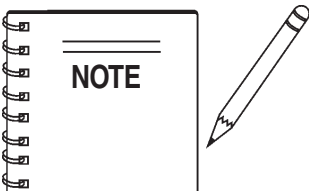


Figure 20. AC Ammeter (Amp reading on U lug)



The **ammeter** gauge will only show a reading when the **Output Terminal Lugs** are connected to a load and in use.

DCA-45USI — OUTPUT TERMINAL PANEL CONNECTIONS

UVWO Terminal Output Voltages

Various output voltages can be obtained using the using the **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 Output Terminal Lug Voltages

1. Place the voltage selector switch in the 3Ø 240/139 position as shown in Figure 21.

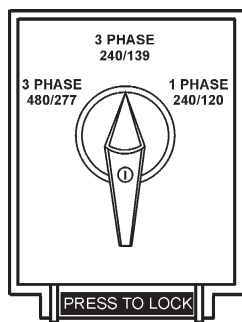


Figure 21. Voltage Selector Switch 240/139V Three-Phase Position

2. Connect the load wires to the **Output Terminal Lugs** as shown in Figure 22.

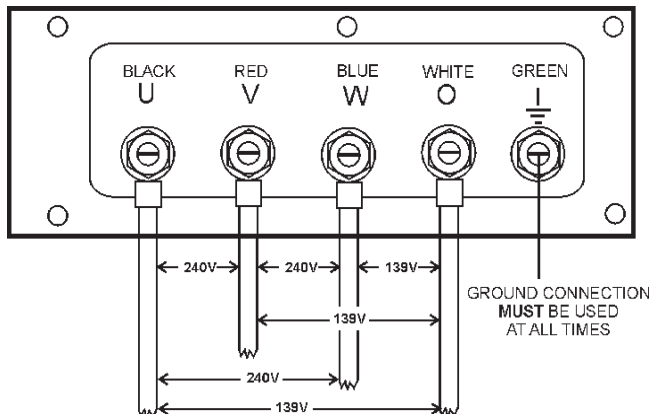


Figure 22. Output Terminal Lugs 240/139V Three Phase Connections

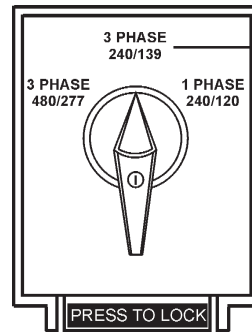
3. Turn the voltage regulator knob (Figure 23) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.



Figure 23. Voltage Regulator Knob

3Ø 208V/1Ø120V Output Terminal Lug Voltages

1. Place the voltage selector switch in the 3Ø 240/139 position as shown in Figure 24.



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

Figure 24. Voltage Selector Switch 3Ø-208V/1Ø-120V Three-Phase Position

2. Connect the load wires to the **Output Terminal Lugs** as shown in Figure 25.

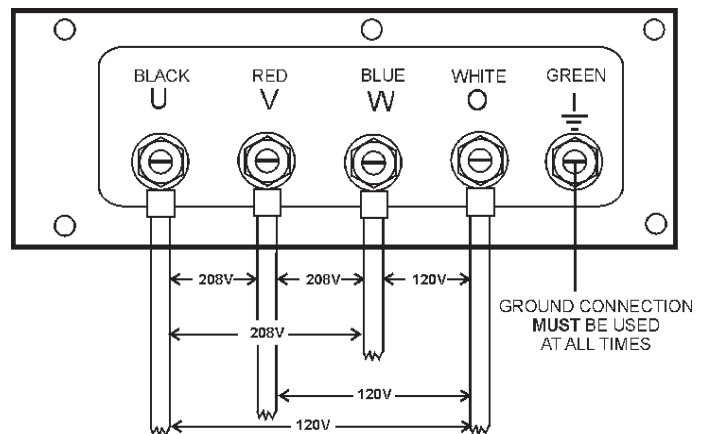
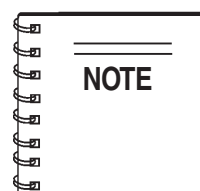


Figure 25. Output Terminal Lugs 3Ø-208V/120V Connections

3. Turn the voltage regulator knob (Figure 23) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.



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

DCA-45USI — OUTPUT TERMINAL PANEL CONNECTIONS

3Ø 480/277 Output Terminal Lug Voltages

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

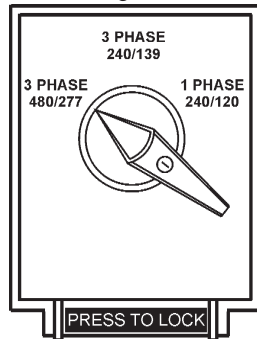


Figure 26. Voltage Selector Switch 480/277V Three-Phase Position

2. Connect the load wires to the **Output Terminal Lugs** as shown in Figure 27.

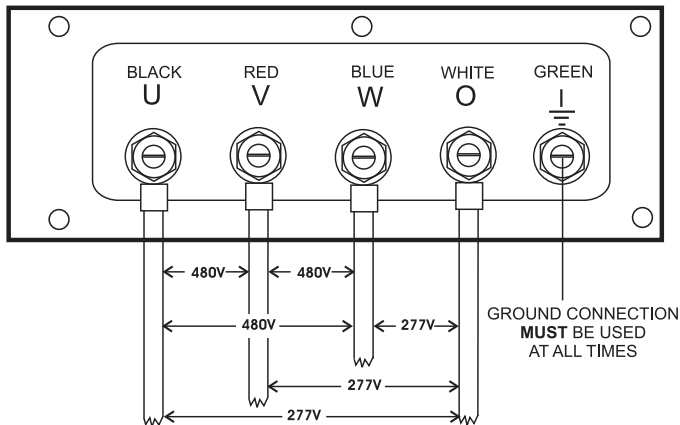


Figure 27. Output Terminal Lugs 277/480V Three Phase Connections

3. Turn the voltage regulator knob (Figure 23) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.

1Ø 240V/120V Output Terminal Lug Voltages

1. Place the voltage selector switch in the 1Ø 240/120 position as shown in Figure 28.

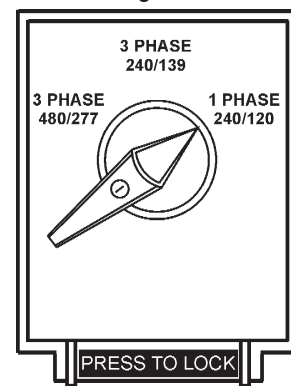


Figure 28. Voltage Selector Switch 240/120V Single-Phase Position

2. Connect the load wires to the **Output Terminal Lugs** as shown in Figure 29.

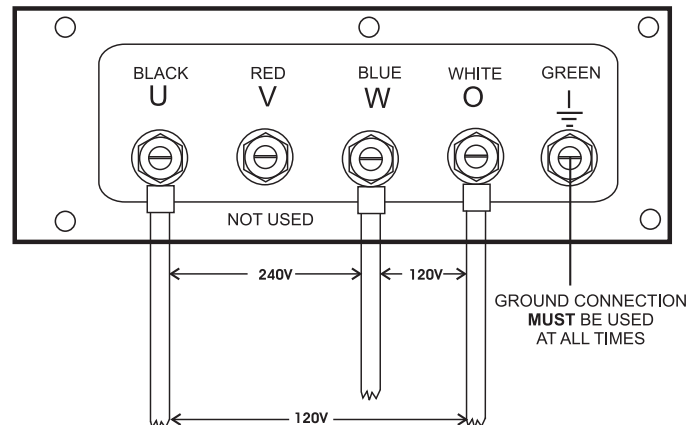


Figure 29. Output Terminal Lugs 1Ø-240V/120V Connections

3. Turn the voltage regulator knob (Figure 23) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.

Circuit Breakers

To protect the generator from an overload, a 3-pole, 110 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 30) on the dipstick. See Table 10 for proper selection of engine oil.

