

KIPOR

WUXI KIPOR POWER PRODUCTS CO., LTD.

IG3000/IG3000E SHOP MANUAL

EPA/CARB/CETL Certified Models



Kipor Power Systems, Inc.

Revision 6 July, 2011

Preface

This manual covers the construction, function and servicing procedure of for the Kipor IG3000 generator. It is applicable to EPA, CARB, and CETL certified models. An appendix to this manual pertains to the IG3000E open frame model.

Careful observance of the instructions contained in this manual will result in safe and quality service work.

All information, illustrations, directions and specifications included in this publication are based on the latest product information available at the time of approval for printing.

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CONTENTS

PREFACE.....	i.
CONTENTS.....	1
1. SPECIFICATIONS/WIRING DIAGRAM.....	3
1.1 SPECIFICATIONS.....	3
1.2 PERFORMANCE CHARACTERISTICS.....	4
1.3 PERFORMANCE CURVES.....	5
1.4 DIMENSIONAL DRAWING.....	6
1.5 WIRING DIAGRAMS.....	7
2. SERVICE INFORMATION.....	9
2.1 THE IMPORTANCE OF PROPER SERVICING.....	9
2.2 IMPORTANT SAFETY PRECAUTIONS.....	9
2.3 SERVICE RULES.....	10
2.4 ELECTRICAL PRECAUTIONS.....	10
2.5 SERIAL NUMBER AND BARCODE.....	11
2.6 MAINTENANCE STANDARDS.....	12
2.7 TORQUE VALUES.....	13
3. TROUBLESHOOTING.....	14
3.1 GENERAL SYMPTOMS AND CAUSES.....	14
3.2 HARD STARTING.....	15
3.3 IGNITION SYSTEM FAULT.....	16
3.4 OIL SWITCH DEFECTIVE.....	18
3.5 ENGINE WON'T STAY RUNNING.....	18
3.6 ENGINE SPEED DOES NOT STABILIZE.....	19
3.7 SMART THROTTLE.....	19
3.8 LOW OR NO AC OUTPUT.....	20
3.9 NO DC OUTPUT.....	21
3.10 NO ELECTRIC START.....	22
3.11 BATTERY WON'T CHARGE OR HOLD A CHARGE.....	22
4. MAINTENANCE.....	23
4.1 MAINTENANCE SCHEDULE.....	23
4.2 ENGINE OIL.....	23
4.3 LOW ENGINE OIL ALARM INSPECTION.....	25
4.4 AIR FILTER.....	26
4.5 SPARK PLUG.....	26
4.6 VALVE CLEARANCE.....	27
4.7 FUEL FILTER AND FUEL SWITCH.....	29
5. AIR FILTER AND MUFFLER.....	30
5.1 AIR FILTER.....	30
5.2 MUFFLER.....	30
5.3 EXHAUST TUBE/SECONDARY AIR INJECTION VALVE.....	31

6. CARBURETOR	32
6.1 CARBURETOR REMOVAL AND REINSTALLATION	32
6.2 STEPPING MOTOR DISASSEMBLY AND REASSEMBLY	33
6.3 CARBURETOR DISASSEMBLY AND REASSEMBLY	34
6.4 FLOAT AND STEPPING MOTOR INSPECTION	35
7. CONTROL PANEL COMPONENTS	36
7.1 DISASSEMBLY AND REASSEMBLY	36
7.2 AC RECEPTACLES	36
7.3 DC RECEPTACLES	36
7.4 SMART THROTTLE SWITCH	36
7.5 IGNITION MODULE	37
7.6 IGNITION SWITCH	37
7.7 BRIDGE RECTIFIER.....	38
7.8 CHARGING REGULATOR.....	38
8. HOUSING AND FUEL TANK	39
8.1 DISASSEMBLY AND REASSEMBLY	39
8.2 VAPOR CONTROL SYSTEM.....	40
9. RECOIL STARTER/AIR CONDUCT COVER.....	41
9.1 DISASSEMBLY AND REASSEMBLY	41
9.2 RECOIL STARTER INSPECTION AND ASSEMBLY	42
10. ALTERNATOR/TRIGGER/IGNITION COIL/STARTER	45
10.1 ALTERNATOR.....	45
10.2 IGNITION COIL AND TRIGGER	47
10.3 STARTER MOTOR.....	50
11. VALVE COVER AND CYLINDER HEAD.....	51
11.1 VALVE COVER DISASSEMBLY/REASSEMBLY	52
11.2 CYLINDER HEAD ASSEMBLY.....	51
11.3 INSPECTION.....	54
12. CRANKCASE/ CRANKSHAFT/CAMSHAFT/ PISTON	56
12.1 CRANKCASE COVER	56
12.2 CRANKSHAFT AND CAMSHAFT	57
12.3 PISTON AND CONNECTING ROD.....	58
12.4 INSPECTION	59
APPENDIX A- IG3000E	69
APPENDIX B- CAPCITOR	77

1. SPECIFICATIONS

1.1 SPECIFICATIONS

Dimensions and weights

Model	IG3000
Length	28.5 in (725mm)
Width	17.9 in (455mm)
Overall height	21.6 in (548mm)
Net weight	124.3lbs, 60kg

Engine

Model	KG205GETi
Type	4-stroke,overhead valve, single cylinder
Displacement in (cc)	12.0 (196)
Bore x stroke in.(mm)	2.68 x 2.13 (68x54)
Horsepower	4.0 @ 3600 rpm
Compression ratio	8.5:1
Cooling system	Forced air
Ignition system	T.C.I
Ignition timing	25 B.T.D.C
Spark plug	WR7DC
Carburetor	Float type, horizontal butterfly valve
Air cleaner	Semi-dry
Governor	Electronic control
Lubrication system	Forced splash
Oil capacity	.63 qt (0.6L)
Starting system	Recoilr and Electrical starter

Stopping system	electron ground
Fuel	Automotive unleaded gasoline

Alternator

Model	KD 35
Generator type	Pole rotation magnetic field type
Generator structure	Self-ventilation drip-proof type
Excitation	Self-excitation (Magnet type)
Voltage regulation system	PWM (Plush width modulation)
Phase	single phase
Rotating direction	Clockwise (Viewed from the generator)
Frequency regulation	AC-DC-AC conversion (Inverter type)

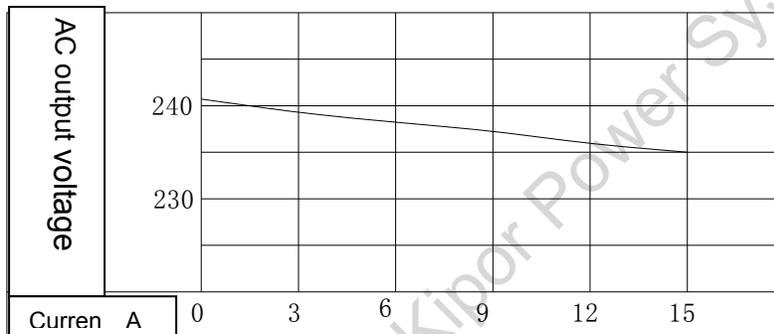
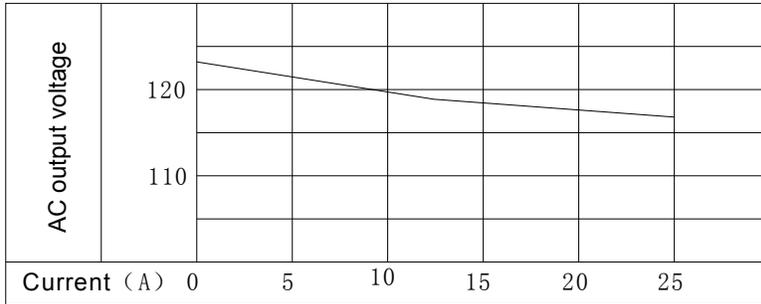
1.2 Performance

Model	IG3000
Maximum output watts/amps	3000/25 Amps
Rated output watts/amps	2800/23 Amps
Rated output DC	60W
Rated frequency	60 HZ
Rated voltage AC	120V
Rated Voltage DC	12V
Rated current AC	23.3A
Rated current DC	5A
Power factor	$1.0\cos\phi$
Voltage variation rate- Momentary	10%max.
Average	1.5%max.
Average time	3 sec. max.
Voltage stability	$\pm 1\%$
Frequency variation rate	1%max.
Momentary	1%max.
Average time	1 sec. max.
Frequency stability	$\pm 0.1\%$
Insulation resistance	10M Ω min.
AC circuit protector	26A(120V)
DC circuit protector	7A
Fuel tank capacity	11.6L
Fuel consumption g/KW.h (rated load)	395
Operating hours at rated load	7.0 Hours
Noise level dBA @ 23' (7M)	63-69

1.3 PERFORMANCE CURVES

The curves show performance of the generator under average conditions. Performance may vary to some degree depending on ambient temperature and humidity. The output voltage will be higher than usual when the generator is still cold, immediately after the engine starts.

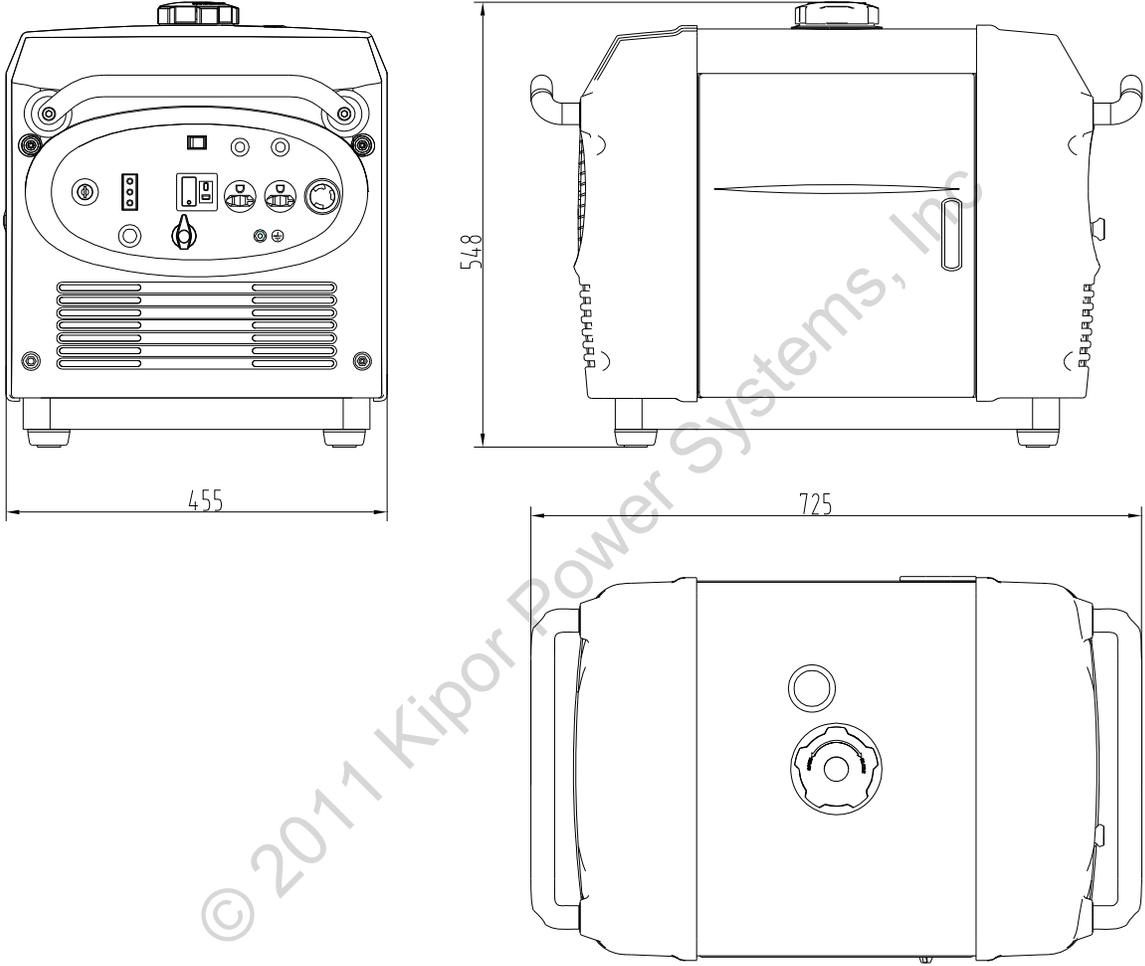
AC external characteristic curve



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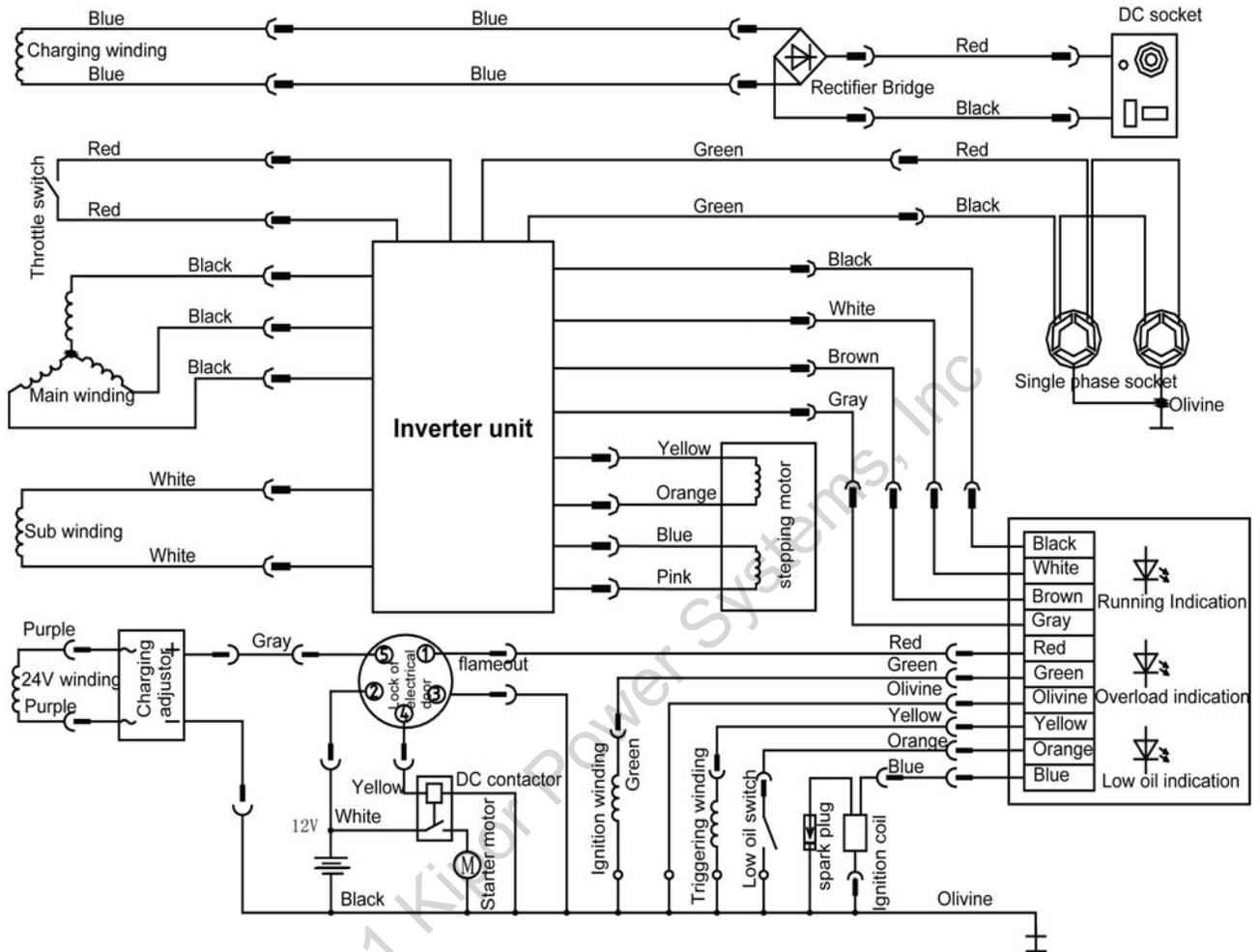
1.4 DIMENSIONAL DRAWING

Unit: mm

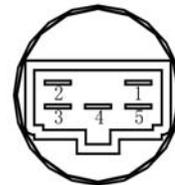


1.5 WIRING DIAGRAMS

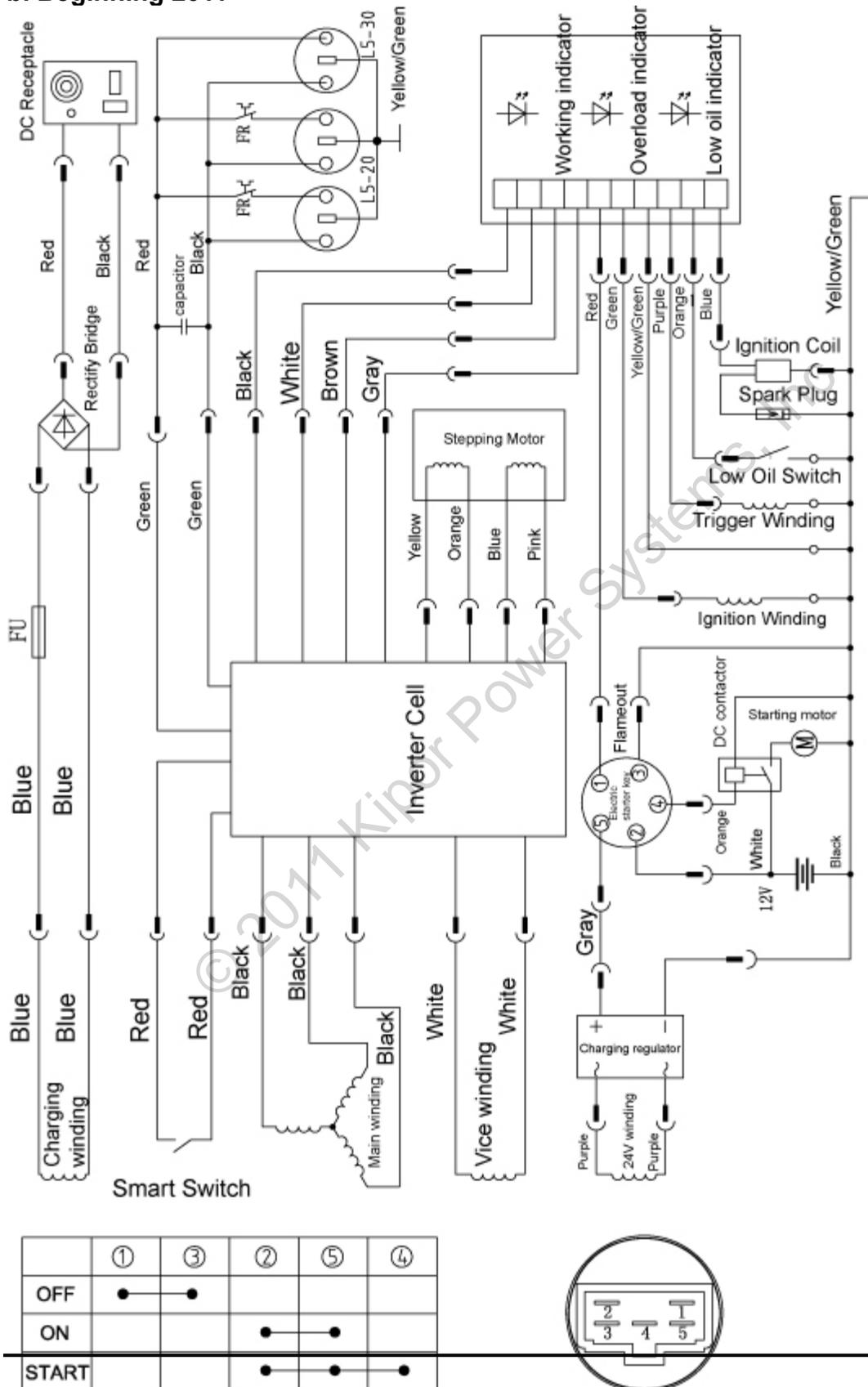
a. Pre 2011 models



	①	③	②	⑤	④
OFF	●	●			
ON			●	●	
START			●	●	●



b. Beginning 2011



2. SERVICE INFORMATION

2.1 The importance of proper servicing

Proper servicing is essential to the safety of the operator and the reliability of the generator. Any error or oversight made by the technician while servicing can easily result in faulty operation and/or damage to the equipment or injury to the operator.



Improper servicing can cause an unsafe condition that can lead to serious injury or death. Follow the procedures and precautions in this shop manual carefully.

Some of the most important precautions are stated below. But we could not list all the potential danger, you should judge yourself if it need to do the maintenance task.



Could not follow the maintenance instruction and safety precautions can cause an unsafe condition that can lead to serious injury or death. Follow the procedures and precautions in this shop manual carefully.

2.2 Important safety precautions

Be sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and safety equipment. When performing maintenance or repairs, be especially careful of the following:

- Read the instructions before you begin, and be sure you have the tools and skills required to perform the tasks safely.
- Be sure that the engine is off before you begin any maintenance or repairs. This will reduce the possibility of several hazards:
 - Carbon monoxide poisoning from engine exhaust:
 - Run engine in the ventilated place whenever .
 - Burns from hot parts.
 - Touch the engine parts after it cooled.
 - Injury from moving parts.
- Do not run the engine unless the instructions tell you to do so. Keep your hands and clothing away from rotating parts.

- To reduce the possibility of fire or explosion, exercise extreme caution when working around gasoline. Use only a nonflammable solvent, not gasoline, to clean parts. Keep cigarettes, sparks and flames away from all fuel-related parts.

