

TECHNICAL MANUAL

MAINTENANCE OPERATIONAL CHECKS AND CHECK FLIGHTS

THIS MANUAL SUPERSEDES TO 1-1-300, DATED 15 AUGUST 2023.

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PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

15 DECEMBER 2023

1 PURPOSE.

1.1 Policy and Requirements. This technical manual establishes policy and requirements to perform Maintenance Operational Checks and Check Flights on USAF aircraft. It establishes requirements to ensure the aircraft is airworthy via Functional Check Flights (FCF) of primary / critical aircraft systems or capable of mission accomplishment via Operational Check Flights (OCF). It establishes requirements to be used by USAF in accepting new production aircraft and guidelines for conducting Acceptance Check Flights (ACF). It establishes requirements to be used for secondary / noncritical systems checks via Equipment Check Flights (ECF). It also describes the use of an In-Flight Operational Check (IFOC) to complete a maintenance action. This technical manual is the principal guidance for conducting check flights. Specific aircraft maintenance inspection manuals (eg-6) augment this guidance. Aircraft maintenance inspection manuals (eg-6) may not negate requirements in this technical manual.

1.2 Changes. Submit proposed changes to this technical manual through the major command using the ETIMS change request to HQ AFMC/A3V, 508 W Choctawhatchee Ave, Suite 4, Eglin AFB, FL 32542-5713.

2 SCOPE.

This technical manual applies to all commands, field operating agencies, and direct reporting units of the DAF (USAF and USSF), Air Force Reserve Command, Air National Guard, and Air Force contractors involved in the manufacture of new production aircraft, having bailed aircraft or processing aircraft on contract for maintenance, modification, or removal from storage.

3 MAINTENANCE OPERATIONAL CHECKS.

3.1 Maintenance Checks. Maintenance operational checks are checks accomplished on the ground to ensure aircraft systems or components, which have been disturbed during inspection or maintenance operations, have been repaired, reassembled or adjusted satisfactorily.

3.2 Safe For Operational Use. These checks will be accomplished to simulate, insofar as possible, the conditions under which the system or component will be operated. The affected equipment will be operated through a sufficient number of cycles to ensure aircraft is safe for operational use.

3.3 Pilot Requirements. Maintenance operational checks involving ground or hover taxi of helicopter or high-speed taxi of fixed wing aircraft will be accomplished and certified by pilots qualified as specified in [Paragraph 5.1](#). Pilots performing high-speed taxi checks will compute takeoff data to indicate the highest speed expected and the stopping distance.

3.4 Record Results. Maintenance operational checks will be recorded on AFTO Form 781A and in the Integrated Maintenance Data System (IMDS) in accordance with TO 00-20-1 and TO 00-20-2 series technical manuals.

3.5 Acceptance Inspections. Acceptance inspections on newly produced weapon systems, major system modifications or upgrades will be accomplished on receipt at either test or operational locations for the purpose of ensuring proper configuration control and to provide feedback to the developing command and contractors concerning manufacturing quality assurance.

4 CHECK FLIGHTS.

4.1 Airworthy. Check flights are performed to determine whether an aircraft and its various components are functioning according to predetermined specifications while subjected to the flight environment. Such flights are conducted when it is not feasible to determine safe or required operation (aerodynamic reaction, air loading, signal propagation, etc.) by means of ground or shop tests. Equipment operating procedures, limit pressure readings, and conditions to be noted and recorded during FCF/ACF are normally specified in the -6CF (or equivalent) Acceptance/Functional Check Flight Procedures Manual. Check flights are normally conducted following maintenance work and prior to release of the aircraft for operational use. For the purpose of this instruction, to ensure aircraft is airworthy, primary / critical aircraft systems are

those affecting engines; flight controls; landing gear; and those systems affecting the basic Instrument Flight Rules (IFR) capability of the aircraft (i.e., pitot static; compasses; attitude references, air data computers, etc.). Work performed on these systems may impact an aircraft's airworthiness and require a check flight to reestablish that the aircraft is airworthy. Secondary / noncritical systems are those aircraft systems which do not affect airworthiness and are distinguished from mission specific equipment which affect aircraft mission readiness. When in question, local Operations and Maintenance organizations will be consulted for a determination on the need for a check flight.

4.2 FCF/ACF/ECF/OCF. Any flight performed to accept or check accomplishment of depot maintenance or modification will be identified as an FCF/ACF/ECF/OCF. Any modification or TCTO that affects a primary / critical aircraft system as defined in [Paragraph 4.1](#) will be identified as an FCF/ACF.