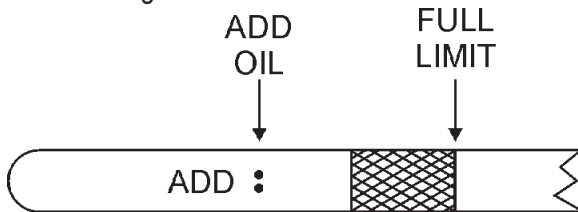


Figure 30. Engine Oil Dipstick

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 **Isuzu 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 11. Recommended Motor Oil

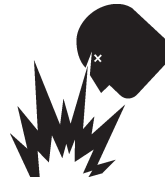
Temperature Range	Type Oil
77°F and greater (25°C and greater)	SAE15W-40 or SAE40
32°F to 77°F (0°C to 25°C)	SAE 10W-30 or SAE30
-22°F to -32°F (-30°C to 0°C)	SAE10W-30 or SAE10

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

WARNING:



ONLY properly trained personnel who have read and understand this section should re-fill the fuel tank system.

The generator unit has an internal fuel tank located at the bottom of the cabinet (Figure 31). **ALWAYS** fill the fuel tank with clean and fresh **#2 diesel fuel**. **DO NOT** fill the fuel tanks 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.

Generator Internal Fuel Tank

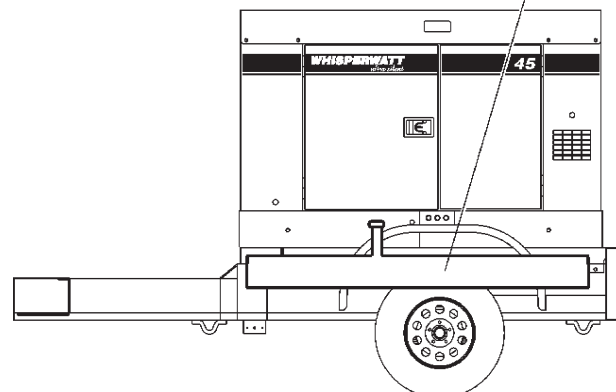


Figure 31. Internal Fuel Tank System

Refueling Procedure:

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 (Figure 32).

WARNING:

ALWAYS! place trailer on firm level ground before refueling.

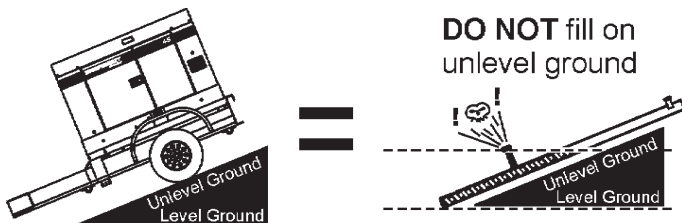
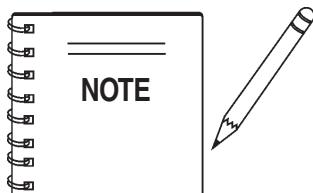


Figure 32. Only Fill on Level Ground



ONLY! use #2 diesel fuel when refueling.

2. Open cabinet doors on the generator. Locate and remove the fuel tank cap and fill tank (Figure 33).

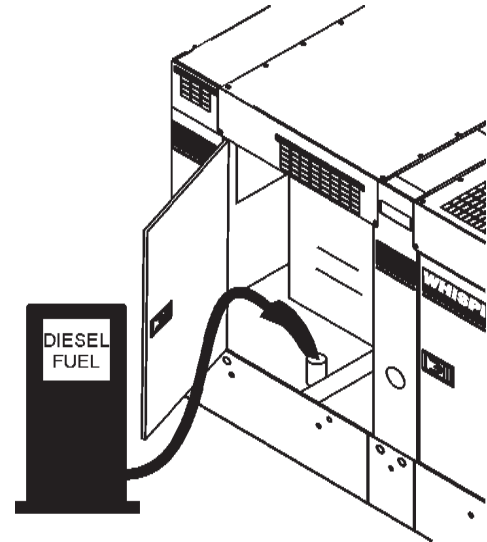


Figure 33. Fueling the Generator

3. **NEVER overfill fuel tank** – It is important to read the fuel gauge when filling trailer fuel tank. **DO NOT** wait for fuel to rise in filler neck (See Figure 34).

FUEL GAUGE LOCATED ON CONTROL PANEL

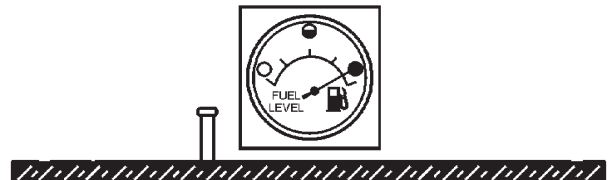


Figure 34. Full Fuel Tank

WARNING:



DO NOT OVER-FILL fuel system. Leave room for fuel expansion. Fuel expands when heated (Figure 35).



Figure 35. Fuel Expansion

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 12 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.

Table 12. Coolant Capacity

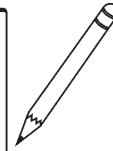
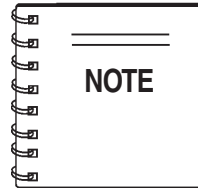
Engine and Radiator	5.3 Gal. (20 L)
Reserve Tank	0.26 Gal. (1L)

Operation Freezing Weather

When operating in freezing weather, be certain the proper amount of antifreeze (Table 13) has been added.

Table 13. 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



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 **Isuzu 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 **Isuzu Engine Owner's Manual**.

The fan belt tension is proper if the fan belt bends 10 to 15 mm (Figure 38) when depressed with the thumb as shown below.

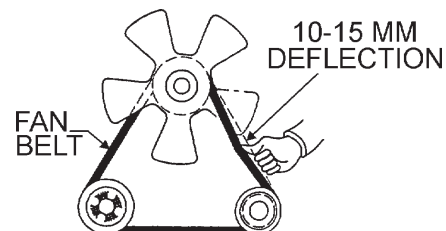


Figure 36. Fan Belt Tension

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 37) 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**.

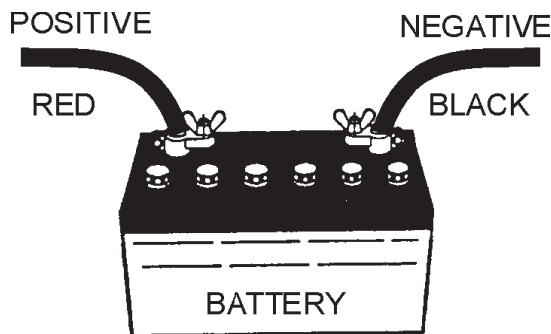
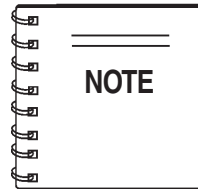


Figure 37. Battery Connections

When connecting battery do the following:

1. **NEVER** connect the battery cables to the battery terminals when the **ignition** switch is in the **PRE-HEAT/RUN** 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-45USI — GENERATOR START-UP PROCEDURE

WARNING:



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

Before Starting

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 40) in the **OFF** position prior to starting the engine.