2.3 Service rules

- Use genuine KIPOR or KIPOR-recommended parts and lubricants or their equivalents. Parts that do not meet Kipor's design specifications may damage the engine.
- Use the special tools designed for the product.
- Always install new gaskets, O-rings, etc. when reassembling components.
- When tighten the bolt or nut, please from major diameter to minor diameter, from inside to outside. Tighten the bolt and nut to the specific torque in this way.
- Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
- After reassembly, check all parts for proper installation and operation.
- Many screws used in this machine are self-tapping. Be aware that cross-threading or over tightening these screws will strip the threads and ruin the hole.
- Use only metric tools when servicing this engine. Metric bolts, nuts and screws are not interchangeable with non metric fasteners. The use of incorrect tools and fasteners will damage the engine.
- Be sure to follow the mark and instruction of the book when use the tools.

2.4 Electrical precautions

- Hold the connector body to disconnect the connector. Do not disconnect by pulling the wire harness. To disconnect the locking connector, be sure to unlock first, and then disconnect.
- Check the connector terminals for bend, excessive extrusion, missing terminals, or other abnormalities before connecting the connector.
- To connect, insert the connector as far as it goes. If the connector is a locking type, be sure that it is locked securely.
- Check the connector cover for breakage and check whether the connector female terminal is not opened excessively. Then, connect the connector securely. Check the connector terminal for rust. Remove the rust using an emery paper or equivalent

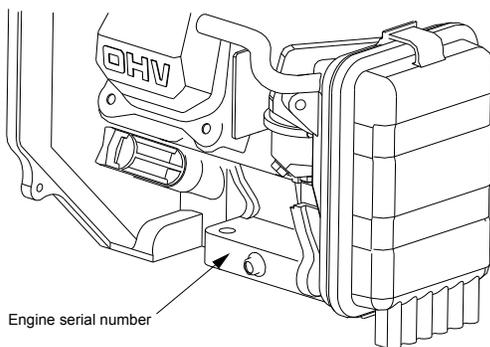
material before connecting the connector.

- Set the harness clips in the specified places of the frame securely, and secure the wire harnesses.
- Clamp the cables securely.
- Clamp the wire harnesses securely so that they do not interfere with the rotating parts, moving parts and hot parts.
- Route and connect the wire harnesses properly. Be sure that the harnesses are not slack, twisted or pulled overly taut.
- Route the wire harnesses properly so that they do not contact sharp edges and corners and the end of the bolts and screws on the body.
- If a wire harness must contact the end of the bolts or screws or sharp edges and corners, protect the contact part of the harness with a loom or by winding with electrical insulating tape. If the wire harness has a grommet, set the grommet securely.
- Take care not to pinch the wire harnesses during installation of a part. If a wire harness has damaged insulation, repair by winding with electrical insulating tape.
- When using an electrical tester like a volt/ohm meter or clamp on meter, read the manufacturer's operating instructions carefully before operating the tester. Be sure that the tester battery is fully charged and the meter is functioning properly

2.5 Serial number location

The engine serial number is stamped on the engine block to the left of the oil drain bolt. Refer to this number when ordering parts or making technical inquiries.

Engine serial number



2.6 Maintenance standards

Engine

Part	Item	Standard in. (mm)	Service limit
Engine	Max. speed under zero load (rpm)	3600±100 0.45MPa/600rpm	— —
Cylinder	Sleeve I.D.	2.67~2.68 (68.02~68.04)	2.68 (68.17)
Piston	Skirt O.D. Piston-to-cylinder clearance Pin bore I.D.	2.68~2.68 (67.97~67.99) (0.030~0.070) 18.002~18.008	2.68 (67.62) .0047 (0.12) 18.042
Piston pin	O.D. Pin-to-piston clearance	.708~.709 (17.990~18.000) .0001~.0071 (0.002~0.018)	.709 (17.95) .0003 (0.080)
Piston ring	Ring width Top Second Ring side clearance Top/second Ring end clearance Top/second	1.420~1.440 1.420~1.440 0.02~0.06 0.150~0.350	1.32 1.32 0.15 1.0
Connecting rod	Small end I.D. Big end I.D. Big end oil clearance Big end side clearance	.7089~.7093 (18.006~18.017) 1.182 (30.015~30.025) .0018~.0024 (0.046~0.060) .0177~.0276 (0.45~0.70)	0.711 (18.07) 1.184 (30.07) 0.12 .0394 (1.0)
Crankshaft	Crank pin O.D.	29.960~29.975	29.90
Valve	Valve clearance Intake Exhaust Valve rod OD Intake Exhaust Vessel I.D. Intake/Exhaust Clearance of valve and vessel Intake Exhaust Seat width Intake/Exhaust	0.06±0.02 0.08±0.02 5.45~5.48 5.45~5.47 0.020~0.052 0.030~0.062 0.8~1.2	— — .211 (5.35) .211 (5.35) .219 (5.56) .0039 (0.1) .0047 (.12) .079 (2.0)
Valve spring	Free Length Intake/Exhaust	1.20 (30.5)	1.14 (29)
Cam wheel	Cam height I.D. Intake/Exhaust	1.09~1.10 (27.63~27.91) 1.09~1.10 (27.68~27.94)	1.08 (27.34) 1.08 (27.34)
Camshaft	O.D.	.550~.551 (13.966~13.984)	.553 (13.92)
Valve lifter	O.D.	.313~.314 (7.96~7.98)	.310 (7.87)
Crankcase cover	Camshaft Bearing I.D.	>550~.552 (14.000~14.027)	.553 (14.05)
Cylinder block	Valve lifter I.D. Camshaft Bearing I.D.	.315~.316 (8.000—8.015) .550~.552 (14.000—14.027)	.317 (8.06) .553 (14.05)
Carburetor	Floater height	14	—
Spark plug	Clearance	0.7—0.8	—
Ignition coil	Resistance Primary side Second side	0.8—1.3Ω 15—21kΩ	— —
Pulse coil (Trigger)	Air gap Resistance	.020~.030 (0.5~0.75) 80~130Ω	— —
Starting relay	Resistance	3.8~4.1Ω	—

Generator

Part	Item	Type	Standard (Ω)		Service limit
			120V	240V	
Ignition coil	Resistance	Yellow/Green—Green	0.26~0.28	0.26~0.28	—
Outer charging winding coil	Resistance	Blue-Blue	0.12~0.15	0.12~0.15	—
Inner charging winding coil	Resistance	Purple-purple	0.19~0.21	0.19~0.21	—
Sub winding coil	Resistance	White—White	0.12~0.14	0.12~0.14	—
Main winding coil	Resistance	Black—Black	0.8~1.1	33-35	—

2.7 Torque values

Item	Thread dia. X pitch	Tightening torque	
		Ft/lbf	N.m
Connecting rod bolt	M7	10.3~11.8	14~16
Cylinder cover bolt	M8×60	20.7~23.6	28~32
Spark plug	M14×1.25×19	18.4~22.2	25~30
Crankcase cover	M8×30	14.75~17.0	20~23
Flywheel nut	M14×1.5	59.0~66.42	80~90
Tightening bolt of rocker arm base	M8×16	14.75~17.0	20~23
Adjusting nut of rocker axis	M6×0.75	7.4~8.8	10~12
Standard torque	M5 bolt、nut	4.4~5.9	6~8
	M6 bolt、nut	5.9~7.4	8~10
	M8 bolt、nut	14.8~17.0	20~23
	M10 bolt、nut	40.6~44.3	55~60

Note:

Use standard torque values for fasteners that are not listed in this table.

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3. TROUBLESHOOTING

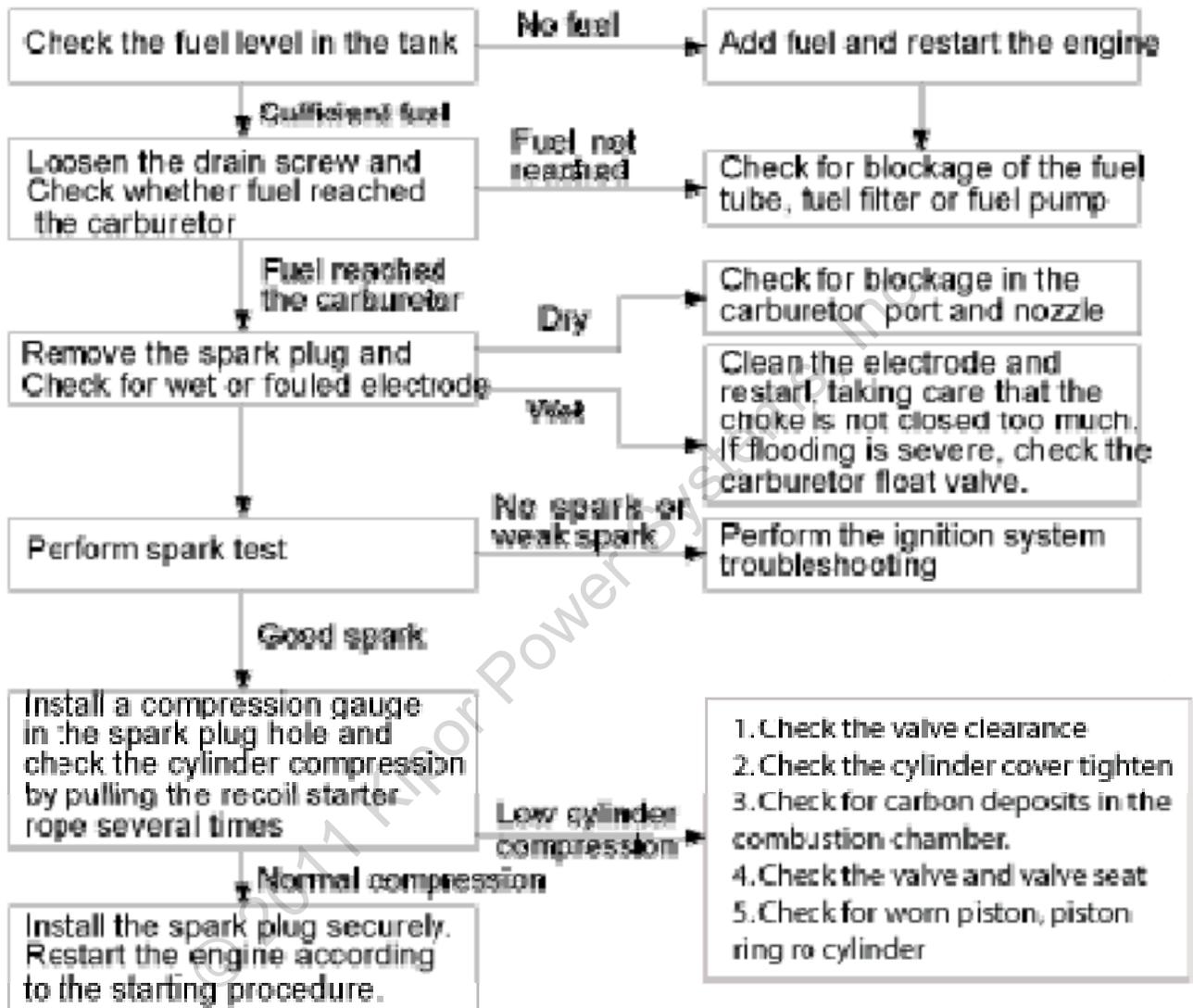
3.1 General symptoms and possible causes

Symptom	Cause(s)	Remedy
Engine does not start or hard starting	Fuel filter clogged	Clean
	Fuel tank tube clogged	Clean
	Fuel switch clogged	Clean
	Carburetor failure	Clean and/or replace*
	Spark plug cap disconnected	Install securely
	Ignition coil failure	Inspect and replace
	Trigger failure	Inspect and replace
	Spark plug failure	Inspect and replace
	Oil level switch (Low oil alarm) failure	Inspect and replace
	Igniting device failure	Inspect and replace
	Igniting winding failure	Inspect and replace
Choke air inlet not controlled properly	The position can be full open or half open	
Engine speed does not stabilize, too high or too low	Carburetor failure	Adjust and/or disassemble and clean
	Throttle control motor (stepping motor) failure	Inspect and replace
	Inverter unit failure	Inspect and replace
	Valve clearance misadjusted	Adjust

* Carburetor replacement parts are not available. No adjustments or overhaul is permitted under current EPA/CARB guidelines.

3.2 Hard starting

If the engine does not start or is hard starting after reassembly, check to see whether the throttle valve is at the full open position.



- Cylinder compression check

1. Remove the spark plug cap and spark plug
2. Install a compression gauge in the spark plug hole. Pull the recoil starter rope several times with force and measure the cylinder compression.

Cylinder compression	0.45Mpa/600rpm
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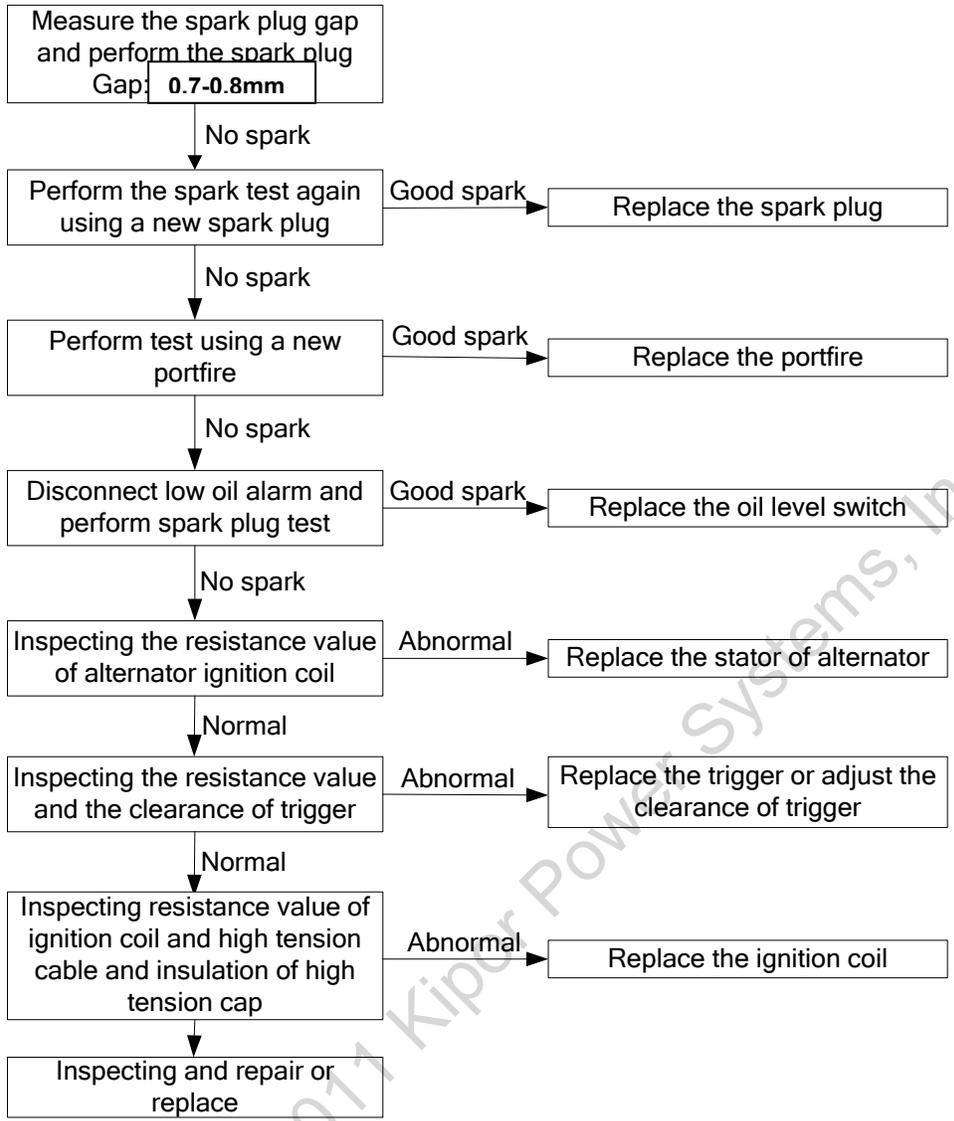
3.3 Ignition system fault

- Fill oil to the specified location before inspecting
- Please use the WR7DC spark plug
- check the spark plug
 1. Remove the spark plug.
 2. Install the spark plug onto spark plug cap.
 3. Turn the ignition switch of engine to the position "ON". Then ground the spark electrode to the cylinder head cover and pull the start motor rope to check if sparks jump across the electrode.



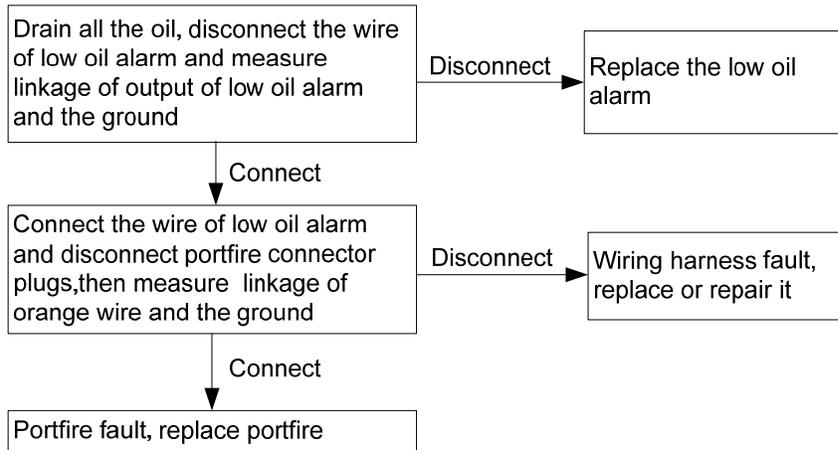
- Do not pull the recoil starter rope while touching the high tension wire with a wet hand. High voltage is generated which is dangerous. Be sure to ground the spark plug and hold the plug cap with an insulated pair of pliers to perform the spark test.
- Make sure no spilled fuel is anywhere on the engine and no fuel is on the spark plug
- Keep sparks and any other combustible source away from the spark plug hole.

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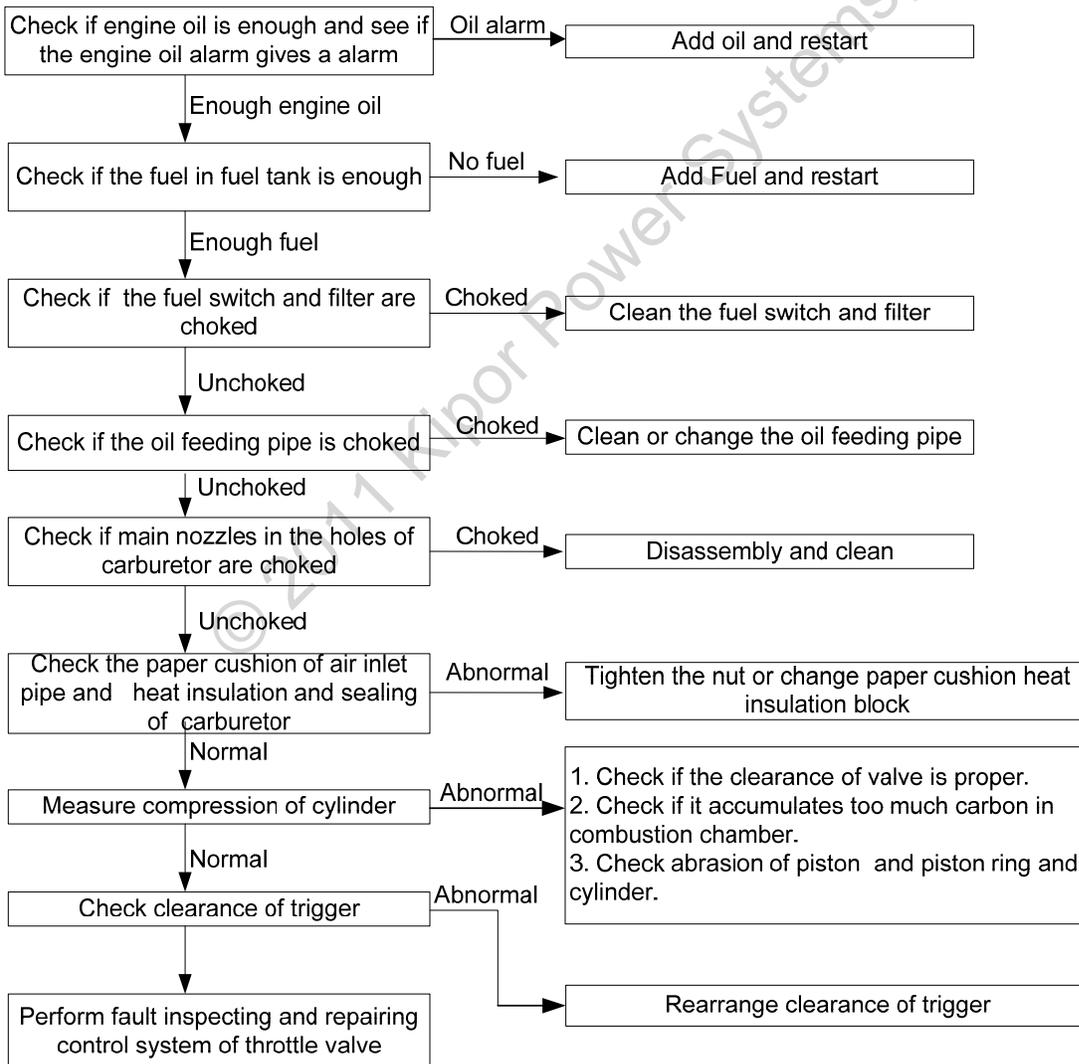


