OPERATOR MANUAL

Gasoline Generator

Promate®

PM 15000 ES-R

IMPORTANT – Please make certain that persons who are to use this equipment thoroughly read and understand these instructions and any additional instructions provided prior to operation.

Record the model and serial numbers of your Generator below:

Model No. _____ Serial No. _____

Thank you for purchasing a power generator.

This manual covers operation and maintenance of your generators. All information in this publication is based on the latest production information available at the time of approval for printing.

Pay special attention to statements preceded by the following words:

⚠ WARNING

Indicates a strong possibility of severe personal injury, loss of life and equipment damage if instructions are not followed.

[CAUTION]

Indicates a possibility of personal injury, or equipment damage if instructions are not followed.

NOTE:

Gives helpful information.

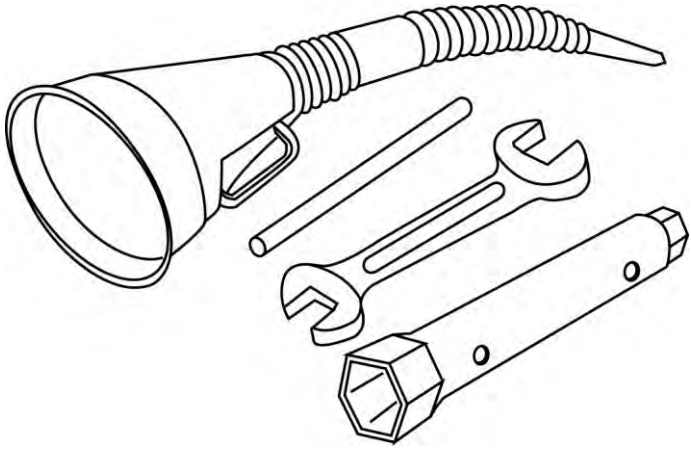
If a problem should arise, or if you have any questions about the generator, consult an dealer selling our generator.

⚠ WARNING

- The generator is designed to give safe and dependable service If operated according to instructions.
- Do not operate the generator before you have read and understood the instructions. Failure to do so could result in personal Injury or equipment damage.

Check the accessories coming with yourgenerator

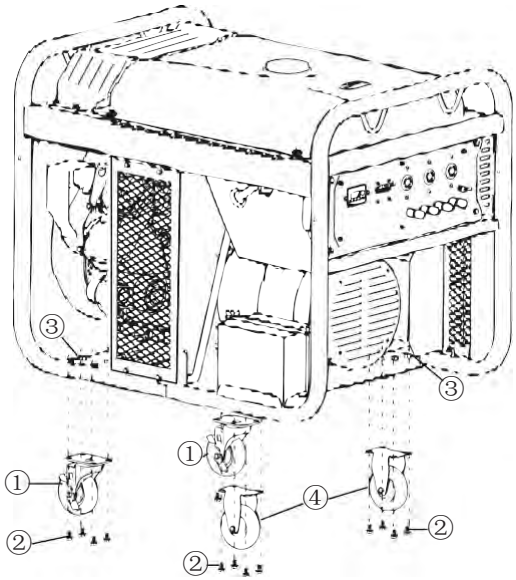
(1)Owner'smanual
(2)Wheel kits (3)Servicing
tools (4)Battery



Be sure to replenish with engine oil.
(See page 09 for details)

INSTALL THE WHEELS:

A. Installing 4 wheel kits

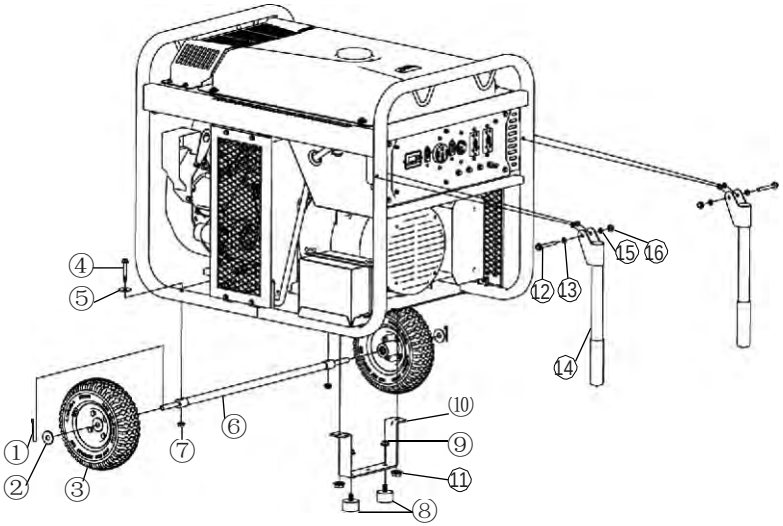


a. Raise the generator,with hoist or with square bar .

b. Assemble 2 self-lock universal wheels① to bottom cross bar ③(engine side) withscrews②.

c. Assemble 2 normal wheels④ to bottom cross bar③(alternator side) with screws②.

B. Installing 2 wheel kit (optional)



a. Assemble the rubber absorber ⑧ to the leg ⑩ by the nut ⑨.

b. Raise the generator with hoist or square bar

c. Remove the nuts ⑪ under the alternator and assemble the leg ⑩ to bottom crossbar with the nuts ⑪.

d. Assemble the wheel shaft ⑥ to the frame with ④ ⑤ ⑦.

e. Assemble the wheels ③ to the shaft ⑥ by ② ①.

f. Bend the clip to lock the wheel.

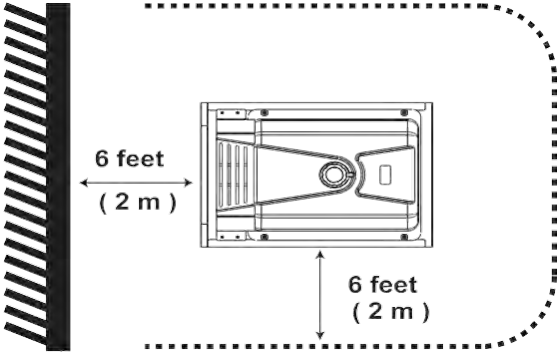
Contents

1. SAFETY PRECAUTIONS

⚠ Do not operate the generator near gasoline or gaseous fuel because of the potential danger of explosion or fire.
Do not fill the fuel tank with fuel while the engine is running.
Do not smoke or use open flame near the fuel tank. Be careful not to spill fuel during refueling. If fuel is spilt, wipe it off and let dry before starting the engine.

⚠ Do not place inflammables near the generator.
Be careful not to place fuel, matches, gunpowder, oily cloths, straw, trash, or any other inflammables near the generator.

⚠ Do not operate the generator inside a room, cave, tunnel, or other insufficiently ventilated area. Always operate it in a well-ventilated area, otherwise the engine may become overheated and the poisonous carbon monoxide gas contained in the exhaust gases will endanger human lives. Keep the generator at least 2 meter (6 feet) away from any structure or building during use.
If the generator must be used indoors, the area must be well-ventilated and extreme caution must be taken regarding the discharge of exhaust gases.



⚠ Do not enclose the generator nor cover it with a box.

The generator has a built-in forced air cooling system, and may become overheated if it is enclosed. If generator has been covered to protect it from the weather during non use, be sure to remove it and keep it well away from the area during generator use.

⚠ Operate the generator on a level surface.
it is not necessary to prepare a special foundation for the generator. However, the generator will vibrate on an irregular surface, so choose a level place without surface irregularities.
If the generator is tilted or moved during operation, fuel may spill and/or the generator may tip over, causing a hazardous situation.
Proper lubrication cannot be expected if the generator is operated on a steep incline or slope. In such a case, piston seizure may occur even if the oil is above the upper level

⚠ Pay attention to the wiring or extension cords from the generator to the connected device.
If the wire is under the generator or in contact with a vibrating part, it may break and possibly cause a fire, generator burnout, or electric shock hazard. Replace damaged or worn cords immediately.

⚠ Do not operate in rain, in wet or damp conditions, or with wet hands.
The operator may suffer severe electric shock it the generator is wet due to rain or snow.

⚠ If wet, wipe and dry it well before starting. Do not pour water directly over the generator, nor wash it with water.

⚠ Be extremely careful that all necessary electrical grounding procedures are followed during each and every use. Failure to do so can be fatal.

⚠ Do not contact the generator to a commercial power line. Connection to a commercial power line may short circuit the generator and ruin it or cause electric shock hazard. Use the transfer switch for connecting to domestic circuit.

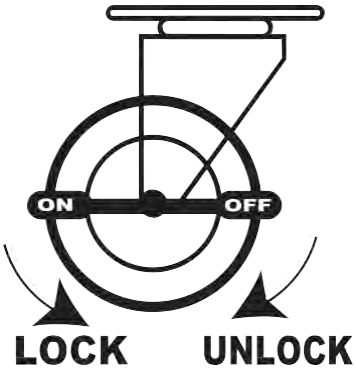
⚠ No smoking while handling the battery. The battery emits flammable hydrogen gas, which can explode if exposed to electric arcing or open flame. Keep the area well-ventilated and keep open flames/sparks away when handling the battery.

⚠ Engine becomes extremely hot during and for some time after operation. Keep combustible materials well away from generator area.
Be very careful net to touch any parts of the hot engine especially the muffler area or serious burns may result.

⚠ Keep children and all bystanders at a safe distance from work areas.

⚠ It is absolutely essential that you know the safe and proper use of the power tool or appliance that you intend to use. All operators must read, understand and follow the tool/appliance owners manual. Tool and appliance applications and limitations must be understood. Follow all directions given on labels and warnings. Keep all instruction manuals and literature in a safe place for future reference.