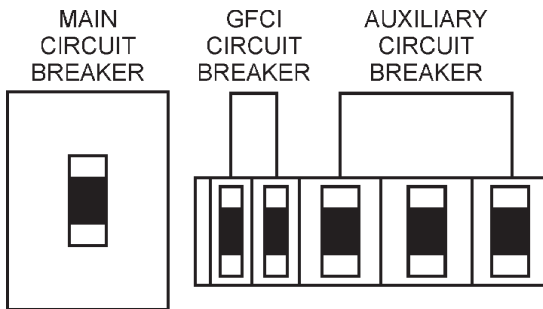


Figure 38. Main, Aux. and GFCI Circuit Breakers

2. Connect the load to the **Output Terminal Lugs** or **auxiliary receptacles** as shown in Figure 39. These load connection points can be found on the output terminal panel.

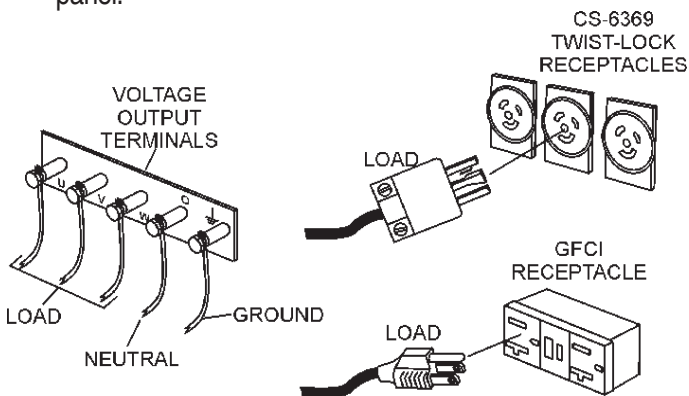


Figure 39. Load Connections

3. Close all engine enclosure doors (Figure 40).

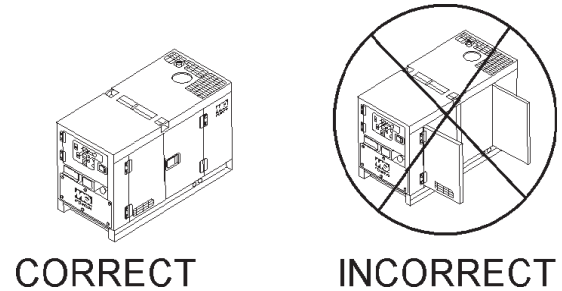


Figure 40. Engine Enclosure Doors

4. Place the voltage selector switch in the desired voltage position (Figure 41).

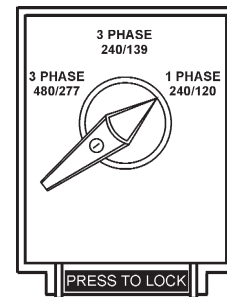


Figure 41. Voltage Selector Switch

5. Preheat the engine **glow plugs** by turning the ignition key (Figure 42) to the **PRE-HEAT/RUN** position. When the preheat lamp (Figure 43) turns off, proceed to step 6.

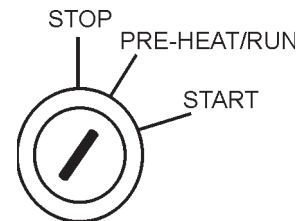


Figure 42. Ignition Switch (Pre-Heat/Run Position)

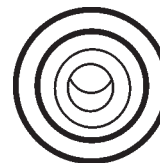


Figure 43. Pre-Heat Indicator Lamp

DCA-45USI — GENERATOR START-UP PROCEDURE

6. Turn the ignition key to the **START** position (Figure 44). Once the engine starts, release the ignition key and allow it to return to the **PRE-HEAT/RUN** position (Figure 42).

If the engine fails to start after 10 seconds, wait approximately 30 seconds and repeat steps 5-6.

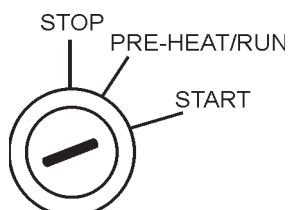


Figure 44. Ignition Switch (Start Position)

7. Let the engine run for 3-5 minutes and listen and check for any abnormal sounds or smells. Check for fuel leaks, and noises that would associate with a loose cover or hardware.

Check the electric motor fan cooling the radiator for abnormal speed, sound or vibration conditions.

If any of the above mentioned conditions exists, shut-down the engine and correct the problem before operating the generator.

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

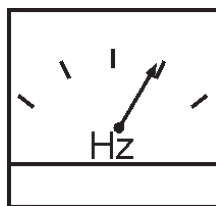


Figure 45. Frequency Meter (Hz)

9. The generator's voltage meter (Figure 46) displays the output voltage in **VOLTS**.

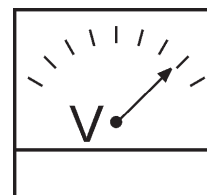


Figure 46. AC Voltmeter

10. If the voltage is not reading at the specified level, use the voltage adjustment control knob (Figure 47) to increase or decrease the voltage until you reach the desired voltage.



Figure 47. Voltage Adjust Control Knob

11. 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.

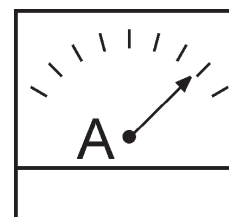


Figure 48. Ammeter (No Load)

DCA-45USI — GENERATOR START-UP PROCEDURE

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

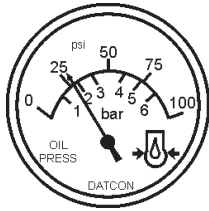


Figure 49. Oil Pressure Gauge

13. The coolant temperature gauge (Figure 50) will indicate the coolant temperature. Under normal operating conditions the coolant temperature is between 165 and 203° degrees Fahrenheit.

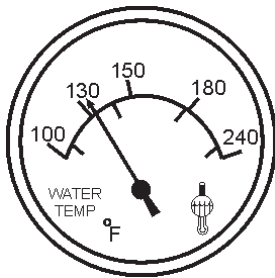


Figure 50. Coolant Temperature Gauge

14. 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.

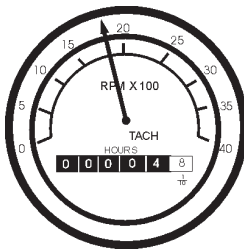


Figure 51. Engine Tachometer

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

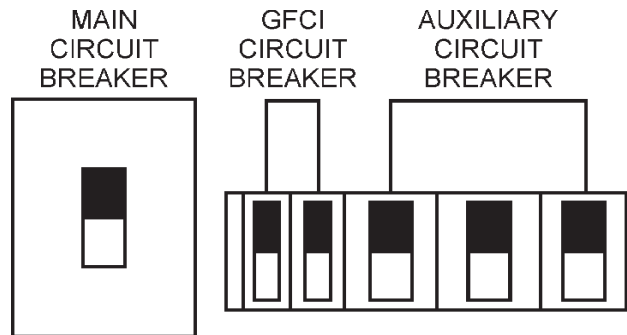


Figure 52. Main, AUX. and GFCI Circuit Breakers (ON)

16. 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.

