

1 OCTOBER 1996

**Flying Operations**

**C-141 OPERATIONS--MINIMUM EQUIPMENT LIST (MEL) AND  
AIRCRAFT OPERATING RESTRICTIONS**

**(COMPLIANCE WITH THIS PUBLICATION IS MANDATORY.)**

MCI 11-241, *C-141 Operations*, implements AFD 11-2, *Aircraft Rules and Procedures*. Volume 4 establishes aircrew procedures for the operation of C-141 aircraft to accomplish their worldwide missions. Offices of collateral responsibility are HQ AETC/XOTA, HQ AFRES/DOA, and NGB/XOOM. This MCI also applies to US Air Force Reserve (USAFR) mobility units. Submit suggested changes to this instruction on AF Form 847, *Recommendation for Change of Publication*, through Stan/Eval channels to the parent MAJCOM.

**SUMMARY OF REVISIONS**

Refined waiver process and introduced Minimum Equipment List (MEL).

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**1. Objective.** The ultimate objective of the aircraft maintenance team is to provide an aircraft for launch with all equipment operational (Fully Mission Capable, FMC). Manpower limitations, skills, and spare part availability have a negative and direct impact on accomplishment. However, some redundant systems allow safe operation with less than all equipment operational for certain missions under specific circumstances. The aircraft commander, using the following policies, determines an aircraft's overall status. Use the following maintenance identifiers to effectively communicate an aircraft's status:

**1.1. Mission Essential (ME).** An item, system, or subsystem component essential for safe aircraft operation or mission completion will be designated Mission-Essential (ME) in AFTO Form 781A, **Maintenance Discrepancy and Work Document**. Include a brief explanation of the reason for ME status in the AFTO Form 781A discrepancy block. An aircraft commander accepting an aircraft (one mission or mission segment) without an item or system does not commit that aircraft commander (or a different aircraft commander) to subsequent operations with the same item or system inoperative.

**1.2. Mission Capable (MC).** Any discrepancies that are not currently ME, but may become ME (if circumstances change), are designated as MC in the AFTO Form 781A discrepancy block. Every effort will be made to clear the MC discrepancies at the earliest opportunity to the extent that maintenance skills, ground time, and spare part availability permit. If subsequently, in the AC's judgment, mission safety would be compromised by the lack of any

Supersedes AMCR 55-141, Chapter 4, 15 January 1994

OPR: HQ AMC/DOA (CMSgt McCarthy)

Certified by: HQ AMC/DOA (Colonel Porter)

Editor: Mary S. Burns

Pages: 15/Distribution: F

component, he/she may redesignate the said component as ME. However, do not delay a mission to correct an MC discrepancy.

**1.3. Open Item.** Discrepancies not expected to adversely impact the current mission or any subsequent mission are not designated MC or ME. These items receive low priority and are normally worked at home station. Do not accept aircraft from factories, modification centers, or depots unless all instruments are installed and operative.

**2. Policy.** It would be impractical to prepare a list that would anticipate all possible combinations of equipment malfunction and contingent circumstances. This volume, with attachments 1 and 2, lists the minimum equipment and systems to launch the aircraft under normal conditions. The list represents MAJCOM restrictions only and does not necessarily include all equipment or systems essential to airworthiness, e.g., rudder, elevator, flaps, ailerons, tires, etc. Those items which state a minimum requirement and have no listed exceptions are grounding items (based on mission requirements).

**2.1.** The MEL shall not direct deviation from the aircraft flight manual limitations, emergency procedures, or USAF/MAJCOM directives. The diversity of the C-141 operating on various worldwide missions complicates the task of balancing operational reliability with safe mission completion. Safety-of-flight is paramount.

**2.2.** The aircraft commander is responsible for exercising the necessary judgment to ensure **no aircraft is dispatched with multiple items inoperative** that may result in an unsafe degradation and/or an undue increase in crew workload. The possibility of additional failures during continued operation with inoperative systems or components shall also be considered. This volume is not intended to allow for continued operation of the aircraft for an indefinite period with systems/subsystems inoperative.

**2.3.** If, after exploring all options, an aircraft commander determines a safe launch is possible with an item inoperable (beyond a particular restriction) the aircraft commander shall request a waiver. Use C2 channels to notify the appropriate execution agency of intentions. Plan a minimum 1 hour response to waiver request.

**3. Waiver Protocol.** Waiver to operate with degraded equipment or waiver to MAJCOM policy exceeding this directive may be granted on a case-by-case basis. Waiver authority is based on "who" has operational control and execution of the aircraft performing a specific mission. Each MAJCOM may have a unique waiver process. The aircraft commander determines the need for a waiver (see Typical Launch Decision Matrix, attachment 1). If waiver process, authority, or protocol is in doubt--contact the TACC (appropriate cell).

**3.1. Local Missions** (executed by the units' Operations Group Commander (OG/CC) or equivalent). Waiver authority for local missions is the OG/CC or equivalent.

**3.2. AMC-Directed Missions.** Waiver authority for active duty and ARC units flying AMC or AMC-directed missions controlled by the AMC/TACC (and HQ AMC Operational Readiness Inspections) is HQ AMC/DO. HQ AMC/DOT personnel are the authorized agent and maintain 24 hour watch through the appropriate TACC cell (East or West).

