

HONDA

PORTABLE GENERATOR

ES3500

OWNER'S MANUAL

This manual covers operation and maintenance of the ES3500 generator. All information in this publication is based on the latest product information available at the time of approval for printing. Honda Motor Co., Ltd. reserves the right to make changes at any time without notice and without incurring any obligation. The manual should be considered a permanent part of the generator and remain with the generator when sold.

Read the manual carefully. Pay special attention to statements preceded by the following words:

WARNING

Indicates a possibility of personal injury or loss of life if instructions are not followed.

CAUTION

Indicates a possibility of equipment damage if instructions are not followed.

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

Thank you for purchasing a Honda Generator.

No part of this publication may be reproduced without written permission.

WARNING

The Honda generator is designed to give safe and dependable service if operated according to instructions. Read and understand the Owner's Manual before operating the generator. Failure to do so could result in personal injury or equipment damage.

CONTENTS

GENERATOR SAFETY	4
COMPONENT IDENTIFICATION	5
CONTROL BOX	7
BATTERY CONNECTION	8
OPERATION	9
GENERATOR USE	16
MAINTENANCE	18
TRANSPORTING/STORAGE	27
TROUBLESHOOTING	28
SPECIFICATIONS	29
WIRING DIAGRAM	30

GENERATOR SAFETY

WARNING

To ensure safe operation –

- * Know how to stop the generator quickly and understand operation of all the controls. Never permit anyone to operate the generator without proper instruction.
- * Keep children and pets away from the generator when in operation.
- * The generator is a potential source of electrical shock when misused: Do not operate with wet hands. Do not operate in rain or snow.

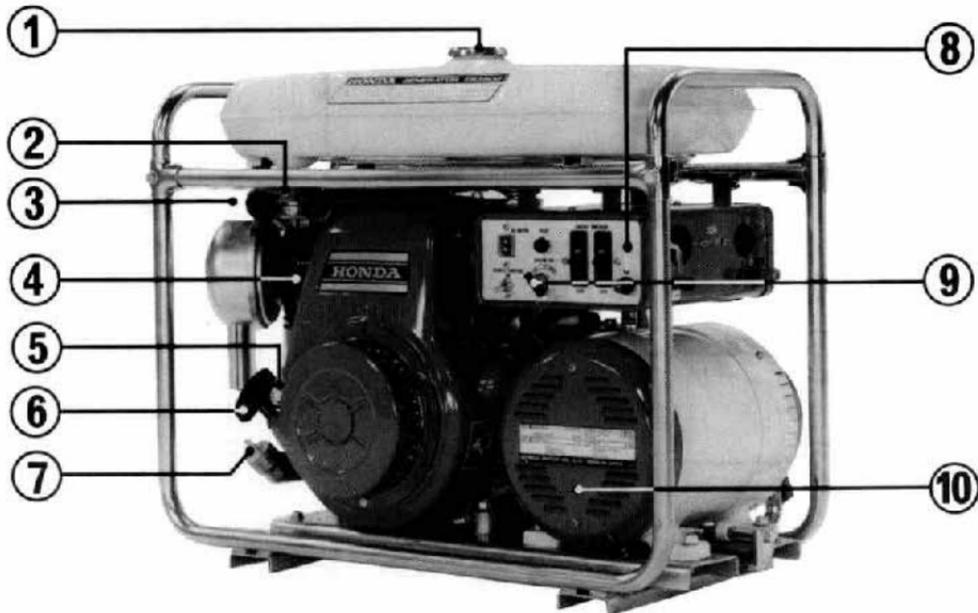
If a battery is used –

- * Battery electrolyte contains sulphuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if your eyes were exposed.
- * Batteries generate hydrogen gas which can be highly explosive. Do not smoke or allow flames or sparks near a battery, especially while charging it.

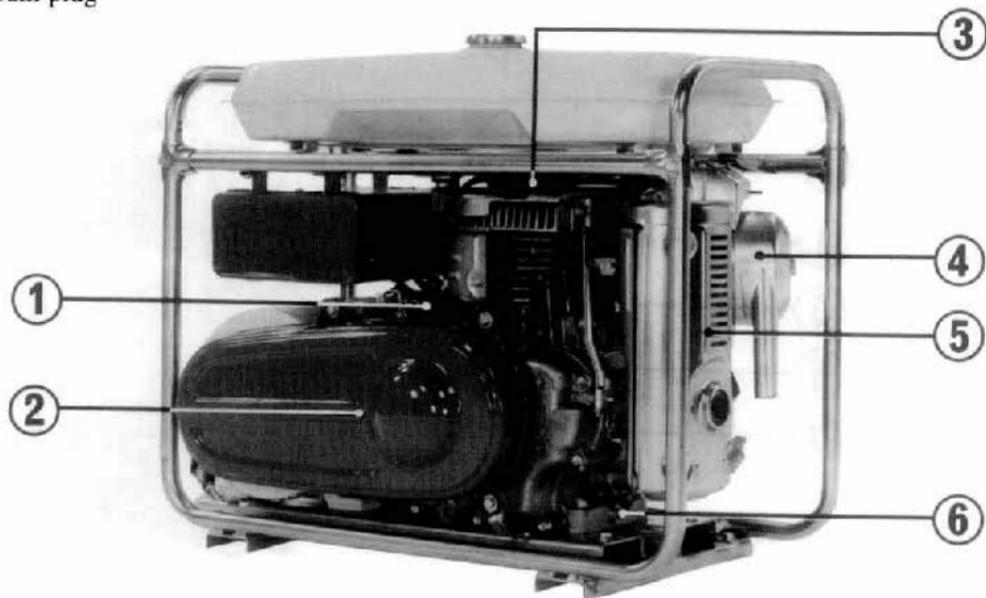


COMPONENT IDENTIFICATION

- (1) Fuel filler cap
- (2) Fuel valve
- (3) Choke rod
- (4) Carburetor
- (5) Throttle knob
- (6) Manual starter
- (7) Oil filler cap
- (8) Control box
- (9) Engine switch
- (10) Generator

