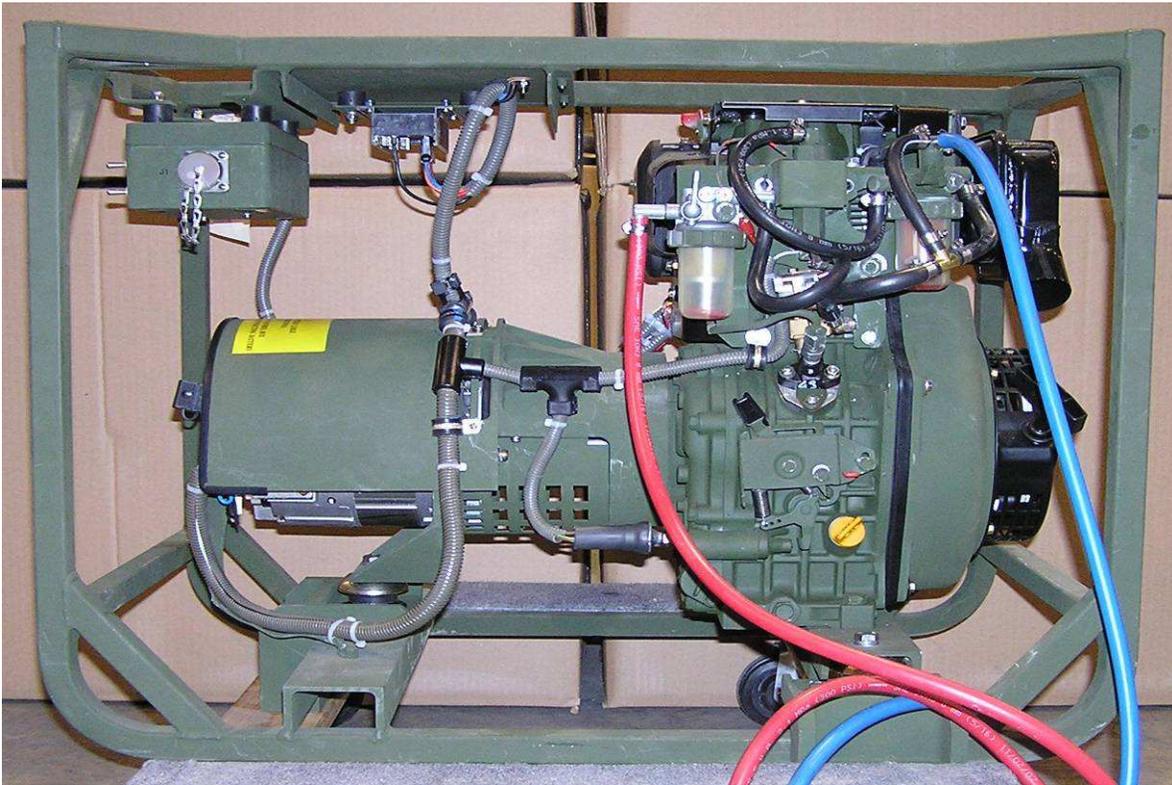




**OPERATOR'S MANUAL  
VPS, 28VDC, 3500W**

**P/N: 70101-501**



**The Dewey Electronics Corporation  
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Tel: 201-337-4700  
<http://www.deweyelectronics.com>**



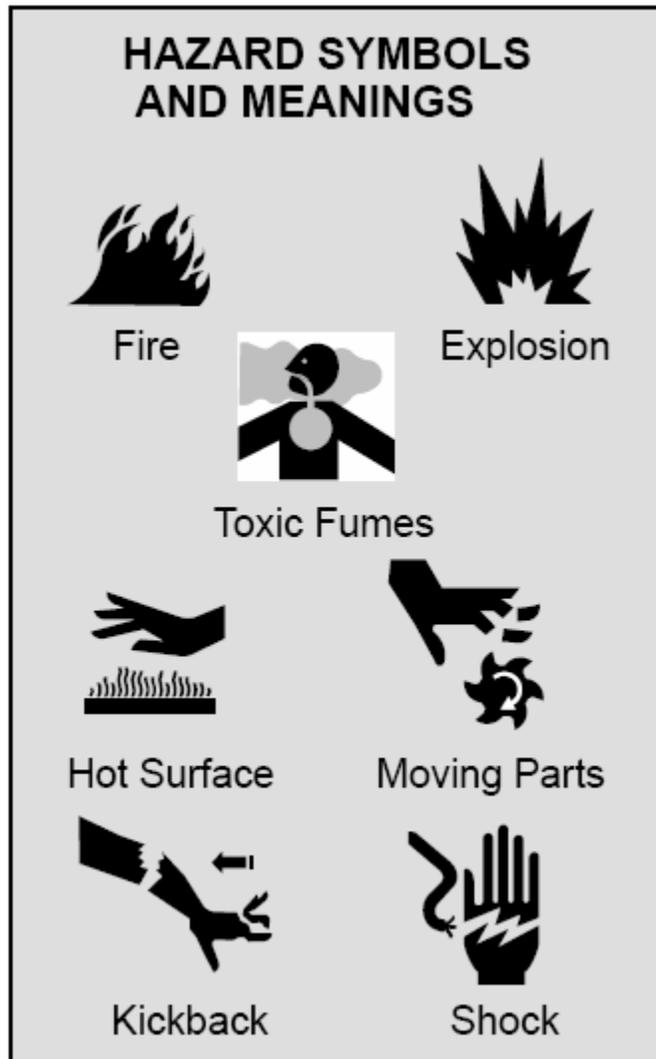
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## SAFETY RULES

The safety alert symbol (  ) is used with a signal word (**DANGER, CAUTION, WARNING**), a pictorial and/or a safety message to alert you to hazards. **DANGER** indicates a hazard which, if not avoided, *will* result in death or serious injury. **WARNING** indicates a hazard which, if not avoided, *could* result in death or serious injury. **CAUTION** indicates a hazard which, if not avoided, *might* result in minor or moderate injury. **CAUTION**, when used without the alert symbol, indicates a situation that could result in equipment damage. Follow safety messages to avoid or reduce the risk of injury or death.



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Fuel and its vapors are extremely flammable and explosive.

Fire or explosion can cause severe burns or death.

**WHEN ADDING OR DRAINING FUEL**

- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- DO NOT light a cigarette or smoke.

**WHEN STARTING EQUIPMENT**

- Ensure muffler and air filter are in place.
- If fuel spills, clean up the affected area before starting engine.

**WHEN OPERATING EQUIPMENT**

- Do not tip engine or equipment at angle which causes fuel to spill.

**WHEN REPAIRING EQUIPMENT**

- Repair with fuel shutoff valve OFF.

**WHEN STORING FUEL OR EQUIPMENT WITH FUEL IN TANK**

- Store away from furnaces, stoves, water heaters, clothes dryers or other appliances that have pilot light or other ignition source because they can ignite fuel vapors.



 <b>Fire</b>	<b>Unintentional sparking can result in fire.</b>
<b>WHEN ADJUSTING OR MAKING REPAIRS TO YOUR GENERATOR</b> <ul style="list-style-type: none"><li>• Disconnect the VPS cables from the battery source.</li></ul>	

 <b>Toxic Fumes</b>	<p>Running generator gives off carbon monoxide, an odorless, colorless, poison gas. Breathing carbon monoxide will cause nausea.</p> <ul style="list-style-type: none"><li>• Operate generator <b>ONLY</b> outdoors.</li><li>• Keep exhaust gas from entering a confined area through windows, doors, ventilation intakes or other openings.</li><li>• <b>DO NOT</b> operate VPS inside any building or enclosure, including the generator compartment of a vehicle.</li></ul>
--	--



 Hot Surface	<p>Running engines produce heat. Temperature of muffler and nearby areas can reach or exceed 150°F (65°C). Severe burns can occur on contact.</p>
<ul style="list-style-type: none"><li>• <b>DO NOT touch hot surfaces. Allow equipment to cool before servicing.</b></li></ul>	

**WARNING**

High fuel pressure is generated as a result of operation of the generator set. High-pressure leaks could cause severe personal injury or death.

**WARNING**

Avoid contacting metal items with bare skin in extremely cold weather. Failure to observe this warning can result in personal injury.

**WARNING**

Remove metal jewelry when working on electrical systems/components. Failure to observe this warning could cause severe personal injury from high current burns.

**WARNING**

The noise level of this generator set when operating could cause hearing damage. Hearing protective devices must be worn when operating or working within close proximity of the generator set when it is running. Failure to observe this warning can result in personal injury.

**WARNING**

Never attempt to start the generator set if it is not properly grounded. Failure to observe this warning could result in serious injury or death by electrocution.

**WARNING**

Never attempt to connect or disconnect load cables while the generator set is running. Failure to observe this warning could result in severe personal injury or death by electrocution.



**WARNING**

If the 24 VDC battery source is connected, DC voltages are present at the generator set electrical components even with the generator set shutdown. Avoid grounding self when touching any electrical components. Failure to observe the warning can result in personal injury.

**WARNING**

The fuels in this generator set are flammable. Do not smoke or use open flames when performing maintenance. Do not service or drain the fuel system while open flames are present. Flames and explosion could result in severe personal injury or death. Use a container or cloth to catch any excess fuel to prevent spilling over engine components. Be sure to properly dispose of diesel fuel soaked cloths.

**WARNING**

CARC paint dust is a health hazard. Wear protective eyewear, mask, and gloves when sanding CARC painted surfaces. Failure to comply can cause personal injury.

**WARNING**

The LVPS utilizes an output current limiting regulator. Inherent in its design (exclusive of the batteries) is built in short circuit protection. If a dead short is applied across the alternator terminals, the output current and voltage drop to zero. In regards to a short circuit condition across the batteries, it is not possible to implement any battery short circuit protection scheme at the LVPS side of the application. This is due to the fact that the battery is an output source in its own right. Any battery short circuit protection scheme would have to be implemented at the battery terminals and not at the LVPS connections. Factors affecting this depend on battery location, battery cable wear and care and handling in the battery connection procedures. All of these factors are end user dependent and render any battery short circuit protection scheme to the LVPS “application specific” by its nature.

**THE LVPS IS NOT PROTECTED BY AN OUTPUT CIRCUIT BREAKER.** To avoid accidental short circuits when connecting the battery cables to the LVPS, connect the positive cable first and then connect the negative cable. When removing the battery cable, first remove the negative cable and then remove the positive cable. Failure to observe this warning can result in personal injury.

**CRITICAL SAFETY ITEMS LIST**

The following is a list of critical safety items for operating the generator sets:

1. Ensure that the generator set is properly grounded.
2. Ensure that the load cables are properly installed.
3. Diesel engine exhaust and some of its constituents are known in the State of California to cause cancer, birth defects, and other reproductive harm.

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## VPS GENERAL OVERVIEW

The VPS is a 3500W, 28VDC power generator manufactured by Dewey Electronics Corporation designed to operate in parallel with the 24V Vehicle Power System. This section provides general overview and summary ratings of the VPS, and identifies key components of the unit.