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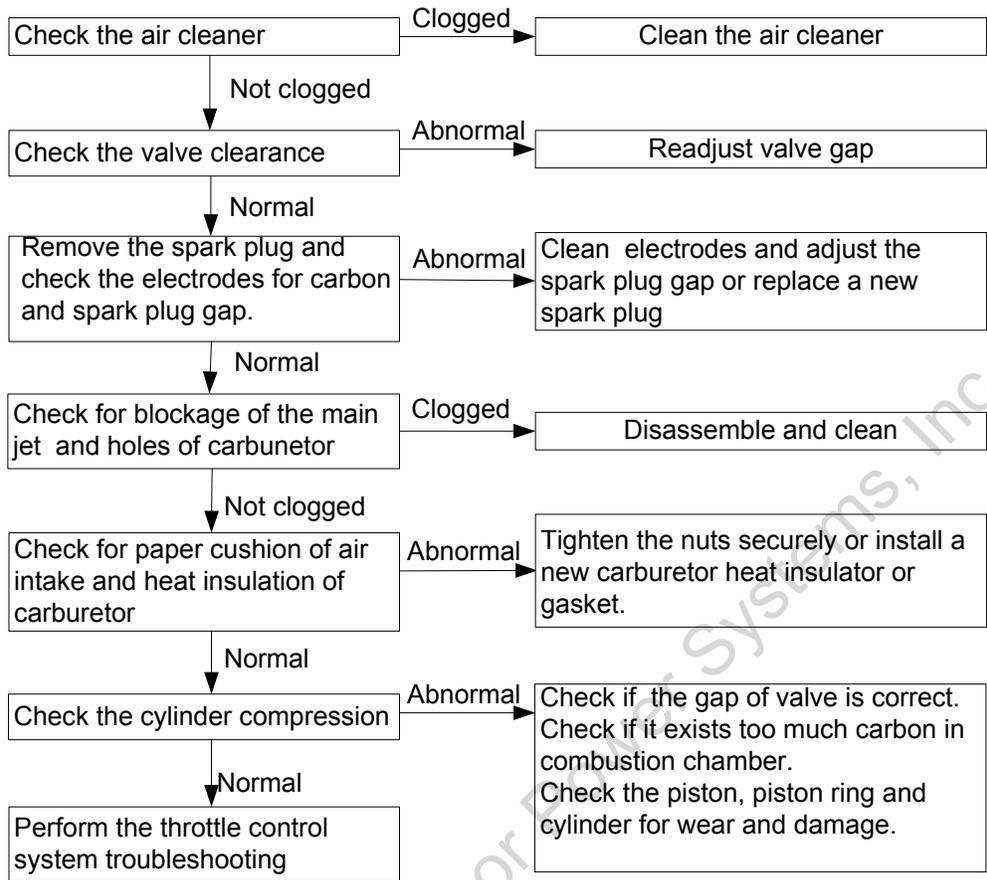
3.4 Engine oil level is low, but engine does not stop (defective oil switch)



3.5 Engine starts but won't stay running

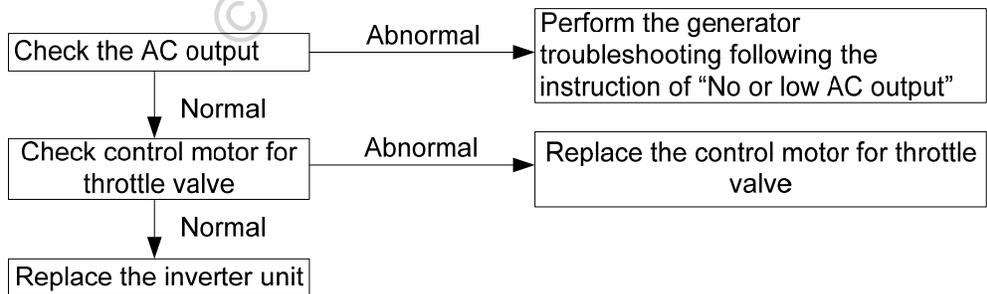


3.6. Engine speed does not increase or stabilize. (smart throttle is in right position)

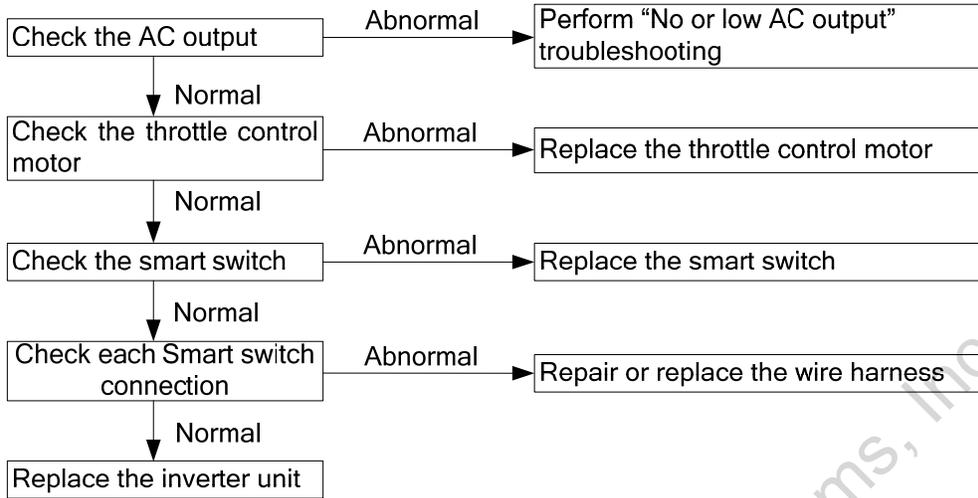


3.7 Smart throttle problems

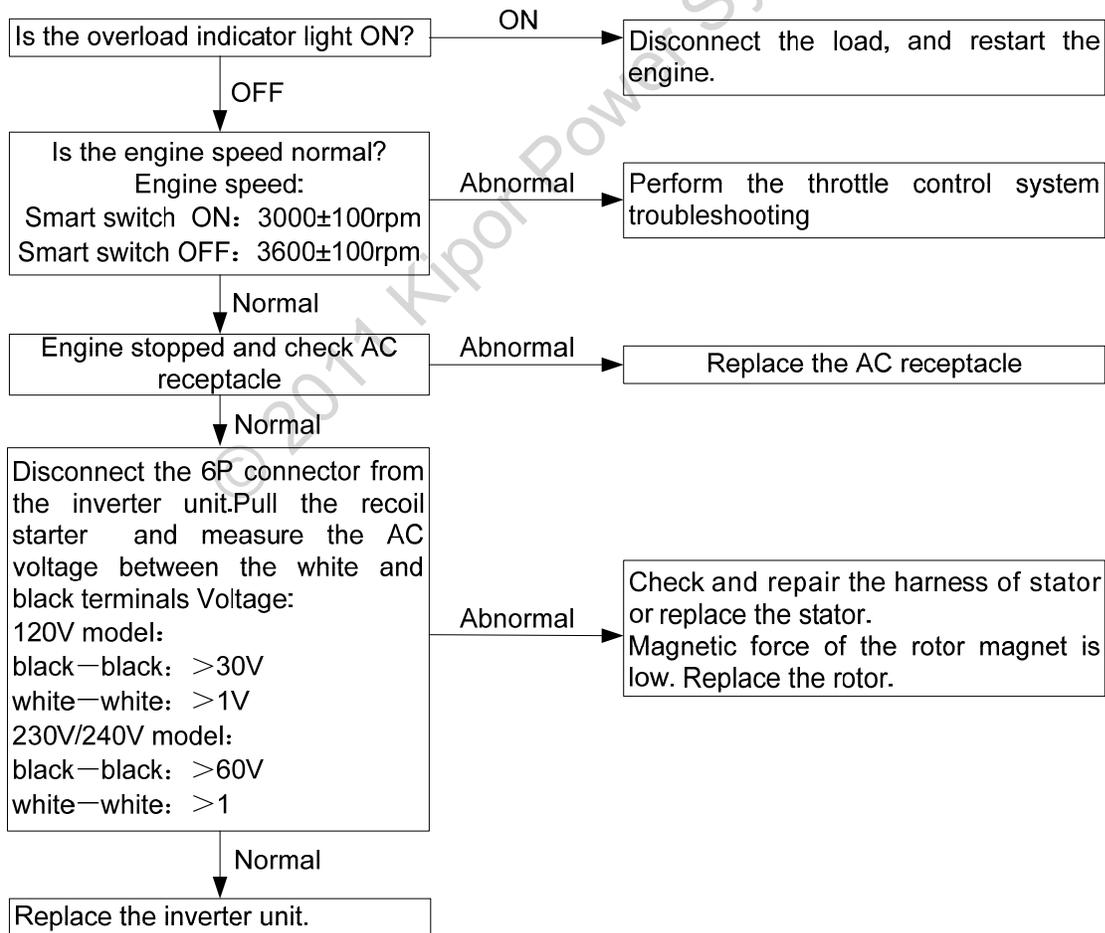
1. Engine speed is too high, hunting or too low.



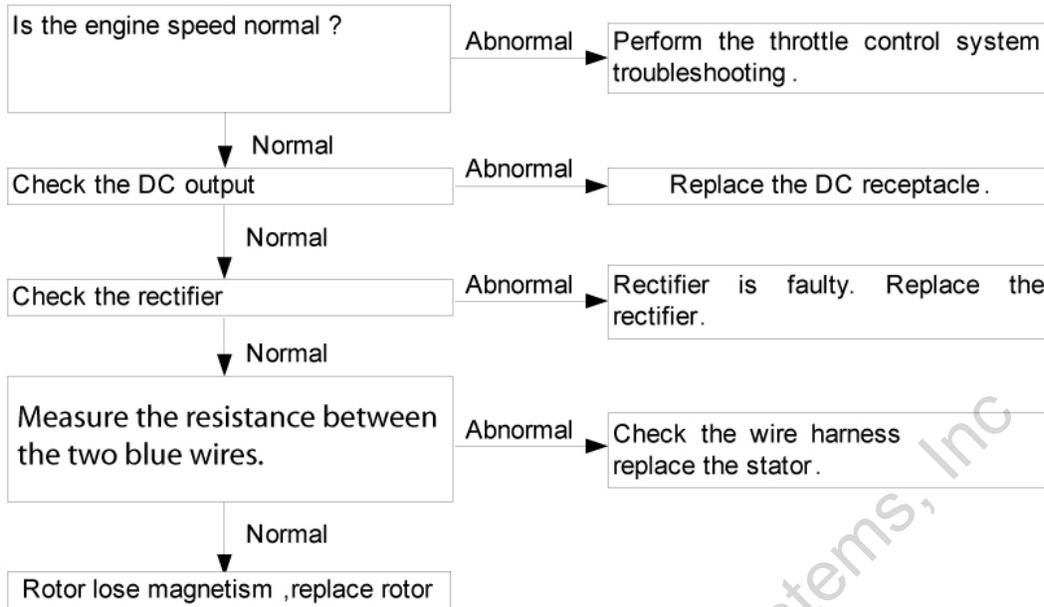
2. Smart Throttle system does not work under no load (engine speed does increase after connecting load with Smart Throttle system ON).



3.8 Low or no AC output

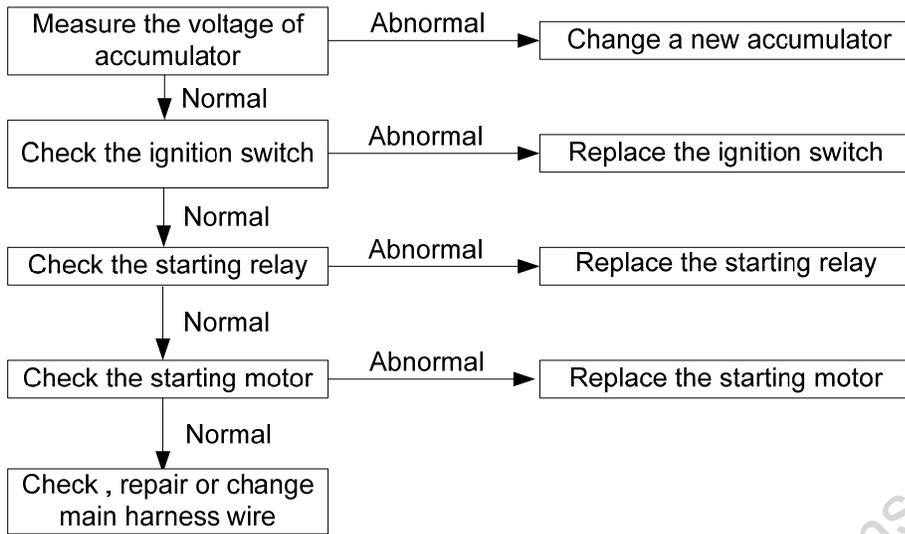


3.9 No DC Output

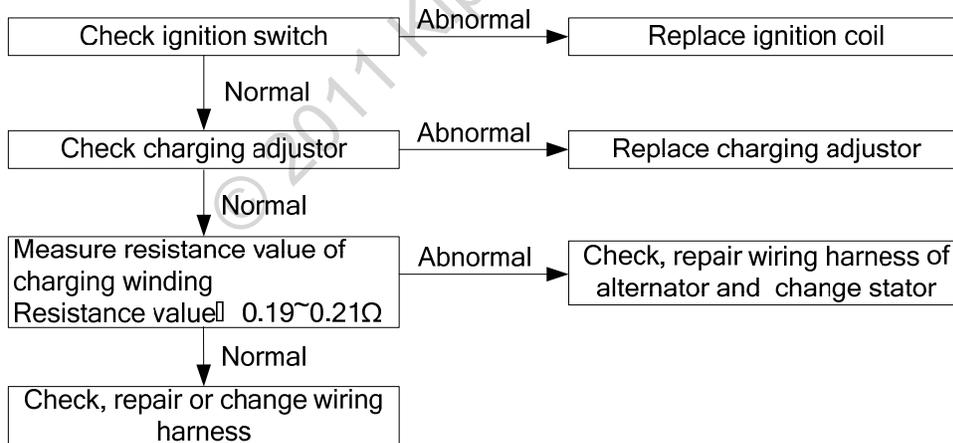


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3.10 No Electric Start



3.11 Battery will not hold a charge



4. MAINTENANCE

4.1 Maintenance schedule

Regular service period ^①		Each use	First month or 20 Hrs.	Every 3 months or 50Hrs.	Every 6 months or 100 Hrs.	Every year or 300 Hrs.
Perform at every indicated month or operating hour interval, whichever comes first						
Engine Oil	Check	●				
	Replace		●		●	
Air cleaner	Check	●				
	Clean			● ^②		
Spark plug	Clean-Adjust				●	
Spark arrestor	Clean				●	
Valve clearance	Check-Adjust					● ^③
Fuel tank and filter	Clean					● ^③
Fuel lines	Check	Every 2 years (Replace if necessary ^③)				

Note:

① Interval operating time in normal troubleshooting.

② When used in dusty conditions, filter should be cleaned every 10 hours.

③ Maintenance should be carried out by the qualified technicians.

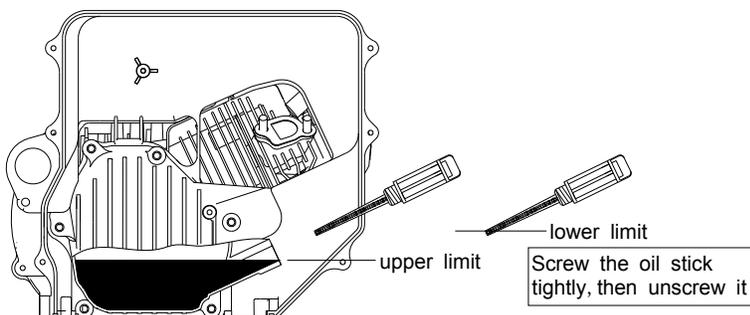
PLEASE READ KIPOR OPERATION MANUAL.

4.2 Engine Oil

A. Checking Oil Level

Engine should be shut off and generator placed on level ground when checking the oil level.

(1) Remove the oil dipstick, check oil level.



- (2) Add the proper viscosity engine oil to the upper limit if oil level is low. Be careful to over fill.

B. Changing engine oil

- (1) Remove the oil dipstick and unscrew oil drain plug to drain used oil.
- (2) Replace the drain plug and secure tightly.
- (3) Refill the oil (oil capacity 0.6L)

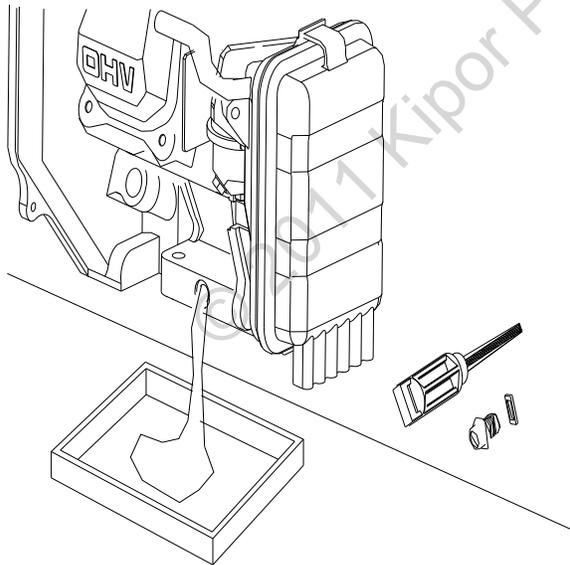
Recommend engine oil:

SE, SF engine oil classified by API or SAE10W-30 engine oil which same as SG grade.

Use SAE10W-30 engine oil when the temperature is below 10°C.

Use SE, SF engine oil classified by API or SAE5W-30 engine oil which same as SG grade when the temperature is below -15°C.

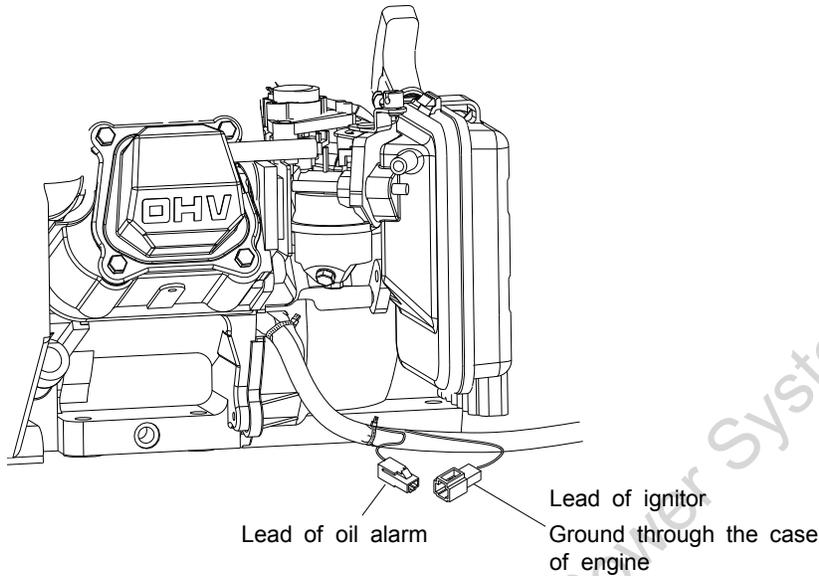
- (4) Add the proper viscosity oil to the upper oil limit level.
 - (5) Reinstall the dipstick and screw it tightly
- Discharge oil quick and thorough when the engine is hot, but the temperature is not too hot, prevent scalding.
 - Please send the discarded oil to maintenance station or recycle centre. Don't pour the discarded oil into earth or waste.



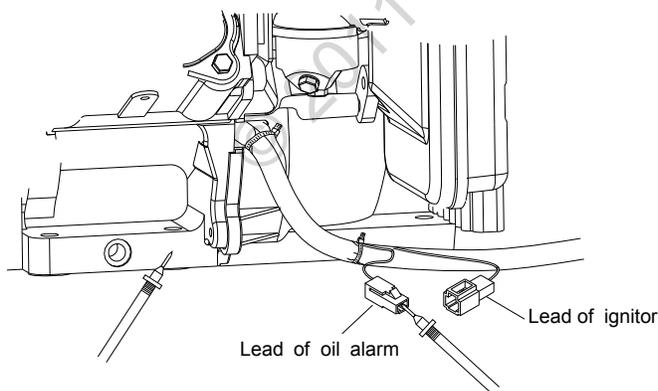
4.3 Inspection of the Low Oil Alarm

- (1) Disconnect the orange connection of the low oil alarm wire when engine is running, and ground one end to the engine block as shown below to ensure that the engine will stop when the low oil alarm lamp is light.

NOTE: On early models, the low oil alarm connection is in the back of the generator on the opposite side of the service door.



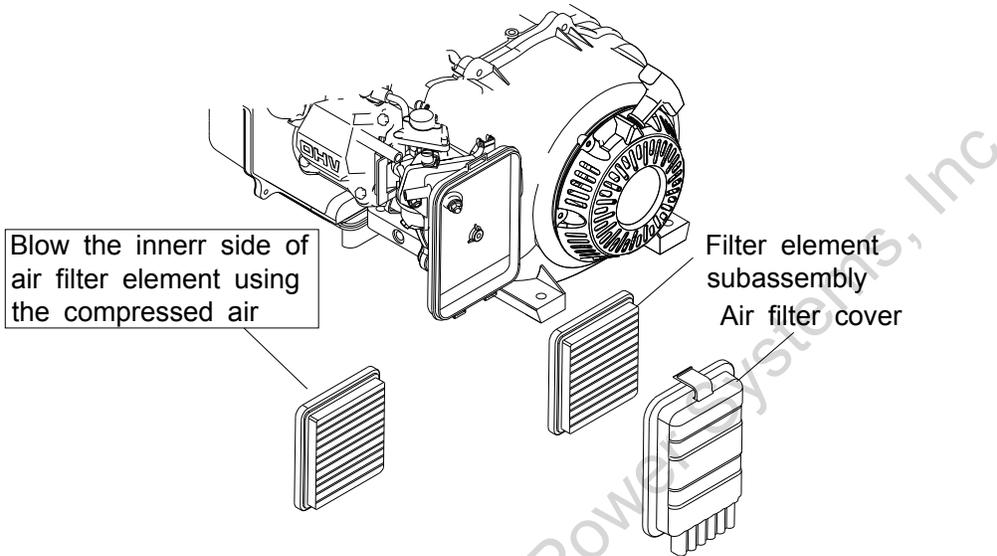
- (2) Stop the engine and disconnect the orange wire of the low oil alarm after insuring that the engine oil is at the proper level. Test the conductivity between the end shown in the figure and the case of engine, No conductivity indicates a normal condition.



- (3) Drain all the engine oil in the engine repeat the test. The switch is working properly if there is normal conductivity.