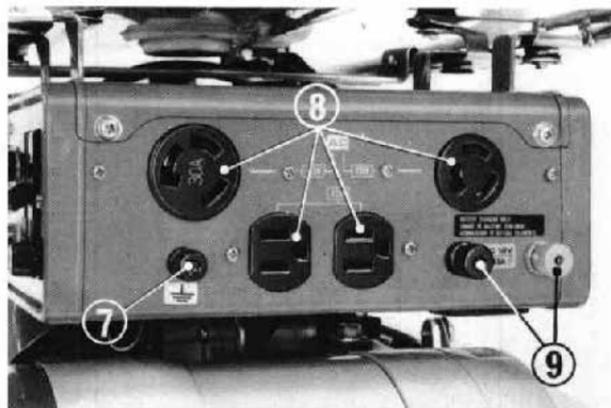
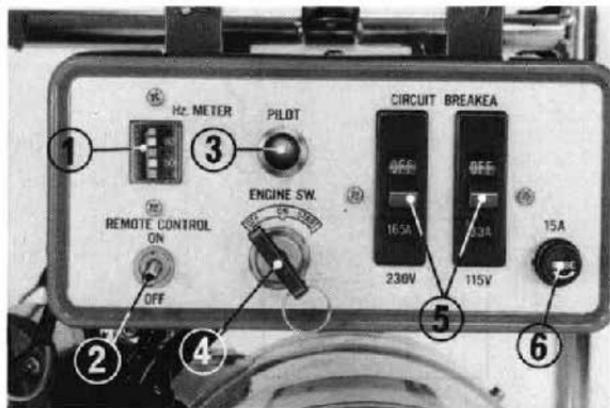


- (1) Electric starter
- (2) Belt cover
- (3) Spark plug cap
- (4) Air cleaner
- (5) Muffler
- (6) Oil drain plug



CONTROL BOX

1. **FREQUENCY METER.** Indicates generator frequency by oscillation.
2. **REMOTE CONTROL SWITCH.** Use the switch only if the unit has been equipped with the optional Remote Control Kit. (See p. 15)
3. **PILOT LAMP.** Lights when the engine is running.
4. **ENGINE SWITCH (IGNITION KEY).** Turn the key to "START" to activate the self-starting motor. Turn the key to "ON" when the engine is running. Turn the key to "OFF" to stop the engine.
5. **CIRCUIT BREAKERS.** Switch "ON" for AC power. A breaker will automatically switch "OFF" if the generator is overloaded.
6. **FUSE HOLDER.** Houses a 15A fuse for the DC circuit.
7. **GROUND TERMINAL.**
8. **AC RECEPTACLES.** The generator is equipped with outlets for both 115V and 230V applications.
9. **DC TERMINALS.**



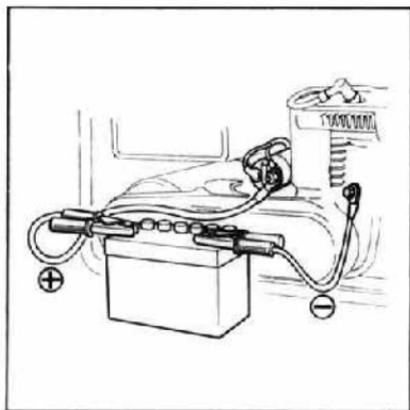
BATTERY CONNECTION

Use a battery rated at 12V, 26AH or more.

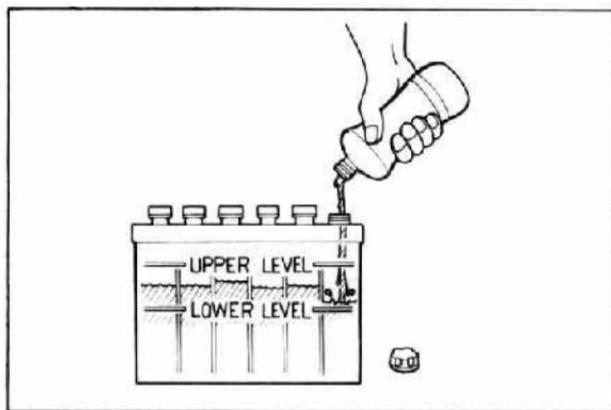
CAUTION

Do not reverse polarity. Serious damage to the generator and/or battery may occur.

1. Using a cable, connect the positive terminal to the right (non-capped) starter motor terminal with an 8mm nut. Connect the negative terminal to the cylinder block with an 8mm bolt.



2. Coat the terminals with grease.
3. Check the electrolyte level to be sure that it is between the marks on the case. If the level is below the lower mark, remove the caps and add distilled water to bring the electrolyte level to the upper mark. The cells should be equally full.



OPERATION

WARNING

- * *Exhaust gas contains poisonous carbon monoxide. Never run the generator in an enclosed area. Be sure to provide adequate ventilation.*
- * *Operate the generator on a level surface. If the generator is tilted, fuel spillage may result.*
- * *Keep away from rotating parts while the generator is running.*

CAUTION

The generator is air-cooled and may be damaged if ventilation is inadequate.

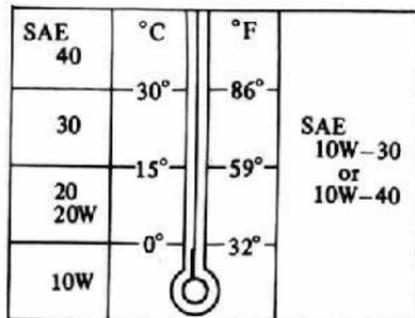
Pre-Operation Check

1. Check the engine oil level.

CAUTION

Engine oil is a major factor affecting engine performance and service life. Non-detergent or vegetable oils are not recommended.

Use Honda 4-stroke, or an equivalent high detergent, premium quality motor oil certified to meet or exceed U.S. automobile manufacturer's requirements for Service Classification SE. (Motor oils classified SE will show this designation on the container.) SAE 10W-40 is recommended for general, all-temperature use. If single viscosity oil is used, select the appropriate viscosity for the average temperature in your area.

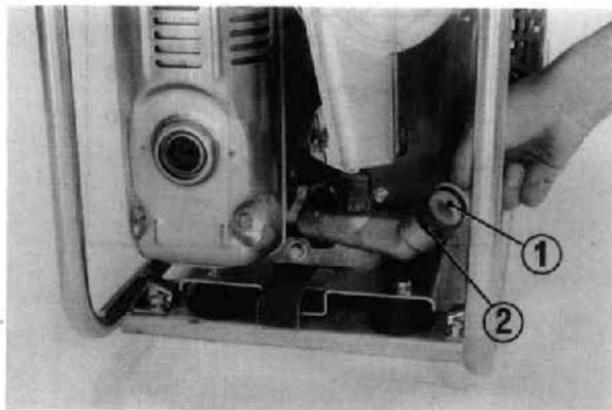


- A. With the generator on a level surface, remove the oil filler cap and check the oil level.
- B. If the level is low, fill to the upper limit. Do not overfill; excess oil will result in power loss and smoking.