## SUMMARY SPECIFICATION

<b>ELECTRICAL RATINGS</b>	
Output Voltage	24VDC (28VDC)
Output power	3500W at 28VDC
<b>SIZE and WEIGHT</b>	
Length	33"
Width	21"
Height	25"
Weight	201 lbs, Dry.
<b>Operating Environment.</b>	
Temperature Range	-51 to 130°F (-46 to +50 °C)
Incline Angle	15° max.
<b>ENGINE</b>	
Manufacturer	Yanmar
Model	<b>L 100V</b>
Engine Type:	Air cooled, 4 cycle, Vertical Cylinder
Fuel:	Diesel
Number of Cylinders:	1
Bore x Stroke, mm:	86 x 75
Total Displacement (cc):	435
Combustion Type:	Direct Injection
Aspiration:	Natural Aspiration
Valves per Cylinder:	2
Rated Speed:	3600 rpm
Net Intermittent Hp ([kW] / rpm):	9.1 [6.8] / 3600
Net Continuous Hp ([kW] / rpm):	8.3 [6.2] / 3600

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<b>ENGINE (Cont.)</b>	
Direction of Rotation:	Counter Clockwise, Viewed from PTO Side
Crankshaft Type:	Straight Keyed, Tapered or Threaded
Starting System:	24 V Electric
Decompression System:	Manual Type with Auto-return Lever
Charging System:	24 Volt
Electric Stop Device:	Fuel Stop Solenoid
Brake Specific Fuel Consumption at Rated Output, g / kW-hr:	279
Lubrication System:	Pressure Lubrication with Trochoid Pump
Engine Oil Pan Capacity	Dipstick Upper Limit = 1.7 qt (1.6L) Dipstick Lower Limit = 1.06 qt (1.0L)
Exhaust System:	Expansion Silencer with Cover
Air Cleaner:	Dry Type with Paper Element Filter
Balancing System:	Single, Counter-Rotating, Balancer Shaft
Length, Inches [mm]:	16.4 [417]
Width, Inches [mm]:	18.5 [470.5]
Height, Inches [mm]:	19.4 [493]
Dry Weight, lbs. (Recoil Start) [kg]:	105.8 [48.0]
Dry Weight, lbs. (Electric Start) [kg]:	120.2 [54.5]
Noise Output at Continuous Output Rating, Mean of Four Direction at 1 Meter:	97.0 dB(A)
<b>Fuel System:</b>	
Type of Fuel	DL-2, JP5, or JP8
Fuel Consumption Rate	4.64 gal/8.0 hrs @ 100% load
Max. Distance for Fuel Lines (Fuel Source to Fuel Pump)	72 inches
<b>ALTERNATOR</b>	
Manufacturer	Balmar Products Inc.
Type	Brush AC rectified to DC
Load Capacity	3.5 kW
Voltage Output	28 VDC
<b>Load Recovery Time (Voltage):</b>	
NL to FL	1.0 seconds
FL to NL	0.5 seconds
Cooling	Forced air
Lubrication Requirements	None
Drive Type	Direct coupling
Duty Classification	Continuous

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## **VPS COMPONENT IDENTIFICATION**

Please refer to **Figure 1** for the following description.

### **[1] YANMAR L100V ENGINE**

The VPS is powered by a one-cylinder, four-cycle, fuel injected, naturally-aspirated, air-cooled diesel engine which occupies the front half of the generator set. The engine is also equipped with a fuel filter, lubricating oil strainer, and foam covered, dry-paper air filter. A safety device automatically stops the diesel engine during conditions of low engine oil pressure.

### **[2] EXHAUST & MUFFLER**

The Engine exhaust gases pass through the muffler and out of the spark arrestor which diffuses the gas. **WARNING:** Temperature of muffler and nearby areas can reach or exceed 150°F (65°C). Severe burns can occur on contact. Combustible debris, such as leaves, grass, brush, etc... can catch fire. **WARNING:** Running the VPS gives off carbon monoxide; keep exhaust gas from entering a confined area through windows, doors, ventilation intakes, or other openings.

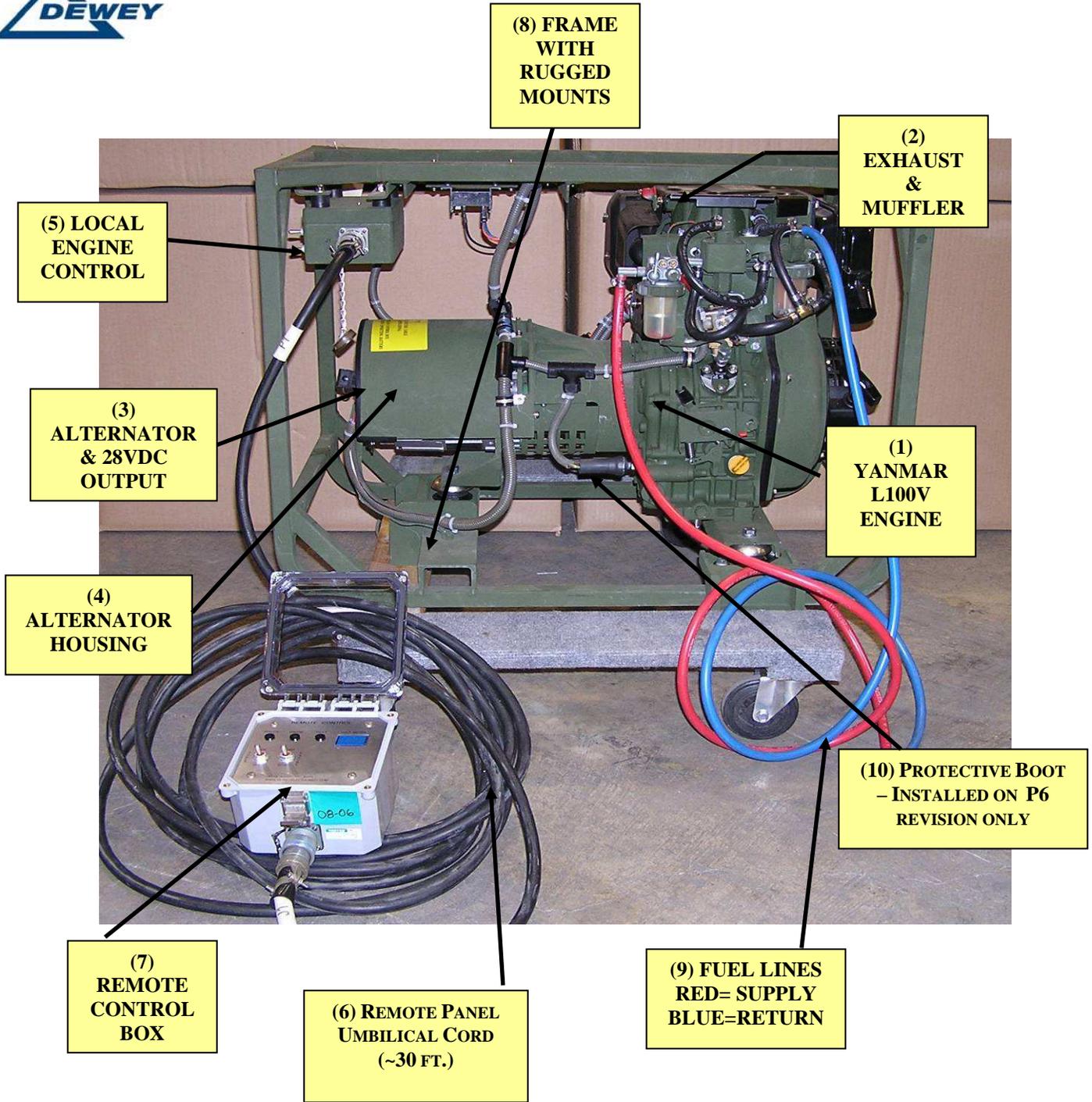
- DO NOT operate VPS inside any building or enclosure, including the generator compartment of a vehicle.

### **[3] ALTERNATOR & 28VDC OUTPUT**

The DC alternator is a two-pole, revolving field-type AC alternator rectified to DC. The alternator is coupled directly to the diesel engine crankshaft.

### **[4] ALTERNATOR HOUSING**

The Alternator housing shrouds the DC alternator. The housing protects the Alternator from falling debris as well offering additional protection to the operator against unwanted contact with rotating parts.



**FIGURE 1 VPS - MAJOR COMPONENTS**

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## [5] LOCAL ENGINE CONTROLLER

The Control to the VPS can be provided via local or remote means. The local control assembly is located on the rear of the unit and is shown in more detail in **Figure 2**.



**FIGURE 2**  
**VPS – GENERATOR CONTROLLER**

The indicators and controls on the Engine Controller assembly include:

**ELAPSED TIME METER** - Measures operating time in hours when the VPS is operational.

**FUEL PRIME SWITCH**- Activates the Fuel pump to prime the fuel lines.

**MODE SELECT SWITCH** – the Switch selects the operating mode of the VPS:

**REM** = Control is delegated to the Remote Control Box.

**OFF** = The system is off and draws no current from the vehicle battery. The switch should be in this position for VPS storage.

**LOC** = Local mode control where the VPS is controlled locally via the Engine Controller and the Remote Control Box has no influence on the VPS operation.

### **STATUS INDICATORS:**

**LOC (Amber)** -is illuminated when VPS is in Local Mode. (Will light when unit is running in REM mode)

**REM (Blue)** -is illuminated when VPS is in Remote Mode.

**ENG (Green)** -is illuminated when VPS engine is running.

**FAULT (Red)** -is illuminated when a fault has been detected.

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### [6] REMOTE PANEL UMBILICAL CORD

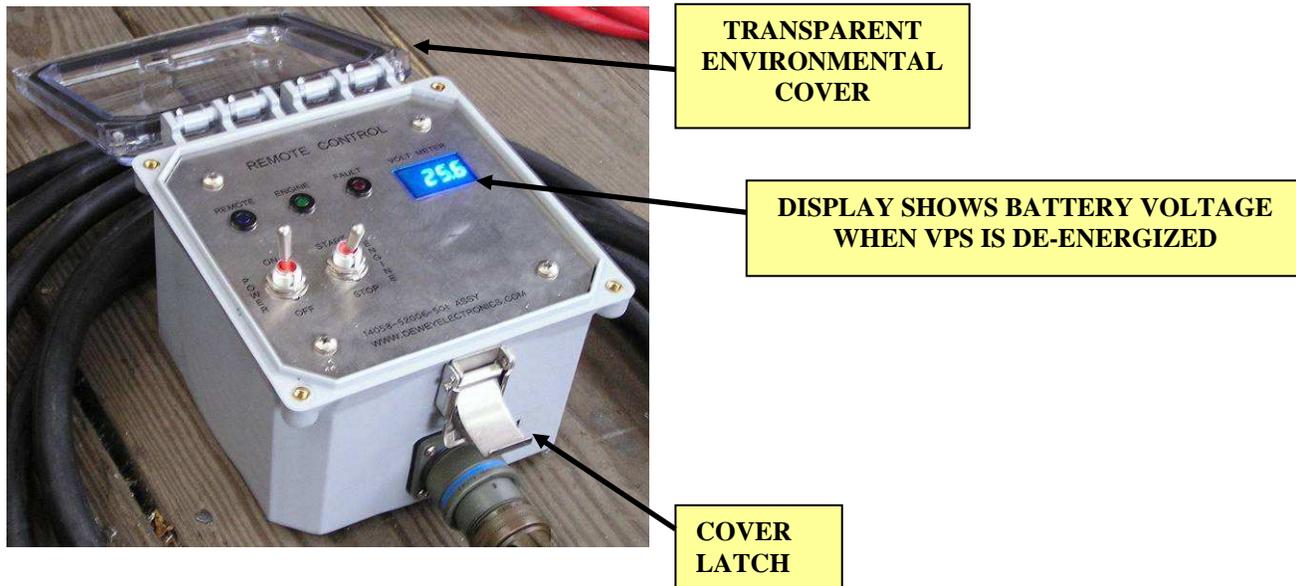
The remote umbilical cord connects the VPS to the Remote Control Box. The length of the umbilical cord is at least 25 feet.

### [7] REMOTE CONTROL BOX

The VPS can be controlled via remote means with the provided Remote Control Box, which is connected to the VPS through the approximately 25 ft Umbilical cord [6].

The Remote Control Box is a sealed assembly, protected from the environment only when the cover is securely closed. This assembly has a transparent cover that allows for monitoring of the Display and Switch settings.

