PARTS AND OPERATION MANUAL

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MQ POWER MODEL DCA-180SSK GENERATOR

FOR General Electric Equipment Rental (GEER)

PARTS LIST No. C0875300304
S/N 3698950~

Revision #2 (03/14/01)

MULTIQUIP INC.
18910 WILMINGTON AVE.
CARSON, CALIFORNIA 90746
310-537-3700
800-421-1244
FAX: 310-537-3927

PARTS DEPARTMENT:
800-427-1244
FAX: 800-672-7877

SERVICE DEPARTMENT:
800-835-2551
FAX: 310-638-8046

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

WARNING

CALIFORNIA — Proposition 65 Warning

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

HERE'S HOW TO GET HELP

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

PARTS DEPARTMENT
800/427-1244 or 310/537-3700
FAX: 800/672-7877 or 310/637-3284

SERVICE DEPARTMENT
800/835-2551 or 310/537-3700
FAX: 310/638-8046

WARRANTY DEPARTMENT
800/835-2551 or 310/537-3700
FAX: 310/638-8046

MAIN
800/421-1244 or 310/537-3700
FAX: 310/537-3927

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MQ Power DCA-180SSK AC Generator

NOTE

Specification and part number are subject to change without notice.

- **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:**
  - UPS Ground
  - UPS Second Day or Third Day*
  - UPS Next Day*
  - Federal Express Priority One (please provide us with your Federal Express account number)*
  - Airborne Express*
  - Truck or parcel post

**Normally shipped the same day the order is received, if prior to 2PM west coast time.*

Earn Extra Discounts when you order by FAX!

All parts orders which include complete part numbers and are received by fax qualify for the following extra discounts:

Number of line items ordered	Additional Discount
1-9 items	3%
10+ items**	5%

Extra Fax Discount for Domestic USA Dealers Only

Up to 5% extra savings!

UPS Special
For faxed orders only

Get special freight allowances when you order 10 or more line items via FAX!**

- UPS Ground Service **at no charge for freight**
- PS Third Day Service **at one-half of actual freight cost**

No other allowances on freight shipped by any other carrier.

**Common nuts, bolts and washers (all items under $1.00 list price) do not count towards the 10+ line items.

DISCOUNTS ARE SUBJECT TO CHANGE

Fax order discount and UPS special programs revised June 1, 1995

Now! Direct TOLL-FREE access to our Parts Department!

Toll-free nationwide:

800-421-1244

Toll-free FAX:

800/6-PARTS-7 • 800-672-7877

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-180SSK portable 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.

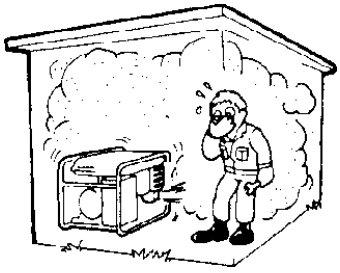
- **NEVER** operate this equipment when not feeling well due to fatigue, illness or taking medicine.

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

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

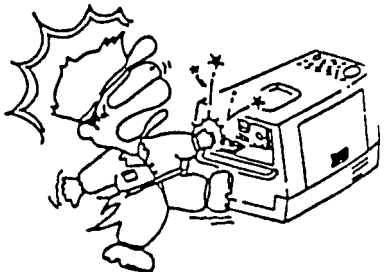


CAUTION:

- Always refuel in a well-ventilated area, away from sparks and open flames.
- Always use extreme caution when working with **flammable** liquids. When refueling, **stop the engine** and allow it to cool. **DO NOT** smoke around or near the machine. Fire or explosion could result from fuel vapors, or if fuel is spilled on a hot engine.

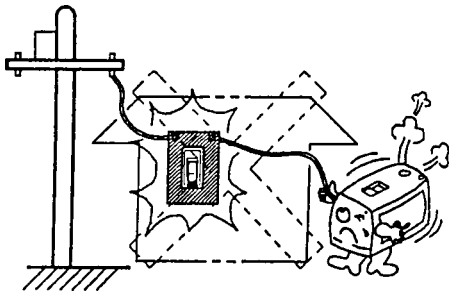
- **NEVER** operate the generator in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe *bodily harm or even death.*
- Topping-off to filler port is dangerous, as it tends to spill fuel.

CAUTION:



■ **DO NOT** touch output terminals during operation. This is extremely dangerous when your hands are ***wet.*** Always stop the machine when contact with the output terminals.

CAUTION:



■ **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.**

CAUTION:

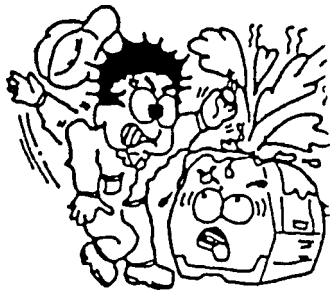
■ **Never** use damaged or worn cables when connecting power tools or equipment to the generator. Make sure power connecting cables are securely connected to the generator's output terminals, insufficient tightening of the terminal connections may cause damage to the generator and electrical shock.

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, therefore causing severe scalding to any persons in the general area of the generator.



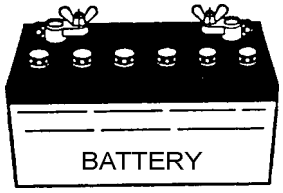
2. **Coolant Drain Plug -** Removing the coolant drain plug while the engine is hot will result in hot coolant to gush out of the coolant drain plug, therefore causing severe scalding to any persons in the general area of the generator.
3. **Engine Oil Drain Plug -** Removing the engine oil drain plug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

Battery

CAUTION:

- Never over fill the battery with water above the upper limit.

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 exploded.
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 booster cables in working condition. Repair or replace all defective cables.
5. Always recharge the battery in an open 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.

- **NEVER** Run engine without air filter. Severe engine damage may occur.
- Always service air cleaner frequently to prevent carburetor malfunction.
- Always disconnect the battery before performing service on the 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.
- **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.
- Always be sure the operator is familiar with proper safety precautions and operations techniques before using generator.
- Refer to the ***Komatsu Engine Owner's Manual*** for engine technical questions or information.

Loading and Unloading (Crane)

- Before lifting, make sure the generator's lifting hook is secure and that there is no apparent damage to the generator itself (loose screws, nuts and bolts). If any part is loose or damaged, please take corrective action before lifting.
- Always drain fuel prior to lifting.
- Always make sure crane or lifting device has been properly secured to the hook of guard frame on generator.
- **NEVER** lift the machine while the engine is running.
- Use adequate lifting cable (wire or rope) of sufficient strength.
- When lifting the generator, always use the balanced center-point suspension hook and lift straight upwards.
- **NEVER** allow any person or animal to stand underneath the machine while lifting.
- When loading the generator on a truck, be sure to use the front and back frame bars as a means to secure the generator during transport.

Transporting

- Always shutdown engine before transporting.
- Tighten fuel tank cap securely.
- Drain fuel when transporting generator over long distances or bad roads.
- Always tie-down the generator during transportation by securing the generator.
- If generator is mounted on a trailer, make sure trailer complies with all local and state safety transportation laws. See page 10 for basic towing procedures.

Emergencies

- Always know the location of the nearest ***fire extinguisher*** and ***first aid kit.*** Know the location of the nearest telephone. Also know the phone numbers of the nearest ***ambulance***, ***doctor*** and ***fire department***.

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.
- Dispose of hazardous waste properly. Examples of potentially hazardous waste are used motor oil, fuel, engine coolant, and fuel filters.
- **DO NOT** use plastic containers to dispose of hazardous waste.
- **DO NOT** pour waste, oil, engine coolant or fuel directly onto the ground, down a drain or into any water source.

Towing Safety Precautions

CAUTION :

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

To reduce the possibility of an accident while transporting the generator on public roads, always make sure the trailer (Figure 1) 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.
- Remember the maximum speed unless otherwise posted for highway towing is **45 MPH**. Recommended off-road towing is not to exceed **10 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.

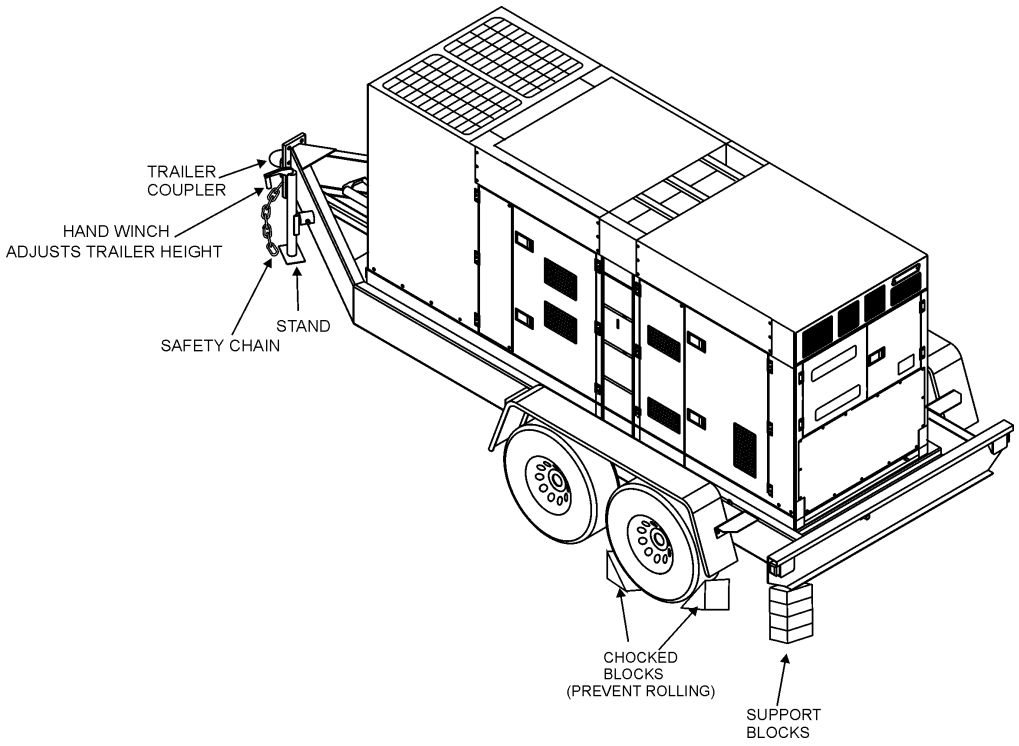


Figure 1. Generator with Trailer

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 intendedto 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 thie section:

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

Use the following definitions with reading Table 1.

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 -** This measurment is from the ball hitch to the rear bumper (reflector).
5. **Frame Width -** This 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 -** Thr 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 4 and Figure 5 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 3). Please not 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. See Figure 19 for proper wiring connections.
16. **Application -** Indicates which units can be employed on a particular trailer.

Table 1. Specifications							
MODEL	**APPLICATION**	**FUEL CELL**	**BRAKE SYSTEM**	**GVWR**	**FRAME LENGTH**	**FRAME WIDTH**	**JACK STAND**
TRLR-10-15	TLG-12, DCA15, TLW-300	NO	NO	1900LBS	96"	50"	800LB. FULL TILT WHEEL
TRLR-10X	TLG-12, DCA15, TLW-300	NO	NO	1900LBS	96"	50"	800LB. FULL TILT WHEEL
TRLR-10XF	TLG-12, DCA15, TLW-300	51 GAL	NO	1900LBS	96"	50"	800LB. FULL TILT WHEEL
TRLR-225W	DCA-10	NO	NO	2200LBS	85"	42"	800LB. FULL TILT WHEEL
BLW-400	BLW-400	NO	ELECTRIC	2700LBS	W/MAST 154" W/O 124"	55" (78" TALL)	800LB. FULL TILT WHEEL
TRLR-15XF	DCA-15	41 GAL	NO	2700LBS	124"	55"	800LB. FULL TILT WHEEL
TRLR-50X	DCA-25	NO	NO	2700LBS	124"	55"	800LB. FULL TILT WHEEL
TRLR-50XF	DCA-25	41 GAL	NO	2700LBS	124"	55"	800LB. FULL TILT WHEEL
TRLR-25SBT	DCA-25	NO	NO	2990LBS	120"	66"	800LB. FULL TILT WHEEL
TRLR-70W	DCA-45, -60, 70	NO	SURGE	7000LBS	186"	77"	2000LB. FLAT PAD
TRLR-70X	DCA-45, -60, 70	OPT	SURGE	7000LBS	138"	66"	2000LB. FLAT PAD
TRLR-70XF	DCA-45, -60, 70	53 GAL	SURGE	7000LBS	138"	66"	2000LB. FLAT PAD
TRLR-100XF	DCA-100, 125	150 GAL	HYDRAULIC SURGE	7000LBS	190"	76"	2000LB. FLAT PAD
TRLR-85/125	DCA-85, 100, 125	145 GAL	HYDRAULIC	10000LBS	186"	77"	2000LB. FLAT PAD
TRLR-150XF	DCA-150, 180	200 GAL	HYDRAULIC SURGE	11160LBS	204"	84"	5000 LB. FLAT PAD
TRLR-220XF	DCA-220	250 GAL	HYDRAULIC SURGE	14000LBS	222"	83"	5000 LB. FLAT PAD
TRLR-300XF	DCA-300	250 GAL	HYDRAULIC SURGE	18000LBS	238"	83"	5000 LB. FLAT PAD
TRLR-400XF	DCA-400	350 GAL	ELECTRIC	18000LBS	238"	83"	5000 LB. FLAT PAD
TRLR-600XF	DCA-600, 800	550 GAL	AIR	30000LBS	384"	96"	5000 LB. FLAT PAD
TRLR-800SX	DCA-600, 800	550 GAL	AIR	30000LBS	384"	96"	5000 LB. FLAT PAD

Table 1. Specifications (Con't)							
MODEL	**COUPLER**	**TIRES**	**WHEELS**	**AXLE**	**HUBS**	**SUSPENSION**	**ELECTRICAL**
TRLR-10-15W	2" BALL CLASS 2 ADJUSTABLE	175-13C	13"X4.50"	2200# 2X2	5 LUG	3 LEAF	4 WIRE LOOM W/ 4 POLE FLAT
TRLR-10X	2"BALL CLASS 2 ADJUSTABLE	175-13C	13"X4.5"	2200#2X2	5 LUG	3 LEAF	4 POLE FLAT
TRLR-10XF	2"BALL CLASS 2 ADJUSTABLE	175-13C	13"X4.5"	2200#2X2	5 LUG	3 LEAF	4 POLE FLAT
TRLR-225W	2"BALL CLASS 2 ADJUSTABLE	175-13B	13X4.5"	2200#2X2	5 LUG	Q FLEX	4 POLE FLAT
BLW 400	2"BALL CLASS 2 ADJUSTABLE	175-13C	13 X 4.5"	2200#2X2	5 LUG	3 LEAF	4 POLE FLAT
TRLR-15XF	2" BALL CLASS	B78-13LRC	13"X4.50"	3500# 2-1/2"	5 LUG	4 LEAF	4 POLE RUBBER FLAT
TRLR-50X	2" BALL CLASS	B78-13LRC	13"X4.50"	3500lbs. 2-3/8"	5 LUG	4 LEAF	4 POLE RUBBER FLAT
TRLR-50XF	2" BALL CLASS	B78-13LRC	13"X4.50"	3500lbs. 2-3/8"	5 LUG	4 LEAF	4 POLE RUBBER FLAT
TRLR-70W	2" BALL CLASS 3" ADJUSTABLE	205-14C BIAS (4)	14"X5"	3500lbs. 3"	5 LUG	5 LEAF	4 POLE RUBBER FLAT
TRLR-70X	2" BALL CLASS 3" ADJUSTABLE	205-14C BIAS (4)	14"X5"	3500lbs 3"	5 LUG	5 LEAF	4 POLE RUBBER FLAT
TRLR-70XF	2" BALL CLASS 3" ADJUSTABLE	205-14C BIAS (4)	14"X5"	3500lbs. 3"	5 LUG	5 LEAF	4 POLE RUBBER FLAT
TRLR-100XF	ADJUSTABLE 2-5/6 OPT 3" EYE	205-15C BIAS (4)	14"X5.5"	3500lbs 3"	5 LUG	5 LEAF	4 WIRE LOOM
TRLR-85/125	ADJUSTABLE 2-5/6 OPT 3" EYE	ST225/75R15D RADIAL (4)	14"x6"	(2)-6000lbs	6 LUG	7 LEAF	4 WIRE LOOM
TRLR-150XF	3" BALL EYE	750-16 E BIAS (4)	16"X7"	(2)-6000lbs	8 LUG	7 LEAF	4 WIRE LOOM
TRLR-220XF	3" EYE ADJUSTABLE	ST235/85R16E RADIAL(4)	16"X7"	(2)-7000lbs	8 LUG	Q FLEX	4 WIRE LOOM
TRLR-300XF	3" EYE ADJUSTABLE	ST235/85R16E RADIAL(6)	16"X7"	(2)-6000lbs	8 LUG	Q FLEX	4 WIRE LOOM
TRLR-400XF	3" EYE ADJUSTABLE	ST235/85R16E RADIAL(6)	16"X7"	(3)-7000lbs.	8 LUG	Q FLEX	4 WIRE LOOM
TRLR-600XF	5TH WHEEL	ST215/75R17.5H RADIAL (8)	16"X7"	(3)-10000lbs	8 LUG	7 LEAF	6 WIRE LOOM
TRLR-800AR	5TH WHEEL	ST215/75R17.5H RADIAL (8)	16"X7"	(3)-10000lbs	8 LUG	AIR-RIDE	6 WIRE LOOM

Brakes

If your trailer has a braking system, the 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.

Electric Brakes

Electrically actuated brakes (Figure 2) are similar to hydraulic brakes. The basic difference is that hydraulic brakes are actuated by an electromagnet.

Listed below are some of the advantages that electric brakes have over hydraulic brakes:

- Brake system can be manually adjusted to provide the corrected braking capability for varying road and load conditions
- Brake system can be modulated to provide more or less braking force, thus easing the brake load on the towing vehicle
- Brake system has very little lag time between the time the vehicle's brakes are actuated and the trailer's brakes are actuated
- Brake system can provide an independent emergency brake system

Remember in order to properly synchronize the tow vehicle's braking to the trailer's braking, can only be accomplished by road testing. Brake lockup, grabbiness or harshness is due to lack of synchronization between the tow vehicle and the trailer being towed or under-adjusted brakes.

Before any brake synchronizations adjustments can be made, the trailer brakes should be burnished-in by applying the brakes 20-30 times with approximately a 20 m.p.h. decrease in speed, e.g. 40 m.p.h. to 20 m.p.h. Allow ample time for brakes to cool between application. This allows the brake shoes to slightly be seated into the brake drum surface.

Figure 2 displays the major electric brake components that will require inspection and maintenance. Please inspect these components as required.

Electric 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. 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 6 on the remaining brakes.

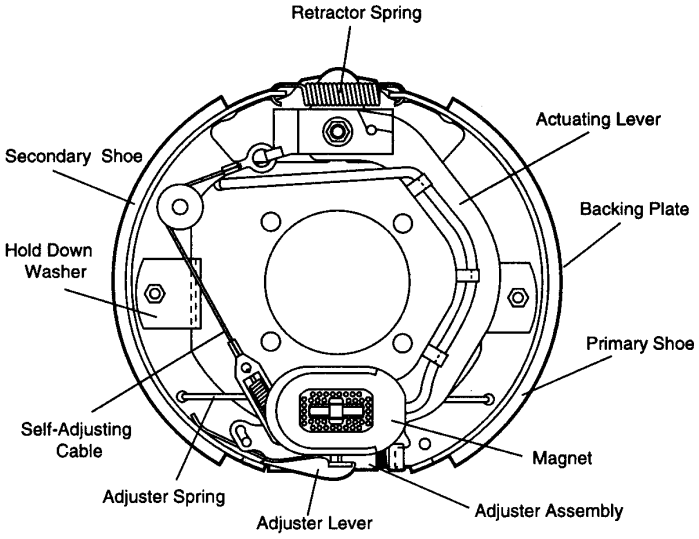


Figure 2. Electrical Brake Components

Hydraulic/Air/Surge Brakes

Hydraulic brakes (Figure 3) should not require any special attention with the exception of routine maintenance such as shoe and lining replacement. These brakes can be adjusted in the same manner as electric brakes. Brake lines should be periodically checked for cracks, kinks, or blockage.

Figure3 below displays the major hydraulic/air/surge brake components that will requrie inspection and maintenance. Please inspect these components as required using steps 1 through 6 as referenced in the electric brake adjustments section.

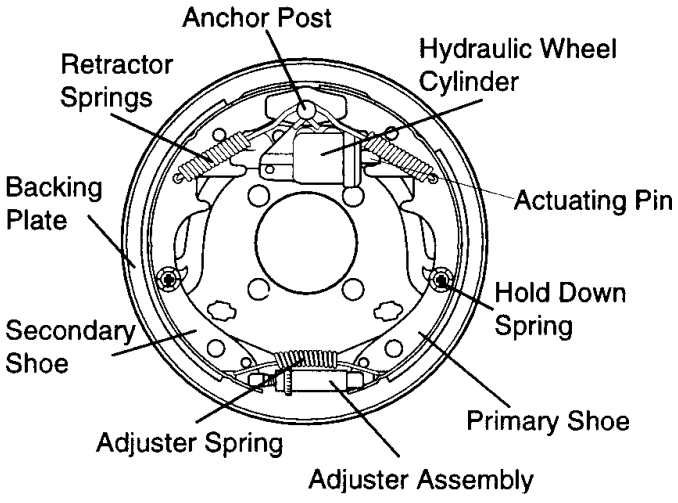


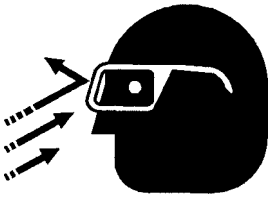
Figure 3. Hydraulic Brake Components

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 attemp 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 themost important factor in tire life. Pressure should be checked cold before operation DO NOTbleed air from tires when they ar hot. Check inflation pressure weekly during use to insure the maximum tire life and tread wear.

Table 2 (Tire Wear Troubleshooting) will help pinpoint the causes and solutions of tire wear problems.

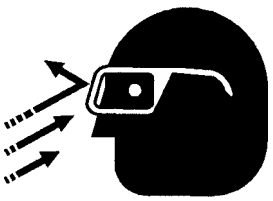
TABLE 2. TIRE WEAR TROUBLESHOOTING

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 4) 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 3.

CAUTION:



NOTE

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

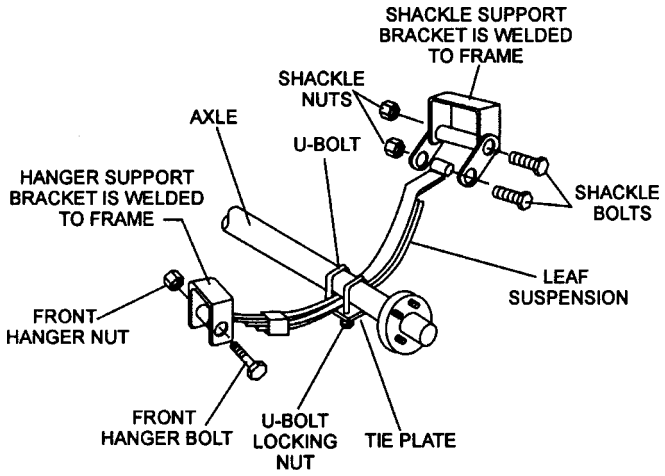


Figure 4. Major Suspension Components

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

Lug Nut Torque Requirements

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

1. Start all wheel lug nuts by hand.
2. Torque all lug nuts in sequence. See Figure 5. DO NOT torque the wheel lug nuts all the way down. Tighten each lug nut in 3 separate passes as defined by Table 4.
3. After first road use, retorque all lug nuts in sequence. Check all wheel lug nuts periodically.

Table 4. 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

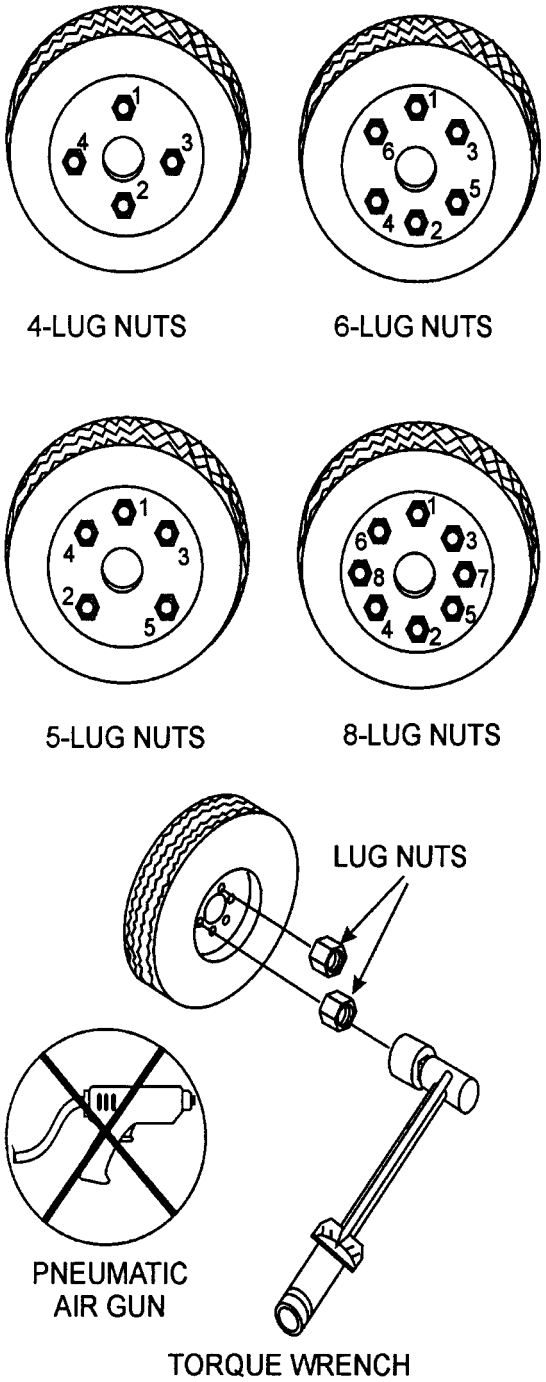


Figure 5. Wheel Lug Nuts Tightening Sequence

NOTE

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

DCA-180SSK —TRAILER WIRING DIAGRAM

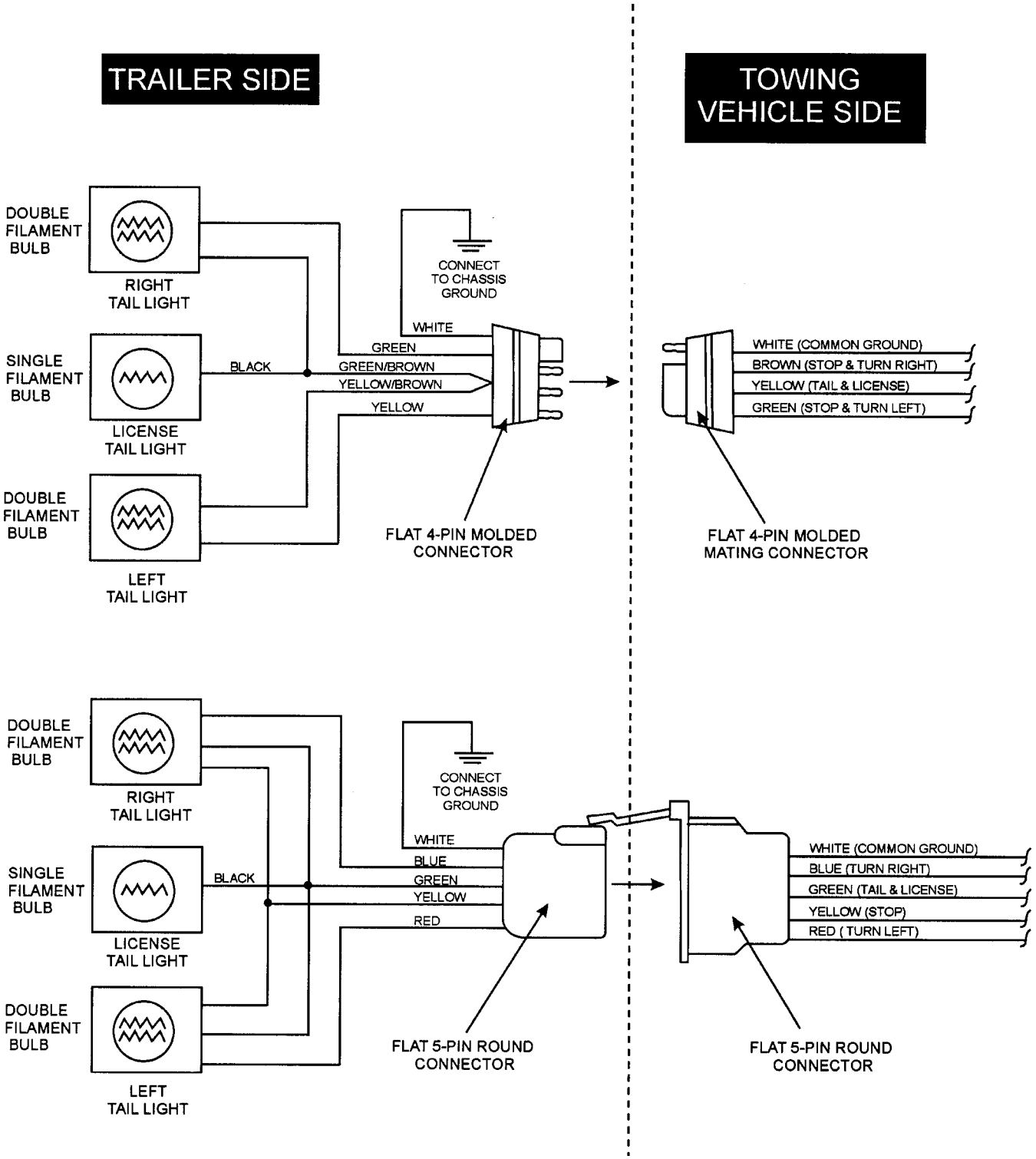


Table 5. Electric Brake Troubleshooting		
Symptom	**Possible Cause**	**Solution**
No Brakes or Intermittent Brakes	Any open circuits or broken wires?	Find and correct.
	Any short circuits?	Find and correct.
	Faulty controller?	Test and correct.
	Any loose connections?	Find and repair.
	Ground wire secure?	Find and secure.
Weak Brakes or Brakes Pull to One Side	Grease or oil on magnets or linings?	Clean or replace.
	Connections corroded?	Clean and correct cause of corrosion.
	Brake drums scored or grooved?	Machine or replace.
	Brakes synchronized?	Correct.
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	Bearings of the wheel adjusted?	Adjust.

