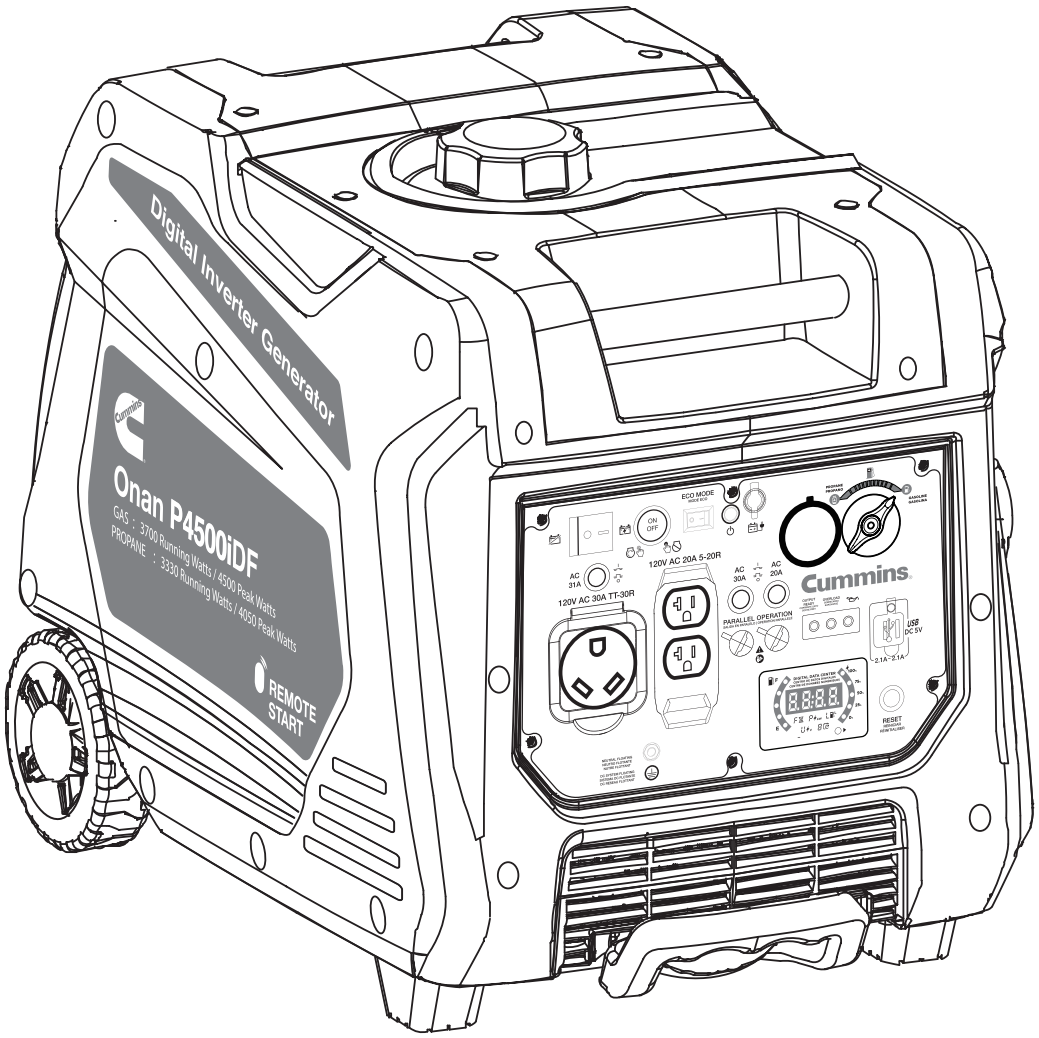
Service Manual

Onan P4500iDF Inverter



CALIFORNIA ENERGY COMMISSION COMPLIANT BC

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INTRODUCTION

⚠WARNING Operating, servicing, and maintaining this equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, and wear gloves or wash your hands frequently when servicing this equipment. For more information go to www.P65warnings.ca.gov.

DISCLAIMERS

All information, illustrations, and specifications in this manual were in effect at the time of publishing. The illustrations used in this manual are intended as representative reference views only. We reserve the right to make any specification or design change without notice.

ALL RIGHTS RESERVED

⚠DANGER Read this manual before using or performing maintenance on this product. Failure to follow the instructions and safety precautions in this manual can result in serious injury or death.

PRODUCT REGISTRATION

To ensure trouble-free warranty coverage, it is important you register your Cummins generator.

You can register your product online at:
www.cummins.com/support/product-registration

For Your Records

Date of Purchase: _____

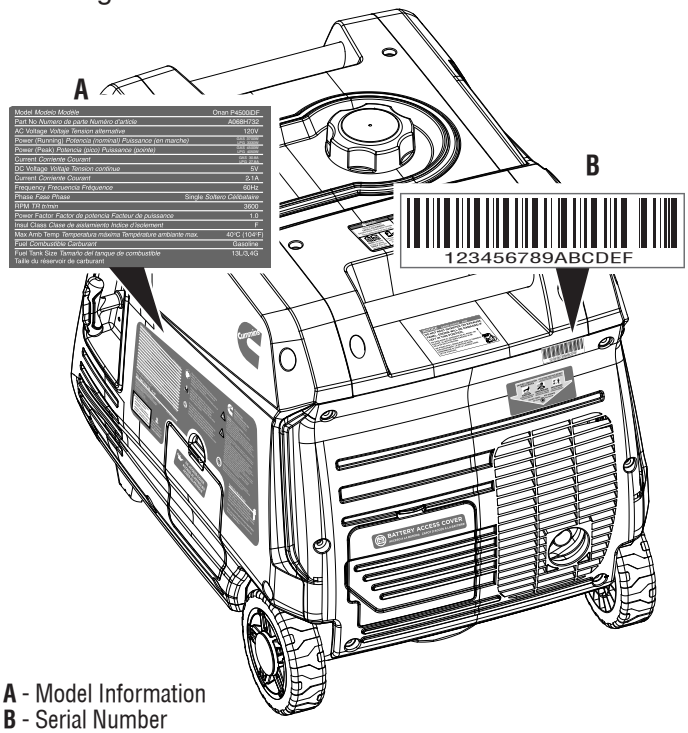
Model Number: _____

Serial Number: _____

Place of Purchase: _____

IMPORTANT: Keep your purchase receipt for trouble-free warranty coverage.

To register your inverter you will need to locate the following information:



A - Model Information
B - Serial Number

INTRODUCTION

SPECIFICATIONS

AC Voltage.....120V
Power (Running).....Gas 3700W/LPG 3330
Power (Peak).....Gas 4500W/LPG 4050W
Current (at 120V).....Gas 30.8A/LPG 27.8A
DC Voltage 5V
Current (at 5V).....2.1A
Frequency.....60 Hz
Phase .....Single
RPM.....3600
Power Factor 1.0
Insulation Class .....F
Maximum Ambient Temperature.....104°F (40°C)

Fuel Type.....Unleaded gasoline 87–93 Octane*
Do not use E15 or E85 fuel in this product.
Fuel Capacity.....3.4 gallons (13 liters)
Oil Capacity .....0.6 quarts (20.3 oz)
Oil Type .....SAE 10W-30
Spark Plug.....A058V025/Torch F7RTC
Spark Plug Gap .....0.032 in. (0.80 mm)
Valve Intake Clearance.....0.0031 – 0.0047 in. (0.08 – 0.12 mm)
Valve Exhaust Clearance .....0.0051 – 0.0067 in. (0.13 – 0.17 mm)
AC Grounding System.....Floating neutral

NOTICE This product is designed and rated for continuous operation at ambient temperatures up to 104°F (40°C). If needed, this product can be operated at temperatures ranging from 5°F (-15°C)–122°F (50°C) for short periods. If the product is exposed to temperatures outside of this range during storage, it should be brought back within this range before operation. This product must always be operated outdoors in a well-ventilated area and far away from doors, windows, and other vents.

Maximum wattage and current are subject to and limited by such factors as fuel BTU content, ambient temperature, altitude, engine conditions, etc. Maximum power decreases about 3.5% for each 1,000 feet above sea level, and will also decrease about 1% for each 10°F (6°C) above 60°F (16°C) ambient temperature.

NOTICE The effect of altitude on horsepower will be greater if no carburetor modification is made. A decrease in engine horsepower will decrease the power output of the generator. Contact our service team to order altitude kits.

NOTICE Thank you for choosing Cummins! PLEASE READ BEFORE RETURNING THIS PRODUCT FOR ANY REASON.

If you have a question or experience a problem with your Cummins purchase, call us at 1-800-286-6467 to speak with an agent.

SAVE THIS MANUAL FOR FUTURE REFERENCE.

HAVE QUESTIONS?
Call 1-800-CUMMINS
(1-800-286-6467)

SAFETY

SAFETY DEFINITIONS

The words DANGER, WARNING, CAUTION, and NOTICE are used throughout this manual to highlight important information. Make sure that the meanings of this safety information is known to all who operate, perform maintenance on, or are near the generator.

This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alerts symbol.

⚠DANGER Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE Indicates a situation which can cause damage to the generator, personal property, and/or the environment, or cause the equipment to operate improperly.

NOTE: Indicates a procedure, practice or condition that should be followed for the generator to function in the manner intended.

SAFETY SYMBOLS

Follow all safety information contained in this user's manual as well as the information on the product labeling.

Symbol	Description
	Safety Alert Symbol.
	Fire Hazard.
	Electrical Shock Hazard.
	Burn Hazard. **DO NOT** touch hot surfaces.
	Asphyxiation Hazard.
	Do not operate in wet conditions.
	Read Manufacturer's Instructions.
	Maintain Safe Distance.
	Ground. Consult with electrician to determine grounding requirements before operation.
	Electrocution Hazard.
	Lift Hazard.

IMPORTANT SAFETY INSTRUCTIONS

⚠DANGER Generator exhaust contains high levels of carbon monoxide (CO), an invisible, odorless, and extremely poisonous gas. If you smell exhaust fumes, you are breathing carbon monoxide. But, even if you do not smell exhaust fumes you may be inhaling CO.

ONLY operate generators outside, in a well-ventilated area. NEVER operate generators indoors, doing so CAN KILL YOU IN MINUTES.

Correct Use- ONLY use generators outside and downwind, far away from windows, doors and vents. ALWAYS direct exhaust away from occupied spaces. ALWAYS install battery-powered carbon monoxide detectors or plug-in carbon monoxide detectors with battery back-up in living areas. **See Figure 1**.

Incorrect Use- NEVER use a generator in your home, garage, basement, attic, crawl space or any other fully or partially enclosed area. Areas such as these can allow dangerous levels of carbon monoxide to accumulate. An open door or a running fan WILL NOT provide adequate ventilation. **See Figure 2**.

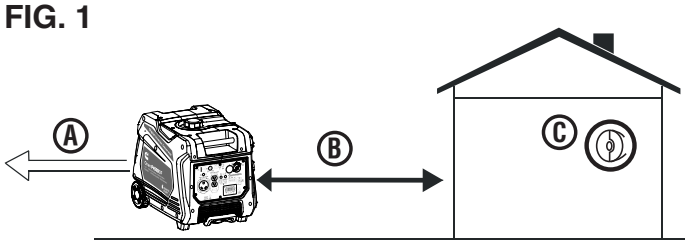
If you start feeling dizzy, weak, or sick while using the generator, move to fresh air IMMEDIATELY. Contact a doctor. You may be experiencing carbon monoxide poisoning.

⚠DANGER Fire and electrocution hazard. **DO NOT** connect to a building's electrical system unless the generator and a transfer switch have been properly installed and the electrical output has been verified by a qualified electrician. The connection must isolate the generator power from utility power and must comply with all applicable laws and electrical codes. Failure to properly isolate the generator power could cause property damage and create a dangerous backfeed of electricity which could kill or seriously injure utility workers.

⚠DANGER Electrocution hazard. **NEVER** use the generator in a location that is wet or damp. **NEVER** expose the generator to rain, snow, water spray, or standing water while in use. Protect the generator from all hazardous weather conditions. Moisture or ice can cause a short circuit or other malfunction in the electrical circuit.

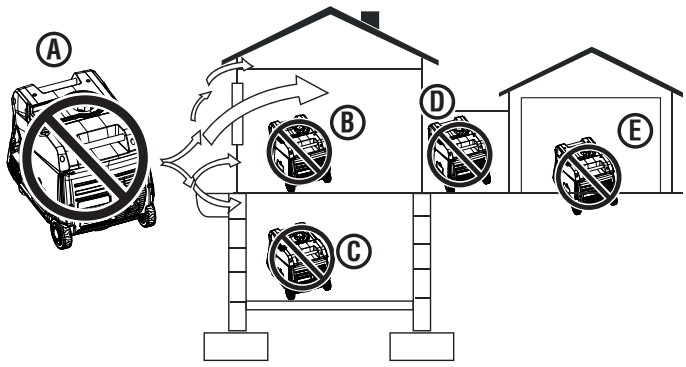
⚠WARNING Familiarize yourself with all the instructions, safety warnings, illustrations, and specifications provided with this product. Failure to follow the manufacturer's instructions may result in electric shock, fire, and/or carbon monoxide poisoning that can lead to death or serious injury.

FIG. 1



A - Exhaust (CO)
B - Only use OUTSIDE and FAR AWAY from windows, doors, and vents
C - CO detectors in living areas

FIG. 2



A - Exhaust (CO)
B - Living Area
C - Basement Crawlspace
D - Entryway/Porch/Mudroom
E - Garage

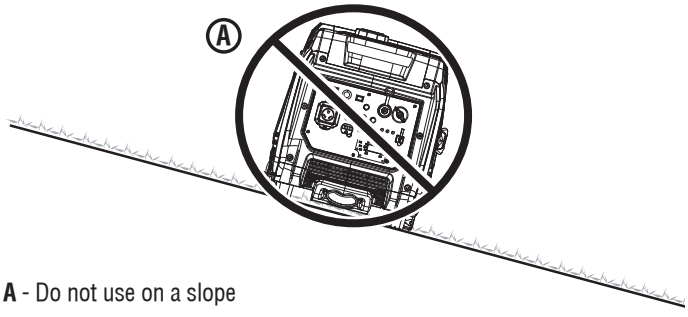
NOTICE Install battery-powered carbon monoxide detectors or plug-in carbon monoxide detectors with battery back-up in living areas.

- This product should ONLY be used outdoors.
- NEVER use a generator in your home, garage, basement, attic, crawl space or any other fully or partially enclosed area. Areas such as these can allow dangerous levels of carbon monoxide to accumulate. Carbon monoxide (CO), an invisible, odorless, and extremely poisonous gas CAN KILL YOU IN MINUTES.
- Only use OUTSIDE and far away from windows, doors, and vents as recommended by the US Department of Health and Human Services Centers for Disease Control and Prevention. Your specific home and/or wind conditions may require additional distance.
- The National Electrical Code requires the use of a transfer switch or other suitable transfer equipment whenever a portable generator is connected to a building's electrical system. Transfer switches isolate generator power from utility power and prevent backfeeding of electric power into the utility system.

NOTE: A transfer switch must be installed by a qualified electrician in accordance with applicable electrical codes. Some jurisdictions may require the installation to be inspected by local authorities. Keep all relevant installation, inspection, and maintenance information.

- Never use the generator to power medical support equipment.
- Never expose the generator to rain, snow, water spray, or standing water while in use. Store and operate the unit in a dry or covered (but not enclosed) location.
- Do not let children or untrained individuals operate the generator.
- Keep children, bystanders, and pets a minimum of 10 ft. away from a running generator.
- Maintain Safe Distance. While operating and storing, keep at least five feet of clearance on all sides of the generator, including overhead. Turn the unit off and allow it to cool a minimum of 30 minutes before storage. Heat created by the muffler and exhaust gases could be hot enough to cause serious burns and/or ignite combustible objects.
- Do not operate the unit in areas where combustible or hazardous materials are stored including gasoline and natural gas filling stations.
- Do not operate the generator while barefoot, with wet hands or feet, while standing in water or in wet conditions.
- Do not use this unit when you are tired or under the influence of drugs, alcohol, or medication.
- Burn Hazard. Do not touch hot surfaces.
- Do not contact the muffler or engine. They are very HOT and will cause severe burns. Do not put body parts or any flammable or combustible materials in the direct path of the exhaust.
- Keep hands, fingers, feet, and other body parts away from all moving parts of the generator.
- Do not connect worn or damaged electrical cords to the generator. NEVER touch frayed or exposed wires.
- Do not operate the generator on an incline. The unit should always be placed on a flat stable surface (see figure 3).

FIG. 3



A - Do not use on a slope

- Check the physical condition of the product prior to each use. Look for loose bolts, fluid leaks, and other signs of wear. Replace all damaged items. For replacement parts or assistance, contact our customer service team.
- For optimal performance, use the generator in temperatures between 23°F (-5°C) and 104°F (40°C) with a maximum relative humidity of 90%.
- Before starting the generator, check all fluids (oil and gasoline).
- Do not remove the oil dipstick or fuel cap when the generator is running.
- Securely tighten the oil dipstick after adding oil and the fuel cap after adding gasoline.
- Avoid skin contact with engine oil or gasoline. Wear protective clothing and equipment. Wash all exposed skin with soap and water. Prolonged skin contact with gasoline or engine oil may cause severe skin irritation and other adverse reactions.
- Generator's vibrate and bounce during normal operation. Check the generator and all of the cords connected to it for any damage that may have resulted from the vibration. Replace or repair damaged items as needed. Do not use the generator or any items that show signs of damage.
- All electrical tools and appliances operated from this generator must be properly grounded by use of a third wire or be double-insulated.
- Before transporting the generator, disconnect the spark plug boot, drain the fuel tank and properly restrain the unit.
- Fuel or oil may leak from the generator during transport. Place a towel, plastic sheet, or absorbent pad beneath the unit to protect your vehicle.
- To prolong the life of this product, follow the instructions in the *Care and Maintenance* section of this manual.
- Replace damaged or worn items with recommended or equivalent replacement parts. Using an incorrect or incompatible part might create a hazard that could result in serious personal injury.
- Always remove any tools or other service equipment used during maintenance away from the generator before operating.

GROUNDING

See Figure 4.

⚠WARNING Shock hazard. Failure to properly ground the generator can result in electric shock.

NOTICE Only use grounded 3-prong extension cords, tools, and appliances, or double-insulated tools and appliances.

The generator neutral is floating. The generator ground terminal is connected to the frame of the generator, the metal non-current-carrying parts of the generator, and the ground terminals of each receptacle. The generator (stator winding) is isolated from the frame and from the AC receptacle ground pin. Electrical devices that require a grounded receptacle pin connection may not function properly.

If this generator will be used only with cord and plug equipment connected to the receptacles mounted on the generator, National Electric Code does not require that the unit be grounded. However, other methods of using the generator may require grounding to reduce the risk of shock or electrocution.

