

## Voltage Regulator Adjustment - VR515GA

### INTRODUCTION:

Recently there have been several questions regarding access and adjustment of the Kelly Aerospace Power Systems (Electrodelta) voltage regulator part number VR515GA & VR515GA-1. The three primary inquiries were how to properly access the internal adjustment potentiometer, the proper range of adjustment, and whether adjustment voids the warranty.

This Service Information letter is intended to provide answers to the above questions and to illustrate and elaborate the adjustment procedure..

### COMPLIANCE:

At the discretion of the owner/operator or the facility performing maintenance any time a voltage regulator adjustment is required.

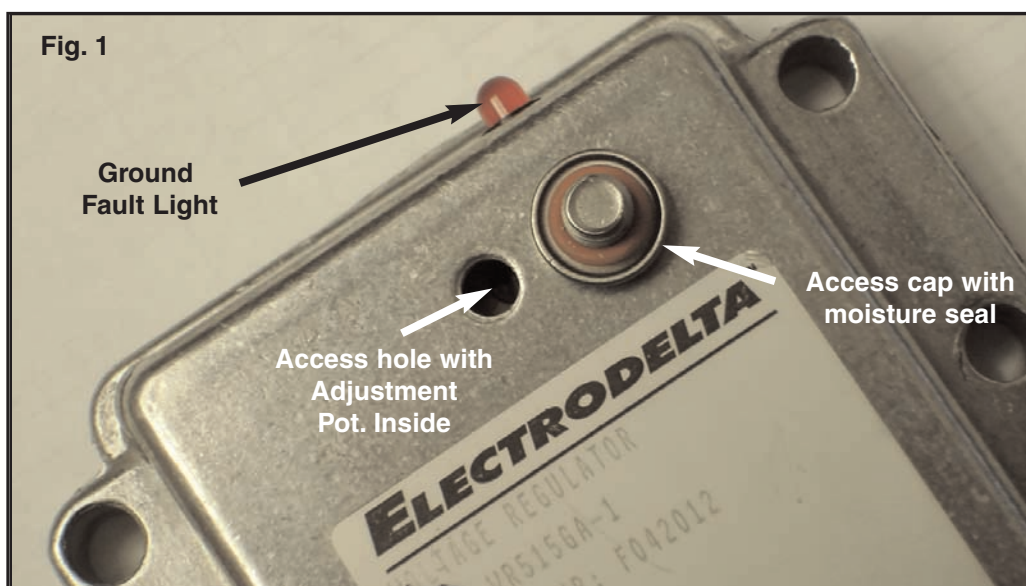
### EFFECTIVITY:

Any aircraft or rotorcraft utilizing a Kelly Aerospace Power Systems (Electrodelta) voltage regulator part number VR515GA or VR515GA-1. (Both regulators are the same except for a change in the connector.)

### PROCEDURE:

Voltage Regulator removed from Aircraft:

1. Remove the screw cap to gain access the internal voltage regulator adjustment potentiometer. Take care not to loose cap.



*If you have any questions concerning these instructions please contact  
Kelly Aerospace Power Systems, Technical Service at 888-461-6086 Or 888-461-6077.*

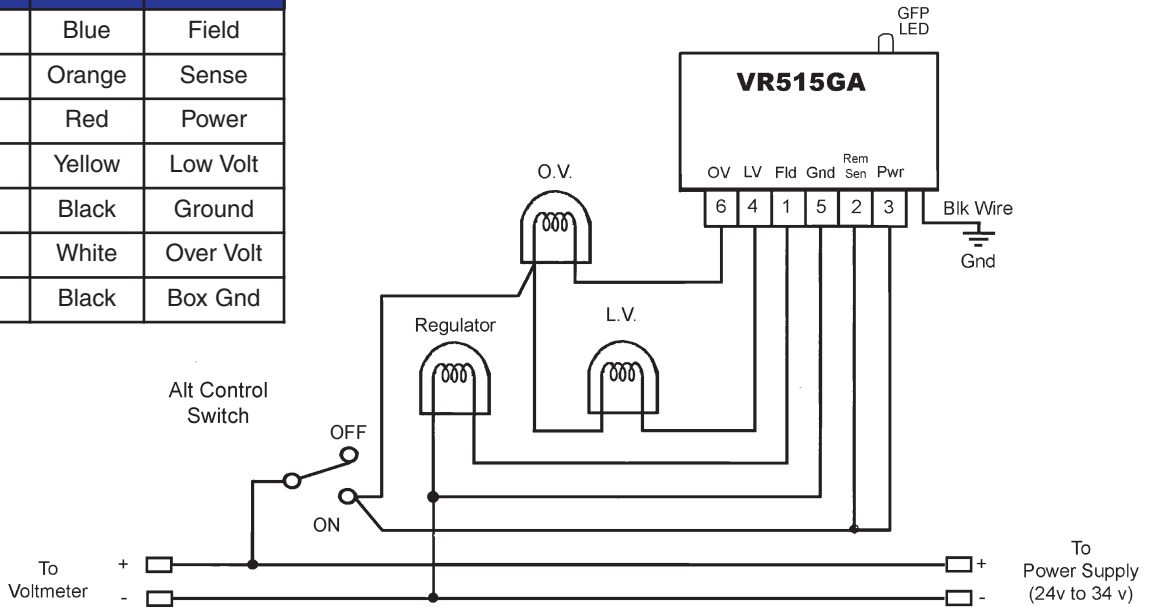
**PROCEDURE: (cont'd)**

Voltage Regulator Removed from aircraft: (cont'd)