Table 6. 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 correct or in right wrong position?	Install new shoes and linings.
	Enough brake fluid or correct fluid?	Replace rubber parts fill with dot4 fluid.

Machine Safety Decals

The DCA-180SSK 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 pages shows the decals as they appear on the machine. Should any of these decals become unreadable, replacements can be obtained from your dealer.

GENERAL

HANDLING PROCEDURES

1. CHECK TO OPERATING
Prior to operating the engine, be sure to check the following items to prevent trouble and accidents:
(1) Check lubricating oil, cooling water and diesel fuel.
(2) Check the tension of the fan-belt and charging generator driving belt.
(3) Check the CIRCUIT BREAKER is turned "OFF".
(4) Set the voltage change-over board to the rated voltage (only Dual voltage type).

2. STARTING AND OPERATING
(1) Turn the battery switch to "ON" position.
(2) Turn the STARTER SWITCH to "PREHEAT" position for 10 ~ 30 seconds.
Preset the STARTER SWITCH to "START" POSITION to start the engine.
When the engine starts, release the STARTER SWITCH.
(3) Warm-up the engine for about 5 minutes.
(4) Rotate the THROTTLE HANDLE to "HIGH SPEED" and adjust the engine speed according to the following table.

	No - load operating speed
50 Hz operation	Approx. 52.5 Hz (1575 rpm)
60 Hz operation	Approx. 62.5 Hz (1875 rpm)

(5) Adjust the VOLTAGE REGULATOR to the rated voltage.
(6) turn on the CIRCUIT BREAKER to supply electric power to the load.
3. OPERATING PRECAUTIONS
(1) While operating do not turn the BATTERY SWITCH "OFF" to protect the charging generator and engine circuit against damage.
(2) When the CIRCUIT BREAKER is tripped "OFF" for over current or short-circuit, check the trouble cause and repair defective parts.
The CIRCUIT-BREAKER cannot be reset unless it is once turned "OFF" and next turned "ON".
4. STOPPING THE ENGINE
(1) Turn the Circuit Breaker to "OFF"
Rotate the THROTTLE HANDLE TO THE "Low Speed" side. Cool-down the engine for about 5 minutes.
(2) Depress the STOP BUTTON.
After the engine stops completely, turn "OFF" STARTER SWITCH and BATTERY SWITCH.

S-2763

P/N 0800655603

CONTROL BOX GROUP

SAFETY INSTRUCTIONS

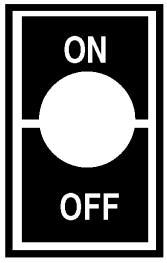
Improper operation of this machine can cause severe injury or death.
- Read the instruction manual carefully before operating or servicing.

This machine should only be operated by a person with sufficient knowledge and skill to ensure safe operation.
High voltage circuits are located inside the output terminal cover and control panel.
- Close the cover and control panel before operating.

Moving parts and hot surfaces are contained within the enclosure.
- Close all doors and lock them before operating.

C25100000

P/N C2551000004



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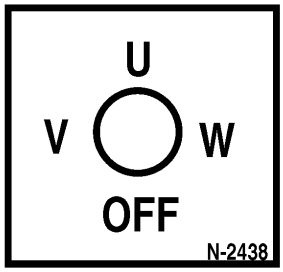

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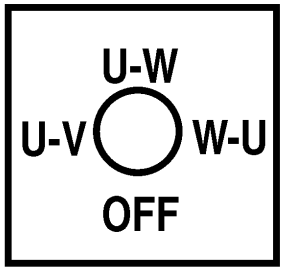

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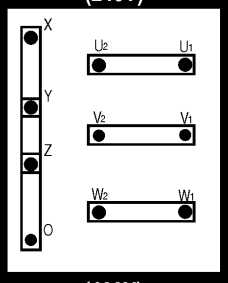
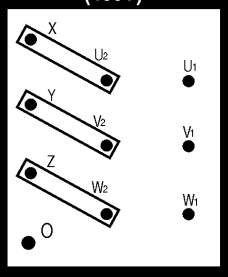
SETTING FOR OUTPUT VOLTAGE

(240V)



(480V)



Tighten hexagon head bolts securely.

C0510090

P/N C0551000903

WHISPERWATT 180

MQ POWER

MQ POWER CORP.
WHISPERWATT 180
180 KVA AC GENERATOR
MODEL DCA-180SSK

C06110340

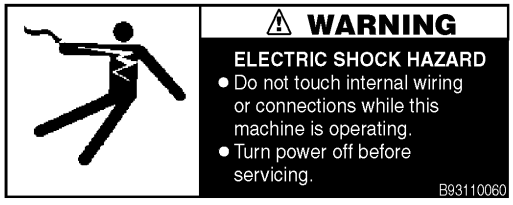
P/N C0561103403

CIRCUIT BREAKER
S-3031

P/N 08406 24504

PILOT LAMP
S-3033

P/N 0840624704



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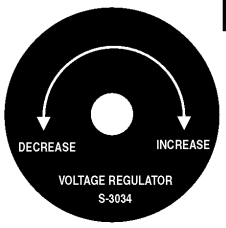

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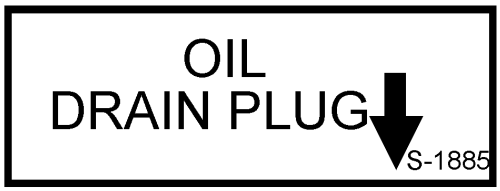
ENGINE & RADIATOR GROUP



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P/N 63606 10304

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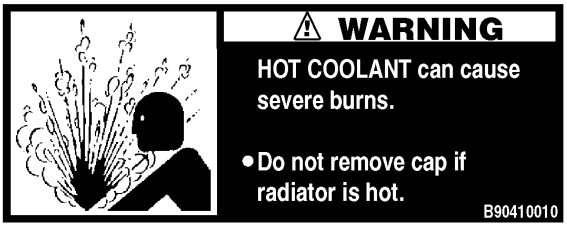

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ENGINE OPERATING PANEL GROUP

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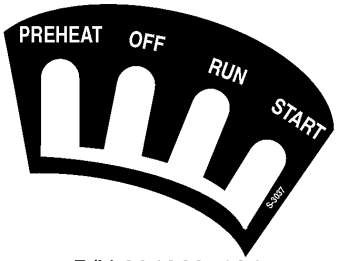
P/N C0551000704

P/N C0551000804



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ENGINE & RADIATOR GROUP

OUTPUT TERMINAL GROUP

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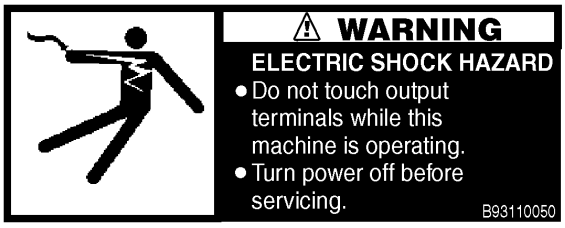
P/N 08040619904

P/N C1551000404



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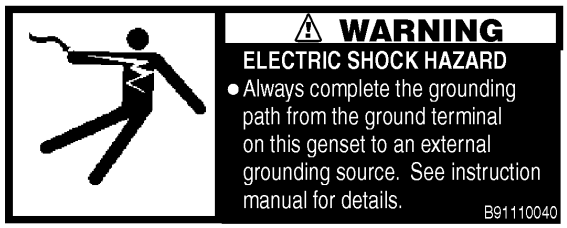

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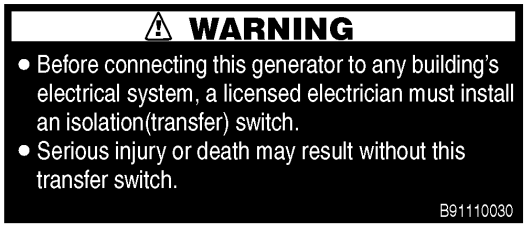

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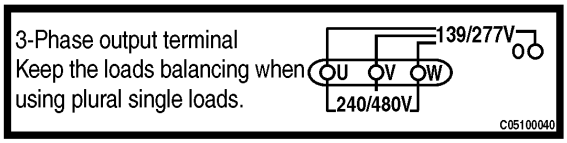

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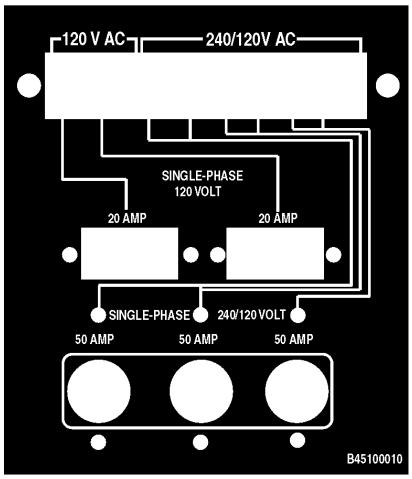

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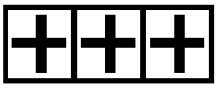
BATTERY GROUP



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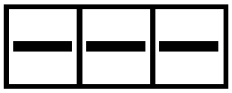

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MUFFLER GROUP

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FUEL TANK GROUP

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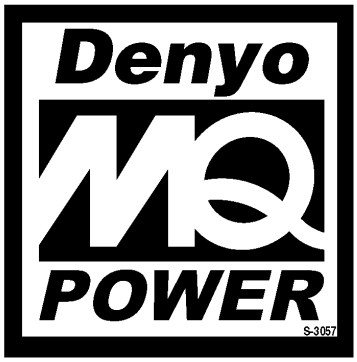
P/N B9504500004

P/N 1320620904

ENCLOSURE GROUP



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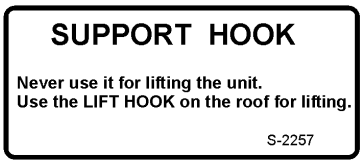

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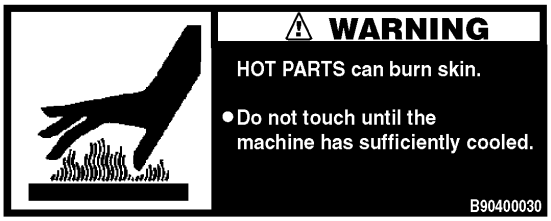

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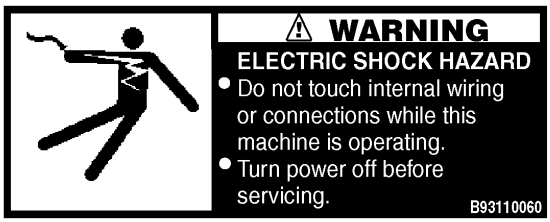


P/N B9531100604

Table 7. Specifications	
Generator Specifications	
Model	DCA-180SSK
Type	Revolving field, self ventilated, open protected type synchronous generator
Armature Connection	Star with Neutral
Phase	3
Standby Output	198 KVA (158.4 KW)
Prime Output	180 KVA (144 KW)
Voltage	240V or 480V
Frequency	60 Hz
Speed	1800 rpm
Power Factor	0.8
Aux. AC Power	Single Phase, 60 Hz
Voltage	120 V
Output	4.8 KW (2.4 KW x 2)
Engine Specifications	
Model	KOMATSU SA6D108E-2
Type	4 Cycle, water-cooled, direct injection, turbo-charged with after-cooler
No. of Cylinders	6 cylinders
Bore x Stroke	4.2 in. x 5.1 in. (108 mm x 130 mm)
Rated Output	217 HP/1800 rpm
Displacement	436 cu. in. (7150 cc)
Starting	Electric
Coolant Capacity	6.1 gal. (23 liters)
Lube Oil Capacity	6.6 gal. (25 liters)
Fuel Consumption	9.6 gal. (36.4 liters)/hr (at full load)
Battery	12V- 120 AH x 2
Fuel	#2 Diesel Fuel

DCA-180SSK 3 FAMILIARIZATION

Generator

The MQ Power Model DCA-180SSK is a 320 kW ***generator*** that has been 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 Control Panel

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

- Tachometer
- Water Temperature Gauge
- Oil Pressure Gauge
- Charging Ammeter Gauge
- Engine Warning Lamp Module
- Fuel Leak Detected Alarm Lamp
- Engine Speed Switch
- Pre-Heat Button
- Pre-Heat Lamp
- Emergency Stop Button
- Battery Switch

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)
- AC Wattmeter (Kw)
- Ammeter Change-Over Switch
- Voltmeter Change-Over Switch
- Panel Light
- Panel Light Switch
- MPEC Module
- Pilot Lamp

Output Terminal Panel

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

- Two 120V GFCI receptacles, 20 amp
- Three 240/139V output receptacles, 50 amp
- Two 120V input receptacles, 20 amp
- 3 Load Circuit Breakers 265V @65 amps
- 2 Load GFCI Circuit Breakers 265V@ 20amps

Control Box

The "Control Box" is provided with the following:

- Main Circuit Breaker 500 amps
- Over-Current Relay
- High Idle Adjust Trimmer

Microprocessor Controlled Alarm System

The DCA-180SSK generator is equipped with various alarms and LED status indicators. These alarms and status indicators are provided to add safety to the generator when operating under normal conditions. The DCA-180SSK generator is designed to shutdown in the event of low oil, high coolant temperature, low battery and other operation conditions that may cause severe damage to the generator.

Open Delta Excitation System

The DCA-180SSK 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 leads: A, B, C and D. During light loads, the power to the ***Automatic Voltage Regulator*** (AVR) is supplied from the leads parallel connections of B&C. When loads increase, the AVR switches and accepts power from leads A&D. The output of leads A&D increase proportionally with load. This of adding the voltages to each phase provides better voltage response during 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-180SSK** is powered by a 4-cycle water cooled, turbocharged KOMATSU Model SA6D108E-2 ***diesel*** gasoline engine. This engine is designed to meet every performance requirement for the generator. Reference Table 1, page 16 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-180SSK generator are addressed on the following pages.

Electronic Governor System Option

The electronic governor system replaces the standard mechanical governor system. The frequency regulation improves from ±1.5% regulation with the mechanical governor to ±0.25% regulation with the electronic governor system.

Jacket Water Heater Option

The jacket water heater is a 1500-watt heater designed to keep the coolant from freezing in the engine block. The heater is thermostatically controlled and once an acceptable engine temperature is achieved it will cycle on and off, operating only about 1/3 of the time. This becomes a very energy efficient option compared to a direct immersion block heater. It is designed to keep the engine between 100 and 120 degrees fahrenheit. This is not a throwaway heater. It is completely serviceable.

Battery Charger

The battery charger will operate in a 'BOOST' mode until the battery's current acceptance falls to 70% of the charger's rating. The charger will then go into a 'FLOAT' mode, where it discharges a lower voltage until an AC failure, or the battery is discharged.

CAUTION :

ALWAYS unplug the jacket water heater before servicing.

Magnetic Fuel Conditioner

The magnetic fuel conditioner inhibits growth of bacteria and fungi in the fuel, therefore, sludge and rust will be reduced and extend fuel life.

Blow-by Oil Mist Tank

A blow-by oil mist from the engine collects in this tank. The valve below the tank is used for daily draining of oil from the tank. Daily draining will prevent the breather from clogging and deteriation. It will also prevent oil leaking from the seals.

Water Separator Filter (OPTIONAL)
The DCA-180SSK generator may be equipped with a "Water Fuel Separator. This unit is designed to prevent dirt, rust, algae, varnishes and water from entering the fuel system.

This water separator system is designed around two filters connected in parallel (Figure 6). These two filters can be configured in a variety of ways to filter water from the fuel system.

For best results it is best to have both filters active (ON) at the same time or use only one filter, and use the other filter as a reserve, that way you can use the filters alternately every time the filter element is replaced.

CAUTION:

DO NOT turn the control valve while the generator is in operation. This may stop fuel flow to the generator if both filters are set to the OFF position.

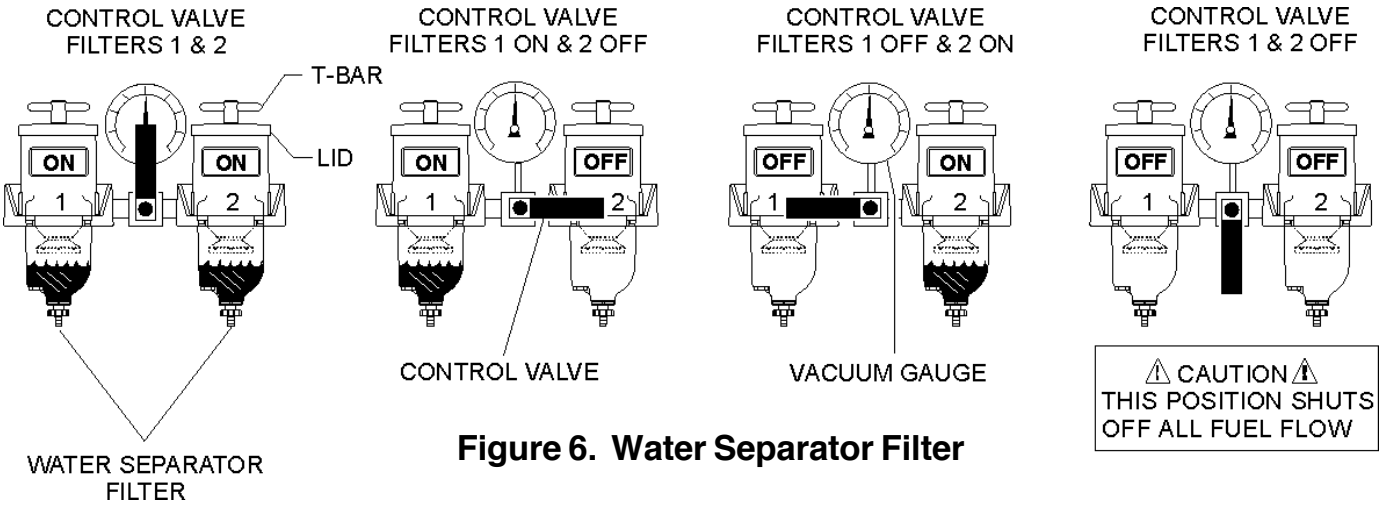


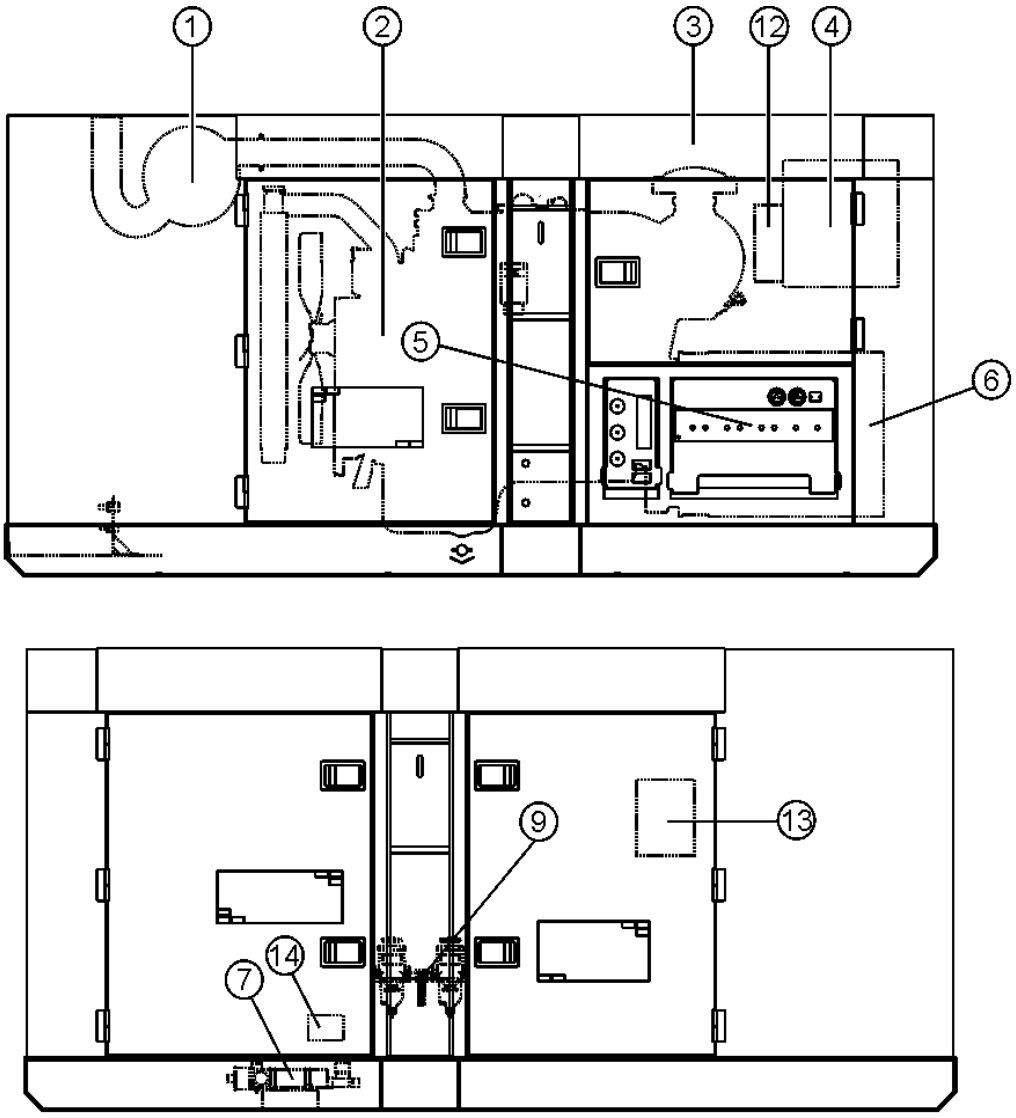
Figure 6. Water Separator Filter

Collection Bowl Water Drainage
Inspect or drain the water in the collection bowl daily. The collection bowl must be drained before contaminants reach the bottom of the turbine.

To drain the collection bowl perform the following:

1. Open the self-venting drain to evacuate contaminants with a suitable collection container in place.
2. Prime the unit by removing the filter lid and filling with clean fuel.
3. Replace the filter lid and snugly tighten the T-handle by hand only.