Notes on Installation



1. Always be sure to place the generator on a level surface, locking the wheel with the stopper and/or chocking the wheels.
2. Select a place which allows you to maintain and inspect the generator, which is net exposed to contamination caused by exhaust gas.
   If you are planning to install the generator without its wheels attached, consider the work efficiency in terms of an oil change.
3. In ground connection, be sure to use the designated ground terminal. (A grounding cable is not included in the set of accessories.)
4. During use, be sure not to disconnect the battery.
5. While the power is on, do not unplug the unit or disconnect cables from the terminals.

Safety symbols

1. Precautions that involve your safety

2. Start and run the generator outdoors. Do not run the generator in an enclosed area, even if doors or windows are open.

3. To reduce the risk of serious injury, avoid attempting to touch the hot surface.

4. Units should not be operated or stored in wet or damp conditions or on highly conductive locations such as metal decking and steel work.

5. Could not use under the rain.

6. Fuel and its vapors are extremely flammable and explosive. Fire or explosion can cause severe burns or death.

7. Ear protection.

8. Read carefully and understand operator manual prior to operation of this product. Follow all warnings and instructions.

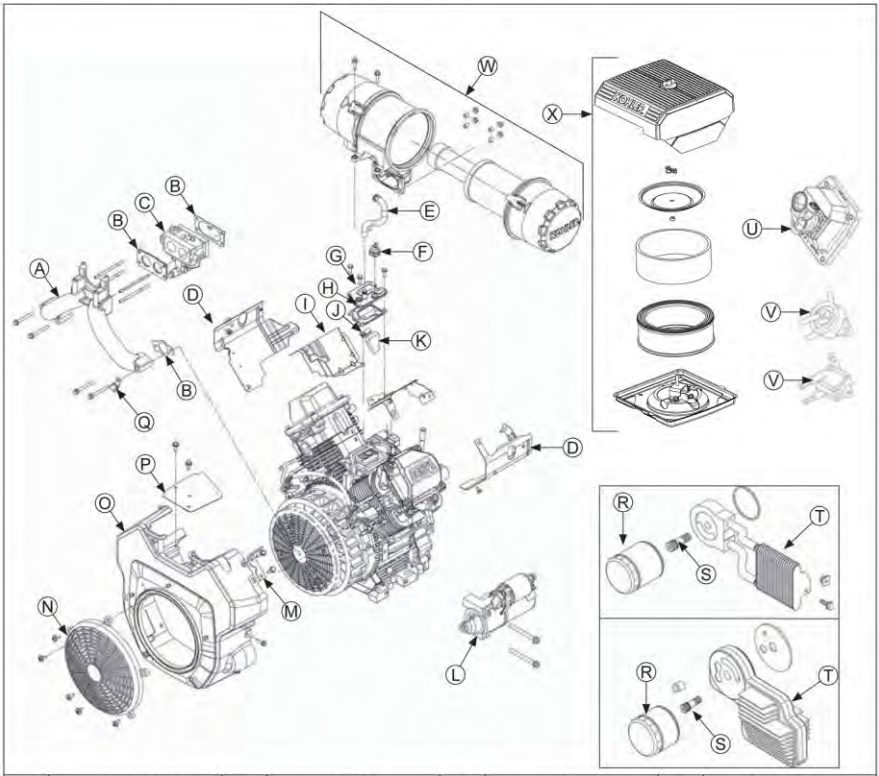
2 . SPECIFICATIONS

	Model	PM15000ES-R
Generator	Rated AC Output	12.0 kW@60HZ
	Surge AC Output	15.0 kW@60HZ
	Rated AC Voltage	120 V/240 V
	Phase	Single Phase
	Voltage regulator	AVR
	Power Factor	1
	Engine Model	KOHLER CH730
	Engine Type	Air cooling,4-stroke,V-twin cylinder,OHV
	Displacement	725cc
	Maximum output	23.5HP@3600rpm
	Ignition System	Flywheel Magneto
	Starting System	Electric
	Fuel	Unleaded Automobile Gasoline
	Capacity Fuel Tank	10.6 US-GAL / 40L
	Lubricating Oil Capacity	0.45 US-GAL / 1.6L
	Runtime(appr.)on One Tankful @3/4 Load	6.5 h
	Sound pressure Level @7m	79.5 dB(A)
	Alternator Type	Brush
	ProtectinType	IP23
Dime-nsion	L X W X H	910X650X846mm
	Dry Weight (appr.)	167 kg

Specifications are subject to change without notice.

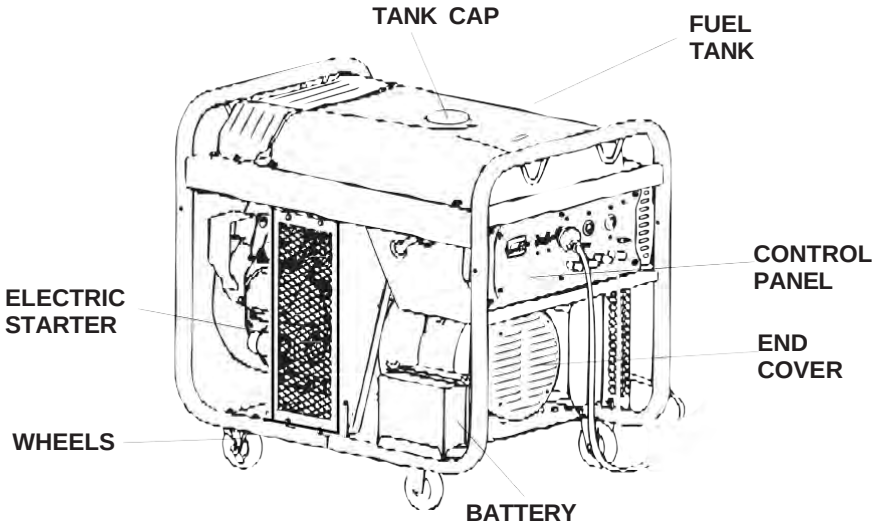
3. COMPONENTS

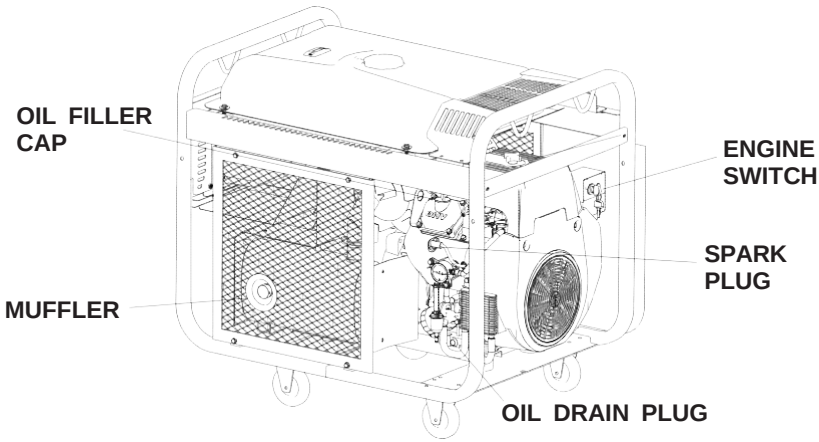
ENGINE



A	Intake Manifold	B	Gasket	C	Carburetor	D	Outer Baffle
E	Breather Tube	F	Oil Sentry™	G	Breather Cover	H	Breather Gasket
I	Inner Baffle	J	Breather Reed	K	Filter	L	Electric Starter
M	Lifting Bracket	N	Fixed Guard	O	Blower Housing	P	Debris Shield
Q	Wire Clip	R	Oil filter	S	Nipple	T	Oil Cooler
U	Valve Cover Fuel Pump	V	Pulse Fuel Pump	W	Heavy-Duty Air Cleaner	X	Low-Profile Air Cleaner

General description of generator





4. PRE-OPERATION CHECKS

4.1 CHECK ENGINE OIL

NOTE: To prevent extensive engine wear or damage, never run engine with oil level below or above operating range indicator on dipstick.

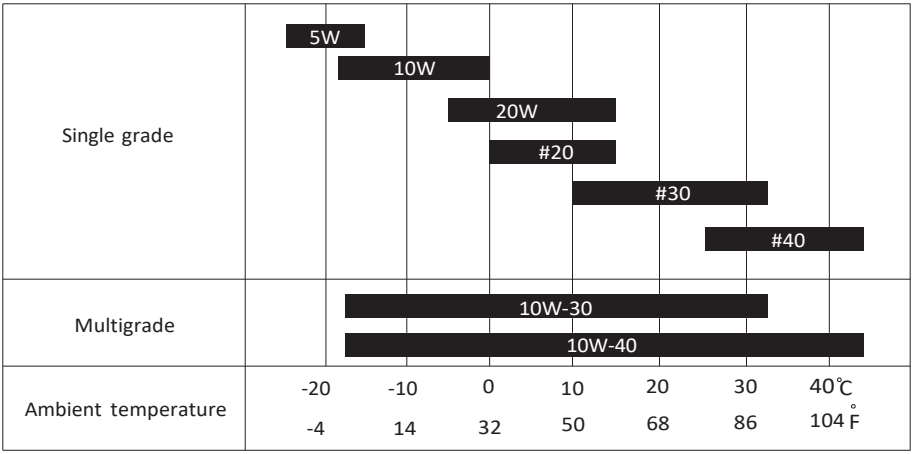
- Ensure engine is cool. Clean any debris from oil fill/dipstick areas.

1. Remove dipstick; wipe oil off.
   a. Press-in cap: reinsert dipstick into tube; press completely down.
      or
   b. Thread-on cap: reinsert dipstick into tube; rest cap on tube, do not thread cap onto tube.
2. Remove dipstick; check oil level. Level should be at top of indicator on dipstick.
3. If oil is low on indicator, add oil up to top of indicator mark.
4. Reinstall dipstick and tighten securely.

