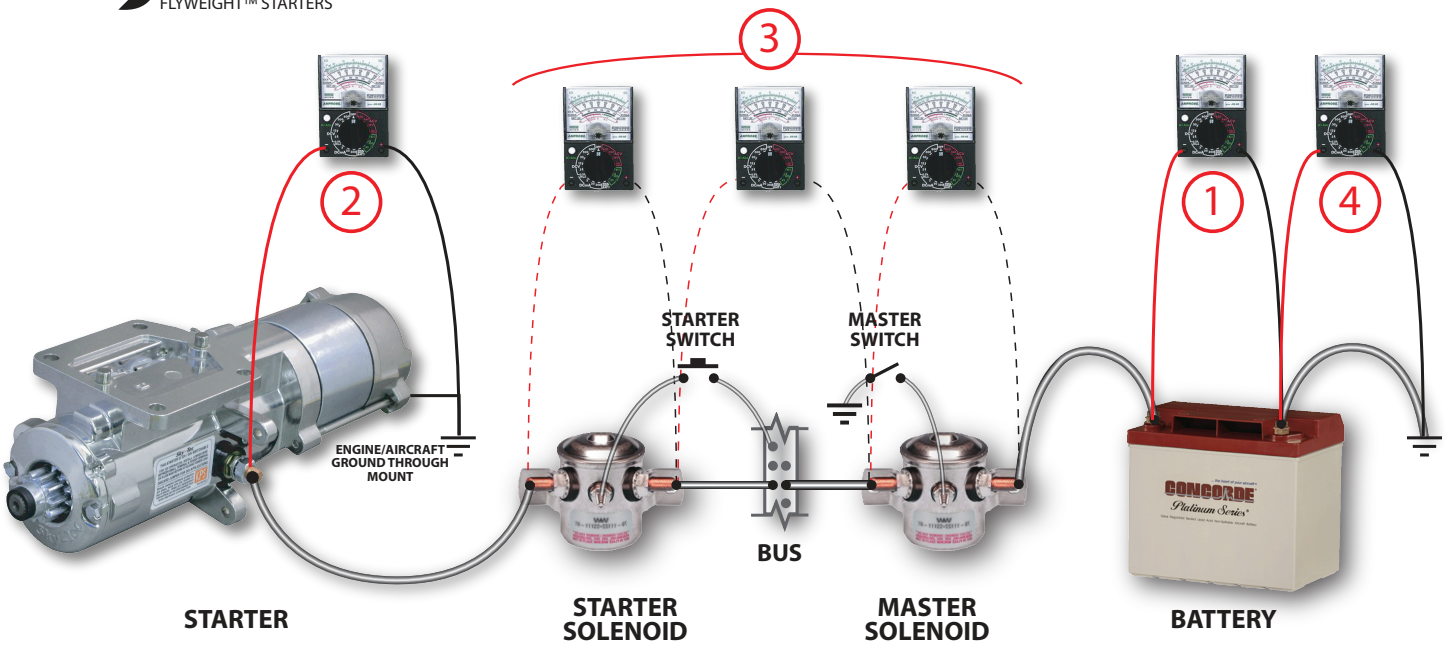
AIRCRAFT STARTING SYSTEM TROUBLESHOOTING GUIDE

REV_10.0

Sky-Tec FLYWEIGHT™ STARTERS



IMPORTANT NOTES: REFER TO AIRCRAFT PARTS AND MAINTENANCE MANUALS FOR PROPER WIRING. THIS DIAGRAM IS FOR TROUBLESHOOTING ILLUSTRATION PURPOSES ONLY.

DO NOT USE THIS DIAGRAM AS GUIDANCE FOR INSTALLING YOUR STARTER!

FAA-approved installation instructions are ALWAYS included with each starter. Copies are also downloadable from the www.skytecair.com

DO NOT REMOVE THE STARTER FROM THE AIRCRAFT TO PERFORM TESTING! For accuracy and relevance, starter testing should be conducted in the aircraft while the starter is in its failure mode (when the operator presses "start" but the starter fails to perform to spec).

