Policies & Procedures Bulletin

G1000 Standby Battery Test

Issue Date: 2017-12-04

Applicability

All ATP instructors operating Cessna 172 aircraft with G1000 avionics.

Purpose

To address an increase in the number of maintenance reports for failed standby battery checks in G1000-equipped Cessna 172s by:

- Shortening the duration of the test from 20 to 10 seconds, per Cessna's latest guidance
- Moving the test to the Run Up Checklist
- Clarifying that test results may vary in cold weather, and
- Clarifying that the standby battery is not required equipment

Synopsis

Standby Battery Test Overview

G1000-equipped Cessna 172s are equipped with a 24-volt standby battery. If the main bus voltage drops below 20 volts, the standby battery will automatically supply power to the essential bus for at least 30 minutes. This will power the PFD, ADC, AHRS, engine monitor, Nav 1, Comm 1, and the lights for the standby instruments. (See Image 1.)

The energy level of the standby battery is checked prior to flight. Holding the STBY BATT switch in the TEST position places it under load to confirm its voltage and power. The test is passed if the green TEST lamp remains illuminated for 10 seconds (reduced from 20 seconds – see "Checklist Edits" section). The switch is then moved to ARM. Keeping the switch in the ARM position during flight charges the standby battery and makes it available in the event of a main electrical system failure.

Checklist Edits

The standby battery test is to be moved to the end of the Run Up Checklist, to allow the battery time to charge prior to the test. Additionally, the duration of the test is shortened (per Cessna's latest AFM update) from 20 seconds down to 10 seconds. The next print run will include these changes; in the meanwhile, please make a pen/paper update.

The functional check of the standby battery during the Before Starting Engine Checklist (switching to ARM and ensuring the PFD powers on, with the correct Engine Indicating System readings) remains in its current location.

If the PFD Does Not Activate

For IFR flights, if the PFD does not come on when the STBY BATT switch is moved to ARM during the Before Starting Engine Checklist (or if BUS E Volts reads below the minimum of 24), attempt to recharge the battery before cancelling the flight. Proceed with the Engine Start checklist and run the engine for 5 minutes at 1000 RPM, with the alternator master ON and the STBY BATT switch in the ARM position. Shut the engine down per the Shutdown/Terminate Checklist (including switching STBY BATT to OFF), then perform the Before Starting Engine Checklist again. The PFD should now power on properly.

In the Event of Test Failure

A failed standby battery test does not ground the aircraft. The Kinds of Operations Equipment List states that the 24V Standby Battery is not required for VFR day flight. (See Image 2.) In VFR day conditions, even if the alternator, main battery, **and** standby battery all fail, the aircraft can still be flown safely to the nearest airport with zero electrical power.

For VFR night or IFR operations, Cessna states that correct operation of the standby battery is recommended, but not required (except in Europe). The PIC has the responsibility to evaluate current conditions and determine if the flight can be conducted safely. Note that the standby airspeed indicator, altimeter, and attitude indicator are not electrically powered, and will remain operational even if the main and standby batteries are drained.

In the winter season, battery performance will be reduced by cold weather conditions, until the aircraft has time to warm up. From the POH/AFM:

> During cold weather starting, when performing the Standby Battery energy level test, the test lamp may not illuminate and the BUS E volts may be less than 24 volts before turning on the MASTER (ALT and BAT) switch. After engine start, verify the S BATT ammeter shows a charge (positive) at 1000 RPM or greater. Prior to takeoff verify the S BATT ammeter shows a charge less than 0.4 amps.

Effective Date	Immediately.
Action Required	Test the G1000 standby battery for 10 seconds, rather than 20. Perform this test at the end of the Run Up Checklist. Note this change on your Cessna 172SP (G1000) checklists with pen or pencil. Understand that the standby battery is not required equipment, and make appropriate risk management decisions if it fails the test (particularly in cold weather).
Contact	Direct any questions about this bulletin to Ben Gabriel, Director of Training, at 904-595-7927 or ben@allatps.com.

ELECTRICAL SYSTEM (Continued)