- Change oil if it is contaminated. (See "HOW TO" MAINTENANCE)
- Oil capacity: 1.6L

Recommended engine oil:

Use class "SE" (API classification) oilor a higher grade oil according to the table below. SAE 10W-30 is recommended for general, all-temperature use. If single viscosity oil is used, select the appropriate viscosity for the average temperature in your area.



4.2 CHECK ENGINE FUEL

⚠ WARNING

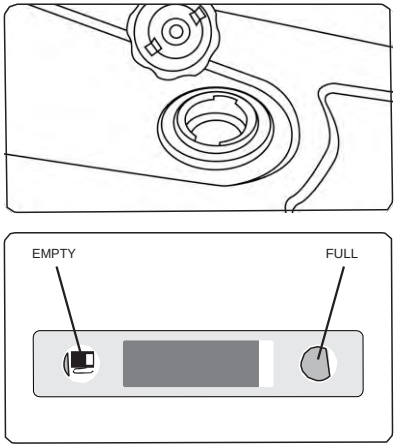
Do not refuel while smoking or near open flame or other such potential fire hazards. Otherwise fire accident may occur.

- Check fuel level at fuel gauge.
- If fuel level is low, refill with unleaded automotive gasoline.
- Be sure to use the fuel filter screen on the fuel filter neck.
- Recommended fuel:

  Unleaded automotive gasoline of octane rating RON87 or higher

- Fuel tank capacity:

  Model
  PM15000ES-R.....10.6 US-GAL/40L



NOTE:

- The full level of fuel is the upper surface of the fuel filter.
- Refuel through each filler hole alternately for easier operation. In this case, be sure to add the fuel little by little when the fuel level approaches to the full level.

Continuous operation time in normal use(75%rated load)	
PM15000ES-R	Approx. 6.5hours

⚠ WARNING

Make sure you review each warning in order to prevent fire hazard.

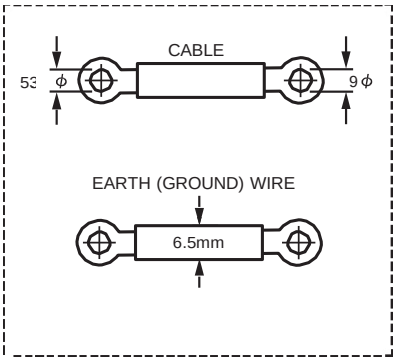
- Do not refill tank while engine is running or hot.
- Close fuel cock before refueling with fuel.
- Be careful not to admit dust, dirt, water or other foreign objects into fuel
- Wipe off spilt fuel thoroughly before starting engine.
- Keep open flames away.

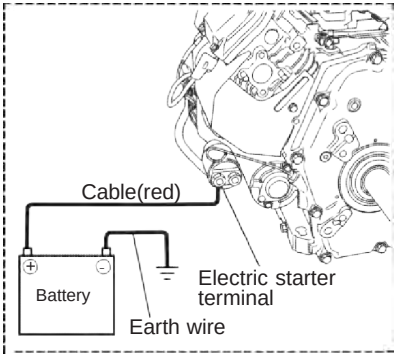
4.3BATTERY INSTALLATION

Recommended Battery
Lead-acid battery: A capacity of 12V-30A.h or larger.
For the generators used in low temperature (below -5℃),
12V-40A.h or larger battery is recommended.

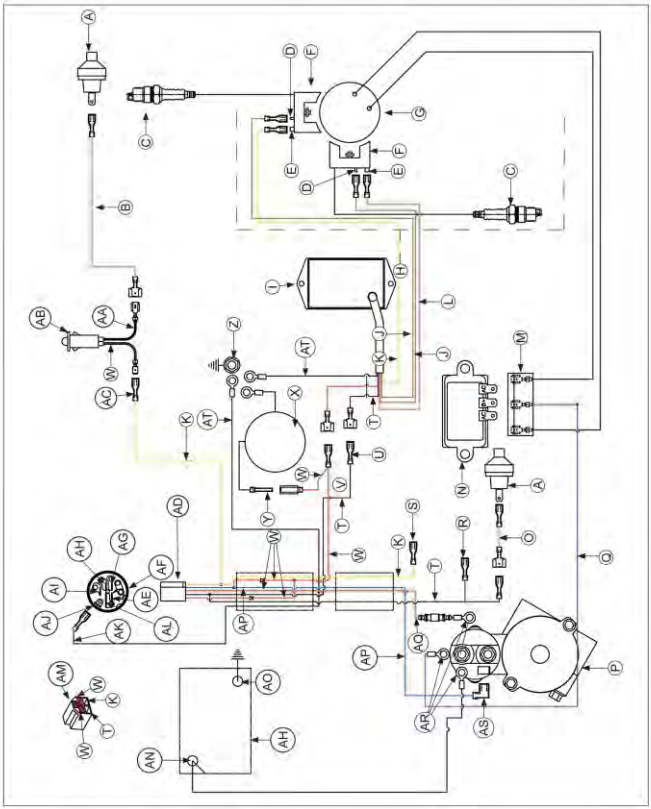
- Use a proper cable and ground wire to connect battery and keyswitch and electric starter.
- Only after checking that the engine's starter key is in the "OFF" position, securely connect the cable with a red stripe, to the positive (+) terminal. And then connect the other cable to the negative (-) terminal.

Cable with red stripe: to the (+) terminal
Cable with no stripe: to the (-) terminal





WIRING DIAGRAM



A	Oil Pressure Switch	B	Oil Sentry (Green)	C	Spark Plug(s)	D	Kill
E	Trigger	F	Ignition Module	G	Flywheel Stator Assembly	H	22, 25 HP Smart-Spark Ignition
I	Module Speed Advance 22, 25 HP	J	Brown	K	Yellow	L	Yellow on Analog SAMs Pink on Digita SAMs
M	Rectif er-Regulator Connector	N	Rectif er-Regulator	O	Oil Sentry Kill (Green)	P	Solenoid Shift Starter Assembly
Q	Violet (B+)	R	Alternate Ignition Kill (-)	S	Accessory Terminal (+)	T	White
U	Ignition Kill	V	Smart-Spark	W	Red	X	Carburetor
Y	Solenoid Lead	Z	Intake Manifold Screw	AA	Black	AB	Oil Sentry Panel Light/Remote Light
AC	Oil Sentry Light	AD	Connector	AE	Magneto	AF	Key Switch
AG	Accessory	AH	Battery	AI	Starter	AJ	Ground
AK	Key Switch Ground	AL	Rectifer	AM	Blue/Red	AN	Battery Positive
AO	Battery Negative	AP	Blue	AQ	Fuse	AR	Starter Solenoid Stud
AS	Starter Solenoid Tang	AT	Black (Ground)				

⚠ WARNING

Death, personal injury and/or property damage may occur unless instructions are followed carefully.

- Disconnect battery cables when charging battery.
- Use battery of specified capacity listed in the owner's manual.
- Turn the Starter switch to the "STOP" position when mounting or dismounting battery. Connect positive (+) terminal first when mounting battery, and disconnect negative (-) terminal first when dismounting.

  RED CABLE: To positive (+) terminal
  BLACK CABLE: To negative (-) terminal

4.4 CHECKING COMPONENTS

Check following items before starting engine:

- Fuel leakage from fuel hose, etc.
- Bolt sand nuts for looseness.
- Components for damage or breakage.
- Generator not resting on or against any adjacent wiring.

4.5 CHECKING GENERATOR SURROUNDINGS

⚠ WARNING

Make sure you review each warning in order to prevent fire hazard.

- Keep area clear of inflammables or other hazardous materials.
- Keep generator at least 6 feet (2 meter) away from buildings or other structures.
- Only operate generator in a dry, well ventilated area.
- Keep exhaust pipe clear of foreign objects.
- Keep generator away from open flame.
- Keep generator on a stable and level surface.
- Do not block generator air vents with paper or other materials.

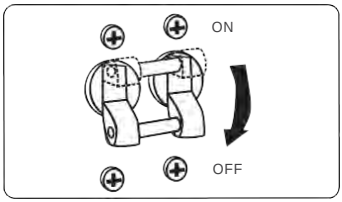
5. OPERATING PROCEDURES

5.1 STARTING THE ENGINE

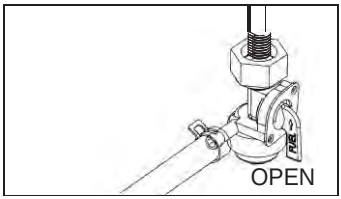
[CAUTION]

- Check the oil level before each operations. (See page 6)
- Perform the specified Daily Inspection to see if it is in normal condition

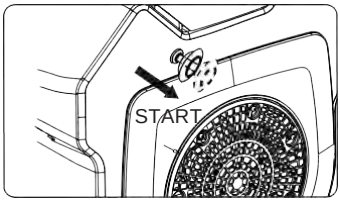
(a) Make sure the no-fuse circuit breaker is in the OFF position. The generator may be hard to start if a load is connected.



(b) Turn the fuel valve lever to the open position.



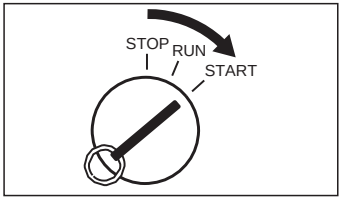
(c) Set the choke lever to the full "CLOSE" (arrow mark) position.



NOTE:

Be sure to pull the choke even if the engine is warm.

(d) Turn the starter switch to the "START" position.



- Do not operate the electric starter continuously for more than 5 seconds, even if the engine dose not start.
- If the engine won't start, turn the switch back to "RUN" position and then wait for approximately 10 seconds to try it again.
- Never turn the key switch to the "START" position while engine is running.

