CHAMPION'S INFRINGEMENT CONTENTIONS FOR
U.S. PATENT NO. 10,697,398
AS ASSERTED AGAINST
GENERAC MODEL PM4500DF ET AL.
FILING DATE: OCTOBER 28, 2015
PRIORITY DATE: JUNE 12, 2015

I. Generac Model PM4500DF



II. Brief Description

Generac Model PM4500DF is a dual fuel portable generator under Generac's Powermate brand. Model PM4500DF produces 4,500W (starting)/3,600W (running) when using gasoline and 4,180W (starting)/3,240W (running) when using liquified petroleum gas ("LPG"; also known as propane). Model PM4500DF can operate at 50% load for up to 14 hours with its 5-gallon gasoline tank and up to 8.75 hours on LPG. Model PM4500DF has a recoil starter for its 224cc, pull start engine with a low oil shutoff. Model PM4500DF also includes an automatic voltage regulator ("AVR"), five receptacles, circuit breaker protection, a carbon monoxide ("CO") detection and shutoff system, and a control panel with a digital hour meter. Model PM4500DF also has a handle and 8-inch never flat wheels.

III. Accused Instrumentalities

Generac Model PM4500DF and also Generac Models PM7500DF and GP7500E DF, which are dual fuel portable generator as well, are the Accused Instrumentalities that are alleged to infringe claims 43, 44, and 56-58 (the "Asserted Claims") of U.S. Patent No. 10,697,398 (the "'398 Patent").

Image of Models PM7500DF and GP7500E DF are provided below:



PM7500DF



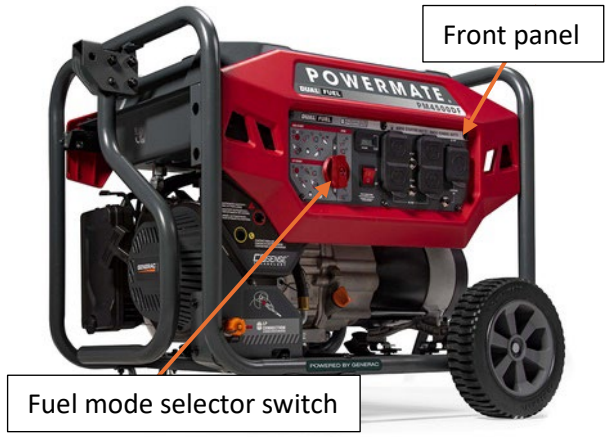
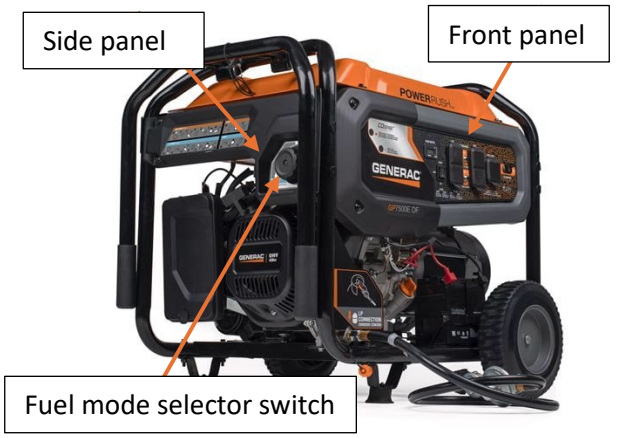
GP7500E

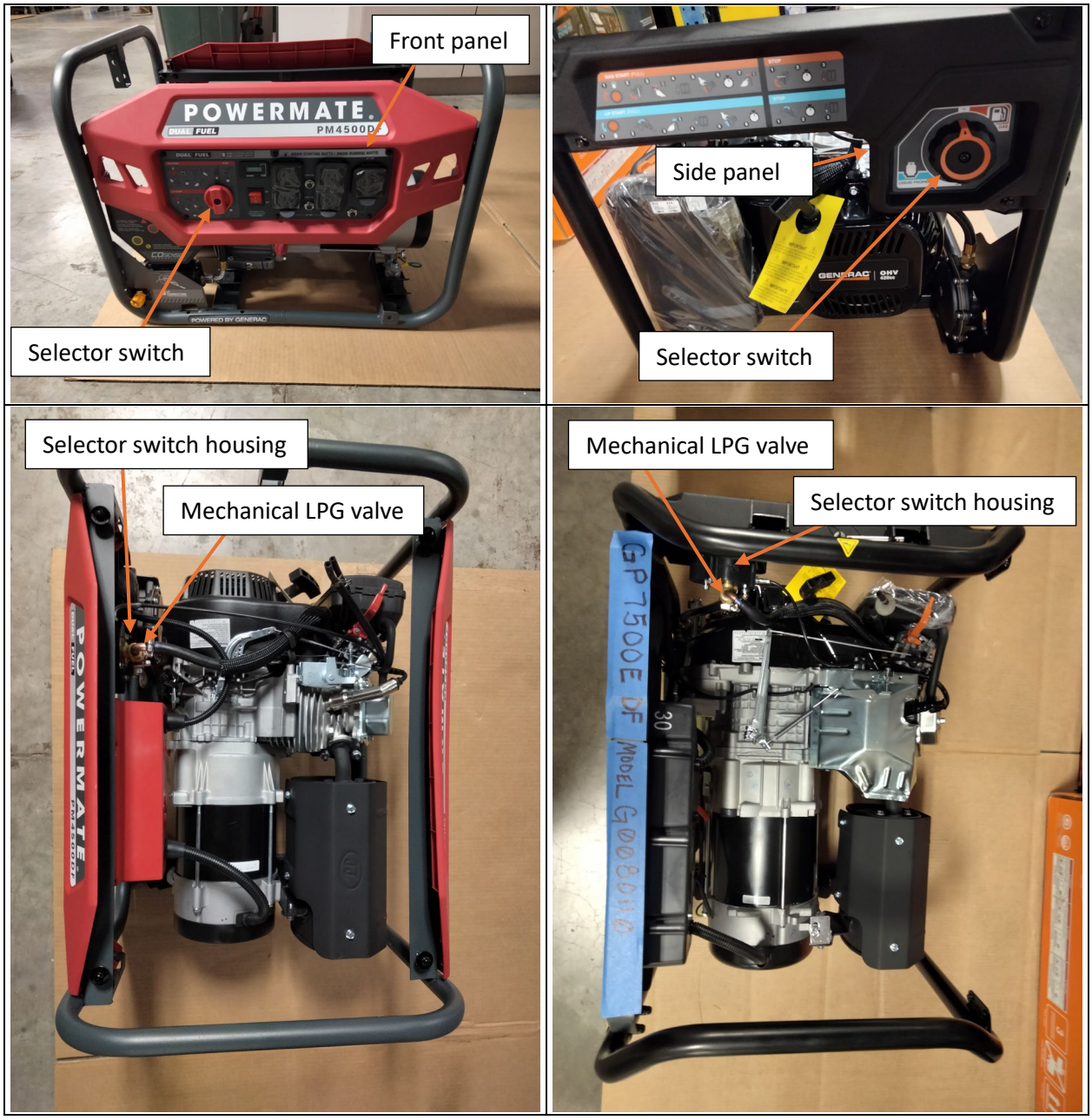
IV. Protocol

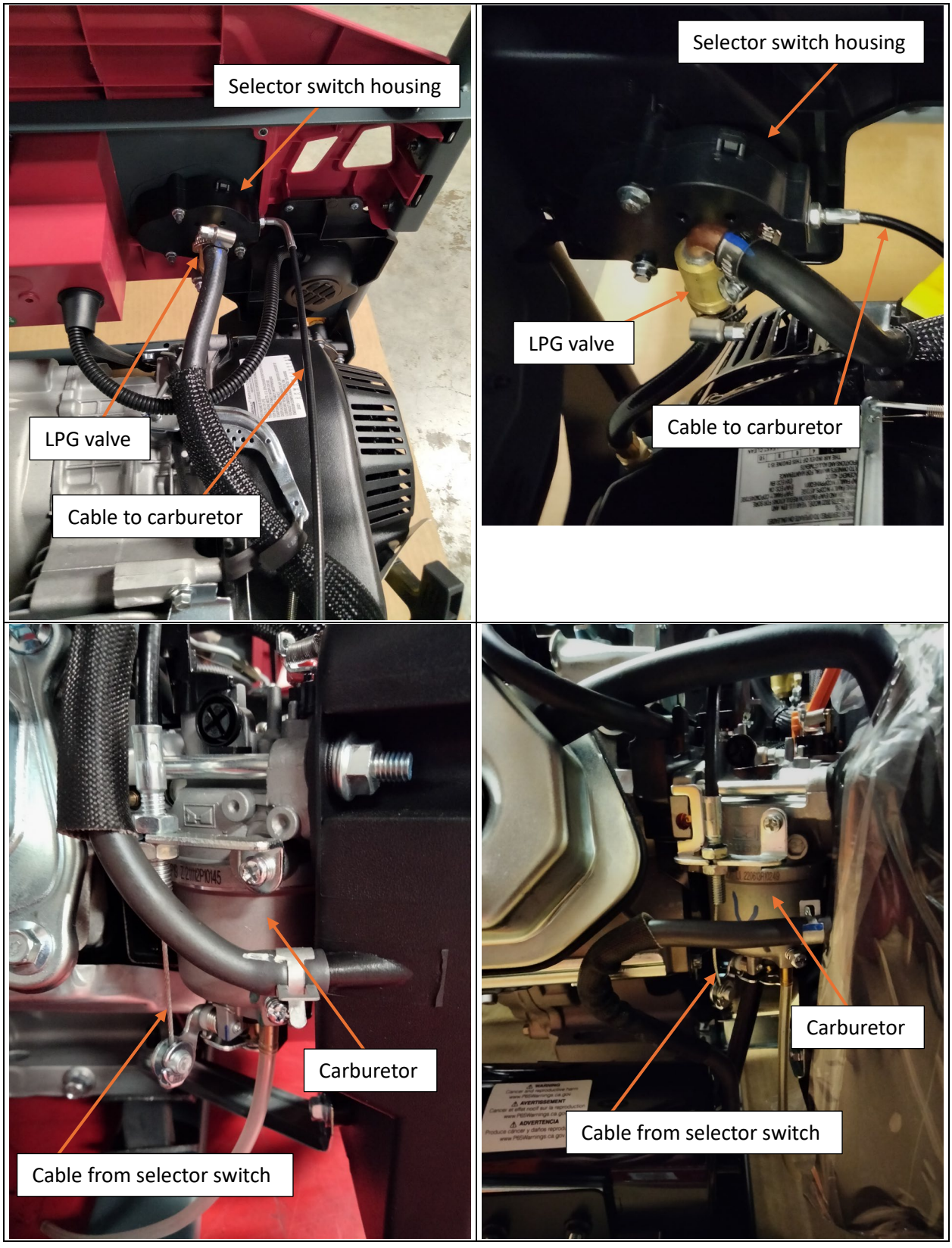
For purposes of analyzing the Asserted Claims of the '985 Patent against the Accused Instrumentalities, Model PM4500DF is considered representative. Models PM7500DF and GP7500E DF include the same components for switching between gaseous fuel and liquid fuel that infringe the claims of the '985 Patent in the same manner as discussed herein with respect to Model PM4500DF and are thus Accused Instrumentalities. In each Accused Instrumentality, the gaseous fuel is LPG, and the liquid fuel is gasoline.

A minor difference exists in Model GP7500E DF. In this model, the same components are included, but with a slightly different positioning of the components. More specifically, the fuel mode selector switch is not positioned on the front panel like in the other generator models. Instead, the fuel mode selector switch is positioned on a side panel adjacent to the front panel. This alternate configuration of Model GP7500E DF does not change the infringement contentions for any of the Asserted Claims, which are equally applicable to the alternate configuration.

Images comparing Model PM4500DF and GP7500E DF are provided below to show the minor difference in configuration:

PM4500DF	GP7500E
	


Front panel
POWERMATE.
DUAL FUEL
PM4500DF
Selector switch
Side panel
Selector switch
Selector switch housing
Mechanical LPG valve
POWERMATE
Mechanical LPG valve
Selector switch housing
GP7500E DF
MODEL G008011
30


Selector switch housing
LPG valve
Cable to carburetor
Selector switch housing
LPG valve
Cable to carburetor
Carburetor
Cable from selector switch
Carburetor
Cable from selector switch

Accordingly, while the claim chart provided below in Section VII is illustrated with reference to Model PM4500DF, each element in the claim chart is found in Models PM7500DF and GP7500E DF in the same manner as illustrated with reference to Model PM4500DF.

V. Priority Dates

The priority dates for the Asserted Claims of the '398 Patent are as follows:

Asserted Claim	Priority Date
43	October 28, 2015
44	October 28, 2015
56	October 28, 2015
57	June 12, 2015
58	October 28, 2015

VI. Statement Regarding Contributory and Induced Infringement

The claimed dual fuel engine operates on different fuels, like a liquid fuel (e.g., gasoline) or a gaseous fuel (e.g., LPG), but a gaseous fuel tank (e.g., an LPG tank), the gaseous fuel in the gaseous fuel tank, and liquid fuel in the liquid fuel tank (e.g., gasoline in a gasoline tank) are not required for infringement unless explicitly claimed in the Asserted Claims. Nonetheless, to the extent the Court construes any claim to require a gaseous fuel tank, gaseous fuel in the gaseous fuel tank, or liquid fuel in a liquid fuel tank, Generac contributes to or induces infringement by instructing its users to use a gaseous fuel tank and gaseous fuel and to fill the liquid fuel tank in order to operate the dual fuel engine.

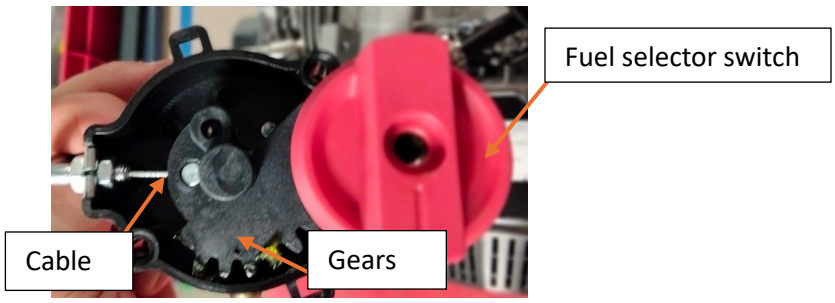
Generac induces infringement of various Asserted Claims by specifically instructing its customers to attach an LPG tank to the engine and to put liquid fuel in the liquid fuel tank. [*See* Generac Owner's Manual for Model PM4500DF at 11 (listing gasoline quality requirements with instructions to "4. Slowing add recommended fuel" and making several notes on the use of LPG) and at 12 (providing instructions to, "Before Starting Engine," "2. If using gasoline, verify fuel level is correct. 3. If using LP[G], verify the fuel hose is properly connected to the LP[G] tank and the second stage regulator.").] To the extent the Court construes any Asserted Claim to require an LPG tank, gaseous fuel, or liquid fuel for infringement, when Generac's customers use the Accused Instrumentalities with a filled LPG tank connected and with fuel in the liquid fuel tank, the infringement of any such Asserted Claims is completed. As such, Generac's instructions to customers to connect a filled LPG tank and fill the liquid fuel tank before operation of the Accused Instrumentalities constitutes indirect infringement.