4.2.1 Functional Check Flight (FCF). Check flight conducted for to ensure the aircraft is airworthy (and not simply for contractual conformance) in accordance with [Paragraph 4.1](#). FCF missions are flown to check the operations of selected primary / critical aircraft systems or equipment that requires flight verification. Full FCF profiles are flown when required.

4.2.2 Equipment Check Flight (ECF). Includes check flights with the primary purpose to establish secondary / non-critical (e.g. F-16 Environmental Control System) aircraft systems are operating properly when subjected to the design environment in accordance with [Paragraph 4.1](#). The required checks and methods to determine completion will be clearly stated in the aircraft records (e.g. AFTO 781).

NOTE

Some secondary aircraft systems, if failed, could rise to the level of affecting safety of flight.

4.2.3 Operational Check Flight (OCF). Check flight conducted after maintenance to ensure aircraft mission specific equipment is operational and the aircraft is mission ready (e.g., AC-130J 105 mm gun check firing). The required checks and methods to determine completion will be clearly stated in the aircraft records (e.g. AFTO 781). If a check flight consists of both secondary / noncritical aircraft system checks and mission specific equipment checks it will be designated as an equipment check flight (ECF: [Paragraph 4.2.2](#).)

4.2.4 Acceptance Check Flight (ACF). Includes check flights for performance and operation of systems/equipment to verify contractual conformance and/or to ensure aircraft is airworthy in accordance with [Paragraph 4.1](#). This is applicable to all aircraft on new aircraft production, modification, or Programmed Depot Maintenance (PDM) contracts. ACF missions are flown to check the operations of selected systems or equipment that requires flight verification. Full ACF profiles are flown when required. Any flight performed to accept or check new aircraft production will be identified as an ACF. Normally

all -6 and -6CF, or equivalent requirements will be completed, however, procedures developed by the contractor and approved by the government may be used.

4.2.5 In-flight Operational Check (IFOC). An IFOC is not a dedicated check flight. It is accomplished at the request of maintenance to validate a maintenance action that cannot be fully verified on the ground that does not involve an FCF/ACF/ECF/OCF. The required checks and methods to determine completion will be clearly stated in the aircraft records (e.g. AFTO 781). An IFOC is completed in conjunction with other flight requirements. It is not the principal reason to schedule the flight. It is typically the final step of a maintenance corrective action.

4.3 Conditions. Conditions requiring an FCF/ACF for establishing airworthiness (see para 4.1) and/or other required check flights (ECF/OCF) will be specified in the maintenance inspection manual (e.g. -6) for each type of aircraft. The conditions requiring a check flight specified in the maintenance inspection manual (e.g. -6) will be the result of both operations and maintenance after considering the maintenance performed and the effectiveness of determining safe or required operation by means of ground or shop tests alone. Where ground or chop checks are insufficient, a check flight will be flown. Time Compliance Technical Orders (TCTO) may also require a check flight for work accomplished in accordance with the TCTO. In the event the aircraft maintenance manual (e.g.-6) does not provide guidance as to what maintenance actions require a check flight, the MAJCOM/A3 in conjunction with the MAJCOM/A4 will develop an FCF/ACF/ECF/OCF maintenance action guidance matrix for use by the field.

4.4 Other Conditions. Under circumstances other than those specified in the aircraft maintenance inspection manual (e.g. -6), the need for an aircraft Check Flight following maintenance or repair work is an engineering decision to be exercised by the maintenance and/or operations group commander (or equivalent). Such decisions will be based upon the scope of work accomplished and consideration of the affected components relative to safety of operation.

4.5 Subsequent Flights. The FCF/ACF that have validated airworthiness but must continue to subsequent sortie(s) for additional in-flight verification of secondary / noncritical systems will still be documented as an FCF/ACF. The FCF/ACF is not complete until all required items have been verified or the aircraft is released IAW [Paragraph 8.3](#). Subsequent sortie(s) status will not be changed to ECF/OCF status.

4.6 Requirements. Check flights will:

- a. Be conducted at power settings within the limits specified in flight operating flight manual/publications.
- b. Be conducted within the designated check flight airspace of the base from which the flight was launched except when the flight must be conducted under specific environmental conditions not compatible with local

conditions and/or restrictions. This does not preclude departing from an auxiliary field or base within the home station.

- c. Be conducted from runways with an operable barrier system for those aircraft equipped with arresting gear (tail hook). See published MAJCOM guidance (AFI/AFMAN 11-2MDS, Vol 3) for detailed requirements and/or exceptions to this requirement.