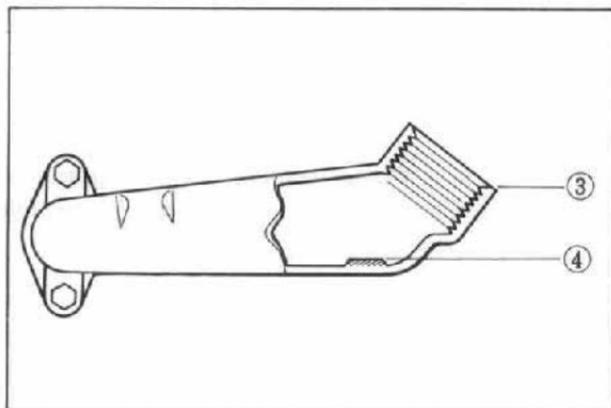
CAUTION

Running the engine with insufficient oil can cause serious engine damage.

- (1) Oil filler cap
(2) Oil filler hole



- (3) Upper limit
(4) Lower limit



2. Check the fuel level.

Use automotive gasoline with a research octane of 91 or higher or a pump octane ($\frac{R+M}{2}$) of 86 or higher. Fill to half-way up the filler screen. Never use an oil/gasoline mixture or dirty gasoline. Avoid getting dirt, dust or water in the fuel tank.

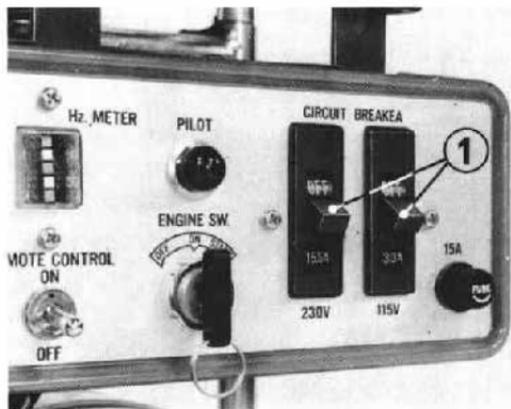
WARNING

- * Gasoline is extremely flammable and explosive under certain conditions. Refuel in a well ventilated area with the engine stopped.
- * Do not smoke or allow open flames or sparks in the area where the generator is refueled or where gasoline is stored.
- * Do not overfill the tank. There should be no fuel in the filler neck.
- * Be careful not to spill fuel when refueling. Fuel vapor or spilled fuel may ignite. Wipe up any spilt gasoline and let the area dry before starting the engine.
- * Make sure the filler cap is securely closed after refueling.

If a battery is used —

3. Check that the battery electrolyte level is between the marks on the case. Be sure that the cable connections are secure.
4. Insure that the circuit breakers are off, and that there is no load on the DC terminals. The generator may be hard to start if a load is connected.

(1) Circuit breakers



Starting the Engine

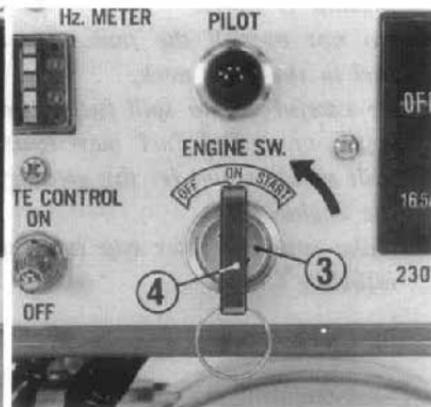
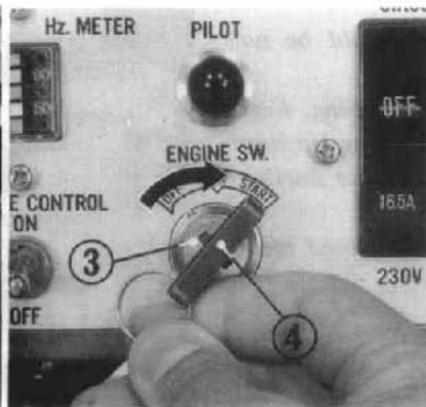
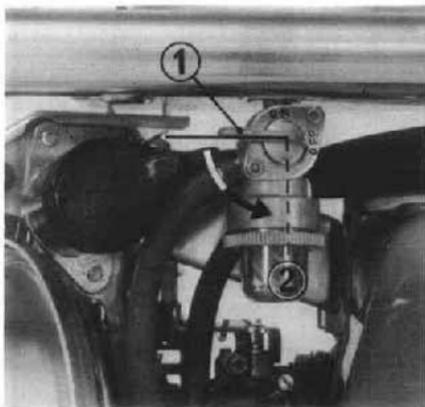
Electric Starter –

1. Turn the fuel valve to “ON”.
2. Make sure that the remote control switch is OFF. Otherwise, the engine switch will not work.
3. Insert the ignition key and hold it at “START” until the engine starts.

NOTE: When the speed of the starter motor drops after a period of time, it is an indication that the battery should be recharged.

- (1) Fuel valve
- (2) “ON” position

- (3) Engine switch
- (4) Ignition key



3. After the engine starts, turn the key “ON”.

NOTE: The generator employs an automatic choke when the starter motor and battery are used.

Manual Starting —

1. Turn the fuel valve to "ON".
2. Turn the ignition key "ON".
3. Close the choke.

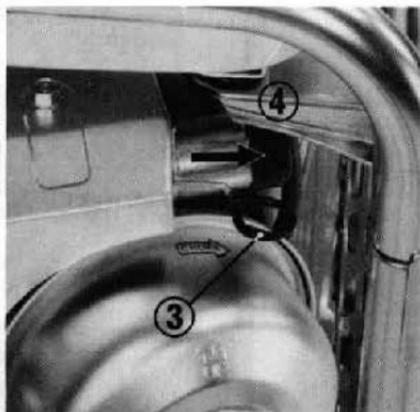
NOTE: Do not use the choke when the engine is warm or air temperature is high.