For the same reasons, Generac's conduct also constitutes contributory infringement. To the extent the Court's claim construction requires an LPG tank, gaseous fuel, or liquid fuel for infringement, Generac supplies its customers every component necessary to infringe the Asserted Claims except the filled LPG tank and the liquid fuel. Because the Owner's Manual for Model PM4500DF instructs customers to connect a filled LPG tank to the generator and to fill the liquid fuel tank with fuel, [*id.*], Generac knew that Model PM4500DF would be used to infringe any applicable Asserted Claims. By connecting and using the Accused Instrumentalities with a filled LPG tank connected or with liquid fuel in the liquid fuel tank, Generac's customers complete the infringement of

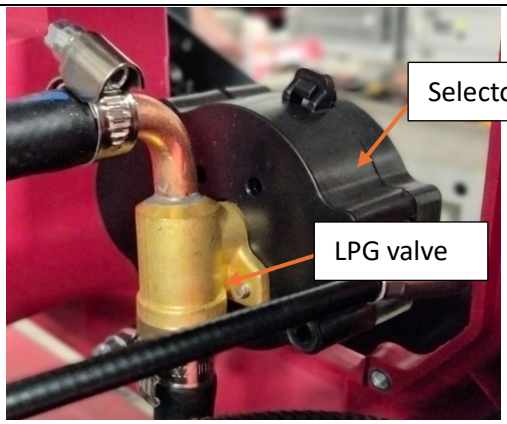
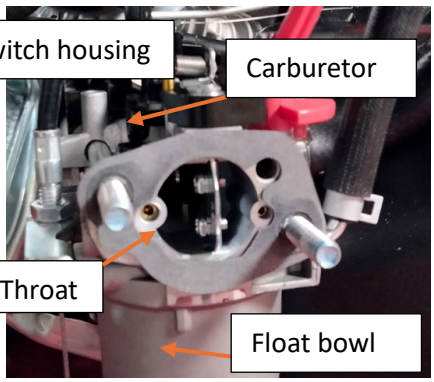
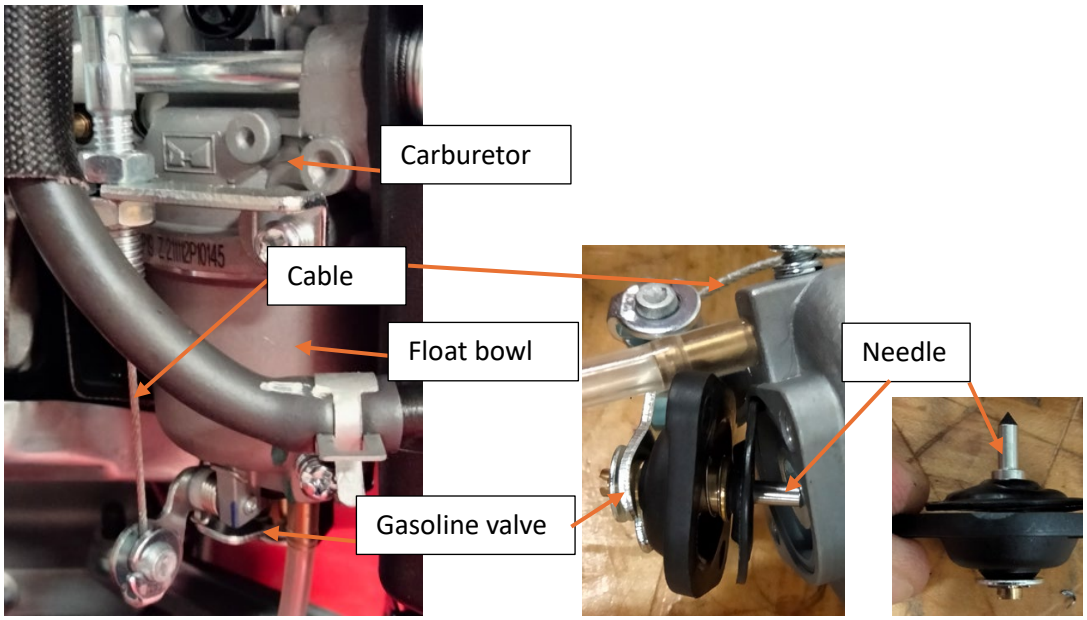
such Asserted Claims. As such, Generac's conduct also constitutes contributory infringement of such Asserted Claims.

Champion incorporates this Section VI by reference into any element of any asserted claim that is construed to require attachment of a gaseous fuel tank, gaseous fuel, or filling of the liquid fuel tank with fuel.

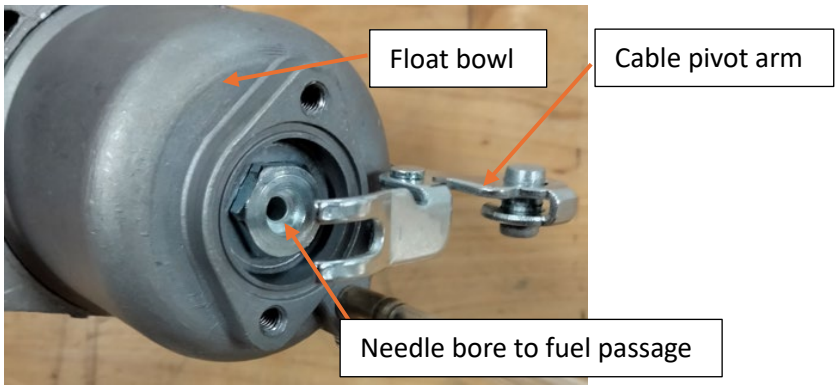
VII. Claim Chart

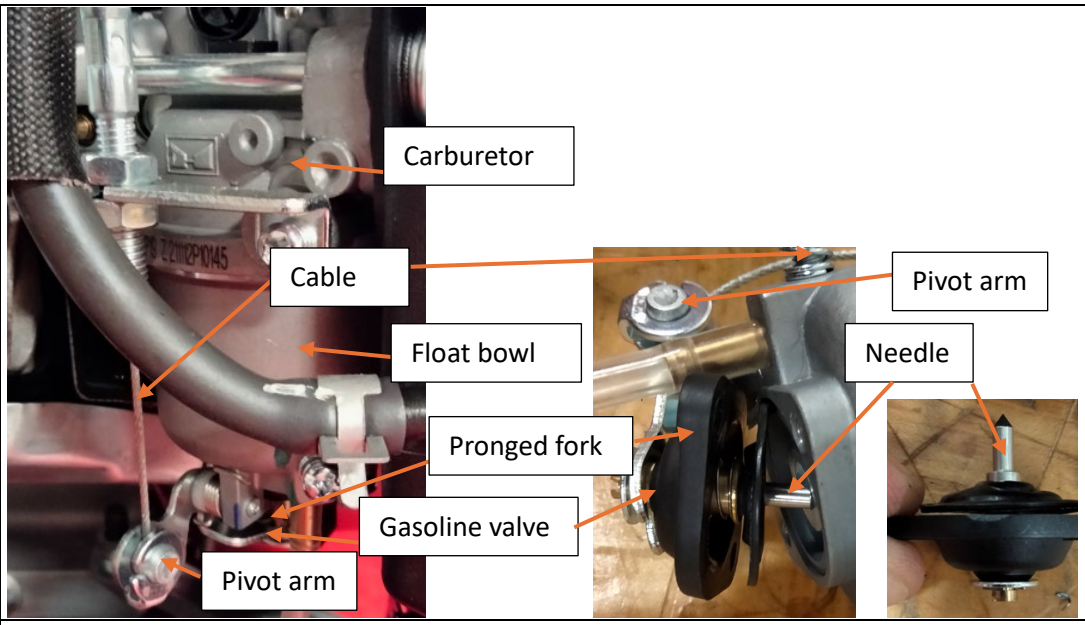
'398 Patent Asserted Claims	Accused Instrumentality Components Illustrated with Respect to Model PM4500DF
43. (Preamble) A carburetor having a fuel shutoff comprising:	Although not necessary for infringement[1], the preamble of claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) as follows: Model PM4500DF includes a carburetor with a gasoline valve incorporated into the float bowl. The gasoline valve is a needle valve that includes a needle and operates via a cable of a fuel selector switch. The cable either pushes the needle to extend and seal off the flow of gasoline through the float bowl or pulls the needle to retract and allow gasoline to flow through the float bowl. When extended, gasoline is shutoff from flowing to the carburetor. The cable operates by rotating a fuel selector switch which rotates gears to push/pull the cable. 

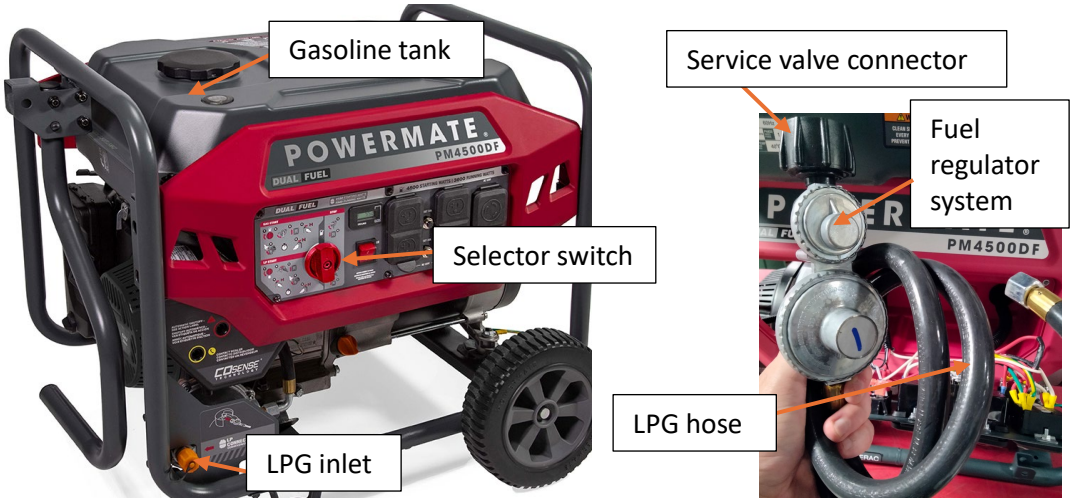
[1] The preambles of the Asserted Claims of the '398 Patent are not limiting and therefore should not be part of the infringement analysis. *See Artic Cat Inc. v. GEP Power Prods., Inc.*, 919 F.3d 1320, 1328 (Fed. Cir. 2019) ("We have long ruled that 'a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.") (quoting *Cataline Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002)). Nonetheless, Champion provides general description of Model DF3500E next to the preamble to show how it meets the preamble and to assist in the infringement analysis by giving an overview of the Accused Instrumentalities. Champion incorporates this footnote by reference in the preambles of all the Asserted Claims.

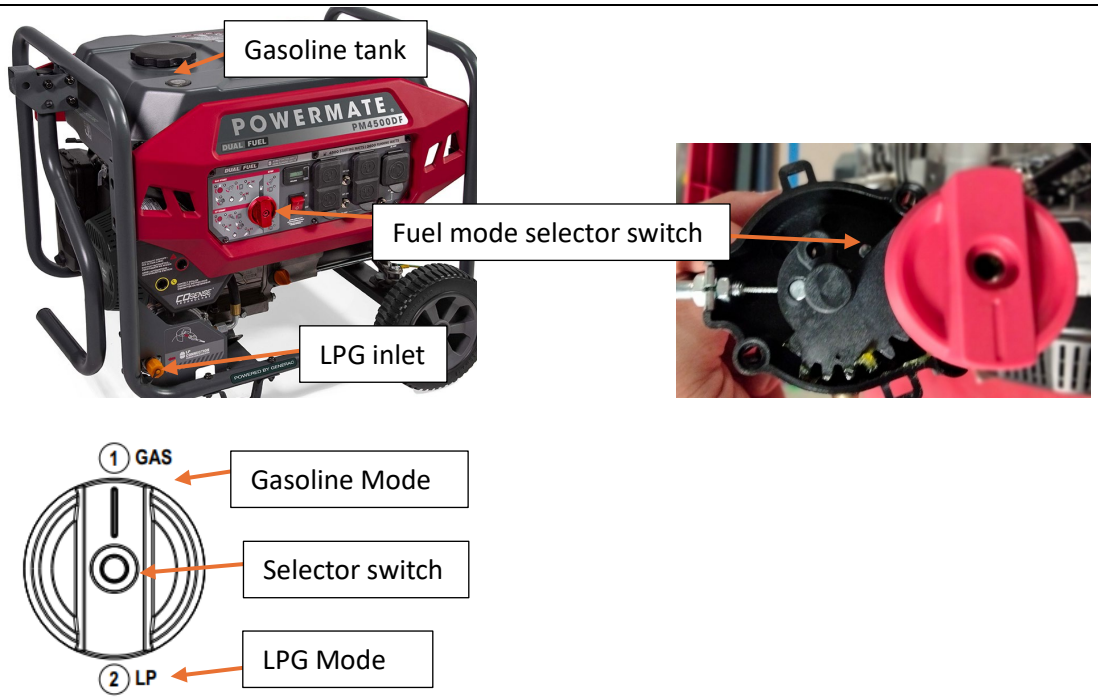
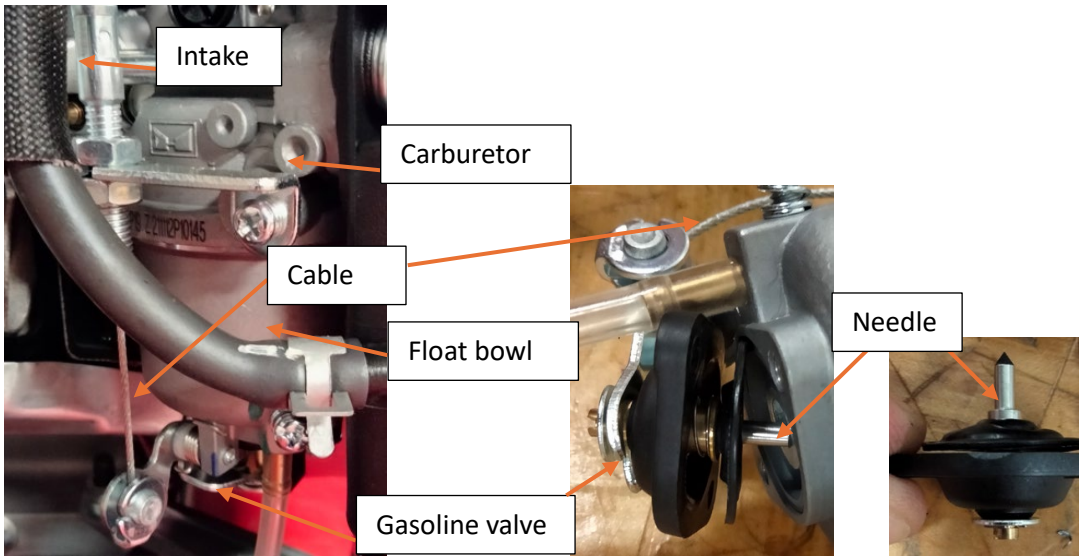
	  
(a) a carburetor comprising:	Element (a) of claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally[2] as follows: The carburetor is pictured above.
(a)(1) a float bowl,	Element (a)(1) of claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows:

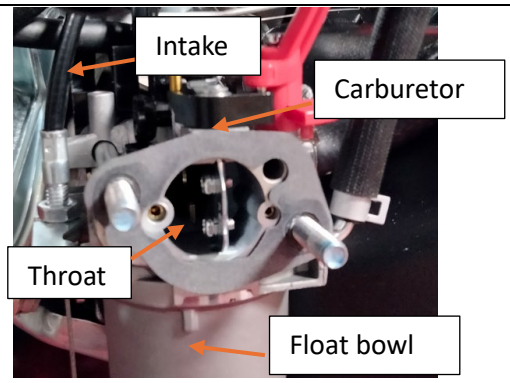
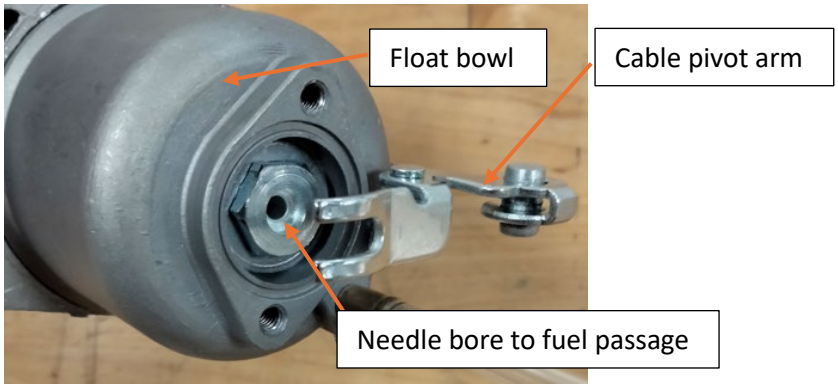
[2] To the extent further discovery or claim construction reveals that any of the Accused Instrumentalities do not literally infringe the '398 Patent, Champion reserves the right to argue the Accused Instrumentalities infringe any of the Asserted Claims of the '398 Patent under the doctrine of equivalents. Champion incorporates this footnote by reference into each element of each Asserted Claim that Champion alleges is literally infringed by the Accused Instrumentalities.