Before using the ground terminal, consult a qualified electrician, electrical inspector, or local agency having jurisdiction for local codes or ordinances that apply to the intended use of the generator.

SAFETY PRECAUTIONS FOR GASOLINE AND GASOLINE VAPOR

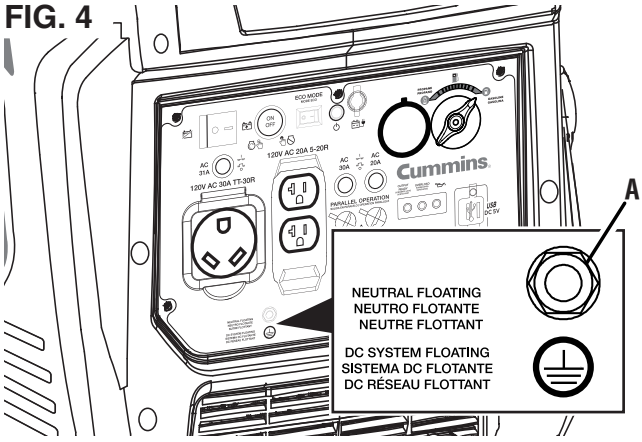
⚠DANGER Fire and explosion hazard. Gasoline is highly explosive and flammable and can cause severe burns or death.

⚠WARNING Fire and Burn Hazard. NEVER loosen or remove the fuel cap while the generator is running. Turn the unit off and allow it to cool for at least five minutes before adding gasoline. Loosen the fuel cap slowly.

⚠WARNING In case of a gasoline fire, do not attempt to extinguish the flame if the fuel switch is in the ON position. Introducing an extinguisher to a generator with an open fuel switch could create an explosion hazard.

- Fire Hazard. Gasoline is highly flammable. Handle with care.
- Never use gasoline as a cleaning agent.
- Gasoline is a skin irritant and needs to be cleaned up immediately if it comes in contact with the skin.

FIG. 4



A - Ground Terminal

- Do not store gasoline near furnaces, water heaters, or any other appliances that produce heat or have automatic ignitions.
- Keep gasoline away from sparks, open flames, pilot lights, heat, and other sources of ignition.
- Store any containers containing gasoline in a well-ventilated area, away from any combustibles or source of ignition.
- ALWAYS store gasoline in a container approved for gasoline. Unapproved containers can break or deteriorate allowing gasoline or gasoline vapors to escape which can create a serious hazard.
- Gasoline has a distinctive odor, this will help detect potential leaks quickly.
- Gas vapors can cause a fire if ignited.
- Do not smoke when handling fuel, adding fuel to the generator, or emptying the gas tank.
- Wear eye protection while refueling.
- Before adding fuel to the generator, turn the unit off and allow it to cool a minimum of five minutes. If necessary, move the unit to level ground.
- Do not remove the fuel tank cap when the generator is running.
- Loosen the fuel cap slowly to safely release pressure, keep gasoline from escaping around the cap, and to avoid the heat from the muffler igniting fuel vapors.
- NEVER fill the generator's gasoline tank beyond the maximum fill ring on the fuel screen. Keeping gasoline levels at or below the fill ring will allow for fuel expansion. Overfilling the fuel tank can result in a sudden overflow of gasoline and result in spilled gasoline coming in contact with HOT surfaces.
- Spilled fuel can ignite. Wipe up spills immediately and allow area to dry before operating the generator. NEVER attempt to burn off spilled fuel.

- Securely tighten the fuel cap after adding gasoline.
- Do not cover the fuel cap while the generator is in operation. Covering the cap may cause the engine to fail or damage the product.
- Drain fuel before storing the unit. Store the unit and the fuel separately in well-ventilated areas away from sparks, open flames, pilot lights, heat, and other sources of ignition.
- Turn the unit off and allow it to cool a minimum of 30 minutes before draining fuel.

LIQUID PETROLEUM GAS (LPG/PROPANE)

⚠WARNING Fire and explosion hazard. Never use a gas container, LPG/propane connector hose, LPG/propane tank or any other fuel item that appears to be damaged. If there is a strong smell of propane while operating the generator, fully close the LPG/propane tank valve immediately. Once the propane is off, use soapy water to check for leaks on the hose and connections on the tank valve and the generator. Do not smoke or light a cigarette or check for leaks using any open flame source such as a match or lighter. If a leak is found, contact a qualified technician to inspect and repair the LPG/propane system before using the generator.

⚠CAUTION Fire and explosion hazard. Only use approved LPG/propane tanks with an Overfilling Prevention Device (OPD) valve. Always keep the tank in a vertical position with the valve on top and placed at ground level on a flat surface. Do not allow tanks to be near any heat source. When transporting and storing, turn the propane tank valve to the fully closed position and disconnect the tank. Make sure to always cover the generator inlet and tank outlet with protective plastic caps.

- LPG/Propane is highly flammable and explosive.
- In case of a LPG/Propane fire, DO NOT attempt to extinguish the flame if the fuel valve is in the gas position. Introducing an extinguisher to a generator with an open fuel valve could create an explosion hazard.
- LPG/Propane can settle in low places because it is heavier than air.
- LPG/Propane has a distinctive odor added to help detect potential leaks.
- Always keep a LPG/Propane tank in an upright position.
- When exchanging LPG/propane tanks, be sure the tank valve is the same type.
- LPG/propane will burn the skin. Prevent skin contact at all times.
- Keep the propane tank away from the generator exhaust.
- Large (500–1000 gallon) LPG/propane tanks will require a certified plumber to install the fuel line to the generator and the loose regulator is not used (the regulator that is attached to the fuel tank). The pressure as measured at the regulator mounted to the generator must be 7” to 14” of water column. A certified plumber must ensure that the pressure is correct or install a step down regulator if needed.
- Make sure the generator and LPG/propane tank are on a flat surface before operating.
- If there is a propane odor do not start the unit because there may be a potential leak. Never place a LPG/propane tank near the engine exhaust.
- When transporting, make sure the LPG/propane tank and LPG/propane hose are not attached to the generator.
- Store LPG/propane tank away from sparks, open flames, pilot lights, heat, and other sources of ignition.
- Do not store LPG/propane tank near furnaces, water heaters, or any other appliances that produce heat or have automatic ignitions.

SERVICE INFORMATION

ABOUT THIS MANUAL

This manual provides troubleshooting and repair information for the generators listed on the front cover. The information contained within the manual is based on information available at the time of going to print. In line with the Cummins Inc. policy of continuous development and improvement, information may change at any time without notice. The users should therefore make sure that before commencing any work, they have the latest information available.

This manual contains schematics that are included to help in troubleshooting. The schematics that are maintained with the unit should be updated when modifications are made to the unit.

Operating and basic maintenance instructions are in the applicable generator user manual. Read and carefully observe all instructions and precautions in this manual.

RELATED LITERATURE

Before any attempt is made to operate the generator set, the operator should take time to read all of the manuals supplied with the generator set and familiarize themselves with the warnings and operating procedures.

NOTICE Keep multi-type ABC fire extinguishers close by. Class A fires involve ordinary combustible materials such as wood and cloth. Class B fires involve combustible and flammable liquid fuels and gaseous fuels. Class C fires involve live electrical equipment. (Refer to NFPA No. 10 in the applicable region.)

A generator must be operated and maintained properly if you are to expect safe and reliable operation.

SERVICE RULES

- Use genuine Cummins recommended parts and lubricants or their equivalents. Parts that do not meet Cummins design specifications may damage the engine.
- Always install new gaskets, O-rings, etc., when reassembling.
- When tightening bolts or nuts, begin with larger-diameter or inner bolts first and tighten to the specified torque diagonally, unless a particular sequence is specified.
- 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.

ELECTRIC 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 bent, excessive extrusion, missing terminal, or other abnormalities before connecting the connector.
- To connect, insert the connector fully. 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 open 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 clamp the wire harnesses.
- Clamp the wire harnesses securely so that they do not interfere with the rotating parts, moving parts and the hot parts.
- Route and connect the wire harnesses properly. Be sure that the harnesses are not loose, twisted or pulled tight.
- Route the wire harnesses properly so that they do not contact with the shape edges and corners, and the end of the bolts and screws on the body.
- If a wire harness contacts the end of the bolts/screws or sharp edges and corners, protect the contact part of the harness with a tube or by winding with an electrician"s 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 the damaged insulation, repair by winding with the electrician"s insulating tape.
- Read the tester manufacturer’s operation instructions carefully before operation with tester.
- Follow the instructions of the Service Manual. Be sure that the battery built in a tester is fully charged and check the meter before inspection using the tester.

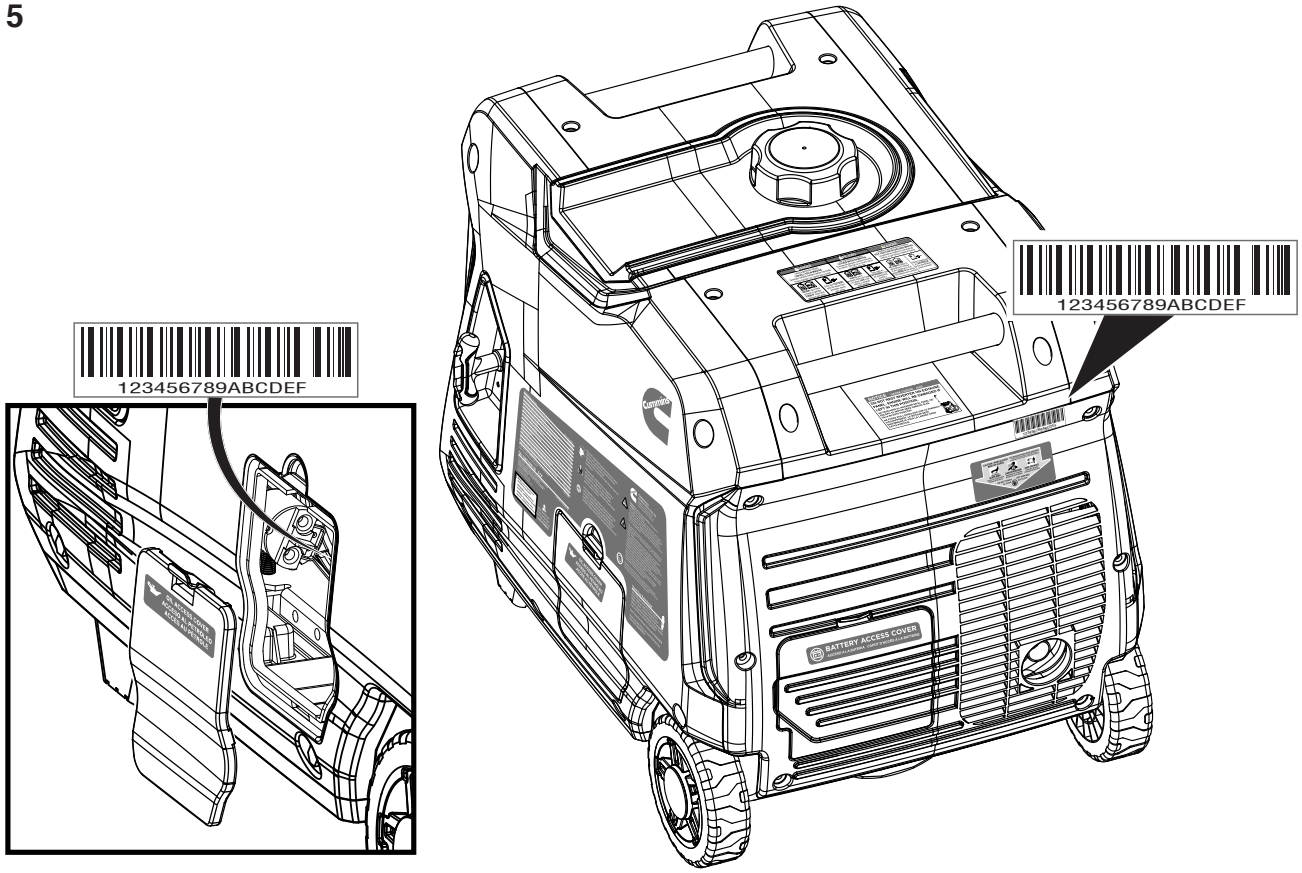
SERVICE INFORMATION

SERIAL NUMBER LOCATION

See Figure 5.

This unit has a serial number label in two locations; on the back near the top of the unit, and on the frame inside the service cover.

FIG. 5



SPECIFICATIONS

TORQUE SPECIFICATIONS

ITEM	SCREW DIAMETER	TIGHTENING TORQUE (NM)	
		MINIMUM	MAXIMUM
Head cover bolt	M6	8	12
Drain plug	M10	15	25
Spark plug	M14	20	30
Cylinder head bolt	M8	26	30
Flywheel nut	M14	55	65
Muffler nut	M8	20	30
Crankcase cover bolt	M8	26	30
Connecting rod bolt	M6	11	13
Rocker arm adjust lock nut	M6	8	12
*Use standard torque values for fasteners not listed			

TEMPERATURE

ITEM	TEMPERATURE (°C)	
	MINIMUM	MAXIMUM
Oil temperature	NA	140
Spark plug temperature	NA	240

RESISTANCE AND CLEARANCE

ITEM	CLEARANCE (MM)	
	MINIMUM	MAXIMUM
Spark plug clearance	0.7	0.8
Ignition trigger clearance	0.3	0.5

VALVE CLEARANCE

ITEM	CLEARANCE (mm)	
Intake Valve Clearance	0.08	0.12
Exhaust Valve Clearance	0.13	0.17

IGNITION COIL

ITEM	POSITION	RESISTANCE
Ignition Coil	From Rotor Trigger	131Ω

MOTOR

ITEM	SPECIFICATION
Cylinder compression	50 - 90 psi
Stepper motor resistance values	50Ω
Starter relay resistance value	3.85Ω
Ignition coil clearance (from rotor trigger)	0.3~0.5mm

SPECIFICATIONS

ENGINE MAINTENANCE STANDARDS				
PART	**ITEM**		**STANDARD**	**SERVICE LIMIT**
Engine	Maximum speed without load		3000 rpm	---
Cylinder	Sleeve I.D.		70 - 70.01 mm	70.1
Piston	Skirt O.D		69.97 - 39.98 mm	69.9
	Pin bore I.D.		18.002 - 18.008 mm	18.04
Piston pin	O.D		18.192 - 18.198 mm	18.15
Piston rings	1st ring	Height (H)	0.97 - 0.99 mm	0.9
		Ring side clearance	0.02 - 0.06 mm	0.15
		Ring end clearance	0.12 - 0.24 mm	1
		Width (WD)	2.25 - 2.45 mm	2
	2nd ring	Height (H)	0.97 - 0.99 mm	0.9
		Ring side clearance	0.02 - 0.06 mm	0.15
		Ring end clearance	0.2 - 0.35 mm	1
		Width (WD)	2.5 - 2.7 mm	2.2
	Oil ring	Height (H)	2.487 - 2.497 mm	2.417
		Ring side clearance	0.04 - 0.155 mm	---
		Ring end clearance	0.15 - 0.6 mm	1
		Width (WD)	2.43 - 2.83 mm	2.1
Connecting rod	Small end I.D.		18.206 - 18.217 mm	18.225
	Big end I.D.		30.02 - 30.03 mm	30.1
Crankshaft	Crank pin O.D.		29.975 - 29.985 mm	29.925
Valves	Valve clearance	IN	0.08 - 0.12 mm	0.25
		EX	0.13 - 0.17 mm	0.35
	Stem O.D.	IN	5.465 - 5.48 mm	5.4
		EX	5.43 - 5.45 mm	5.37
	Guide I.D.	IN	5.5 - 5.512 mm	5.58
		EX	5.5 - 5.512 mm	5.6
	Seat width	IN/EX	0.6 - 0.8 mm	1.8
Valve spring	Free length	IN/EX	30 - 31 mm	28.5
Cam wheel	Cam height	IN	5.62 - 5.74 mm	5.4
		EX	5.71 - 5.83 mm	5.5
Carburetor	Main jet		74	---
	Float height		---	---

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION	SEE...
HARD STARTING OR ENGINE WILL NOT START	No gasoline or propane	Refill fuel tank or LPG/propane cylinder and restart the engine.	**User Manual**
	Wet spark plug	Clean/unclog fuel line and fuel filter.	**Replacing the Fuel Filter**
		Float valve malfunction.	**Check Float Level Height**
		Clogged carburetor.	**Cleaning/ Replacing the Carburetor**
	No spark or abnormal spark at the spark plug	Clean the electrode, and try to start without closing the choke. If flooding is severe, check the carburetor float valve.	**Cleaning/Replacing The Spark Plug** **Check Float Level Height**
		Check ignition system and grounds.	**Spark Test**
		Check cylinder compression. • Blown head gasket. • Improperly tightened head gasket. • Poor valve seat contact. • Worn cylinder, piston, or piston ring(s). • Cylinder head warping. • Insufficient tappet clearance. • Improper valve timing.	**Check Engine / Cylinder Leak Down Test / Compression Test**
IGNITION	Faulty ignition coil or spark plug	• Measure the spark plug gap and perform the spark plug test. Standard clearance 0.024 – 0.032 in. (0.60 – 0.80 mm) • Perform the spark test again using a new spark plug. Replace the spark plug. • Check again with a new spark plug boot. Faulty spark plug boot. Install new spark plug boot. • Check the ignition switch. Replace the ignition switch.	**Cleaning/Replacing The Spark Plug** **Spark Test** **Inspecting The Ignition Coil**
		Disconnect the low oil sensor and perform spark test. Replace low oil sensor.	**Checking The Low Oil Sensor**
		Check the ignition coil resistance. Replace the ignition coil.	**Inspecting The Ignition Coil**
ENGINE OIL IS LOW BUT ENGNIE DOESN'T STOP	Faulty or inoperative low oil sensor	Drain out oil completely, disconnect the oil sensor wire harness, and check the continuity between the black wire and the chassis ground.	**Checking The Low Oil Sensor**
		Check and repair all wire connections.	
		Replace the oil level sensor	

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION	SEE...
ENGINE STOPS RUNNING	Low oil	Check the oil level and oil sensor. Fill the oil reservoir to the proper level and restart the engine.	**Checking The Low Oil Sensor**
	No gasoline or propane	Check fuel level. Fill the tank with fuel and restart the engine.	**User Manual**
	Clogged fuel hose, fuel valve, or fuel valve	Check the fuel valve and fuel filter for blockage. Clear the fuel valve and replace the fuel filter	**Replacing the Fuel Filter**
		Check the fuel supply hose for blockage. Clear or replace the fuel supply hose	**Replacing the Fuel Filter**
	Leaking carburetor	Check the carburetor gasket for leakage. Tighten carburetor bolts or replace gasket as required.	**Cleaning/ Replacing The Carburetor**
	Faulty stepper motor	Test or replace the stepper motor	**Measure resistance of Throttle Stepper Motor**
	Faulty ignition coil	Check the primary and secondary resistance of the ignition coil	**Inspecting The Ignition Coil**
	Engine isn't sealing properly	Check for compression loss at carburetor, exhaust, breather, and cylinder head. • Check the valve clearance • Check the carbon deposit in combustion chamber • Check the piston, piston ring(s) and cylinder for damage	**Check Engine / Cylinder Leak Down Test / Compression Test**
ENGINE SPEED DOES NOT INCREASE OR IS UNSTABLE	Dirty air filter	Inspect and clean the air filter	**Cleaning/Replacing The Air Filter**
	Blocked spark arrestor	Inspect spark arrestor for carbon build up. Remove and clean carbon deposits.	**Cleaning The Spark Arrestor**
	Faulty spark plug	Remove the spark plug and check the electrode clearance for carbon deposit. Clean electrode or replace spark plug.	**Cleaning/Replacing The Spark Plug**
	Carburetor obstructed	Inspect and clean the carburetor	**Cleaning/ Replacing The Carburetor**
	Carburetor gasket damaged or leaking	Check carburetor gasket. Replace gasket if damaged.	**Cleaning/ Replacing The Carburetor**
	Cylinder compression loss	Check cylinder compression • Check the valve clearance • Check the carbon deposit in combustion chamber. • Check the piston, piston ring(s) and cylinder for damage.	**Check Engine / Cylinder Leak Down Test / Compression Test**
	Faulty stepper motor	Test or replace the stepper motor	**Measure resistance of Throttle Stepper Motor**
ENGINE SPEED TOO HIGH OR TOO LOW	Abnormal AC output	Check the AC output.	**No or Low AC Output**
	Faulty stepper motor	Test or replace the stepper motor	**Measure resistance of Throttle Stepper Motor**
	Faulty ECO mode switch and connection wire	Check ECO mode switch and connection wire. Replace the ECO switch.	**Continuity Check For Battery, Eco Mode, And Start/Stop Switch**
	Damaged inverter unit	Replace the inverter unit	**Replacing The Inverter Module**
NO POWER TO OUTLETS	Circuit breaker tripped	Check and reset circuit breakers/main circuit breaker.	**User Manual**
	Voltage issues at alternator	Check alternator voltage (continuity tests).	**Stator Inspection**
		Check voltage output. If bad, contact technical support.	**Measure Stator Output Voltage While Running**

REMOVING THE ACCESS COVERS

See Figure 6.