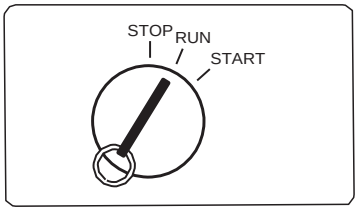
NOTE:

- You might have to keep the starter running for at least 3 to 5 seconds, since the engine incorporates the mechanism in it where the ignition circuit is activated by the increase of hydraulic pressure.
- In the following occasion, two or three trials may be required for starting the engine:

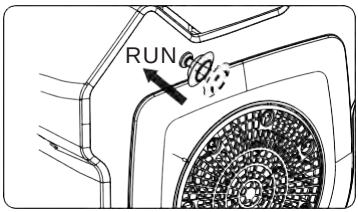
  (1)The very first starting of a new generator.
  (2)After the refueling of the engine which has been stopped due to fuel shortage
  (3)Starting after the oil filter change.

- Even if the engine has already been warmed, be sure to pull the choke knob.

(e) Return the starter switch to "RUN" position soon after the engine has started



(f) After starting the engine, gradually open choke by pushing the choke knob and finally keep it fully opened.



NOTE:

- Do not fully open the choke immediately when the engine is cold or the ambient temperature is low, because the engine may stop.

(g) Warm up the engine without load for a few minutes.Longer time would be needed in cold weather.

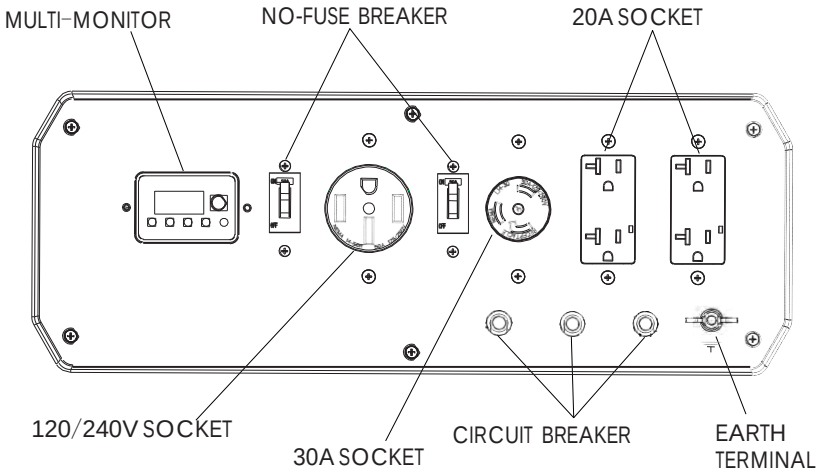
5.2 USING ELECTRIC POWER

⚠ WARNING

- Make sure that the appliance is switched OFF before connecting it to the generator.
- Do not move the generator while it is running.
- Be sure to ground the generator if the connected appliance is grounded. Failure to ground unit may lead to electrical shock.

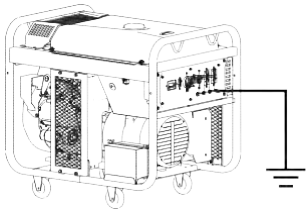
CONTROL PANEL

120V/240V 60HZ

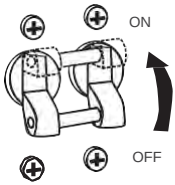


(1) AC APPLICATION

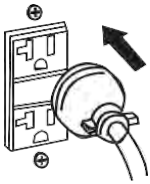
(a) Ground the generator, using the ground terminal located at the panel.



(b)) Before starting the engine, check that the no-fuse breakers of the generator are turned off.



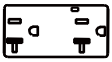
(c) Connect the plugs of the appliances to the receptacles before starting the engine. If you wish to use for a long period of time, connecting to the output terminal is recommended.



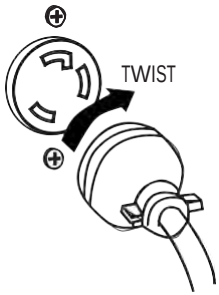
Insert the plug into receptacle.

(d) Start the engine and check that the multi monitor display the proper voltage and frequence.

- This generator is thoroughly tested and adjusted in the factory. If the generator does not produce the specified voltage, consult your nearest dealer selling our generator.
- Check the amperage of the socket, and be sure not to take a current exceed the exceed the specified amperage.

	Up to 50A, two voltage
	Up to 30A, locking receptacle
	Up to 20A, locking receptacle

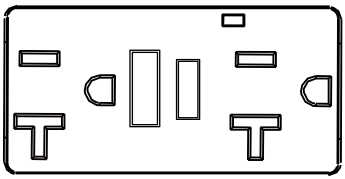
- Be sure that the total wattage of all appliances does not exceed the rated output of the generator.



⚠ WARNING

- To take power out from the TWIST LOCK RECEPTACLE, insert the plug into the receptacle, and turn it clockwise to the lock position.
- Be sure to ground the generator if the connected electrical device is grounded.

OPTION GFCI RECEPTACLE



GFCI SOCKET

[CAUTION]

The duplex 120V receptacle is protected by a GFCI (Ground Fault Circuit Interrupter). GFCI shuts off the output current from the duplex 120V receptacle when a ground fault occurs in the generator or the appliance. Please note that other receptacles are not protected by GFCI.

After starting the engine, check the GFCI for proper functioning by the following test procedure.

- Push blue TEST button, The red RESET button will pop out exposing the word TRIP. Power is now off at the outlets protected by the GFCI, indicating that the device is functioning properly.
- If TRIP dose net appear when testing, de not use the generator. Call a qualified electrician.
- To restore power, push RESET button.

⚠ WARNING

If the RESET button pops out during operation, stop the generator immediately and call a qualified electrician for checking generator and the appliances.

Connecting to Domestic Circuit
(House Wiring for PM15000ES-R)

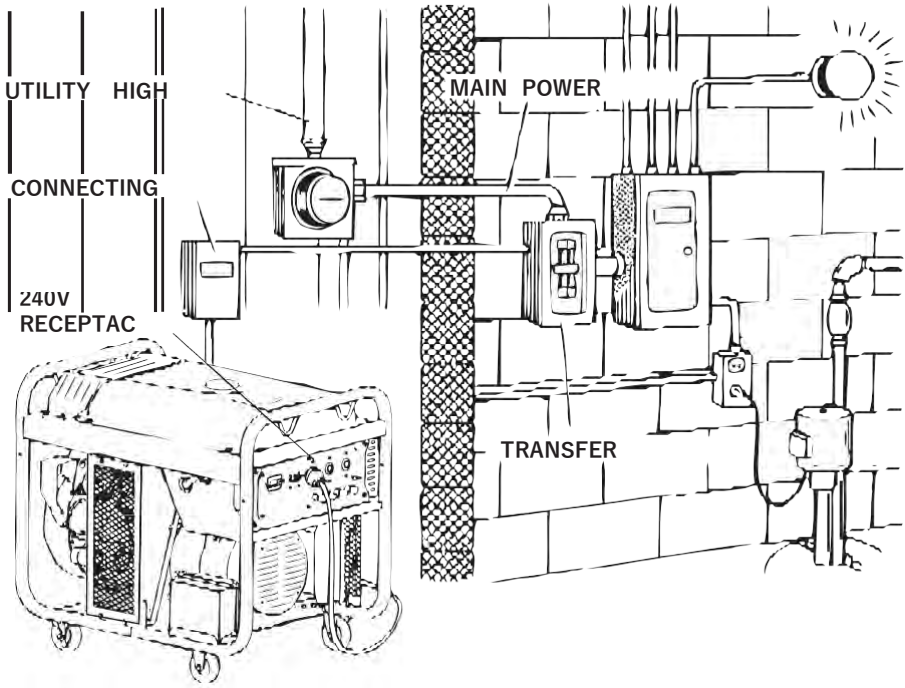
(a) When connecting a generator to a house wiring, generator output power must be taken from the 240V–4P receptacle or output terminal.

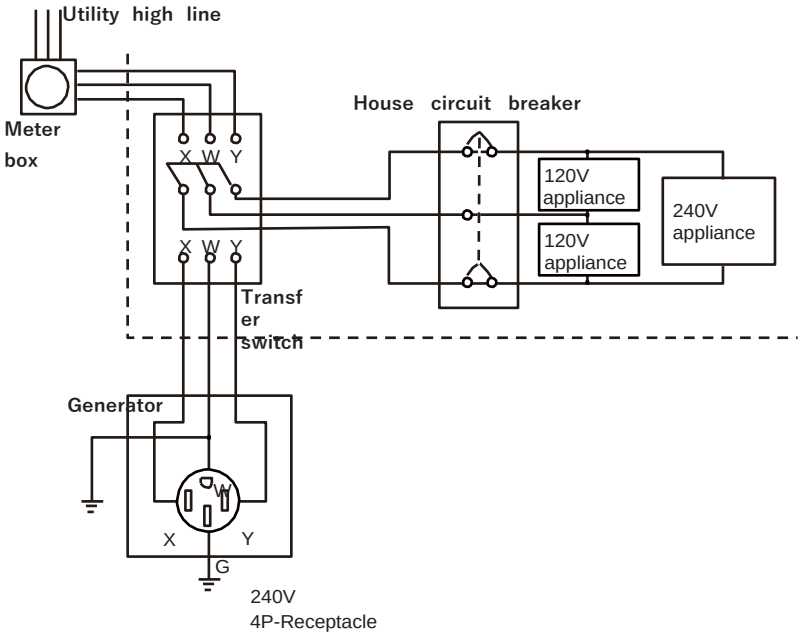
(b) Install a transfer switch

A transfer switch must be installed to transfer the load from the commercial power source to the generator. This switch is necessary to prevent accidents caused by the recovery from power outage. Use a transfer switch of the correct capacity.
Install transfer switch between the meter and the fuse or AC breaker box.

