OPERATIONS PARTS MANUAL

MQ POWER DCA-25USI ULTRA-SILENT™ GENERATOR

PRELIMINARY

PARTS LIST NO. M1871400104

Revision #1 (04/22/05)

MQPOWER
A Division of Multiquip Inc.
POST OFFICE BOX 6254
CARSON, CA 90749
310-537-3700 • 800-421-1244
FAX: 310-632-2656
E-MAIL: mqpower@multiquip.com
WWW: www.mqpower.com

PARTS DEPARTMENT:
800-427-1244
FAX: 800-672-7877
SERVICE DEPARTMENT:
800-835-2551
FAX: 310-638-8046

WARNING

CALIFORNIA — Proposition 65 Warning

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

HERE'S HOW TO GET HELP

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

MULTIQUIP'S MAIN PHONE NUMBERS

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

PARTS DEPARTMENT

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

MAYCO PARTS

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

SERVICE DEPARTMENT

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

MQ POWER SERVICE DEPARTMENT

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

TECHNICAL ASSISTANCE

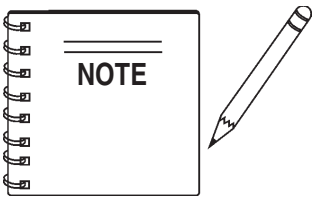
800-478-1244 FAX: 310-631-5032

WARRANTY DEPARTMENT

800-421-1244, EXT. 279 FAX: 310-537-1173
310-537-3700, EXT. 279

MQ POWER DCA-25USI AC GENERATOR

COMPONENT DRAWINGS



Specification and part number are subject to change without notice.

When ordering parts, please supply the following information:

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

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

Here's how to get help...

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

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

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

Service Department
800-478-1244 — Fax: 310-537-4259
310-537-3700

MQ Power Service Department
800-835-2551 — Fax: 310-638-8046
310-537-3700

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

Multiquip's Main Phone Numbers
800-421-1244 — Fax: 310-537-3927
310-537-3700

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

Extra Discounts!

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

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

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

FedEx Ground Service ***at no charge for freight***

No other allowances on freight shipped by any other carrier.

NOTE: DISCOUNTS ARE SUBJECT TO CHANGE

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310-537-3700 • 800-421-1244
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E-MAIL: mqpower@multiquip.com
WWW: www.mqpower.com

Direct TOLL-FREE access to our Parts Department:

Toll-free nationwide — 800-427-1244

Table 1. Generator Specifications		
Model	**DCA-25USI**	
Type	Revolving field, self ventilated, open protected type synchronous generator	
Armature Connection	Star with Neutral	Zig Zag
Phase	3	Single
Standby Output	26.5 KVA (21.2 KW)	15.3 KW
Prime Output	25 KVA (36 KW)	14.4 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 AA-4LE2**	
Type	4 Cycle, water-cooled, direct injection	
No. of Cylinders	4 cylinders	
Bore x Stroke	3.35 in. x 3.78 in. (85 mm x 96 mm)	
Rated Output	31.9 HP/1,800 rpm	
Displacement	132 cu. in. (2,179 cc)	
Starting	Electric	
Coolant Capacity	1.7 gal. (6.4 liters)	
Lube Oil Capacity	2.24 gal. (8.5 liters)	
Fuel Consumption	1.44 gal. (5.47 L)/hr at **full load**	1.05 gal. (3.99 L)/hr at **3/4 load**
	0.74 gal. (2.81 L)/hr at **1/4 load**	0.45 gal. (1.7 L)/hr at **no load**
Battery	12V - BCI Group 27	
	2.6 gal. (9.84 L)/hr at **full load**	
Fuel	#2 Diesel Fuel	

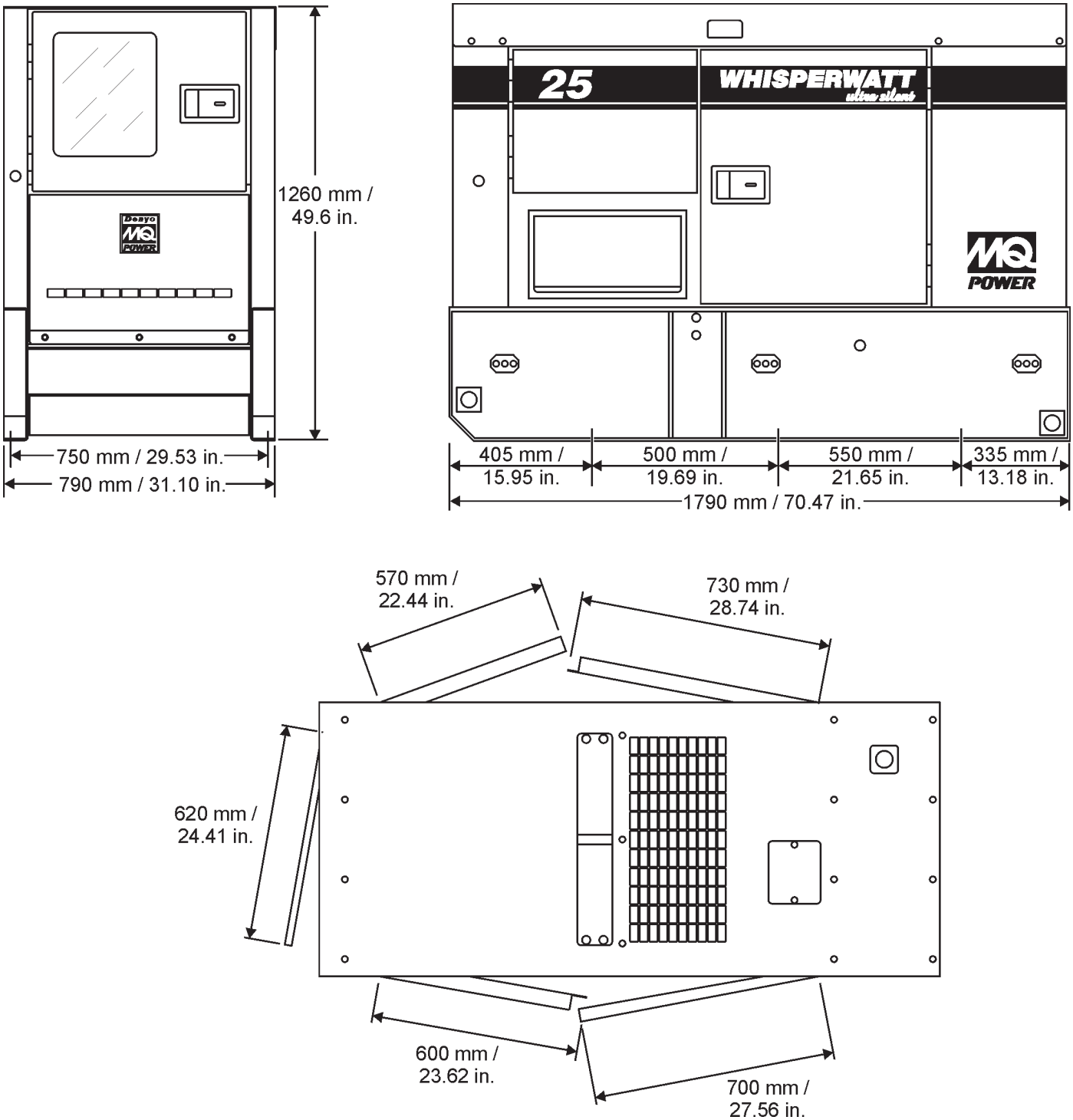
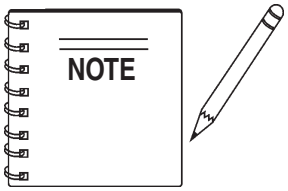


Figure 1. Dimensions

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 DCA-25USI 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.

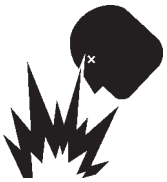
Potential hazards associated with trowel operation will be referenced with "***Hazard Symbols***" which appear throughout this manual, and will be referenced in conjunction with Safety "***Message Alert Symbols***".

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.

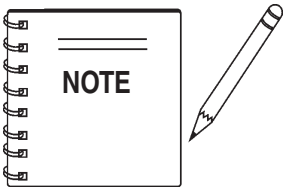
DCA-25USI — SAFETY MESSAGE ALERT SYMBOLS

Accidental Starting

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

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.

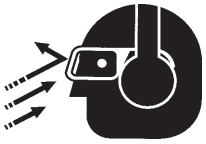


This ***generator***, other property, or the surrounding environment could be damaged if you do not follow instructions.

Respiratory Hazard

ALWAYS wear approved respiratory protection.

Sight and Hearing hazard



ALWAYS wear approved eye and hearing protection.

Equipment Damage Messages

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

CAUTION:

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

The following safety guidelines should always be used when operating the **DCA-25USI 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 or 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.

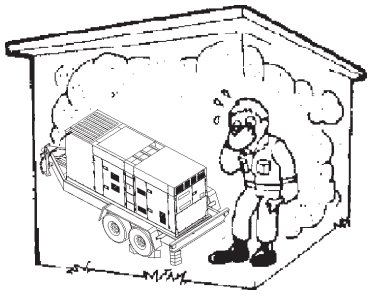
■ **ALWAYS** check the machine for loosened threads or bolts before starting.

■ **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 wate***r.

■ **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.

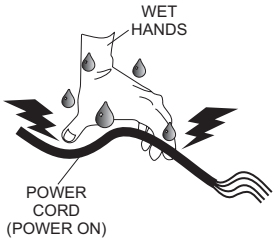
- **ALWAYS** make sure that electrical circuits are properly ***grounded*** per the ***National Electrical Code*** (NEC) and local codes before operating generator. Severe ***injury*** or ***death!*** by electrocution can result from operating an ungrounded generator.
- **ALWAYS** be sure the operator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

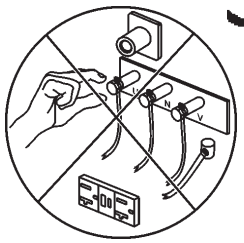
Never use damaged or worn cables when connecting equipment to the generator. Make sure power connecting cables are securely connected to the generator's output terminals, insufficient tightening of the terminal connections may cause damage to the generator and electrical shock.

DANGER:

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

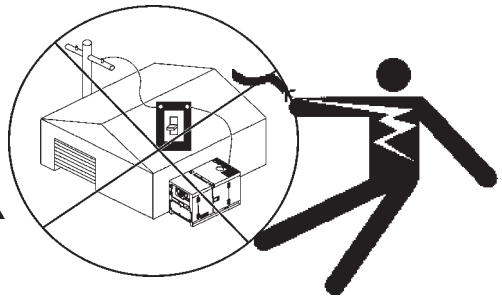


DANGER:



- **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.

- **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

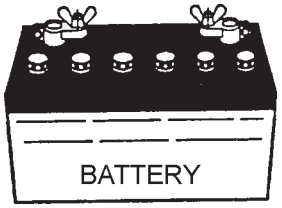
To guard against electrical shock and possible damage to the equipment, it is important to provide a good **EARTH** ground.

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.

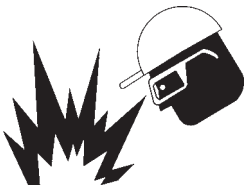
ALWAYS be sure to use the ground terminal (green wire) when connecting a load to the UVWO output terminals.

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 **45 MPH** unless posted otherwise. Recommended off-road towing is not to exceed **10 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.

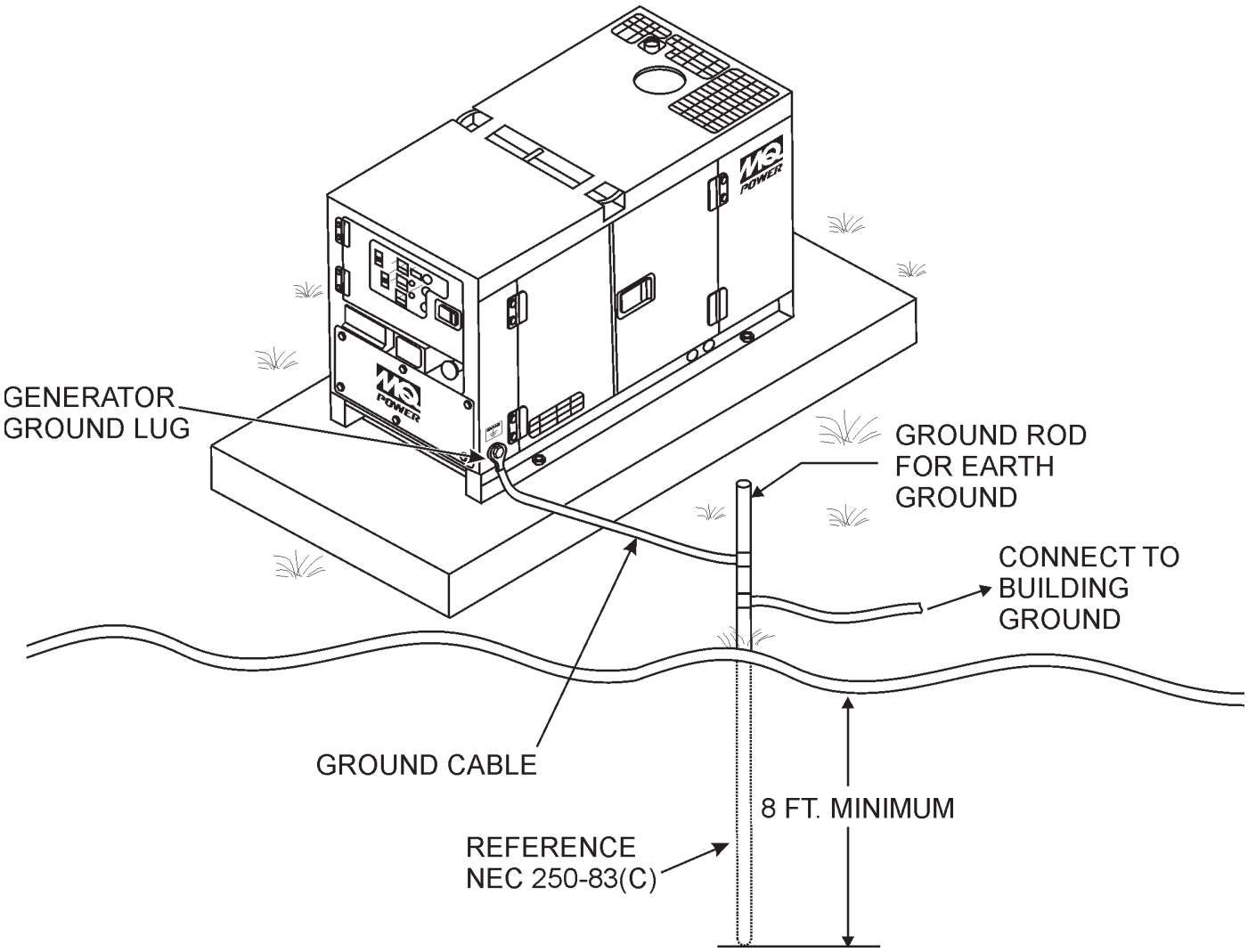


Figure 2. Typical Generator Grounding Application

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.

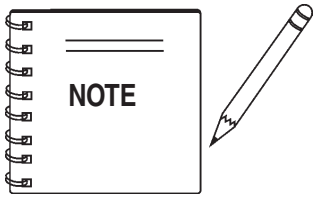
Generator Grounding

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 mm^2) or larger.
   b. Aluminum - 8 AWG (8.4 mm^2) 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 aminimum of 8 ft. into the ground.



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

Towing Safety Precautions

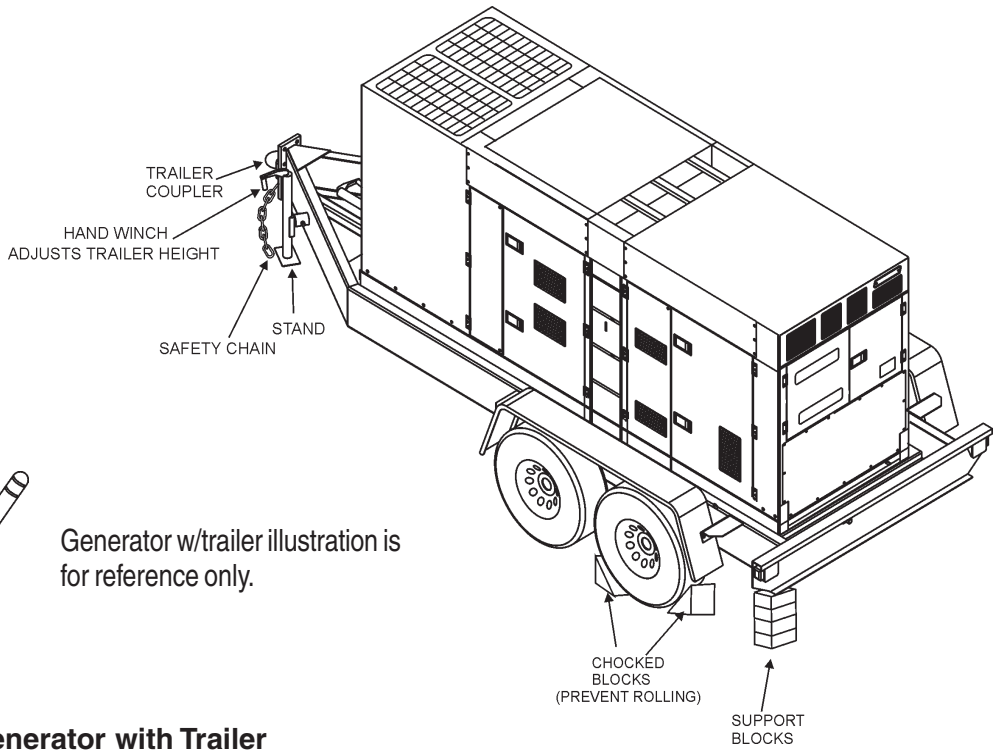
CAUTION:

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 milage.
- Avoid sharp turns to prevent rolling.
- Remove wheel stand when transporting.
- **DO NOT** transport generator with fuel in tank.



NOTE

Generator w/trailer illustration is for reference only.

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.

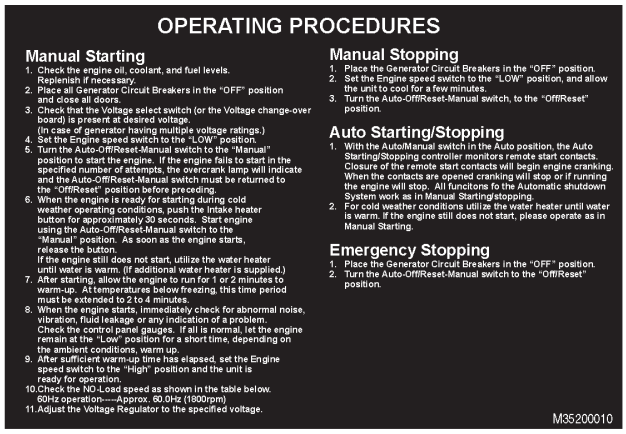
It is the purpose of this section to cover the major maintenance components of the trailer. The following trailer components will be discussed in this section:

- 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 Length -** 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.

The DCA-25USI 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.



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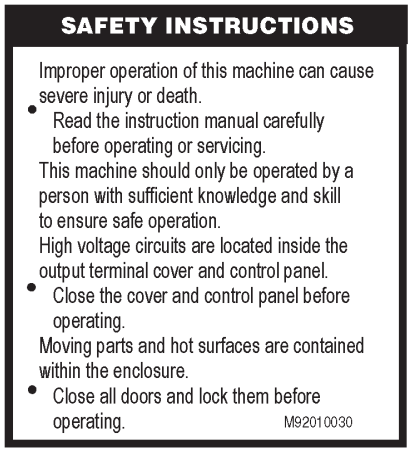

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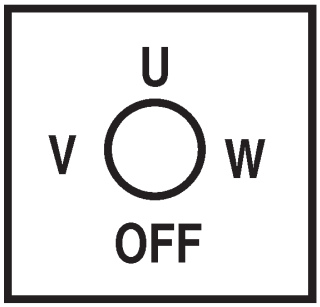

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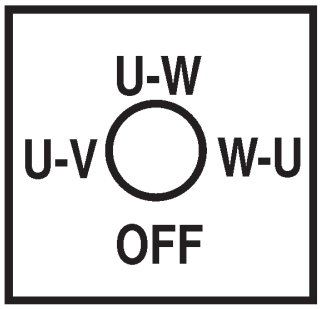

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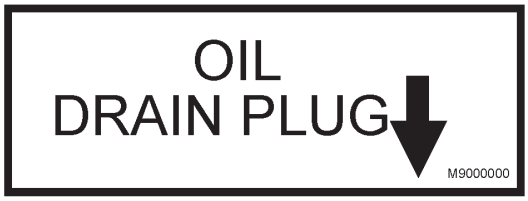

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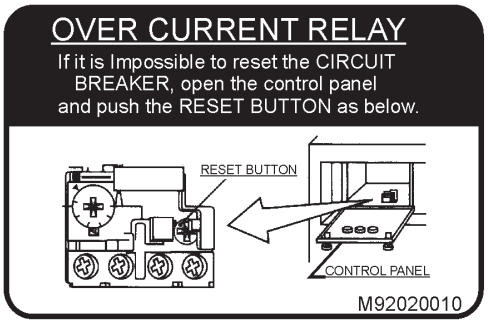

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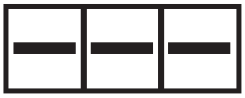

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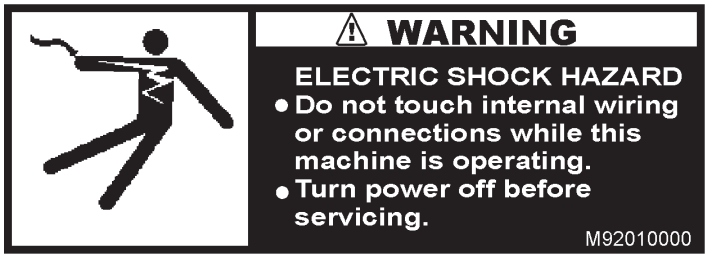

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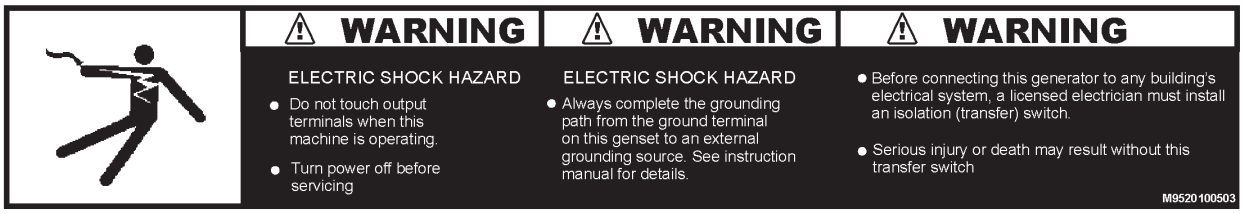
FUELING INSTRUCTIONS

For best results:
1. Elevate trailer tongue slightly.
2. Fill trailer tank first
3. Fill generator tank next

Optimum venting will be achieved as a result of this procedure.