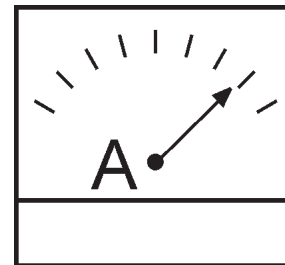


Figure 53. Ammeter (Load)

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

DCA-45USI — GENERATOR SHUT-DOWN PROCEDURE

Normal Shut-down Procedure

To shutdown the generator, use the following procedure:

1. Switch the **MAIN**, **AUX** and **GFCI** circuit breakers (Figure 54) to the **OFF** position (no load).

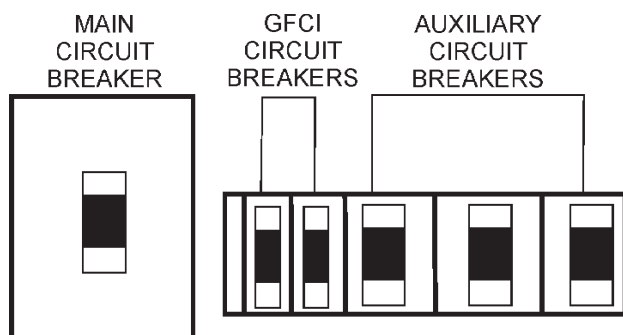


Figure 54. Main, AUX. and GFCI Circuit Breakers (OFF)

3. Let the engine cool by running it for 3-5 minutes with no load applied (circuit breakers in the **OFF** position).
4. Place the ignition switch (Figure 55) in the **STOP** position, remove the key and store in a safe place.

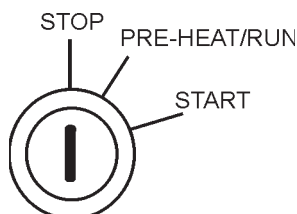


Figure 55. Ignition Switch (Off Position)

5. Remove **all** loads from the generator.
6. Allow for sufficient time for cooling and then inspect the complete unit for any damage or loosening that may have occurred during operation.
7. Check the engine oil, coolant and fuel levels. Replenish as necessary.

Emergency Shut-down Procedure

1. To shut-down the engine in the event of an emergency, switch the **MAIN**, **GFCI** and **LOAD** (Figure 54) circuit breakers to **OFF** position.
2. Turn the ignition switch key to the **STOP** position (Figure 55).

Automatic Shut-down System

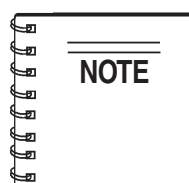
This unit is equipped with safety devices to automatically stop the engine in the event of low oil pressure (approx. 14 PSI.), or high water temperature (approx. 221° F). The alarm lamps on the Engine Control Panel (Figure 5) illuminate to signify the reason for the shut-down.

CAUTION:



After automatic shut-down, **ALWAYS** inspect the unit and eliminate any problems before attempting to restart. Failure to do so can damage the unit.

Before inspecting, turn the **starter switch** to the **STOP** position, place all **Generator Circuit Breakers** in the **OFF** position and allow sufficient time for adequate cooling. When ready to restart, complete all steps in the Generator Startup Procedure section of this manual.



Engine protection is furnished during operation, but cannot replace normal preventive maintenance.

Regularly maintain the unit as specified in the Maintenance section of this manual to prevent damage.

TABLE 14. INSPECTION/MAINTENANCE		10 Hrs DAILY	250 Hrs	500 Hrs	1000 Hrs
ENGINE	Check Engine Fluid Levels	X			
	Check Air Cleaner	X			
	Check Battery Acid Level	X			
	Check Fan Belt Condition	X			
	Check for Leaks	X			
	Check Fluid Levels for Containment	X			
	Check for Loosening of Parts	X			
	Replace Engine Oil and Filter * 1		X		
	Drain Bottom of Fuel Tank		X		
	Check Fuel Filter/Water Separator Bowl		X		
	Clean Unit, Inside and Outside		X		
	Check Blowby Hose * 2		X		
	Clean Air Filter		X		
	Replace Air Filter Element * 3			X	
	Change Fuel Filter * 4			X	
	Clean Radiator and Check Coolant Protection Level			X	
	Check all Hoses and Clamps				X
	Clean Inside of Fuel Tank				X
GENERATOR	Measure Insulation Resistance		X		
	Check Rotor Rear Support Bearing			X	

*1 Replace engine oil and filter at 50 hours, first time only.

*2 If blowby hose needs to be replaced, ensure that the slope of the blowby hose is at least a 1/2 inch per foot, with no sags or dips that could collect moisture and/or oil.

*3 Replace primary air filter element when restriction indicator shows a vacuum of 625 mm. (25 in.) H₂O

*4 Push priming pump on fuel filter when air bleeding. It is not necessary to loosen any plugs.

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 250 hours: Remove air cleaner element and clean the heavy duty paper element with light spray of compressed air. Replace the air cleaner as needed.

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 inspect the fuel tank for water contamination and drain the contents if required.

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.

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

- Remove the old oil filter.
- Apply a film of oil to the gasket on the new oil filter.
- Install the new oil filter.
- 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 500 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.

CAUTION:



Allow engine to **cool** when flushing out radiator. Flushing the radiator while hot could cause serious burns from water or steam.



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.

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 blocks so tires do not touch the ground or block and completely remove the tires.

DCA-45USI — TRAILER BRAKES MAINTENANCE

Brakes

Trailer brakes should be inspected the **first 200 miles** of operation. This will allow the brake shoes and drums to seat properly. After the first 200 mile interval, inspect the brakes **every 3,000 miles**. If driving over rough terrain, inspect the brakes more frequently.

Figure 74 displays the major hydraulic surge brake components that will require inspection and maintenance. Please inspect these components as required using steps 1 through 8 as listed below:

Brake Adjustment

1. Place the trailer on jack stands. Make sure the jack stands are placed on secure level ground.
2. Check the wheel and drum for free rotation.
3. Remove the adjusting hole cover from the adjusting slot at the bottom brake backing plate.
4. With a screwdriver or standard adjusting tool, rotate the star wheel of the adjuster assembly to expand the brake shoes.
5. Adjust the brake shoes outward until the pressure of the lining against the wheel drum makes the wheel difficult to turn.
6. Adjust, rotate the star wheel in the opposite direction until the wheel rotates freely with slight lining drag.
7. Replace the adjusting hole cover and lower the trailer to the ground.
8. Repeat steps 1 through 7 on the remaining brakes.

Hydraulic Surge Brakes

Hydraulic surge brakes (Figure 56) should not require any special attention with the exception of routine maintenance such as shoe and lining replacement. Brake lines should be periodically checked for cracks, kinks, or blockage.