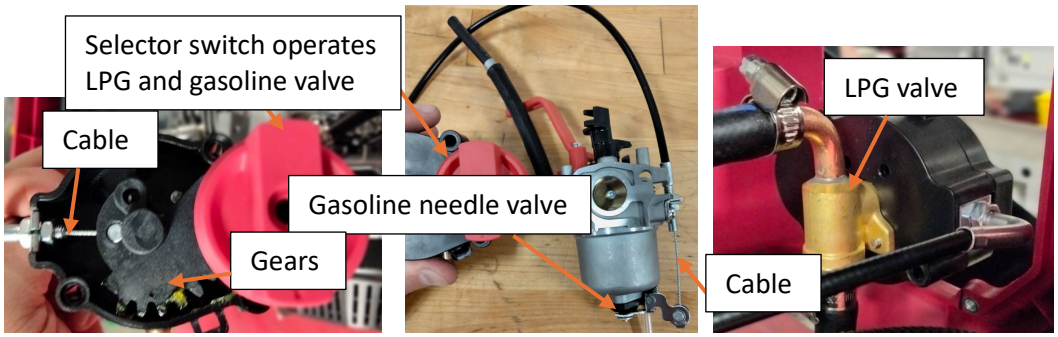
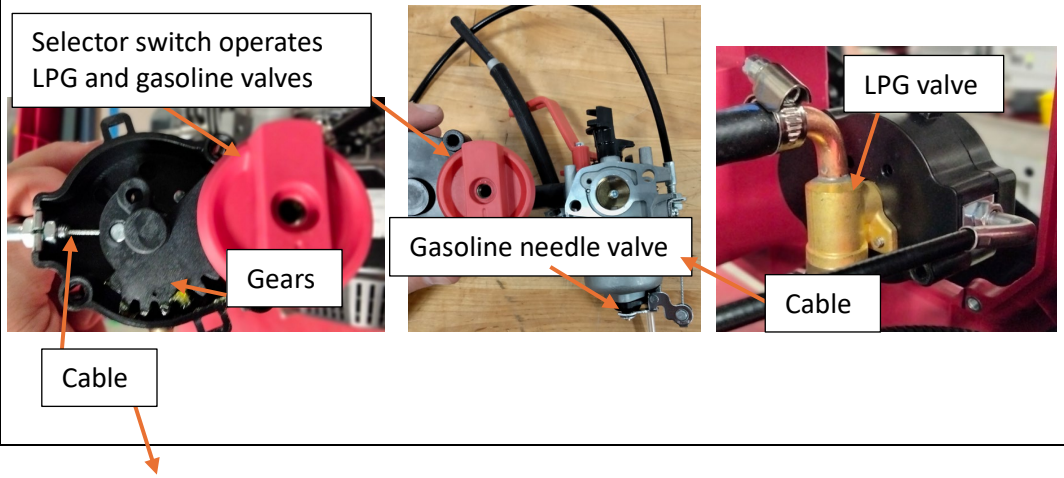
	The float bowl is shown in the images above. Gasoline accumulates in the float bowl.
(a)(2) a throat, and	Element (a)(2) of claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The throat of the carburetor is shown above.
(a)(3) a fuel passage extending from the float bowl to the throat; and	Element (a)(3) of claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The carburetor has a fuel passage in which an emulsion tube resides. A needle bore exposes the fuel passage, which leads to the throat. When the selector switch cable is pulled, the needle is retracted to allow fuel to flow through the passage and into the throat. When the cable is pushed, the needle valve is extended to close the fuel passage. 
(b) a fuel shutoff coupled to the carburetor having a first end in the carburetor that actuates to close the fuel passage and a second end external to the carburetor to actuate the first end; and	Element (b) of claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The gasoline valve is a fuel shutoff coupled to the carburetor having a needle (the first end) in the carburetor that actuates to close the fuel passage and a pivot arm (the second end) external to the carburetor to actuate the needle via a two-pronged fork.

	
(c) wherein the fuel shutoff actuates free from linear motion.	Element (c) of claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The actuation by the cable causes rotational motion on the pivot arm and the two-pronged fork of the gasoline valve. Since that motion is rotational, the motion of the needle must also be rotational. When looking at the motion of the needle, it does not travel in a straight linear motion of in and out. Rather, the rotational motion of the pivot arm causes the needle to be slightly angled such that it runs into the wall of the needle bore into the float bowl. In other words, the fuel shutoff actuates free from linear motion and instead relies solely on rotational motion. The cable actuates the valve by causing the pivot arm to rotate. Since the two-pronged fork is fixed to one end of the pivot arm, the rotational motion of the pivot arm translates to the needle. That is, the pivot arm causes the needle to rotate between its extended and retracted positions.
44. The carburetor having a fuel shutoff of claim 43, wherein the fuel shutoff is a manually actuated fuel shutoff.	Claim 43 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: Champion incorporates by reference in claim 44 the contentions set forth above for claim 43. The fuel shutoff is mechanically actuated by a cable that is pushed and pulled by rotating the fuel selector switch. The fuel selector switch is manually rotated. As a result, the fuel shutoff is manually actuated.

56. The carburetor having a fuel shutoff of claim 43, wherein the fuel shutoff extends through an opening into the float bowl such that the first end actuates in the float bowl to close the fuel passage.	Claim 56 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: Champion incorporates by reference in claim 56 the contentions set forth above for claim 43. The fuel shutoff consists of a needle valve that extends through an opening in the float bowl. When the fuel selector switch is rotated to the LPG position, the needle valve is extended, blocking the fuel passage and preventing gasoline from flowing through the passage.
57. (Preamble) A method of assembling a dual fuel engine comprising:	The preamble of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: As explained in more detail below, the components of the Model PM4500DF generator are arranged in a manner such that they had to be assembled as claimed to include the dual fuel engine. Model PM4500 DF generator has a dual fuel engine. The first fuel source is an LPG bottle that is connected to the generator with a supplied regulator and fuel hose. The second fuel source is the on-board gasoline tank. Both fuel sources feed fuel to the carburetor and engine. 
(a) providing an engine operable on a gaseous fuel and a liquid fuel;	Element (a) of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The dual fuel engine operates on gaseous LPG or liquid gasoline. A fuel selector may be rotated between an LPG position and a gasoline position to choose LPG or gasoline.

	
(b) attaching a carburetor to an intake of the engine, the carburetor comprising:	Element (b) of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The carburetor is attached to the engine's intake and receives gasoline and LPG via fuel hoses. The fuel is mixed with air and delivered to the engine. A float bowl keeps a reservoir of liquid gasoline. A gasoline needle valve may be used to shutoff the flow of gasoline when LPG is chosen. 

	
(b)(1) a throat to mix gaseous fuel with air and liquid fuel with air,	Element (b)(1) of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The throat of the carburetor is shown above and includes the bore in which air enters the carburetor and is mixed with fuel.
(b)(2) a float bowl, and	Element (b)(2) of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The float bowl is shown in the images above and includes the gasoline valve. Gasoline accumulates in the float bowl.
(b)(3) a fuel passage extending from the float bowl to the throat to provide liquid fuel;	Element (b)(3) of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The carburetor has a fuel passage in which an emulsion tube resides. A needle bore exposes the fuel passage, which leads to the throat. When the selector switch cable is pulled, the needle is retracted to allow fuel to flow through the passage and into the throat. When the cable is pushed, the needle valve is extended to close the fuel passage. 
(c) coupling a switch to the engine to	Element (c) of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows:

change operation of the engine between gaseous fuel and liquid fuel; and	The selector switch is a mechanical switch used to change operation between liquid gasoline and gaseous LPG fuels. Inside the switch there are gears and a cable allowing the one handle to control operation of both the LPG and gasoline valves. When the selector is turned, one valve is opened, and the other is closed. 
(d) attaching a liquid fuel cut-off to the carburetor to close the fuel passage upon actuation of the switch from liquid fuel to gaseous fuel.	Element (d) of claim 57 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The gasoline valve is a liquid fuel cut-off attached to the carburetor having a needle in the carburetor that actuates to close the fuel passage and a pivot arm external to the carburetor to actuate the needle via a two-pronged fork. The gasoline valve operates via the cable of the fuel selector switch. The cable either pushes the needle to extend and seal off the flow of gasoline through the float bowl or pulls the needle to retract and allow gasoline to flow through the float bowl. When selector switch is in the gasoline position, the needle is retracted, and gasoline is allowed to flow through the carburetor. When selector switch is in the LPG position, the needle is extended, and gasoline is cut off from flowing to the carburetor. The cable operates by rotating the fuel selector switch which rotates the gears to push/pull the cable. 

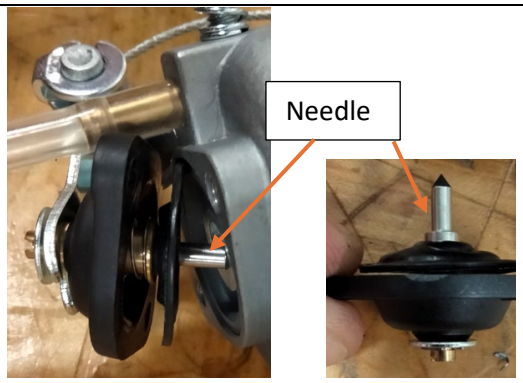
	
58. The method of claim 57 further comprising coupling a manually operated control operatively to the liquid fuel cut-off.	Claim 58 is found within Model PM4500DF (and, thereby, Models PM7500DF and GP7500E DF) directly and literally as follows: The fuel shutoff is mechanically actuated by a cable that is pushed and pulled by rotating the fuel selector switch. The fuel selector switch is manually rotated. As a result, the fuel shutoff is manually operated.

EXHIBIT 1015

United States Patent [19]

Walker

[11] **3,718,000**

[45] **Feb. 27, 1973**

[54] **DUAL FUELED ENGINE WITH TEMPERATURE SWITCHOVER**

[76] Inventor: **Brooks Walker,** 1280 Columbus Avenue, San Francisco, Calif. 94133

[22] Filed: **June 1, 1971**

[21] Appl. No.: **148,545**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 17,167, March 6, 1970, abandoned.

[52] **U.S. Cl.**.....**60/285,** 123/121

[51] **Int. Cl.**.....**F02b 75/10**

[58] **Field of Search** .123/27 GE, 120, 121, 127, 136; 60/285, 284

[56] **References Cited**

UNITED STATES PATENTS

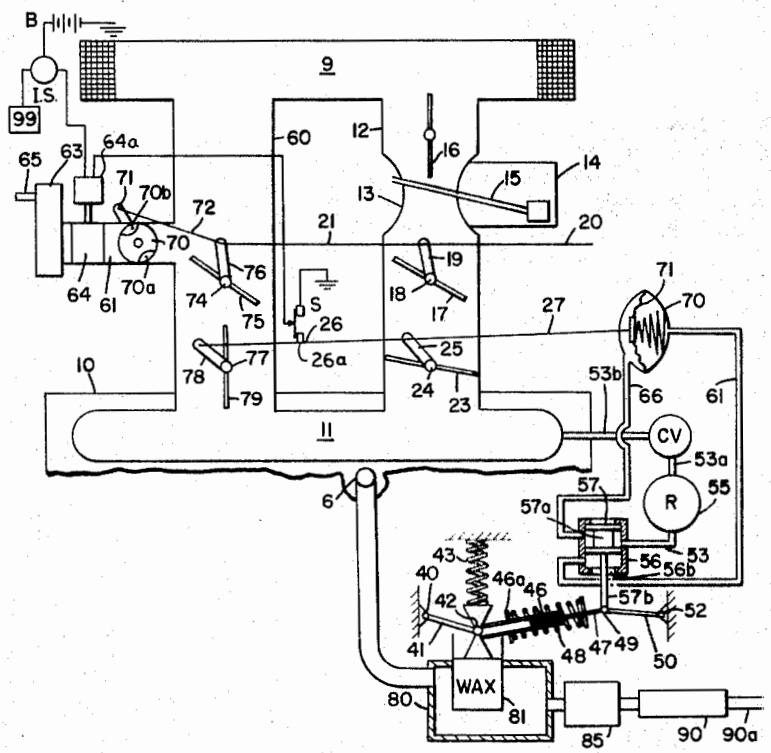
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2,339,988	1/1944	Gerson	123/121
2,381,304	8/1945	Merrill	123/121
2,675,793	4/1954	Ziege	123/121
3,366,194	1/1968	Walker	123/127
3,540,419	11/1970	Fox	123/27 GE

Primary Examiner—Douglas Hart
Attorney—Brooks Walker

[57] **ABSTRACT**

A duel fueled motor using a liquid fuel such as gasoline and a gaseous fuel such as LPG or pressurized natural gas with one or two exhaust treating devices in the exhaust system that operate efficiently when above a selected temperature in treating exhaust from gasoline powered operation, a thermally sensitive controlled changeover from gas to gasoline when the treater reaches a desired temperature and switches back to gas fuel when below a desired temperature.

4 Claims, 3 Drawing Figures



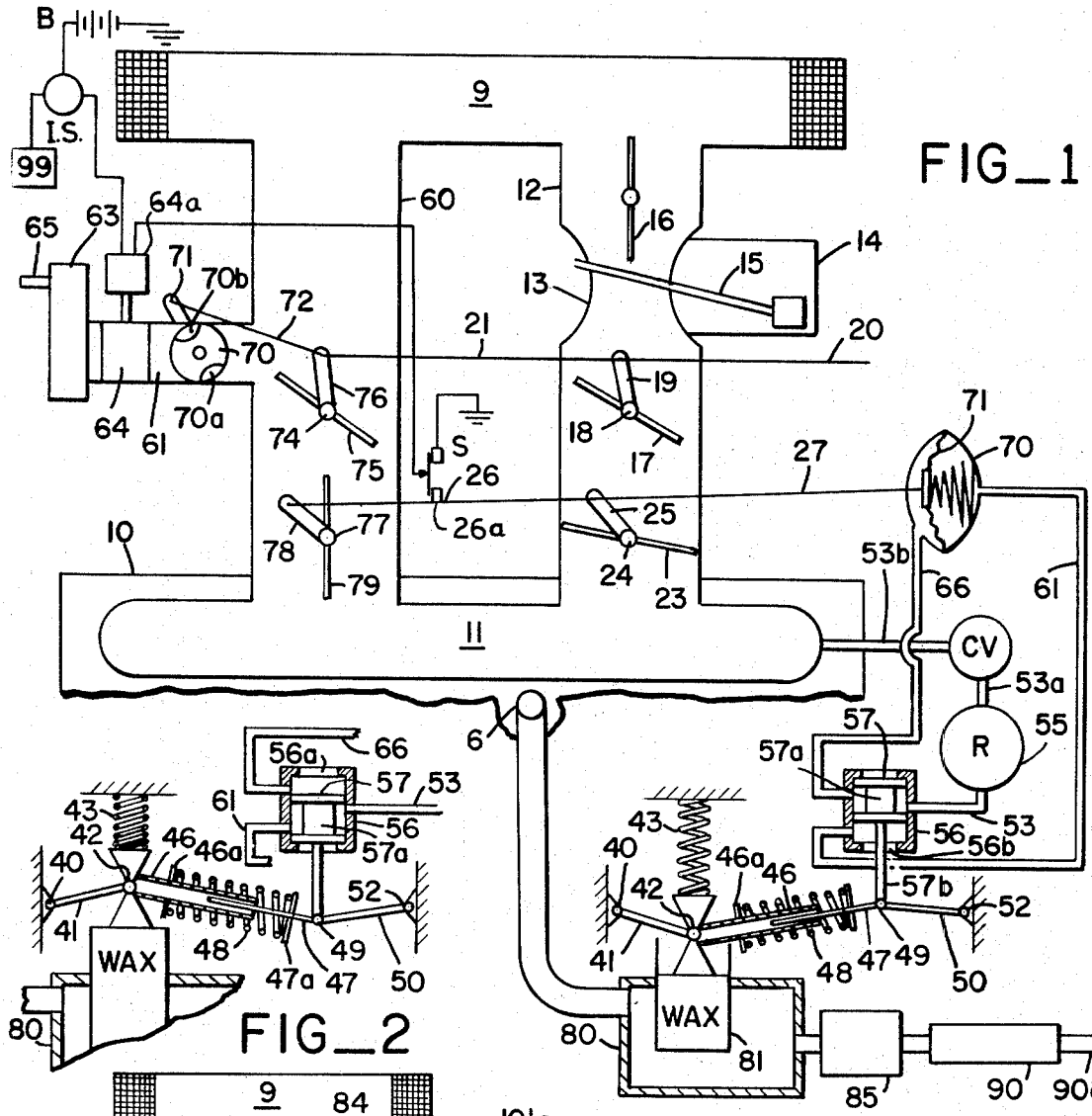


FIG_1

FIG_2

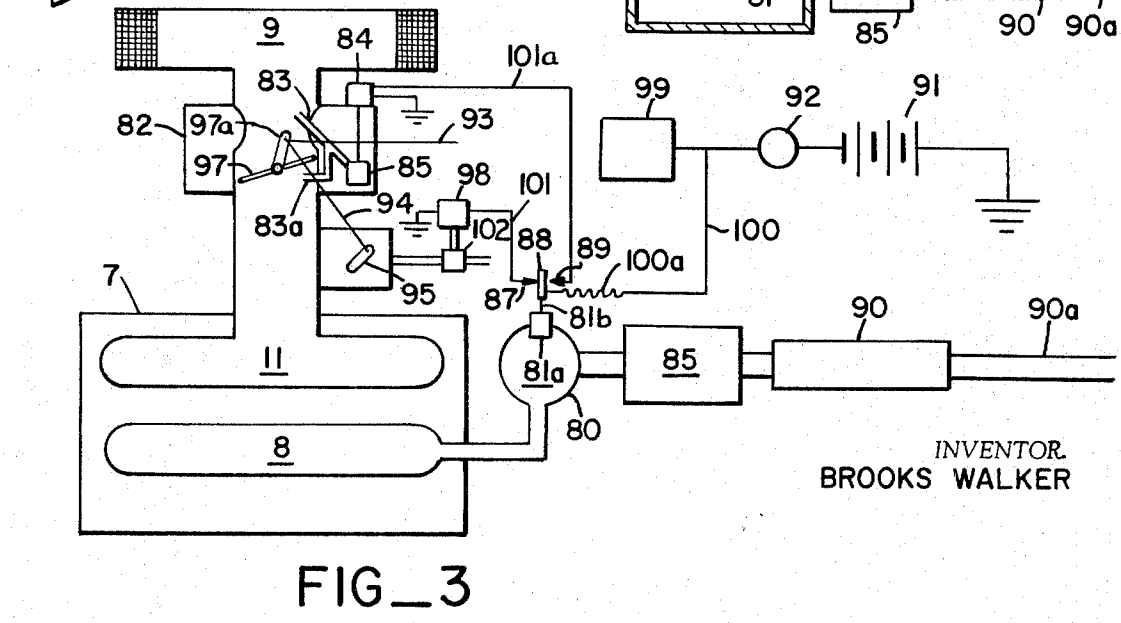


FIG_3

INVENTOR.
BROOKS WALKER

DUAL FUELED ENGINE WITH TEMPERATURE SWITCHOVER

This case is a Continuation-in-part of Ser. No. 17,167, filed Mar. 6, 1970 and now abandoned, for DUAL CARBURETORS FOR DUAL FUELS, insofar as the material common to both is concerned.