2. Assemble the test set up (harness) as shown in Figure 2. Use 20 to 22 gauge wire, common 28v rated switch and common 28v lamps or LEDs. Use any appropriately sized male or female pin to connect to the voltage regulator connector terminals. Be sure to insulate test connections enough to avoid touching adjacent terminals.
3. Attach an adjustable DC power supply capable of 0 to 34 volts at 1.5 amps to the power input wires as shown in Fig. 2. Hook up the black ground wire coming from the box (not in the connector) to a grounding point on your test bench.
4. Observe the voltage regulator specifications in Table 1 and proceed to the tests below.
5. Use only a properly calibrated meter for all measurements which has an error tolerance no greater than 1/2% of full scale.
6. Use a non-metallic, flat blade, miniature screw driver for adjustments. Adjustment pot is a 360° pot. Do not force past limit as damage will occur.

Pin No.	Color	Usage
1	Blue	Field
2	Orange	Sense
3	Red	Power
4	Yellow	Low Volt
5	Black	Ground
6	White	Over Volt
Box	Black	Box Gnd

**Fig. 2 - Test Set Up**



**Table 1 - Specifications**

Voltage Setting	28.7 volts +/- .05 volts
Voltage Regulation Window	.25 volt to 1.00 volt width (not a limit) 28.25 v to 28.75 Midpoint (not a limit)
Field Current	4.0 amps continuous
Over Voltage Trigger Point	32.0 volts to 33.4 volts DC
Low Voltage Setting	Remains at or below 24 volts (Low volt lite <b>on</b> ) Remains at or above 25 volts (Low volt lite <b>off</b> )

Voltage Regulator Test and Adjustment (Removed from aircraft):

**CAUTION:**

WHILE PERFORMING THESE TESTS, DO NOT CONNECT OR DISCONNECT THE UNIT UNDER TEST WITHOUT FIRST TURNING OFF THE POWER SUPPLY. DAMAGE MAY RESULT TO THE VOLTAGE REGULATOR OR POWER SUPPLY.

1. **Voltage Regulator:** Set Main Power Supply to 28.8 VDC. Adjust until the field indicator light is approximately half illuminated. Adjust input voltage upward until the field indicator light just goes **OUT**. This should be at approximately 30 volts. Readjust input voltage downward until the field indicator light just goes to full **ON**. This should be at approximately 28 volts. This completes the check out of the voltage regulation portion.
2. **Reset:** Momentarily turn the alternator control switch **OFF** then **ON** again. The field indicator light shall illuminate indicating a reset. Use this procedure for reset whenever necessary.
3. **Overvoltage:** With input power supply set to 28.8 VDC, adjust it slowly up to 31.0 volts. The field indicator light shall be **OFF**. Wait 10 seconds. and reduce input voltage to 28.8 volts. The field indicator light shall go back **ON** indicating the unit did not trip.
4. **GFP and Overvoltage:** Raise input voltage to 33.4 volts. The field indicator light shall go **OFF** and both the ground fault protection (GFP) and overvoltage (OV) lights shall illuminate. Wait five seconds, reduce main supply voltage to 28.8 volts. The field indicator light shall remain **OFF** and GFP and OV lights shall remain **ON** signifying trip. Reset. *Note the GFP light is an LED on the box.*
5. **Low Voltage Indication:** With input power supply set to 28.8 VDC, observe the Low Voltage (LV) indicator light. It should be **OUT**. Reduce input voltage to 24 volts. The LV light shall go **ON**. Return input voltage slowly back to 28.8 Volts. the LV light shall go **OUT** at approximately 26.5 Volts. This completes check out of the Low Voltage function.
6. **Output Ground Fault Protection (GFP):** With the main power supply set to 28.8 VDC, (field indicator light half illuminated) while monitoring the current output meter of the power supply, momentarily apply a short circuit from ground to the field output lead, (Blue). The field indicator light shall go **OUT** with no continuous indication of over current on the meter and the GFP indicator light on the unit shall illuminate. Remove the short. The unit shall remain **OFF** with the GFP indicator light illuminated. Reset. GFP, the indicator light shall go out and the field indicator light shall come back **ON** at half brilliance as before the test. This completes check out of the GFP function.
7. Inspect moisture seal on the screw cap and replace if necessary. Install the screw cap.
8. If the unit being tested has been removed from an aircraft or rotorcraft and is being reinstalled, to be returned to service, a logbook entry of compliance with this service information letter is required.