4. Pull the starter rope lightly until compression is felt, then pull briskly.
5. Open the choke as the engine warms up.

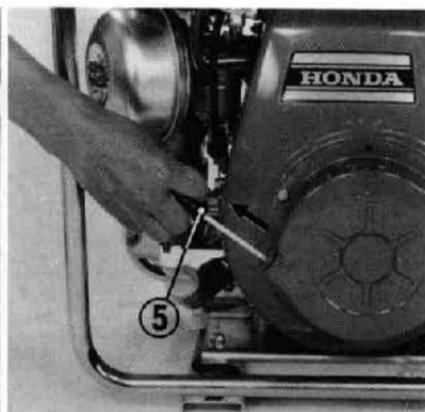
- (1) Fuel valve
- (2) "ON" position



- (3) Choke rod
- (4) "CLOSE" position



- (5) Starter



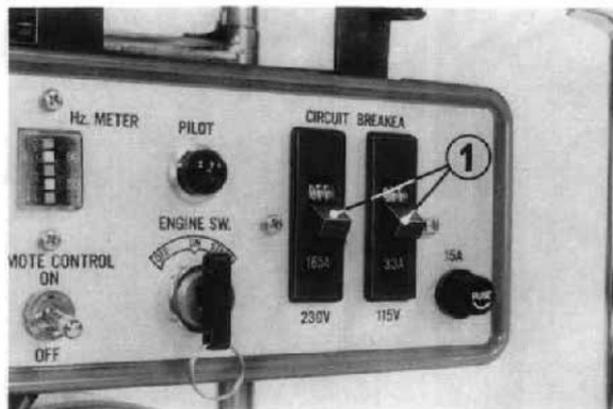
Stopping the Engine

1. Turn the circuit breakers "OFF" or disconnect the charging cord.

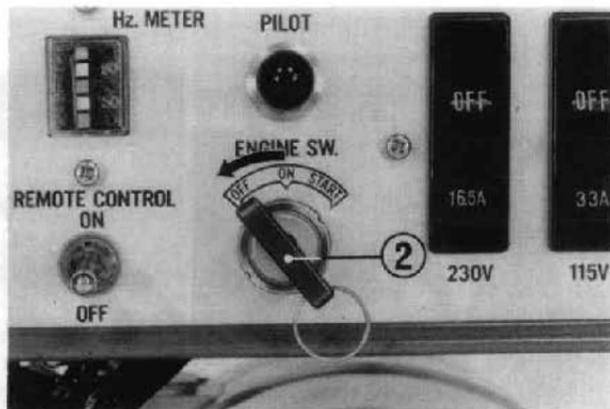
2. Turn the ignition key "OFF".
3. Turn the fuel valve to "OFF".

NOTE: The automatic choke solenoid operates with the engine switch. Always make sure that the switch is off when the engine is not running or the battery will discharge.

(1) Circuit breakers



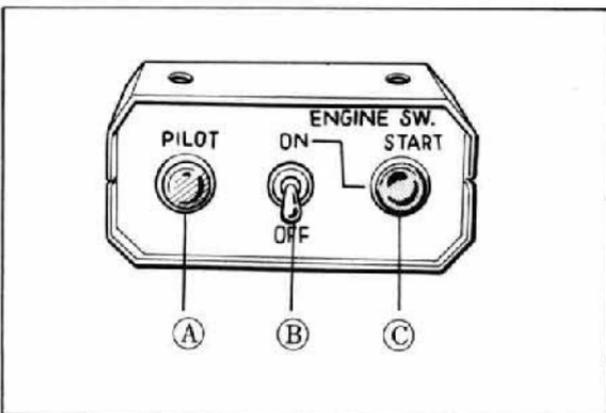
(2) Ignition key



REMOTE CONTROL OPERATION

The generator may be adapted for remote control operation by use of an optional kit, available from an authorized Honda dealer. The kit contains a control box with the following components:

- A. PILOT LAMP. Lights when the engine is running.
- B. ENGINE SWITCH. Snaps on or off to start or stop the engine.
- C. STARTER BUTTON. Activates the starter motor when the engine switch is on.

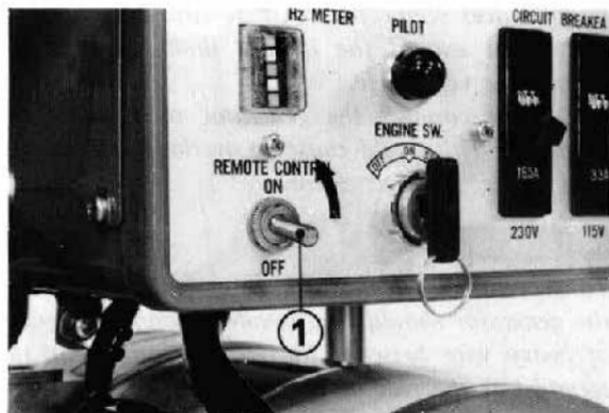


CAUTION

While the remote control switch is ON, do not attempt to operate the engine switch.

To operate by remote control, first snap on the remote control switch at the generator. Next, turn the engine switch "ON" and press the starter button. Since the control box is not equipped with a frequency meter, adjust frequency at the unit before using the kit.

(1) Remote control switch



GENERATOR USE

AC Applications

The generator is equipped with two receptacles for 115V, 15A power, one receptacle for 115V, 24.3A, and one receptacle for 230V, 12.2A. The maximum power available at the receptacles is 3.5 KVA (3,500 watts).

CAUTION

- * *Limit operation requiring maximum power to 30 minutes. For continuous operation, do not exceed the rated power limit of 2.8 KVA (2,800 watts). In either case, the total wattage of all appliances connected must be considered.*
- * *Do not exceed the current limit specified for any one receptacle.*
- * *Do not connect the generator to a household circuit. This could cause an overload and seriously damage the generator.*

WARNING

To prevent electrical shock from faulty appliances the generator should be grounded. Connect a length of heavy wire between the ground source and the terminal at the rear of the generator.

1. Start the engine and verify that the generator is operating at 60 Hz. If it is not, turn the throttle knob in the appropriate direction until the correct frequency is obtained.

- (1) Throttle knob
- (2) Frequency meter



2. Plug in the appliance.

NOTE: Watch the frequency meter carefully when connecting a tape recorder or a radio. If the frequency drops, readjust the throttle as required.

The generator is equipped with an AVR (Auto Voltage Regulator). Voltage need not be adjusted if the frequency is adjusted properly. If the generator does not produce the specified voltage at the proper frequency, consult an authorized HONDA dealer.

DC Applications

CAUTION

Use the DC terminals for charging 12 volt automotive type batteries only. Check the positive (+) and negative (-) sides and make a proper connection. Do not reverse the polarity of the terminals when charging a battery. Serious damage to the generator and/or battery may occur.

NOTE: The DC terminals may be used while the AC outlet is in use.

MAINTENANCE

The purpose of the maintenance schedule and adjustment is to keep the generator in the best operating condition.

Perform inspections as scheduled in the table on page 19.