[CAUTION]

If the neutral wire of house wiring is grounded, be sure to ground the ground terminal of the generator, otherwise an electric shock may occur to the operator.





(c)Operating the generator.

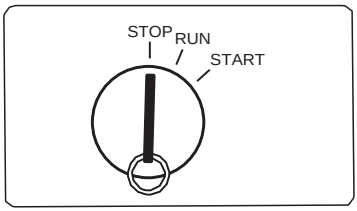
- Turn the house AC breaker off before starting the generator.
- Start the generator and warm it up.
- Turn the house AC breaker on.

[CAUTION]

Do not start the generator with electrical appliance(s) connected and with their switches on.
Otherwise the appliance(s) may be damaged by the surge voltage at starting.

5.3 STOPPING THE GENERATOR

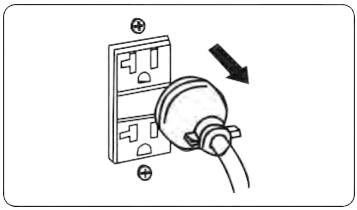
■ In an emergency:
To stop the engine in an emergency, turn the engine switch to the STOP position.



■ In normal use:

(a) Turn off the power switch of the electric equipment

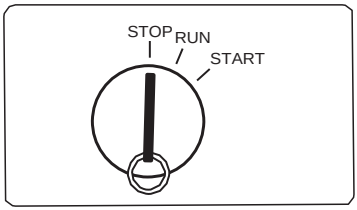
(b) Turn the AC circuit breaker to the OFF position.



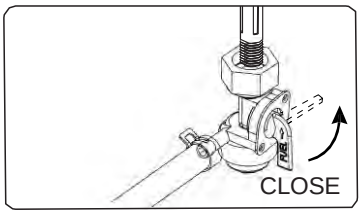
(c) Unplug the cord from receptacle of the generator.

(d) Allow the engine to run at no-load for about 3 minutes to cool down before stopping.

(e) Set the engine switch to "STOP" position.



(d) Close the fuel cock.



6. WATTAGE INFORMATION

For single phase

Some appliances need a "surge" of energy when starting.
This means that the amount of electrical power needed to start the appliance may exceed the amount needed to maintain its use.
Electrical appliances and tools normally come with a label indicating voltage, cycles/Hz, amperage (amps) and electrical power needed to run the appliance or tool.
Check with your nearest dealer or service center with questions regarding power surge of certain appliances or power tools.

Electrical loads such as incandescent lamps and hot plates require the same wattage to start as is needed to maintain use.

Loads such as fluorescent lamps require 1.2 to 2 times the indicated wattage during start-up.

Loads for mercury lamps require 2 to 3 times the indicated wattage during start-up.

Electrical motors require a large starting current. Power requirements depend on the type of motor and its use. Once enough "surge" is attained to start the motor, the appliance will require only 50% to 30% of the wattage to continue, running.

Most electrical tools require 1.2 to 3 times their wattage for running under load during use. (For example, a 9,000 watt generator can power a 3,200 to 7,000 watt electrical tool.)

Loads such as submersible pumps, air conditioners and air compressors require a very large force to start. They need 3 to 5 times the normal running wattage in order to start. (For example, a 5,000 watt generator would only be able to drive a 1,800 to 3,100 watt pump.)

If the power consumption of electrical appliances exceeds the operating range or if there is short circuit or other problems in the appliances, the AC breaker could trip "OFF" or the rotation of the generator could be abnormally reduced. In this case, stop the generator to see if the power consumption of the appliances is too large and if there is a problem in the appliances.

The frequency (the number of the generators rotation) was adjusted before the time of shipment. Changing the frequency could result in the generators breakdown, se refrain from changing it.

To determine the total wattage required to run a particular electrical appliance or tool, multiply the voltage figure of the appliance/tool by the amperage (amps) figure of same. The voltage and amperage (amps) information can be found on rating label which is normally attached to electrical appliances and tools.

Applications	Applicable Wattage
	PM 15000ES-R
	60Hz
Incandescent lamp, Heater	12000
Fluorescent lamp, Electric tool	6000
Pump, Compressor	3000

NOTE:

- The above wattage chart is general guide only. Refer to your specific appliance for correct wattage.
- When you use two or more alternating current outlets at a time, be careful that the sum of the appliances' power consumption does not exceed the value specified in the above chart.

VOLTAGE DROP IN ELECTRIC EXTENSION CORDS

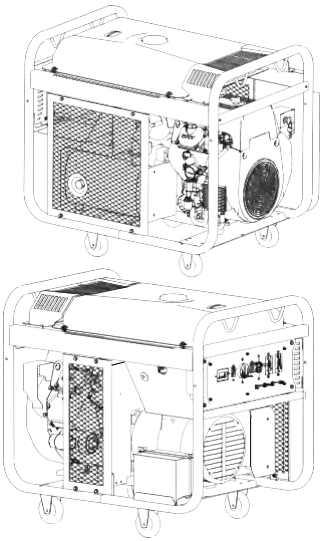
When a long electric extension cord is used to Connect an appliance or tool with the generator, a certain amount of voltage drop occurs in the extension cord which lessens the effective voltage available to the appliance or tool.
The chart below has been prepared to illustrate the approximate voltage loss when an extension cord of 300 feet (approx. 100 meters) is used to connect an appliance or tool to the generator.

Nominal Cross section	A.W.G. Gauge No.	Allowable current	No.of strands /strands dia.	Resistance	Current Amp.						
mm^2	No.	A	No./mm	Ω/100m	1A	3A	5A	8A	10A	12A	15A
0.75	18	7	30/0.18	2.477	2.5V	8V	12.5V	---	---	---	---
1.27	16	12	50/0.16	1.486	1.5V	5V	7.5V	12V	15V	18V	
2.0	14	17	37/0.26	0.952	1V	3V	5V	8V	10V	12V	15V
3.5	12	23	45/0.32	0.517	---	1.5V	2.5V	4V	5V	6.5V	7.5V
5.5	10	35	70/0.32	0.332	---	1V	2V	2.5V	3.5V	4V	5V
8.0	8	50	100/0.32	0.228	---	0.6V	1V	2V	2.3V	2.6V	3.4V

7. MAINTENANCE SCHEDULE

7.1DAILY INSPECTION

Before running the generator, check the following service items:



Safe surroundings
Leakage of gasoline and engine oil
Clean air cleaner element
Enough gasoline
Excessive vibration, noise
Enough clean engine oil
Loose or broken bolts and nuts

PERIODIC MAINTENANCE

Periodic maintenance is vital to safe and efficient operation of your generator. Check the table below for periodic maintenance intervals.
It is also necessary for the user of this generator to conduct the maintenance and adjustments on the emission-related parts listed below to keep the emission control system effective.

The emission control system consists of the following parts:
(1) Carburetor and internal parts (2)Choke system (3)Fuel strainer
(4)Air cleaner elements (5)Intake pipe (6)Spark plug
(7)Magneto (8)Fuel hoses, clamps, and sealing gaskets

The maintenance schedule indicated in the table is based on the normal generator operation. Should the generator be operated in extremely dusty condition or in heavier loading condition, the maintenance intervals must be shortened depending on the contamination of oil, clogging of filter elements, wear of parts, and so on.

Periodic Maintenance Schedule table

Maintenance Items	Every 8 hours (Daily)	Every 20 hours		Every 200 hours	Every 500 hours	Every 1000 hours
Clean engine and check bolts and nuts	● (Daily)					
Check and refill engine oil	● (Refill daily to upper level)					
Change engine oil (*Note 1)		● (Initial)	●			
Replace engine oil filter (*Note 1)		● (Initial)		●		
Check battery electrolyte fluid level			●			
Clean spark plug			●			
Clean air cleaner			●			
Replace air cleaner element				●		
Clean fuel strainer				●		
Clean and adjust spark plug and electrodes				●		
Replace spark plug					●	
Remove carbon from cylinder head					●	
Clean and adjust carburetor					●	
Clean engine base (oil pan)					●	
Check and adjust valve clearance					●	
Replace fuel lines						● (Yearly)
Overhaul engine (*Note 2)						●

*Note 1 : Initial oil change and oil filter replacement should be performed after 20 hours of operation.
Thereafter change oil every 50 hours and replace oil filter 200 hours.
Before changing oil, check for a suitable way to dispose of old oil. Do not pour it down into sewage drains, onto garden soil or into open streams. Your local zoning or environmental regulations will give you more detailed instructions on proper disposal.

*Note 2 : As to the procedures, please consult your nearest service dealer.

*Note 3 : More frequent oil changing, oil filter replacement and air cleaner service on replacement may be necessary depending on operating conditions.
This would include dusty environment, high ambient temperature, heavy engine loading.

7.2 SERVICING WORK

Servicing work should only be carried out by personnel qualified for this purpose.
All the works listed in the service plan are to be carried out in accordance with the operating and service instructions for the motor.
We recommend that these works be carried out by an authorized service station.

7.3 CHECKING ELECTRICAL SAFETY

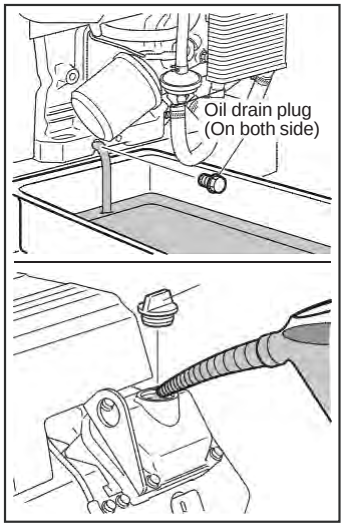
The electrical safety may only be checked by personnel authorised for this task.

