

The Comanche Flasher (Dec 2011) Friedrich Rehkopf, ICS #9153

The last Comanches built are now almost 40 years old; the age of the earliest is 55. Consumables and parts commonly replaced on a regular basis are readily available, thanks to many individuals and small companies who are engaged in keeping us in the air.

Even for bigger problems like the horn issue and the main landing gear struts, solutions have become available.

However, the repair or replacement of some small items, like the warning flasher unit, is not that well known.



Figure 1: Flasher Box Assembly, F3A and G3L denote wire markings.

In Comanches, the function of the flasher is to pulse the stall warning light as well as the stall horn; twins, however, have an additional flasher. Its sole function is to flash the gear-up light if one of the throttles is pulled back below 12 inches of MP whilst the gear is still retracted. The flasher units themselves are not that easy to locate. In the single, it is mounted behind the circuit breaker panel on its left upper edge. Both flasher units of the twin can be found under the nose cowl in front of the forward cabin bulkhead, near the filter of the vacuum system (see Figs. 1 and 2).



Figure 2: The flasher being used for stall warning and gear warning in the twins. Two resistors have been replaced earlier.

The Piper flasher, P/N 460 901, is used in singles (except 180s). In twins, it is used for both the stall warning and the gear warning systems. The original unit is a thermo-wire type device based on a U.S. patent initially granted in 1939 and updated in 1945. This Piper component part was produced by Tung-Sol as flasher P/N 617.

The flasher units (see Fig. 3) normally last a very long time. However, three types of malfunctions may arise. The most common problem seems to be a broken spot-welded joint between the very thin steel sheet metal strip that holds the flasher element in place, and the flasher element itself (Fig. 4). The second problem is that the contacts in the flasher element may become sticky and the force of the heater wire is insufficient to operate the contacts. The third failure is a burned heater wire.



Figure 3: The flasher unit.

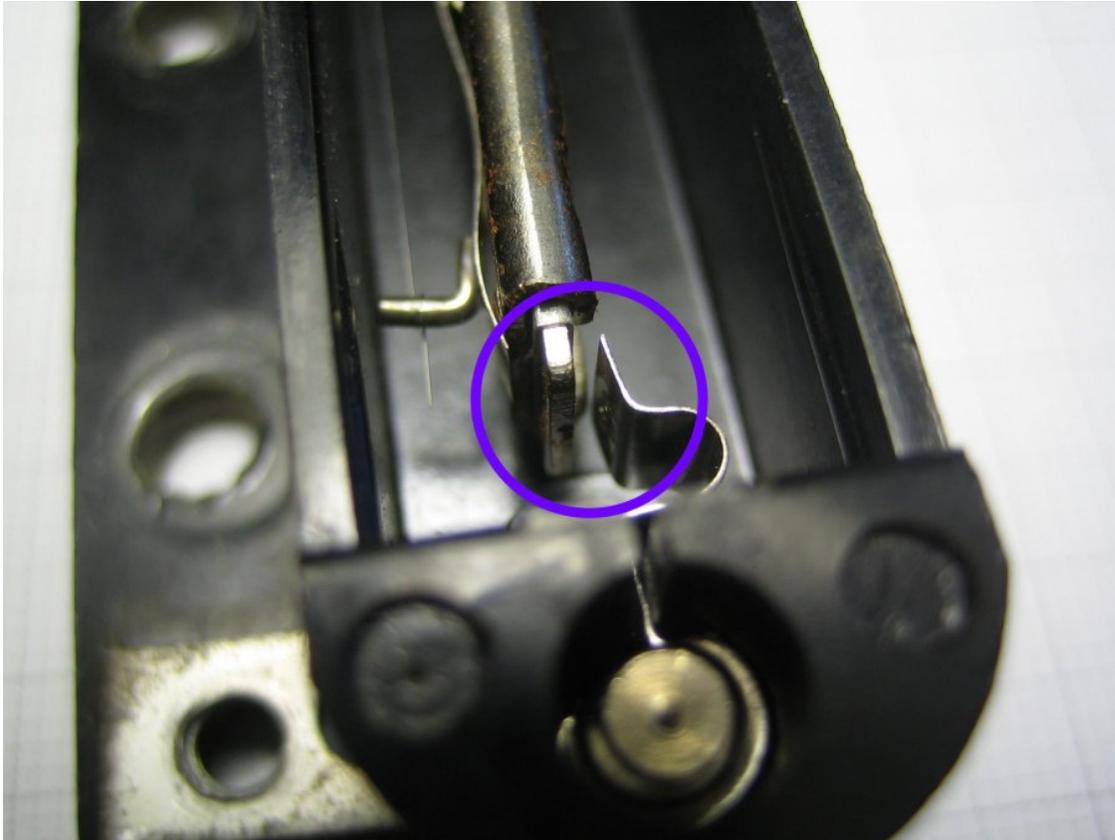


Figure 4: Broken spot-welding

The broken spot-welded joint can be repaired primarily by soldering the pieces together. I personally would not recommend doing this because of the disparity in size of the two parts which may result in a sub-optimal solder joint and a limited service life. Sticky contacts are usually easier to fix. Just spray some electronic contact cleaner or similar solvent onto the flasher element, and after a minute or two, blow it dry with compressed air. If you find a burned thermo-wire in your 617, you will need to replace it.