One object of the invention is as stated in the abstract as the exhaust of a cold engine or an engine while warming up to desired temperature has less emissions when operating on gas than when operating on gasoline. If the warm up of the catalyst exhaust treater is on gas while the engine is warmed up and when warm enough the engine is automatically switched to gasoline operation, the exhaust emissions will then be within the present legally prescribed limits with the catalyst treater operating at or above the desired temperature.

Another object is to have such automatic switchover powered by suction from the intake of said engine with a storage reservoir for suction to provide suction when operating at or near wide open throttle. Also, a spring in the switchover will result in all starts being on gas when starting cold even with insufficient suction to operate the switchover mechanism during cranking if no spring were used, the reservoir holding suction when operating on gasoline after warm up for a limited time.

Another object is to conserve the gas supply and only use it while warming up for the first few minutes until the converter can operate efficiently.

Another object is to provide an electrically powered switchover in order to have a suitable changeover before sufficient engine suction is developed for the switch to gas operation when starting cold. Suction after standing a long time might be insufficient to switch from gasoline to gas operation for a cold start on gas. Gas makes a better starting fuel with lower exhaust emissions with a cold motor than when operating on gasoline. A snap thermally sensitive electric switch may be simpler than a snap action vacuum valve.

Another object is to provide a switchover means which will work whether two carburetors—one for gas and one for gasoline—are used or whether a combination carburetor with one throttle for operation on gasoline or gas.

Other features will be pointed out in the accompanying specification and claims.

I have illustrated my invention by way of example in the accompanying drawings, in which:

FIG. 1 is a side elevation partly in section and partly schematic showing one form of the invention.

FIG. 2 is a side elevation of the control in another position.

FIG. 3 is a side elevation partly in section and partly schematic showing another form of control for switching from gas to gasoline and vice versa, with a combined gas and gasoline carburetor with suitable shut off controls.

In all forms like numerals of reference refer to corresponding parts.

In FIG. 1 and FIG. 2 I have shown an engine **10** with an intake manifold **11**. A choke **16** operates between the air cleaner **9** and venturi **13** which has the proper fuel feeding (not shown) from the fuel in bowl **14**. A throttle **17** is mounted on the usual rotatable shaft **18** and controlled by arm **19**. A shut off butterfly valve **23** is mounted on rotatable shaft **24** controlled by arm **25**

and connected to rod **27** which goes to control motor **70**.

Another carburetor **60** operates on gas, such as LPG or pressurized gas, and has a mixing valve **70** with calibrated openings **70*a*** and **70*b*** so that when arm **71** moves in connection with the movement of control arm **76** for throttle **75** through rotatable shaft **74**, the correct amount of gas from high pressure pipe **65** will enter area **61** after being reduced in pressure by the usual controls **63** and **64**, as described in S.A.E. Report No. 70 000 78 presented at Auto Engineering Congress, Detroit, Mich., Jan. 2–16, 1970, FIG. 1 per copy attached. A shut off solenoid **64*a*** is controlled by switch S which completes the ground to turn on the gas when stop **26*a*** moves to the left to open valve **79** for gas operation. Power to operate comes from battery B through ignition switch **15**.

Control rod **21** connects control arm **76** for throttle **75** of gas carburetor **60** to work in unison with throttle **17** of gasoline carburetor **12**. Gas carburetor shut off butterfly **79** is mounted on shaft **77** and controlled by arm **78**.

Arm **78** is connected to arm **25** by control rod **26** so that when rod **26** is moved to the left, as shown in FIG. **1**, gas shut off valve **79** and the valve operated by solenoid **64*a*** will be wide open for operating on gas carburetor **60** and gasoline shut off valve **23** will be tight closed, as shown in FIG. **1**, to shut off operation on gasoline and operate on gas carburetor **60** and gas flow to carburetor **60** will be open by the operation of solenoid **64a** when switch S forms a ground.

Exhaust manifold **6** is connected to first treatment device **80** and if necessary to a second treater **85** and then muffler **90** to tailpipe **90*a***.

When the sensor **81** in exhaust treatment device **80** gets up to the desired temperature, the hot wax on other sensing material or mechanisms in **81** will move the joint **42** above the line joining joints **40** and **49**. A snap action by spring **48** acting on washers **46*a*** and **47*a*** will result to snap plunger **57** of valve **56** to the lower position as shown in FIG. **2** to allow engine suction from line **53** to pass valve plunger Section **57*a*** to line **61** to the right of diaphragm **71** in suction operated motor **71** to quickly switch control rods **27** and **26** to the right (as viewed in FIG. **1**) to close valve **79** and the valve operated by solenoid **64*a*** and open valve **23** to close off gas carburetor **60** operation and operate the engine on gasoline carburetor **12** with efficient treatment of the gasoline exhaust by preheated catalyst in treatment **80** and **85** before going out tailpipe **90*a***. To assure adequate suction to provide the desired switchover to operation on gasoline when treatment **80** is up to temperature, a reservoir **55** is between hose **53*a*** and **53** with a check valve CV, between reservoir **55** and intake **1** to hold suction in reservoir **55**.

When treatment device **80** is below the desired temperature sensing material in sensor **81** will contract and pivot **42** will drop below the line connecting pivots **40** and **49**. Spring **46** will snap joint **49** up and snap valve **57** to the upper position, as shown in FIG. **1**, so the engine will operate on gas carburetor **60** until switched to gasoline operated on carburetor **12** as described previously. Valve **56** provides a bleed **56*a*** for line **66** in the position shown in FIG. **2** and bleed **56*b*** (Space around stem **57*c***) for line **61** when in the position shown in FIG. **1**.

In FIG. 3 we have a motor 7 with intake manifold 11. Exhaust manifold 8 leads to first treatment 80, then to second treatment 85, muffler 90, and out tailpipe 90*a*. Thermally sensitive snap switch 81 senses the temperature inside first treatment 80 by element in 81*a* and operates insulated contact 88 which when treatment 80 is below the desired temperature contacts point 87 is contacted by contact 88 and is free of point 89 (as shown in FIG. 3) so that line 100 brings electric power from battery 91 through ignition switch 92 to the ignition system 99 and to insulated contact 88 by a flexible portion 100*a*. Wire 101 is connected to point 87 to energize solenoid 98 to open gas flow valve 99 to the engine. Valve 85 will be closed until energized to close gasoline flow to the main jet by line 83 and to the idle jet by branch line 83*a* to close off gasoline flow from the float bowl of carburetor 82 to the air passing through carburetor 82. When engine 7 is below temperature solenoid 98 will be energized as points 88 and 87 are closed, so gas control valve 102 will be open for operating on gas until first treatment 80 is up to the desired temperature. When the desired temperature is reached by treatment 80 as sensed by 81*a*, insulated element 88 snaps over to the right, as viewed in FIG. 3, to contact point 89 to energize solenoid 84 to open gasoline flow control valve 85 and gasoline will flow to main jet line 83 and idle line 83*a* through valve 85. Gas flow will be cut off by the cutting of current to solenoid 90 (which closes valve 91 when not energized). The engine 7 will then operate on gasoline as long as exhaust treatment in 80 is above the desired temperature.

This construction allows the use of electric solenoids controlled by very limited action of the temperature sensitive element 81*a* in the exhaust treatment device 80 to control the operation of the engine to operate on gas below the desired temperature at exhaust treatment 80 and then automatically switch to gasoline operation with a single dualed fueled air and gas mixing device or gasoline fed carburetor 82 and allows two fuels to use a single power controlling throttle 97 for both fuels when supplied separately.

The electric control circuit shown in FIG. 3 could be used to control the shut off valves 79 and 23 of FIG. 1, if suitable solenoids somewhat like 84 and 98 are used to control the motion of rod 27 to shift from gas operation below a desired temperature of treatment 80 to gasoline operation when above said desired temperature of 80 as sensed by element 81*a*. Solenoids and valves which are closed when energized instead of open when energized could be used by changing the switching if this were desirable.

Other features will be pointed out in the accompanying claims.

I have illustrated my inventions in these various forms; many other variations may be possible within the scope of this invention.

To those skilled in the art to which this invention relates many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. An engine having dual air and fuel mixing devices for feeding said engine, said mixing devices adapted to feed liquid fuel such as gasoline or gas fuel, such as LPG or gas from a pressurized container, means for switching the feeding of the fuel to the engine from one mixing device to the other, an exhaust system, a treatment device in said exhaust system, said treatment device operating better above a desired temperature than below said temperature, a temperature sensing device disposed to sense the temperature of said treatment device, and means operated by said temperature sensing device for controlling the switching means to cause the feeding of said engine with gas fuel when the treatment device is operating below a selected temperature and to automatically cause the feeding of said engine with gasoline when said treatment device is above said temperature said means operated by the temperature sensing device also controlling the switching back to gas fueled operation of said engine when said treatment is below the desired temperature.

2. An apparatus for operating a dual fueled internal combustion engine having an intake manifold and an exhaust system, a treatment device in the exhaust system, a thermally sensitive device disposed to sense the temperature of said treatment device, automatic means responsive to said device for shifting said engine to operate on a gaseous fuel when said treatment device is below a selected temperature as sensed by said device, said device controlling the automatic means to shift said engine to operate on a liquid fuel from operating on said gaseous fuel when said device is above a selected temperature of said treatment device.

3. A device as defined in claim 2, in which the power means to operate said automatic means for shifting from operation of said engine on one fuel to the other fuel, the power for energizing the power means being derived from the suction from said intake manifold of said engine.

4. A device as defined in claim 2, including electrically powered motors for operating the automatic means for shifting from operation of said engine on one fuel to operation on the other fuel, said motors being controlled by said sensing device associated with said treatment device.

* * * * *

EXHIBIT 1016

DuroMax NEXT GENERATION POWER SYSTEMS

DUAL FUEL



DUAL FUEL HYBRID ELITE XP4400EH

Product Support (Product: information, application, service info & warranty questions)

Please email us at support@duromaxgenerators.com
or call 1-800-629-3325 (option 3) Monday -Thursday 6am to 6:30pm and Fridays 6am to 5pm. PST

This manual provides information regarding the operation and maintenance of these products.
We have made every effort to ensure the accuracy of the information in this manual.
We reserve the right to change this product at any time without prior notice.

FEATURES

- **Dual Fuel Option, LPG or Gasoline.**
- **Durable 7.0 HP, Air Cooled Overhead Valve Engine.**
- **Heavy Duty Steel Frame with Four Point Fully Isolated Motor Mounts for Smooth and Quiet Operation.**
- **Wheel and Handle Kit for Easy Transporting.**
- **Full Power Panel with Engine Shutoff Switch, Volt Meter, Circuit Breaker and Power Outlets.**
- **(2) Fully Protected 120V Outlets & (1) 120V/240V Twist-Lock Outlet.**
- **8 Hour Run Time.**
- **All Steel 4.0 Gal. Fuel Tank with EZ-Read Gauge.**
- **Low Oil Shut-Off Protects Engine.**
- **Super Quiet Muffler Reduces Engine Noise.**
- **Meets EPA and CARB Emission Standards.**

This manual provides information regarding the operation and maintenance of these products.
We have made every effort to ensure the accuracy of the information in this manual.
We reserve the right to change this product at any time without prior notice.

Notice Regarding Emissions

Engines that are certified to comply with California and U.S. EPA emission regulations for SORE (Small Off Road Equipment), are certified to operate on regular unleaded gasoline, and may include the following emission control systems: (EM) Engine Modifications and (TWC) Three-Way Catalyst (if so equipped).

GENERAL SAFETY PROCEDURES

Please familiarize yourself with the following safety symbols and words:
The safety alert symbol ⚠ is used with one of the safety words (**DANGER, CAUTION,** or **WARNING**) to alert you to hazards. Please pay attention to these hazard notices both in this manual and on the generator.

DANGER: Indicates a hazard that will result in serious injury or death if instructions are not followed.

WARNING: Indicates a strong possibility of causing serious injury or death if instructions are not followed.

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

⚠DANGER: This generator produces poisonous carbon monoxide gas when running. This gas is both odorless and colorless. Even if you do not see or smell gas, carbon monoxide may still be present. Breathing this poison can lead to headaches, dizziness, drowsiness, and eventually death.

- Use outdoors **ONLY** in non-confined areas.
- Keep several feet of clearance on all sides to allow proper ventilation of the generator.

⚠ **WARNING: The exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.**

⚠ **WARNING: This generator may emit highly flammable and explosive gasoline vapors, which can cause severe burns or even death. A nearby open flame can lead to explosion even if not directly in contact with gas.**

- Do not operate near open flame.
- Do not smoke near generator.
- Always operate on a firm, level surface.
- Always turn generator off before refueling. Allow generator to cool for at least 2 minutes before removing fuel cap. Loosen cap slowly to relieve pressure in tank.
- Do not overfill gas tank. Gas may expand during operation. Do not fill to the top of the tank.
- Always check for spilled gas before operating.
- Empty the gasoline tank before storing or transporting the generator.
- Before transporting, turn fuel valve to off and disconnect the spark plug.

⚠ **WARNING: This generator produces powerful voltage, which can result in electrocution.**

- ALWAYS ground the generator before using it (see the "*Grounding the Generator*" portion of the "*PREPARING THE GENERATOR FOR USE*" section).
- Generator should only be plugged into electrical devices, either directly or with an extension cord. NEVER connect to a building electrical system without a qualified electrician. Such connections must comply with local electrical laws and codes. Failure to comply can create a backflow of power, which may result in serious injury or death to utility workers.
- Use a ground fault circuit interrupter (GFCI) in highly conductive areas such as metal decking or steel work. GFCIs are available in-line with some extension cords.
- Do not use uncovered in rainy or wet conditions.
- Do not touch bare wires or receptacles (outlets).
- Do not allow children or non-qualified persons to operate.