8. "HOW-TO" MAINTENANCE

8.1 ENGINE OIL CHANGE

Change engine oil every 50 hours.
(for a new engine, change oil after 20 hour.)

(A) When changing oil, stop the engine and loosen the drain plug.



NOTE:

Please use a container to load the used oil for protecting environment.

(b) Reinstall the drain plug and fill the engine with oil until it reaches the upper level on the oil filler cap.

(c)Refer to the recommended oil table o page 6.

- Use fresh and high quality lubricating oil to the specified quantity. If contaminated or deteriorated oil is used or the quantity of the engine oil is not sufficient, the engine damage will result and its life will be greatly shortened.

Oil capacity.....0.41 US-gal (Upper level)
1.55 liters (Upper level)

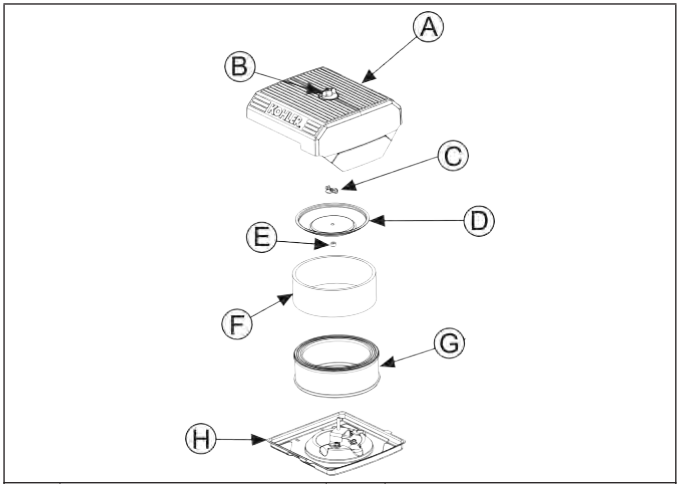
8.2 ENGINE OIL FILTER REPLACEMENT

- Initial engine oil filter replacement should be performed after 20 hours of operation. Thereafter replace the engine oil filter every 200 hours.
- When installing a new oil filter, apply oil to O-ring, attach the oil filter in position and tighten 2/3 turns by hand or with wrench after touching the O-ring to the sealing surface of engine.
- Run the engine for a minute; stop the engine and check for oil leakage around the oil filter and recheck the oil level.

CAUTION:

To prevent injury, pay attention to the spilled hot engine oil when replacing engine oil filter.

8.3 SERVICING THE AIR CLEANER



A	Air Cleaner Cover	**B**	Air Cleaner Knob
C	Wing Nut	**D**	Element Cover
E	Rubber Seal	**F**	Precleaner
G	Paper Element	**H**	Air Cleaner Base

NOTE: Operating engine with loose or damaged air cleaner components could cause premature wear and failure. Replace all bent or damaged components.

Paper element cannot be blown out with compressed air.

Precleaner

1. Remove precleaner from paper element.
2. Replace or wash precleaner in warm water with detergent. Rinse and allow to air dry.
3. Saturate precleaner with new engine oil; squeeze out excess oil.
4. Reinstall precleaner over paper element.

Paper Element

1. Clean area-around element. Remove wing nut,element cover, and paper element with precleaner.
2. Separate precleaner from element; service precleaner and replace paper element.
3. Check condition of rubber seal and replace it if necessary.
4. Install new paper element on base; install precleaner over paper element; reinstall element cover and secure with wing nut.

Reinstall air cleaner cover and secure with knob.

8.4 CLEANING AND ADJUSTING SPARK PLUG

NOTE:

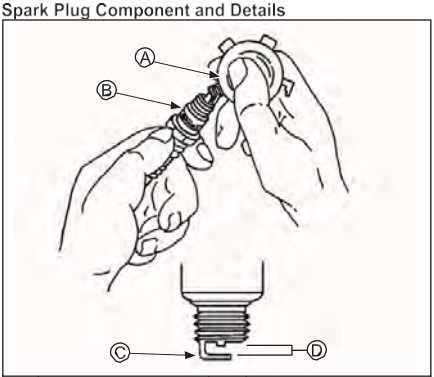
Do not clean spark plug in a machine using abrasive grit. Some grit could remain in spark plug and enter engine causing extensive wear and damage.

Engine misfire or starting problems are often caused by a spark plug that has improper gap or is in poor condition.

Engine is equipped with following spark plugs:

Gap	0.76 mm (0.03 in.)
Thread Size	14 mm
Reach	19.1 mm (3/4 in.)
Hex Size	15.9 mm (5/8 in.)

Spark Plug Component and Details



A	Wire Gauge	B	Spark Plug
C	Ground Electrode	D	Gap

Service

Clean out spark plug recess. Remove plug and replace it.
1. Check gap using wire feeler gauge. Adjust gap to 0.76 mm (0.03 in.).
2. Install plug into cylinder head.
3. Torque plug to 27 N·m (20 ft. lb.).

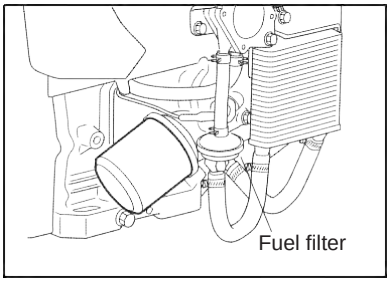
8.5 CLEANING FUEL FILTER

Dirt and water in the fuel are removed by the fuel filter.

(a) Remove the strainer cup and throw away water and dirt.

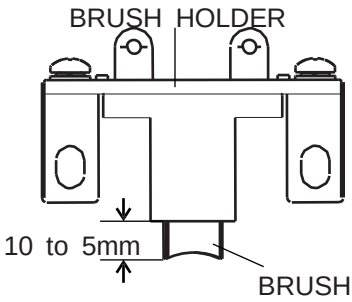
(b) Clean the screens and strainer cup with gasoline.

(c) Tightly fasten the cup to main body, making sure to avoid fuel leak.



8.6 CHECKING CARBON BRUSH

If the brush become excessively worn, its contact pressure with the slip ring changes and causes a roughened surface on the slip ring, resulting in irregular generator performance.



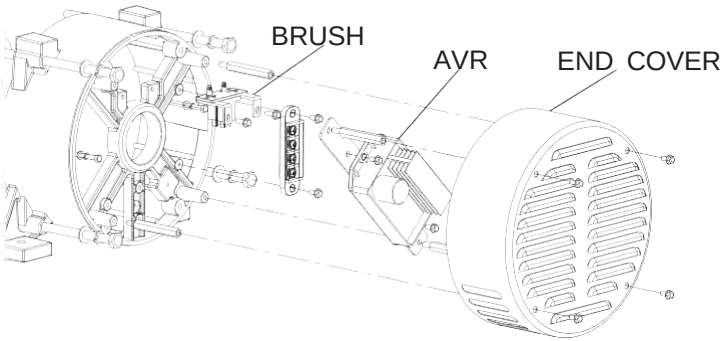
Check the brush every 500 hours or if generator performance is irregular. if the brush is 5 mm long or less replace it with a new one.

(a) Remove the end cover

(b) Disconnect the AVR and remove the AVR.

(c) Disconnect the wire connector and remove the brush.

(d) Carefully note the brush direction andrelative position with the slip ring when installing new brush.

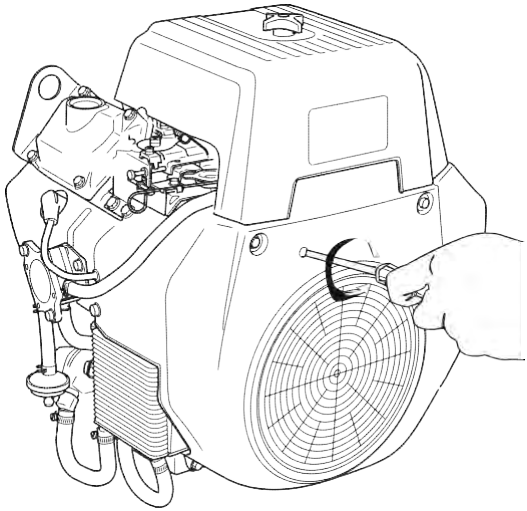


9. PREPARATION FOR STORAGE

The following procedures should be followed prior to storage of your generator for periods of 6 months or longer.

- Drain fuel from fuel tank carefully by disconnecting the fuel line. Gasoline left in the fuel tank will eventually deteriorate making engine-starting difficult.
- In order to remove the fuel in the carburetor, run the engine at no-load until it stops.
- Disconnect the terminal of the battery.
- Change engine oil.
- Check for loose bolts and screws, tighten them if necessary.
- Clean generator thoroughly with oiled cloth. Spray with preservative if available.

  NEVER USE WATER TO CLEAN GENERATOR.
- Pull starter handle until resistance is felt, leaving handle in that position.
- Store generator in a well ventilated, low humidity area.



10.TROUBLE SHOOTING

When generator engine fails to start after several attempts, or if no electricity is available at the output socket, check the following chart. If your generator still fails to start or generate electricity, contact your nearest FIRMAN Generator dealer for further information or corrective procedures.

10.1 Engine Fails to Start:

Check the battery voltage		If the battery voltage is low please charge the battery
Check the air cleaner for clogging.		Make sure the air cleaner is unobstructed.
Check if choke lever is in its proper position	↔	Set the choke lever to "CLOSE" position.
Check if fuel cock is open.		If closed, open fuel cock.
Check fuel level.		If empty, refill fuel tank making sure not to overfill
Check to make sure generator is not connected to an appliance.	↔	If connected, turn off the power switch on the connected appliance and unplug.
Check spark plug for loose spark plug cap.		If loose, push spark plug cap back into place.
Check spark plug for contamination.		Remove spark plug and clean electrodes.