4.4 Air Filter

- (1) Open the service door.
- (2) Open the cover of air filter and take out the filter element.
- (3) Blow the inner side of filter element using compressed air or lightly knock it to remove dirt. If any dirt remains, change the element. Be sure to use a genuine Kipor element to maintain a proper seal and avoid engine damage.
- (4) Reinstall the filter element and close the service door.



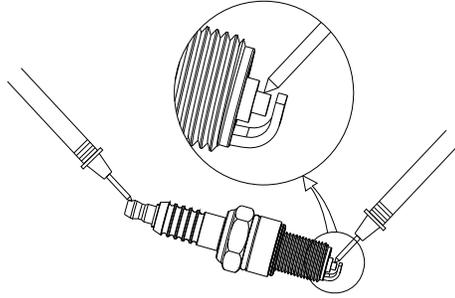
▲ Attention !

- Dirty air filter will affect the air into the carburetor, and reduce engine power.
- Don't operate the generator without the filter element in place or serious engine damage may result.

4.5 Spark Plug

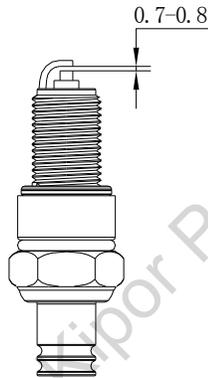
- (1) Remove the spark plug cap and use a spark plug wrench to remove the spark plug.
- (2) Remove carbon or other deposits with a stiff wire brush. Check if the sealing washer is damaged.
- (3) Check the resistance of the spark plug and replace it if it is not within the specified resistance value.

Resistance of spark plug	3~9K Ω
--------------------------	---------------



(4) Use a feeler gauge to check the electrode gap. Adjust the electrode to the following specification by carefully bending the side electrode to the specified value.

Clearance of spark plug	0.7~0.8mm
Standard spark plug	WR7DC



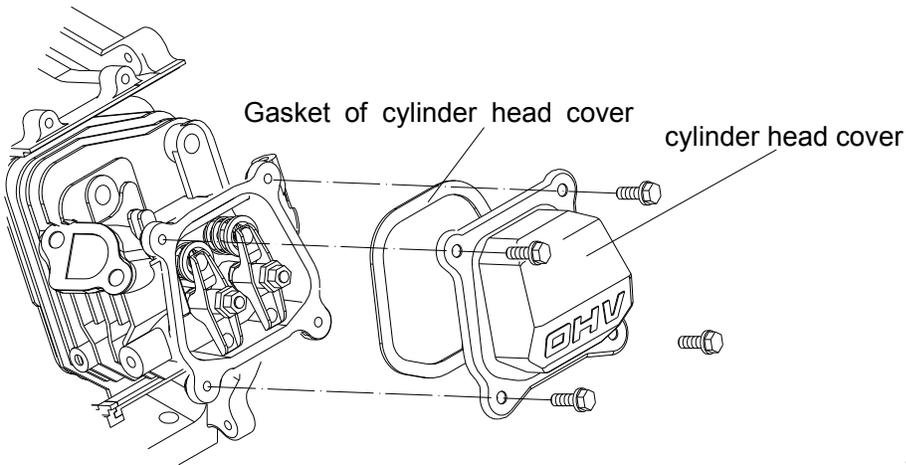
(5) Reinstall the spark plug and screw it tightly after regulating, the specified torque is 20~30 N.

4.6 Adjusting valve clearance

▲ Attention !

Valve adjustment should only be performed on a cool engine.

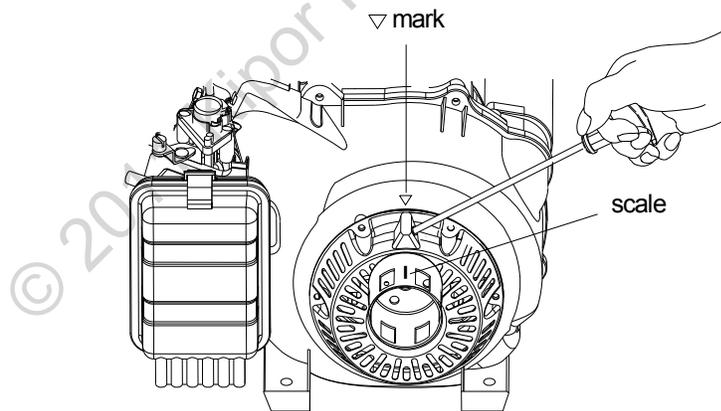
(1) Remove cylinder cover bolt, cylinder cover, cylinder cover gasket.



(2) Pull the starter rope gently and set the piston in top dead center (the scale of starting wheel should align with the sign “△” on the air guiding cover)

▲ Attention !

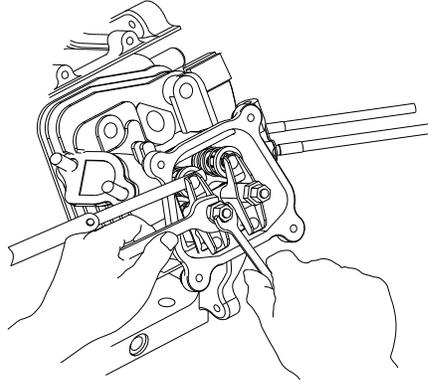
If the intake valve is in the START position, please pull the starter again when align the scale of starting wheel with the sign “△” on the air guiding cover.



(3) Insert a feeler gauge into the gap between rocker and valve to measure the valve clearance.

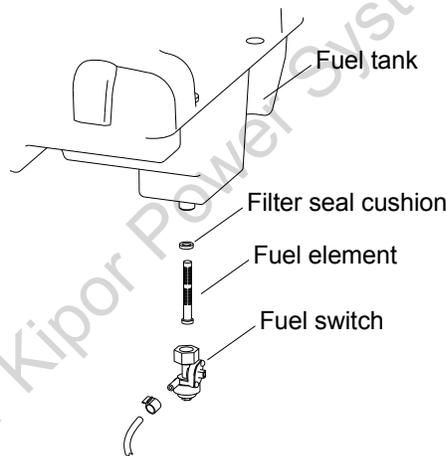
Valve Clearance	Intake: $0.06 \pm 0.02\text{mm}$ Exhaust: $.0.08 \pm 0.02\text{mm}$
-----------------	--

- (4) If adjustment is necessary, proceed as follows:
- Hold rocker axis with the wrench and loosen the lock nut.
 - Loosen the lock nut of rocker axis to gain the specified intake and exhaust valve clearance.
 - Hold rocker axis with a wrench and tighten the lock nut.



- Check the clearance of valve after adjustment.

4.7 Fuel filter and fuel switch



▲ Attention !

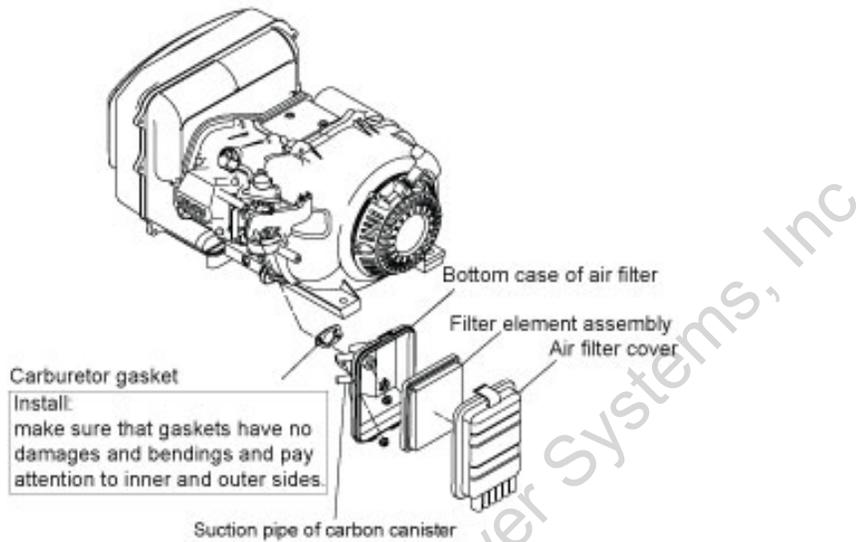
- Keep smoking materials and any open flames away during fuel system maintenance.
- Make sure that there is no leaking fuel after service.

- Drain all fuel from the tank and carburetor and remove the fuel tank.
- Loosen the nuts between fuel switch and fuel tank and remove the filter element.
- Turn the fuel switch to the open position. Clean it with a suitable solvent then blow dry with compressed air.
- Remove any foreign material from the fuel filter and insure the filter net is undamaged. Replace if necessary
- Properly install seal cushion and filter element and tighten the nuts between fuel switch and the fuel tank.

5. Air Filter and Muffler

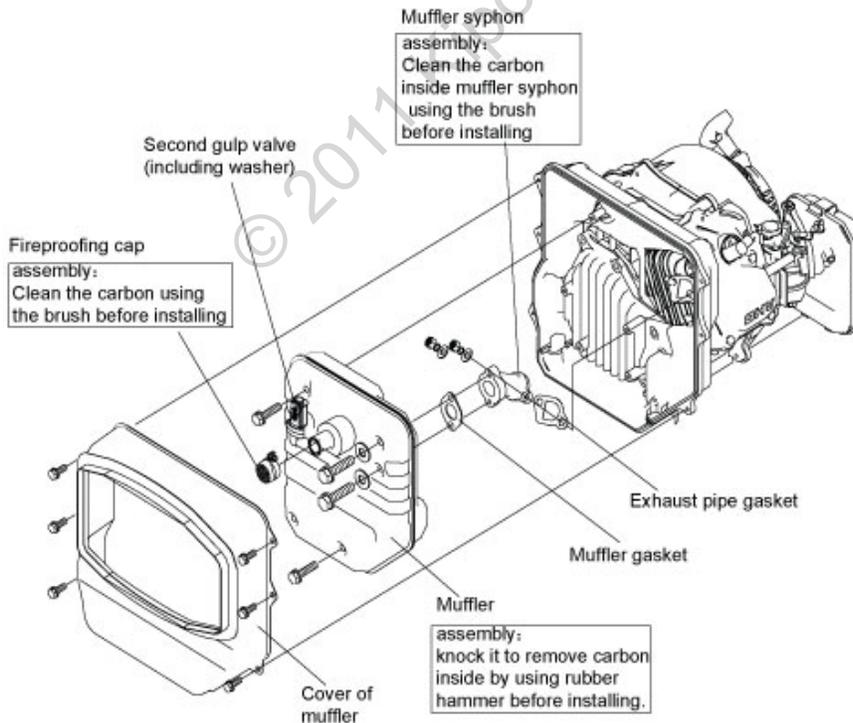
5.1 Air filter

● Disassembly and assembly



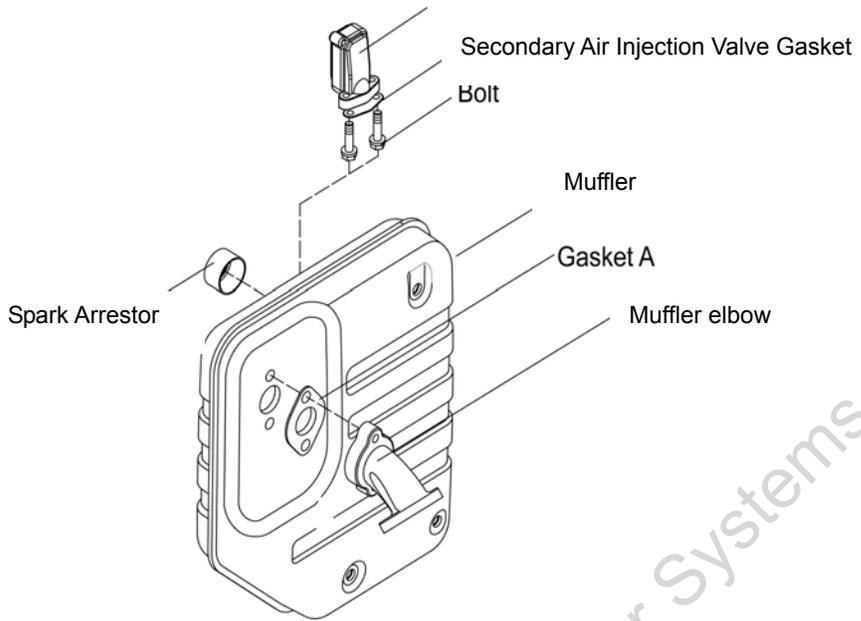
5.2 Muffler

● Disassembly and assembly



5.3 Air outlet pipe, second air valve assembly (EPA 2011 and CARB models)

Secondary Air Injection Valve



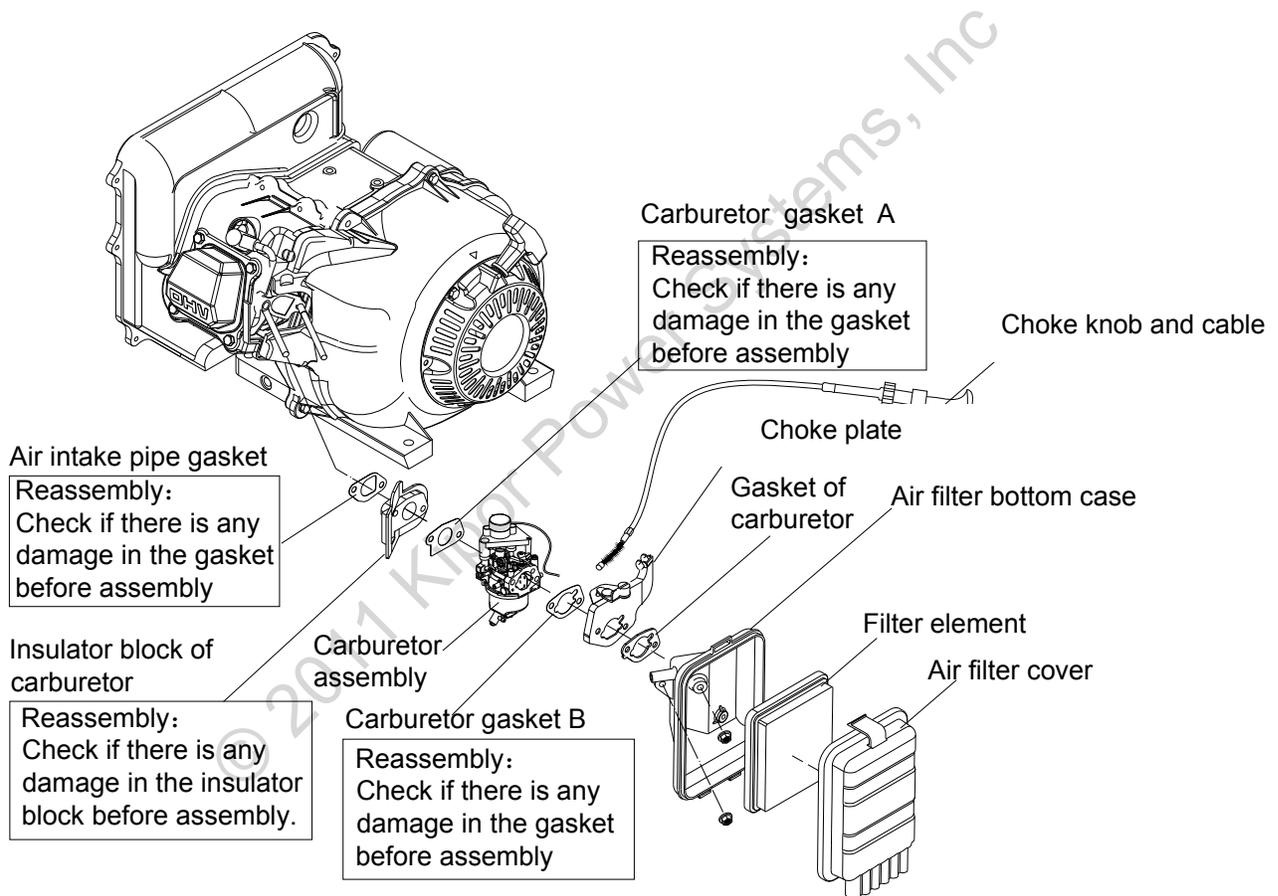
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6. Carburetor

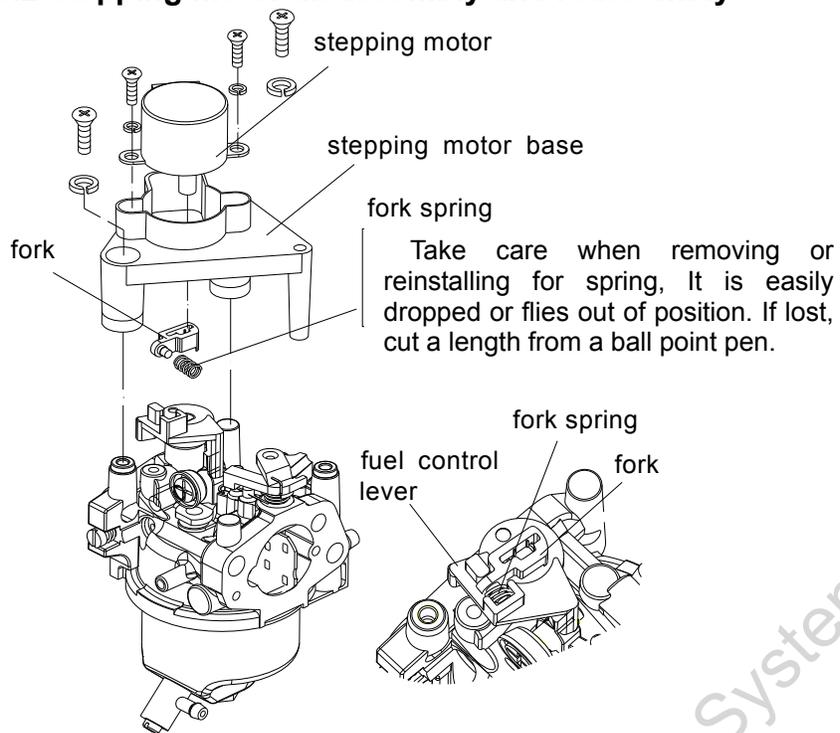
▲ Attention !

- Drain fuel from carburetor bowl before removal and disassembly
- Smoking and any source of combustion are strictly forbidden in the process of disassembly.

6.1 Carburetor removal and reinstallation



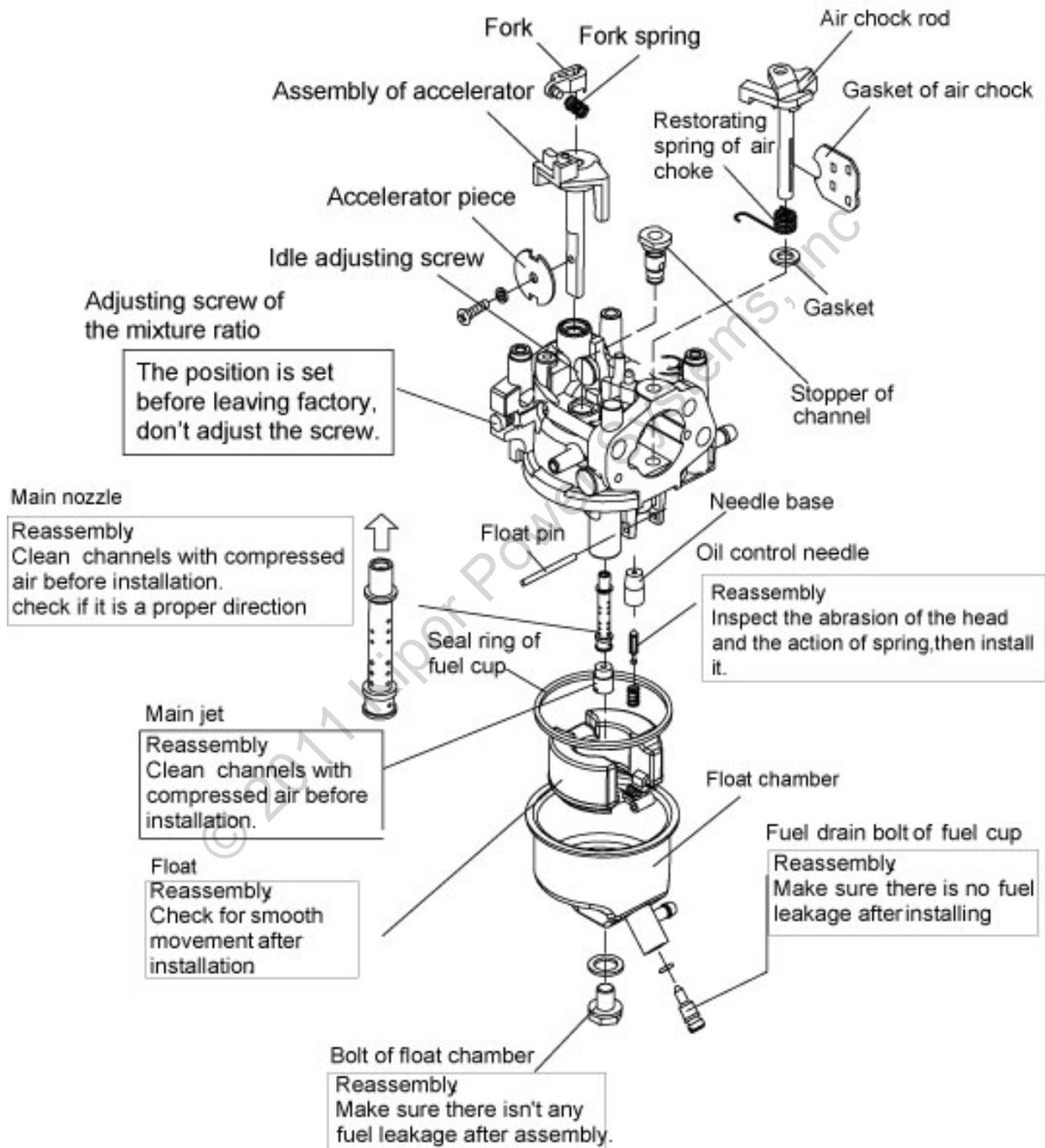
6.2 Stepping motor disassembly and reassembly



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6.3 Carburetor disassembly and reassembly

NOTE: With the exception of changing the main jet, no adjustments, modifications, or other maintenance is permitted on EPA and CARB certified engines. This includes any Kipor generator ever sold in North America. This drawing is for information only.



