

Current as of Jul 1/09

ICE AND RAIN PROTECTION PROPELLERS TROUBLESHOOTING

1. PROPELLERS - TROUBLESHOOTING

A. Propeller - Troubleshooting Deicer System

The ammeter of the deicing system can be used to indicate the general nature of most electrical problems. Consequently, it is recommended that, to determine which circuits are involved, troubleshooting be preceded by the ammeter test outlined in step (1) of the 50 HOUR INSPECTION (5-20-00), and the HEAT TEST (30-60-00, 201). A reading of two thirds the normal amount of current (or one half on two bladed props) is an indication that one of the circuits is open between the slip ring assembly and deicer heater. If the ammeter registers excess current, the power lead is shorted to ground. It is possible that the excess current has welded the timer contacts in one phase. Under these circumstances, the timer will either feed current to the welded contacts continuously, or not cycle. If the former is true, the heat test will show heating throughout the two phases. Unless the grounded power lead is located and corrected, any new timer that is installed may suffer the same internal damage during the first use of the system. In general, for most effective use of the troubleshooting table (Ref. Table 101) all of the "indication" entries should be read to locate that which matches conditions of the particular system being checked. The numbered "probable cause" and "remarks" then indicate the proper sequence of checks. It should be noted, however, that such numbers are assigned with respect to the approximate usefulness of the check rather than to the most likely sequence of occurrence.

Table 101
Troubleshooting Propeller Deicer System

Indication	Probable Cause	Remarks
1. Ammeter shows zero current (both phases of the 3 minute cycle).	a. Switch circuit breaker tripped.	a. Locate and correct short before resetting circuit breaker by turning switch OFF then ON.
	b. Switch faulty.	b. If no voltage at switch output with voltage at switch input, replace the switch. If voltage is OK at switch output, go to step "d".

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	<p>c. No power from airplane.</p>	<p>c. If no voltage into switch, locate and correct open circuit.</p>
	<p>d. Ammeter faulty. (If some or all deicers heat with ammeter at zero, replace ammeter.</p>	<p>d. Test for voltage up to and out of ammeter. If low or zero output but proper input, replace the ammeter. If no voltage to ammeter, locate and fix open circuit between switch and ammeter.</p>
	<p>e. Open circuit between ammeter and timer.</p>	<p>e. Disconnect harness at timer and check voltage pin B (of harness) to ground. If none, locate and correct open circuit.</p>
	<p>f. Open circuit in wiring between timer and firewall connector.</p>	<p>f. Refer to the paragraph on HEAT TEST (30-60-00, 201) to find deicers not heating and test for voltage on that pin of firewall connector. If zero over three minutes, locate and fix open circuit in wiring from timer to firewall.</p>

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	g. Open between firewall and deicer lead straps.	g. If voltage OK to firewall plug, try voltage at junction of deicer lead and slip ring lead. If no voltage, find and correct open circuit in wiring to brush block, open circuit within brush block, or no contact brush to slip ring.
	h. No ground circuit.	h. If voltage at deicer leads, locate and fix open circuit from deicer to ground.
2. Ammeter shows normal current part of cycle, low current rest of cycle.	a. Open circuit in deicer or slip ring assembly.	a. Disconnect deicer straps to check heater resistance. If resistance is within specified limits, locate and fix open circuit in slip ring leads. If not, replace deicer with open circuit.
	b. High resistance in circuit with low current.	b. If not in contact of brush to slip ring (including ground brush), trace wiring to deicer and to timer to fix partially broken wire, loose or corroded connection.
3. Ammeter shows low current.	a. Airplane voltage low.	a. Check bus voltage.
	b. Ammeter faulty.	b. Refer to step "1.d".

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	c. High resistance up to timer.	c. Check for partially broken wire, loose or corroded connection in wiring from airplane supply to timer input.
4. Ammeter shows excess current.	a. Ammeter faulty.	a. Refer to step "1.d".
	b. Ground between ammeter and timer.	b. Disconnect harness at timer and with ohmmeter, check from pin B (of harness) to ground. If ground is indicated, locate and correct.
	c. Ground between brush block and timer.	c. Disconnect leads at brush block and check from power leads to ground with ohmmeter. If ground is indicated, locate and correct.
	d. Ground between brush block and deicers (excluding ground brush circuit).	d. If no short exists at brush slip ring contact, check for ground from slip ring lead to prop while flexing slip ring and deicer leads. If a ground is indicated, locate and correct.
	e. Timer faulty.	e. Test timer as indicated paragraph on TIMER CHECK (30-60-00, 201)

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5. Ammeter does not "flick" each 90 seconds.	a. Timer ground open.	a. Disconnect harness at timer and check with ohmmeter from pin G (of harness) to ground. If no circuit, refer to Bonanza Wiring Diagram Manual P/N 35-590012-9 .
	b. Timer contacts are welded (caused by short circuit in system).	b. Test timer as in paragraph on TIMER CHECK (30-60-00, 201) . If timer does not cycle with voltage at pin B, replace timer but be sure short causing original failure has been located and corrected.
6. Ammeter flicks between 90 second phase periods.	a. Loose connection between airplane power supply and timer input.	a. If trouble occurs over entire cycle, trace wiring from power source to timer input to locate and tighten loose connections.
	b. Loose or poor connection, timer to deicers.	b. Check for rough or dirty slip rings causing brush to "skip". If not this, trace circuits to locate and fix loose or poor connection.
	c. Timer cycles erratically.	c. Test timer as indicated in TIMER CHECK (30-60-00, 201) .
	d. Electrical wiring breakdown.	Replace the faulty deicer boot.

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7. Radio noise or interference with deicers on.	a. Brushes arcing.	a. Check brush alignment as in step (8) of 100 HOUR INSPECTION (5-20-00). Look for rough or dirty slip rings. If this is the cause, clean, machine or replace slip ring assembly. Check for slip ring alignment.
	b. Loose connection.	b. Refer to step (7) of 100 HOUR INSPECTION (5-20-00).
	c. Switch faulty.	c. Try jumper wire across switch. If radio noise disappears, replace the switch.
	d. Wiring located within less than 8 inches of radio equipment wiring.	d. Replace at least 8 inches from input wiring to radio equipment.
8. Rapid brush wear or frequent breakage.	a. Brush block out of alignment.	a. Check brush alignment as in step (8) of 100 HOUR INSPECTION (5-20-00).
	b. Slip ring wobbles.	b. Check slip ring alignment with dial indicator.
	c. Rough slip ring.	c. Replace or machine.
	d. Dirty slip rings.	d. Clean the slip rings.
	e. Brushes arcing.	e. See step "8.a".