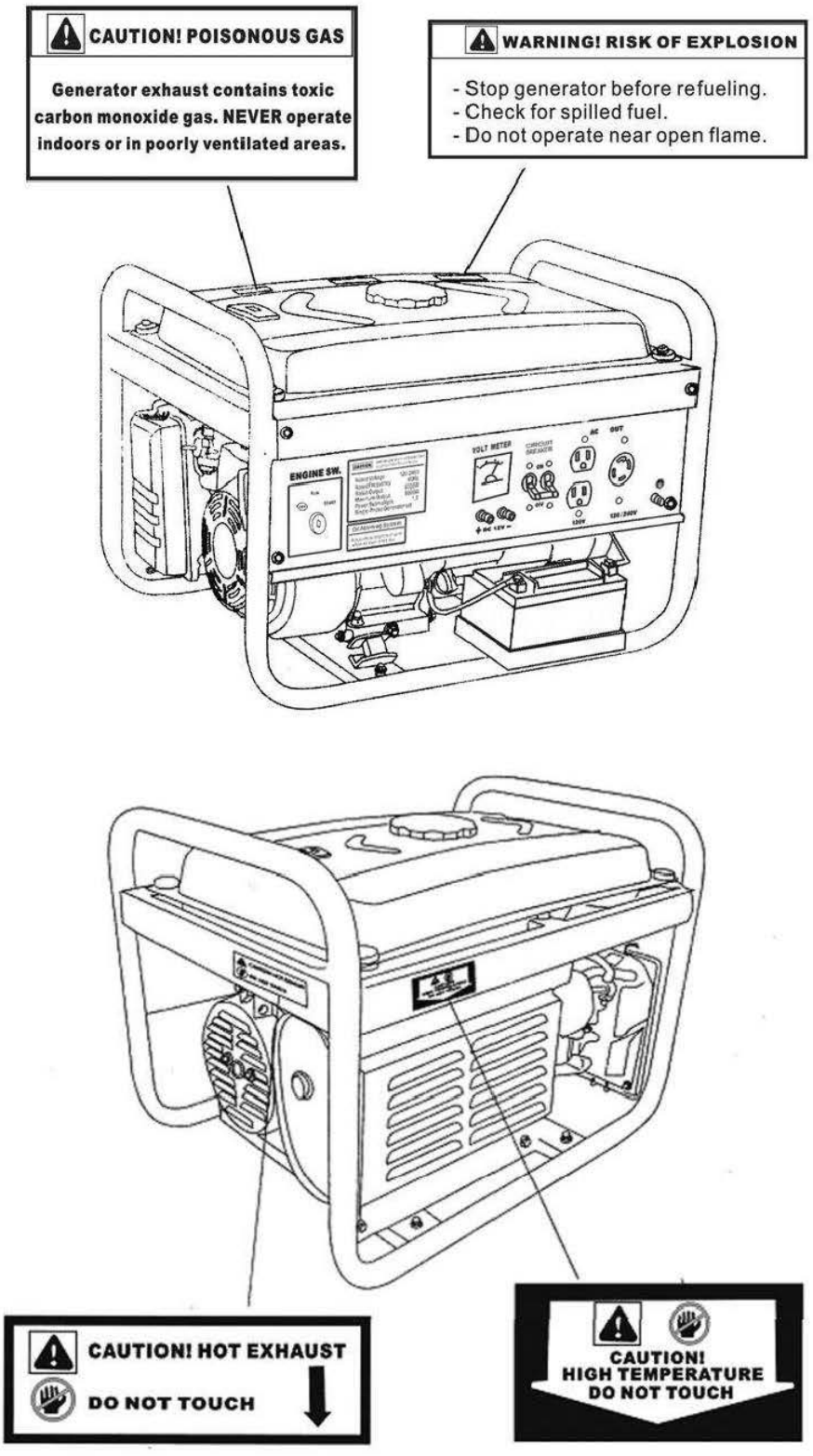
⚠ **WARNING: This generator produces heat when running. Temperatures near exhaust can exceed 150°F (65°C).**

- Do not touch hot surfaces. Pay attention to warning labels on the generator denoting hot parts of the machine.
- Allow generator to cool several minutes after use before touching engine or areas which heat during use.

CAUTION: Misuse of this generator can damage it or shorten its life.

- Use the generator only for its intended purposes.
- Operate only on dry, level surfaces.
- Allow generator to run for 3 - 5 minutes before connecting any electrical devices.
- Shut off and disconnect any malfunctioning devices from generator.
- Do not exceed the Wattage capacity of the generator by plugging in more electrical devices than the unit can handle (see "*PRECAUTIONS-OVERLOADING THE GENERATOR*").
- Do not turn on electrical devices until after they are connected to the generator.
- Turn off all connected electrical devices, and turn off the breaker, before stopping the generator.

In addition to the above safety notices, please familiarize yourself with the safety and hazard markings on the generator.



PACKAGE CONTENTS

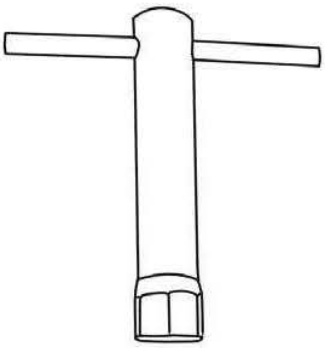
Your generator comes with the items listed below. Please check to see that all of the following items are included with your generator.



Screw driver



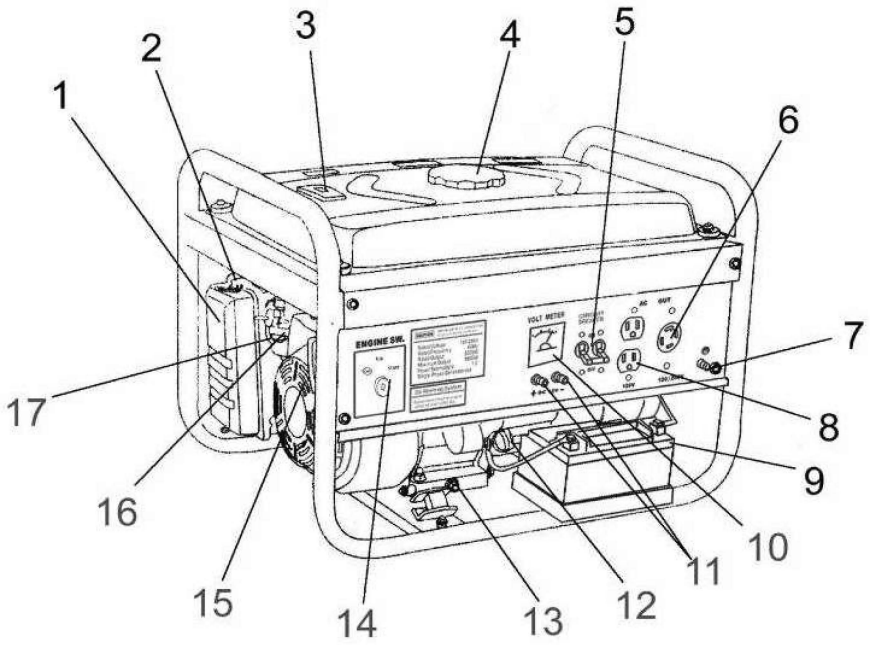
Spanner

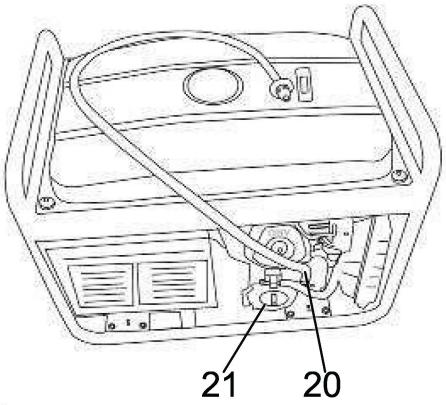


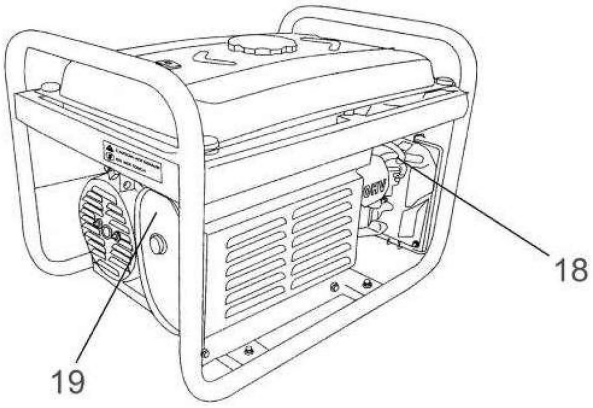
Spark plug wrench

GENERATOR COMPONENTS

Please familiarize yourself with the locations and functions of the various components and controls of your generator.







1. **Air cleaner -** a removable, cleanable, sponge-like element that limits the amount of dirt pulled into the engine.
2. **Choke lever -** Adjusts the amount of air let into the engine.
3. **Fuel Gauge -** Indicates the amount of fuel in the tank.
4. **Fuel Cap -** Access to the fuel tank for adding fuel.
5. **Circuit Breaker -** Reset switch that protects the generator from electrical overload.
6. **120/ 240 Volt AC Receptacle -** Use to connect electrical devices that run 120 and/or 240 Volt, 60Hz, single phase, AC current (NEMA L14-30).
7. **Ground Terminal -** Connect grounding wires here to properly ground unit.
8. **120 Volt AC Receptacle -** Use to connect electrical devices that run 120 Volt, 60 Hz, single phase, AC current (2×duplex GFCI).
9. **12V DC Battery.**
10. **Volt Meter -** Provides reading of voltage output.
11. **12v DC Receptacle-** Use for charging 12 Volt automotive-type batteries only.

12. **Oil Filler Cap-** Use to Add oil or checking the oil.
13. **Oil Fill and Dipstick-** Location for checking and filling engine oil.
14. **Engine Switch-** Used to start/stop engine.
15. **Recoil Starter-** Pull-cord for starting engine.
16. **Fuel Filter Cup-** Traps dirt and water from fuel before it enters the engine.
17. **Fuel valve-** Allows fuel to enter engine.
18. **Spark plug-** Provides proper engine ignition.
19. **Muffler-** Reduces engine noise.
20. **Hose connector-** Connect liquid propane gas to generator.
21. **Pressure Release Valve-** Provides regulated liquid propane gas supply.

PREPARING THE GENERATOR FOR USE

Using the Generator for the First Time
If you are using the generator for the first time, there are a few steps you must take to prepare it for operation.

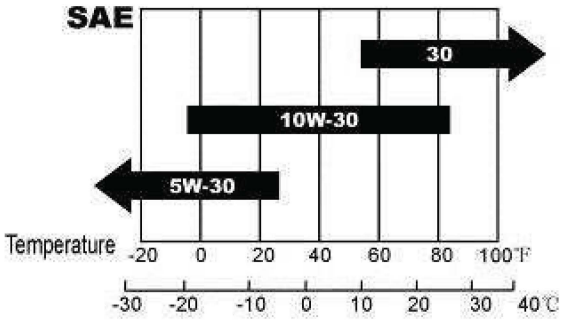
Step 1 - Add oil

The generator requires engine oil to operate properly. The generator, when new from the package, contains no oil in the crankcase. You must add the proper amount of oil before operating the generator for the first time. This amount, which is equal to the oil capacity of the engine crankcase, can be found on the chart in *figure 1*. When filling the engine with oil in the future, please refer to this chart.

Model number	**XP4400H**	**XP4400EH**
Engine oil capacity	20 fluid oz.	

Figure 1- Generator Oil Capacity

CAUTION:
- **Do not apply engine oil with additives or 2-stroke gasoline engine oil,** as they haven't enough lubrication, which may shorten the engine's service life.
- **Engine oil recommended: SAE 10W-30.** As viscosity varies with regions and temperatures, so the lubricant has to be selected in accordance with our recommendation.



To add oil, follow these steps:
1. Make sure the generator is on a level surface.
2. Unscrew the oil filler/dipstick cap from the engine as shown in *figure 2*.
3. Using a funnel, add the appropriate amount of oil, as found in *figure 1*, into the crankcase. You will know the crankcase is full when the oil level has reached the lower lip of the opening you have just poured the oil into (see *figure 3*).
4. Replace oil filler cap.

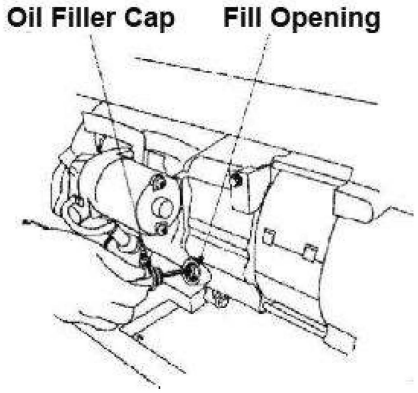


Figure 2- Unscrewing the oil cap



Figure 3 - Adding oil

Step 2 - Add Gasoline

⚠ **WARNING: Gasoline and gas fumes are highly flammable.**

- **Do not fill tank near an open flame.**
- **Do not overfill. Always check for fuel spills.**

To ensure that the generator runs smoothly use only FRESH, UNLEADED GAS WITH AN OCTANE RATING OF 87 OR HIGHER.

To add gasoline:

1. Make sure the generator is on a level surface.
2. Unscrew gas cap and set aside (NOTE: the gas cap may be tight and hard to unscrew).
3. Slowly add unleaded gasoline to the fuel tank. Be careful not to overfill. Please refer to the chart in *figure 4* to find the gas capacity of your generator model. The fuel gauge on the top of the gas tank indicates how much gasoline is in the generator gas tank. **NOTE: Gas can expand. Do not fill the gas tank to the very top.**
4. Replace fuel cap and wipe up any spilled gasoline with a dry cloth.

IMPORTANT:

- Never use an oil/gasoline mixture.
- Never use old gas.
- Avoid getting dirt or water in the fuel tank.
- Gas can age in the tank and make it hard to start up the generator in the future.
- Never store generator for extended periods of time with fuel in the tank.

Model number	**XP4400H**	**XP4400EH**
Gas tank capacity	15L (3.96 US Gallons)	

Figure 4 - Gas Tank Capacity

Step 3 - Ground the Generator

⚠ **WARNING: Failure to properly ground the generator can result in electrocution.**

Ground the generator by tightening the grounding nut against a grounding wire (see *figure 5*). A generally acceptable grounding wire is a No. 12 AWG (American Wire Gauge) stranded copper wire. This grounding wire should be connected at the other end to a copper or brass-grounding rod

that is driven into the earth. Grounding codes can vary by location. Please contact a local electrician to check the grounding regulations for your area.

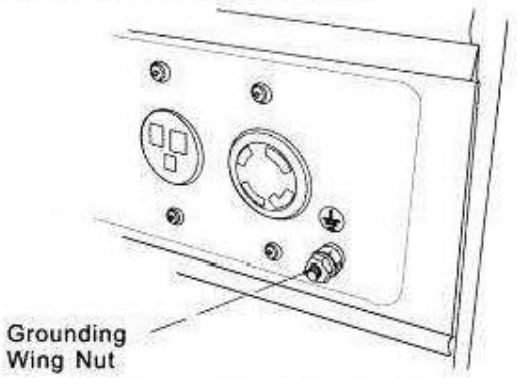


Figure 5 – Attaching the Grounding Wire to the Generator

Subsequent Use of the Generator

If this is not your first time using the generator there are still steps you should take to prepare it for operation.

IMPORTANT: At this point you should be familiar with the procedures described in the first portion of this section entitled "*Using the Generator for the First Time.*" If you have not yet read this section, go back and read it now.

Step 1- Check the oil

The generator is equipped with an automatic shutoff to protect it from damage due to low oil. Nonetheless, you should check the oil level of the engine before each use to ensure that the engine crankcase has a sufficient amount.

To check the oil level:

1. Make sure the generator is on a level surface.
2. Unscrew the oil filler/dipstick cap.
3. With a dry cloth, wipe the oil off of the stick on the inside of the cap.
4. Insert the dipstick as if you were replacing the cap and then remove again. There should now be oil on the stick. If there is no oil on the stick, or oil only at the very end of the stick, you should add oil until the engine crankcase is filled (see "*Adding Oil*" portion of the "*Maintenance*" section).
5. Be sure to replace the cap when finished checking oil.

NOTE: The oil capacity for your generator can be found in the "*Specifications*" section of this manual.

Step 2 - Check the Gas Level

Before starting the generator, check to see that there is sufficient gasoline in the gas tank. The fuel gauge on top of the generator will indicate the gas level in the tank. Add gas if necessary according to the steps in the "Adding Gasoline" portion of the "Maintenance" section.

⚠ WARNING: Gasoline and gasoline fumes are highly flammable.

- Do not fill tank near an open flame.
- Always allow engine to cool for several minutes before refueling.
- Do not overfill (check the "Specifications" section for the tank capacity of your generator). Always check for fuel spills.

⚠ IMPORTANT:

- Use only UNLEADED gasoline with an octane rating of 87 or higher.
- Do not use old gas.
- Never use an oil/gasoline mixture.
- Avoid getting dirt or water in the fuel tank.
- Never store generator for extended periods of time with fuel in the tank.

Step 3- Ground the Generator

⚠ **WARNING: Failure to properly ground the generator can result in electrocution.** Ground the generator by tightening the grounding nut against a grounding wire (see figure 5). A generally acceptable grounding wire is a No. 12 AWG (American Wire Gauge) stranded copper wire. This grounding wire should be connected at the other end to a copper or brass-grounding rod that is driven into the earth.

Grounding codes can vary by location. Please contact a local electrician to check the grounding regulations for your area.

STARTING THE GENERATOR - Gasoline or LPG separately

⚠ CAUTION:

When using gasoline, LPG must be shut off! When using LPG, gasoline must be shut off!