NOTE PAGE



ITEM	DESCRIPTION
1	MUFFLER ASSEMBLY
2	ENGINE & RADIATOR ASSEMBLY
3	ENCLOSURE ASSEMBLY
4	CONTROL BOX ASSEMBLY
5	OUTPUT TERMINAL ASSEMBLY
6	GENERATOR ASSEMBLY
7	WATER HEATER ASSEMBLY
8	CONTROL PANEL ASSEMBLY
9	FUEL-WATER SEPARATOR ASSEMBLY
10	ENGINE OPERATING PANEL ASSEMBLY
11	BATTERY
12	BATTERY CHARGER
13	BLOW-BY MIST TANK
14	MAGNETIC FUEL CONDITIONER

Figure 7. Major Components

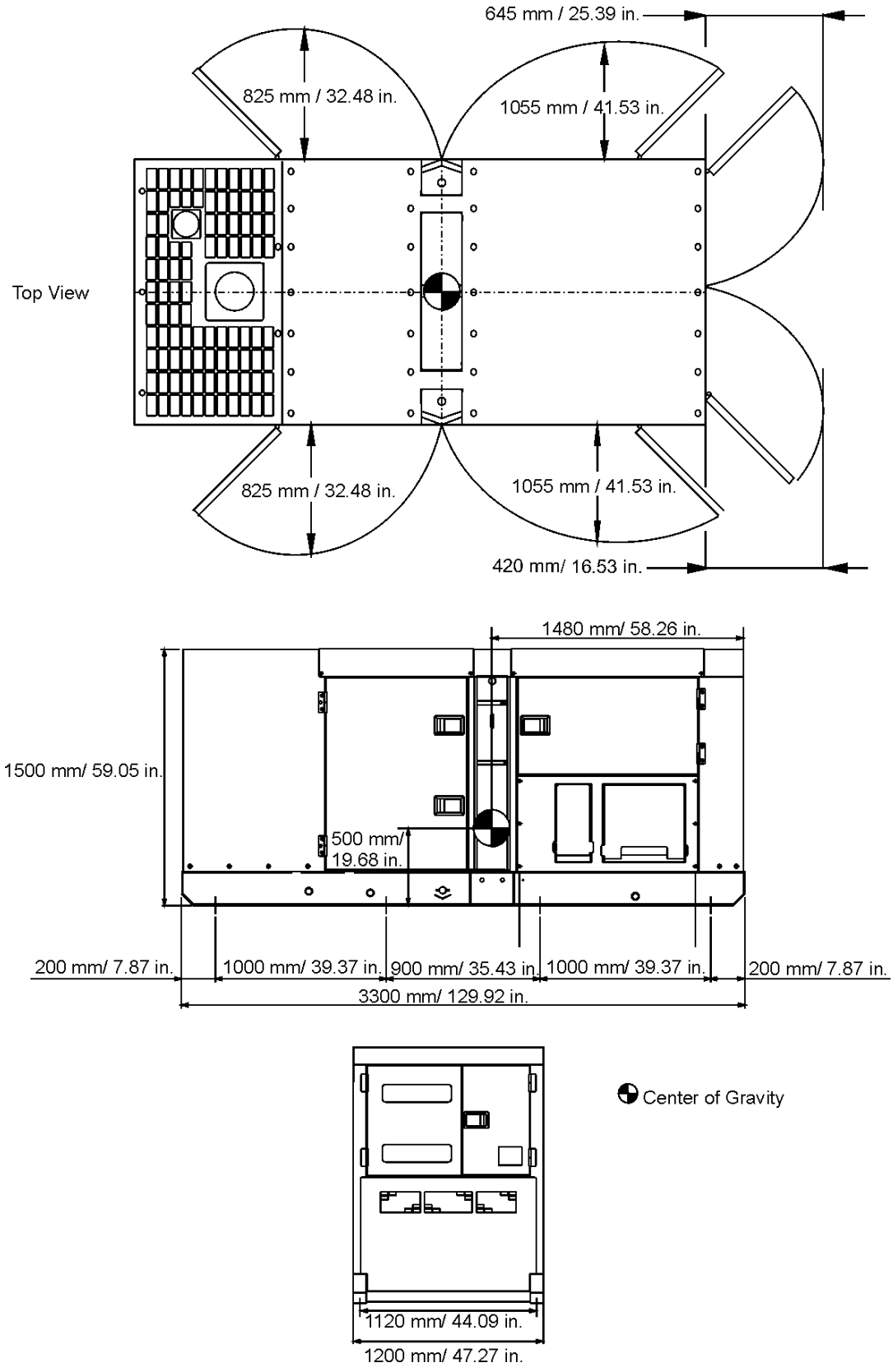
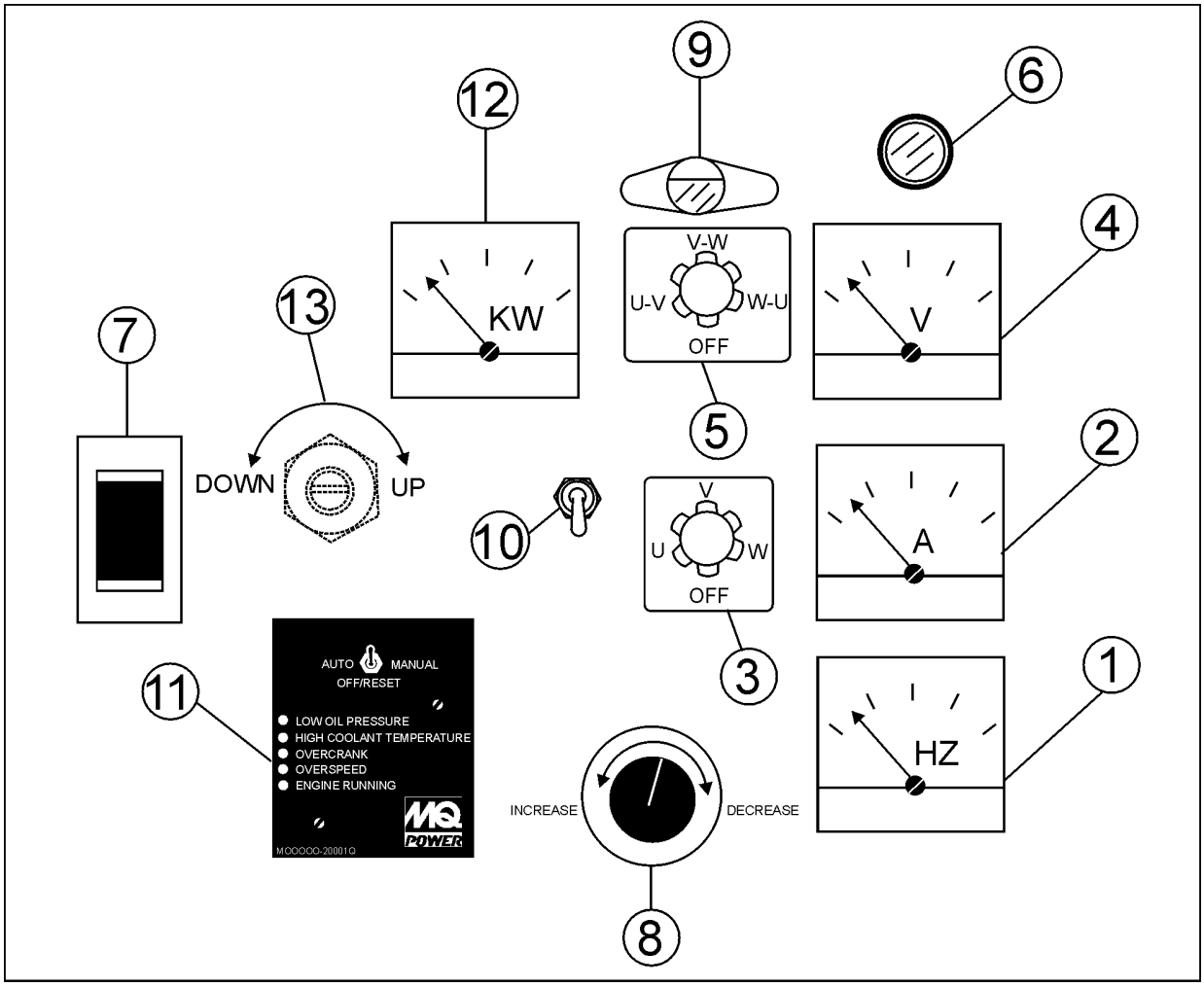


Figure 8. Dimensions



NO	DESCRIPTION
1	FREQUENCY METER
2	AC AMMETER
3	AMMETER CHANGE-OVER SWITCH
4	AC VOLTMETER
5	VOLTMETER CHANGE-OVER SWITCH
6	PILOT LAMP
7	CIRCUIT BREAKER
8	VOLTAGE REGULATOR
9	PANEL LIGHT
10	PANEL LIGHT SWITCH
11	MPEC
12	AC WATT METER
13	HIGH IDLE ADJUST TRIMMER

Figure 9. Control Panel

The definitions below describe the controls and functions of the DCA-180SSK " ***Control Panel*** " (Figure 9).

1. **Frequency Meter –** Indicates the output frequency in hertz (Hz). Normally 60 Hz ±1 Hz .
2. **AC Ammeter –** Indicates the amount of current the load is drawing from the generator.
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.
4. **AC Voltmeter –** Indicates the single phase output voltage present at the UNV terminals.
5. **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.
6. **Pilot Lamp –** Indicates that the generator is working properly.
7. **Main Circuit Breaker –** This three-pole, 500 amp main breaker is provided to protect the UNV voltage output terminals from overload.
8. **Voltage Regulator Control –** Allows manual adjustment of the generator's output voltage.
9. **Panel Light –** Normally used in dark areas or at night time. When activated, panel lights will illuminate. When the generator is not in use be sure to turn the panel light switch to the OFF position.
10. **Panel Light Switch –** When activated will turn on control panel light.
11. **MPEC – Microprocessor Engine Control Module –** (MPEC) has a vertical row of status LED's (Figure 10), that when lit, indicate that an engine malfunction (fault), has been detected. When a fault has been detected the MPEC will evaluate the fault and if the fault is major will shutdown the generator.

Figure 10. MPEC Module

During ***cranking cycle*** , The MPEC will attempt to crank the engine for 10 seconds before disengaging.

If the engine does not engage (start) by the third attempt, the engine will be shut-down by the MPEC's " Over Crank Protection" mode. If the engine engages at a speed (RPM's) that is not safe, the MPEC will shut-down the engine by initializing the "Over Speed Protection" mode.

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

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

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

B. **Low Oil Pressure –** Indicates the engine pressure has fallen below 15 psi. The oil pressure is detected using variable resistive values from the oil pressure sending unit. This is considered a ***major*** fault.

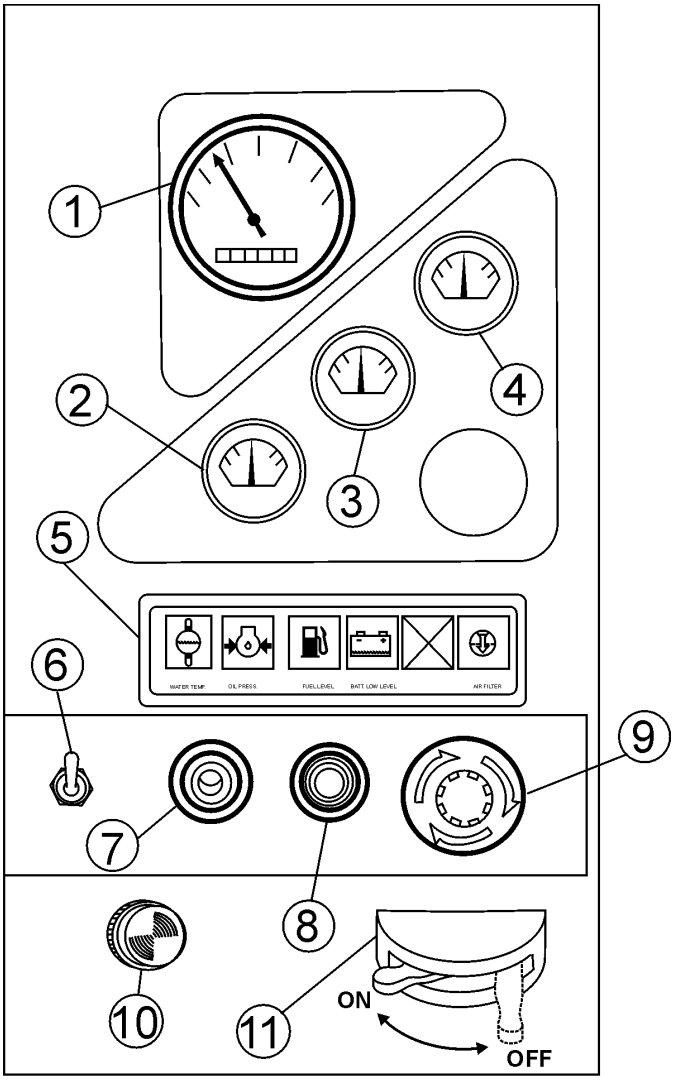
C. **High Coolant Temperature –** Indicates the engine temperature has exceeded 215°F. The engine temperature is detected using variable resistive values from the temperature sending unit. This is considered a ***major*** fault.

D. **Overcrank Shutdown –** Indicates the unit has attempted to start a pre- programmed number of times, and has failed to start. The number of cycles and duration are programmable. Typical programmable start settings is 3 cycles with a 10 second duration .This is considered a ***major*** fault.

E. **Overspeed Shutdown –** Indicates that the engine is running at an unsafe speed. This is considered a ***major*** fault.

F. **Engine Running –** Indicates the engine is running at a safe operating speed.

12. **AC Wattmeter –** Indicates the output power of the generator.
13. **High Idle Adjust Trimmer –** Use this trimmer to adjust the engine speed.



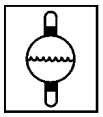
NO	DESCRIPTION
1	TACHOMETER
2	CHARGING AMMETER GAUGE
3	OIL PRESSURE GAUGE
4	WATER TEMPERATURE GAUGE
5	WARNING LAMP MONITOR
6	IDLE CONTROL SWITCH
7	PRE-HEAT LAMP
8	PRE-HEAT BUTTON
9	EMERGENCY STOP BUTTON
10	FUEL LEAK DETECTED LAMP
11	BATTERY SWITCH

Figure 11. Engine Operating Panel

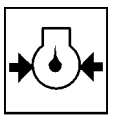
The definitions below describe the controls and functions of the DCA-180SSK " ***Engine Operating Panel*** "(Figure 11).

1. **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.
2. **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.
3. **Oil Pressure Gauge –** During normal operation this gauge be should read in the "GREEN" zone. When starting the generator the oil pressure mar read a little bit higher, but after the engine warms up the oil pressure should return to the green zone.
4. **Water Temperature Gauge –** During normal operation this gauge be should read in the "GREEN" zone.
5. **Engine Warning Display Module –** This module display's the following engine failures:

A. **Overheat Lamp –** This lamp goes ON when the cooling water temperature rises abnormally. If the lamp goes ON during normal operation of the generator, the emergency shut-down device will stop the engine automatically.


WATER TEMP.

B. **Low Oil Pressure Lamp –** During normal operation of the generator this lamp should remain OFF. When the Auto-OFF/Reset-Manual switch is set to the "Manual" position to start the engine, the lamp will be lit. After the oil pressure rises after start-up the lamp will go OFF. If this lamp is ever lit (ON) during normal operation of the generator, the emergency shut-down device will stop the engine automatically.


OIL PRESS.

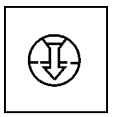
C. **Low Fuel Level Lamp –** When this lamp is ON, it is time to stop the engine and add fuel. Remember to let the engine cool before adding fuel.


FUEL LEVEL

D. **Low Battery Fluid Lamp –** This lamp goes ON when the battery fluid is low. If this lamp goes ON during normal operation of the generator, stop the engine and fill the battery with distilled water to the specified level.

BATT. LOW LEVEL

E. **Clogged Air Filter Lamp –** This lamp goes ON when the air filter is clogged. If this lamp goes ON during normal operation of the generator, stop the engine and replace the air filter.


AIR FILTER

6. **Engine Speed Switch** - This adusts the speed of the engine from high to low.

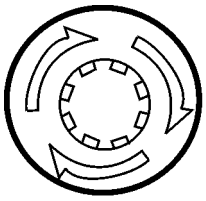
7. **Pre-Heat Lamp –** Indicates that the glow plugs of the diesel engine are hot and the engine is ready to be started.


PRE-HEAT LAMP

8. **Pre-Heat Button –** Press hold this button until the pre-heat lamp is lit (ON).


PRE-HEAT BUTTON

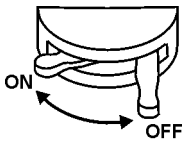
9. **Emergency Stop Switch –** Push this button inward to stop the engine in the event of an emergency. **DO NOT** use this button as a means of stopping the engine. Turn the button clockwise to dis-engage the stop function.


EMERGENCY STOP BUTTON

10. **Fuel Leak Detected Lamp –** This lamp goes ON when liquid has been detected in the containment area of the double-wall fuel tank.


FUEL LEAK DETECTED

11. **Battery Switch –** This switch should be set to the ON position during normal operation. When the engine has been stop, place this switch in the OFF position. **DO NOT** turn this switch during normal operation, it could cause damage to the electrical equipment.



BATTERY SWITCH

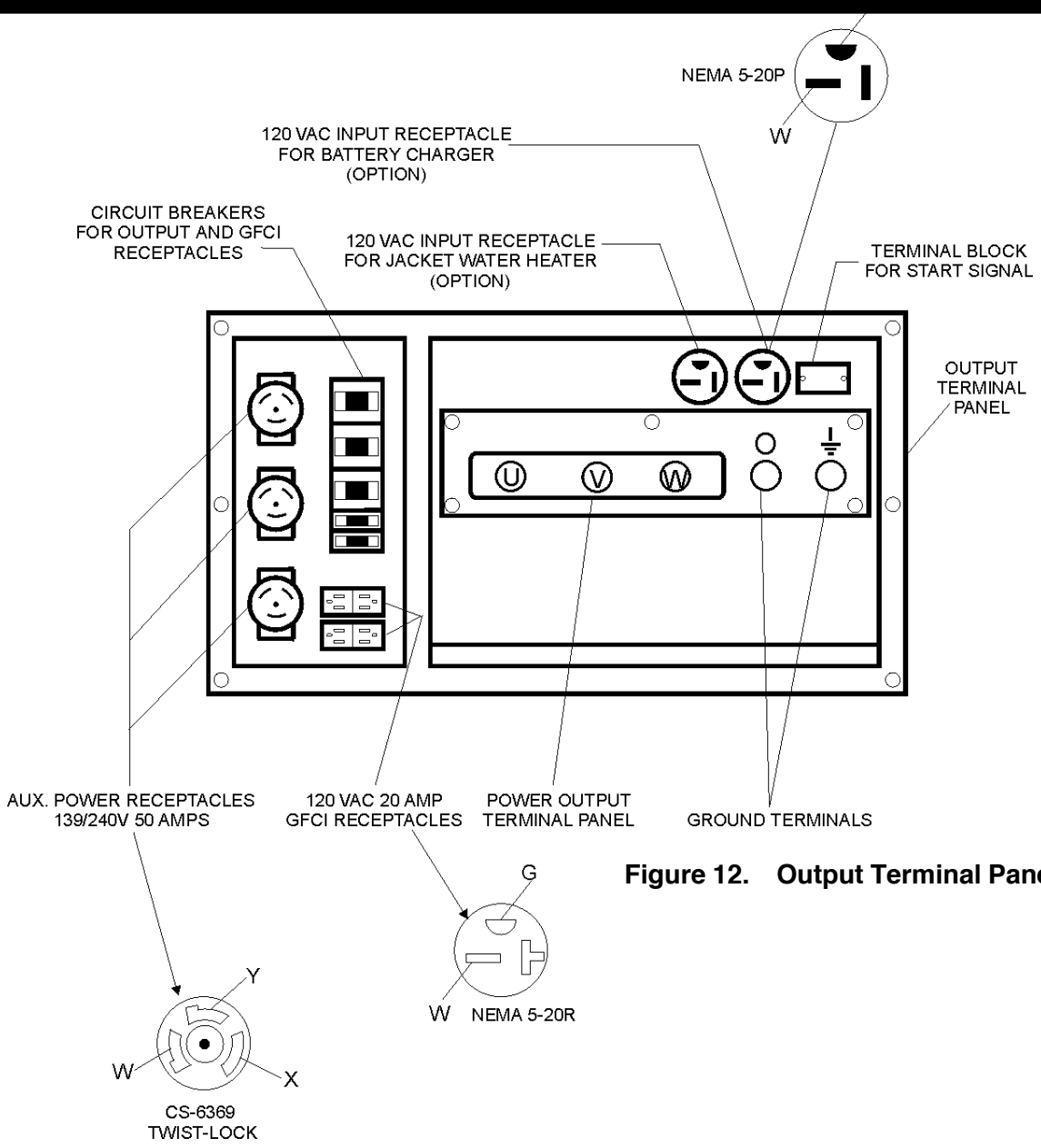


Figure 12. Output Terminal Panel

120V Receptacles - These receptacles can be used anytime the generator is in operation. They are controlled by the circuit breakers above them.

Twist Lock Dual Voltage Receptacles - To use these receptacles, place the voltage selector switch in the single phase 240/120 voltage position and adjust the output voltage to 240 volts with the voltage regulator on the Control Panel (see Figure 9). Place the voltmeter change-over switch to the U-W positon and the ammeter change-over switch to the U or W to read the output.

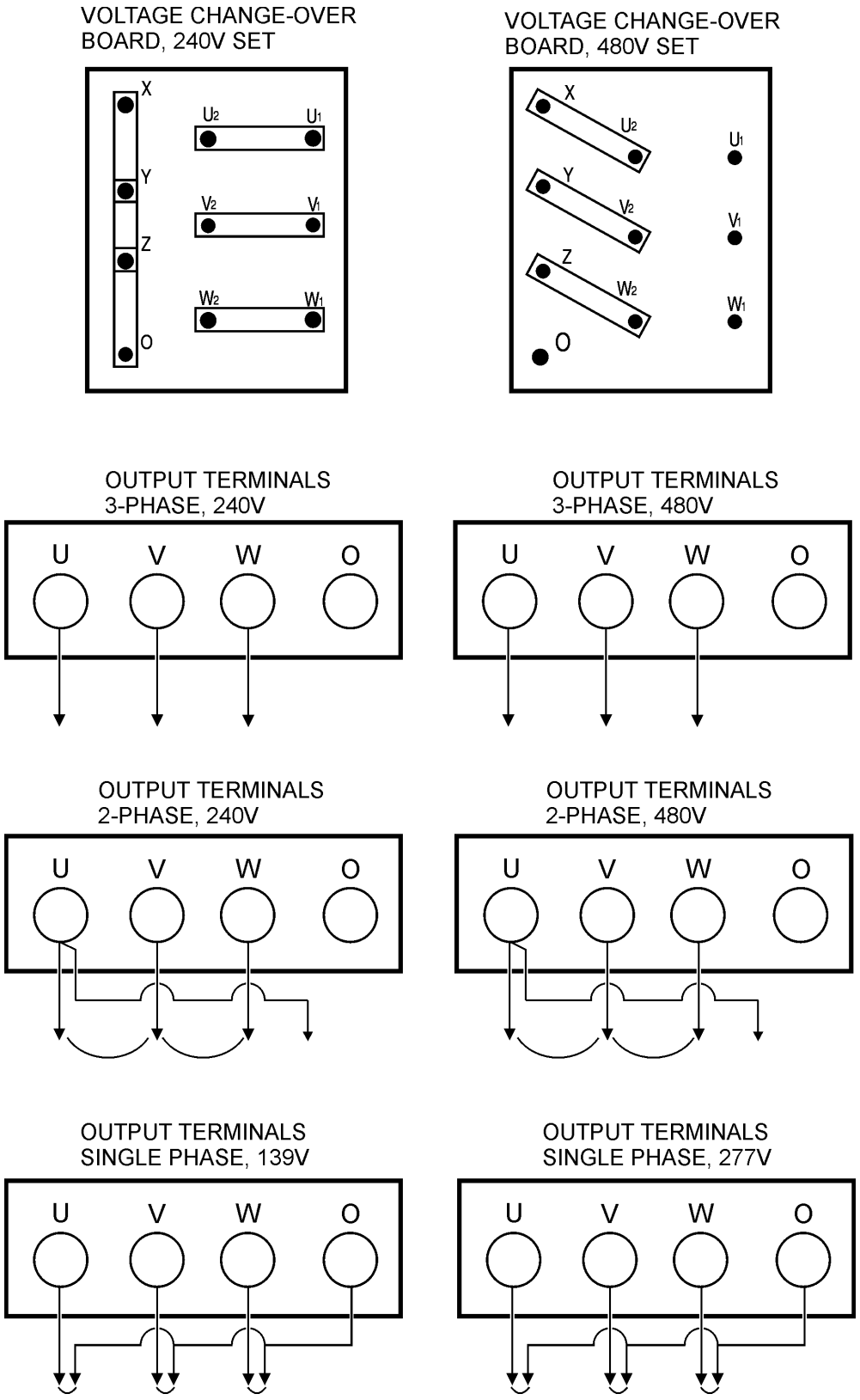


Figure 13. Output Terminal Voltage Selection

Outdoor Installation

Install the generator in a location where it will not be exposed to rain or sunshine. 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 the engine parts and the alternator.

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.

CAUTION :

An electric shock may happen when vibrators are used. Pay close attention to handling when operating vibrators and always use rubber boots and gloves to insulate the body from electrical shock.

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 14) connect the ground cable between the lock washer and the nut on the generator and tighten the nut fully. Connect the other end of the ground cable to earth ground.
3. NEC article 250-52(c) specifies that the earth ground rod should be buried a minimum of 8 ft. into the ground.

NOTE

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

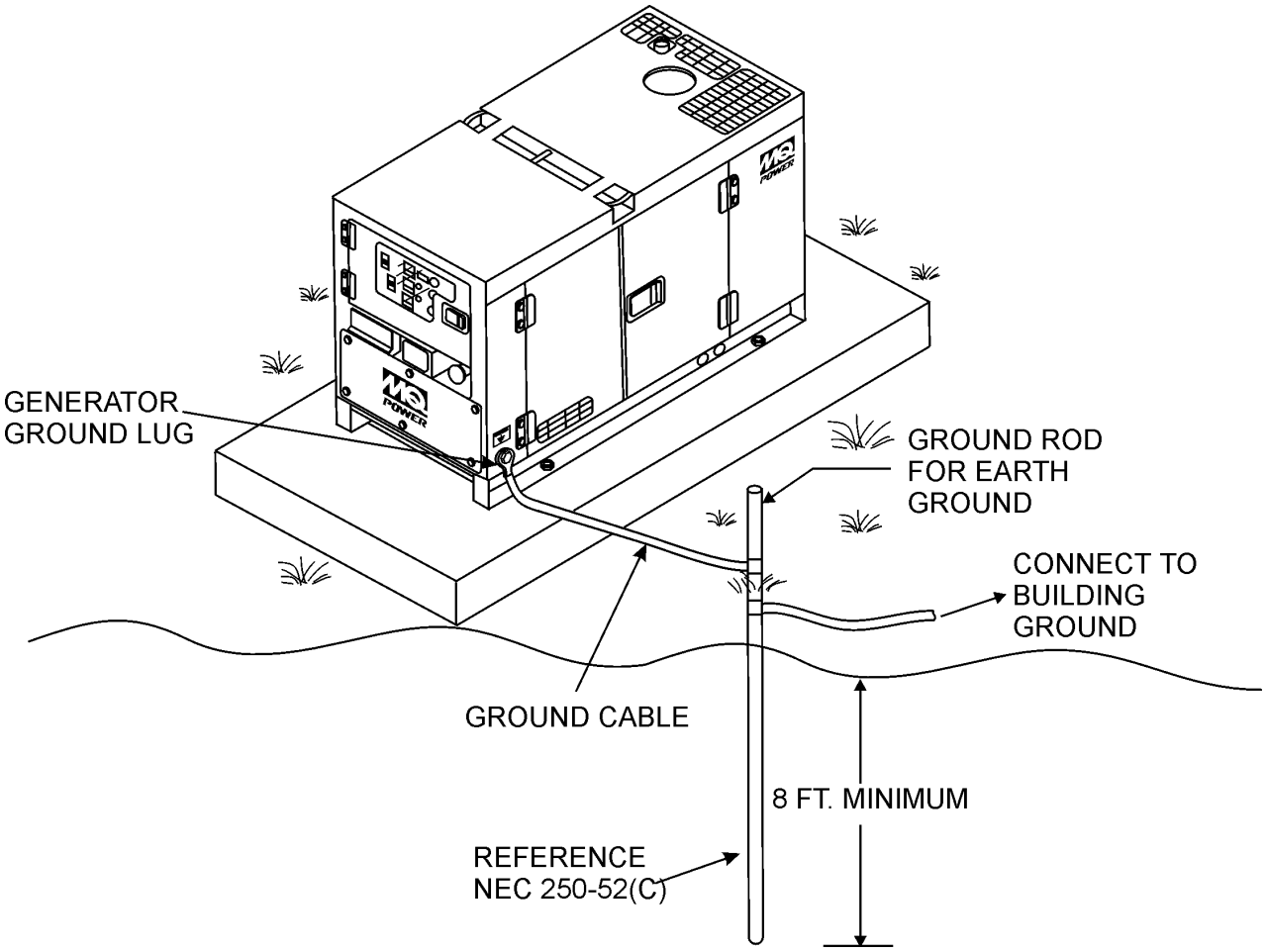


Figure 14. Typical Generator Grounding Application

General Inspection Prior to Operation

The DCA-180SSK generator has been thoroughly inspected and accepted prior to shipment from the factory. However, be sure to check for damaged parts or components, or loose nuts and bolts, which could have occurred in transit.

Extension Cable

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 Guide (Table 8) as a guide for selecting proper cable size.

Circuit Breakers

To protect the generator from an overload, a 3-pole, 500 amp, ***main*** circuit breaker is provided to protect the UNV 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 load side of the generator from overload. Make sure to switch ***ALL*** circuit breakers to the "OFF" position prior to starting the engine.

NOTE

ALWAYS consult with a licensed electrician for correct extension cord wire size.

Table 8. 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.						

Lubrication Oil

Fill the engine crankcase with lubricating oil through the filler hole, but do not overfill. Make sure the generator is level. With the dipstick inserted all the way, but without being screw into the filler hole, verify that the oil level is maintained between the two notches (Figure 15) on the dipstick. See Table 9 for proper selection of engine oil.