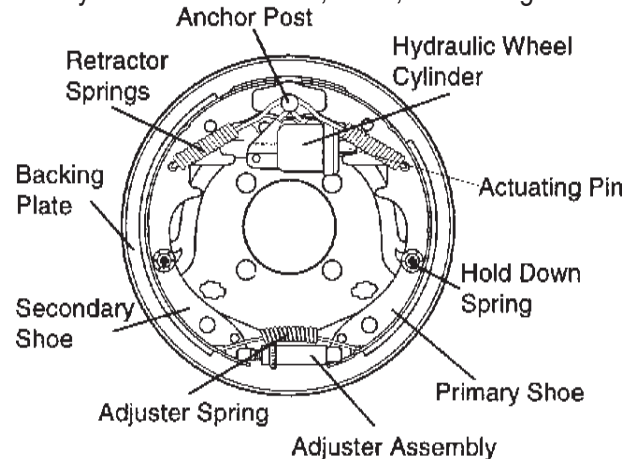


Figure 56. Hydraulic Brake Components

Actuator

Hydraulic surge braking requires the installation of an actuator at the tongue of the trailer. Remember the **surge** or **push** of the trailer toward the tow vehicle automatically synchronizes the trailer brakes with the tow vehicle brakes. As the trailer pushes against the tow vehicle the actuator telescopes together and applies force to the master cylinder, supplying hydraulic pressure to the trailer brakes.

Periodically check and test the surge “**actuator**” to make sure that it is functioning correctly. Never use an undersize actuator.

Table 15. Hydraulic Brake Troubleshooting

Symptom	Possible Cause	Solution
No Brakes	Brake line broken or kinked?	Repair or replace.
Weak Brakes or Brakes Pull to One Side	Brake lining glazed?	Reburnish or replace.
	Trailer overloaded?	Correct weight.
	Brake drums scored or grooved?	Machine or replace.
	Tire pressure correct?	Inflate all tires equally.
	Tires unmatched on the same axle?	Match tires.
Locking Brakes	Brake components loose, bent or broken?	Replace components.
	Brake drums out-of-round?	Replace.
Noisy Brakes	System lubricated?	Lubricate.
	Brake components correct?	Replace and correct.
Dragging Brakes	Brake lining thickness incorrect or not adjusted correctly?	Install new shoes and linings.
	Enough brake fluid or correct fluid?	Replace rubber parts fill with dot 4 fluid.

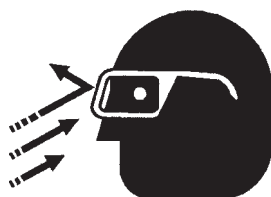
Tires/Wheels/Lug Nuts

Tires and wheels are a very important and critical components of the trailer. When specifying or replacing the trailer wheels it is important the wheels, tires, and axle are properly matched.

CAUTION:



DO NOT attempt to repair or modify a wheel. **DO NOT** install in



inner tube to correct a leak through the rim.

If the rim is cracked, the air pressure in the inner tube may cause pieces of the rim to explode (break off) with great force and cause serious eye or bodily injury.

Tire Wear/Inflation

Tire inflation pressure is the most important factor in tire life. Pressure should be checked cold before operation **DO NOT** bleed air from tires when they are **hot!** Check inflation pressure weekly during use to insure the maximum tire life and tread wear.

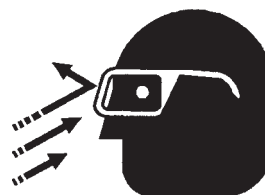
Table 16 (Tire Wear Troubleshooting) will help pinpoint the causes and solutions of tire wear problems.

TABLE 16 TIRE WEAR TROUBLESHOOTING			
WEAR PATTERN		CAUSE	SOLUTION
	Center Wear	Over Inflation.	Adjust pressure to particular load per tire manufacturer.
	Edge Wear	Under Inflation.	Adjust pressure to particular load per tire manufacturer.
	Side Wear	Loss of camber or overloading.	Make sure load does not exceed axle rating. Align wheels.
	Toe Wear	Incorrect toe-in.	Align wheels.
	Cupping	Out-of-balance.	Check bearing adjustment and balance tires.
	Flat Spots	Wheel lockup & tire skidding.	Avoid sudden stops when possible and adjust brakes.

CAUTION:



ALWAYS wear safety glasses when removing or installing force fitted parts. Failure to comply may result in serious injury.



Suspension

The **leaf suspension** springs and associated components (Figure 57) should be visually inspected every 6,000 miles for signs of excessive wear, elongation of bolt holes, and loosening of fasteners. Replace all damaged parts (suspension) immediately. Torqued suspension components as detailed in Table 17.

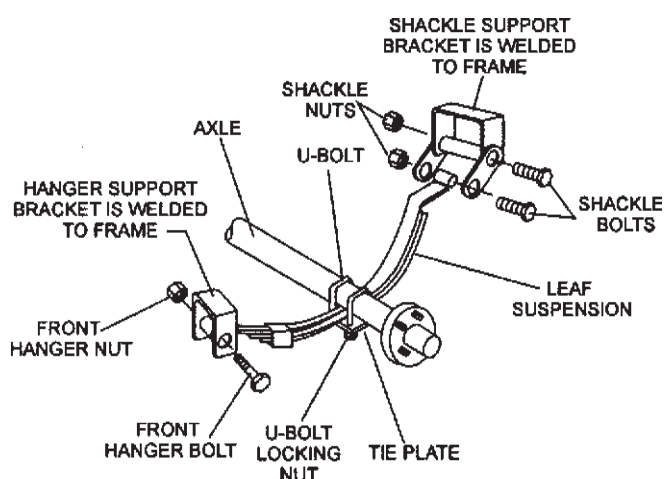


Figure 57. Major Suspension Components

Table 17. Suspension Torque Requirements

Item	Torque (Ft.-Lbs.)
3/8" U-BOLT	MIN-30 MAX-35
7/16" U-BOLT	MIN-45 MAX-60
1/2" U-BOLT	MIN-45 MAX-60
SHACKLE BOLT SPRING EYE BOLT	SNUG FIT ONLY. PARTS MUST ROTATE FREELY. LOCKING NUTS OR COTTER PINS ARE PROVIDED TO RETAIN NUT-BOLT ASSEMBLY.
SHOULDER TYPE SHACKLE BOLT	MIN-30 MAX-50

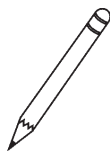
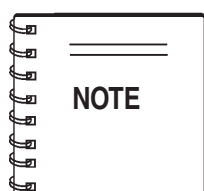
Lug Nut Torque Requirements

It is extremely important to apply and maintain proper wheel mounting torque on the trailer. Be sure to use only the fasteners matched to the cone angle of the wheel. Proper procedure for attachment of the wheels is as follows:

1. Start all wheel lug nuts by hand.
2. Torque all lug nuts in sequence. See Figure 58. **DO NOT** torque the wheel lug nuts all the way down. Tighten each lug nut in 3 separate passes as defined by Table 18.
3. After first road use, retorque all lug nuts in sequence. Check all wheel lug nuts periodically.

Table 18. Tire Torque Requirements

Wheel Size	First Pass FT-LBS	Second Pass FT-LBS	Third Pass FT-LBS
12"	20-25	35-40	50-65
13"	20-25	35-40	50-65
14"	20-25	50-60	90-120
15"	20-25	50-60	90-120
16"	20-25	50-60	90-120



NEVER use an pneumatic air gun to tighten wheel lug nuts.