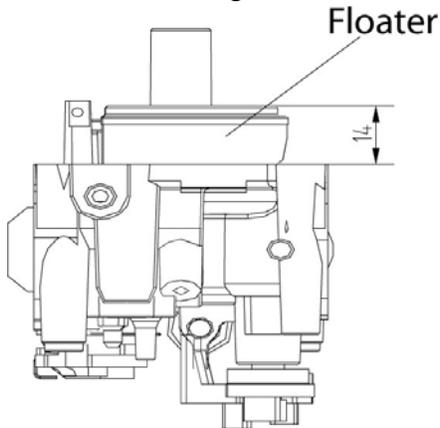
6.4 Float and stepping motor inspection

●Floater height

Place the carburetor as fig. and measure the size between floater and body.(floater height)

Specified height	14mm
------------------	------

If the floater height don't meet the specified height, please replace.

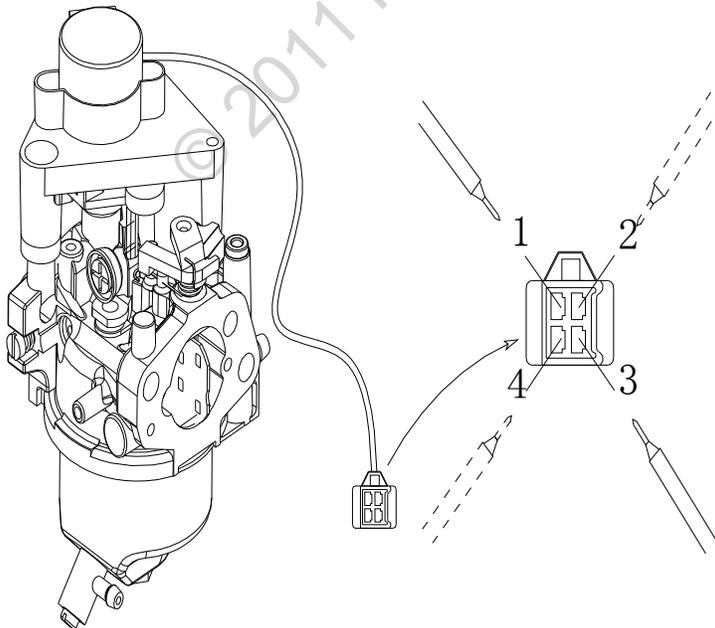


●Stepping motor

Measuring the resistance of stepping motor leading wires

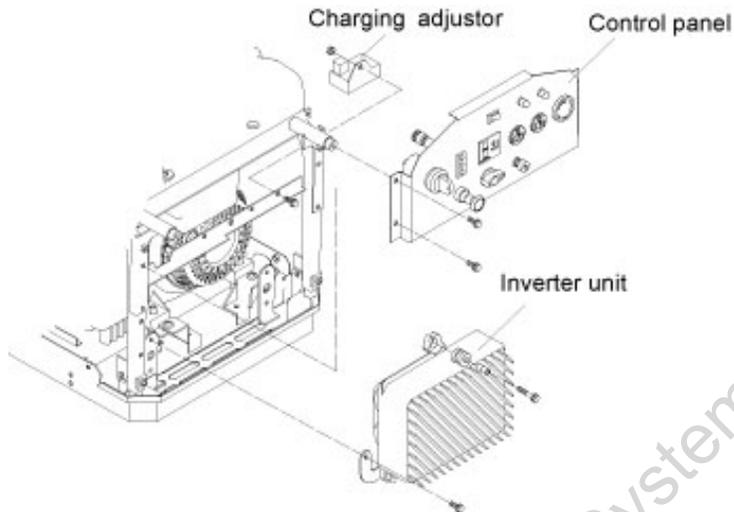
Specified resistance	1 and 3: 45~55 Ω
	2 and 4: 45~55 Ω

Replace the stepping motor if the resistance value exceeds the specified range.



7. CONTROL PANEL, CHARGING REGULATOR AND INVERTER UNIT

7.1 Disassembly and assembly



Component Inspection

7.2 AC receptacle

If no AC power, first check for continuity between the terminals on the receptacle and the red and black wires going to the inverter module. See the wiring diagram. Check the contacts for discoloration or evidence of burning.

7.3 DC receptacle

Use a length of wire to make the hole behind the receptacle short circuit. Insert two test leads into the output holes to test the circuit. If the circuit is open, push the reset button on the panel and recheck. If the circuit remains open, change the DC receptacle. Newer models have a 5A fuse in the receptacle. Check that first.

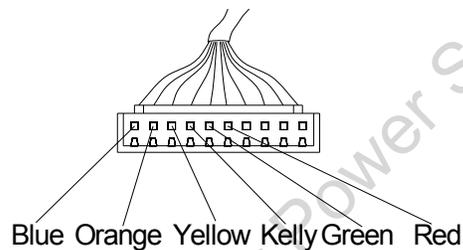
7.4 Smart Throttle switch

There should be continuity with the switch ON, no continuity with the switch OFF.

7.5 Ignition Module

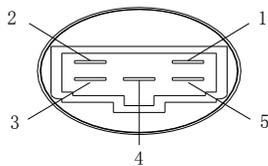
Pull the 10 pin connector plug(10P) from the ignition module. Connect an ohm meter to ground and measure the resistance in the various 10P connector pins to measure the resistance. Use the following chart for reference:

Color	Circuit unit	Specified resistance value
Blue	Primary ignition coil	0.8~1.3 Ω
Orange	Low oil alarm	It is not lit under the condition that oil position is normal
Yellow	Trigger coil	80~130 Ω
Kelly	Ground wire	continuity
Green	Ignition power coil winding	0.26~0.28 Ω
Red	Engine ignition cutoff switch	The Ignition switch is put through when it switches on, otherwise it will disconnect.



7.6 Ignition switch

Check the connection between each terminal pair, the results should agree with the following table, otherwise replace the switch.



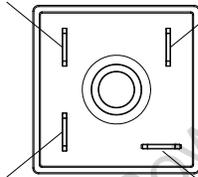
	①	③	②	⑤	④
OFF	●	●			
ON			●	●	
START			●	●	●

7.7 Bridge rectifier

Use the $\rightarrow + \rightarrow \rightarrow$ mode of a multimeter to test connection between each group. The results must agree with standard listed in the following table.

Positive lead Negative lead	1	2	3	4
1		Block	Block	Block
2	Connect		Block	Block
3	Connect	Connect		Connect
4	Connect	Block	Block	

(1) Negative terminal (-) (2) AC terminal (~)

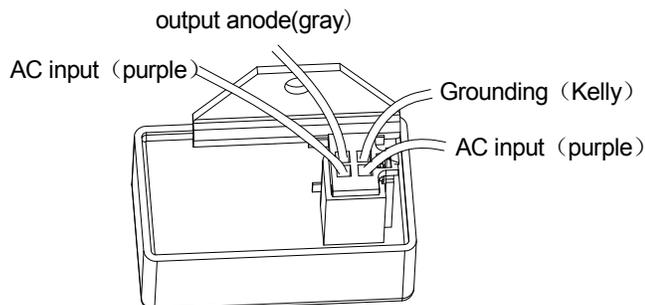


(4) AC terminal (~) (3) Negative terminal (+)

7.8 Charging Regulator

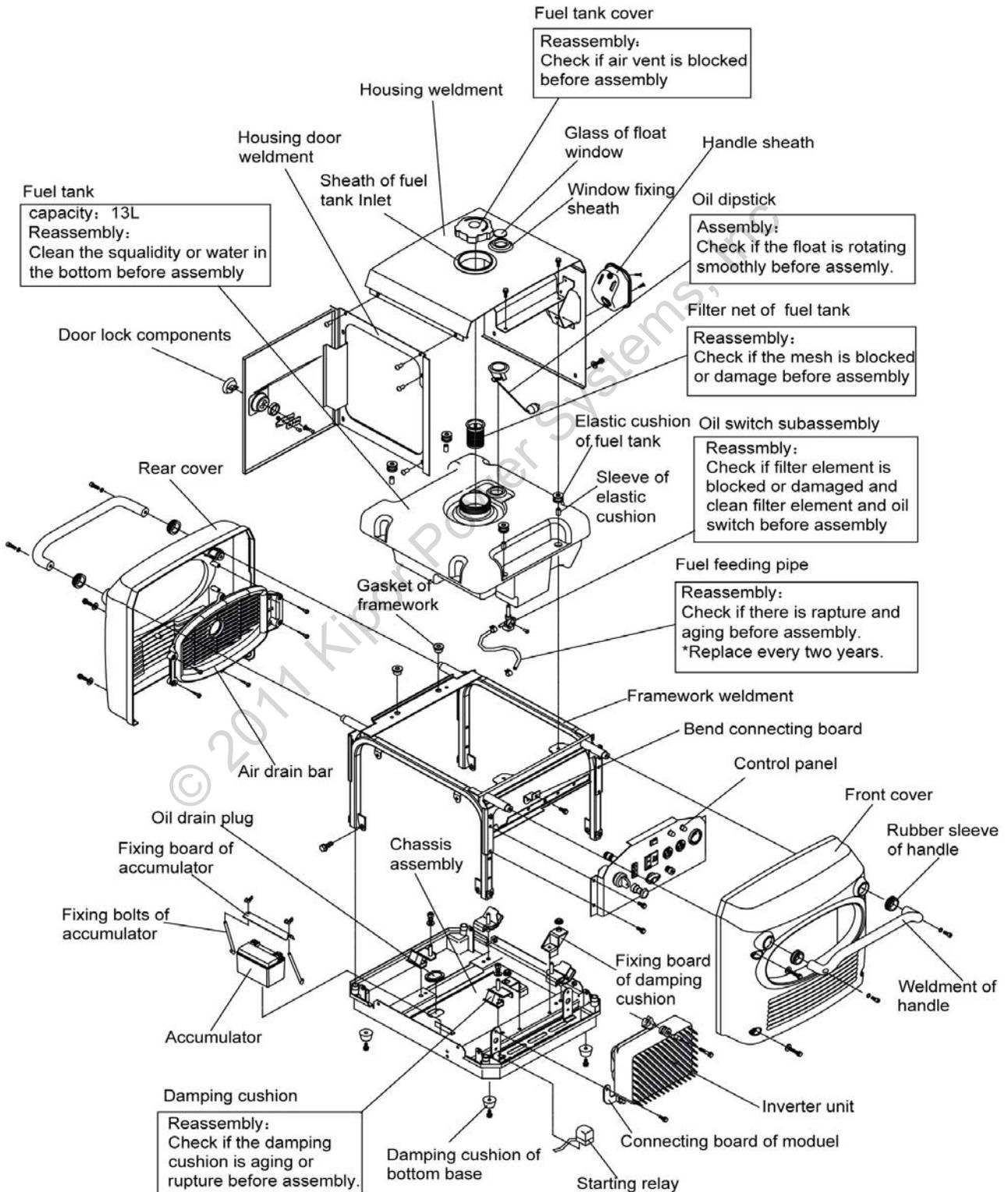
Start the engine and disconnect the wire of charging adjuster with the two battery terminals. Measure the voltage between output terminal of charging adjuster and grounding wire. If no output, check the AC input from the stator (purple wires).

DC charging voltage	13~14V
---------------------	--------

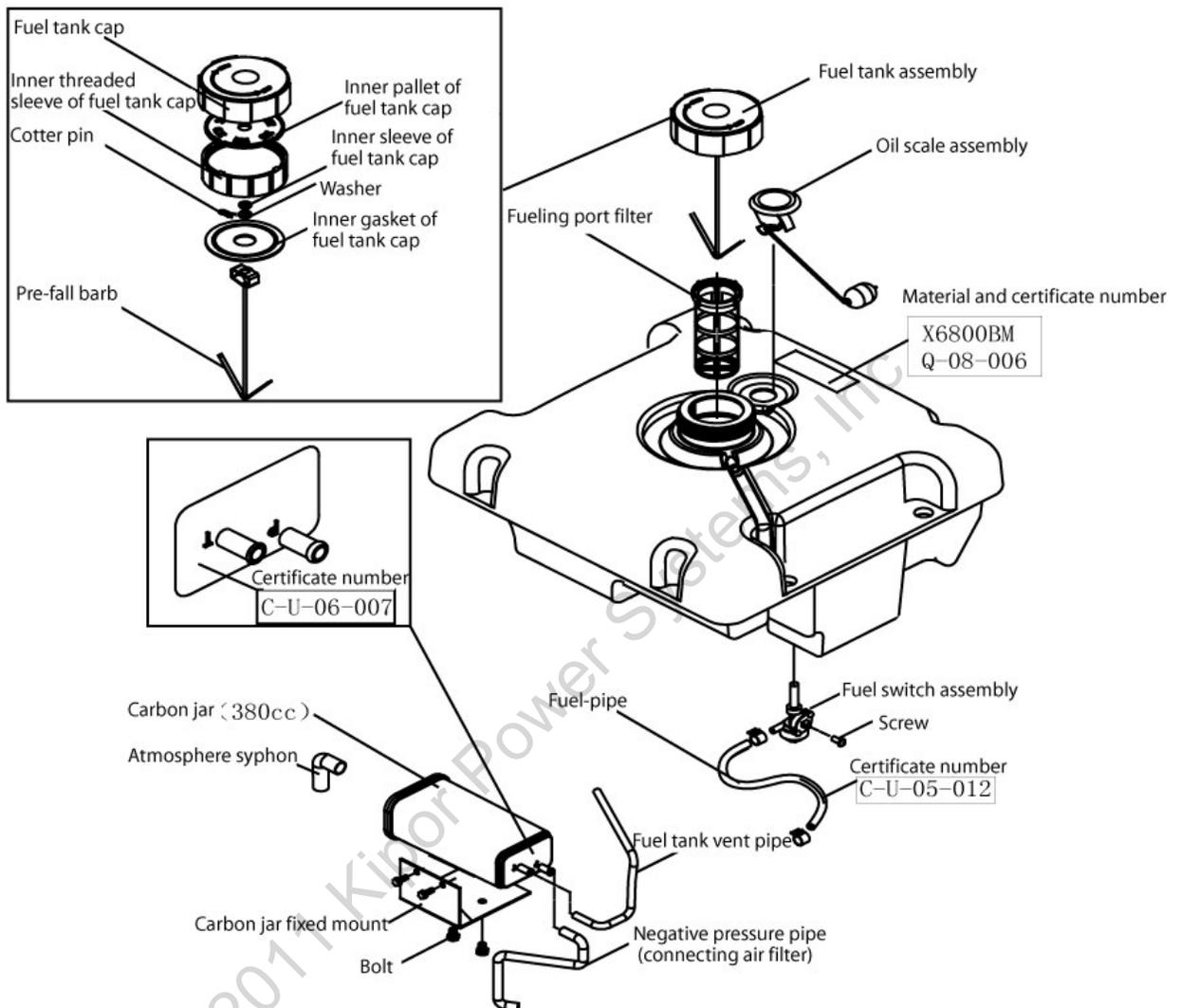


8. HOUSING GROUP AND FUEL TANK

8.1 Disassembly and installation

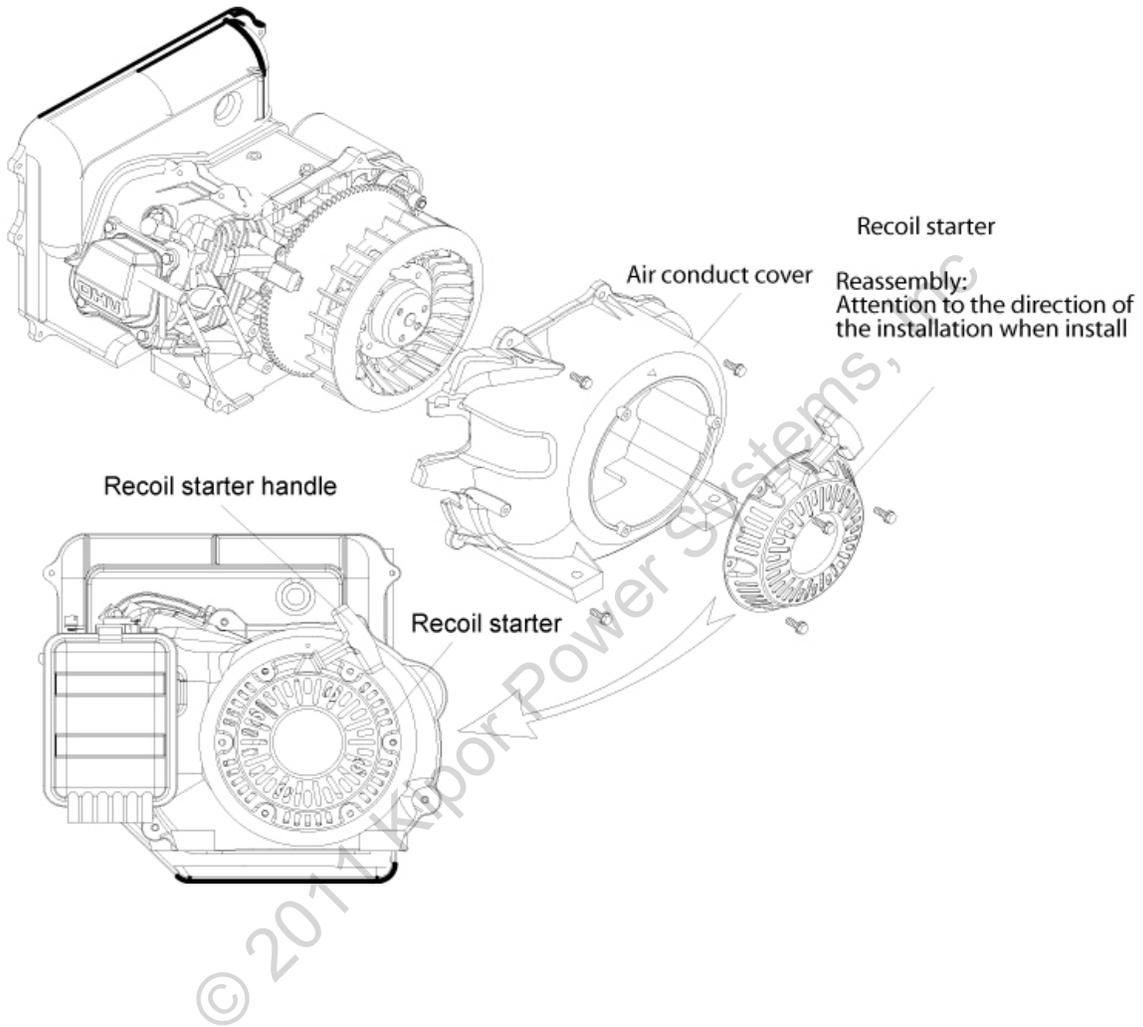


8.2 Vapor Control System (CARB Models)



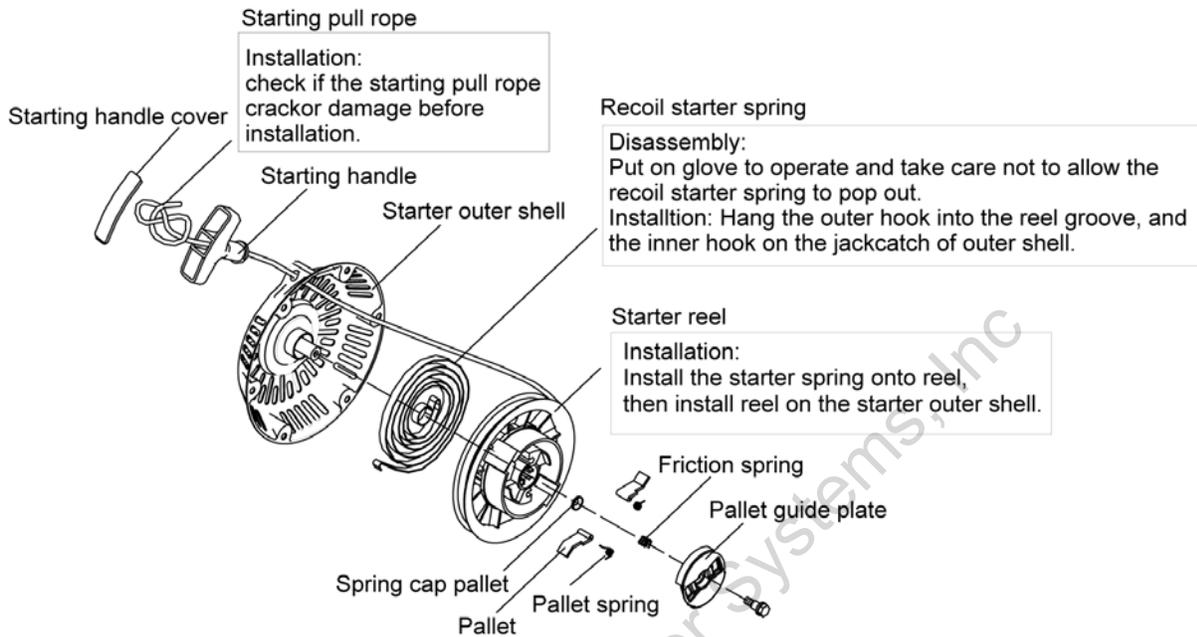
9. Recoil starter, Air conduct cover

9.1 Disassembly and Reassembly

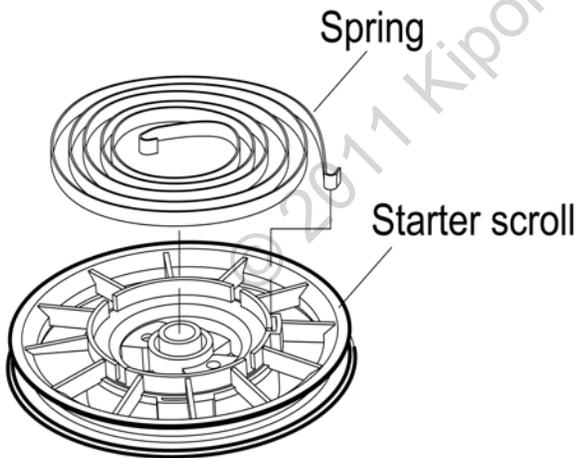


9.2 Recoil starter assembly

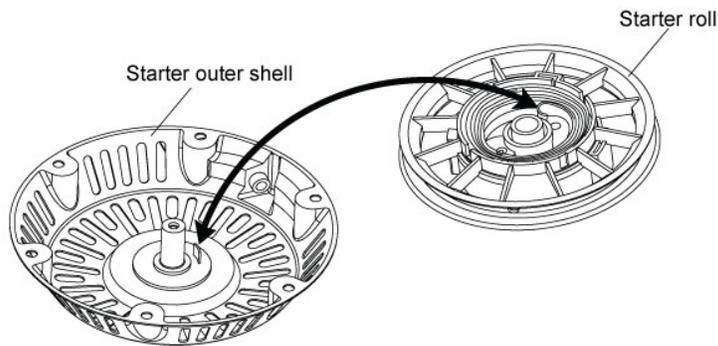
Note: this section is primarily for information. Kipor no longer provides replacement parts for the recoil starter.