P/N TBD



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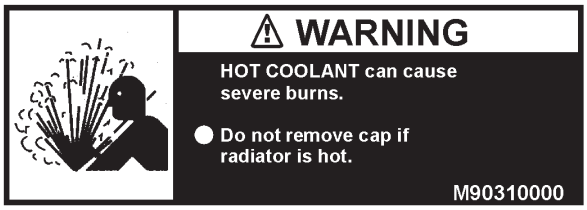

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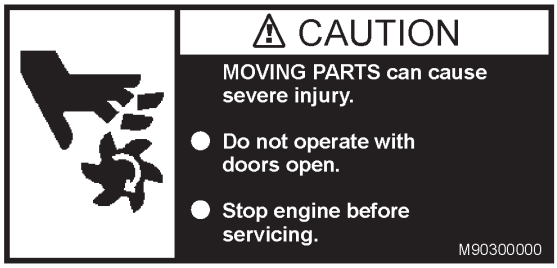

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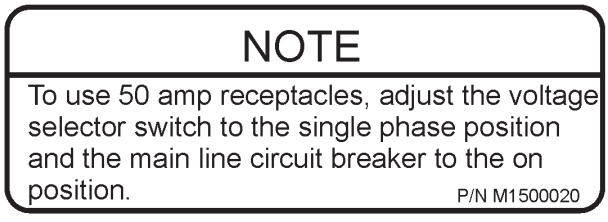

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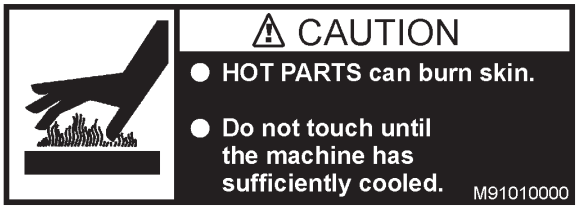

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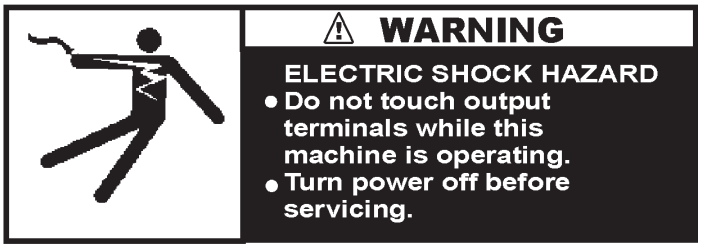

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DCA-25USI FAMILIARIZATION

Generator

The MQ Power Model DCA-25USI (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
- Over-Current Relay
- 3-Pole, 60 amp Main Circuit Breaker

Output Terminal Panel

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

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

Control Box

The "Control Box" is provided with the following:

- Automatic Voltage Regulator
- Current Transformer
- Emergency Relay

Open Delta Excitation System

The DCA-25USI 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 ot 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-25USI** is powered by a 4 cycle, water cooled, turbocharged Isuzu AA-4LE2 ***diesel*** engine. This engine is designed to meet every performance requirement for the generator. Reference Table 1 for engine specifications.

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

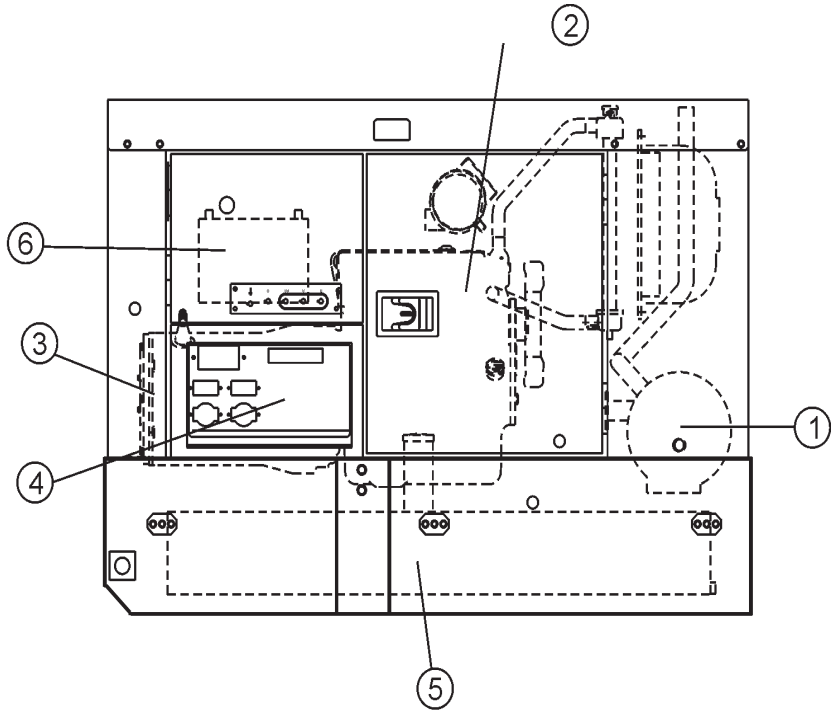
The basic controls and indicators for the DCA-25USI generator are addressed on the following pages.

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 ±.5%. The electronic governor option increases frequency variation to ±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.



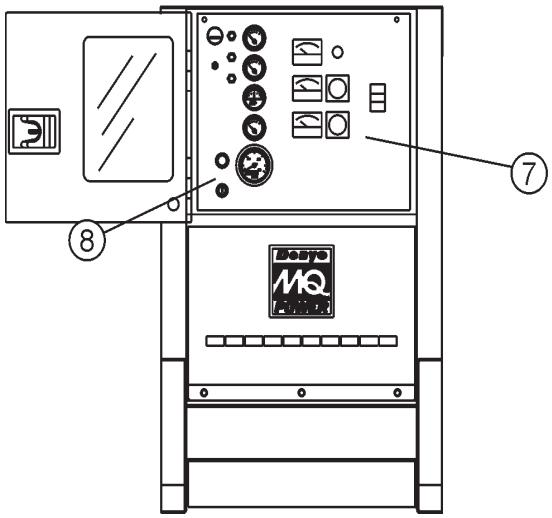


Figure 4. Major Components

Table 3. Generator Major Components

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

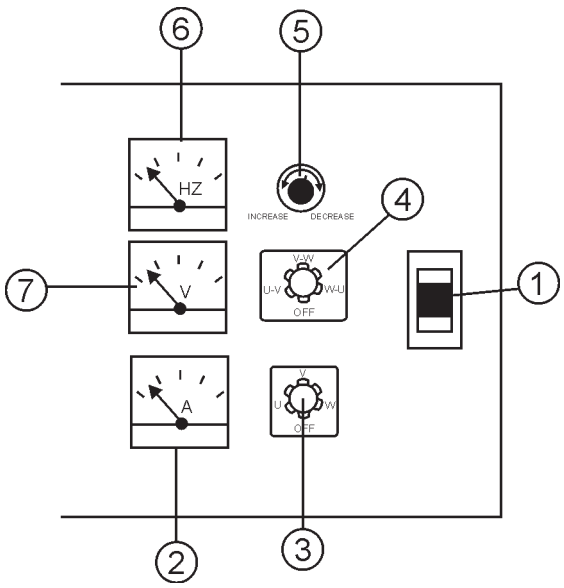


Figure 5. Generator Control Panel

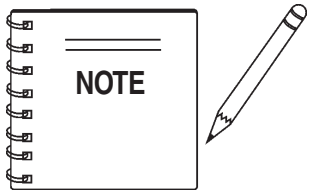
The definitions below describe the controls and functions of the DCA-25USI "***Generator Control Panel***" (Figure 5).

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

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

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

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



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

In the event of a short circuit or over current condition, it will automatically trip the main 250 amp breaker.

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

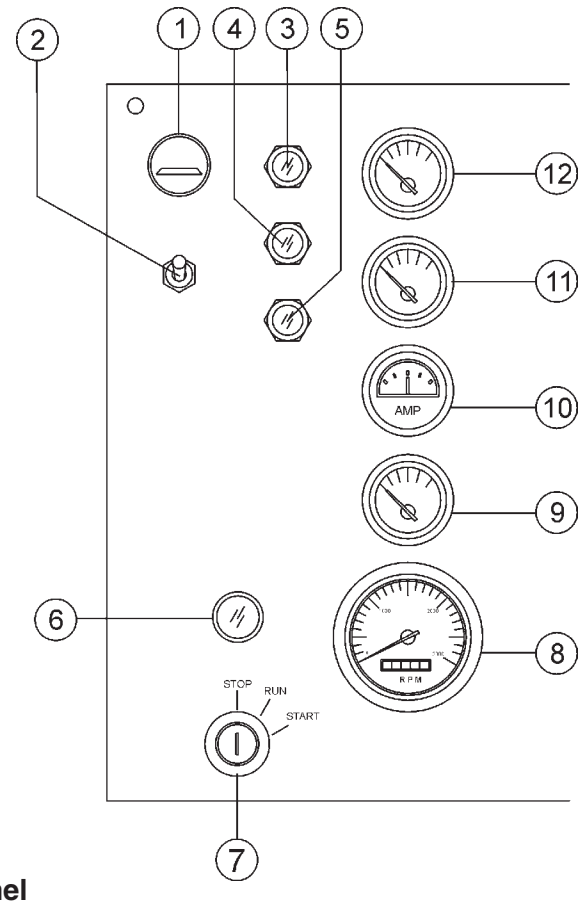


Figure 6. Engine Operating Panel

The definitions below describe the controls and functions of the DCA-25USI "***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 or high and will shut down the engine.
4. **Water Temperature Lamp -** Indicates that the water temperature is outside of normal range and will shut down the engine.
5. **Fuel Filter Water Level Alarm Lamp -** This lamp turns on when the water level in the fuel filter rises too high. Drain the water in the fuel filter strainer to correct the problem.
6. **Pre-heat Lamp -** This indicates when the engine is ready for starting during cold weather operating conditiions.
7. **Starter Switch –** Four position switch, pre-heat, stop, run and start. Insert ignition key to start and stop engine.
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 215° F.
12. **Oil Pressure Gauge –** Normal operation should be about 25 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.

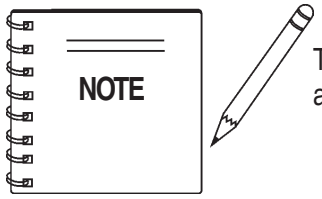
Output Terminal Familiarization

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

- Three (3) 240V output receptacles, 50 amp
- Three (3) Circuit Breakers 240V @50 amps
- Two (2) 120V GFCI receptacles, 20 amp
- Two (2) GFCI Circuit Breakers 120V@ 20 amps
- One Main Circuit Breaker @ 60 amps
- Five (5) Output Terminal Lugs

Output Terminal Panel

The ***Output Terminal Panel*** (Figure 8) shown below is located on the right-hand side (left from control panel) of the generator. Lift up on the cover to gain access to receptacles and terminal lugs.



Terminal legs "**O**" and "**Ground**" are considered ***bonded grounds***.

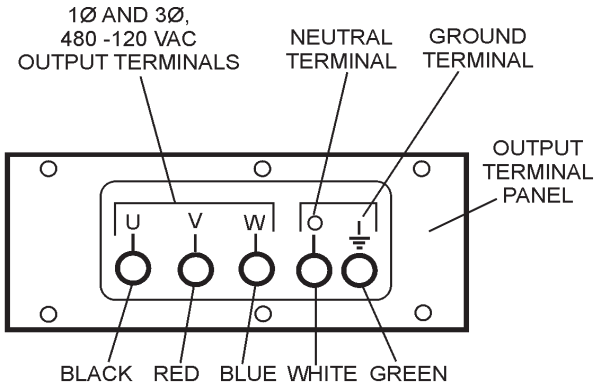
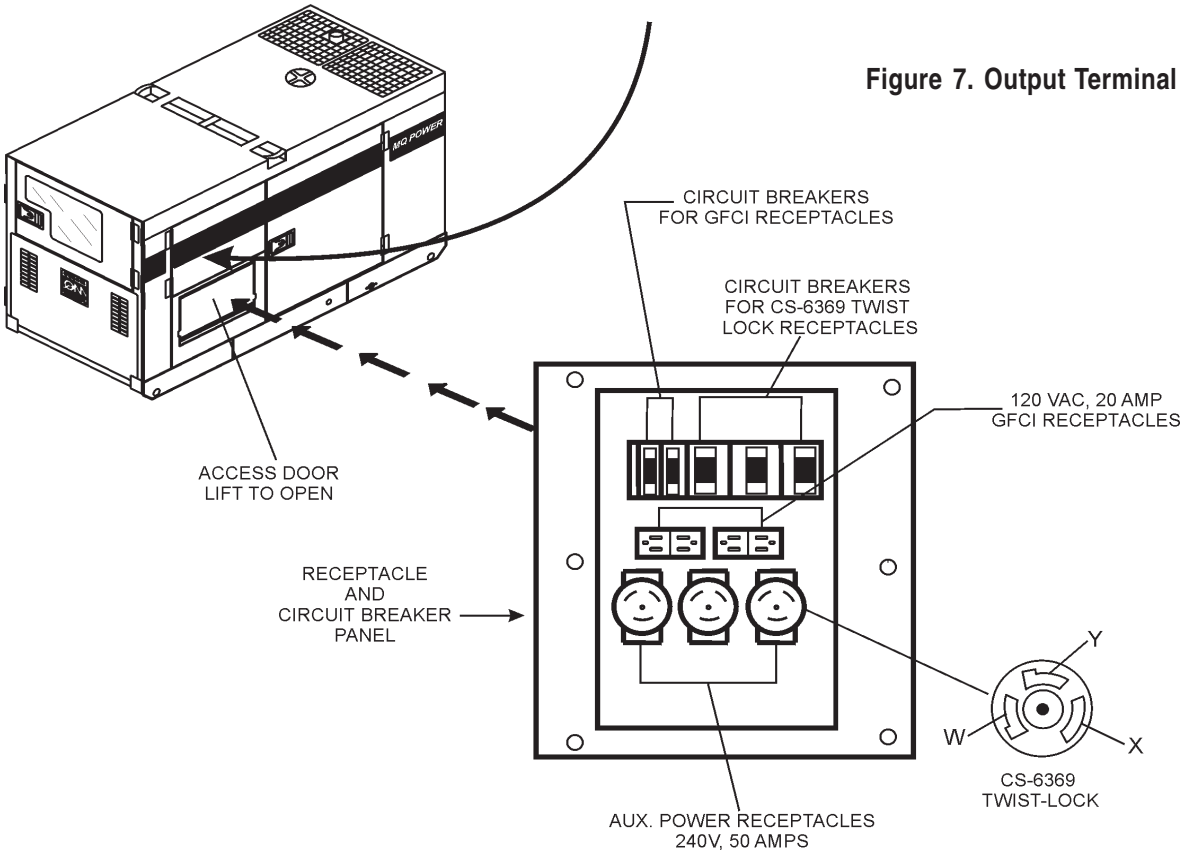


Figure 7. Output Terminal Panel



120 VAC GFCI Receptacles

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

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

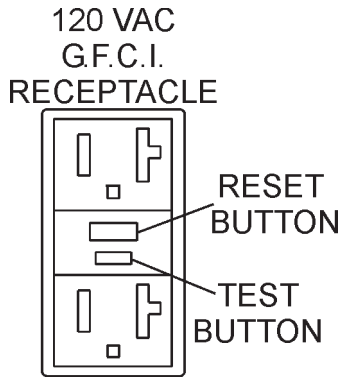


Figure 8. G.F.C.I. Receptacle

Twist Lock Dual Voltage 120/240 VAC Receptacles

There are three 240 VAC, 50 amp auxilliary twist-lock (CS-6369) recepacles (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.***

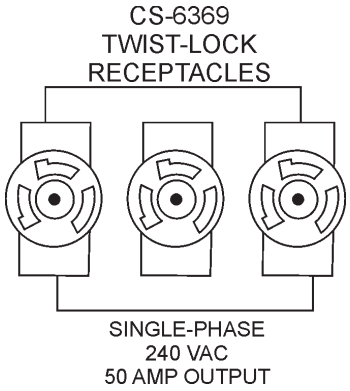


Figure 9. 240 VAC Twist-Lock Auxiliary Receptacles

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 UVWO terminals.

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

Figure 10. Voltage Regulator Control Knob

Removing the Plastic Face Plate (UVWO Terminals)

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

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

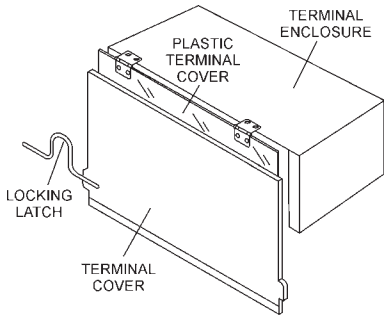


Figure 11. Plastic Face Plate (UVWO Terminals)

Connecting Loads

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

To protect the UVWO output terminals from overload, a 3-pole, 250 amp, ***main*** circuit breaker is provided. Make sure to switch ***ALL*** circuit breakers to the "**OFF**" position prior to starting the engine.

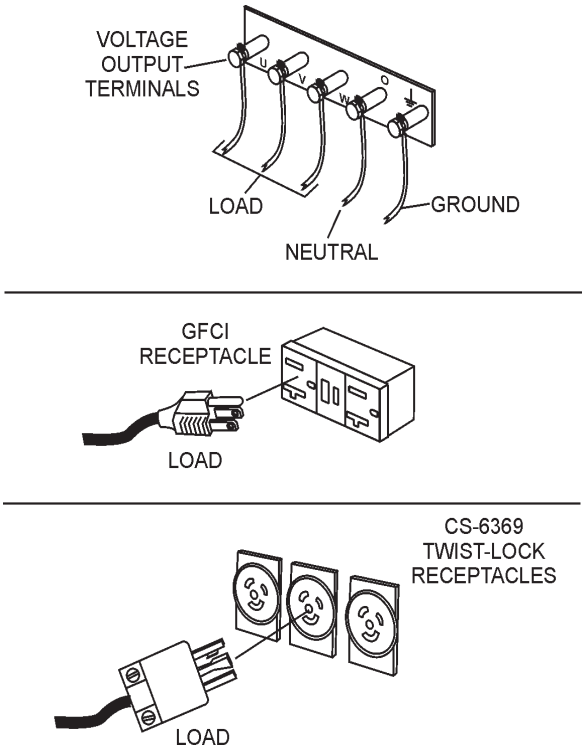


Figure 12. Connecting Loads

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.

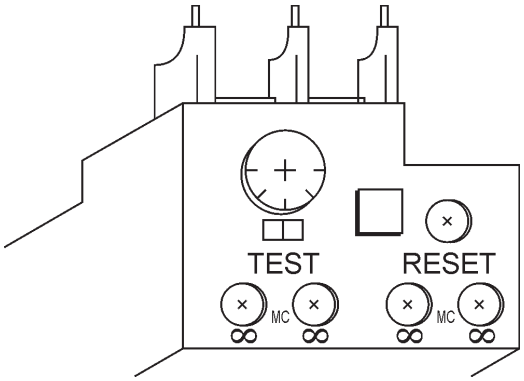
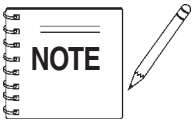


Figure 13. Over Current Relay

Single Phase Load

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

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



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

WATTS I 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

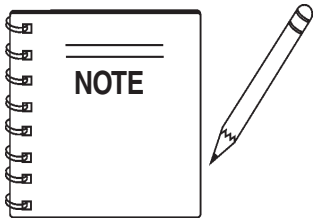
Table 5. Cable Selection (60 Hz, Single Phase Operation)

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.

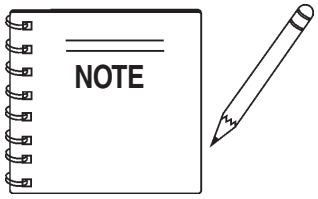
An inadequate size connecting cable which cannot carry the required load can cause a voltage drop which can burn out the appliance or tool and overheat the cable. See Table 5.

- 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 injury or death may result 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.

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 15). 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.

Voltage Selector Switch

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

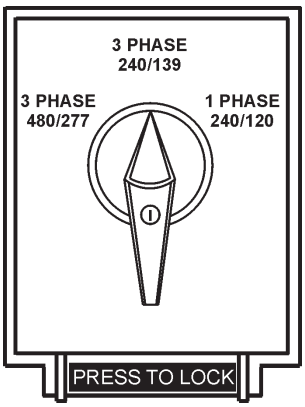


Figure 14. Voltage Selector Switch

Voltage Selector Switch Locking Button

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

CAUTION:

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

Generator Amperage

Tables 7 and 8 describe the generator's current output capability for both 1Ø-phase and 3Ø phase applications.