So what do you do when the flasher is not repairable? An easy solution should be available in solid-state electronic components. After searching the internet, I found a very small self contained flasher unit called the “m-Flash” which is intended for driving the LED replacement bulbs of motorcycle turn indicator lights. Normal flashers cannot be used for this function because of the very small current load of the LEDs. The flasher unit I found works with electrical loads as low as one watt, which is perfect for our application (Fig. 5). Thanks to miniaturization, this modern electronic component will fit into a very small space such as the original Tung-Sol flasher housing.

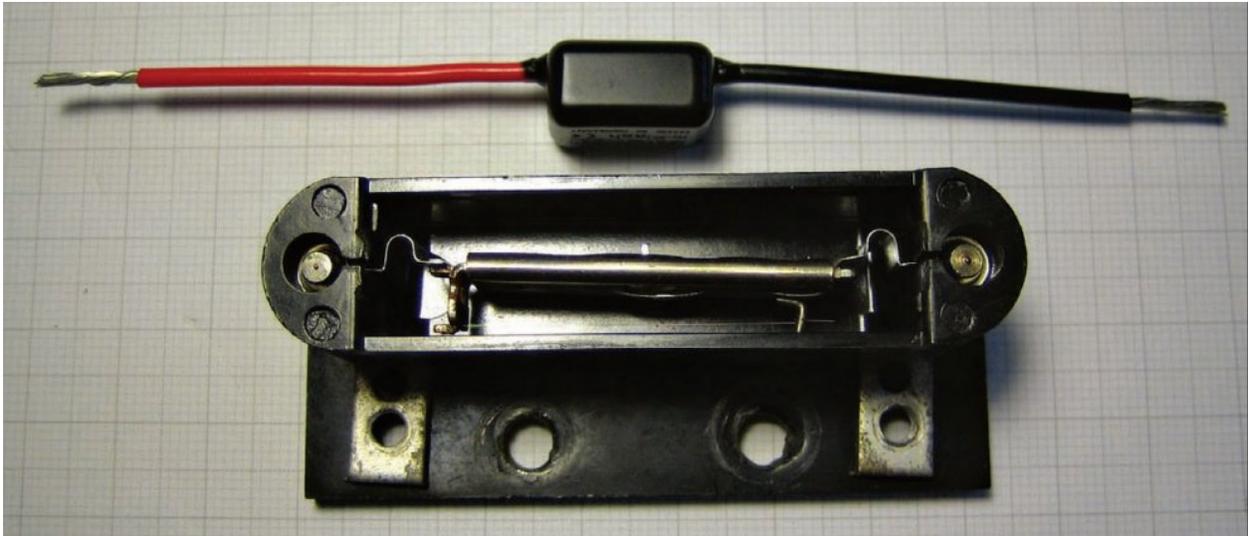


Figure 5: Open flasher housing with the solid-state flasher circuit.

Replacement of the hot-wire flasher element by the m-Flash unit is straightforward:

1. Remove the old element by breaking off the spot-welded joints from the steel ribbon support strips.
2. Before soldering the m-Flash unit into the housing, two important items have to be considered. The first is the polarity. The red wire of the m-Flash must be connected to the positive side of the warning circuit. For twins, the POSITIVE side gear warning wire is labelled "G3L," and the equivalent stall warning wire is labelled "F3A."
The second consideration is the soldering process itself. Solid-state circuits can often be destroyed by excessive heat. When soldering the wires to the steel ribbon strips, heat up the sheet metal first to minimise the heat to the wires.
3. Position the m-Flash unit in the flasher housing, and solder the wires to the thin steel strips. Before soldering, double check for correct orientation of the polarity of the wiring. When the solder joints are cooled down, check the wires for firm connections. The last step is to apply a little bit of adhesive between the m-Flash unit and the flasher housing to stabilize it (see Fig. 6).

Sources for the m-Flash Flasher Unit

Spiegler Performance Parts (USA) <http://spieglerusa.com/m-flash-6001.htm>

Motogadget (Europe)

<http://motogadget.com/elektrik/digitalesblinkrelais-m-flash/m-flash/m-flashblinkrelais.html>



Figure 6: The repair completed with the solid-state flasher circuit inside the original flasher housing lid.