⚠ **Disconnect all electrical loads from the generator before attempting to start!**

To start your generator with gasoline, perform the following steps:

1. Make sure no electrical devices are connected to the generator. Such devices can make it difficult for the engine to start.
2. Check that the generator is properly grounded (see page 13, "*Ground the Generator*").
3 Turn the gasoline fuel valve to the "ON" position
4. Move the choke lever to the "CLOSED" position (see *figure 7*).
5. Set the engine switch to the "ON" position.
6. Pull on the recoil starter handle slowly until a slight resistance is felt (see *figure 8*). Then pull quickly to start the engine. Return cord gently into the machine. Never allow the cord to snap back.
7. If engine fails to start, repeat step 4. NOTE: After repeated attempts to start the engine, please consult the troubleshooting guide before attempting again.
8. Once the engine has started and run for about a minute, move the choke lever about half way towards the "OPEN" position. Wait another 30 seconds and then move the choke lever all the way to the "OPEN" position.
9. Allow the generator to run for several minutes before attempting to connect any electrical devices.

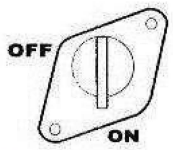


Figure 6 - fuel valve in the "on" position



Figure 7 - Choke in the close position



Figure 8 - Pulling the recoil start.

To start your generator with LPG, perform the following steps:

1. Make sure no electrical devices are connected to the generator.
2. Check that the generator is properly grounded (see page 13, "*Ground the Generator*").
3. Turn the gasoline fuel valve to the "OFF" position (see *figure 6*).
4. Connect the propane gas hose to the regulator (see figure B).
5. Connect the regulator to the liquid propane gas supply and then turn on the liquid propane gas supply, making sure there are no leaks (see figure C).
6. Open the clasp connected to the Pressure Release Valve (see figure C).
7. Press the button on Pressure Release Valve two to three times before starting the engine. (see figure D)
8. When starting the engine:
   a. If the engine is warm (The unit was run recently) start with the choke half open.
      i. Wait another 30 seconds and then move the choke lever all the way to the "OPEN" position.
   b. If the engine is cold (The unit has not been run for half an hour or more) start with the choke open. (see figure E & F).
9. Pull on the recoil starter handle slowly until a slight resistance is felt (see *figure 8*). Then pull quickly to start the engine. Return cord gently into the machine. Never allow the cord to snap back.
10. Allow the generator to run for several minutes before attempting to connect any electrical devices.

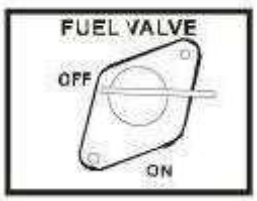


Figure A - Fuel Valve in the "OFF" position


Figure B - Connect the Hose


To LPG Supply

Figure C-Connect Valve



Figure D -Button on Presssure Release Valve


Figure F - Start with LPG(Liquid Propane Gas)

⚠ WARNING: WHEN USING THE GENERATOR WITH LPG

MAKE SURE THERE IS NO POSSIBLE IGNITION SOURCE CLOSE TO THE GENERATOR.

1. Before using, make sure all of the connectors and hoses are well connected and sealed.
2. Connect electrical devices to generator ONLY after the engine runs smoothly. (There may be remnant gasoline in the carburetor; this can cause unsteady engine performance for several minutes)
3. If the propane gas leaks, shut off the LPG supply first and then quickly unplug or turn off any electrical devices powered by the unit.
4. When stopping the engine, unplug or turn off any electrical devices and then turn off the LPG CLASP (see figure C). After the engine has stopped, turn the KEY to 'OFF" position, then shut off the LPG supply.

USING THE GENERATOR

Once you have allowed the engine to run for several minutes, you may connect electrical devices to the generator.

AC Usage

You may connect electrical devices running on AC current according to their wattage requirements. The chart in figure 9 shows the rated and surge wattage of your generator according to its model number.

The *rated wattage* corresponds to the maximum wattage the generator can output on a continuous basis.

The *surge wattage* corresponds to the maximum amount of power the generator can output for a short period of time. Many electrical devices such as refrigerators require short bursts of extra power, in addition the rated wattage listed by the device, to stop and start their motors. The surge wattage ability of the generator covers this extra power requirement.

Model Number	Rated (Running) Wattage	Surge Wattage
XP4400	3500	4400
XP4400E	3500	4400

Figure 9-generator wattage by model number

The total running wattage requirement of the electrical devices connected to the generator should not exceed the rated wattage of the generator itself. To calculate the total wattage requirement of the electrical devices you wish to connect, find the rated (or running) wattage of each device. This number should be listed somewhere on the device or in its instruction manual.

If you cannot find this wattage, you may calculate it by multiplying the Voltage requirement by the Amperage drawn: Watts = Volts × Amperes. If these specifications are not available you may estimate the Watts required by your device by using the chart in *figure 10*.

Tool or Appliance	Rated (Running) Watts	Additional Surge Watts
Electric water heater (40 gal)	4000	0
Hot plate	2500	0
Saw-radial arm	2000	2000
Electric stove	1500	0
Saw-circular	1500	1500
Air compressor (1HP)	1500	3000
Window air conditioner	1200	1800
Saw-miter	1200	1800
Microwave	1000	2000
Well water pump	1000	1500
Reciprocating saw	960	1040
Sump pump	800	1200
Refrigerator freezer	800	1200
Furnace blower	800	1300
Computer	800	0
Electric drill	600	900
Television	500	0
Deep freezer	500	800
Garage door opener	480	600
Stereo	400	0
Box fan	300	600
Clock radio	300	0
Security system	180	0
DVD player/VCD	100	0
Common light bulb	75	0

Figure 10- Estimated wattage requirements of common electrical devices.

Once you have found the rated wattage requirement of each electrical device, add these numbers to find the total rated wattage you wish to draw from the generator. If this number exceeds the rated wattage of the generator, **DO NOT** connect all these devices. Select a combination of electrical devices, which has a total rated wattage lower than or equal to the rated wattage of the generator.

CAUTION - The generator can only run at its surge wattage capacity for a short time. Connect only electrical devices requiring a rated (running) wattage equal to or less than the rated wattage of the generator. Never connect devices requiring a rated wattage equal to the surge wattage of the generator.

NOTE: The above wattage figures are estimates only. Try to check the wattage listed on your electrical devices before consulting this chart.

Once you have determined what electrical devices you will be powering with the generator, connect these devices according to the following procedure:

1. Plug in each electrical device with the device turned off.
    a. NOTE: Be sure to attach appliances to the correct receptacle (outlet). Connect standard 120 Volt, single phase, 60 Hz loads only to the 120 Volt receptacles.
    b. Connect 120/240 Volt, single phase, 60Hz loads with NEMA L14-30 plug **only** to the 120/240 Volt receptacle See *Figure 11* for a depiction of each of these receptacles.
2. Switch the circuit breaker to the "ON" position.
3. Turn on the connected electrical devices in the order of the amount of power they require beginning with the device with the highest rated Wattage requirement.

⚠ **CAUTION: Do not connect 50Hz or 3-phase loads to the generator.**

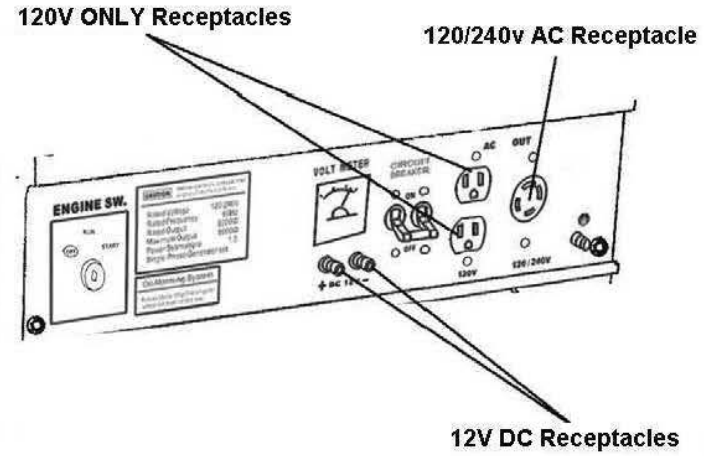


Figure 11- Receptacles available on the generator

VOLTAGE SELECTOR SWITCH

The voltage selector switches the dual 120v AC windings of the generator to produce "120V ONLY" or "120/240V". If a 240V appliance is connected to the 4-prong receptacle, the switch must be in the "120/240V" position. If only 120V appliances are being connected to the generator select the "120V ONLY" position to double the 120v amperage.

WARNING:

Only change the Voltage Selector Switch with the main AC circuit breaker OFF. The generator can be seriously damaged if the Voltage Selector Switch is changed with the breaker ON.

SOME NOTES ABOUT POWER CORDS

Long or thin cords can drain the power provided to an electrical device by the generator. When using such cords, allow for a slightly higher rated wattage requirement for the electrical device. See *Figure 12* for recommended cords based on the power requirement of the electrical device.

Device Requirements			Max. Cord Length (ft.) by Wire Gauge				
Amps	Watts (120V)	Watts (240V)	#8 wire	#10 wire	#12 wire	#14 wire	#16 wire
2.5	300	600	NR	1000	600	375	250
5	600	1200	NR	500	300	200	125
7.5	900	1800	NR	350	200	125	100
10	1200	2400	NR	250	150	100	50
15	1800	3600	NR	150	100	65	NR
20	2400	4800	175	125	75	50	NR
25	3000	6000	150	100	60	NR	NR
30	3600	7200	125	65	NR	NR	NR
40	4800	9600	90	NR	NR	NR	NR

*NR= not recommended

Figure 12 - Maximum Extension Cord Lengths by Power Requirement

DC Usage

- ⚠ **CAUTION: The DC receptacle is for recharging 12 Volt automotive-type batteries only. Do not connect any other device to this receptacle.**
- ⚠ **CAUTION: Never try to jump start a car with your generator.**

To connect 12 Volt batteries to the DC receptacle:

1. Connect one charging wire to the positive terminal on the battery and the other charging wire to the negative terminal on the battery.
2. Connect the free end of the positive wire to the positive receptacle (outlet) on the generator.
3. Start the generator.
4. Carefully connect the free end of the negative wire to the negative receptacle on the generator.
5. When disconnecting, always disconnect the wires from the generator first to avoid a spark.

⚠ **DANGER: Storage batteries emit highly explosive hydrogen gas when charged. Batteries also contain acid, which can cause severe chemical burns.**

- ⚠ **Do not allow open flames or cigarettes nearby for several minutes after charging a battery.**
- ⚠ **Always wear protective goggles and rubber gloves when charging a battery.**
- ⚠ **If battery acid gets on your skin, flush with water.**
- ⚠ **If battery acid gets in your eyes, flush with water and call a physician immediately.**
- ⚠ **If battery acid is swallowed, drink large quantities of milk and call a Physician immediately.**

If your generator is the electric start model, once running, it will charge the battery on the generator automatically. While charging, you can see the recharge indicator light lit, after the battery is full, the light will turn off.

STOPPING THE GENERATOR

To stop the generator:

1. Power down, and then unplug all connected electrical devices.
2. Switch the main AC circuit breaker to the "OFF" position.
3. Allow the generator to run for several more minutes with no electrical devices connected. (This helps stabilize the temperature of the generator.)
4. Turn the engine switch to the "OFF" position.
5. Turn the fuel valve to the "OFF" position.

⚠ **WARNING**: Allow the generator to cool for several minutes before touching areas that become hot during use.

⚠ **CAUTION**: Allowing gas to sit in the generator tank for long periods of time without use can make it difficult to start the generator in the future. Never store generator for extended periods of time with fuel in the tank.

MAINTENANCE /CARE

Proper routine maintenance of your generator will help prolong the life of your machine. Please perform maintenance checks and operations according the schedule in *figure 13*.

⚠ **CAUTION:** Never perform maintenance operations while the generator is running.

Recommended Maintenance schedule

		Each use	Every month or	Every 3 months or	Every 6 months or	Every year or
Engine oil	Check level	×				
	Replace		×			
Air cleaner	Check	×				
	Clean			×		
Fuel filter cup	Clean				×	
Spark plug	Check/clean				×	
Gas tank	Check gas level	×				
	Clean		×			×

Figure 13 - Recommended maintenance schedule

Cleaning the Generator

Always try to use your generator in a cool dry place. However, in the event your generator becomes dirty you may clean the exterior with one or more of the following:

- A damp cloth
- A soft brush

- A vacuum
- Pressurized air

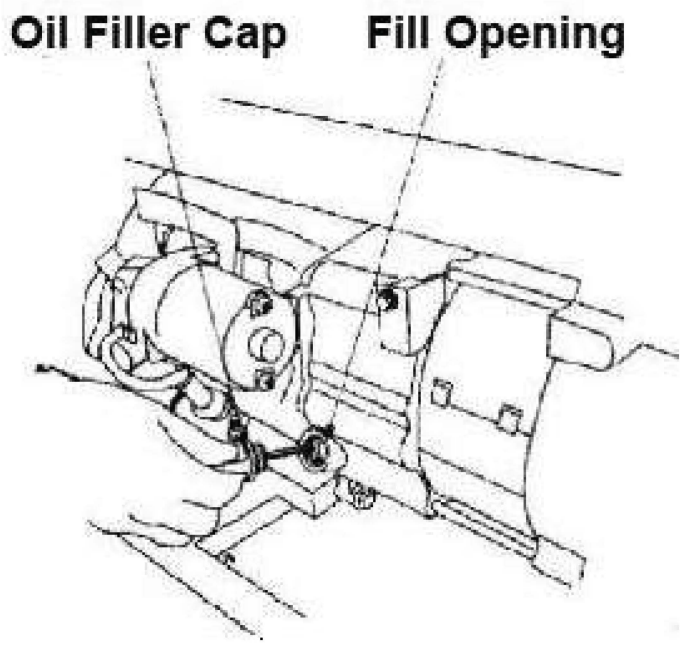
⚠ **Never** clean your generator with a bucket of water or a hose. Water can get inside the working parts of the generator and cause a short circuit or corrosion.

Checking the Oil

The generator is equipped with an automatic shutoff to protect it from running on low oil. Nonetheless, you should check the oil level of the generator before each use to ensure that the generator crankcase has a sufficient amount.

To check the oil level:

1. Make sure the generator is on a level surface.
2. Unscrew the oil filler/dipstick cap (see *figure 14*).
3. With a dry cloth, wipe the oil off of the stick on the inside of the cap.
4. Insert the dipstick as if you were replacing the cap and then remove again. There should now be oil on the stick. If there is no oil on the stick, or oil only at the very end of the stick, you should add oil until the engine crankcase is filled. See "*Changing/ Adding Oil*" in this section.
5. Be sure to replace cap when you are finished checking the oil.



You should check the oil level of your generator according to the maintenance schedule in *figure 13*. When the oil level is low you will need to add oil until the level is sufficient to run the generator. The oil capacity of your generator engine is listed in *figure 15*.

Model number	**XP4400**	**XP4400E**
Engine oil capacity	20 fluid oz.	20 fluid oz.

Figure 15- Engine Oil Capacity.

It is only necessary to drain the oil from the crankcase, other than for regular oil changes if it has become contaminated with water or dirt. In this case, you can drain the oil from the generator according to the following steps:

1. Place an approved oil disposal container underneath the generator to catch oil as it drains.
2. Using a 10 mm hex wrench, unscrew the oil drain plug, which is located on the crankcase underneath the oil filler/dipstick cap (see *figure 16*). Allow all the oil to drain from the generator.
3. Replace the oil drain plug and tighten with a 10 mm hex wrench.

To add oil to the crankcase, follow these steps:

1. Make sure the generator is on a level surface.
2. Unscrew the oil filler/dipstick cap from the engine as shown in *figure 14* above.
3. Using a funnel, add motor oil to the crankcase. We recommend SAE 10W30 motor oil for general use. When full, the oil level should come close in the top of the oil fill opening (*see figure 17*).

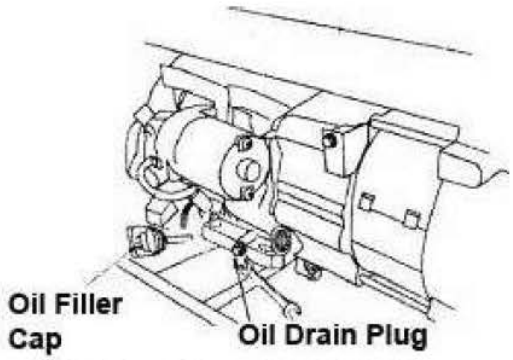


Figure 16: Draining Oil



Figure 17: Adding Oil

NOTE: Never dispose of used motor oil in the trash or down a drain. Please call your local recycling center or auto garage to arrange oil disposal.