4.7 Armed Conflict. Combat and combat support aircraft assigned to units engaged in armed conflict, which have had temporary repairs made at an auxiliary or recovery base, may have an FCF accomplished enroute to home station or a designated repair facility. If practical, the FCF portion of the flight will be accomplished in the immediate area of the departure base to determine the aircraft is airworthy for the flight. The decision to approve combined FCF and ferry flight is the responsibility of the wing commander of the unit to which the aircraft is assigned, in coordination with the wing or equivalent commander of the unit where the repair is accomplished. Prior to approval, the following should be considered: pilot proficiency, route of flight, weather conditions, extent of repair, and conditions under which the repairs were accomplished. Authority to approve combined FCF and ferry flights will not be delegated. The wing or equivalent commander shall have the option to conduct combat aircraft functional check flights with loaded and charged internal gun systems in a hostile environment. (Helicopter only) Combined FCF and ferry flights may be conducted from isolated combat locations such as a Forward Operating Base (FOB) with a normal weapons and self-protection combat loadout.

4.8 Mission/Training Events. If the mission is an FCF/ACF flown to ensure aircraft is airworthy, mission or training events may be flown at the end of the sortie, provided the primary / critical aircraft systems as defined in [Paragraph 4.1](#) are first checked and verified as functional.

4.9 Combination FCF/ACF. The wing or equivalent commander may authorize a combination FCF/ACF with a mission or training flight if the FCF/ACF is a re-fly to check the operation of secondary / non-critical aircraft systems.

4.10 Scope. Commanders or their maintenance officers may expand the scope of check flight requirements. During the crew briefing, the check flight items/scope will be mutually understood.

4.11 FCF/ACF/ECF/OCF Waived. Major commands may waive FCF/ACF/ECF/OCF only under extenuating circumstances, such as when weather delays would seriously degrade combat potential or preclude meeting operational mission requirements.

4.12 Duplicate Flights. Duplication of ACF by the USAF/USSF and contractors will be held to a minimum. The USAF/USSF should use flight test sampling when a contractors production quality levels permit.

4.13 AFTO Form 781. Refer to TO 00-20-1 for AFTO Form 781 documentation of Check Flight requests.

5 AIRCREW REQUIREMENTS.

5.1 Aircrew. FCF/ACF check flights will be accomplished by aircrew possessing the best qualifications as determined by command directives and flying unit commanders. ECF/OCF check flights do not require specific aircrew qualifications, however the use of FCF/ACF checklists is reserved for appropriately trained aircrew. Check flights accomplished on USAF/USSF aircraft by contractor personnel in the performance of contractor maintenance requirements will be performed by flight crews qualified in accordance with the provisions of DCMA Instruction 8210.1, Contractors Flight and Ground Operations as defined by contract.

5.2 Minimum Aircrew. Check flights will be conducted by the minimum aircrew defined by the technical manual and MAJCOM directives plus any personnel designated by the OG/CC or equivalent as required for the mission in accordance with DAFMAN 11-401, Aviation Management, and applicable MAJCOM supplements. Check flights will be accomplished without cargo or nonessential passengers/crew members (as determined by the OG/CC or equivalent).

5.3 Aircrew Designation. Major commands will determine Check Flight crew complement and certification. These crew members will be designated in writing.

6 WEATHER REQUIREMENTS.

6.1 General Weather Requirements. MAJCOMs will publish specific weather requirements to include ceiling and visibility for FCF/ACF missions to include waiver authority if desired. Alternative weather requirements for re-fly FCF/ACF after primary / critical aircraft systems as defined in [Paragraph 4.1](#) are first verified as functional (aka Subsequent FCF/ACF) may be published if desired. ECF/OCF/IFOC have no additional weather or daylight requirements unless specified by MAJCOM.

6.2 Daylight Operations. FCF/ACF flights will normally be conducted in daylight, Visual Meteorological Conditions (VMC). Aircraft with four or more engines may conduct check flights during hours of darkness if VMC exists at the departure airfield. MAJCOMS will publish conditions for FCF/ACF in other than daylight, VMC to include waiver authority if desired.

6.3 Flight Conditions. The operations group (or equivalent) commander to which the aircraft is assigned (for transient aircraft, the wing or equivalent commander at the transient base) may waive [Paragraph 6.1](#) and authorize FCF/ACF under the following conditions, when required:

- a. Takeoff in VMC to begin the check flight. If the aircraft is operating properly in VMC, pilots may proceed into Instrument Meteorological Conditions (IMC) to pen-

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erate cloud cover and complete the check flight in VMC conditions above the clouds.

- b. Weather conditions versus the necessity to conduct a check flight must be considered.