WARNING

Shut off the engine before performing any maintenance. If the engine must be run, make sure the area is well ventilated. The exhaust contains poisonous carbon monoxide gas.

CAUTION

Use only genuine HONDA parts or their equivalent. The use of replacement parts which are not of equivalent quality may damage the generator.

Maintenance Schedule

Items \ Period	First 20 Hrs.	Every 50 Hrs.	Every 100 Hrs.	Every 300 Hrs. or One Year
Engine oil change	○		○	
Air cleaner maintenance		○ (1)		
Spark plug maintenance			○	
Fuel filter cleaning			○	
Belt adjustment			○	
Ignition timing adjustment				○ (2)
Tappet clearance adjustment				○ (2)
Combustion chamber and valve cleaning				○ (2)
Fuel tube check (Replace, if necessary)				○

NOTES: (1) When the generator is used in dusty areas, service the air cleaner more frequently.

(2) This service procedure should be performed by an authorized HONDA dealer unless the owner has the proper tools and is mechanically proficient.

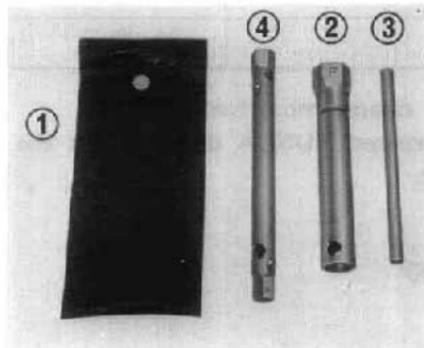
CAUTION

The spark arrester must be serviced every 100 hours to maintain its efficiency.

Tool Kit

The tools supplied are necessary for performing some periodic maintenance, simple adjustments and repairs. Always keep the kit with the generator.

- (1) Tool bag
- (2) Spark plug wrench
- (3) Plug wrench handle
- (4) 10 x 12 mm wrench

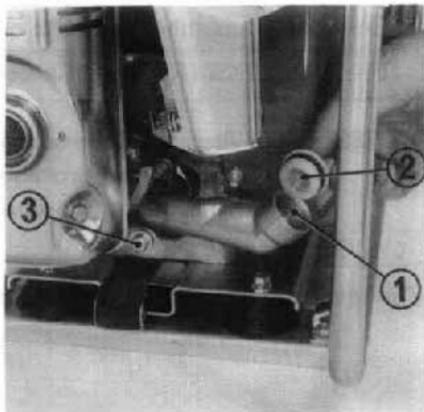


Changing Oil

Drain the oil while the engine is still warm to assure rapid and complete draining.

1. Remove the drain plug and filler cap, and drain the oil. Retighten the plug securely.
2. Refill with the recommended oil (see p. 9) and check the level.

- (1) Oil filler hole
- (2) Oil filler cap
- (3) Drain plug



Air Cleaner Service

A dirty air cleaner will prevent air flow to the carburetor. To prevent carburetor malfunction, service the air cleaner regularly.

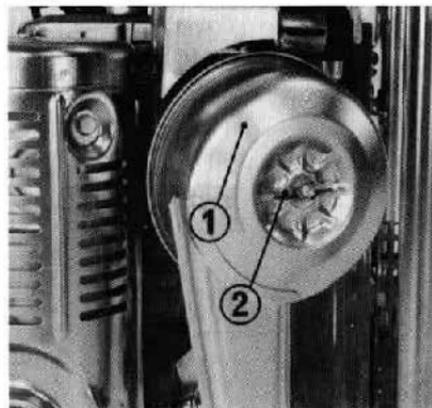
1. Remove the wing nut to remove the air cleaner cover.

Remove the element.

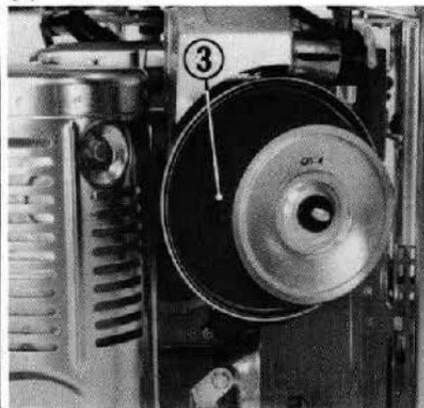
2. Clean the air cleaner element by tapping it lightly to remove dust.

The remaining dust can be brushed from the outer element surface or blown away by applying a compressed air from the inside of the element.

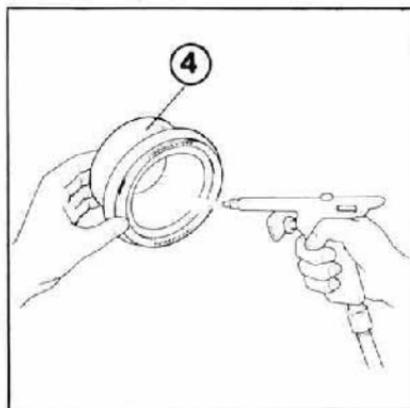
- (1) Air cleaner cover
- (2) Wing nut



- (3) Element



- (4) Paper element

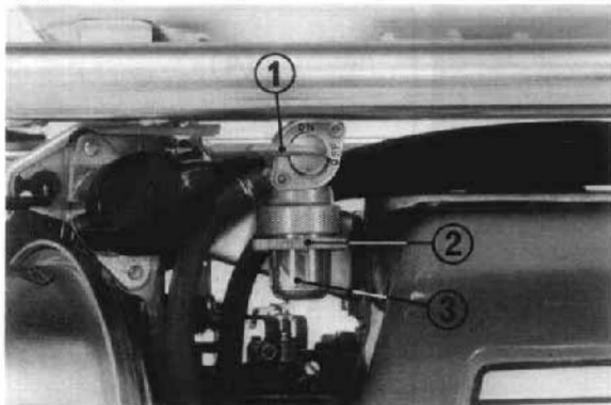


Fuel Filter Service

The filter prevents dirt or water which may be in the fuel tank from entering the carburetor. If the engine has not been run for a long time, the filter should be cleaned.

1. Turn the fuel valve to "OFF". Remove the ring nut and strainer cup.
2. Clean the cup thoroughly.
3. Reassemble. Do not damage the rubber gasket.