Air Cleaner Maintenance

Routine maintenance of the air cleaner helps maintain proper airflow to the carburetor. Occasionally check that the air cleaner is free of excessive dirt.

1. Unhinge the clasps at the top and bottom of the air cleaner cover (see *figure 18*).
2. Remove the sponge-like elements from the casing.
3. Wipe the dirt from inside the empty air cleaner casing.
4. Wash the sponge-like elements in household dish detergent and warm water.
5. Allow the elements to dry completely.
6. Soak the dry elements in a small amount of engine oil. Ring out any excess oil.
7. Replace the sponge-like elements in the air cleaner casing and replace the cover.

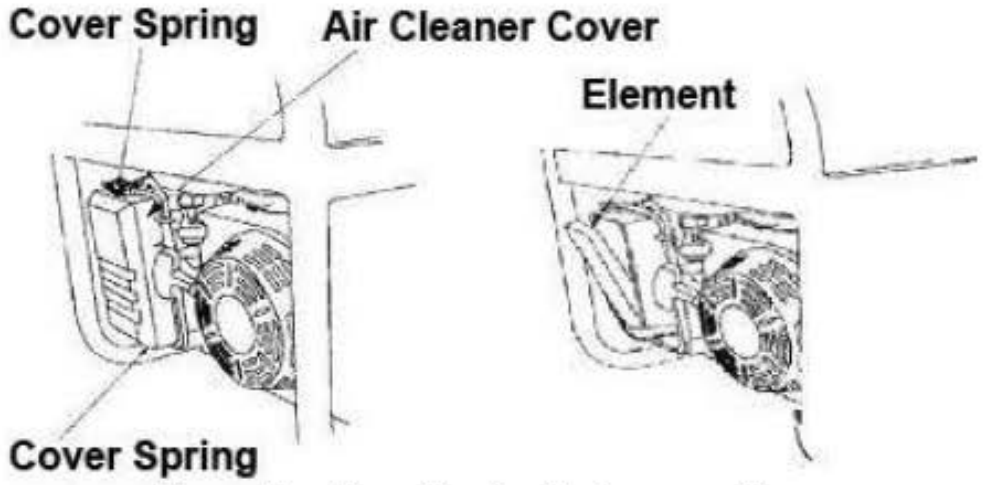


Figure 18 – Removing the air cleaner casing.

Fuel Filter Cup Cleaning

The fuel filter cup is a small well underneath the fuel valve. It helps to trap dirt and water that may be in your fuel tank before it can enter the engine.

To clean the fuel filter cup:

1. Turn the fuel valve to the "OFF" position.
2. Unscrew the fuel filter cup from the fuel valve using a wrench. Turn the valve toward you to unscrew (*see figure 19*).
3. Clean the cup of all sediment using a rag or brush.
4. Reinstall the fuel filter cup.

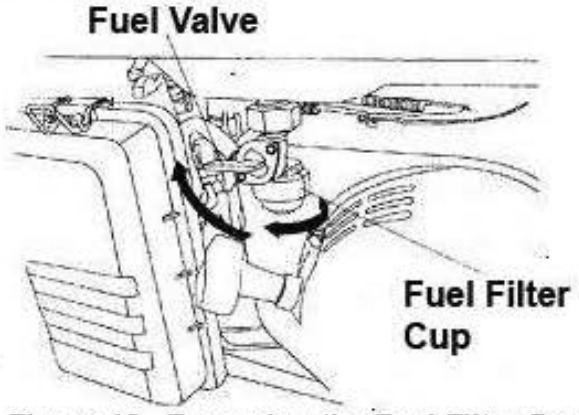


Figure 19 –Removing the Fuel Filter Cup

Spark Plug Maintenance

The spark plug is important for proper engine operation. A good spark plug should be intact, free of deposits, and properly gapped.

To inspect you spark plug:

1. Pull on the spark plug cap to remove it.
2. Unscrew the spark plug from the generator using the spark plug wrench included with this product (see *figure 20*).
3. Visually inspect the spark plug. If it is cracked or chipped, discard and replace with a new spark plug. We recommend using a F6RTC spark plug such as NGK BPR5ES.
4. Measure the plug gap with a gauge (see *figure 21*). The gap should be 0.7-0.8 mm (0.028-0.031 in).
5. If you are re-using the spark plug, use a wire brush to clean any dirt from around the spark plug base and then re-gap the spark plug.

6. Screw the spark plug back into its place on the generator using the spark plug wrench.
7. Replace the spark plug cap.

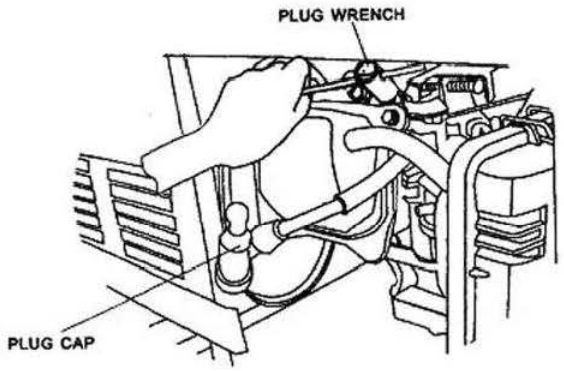


Figure 20- Removing the spark plug

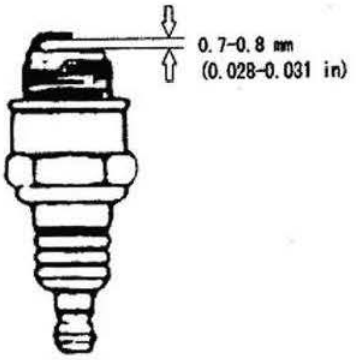


Figure 21- Measuring the spark plug gap

Emptying the Gas Tank

Before storing your generator for extended periods of time, you should drain your generator of gasoline.

To drain the generator of gas:

1. Turn the fuel valve to the "OFF" position.
2. Remove the fuel filter cup (see "*Removing the Fuel Filter Cup*" earlier in this section.
3. Empty the fuel filter cup of any fuel.
4. With a receptacle underneath the generator to catch the gas, turn the fuel valve to the "ON" position. Drain all the gas from the generator.
5. Turn the fuel valve to the "OFF" position.
6. Replace the fuel filter cup.
7. Store the emptied gasoline in a suitable place.

⚠CAUTION: Do not store fuel from one season to another.

STORAGE/TRANSPORT PROCEDURES

⚠ Caution: Never place any type of storage cover on the generator while it is still hot.

When transporting or storing your generator for extended periods of time:

- Empty the gas tank (see "*Emptying the Gas Tank*" in the "*Maintenance*" section).
- Disconnect the spark plug.
- Do not obstruct any ventilation openings.
- Keep the generator in a cool dry area.

GENERATOR SPECIFICATIONS

AC Output

	XP4400H	XP4400EH
Rated Wattage	3500W	3500W
Surge Wattage	4400W	4400W
Rated Voltage	120/240V	120/240V
Rated Frequency	60Hz	60Hz
Phase	Single	Single

DC Output

	XP4400H	XP4400EH
Voltage	12V	12V
Amperage	8.3A	8.3A
Dimensions (in):	Length=23.2 Width=17 Height=17	Length=23.2 Width=17 Height=17

Engine

	XP4400H	XP4400EH
Engine type	4-stroke OHV single cylinder with forced air cooling system	
Ignition system	Non-contact transistor	
Displacement	200cc	
Starting type	Recoil	Electric
Fuel tank capacity:	15L(3.96US gal.)	
Oil capacity	0.6L(20fl oz.)	
Run time on 50% load	14hrs	12 hrs
Noise Level	< 69dB	

TROUBLESHOOTING

Problem	Cause	Solution
Engine will not start	Engine switch is set to “OFF”.	Set engine switch to “ON”.
	Fuel valve is turned to “CLOSED”.	Turn fuel valve to “OPEN” position.
	Choke is open.	Close the choke
	Engine is out of gas.	Add gas.
	Engine is filled with contaminated or old gas	Change the gas on the engine.
Engine will	Spark plug is dirty.	Clean spark plug.
not start (continued from page 19)	Spark plug is broken.	Replace spark plug.
	Generator is not on level surface.	Move generator to a level surface to prevent low oil shutdown from triggering.
	Oil is low	Add or replace oil.
Engine runs but there is no electrical output	Circuit breaker is off.	Set the circuit breaker to the “ON” position.
	Bad connecting wires/cables.	If you are using an extension cord, try a different one.
	Bad electrical device connected to generator.	Try connecting a different device.
Generator runs but does not support all electrical devices connected.	Generator is overloaded	Try connecting fewer electrical loads to the generator.
	Shorten one of the connected devices.	Try disconnecting any faulty or short-circuited electrical loads.
	Air cleaner is dirty.	Clean or replace air cleaner.

GENERATOR ASSEMBLY AND MOUNTING

Generator is supplied with a wheel kit. If you want to install the wheel kit on your unit, please follow the instructions below. If you will not be using the wheel kit, skip this section.

1. Place the bottom of the generator cradle on a flat, even surface. Temporarily place unit on blocks to ease assembly.
2. Secure the support leg to the cradle with cap screws (M8 x 16) and lock nuts (M8) (see *figure 22*).
3. Secure the axle to the cradle with cap screws (M8 x 16) and lock nuts (M8) (see *figure 23*).
4. Slide a wheel over the axle, then secure the wheel with a retaining pin. (see *figure 24,Figure 25, Figure 26*).
5. Position the handles on the cradle and attach, cap screws (M8 x 16) and lock nuts (M8) (*Figure 27,Figure 28*).
6. Check that all fasteners are tight.



Figure 22



Figure 23



Figure 24



Figure 25



Figure 26



Figure 27

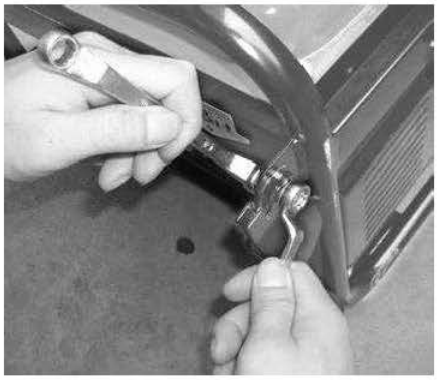
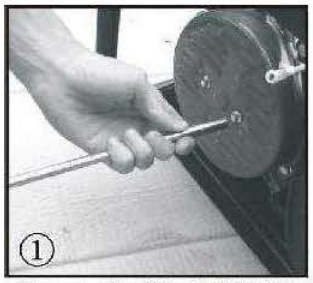
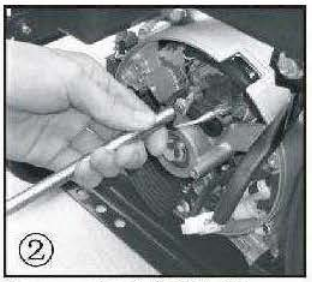


Figure 28

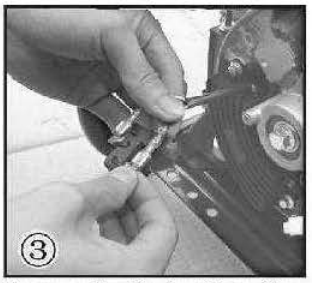
CHANGE THE CARBON-BRUSH



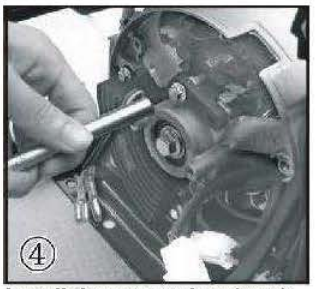
Remove the 2 bolts (M5x12) on the generator back-cover



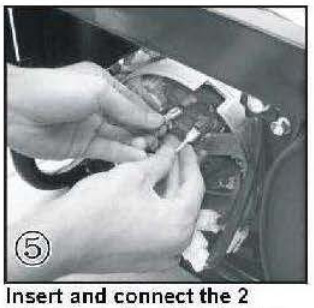
Remove the bolt (M5x16) holding the carbon brush.



Remove the 2 wires from the AVR on the carbon brush.



Install the new carbon brush with bolt (M5x16)

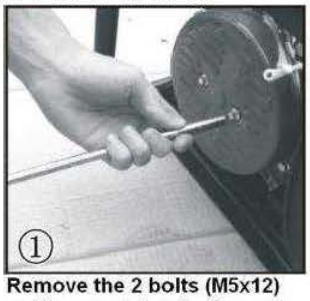


Insert and connect the 2 wires from the AVR, be sure to connect + and - correctly.



Replace the back cover of the generator and secure with the 2 bolts (M5x12)

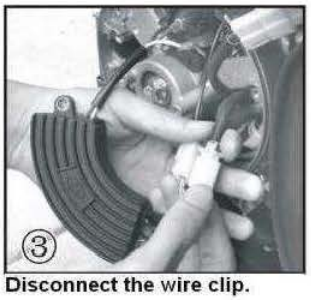
CHANGE THE AVR



Remove the 2 bolts (M5x12) on the generator back cover.



Remove the 2 bolts (M5x16) holding the AVR.



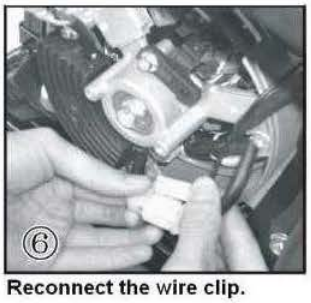
Disconnect the wire clip.



Remove the 2 wires of the AVR from the carbon brush.



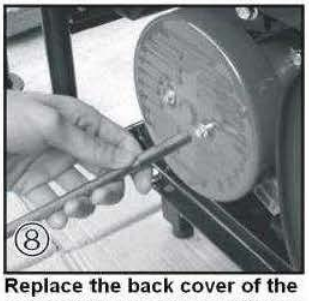
Install the new AVR with the 2 bolts (M5x16).



Reconnect the wire clip.

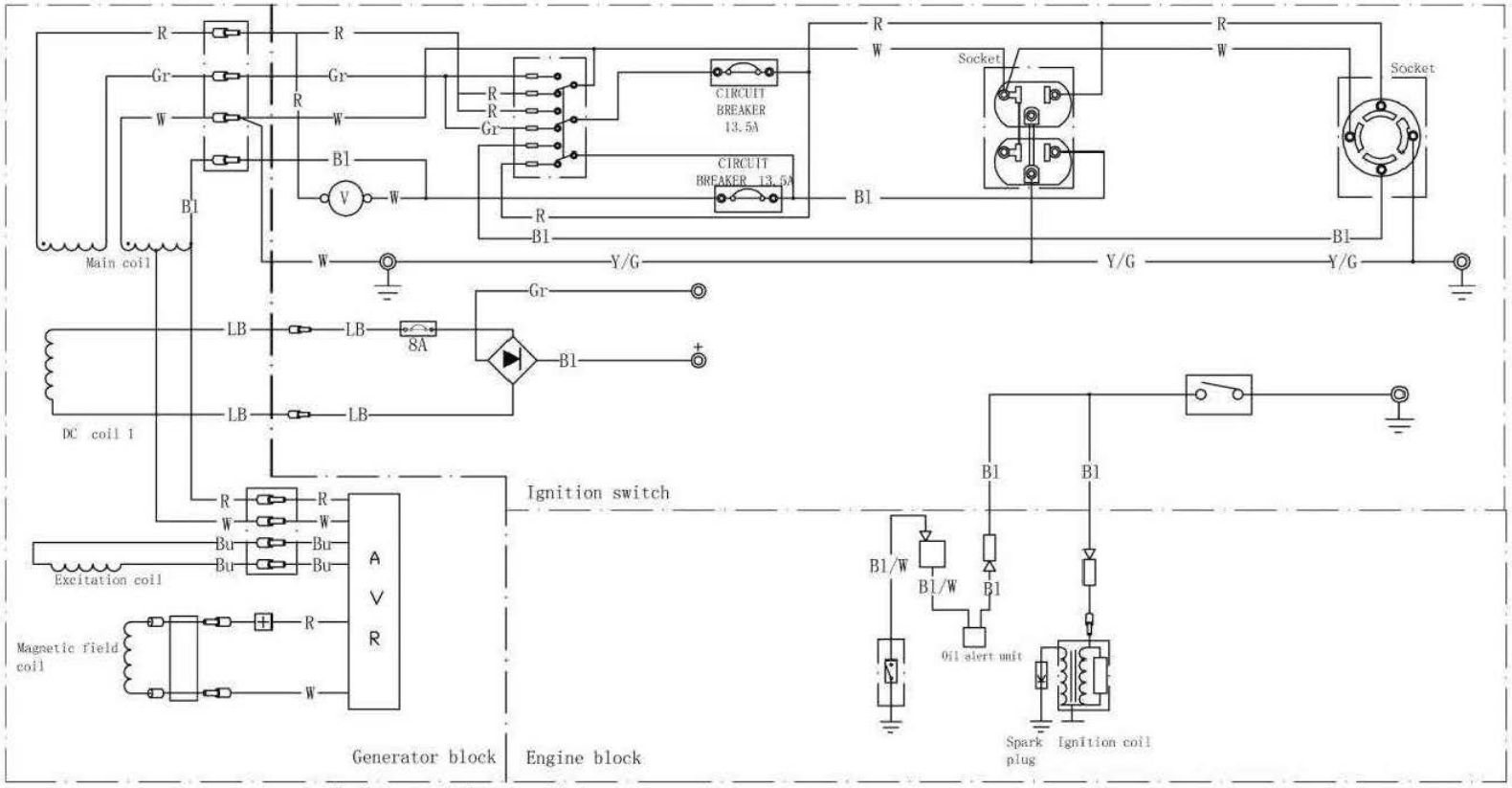


Connect the 2 wires to the carbon brush, be sure to connect the + and - correctly.