Voltage Regulator Adjustment (Installed in aircraft/rotorcraft):

**WARNING:**

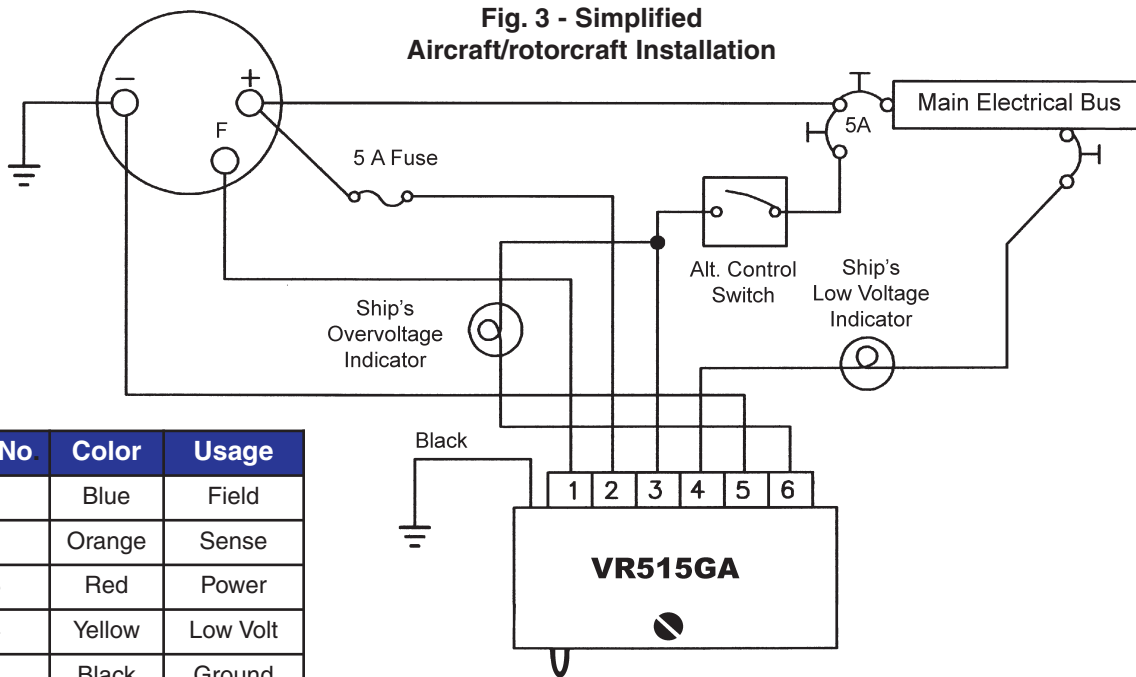
SERIOUS INJURY CAN OCCUR DURING OPERATION OF PROPELLERS AND ROTOR BLADES. BE SURE THAT ALL PRECAUTIONS ARE TAKEN TO MAKE THE PROCEDURE SAFE.

1. Gain access to the voltage regulator. Refer to the aircraft/rotorcraft manufacturers service and maintenance manuals.
2. Remove the screw cap to gain access the internal voltage regulator adjustment potentiometer. Take care not to loose cap.
3. With the aircraft/rotorcraft running attach a voltmeter to measure the aircraft/rotorcraft main DC bus voltage. (See Fig. 3.)

Voltage Regulator Adjustment (Installed in aircraft/rotorcraft): (cont'd)

4. Use a non-metallic, flat blade, miniature screw driver for adjustments. Adjustment pot is a 360° pot. Do not force past limit as damage will occur.
5. Unless otherwise stated in the aircraft/rotorcraft manufacturers service and maintenance manuals, adjust the voltage regulator to 28.8 volts +/- .05 volt. If regulation cannot be achieved, investigate cause starting with the ships systems (wiring, battery, and alternator). If ships system check OK, remove voltage regulator and perform the tests above or replace the voltage regulator.
6. Upon successful completion of the adjustment procedure, inspect moisture seal on the screw cap and replace if necessary. Install the screw cap and prepare the aircraft/rotorcraft for return to service.
7. Make a logbook entry of compliance with this service information letter.

**Fig. 3 - Simplified Aircraft/rotorcraft Installation**



Pin No	Color	Usage
1	Blue	Field
2	Orange	Sense
3	Red	Power
4	Yellow	Low Volt
5	Black	Ground
6	White	Over Volt
Box	Black	Box Gnd

**Warranty Note:**

Adjustments to the voltage regulator (VR515GA or VR515GA-1) are permitted without voiding the Kelly Aerospace Power Systems Limited Warranty provided the "warranty seal" as shown in Fig.4 has not been broken or tampered with.