Table 7. Generator Ampere Ratings — 1Ø

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

Table 8. Generator Ampere Ratings — 3Ø

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

Table 6. Voltages Available

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

GFCI Receptacle Load Capability

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

Tables 9 and 10 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 9. GFCI Receptacle Load Capability

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

Table 10. GFCI Receptacle Load Capability

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

How to Read the Output Terminal Gauge.

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

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

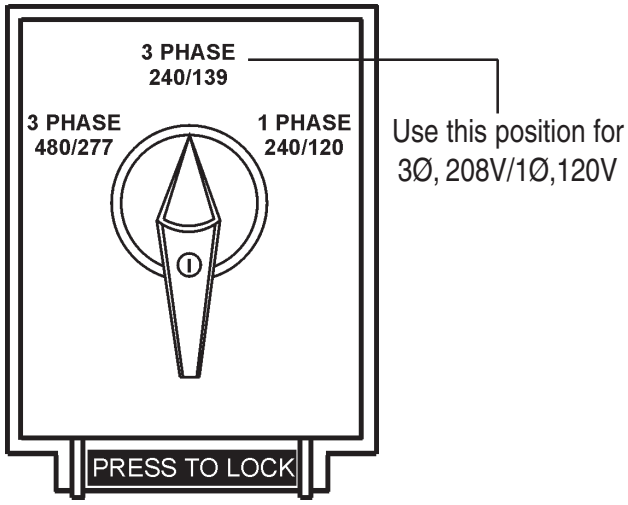


Figure 15. Voltage Selector Switch 240/139V Three Phase Position (for 3Ø, 208V, 120V voltage)

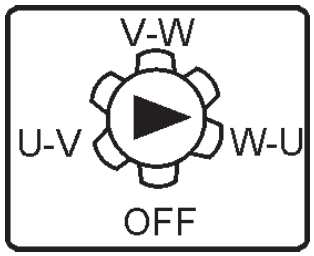


Figure 16. AC Voltmeter Change-Over Switch

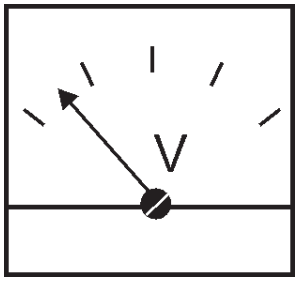


Figure 17. AC Voltmeter Gauge (Volt reading on W-U Lug)

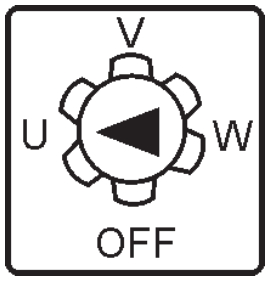


Figure 18. AC Ammeter Change-Over Switch

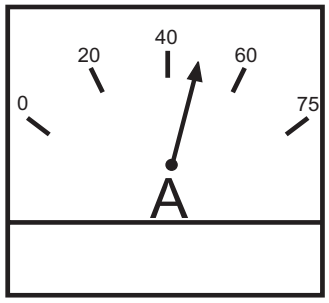
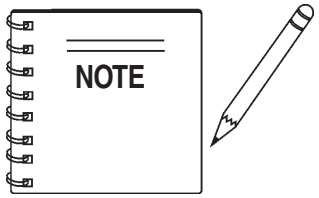


Figure 19. AC Ammeter (Amp reading on U lug)



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

UVWO Terminal Output Voltages

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

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

3Ø 240/139 UVWO Terminal Output Voltages

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

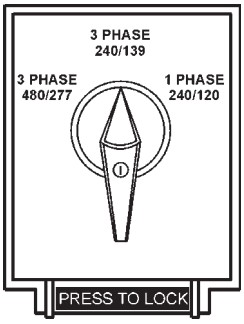


Figure 20. Voltage Selector Switch 240/139V Three-Phase Position

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

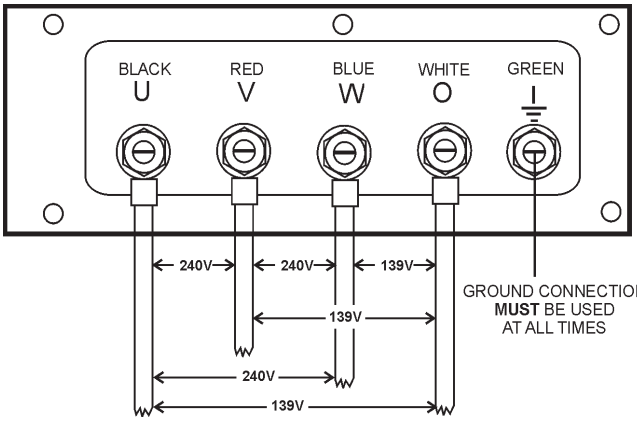


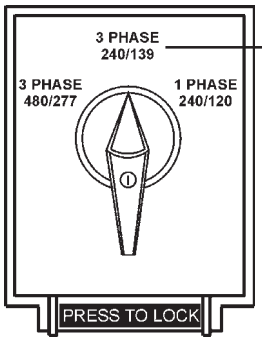
Figure 21. UVWO Terminal Lugs 240/139V Three Phase Connections

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

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

3Ø 208V/1Ø120V UVWO Terminal Output Voltages

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



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

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

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

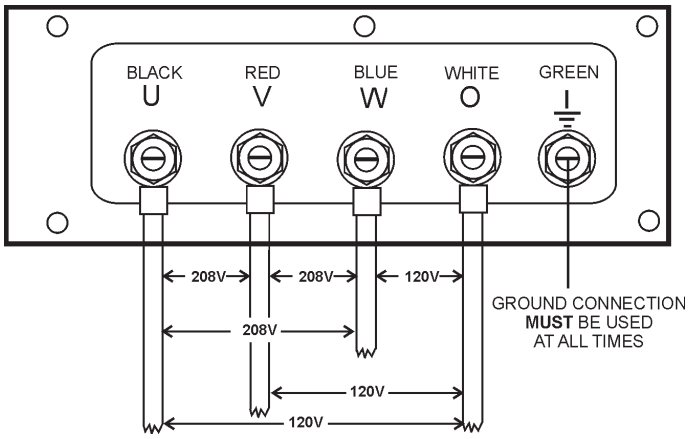
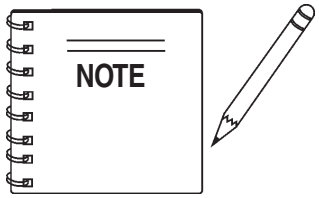


Figure 24. UVWO Terminal Lugs 3Ø-208V/120V Connections

3. Turn the voltage regulator knob (Figure 26) clockwise to increase voltage output, turn counterclockwise to decrease voltage output.

Figure 25. Voltage Regulator Knob (208V)



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

3Ø 480/277 UVWO Terminal Output Voltages

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

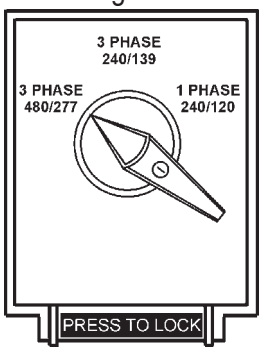


Figure 26. Voltage Selector Switch 480/277V Three-Phase Position

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

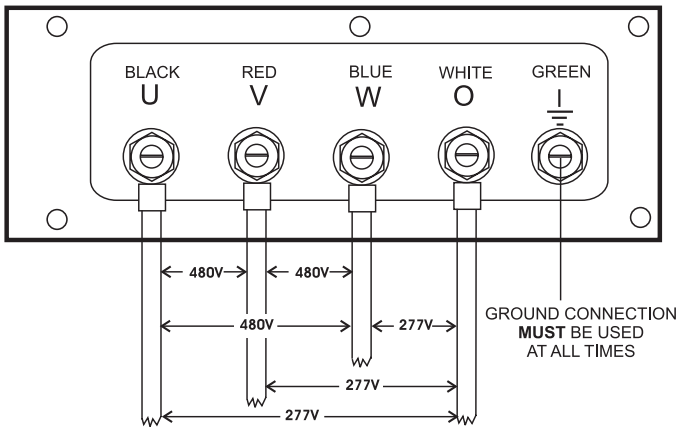


Figure 27. UVWO Terminal Lugs 240/139V Three Phase Connections

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

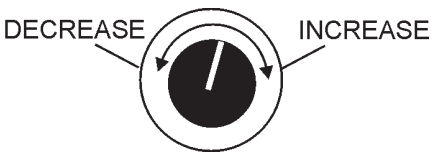


Figure 28. Voltage Regulator Knob (139V/240V)

1Ø 240V/120V UVWO Terminal Output Voltages

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

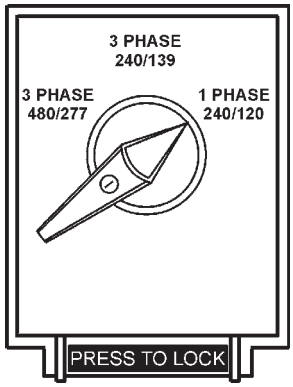


Figure 29. Voltage Selector Switch 240/120V Single-Phase Position

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

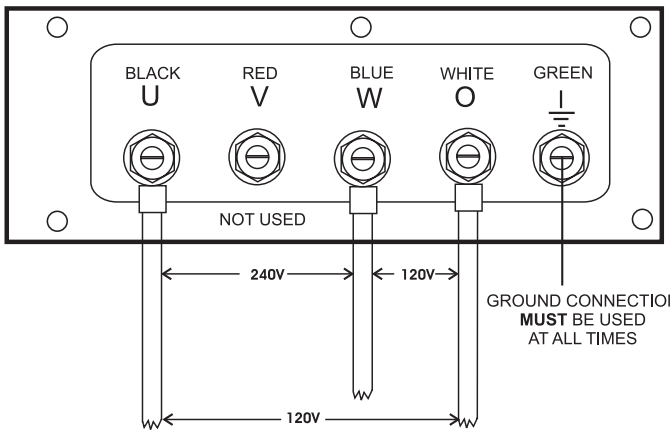


Figure 30. UVWO Terminal Lugs 1Ø-240V/120V Connections

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

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

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 32) on the dipstick. See Table 11 for proper selection of engine oil.

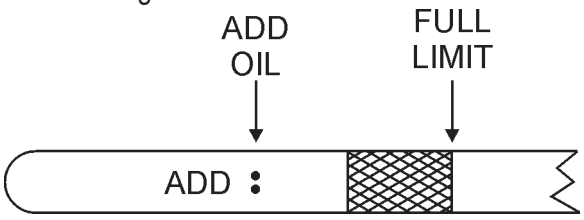


Figure 32. Engine Oil Dipstick

When checking the engine oil, be sure to check if the oil is clean. If the oil is not clean, drain the oil by removing the oil drain plug, and refill with the specified amount of oil as outlined in the **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°C0°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 personel who have read and understand this section should re-fill the fuel tank system.

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.

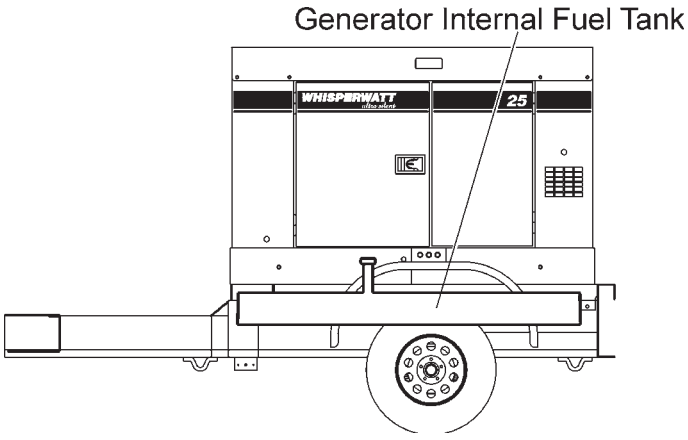


Figure 33. Internal Fuel Tank System

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 35).

WARNING:

ALWAYS! place trailer on firm level ground before refueling.

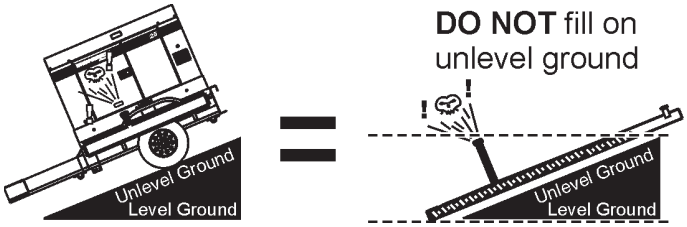
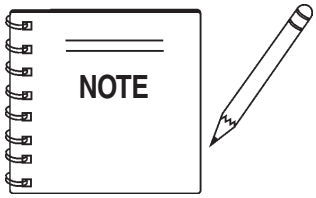


Figure 34. Only Fill on Level Ground



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 35).

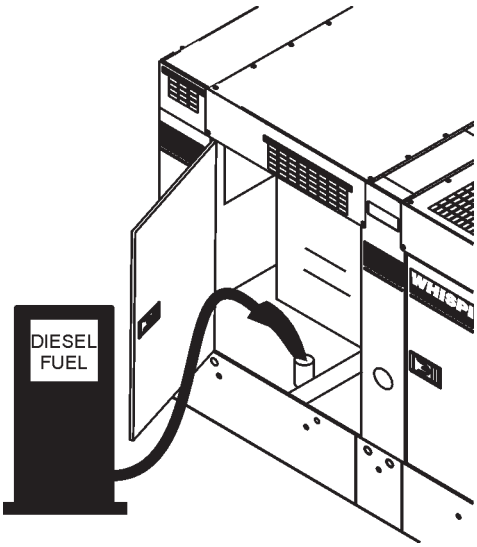


Figure 35. Fueling the Generator

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 36).

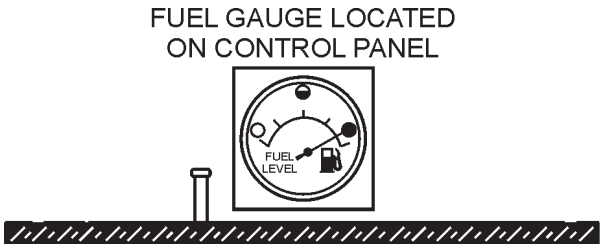


Figure 36. Full Fuel Tank

WARNING:

DO NOT OVER-FILL fuel system. Leave room for fuel expansion . Fuel expands when heated (Figure 37).

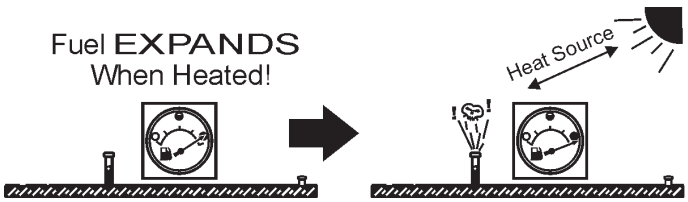


Figure 37. Fuel Expansion

Coolant (Ethylane 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.

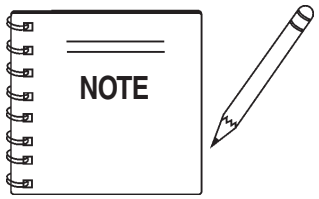
Day-to-day addition of coolant is done from the recovery tank. When adding coolant to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. See Table 12 for engine, radiator, and recovery tank coolant capacities. Make sure the coolant level in the recovery tank is always 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.

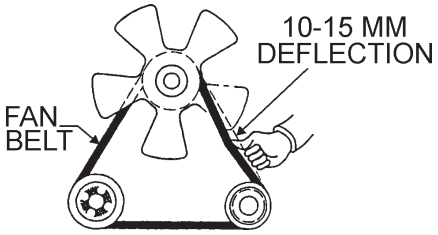


Figure 38. Fan Belt Tension

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 39) 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**.

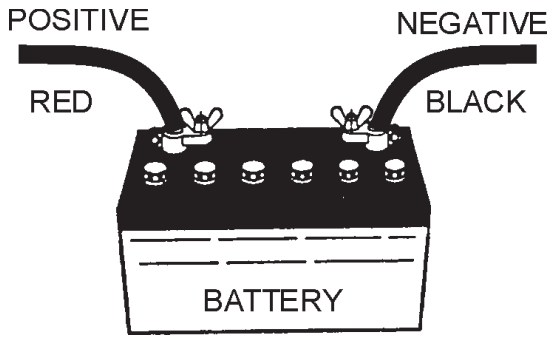


Figure 39. Battery Connections

When connecting battery do the following:

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

NOTE

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.

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 auailliary 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.

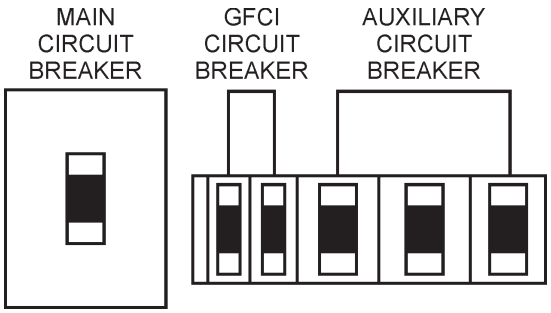


Figure 40. Main, Aux. and GFCI Circuit Breakers

2. Connect the load to the ***UVWO*** terminals or ***auxiliary receptacles*** as shown in Figure 41. These load connection points can be found on the output terminal panel. To gain access to the UVWO terminals or other power receptacles, unlock the access cover and lift the door.

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

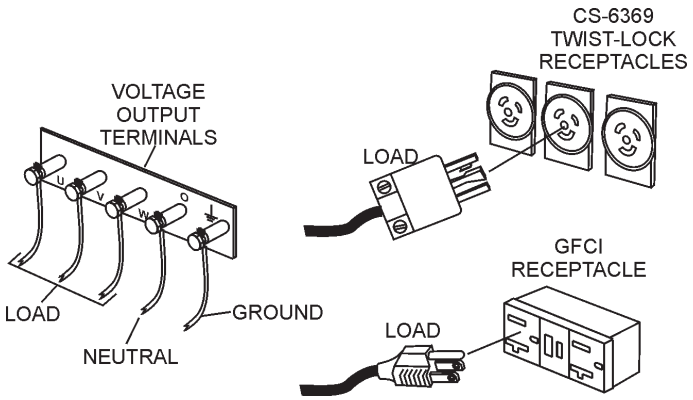


Figure 41. Load Connections

3. Close all engine enclosure doors (Figure 42).

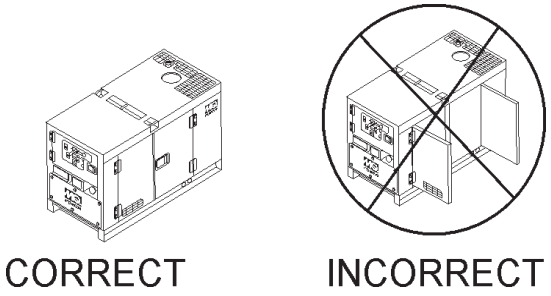


Figure 42. Engine Enclosure Doors

4. Place the voltage selector switch in the desired voltage position (Figure 43).

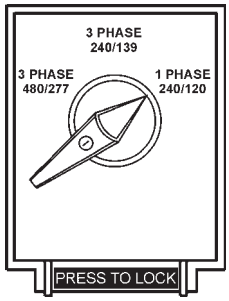


Figure 43. Voltage Selector Switch

5. In warm weather conditions, skip to step 6. Preheat the engine ***glow plugs*** by turning the ignition key (Figure 49) to the **RUN** position. When the preheat lamp (Figure 45) illuminates, proceed to step 6.

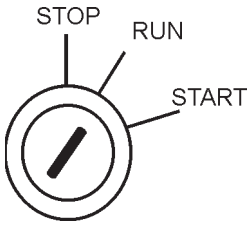


Figure 44. Ignition Switch Pre-Heat (Run Position)

Figure 45. Pre-Heat Indicator Lamp

6. Turn the ignition key to the **START** position (Figure 46). Once the engine starts, release the ignition key and allow it to return to the **RUN** position (Figure 45).

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

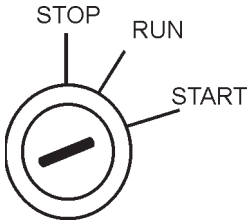


Figure 46. Ignition Switch (Start Position)

7. Let the engine idle for 3-5 minutes, 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 47) displays the 60 cycle output frequency in **HERTZ**.

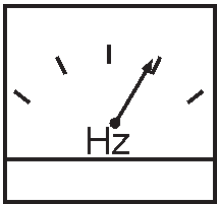


Figure 47. Frequency Meter (Hz)

9. The generator's voltage meter (Figure 48) displays the 120 VAC in **VOLTS**. If the voltage is not within the specified frequency tolerance,

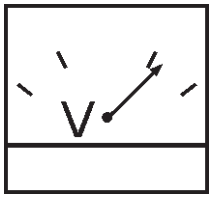


Figure 48. AC Voltmeter

10. Use the voltage adjustment control knob (Figure 49) to increase or decrease the desired voltage.

Figure 49. Voltage Adjust Control Knob

11. The ammeter (Figure 50) 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.

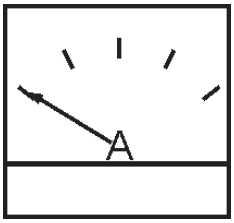


Figure 50. Ammeter (No Load)

12. The engine oil pressure gauge (Figure 51) will indicate the oil pressure (kg/ cm^2) of the engine. Under normal operating conditions the oil pressure is approximately

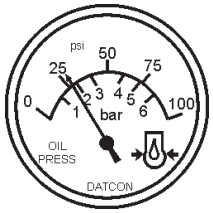


Figure 51. Oil Pressure Gauge

13. The coolant temperature gauge (Figure 52) will indicate the coolant temperature. Under normal operating conditions the coolant temperature is between 165 and 215 degrees Fahrenheit.