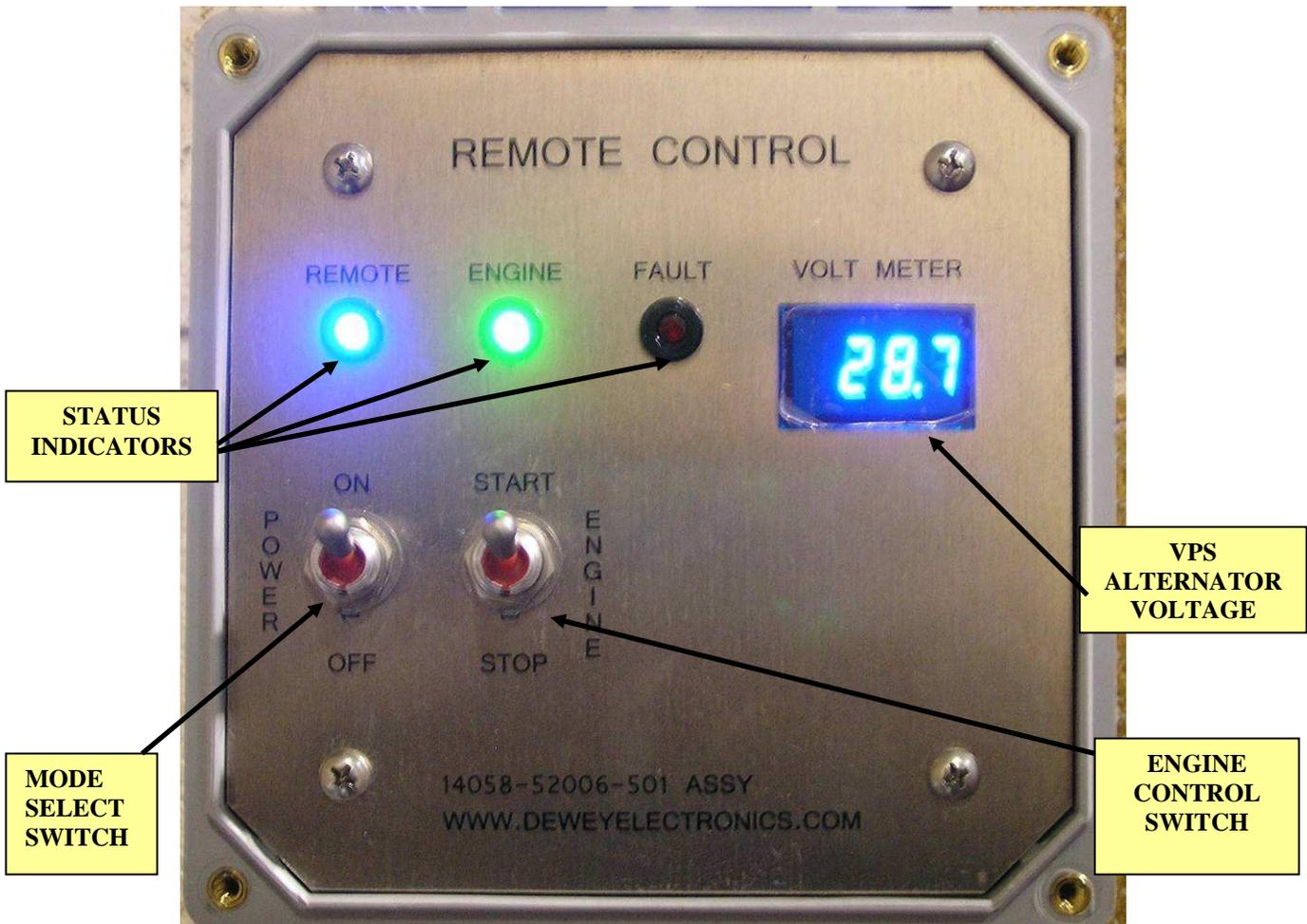
To operate the Remote Control Box, the cover must be opened by loosening the Cover latch (**Figure 3**)



**FIGURE 3 – VPS REMOTE CONTROL BOX**

The Controls of the Remote Control Box are shown in detail in **Figure 4**.

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**FIGURE 4**  
**VPS – REMOTE CONTROL PANEL**

**VOLTMETER** - The voltmeter measures the VPS output voltage. When the VPS is running, it measures the Alternator output. When the VPS is de-energized, it measures the voltage of the vehicle battery (if connected). The Voltmeter is deactivated when the Mode select switch is in “OFF” position to prevent energy drain from the vehicle battery.

**MODE SELECT SWITCH** – the Switch selects the operating mode of the VPS:

**ON** = The Remote Control Box is activated.

**OFF** = The system is OFF and draws no current from the vehicle battery. The switch should be in this position for VPS storage.

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**ENGINE CONTROL SWITCH** - Starts and stops the VPS engine.

**START** - Starts the VPS (refer the Instructions in the following section)

**STOP** - Stops the VPS (refer the Instructions in the following section).

**STATUS INDICATORS:**

**REMOTE (Blue)** - is illuminated when VPS is in Remote Mode.

**ENGINE (Green)** - is illuminated when VPS engine is running.

**FAULT (Red)** - is illuminated when a fault has been detected.

**[8] FRAME WITH RUGGED MOUNTS**

Rugged mounts, part numbers 100271-001 (1) and 100272-001 (2) have been added to the frame. These mounts provide three points for mounting the LVPS to a secure surface. The Installation Drawing in Figure 4.1 defines the dimensions of the mounting point in reference to the LVPS frame. It also calls out the materials used to make the mounts.

**[9] FUEL LINES**

Unit is supplied with Red and Blue, Supply and Return Fuel Lines. These lines are equipped with quick disconnect ends for easy connection to a jerry can.

**[10] PROTECTIVE BOOT (P6 Revision Only)**

A Protective Rubber Boot has been installed over the Low Oil Pressure Switch on the P6 Revision Units only.

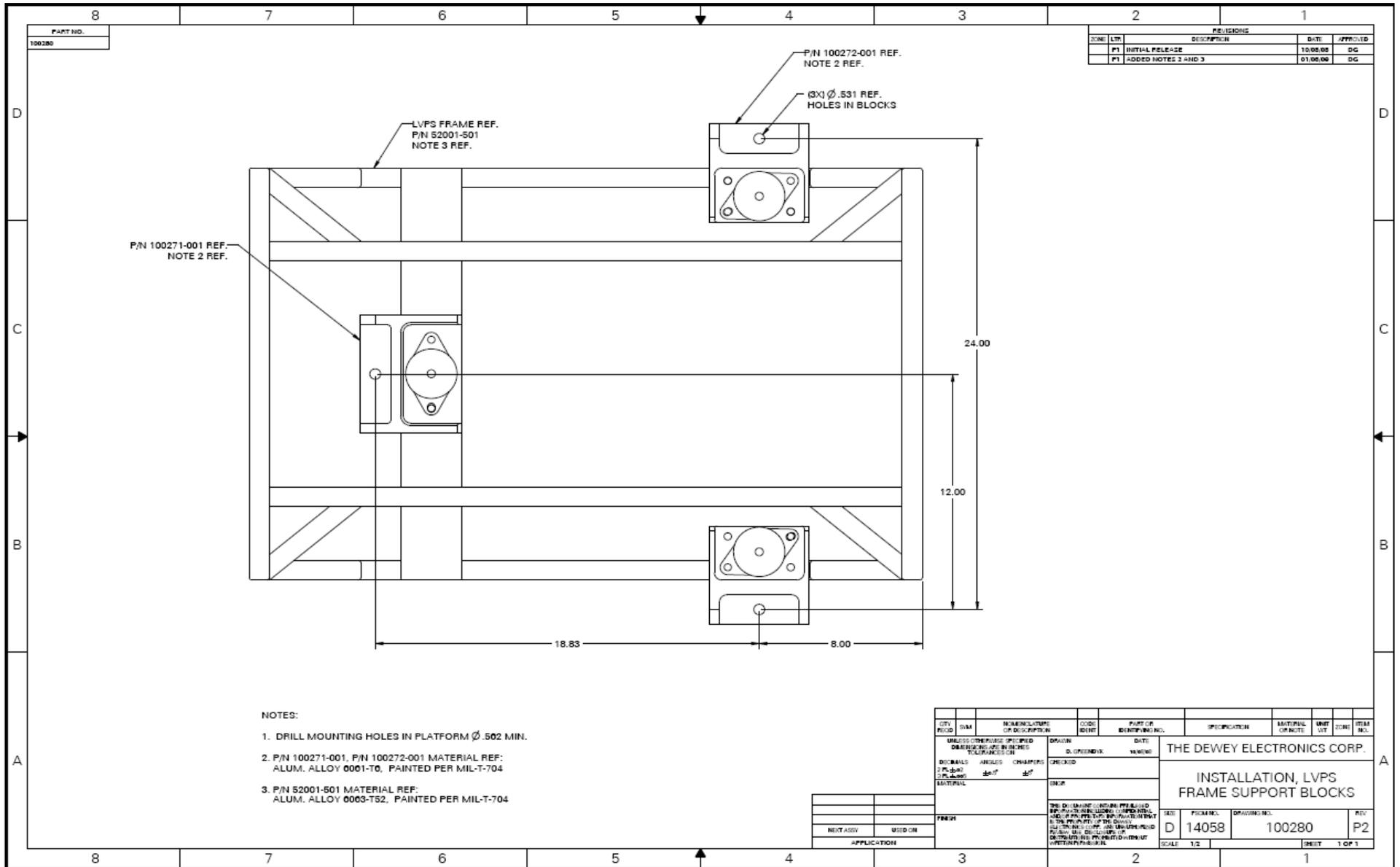


Figure 4.1  
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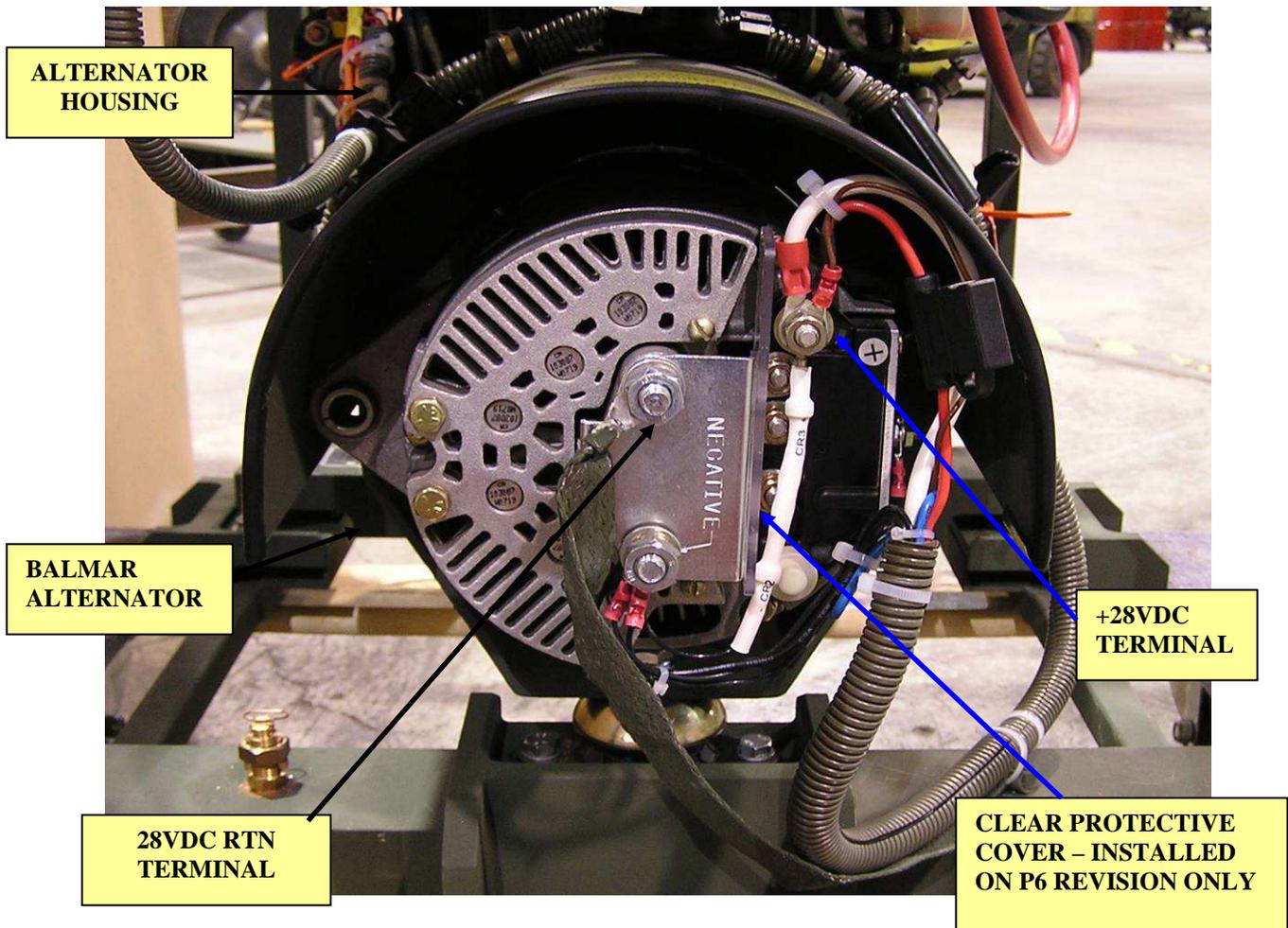
## VPS CONNECTION AND PREPARATION FOR USE

This section describes the Connections and Setting needed for proper operation of VPS.

