



WHELEN AEROSPACE TECHNOLOGIES

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## Strobe Check Unit Instructions

**⚠ WARNING:** This product can expose you to chemicals including Lead which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

The Whelen Strobe Check Unit is designed to determine the reason the strobe light system is not working properly. It is not necessary to be an electrical engineer to do this type of troubleshooting.

The Strobe Check Unit will only display adequate anode and trigger voltage. You can still have open or bad discharge capacitors which will cause the flash tube not to flash. The use of a known good flash tube will determine this condition if the strobe check confirms anode voltage.

**There are only two things that cause a strobe light system not to operate.**

1. The flash tube is bad.
2. It is not getting anode voltage or trigger voltage to the system. Therefore, the power supply requires repairing.

The Strobe Check Unit will determine the cause for you.

On the top of the Strobe Check Unit you will see three neon lamps. The one in the corner marked "ANODE" will glow only if you have sufficient anode voltage from the power supply. The two neon lamps on either end, marked "T1" and "T2", flash on and off when there is sufficient trigger voltage from the power supply.

To test a strobe light system, insert the Strobe Check Unit in place of the flash tube in question. Turn on the system. If the power supply is OK the anode lamp will glow and the "T1" or "T2" lamp will flash at the strobe unit's flash rate.

To test a remote strobe light system, connect either or both remote cables from the Strobe Check Unit in place of the strobe light head in question. Turn on the system and check to see if the Anode lamp is glowing and if the "T1" or "T2" are flashing.

If you have anode voltage and trigger voltage, replace the flash tube.

If you do not have anode voltage or trigger voltage, check to see if you have input power to the strobe light power supply.

Using the Strobe Check Unit you can test cable continuity. If the Strobe Check Unit indicates that everything is OK at the power supply but not at the far end of the cable, there is a defective cable.

### TROUBLESHOOTING PROCEDURES

When repairing Whelen Strobe Light Systems, use only Whelen approved hardware. Be careful of strobe light parts that are similar in appearance, but not in quality.

The Whelen Aviation Strobe Light is a condenser discharge strobe light system.

A condenser is charged to approximately 400 volts DC, then discharged across a xenon flash tube at controlled intervals. The condenser is parallel across the xenon flash tube that is designed to hold off the 400 volts DC applied until the flash tube is triggered by an external pulse. This pulse is generated by a solid state timing circuit in the power supply.

When troubleshooting a strobe light system, you must first determine if the trouble is in the flash tube or the power supply by replacing the flash tube assembly with a known good flash tube. A normal operating power supply emits an audible tone.

**If there is no sound emitted when you first turn it on, investigate the following:**

- A** Determine that there is a proper input voltage at the power supply input 12 or 24 volts, whichever is applicable.

**WARNING!** Reversed polarity of the input power for just an instant will permanently damage the power supply. This damage is sometimes not immediately apparent, but will cause a failure in time. The reversed polarity destroys a protective diode in the power supply, causing self-destruction from over-heating of the power supply.

**CAUTION!!!** Let the power supply bleed down 5 minutes before handling

- B** Clear all possible shorts at the power supply and check the power supply operationally disconnect the output cables from the power supply outlets, and connect an operating strobe head assembly directly to the power supply outlet. Then apply the required voltage to the power supply input.

If this application functions normally, look for the following problems in the inter-connecting cable.

**C CHECK FOR MALFUNCTIONS IN THE INTER-CONNECTING CABLES:**

If pins 1 and 3 are reversed or if there is a short between pins 1 and 2 of the inter-connecting cable, the power supply will be rendered non-operable until the short is cleared. A short of this type will not cause any permanent damage to the power supply. A discharge of the condenser across pin 1 and 3 will destroy the trigger circuit.

**Continuity Checks:**

- Check for continuity between the connectors of each inter-connecting cable:  
Pin 1 to Pin 1 (Red Wire-anode) +  
Pin 2 to Pin 2 (Black Wire-ground) -  
Pin 3 to Pin 3 (White Wire-trigger)
- Check for shorts between Pins 1 & 2, 1 & 3 and 2 & 3 of the inter-connecting cable.
- Check for shorts from Pins 1, 2, 3 to aircraft ground.

- D** When pins 1 and 2 and Pins 2 and 3 are reversed, the system will appear to operate normally, but these conditions will cause early flash tube failure and void the flash tube warranty.

**E CHARACTERISTICS OF A XENON FLASH TUBE**

- A xenon flash tube can be very photo-sensitive. One will flash normally when exposed to an external light source, but may become hard to fire when subject to darkness.
- They will become hard firing with age, or when exposed to very high temperature. A hard firing tube will sometimes operate with the engine running but will fail when operated on a low battery.
- They can develop a leak through eggshelling of the glass, or a leak can develop around the seal of the wire to the glass. This is caused by hot and cold cycling of normal operation of the system.
- They can go into self-ionization (continuously glow a light blue), thus rendering the entire system non-operational until replaced. This most likely occurs when the input voltage is highest. This can be checked by turning the system off. When turning the system back on, it generally will operate normally for a few flashes before going back into self-ionization.

Any of the aforementioned conditions are reason for replacement of the flash tube.

- To check a questionable flash tube, install it in a system and apply 10 volts to a 14 volt system, or 22 volts to a 28 volt system. If the flash tube will operate at the reduced level, it has a great deal of service life in it.

A flash tube becomes harder to fire as it ages.