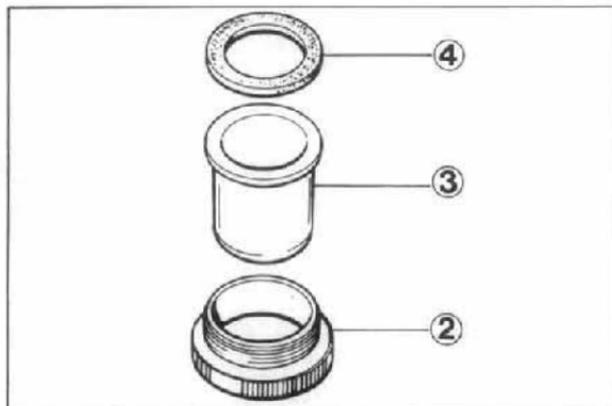
- (1) Fuel valve
- (2) Ring nut



WARNING

After installing the filter cup, be sure to tighten the ring nut securely. Check for fuel leaks and remove any spilled fuel prior to starting.

- (3) Strainer cup
- (4) Gasket

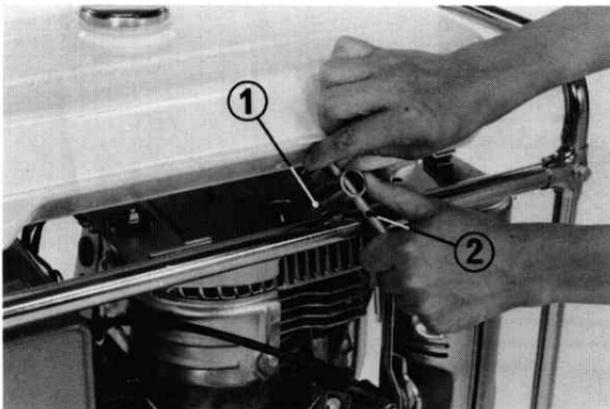


Spark Plug Service

To insure proper engine operation the spark plug must be properly gapped and free of deposits.

1. Remove the spark plug with the plug wrench.
2. Use a wire brush to remove deposits from the electrodes. Be careful not to damage the electrodes.
3. Check the plug gap with a feeler gauge. Correct as necessary.
4. Replace the plug.

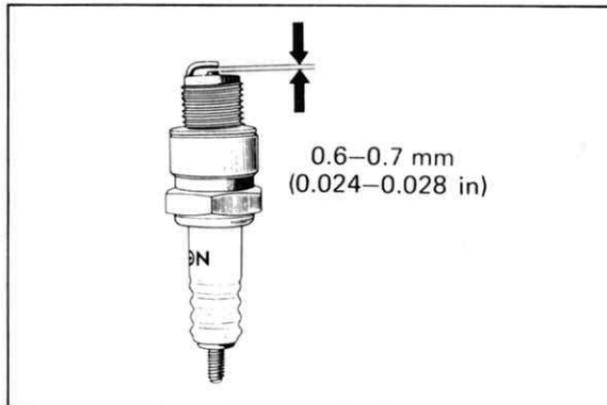
- (1) Spark plug wrench
- (2) Plug wrench handle



CAUTION

The spark plug must be securely tightened. An improperly tightened plug can damage the generator.

- (3) Spark plug



Drive Belt Adjustment

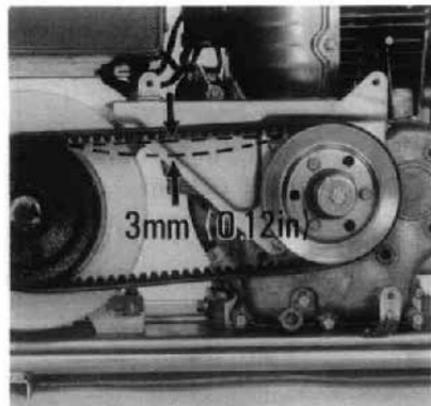
A loose or slipping belt will cause a drop in output power.

1. Remove the belt cover and check tension by pushing the middle of the belt. There should be approximately 3mm (1/8") of slack.
2. To adjust tension, loosen the generator mounting bolts. Loosen the lock nut on the adjusting bolt, and turn the bolt.

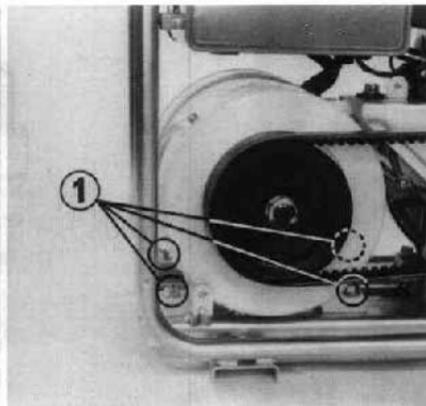
CAUTION

An overtightened drive belt will cause rapid bearing wear.

3. Retighten the lock nut and mounting bolts securely.

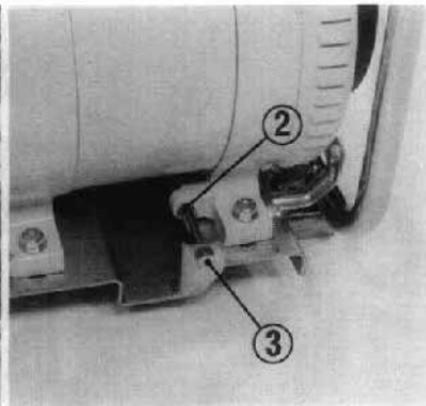


(1) Generator mounting bolts



(2) Lock nut

(3) Adjusting bolt



Ignition Timing Adjustment

Check the timing when specified by the periodic maintenance chart. Improper timing can cause starting difficulty and loss of power.

1. Remove the fan shroud and flywheel, and the point cover.
2. Using the woodruff key remount the flywheel on the crankshaft and check that the points

start to open when the "F" mark on the flywheel passes the aligning mark on the crankcase.