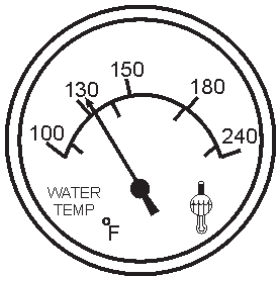


Figure 52. Coolant Temperature Gauge

14. The tachometer (Figure 53) will indicate the speed of the engine when the generator is operating. Under normal operating conditions this speed is approximately 1800 RPM's.

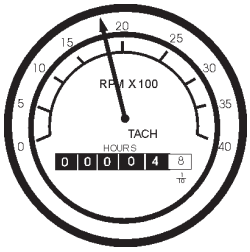


Figure 53. Engine Tachometer

15. Turn the ***main***, ***GFCI***, and ***aux***. circuit breakers to the **ON** position (Figure 54).

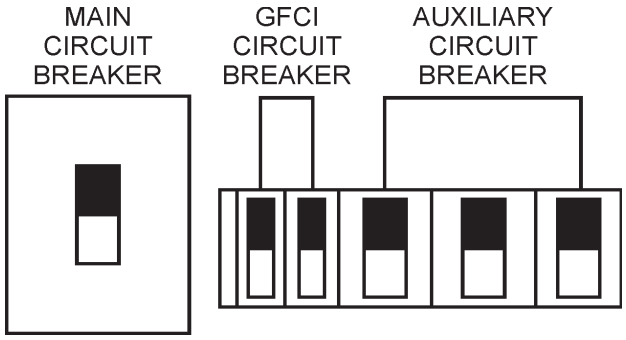


Figure 54. Main, AUX. and GFCI Circuit Breakers (ON)

16. Observe the generator's ammeter (Figure 55) 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.

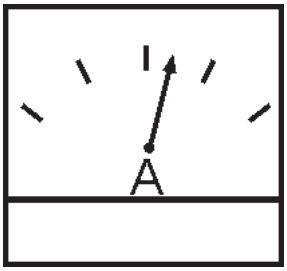


Figure 55. Ammeter (Load)

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

Normal Shut-down Procedure

To shutdown the generator, use the following procedure:

1. Switch the **MAIN**, **AUX** and **GFCI** circuit breakers (Figure 55) to the **OF**F position (no load).

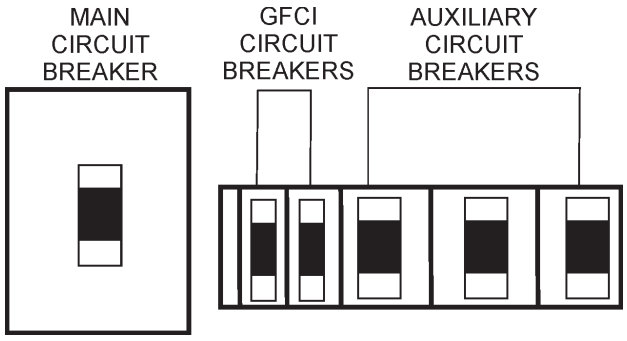


Figure 55. Main, AUX. and GFCI Circuit Breakers (OFF)

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 56) in the "**STOP**" position, remove the key and store in a safe place.

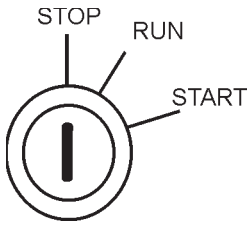


Figure 56. Ignition Switch (Off Position)

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 occured 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 55) circuit breakers to **OFF** position.
2. Turn the ignition switch key to the **STOP** position (Figure 56).

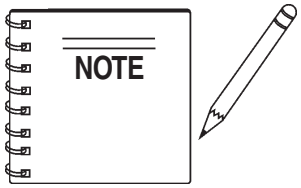
Automatic Shut-down System

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 for Loosening of Parts	X			
	Replace Engine Oil and Filter * [1]		X		
	Drain Bottom of Fuel Tank		X		
	Check Fuel Filter/Water Seperator 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			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 anf filter at 100 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 vaccumm of 625 mm. (25 in.) H_20

General Inspection

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

Engine Side (Refer to the Engine Instruction Manual)

Air Cleaner

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

Air Cleaner with Dust Indicator

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

Service Daily

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

Fuel Addition

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

Removing Water from the Fuel Tank

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

Air Removal

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

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

Cleaning the Fuel Strainer

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

Check Oil Level

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

Replacing Oil Filter

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

Replacing Fuel Filter

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

Feed Pump Strainer Cleaning

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

Flushing Out Radiator and Replacing Coolant

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

CAUTION:

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

Generator Storage

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

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

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 57) 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.

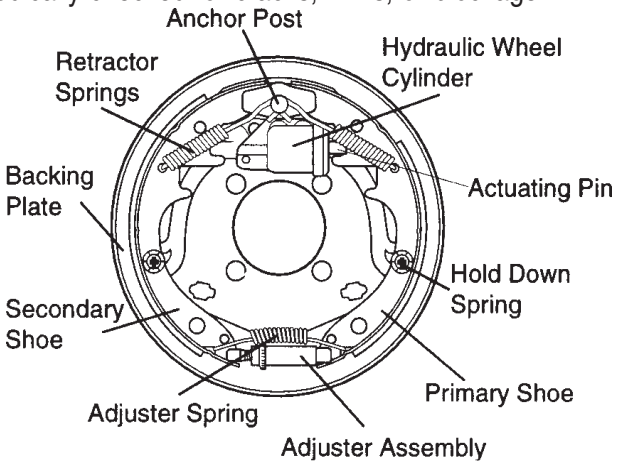


Figure 57. Hydraulic Brake Components

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.

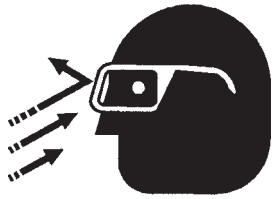
Table 15. Hydraulic Brake Troubleshooting

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.

Suspension

The ***leaf suspension*** springs and associated components (Figure 58) 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.

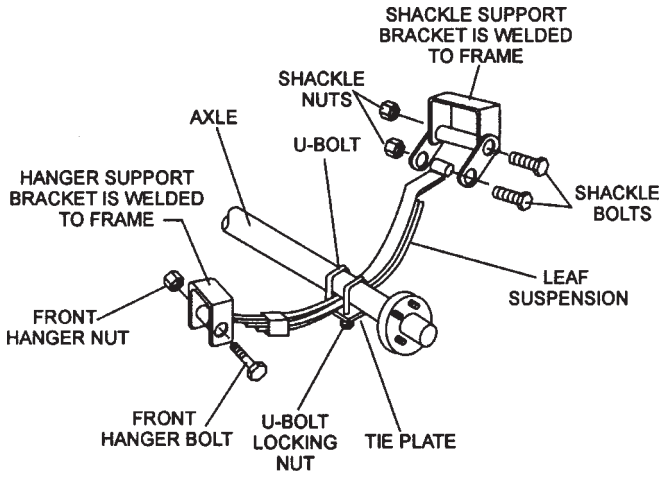


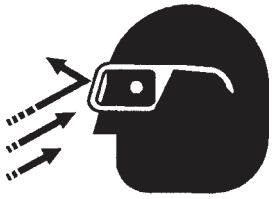
Figure 58. Major Suspension Components

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

CAUTION:

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



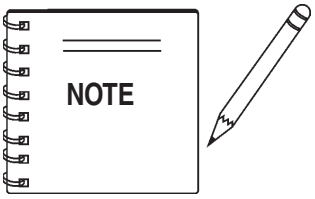
Lug Nut Torque Requirements

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 59. **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.

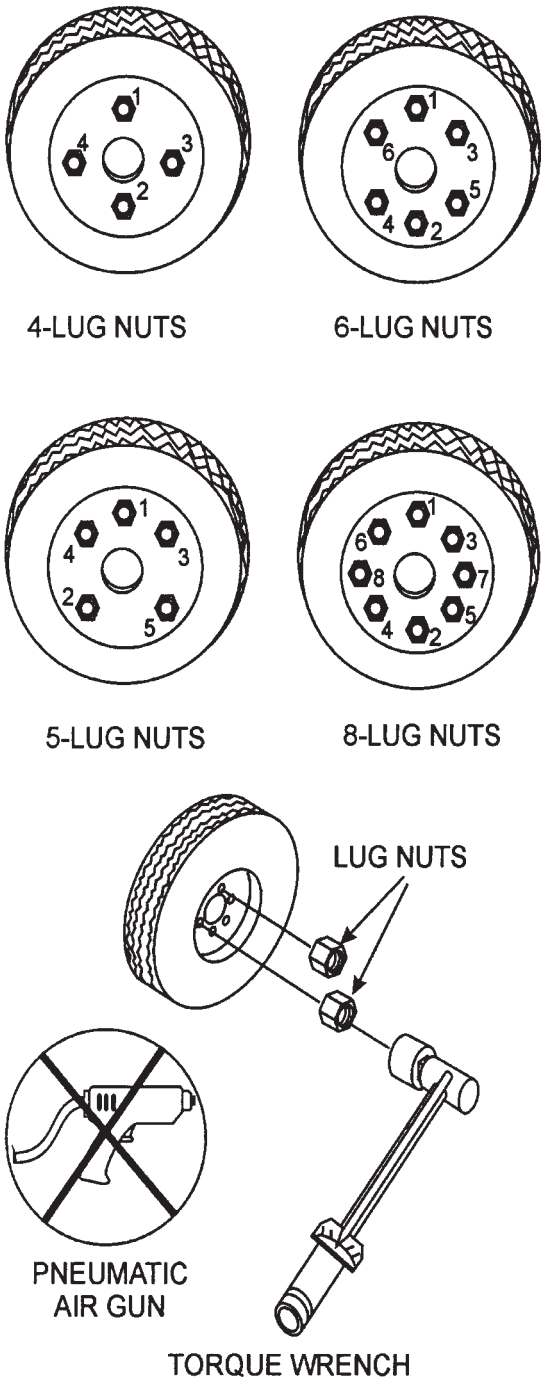


Figure 59. Wheel Lug Nuts Tightening Sequence

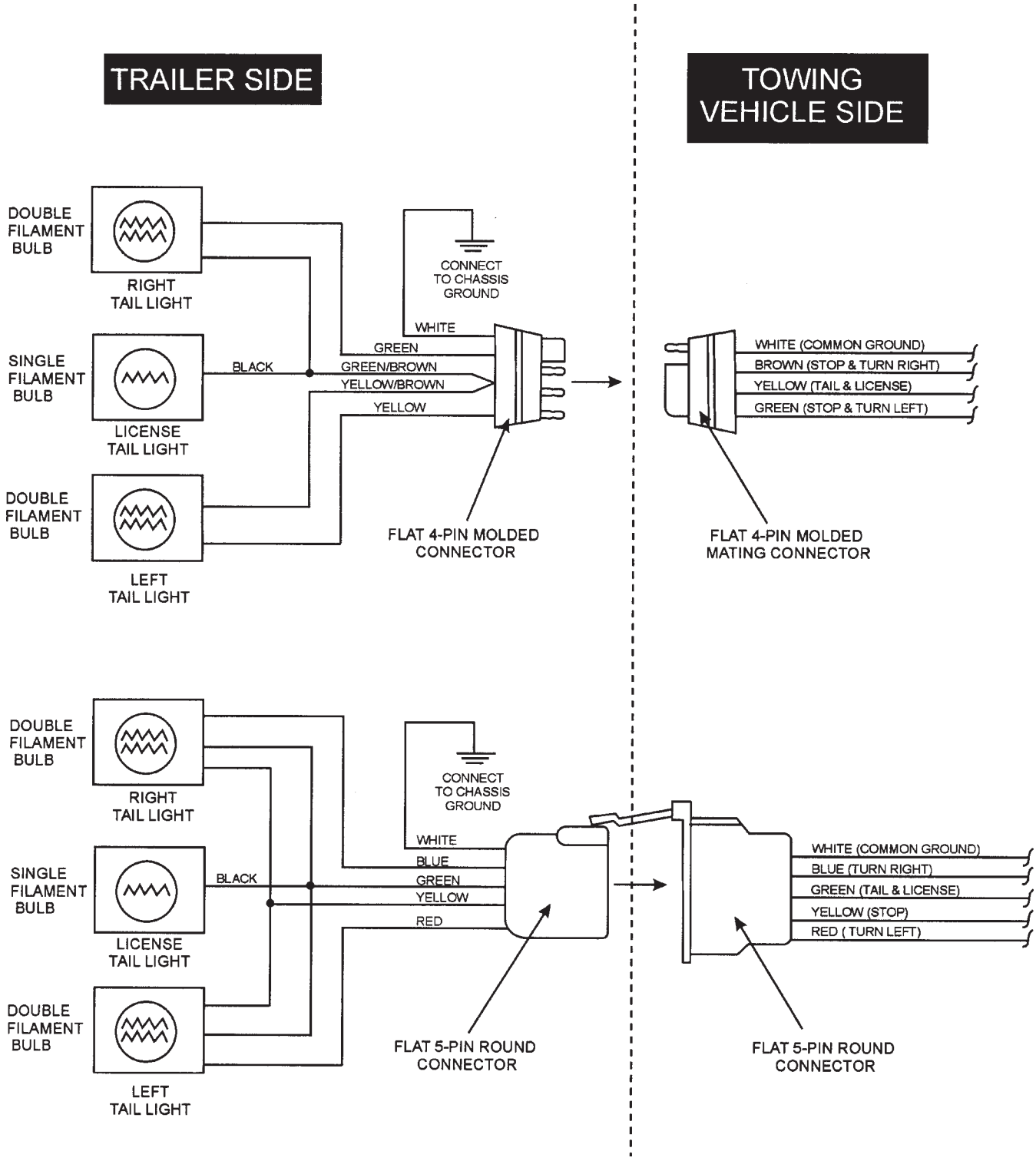
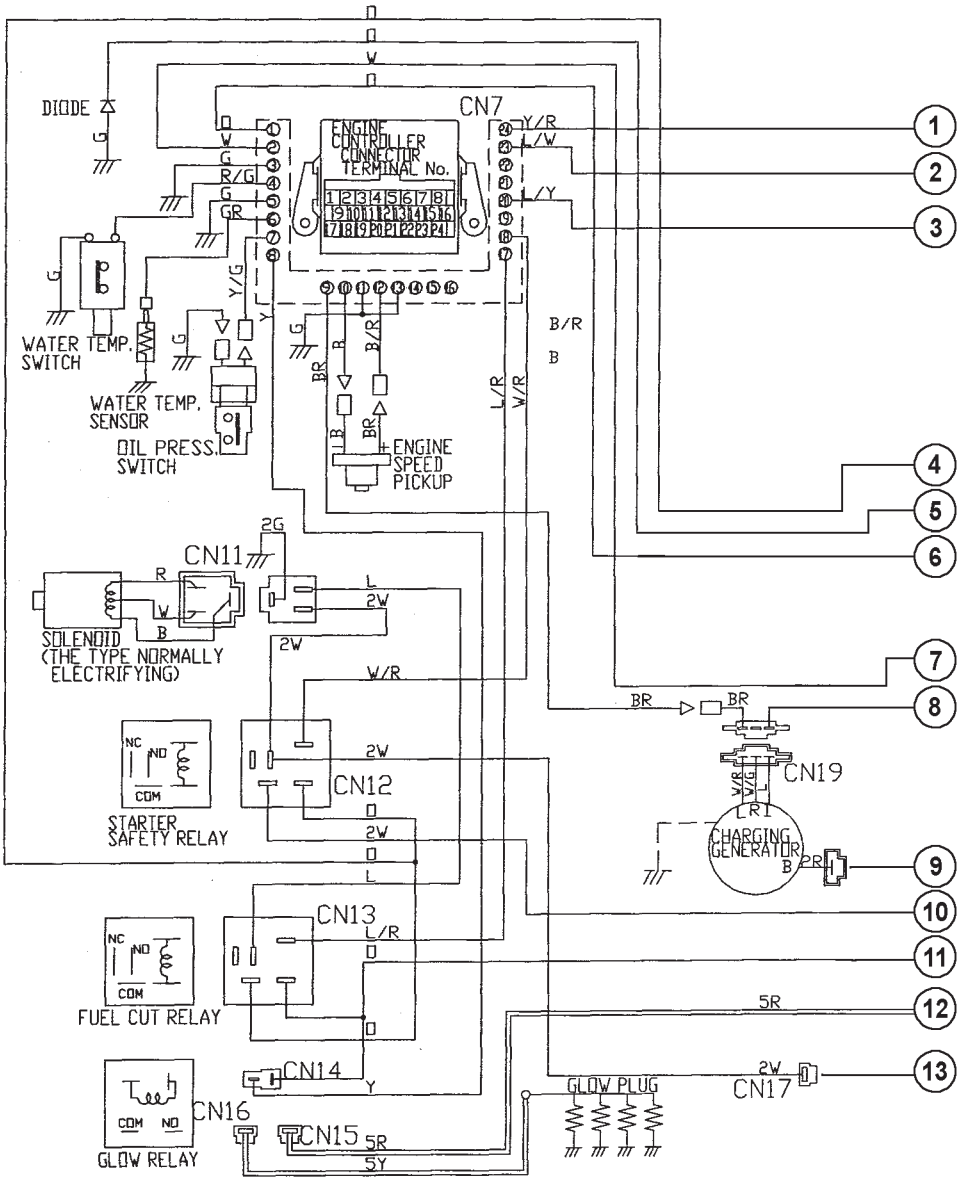


Figure 60. Trailer/Towing Vehicle Wiring Diagram



WIRE SIZE
60 : 50mm²
5 : 5 mm²
No : 1.25mm²

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

CONNECTOR
(VIEW FROM INSERTING WIRE SIDE)

KEY CONNECTION DIAGRAM						
	B	Br	R1	ACC	R2	C
OFF	○					
RUN	○	○		○		
START	○	○		○	○	○

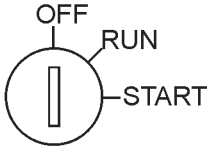
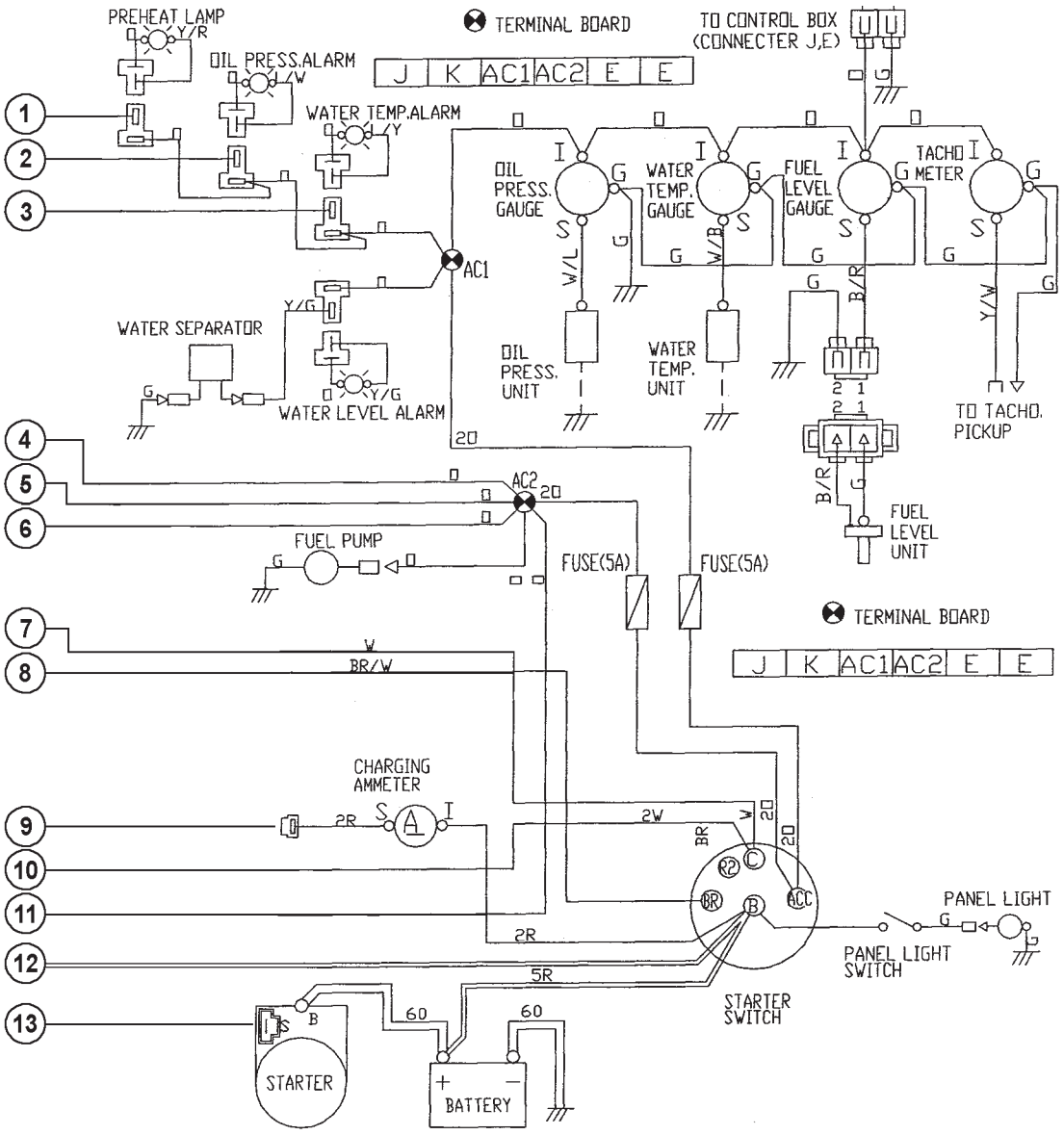