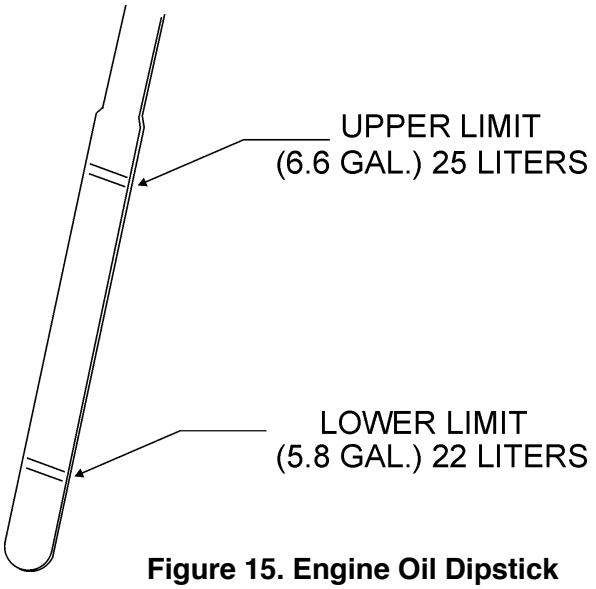


Figure 15. Engine Oil Dipstick

When checking the engine oil, be sure to check if the oil is clean and viscous. 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 **Komatsu Engine Owner's Manual.**

Fuel

Pay attention to the fuel tank capacity when replenishing fuel. Fill the fuel tank with clean and fresh ***diesel fuel***. **DO NOT** fill the tank beyond capacity.

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.

CAUTION :

Never fill the fuel tank while the engine is running or in the dark. Diesel fuel spillage on a hot engine can cause a fire or explosion. If diesel fuel spillage occurs, wipe up the spilled fuel completely to prevent fire hazards.

Coolant

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.

Table 9. Recommended Motor Oil

Temperature Range	Type Oil
104° F ~ 23° F (40° C ~ -5°C)	SAE 30
23° F ~ 5° F (-5° C ~ -15°C)	SAE 20 or SAE 10W-30
Below 5° C (-15°)	SAE 10W or SAE 10W-30

CAUTION :

When adding coolant or antifreeze to the radiator, do not remove the radiator cap until the unit has completely cooled.

Day-to-day addition of coolant is done from the reserve tank. When adding coolant to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. See Table 4 for engine, radiator, and reserve tank coolant capacities. Make sure the coolant level in the reserve tank is always between the "H" and the "L" markings.

Table 10. Coolant Capacity	
Engine and Radiator	7.4 Gal. (28 Liters)
Reserve Tank	2 Quarts (1.9 Liters)

Operation in Freezing Weather
When operating in freezing weather, be certain the proper amount of antifreeze (Table 5) has been added.

Table 11. Anti-Freeze Operating Temperatures				
Vol % Anti-Freeze	Freezing Point		Boiling Point	
	℃	℉	℃	℉
40	-24	-12	106	222
50	-37	-34	108	226

NOTE

When the anti-freeze is mixed with water, the anti-freeze mixing ratio must be less than 50%.

Cleaning the Radiator
The radiator may overheat if the 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 battery disconnected.

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

The fan belt tension is proper if the fan belt bends 7 to 10 mm (Figure 16) when depressed with the thumb as shown below.

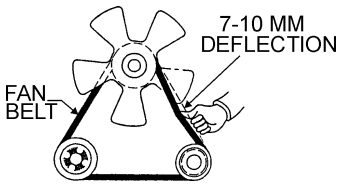


Figure 16. Fan Belt Tension

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 is not properly maintained. Add only distilled water when replenishment is necessary.

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.

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 a thin film of grease will help to inhibit corrosion.

Battery Cable Installation

ALWAYS be sure the battery cables (Figure 17) 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.

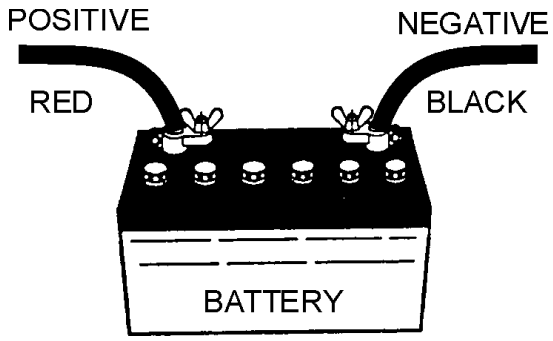


Figure 17. Battery Connections

CAUTION :

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

When connecting battery do the following:

1. **DO NOT** connect the battery cables to the battery terminals when the ***Off/Manual/Auto*** switch is in either the manual or auto position (ON). **ALWAYS** make sure that the Off/Manual/Auto switch is in the OFF position when connecting the battery.
2. Place a small amount of grease around both battery terminals. This will ensure a good connection and will help prevent corrosion around the battery terminals.

CAUTION :

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

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.

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.

NOTE

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

WATTS = VOLTAGE x AMPERAGE

The power factor of this generator is 0.8. See Table 6. below when connecting loads.

Table 12. 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

Three Phase Load

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

$$KVA = \frac{VOLTAGE \times AMPERAGE \times \sqrt{3}}{1000}$$

CAUTION:

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.

- 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.

NOTE

If output (kVA) is not given on the equipment nameplate, approximate output may be determined by multiplying voltage by amperage by $\sqrt{3}$.

WARNING:

The engine's exhaust contains harmful emissions. ***ALWAYS*** ventilate the exhaust when operating inside tunnels, excavations or buildings. Direct exhaust away from nearby personnel.

Before Starting

Engine

1. Check the lubricating oil level prior to starting the engine. Make sure the generator is level. The oil level must be maintained between two notches on the dipstick.
2. When there is not enough lubricating oil, fill the crankcase with high grade motor oil. Use a high quality detergent oil classified CC or higher (See Table 9 on page 41).
3. Check the coolant level in the radiator and subtank. Replenish with antifreeze as necessary. Always maintain the coolant level between the **FULL** and **LOW** markings on the coolant container. Be sure the radiator cap is fastened securely.
4. Check the fuel level on the fuel gauge. If fuel is low, fill the fuel tank with clean fresh diesel fuel. If fuel spillage occurs, completely wipe up the spilled fuel immediately.

Before Starting

Generator and Control Panel

CAUTION:

NEVER start the engine with the ***main, GFCI*** or ***load*** circuit breakers in the **ON** position.

1. Be sure to disconnect the electrical load and switch the ***main, load*** and ***G.F.C.I.*** circuit breakers (Figure 18) to the "OFF" position prior to starting the engine.

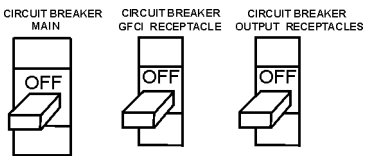


Figure 18. Main, GFCI and Load Circuit Breakers

Jacket Water Heater and Internal Battery Charger 120 VAC Output Receptacles

This generator is equipped with two 120 VAC, 20 amp output receptacles located on the output terminal panel, page 36, Figure 12.

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

Remember that these receptacles will **ONLY** function when commercial power has been supplied to them (Figure 18). To apply commercial power to these receptacles, a power cord of adequate size will be required.

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

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

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

CAUTION:

ALWAYS have power applied to the generator's internal battery charger when connecting the generator to a isolation (transfer) switch. Remember before connecting this generator to any buildings electrical system, have a ***licensed*** electrician perform the installation of the transfer switch.

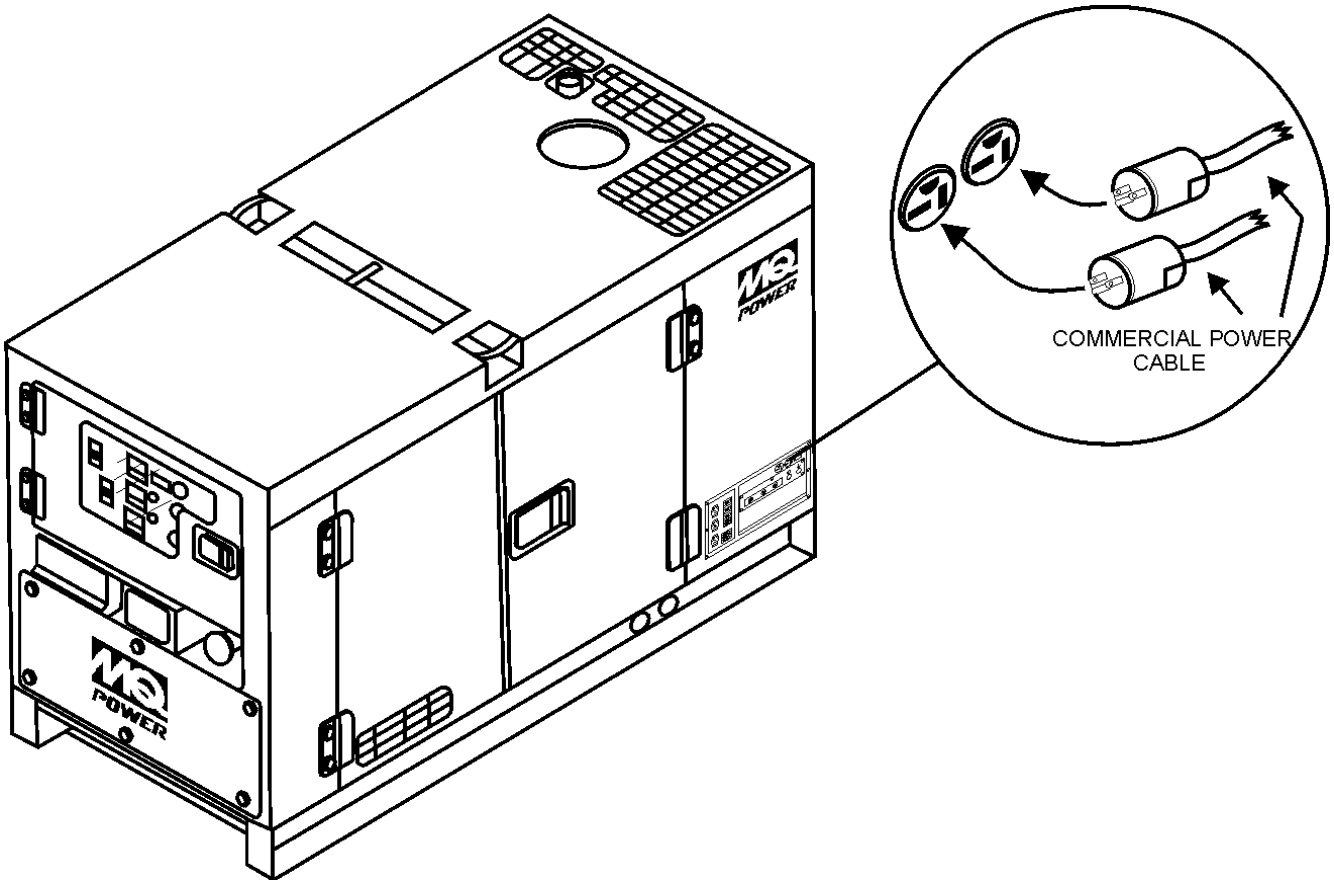


Figure 19. 120 VAC Accessory Receptacle/Cable

2. Once it is determined if commercial power is required, connect the load to the UNV terminals as shown in Figure 20. These terminals can be found on the output terminal panel, see page 36, Figure12. To gain access to the output terminals lift the UNV cover. Make sure to tighten terminal nuts securely to prevent load wires from slipping out.

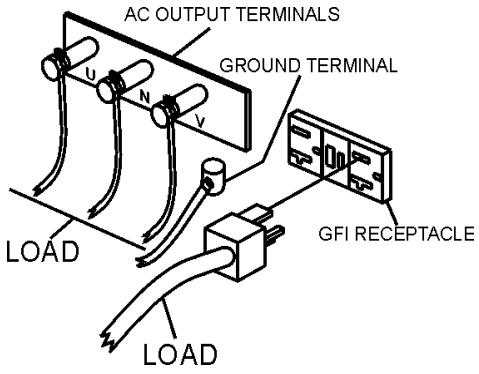


Figure 20. UNV Terminal Lugs (Load)

3. Connect the negative battery cable (BLACK) to the negative post on the battery (Figure 21).

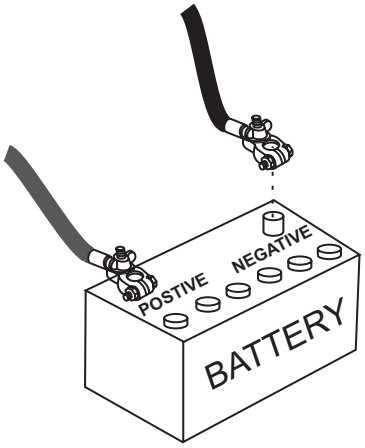


Figure 21. Battery Connections

4. Close all engine enclosure doors (Figure 22).

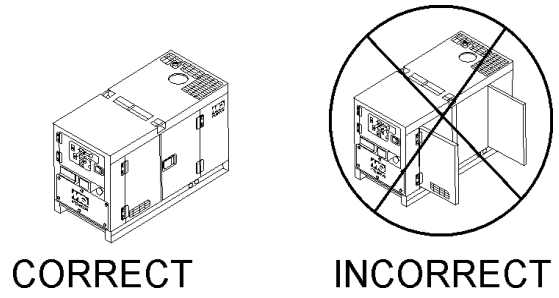


Figure 22. Engine Enclosure Doors

5. Make sure the "**Emergency Stop Button**" (Figure 23) is **pulled out** (not engaged).

Figure 23. Emergency Stop Button

6. Set the battery ON/OFF switch (Figure 24) to the ON position.

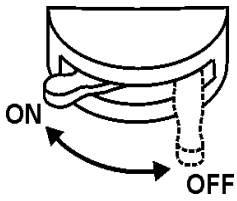


Figure 24. Battery ON/OFF Switch

7. When starting the generator in **COLD** weather conditions, press and hold the engine preheat button (Figure 25) until the pre-heat lamp (Figure 26) is lit (ON).

Figure 25. Engine Pre-Heat Button

Figure 26. Engine Pre-Heat Lamp

8. Place the Off/Manual/Auto switch (Figure 27) in the **MANUAL** position (down). Observe that the engine begins to crank.

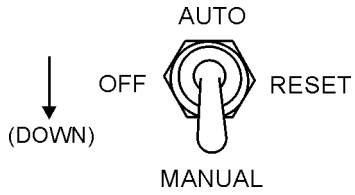


Figure 27. Off/Manual/Auto Switch (Manual)

9. After engine starts, verify that the "**Engine Running**" status LED (Figure 28) on the Microprocessor Engine Control Module (MPEC) display is "ON" (lit).

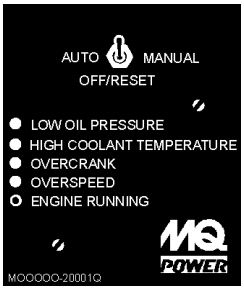


Figure 28. MPEC Engine Running Status LED

10. The generator's frequency meter (Figure 29) displays the 60 cycle output frequency in **HERTZ**.

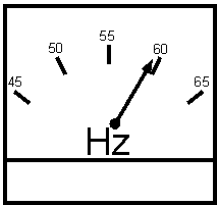


Figure 29. Frequency Meter (Hz)

11. The generator's voltage meter (Figure 30) displays the 120 VAC in **VOLTS**. If the voltage is not within the specified frequency tolerance, use the voltage adjustment control knob (Figure 31) to increase or decrease the desired voltage.

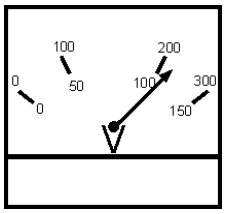


Figure 30. Voltage Meter (Volts)

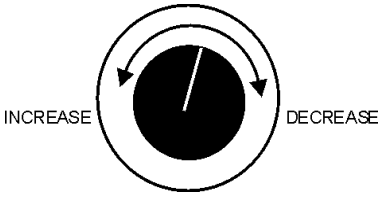


Figure 31. Voltage Adjust Control Knob

12. The ammeter (Figure 32) 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's alternator.

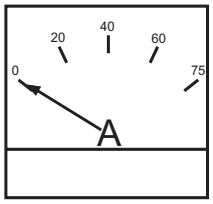


Figure 32. Ammeter (No Load)

13. The wattmeter (Figure 33) will indicate zero watts with no load applied. When a load is applied, this meter will indicate the output power of the generator with respect to the applied load.

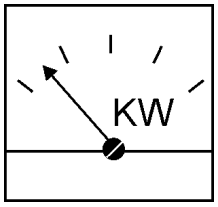


Figure 33. Kilowatt Meter

14. The engine oil pressure gauge (Figure 34) will indicate the oil pressure (kg/ cm^2) of the engine. Under normal operating conditions the oil pressure should be approximately 25 psi.

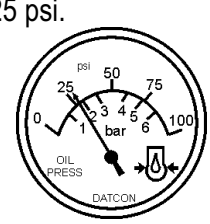


Figure 34. Oil Pressure Gauge

15. The coolant temperature gauge (Figure 35) will indicate the coolant temperature. Under normal operating conditions the coolant temperature should be between 105 and 215 degrees fahrenheit (Green Zone).

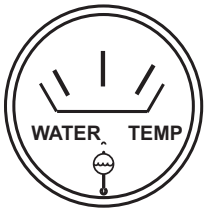


Figure 35. Coolant Temperature Gauge

16. Set the engine speed switch (Figure 36) to low to idle engine, set to high when a load is being applied.

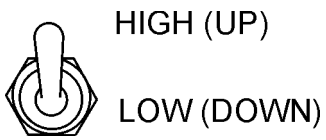


Figure 36. Engine Speed Switch

17. The tachometer (Figure 37) will indicate the speed of the engine when the generator is operating. Under normal operating conditions this speed should be approximately 1800 RPM's.

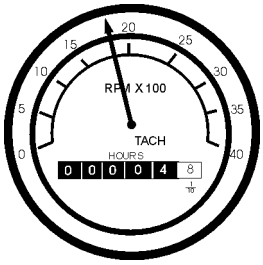


Figure 37. Engine Tachometer

18. If the engine speed is too high or low, use the high idle adjust trimmer (Figure 38) located on the control box to adjust the rated speed of the engine

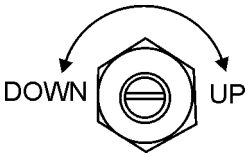


Figure 38. Engine Idle Adjust Trimmer

19. After the engine has been running for a few minutes, look at the status LED'S on the **"MPEC"** display (Figure 24) and check it for any abnormal conditions. If any abnormal conditions exist, shut down the engine and take corrective action to solve the problem.

20. If there are no abnormal problems shown on the "MPEC" LED display, turn the MAIN, GFCI and LOAD circuit breakers to their ON position (Figure 39).

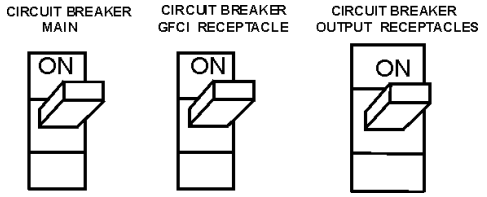


Figure 39. Main and GFCI Circuit Breakers

21. Look at the generator's ammeter (Figure 40) and verify that it reads the anticipated amount of current with respect to the load. Remember the ammeter will only display a current reading if the load is in use.

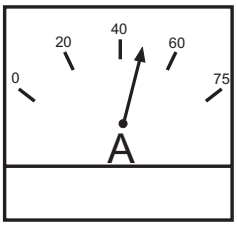


Figure 40. Ammeter (Load)

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

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.

CAUTION:

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

Starting the generator in the "**AUTO**" mode is similar to starting the generator in the "**MANUAL"** mode, with a few exceptions.

CAUTION:

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

When starting generator in Auto mode use the "Manual Start-up" procedure except where noted (see below).

1. Perform steps 1 through 7 (Before Starting, page 45-47) as outlined in the manual starting procedure.
2. Place the Off/Manual/Auto switch (Figure 41) in the **AUTO** position (up). The engine may not crank.

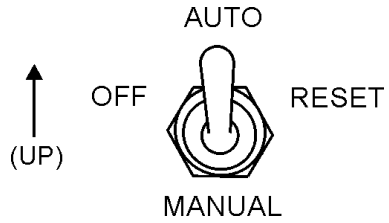


Figure 41. Off/Manual Auto Switch (AUTO)

3. Continue to follow the steps outline in the manual start-up procedure (start at step 10, page 38).

Engine Shutdown

To shut-down the generator use the following procedure:

1. Place both the **MAIN**, **GFCI** and **LOAD** circuit breakers to the "OFF position"

3. Set the engine speed switch (Figure 42) to the idle (low) position.

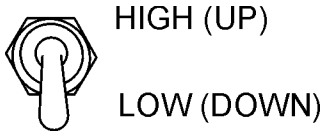


Figure 42. Engine Speed Switch

4. Let the engine run 3-5 minutes with no load applied.

5. Place the Off/Manual/Auto Switch (Figure 43) in the "**OFF/ RESET**" position

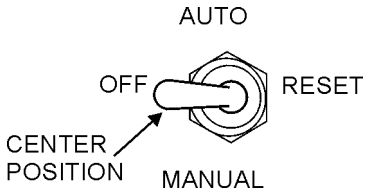


Figure 43. Off/Manual Auto Switch (OFF)

6. Verify that the "Engine Running" status LED (Figure 44) on the Microprocessor Engine Control Module (MPEC) display is "OFF" (not lit).

Figure 44. MPEC Engine Running Status LED (OFF)

2. Remove the load from the UNV terminal strip (Figure 20).

Emergency Stop

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

1. To stop the engine in the event of an emergency, **PUSH** the emergency stop button (Figure 45) inward. This button is located on the generator's engine panel, see page 34, Figure 11.

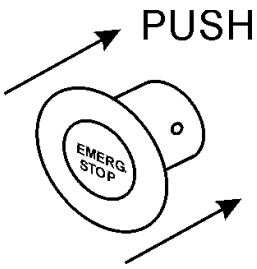


Figure 45. Emergency Stop Button (Engaged)

2. To dis-engage the emergency stop switch (Figure 46), **PULL** the emergency stop outward and turn clockwise. When the switch is in this position (not active) the engine can be restarted.

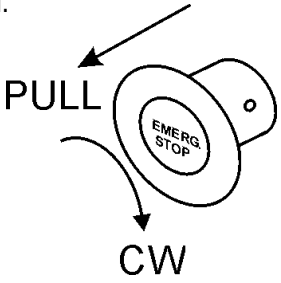


Figure 46. Emerg. Stop Button (Dis-engaged)

General Inspection

At least daily or prior to each use, the generating set should be cleaned and inspected for deficiencies. Check for loose, missing or damaged nuts, bolts or other fasteners. Also check for fuel or oil leaks.

Engine Side (Refer to the Engine Instruction Manual)

Air Cleaner

Every 50 hours: Remove air cleaner element (std. or heavy duty types), and wash in kerosene or liquid detergent and hot water. Wrap foam element in a cloth and squeeze dry. Wipe heavy duty paper element dry with toweling. Saturate element with kerosene; squeeze excess from foam element. Wipe excess from heavy duty paper element.

Fuel Addition

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

Removing Water from the 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 area inside the tank, the easier it is for water to accumulate. This can be reduced by always keeping the tank as full as possible.

Air Removal

If air enters the fuel 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 key switch to the "START" position for 15-30 seconds. Try again, if needed. This unit is equipped with an automatic air bleeding system.

Service Daily

If engine is operating in very dusty and dry grass conditions. A clogged air cleaner will result in high fuel consumption, loss of power and excessive carbon buildup in the combustion chamber.

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 11, page 31.

Generator Storage

For storage of the generator for over 30 days, the following is required:

- Drain the fuel tank completely.
- Run the engine until the fuel completely consumed**.**
- Completely drain the oil from the crankcase and refill with fresh oil.
- Stop the engine at the compression point.
- Clean all external parts of the generator with a cloth.
- Cover the generating set and store in a clean, dry place.

Water Separator Filter

Replace the water separator (Figure 47) filter every 500 hours if two filters are being used. If one filter is being used, replace every 250 hours.

The filters should also be replace if the vacuum gauge indicates between 6 to 10 inches of mercury (in Hg.)

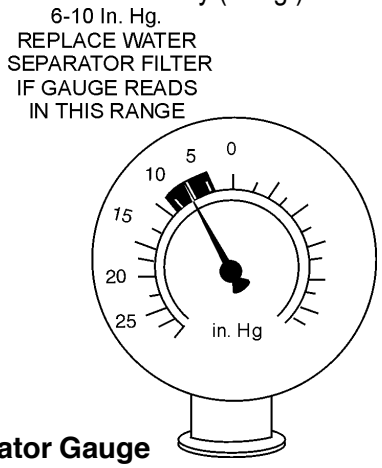


Figure 47. Water Separator Gauge

To replace the ***water separator filter*** element perform the following:

1. Remove the lid from the filter housing. Remove the element by holding the module handle and slowly pulling upward with a twisting motion.
2. Replace the lid gasket with the one supplied with the new filter element. Apply a coating of clean fuel or motor oil to seal prior to reassembly. Insert the new filter element with a slow downward twisting motion.
3. Fill the unit with clean fuel, then set the lid back on top of the filter housing, and tighten snugly using the T-bar handle.
4. Start the engine and check for any leaks. If any leaks occur with the engine running, turn the engine off and fix the leak.

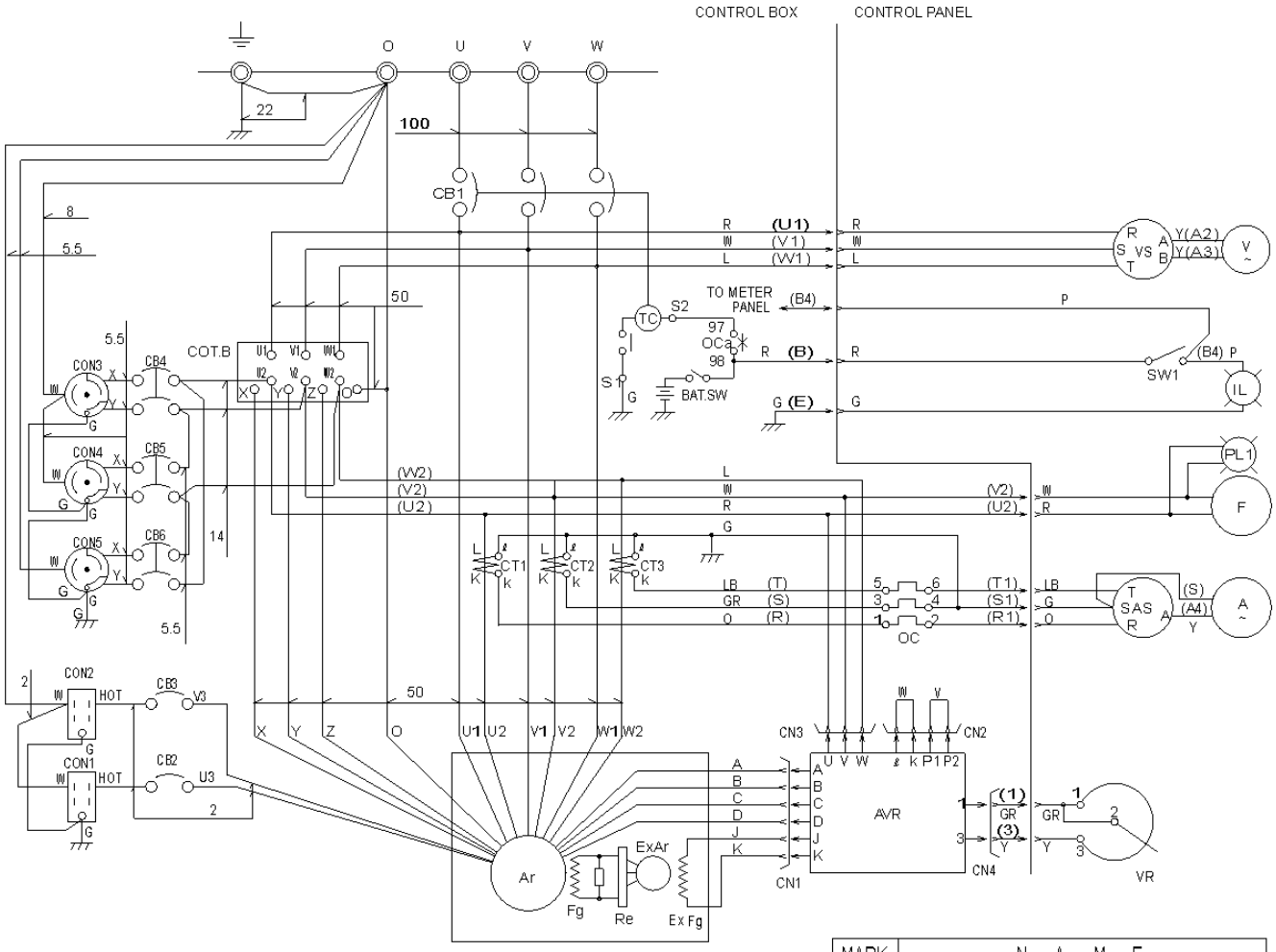
INSPECTION / MAINTENANCE		10 Hrs DAILY	250 Hrs	500 Hrs	1000 Hrs
ENGINE	Check Engine Fluid Levels	X			
	Check Air Cleaner	X			
	Check Battery Acid Level	X			
	Check Fan Belt Condition	X			
	Check for Leaks	X			
	Check for Loosening of Parts	X			
	Check Water Separator	X			
	Check Blow-by Oil Mist Tank	X			
	Replace Engine Oil and Filter *1		X		
	Clean Air Filter		X		
	Drain Bottom of Fuel Tank		X		
	Clean Unit, Inside and Outside		X		
	Change Fuel Filter *2			X	
	Replace Water Separator Element *3		(X)	X	
	Clean Radiator and Check Coolant Protection Level			X	
	Replace Air Filter Element				X
	Change Corrosion Resistor				X
	Check all Hoses and Clamps				X
	Clean Inside of Fuel Tank				X
GENERATOR	Measure Insulation Resistance Over 3M ohms		X		

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

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

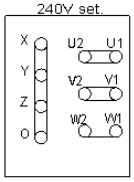
*3 Refer to the item "Water Separator Filter".