Follow the procedure outlined below to prepare VPS for operation:

### 1. Connect VPS to the external 24V Battery bank

**CAUTION:** Before connecting the electrical output from the VPS to a bank of 24 VDC batteries, as intermediate buffer to the power consumption device, make sure the “LOC” “OFF” “REM” switch on the Engine Controller (**Figure 3**) is in “OFF” position and the Power Switch in Remote Control Box (**Figure 4**) is in “OFF” position and engine “START” “STOP” switch is in “STOP” position.



**FIGURE 5**  
**VPS – 28VDC OUTPUT TERMINATIONS**



**TO AVOID DAMAGE TO THE VPS AND POSSIBLE INJURY TO THE OPERATOR, MAKE SURE THAT ALL ELECTRICAL CONNECTIONS ARE MADE WITH BATTERY DISCONNECTED. ENSURE THE CORRECT POLARITY ON THE OUTPUT CONNECTION. REVERSE POLARITY MAY CAUSE DAMAGE TO EQUIPMENT OR OPERATOR INJURY.**

### Recommended VPS DC Output Connections.

The VPS DC Output is available via Stud connection on the rear of the Alternator as shown in **Figure 5**. A heavy-duty Crimp lug with an appropriately sized cable is recommended for DC electrical termination.

#### STUD SIZE:

Positive Stud Size (+28VDC) **5/16-24 UNF**

Negative Stud Size (28VDC RTN) **3/8-16 UNF**

#### Recommended Wire size:

The VPS can output up to 150A of continuous current. The wire size should be selected on the round-trip length of the cable.

	Recommended Wire Size
10 Ft.	2 Awg
15 Ft	1 Awg
20 Ft	1/0 Awg
30 Ft	3/0 Awg
40 Ft	4/0 Awg



## 2. Connecting Fuel Supply and Return lines



Fuel and its vapors are extremely flammable and explosive.

Fire or explosion can cause severe burns or death.

### WHEN ADDING OR DRAINING FUEL

- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- DO NOT light a cigarette or smoke.

### WHEN STARTING EQUIPMENT

- Ensure muffler and air filter are in place.
- If fuel spills, clean up the affected area before starting engine.

### WHEN OPERATING EQUIPMENT

- Do not tip engine or equipment at angle which causes fuel to spill.

### WHEN REPAIRING EQUIPMENT

- Repair with fuel shutoff valve OFF.

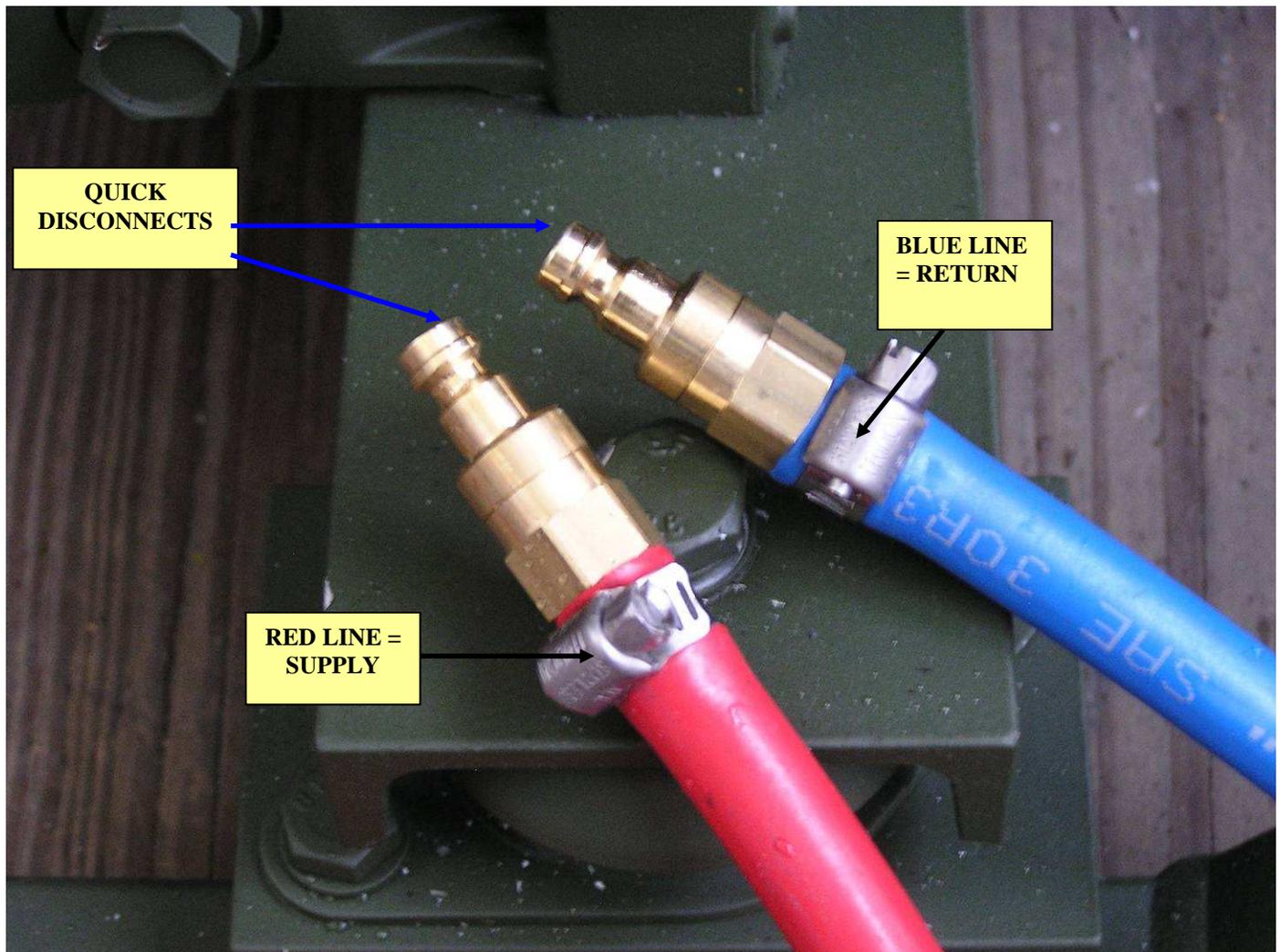
### WHEN STORING FUEL OR EQUIPMENT WITH FUEL IN TANK

- Store away from furnaces, stoves, water heaters, clothes dryers or other appliances that have pilot light or other ignition source because they can ignite fuel vapors.



The VPS is designed to operate on JP5, JP8, & Diesel 2. The VPS self-contained fuel system contains self-priming features, hoses, Filters, water separators and fittings. The FUEL SUPPLY LINE (RED) and FUEL RETURN LINE (BLUE) are terminated through the Quick –disconnect fitting, Series 21 (**Figure 6**).

**Connect VPS Fuel lines to an external fuel tank.**



**FIGURE 6**  
**VPS – FUEL LINES**

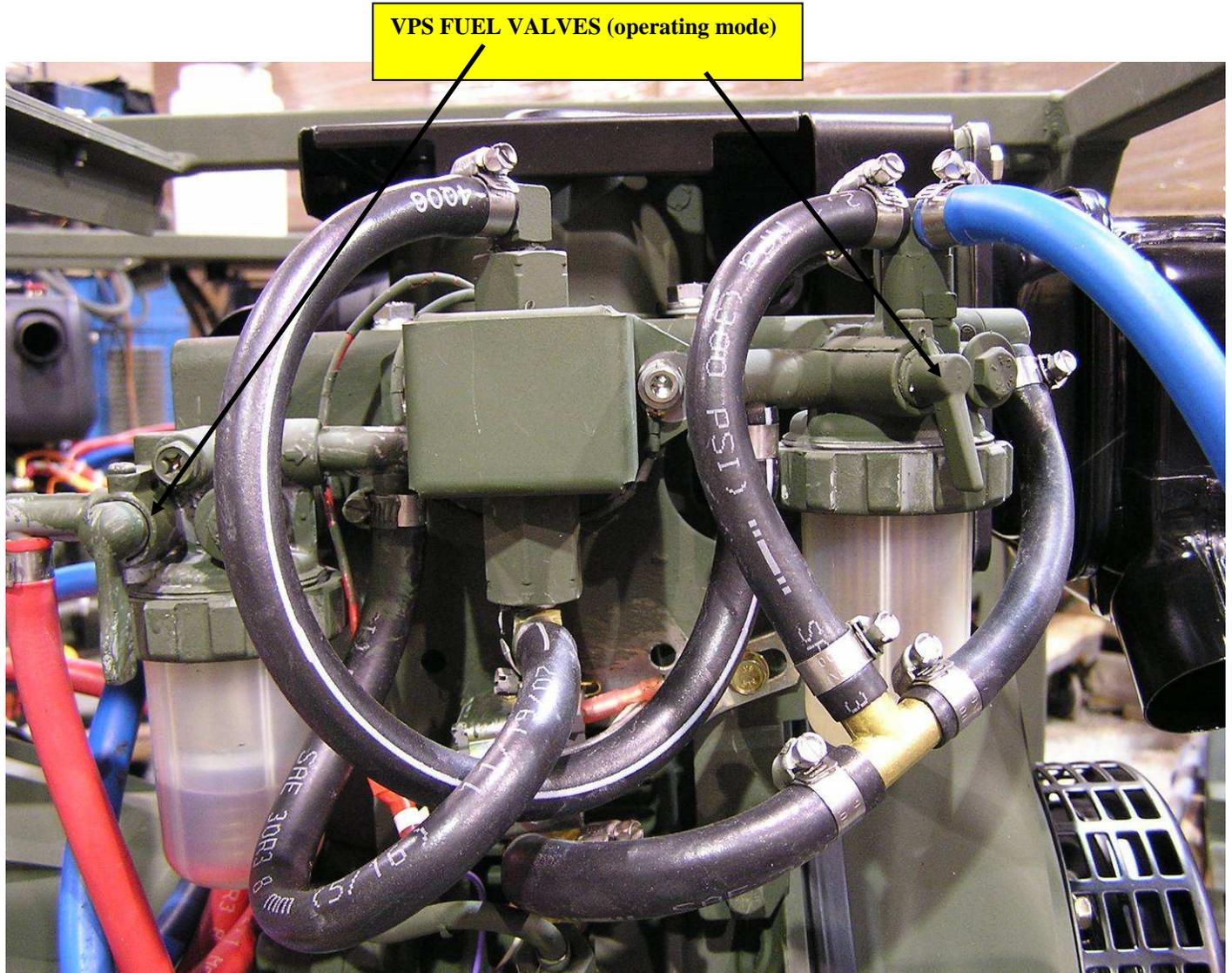
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## MISCELLANEOUS SETTINGS

Prior to starting the VPS check the settings of the following items:

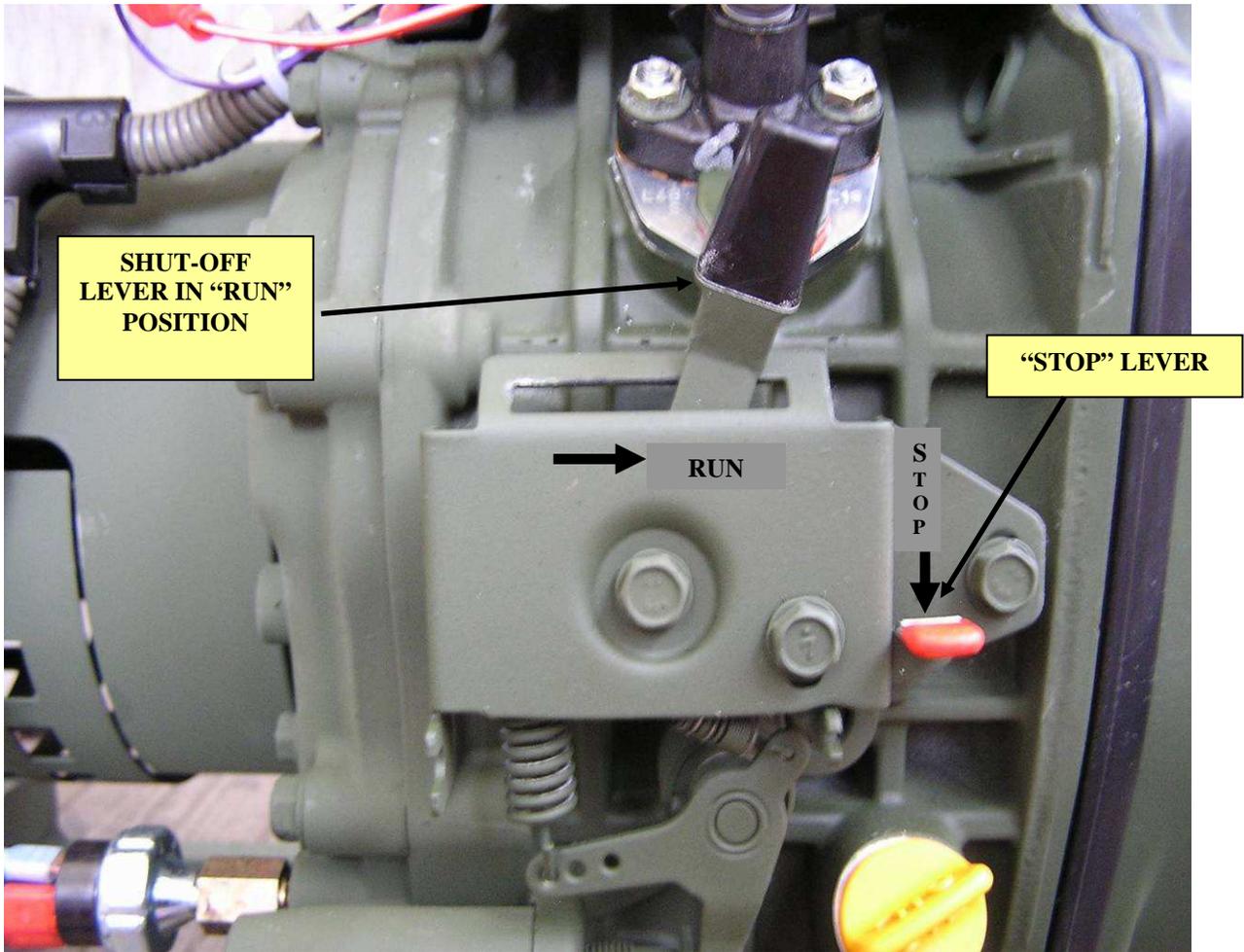
1. Verify that the FUEL supply valves are set to Operating Mode. **Figure 7** shows the position of the valves.



**FIGURE 7 – VPS VALVES (OPERATION CONDITION)**



2. Verify that the Engine Manual Shut-Off Lever is set to the “RUN” position. **Figure 8** shows the position of the Shut-Off Lever for starting and operating mode. The VPS ships with the Shut-Off Lever already set in proper position.



**FIGURE 8**  
**VPS – ENGINE “RUN” AND “STOP” CONTROLS**



## **OPERATING INSTRUCTIONS**

**Prior to operating the VPS make sure that all power and fuel connections have been made. Be sure to follow all safety rules.**

### **Notes:**

1. The voltmeter on the Remote Control box (**Figure 3**) can be used to monitor the connection and health of the external 24V Battery prior to starting the VPS. To use this feature, set the Mode Select Switch (Power switch) (**Figure 3**) to the "ON" position and the voltmeter will display the battery voltage. After the VPS starts, the Voltmeter will display the VPS output Voltage.

1. When connecting the VPS to the external FUEL source, prime the fuel lines by activating the "Prime" switch on the Generator Controller (**Figure 2**) to "prime" position (left) for approximately 30 seconds. The use of the Prime switch is required only during initial connection or after running out of fuel. Use of this switch is not anticipated during normal VPS operation.

### **STARTING THE VPS in Local Mode:**

**Set the "MODE" Select Switch on the Engine Controller (Figure 2) to "LOC" position.**

The Amber "LOC" indicator will light confirming the Local mode selection. The Fuel Pump will start the priming cycle for approximately 5-10 seconds. The engine will start automatically. If the engine fails to start on the first attempt, a second and third attempt will be made automatically. If the engine fails to start after the third attempt, the red Fault light will illuminate. To clear the Fault, turn the Mode Switch to the OFF position. Repeat the starting sequence again. If the engine still fails to start, refer to the Troubleshooting section of this manual for possible solutions. Once the engine starts, the Green "ENG" indicator will turn on and the Voltmeter on the Remote control box (**Figure 4**) will read a voltage dependent on the battery charge state which can range from 24.0 VDC to 29.9 VDC. After a 10 second initialization period, the voltage will begin to ramp up from the battery state to the target voltage of 29.5 VDC.

### **STOPPING THE VPS in Local Mode:**

**Set the "MODE" Select SWITCH on the Engine Controller (Figure 2) to "OFF" position.**

The Fuel Pump will shut off and engine will stop, and the Green "ENG" indicator lamp on the Generator Controller Box (Figure 2) will turn off. If the engine fails to turn off, depress the Red STOP lever shown in Figure 8. This will manually shutdown the engine.



## **STARTING THE VPS in REMOTE Mode:**

**Set the “MODE” Select Switch on the Engine Controller (Figure 2) to “REM” position.**

The Blue “REM” Indicator will light confirming that the Remote control method was selected and VPS control was relegated to the Remote Control Box (**Figure 4**)

On the Remote Control Box (**Figure 4**), set the Mode Select Switch (Power switch) to “ON” position. The BLUE “REMOTE” Indicator will light and the voltmeter will display the battery voltage. Set the ENGINE Switch to “START” position. The Fuel Pump will start the priming cycle for approximately 5-10 seconds. The engine will start automatically. If the engine fails to start on the first attempt, a second and third attempt will be made automatically. If the engine fails to start after the third attempt, the red Fault light will illuminate. To clear the Fault, turn the Mode Switch to the OFF position. Repeat the starting sequence again. If the engine still fails to start, refer to the Troubleshooting section of this manual for possible solutions. Once the engine starts, the Green “ENG” indicator will turn on and the Voltmeter on the Remote control box (**Figure 4**) will read a voltage dependent on the battery charge state which can range from 24.0 VDC to 29.9 VDC. After a 10 second initialization period, the voltage will begin to ramp up from the battery state to the target voltage of 29.5 VDC.

## **STOPPING THE VPS in Remote Mode:**

Set the ENGINE Switch on the Remote Control Box (Figure 4) to “STOP” position. The engine will stop and the GREEN “ENGINE” indicator will turn off. If the engine fails to turn off, depress the Red STOP lever shown in Figure 8. This will manually shutdown the engine.

## **Operation in Dusty or Sandy Areas:**

1. Clean dust and dirt from the generator set as required. Do not allow dust to accumulate around generator set.
2. Inspect and clean secondary Donaldson air intake filter.
3. Keep generator air inlet and outlet areas clean.
4. Carefully remove dust and sand from the control box.



## **VPS SWITCH SETTING for Storage**

To prevent unwanted battery drain during VPS storage:

- 1 Set the Mode Select Switch on the Generator Controller (**Figure 2**) to "OFF" position.
- 2 Set the Mode Select Switch (Power switch) on the Remote Control Box (**Figure 4**) to "OFF" position.

## **VPS FAULT INDICATORS RESET**

THE VPS monitors and reports several internal fault scenarios. For instance, the VPS features a Low Oil Pressure (LOP) shutoff switch and solenoid which are designed to shut down the VPS if the diesel engine loses oil pressure.

In case of fault, the unit will shut down and the Red "FAULT" LED indicator will light. The fault will be also reported if the VPS runs out of fuel or fails to start in 3 attempts.

The Fault indicator can be reset by setting the Mode Select Switch on the Generator Controller (**Figure 2**) to the "OFF" position for at least 5 seconds.

## ***Maintenance, Troubleshooting, and Adjustments:***

### **FUEL ASSEMBLY (SERVICE / REPLACEMENT PARTS)**

Figure 9 shows a breakdown of the replaceable parts related to the Fuel Filter Assembly. Replacement parts can be procured by contacting the Dewey Electronics Corporation.



## Fuel Pump Assembly Attached to Engine 100087-501 Retro Fit

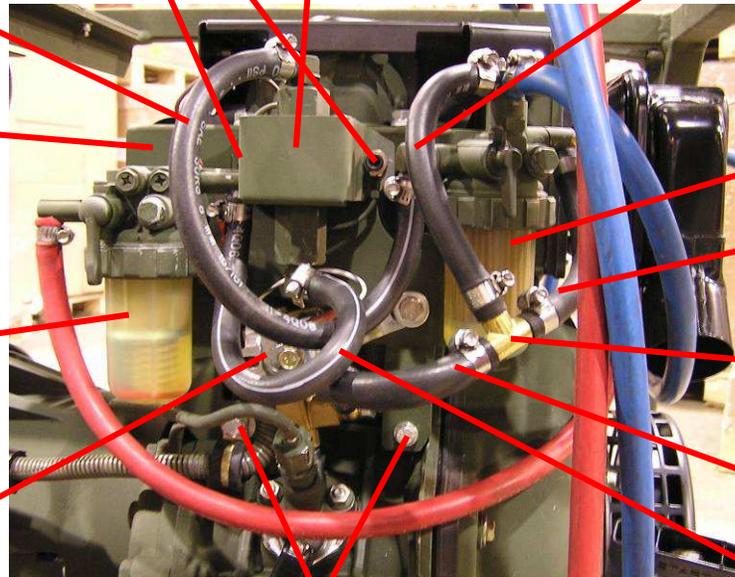
91280A530	Bolt	1 ea.
91202A238	Lock Washer	1 ea.
91166A270	Washer	1 ea.

100293	Fuel Pump Support Bracket	1 Ea.
05-00789-40194	Fuel Pump	1 ea.
129-5-2	Brass Elbows	2 ea.
92196A541	1/4-20 X 7/8 Socket Head	2 ea.
91102A750	1/4" Lock Washer	2 ea.

5645K23	Hose	6" long
331-003	Clamp	2 ea.
183250-59040	Nylon piece goes inside Hose	2" deep from top

5645K23	Hose	12"
331-003	Clamp	2 ea.

52002	Filter Bracket	1 ea.
18RA251T	Nylon Lug	1 ea.



114354-55501	Fuel Filter Assy. Heads	1 ea.
91236A553	1/4-20 X 2 3/4 HH Bolt	1 ea.
91102A750	1/4" Lock Washer	2 ea.
90108A413	1/4" Flat Washer	1 ea.
90480A029	1/4-20 Hex Nut	1 ea.
114789-55500	Fuel Filter Assy.	1 ea.