6.4 Secondary / Noncritical Aircraft Systems. When a flight is required only to check the operation of secondary / noncritical aircraft systems, such as a re-fly FCF/ACF or an ECF/OCF, or components, the flight may be initiated during daylight hours in IMC conditions or during hours of darkness in VMC conditions provided:

- a. The aircraft is known to be operational for night or IMC flight as appropriate.
- b. Failure or malfunction of the component or system to be checked would not affect operation of the aircraft at night or under IMC, as appropriate.
- c. The check flight portion of the flight can be accomplished under VMC or VMC conditions above the clouds.

7 FLIGHT DURATION.

7.1 Engine Changes. FCF/ACF duration for engine changes are specified in the -6 inspection manual or equivalent. These are minimum times based on the time required to accomplish the functional checks prescribed in the applicable FCF/ACF checklist.

7.2 Inspection Flight Duration. Duration of a flight to complete a specified inspection is the time necessary to accomplish the checklist, determine the affected equipment is operating properly, and ensure aircraft is airworthy and capable of mission accomplishment.

7.3 Other Conditions. Duration of flights for other conditions will be determined by the responsible maintenance officer or pilot but must be sufficient duration to accomplish the checks specified in the check list at specified altitudes.

7.4 Timing. The FCF/ACF should not take off unless sufficient time is available to complete the required elements as defined in the -6CF (or equivalent) and in accordance with [Paragraph 6.1](#). However, the FCF/ACF may takeoff at the request of maintenance provided there is sufficient time available to check, at a minimum, the primary / critical aircraft systems as defined in [Paragraph 4.1](#).

8 FLIGHT DOCUMENTATION.

8.1 Use of AFTO Form 781. FCF/ACF and release of aircraft for operational use are recorded in the AFTO Form 781 series or IMDS in accordance with TO 00-20-1 and TO 00-20-2 series technical manuals.

8.2 Documentation of Discrepancies. The check pilot is responsible to ensure all discrepancies noted by the flight crew

before, during, and after flight are recorded on AFTO Form 781A or on the contractor form approved by the government in accordance with TO 00-20-1.

8.3 Aircrew Authority. An FCF is normally flown until all -6 CF/CL (or equivalent) items are checked and verified as functional and the aircraft is released. Under extenuating circumstances, aircrew have the authority to release the aircraft from the FCF after all required items have been checked and at a minimum primary / critical aircraft systems as defined in [Paragraph 4.1](#) are first checked and verified as functional. Aircrew retain the same authorities for ECF/OCF. Additionally, secondary / noncritical/mission specific systems that fail associated checks must be properly documented in the AFTO Form 781A and must not affect safety of flight.

9 FLIGHT CHECKLISTS.

9.1 Use of Checklists. USAF FCF/ACF checklists are issued for each type, model or series aircraft for which a -6 (or equivalent) inspection manual exists. These checklists specify minimum requirements for accomplishment of FCF/ACF. Use of the entire checklist is required only when a complete check flight is accomplished. Locally developed checklists may be used for aircraft that do not have a published checklist. Units may develop local checklist guides to accommodate local air-space configuration, weather, etc., to facilitate the smooth flow of the mission. Once the mission is complete, transcribe the results into the -6CF published checklists (if available) for inclusion in the aircraft documentation folders. Locally developed FCF/ACF results worksheets must capture the pertinent information from the ACF/FCF checklist and contain all signature and FCF/ACF sign-off information. Contact the applicable TO manager for approval to use FCF/ACF worksheets.

9.2 ACF Checklists. ACF checklists are developed by the contractor and approved by the government. These checklists specify minimum requirements for accomplishment of ACF.

9.3 Checklists Documentation. FCF/ACF checklists are divided into sections pertaining to particular stations and flight crew members. Flight crew members will use the specified symbols to complete the checklist or section of the checklist applicable to their station and/or equipment. When check flights are accomplished to check specific equipment or systems, only applicable portions of the checklist will be used. The AFTO Form 781A may also be used to record and verify accomplishment of specific checklist requirements of partial check flights. Upon completion of the check flight, the pilot in command will sign the checklist to indicate they have completed the inspection requirements. Government approved procedures apply for ACF.

9.4 Maintaining Records. Completed FCF/ACF checklists or approved FCF/ACF results worksheets are filed with the aircraft maintenance records for a period of 3 months or until replaced by a new FCF/ACF checklist/worksheet, whichever is later. Copies of worksheets used in place of an AFTO Form 781A to report FCF/ACF discrepancies are filed and disposed of in accordance with TO 00-20-1. Checklists containing clas-

sified information entries may be treated as classified waste immediately following debriefing under the provisions of DoDM5200.01V1_AFMAN 16-1401V1, Information Security Program: Overview, Classification and Declassification. The responsible crew members will sign a certificate stating all required equipment checks were made and were satisfactory, and the certificate will be filed instead of the classified checklists. Government approved procedures apply for ACF.

THE END