DCA-180SSK — GENERATOR WIRING DIAGRAM

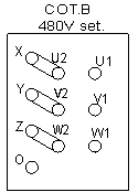


MARK	N A M E
Ar	MAIN GENERATOR ARMATURE WINDING
Fg	MAIN GENERATOR FIELD WINDING
ExAr	EXCITER ARMATURE WINDING
ExFg	EXCITER FIELD WINDING
AVR	AUTOMATIC VOLTAGE REGULATOR
VR	VOLTAGE REGULATING RHEOSTAT
Re	RECTIFIER
CT1~3	CURRENT TRANSFORMER 300/5A
CB1	CIRCUIT BREAKER 500A
OC	OVER CURRENT RELAY
COT.B	VOLTAGE CHANGE-OVER BOARD
AS	AMMETER CHANGE-OVER SWITCH
A	AC.AMMETER 0 300,600A
VS	VOLTMETER CHANGE-OVER SWITCH
V	AC.VOLTMETER 0 600V
F	FREQUENCY METER 45 65Hz
PL1	PILOT LAMP
CB2,3	AUX.CIRCUIT BREAKER 20A
CB4~6	AUX.CIRCUIT BREAKER 50A
CON1,2	AUX.POWER RECEPTACLE 20A
CON4~6	AUX.POWER RECEPTACLE 50A
Re1	RECTIFIER
IL	PANEL LIGHT
SW1	PANEL LIGHT SWITCH

COT.B
240V set.



COT.B
480V set.



NO MARK:1.25mm ^{2}

WIRE SIZE		COLOR CODE		
100: 100mm^2		WIRE COLOR		WIRE COLOR
50: 50mm^2	B	BRACK	R	RED
38: 38mm^2	L	BLUE	W	WHITE
22: 22mm^2	BR	BROWN	Y	YELLOW
14: 14mm^2	G	GREEN	LB	LIGHT BLUE
8 : 8mm^2	GR	GRAY	LG	LIGHT GREEN
5.5: 5.5mm^2	V	VIOLET	O	ORANGE
2 : 2mm^2	P	PINK		

CONTROL BOX SIDE

1	2	3	4
E	W1	V1	U1
		1	U2
B		3	V2

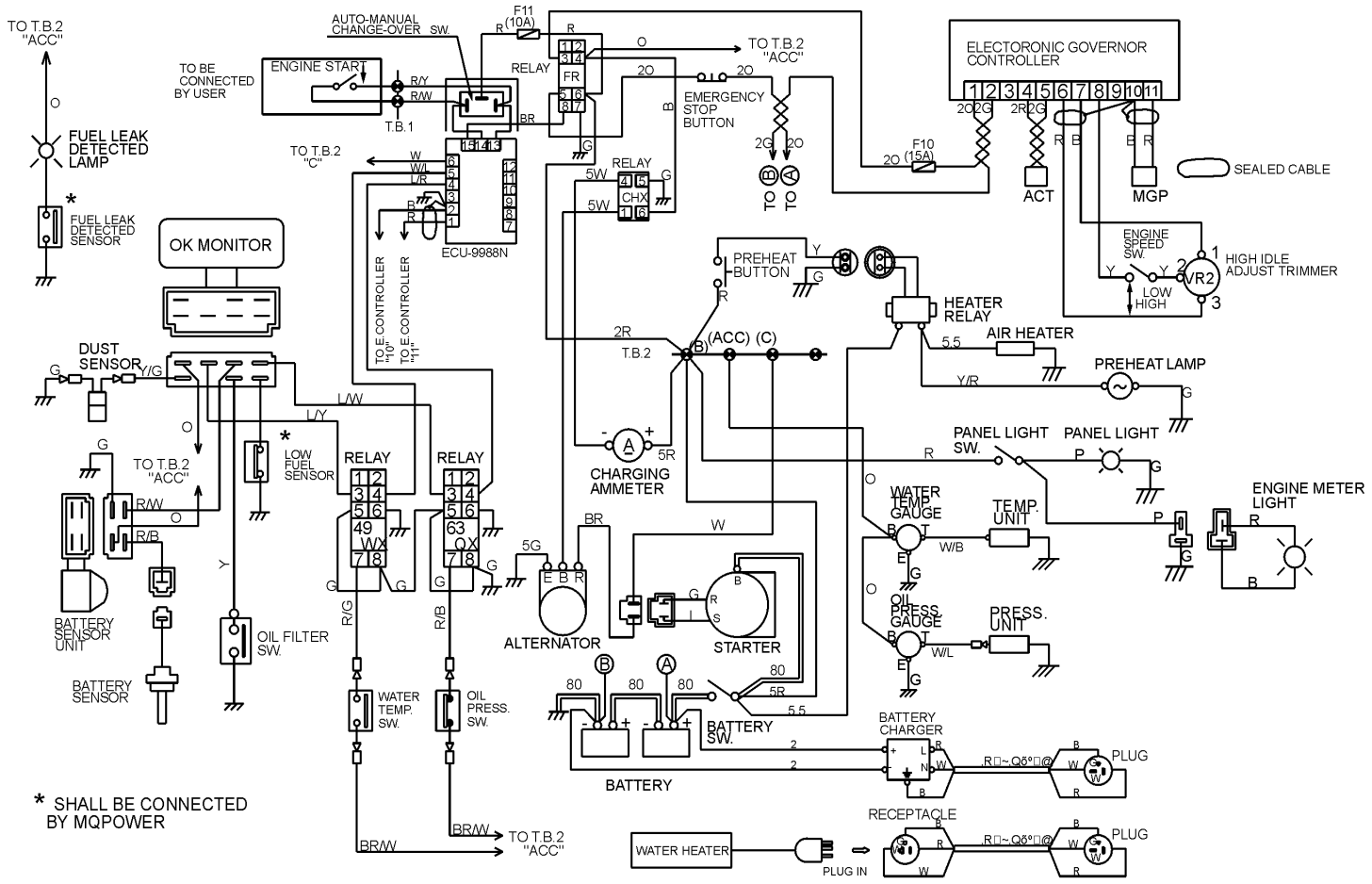
3	2	1
R1	S1	T1

CONTROL PANEL SIDE CONNECTOR
(VIEW FROM INSERTING WIRE SIDE)

4	3	2	1
U1	V1	W1	E
U2	1		
V2	3		B

1	2	3
R1	S1	T1

1 2 3 A J C B K D C N 1	1 2 3 4 k P1 P2 C N 2
1 2 3 U V W C N 3	1 2 1 3 C N 4
AVR CONNECTOR (View from inserting wire side)	



* SHALL BE CONNECTED BY MQPOWER

WIRE SIZE	COLOR CODE			
100: 100mm²		WIRE COLOR		WIRE COLOR
38: 38mm²	B	BLACK	R	RED
22: 22mm²	L	BLUE	W	WHITE
14: 14mm²	BR	BROWN	Y	YELLOW
5 : 5mm²	G	GREEN	LB	LIGHT BLUE
2 : 2mm²	GR	GRAY	LG	LIGHT GREEN
NO MARK WIRE SIZE	V	VIOLET	O	ORANGE
	P	PINK		

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the diagnosis based on the Engine Troubleshooting (Table 13) information shown below and on the proceeding page. If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 13. 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 13. 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.

Practically all generator breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the diagnosed based on the Generator Troubleshooting (Table 14) information shown below. If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 14. ENGINE & GENERATOR TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine fails to start and starter does not rotated.	Dead battery?	Replace battery.
	Defective starter switch?	Replace switch.
	Fuse F5 burned out?	Replace fuse.
Engine fails to start and starter rotates.	Broken pre-heat circuit?	Check pre-heat circuit.
	No fuel?	Add fuel.
	Defective wiring?	Check wiring.
Engine starts and remains at low speed.	Clogged fuel strainer?	Clean or replace.
	Clogged air cleaner?	Clean or replace.
	Disconnected wiring?	Check and repair wiring.
Engine speed rises and no volteage is present n AC power source.	No voltage present in AC power source?	Replace rectifier (RE1).
	Defective rotor?	Replace rotor.
	Defective voltmeter?	Replace voltmeter.
	Disconnected wiring?	Check and repair wiring.
	Layer short-circuit in armature winding?	Replace armature.
Engine speed rises and AC power voltage is too low or cannot be used.	Defective circuit breaker (protector)?	Replace circuit breaker (protector).
	Layer short-circuit, broken wires in armature winding?	Repair or replace armature.
Engine speed rises and battery discharges too soon.	Defective engine regulator?	Replace regulator.
	Defective wiring?	Repair or replace wiring.
Engine speed rises and engine seems overloaded.	Defective alternator?	Repair or replace alternator.
	Damaged alternator bearing?	Replace alternator bearings.

Practically all generator breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the diagnosed based on the MPECTroubleshooting (Table 15) information shown below. If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 15. MPEC TROUBLESHOOTING

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

EXPLANATION OF CODE IN REMARKS COLUMN

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

Items Found In the "Remarks" Column

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

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

Items Found In the "Items Number" Column

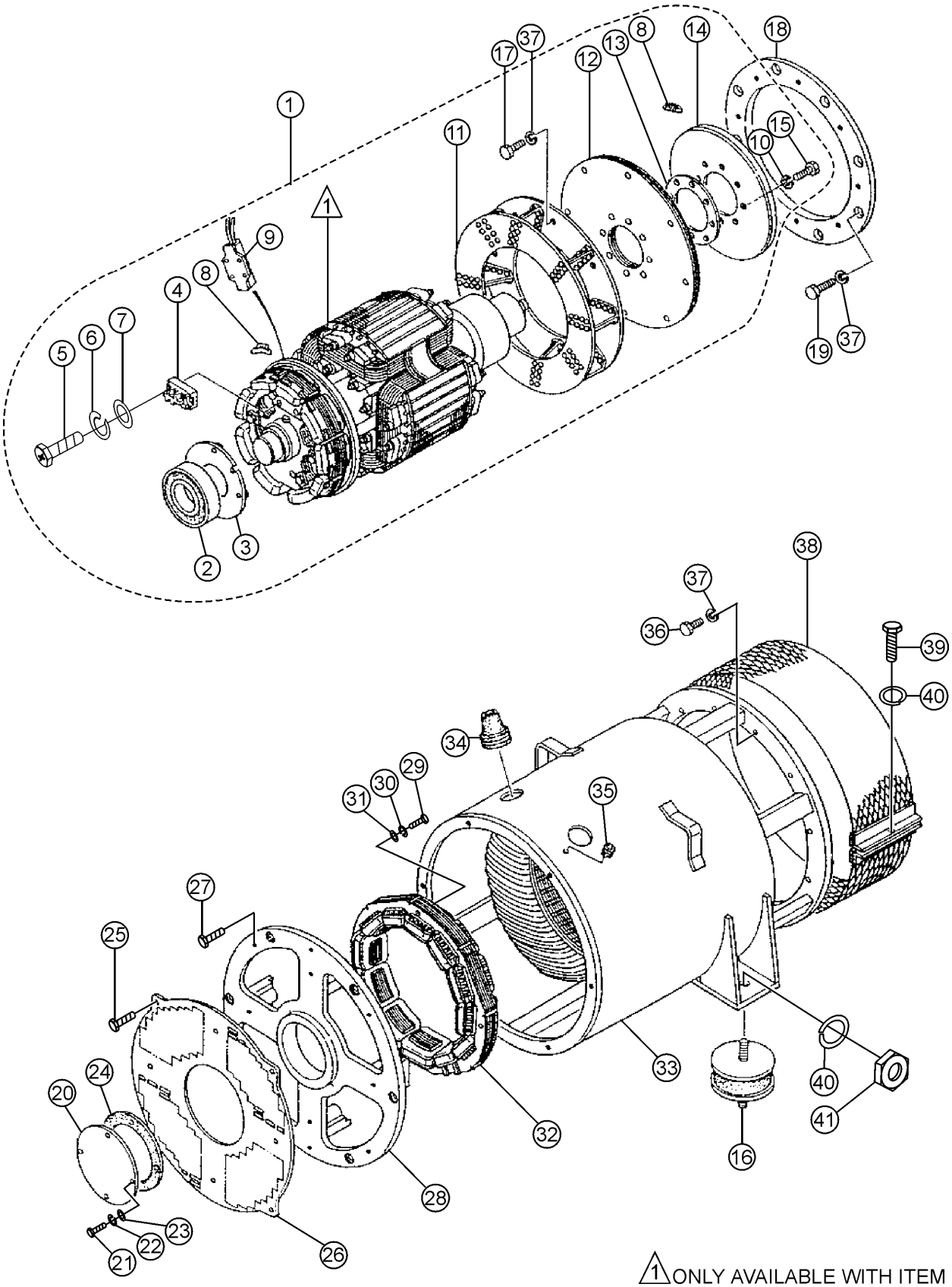
All parts with same symbol in the number column, *, #, +, %, or ■, belong to the same assembly or kit.

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

DCA-180SSK W/KOMATSU SA6D108E-2 DIESEL ENGINE 1 TO 3 UNITS

Qty.	P/N	Description
1	C0325100003	OIL MIST TANK

GENERATOR ASSY.

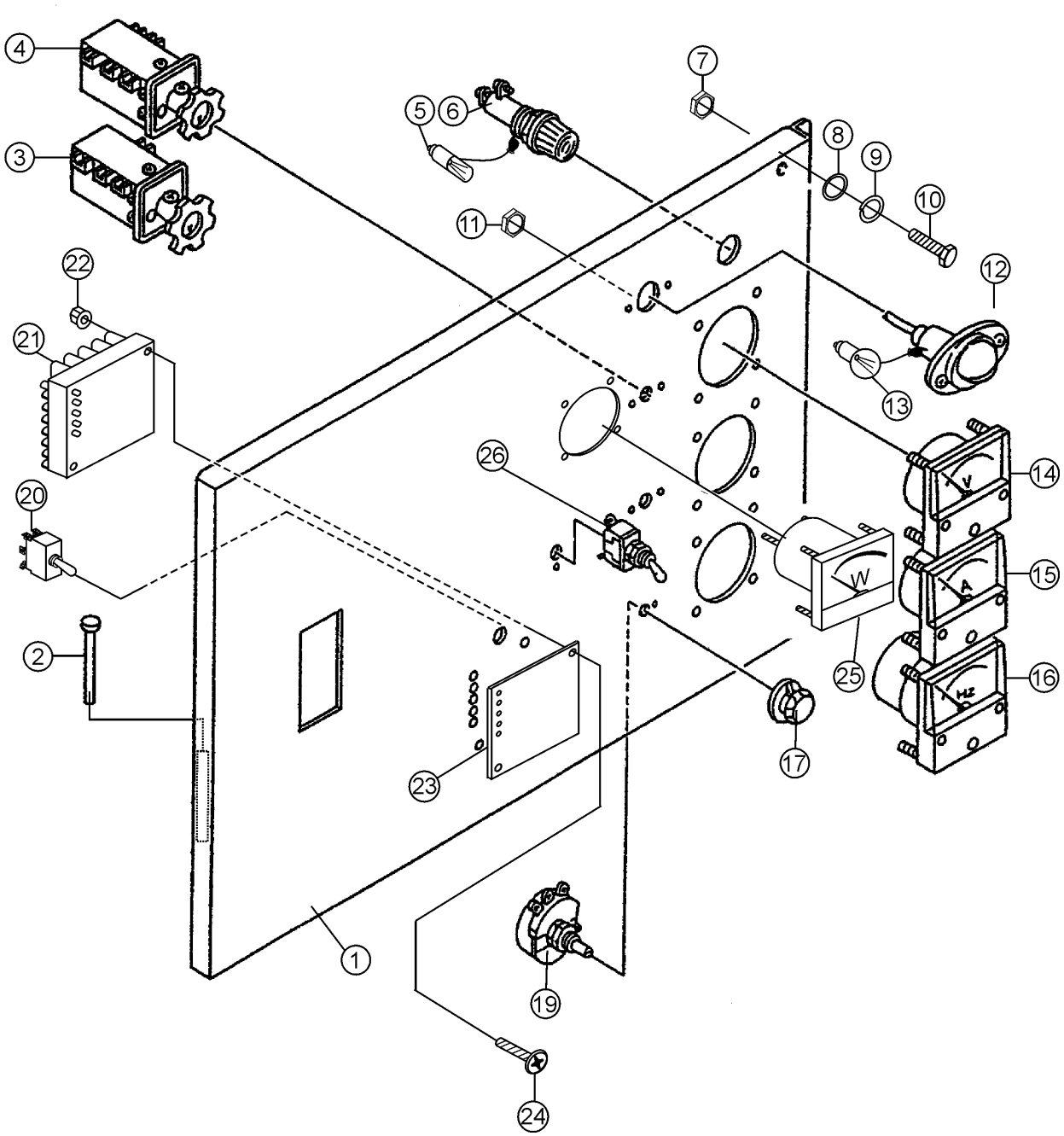


1 ONLY AVAILABLE WITH ITEM 1

GENERATOR ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1	C0110100102	ROTOR ASSEMBLY	1	INCLUDES ITEMS WITH *
2*	0071906314	BEARING	1	6314 DDU C3
3*	C1112500004	BEARING FLANGE	1	
4*	0601823282	RECTIFIER	1	RM50TC-24
5*	0018205020	HEX. CAP SCREW	2	
6*	0040005000	LOCK WASHER	2	
7*	0041205000	PLAIN WASHER	2	
8*	0601000209	BALANCING WEIGHT KIT	1	
9*	0601842334	RESISTOR	1	SMRK 80W 100kS
10*	0042616000	LOCK WASHER	8	
11*	8171070002	FAN	1	
12*	8171611003	COUPLING DISK	9	
13*	C1164200004	WASHER, COUPLING HUB	1	
14*	8171015003	BALANCING PLATE	1	
15	0012116045	HEX. HEAD BOLT	8	
16	0605000012	RUBBER SUSPENSION	2	
17*	0012112040	HEX. HEAD BOLT	8	
18	8301614003	COUPLING RING	1	
19	0012112035	HEX. HEAD BOLT	8	
20	C1154400004	COVER, BEARING	1	
21	0010106060	HEX. HEAD BOLT	4	
22	0040006000	LOCK WASHER	4	
23	0041206000	PLAIN WASHER	5	
24	C1154300004	GASKET, BEARING	1	
25	0017106016	HEX. HEAD BOLT	8	
26	C1154400103	SUCTION COVER	1	
27	0017112045	HEX. HEAD BOLT	6	
28	C1154000002	END BRACKET	1	
29	0012110065	HEX. HEAD BOLT	4	
30	0042610000	LOCK WASHER	4	
31	0041210000	PLAIN WASHER	4	
32	C1138000003	FIELD ASS'Y EXCITER	1	
33	C0130100003	STATOR ASSEMBLY	1	INCLUDES ITEMS WITH #
34#	0845041804	GROMMET	2	
35#	0601850144	GROMMET	1	
36#	0012112035	HEX. HEAD BOLT	12	
37	0042512000	LOCK WASHER	28	
38	C0132300003	COVER, FAN	1	
39	0010106030	HEX. HEAD BOLT	1	
40	0040020000	LOCK WASHER	4	
41	0030020000	HEX. NUT	4	
42*	0042512000	LOCK WASHER	1	

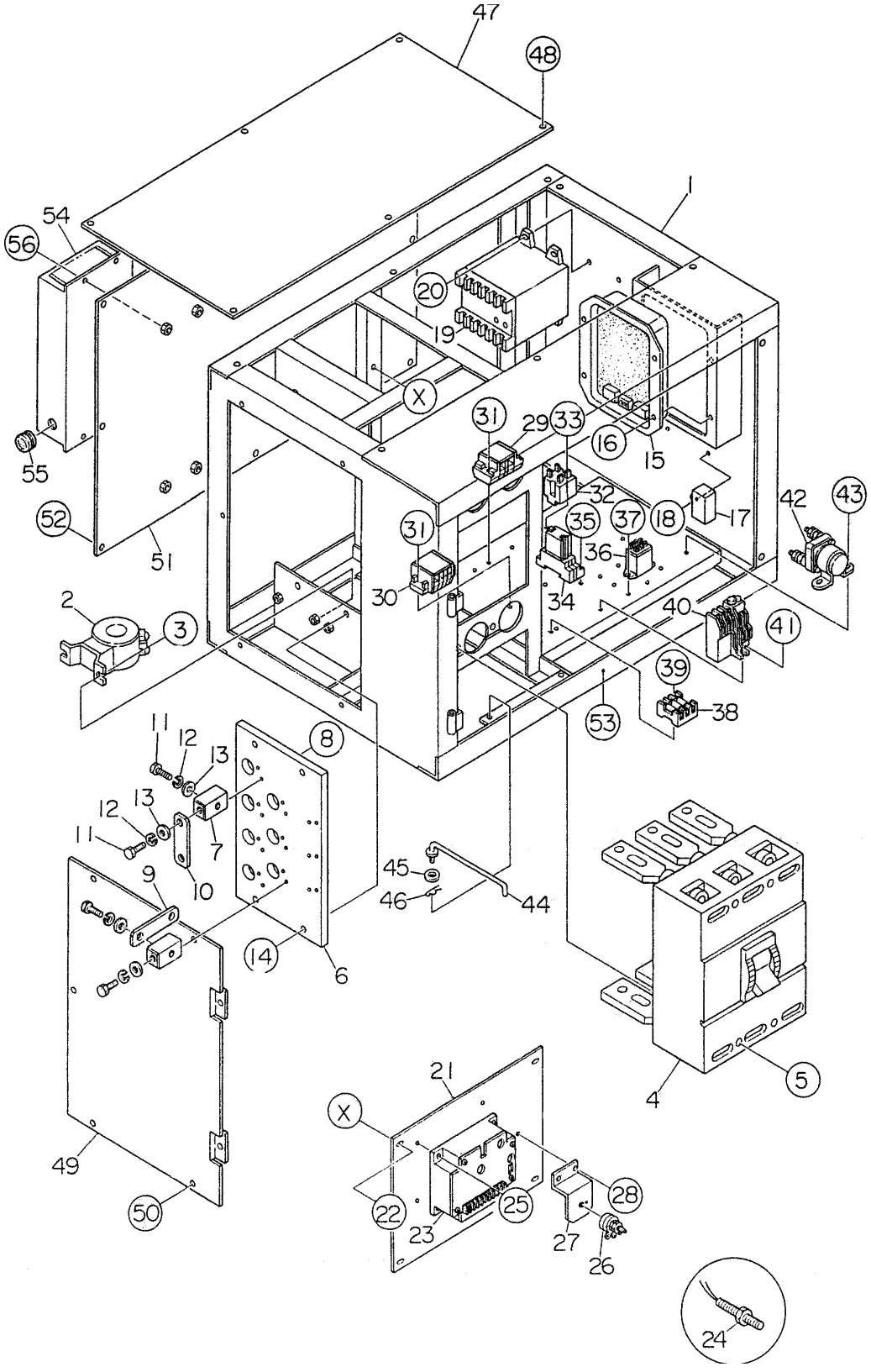
CONTROL PANEL ASSY.



CONTROL PANEL ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1	C0225000003	CONTROL PANEL	1	
2	0605011211	PIN	2	
3	0601801040	CHANGE-OVER SW., AMMETER	1	SL2AS
4	0601801041	CHANGE-OVER SW., VOLTMETER	1	SL2VS
5*	0601810261	BULB	1	CT13W
6	0601810072	PILOT LAMP	1	LP132DC 220V INCLUDES ITEM W/*
7	0080200007	SNAP RING	2	
8	0041208000	PLAIN WASHER	2	
9	0040008000	LOCK WASHER	2	
10	C9221100004	HEX. HEAD BOLT	2	
11	0207004000	HEX. NUT	2	
12	0601810161	PANEL LIGHT	1	CV325070 INCLUDES ITEM WITH #
13#	0601810214	BULB	1	
14	0601806887	AC VOLTMETER	1	RSR80 0~600V
15	0601806967	AC AMMETER	1	RSS80 0~300A,0~600A
16	0601807622	FREQUENCY METER	1	RSC-0F 220V 45~65Hz
17	0601840121	KNOB	1	`
18	0601830710	SWITCH, PANEL LIGHT	1	S301T
19	0601840073	RHEOSTAT (VOLTAGE REGULATOR)	1	RA20A2SE102BJ
20	0601830765	SWITCH	1	S303T
21	ECU9988N	MPEC (MICRO. PROCRSSOR ENG. CTRL.	1	REPLACES 060220245
22	M0000001329Q	NUT B7-8	2	
23	M0000020001Q	MPEC LABEL	1	
24	M1001021017Q	MACHINE SCREW 7-8	2	
25	0601808507	TRANDUCER WATT METER	1	
26	0601830710	SWITCH, PANEL LIGHT	1	S-301T

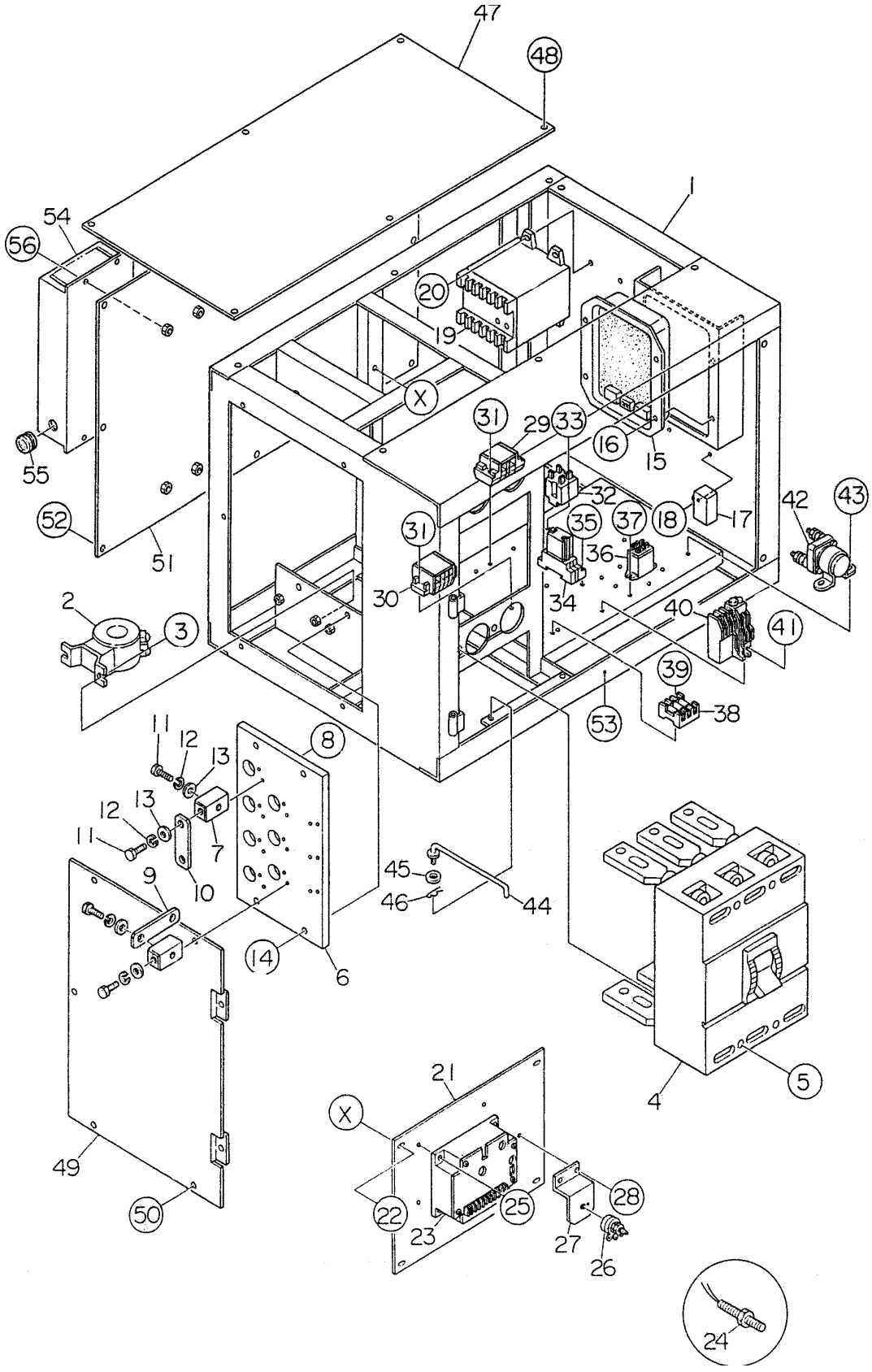
CONTROL BOX ASSY.