You may need to remove one or more of the access covers to perform a test procedure. Always replace the access covers when the test is complete.

To remove the battery access cover:

- Depress the tab on the battery access cover and pull it away from the generator.

To remove the oil access cover:

- Depress the tab on the oil access cover and pull it away from the generator.

To remove the engine service cover:

- Remove the cover screw then pull the engine service cover away from the generator.

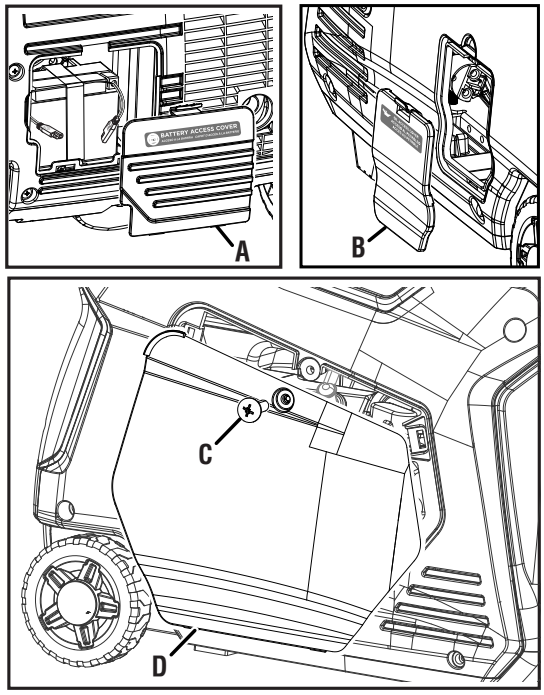
REMOVING THE FRAME AND FUEL TANK

See Figure 7.

Some test procedures can only be performed with the fuel tank, rear frame assembly, and side frame assemblies removed. To remove these items, do the following:

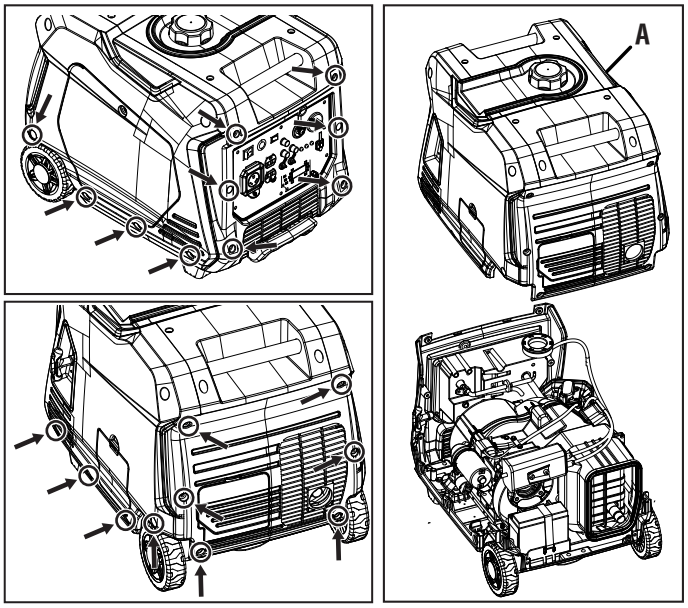
- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Loosen and remove the screws securing the left, right, and rear frame assemblies to the bottom and front of the generator. **ONLY remove screws from the locations identifed by the arrows in figure 6.**
- Using the carrying handles, lift the fuel tank, left, right, and rear frame assemblies up and away from the rest of the unit. **These items may be referred to as "the shell" throughout the rest of this document. NOTE:** You will need to disconnect hoses and cables (including fuel hoses) to completely detach the frame assemblies and fuel tank. Monitor which hoses and cables are disconnected and make certain to reconnect them when reassembling the unit.
- To replace the shell, reconnect all hoses and cables then carefully lower the frame assemblies over the engine and back onto the bottom and front of the generator. Align holes and install hardware to secure.

FIG. 6



A - Battery Access Cover
B - Oil Access Cover
C - Cover Screw
D - Engine Service Cover

FIG. 7



A - "Shell" (fuel tank, left, right, and rear frame assemblies)

TEST PROCEDURES

STARTING THE GENERATOR WITH THE SHELL REMOVED

See Figures 8 - 9.

⚠DANGER Electrocution Hazard. Exercise extreme caution when using the generator without the shell. Several of the generator's high voltage components are exposed once the shell has been removed. Electrocution, severe physical harm, and/or death will result from coming into contact with these components while they are in use.

To start the generator with the shell removed:

- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the shell as previously described.
- Place the shell on a table or platform slightly above the generator.
- Locate the short hose on the end of the fuel filter (connected to tank) and the long hose going from the carb to the fuel switch (connected to control panel).

  NOTE: Inspect hoses for damage or signs of wear. If damaged replace immediately.
- Remove the short hose from the end of the fuel filter and disconnect the long hose from the fuel switch.
- Connect the long hose to the end of the fuel filter.

⚠DANGER **Make sure the fuel hoses are installed and clamped firmly.** Improperly installed hoses can allow gasoline to leak or spill creating the risk of fire and/or explosion.

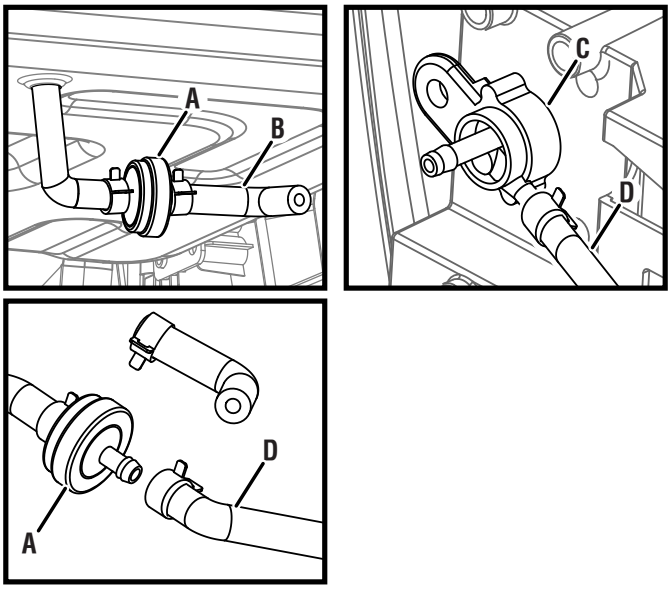
- Remove the fuel cap and add gasoline.
- Replace the fuel cap

  NOTE: Clean up any spills and allow gasoline vapors to dissipate before attempting to start the unit.
- Start the unit and perform the test procedures.

TEST PROCEDURES

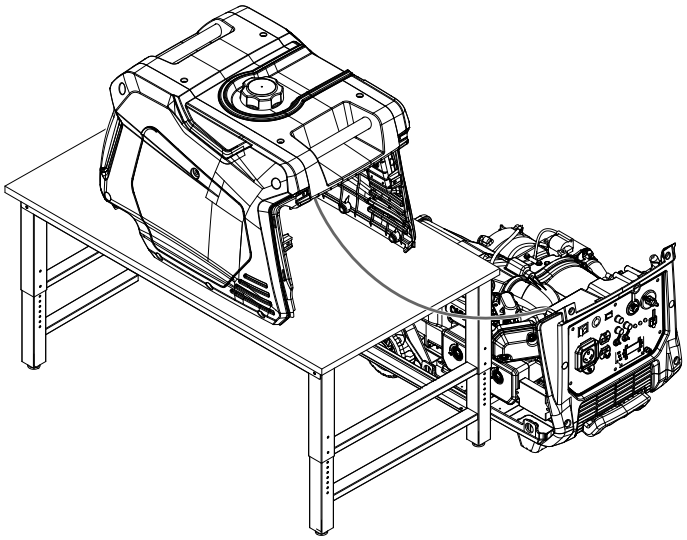
The test procedures in this Manual are not necessarily the only acceptable methods for diagnosing the condition of components and circuits. All possible methods that might be used for system diagnosis have not been evaluated. If any diagnostic method is used other than the method presented in this Manual, the technician must ensure that neither his personal safety nor the product's safety will be endangered by the procedure or method that has been selected.

FIG. 8



A - Fuel Filter
B - Short Hose
C - Fuel Selector Switch
D - Long Hose

FIG. 9



TEST PROCEDURES

TEST 1- CHECK ENGINE / CYLINDER LEAK DOWN TEST / COMPRESSION TEST

See Figure 10.

Most engine problems may be classified as one or a combination of the following:

- Will not start
- Starts hard
- Lack of power
- Runs rough
- Vibration
- Overheating
- High oil consumption

A **Cylinder Leak Down Tester** checks the sealing (compression) ability of the engine by measuring air leakage from the combustion chamber. Compression loss can present many different symptoms. This test is designed to detect the section of the engine where the fault lies before replacing the engine.

- Remove the engine service cover
- Remove the spark plug.
- Pull the recoil handle to rotate the engine to top dead center (TDC). Looking through the spark plug hole; the piston should be at the top (both valves are closed).
- Attach cylinder leak down tester adapter to spark plug hole.
- Connect an air source of at least 90 psi to the leak down tester.
- Adjust the regulated pressure on the gauge to 80 psi.
- Read the right hand gauge on the tester for cylinder pressure. 20 percent leakage is normally acceptable. Use good judgment, and listen for air escaping at the carburetor, the exhaust, and the crankcase breather.

This will determine where the fault lies.

RESULTS	ACTION
Air escapes at the carburetor	Check intake valve
Air escapes through the exhaust	Check exhaust valve
Air escapes through the breather	Check piston rings
Air escapes from the cylinder head	Replace head gasket

TEST 2 - CHECK STARTER MOTOR

See Figure 11.

Conditions affecting starter motor performance:

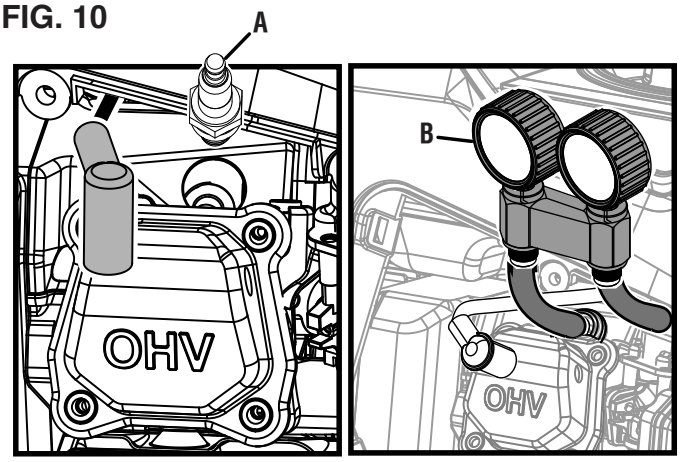
- A binding or seizing condition in the Starter Motor bearings.
- A shorted, open or grounded armature.
  - Shorted, armature (wire insulation worn and wires touching). Will be indicated by low or no RPM.
  - Open armature (wire broken) will be indicated by low or no RPM and excessive current draw.
  - Grounded armature (wire insulation worn and wire touching armature lamination or shaft). Will be indicated by excessive current draw or no RPM.
- A defective Starter Motor switch.
- Broken, damaged or weak magnets.
- Starter drive dirty or binding.

PROCEDURE

The battery should have been checked prior to this test and should be fully charged.

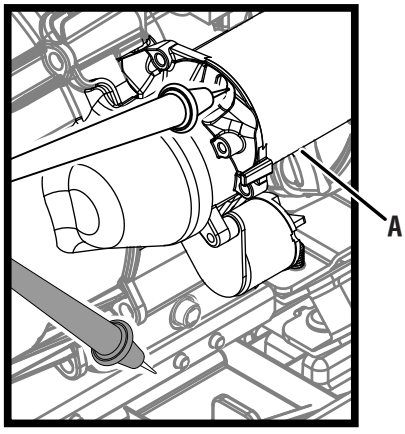
- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”
- Ensure battery is charged and working properly.
- Set a voltmeter to measure DC voltage (12 VDC).
- Connect the meter positive (+) test lead to the Starter Contactor stud which has the small jumper wire connected to the Starter.
- Connect the common (-) test lead to the Starter Motor frame.
- Push the Start/Stop Button and observe the meter. Meter should indicate battery voltage, Starter Motor should operate and engine should crank.

FIG. 10



A - Spark Plug
B - Cylinder Leak Down Tester

FIG. 11



A - Starter Motor

RESULTS

- If battery voltage is indicated on the meter but Starter Motor did not operate, remove and bench test the Starter Motor (see following test).
- If battery voltage is indicated and the Starter Motor tried to engage (pinion engaged), but engine did not crank, check for mechanical binding of the engine or rotor.

  NOTE: If a starting problem is encountered, the engine itself should be thoroughly checked to eliminate it as the cause of starting difficulty. It is a good practice to check the engine for freedom of rotation by removing the spark plug and turning the crankshaft over slowly by hand to be sure it rotates freely.

⚠WARNING DO NOT ROTATE ENGINE WITH ELECTRIC STARTER WITH SPARK PLUG REMOVED. ARCING AT THE SPARK PLUG END MAY IGNITE THE GASOLINE VAPOR EXITING THE SPARK PLUG HOLE.

TEST 3 - CHECK ENGINE COMPRESSION

See Figure 12.

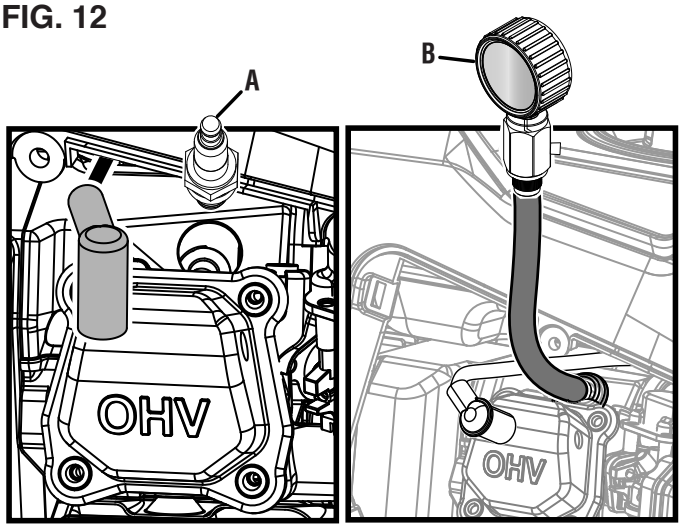
Lost or reduced engine compression can result in (a) failure of the engine to start, or (b) rough operation.

One or more of the following will usually cause loss of compression:

- Blown or leaking cylinder head gasket.
- Improperly seated or sticking-valves.
- Worn piston rings or cylinder. (This will also result in high oil consumption).

- Remove the engine service cover
- Remove the spark plug.
- Insert a compression gauge into the cylinder.

FIG. 12



A - Spark Plug
B - Compression Gauge

- Crank the engine until there is no further increase in pressure.
- Record the highest reading obtained.

RESULTS

Normal compression is approximately 50-90 Psi.

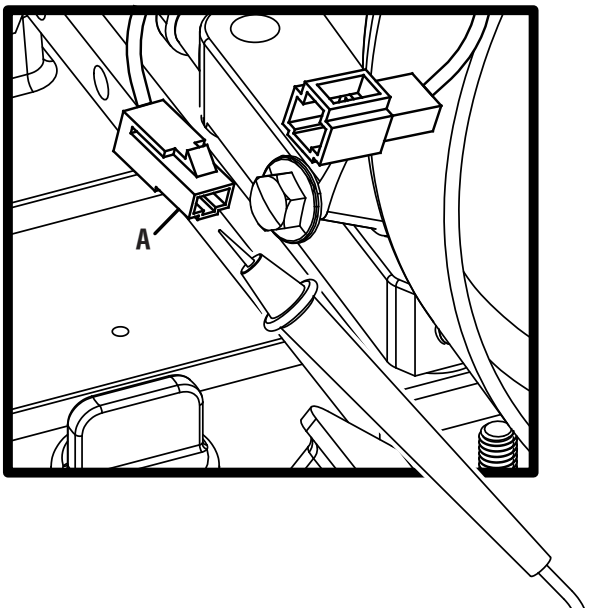
TEST 4 - CHECKING THE LOW OIL SENSOR

See Figure 13.

- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”
- Locate the oil sensor lead which is below and too the right of the dipstick.
- Disconnect the low oil sensor when the engine is running.
- Ground the yellow lead (Female connector) from the indicator module to the engine block, to ensure that the engine will stop when the low oil alarm lamp is lit.
- After insuring that the engine oil is at the proper level, test the continuity between the (Male connector) from the oil sensor and the case of the engine. No continuity indicates a normal condition.
- Continuity between the oil sensor lead and engine when the oil is drained from the engine indicates a normal condition.

⚠WARNING No continuity with the oil drained would indicate a faulty oil sensor or damaged wire that must be repaired or replaced. Failure to do so can lead to permanent damage if the engine runs low on oil.

FIG. 13



A - Sensor Wire (Male Connector)

TEST 5 - SPARK TEST

See Figure 14.

- Turn the battery switch to the ON position. Verify that the low oil indicator is not illuminated. If ON, add oil to bring the level to the upper limit.
- Remove the engine service cover
- Remove the spark plug.
- Clamp the carburetor inlet fuel line and drain the carburetor float bowl.
- Remove spark plug and pull on the starter rope several times to remove any unburned fuel from the combustion chamber.
- Install the spark plug to the plug boot.
- Ground the negative electrode (threaded part) of the spark plug to the cylinder head cover.
- Pull the recoil handle and check for spark at the spark plug. If there is no spark, replace the spark plug with a new one and recheck for spark.

TEST 6 - CHECK NO LOAD VOLTAGE AND FREQUENCY

See Figure 15.

- Disconnect or turn OFF all electrical loads connected to the generator.
- Set a volt meter to measure AC voltage.
- Reset all circuit breakers to the ON position.
- Turn the ECO mode switch to OFF.
- Start the engine and let it stabilize and warm up.
- Place the meter test leads into an outlet.
- Read the AC voltage.
- Connect a AC frequency meter.
- Read the AC frequency.

No load voltage and frequency should be approximately 122-126 volts and 61-63 Hz respectively.

TEST 7 - CHECK LOAD VOLTAGE AND FREQUENCY

See Figure 16.

Apply a load to the generator equal to its rated capacity, then check the voltage and frequency in the same maner as the previous test (**Check No Load Voltage and Frequency**). Frequency should not drop below about 59 Hertz with the load applied.

Voltage should not drop below about 235 VAC with load applied.

RESULTS

- If voltage and/or frequency drop excessively when the load is applied, go to Test 8.
- If load voltage and frequency are within limits, end tests.

FIG. 14

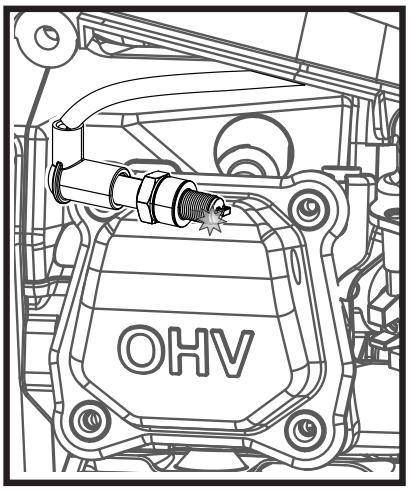


FIG. 15

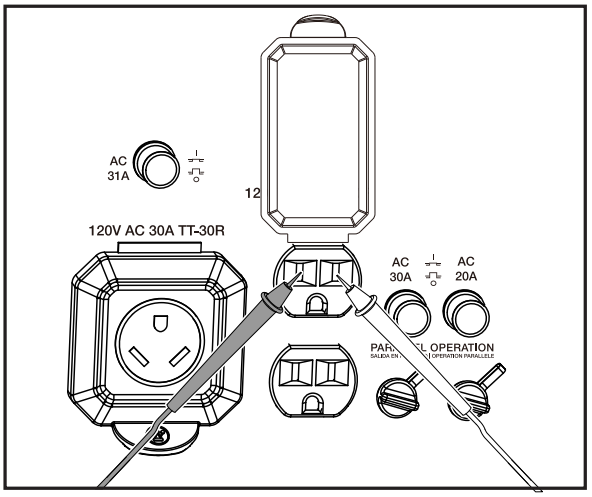
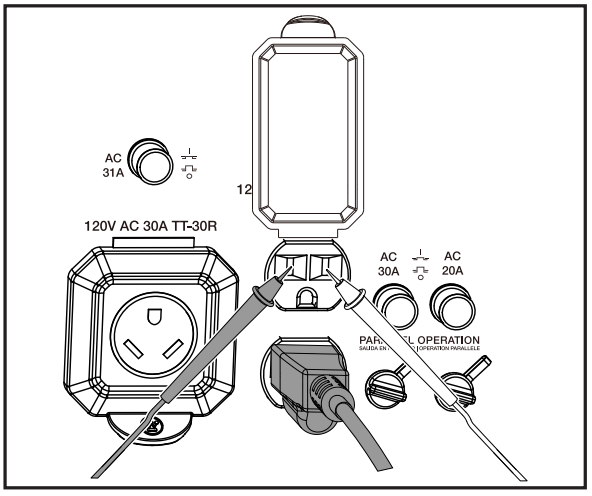


FIG. 16



TEST 8 - CHECK LOAD WATTS AND AMPERAGE

See Figure 17.

Add up the wattages or amperages of all loads powered by the generator at one time. If desired, a clamp-on ammeter may be used to measure current flow.

If the unit is overloaded, reduce the load.

TEST 9 - CHECK MAIN CIRCUIT BREAKER

See Figures 18 - 19.

The generator has circuit breakers located on the control panel. If outlets are not receiving power, make sure the breakers are set to ON or “Closed”. If a breaker is suspected to have failed, perform the following test.

- Set a volt meter to measure resistance.
- Remove the screw securing the knob to the control panel and remove the knob.
- Remove the screws securing the control panel to the generator and remvoe the panel.
- Locate the main circuit breaker.
- With the generator shut down, disconnect all wires from the suspected circuit breaker terminals to prevent interaction.
- With the generator shut down, connect one meter test lead to a one terminal of the breaker and the other meter test lead to the other terminal.
- Set the breaker to its ON or “Closed” position. The meter should read CONTINUITY.
- Set the breaker to its OFF or “Open” position and the meter should indicate INFINITY.

RESULTS

- If the circuit breaker tests good, refer back to the flow chart.
- If the breaker tests bad, it should be replaced.

FIG. 17

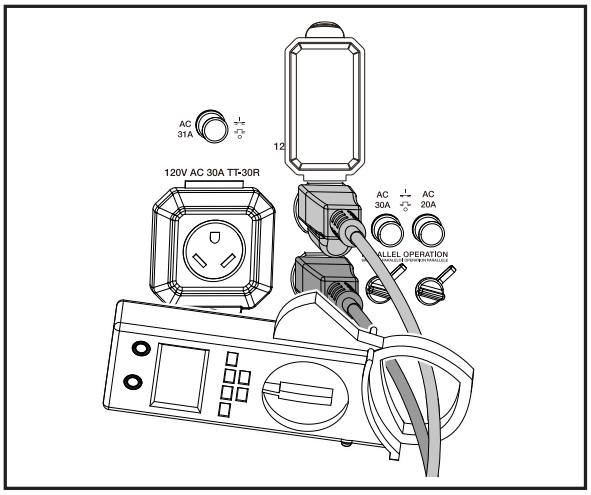
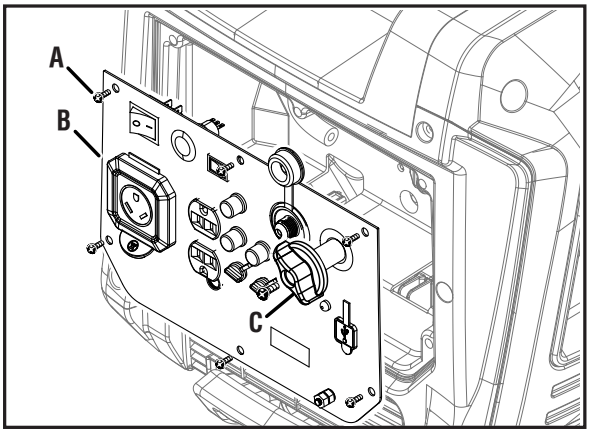
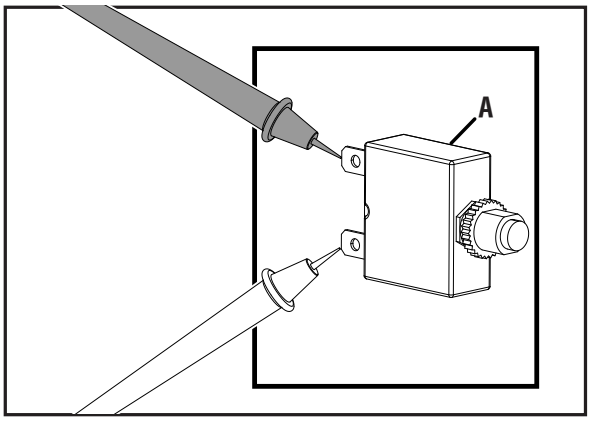


FIG. 18



A - Screw
B - Control Panel
C - Knob

FIG. 19



A - Circuit Breaker

TEST 10 - MEASURE STATOR OUTPUT VOLTAGE WHILE RUNNING

See Figure 20.

- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”
- Locate the stator wire with the 8-pin connector.
- Separate the male and female connector.
- Start the engine, check voltage between blue terminals, between white terminals, and between black terminals.

  NOTE: The engine will be running at a high RPM.

There should be approximately 300 VAC at each test with the engine running at high speed. If one or more of the three tests fail, the problem is either a damaged wire harness or a defective alternator. If the wire harness is the problem, look for and repair the damage.

If the alternator is the problem, the stator will need to be replaced. If all three tests are OK, the problem is likely the inverter.

TEST 11 - STATOR INSPECTION

See Figure 20.

DC CHARGING WINDING

Measure the resistance between the two blue terminals. Blue-Blue, 0.045~0.070 Ω

SUB WINDING

Measure the resistance between the two sub winding terminals.

White-White, 0.100~0.160 Ω

MAIN WINDING

Measure the resistance between each of the main winding terminals.

Black-Black-Black, 0.250~0.350 Ω

TEST 12 - NO OR LOW AC OUTPUT

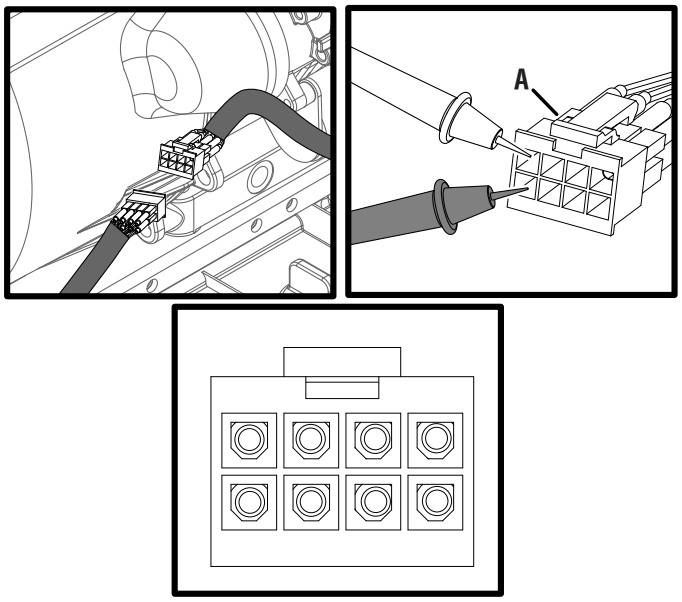
See Figure 21.

⚠WARNING High voltage and electrical current present. Touching the non-insulated portions of the meter leads or generator wiring can cause shock or electrocution. Wear insulated gloves and avoid handing non-insulated wiring.

Use a load bank to verify the customer’s initial complaint and the generator’s performance after the repairs.

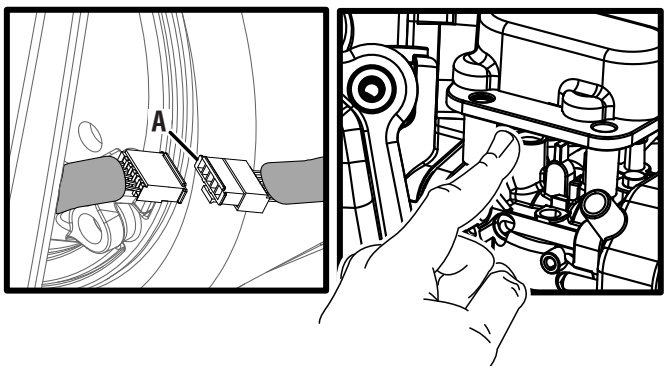
- Remove the “shell”.
- Start the engine.
- Verify that the overload LED is off and the circuit protectors are on.
- Observe the output ready LED.
  - If the output ready LED turns on, inspect the AC receptacle (**TEST 6**); or inspect the wiring to the receptacle (**TEST 15**).
  - If the output ready LED does not turn on, disconnect the 6-pin connector and manually set the RPM by moving the throttle lever with your finger.
    - If the engine speed increases or stabilizes, measure the stator output voltage (**TEST 10**). There may be a problem with the alternator or wiring harness.
    - If the motor speed does not increase or stabilize, check engine compression (**TEST 3**), clean or replace air filter and/or spark plug (see **Maintenance**) and check valve clearance (see **Maintenance**).

FIG. 20



A - Stator Wire (Male Connector)

FIG. 21



A - Throttle Control Wire (Male Connector)

TEST 13 - CONTINUITY CHECK FOR BATTERY, ECO MODE, AND START/STOP SWITCH

See Figures 22.

- Remove the control panel as previously described.
- Identify the switch you want to test.
- Check for continuity between the switch terminals. There must be no continuity with the switch turned ON, and continuity with the switch turned OFF.

TEST 14 - CHECK AC CIRCUIT BREAKER

See Figure 23.

- Remove the control panel as previously described.
- With the generator shut down, disconnect all wires from the suspected circuit breaker terminals to prevent interaction.
- With the generator shut down, connect one meter test lead to a one terminal of the breaker and the other meter test lead to the other terminal.
- Set the breaker to its ON or “Closed” position. The meter should read CONTINUITY.
- Set the breaker to its OFF or “Open” position and the meter should indicate INFINITY.

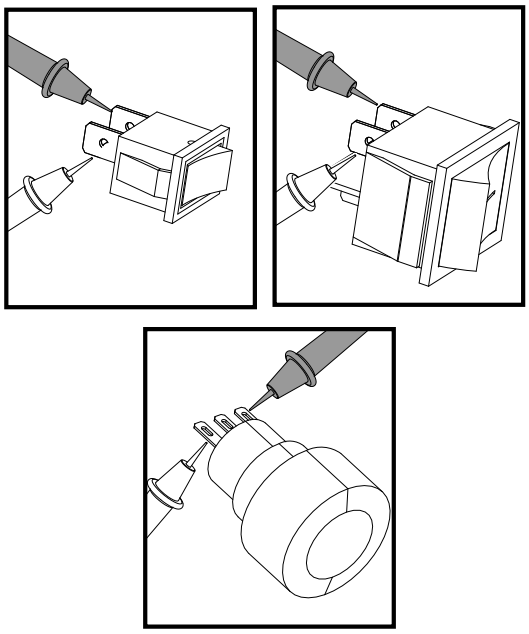
TEST 15 - INSPECT AC RECEPTACLE

See Figure 24.

Remove the control panel as previously described. There must be continuity between the lead wire terminals.

There must be no continuity between the ground terminal of the receptacle and the receptacle installation fitting.

FIG. 22



A - ECO mode switch
B - Start/Stop Switch
C - Start/Stop Switch

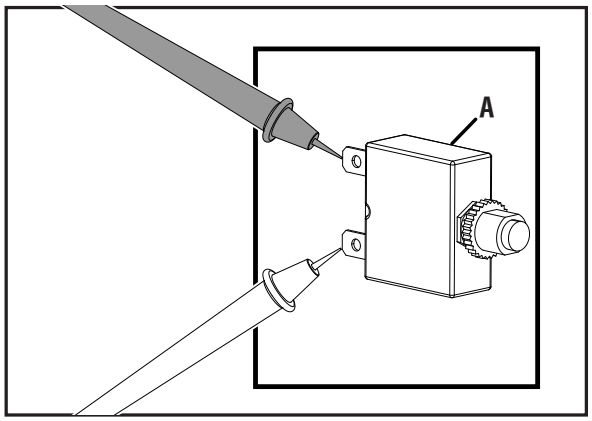
TEST 16 - MEASURE RESISTANCE OF THROTTLE STEPPER MOTOR

See Figures 25 - 26.

- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”.
- Remove the stepper motor wire from the inverter.

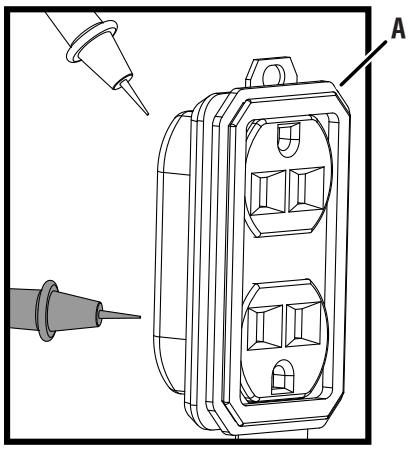
  NOTE: The stepper motor wire goes from the inverter to the stepper motor on top of the carburetor assembly.

FIG. 23



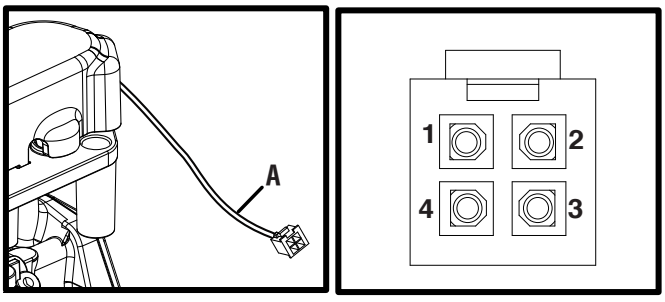
A - Circuit Breaker

FIG. 24



A - AC Receptacle

FIG. 25



A - Stepper Motor Wire

- Check the stepper motor connections on the inverter for debris or damaged/bent pins.
- Measure resistance between wires 1and 3 and between wires 2 and 4. Standard resistance is 45~55Ω.
- Replace the stepper motor if the resistance exceeds the standard range.

To replace the motor:

- Depress the locking tabs to remove the stepper motor cover. Set the cover aside.
- Remove the screws securing the stepper motor to the carburetor assembly.
- Remove the stepper motor from the carburetor assembly.
- Replace the motor and reinstall the cover.