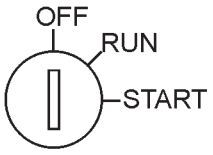
Figure 61. Engine Wiring Diagram



CONTINUED FROM PREVIOUS PAGE

WIRE SIZE		
60	:	50mm²
5	:	5 mm²
No	:	1.25mm²

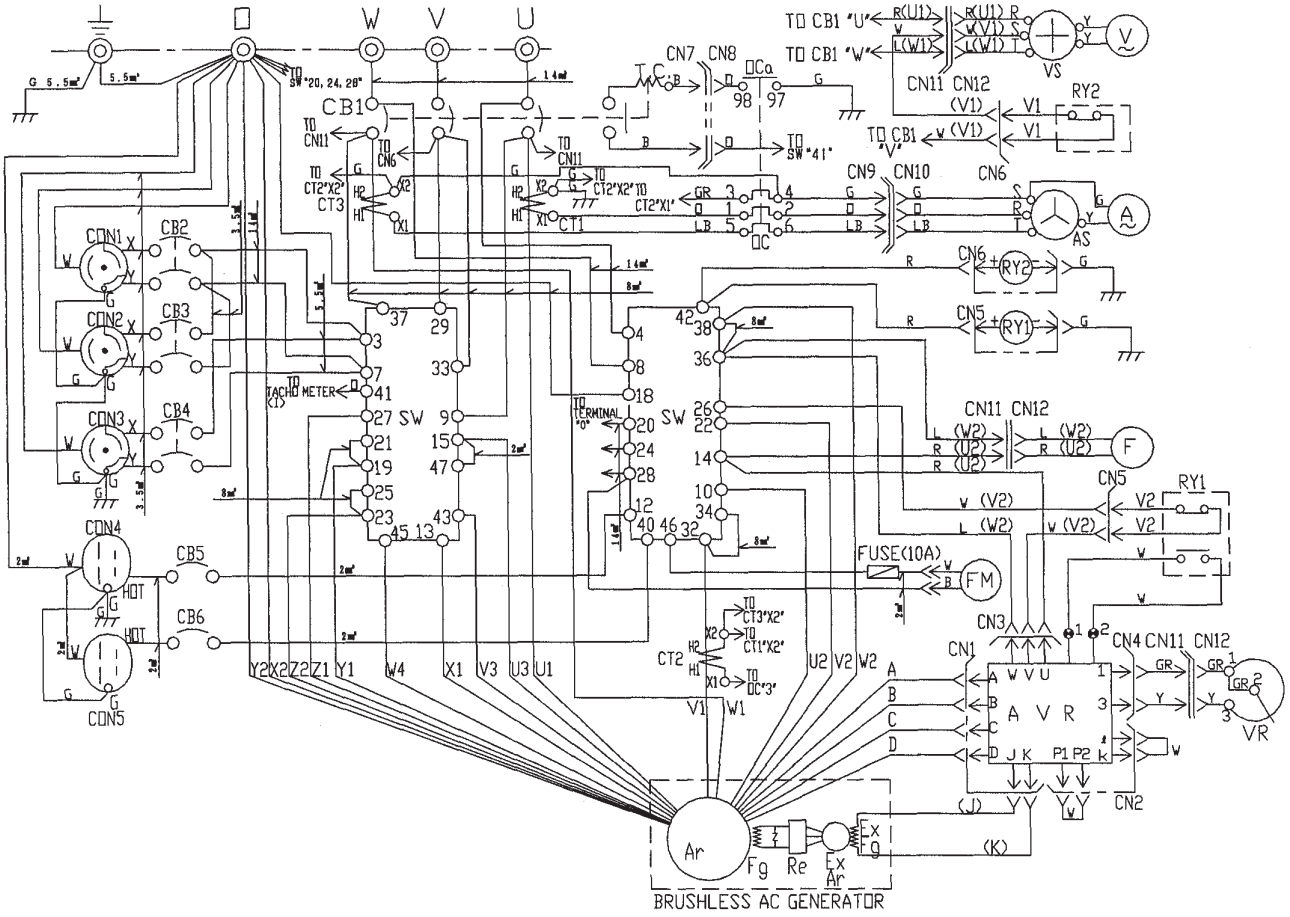
CONNECTOR
(VIEW FROM INSERTING WIRE SIDE)



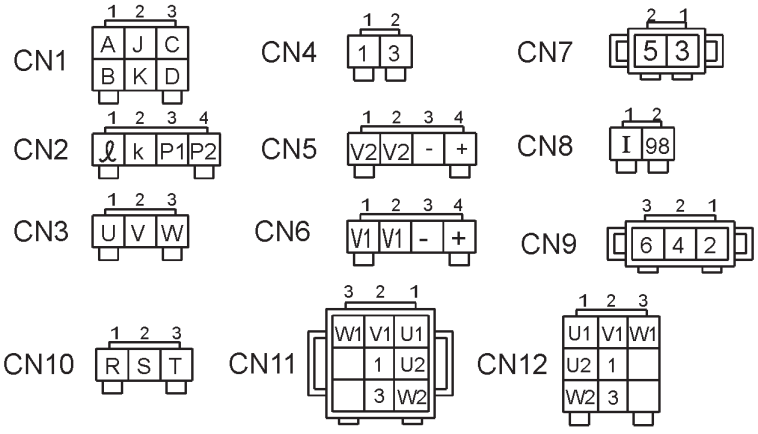
KEY CONNECTION DIAGRAM						
	B	Br	R1	ACC	R2	C
OFF	○					
RUN	○	○		○		
START	○	○		○	○	○

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

Figure 61. Engine Wiring Diagram(Continued)



CONNECTER ARRANGEMENT
(WIRING VIEW)



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

Figure 62. Generator Wiring Diagram

Notice :
1. No designation lead size : 1.25

SYMBOL	DESIGNATION
Ar	MAIN GENERATOR ARMATURE WINDING
Fg	MAIN GENERATOR FIELD WINDING
ExAr	EXCITER ARMATURE WINDING
ExFg	EXCITER FIELD WINDING
Re	RECTIFIER
AVR	AUTOMATIC VOLTAGE REGULATOR
VR	VOLTAGE REGULATOR (RHEOSTAT)
CT 1,2,3	CURRENT TRANSFORMER
AS	CHANGE-OVER SWITCH,AMMETER
A	AC.AMMETER
VS	CHANGE-OVER SWITCH,VOLTMETER
V	AC.VOLTMETER
F	FREQUENCY METER
CB1	CIRCUIT BREAKER 3P 60A
CB2,3,4	CIRCUIT BREAKER 2P 50A
CB5,6	CIRCUIT BREAKER 1P 20A
CON1,2,3	RECEPTACLE 250V 50A
CON4,5	RECEPTACLE 125V 20AX2
OC	OVER CURRENT RELAY
SW	SELECTOR SWITCH
RY1,2	RELAY UNIT
FM	FAN MOTOR
FUSE	10 A

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use the tables shown for diagnosis based on the Engine and Radiator Troubleshooting (Table 20) . If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 20. GENERATOR TROUBLESHOOTING

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

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

TABLE 19. ENGINE TROUBLESHOOTING

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

TABLE 19. ENGINE TROUBLESHOOTING (CONTINUED)

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

EXPLANATION OF CODE IN REMARKS COLUMN

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

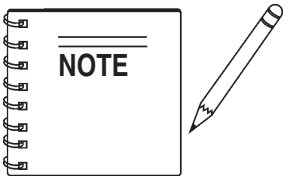
Items Found In the "Remarks" Column

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

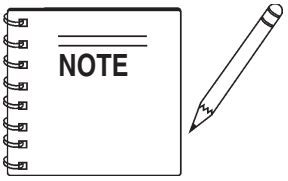
Model Number-Where indicated, this shows that the corresponding part is utilized only with this specific model number or model number variant.

Items Found In the "Items Number" Column

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



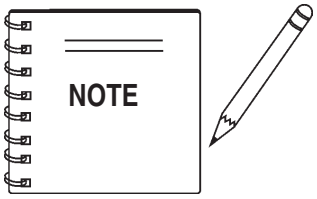
If more than one of the same reference number is listed, the last one listed indicates newest (or latest) part available.



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

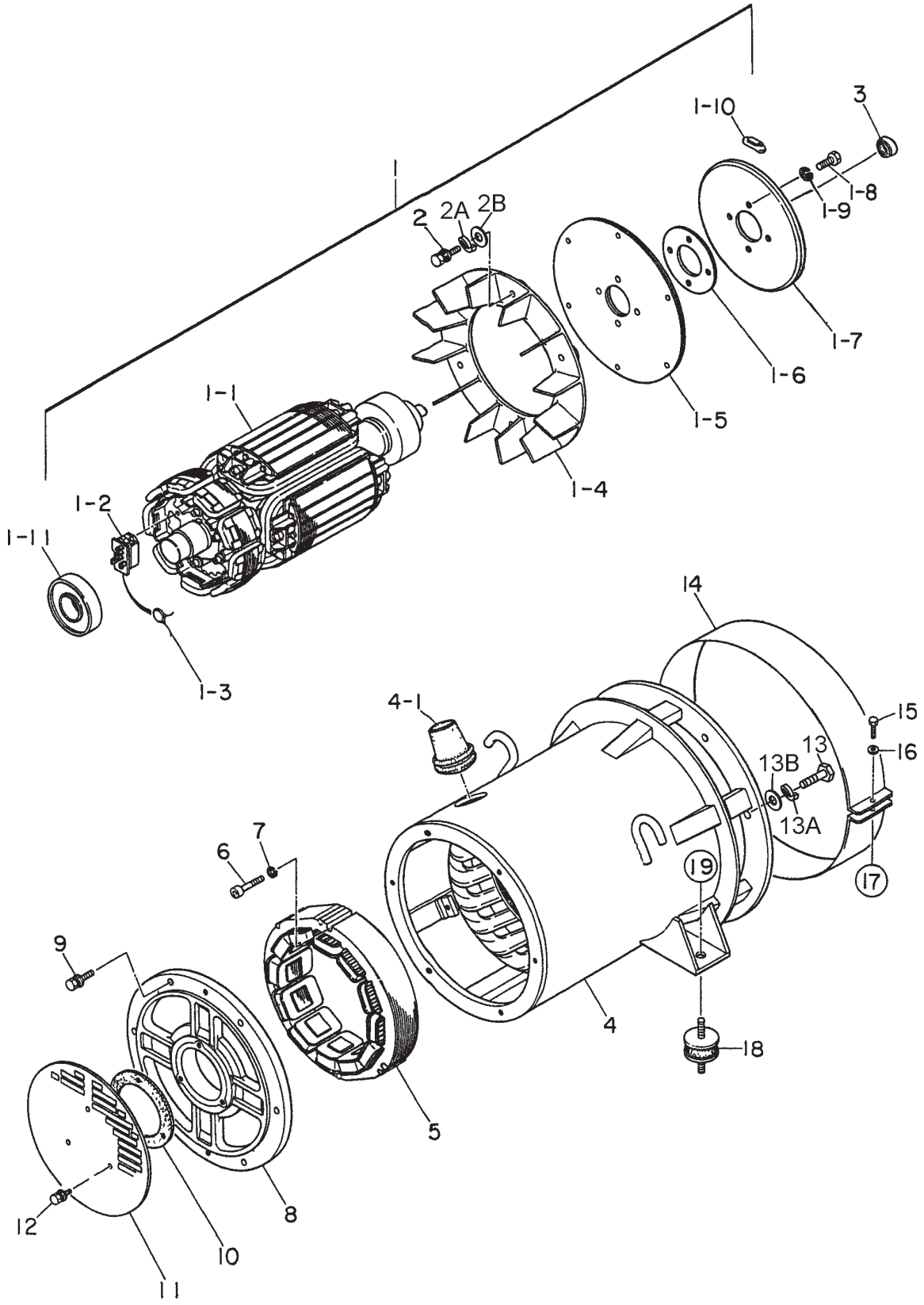
DCA-25USI 1 TO 3 UNITS

Qty.	P/N	Description
3	0602041210	OIL CARTRIDGE
3	0602042203	FUEL FILTER
3	0602046611	AIR ELEMENT
3	0602042203	FUEL TANK, FILTER
1	0602122272	UNIT, OIL PRESSURE
1	0602123266	UNIT WATER TEMPERATURE
1	0605505070	FUEL CAP



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

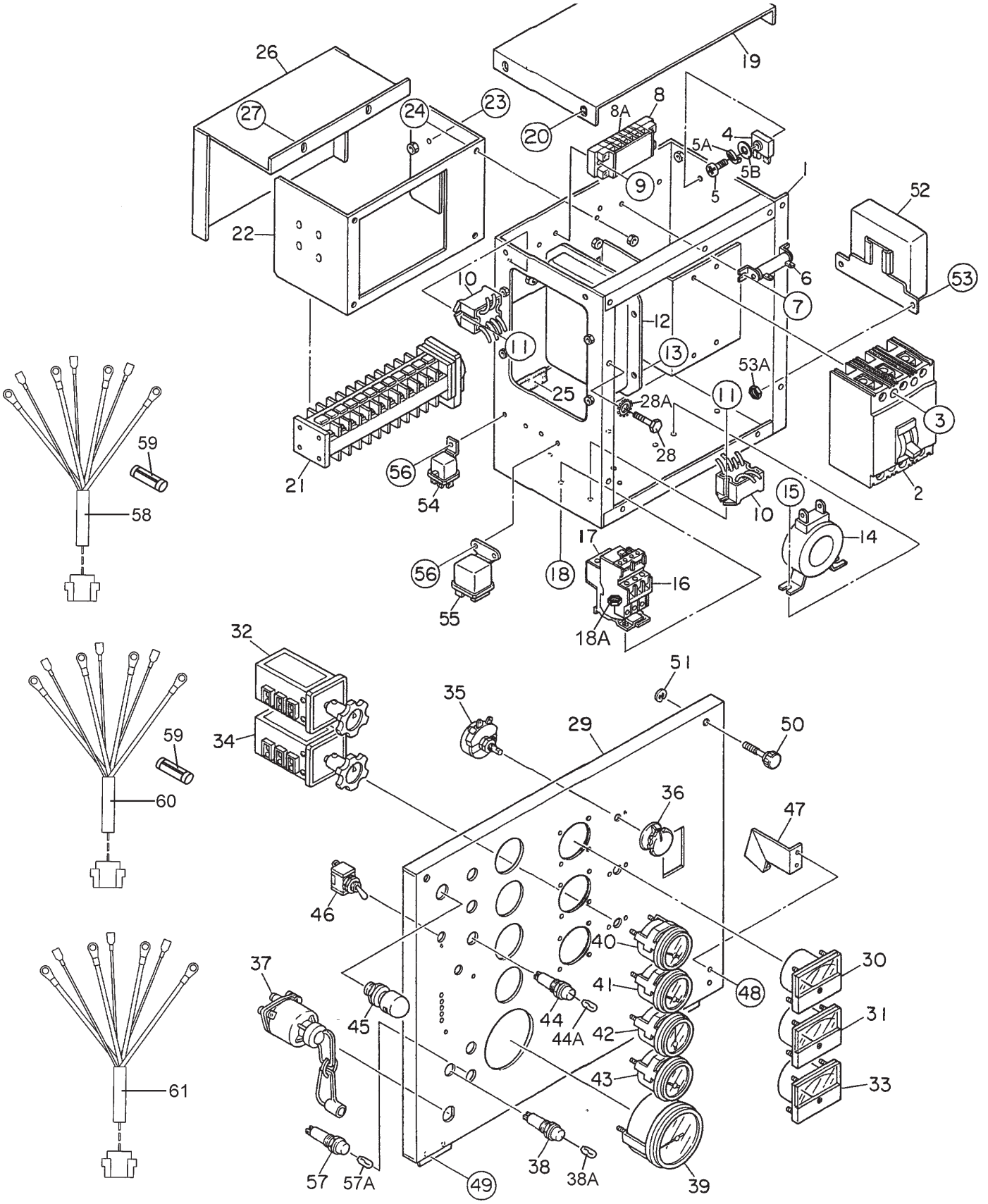
GENERATOR ASSY.



GENERATOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	B1110200602	ROTOR ASSY.	1	INCLUDES ITEMS W/*
1-1*		FIELD ASSY.	1	
1-2*	7961025004	RECTIFIER	1	
1-3*	0601822630	SURGE ABSORBER	1	TNR23G471K
1-4*	8001070003	FAN	1	
1-5*	8351611004	COUPLING DISK	2	
1-6*	8351612004	WASHER, COUPLING HUB	1	
1-7*	B1112300003	BALANCING PLATE	1	PURCHASE SET OF 1-10
1-8*	0010310025	HEX. HEAD BOLT	4	
1-9*	0042510000	SPRING WASHER	4	
1-10*	0601000209	BALANCING WEIGHT KIT	1	
1-11*	0071906308	BEARING	1	6308DDUC3
2	0010308035	HEX, HEAD BOLT	6	
2A	0040008000	SPRING WASHER	6	
2B	0041208000	PLAIN WASHER	6	
3	0070506803	BEARING	1	6803ZZ
4	B1130201103	STATOR ASSY.	1	
4-1	0845041904	GROMMET	1	
5	B1138000003	FIELD ASSY. EXCITER	1	
6	0016008045	HEX, SOCKET HEAD CAP SCREW	2	S=22
7	0042508000	SPRING WASHER	3	
8	8351315003	END BRACKET	1	
9	0017108035	HEX, HEAD BOLT	6	
10	8351312004	PACKING	1	
11	8351331004	COVER, SUCTION	1	
12	0017106016	HEX, HEAD BOLT	3	
13	0010310030	HEX, HEAD BOLT	6	
13A	0040010000	SPRING WASHER	6	
13B	0041210000	PLAIN WASHER	6	
14	B0155400204	COVER, FAN	1	
15	0010106030	HEX, HEAD BOLT	1	
16	0041206000	PLAIN WASHER	1	
17	0600815000	NUT	1	USN-6001
18	M9312600004	RUBBER SUSPENSION	2	
19	0207010000	HEX, NUT	2	

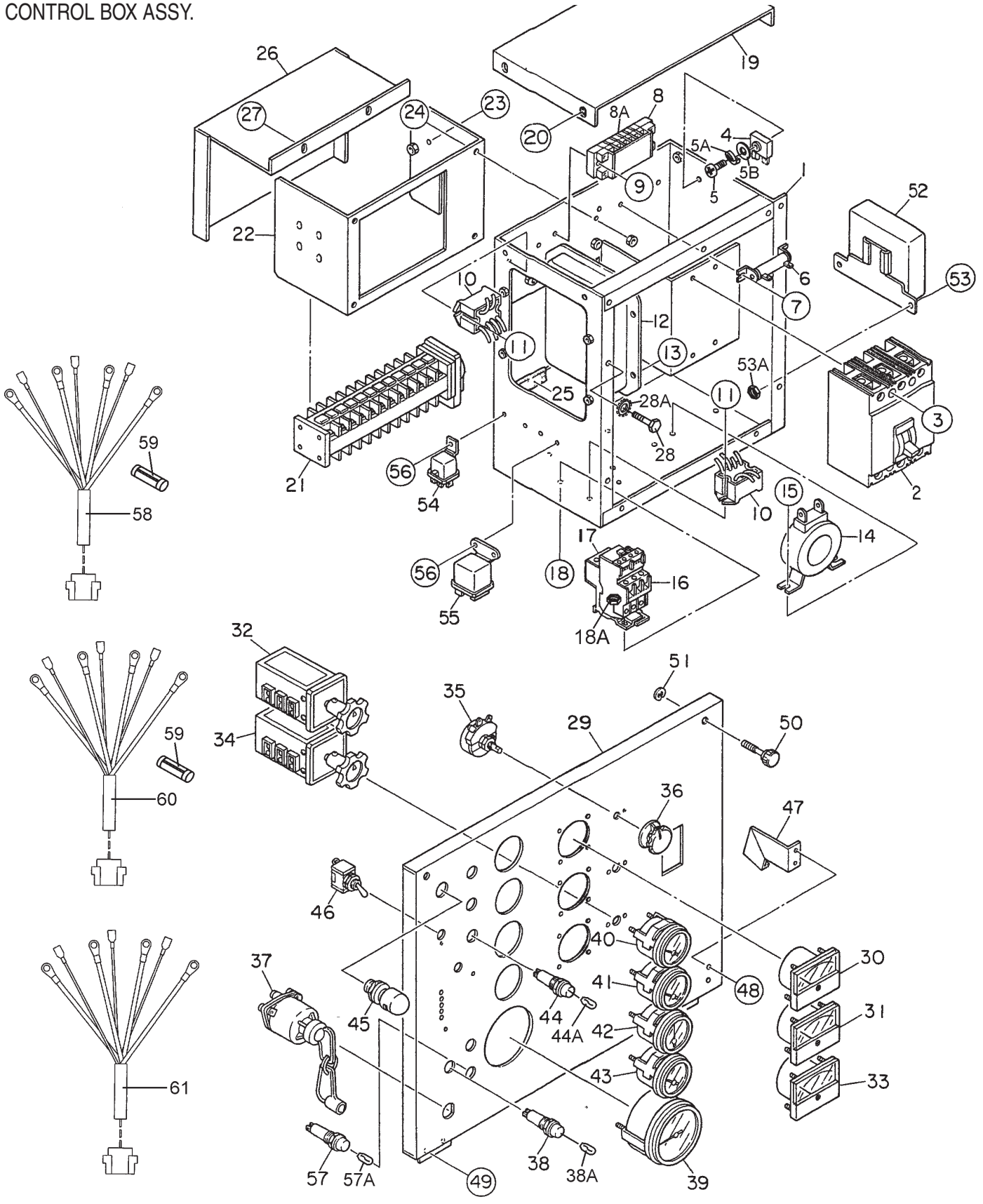
CONTROL BOX ASSY.