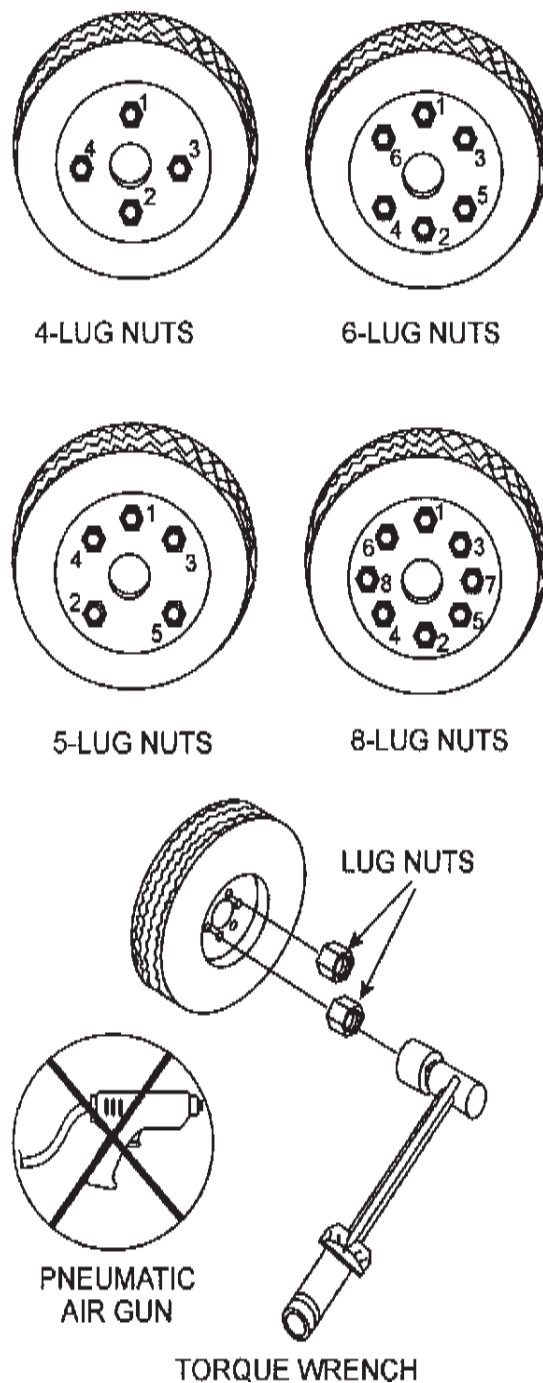


Figure 58. Wheel Lug Nuts Tightening Sequence

DCA-45USI — TRAILER WIRING DIAGRAM

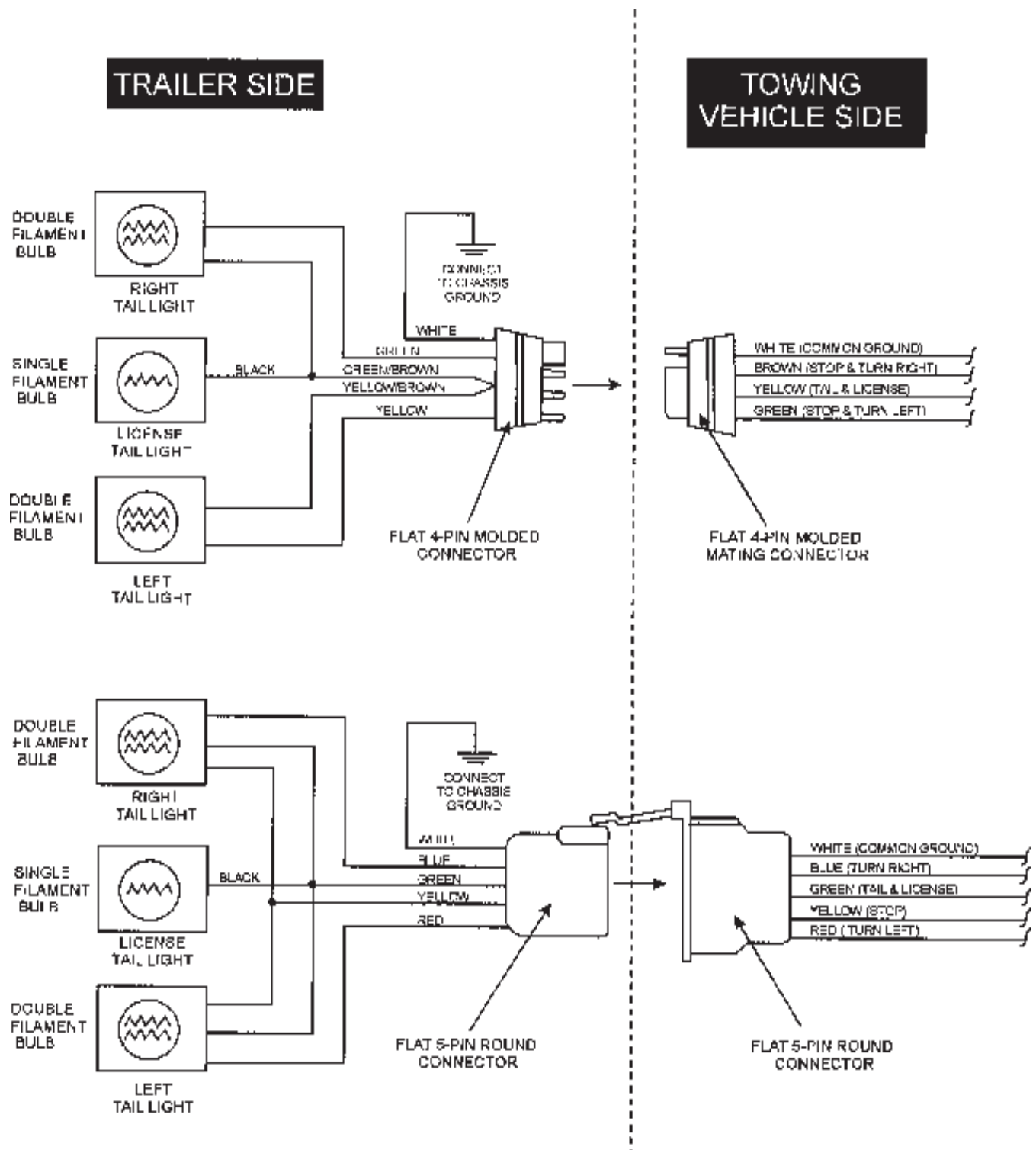