CONTROL BOX ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	C0215000002	CONTROL BOX	1	
2	0601806132	CURRENT TRANSFORMER	3	CT5MRN 300/5A
3	0027106016	MACHINE SCREW	6	
	0207006000	HEX. NUT	2	
4	0601808262	CIRCUIT BREAKER	1	XE600NS 500A
5	0021008045	MACHINE SCREW	4	
	0207008000	HEX. NUT	4	
	0040008000	LOCK WASHER	4	
	0042108000	PLAIN WASHER	4	
6	C0274000003	CHANGE-OVER BOARD, VOLTAGE	1	
7	8131852104	CHANGE TERMINAL	10	
8	0017106025	HEX. HEAD BOLT	20	
9	C0277200004	TERMINAL PLATE	3	
10	8131853104	CHANGE PLATE	6	
11	8131852504	HEX. HEAD BOLT	20	
12	0040010000	LOCK WASHER	20	
13	0041410000	PLAIN WASHER	20	
14	0017108035	HEX. HEAD BOLT	4	
	0207008000	HEX. NUT	4	
15	0601820625	AUTOMATIC VOLTAGE REGULATOR	1	NTA5A2T
16	0027105016	MACHINE SCREW	4	
17	0602201911	UNIT BATTERY SENSOR	1	C7038A0000
18	0027106020	MACHINE SCREW	1	
19	0601808507	TRANSDUCER, WATTMETER	1	WT283S34
20	0027105020	MACHINE SCREW	4	
21	C0262500004	SET PANEL, ELECTRIC PARTS	1	
22	0017108020	HEX. HEAD BOLT	4	
23	DYN110654000024	CONTROLLER	1	REPLACES 0602202598
24	DYNT11100	SPEED SENSOR	1	REPLACES 0602120497
25	0027104020	MACHINE SCREW	4	
26	0601840009	RHEOSTAT	1	RA20A2SE502BJ 2W 5K OHM
27	C3262600004	BRACKET	1	
28	0017106016	HEX. HEAD BOLT	2	
29	0601815730	TERMINAL BOARD	1	KT30 2P
30	0601815402	TERMINAL BOARD	1	TS14 4P
31	0027104020	MACHINE SCREW	4	
32	0601823706	RELAY	1	HE1A DC24V
33	0027104014	MACHINE SCREW	2	
34	LY2US24VDC	RELAY	1	REPLACES 0601827655
	PTF08A	SOCKET	1	REPLACES 0601823109
	PYCA1	HOLDER	1	REPLACES 0601824400
35	0027104020	MACHINE SCREW	2	
36	0601824542	RELAY	2	HH62S DC24V
37	0027103010	MACHINE SCREW	4	
38	0605515003	HOSE BAND	2	

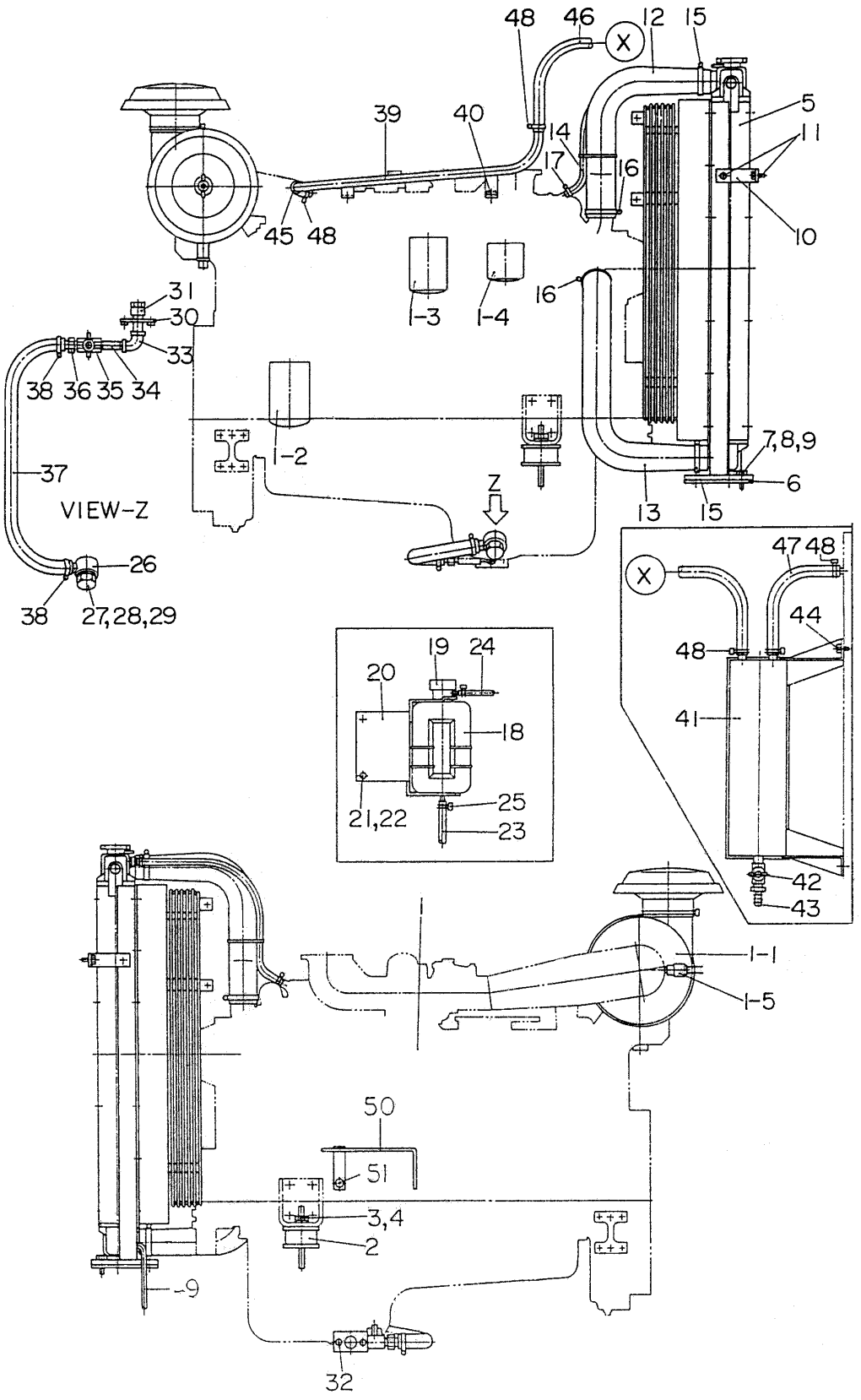
CONTROL BOX ASSY.



CONTROL BOX ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
38	0601806671	FUSE LEFT	1	F1065 15A
	0601802149	FUSE RIGHT	1	F1065 10A
	0601802218	HOLDER, FUSE	1	F7111 3P
39	0027103020	MACHINE SCREW	2	
40	0601820892	OVER CURRENT RELAY	1	THN20HZ
41	0027104016	MACHINE SCREW	2	
42	6008152970	HEATER RELAY	1	REPLACES 0602201227
43	0027106016	MACHINE SCREW	2	
44	3871824004	STOPPER, CONTROL PANEL	1	
45	0041206000	PLAIN WASHER	1	
46	0605010502	SNAP PIN	1	SSP-6
47	C0214500004	COVER, CONTROL BOX	1	
48	0017108020	HEX. HEAD BOLT	6	
49	C0214300004	SIDE PANEL, CONTROL BOX	1	
50	0017108020	HEX., HEAD BOLT	5	
51	C0215400004	PANEL, CONTROL BOX	1	
52	0017108020	HEX. HEAD BOLT	8	
53	0017108020	HEX. HEAD BOLT	4	
54	LC245002	BATTERY CHARGER	1	REPLACES 0601823090
55	0601850263	GROMMET	2	C30SG22A
56	0017105016	HEX. HEAD BOLT	4	

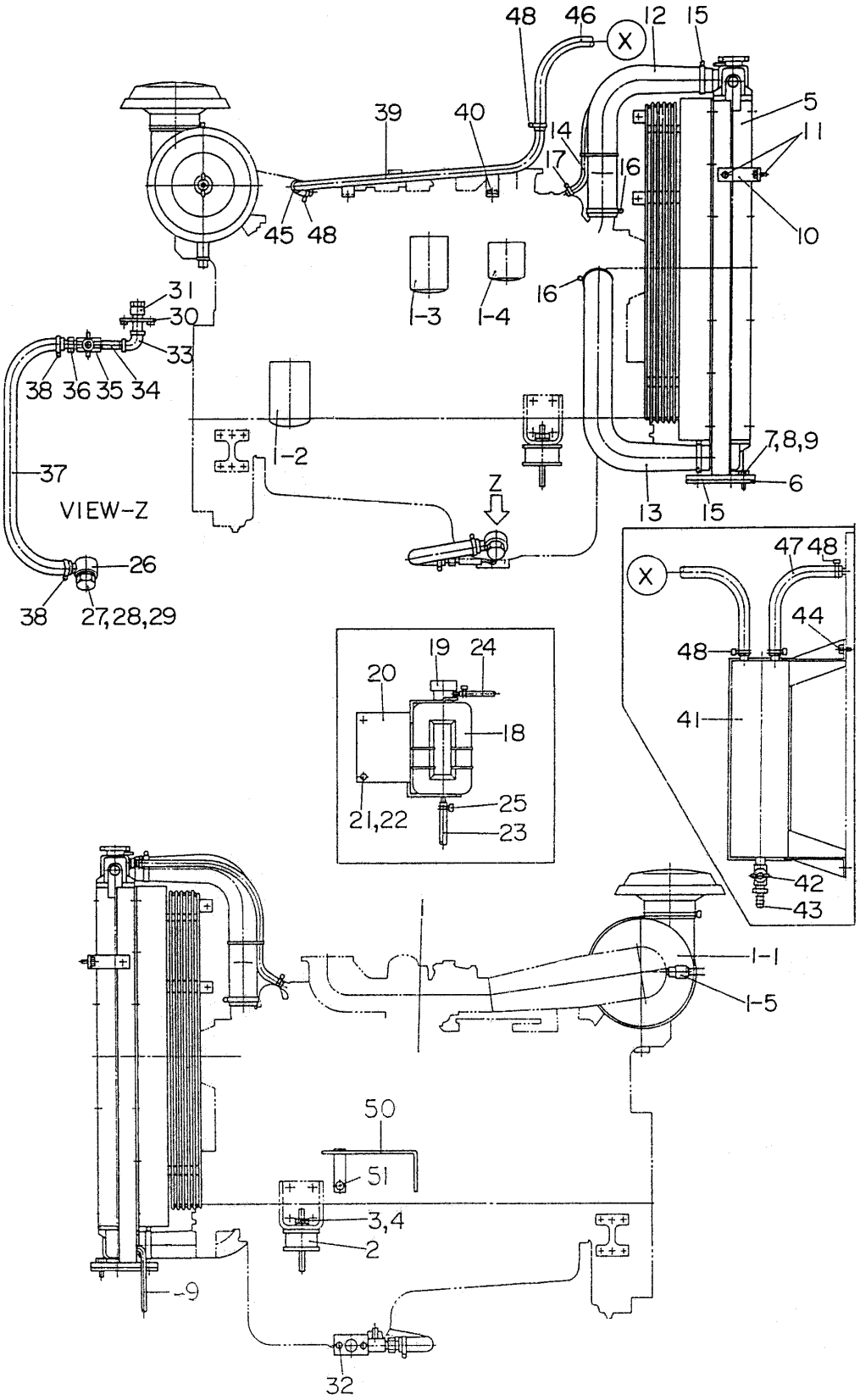
ENGINE & RADIATOR ASSY.



ENGINE & RADIATOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	C0925200054	ENGINE	1	KOMATSU SA6D108E-2 INCLUDE ITEMS W/*
1-1*	6001823200	ELEMENT, AIR CLEANER	1	REPLACES 0602046333
1-2*	6136515121	CARTRIDGE, OIL FILTER	1	REPLACES 0602041147
1-3*	6003118293	CARTRIDGE, FUEL FILTER	1	REPLACES 0602042146
1-4*	6004111151	CARTRIDGE, CORROSION RESISTOR	1	REPLACES 0602045143
1-5*	0602040678	DUST SENSOR	1	
2	0605000011	RUBBER SUSPENSION	2	
3	0030016000	HEX. NUT	4	
4	0040016000	LOCK WASHER	4	
5	6222619210	RADIATOR	1	REPLACES 0602011984
6	6152619170	RUBBER SHEET	2	REPLACES 0605000490
7	0010112060	HEX. HEAD BOLT	4	
8	0030012000	HEX. NUT	8	
9	0041212000	PLAIN WASHER	8	
10	C0311100104	BRACKET, RADIATOR	2	
11	0017110025	HEX. HEAD BOLT	4	
12	6221619350	RADIATOR HOSE	1	REPLACES 0602014594
13	6221619360	RADIATOR HOSE	1	REPLACES 0602014645
14	0726020980	RADIATOR HOSE	1	REPLACES 0602013977
15	0728100709	HOSE BAND	2	REPLACES 0602014068
16	0728100809	HOSE BAND	2	REPLACES 0602014067
17	0728100197	HOSE BAND	2	REPLACES 0602014058
18	C0802081003	RESERVE TANK	1	REPLACES 0802081003
19	0802010900	CAP, RESERVE TANK	1	REPLACES 0602010900
20	C0317100203	BRACKET, RESERVE TANK	1	
21	0021108020	MACHINE SCREW	2	
22	0207008000	HEX. NUT	2	
23	0199901400	HOSE	1	
24	0193601200	HOSE	1	
25	0605515013	HOSE BAND	2	
26	C9101000104	DRAIN JOINT	1	
27	0802024004	PACKING, OIL PAN SIDE	1	
28	0805008004	PACKING	1	

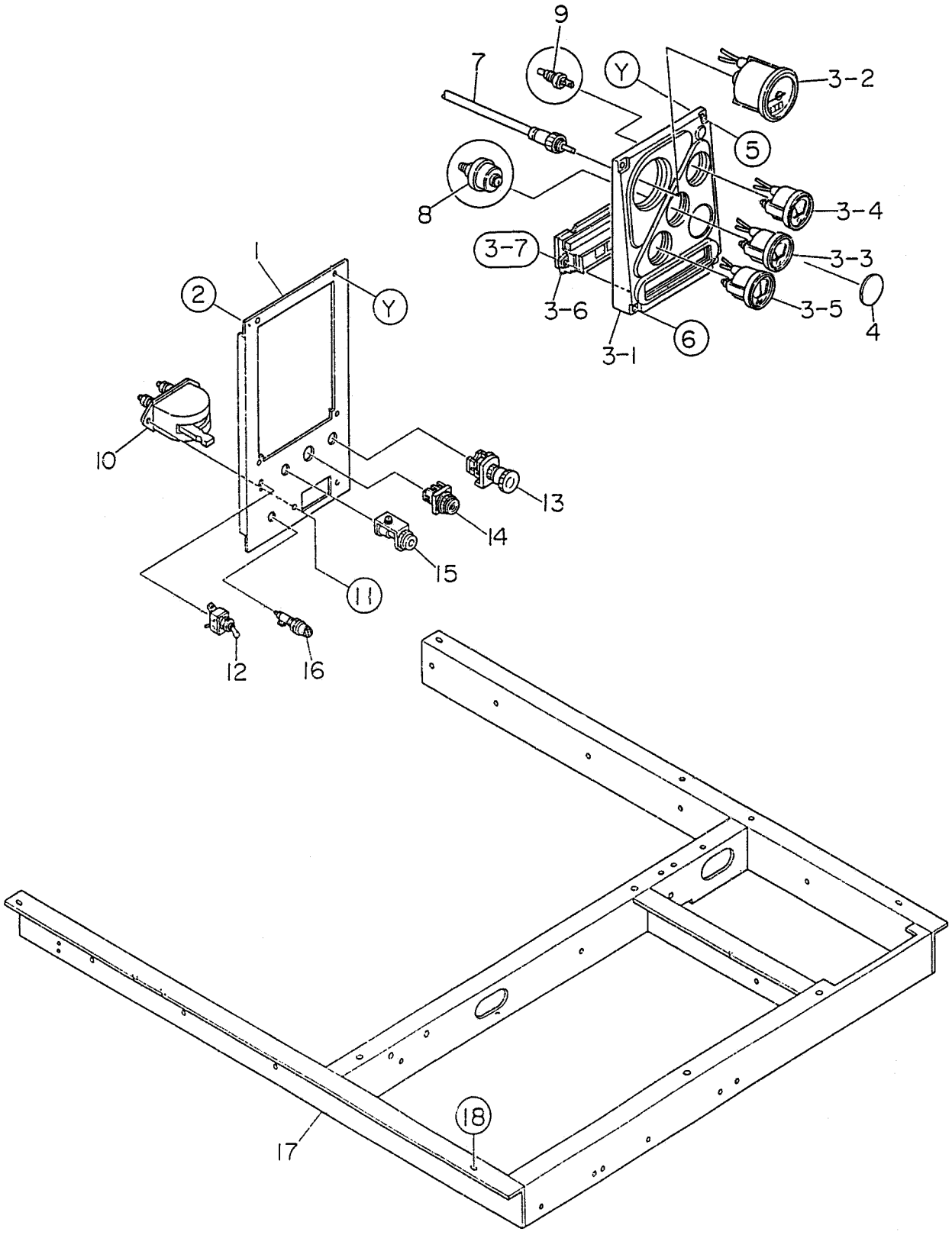
ENGINE & RADIATOR ASSY.



ENGINE & RADIATOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
29	0802025104	JOINT BOLT	1	
30	C0321200004	DRAIN JOINT	1	
31	C0321300004	CAP	1	
32	0017108025	HEX. HEAD BOLT	2	
33	0130008000	ELBOW JOINT, 3/4	1	
34	0134308100	LONG NIPPLE	1	
35	0603325017	VALVE	1	BBS22020
36	0602022294	HOSE JOINT	1	
37	0265800850	DRAIN HOSE	1	
38	0605515003	HOSE BAND	2	
39	C0327100003	BREATHER PIPE	1	
40	0017110025	HEX. HEAD BOLT	2	
41	C0325100003	OIL MIST TANK	1	
42	0603325011	VALVE	1	BBS7715
43	06020222293	HOSE JOINT	1	
44	0017108020	HEX. HEAD BOLT	2	
45	0268400200	HOSE	1	
46	0268400660	HOSE	1	
47	0268400360	HOSE	1	
48	0605515074	HOSE BAND	6	
49	0193600450	HOSE	1	
50	C0358300004	CLAMPER ROD	1	
51	0017110020	HEX. HEAD BOLT	1	

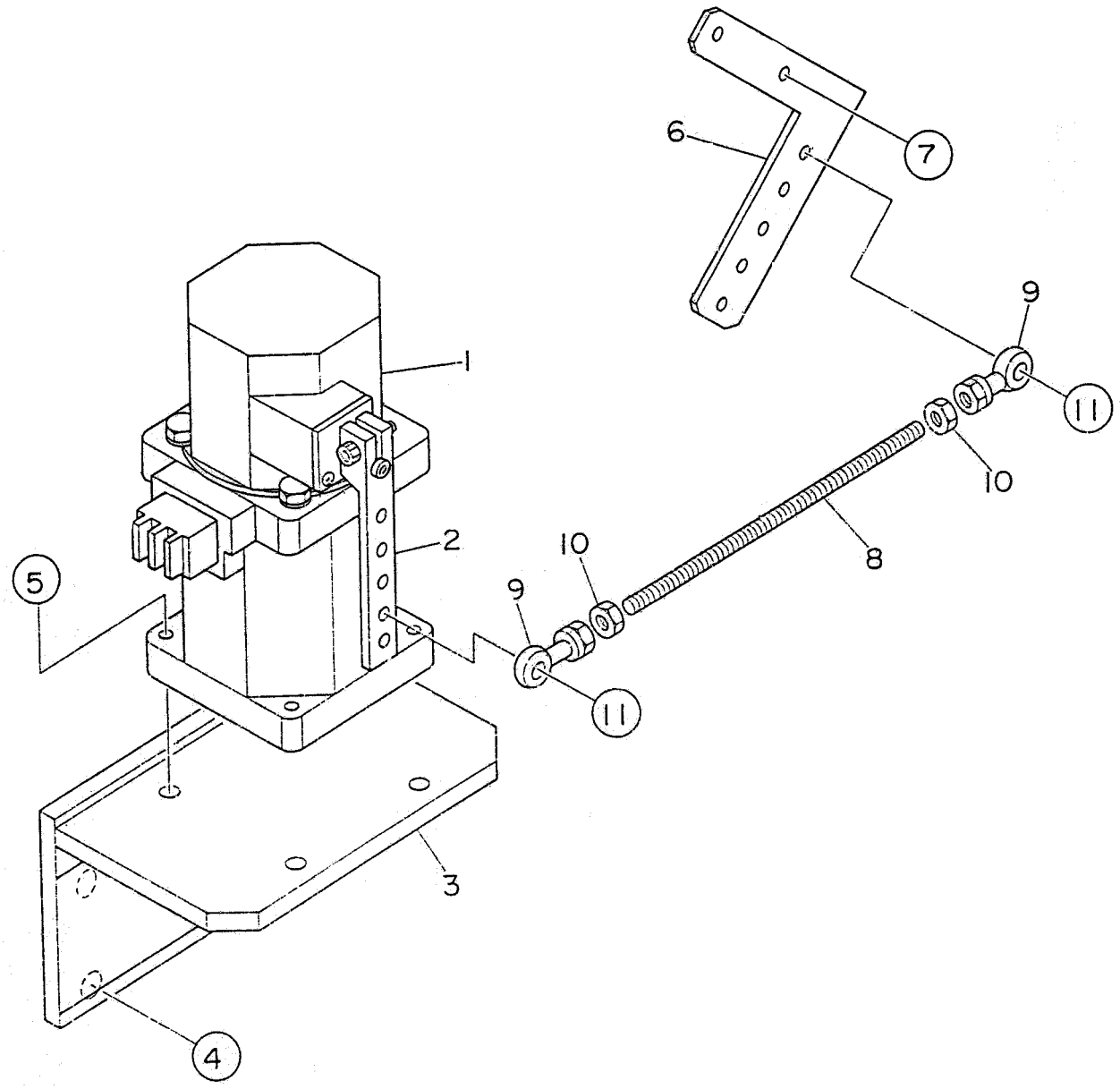
ENGINE OPERATING PANEL ASSY.



ENGINE OPERATING PANEL ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1	C0353100003	OPERATING PANEL	1	
2	0207006000	HEX. NUT	5	
3	0602120562	METER PANEL ASSY.	1	2573109890 INCLUDE ITEMS W/*
	0602120701	WIRING HARNESS	1	
3-1*	0602129033	METER PANEL	1	0577764490
3-2*	0602120069	TACHOMETER	1	1005694600
3-3*	0602122037	OIL PRESSURE GAUGE	1	1005694600
3-4*	0602123087	WATER TEMPERATURE GAUGE	1	1005760430
3-5*	0602121060	CHARGING AMMETER	1	1005730330
3-6*	0602115037	ENGINE WARNING DISPLAY LED	1	0559004040
3-7*	0602129031	MACHINE SCREW	2	
4	B9501401504	COVER	1	
5	0021806020	MACHINE SCREW	2	
6	0021806050	MACHINE SCREW	2	
7	0602120129	CABLE, TACHOMETER	1	0578909990
8	0602122251	UNIT, OIL PRESSURE	1	0716000760
9	0602123250	UNIT, WATER TEMPERATURE	1	0715000331
10	0602101000	BATTERY SWITCH	1	9827300090
11	0021008080	MACHINE SCREW	2	
	0030008000	HEX. NUT	2	
	0040008000	LOCK WASHER	2	
	0041208000	PLAIN WASHER	4	
12	0601830710	ENGINE SPEED SWITCH	1	S301T
13	0601831557	EMERGENCY STOP BUTTON	1	AR22V2R01R
14	0601830448	PREHEAT BUTTON	1	AH25FB10
15	6008152371	PREHEAT LAMP	1	REPLACES 0602103091
16	0602103090	DETECTED LAMP, FUEL LEAK	1	
	0601810244	BULB	1	
17	C0484000003	SET FRAME	1	
18	0017110030	HEX. HEAD BOLT	4	
	0207010000	HEX. NUT	4	

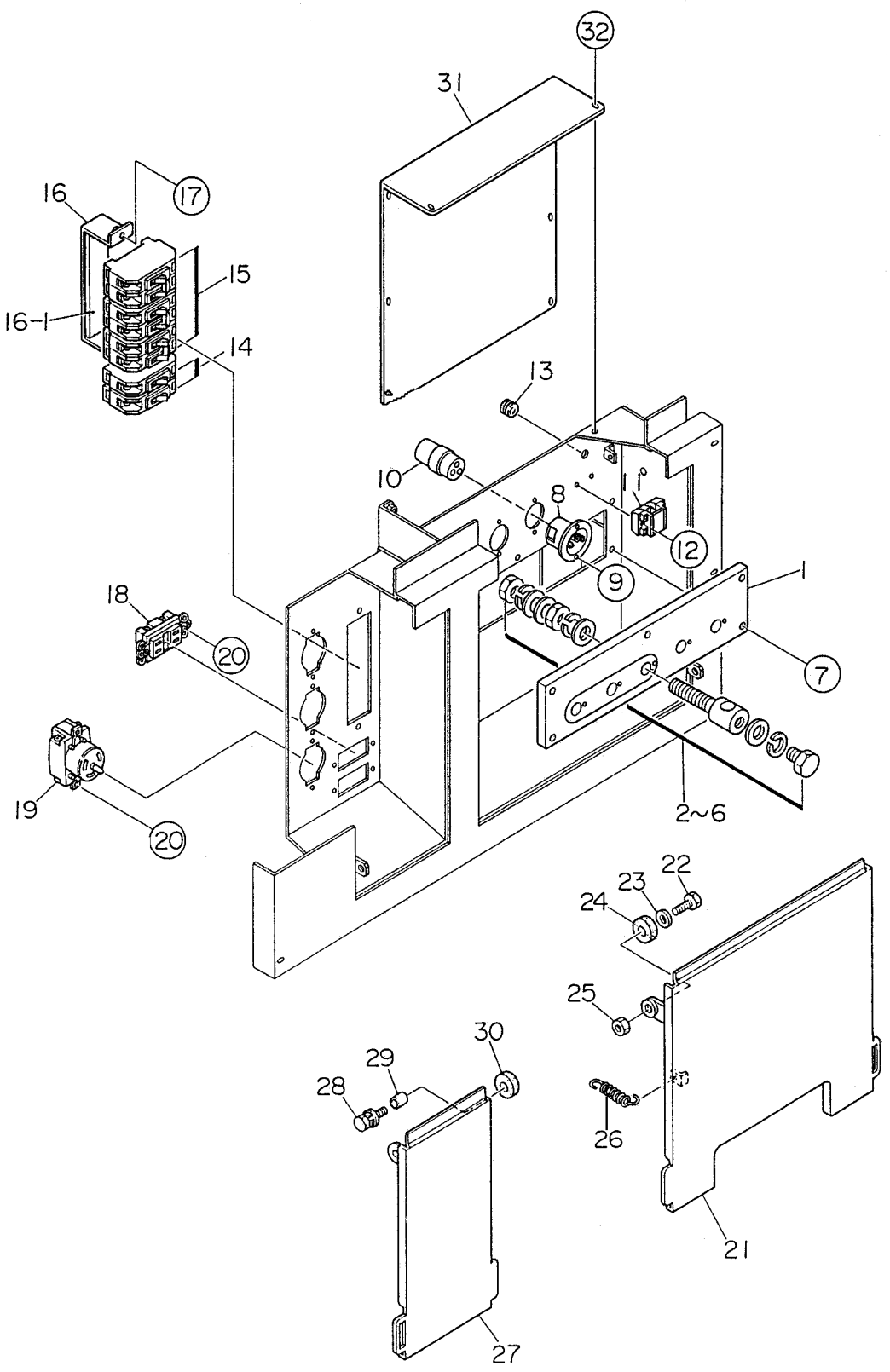
GOVERNOR ACTUATOR ASSY.