CONTROL BOX ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	M1215000612	CONTROL BOX	1	
2	0601808820	CIRCUIT BREAKER	1	FAF340601039 3P 60A
3	0021005080	MACHINE SCREW	4	
4	0601823240	RECTIFIER	2	DE45
5	0021004040	MACHINE SCREW	1	
5A	0040004000	SPRING WASHER	1	
5B	0041204000	PLAIN WASHER	1	
6	0601842384	RESISTOR	1	GG20W 50 OHM
7	0027104010	MACHINE SCREW	2	
8	0601815759	TERMINAL BOARD	1	KT-20 6P
8A	M9521000004	DECAL; TERMINAL SYMBOL	1	
9	0027104020	MACHINE SCREW	4	
10	0601823863	RELAY UNIT	2	MSA9013A
11	0027104016	MACHINE SCREW	4	
12	0601820671	AUTOMATIC VOLTAGE REGULATOR	1	NTA-5A-2DB
13	0027105016	MACHINE SCREW	4	
14	0601806115	CURRENT TRANSFORMER	3	812-943 50/5A
15	0027106016	MACHINE SCREW	6	
16	0601820845	OVER CURRENT RELAY	1	LR2D1308
17	0601820846	OVER CURRENT RELAY	1	LA7D1064
18	0027104016	MACHINE SCREW	2	
18A	0207004000	HEX, NUT	2	
19	M1213500203	CONTROL BOX COVER	1	
20	0016906016	HEX, HEAD BOLT	4	
21	M1201000004	SELECTOR SWITCH	1	VY-40
22	M1215601204	SWITCH BRACKET	1	
23	0027103010	MACHINE SCREW	4	
24	0016906016	HEX, HEAD BOLT	4	
25	0330000160	EDGING	1	
26	M1215601104	SWITCH COVER	1	
27	0016906016	HEX, HEAD BOLT	3	
28	0016906016	HEX, HEAD BOLT	9	
28A	0040506000	TOOTHED WASHER	1	
29	M1225000323	CONTROL PANEL	1	
30	0601808985	FREQUENCY METER	1	FCF-6 45~65Hz 240V

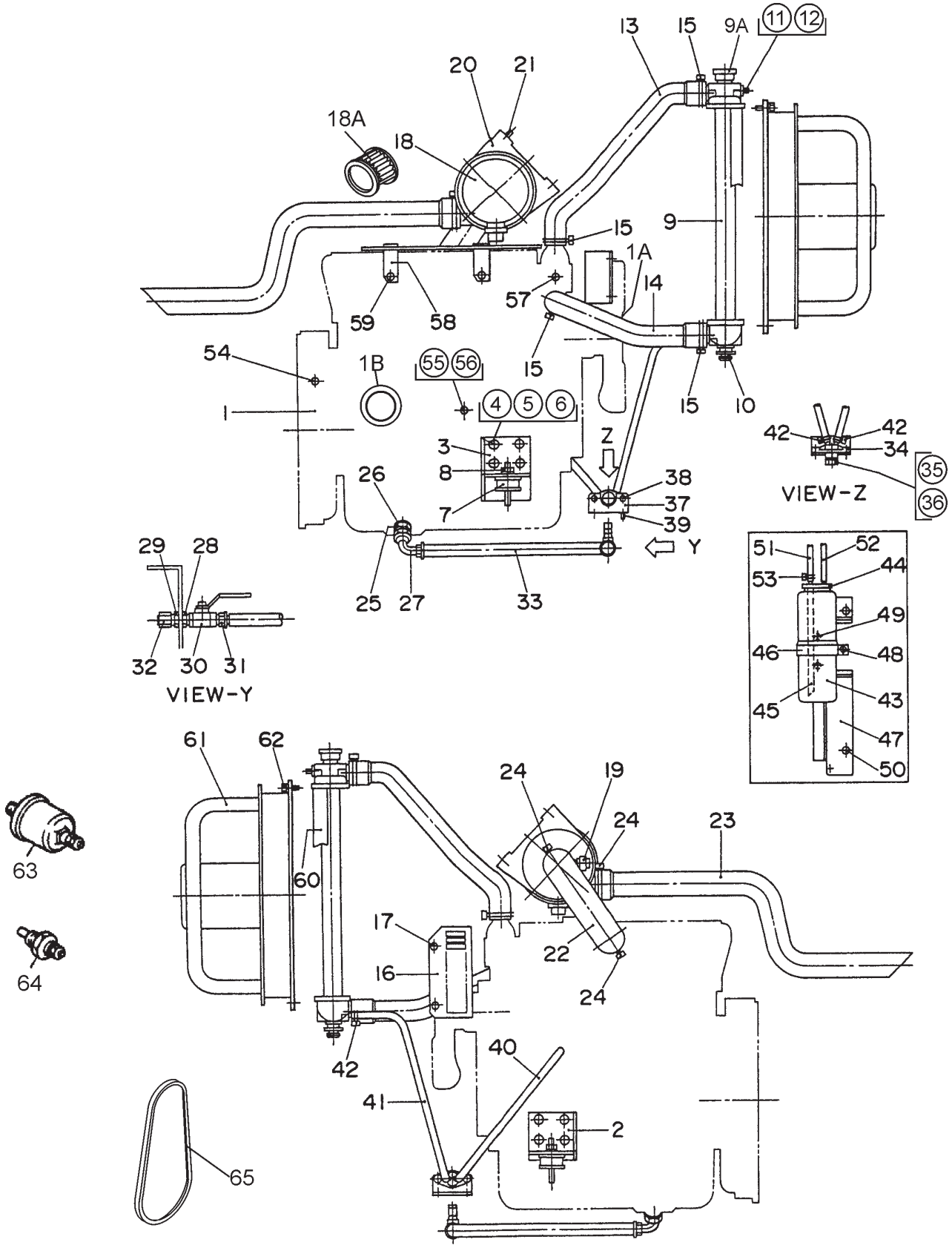
CONTROL BOX ASSY.



CONTROL BOX ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
31	0601808985	AC AMMETER	1	ACF-6 0~50A/100A:5A
32	0601801040	CHANGE-OVER SWITCH, AMMETER	1	SL-2 AS
33	0601806859	AC VOLTMETER	1	SCF-6 0~600V
34	0601801041	CHANGE-OVER SWITCH, AMMETER	1	SL-2 AS
35	0601801041	RHEOSTAT(VOLTAGE REGULATOR)	1	RA2OA2SE102BJ 2W 1k OHM
36	0601840121	KNOB	1	25N
37	0602100009	STARTER SWITCH	1	ISUZU 897044-4180
38	0602103092	PREHEAT LAMP	1	PL-05
38A	0601810245	BULB	1	E-10 T-10 DC18V
39	0602120095	TACHOMETER	1	103680
40	0602122093	OIL PRESSURE GAUGE	1	100174
41	0602123090	WATER TEMPERATURE GAUGE	1	100683
42	0602121080	CHARGING AMMETER	1	100158
43	0602125090	FUEL GAUGE	1	100176
44	0602103092	ALARM LAMP	3	PL-05
44A	0601810245	BULB	3	E-10 T-10 DC18V
45	0601810141	PANEL LIGHT	1	ISUZU 98268-00370
46	0601831330	SWITCH, PANEL LIGHT	1	90-0001
47	M1225100004	STOPPER	1	
48	0027105010	MACHINE SCREW	2	
49	0027105010	MACHINE SCREW	4	
50	M9220100004	SET SCREW	2	
51	0080200007	SNAP RING	2	S-7
52	0602202523	ENGINE CONTROLLER	1	ISUZU 897325-9120
53	0016906016	HEX, HEAD BOLT	2	
53A	0207006000	HEX, NUT	2	
54	0602201400	RELAY	2	ISUZU 582550-0290
55	0602202502	GLOW RELAY	1	ISUZU 894248-1610
56	0027105016	MACHINE SCREW	4	
57	0602103092	ALARM LAMP	1	PL-05
57A	0601810245	BULB	1	E-10 T-10 DC18V
58	M1248700004	WIRE HARNESS, GENERATOR	1	
59	0601802160	FUSE	2	F-7161 5A
60	M1359200602	WIRE HARNESS, ENGINE	1	
61	M3357200304	WIRE HARNESS, FUEL LEAK	1	

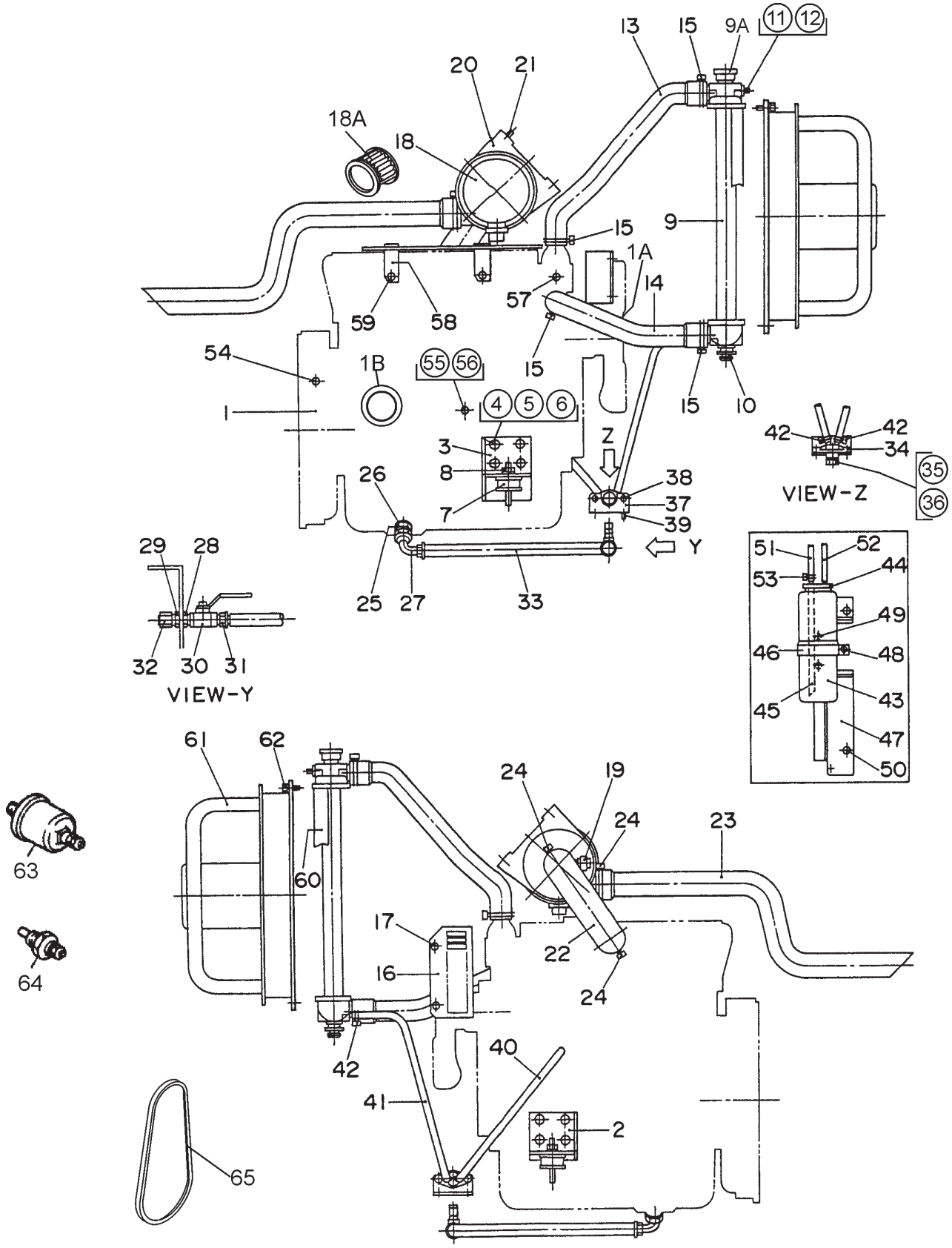
ENGINE & RADIATOR ASSY.



ENGINE & RADIATOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	B1925200254	ENGINE	1	ISUZU AA-4LE2
1A	0602011431	FAN BOLT	1	ISUZU 897230-9390
1B	0602041210	CARTRIDGE, OIL FILTER	1	ISUZU 894456-7411
2	M1305200304	ENGINE FOOT	1	
3	M1305200204	ENGINE FOOT	1	
4	0010310025	HEX, HEAD BOLT	8	
5	0040010000	SPRING WASHER	8	
6	0041210000	PLAIN WASHER	8	
7	060500066	RUBBER SUSPENSION	2	KA-50
8	0207010000	HEX, NUT	2	
9	M1923200074	RADIATOR	1	2951-294-0000
9A	0602011079	CAP, RADIATOR	1	6713-092-0901
10	M9312200104	MOUNT RUBBER	2	
11	0016908040	HEX, HEAD BOLT	2	
12	0207008000	HEX, NUT	2	
13	M1312500203	RADIATOR HOSE	1	
14	M1312500303	RADIATOR HOSE	1	
15	0605515149	HOSE BAND	4	
16	M1312300103	FAN COVER	1	
17	0016906020	HEX, HEAD BOLT	4	
18	0602046531	AIR CLEANER	1	EPG05-8505
18A	0602046611	ELEMENT, AIR CLEANER	1	P82-1575
19	0602040650	INDICATOR, AIR CLEANER	1	X00-2252
20	0602040552	BRACKET, AIR CLEANER	1	P777730
21	0016908030	HEX, HEAD BOLT	2	
22	M1375100303	HOSE, AIR CLEANER	1	
23	M1375100203	HOSE, AIR CLEANER	1	
24	0605515147	HOSE BAND	3	
25	0602022560	ADAPTER	1	10-M20 X 1.5 F80X-S
26	M1320300304	PACKING	1	
27	0602022561	90 DEG. ELBOW	1	33982-10-10+
28	0603306590	CONNECTOR	1	10WFTX-S
29	0603300285	ROCKNUT	1	10WLN
30	0605511395	VALVE	1	XV50 OP-8
31	0603306395	HOSE JOINT	1	30182-8-10
32	0602021070	CAP	1	10FNTX-S
33	0269200380	DRAIN HOSE	1	836-10

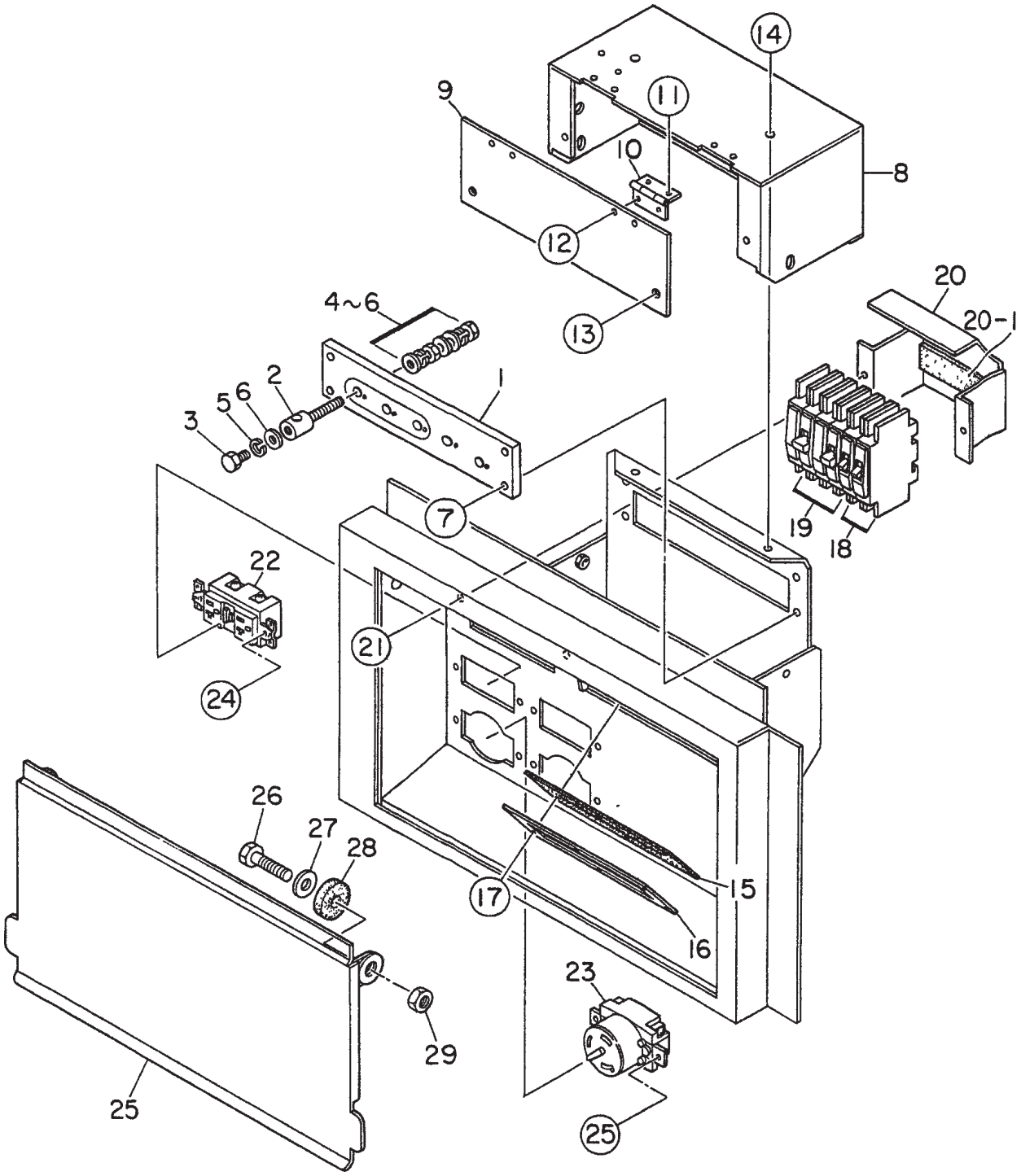
ENGINE & RADIATOR ASSY.



ENGINE & RADIATOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
34	M9602000003	DRAIN JOINT	1	
35	M9200200004	PLUG	1	
36	0150000018	O RING	1	A P18
37	M1312600204	BRACKET	1	
38	0016906020	HEX, HEAD BOLT	2	
39	0016906020	HEX, HEAD BOLT	2	
40	0199901600	DRAIN HOSE	1	
41	0199900800	DRAIN HOSE	1	
42	0605515106	HOSE BAND	4	RS-8006
43	M9300000003	RESERVE TANK	1	
44	M9300100003	CAP, RESERVE TANK	1	
45	0199100215	HOSE	1	
46	M1318100204	BRACKET, RESERVE TANK	1	
47	M1318100103	BRACKET, RESERVE TANK	1	
48	0016906025	HEX, HEAD BOLT	1	
49	0016906020	HEX, HEAD BOLT	2	
50	0016908020	HEX, HEAD BOLT	2	
51	0199100700	HOSE	1	
52	0193600850	HOSE	1	
53	0605515106	HOSE BAND	3	RS-8006
54	0602120481	PICK UP, TACHOMETER	1	71255-00
55	0602122272	UNIT, OIL PRESSURE	1	108497
56	M9200100004	ADAPTER	1	
57	0602123266	UNIT, WATER TEMPERATURE	1	02017-00
58	M1353800004	CLAMPER ROD	1	
59	0016908020	HEX, HEAD BOLT	2	
60	0220300425	SEAL RUBBER	2	
61	0601822794	MOTOR FAN	1	EF35-DSB1-07
62	0016908025	HEX, HEAD BOLT	4	
63	1824100990	SENDER, OIL PRESSURE	1	
64	8970785920	SENDER, WATER TEMPERATURE	1	
65	TBD	V-BELT	1	

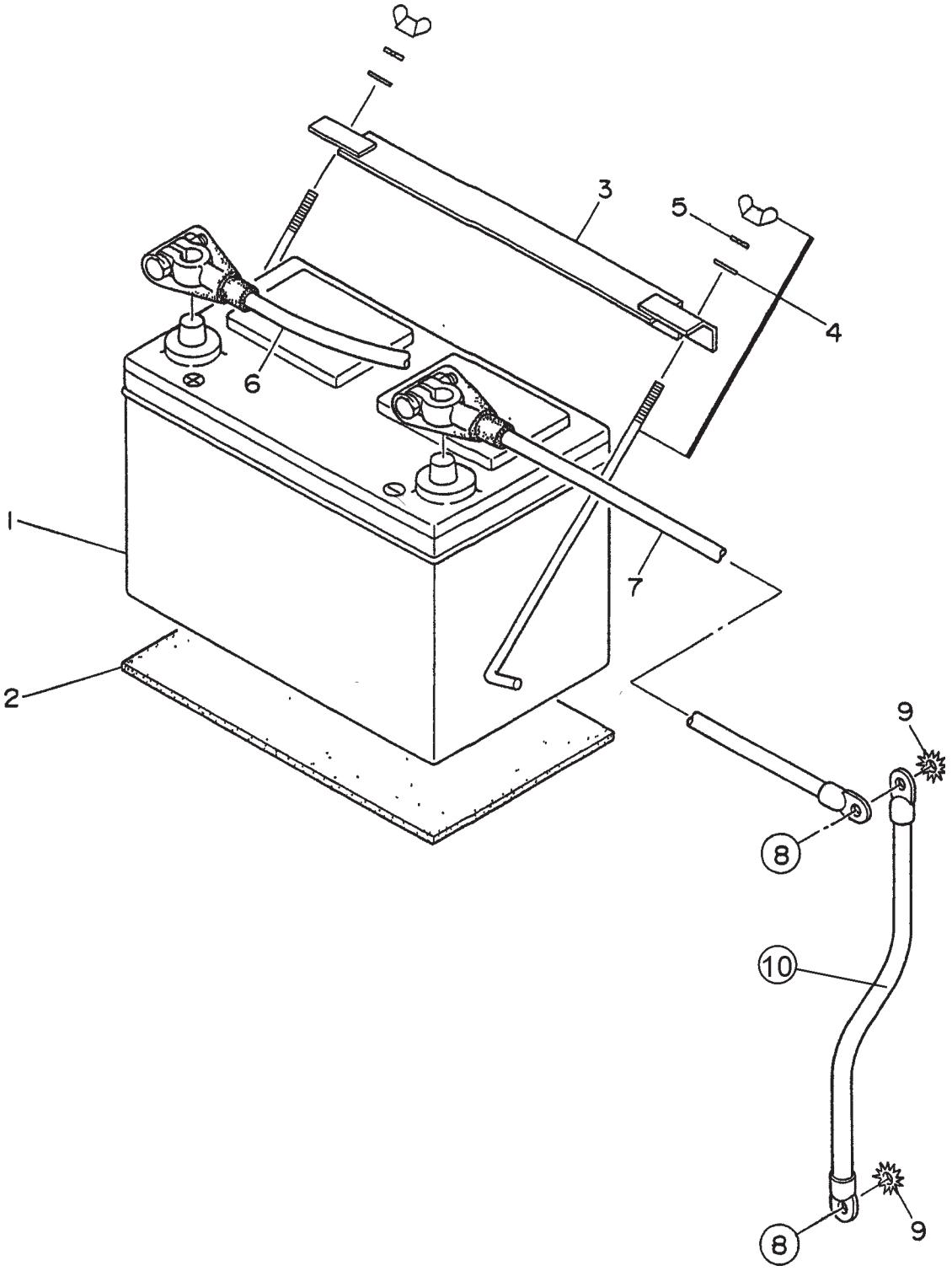
OUTPUT TERMINAL ASSY.