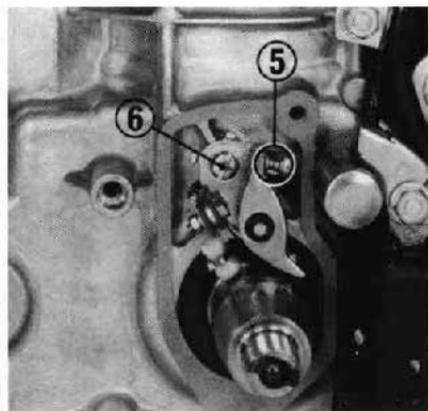
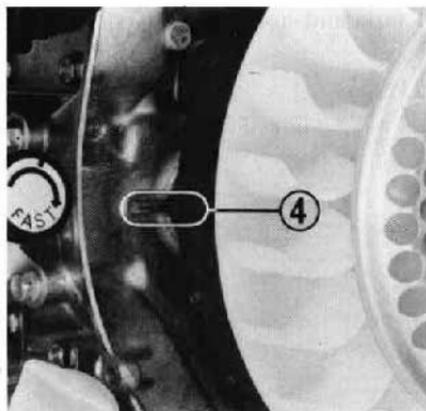
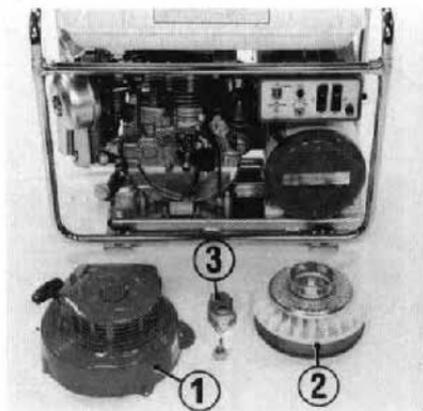
If timing is not correct.....

3. Loosen the 5mm screw and move the breaker plate to the right or left as required. Retighten the screw and recheck the timing.

- (1) Fan shroud
- (2) Flywheel
- (3) Point cover

(4) "F" mark and aligning mark

- (5) Contact breaker points
- (6) 5mm screw



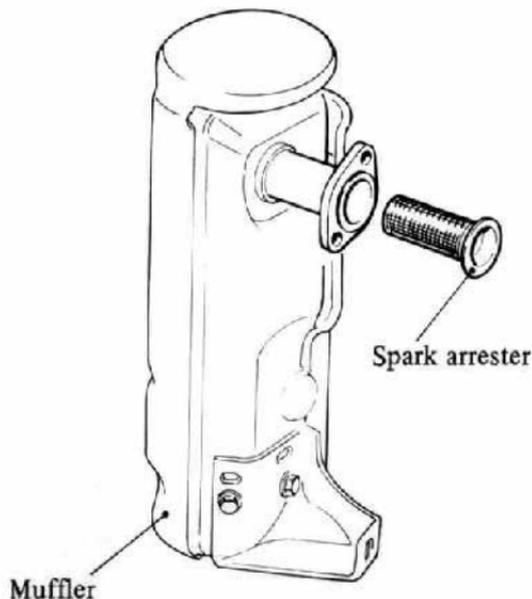
SPARK ARRESTER MAINTENANCE

WARNING

If the generator has been running, the muffler will be very hot. Allow it to cool before proceeding.

1. Loosen two nuts and a bolt and remove the muffler and gasket.
2. Check the muffler exhaust port for carbon deposits. Clean if necessary.
3. Remove the spark arrester from the muffler. Clean the screen and inspect it for damage. Replace if necessary.
4. Install the spark arrester in the muffler. Install the muffler and gasket and tighten the nuts and bolt securely.

TORQUE: 200–280 kg·cm (15–20 ft·lb)



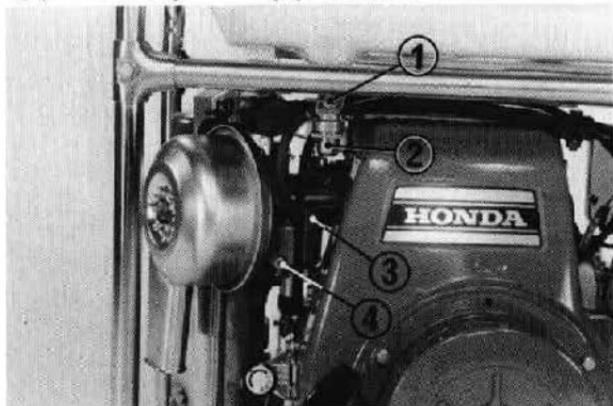
TRANSPORTING/STORAGE

WARNING

When transporting the generator, shut off the fuel valve and keep the generator level to prevent fuel spillage. Fuel vapor or spilled fuel may ignite.

Before storing the unit for an extended period:

1. Assure that the storage area is free of excessive humidity and dust.
2. Drain the fuel.
 - A. Turn the fuel valve to "OFF" and disconnect the fuel tube at the carburetor.
 - (1) Fuel valve
 - (2) Filter cup
 - (3) Carburetor
 - (4) Drain screw

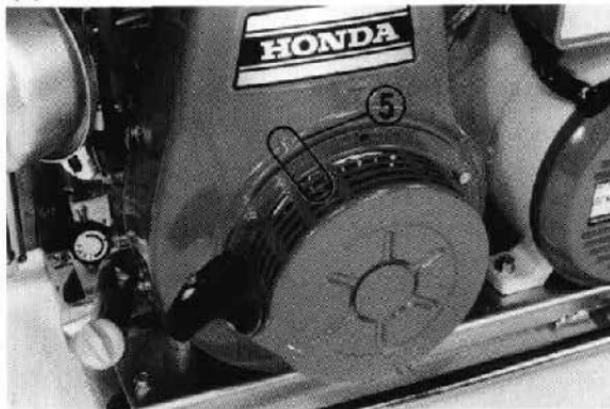


B. Turn the valve "ON" and drain the gasoline into a suitable container.

C. Remove the filter cup.

3. Drain the carburetor by loosening the drain screw. Drain the gasoline into a suitable container.
4. Pull the starter rope so that the mark is aligned with the index mark on the fan shroud on the compression stroke. This helps protect the engine from corrosion.

(5) Marks



TROUBLESHOOTING

Difficult Starting

- 1) Remove any appliances that may be connected to the generator.
- 2) Check the fuel level.
- 3) Check the battery connections, electrolyte level and condition.
- 4) Check the choke position (if starting manually).

No Electricity at the Outlet Receptacles

- 1) Be sure the circuit breaker is "ON".
- 2) Check for a blown fuse.
- 3) Check the electrical appliance or equipment for any defects.

Generator Voltage is Low

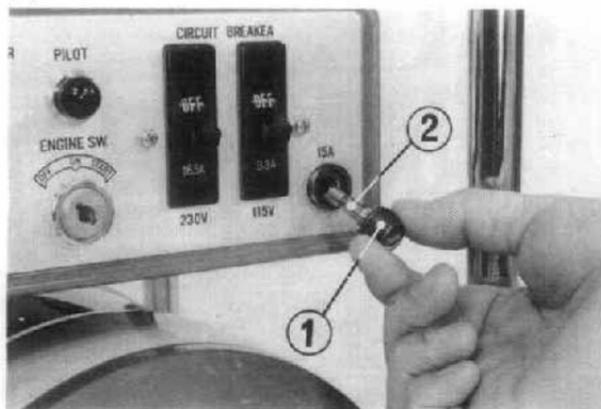
- 1) Check for correct frequency.
- 2) Check for slipping drive belt.