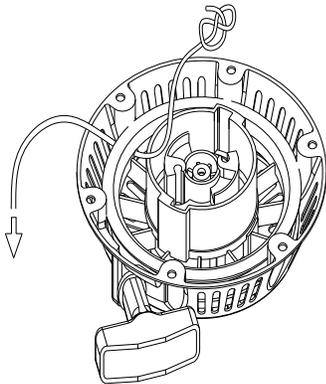
(1) Set the spring into the starter reel, and hang the spring outer hook inside the reel groove.



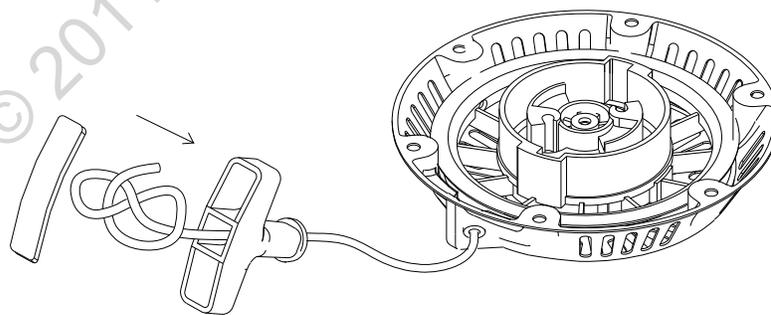
(2) Smear lubrication grease on the starter outer shell claw, install the starter reel. Revolve the reel anticlockwise to hang the spring inner hook on the starter outer shell claw.



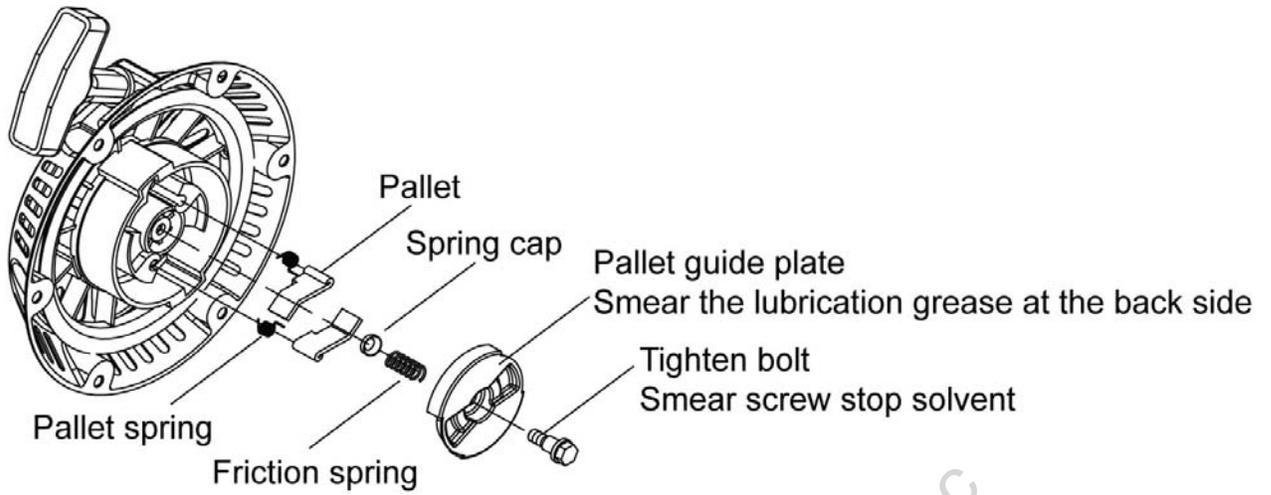
(3) Make a figure 8 knot at one end of the rope, pass the other end through the reel hole. Wind the reel anticlockwise 6 turns to set the reel.



(4) Pull out the rope from from starter outer shell hole completely, pass it through the handle and make a figure 8 knot, then turn over the handle cover. Loosen the reel to rebound the spring taking care not to allow the reel to pop out.



(5) Install the revolving axis, revolving axis parts and friction spring, Fix it with bolts.



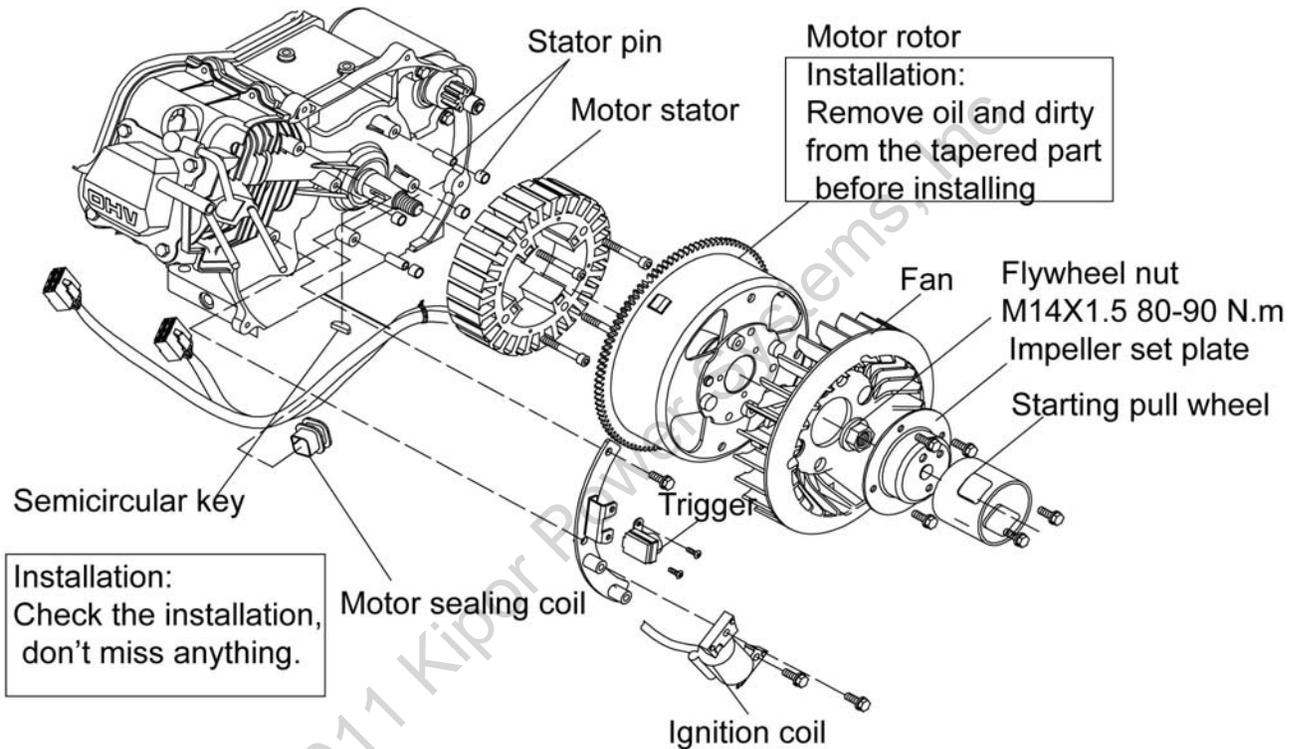
(6) Pull the starter several times, checking for proper operation.

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10. Alternator, ignition coil, trigger, starter motor

10.1 Alternator

A. Disassembly, installation



B. Inspection

(1) Ignition winding

Measure the resistance between green wire and olive wire

Resistance value	0.26~0.28 Ω
------------------	--------------------

(2) Outer charge winding

Measure the resistance between two blue wires.

Resistance value	0.12~0.15 Ω
------------------	--------------------

(3) Inner charge winding

Measure the resistance between two purple wires.

Resistance value	0.19~0.21 Ω
------------------	--------------------

(4) Sub winding

Measure the resistance between two white wires.

Resistance value	0.12~0.14 Ω
------------------	--------------------

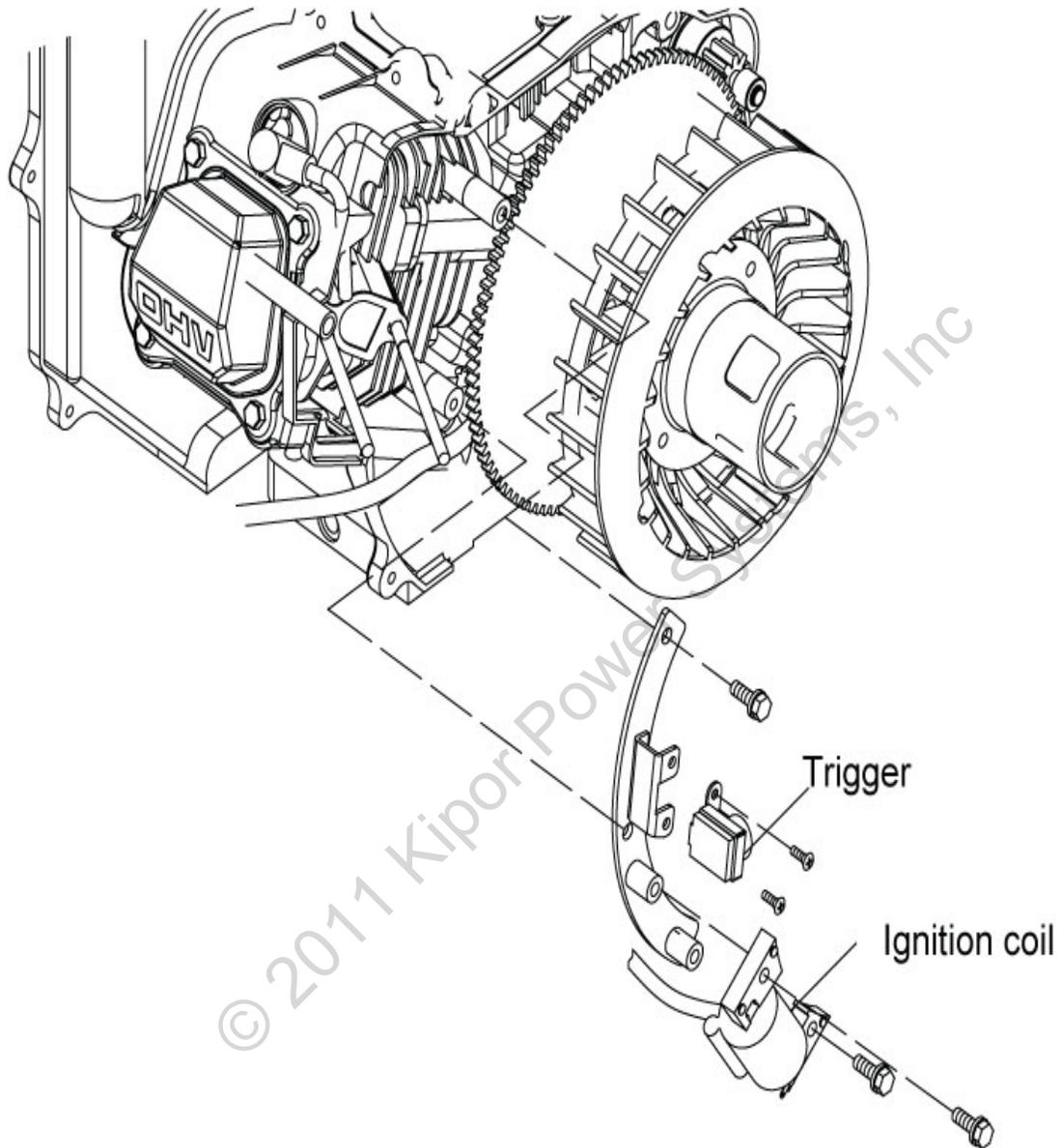
(5) Main winding

Measure the resistance between three black wires.

Resistance value	120V	230/240V
	0.8~1.1 Ω	3.3~3.5 Ω

10.2 Ignition coil and trigger

A. Disassembly and reassembly

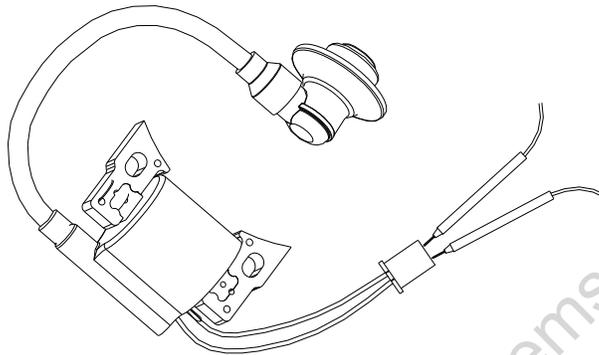


B. Inspection

(1) Ignition coil

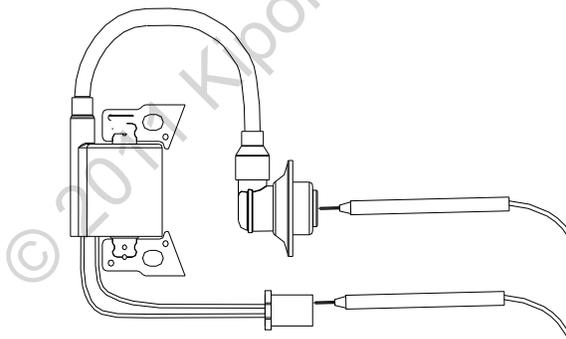
- With an ohmmeter check the resistance between the two wires going to the coil

primary resistance	0.8~1.3 Ω
--------------------	------------------



- Check resistance between one end of primary ignition coil terminals and spark plug cap to measure sub resistance of ignition coil.

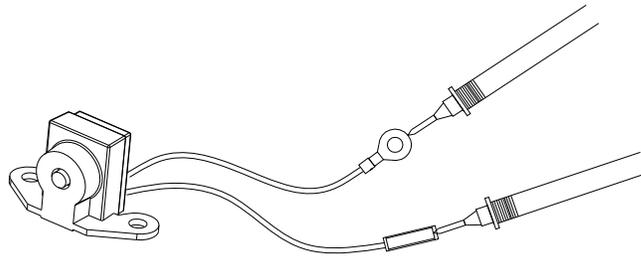
Sub resistance	15~21K Ω
----------------	-----------------



(2) Trigger

Test the resistance between the trigger wires.

Resistance of trigger	80~130 Ω
-----------------------	-----------------



C. Adjustment:

Note: trigger clearance or air gap on 2008 models onward is fixed.

Adjust the clearance between the trigger and rotor.

clearance of trigger	0.020~0.030 in. (0.50~0.75mm)
----------------------	----------------------------------

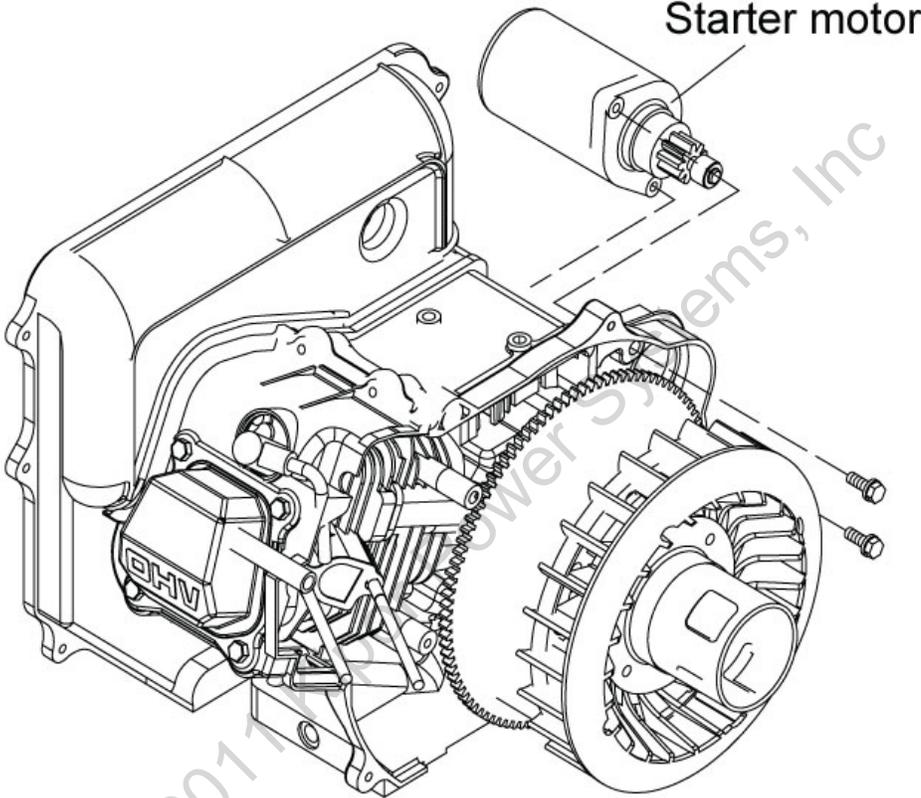


Insert the gauge between the projection on the trigger and the rotor to measure the clearance. If it is not within the specified range, readjust the trigger to the recommended clearance. Alternate tightening of the bolts $\frac{1}{4}$ turn at a time until completely tight.

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10.3 Starter Motor

Removal and reinstallation



11. Valve Cover and Cylinder Head

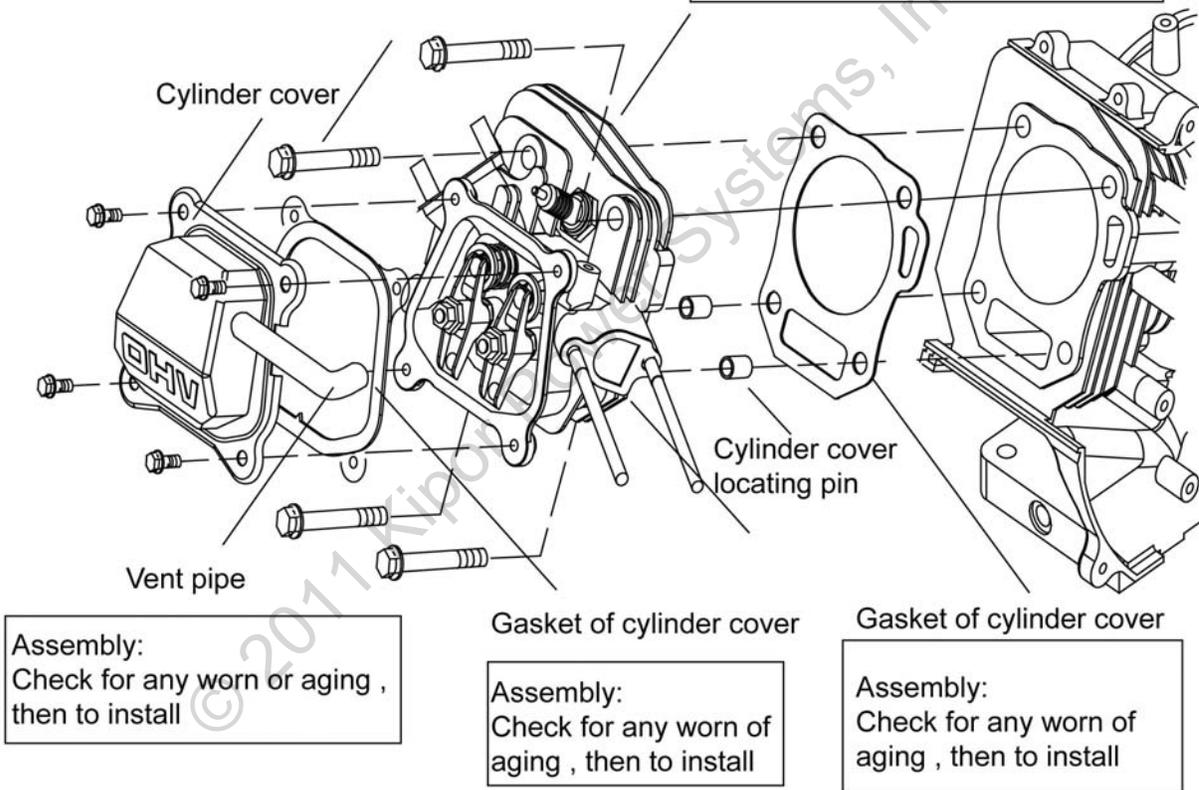
11.1 Valve cover disassembly and reassembly

Cylinder cover bolt M8X60 28-32 N.m

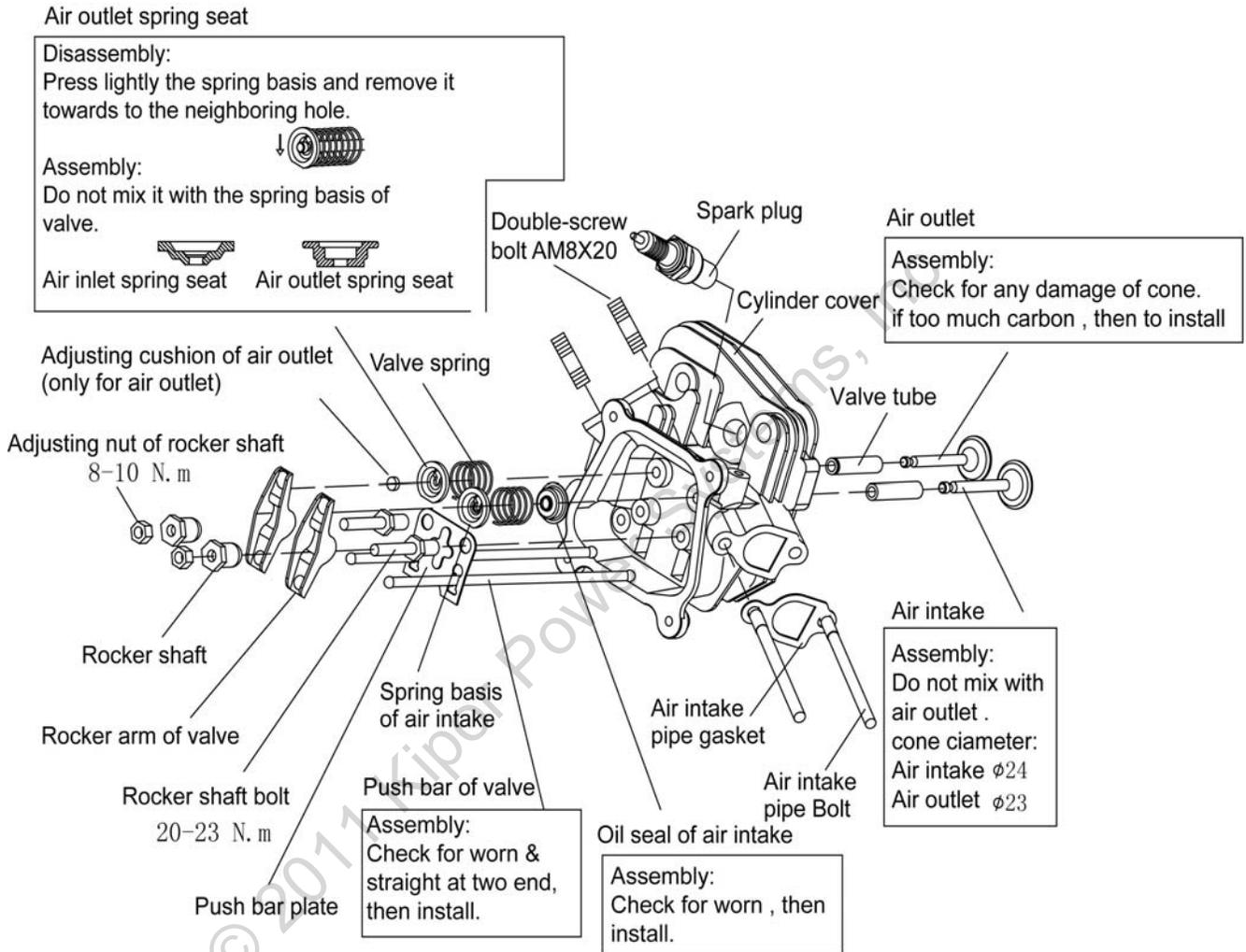
Assembly:
Tighten or loosen the bolt crossedly. Do the tightening equably and ordering until to specified torque.