Figure 59. Trailer/Towing Vehicle Wiring Diagram

DCA-45USI — ENGINE WIRING DIAGRAM

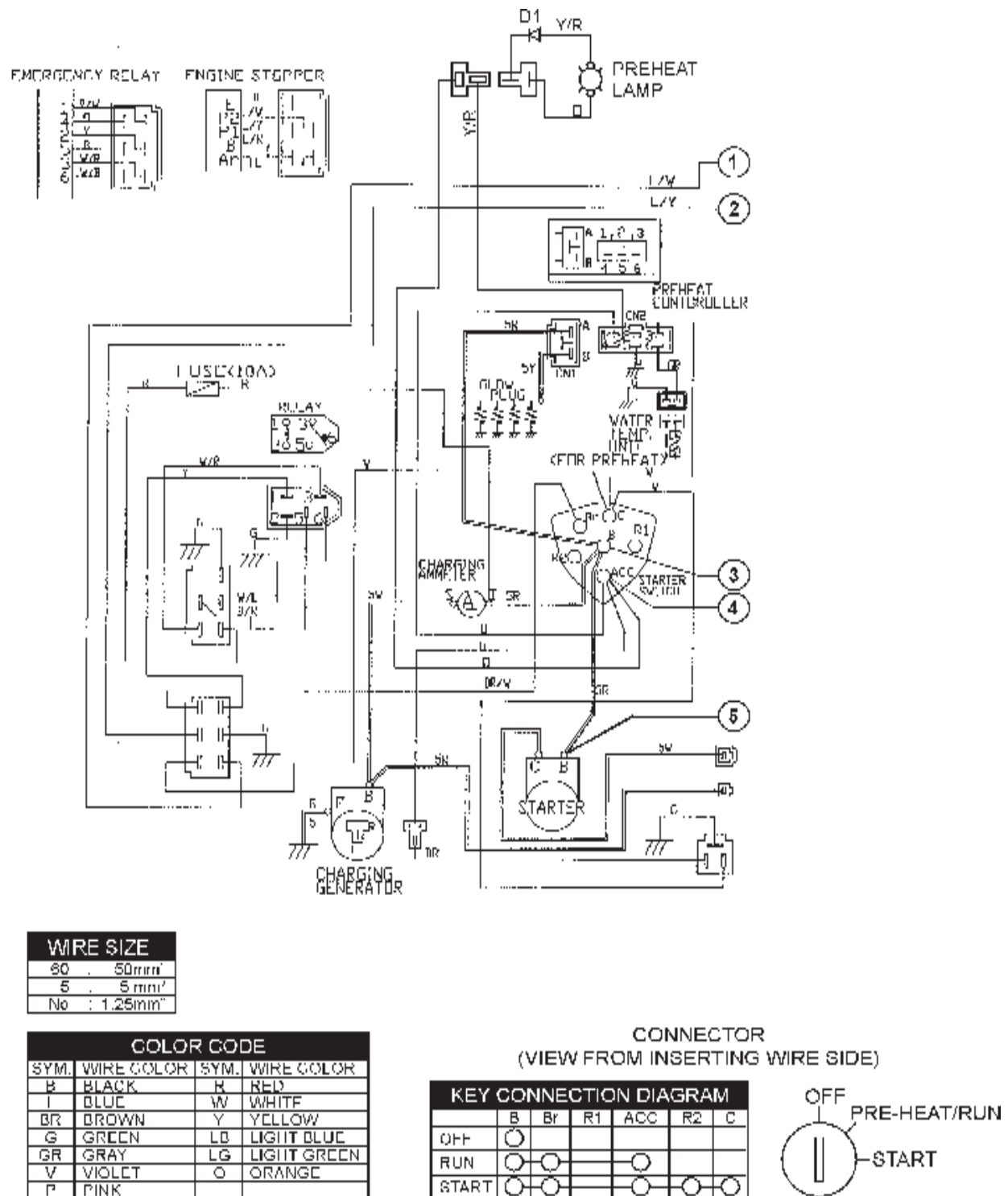
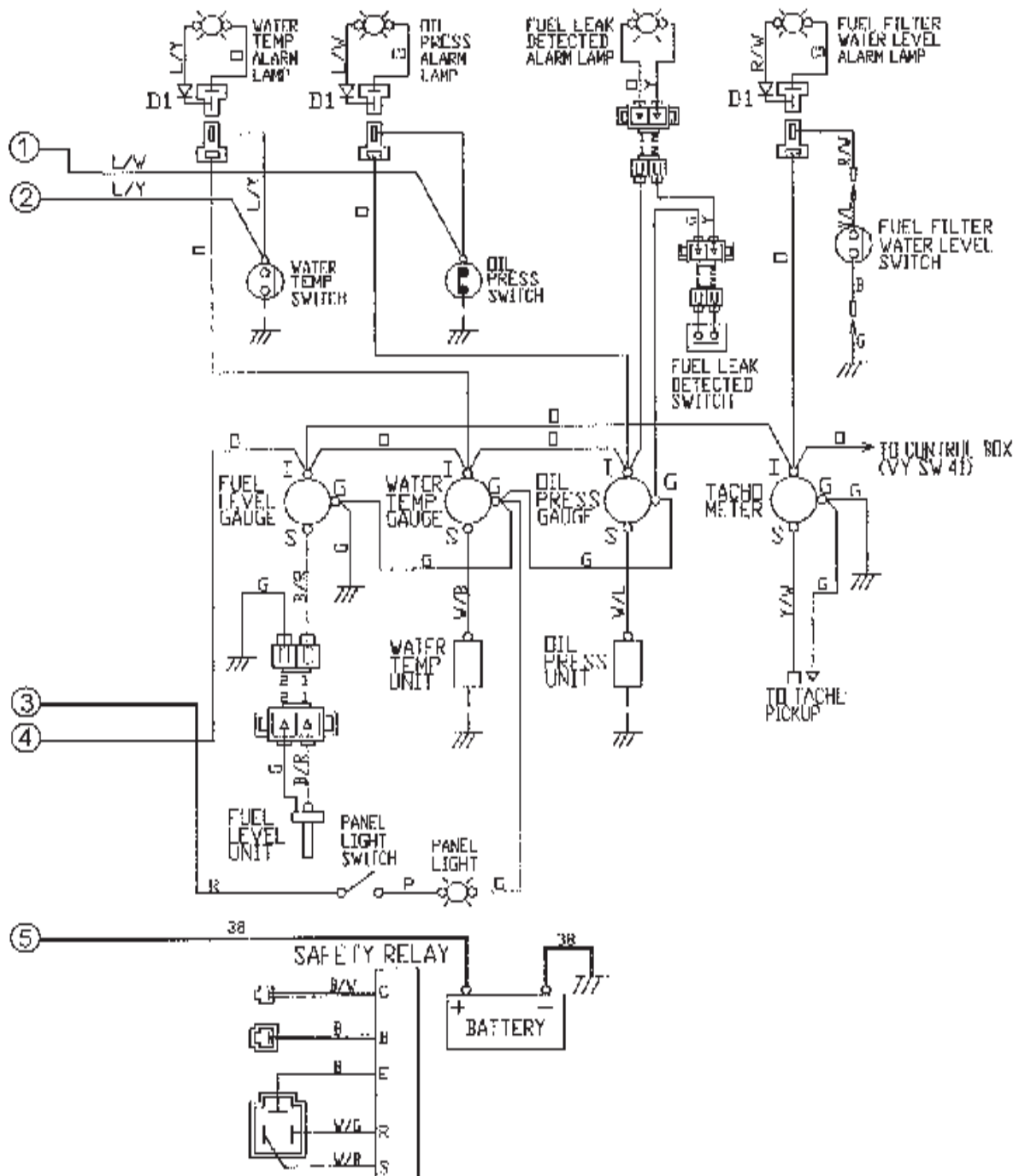