129335-55700	Water Separator	1 ea.
91236A553	1/4-20 X 2 3/4 HH Bolt	1 ea.
91102A750	1/4" Lock Washer	2 ea.
90108A413	1/4" Flat Washer	1 ea.
90480A029	1/4-20 Hex Nut	1 ea.
121257-55720	Screen Spring	1 ea.
171081-55910	Screen	1 ea.
121257-55731	Float	1 ea.

5645K23	Hose	5"
331-003	Clamp	2 ea.

91335K52	Tee	1 ea.
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5645K25	Hose	5 3/4"
331-003	Clamp	2 ea.

L-Series Shutdown Valve (P6 Ver. Only)	1 ea.
Z Bracket	1 ea.
Walbro Fuel Shut-Off (P7 Ver. Only)	1 ea.

331-003	Clamps	2 ea.
5645K23	Hose	10 1/2"

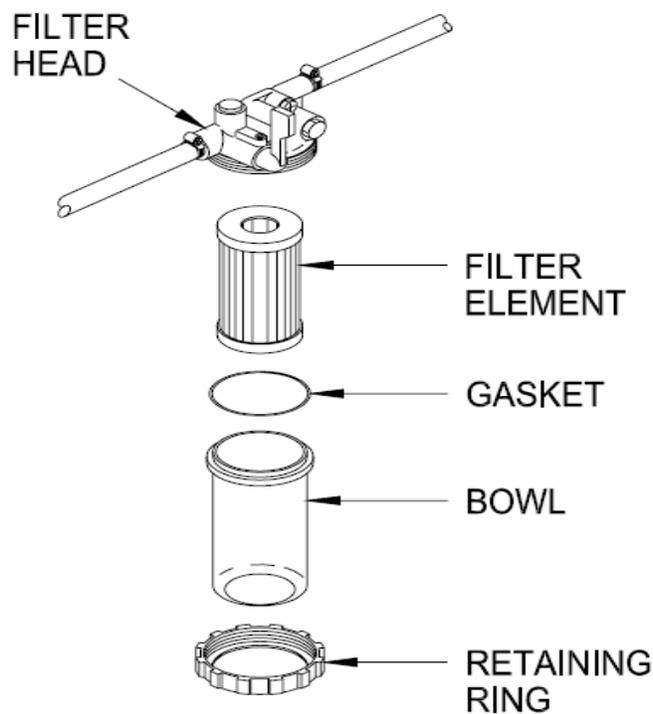
B18231B06012N	Bolt	1 ea.
B18212HRCZ060	Lock Washer	1 ea.
B1822BH060R	Washer	1 ea.



## Fuel Filter Element Replacement

### Removal:

1. Shut down generator set.
2. Close fuel shut-off valve.
3. Unscrew retaining ring (Figure 10) and separate bowl and head using care not to spill diesel fuel trapped in bowl. Then pour diesel fuel into suitable container.
4. Remove and discard fuel filter element and gasket.



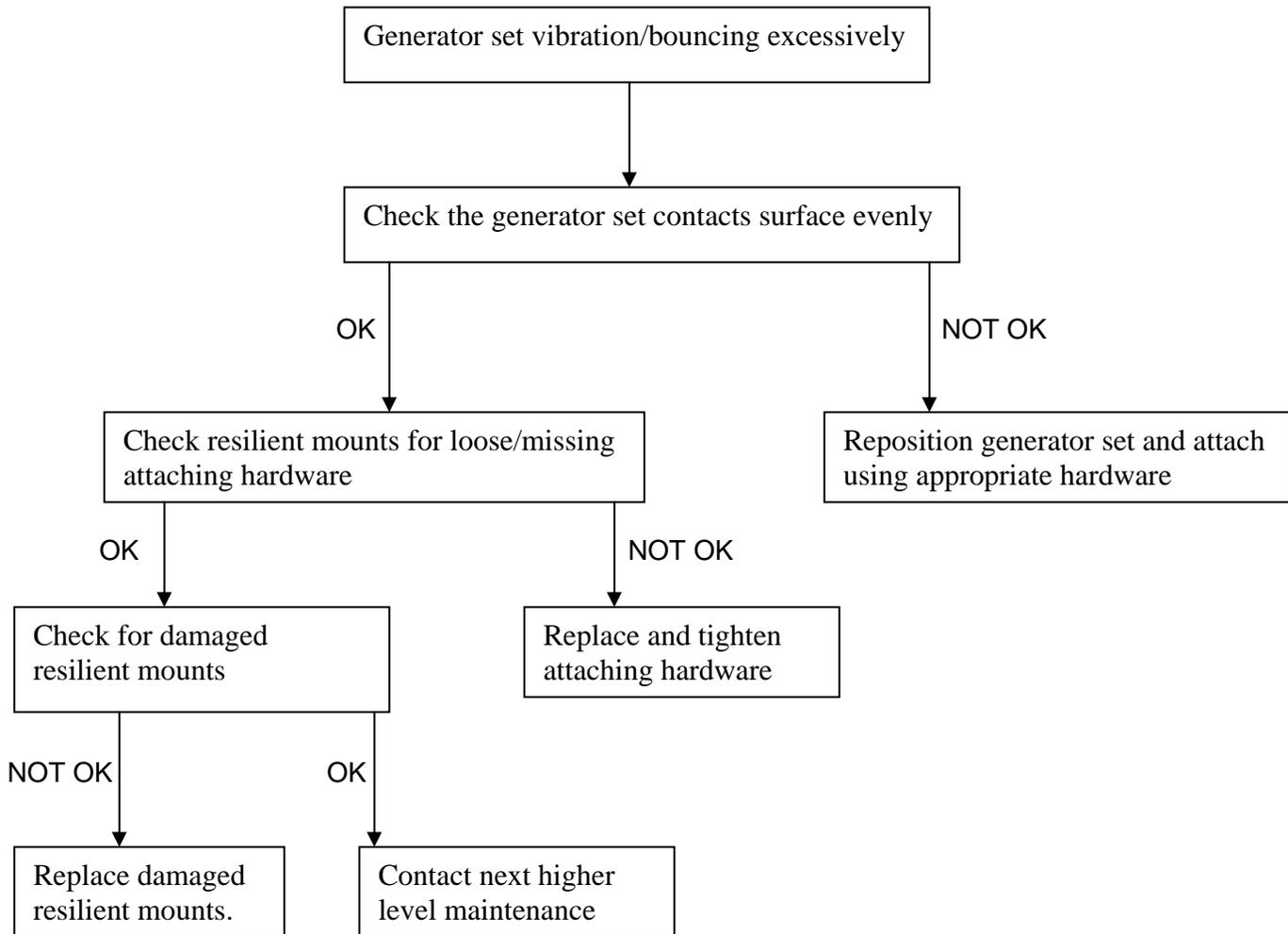
**Figure 10**

### Installation:

1. Clean bowl with clean cloth.
2. Install new fuel filter element in bowl.
3. Lubricate new gasket with clean diesel fuel and seat in land of bowl.
4. Assemble bowl to head and hand-tighten retaining ring.