TEST 17 - INSPECTING THE IGNITION COIL

See Figure 27.

- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”.
- Locate and unplug the blue and black 2-pin coil plug from the control panel.
- Connect two leads to the Blue and Black wires, then measure the ignition coil’s primary resistance.a
- If there is no resistance, check for continuity between the black wire and chassis ground. If there is no continuity repair or correct as necessary.
- Replace the coil if there is no resistance.

To check secondary resistance:

- Connect one lead to the spark plug boot and another to the black wire.
- If there is no resistance remove the spark plug boot and check the lead itself.
- Replace the spark plug boot or coil if there is no resistance.

TEST 18 - AUTOMATIC CHOKE INSPECTION

See Figures 28 - 30.

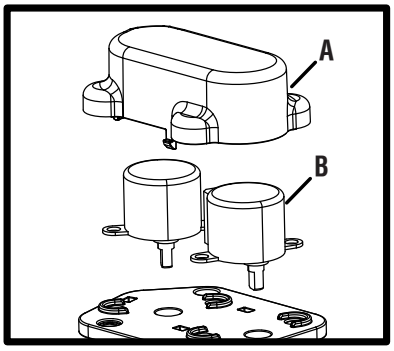
This generator has an automatic choke. Verify that the choke functions and the lever moves properly.

- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”.
- Start the engine.
- Observe the choke lever. When the unit is started, the lever should go from the fully open position to the fully closed position.
- Stop the engine.
- Observe the choke lever. When the unit is stopped, the lever should travel from the fully closed to the fully open position.

If the choke lever does not operate properly, inspect the following items:

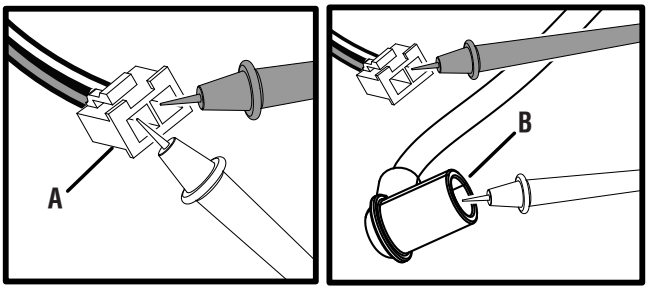
- Stepper Motor
  - If disconnected, connect stepper motor wire to the inverter.
  - If the wire is connected, verify that the motor is engaging when the unit is turned on and off. If the motor doesn’t engage, it may be faulty.
  - Replace damaged or worn items before reassembly.

FIG. 26



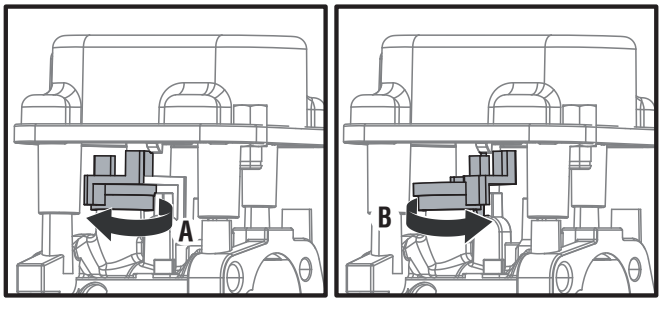
A - Stepper Motor Cover
B - Stepper Motor

FIG. 27



A - Coil Plug
B - Spark Plug Boot

FIG. 28



A - Choke (Fully Open)
B - Choke (Fully Closed)

- Air Cleaner Box
  - Remove the bolts and air cleaner box cover. Inspect and clean the cover, filter, and the air cleaner box.
  - Replace damaged or worn items before reassembly. To replace the air cleaner box, refer to **Replacing the Air Cleaner Box** later in this seciton.
- Fuel
  - Inspect fuel for contaminates.
- Carburetor
  - Remove the bolt, small o-ring, float bowl, and large o-ring from the carburetor. Clean the float bowl and make sure o-rings are in good condition. Replace if necessary.
  - Check the operation of the float. Make sure it doesn't stick in any one position.
  - Using a screwdriver, remove the primary jet and emulsion tube from the carburetor stem. Clean with compressed air or a fine piece of metal.
  - Remove the throttle stop screw beneath the stepper motor. Using a flat head screwdriver, remove the pilot jet. Clean the jet using compressed air or a fine piece of metal.
  - Replace damaged or worn items before reassembly. To replace the carburetor, refer to **Replacing the Carburetor** later in this seciton. **NOTE:** Install the throttle stop screw after installing the pilot jet. After installation, the position of the screw may need to be adjusted refer to **Adjusting the Throttle Stop Screw** later in this manual.

CLEANING/REPLACING THE AIR CLEANER BOX

See Figure 29.

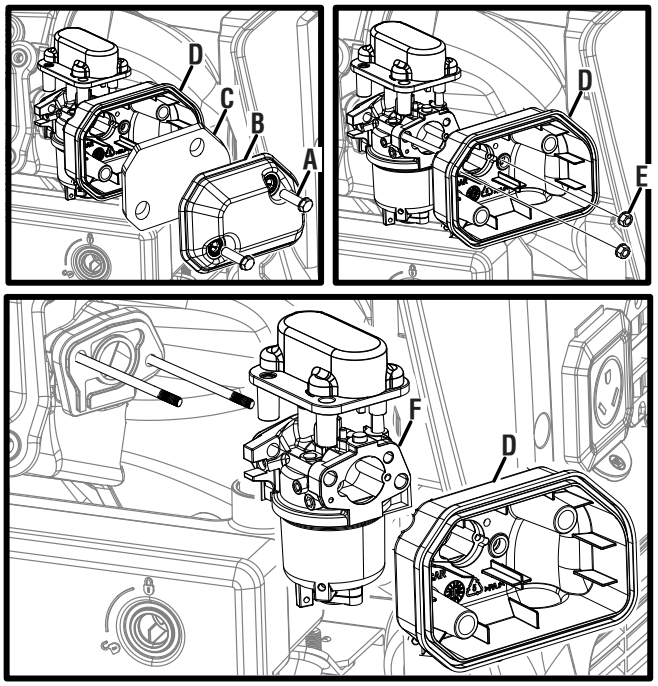
- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the "shell".
- Remove the air cleaner box cover and filter to access the nuts securing the box to the carburetor.
- Remove the nuts and disconnect the hoses from the air cleaner box. Slide the box off the studs.
- Clean components and inspect for damage.
- To replace the air cleaner box, reverse the procedure.

CLEANING/ REPLACING THE CARBURETOR

See Figure 29.

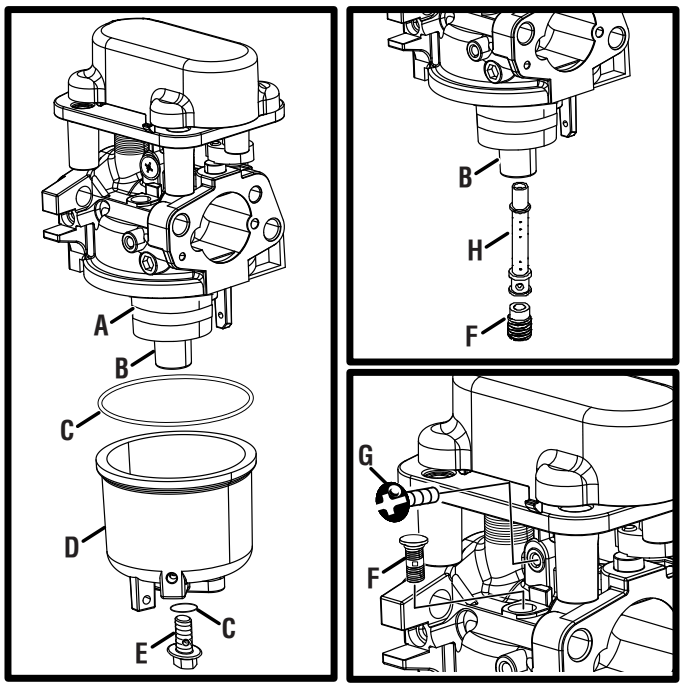
- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the "shell".
- Remove the air cleaner box as previously described.
- Disconnect the carburetor ground wire, stepper motor wire, propane hose, and fuel hose.
- Carefully remove the gaskets and carburetor (and stepper motors) from the cylinder head.
- Clean components and inspect for damage.
- To replace the carburetor, reverse the procedure.

FIG. 29



A - Bolt
B - Air Cleaner Box Cover
C - Air Filter
D - Air Cleaner Box
E - Nut
F - Carburetor

FIG. 30



A - Float
B - Stem
C - O-Ring
D - Float Bowl
E - Bolt
F - Jet
G - Throttle Stop Screw
H - Emulsion Tube

TEST 19 - CHECK FLOAT LEVEL HEIGHT

See Figure 30.

- Remove the carburetor from the cylinder head as previously described.
- Remove the bolt from the bottom of the float bowl.
- Remove the float bowl and o-ring.
- With the carburetor in an upright position, measure the distance between the float top and carburetor body when the float just contacts the float valve.

  NOTE: The standard float height is 12.00 mm (0.47in).
- If the height is outside the specification, replace the float. Check the float operation.

ADJUSTING/INSTALLING THE THROTTLE STOP SCREW

See Figure 31.

To adjust engine idle speed:

- Remove the engine service cover
- Start the engine, turn the ECO mode switch on. Wait until the engine warms up.
- Rotate throttle stop screw in to increase speed and out to decrease speed.

To install the throttle stop screw after replacing a jet:

- Remove the engine service cover
- Install throttle stop screw and tighten fully.
- Start the engine, turn the ECO mode switch on. Wait until the engine warms up.
- Turn the throttle stop screw in until the engine speed starts to increase: then turn the screw out 3/5 turns.

REPLACING THE INVERTER MODULE

See Figure 32.

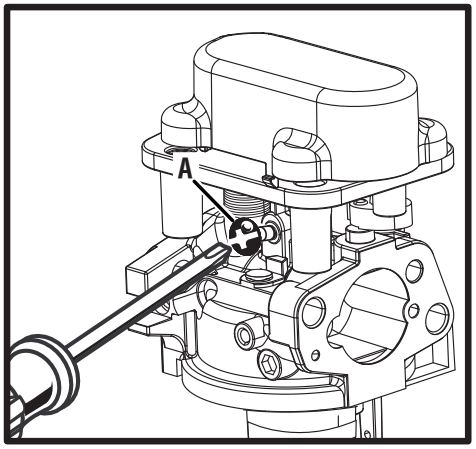
- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”.
- Disconnect the battery.
- Gently lift the front panel up and away from the bottom panel. If you disconnect any wires or hoses from the panel, be sure to replace them during reassembly.
- Disconnect the ground wire and the 6-pin wire from the inverter module.
- Remove the bolts securing the inverter bracket to the bottom panel. Remove the inverter module.
- To replace the inverter module, reverse the procedure.

REPLACING THE RECOIL STARTER ASSEMBLY

See Figure 33.

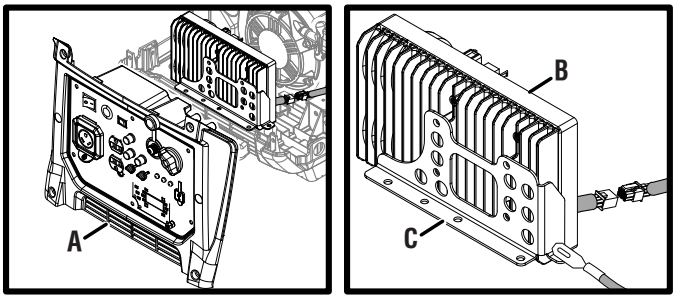
- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the “shell”.
- Disconnect the battery.
- Gently lift the front panel up and away from the bottom panel. If you disconnect any wires or hoses from the panel, be sure to replace them during reassembly.
- Remove the inverter module as described previously.
- Remove the bolts securing the recoil starter assembly to the engine shroud. Remove the recoil starter assembly.
- To replace the recoil starter assembly, reverse the procedure.

FIG. 31



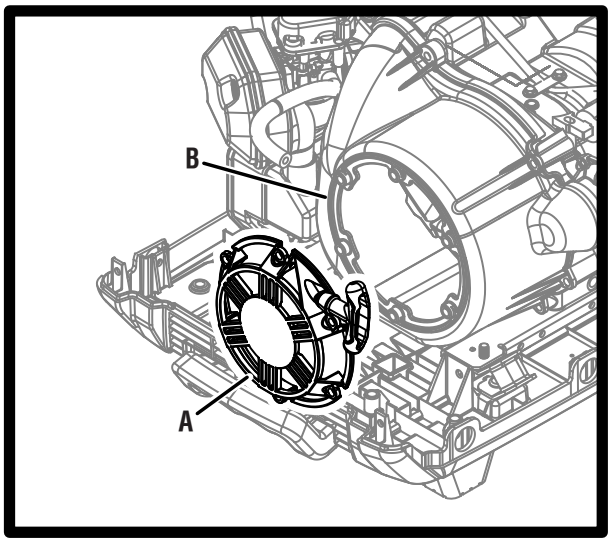
A - Throttle Stop Screw

FIG. 32



A - Front Panel
B - Inverter
C - Bracket

FIG. 33



A - Recoil Starter Assembly
B - Engine Shroud

⚠WARNING Accidental start-up. Disconnect the spark plug boot (see figure 36) from the spark plug when performing maintenance on the generator.

⚠WARNING Replace damaged or worn items with recommended or equivalent replacement parts. Using an incorrect or incompatible part might create a hazard that could result in serious personal injury.

⚠WARNING Allow hot components to cool for 30 minutes before performing any maintenance procedure.

⚠WARNING Avoid skin contact with engine oil or gasoline. Wear protective clothing and equipment. Wash all exposed skin with soap and water. Prolonged skin contact with gasoline or engine oil may cause severe skin irritation and other adverse reactions.

NOTICE Check the physical condition of the product prior to each use. Look for loose bolts, fluid leaks, and other signs of wear. Replace all damaged items. For replacement parts or assistance, contact our customer service team.

To prolong the life of this product, follow the care and maintenance instructions in this section. Do not attempt to service or replace any recall or warranty parts. Such repairs must be performed by an authorized service center. Contact customer service for details.

CLEANING THE GENERATOR

Do not store or operate your generator in dirty, dusty, or corrosive environments. Do not allow foreign materials and debris to clog the vents on the unit.

NEVER clean the generator with a garden hose. Water can damage the generator's fuel system and electrical components. If the unit needs to be cleaned, use a soft brush and damp cloth to clean the exterior and use low pressure air (no greater than 25 psi) to clean the vents.

Never use gasoline as a cleaning agent.

CLEANING/REPLACING THE AIR FILTER

See Figure 34.

Keep air filter clean. A dirty air filter can cause poor performance and decrease the service life of the product. **NEVER operate the generator without an air filter in place.**

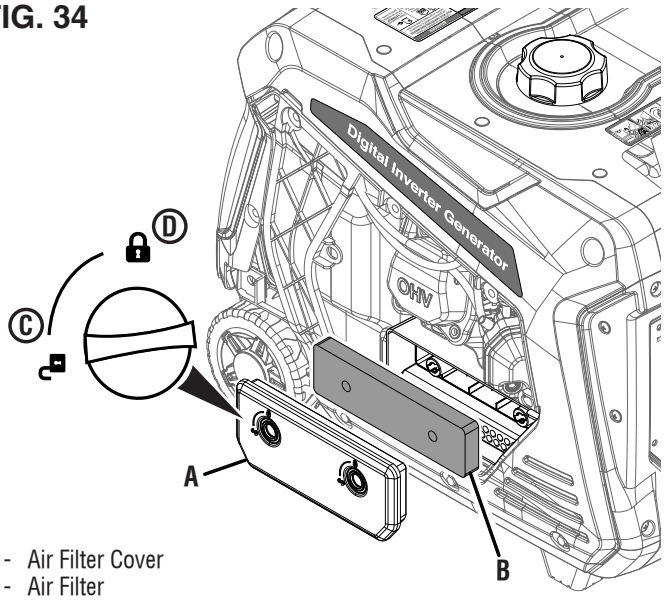
- Turn the generator off and allow the engine to cool for 30 minutes.
- Remove the cover screws then pull the engine service cover away from the generator.
- Turn the knobs on the air filter cover to the unlocked position. Tip the cover down to remove.
- Remove the air filter from the air cleaner housing and place it in a suitable cleaning container. **Replace the air filter if damaged.**

  NOTE: The air filter may be covered in oil. Use an appropriate container.
- Wash the air filter by submerging the filter in a solution of household detergent soap and warm water. Slowly squeeze the filter to thoroughly clean.

  NOTICE DO NOT twist or tear the air filter during cleaning or drying. Only apply slow but firm squeezing action.
- Rinse the air filter by submerging it in fresh water and applying a slow squeezing action. Allow the filter to dry thoroughly.

  NOTICE Do not pollute. Follow the guidelines of the EPA or other governmental agencies for proper disposal of hazardous materials. Consult local authorities or reclamation facility.
- Dip the air filter in clean engine oil then squeeze out all excess oil. The engine will smoke when started if too much oil is left in the filter.
- Install the air filter in the air cleaner housing and reinstall the air filter cover.
- Install the engine service cover and secure with screws.

FIG. 34



A - Air Filter Cover
B - Air Filter
C - Unlock Position
D - Lock Position

CHANGING THE ENGINE OIL

See Figure 35.

For optimal performance, change the engine oil according to the figures specified in the **maintenance schedule** or the engine manual (if applicable). When using the generator under extreme, dirty, dusty conditions or in extremely hot weather, change the oil more frequently.

NOTE: Change the oil while the engine is warm but not hot. Warm engine oil drains more quickly and thoroughly than cool lubricant. Contact with hot lubricant will cause serious burns.

- Turn the generator off and allow the engine to cool for 30 minutes.
- Depress the tab on the oil access cover and pull it away from the generator.
- Clean the area around the oil dipstick.
- Slowly unscrew and remove the oil dipstick.
- Remove the rubber plug under the oil drain bolt and place an oil pan (or suitable container) under the drain hole.
- Using a 10mm wrench, remove the oil drain bolt and allow the oil the to drain.
- After the oil has drained completely, clean any spilled oil from the exterior and interior of the generator.
- Reinstall the oil drain bolt and rubber plug.
- Refill the oil as described in the *Operations* section.
- Replace the oil dipstick and hand-tighten.
- Clean up any spilled oil.
- Reinstall the cover.

CLEANING/REPLACING THE SPARK PLUG

See Figure 36.

NOTICE **ALWAYS** use the Cummins OEM or compatible non-resistor-type spark plug. Use of resistor-type spark plug can result in rough idling, misfire, or may prevent the engine from starting.