DO NOT USE JUMPER CABLES, a friend's battery, or auto store battery testers to test aircraft starter systems. Doing so will not help troubleshoot the starter.

USE AN ANALOG VOLT METER. It is difficult to obtain steady readings on a digital meter. Typical shop ohmmeters will not produce useful data. Check voltage. Keep it simple & follow these easy steps:

PRETEST CONSIDERATIONS: If possible, visually inspect the starter and/or interview pilot/operators for starting history. Indications of long cranking periods, burning odor or smoke from the starter, kickback(s), a cracked starter mount, a fast spinning starter w/no prop movement (for Sky-Tec NL model starters replace shear pin), oil in starter, grinding noise or a damaged ring gear are generally indications that the starter is in need of repair and the following tests will not be helpful. Simply remove the starter for repair or overhaul (the NL series starters' shear pin is FIELD REPLACEABLE - do not send in for shear pin replacement).

TESTING RELEVANCE: The following testing procedure is relevant to any make of Lycoming or Continental engine starters exhibiting undesirable performance including slow cranking and/or failure to crank the engine over a compression stroke. If a starter is damaged by overcranking or a stuck firewall solenoid, voltage in step one may read below acceptable levels thus incorrectly indicating a potential battery problem. Therefore, in such cases some consideration must be to the pretest conditions noted above (if it smells burned...). If the only effect of energizing the starter results only in an audible "click" with no prop movement, confirm step 2 to isolate problem to starter or starter contactor. ***Note for Sky-Tec CvST3 (Continental) model starters***: Sky-Tec CvST3 starters feature a clutch slippage inspection port. If starter rotates but prop does not, remove inspection plug and note clutch drum rotation. If rotation is observed, starter is OK - suspect TCM starter adaptor requires service.

	TEST	RECORD	RESULT	ANALYSIS
STEP 1	Record voltage at the battery while cranking the starter in its failure mode.	_____ VOLTS	Below 11V / 22V?	***YES*** - Voltage at battery drops below 11V / 22V? Questionable battery. See Testing Relevance above as a shorted (cooked) starter will pull voltage down appreciably. However, if starter rotates at all, this is generally not a shorted starter condition. Battery issue - no need to proceed with remainder of troubleshooting. ***NO*** - Voltage at battery remains above 11V / 22V? Proceed to Step 2
STEP 2	Record voltage at the starter while cranking the starter in its failure mode.	_____ VOLTS	Below 10V / 20V?	***YES*** - Voltage at starter drops below 10V / 20V? Not a starter problem. The starter needs 10V / 20V to perform to spec. Below that voltage minimum, it cannot perform to spec. Suspect cables, terminals and/or solenoids. Or maybe that airframe just isn't up to the task. If the difference between Step 1 and Step 2 is more than 2 volts, Proceed to Steps 3 & 4 to find airframe voltage losses. ***NO*** - Voltage at starter remains above 10V / 20V and the starter's performance is not pleasing you? Visit www.skytecair.com to return the starter to Sky-Tec for analysis/repair. There is nothing more you can do.

OPTIONAL AIRFRAME VOLTAGE TROUBLESHOOTING (Perform only if battery remains above 11V / 22V in Step 1 and starter receives less than 10V / 20V in Step 2)

STEP 3	Record voltages between each and every cable terminal and across solenoids while cranking the starter in its failure mode.	Assuming the voltage difference noted in Step 2 exceeded 2V / 4V, flush out any appreciable loss in voltage in any cable or solenoid by placing the meter along each link in the diagram. A tight electrical system will lose no more than 0.5 volts between the battery and starter. Be sure to conduct these tests while cranking the starter in its failure mode (when it's powered but not performing to spec).
STEP 4	Record voltages between battery & ground and starter & ground while cranking the starter in its failure mode.	If no appreciable loss of voltage is noted in Step 3, flush out the integrity of all electrical system grounds. Pay close attention to battery and engine grounds. Clean up or repair any questionable ground connections and re-test.