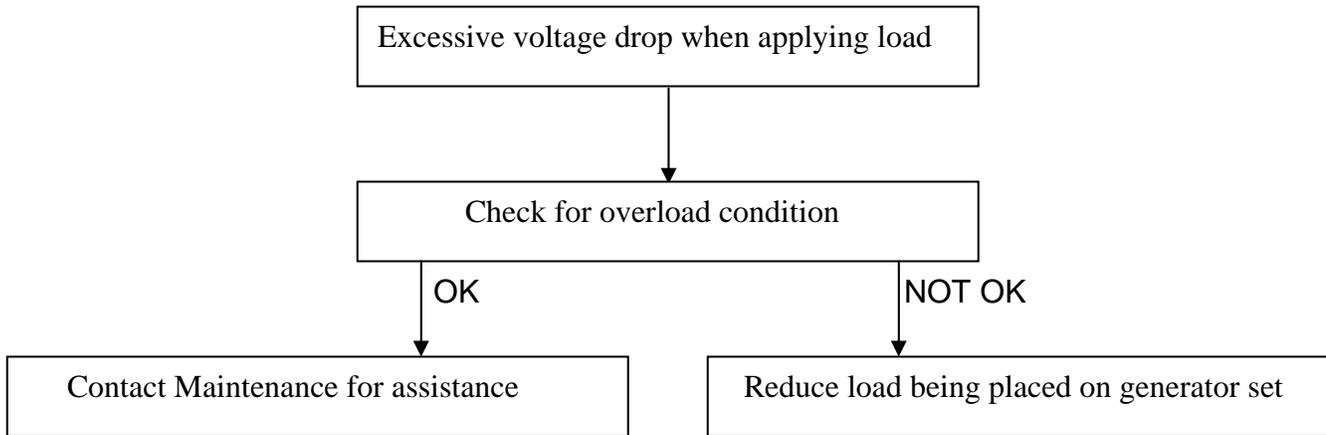


### Generator Set Vibration/Bouncing Excessively Troubleshooting



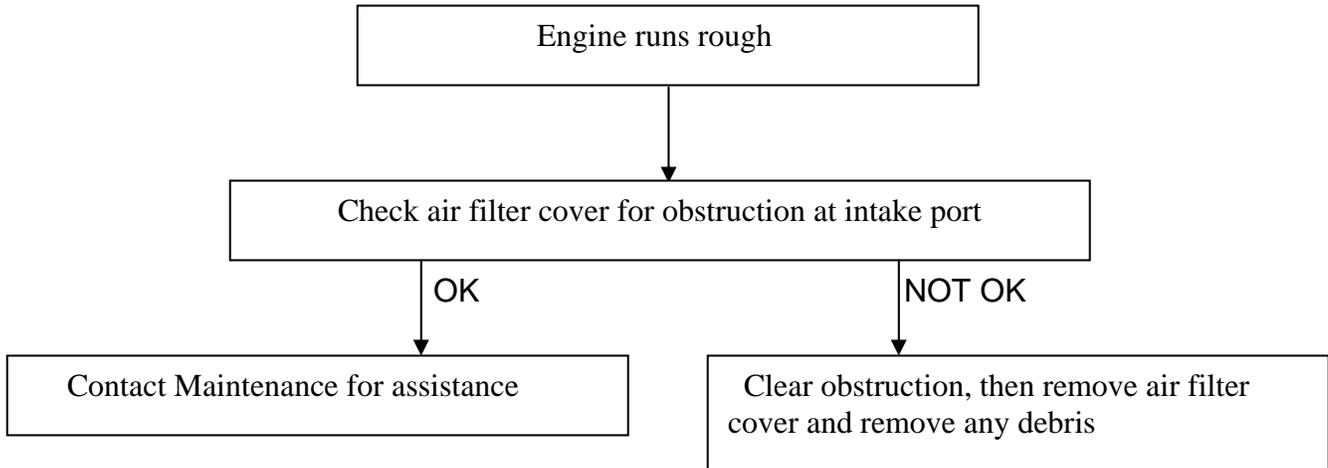


### Excessive Voltage Drop When Applying Load Troubleshooting



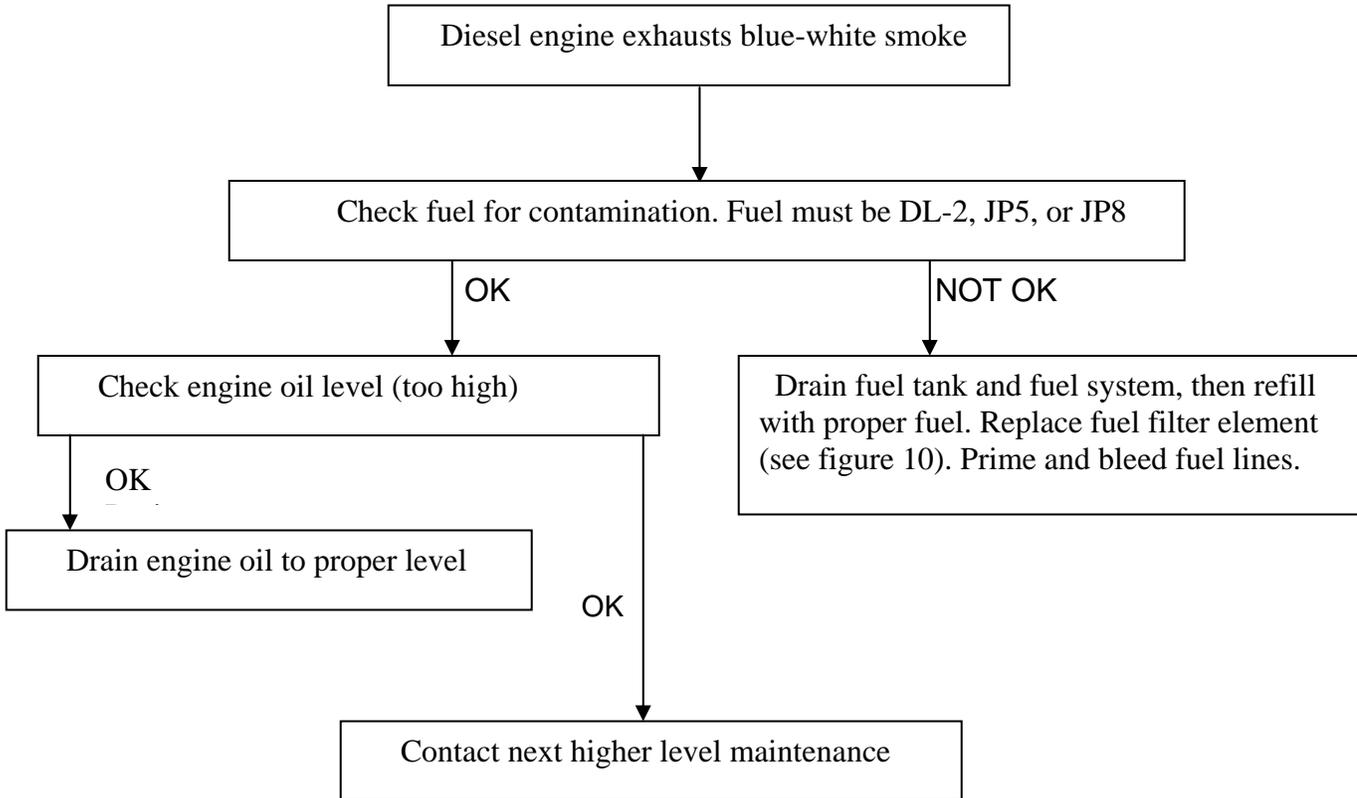


## Diesel Engine Runs Rough Troubleshooting



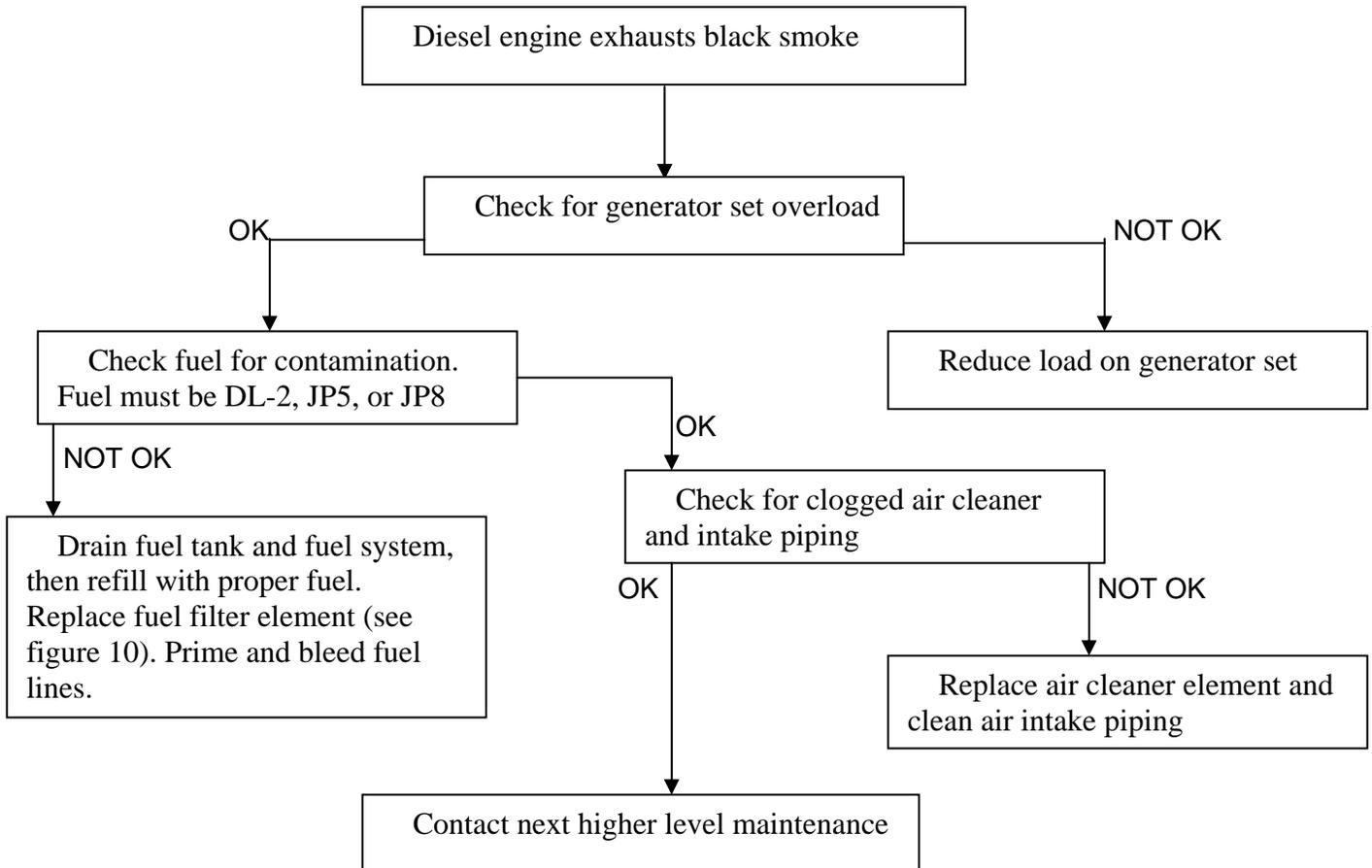


## Diesel Engine Exhausts Blue-White Smoke Troubleshooting



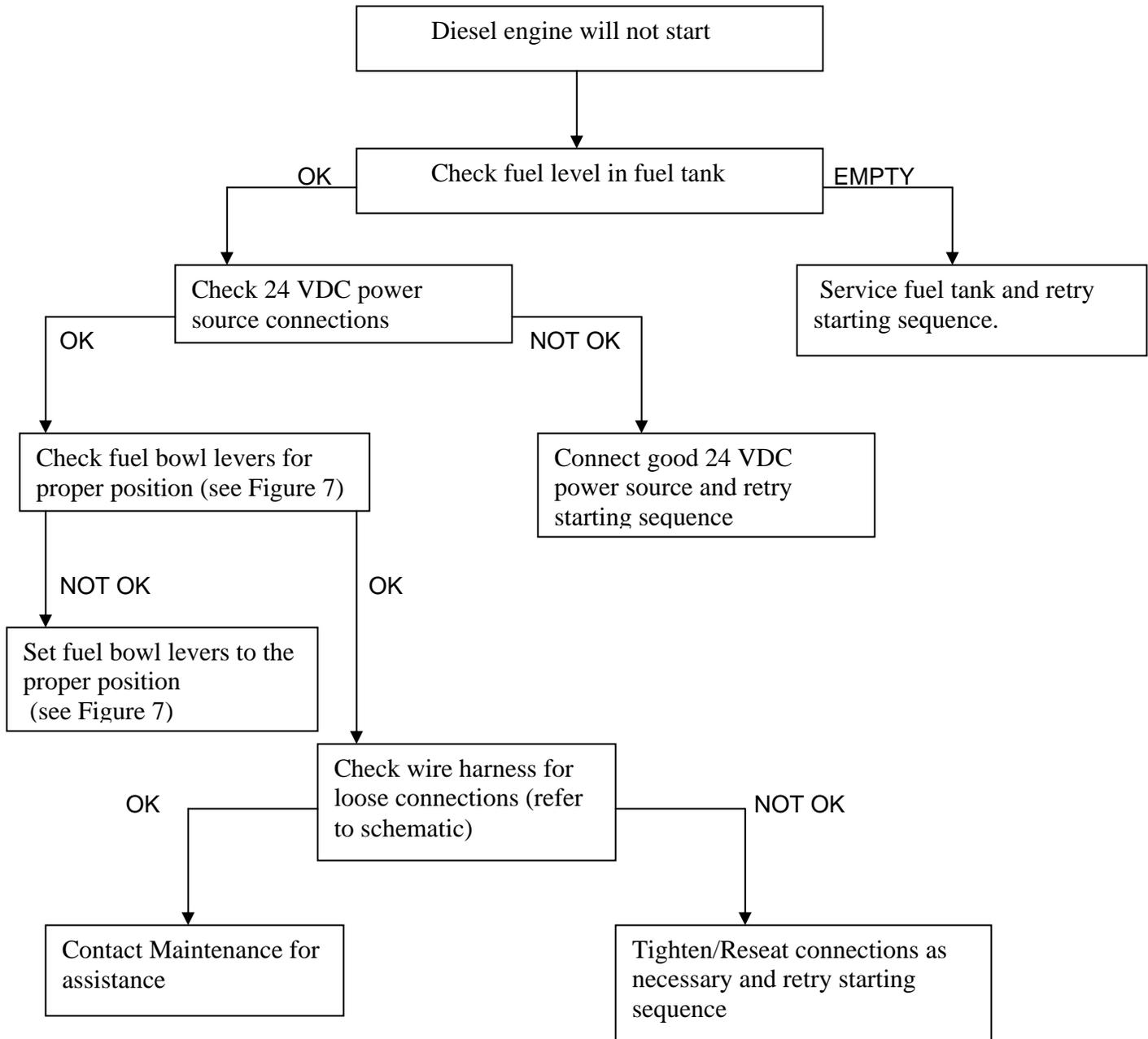


## Diesel Engine Exhausts Black Smoke Troubleshooting



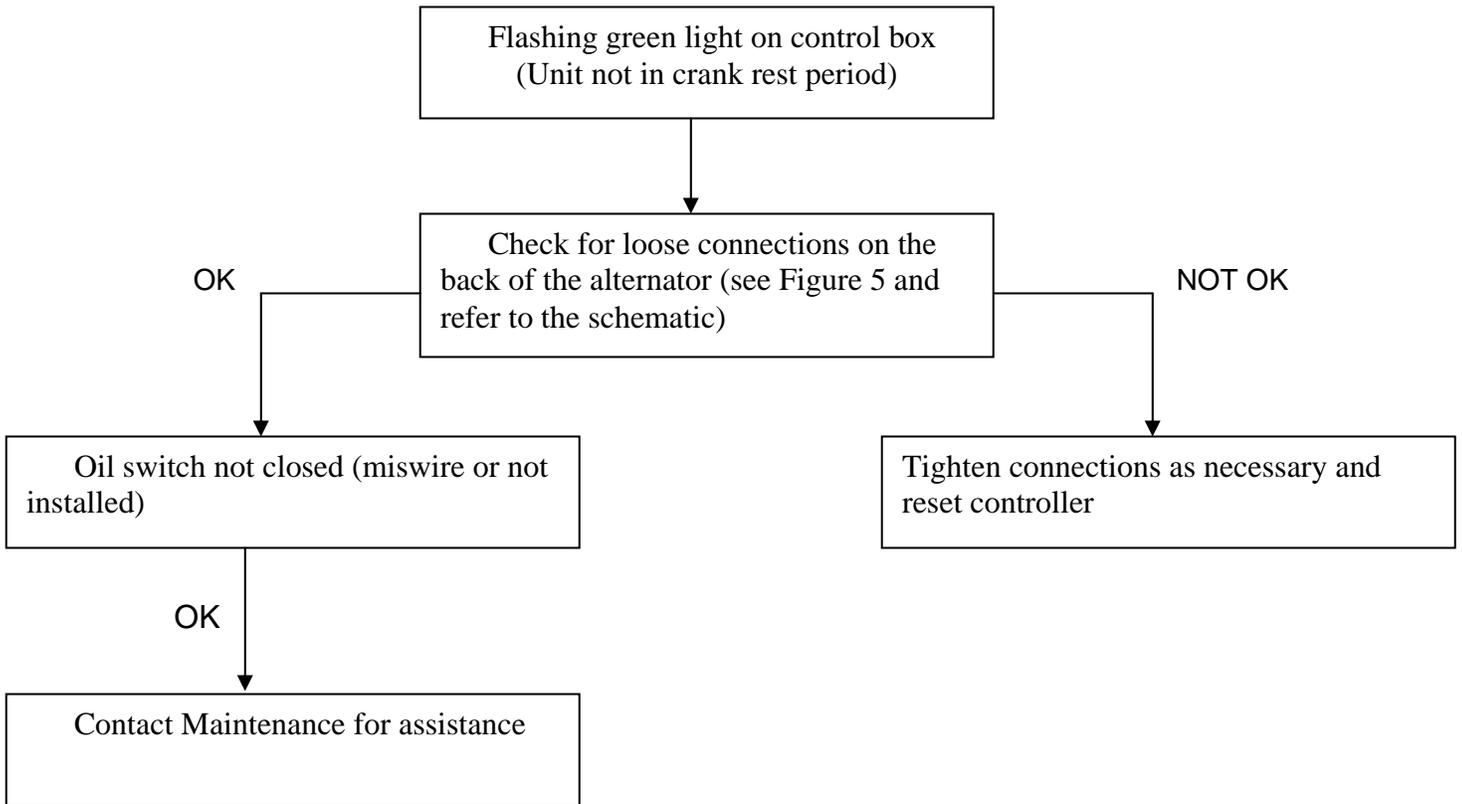


### Diesel Engine Will Not Start (Electric Starting) Troubleshooting



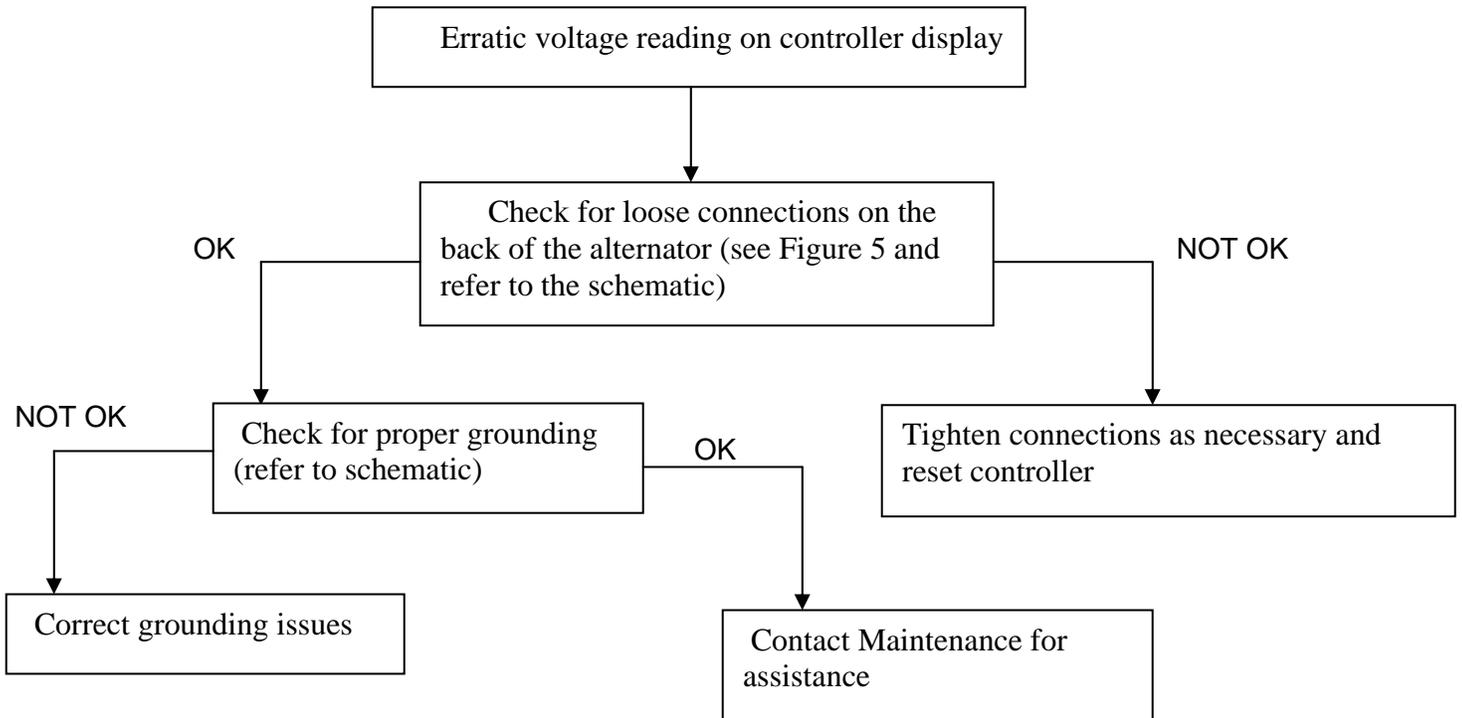


## Flashing Green Indicator Lamp on Control Box Troubleshooting





### Erratic Voltage Reading Troubleshooting





## Regulator Adjustments

The Regulator, P/N 100263, is factory adjusted with the following profile:

**Start Delay** – 10 seconds (Once the generator is started, after 10 seconds the output is enabled. The output voltage slowly rises from battery voltage to 29.5 +/- 0.5 VDC. Time will depend upon the battery condition. If the battery is fully charged, then the output will reach this value in a couple of minutes. Once the battery is fully charged, the output will be 29.5 VDC at approximately 3500 Watts.

**Bulk Voltage** – 29.5 +/- 0.5 VDC

**Bulk Time** – 4 Hours

**Absorption Voltage** – 29.4 +/- 0.5 VDC

**Absorption Time** – 4 Hours

**Float Voltage** – 27.2 +/- 0.5 VDC

**Float Time** – 4 Hours

### **Troubleshooting Regulator:**

**NO OUTPUT** – Regulator must have a battery voltage of +18.0 VDC or higher at the RED wire to operate properly. Check voltage at the wire to ensure voltage is present when engine is running. Red wire includes a 10-amp fuse inline. Check fuse.