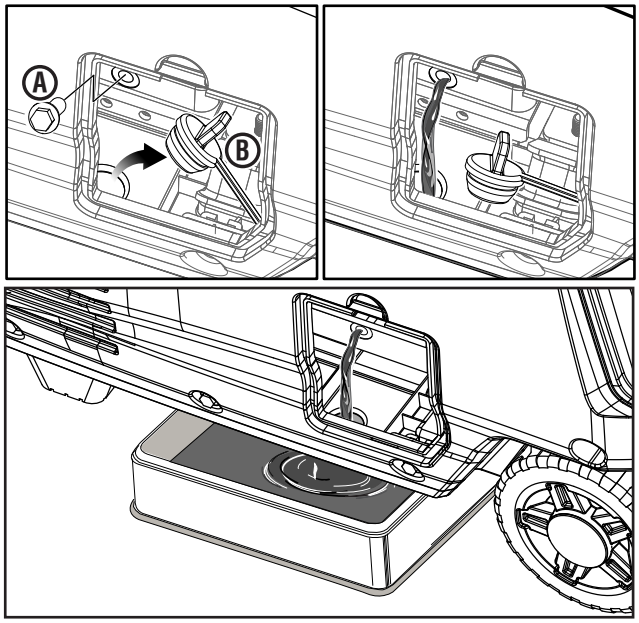
Make sure the spark plug is clean and properly gapped. To clean or replace your spark plug:

- Turn the generator off and allow the engine to cool for 30 minutes.
- Place the generator on a level surface in a well-ventilated area.
- Remove the cover screws then pull the engine service cover away from the generator.
- Remove the spark plug boot by firmly pulling the spark boot directly away from the engine.
- Clean the area around the spark plug.
- Remove the spark plug with the included spark plug socket wrench.

NOTICE Never apply any side load or move the spark plug laterally when removing the spark plug.

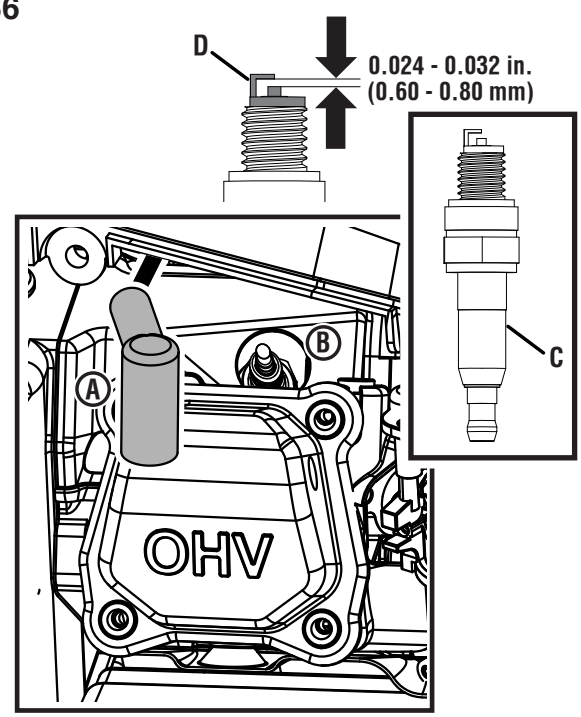
- Inspect the spark plug. Replace if electrodes are pitted, burned, or the insulator is cracked. Only use a recommended replacement plug.

FIG. 35



A - Oil Drain Bolt
B - Rubber Plug

FIG. 36



A - Spark Plug
B - Spark Plug Boot
C - Insulator
D - Electrode

- Measure the spark plug electrode gap with a wire-type feeler gauge. If necessary, correct the gap by carefully bending the side electrode.

  Spark plug gap: 0.024 - 0.032 in. (0.60 - 0.80 mm)
- Carefully install the spark plug finger tight, then tighten as additional 3/8 to 1/2 turn with the spark plug wrench.
- Install the spark plug boot and replace the engine service cover.

CLEANING THE SPARK ARRESTOR

See Figure 37.

Check and clean the spark arrestor according to the figures specified in the **maintenance schedule** or the engine manual (if applicable). Failure to clean the spark arrestor will result in degraded engine performance.

- Turn the generator off and allow the engine to cool for 30 minutes.
- Place the generator on a level surface in a well-ventilated area.
- Remove the two screws securing the spark arrestor bracket.
- Remove the bracket, screen, and spark arrestor from the generator.
- Gently clean the screen and spark arrestor using a wire brush.
- Reinstall the spark arrestor, screen, and bracket. Tighten screws securely.

DRAINING THE FUEL TANK AND CARBURETOR FLOAT BOWL

See Figures 38 - 39.

⚠WARNING **ALWAYS** store gasoline in a container approved for gasoline. Unapproved containers can break or deteriorate allowing gasoline or gasoline vapors to escape which can create a serious hazard.

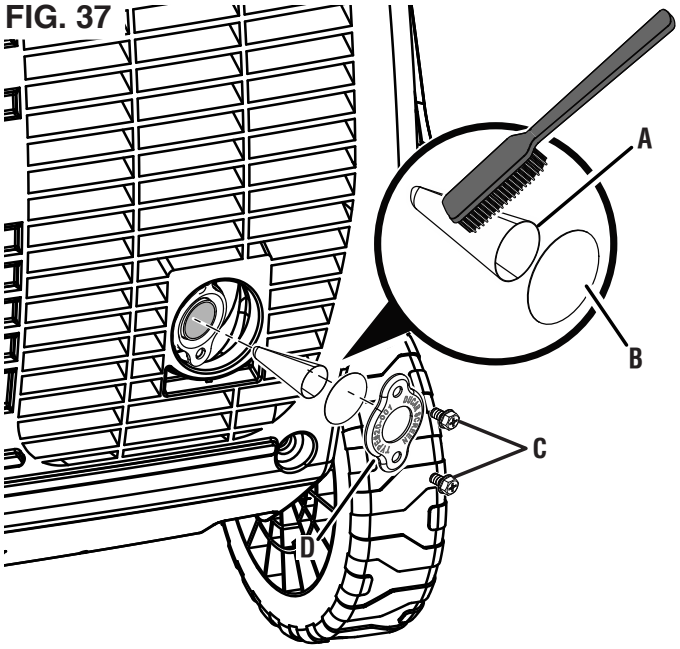
Even properly stabilized fuel can leave residue and cause corrosion if left long term. If storing the generator for two to six months, drain the float bowl to prevent gum and varnish buildup in the carburetor. If storing the generator for longer than six months, drain the fuel tank to prevent fuel separation, deterioration, and deposits in the fuel system.

- Turn the generator off and allow the engine to cool for 30 minutes.
- Place the generator on a level surface in a well-ventilated area.

To drain the float bowl:

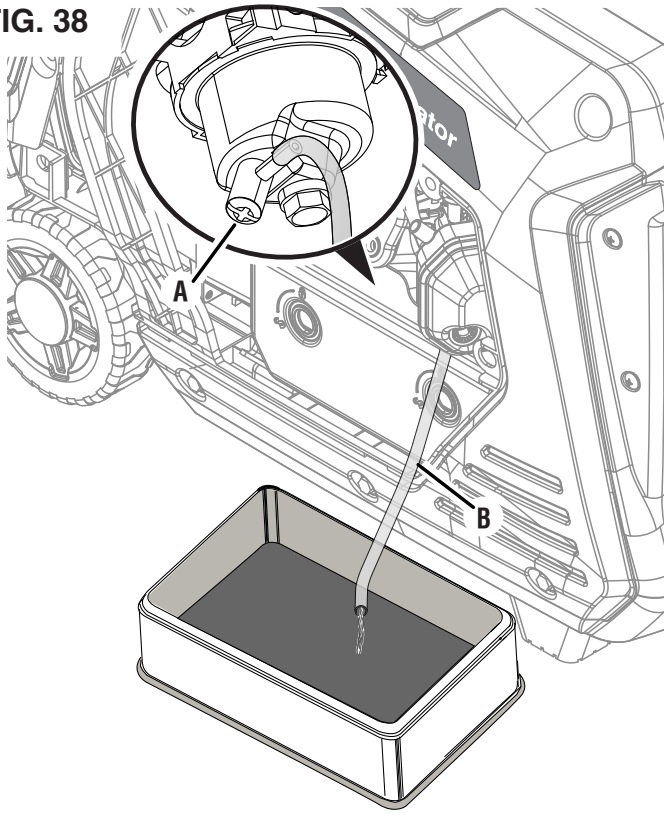
- Remove the cover screws then pull the engine service cover away from the generator.
- Locate the drain hose extending from the bottom of the carburetor float bowl.

FIG. 37



A - Spark Arrestor
B - Screen
C - Screws
D - Bracket

FIG. 38



A - Drain Screw
B - Drain Hose

- Place the bottom end of the hose outside the generator into an approved gasoline container to catch the drained fuel.
- Loosen the float bowl drain screw and allow the fuel to drain. Tighten the float bowl drain screw.
- Route the drain hose between the air cleaner housing and the engine service cover. Install the engine service cover.

To drain the fuel tank:

NOTICE To prevent damage to the unit, drain the engine oil before emptying the fuel tank. See **Changing the engine oil** for details.

- Clean area around fuel cap and remove the cap slowly.
- Remove the fuel screen filter by slightly compressing it while removing it from the tank.
- Using a commercially available gasoline hand pump (not included), siphon the gasoline from the fuel tank into an approved gasoline container. **DO NOT** use an electric pump.
- Reinstall the fuel screen filter and the fuel tank cap.
- Clean up any spilled fuel.
- Start the generator and allow it to run until the generator engine stops.
- Push the battery switch to the OFF position.
- Disconnect the battery quick connect cable.

REPLACING THE FUEL FILTER

See Figure 40.

Overtime, the fuel filter may become dirty or clogged. To reduce the risk of engine failure, replace the fuel filter according to the figures specified in the **maintenance schedule** or the engine manual (if applicable).

- Turn the generator off and allow the engine to cool for 30 minutes.
- Drain the fuel tank as described previously.
- Remove the engine service cover.
- Locate the fuel filter and note the filter's orientation.
- Using pliers, squeeze the fuel line clips and slide the fuel lines away from the filter.
- Install the fuel lines onto the new filter. Ensure the fuel filter is oriented correctly.

FIG. 39

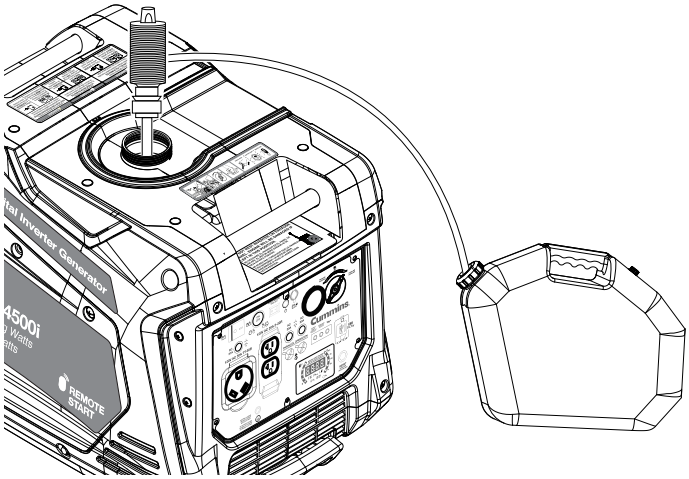
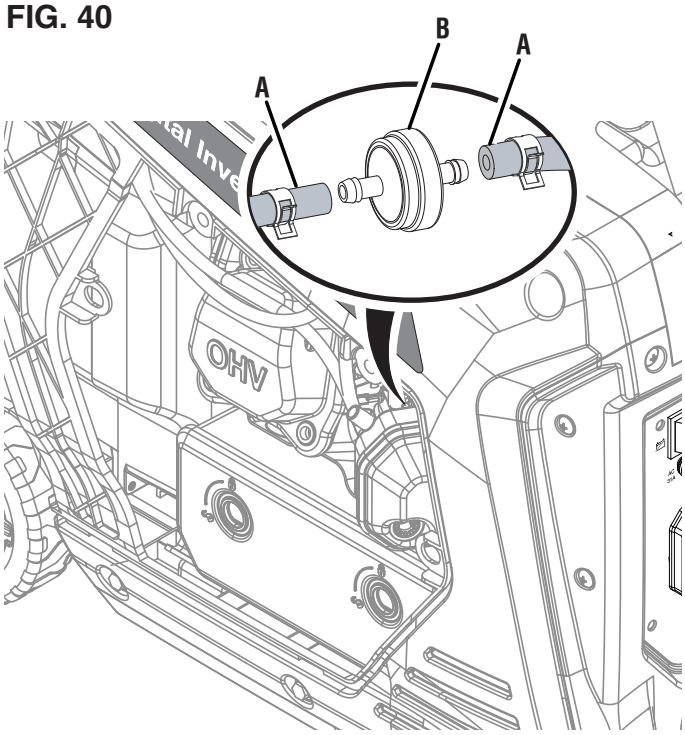


FIG. 40



A - Fuel Line
B - Fuel Filter

CHECKING/ADJUSTING THE VALVE CLEARANCE

See Figures 41 - 42.

NOTICE Checking and adjusting valve clearance must be done when the engine is cold.

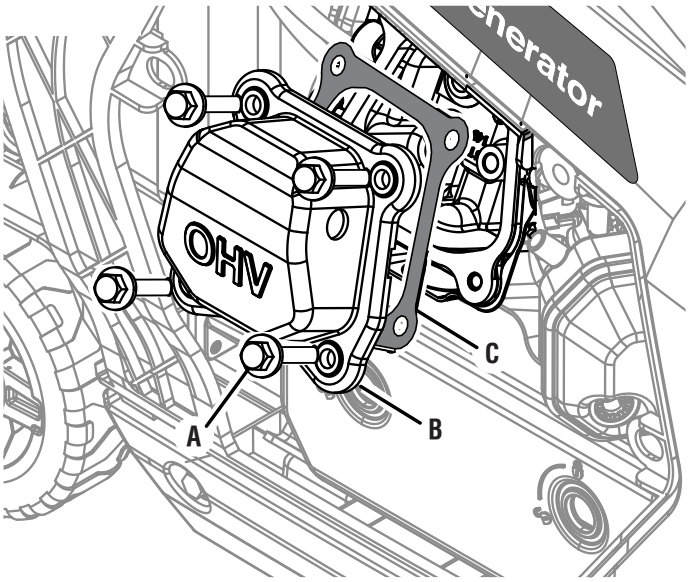
- Turn the generator off and allow the engine to cool for 30 minutes.
- Place the generator on a level surface in a well-ventilated area.
- Remove the engine service cover.
- Remove the rocker arm cover and carefully remove the gasket. If the gasket is torn or damaged, it must be replaced.
- Remove the spark plug so the engine can be rotated more easily.
- Pull the recoil handle to rotate the engine to top dead center (TDC). Looking through the spark plug hole; the piston should be at the top (both valves are closed).
- Both rocker arms should be loose at TDC on the compression stroke. If they are not, rotate the engine 360°.
- Insert a feeler gauge between the rocker arm and the valve stem to measure valve clearance.

	Intake Valve	Exhaust Valve
Valve Clearance	0.0031 – 0.0047 in (0.08 – 0.12 mm)	0.0051 – 0.0067 in (0.13 – 0.17 mm)
Torque	8-12 Nm	8-12 Nm

- If an adjustment is necessary, hold the rocker arm pivot and loosen the pivot adjusting nut.
- Slide the appropriate feeler gauge between the rocker arm and the valve stem.
- Turn the rocker arm pivot to obtain the specified clearance. Hold the rocker arm pivot and re-tighten the pivot adjusting nut to the specified torque.

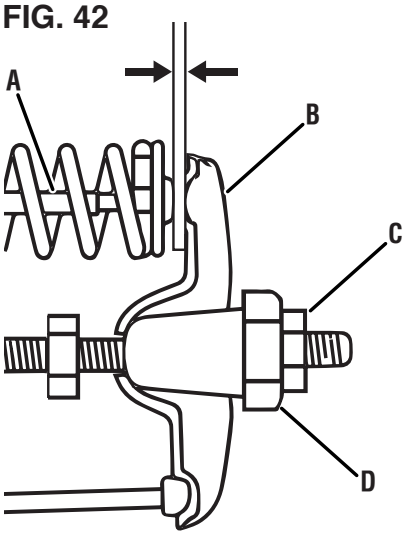
  Torque: 106 inch-pound (12 Nm)
- Recheck valve clearance.
- If no further adjustments are needed, perform this procedure on the other valve.
- When finished, install the gasket, rocker arm cover, and spark plug.

FIG. 41



A - Bolt
B - Rocker Arm Cover
C - Gasket

FIG. 42



A - Valve Stem
B - Rocker Arm
C - Pivot Adjusting Nut
D - Rocker Arm Pivot

BATTERY MAINTENANCE

See Figure 43.

⚠WARNING The battery gives off explosive hydrogen gas during normal operation. A spark or flame can cause the battery to explode with enough force to kill or seriously hurt you. Wear protective clothing and a face shield, or have a skilled technician perform battery maintenance.

⚠WARNING Burn hazard. The battery contains sulfuric acid (electrolyte) which is highly corrosive and poisonous. Wear protective clothing and eye protection when working near the battery. Keep children away from the battery.

⚠WARNING NEVER smoke or work near sparks or other sources of ignition. NEVER touch both battery terminals at the same time with your hand or any non-insulated tools. If battery acid contacts skin or clothing, flush immediately with water and neutralize with baking soda.

The battery shipped with the generator has been fully charged. A battery may lose some charge when not in use for prolonged periods of time.

NOTE: Once started, the generator will charge the battery after 30–60 minutes of use.

When the generator is not running, the included trickle charger can remain connected and will maintain the battery for an indefinite period of time. A red light on the charger indicates charging in progress. A green light indicates charging complete. Charge in a dry location.

- Plug the charger into the battery charging port on the control panel.
- Plug the wall receptacle end of the battery charger into a 120 Volt AC wall outlet.

BATTERY REPLACEMENT

See Figure 44 .

⚠CAUTION Battery posts, terminals contain lead and lead compounds. Wash hands after handling.

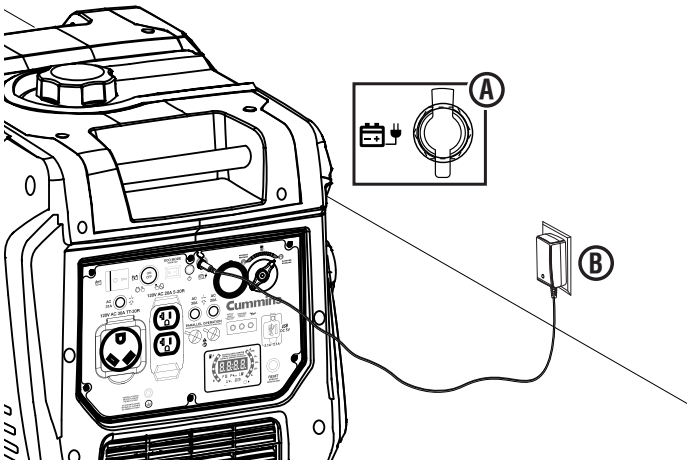
- Depress the tab on the battery access cover and pull it away from the generator.
- Disconnect the quick-connect plug and battery strap, then remove the battery from the generator.
- Disconnect the quick-disconnect cable leads from the battery.

