



1400 East South Blvd  
Montgomery, AL 36116  
(334) 286-8551 • (334) 286-8018 Fax  
<http://www.kellyaerospace.com>

# Service Information

Bulletin No. 0101

Issue Date: October 5, 2001

## VR286, VR288 & VR710A PARALLELING PROCEDURE

### INTRODUCTION:

This Service Instruction provides information for installation of alternators in parallel.

### SCOPE:

This Service Instruction applies only to systems using Electrodelta VR286, VR288, or VR710A voltage regulators.

### RESPONSIBILITY:

This document is the responsibility of Product Support.

### REFERENCES:

Not applicable.

### DEFINITIONS:

Not applicable.

### PROCEDURE:

#### SET-UP:

- a. Assuming an aircraft installation with two or more VR286, VR288, & VR710A voltage regulators installed and connected to appropriate alternators in parallel, a suitable voltmeter is connected across the load bus to read the voltage developed by each alternator as it is brought on line. In addition, each alternator should have an individual load meter connected to read its current.
- b. If it is not convenient or in some cases possible to reach each voltage regulator to make individual voltage adjustments with engines running, an extension cable made up of six each 16 AWG wires and a terminal block at the regulator end should be fabricated long enough to reach inside the flight deck. The regulators should be temporarily installed there for adjustment. Each regulator should be appropriately marked (e.g., left side, right side) so they can be reinstalled in the correct place after adjustments are made.
- c. With the paralleling wire disconnected and batteries and only essential loads switched on, the engines are started and only one of the Alternator Control Switches should be turned on.
- d. With the engines brought up to 125% minimum speed, the voltage on the operating system is adjusted to 14.5 volts (14 volt systems) or 28.5 volts (28 volt system). This system is switched off and the next system is switched on. This system is in turn adjusted to the same voltage at the same load and engine speed.

- e. When this is completed the paralleling lead is reconnected, the first system is switched on and the loads compared. Each load should be equal or its maximum differential no more than 15% of the rating of a single alternator. (Example: In the case of 60 amp alternators, 9 amps should be the maximum difference.)
- f. If it is desired to pull the load division closer together, the heavier loaded channel's regulator may be adjusted lower, the lighter channel's regulator adjusted higher on both. This is a very fine adjustment and may not be readjusted too far.
- g. An alternate method used when it is anticipated that very small loads are to be paralleled is to use the Alt. Out Indicators as an aid for the adjustment. This involves using the lightest loading possible and begins by setting the systems as shown above. If one channel's Alt. Out indicator is lit signifying that it's off the bus, readjust it slowly upward until its Alt. Out indicator just goes out. This usually provides the sharpest paralleling for low loads.
- h. Regardless of the procedure, test the system by turning on the heaviest loads available and vary engine speeds, together and separately (if possible) to be certain that everything remains properly in balance throughout the speed and load range of the alternators.

**PROBLEMS & TROUBLESHOOTING:**

- a. If problems are encountered the first thing is to check each channel individually. If both channels don't operate properly, don't attempt to parallel until the problem is remedied. It may be anything from a loose belt to a bad rotor coil in one of the alternators.
- b. Good paralleling depends on balance. If substantial voltage rise is necessary to achieve equal load division the problem is usually a higher impedance across one of the channels. The ground return must also be included in this analysis.
- c. In order for proper load sharing to occur both channels must be approximately the same impedance. If not the higher impedance channel's voltage regulator must raise voltage excessively to achieve load balance. This voltage rise is an indication that such a problem has occurred. Sometimes the higher impedance channel may be determined by precise measurement of the voltage drop when it is operated by itself and compared to the other side.

**WARNINGS & PRECAUTIONS:**

Consult your airframe operating and maintenance manuals and technical information for additional guidance in application.

**RECORDS:**

Not applicable.

**REVISION HISTORY:**

New

**APPROVAL:**

Randy Knuteson, Director of Product Support