**VOLTAGE TOO HIGH** – Regulator must sense battery voltage accurately to ensure proper voltage control. Check for differences in voltage at the batteries and on the RED wire at the regulator. If voltage shown is lower at the regulator, check for, and correct, voltage drop in wiring.

**VOLTAGE ERRATIC or NO VOLTAGE** – Check the two brown wires on the low oil pressure switch. Stop the unit and disconnect the brown wires and check the continuity between the two tabs on the low oil pressures switch. When engine is not running, it should be open and when is running it should be closed.



## **PERIODIC MAINTENANCE**

### **Air Intake:**

Clean or replace air cleaner element. May need more frequent service in dusty environments

- Every 200 Hours

### **Engine Oil:**

Check engine oil levels and add engine oil as necessary.

- Before every operation.

Drain and refill engine oil

- After first 50 hours and then every 200 hours after that.

Clean engine oil filter – Replace if damaged

- After first 50 hours and then every 400 hours after that.

Check engine for oil leakage

- Before and after operation.

### **Fuel:**

Replace outlet fuel filter

- Check every 200 hours and replace every 400 hours.

Check for fuel leakage

- Before and after operation

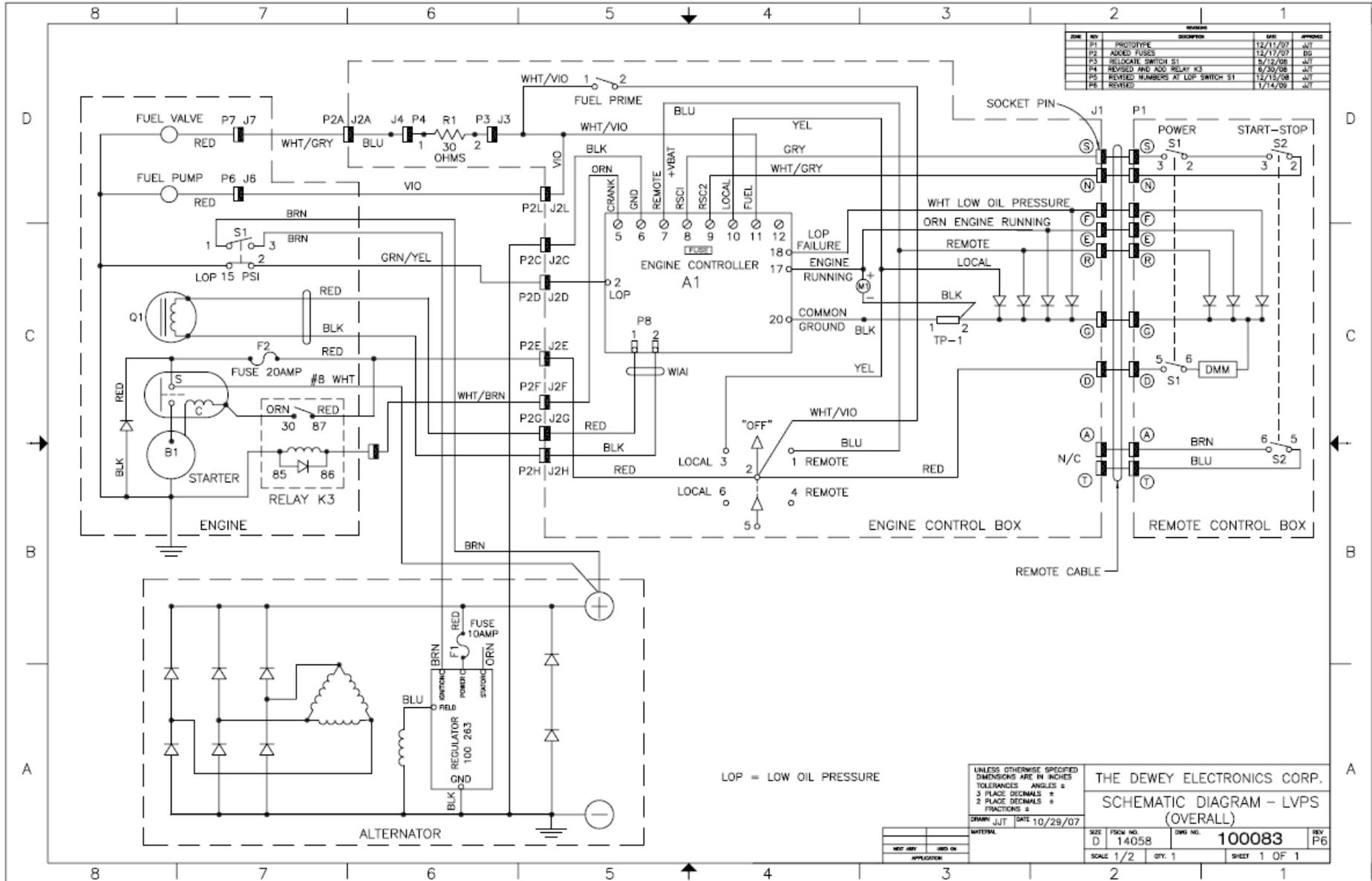
### **Hoses:**

Replace fuel system hoses

- Every 2000 hours or 2 years (which ever comes first)



# VPS SCHEMATIC



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