OUTPUT TERMINAL ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	M1230700003	TERMINAL PANEL	1	
2	M9220000004	OUTPUT TERMINAL BOLT	5	
3	M9220000104	TIE SCREW	5	
4	0039308000	HEX, NUT	10	
5	0040008000	SPRING WASHER	15	
6	0041408000	PLAIN WASHER	20	
7	0016906025	HEX, HEAD BOLT	4	
8	M1238100603	TERMINAL COVER	1	
9	M1238100704	OUTPUT WINDOW	1	
10	0605010040	HINGE	2	TH-TM122
11	0027103010	MACHINE SCREW	8	
11A	0030003000	HEX, NUT	8	
11B	0041203000	PLAIN WASHER	4	
13	0016906020	HEX, HEAD BOLT	2	
14	0016906016	HEX, HEAD BOLT	4	
15	M1236400004	CABLE OUTLET COVER	1	
16	M1236300004	SUPPORTER, CABLE OUTLET COVER	1	
17	0016906020	HEX, HEAD BOLT	6	
18	0601808803	CIRCUIT BREAKER	2	QOU120B1P 20A
19	0601808804	CIRCUIT BREAKER	2	QOU250B2P 50A
20	M1260700204	BREAKER FITTING COVER	1	
20A	0222100115	CUSHION RUBBER	1	
21	0016906020	HEX, HEAD BOLT	2	
22	0601812598	RECEPTACLE	2	GF-530EM 125V 20A X 2
23	0601812538	RECEPTACLE	2	CS6369 250V 50A
24	0027104018	MACHINE SCREW	8	
24A	0207004000	HEX, NUT	8	
25	M1238100503	TERMINAL COVER	1	
26	0010112045	HEX, HEAD BOLT	2	
27	0041212000	PLAIN WASHER	2	
28	M9310200004	STAY RUBBER	2	
29	0030012000	HEX, NUT	2	

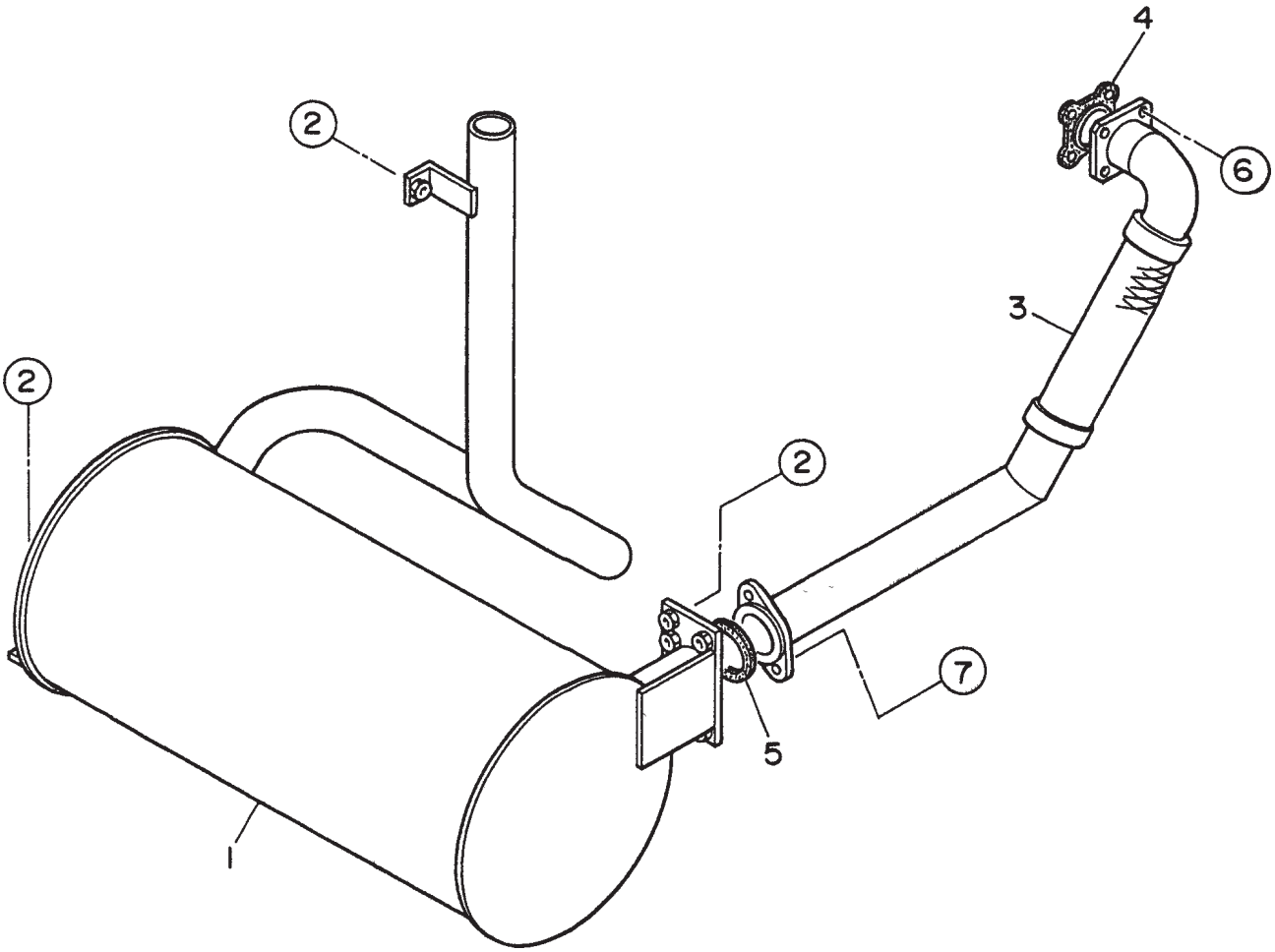
BATTERY ASSY.



BATTERY ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	0602220185	BATTERY	1	427MFD
2	M9310500014	BATTERY SHEET	1	
3	M9103000304	BATTERY BAND	1	
4	0602220920	BATTERY BOLT SET	2	BHL-10J
5	0040006000	SPRING WASHER	2	
6	M1348400204	BATTERY CABLE	1	
7	M1348400314	BATTERY CABLE	1	
8	0016910020	HEX, HEAD BOLT	1	
9	0040510000	TOOTHED WASHER	1	

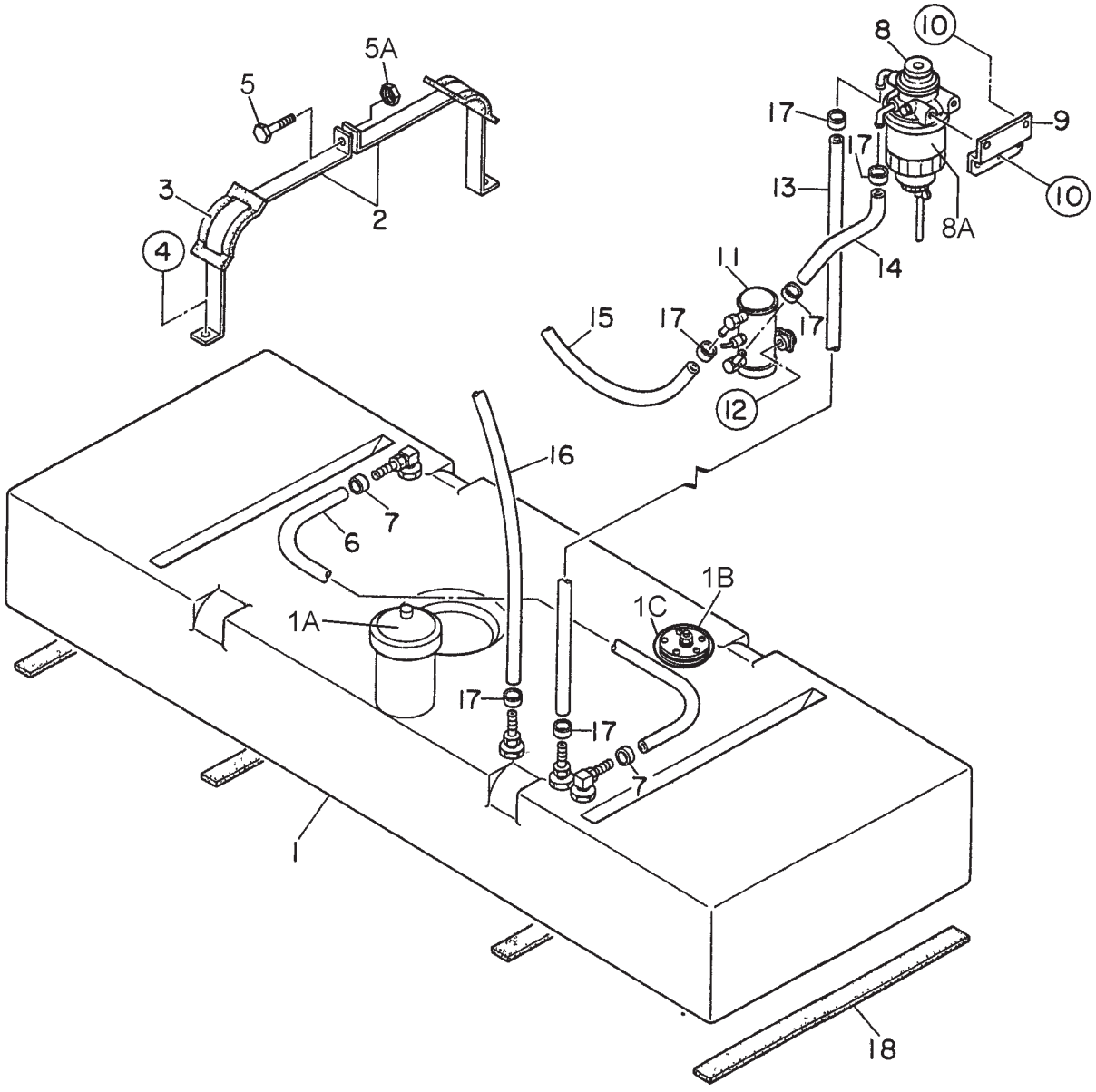
MUFFLER ASSY.



MUFFLER ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	M1332000002	MUFFLER	1	
2	0016908020	HEX, HEAD BOLT	7	
3	M1335000103	EXHAUST PIPE	1	
4	0602320100	GASKET	1	ISUZU 897042-0280
5	M0335200004	GASKET	1	
6	0207008000	HEX, NUT	4	
7	0016908030	HEX, HEAD BOLT	2	

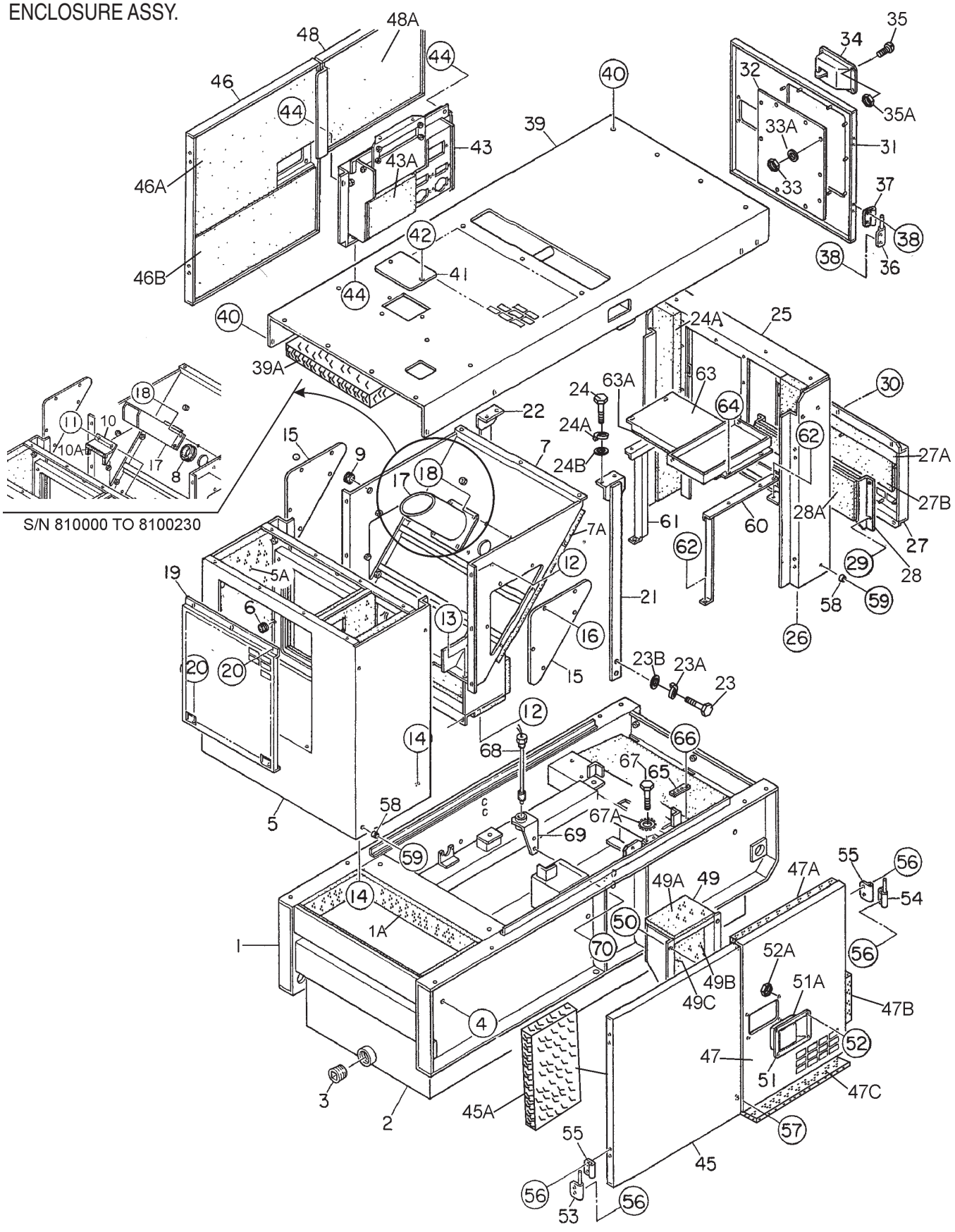
FUEL TANK ASSY.



FUEL TANK ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	M1365000302	FUEL TANK	1	
1A	0605505070	FUEL TANK CAP	1	
1B	0605501071	FUEL SENDER UNIT	1	
1C	0605516090	GASKET	1	
2	M1365200204	TANK BAND	4	
3	M9310500104	SUPPORTER SHEET	4	
4	0016908020	HEX, HEAD BOLT	4	
5	0016908040	HEX, HEAD BOLT	2	
5A	0207008000	HEX, NUT	6	
6	0191201200	VENT HOSE	1	
7	0605515108	HOSE BAND	2	RS-8009
8	0602042203	FUEL FILTER	1	ISUZU 897211-2730
8A	0602042701	CARTRIDGE, FUEL FILTER	1	ISUZU 897213-4720
9	M1368700004	BRACKET, FUEL FILTER	1	
10	0016908020	HEX, HEAD BOLT	4	
11	0602023177	FUEL PUMP	1	ISUZU 897039-8340
11A	8943370220	FUEL FILTER, KIT	1	
12	0016906025	HEX, HEAD BOLT	2	
13	0191200330	SUCTION HOSE	1	
14	0191200200	SUCTION HOSE	1	
15	0191201300	SUCTION HOSE	1	
16	0191200800	RETURN HOSE	1	
17	0605515198	HOSE BAND	8	5008
18	0222100550	TANK SHEET	4	

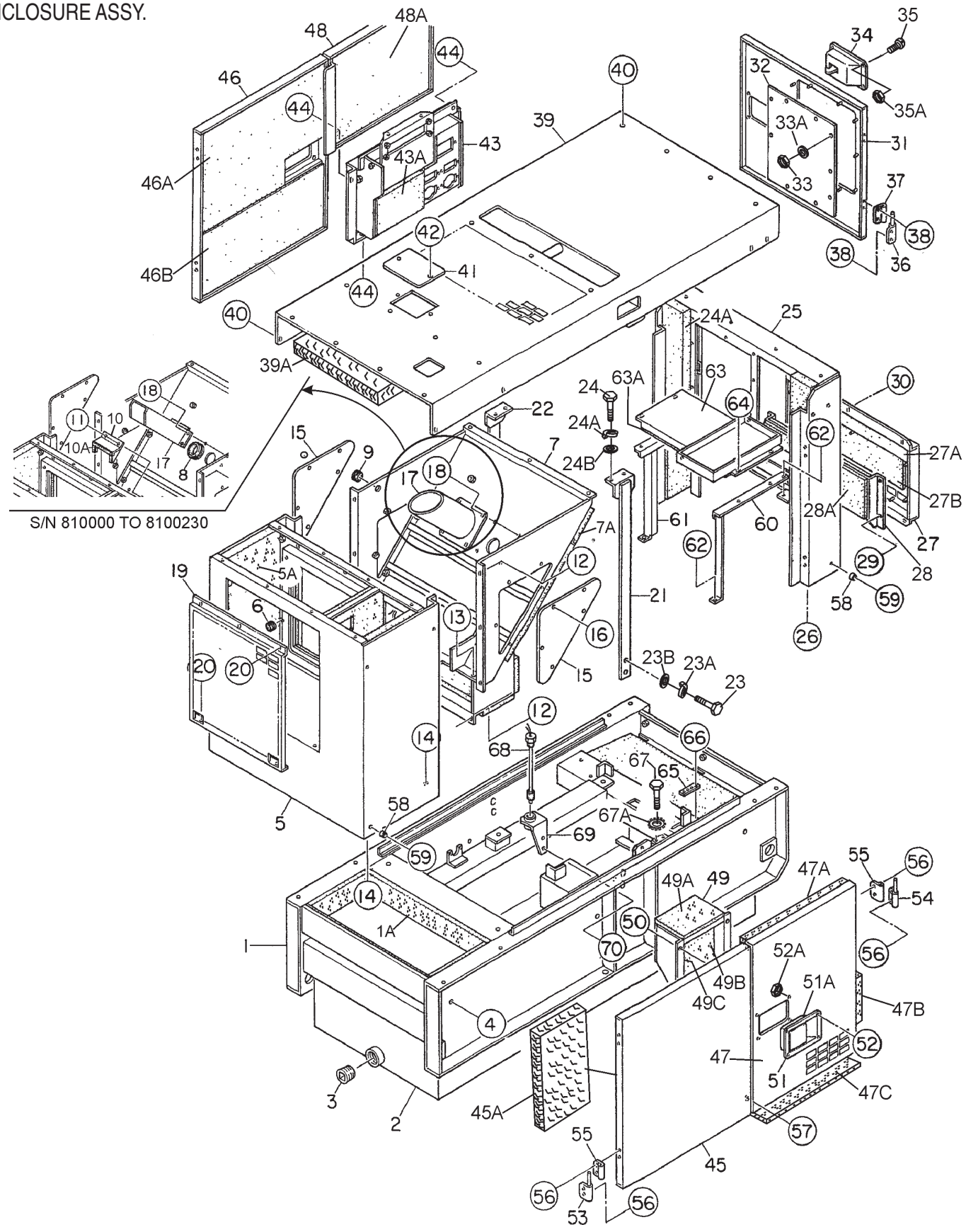
ENCLOSURE ASSY.