10.2 No AC output:

Check to make sure no-fuse breaker is in the ON Position.	↔	After making sure that the total wattage of the electrical appliance is within permissible limits and there are no defects in the appliance, turn the circuit breaker to the"ON"position. If breaker, continue to actuate, consult your nearest servicing dealer.
Check AC terminals for loose connections.		Secure connections if necessary.
Check to see if engine starting was attempted with appliances already connected to generator.	↔	Turn off switch on the appliance and disconnect cable from receptacle. Reconnect after generator has been started properly.

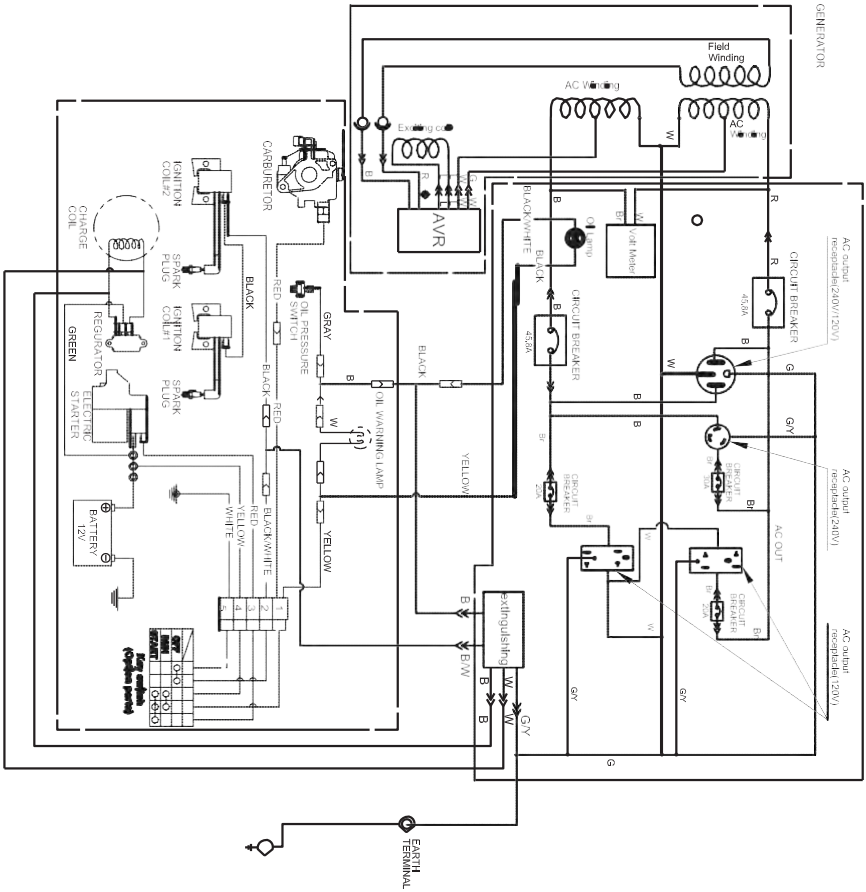
10.3 Engine lacks power:

Dirty air filter.		Check air filter element. Clean or replace as needed
Engine stored out treating or draining gasoline,or refueled with bad gasoline.	↔	Drain fuel and carburetor. Refuel with fresh gasoline. If problem continues, contact your nearest authorized service center.
Checktoseeifenginestartingwas attempted with appliances already connected to generator.	↔	Turn offswitch on the appliance and disconnect cable from receptacle. Reconnect after generator has been started properly.

11. WIRING DIAGRAM

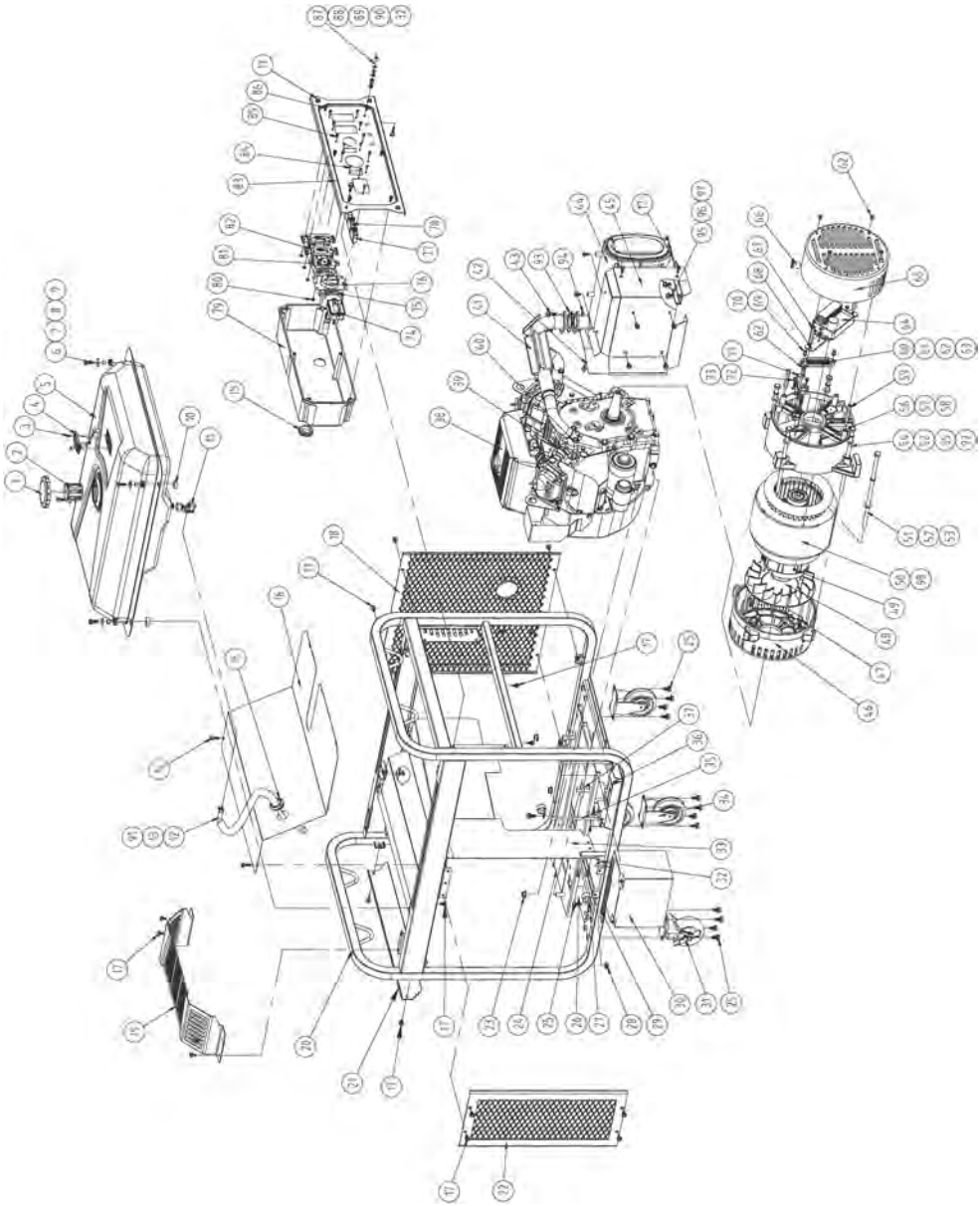
PM15000ES-R(60Hz)

B	BLACK	Br	BROWN
Y	YELLOW	B/W	BLACK WHITE
L	BLUE	W/G	WHITE GREEN
G	GREEN	G/Y	GREEN YELLOW
R	RED	W/L	WHITE BLUE
W	WHITE	Gr	ORANGE
Y/R	YELLOW RED		