GOVERNOR ACTUATOR ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1	DYNC11020000024	ACTUATOR	1	REPLACES 0602150090
2	DYNC182	LEVER	1	REPLACES 0602211090
3	C0356200004	BRACKET, ACTUATOR	1	
4	0012310030	HEX. HEAD BOLT	4	
5	0010306035	HEX. HEAD BOLT	4	
	0207006000	HEX. NUT	4	
	0040006000	LOCK WASHER	4	
	0041206000	PLAIN WASHER	4	
6	C0356200104	LEVER	1	
7	0010106020	HEX. HEAD BOLT	2	
	0207006000	HEX. NUT	2	
	0040006000	LOCK WASHER	2	
	0041206000	PLAIN WASHER	2	
8	0602211091	ROD	1	
9	0602180190	BALL JOINT, 1/4-28	2	
10	0602211092	HEX. NUT	2	
11	0010106025	HEX. HEAD BOLT	2	
	0207006000	HEX. NUT	2	
	0041206000	PLAIN WASHER	2	

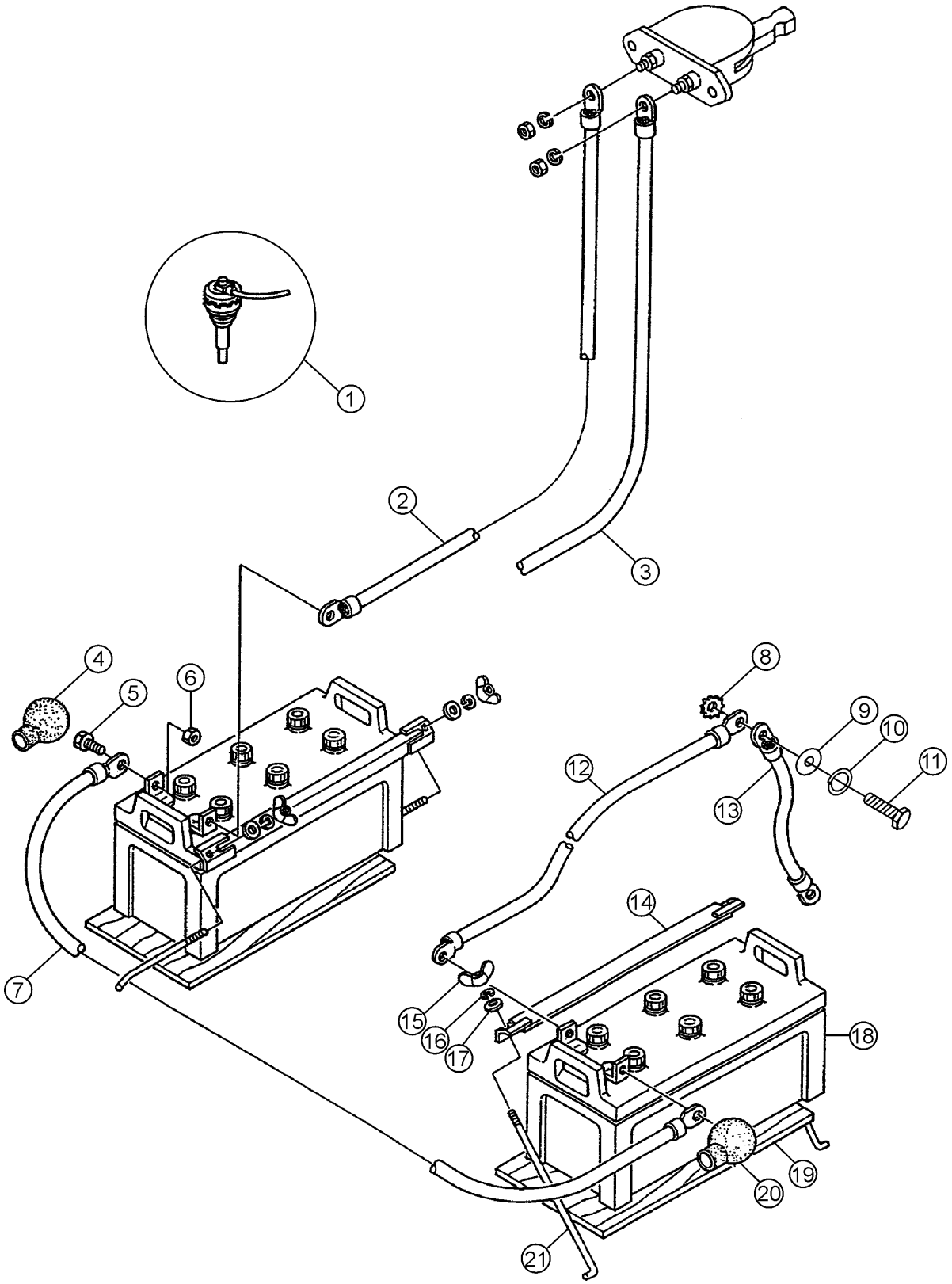
OUTPUT TERMINAL ASSY.



OUTPUT TERMINAL ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	C0231700003	SET BOARD, OUTPUT TERMINAL	1	
2	0801830404	OUTPUT TERMINAL	5	
3	0801830904	HEX. HEAD BOLT	5	
4	0039320000	HEX. NUT	10	
5	0040020000	LOCK WASHER	15	
6	0041420000	PLAIN WASHER	20	
7	0017108040	HEX. HEAD BOLT	5	
8	0601811189	RECEPTACLE	2	HBL5378C 125V 20A
9	0027103010	MACHINE SCREW	4	
10	0601812537	ADAPTER	1	HBL5369C 125V 20A
11	0601815324	TERMINAL BOARD	1	
12	0027104020	MACHINE SCREW	2	
13	0601850275	GROMMET	1	SG14A
14	0601804887	CIRCUIT BREAKER	2	KM51B 265V 20A REPLACES 0601805313
15	0601805840	CIRCUIT BREAKER	3	KM52 265V 50A
16	C1261600204	BRACKET, CIRCUIT BREAKER	1	INCLUDE ITEM W*
16-1*	0223300200	RUBBER CUSHION	1	
17	0017106020	HEX. HEAD BOLT	2	
18	0601812597	RECEPTACLE	2	REPLACES 0601812598
19	0601811034	RECEPTACLE	3	REPLACES 0601812565
20	0027104016	MACHINE SCREW	10	
	0030004000	HEX. NUT	10	
	0041204000	PLAIN WASHER	10	
21	C0237101313	COVER, OUTPUT TERMINAL	1	
22	0019112045	HEX. HEAD BOLT	2	
23	0042412000	PLAIN WASHER	2	
24	0805015604	STAY WASHER	2	
25	0205012000	HEX. NUT	2	
26	0845043704	SPRING	2	
27	C0237101504	COVER	1	
28	0017110040	HEX. HEAD BOLT	2	
29	0845054204	COLLAR	2	
30	0805015604	STAY RUBBER	1	
31	C0237101414	COVER	1	
32	0017108020	HEX. HEAD BOLT	7	

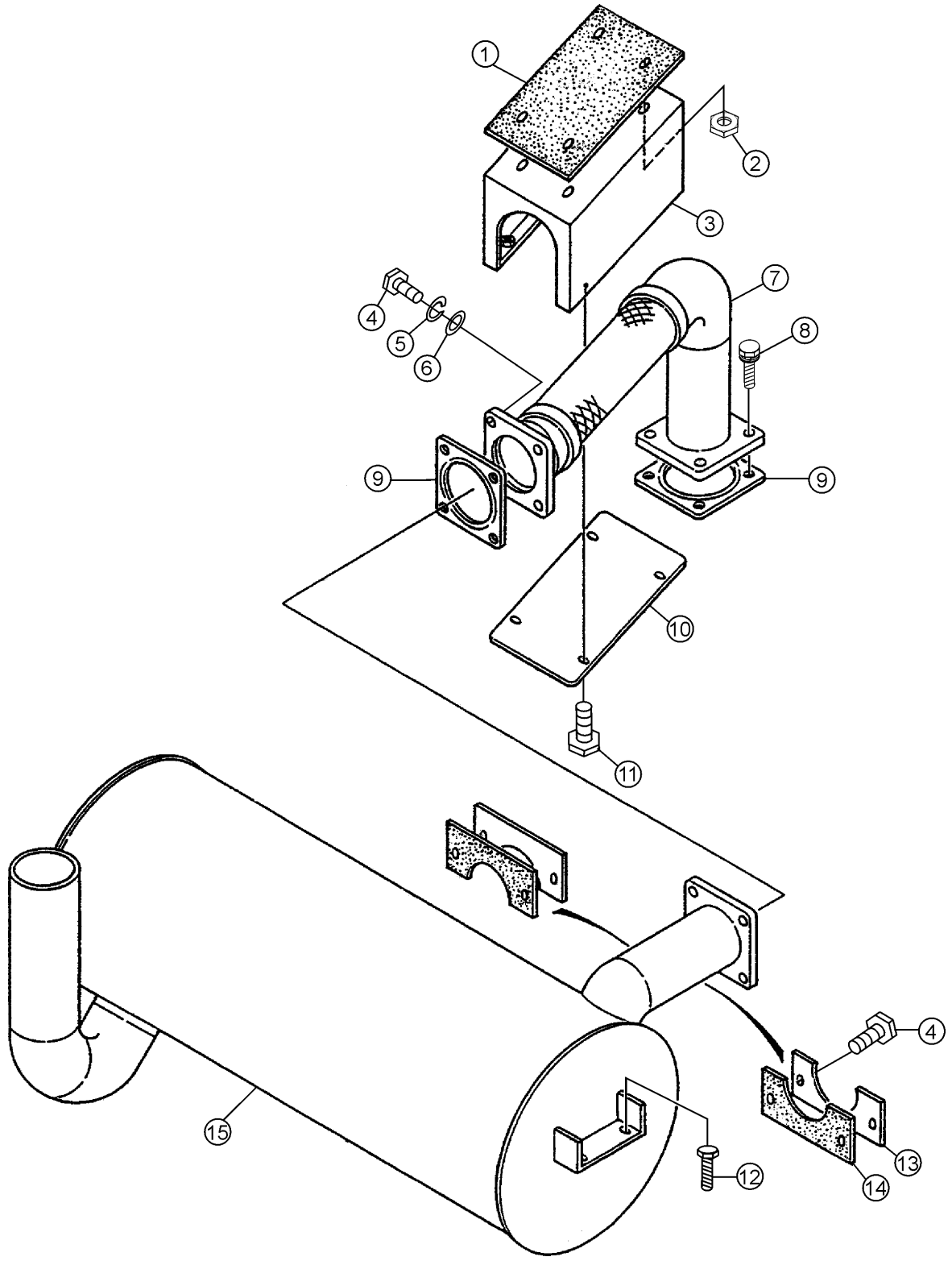
BATTERY ASSY.



BATTERY ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	0602220203	BATTERY SENSOR	1	AISP
2	8302265104	BATTERY CABLE	1	
3	8302265704	BATTERY CABLE	1	
4	0845041304	TERMINAL CAP (-)	2	
5	0010010030	HEX. HEAD BOLT	4	
6	0030010000	HEX. NUT	4	
7	8302265304	BATTERY CABLE	1	
8	0040512000	TOOTHED WASHER	1	
9	0041212000	PLAIN WASHER	1	
10	0040012000	LOCK WASHER	1	
11	00100-12025	HEX. HEAD BOLT	1	
12	83022-65504	BATTERY CABLE	1	
13	C0347200104	EARTH CABLE	1	
14	0805000904	BATTERY BAND	2	
15	0037808000	WING NUT	4	
16	0040008000	LOCK WASHER	4	
17	0041208000	PLAIN WASHER	4	
18	0165511551	BATTERY	2	REPLACES 0168511551
19	0805000804	BATTERY SHEET	2	
20	0845040414	TERMINAL CAP (+)	2	
21	0805002904	BATTERY BOLT	4	

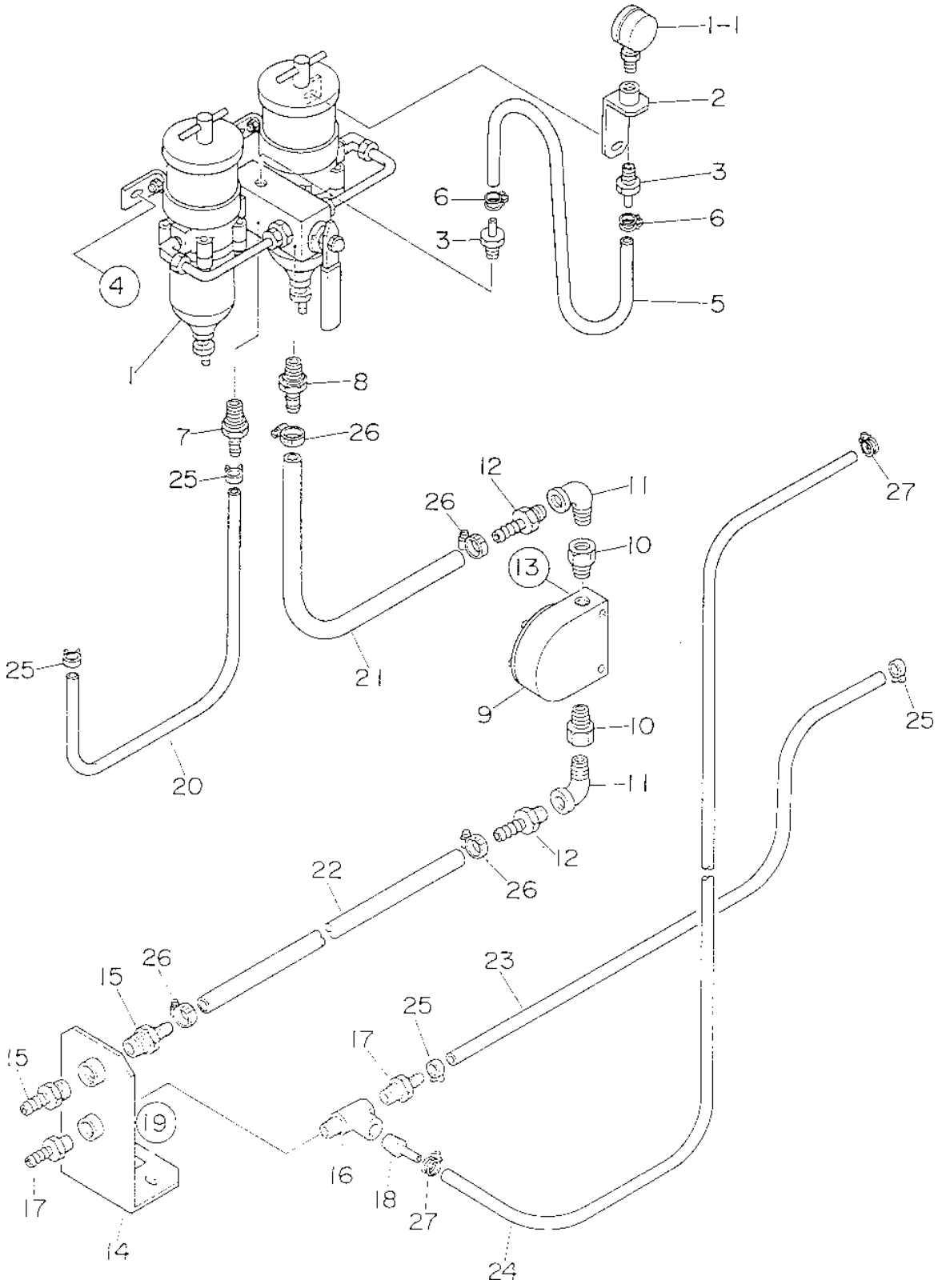
MUFFLER ASSY.



MUFFLER ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	C0334200204	SHEET	1	
2	0207308000	HEX. NUT	4	
3	C0331400104	COVER, EXHAUST PIPE	1	
4	0010112050	HEX. HEAD BOLT	4	
5	0030012000	HEX. NUT	8	
6	0041212000	PLAIN WASHER	16	
7	C0334000003	EXHAUST PIPE	1	
8	0012112045	HEX. HEAD BOLT	4	
9	6150115751	GASKET	2	REPLACES 0602320142
10	C0331400003	COVER, EXHAUST PIPE	1	
11	0017108020	HEX. HEAD BOLT	8	
12	0017110025	HEX. HEAD BOLT	4	
13	8252354004	COVER	2	
14	C0334200104	SHEET	2	
15	C0331100302	MUFFLER	1	

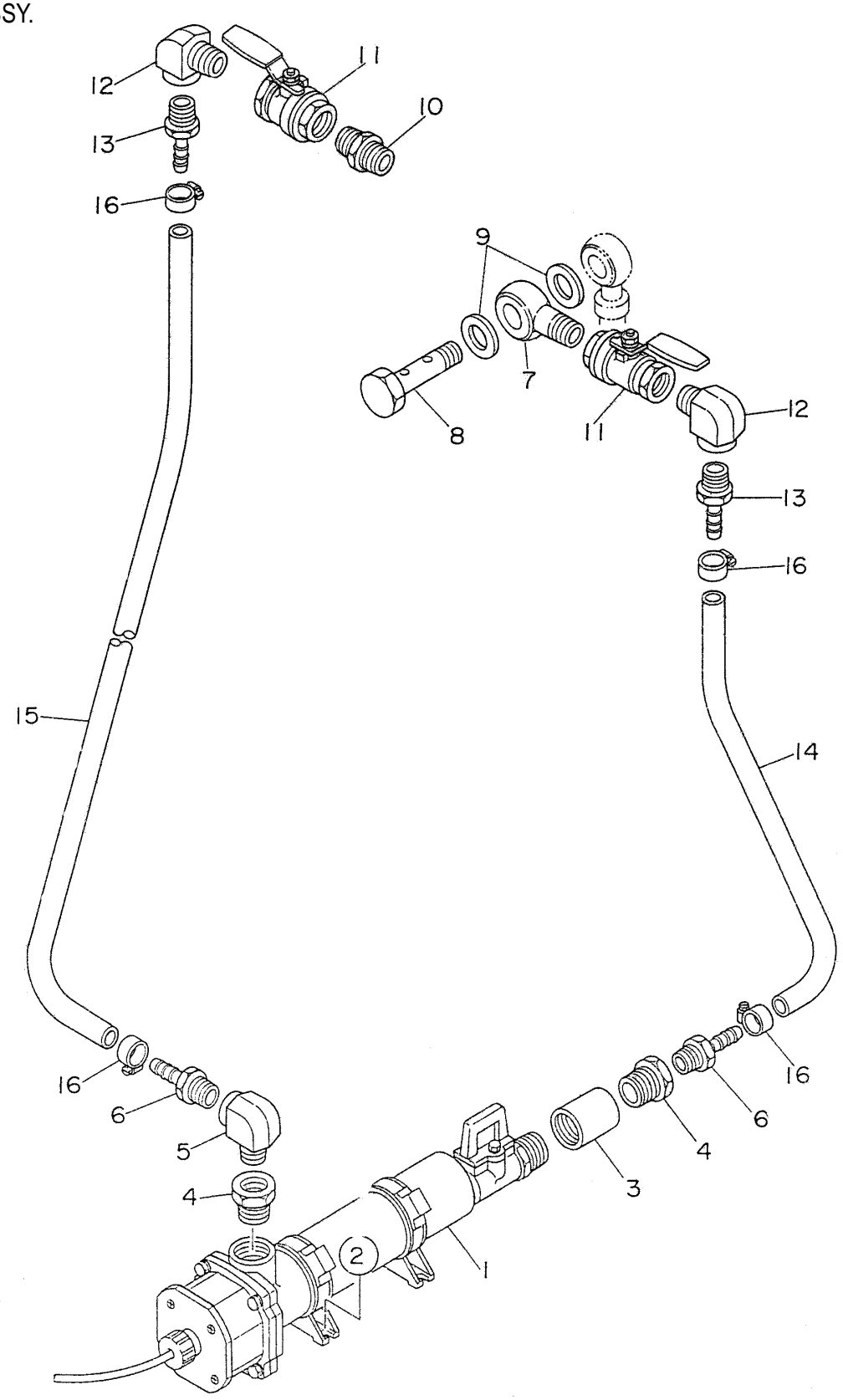
FUEL-WATER SEPARATOR ASSY.



FUEL-WATER SEPARATOR ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	75500FGX	WATER SEPARATOR	1	REPLACES 0602042270 INCLUDES ITEM W/*
	R2010PMOR	RACOR FILTER	2	
1-1*	RK19476	PRESSURE GAUGE	1	REPLACES 0602130190
2	C0368700004	BRACKET, PRESSURE GAUGE	1	
3	C9202000604	HOSE JOINT	2	
4	0017108020	HEX. HEAD BOLT	4	
5	0191000620	HOSE	1	
6	0605515013	HOSE BAND	2	
7	91108H6	HOSE JOINT	1	REPLACES 0602022787
8	91108H10	HOSE JOINT	1	REPLACES 0602022786
9	LGX500	FUEL CONDITIONER	1	REPLACES 0602042490
10	C9202000304	ADAPTER	2	
11	0130206000	STREET ELBOW, 1/2	2	
12	0602022293	HOSE JOINT	2	
13	0017106040	HEX. HEAD BOLT	2	
14	C4368700104	BRACKET	1	
15	0602022284	HOSE JOINT	2	
16	0130506000	SERVICE T , 1/2	1	
17	0602022203	HOSE JOINT	2	
18	6185517204	HOSE JOINT	1	
19	0017110025	HEX. HEAD BOLT	2	
20	0191300900	SUCTION HOSE	1	
21	0191500700	SUCTION HOSE	1	
22	0191502000	SUCTION HOSE	1	
23	0191301900	RETURN HOSE	1	
24	0191002550	RETURN HOSE	1	
25	0605515109	HOSE BAND	4	
26	0605515074	HOSE BAND	4	
27	0605515220	HOSE BAND	2	

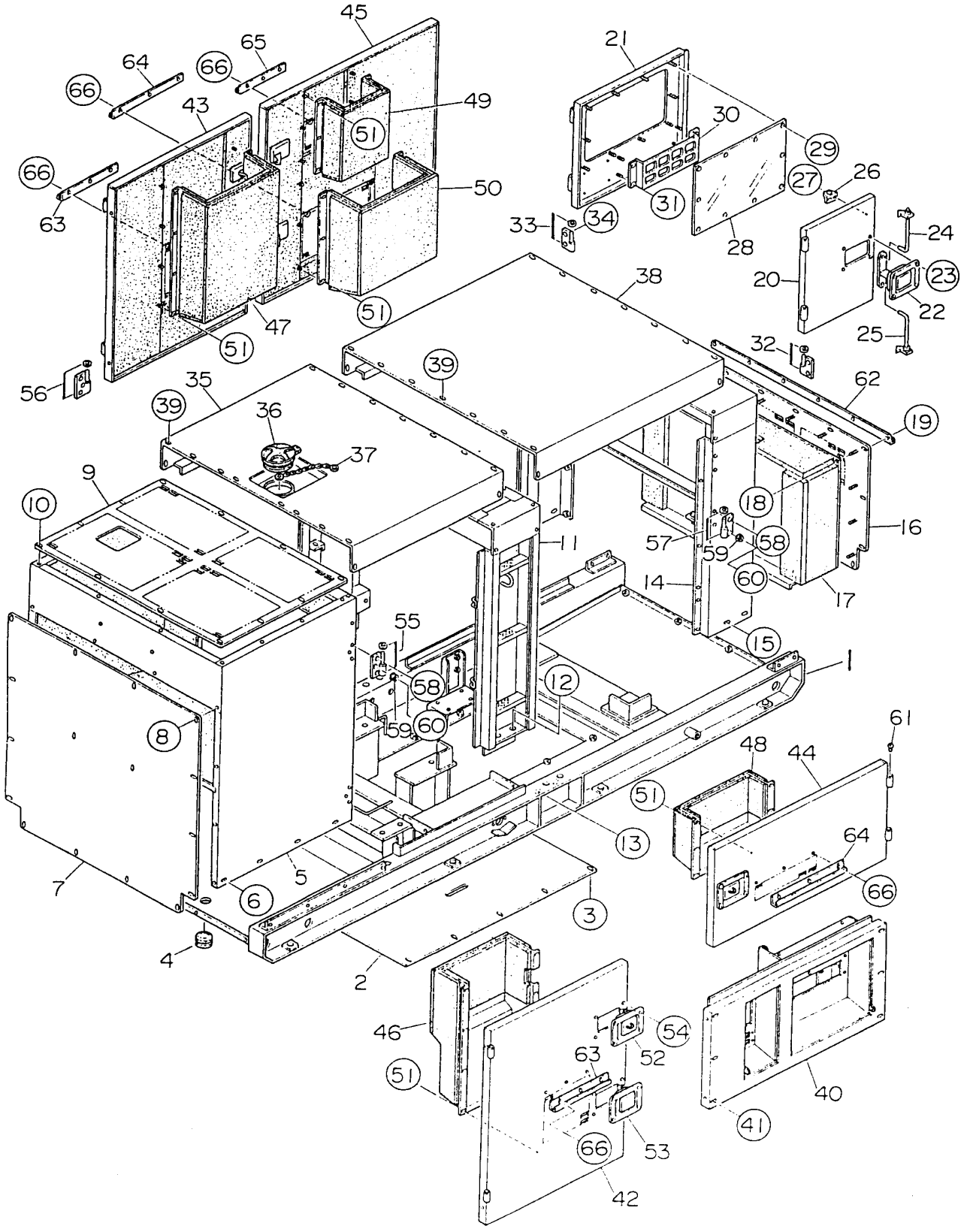
WATER HEATER ASSY.