NOTICE Always connect the cables in the following sequence to avoid possible shock.

- On the replacement battery, connect the white (-) quick-connect cable to the battery negative terminal. Slide the rubber boot over the connection hardware.
- Connect the red (+) quick-connect cable to the battery positive terminal. Slide the rubber boot over the connection hardware.
- Lift the battery strap and install the battery into the generator. Thread the battery strap under the quick-connect cables and secure it on the mounting base.
- Connect the quick-connect plug and install the battery access cover.

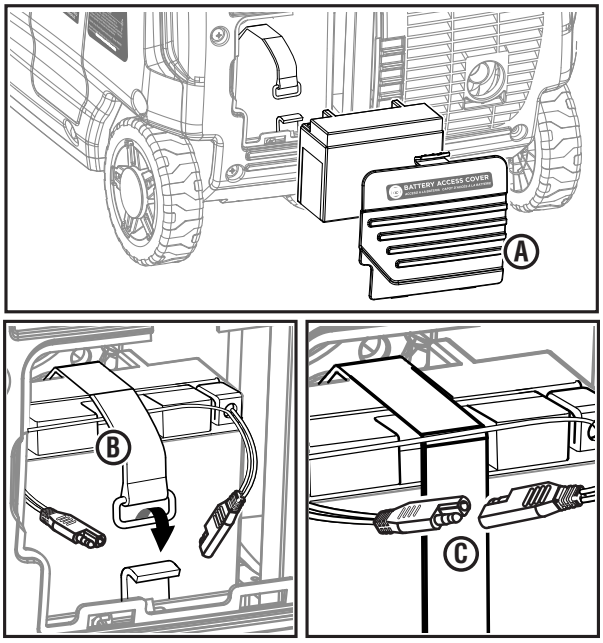
NOTICE Dispose of the used battery properly according to the guidelines established by your local or state government.

FIG. 43



A - Battery Charging Port
B - Charger

FIG. 44



A - Battery Access Cover
B - Battery Strap
C - Quick-connect battery cable

HIGH ALTITUDE KIT (HAK)

⚠WARNING Accidental start-up. Disconnect the spark plug boot (see figure 36) from the spark plug when performing maintenance on the generator.

⚠WARNING Allow hot components to cool for 30 minutes before performing any maintenance procedure.

NOTICE By default, your generator's engine will perform optimally at or below 2000 feet. Install the carburetor jets included in this kit to maintain performance at higher elevations. At elevations above 7000 feet, the engine may experience decreased performance, even with the high-altitude kit. **DO NOT** throw away any carburetor jets. You may need them again if you change altitude of operation.

If the carburetor is replaced, the proper carburetor jet will need to be installed into the replacement carburetor. The warranty may be void if necessary adjustments are not made for high altitude use.

HIGH-ALTITUDE KIT FOR 98CC GASOLINE INVERTER

Part No. (518918) for units produced before June 2019.
Part no. (518918-01) for units produced after June 2019.

Altitude Range	Kit Part Number	Number on Jet
0-2000ft	Not required	NA
2000-3000ft	518918 - A	58
3000-5000ft	518918 - B	57
5000-6000ft	518918 - C	56
6000-7000ft	518918 - D	55

INCLUDED LIST

See Figure 45.

The following items are included in your high altitude kit:

Carburetor Seals (4) and Carburetor Jets (4)

If any parts are missing, contact our service team at service@wpowereq.com or call 1-855-944-3571.

HIGH ALTITUDE KIT INSTALLATION

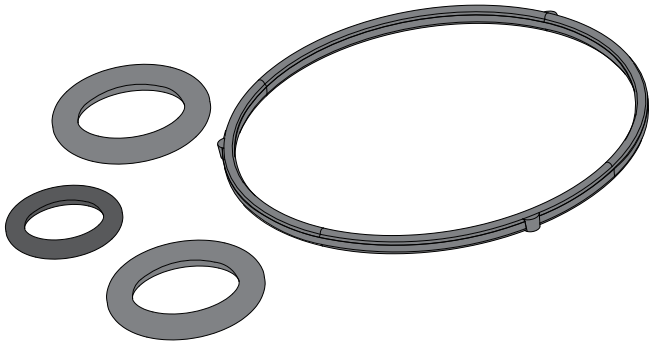
See Figure 46 - 48.

Keep air filter clean. A dirty air filter can cause poor performance and decrease the service life of the product. **NEVER operate the generator without an air filter in place.**

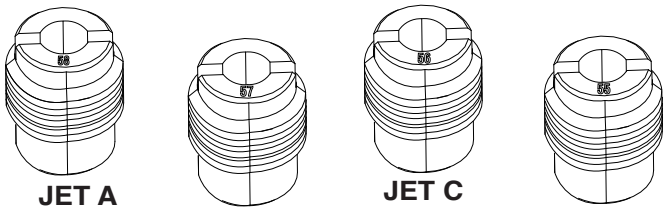
- Drain the fuel tank and float bowl as described in the **Maintenance** section.
- Remove the "shell" as described in the **Test Procedures** section.

FIG. 45

CARBURETOR SEALS



CARBURETOR JETS



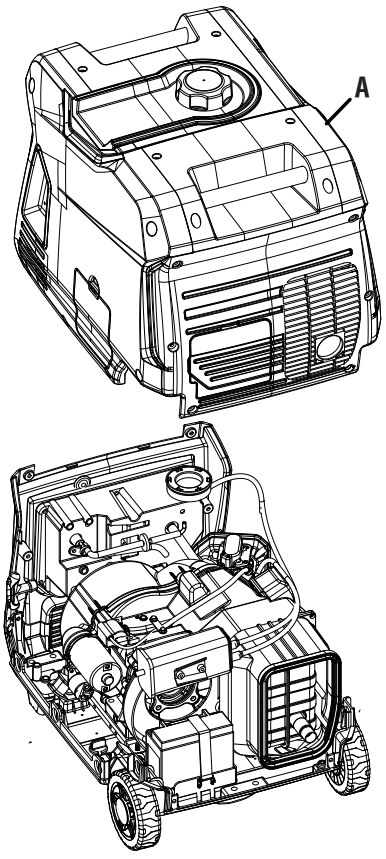
JET A 2000-3000ft.

JET B 3000-5000ft.

JET C 5000-6000ft.

JET D 6000-7000ft.

FIG. 46



A - "Shell" (fuel tank, left, right, and rear frame assemblies)

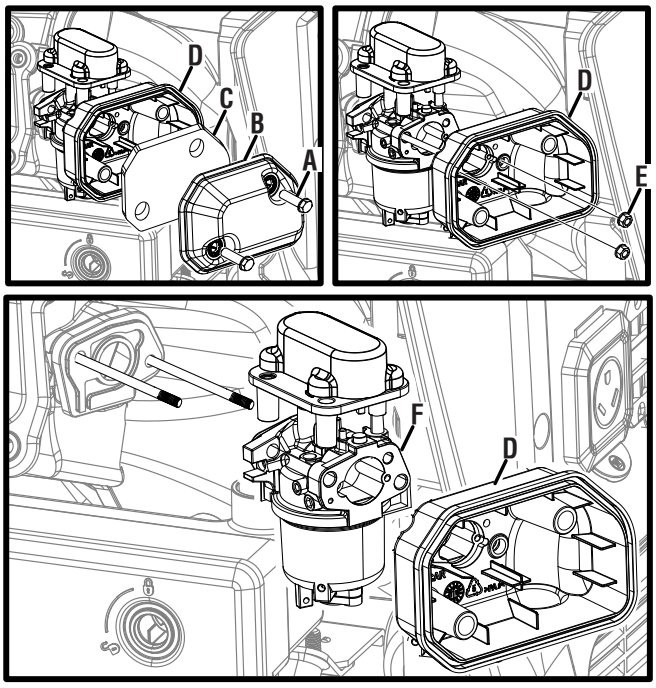
HIGH ALTITUDE KIT (HAK)

- Remove the air cleaner box cover and filter to access the nuts securing the box to the carburetor.
- Remove the nuts and disconnect the hoses from the air cleaner box. Slide the box off the studs.
- Disconnect the carburetor ground wire, stepper motor wire, propane hose, and fuel hose.
- Carefully remove the gaskets and carburetor (and stepper motors) from the cylinder head.
- Remove the bolt, small o-ring, float bowl, and large o-ring from the carburetor.
- Clean the float bowl and make sure o-rings are in good condition. Replace if necessary.
- Using a screwdriver, remove the primary jet and emulsion tube from the carburetor stem. Clean with compressed air or a fine piece of metal.

NOTICE Make sure you are using the correct size screwdriver as you can easily damage the brass jets.

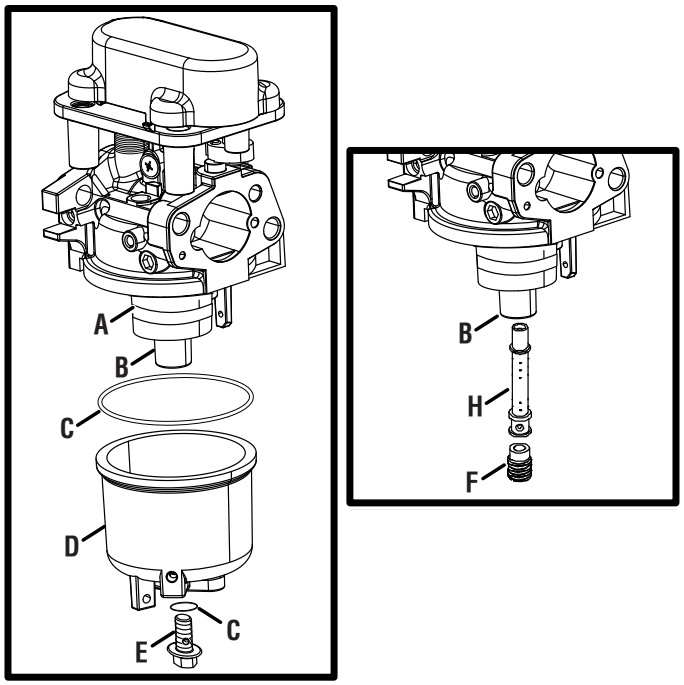
- Install emulsion tube back into the carburetor. Make sure the ridge on the top goes in first. Installing the tube backwards can damage the carburetor
- Select the appropriate jet kit for your desired altitude and install the jet by screwing it in with flathead screwdriver. Make sure the slot for the screwdriver is facing out. Jet A: 2,000-3,000ft ASL (Above Sea Level), Jet B: 3,000-6,000ft ASL, Jet C: 6,000-7,000ft ASL.
- Reinstall the o-rings and the float bowl.
- Install screw and tighten securely.
- Place the carburetor back inside the generator.
- Reconnect the carburetor ground wire, stepper motor wire, propane hose, and fuel hose.
- Place the air box inside the generator and secure with nuts.
- Place the air box inside the generator and secure with nuts.
- Reinstall and clamp hoses. Turn on fuel valve and check for fuel leaks.
- Place the air filter back inside the air box.
- Replace air box cover and secure with bolts.
- Replace the “shell”.

FIG. 47



A - Bolt
B - Air Cleaner Box Cover
C - Air Filter
D - Air Cleaner Box
E - Nut
F - Carburetor

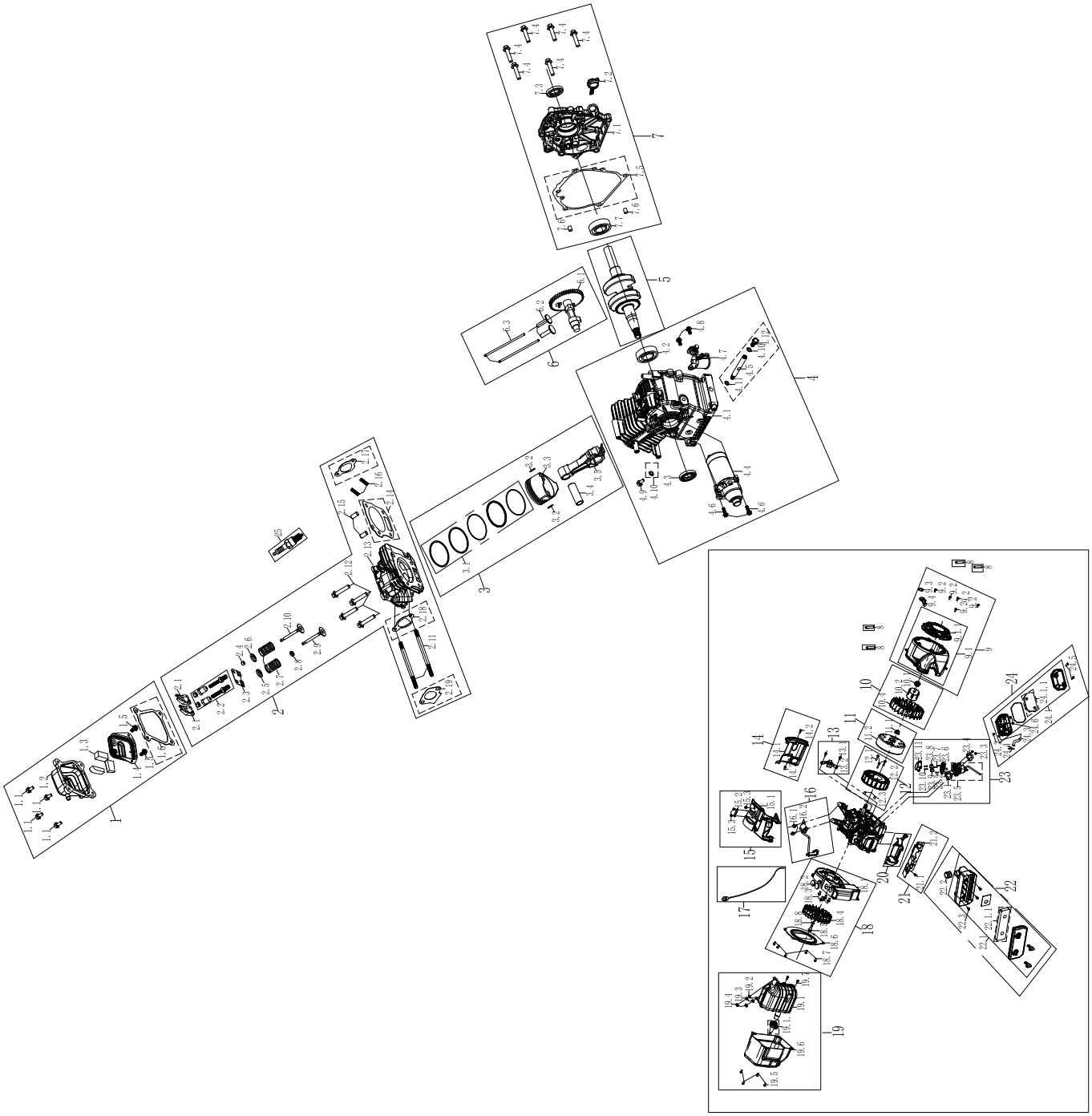
FIG. 48



A - Float
B - Stem
C - O-Ring
D - Float Bowl
E - Bolt
F - Jet
G - Throttle Stop Screw
H - Emulsion Tube

EXPLODED VIEWS

EXPLODED VIEW A
ENGINE EXPLODED VIEW



EXPLODED VIEWS

PARTS LIST A
ENGINE PARTS LIST

No.	Part Num.	Description
1	**CYLINDER HEAD COVER KIT ASSEMBLY**	
1.1	91325	Bolt (M6 x 12 mm)
1.2	241115	Cylinder Head Cover
1.3	339915	Polyurethane Screen
1.4	241116	Cylinder Head Internal Cover
1.5	91322	Bolt (M5 x 12 mm)
1.6	96200	Cylinder Head Cover Gasket
2	**CYLINDER HEAD KIT ASSEMBLY**	
2.1	242101	Rocking Arm
2.2	91818	Rocking Arm With Tight Bolt Assembly
2.3	242202	Valve Retainer Assembly
2.4	241804	Top Cap
2.5	241801	Intake Valve Spring Seat
2.6	241802	Exhaust Valve Spring Seat
2.7	246001	Valve Spring
2.8	241806	Intake Valve Spring Lower Seat
2.9	241704	Intake Valve
2.10	245904	Exhaust Valve
2.11	91029	Air Inlet Stud Stud Bolt
2.12	91359	Bolt M8*60
2.13	331001	Cylinder Head
2.14	96058	Cylinder Head Gasket
2.15	240905	Cylinder Head Locating Pin
2.16	91007	Air Exhaust Stud Stud Bolt
2.17	96055	Exhaust Gasket
2.18	96182	Intake Gasket
2.19	96051	Carburetor Gasket
3	**PISTON & PISTON RING KIT ASSEMBLY**	
3.1	241607	Piston Ring Assembly
3.2	241301	Piston Pin Ring
3.3	241211	Piston
3.4	245503	Piston Pin
3.5	331500	Connecting Rod Assembly
4	**CRANKCASE KIT ASSEMBLY**	
4.1	330208	Crankcase
4.2	93010	Bearing
4.3	93507	Crankcase Oil Seal
4.4	97447	Starting Motor Assembly
4.5	91831	Oil Drain Solenoid

No.	Part Num.	Description
4.6	91334	Bolt (M6 x 30 mm)
4.7	245113	Oil Sensor
4.8	91329	Bolt (M6 x 16 mm)
4.9	91816	Oil Drain Bolt
4.10	94007	Oil Drain Bolt Washer
4.11	94035	Oil Drain Bolt Washer
4.12	91342	Bolt (M8 x 12 mm)
5	240364	Crankshaft Assembly
6	**CAMSHAFT ASSEMBLY**	
6.1	332003	Camshaft Assembly
6.2	246103	Valve Lifter
6.3	241901	Push Rod
7	**CRANKCASE COVER KIT ASSEMBLY**	
7.1	330101	Crankcase Cover
7.2	245601-276	Dipstick Assembly
7.3	93507	Crankcase Oil Seal
7.4	91347	Bolt (M8 x 30 mm)
7.5	96293	Crankcase Gasket
7.6	240904	Crankcase Locating Pin
7.7	93010	Bearing
8	599601	Metal Clip
9	**RECOIL STARTER KIT ASSEMBLY**	
9.1	330501	Recoil Starter Assembly
9.1.1	5324	Start Puller
9.2	91329	Bolt (M6 x 16 mm)
9.3	500017	Recoil Handle Cover
9.4	500018	Recoil Handle
10	**IMPELLER KIT ASSEMBLY**	
10.1	91864	Starter Pulley Compression Bolt
10.2	334501	Starter Pulley
10.3	334601	Impeller
11	**ROTOR KIT ASSEMBLY**	
11.1	90003	Nut (M14)
11.2	500191	Rotor
12	**STATOR KIT ASSEMBLY**	
12.1	91316	Bolt (M6 x 55 mm)
12.2	503978	Stator
12.3	240904	Crankcase Locating Pin
13	**TRIGGER KIT ASSEMBLY**	
13.1	91329	Bolt (M6 x 16 mm)
13.2	503697	Trigger