Cylinder cover assembly

Assembly:
Clean the carbon in burning room and check the status of value basis, then to install



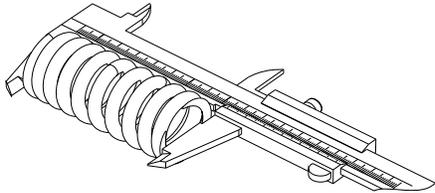
11.2 Cylinder head assembly



11.3 Inspection

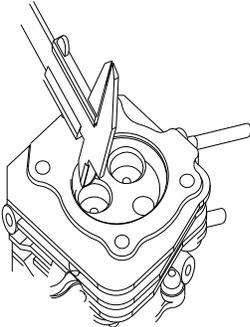
● Valve spring length

Standard(mm)	Service limit(mm)
30.5	29



● Valve seat width

Standard(mm)	Service limit(mm)
0.8-1.2	2.0

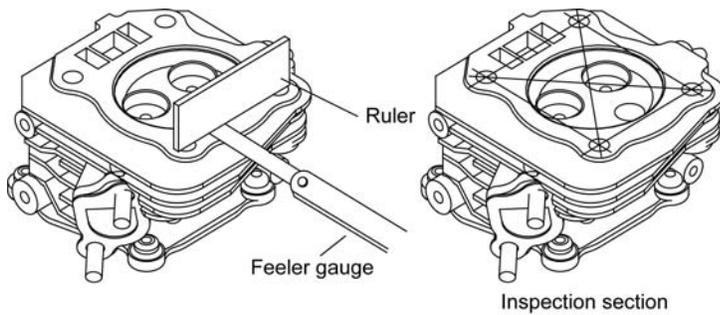


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●Cylinder head

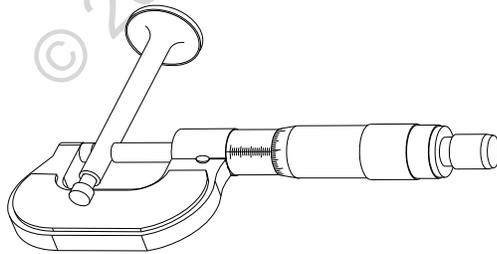
Remove all accumulated carbon in and remaining gasket material on the valve cover mounting surface. Check for cracks around spark plug holes, valve guides valve seats. Check for distortion of the cylinder head with a ruler and feeler gauge.

Service limit	Replace if greater than 0.1mm,
---------------	--------------------------------



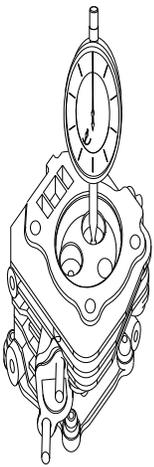
●External diameter of valve stem

	Standard (mm)	Service limit (mm)
Air intake	5.46~5.48	5.35
Air outlet	5.45~5.47	5.35



● Inner diameter of valve seat

	Standard (mm)	Service limit (mm)
Air intake/outlet	5.500~5.512	5.56

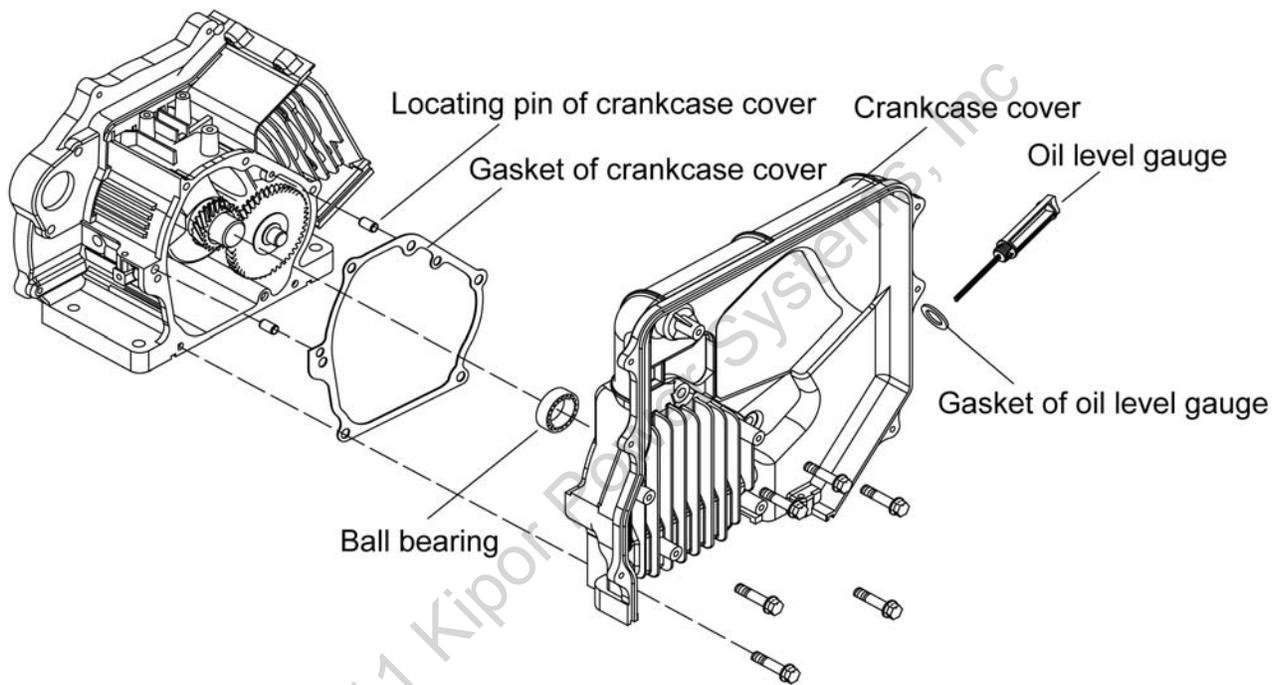


● Clearance between valve stem and valve guide

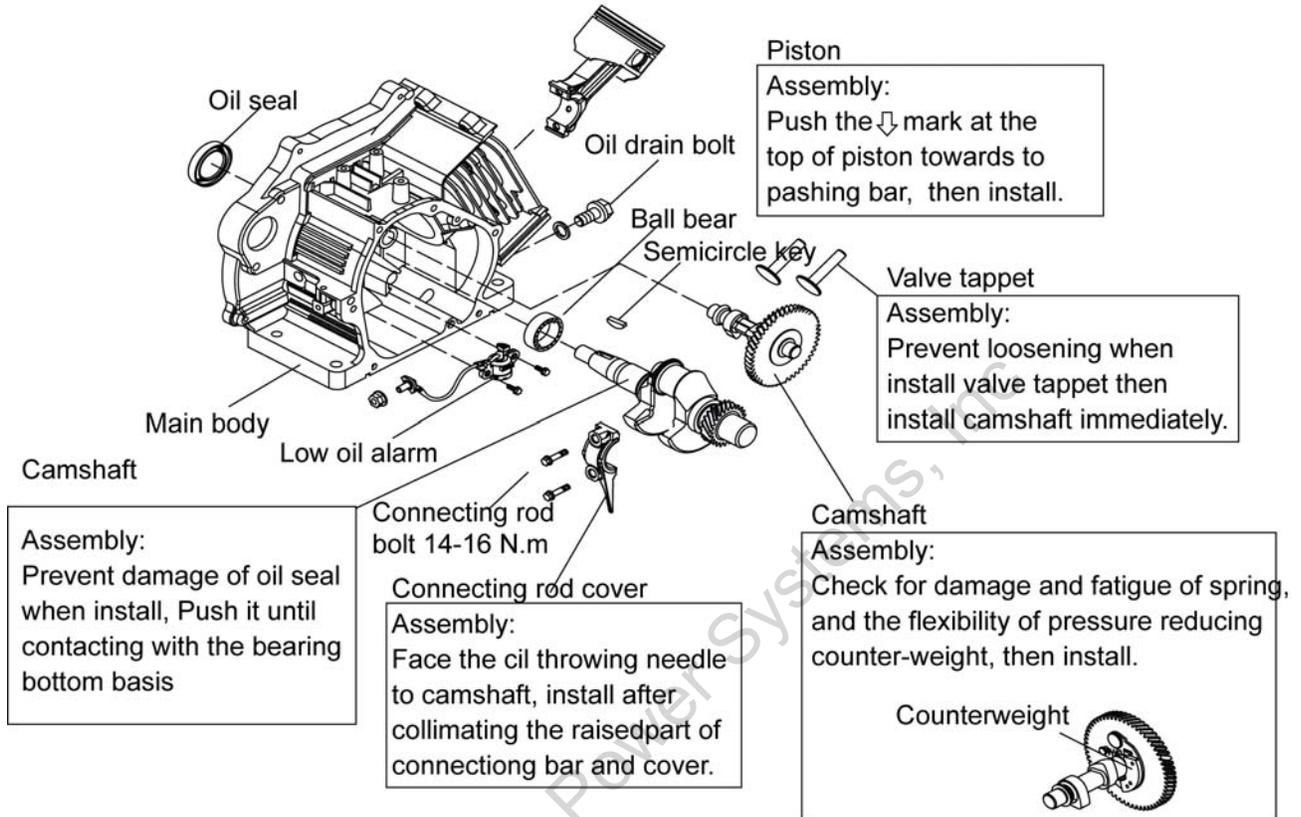
	Standard (mm)	Service limit (mm)
Air intake	0.020~0.052	0.10
Air outlet	0.030~0.062	0.12

12. Crankcase, Crankshaft, Piston

12.1 Crankcase cover

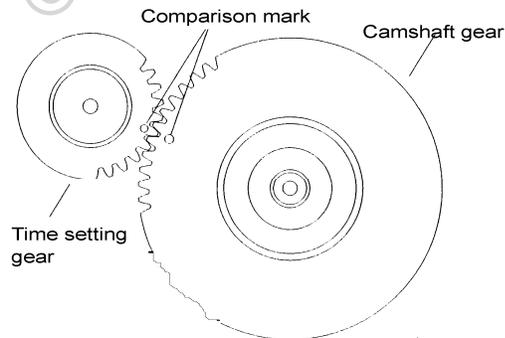


12.2 Crankshaft and camshaft

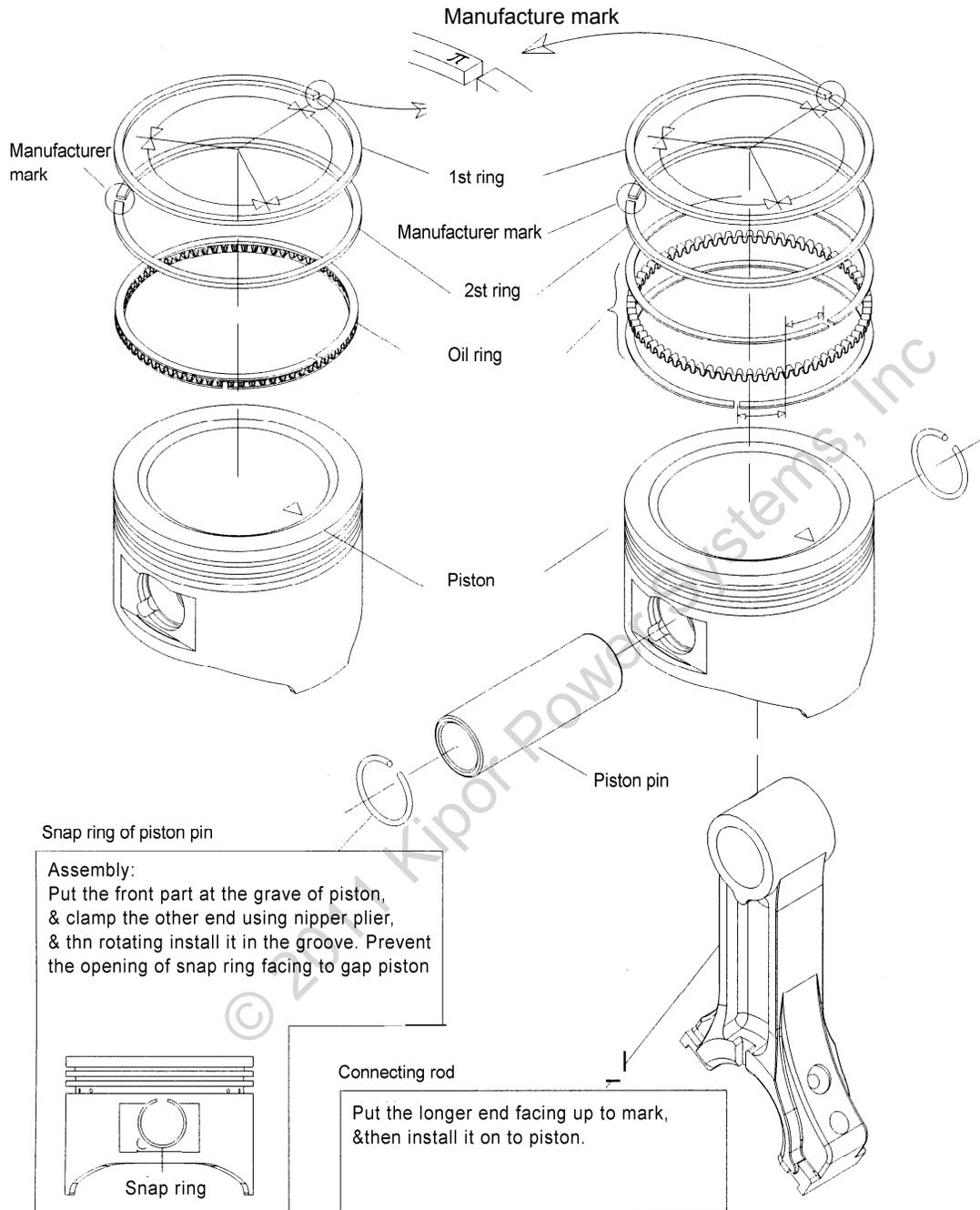


● Alignment of time setting marks

Align and install of comparison marks of camshaft and time setting gear (small gear on camshaft).



12.3 Piston



Piston ring installation

Caution

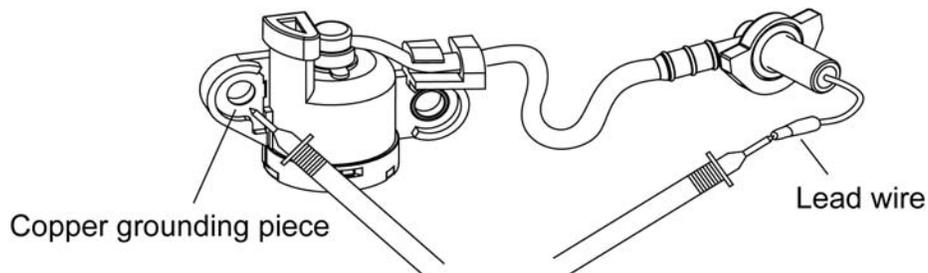
- Put the manufacturer mark facing up when installation;
- Pay attention to the installation positions of 1st and 2nd ring.
- Check if the piston ring can rotate freely when installation.
- All openings of piston ring should be kept away from the direction of piston pin with 120 degree angle.



12.4 Inspection

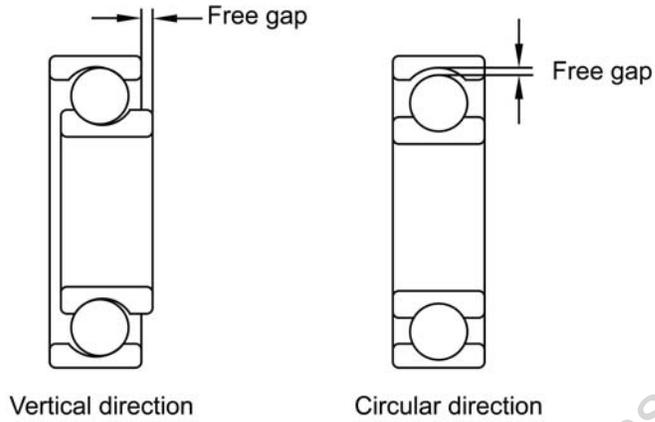
Low oil alarm inspection

- (1) Lift the low oil alarm and measure the conductivity between lead wire and copper grounding piece using instrument.
- (2) Convert the low oil alarm and measure again, it should be not conductive.
- (3) Dip the low oil alarm into engine oil in order to inspect float, and measure again, it should be not conductive.



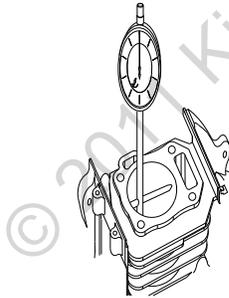
● **Noise and moving of shaft**

Clean and dry the shaft, rotate the shaft manually and check the free gap; if any noise or moving, replace the shaft.



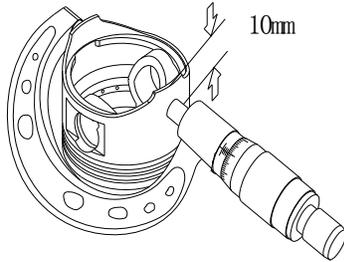
● **Inner diameter of cylinder**

Standard (mm)	Service limit (mm)
68.02~68.04	68.17



• **External diameter of the apron of piston**

Standard (mm)	Service limit (mm)
67.97~67.99	67.62

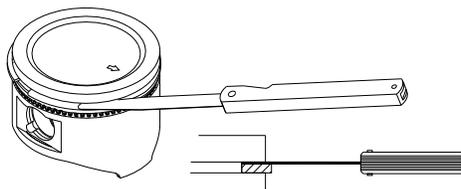


• **Clearance between piston and cylinder**

Standard (mm)	Service limit (mm)
0.030~0.070	0.120

• **Side clearance of piston**

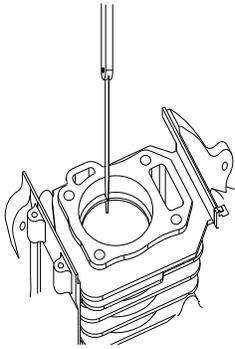
Standard (mm)	Service limit (mm)
0.020~0.060	0.150



● **Terminal clearance of piston ring**

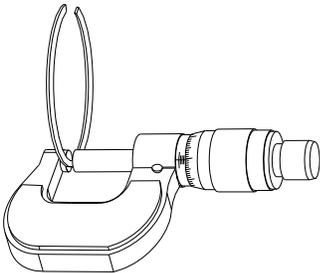
Fix the piston ring in cylinder using the top part of piston and measure the terminal clearance of piston.