Fuse Replacement

Before replacing a blown fuse, determine the cause and correct the problem.

Remove the old fuse by turning the holder counter-clockwise. Replace with a 15A fuse.

- (1) Fuse holder
- (2) Fuse



SPECIFICATIONS

Dimensions

Length x Width x Height	715 x 415 x 595 mm (28.2 x 16.3 x 23.4 in)
Dry weight	89.5 kg (197 lbs)

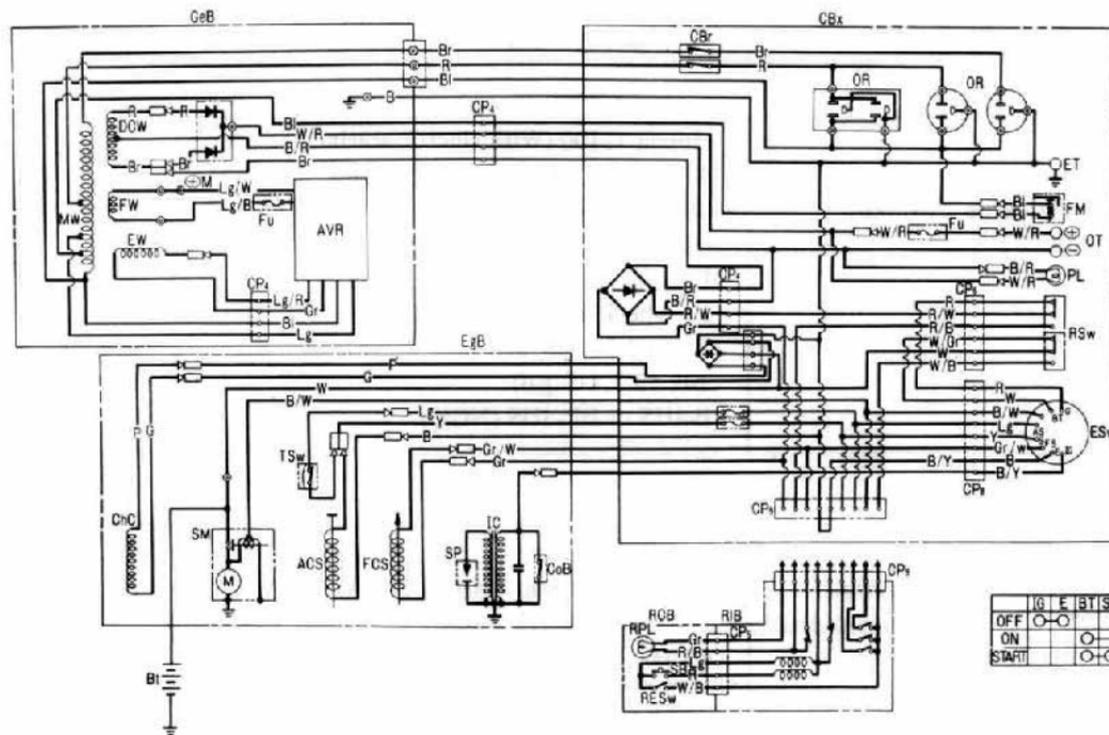
Engine

Model	Honda G400 (With electric starter)
Engine Type	4-Stroke, side valve, 1 cylinder
Displacement [Bore x Stroke]	406 cc (24.7 cu in) [86 x 70 mm (3.4 x 2.8 in)]
Compression Ratio	6.5 : 1
Cooling	Forced air
Ignition	Flywheel magneto
Oil Capacity	1.2ℓ (2.54 US pt)
Fuel Tank Capacity	14ℓ (3.7 US gal)
Spark Plug	B-4HS or BR-4HS (NGK)

Generator

AC output	Rated voltage	115V/230V
	Rated output	2.8 KVA (2,800 watts), 24.3A/12.2A
	Maximum output	3.5 KVA (3,500 watts)
	Cycles	60 Hz
DC output	Only for charging 12V automotive batteries. Maximum charging output = 8.3A.	

WIRING DIAGRAM



	Part Name
ACS	Automatic Choke Solenoid
AVR	Automatic Voltage Regulator
Bt	Battery
CBr	Circuit Breaker
CBx	Control Box
ChC	Charging Coil
CoB	Contact Breaker
CP~	~P Connector
DCW	DC Winding
EgB	Engine Block
ESw	Engine Switch
EW	Exciter Winding
FCS	Fuel Cut Solenoid
FM	Frequency Meter
Fu 1	Fuse (15A)
Fu 2	Fuse (5A)
FW	Field Winding
GeB	Generator Block
GT	Ground Terminal
IC	Ignition Coil
MW	Main Winding
OR	Output Receptacle
OT	Output Terminal

	Part Name
PL	Pilot Lamp
RCB	Remote Control Box
RESw	Remote Engine Switch
RIB	Relay Box
RPL	Remote Pilot Lamp
RSw	Remote Control Switch
SB	Starting Button
SM	Starting Motor
SP	Spark Plug
TSw	Thermostat Switch
⊕ M	+ Mark

	Color
B	Black
Bl	Blue
Br	Brown
Gr	Green
Lg	Light Green
R	Red
W	White
Y	Yellow

Current customer service contact information:

United States, Puerto Rico, and U.S. Virgin Islands:

Honda Power Equipment dealership personnel are trained professionals. They should be able to answer any question you may have. If you encounter a problem that your dealer does not solve to your satisfaction, please discuss it with the dealership's management. The Service Manager or General Manager can help. Almost all problems are solved in this way.

If you are dissatisfied with the decision made by the dealership's management, contact the Honda Power Equipment Customer Relations Office. You can write:

American Honda Motor Co., Inc.
Power Equipment Division
Customer Relations Office
4900 Marconi Drive
Alpharetta, GA 30005-8847

Or telephone: (770) 497-6400 M-F, 8:30 am - 5:00 pm EST

When you write or call, please provide the following information:

- Model and serial numbers
- Name of the dealer who sold the Honda power equipment to you
- Name and address of the dealer who services your equipment
- Date of purchase
- Your name, address, and telephone number
- A detailed description of the problem



HONDA
HONDA MOTOR CO., LTD. TOKYO, JAPAN

3188002

KI

AH M B20007811
PRINTED IN JAPAN