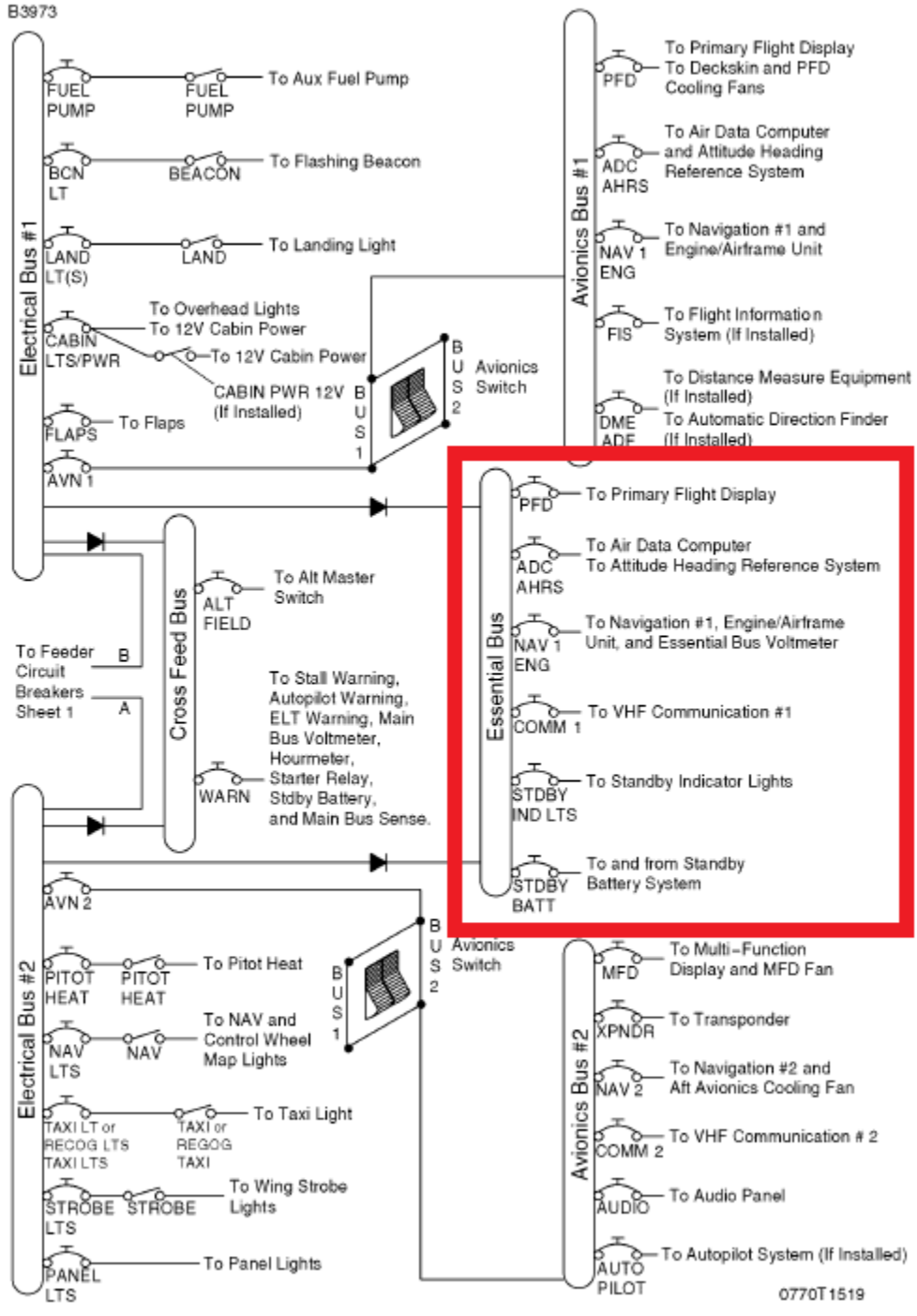

Figure 7-7* (Sheet 2)

Image 1 - Cessna 172 Electrical System (with Essential Bus highlighted)

KINDS OF OPERATIONS EQUIPMENT LIST

System, Instrument, Equipment and/or Function	KIND OF OPERATION				COMMENTS
	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	
PLACARDS AND MARKINGS					
1 - 172S Nav III - GFC 700 AFCS POH/AFM	1	1	1	1	Accessible to pilot in flight.
2 - Garmin G1000 Cockpit Reference Guide	1	1	1	1	Accessible to pilot in flight.
AIR CONDITIONING					
1 - Forward Avionics Fan	1	1	1	1	
2 - PFD Fan	0	0	0	0	
3 - MFD Fan	0	0	0	0	
4 - Aft Avionics Fan	1	1	1	1	
COMMUNICATIONS					
1 - VHF COM	0	0	1	1	
ELECTRICAL POWER					
1 - 24V Main Battery	1	1	1	1	
2 - 28V Alternator	1	1	1	1	
3 - 24V Standby Battery	0	*	*	*	* Refer to Note 1.
4 - Main Ammeter	1	1	1	1	
5 - Standby Ammeter	0	*	*	*	* Refer to Note 1.

NOTE

1. The European Aviation Safety Agency (EASA) requires the 24V Standby Battery and Standby Ammeter to successfully complete the pre-flight check before operating the airplane in VFR night, IFR day, or IFR night conditions in Europe. Correct operation of the 24V Standby Battery and Standby Ammeter is recommended for all other operations.

(Continued Next Page)

Image 2 - Kinds of Operations Equipment List (w/ Standby Battery guidance highlighted)