Standard (mm)	Service limit (mm)
0.150~0.350	1.0



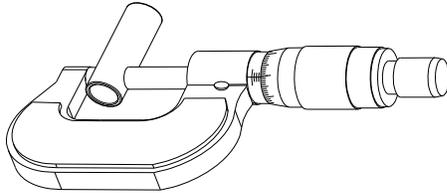
● **Width of piston ring**

	Standard (mm)	Service limit (mm)
The first ring	1.420~1.440	1.320
The first ring	1.420~1.440	1.320



● **External diameter of piston pin**

Standard (mm)	Service limit (mm)
17.990~18.000	17.950



● **Internal diameter of piston pin bore**

Standard (mm)	Service limit (mm)
18.002~18.008	18.042

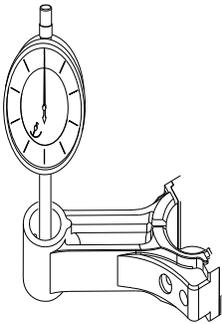


● **Clearance between piston pin and pin bore**

Standard (mm)	Service limit (mm)
0.002~0.018	0.080

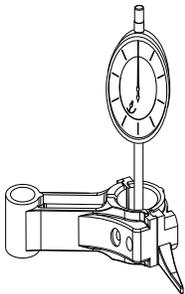
• Internal diameter of the small terminal of connecting rod

Standard (mm)	Service limit (mm)
18.006~18.017	18.070



• Internal diameter of the large terminal of connecting rod

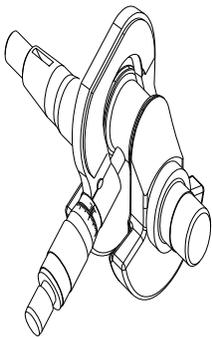
Standard (mm)	Service limit (mm)
30.015~30.025	30.070



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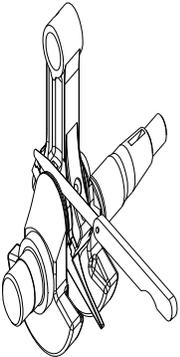
• External diameter of journal

Standard (mm)	Service limit (mm)
29.960~29.975	29.900



• Clearance of side face of big end of the connecting rod

Standard (mm)	Service limit (mm)
0.45~0.70	1.0

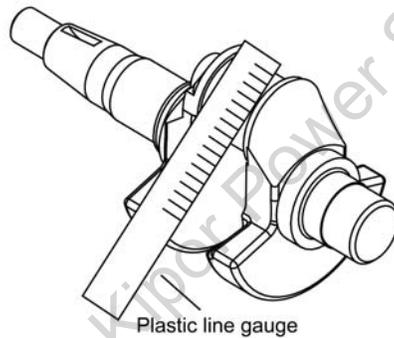


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● Clearance of oil film of big end of connecting rod

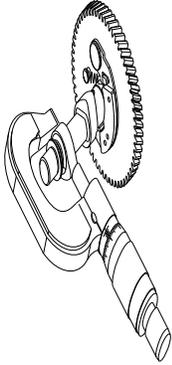
- (1) Remove the engine oil on the surface of journal.
- (2) Set plastic line gauge on the journal and install the connecting rod. Tighten the bolt according to specified torque. Pay attention not to rotate the crankshaft when tightening. Tightening torque: 14~16N.m.
- (3) Remove the connecting rod and measure the thickness of plastic line gauge.
- (4) If clearance exceeds service limit, please replace the connecting rod, and then measure the clearance again. If the clearance still exceeds service limit after changing a new rod, please polish the crankshaft journal and use the connecting rod that is less than standard value or replace the crankshaft.

Standard (mm)	Service limit (mm)
0.046~0.060	0.120



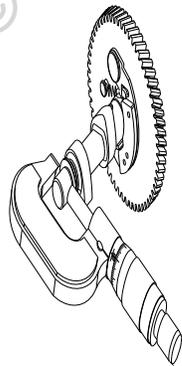
● Height of camshaft

	Standard (mm)	Service limit (mm)
Air intake	27.63~27.91	27.34
Air outlet	27.68~27.94	27.34



● External diameter of camshaft

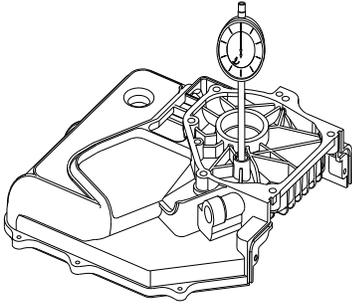
Standard (mm)	Service limit (mm)
13.966~13.984	13.920



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● Inner diameter of bearing of camshaft

Standard (mm)	Service limit (mm)
14.000~14.027	14.050



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APPENDIX A: IG3000E

This appendix regarding the IG3000E is intended to supplement the IG3000 generator and engine service manual. The basic construction and operation of this generator is similar and differs only in the frame, fuel tank, and control panel.

Contents

A1. SPECIFICATIONS.....	70
A2. PERFORMANCE	71
A3. DIMENSIONAL DRAWING	72
A4. SERIAL NUMBER LOCATION	73
A5 WIRING DIAGRAM	74
A6 CONTROL PANEL, CHARGING ADJUSTER, INVERTER MODULE	75
A7 FRAME AND FUEL TANK.....	21

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A1. SPECIFICATIONS

Dimensions and weight

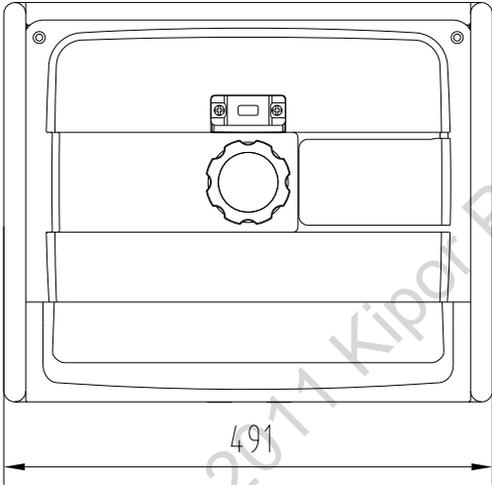
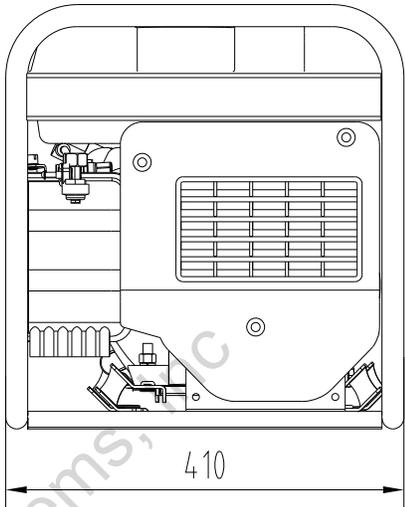
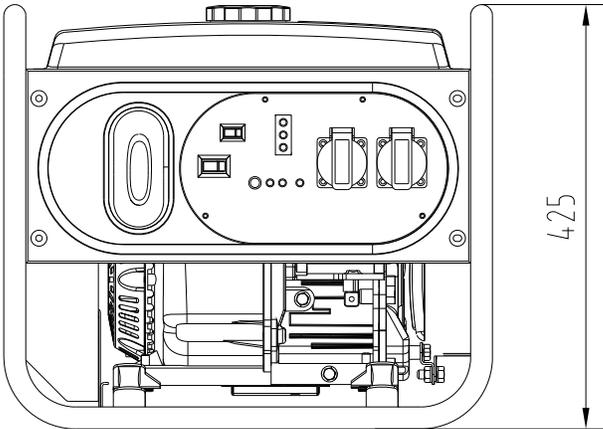
Model	IG3000E
Length	18.9 in. (491mm)
Width	15.75 in. (410mm)
Overall height	20.6 in. (425mm)
Net weight	77 lbs. (36kg)

Engine

Model	KG205GEXi
Type	4 cycle, overhead valve, single cylinder
Displacement	11.96 cu. In.(196 cc)
Bore x stroke (mm)	2.68 x 2.13 (68 x 54 mm)
Horsepower	4.0 @ 3600 rpm
Compression ratio	8.5:1
Cooling system	Forced air
Ignition system	T.C.I
Ignition timing	25 B.T.D.C
Spark plug	F7RTC
Carburetor	Float type, horizontal butterfly valve
Air cleaner	Semi-dry
Governor	Electronic control
Lubrication system	Splash
Oil capacity	.63 qt. (0.6L)
Starting system	Recoil starter /Recoil starter and Electrical starter
Stopping system	Primary circuit ground
Fuel	Automotive unleaded gasoline 87 octane
Fuel tank capacity	4.0 Gal (15.1 L)

A3. DIMENSIONAL DRAWINGS

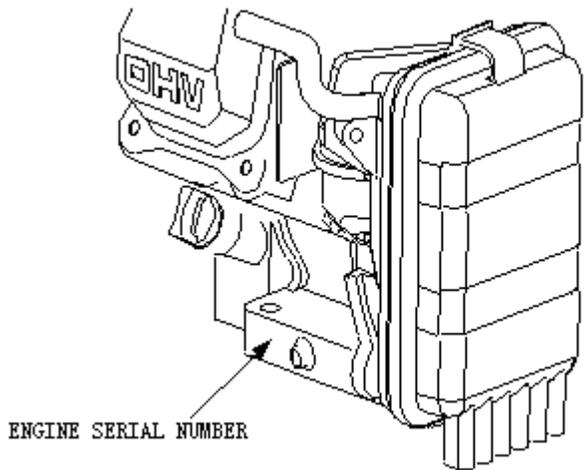
Unit : mm



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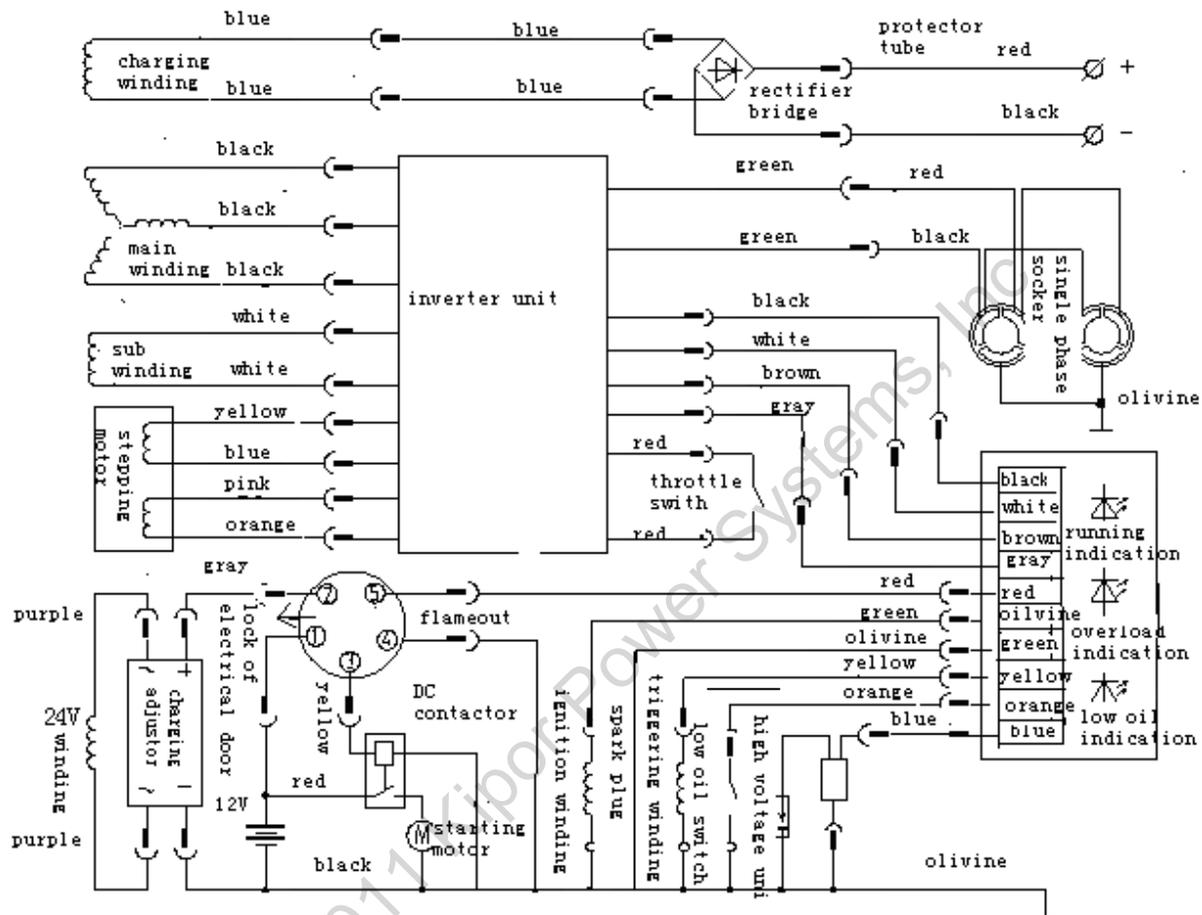
A4. SERIAL NUMBER LOCATION

The engine serial number is stamped on the block to the left of the oil drain bolt. Use this number when ordering parts or making other inquiries.

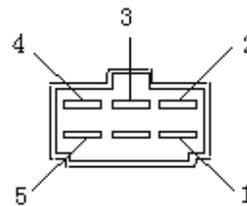


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A5. Wiring Diagram

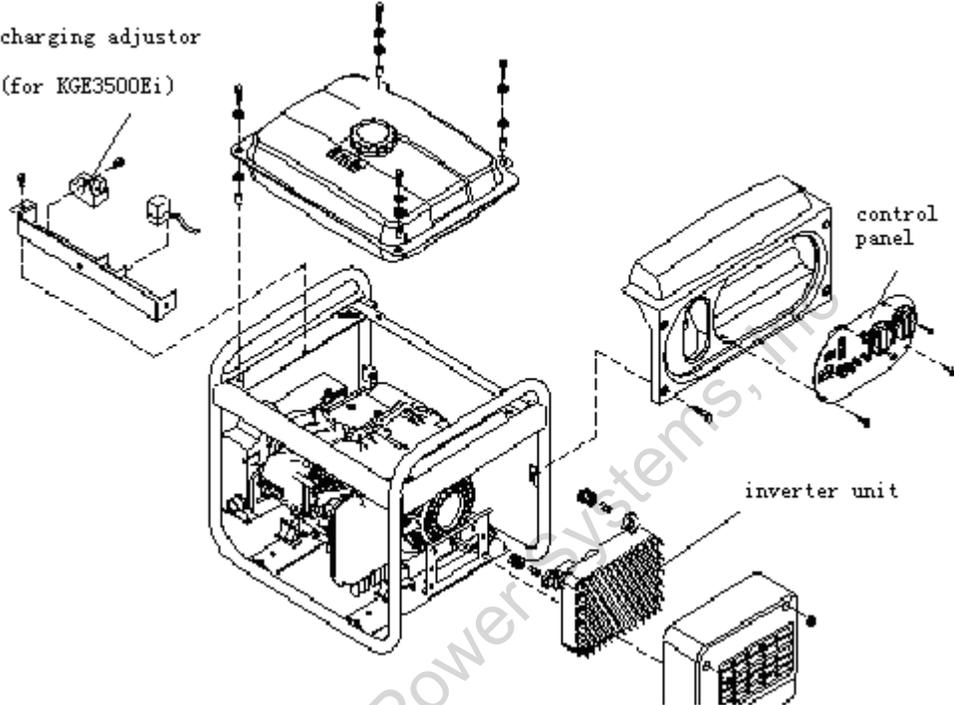


	①	②	③	④	⑤
OFF				●	●
ON	●	●			
START	●	●	●		



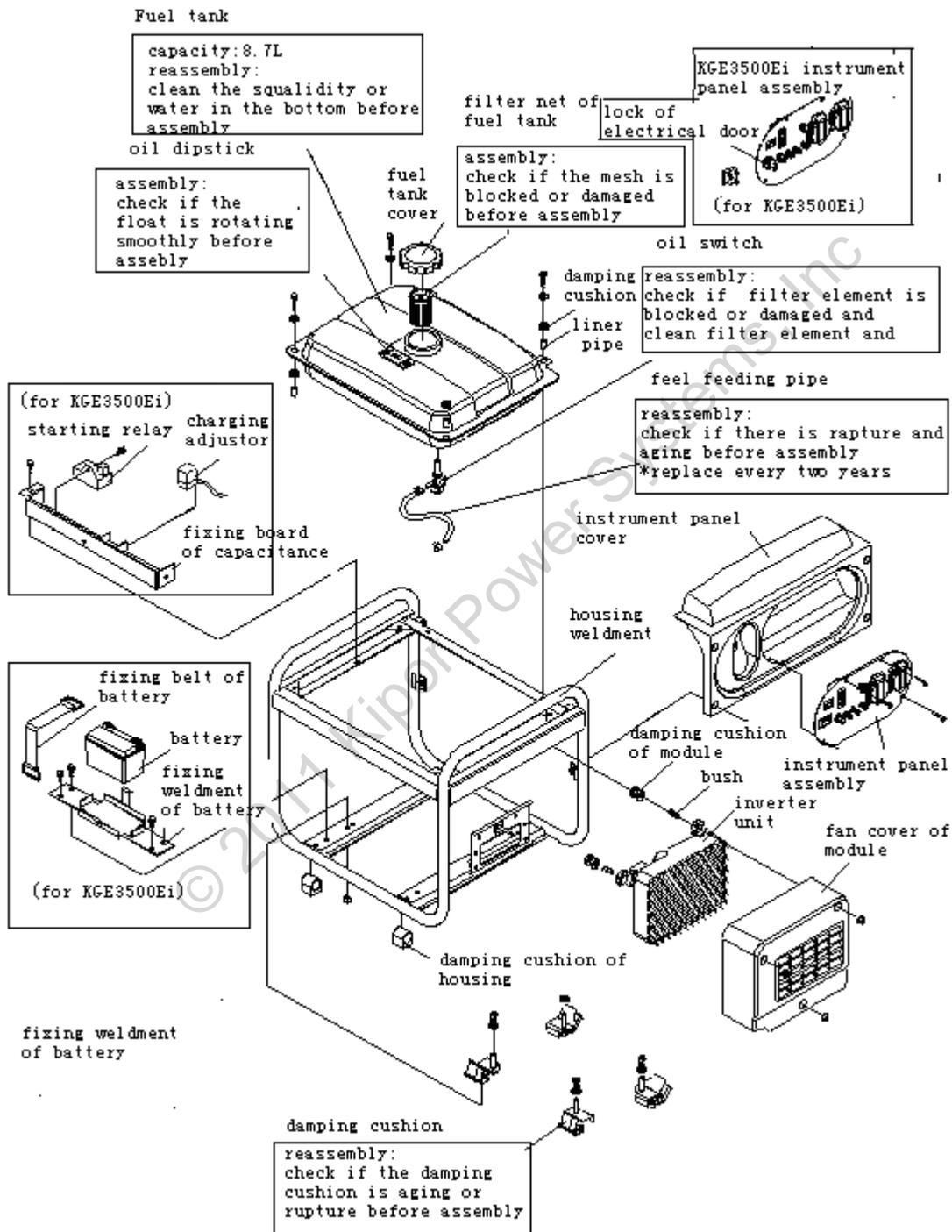
A6. Control Panel, Charging Adjustor and Inverter Module

Disassembly and assembly



A7. Frame and Fuel Tank

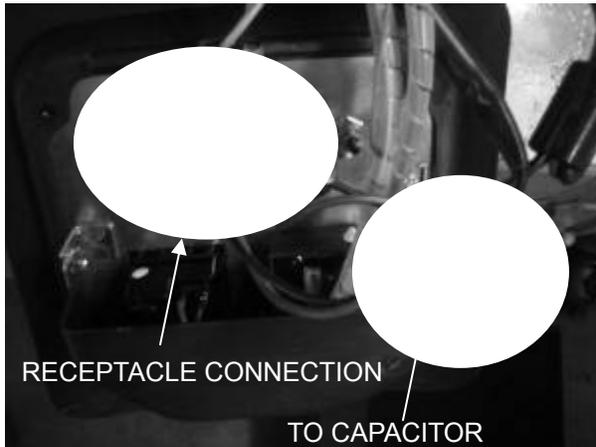
Disassembly and Reassembly



APPENDIX B: CAPACITOR

In all models built between December 2007 and ending in December 2010, a capacitor was added to reduce electro-mechanical interference and eliminate problems with some digital clocks not displaying the time properly.

The capacitor is attached directly to the frame behind the control panel to the left of the inverter module.



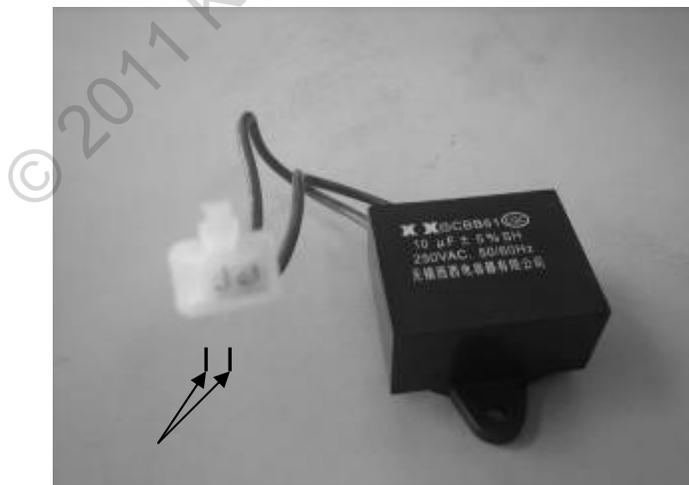
CONNECTION TO RECEPTACLES



CAPACITOR INSTALLATION

2. TROUBLESHOOTING AND TESTING

Check the capacitor when troubleshooting issues regarding digital clock displays. Should the capacitor fail, there will be no impairment of any other generator function or output. As the capacitor is connected directly to the output power supply, it has the potential to store a high voltage charge and should be discharged prior to testing. Unplug the 2p connector and short circuit the capacitor by placing the end of an insulated screwdriver across the two terminals.



Do not touch the exposed terminals nor attempt to take any measurements before discharging the capacitor

Use the capacitance checking mode of a multimeter. Replace the capacitor if any reading is outside the standard value of $10\mu\text{F}\pm 5\%$.



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