Replace the back cover of the generator and secure with the 2 bolts (M5x12).

WIRING DIAGRAM (XP4400H)



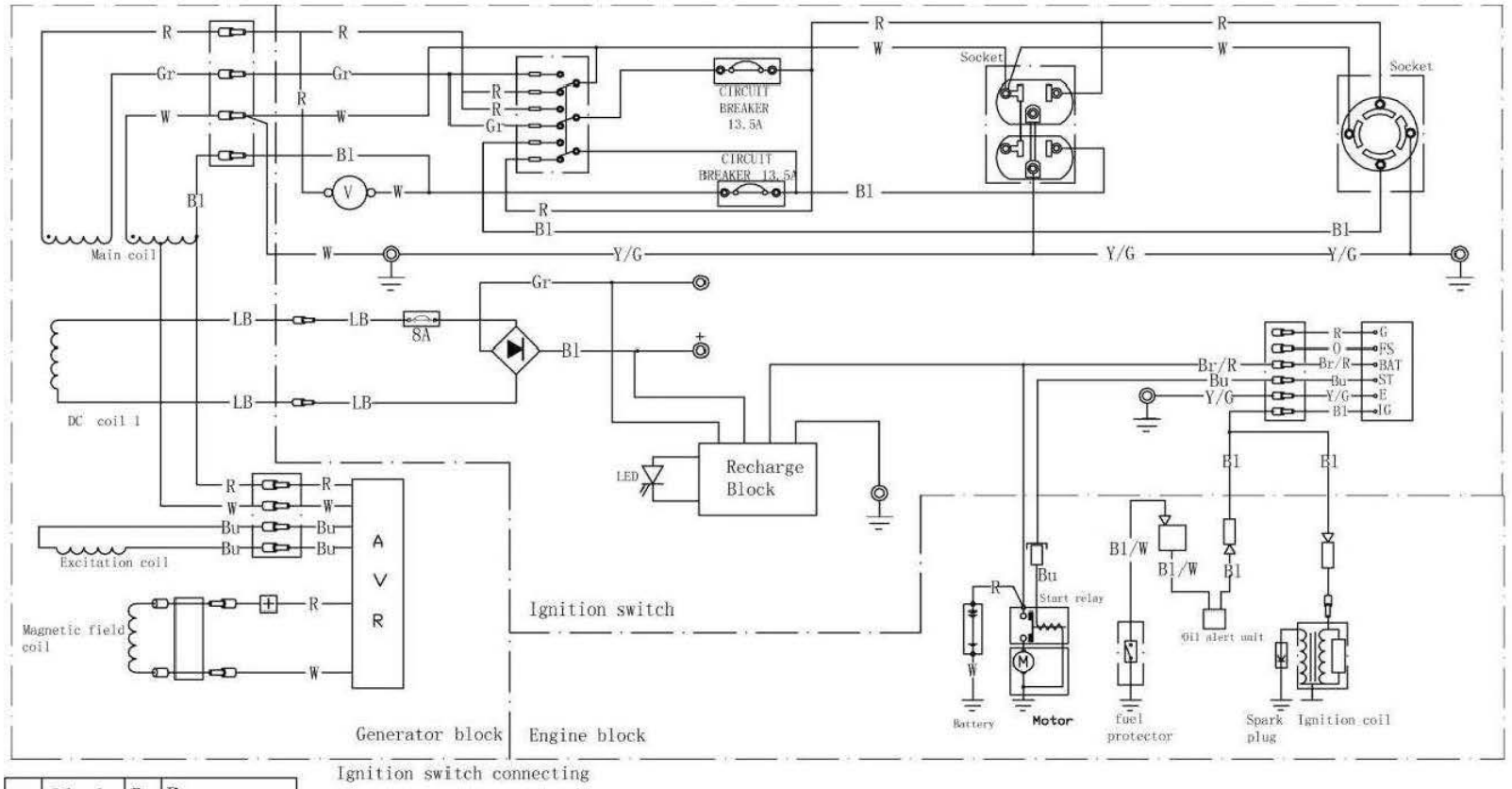
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O	Orange	Br/R	Brown/Red
Bu	Blue	LB	Light blue
Gr	Gray	Y/G	Yellow/Green
R	Red	W	White

	IG	E	BAT	ST	FS	G
OFF	o	o				o
ON						
Start				o		

WIRING DIAGRAM OF 120V/240V GENERATOR SET

Petitioner MWE Investments, LLC, et al.
Exhibit 1003, Page 1396

WIRING DIAGRAM (XP4400EH)



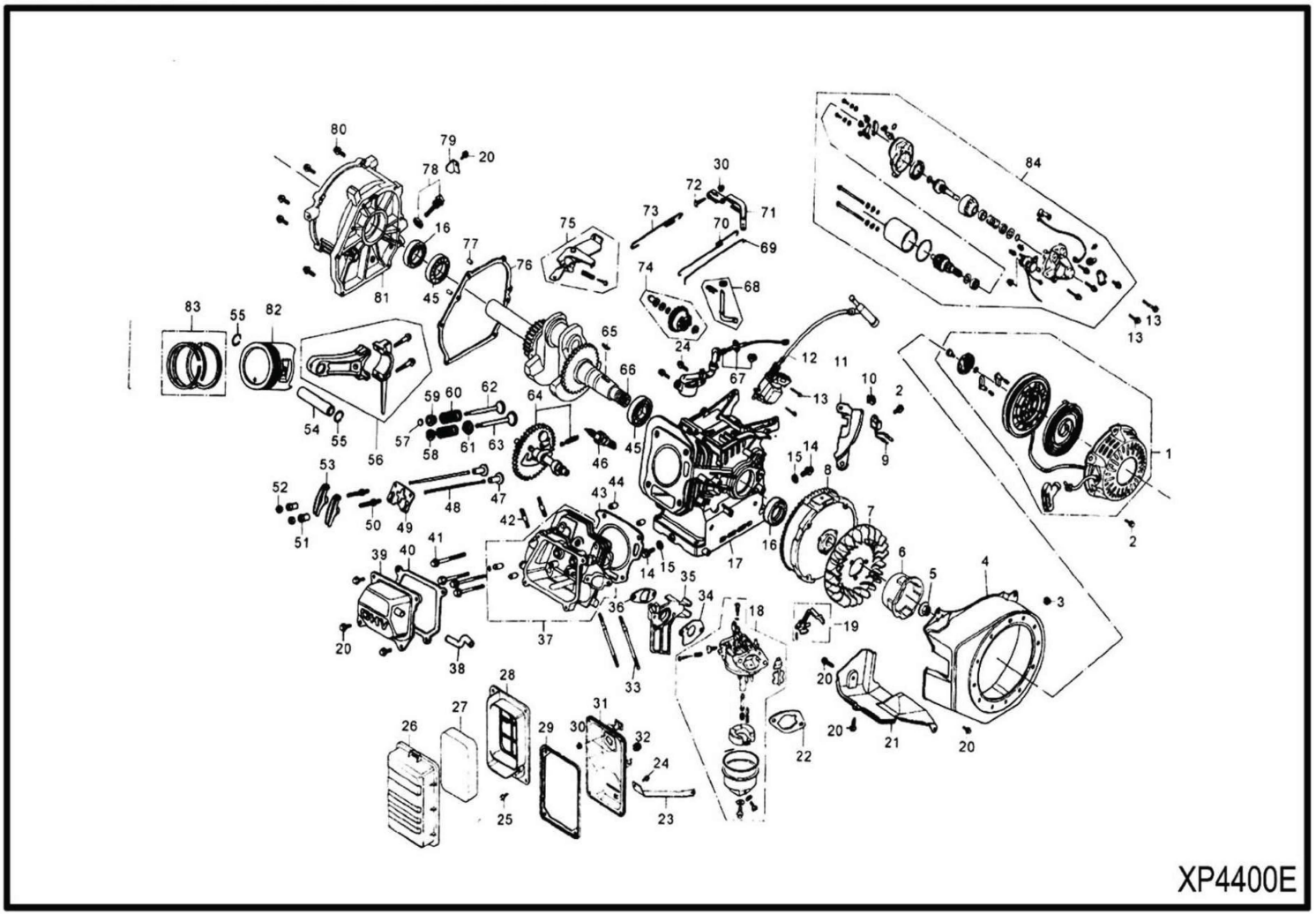
Bl	Black	Br	Brown
O	Orange	Br/R	Brown/Red
Bu	Blue	LB	Light blue
Gr	Gray	Y/G	Yellow/Green
R	Red	W	White

	IG	E	BAT	ST	FS	G
OFF	o	o				o
ON						
Start				o	o	

WIRING DIAGRAM OF 120V/240V GENERATOR SET

Petitioner MWE Investments, LLC, et al.
Exhibit 1003, Page 1397

XP4400E ENGINE EXPLODED



PARTS LIST

Part No.	Article Name	Qty	Cross Reference	Reference No.
1	Recoiler COMP	1	DJ168F-16121-K	XP4400E-1
2	Flange Bolt.M6*8	4	GBT5787-B6-8	XP4400E-2
3	Grommet Drain Hole	1	DJ168F-16118	XP4400E-3
4	Covering Fan COMP	1	DJ170N-16121-A	XP4400E-4
5	Flange, Nut M14	1	GBT6177/10-N-14	XP4400E-5
6	Starting Pulley	1	DJ168F-16000-A	XP4400E-6
7	Cooling Fan	1	DJ168F-16002-A	XP4400E-7
8	Flywheel COMP	1	DJ168F-16200-I	XP4400E-8
9	Oil Blocker	1	DJ168F-18300-A	XP4400E-9
10	**Clip, Oil blocker**	**1**	****SEE REF NO.**	**XP4400E-10**
11	Side Plate	1	DJ170S-11400-A	XP4400E-11
12	Coil ASSY, Ignition	1	DJ168F-18100-C	XP4400E-12
13	Flange Bolt M6*25	2	GBT5787-B6-25	XP4400E-13
14	Bolt, Drain plug	2	DJ168F-11004-A	XP4400E-14
15	Washer, Drain plug	2	DJ168F-11005-A	XP4400E-15
16	Oil seal, 25*41*6	2	DJ168F-11014-A	XP4400E-16
17	Crank Case ASSY	1	DJ170F-11100-C	XP4400E-17
18	**LPG Carburetor ASSY**	**1**	**DJ170FD-14100-C**	**XP4400E-18**
19	Lever COMP, Choke	1	DJ168F-14119	XP4400E-19
20	Flange Bolt M6*12	11	GBT5787-B6-16	XP4400E-20
21	Shroud COMP	1	DJ168F-11012-A	XP4400E-21
22	Gasket, Carburetor to Air cleaner	1	DJ168F-14027-A	XP4400E-22
23	Stay, Air cleaner	1	DF2500H-14205-A	XP4400E-23
24	Flange Bolt M6*12	3	GBT5787-B6-12	XP4400E-24
25	Bolt,M5*12	4	GBT5787-B5-14	XP4400E-25
26	Cover COMP, Air cleaner	1	DJ168F-14204	XP4400E-26
27	Element, Air cleaner	1	DJ170F-14201	XP4400E-27
28	Seperator, Air cleaner	1	DJ168F-14202	XP4400E-28
29	Seal, air cleaner	1	DJ168F-14206	XP4400E-29
30	Flange nut M6	2	GBT6177-N-6	XP4400E-30
31	Case COMP, air cleaner	1	DJ168F-14205-A	XP4400E-31
32	Grommet Fender	1	DJ168F-14014-A	XP4400E-32
33	Bolt Head, 6*94	2	DJ168FD-14001-A	XP4400E-33
34	Gasket,Carburetor	1	DJ168F-14005-A	XP4400E-34
35	Heat Isolator,Carburetor	1	DJ168F-14004-A	XP4400E-35
36	Packing, Heat isolator	1	DJ168F-14003-B	XP4400E-36
37	Cylinder Head COMP	1	DJ170F-11200-B	XP4400E-37
38	Breather	1	DJ168FD-11013-A	XP4400E-38
39	Cover COMP, Cylinder head	1	DJ168F-11300-C	XP4400E-39
40	Gasket,Cylinder head	1	DJ168F-11011-A	XP4400E-40
41	Flange Bolt M8*60	4	GBT5787-B8-60	XP4400E-41
42	Bolt Head, M8*32	2	DJ168F-14002-A	XP4400E-42
43	Gasket,Cylinder head	1	DJ170F-11010-C	XP4400E-43
44	Pin,Dowel 10*16	2	DJ168F-11009-A	XP4400E-44
45	Radial Ball Bearing(6025)	2	GB276-89-6205	XP4400E-45

Part No.	Article Name	Qty	Cross Reference	Reference No.
46	Spark Plug	1	DJ168F-18500-A	XP4400E-46
47	Valve Lifter	2	DJ170F-13009-A	XP4400E-47
48	Push Rod	2	DJ170F-13008-B	XP4400E-48
49	Plate,Push rod guide	1	DJ168F-13300-A	XP4400E-49
50	Bolt,Pivot	2	DJ168F-13202-A	XP4400E-50
51	Nut,Valve rocker am	2	DJ168F-13203-A	XP4400E-51
52	Nut, Pivot Adjust	2	DJ168F-13204-A	XP4400E-52
53	Valve Rocker Am	2	DJ168F-413201-A	XP4400E-53
54	Piston Pin	1	DJ170F-12002-A	XP4400E-54
55	Clip, Piston pin	2	DJ168F-12003-A	XP4400E-55
56	Connecting Rod ASSY	1	DJ170F-12200-B	XP4400E-56
57	Valve Rocker	1	DJ168F-13006-A	XP4400E-57
58	Retainer,Intake Valve spring	1	DJ168F-13004-A	XP4400E-58
59	Retainer,EX.Valve spring	1	DJ168F-13005-A	XP4400E-59
60	Valve Spring	2	DJ168F-13003-A	XP4400E-60
61	Valve Spring Seat	1	DJ168F-13010-A	XP4400E-61
62	Valve Exhaust	1	DJ168F-13001-A	XP4400E-62
63	Valve,Intake	1	DJ168F-13002-A	XP4400E-63
64	Camshaft	1	DJ168F-13100-B	XP4400E-64
65	Key,25*18	1	DJ168F-12104	XP4400E-65
66	Crankshaft	1	DJ168F-12100-BB	XP4400E-66
67	Switch ASSY, Oil level	1	DJ168F-18200-A	XP4400E-67
68	Governor Shaft	1	DJ168F-15001-A	XP4400E-68
69	Rod,Governor arm	1	DJ168F-15006-A	XP4400E-69
70	Spring, Throttle return	1	DJ170F-15008-A	XP4400E-70
71	Governor Arm	1	DJ168F-15004-A	XP4400E-71
72	Bolt, Governor arm	1	DJ168F-15005-A	XP4400E-72
73	Governor Spring	1	DJ170F-15007-A	XP4400E-73
74	Governor ASSY	1	DJ168F-15100-A	XP4400E-74
75	Control ASSY	1	DJ168FD-15200-A	XP4400E-75
76	Packing, Case cover	1	DJ170F-11003-B	XP4400E-76
77	Pin,Dowel 8*14	2	DJ168F-11002-F	XP4400E-77
78	Cap, Oil filler	1	DJ168F-11007-A	XP4400E-78
79	Plat	1	DF1800H-33016-A	XP4400E-79
80	Flange Bolt M8*32	6	GBT5787-B8-35	XP4400E-80
81	Crankcase Cover	1	DJ168FD-11001-C	XP4400E-81
82	Piston	1	DJ170F-12001-B	XP4400E-82
83	Piston Ring Set	1	DJ170F-12300-A	XP4400E-83
84	Start Motor	1	DJ168F-18600-A	XP4400E-84

XP4400E OTHERS EXPLODED