ENCLOSURE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	M1415000502	BASE	1	S/N 8100001 TO 8100230
1	M1414000402	BASE	1	S/N 8100231~
1A	M1495000104	ACOUSTIC SHEET	1	
2	M1415100202	ENVIRONMENTAL TANK	1	
3	0603306797	PLUG	1	1-1/2
4	0016910030	HEX, HEAD BOLT	6	
5	M1425000402	FRONT FRAME	1	S/N 8100001 TO 8100219
5	M1424000502	FRONT FRAME	1	S/N 8100220~
5A	M1495100403	ACOUSTIC SHEET	1	
6	0601850151	GROMMET	1	G-52
7	M1425201102	FRONT DUCT	1	S/N 8100001 TO 8100230
7	M1424200702	FRONT DUCT	1	S/N 8100231~
7A	M1495100503	ACOUSTIC SHEET	1	
8	0601851740	GROMMET	1	B-45-3
9	0601850239	GROMMET	1	C30-BW-14-2
10	M1312600104	HOSE COVER	1	S/N 8100001 TO 8100230
10A	0228800120	SEAL RUBBER	1	S/N 8100001 TO 8100230
10A	0228800040	SEAL RUBBER	2	S/N 8100001 TO 8100230
11	0016906016	HEX, HEAD BOLT	2	S/N 8100001 TO 8100230
12	0016908020	HEX, HEAD BOLT	9	
13	0016906020	HEX, HEAD BOLT	4	
14	0016908020	HEX, HEAD BOLT	6	
15	M1425201204	DUCT COVER	2	
16	0016906020	HEX, HEAD BOLT	10	
17	M1425201304	HOSE COVER	1	S/N 8100001 TO 8100230
17	M1424200803	HOSE COVER	1	S/N 8100231~
18	0016906020	HEX, HEAD BOLT	4	
19	M1425200903	COVER, FROM FRAME	1	
20	0016908020	HEX, HEAD BOLT	5	S/N 8100001 TO 8100231
20	0019208020	HEX, HEAD BOLT	5	S/N 8100232~
21	M1435300503	CENTER FRAME	1	
22	M1435300603	CENTER FRAME	1	
23	0013612030	HEX, HEAD BOLT	4	
23A	0040012000	SPRING WASHER	4	
24B	0041212000	PLAIN WASHER	4	
24	0013612030	HEX, HEAD BOLT	4	
24A	0040012000	SPRING WASHER	4	
24B	0041212000	PLAIN WASHER	4	
25	M1445000802	REAR FRAME	1	
25A	M1495300304	ACOUSTIC SHEET	1	
26	0016908020	HEX, HEAD BOLT	4	

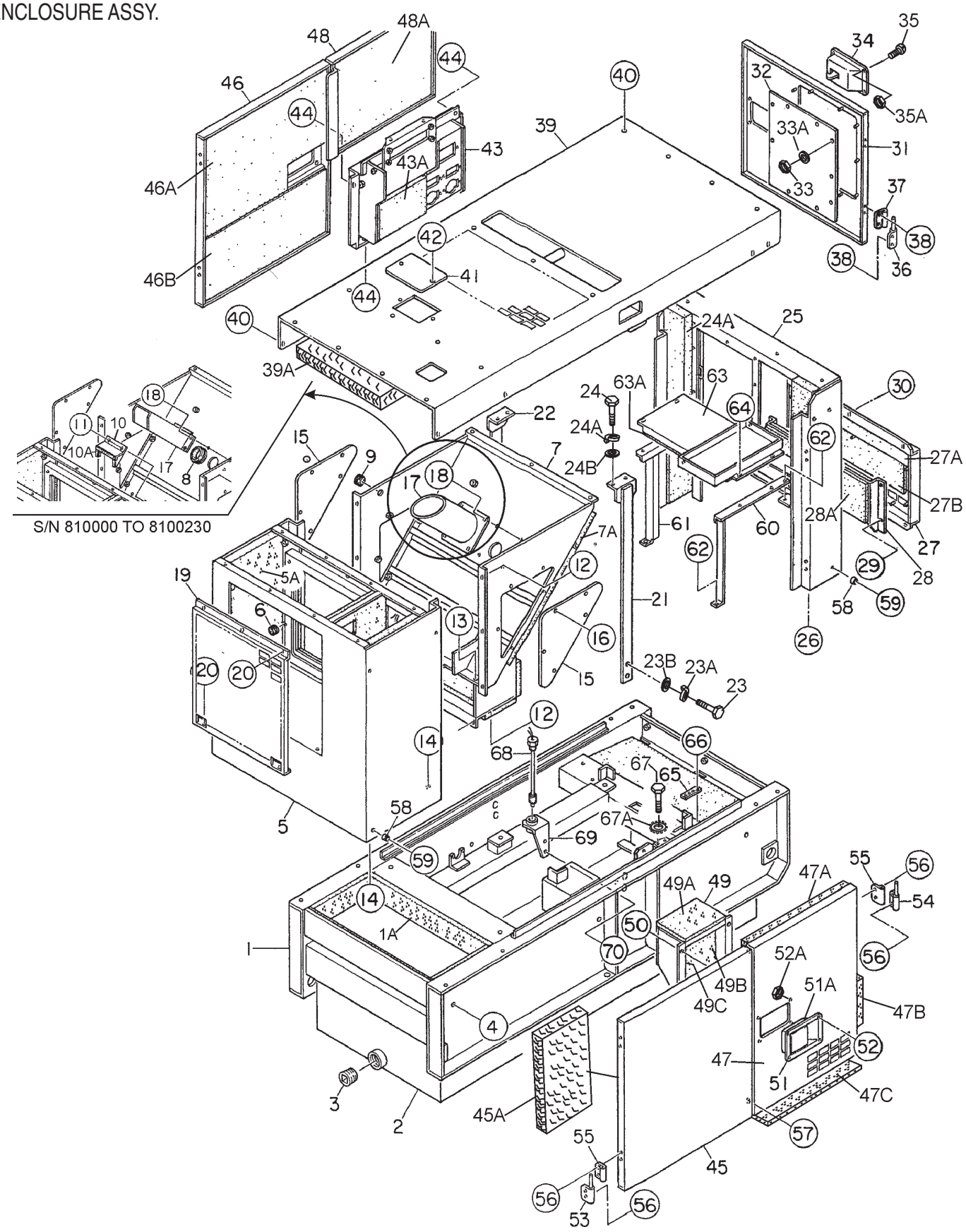
ENCLOSURE ASSY.



ENCLOSURE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
27	M1445300103	REAR COVER	1	
27A	M1495300504	ACOUSTIC SHEET	1	
27B	M1495300604	ACOUSTIC SHEET	1	
28	M1445400103	DUCT	1	
28A	M1495300604	ACOUSTIC SHEET	2	
29	0207006000	HEX, NUT	7	
30	0016908020	HEX, HEAD BOLT	6	S/N 8100001 TO 8100231
30	0019208020	HEX, HEAD BOLT	6	S/N 8100232~
31	M1445200303	REAR DOOR	1	
32	M1445600204	WINDOW PLATE	1	
33	0207306000	HEX, NUT	10	
33A	0041206000	PLAIN WASHER	10	
34	M9113000002	DOOR HANDLE ASSY.	1	
35	0021806016	MACHINE SCREW	4	
35A	0030006000	HEX, NUT	4	
36	M9112100404	HINGE	2	
37	M9112100604	HINGE	2	
38	0016908020	HEX, HEAD BOLT	8	
39	M1465000402	ROOF PANEL	1	
39A	M1495500213	ACOUSTIC SHEET	1	
40	0016908020	HEX, HEAD BOLT	23	S/N 8100001 TO 8100231
40	0019208020	HEX, HEAD BOLT	23	S/N 8100232~
41	M1465400104	COVER	1	
42	0016908020	HEX, HEAD BOLT	2	S/N 8100001 TO 8100231
42	0019208020	HEX, HEAD BOLT	2	S/N 8100232~
43	M1455200702	SPLASHER PANEL	1	
43A	M1495401004	ACOUSTIC SHEET	1	
44	0016908020	HEX, HEAD BOLT	4	
45	M1455100003	SIDE PANEL	1	
45A	M1495400904	ACOUSTIC SHEET	1	
46	M1455000903	SIDE DOOR	1	
46A	M1495500904	ACOUSTIC SHEET	1	
46B	M1495501004	ACOUSTIC SHEET	1	
47	M1455000803	SIDE DOOR	1	
47A	M1495501204	ACOUSTIC SHEET	1	
47B	M1495501304	ACOUSTIC SHEET	1	
46C	M1495401304	ACOUSTIC SHEET	1	
48	M1455000703	SIDE DOOR	1	
48A	M1495501104	ACOUSTIC SHEET	1	
49	M1455300403	DUCT	1	
49A	M1495401204	ACOUSTIC SHEET	3	
49B	M1495401304	ACOUSTIC SHEET	1	
49C	M1495401404	ACOUSTIC SHEET	1	
50	0207006000	HEX, NUT	6	

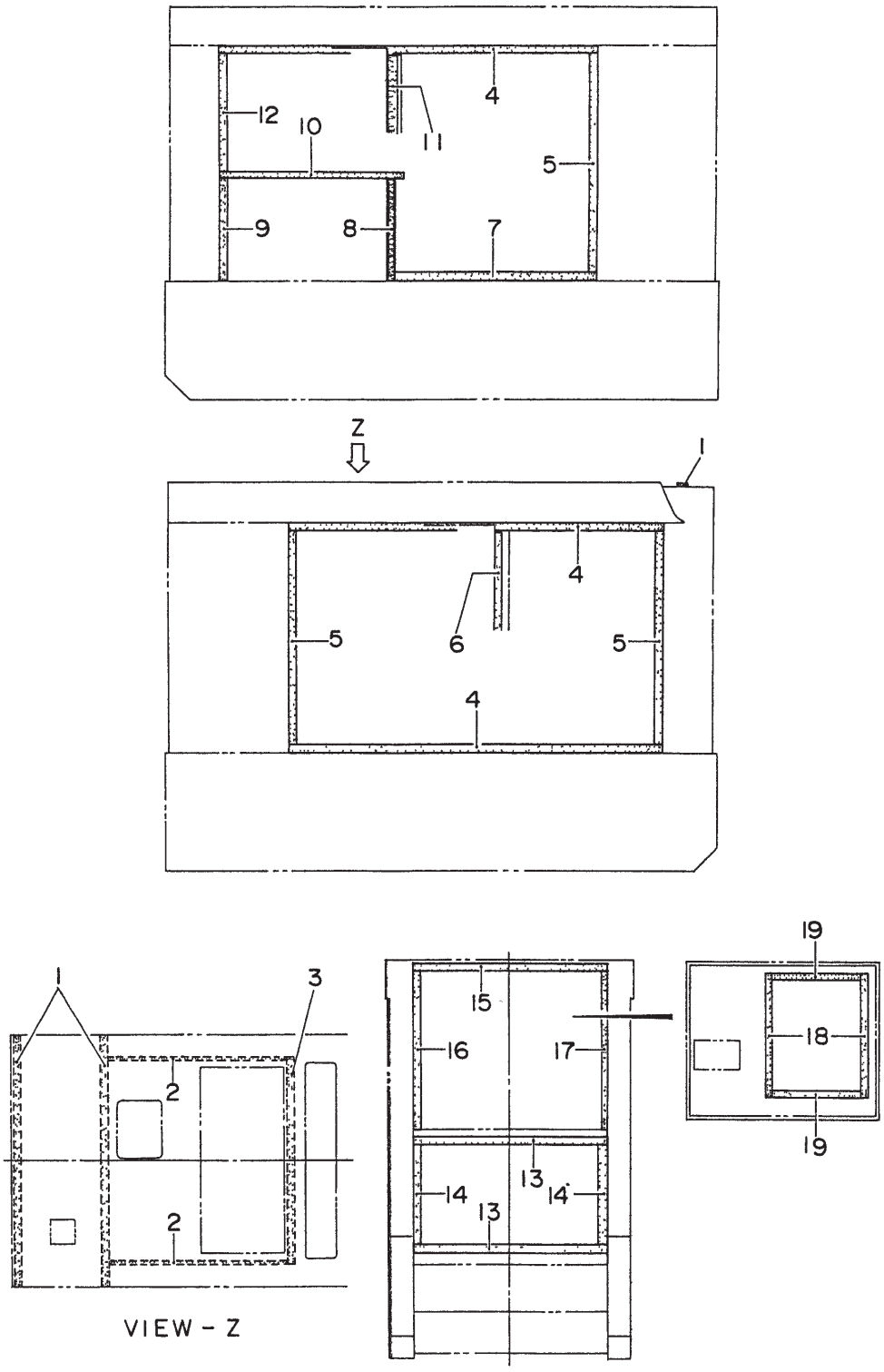
ENCLOSURE ASSY.



ENCLOSURE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
51	M9113000002	DOOR HANDLE ASSY.	2	
51A	C9312500004	SEAL RUBBER	2	
52	0021806016	MACHINE SCREW	8	
52A	0030006000	HEX, NUT	8	
53	M9112100404	HINGE	4	
54	M9112100504	HINGE	4	
55	M9112100604	HINGE	8	
56	0016908020	HEX, HEAD BOLT	32	
57	0016908020	HEX, HEAD BOLT	2	
58	0601850097	STOPPER	5	
59	0027208025	MACHINE SCREW	5	
60	M1435000903	BRACKET STAY	1	
61	M1435000803	BRACKET STAY	1	
62	0016908020	HEX, HEAD BOLT	4	
63	M1435000703	SUPPORT LEG	1	
63A	M1498200004	ACOUSTIC SHEET	1	
64	0016908020	HEX, HEAD BOLT	4	
65	M1278200004	PLATE	1	
66	0016906016	HEX, HEAD BOLT	4	
67	0016908020	HEX, HEAD BOLT	1	
67A	0040508000	TOOTHED WASHER	1	
68	0605503066	FUEL LEAK DETECTED SWITCH	1	S/N 8100231~
69	M1414800204	BRACKET	1	S/N 8100231~
70	0017108020	HEX, HEAD BOLT	2	S/N 8100231~

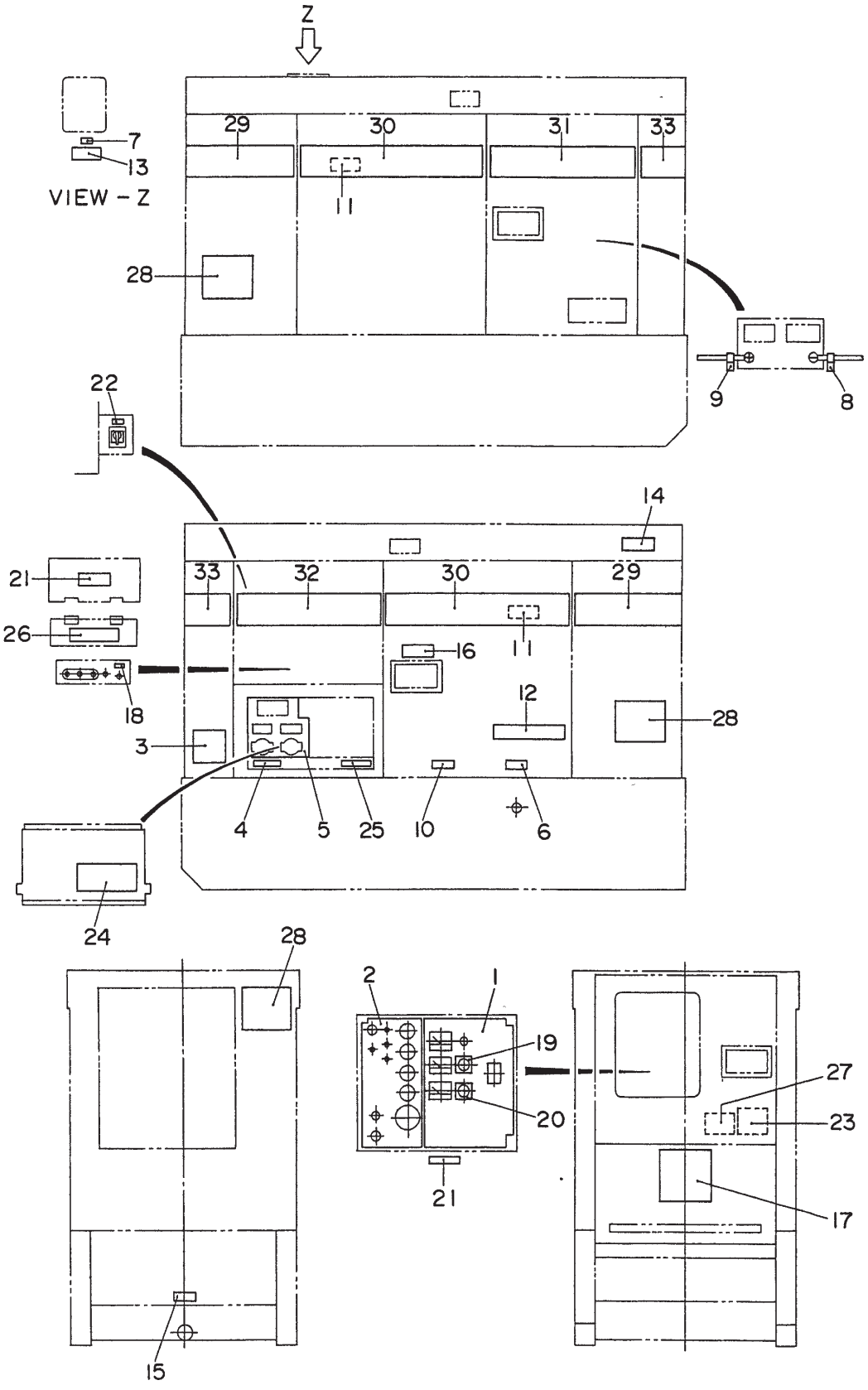
RUBBER SEALS ASSY.



RUBBER SEALS ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	0229200790	SEAL RUBBER	3	
2	0314500560	SEAL RUBBER	2	
3	0229200630	SEAL RUBBER	1	
4	0228901220	SEAL RUBBER	3	
5	0228900690	SEAL RUBBER	3	
6	0228800690	SEAL RUBBER	1	
7	0228900655	SEAL RUBBER	1	
8	0228900325	SEAL RUBBER	1	
9	0229200325	SEAL RUBBER	1	
10	0228800595	SEAL RUBBER	1	
11	0228800375	SEAL RUBBER	1	
12	0228900375	SEAL RUBBER	1	
13	0229200650	SEAL RUBBER	2	
14	0229200320	SEAL RUBBER	2	
15	0228800650	SEAL RUBBER	1	S/N 8100001 TO 8100230
15A	0228800650	SEAL RUBBER	2	S/N 8100231~
16	0228900520	SEAL RUBBER	1	
17	0228800520	SEAL RUBBER	1	
18	0228100390	SEAL RUBBER	2	
19	0228100320	SEAL RUBBER	2	

NAME PLATE ASSY.



NAME PLATE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	M1512400002	DECAL; GENERATOR CONTROL	1	M11240000A
2	M1512400102	DECAL; ENGINE OPERATING	1	M11240010A
	M1512400112	DECAL; ENGINE OPERATING	1	M11240011
3	M1550000104	DECAL; NOTE	1	M15000010
4	M1550000204	DECAL; NOTE	1	M15000020
5	M1552000603	DECAL; AUXILLARY OUTPUT	1	M15200060
6	M9500000004	DECAL; OIL DRAIN PLUG	1	M90000000
7	M9500100004	DECAL; WATER	1	M90010000
8	M9500300004	DECAL; -	1	M90030000
9	M9500300104	DECAL; +	1	M90030010
10	M9500500004	DECAL; DIESEL FUEL	1	M90050000
11	M9503000004	DECAL; WARNING MOVING PARTS	2	M90300000
12	M9503000103	DECAL; WATER - OIL CHECK	1	M90300010
13	M9503100004	DECAL; WARNING HOT COOLANT	1	M90310000
14	M9503200004	DECAL; WARNING ENGINE EXHAUST	1	M90320000
15	M9510000004	DECAL; FLUID DRAIN	1	M91000000
16	M9510100004	DECAL; CAUTION HOT PARTS	1	M91010000
17	M9512200004	DECAL; MQ	1	M91220000
18	M9520000004	DECAL; GROUND	1	M92000000
19	M9520000104	DECAL; AMMETER CHANGE-OVER SW.	1	M92000010
20	M9520000204	DECAL; VOLTMETER CHANGE-OVER SW.	1	M92000020
21	M9520100004	DECAL; WARNING ELECTRIC SHOCK HAZARD	2	M92010000
22	M9520100204	DECAL; CAUTION	1	M92010020A
23	M9520100304	DECAL; SAFETY INSTRUCTION	1	M92010030
24	M9520100404	DECAL; DANGER HIGH VOLTAGE	1	M92010040
25	M9520100503	DECAL; WARNING	1	M92010050
26	M9520200003	DECAL; CONNECTION OF OUTPUT CABLE	1	M92020000
27	M9520200104	DECAL; OVER CURRENT RELAY	1	M92020010
28	M1561000004	DECAL; MQ POWER	3	S/N 8011111 TO 8100219
28	M1561000004	DECAL; MQ POWER	2	S/N 8100220~
29	M1562100004	STRIPE	2	
30	M1562100103	STRIPE; WHISPERWATT	2	
31	M1562100204	STRIPE; 25	1	
32	M1562100304	STRIPE; 25	1	
33	M1562100404	STRIPE	2	
34	M9510100304	DECAL; ENVIR. WARNING, M91010030	1	S/N 8400231~
35	0600500092	PLATE; MQ POWER	1	S/N 8100220~
36	0021106016	MACHINE SCREW	4	S/N 8100220~

PAYMENT TERMS

Terms of payment for parts are net 10 days.

FREIGHT POLICY

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

MINIMUM ORDER

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

RETURNED GOODS POLICY

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

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
    a. The parts numbers and descriptions must match the current parts price list.
    b. The list must be typed or computer generated.
    c. The list must state the reason(s) for the return.
    d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
    e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.
5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
    a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
    b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
    c. Any line item with an extended dealer net price of less than $5.00.
    d. Special order items.
    e. Electrical components.
    f. Paint, chemicals, and lubricants.
    g. Decals and paper products.
    h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

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

SPECIAL EXPEDITING SERVICE

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

LIMITATIONS OF SELLER'S LIABILITY

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

LIMITATION OF WARRANTIES

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

NOTE PAGE

OPERATIONS PARTS MANUAL

HERE'S HOW TO GET HELP

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

MULTIQUIP'S MAIN PHONE NUMBERS

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

PARTS DEPARTMENT

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

MAYCO PARTS

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

SERVICE DEPARTMENT

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

MQ POWER SERVICE DEPARTMENT

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

TECHNICAL ASSISTANCE

800-478-1244 FAX: 310-631-5032

WARRANTY DEPARTMENT

800-421-1244, EXT. 279 FAX: 310-537-1173
310-537-3700, EXT. 279

MQPOWER
A Division of Multiquip Inc.
POST OFFICE BOX 6254
CARSON, CA 90749
310-537-3700 • 800-421-1244
FAX:310-632-2656
E-MAIL: mqpower@multiquip.com
WWW: www.mqpower.com

PARTS DEPARTMENT:
800-427-1244
FAX: 800-672-7877
SERVICE DEPARTMENT:
800-835-2551
FAX:310-638-8046