EXPLODED VIEWS

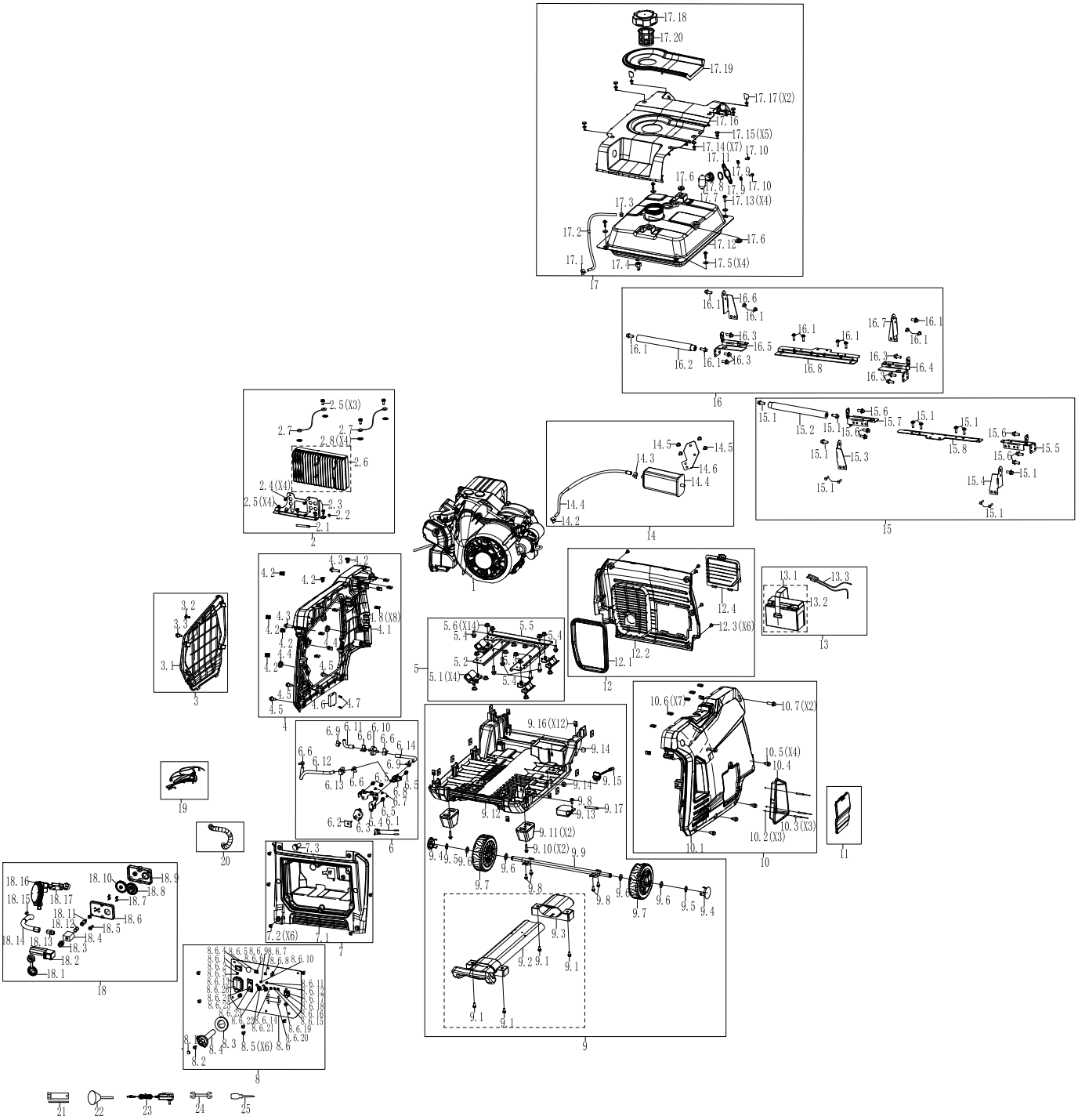
PARTS LIST A
ENGINE PARTS LIST

No.	Part Num.	Description
14	**WIND-LEAD-COVER KIT ASSEMBLY**	
14.1	330503	Wind-Lead-Cover
14.2	91325	Bolt M6x12
15	**UPPER WIND DEFLECTOR KIT ASSEMBLY**	
15.1	330502	Upper Wind Deflector
15.2	249914	Crimping Block
15.3	91325	Bolt M6x12
16	**IGNITION COIL KIT ASSEMBLY**	
16.1	91333	Bolt M6*28
16.2	503785	Ignition Coil
17	335803	Temperature Sensor
18	**CENTRIFUGAL FAN HOUSING KIT ASSEMBLY**	
18.1	244306	Centrifugal Fan Housing
18.2	244304	Centrifugal Fan Plug
18.3	91343	Bolt M8*16
18.4	244606	Impeller
18.5	91419	Bolt M8*1*25
18.6	334302	Centrifugal Fan Cover
18.7	91329	Bolt M6x16
18.8	94216	Flat Washer
19	**EXHAUST MUFFLER KIT ASSEMBLY**	
19.1	243782	Muffler
19.1.1	6790	Spark Arrester
19.2	94216	Flat Washer
19.3	94206	Spring Washer
19.4	90011	Nut M8
19.5	91325	Bolt M6x12
19.6	500057	Muffler Cover
19.7	91342	Bolt M8*12
20	240511	Shield

No.	Part Num.	Description
21	**BRACKET KIT ASSEMBLY**	
21.1	91325	Bolt M6x12
21.2	249917	Bracket
22	**AIR FILTER KIT ASSEMBLY**	
22.1	332901	Air Filter Assembly
22.1.1	5691	Air Filter
22.2	95918	Connecting Pipe
22.3	91325	Bolt M6x12
23	**CARBURETOR KIT ASSEMBLY**	
23.1	332301	Carburetor Connection Block
23.2	92219	Screw M4x20
23.3	90016	Nut M6
23.4	94226	Steel Washer
23.5	332810	Carburetor Assembly
23.6	249925	Stepper Motor Bracket
23.7	92055	Cross Screw Stud M4x25
23.8	249949	Stepper Motor
23.9	249950	Stepper Motor
23.10	92240	Cross Screw Stud M4x6
23.11	249934	Waterproof Cover
23.12	517906	Low Pressure Hose
23.13	599302	Low Pressure Hose Hoop
24	**RESONANT CAVITY KIT ASSEMBLY**	
24.1	337001	Resonant Cavity Assembly
24.1.1	5697	Foam Filter
24.2	249919	Plug
24.3	95602	Breather Tube
24.4	94407	Fuel Line Clamp
24.5	91334	Bolt M6x30
24. 6	90016	Nut M6
25	97109	Spark Plug

EXPLODED VIEWS

EXPLODED VIEW B
GENERATOR EXPLODED VIEW



EXPLODED VIEWS

PARTS LIST B
GENERATOR PARTS LIST

No.	Part Num.	Description
1	N/A	Engine Assembly (DHLG225)
2	**INVETER KIT ASSEMBLY**	
2.1	599601	Metal Clip
2.2	90016	Nut (M6)
2.3	503013	Bracket
2.4	91322	Bolt (M5 × 12 mm)
2.5	91325	Bolt (M6 x 12 mm)
2.6	503763	Inveter Module
2.7	500044	Short Circuiting Wire
2.8	94003	Tooth Washer
3	**LEFT PANEL KIT ASSEMBLY**	
3.1	503730-080	Left Panel
3.2	92079	Bolt (M6 x 16 mm)
3.3	92003	Screw (M6 x 16 mm)
4	**LEFT FRAME KIT ASSEMBLY**	
4.1	503731-080	Left Frame
4.2	504237	Clip
4.3	91325	Bolt (M6 x 12 mm)
4.4	500007	Fuel Tank Isolator A
4.5	92003	Screw (M6 x 16 mm)
4.6	503047	Control Module
4.7	92108	Screw (M4.8 x 16 mm)
4.8	500060	Clip (M6)
5	**BRACKET KIT ASSEMBLY**	
5.1	503004	Isolator
5.2	503001	Bracket
5.3	503002	Bracket
5.4	91348	Bolt (M8 x 35 mm)
5.5	503003	Bracket
5.6	90044	Nut (M8)
6	**BRACKET KIT ASSEMBLY**	
6.1	503677	Gas Control Line
6.2	500011	Oil Switch Holder
6.3	500242	Cable Tray
6.4	503017	Bracket
6.5	91325	Bolt (M6 x 12 mm)
6.6	503034	Fuel Hose Clip (9.5 x 0.8)
6.7	92018	Screw (M4 x 12 mm)
6.8	503062	Fuel Switch
6.9	94402	Fuel Hose Clip 8.5
6.10	516401	Filter

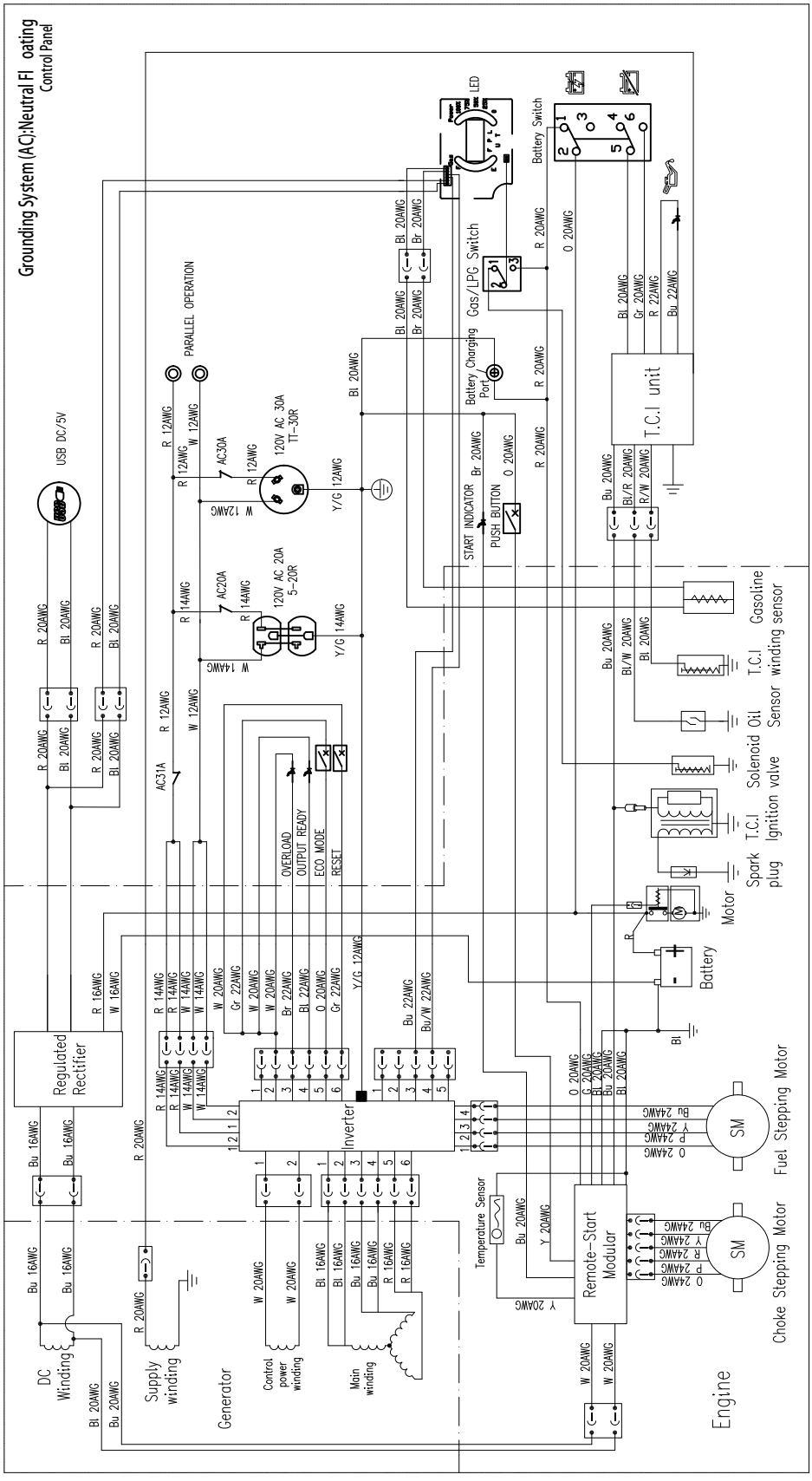
No.	Part Num.	Description
6.11	503773	Fuel Pipe (4 x 10 x 6 x 12-45l)
6.12	503020l	Fuel Pipe (4 x 10-194l)
6.13	503044	Clip
6.14	503772	Fuel Pipe (4 x 10 x 6 x 12-89l)
7	**PANEL REAR COVER KIT ASSEMBLY**	
7.1	503736	Control Panel Rear Cover
7.2	92078	Bolt (M6 x 16 mm)
7.3	505027	Wire Sleeve
8	**PANEL KIT ASSEMBLY**	
8.1	500068	Handle Panel Plug
8.2	92032	Screw (M4 x 16 mm)
8.3	503310	Knob Plug
8.4	503123	Knob
8.5	91825	Screw & Washer (M5 x 12 mm)
8.6	503977	Control Panel Assembly
8.6.1	9272	Rocker Switch
8.6.2	9227-31	Thermal Protector (31A)
8.6.3	6404	Waterproof Cap
8.6.4	9223	One Push Button Switch
8.6.5	9224	ECO Switch
8.6.6	9079	Waterproof Cap
8.6.7	9225	Start Indicator
8.6.8	9226	Charging Socket 50vdc5a
8.6.9	9227-30	Thermal Protector (30A)
8.6.10	6404	Waterproof Cap
8.6.11	9227-20	Thermal Protector (20A)
8.6.12	6404	Waterproof Cap
8.6.13	9051	Dust Cover
8.6.14	9243	Running Lights
8.6.15	9236	Fault Warming Light
8.6.16	9236	Oil Warming Light
8.6.17	9229	USB
8.6.18	503108	USB Dust Cover
8.6.19	9230	Voltage Reset Switch
8.6.20	9231	LED
8.6.21	9232	Parrallel Socket (32A)
8.6.22	9122	Waterproof Cap
8.6.23	6032	Receptacle (L5-20R)
8.6.24	500788	Dust Cover
8.6.25	9132	Grounding Bolt
8.6.26	6015	RV Socket (TT-30R)

PARTS LIST B
GENERATOR PARTS LIST

No.	Part Num.	Description
9	**BASEBOARD KIT ASSEMBLY**	
9.1	91335	Bolt (M6 x 35 mm)
9.2	503035	Pull Rod
9.3	503033	Pull Rod Set
9.4	503032	Wheel Cover
9.5	500321	Wheel Axle Clip
9.6	94022	Metal Washer
9.7	503031	Wheel
9.8	91325	Bolt (M6 x 12mm)
9.9	503023	Axle
9.10	91331	Bolt (M6 x 25 mm)
9.11	503026	Isolator
9.12	503735	Bottom Plate
9.13	503048	DC Voltage Regulator
9.14	503053	Block
9.15	503052	Base Oil Cap
9.16	500060	Clip (M6)
9.17	599601	Metal Clip
10	**RIGHT FRAME KIT ASSEMBLY**	
10.1	503732-080a	Right Frame
10.2	94249	Flat Washer
10.3	500661	Blind Rivet (M3 x 15 mm)
10.4	503036-052	Handle Decorative Board
10.5	92003	Screw (M6 x 16 mm)
10.6	500060	Clip (M6)
10.7	91325	Bolt (M6 x 12 mm)
11	503733-080	Observation Cover
12	**MUFFLER PANEL KIT ASSEMBLY**	
12.1	500108	Muffler Sealing Gasket
12.2	503738	Muffler Cover
12.3	92078	Bolt (M6 x 16 mm)
12.4	503737	Cover
13	**BATTERY KIT ASSEMBLY**	
13.1	599606	Tie Wrap
13.2	511019	Battery
13.3	503165	Negative Lead

No.	Part Num.	Description
14	**CARBON CANNISTER KIT ASSEMBLY**	
14.1	95016	Carbon Canister and Air Filter Connecting Pipe
14.2	94403	Fuel Hose Clip (7.5)
14.3	94411	Fuel Hose Clip (11×0.8)
14.4	543301I	Carbon Canister Assembly
14.5	91325	Bolt (M6 x 12 mm)
14.6	503747	Carbon Canister Support
15	**BRACKET KIT ASSEMBLY**	
15.1	91325	Bolt (M6 x 12 mm)
15.2	503743	Handle
15.3	503739	Front Handle Left Bracket
15.4	503740	Front Handle Right Bracket
15.5	503746	Right Connection Plate
15.6	91329	Bolt (M6 x 16 mm)
15.7	503745	Left Connection Plate
15.8	503744	Fuel Tank Connect Bracket
16	**BRACKET KIT ASSEMBLY**	
16.1	91325	Bolt (M6 x 12 mm)
16.2	503743	Handle
16.3	91329	Bolt (M6 x 16 mm)
16.4	503746	Right Connection Plate
16.5	503745	Left Connection Plate
16.6	503741	Rear Handle Left Bracket
16.7	503742	Rear Handle Right Bracket
16.8	503744	Fuel Tank Connect Bracket
17	**FUEL TANK KIT ASSEMBLY**	
17.1	94411	Fuel Hose Clip (11 × 0.8)
17.2	95127	Carbon Canister And Fuel Tank Connecting Pipe
17.3	94403	Fuel Hose Clip (7.5)
17.4	503782	Fuel Outlet
17.5	96801	Fuel Tank Washer
17.6	500008	Fuel Tank Isolator B
17.7	500247	Gasoline Sensor
17.8	500252	Sealing Ring

SCHEMATICS



Bl	Black	Br	Brown	Y/G	Yellow green
R	Red	Br/R	Brown/red	R/Y	Red yellow
B	Blue	Gr	Gray	O	Orange
W	White	P	Pink	Bu/W	Blue/white
Y	Yellow	Bl/W	Black/white		

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