Figure 60. Engine Wiring Diagram

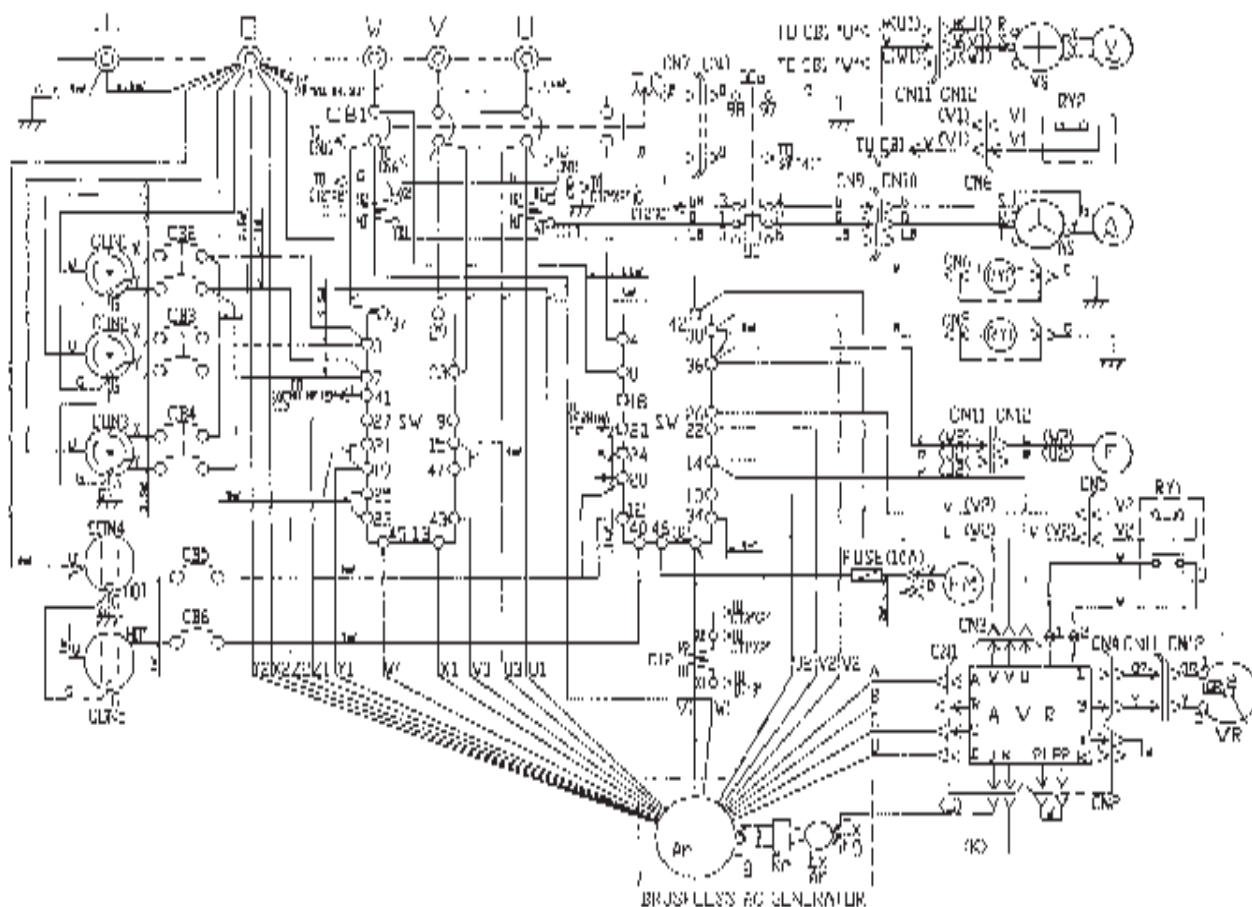
DCA-45USI — ENGINE WIRING DIAGRAM



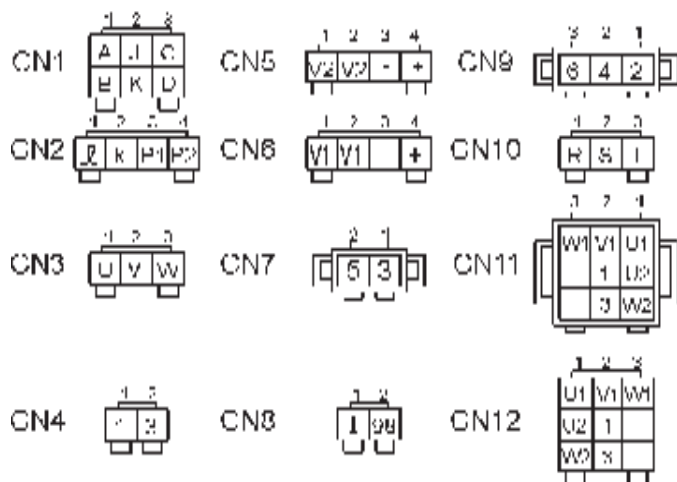
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Figure 60. Engine Wiring Diagram(Continued)

DCA-45USI — GENERATOR WIRING DIAGRAM



CONNECTER ARRANGEMENT
(WIRING VITI W)



COLOR CODE			
SYM	WIRE COLOR	SYM	WIRE COLOR
J	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		

Figure 61. Generator Wiring Diagram

Notes:

1. No designation lead size : 1.25

SYMBOL	DESIGNATION
A	MAIN GENERATOR ARMATURE WINDING
F	MAIN GENERATOR FIELD WINDING
EX	EXCITER ARMATURE WINDING
EXF	EXCITER FIELD WINDING
1a	RECTIFIER
VR	VOLTAGE REGULATOR
VR	VOLTAGE REGULATOR (RECHARGE)
OT 1.2.3	OVER CURRENT RELAY
40	CHARGE OVER SWITCH
A	AC AMMETER
V	CHARGE OVER SWITCH VOLT METER
V	AC VOLT METER
F	FREQUENCY METER
CB1	CIRCUIT BREAKER 1500A
CB2	CIRCUIT BREAKER 1500A
CB3	CIRCUIT BREAKER 1500A
CB4	CIRCUIT BREAKER 1500A
CB5	CIRCUIT BREAKER 1500A
CB6	CIRCUIT BREAKER 1500A
CB7	CIRCUIT BREAKER 1500A
CB8	CIRCUIT BREAKER 1500A
CB9	CIRCUIT BREAKER 1500A
CB10	CIRCUIT BREAKER 1500A
CB11	CIRCUIT BREAKER 1500A
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CB99	CIRCUIT BREAKER 1500A
CB100	CIRCUIT BREAKER 1500A

DCA-45USI — TROUBLESHOOTING (GENERATOR)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use the table (Table 19) shown below for basic Generator Troubleshooting. If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 19. 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.
	Defective Exciter Field?	Check for 17.6 ohms across J and K on CN5
Low Voltage Output	Is engine speed correct?	Check engine speed and adjust to the correct speed
	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.

OPERATION MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON HAND WHEN CALLING

UNITED STATES

Multiquip Inc.

(310) 537- 3700
6141 Katella Avenue Suite 200
Cypress, CA 90630
E-MAIL: mq@multiquip.com
WEBSITE: www.multiquip.com

CANADA

Multiquip

(450) 625-2244
4110 Industriel Boul.
Laval, Quebec, Canada H7L 6V3
E-MAIL: infocanada@multiquip.com

UNITED KINGDOM

Multiquip (UK) Limited Head Office

0161 339 2223
Unit 2, Northpoint Industrial Estate, Globe Lane,
Dukinfield, Cheshire SK16 4UJ
E-MAIL: sales@multiquip.co.uk

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by
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