WATER HEATER ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1	SB115110000	WATER HEATER	1	REPLACES 0602014293
2	0017106020	HEX. HEAD BOLT	4	
3	0603307690	SOCKET, NPT1	1	
4	0603306892	BUSHING, NPT1 x 3/8	2	
5	0603306293	STREET ELBOW, 3/8	1	
6	0602022292	HOSE JOINT	2	
7	6151715950	JOINT	1	REPLACES 0602022719
8	6127715710	BOLT	1	REPLACES 0602022551
9	DK0293414130	GASKET	2	REPLACES 0602021149
10	0603306910	REDUCING NIPPLE	1	
11	0603325076	VALVE, 400 3/8	2	
12	0603306223	STREET ELBOW	2	
13	0602022292	HOSE JOINT	2	
14	C0322700104	HOSE	1	
15	C0322700004	HOSE	1	
16	0605515074	HOSE BAND	4	

ENCLOSURE ASSY.



ENCLOSURE ASSY.

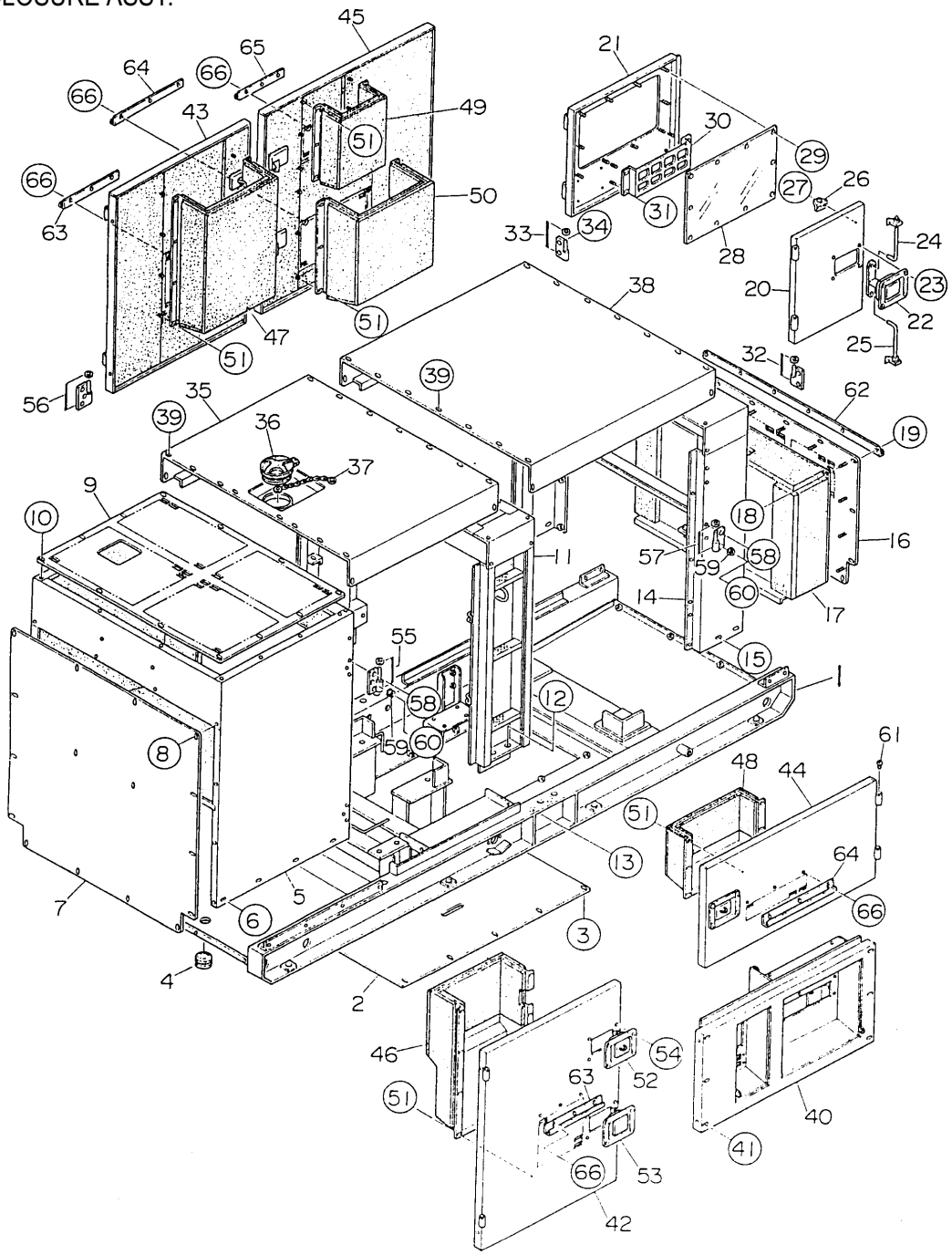
NO.	PART NO.	PART NAME	QTY.	REMARKS
1	C0415000002	BASE	1	S/N3698950 TO S/N3699209
1	C0415000012	BASE	1	S/N3699210 TO S/N3699233
2	7765116004	FLOOR PANEL	1	
3	0017108020	HEX. HEAD BOLT	10	
4	0601851733	GROMMET	2	
5	C0425000002	FRONT FRAME	1	
	C0495100003	LINING	1	
6	0017110020	HEX. HEAD BOLT	8	
7	C0424200104	COVER, FRONT FRAME	1	
	C0494100304	LINING	1	
8	0017108020	HEX. HEAD BOLT	16	
9	C042420003	COVER, FRONT FRAME	1	
10	0017108020	HEX. HEAD BOLT	12	
11	C0435000102	CENTER FRAME	1	
12	020114110	HEX. HEAD BOLT	4	REPLACES 0010114050
	030214350	HEX. NUT	4	REPLACES 0030014000
	031114260	LOCK WASHER	4	REPLACES 0040014000
	0041214000	PLAIN WASHER	8	
13	0010120045	HEX. HEAD BOLT	4	
	0030020000	HEX. NUT	4	
	004002000	LOCK WASHER	4	REPLACES 0040020000
	0041220000	PLAIN WASHER	8	
14	C0444000302	REAR FRAME	1	
	C0494300504	LINING	2	
15	0017110020	HEX. HEAD BOLT	4	
16	C0444300704	COVER, REAR FRAME	1	
17	C0454300803	DUCT	1	
	C0494600403	LINING	1	
18	0207008000	HEX. NUT	12	
19	0017108020	HEX. HEAD BOLT	14	
20	8155143703	DOOR, REAR FRAME	1	
21	C0444200413	DOOR, REAR FRAME	1	
22	B91140000102	DOOR HANDLE	1	
23	0021806015	MACHINE SCREW	4	S/N3698950 TO S/N3699209
23	0021806016	MACHINE SCREW	4	S/N3699210 TO S/N3699233
24	8255146104	DOOR ROD	1	
25	8255146204	DOOR ROD	1	
26	0845050704	STAY	4	
27	0207006000	HEX. NUT	8	
28	8165157004	WINDOW PLATE	1	
29	0207306000	HEX. NUT	10	
30	B9114500104	DOOR POCKET	1	
31	0207006000	HEX. NUT	4	
32	M9110100204	HINGE	2	REPLACES 0845047104
	0845045004	WASHER	2	
33	0845047204	HINGE	2	
	0845045004	WASHER	2	
34	0019208020	HEX. HEAD BOLT	6	

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

MQW- WHITE
MQG-GREY

THE SERIAL NUMBER MAY BE REQUIRED.

ENCLOSURE ASSY.



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

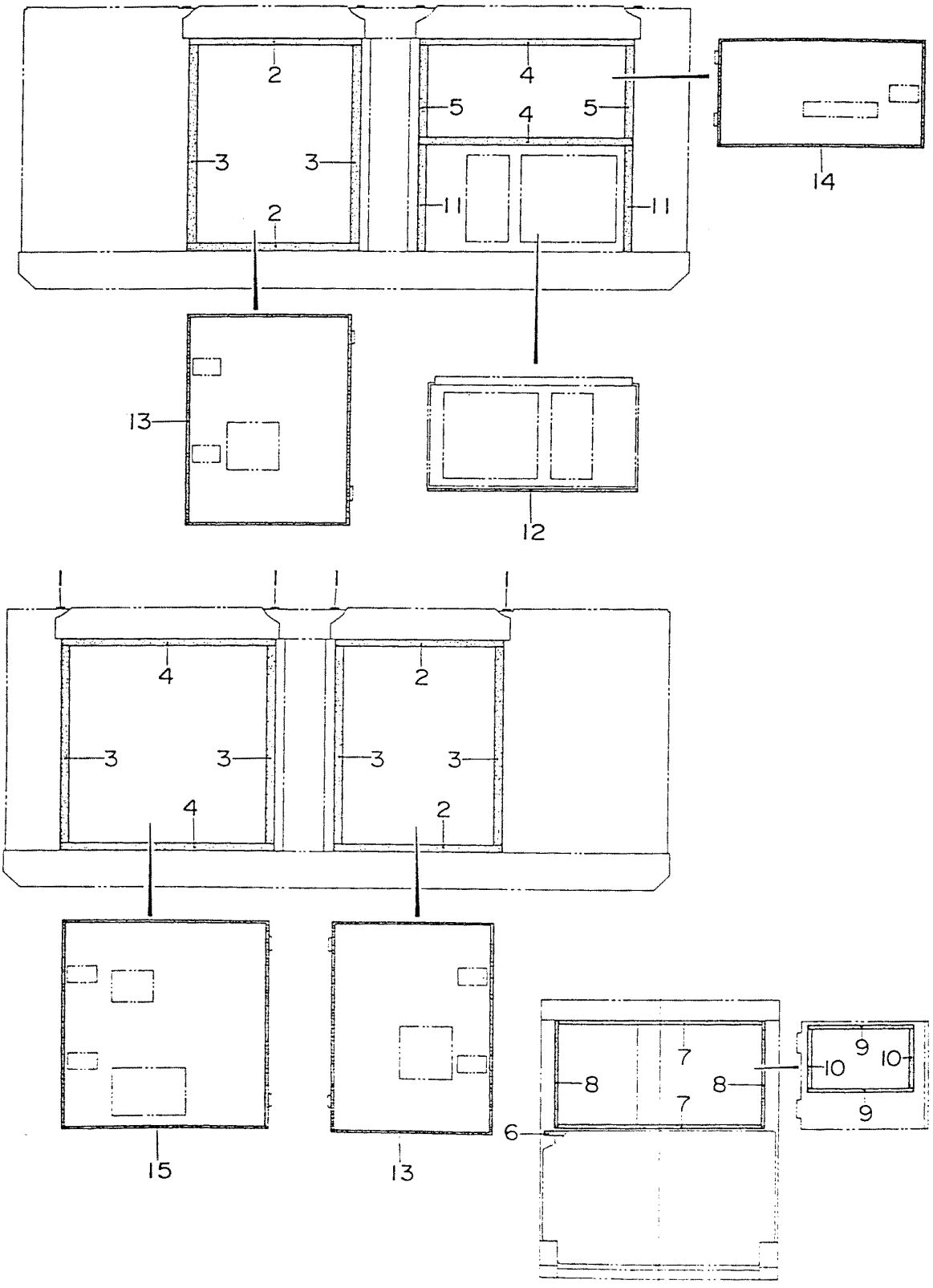
MQW- WHITE
MQG-GREY

THE SERIAL NUMBER MAY BE REQUIRED.

ENCLOSURE ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
35	C0464100503	ROOF PANEL	1	
	C494501604	LINING	1	
36	0845052203	FILLER COVER	1	
37	1625165204	CHAIN	1	
38	C0464200003	ROOF PANEL	1	
	C494500504	LINING	1	
39	0017108020	HEX. HEAD BOLT	37	
	0044508019	SEAL WASHER	37	S/N3699210 TOS/N3699233
40	C0455200002	SPLASHER PANEL	1	
41	0017108070	HEX. HEAD BOLT	6	
	0044508019	SEAL WASHER	6	S/N3699210 TO S/N3699233
42	C454002003	SIDE DOOR	1	S/N 3698950 TO S/N3699209
42	C455001003	SIDE DOOR	1	S/N3699210 TO S/N3699233
	C0494403004	LINING	1	
43	C0454001103	SIDE DOOR	1	S/N3698950 TO S/N3699209
43	C0455001103	SIDE DOOR	1	S/N3699210 TO S/N3699233
	C0494404104	LINING	1	
44	C0454002903	SIDE DOOR	1	S/N3698950 TO S/N3699209
44	C0455001203	SIDE DOOR	1	S/N3699210 TO S/N3699233
	C0494404204	LINING	1	
45	C0454003003	SIDE DOOR	1	S/N3698950 TO S/N3699209
45	C0455001303	SIDE DOOR	1	S/N3699210 TO S/N3699233
46	C0454300904	DUCT	1	
	C0494600704	LINING	1	
47	C0454301404	DUCT	1	
	C0494600304	LINING	1	
48	C0454301704	DUCT	1	
	C0494601004	LINING	1	
49	C0454301004	DUCT	1	
	C0494600804	LINING	1	
50	C0454301804	DUCT	1	
	C0494601104	LINING	1	
51	0207008000	HEX. NUT	39	
52	B9114000002	DOOR HANDLE	4	
	C9312500004	RUBBER SEAL	4	S/N3699210 TO S/N3699233
53	0825007362	DOOR HANDLE	3	
	C9312500004	RUBBER SEAL	3	S/N3699210 TO S/N3699233
54	0021806015	MACHINE SCREW	28	S/N3698950 TO S/N3699209
54	0021806016	MACHINE SCREW	28	S/N3699210 TO S/N3699233
55	0845046904	HINGE	4	
	0845045004	WASHER	4	
56	0845047004	HINGE	2	
	0845045004	WASHER	2	
57	M9110100304	HINGE	2	REPLACES 0845047204
	0845045004	WASHER	2	
58	0019208020	HEX. HEAD BOLT	14	
59	0601850097	STOPPER	10	
60	0021008025	MACHINE SCREW	10	S/N3698950 TO S/N3699209
60	0025008025	MACHINE SCREW	10	S/N3699210 TO S/N3699233
61	0845031504	CAP	12	
62	C045500104	COVER BRACKET	1	S/N3699210 TO S/N3699233
63	C0455600204	DOOR BRACKET	2	S/N3699210 TO S/N3699233
64	C0455600004	DOOR BRACKET	2	S/N3699210 TO S/N3699233
65	C0455600104	DOOR BRACKET	1	S/N3699210 TO S/N3699233
66	0021906016	MACHINE SCREW	15	S/N3699210 TO S/N3699233

RUBBER SEALS ASSY.

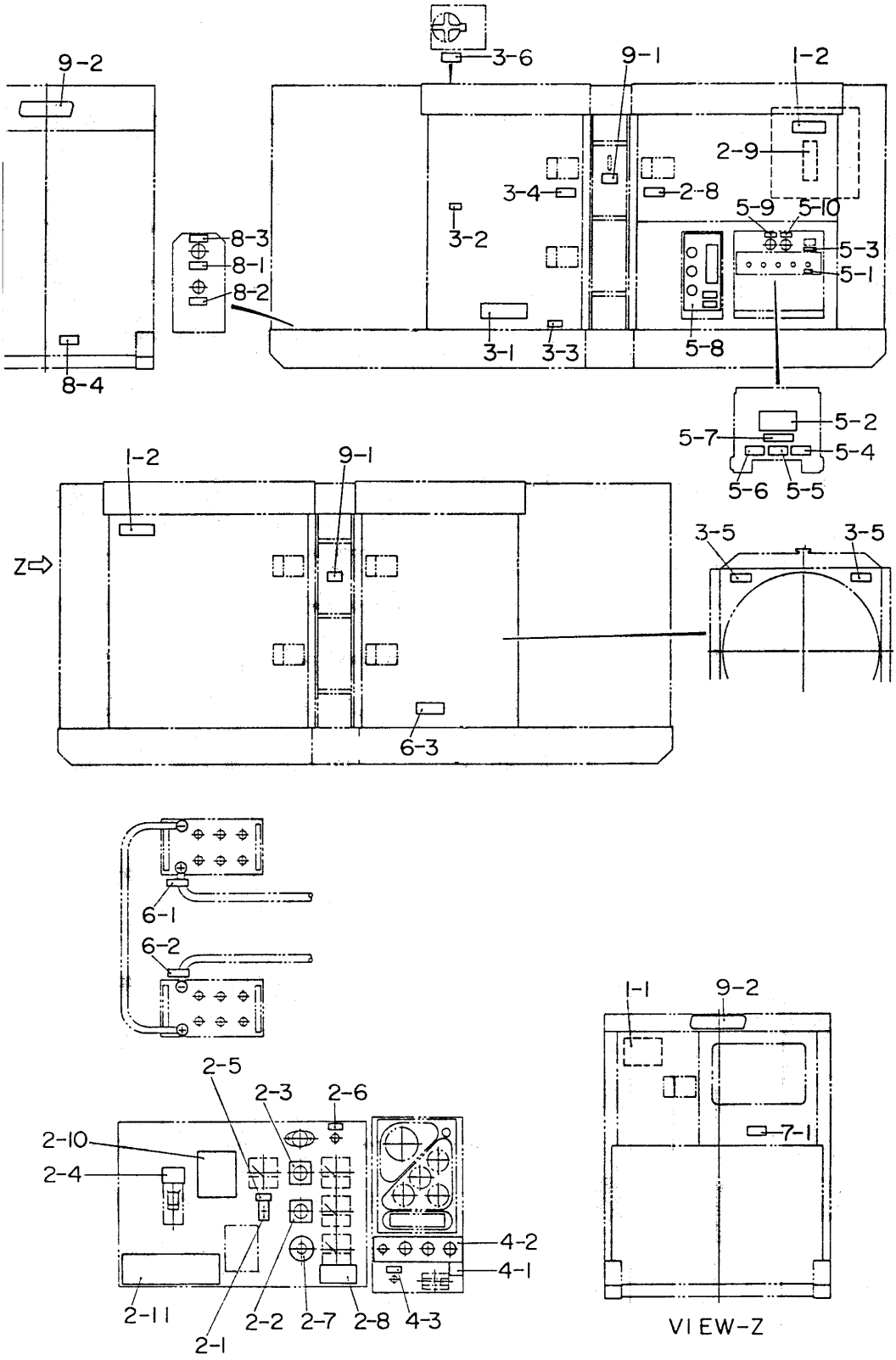


DCA-180SSK — ENCLOSURE ASSY. (RUBBER SEALS)

RUBBER SEALS ASSY.

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	0229201200	RUBBER SEAL	4	
2	0228900840	RUBBER SEAL	4	
3	0228901080	RUBBER SEAL	6	
4	0228901070	RUBBER SEAL	4	
5	0228900520	RUBBER SEAL	2	
6	0229201100	RUBBER SEAL	1	
7	0228801040	RUBBER SEAL	2	
8	0221200600	RUBBER SEAL	2	
9	0228100540	RUBBER SEAL	2	
10	0228100320	RUBBER SEAL	2	
11	0229200560	RUBBER SEAL	2	S/N3699210 TO S/N3699233
12	0229201060	RUBBER SEAL	1	S/N3699210 TO S/N3699233
13	0226903880	RUBBER SEAL	2	S/N3699210 TO S/N3699233
14	0226903220	RUBBER SEAL	1	S/N3699210 TO S/N3699233
15	0226904340	RUBBER SEAL	1	S/N3699210 TO S/N3699233

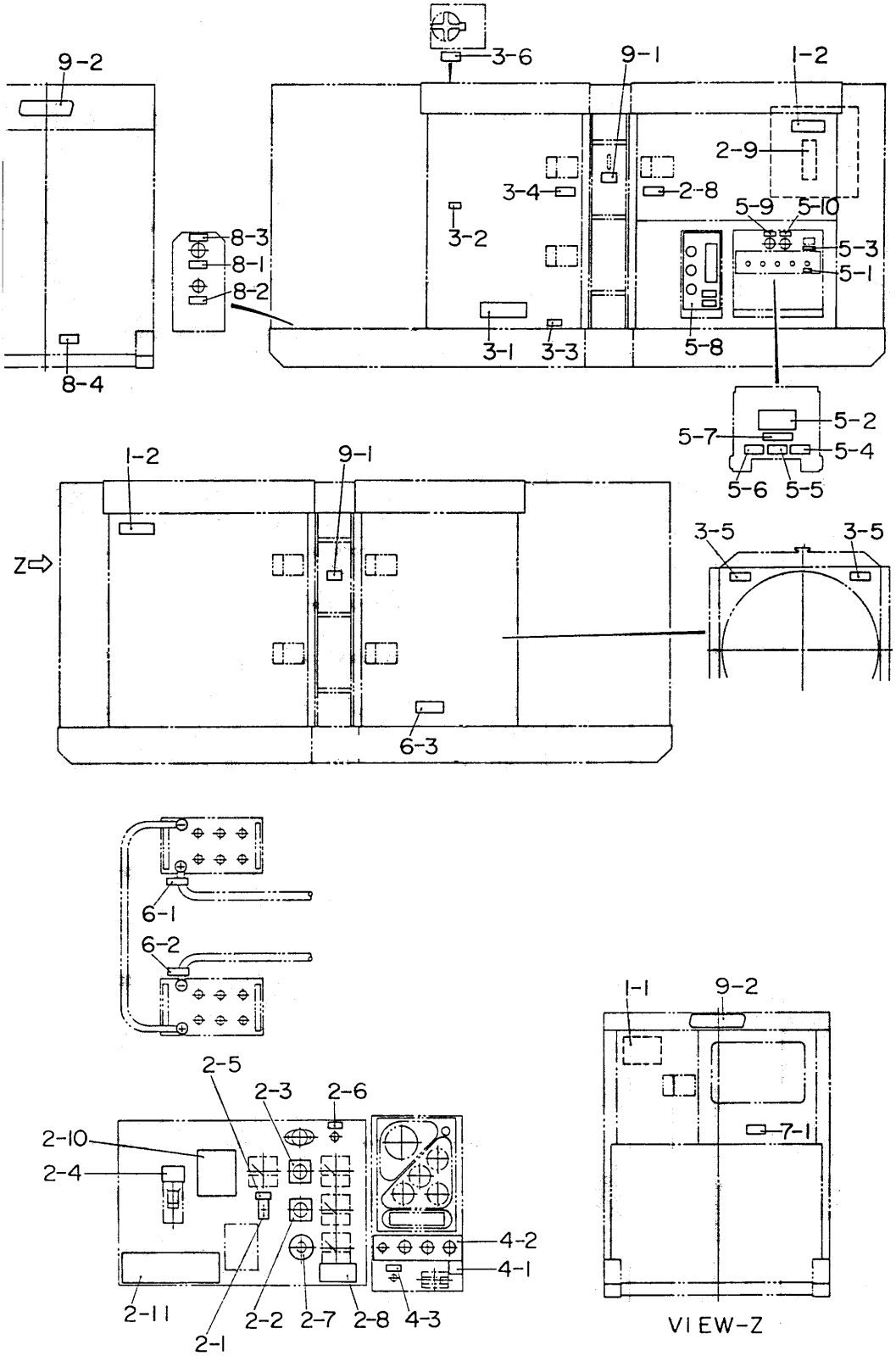
NAME PLATE AND DECALS



NAMEPLATE ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1-1	C1552000403	DECAL; HANDLING PROCEDURES	1	C15200040
1-2	B1552000103	DECAL; CAUTION	2	B15200010
		CONTROL BOX GROUP		
2-1	0800520100	DECAL; ON-OFF	1	AT-202
2-2	0800520904	PLATE; AMMETER CHANGE-OVER SWITCH	1	N-2438
2-3	0800520814	PLATE; VOLTMETER CHANGE-OVER SWITCH	1	N-2439
2-4	0840624504	DECAL; CIRCUIT BREAKER	1	S-3031
2-5	0840624604	DECAL; PANEL LIGHT SWITCH	1	S-3032
2-6	0840624704	DECAL; PILOT LAMP	1	S-3033
2-7	0840624804	DECAL; VOLTAGE REGULATOR	1	S-3034
2-8	B9531100604	DECAL; WARNING ELECTRIC SHOCK HAZARD	2	B93110060
2-9	C0551000903	DECAL; SETTING FOR OUTPUT VOLTAGE	1	C05100090
2-10	C2551000004	DECAL; SAFETY INSTRUCTIONS	1	C25100000
2-11	C0561103403	DECAL; WHISPERWATT 180	1	C06110340
		ENGINE & RADIATOR GROUP		
3-1	1320610603	DECAL; WATER-OIL	1	S-1760
3-2	6360610304	DECAL; WATER	1	S-1880
3-3	6360620204	DECAL; OIL DRAIN PLUG	1	S-1885
3-4	B9504000304	DECAL; CAUTION HOT PARTS	1	B90400030
3-5	B9504000404	DECAL; WARNING MOVING PARTS	2	B90400040
3-6	B9504100104	DECAL; WARNING HOT COOLANT	1	B90410010
3-7	C9542200104	DECAL; BLOW-BY OIL MIST DRAIN DAILY	1	C94220000
3-8	C9542200104	DECAL; BLOW-BY OIL MIST TANK	1	C94220010
3-9	C9542200204	DECAL; INLET	1	C94220020
		ENGINE OPERATING PANEL GROUP		
4-1	C0551000504	DECAL; BATTERY SWITCH	1	C05100050
4-2	C1552000013	DECAL; OPERATING PANEL	1	C15200001
4-3	C1552000104	DECAL; FUEL LEAK DETECTED	1	C15200010

NAME PLATE AND DECALS



NAME PLATE AND DECALS

NO	PART NO	PART NAME	QTY.	REMARKS
		OUTPUT TERMINAL GROUP		
5-1	0840614104	DECAL; GROUND	1	S-2635
5-2	0840619904	DECAL; DANGER HIGH VOLTAGE	1	S-2731
5-3	9039209064	DECAL; START CONTACT	1	S-4468
5-4	B9511100304	DECAL; WARNING	1	B91110030
5-5	B9511100404	DECAL; WARNING ELECTRIC SHOCK HAZARD	1	B91110040
5-6	B9531100504	DECAL; WARNING ELECTRIC SHOCK HAZARD	1	B93110050
5-7	C0551000404	DECAL; 3-PHASE OUTPUT TERMINAL	1	C05100040
5-8	C0551001503	DECAL; RECEPTACLE & CIRCUIT BREAKER	1	C05100150
5-9	C1552000204	DECAL; WATER HEATER	1	C15200020
5-10	C1552000304	DECAL; BATTERY CHARGER	1	C15200030
		BATTERY GROUP		
6-1	0800689404	DECAL; +	1	S-2090
6-2	0800689504	DECAL; -	1	S-2091
6-3	C9505300004	DECAL; CAUTION	1	C90530000
		MUFFLER GROUP		
7-1	B9504200004	DECAL; WARNING ENGINE EXHAUST	1	B90420000
		FUEL PIPING GROUP		
8-1	0800688404	DECAL; FUEL INLET	1	S-1344
8-2	0800688504	DECAL; FUEL OUTLET	1	S-1345
8-3	1320620904	DECAL; DIESEL FUEL	1	S-1756
8-4	B9504500004	DECAL; WARNING DIESEL FUEL	1	B90450000
		BONNET GROUP		
9-1	1320621504	DECAL; SUPPORT HOOK	2	S-2257
9-2	0600500090	EMBLEM	2	
	0021106016	MACHINE SCREW	4	

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 Muiltiquip part numbers clearly marked.
6. The following items are not returnable:
    a. Obsolete parts. (If an item is listed in the parts price book 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 5 working days from notification, pending instructions. If a reply is not received within 5 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 $20.00 to $50.00 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. A part 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

PARTS AND OPERATION MANUAL

HERE'S HOW TO GET HELP

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

PARTS DEPARTMENT
800/427-1244 or 310/537-3700
FAX: 800/672-7877 or 310/637-3284

SERVICE DEPARTMENT
800/835-2551 or 310/537-3700
FAX: 310/638-8046

WARRANTY DEPARTMENT
800/835-2551 or 310/537-3700
FAX: 310/638-8046

MAIN
800/421-1244 or 310/537-3700
FAX: 310 - 537-3927

Manufactured for Multiquip Inc.
by
DENYO MANUFACTURING CO., USA

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WWW: multiquip.com

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