Pro mate

Model: PMI5000ES-R



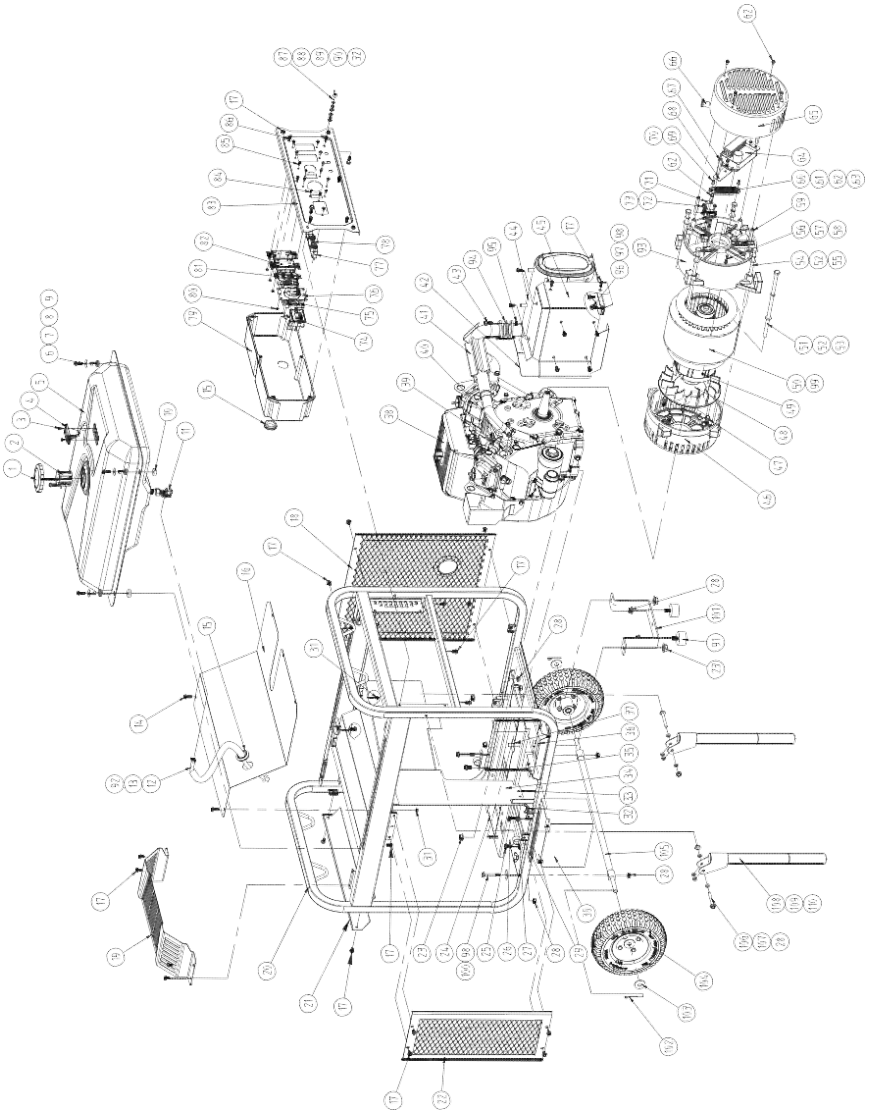
GASOLINE GENERATOR PARTS LIST

Ref. No.	Part No.	Description	Qty.	Note
1	399411046	fuel cap assembly.	1	
2	399721026	fuel filter	1	
3	921100111	Bolt M5X10	2	
4	399411020	Fuel meter	1	
5	399411018	fuel tank	1	
6	921200042	Screw M6X30	4	
7	923200006	Big flat washer 6	4	
8	320712026	Inner spacer	4	
9	320722007	Absorber-Tank	4	
10	399711127	distance ring	4	
11	399411047	Fuel cock	1	
12	332710017	Fuel hose clamp	2	
13	399721009	Fuel hose	1	
14	921200045	Screw M6X20	2	
15	320722013	Rubber bush	2	
16	399711106	Fuel tank Baffle	1	
17	921200044	Bolt M6X12	38	
18	399411014	insulation halftone	1	
19	399711118	Board	1	
20	399411002	frame	1	
21	399711117	Side board for frame	1	
22	399411040	insulation halftone 2	1	
23	922400005	Nut M10	8	
24	399411015	isolation board assembly	1	
25	921300074	screw M8X16	18	
26	399421001	Bottom rubber	4	
27	318720002	hose clip	2	
28	922300004	Nut M8	2	
29	399711011	battery binder plate	1	
30	399451001	battery	1	
31	399421003	4" pu wheel	2	
32	922200009	butterfly nut M6	3	
33	399411031	Separator assembly	1	
34	399421002	4"nylon wheel	2	
35	399711012	Guide bar	2	
36	351721006	absorbing slip	5	
37	399711042	round gasket	2	
38	399461004	CH730	1	
39	351761002	Exhaust gasket	2	
40	351761003	Nut M8	4	
41	399411028	exhaust shaft	1	
42	399711105	Isolation board	1	
43	921300061	bolt M8X22	2	
44	399411006	muffler	1	
45	399711030	muffler stay	1	
46	399711050	front cover	1	
47	921400013	front cover screw	4	
48	399451017	Rotor comp	1	
49	922100017	self-locking nut M5	2	

Ref. No.	Part No.	Description	Qty.	Note
50	399451047	stator comp.	1	
51	921300075	Flange bolt	1	
52	923400004	Spring washer M10	5	
53	923400006	washer M10	1	
54	921400012	bolt M10X190	4	
55	923400005	washer10	4	
56	921100101	bolt M5X165	2	
57	923100004	flat gasket5	2	
58	923100003	spring washer5	2	
59	399711112	Stud	2	
60	399451020	wiring terminal assembly	1	
61	923200007	flat gasket6	8	
62	921200035	Bolt M6X12	14	
63	923200009	spring washer6	8	
64	399451044	AVR	1	
65	399711053	end cover	1	
66	399721006	rubber bushing	1	
67	399711111	Stud	2	
68	399711110	AVR bracket	1	
69	921200043	bolt M6X20	2	
70	923200015	flat gasket6	2	
71	399451021	carbon brush	1	
72	921100102	bolt M4X8	2	
73	923100012	spring washer4	2	
74	601000006	multi-monitor	1	
75	399451072	no-fuse breaker	2	
76	399451045	socket 50A	1	
77	399451073	circuit braaker30A	1	
78	350750012	circuit braaker20A	2	
79	399421004	Panel cover	1	
80	922100013	nut M4	8	
81	399451070	socket 30A	1	
82	350750011	socket 20A	2	
83	399411021	Panel	1	
84	921100073	bolt M3X6	4	
85	921100082	bolt M4X12	10	
86	921100103	hex head screw M4X12	6	
87	92220004	Nut M6	1	
88	923200007	flat gasket6	3	
89	923200009	spring washer6	2	
90	921200019	bolt M6X25	1	
91	399721018	fuel line	1	
92	399711052	End cover	1	
93	399711097	Exhaust gasket	1	
94	922300014	high temperature nut M8	2	
95	921300077	bolt M8X20	2	
96	923300021	spring washer8	2	
97	923300022	flat gasket	4	
98	399711051	Stator cover	1	

Promate®

Model: PM15000ES-R
(Optional: 2 wheel type)



GASOLINE GENERATOR PARTS LIST

Ref. No.	Part No.	Description	Qty.	Note
1	399411046	fuel cap assembly.	1	
2	399721026	fuel filter	1	
3	921100111	BoltM5X10	2	
4	399411020	Fuel meter	1	
5	399411018	fuel tank	1	
6	921200042	ScrewM6X30	4	
7	923200006	Big flat washer 6	4	
8	320712026	Inner spacer	4	
9	320722007	Absorber-Tank	4	
10	399711127	distance ring	4	
11	399411047	Fuel cock	1	
12	332710017	Fuel hose clamp	2	
13	399721009	Fuel hose	1	
14	921200045	ScrewM6X20	2	
15	320722013	Rubber bush	2	
16	399711106	Fuel tank Baffle	1	
17	921200044	BoltM6X12	38	
18	399411014	insulation halftone	1	
19	399711118	Board	1	
20	399411002	frame	1	
21	399711117	Side board for frame	1	
22	399411040	insulation halftone 2	1	
23	922400005	NutM10	8	
24	399411015	isolation board assembly	1	
25	921300074	screwM8X16	2	
26	399421001	Bottom rubber	4	
27	318720002	hose clip	2	
28	922300004	NutM8	2	
29	399711011	battery binder plate	1	
30	399451001	battery	1	
31	922200002	self-lock nut M6	2	
32	922200009	butterfly nut M6	3	
33	380720043	tubing clip	1	
34	399411031	Separator assembly	1	
35	399711012	Guide bar	2	
36	351721006	absorbing slip	5	
37	399711042	roundgasket	2	
38	399461004	CH730	1	
39	351761002	Exhaustgasket	2	
40	351761003	NutM8	4	
41	399411028	exhaust shaft	1	
42	399711105	Isolation board	1	
43	921300061	boltM8X22	2	
44	399411006	muffler	1	
45	399711030	muffler stay	1	
46	399711050	front cover	1	
47	921400013	front cover screw	4	
48	399451017	Rotor comp	1	
49	922100017	self-locking nut M5	2	
50	399451047	stator comp.	1	
51	921300075	Flange bolt	1	
52	923400004	Spring washerM10	5	
53	923400006	washerM10	1	
54	921400012	boltM10X190	4	
55	923400005	washer10	4	

Ref. No.	Part No.	Description	Qty.	Note
56	921100101	boltM5X165	2	
57	923100004	flat gasket5	2	
58	923100003	spring washer5	2	
59	399711112	Stud	2	
60	399451020	wiring terminal assembly	1	
61	923200007	flat gasket6	8	
62	921200035	BoltM6X12	14	
63	923200009	spring washer6	8	
64	399451044	AVR	1	
65	399711053	end cover	1	
66	399721006	rubber bushing	1	
67	399711111	Stud	2	
68	399711110	AVR bracket	1	
69	921200043	boltM6X20	2	
70	923200015	flat gasket6	2	
71	399451021	carbon brush	1	
72	921100102	boltM4X8	2	
73	923100012	spring washer4	2	
74	601000006	multi-monitor	1	
75	399451072	no-fuse breaker	2	
76	399451045	socket 50A	1	
77	399451073	circuit braaker30A	1	
78	350750012	circuit braaker20A	2	
79	399421004	Panel cover	1	
80	922100013	nutM4	8	
81	399451070	socket 30A	1	
82	350750011	socket 20A	2	
83	399411021	Panel	1	
84	921100073	boltM3X6	4	
85	921100082	boltM4X12	10	
86	921100103	hex head screw M4X12	6	
87	92220004	NutM6	2	
88	923200007	flat gasket6	3	
89	923200009	spring washer6	2	
90	921200019	boltM6X25	1	
91	399421006	vibration feet	2	
92	399721018	fuel line	1	
93	399711052	End cover	1	
94	399711097	Exhaustgasket	1	
95	922300014	high temperature nut M8	2	
96	921300077	boltM8X20	2	
97	923300021	spring washer8	2	
98	923300022	flatgasket	4	
99	399711051	Stator cover	1	
100	921300086	boltM8X65	2	
101	399711062	supportor	1	
102	924000019	cotter pin	2	
103	923500002	washer 12	2	
104	399421005	wheel	2	
105	399411022	axle	1	
106	921300085	boltM8X55	2	
107	923300014	washer	8	
108	399411044	handle	2	
109	332720017	handlesleeve	2	
110	370720003	handle plug	2	

Web: www.promate.com.ph
SERVICE/PARTS SUPPORT
TEL: (0063 2) 4281050

P/N:399741017 Rev02