

DCA11MA076

Postaccident Test Card and Test Safety Hazard Analysis for Flaps 10, OEI Takeoff

(3 pages)

TEST SAFETY HAZARD ANALYSIS (TSHA)

ID: TSHA-000084

TEST: Field Performance - Engine-out Takeoffs (OEI)

RISK LEVEL: HIGH

PROBABILITY: OCCASIONAL

HAZARD: CATASTROPHIC

HAZARD: Aircraft Departs Runway/Inadvertent Ground Contact/Inadvertent Stall

CAUSE: Engine failure/Over-rotation at low airspeed/ low altitude stall

EFFECT: Inability to recover directional control on the ground
Loss of controlled flight
Loss of aircraft/loss of crew.

PREVENTATIVE ACTIONS / MINIMIZING PROCEDURES:

1. All testing shall be conducted under day VMC conditions on a smooth, hard-surfaced dry runway. Fuel cut tests shall be conducted at KROW, on Runway 3/21 which is 13000'x300'. Non-fuel cut tests shall be conducted on a runway of at least 12000' in length and at least 150' in width.
2. Brief local fire and rescue crews on test conditions. CFR support will be required for this testing. The CFR support will be "in-position" outside the fire station at a location determined by the local fire chief that will allow the most expeditious response time.
3. Service struts, brakes and tires to recommended limits.
4. Inspect leading edge of wings and gap bands prior to each flight.
5. Only crewmembers deemed essential for conduct of the test shall be onboard. For development, company, or delegated testing, minimum crew will be no more than 2 pilots and 1 FTE. For certification testing with FAA participation, minimum crew will be no more than 2 pilots (1 GAC, 1 FAA) and 2 FTEs (1 GAC, 1 FAA).
6. Initial takeoff pitch attitude target will be limited to 9° for test runs.
7. Winds will be limited to 10 knots, gust spread less than 5 knots, crosswind component of 5 knots, or tailwind component of 2 knots, using the GAC Flight Test wind station as the primary instrument.
8. Testing will be approached in a build-up manner for each configuration. Fuel cuts will be preceded by tests using a throttle chop to idle power. No engine shutdowns will be conducted without conducting build-up tests. The number of required build-ups and repeat testing will be determined by the on-site test team. Additionally, the pilot flying shall have recent experience with the test maneuver or perform a build-up maneuver(s) before conducting the test condition.
9. Brief dual engine-out emergency procedures.
10. The rudder oscillation monitor will be disabled, and alternate control law maximum gains will be loaded prior to testing.
11. Stick shaker and PLI-intercept are set to maintain an in-ground-effect stall AOA margin of at least one (1) degree.
12. Confirm aircraft is airborne prior to increasing pitch from the initial takeoff pitch attitude.
13. Do not allow airplane roll angle to exceed 10 degrees. Wing tip strike is estimated to occur at approximately 15 degrees of roll attitude for the maximum abused takeoff attitude.
14. Periodically visually inspect brakes and tires and check tire temperatures to maintain below 150°F. An alternative method is that tire temperature is acceptable for continued testing if a person can place and maintain their hand on the tire sidewall.
15. Telemetry support is required for this test. A review of test data from each maneuver will be conducted in TM and onboard the aircraft. Concurrence between TM support and flight crew will be required prior to continuing to next test condition.
16. Flight crew will monitor displayed airspeed during each maneuver and determine if airspeed fluctuations are too large to allow continued testing.

CORRECTIVE TECHNIQUES:

1. If the engine fails prior to V_R , reject the takeoff.
2. If the aircraft is airborne and an engine fails, decrease pitch attitude and land aircraft if near the ground and sufficient runway is available. If unable to land, establish a stable bank angle, and advance the operative engine PLA to maximum thrust and continue takeoff using standard engine failure techniques.
3. If the engine fails above V_R during a fuel cut, restart shutdown engine, if possible, and continue flight using standard engine failure techniques. If unable to restart engine, perform dual engine out landing procedure.

4. If the aircraft pitch attitude exceeds the PLI (over-rotated, or rotated early and stalls), the pilot will use his discretion and perform one of the following: decrease angle of attack, advance PLA on both engines to maximum thrust, use all flight controls as required to regain aircraft control and continue climbout to safe altitude, or retard both throttles and land.

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COG ENGR:	[REDACTED]	TEST CONDUCTOR / COORDINATOR:	[REDACTED]
PILOT:	[REDACTED]	MANAGER:	[REDACTED]