**3.3. ARC-Directed Missions** (executed by the NGB or HQ AFRES). The appropriate ARC headquarters maintain C2 and waiver authority for ARC crews performing any ARC-directed mission prior to mobilization (except associate ARC units); waivers must be obtained from NGB/XO or HQ AFRES/DO, as appropriate.

**3.4. Other Missions (Contingencies).** Waiver authority is listed in the OPORD/Tasking Order, etc., or the DIRMFOR (or equivalent) for the agency with C2 of the aircraft. Crewmembers may request additional assistance or confirmation from their home units or AMC/DO through the TACC.

**3.5. Non-AMC Missions.** For aircraft identified as belonging to user-commands according to Air Force Policy Directive (AFPD) 10-9, e.g., AETC, etc., waiver authority is the appropriate MAJCOM/DO, or as specified in MCI 11-241, volume 19.

**4. Technical Assistance Service.** The aircraft commander may request (at anytime in the decision process) technical support and additional assistance from their home unit, MAJCOM staff, and maintenance representatives

(HQ AMC/LG, ANGRC/LG, AFRES/LG or MAJCOM/LG). See MCI 11-241, volume 2 for the appropriate telephone numbers.

4.1. Aircraft commanders electing to operate with degraded equipment or aircraft systems (with appropriate waiver) must coordinate mission requirements (i.e. revised departure times, fuel requirements, maintenance requirements, etc.) with the controlling C2 agency prior to flight.

4.2. If beyond C2 communication capability, the aircraft commander may deviate from the minimum equipment and waiver requirements as specified in volume 1, paragraph 4. Report deviations (without waiver) (RCS: AMC-DOT(AR)9624, Report of Violations and Policy/Procedure Waivers) through channels to HQ AMC/DOT or appropriate MAJCOM within 48 hours. Units must be prepared to collect background information and submit a follow-up written report upon request. **NOTE:** This report is designated emergency status code C1 - Continue reporting during emergency conditions, priority precedence. Submit data requirements in this category as prescribed or by any means to ensure arrival on the established due dates. Continue electronic reporting during MINIMIZE.

5. **Supplements.** Each MAJCOM may supplement the MEL. Supplement may only be more restrictive. MAJCOMs include details in MCI 11-241, volume 19. Units include details in MCI 11-241, volume 10.

## 6. Definitions:

6.1. **Home Station.** Home bases of assignment for C-141 aircraft. Aircraft will not depart their home stations unless MEL home station requirements are met. Exception: During wartime, en route criteria will apply to all aircraft departures.

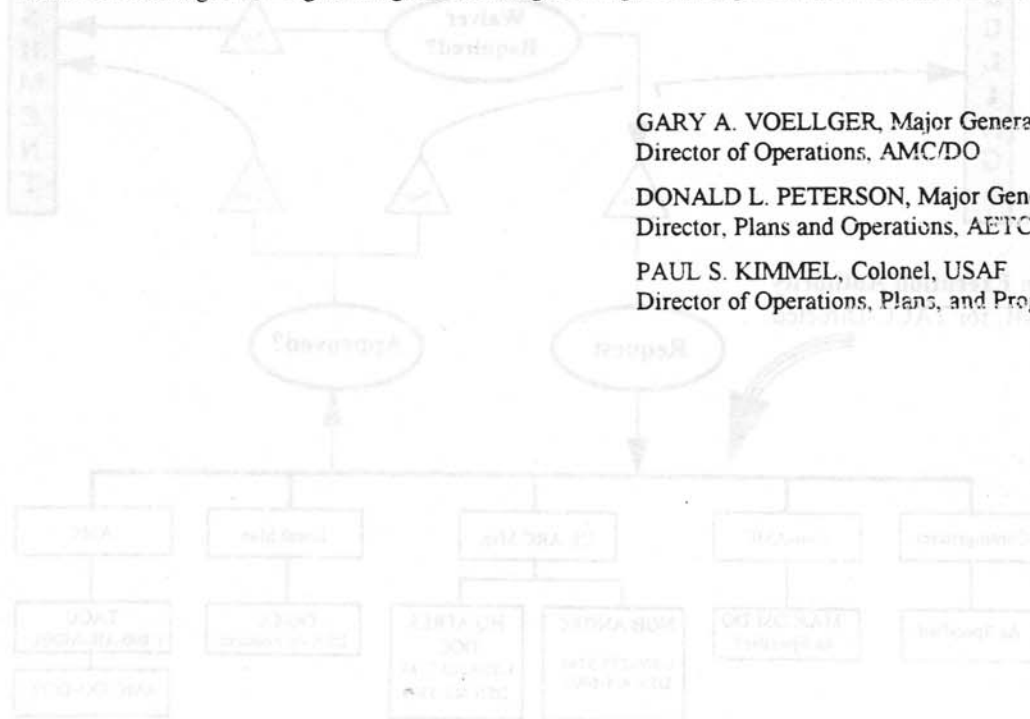
6.2. **En route.** En route locations where C-141 maintenance repair capability exists. An en route station has the necessary skilled USAF, or USAF-contract maintenance personnel, support equipment, and technical data available to accomplish most repairs.

6.3. **Local Training.** A mission that departs home station to perform home station transition training, outbased transition training, NAV-leg training, air refueling training, or airdrop training and returns in the same day.

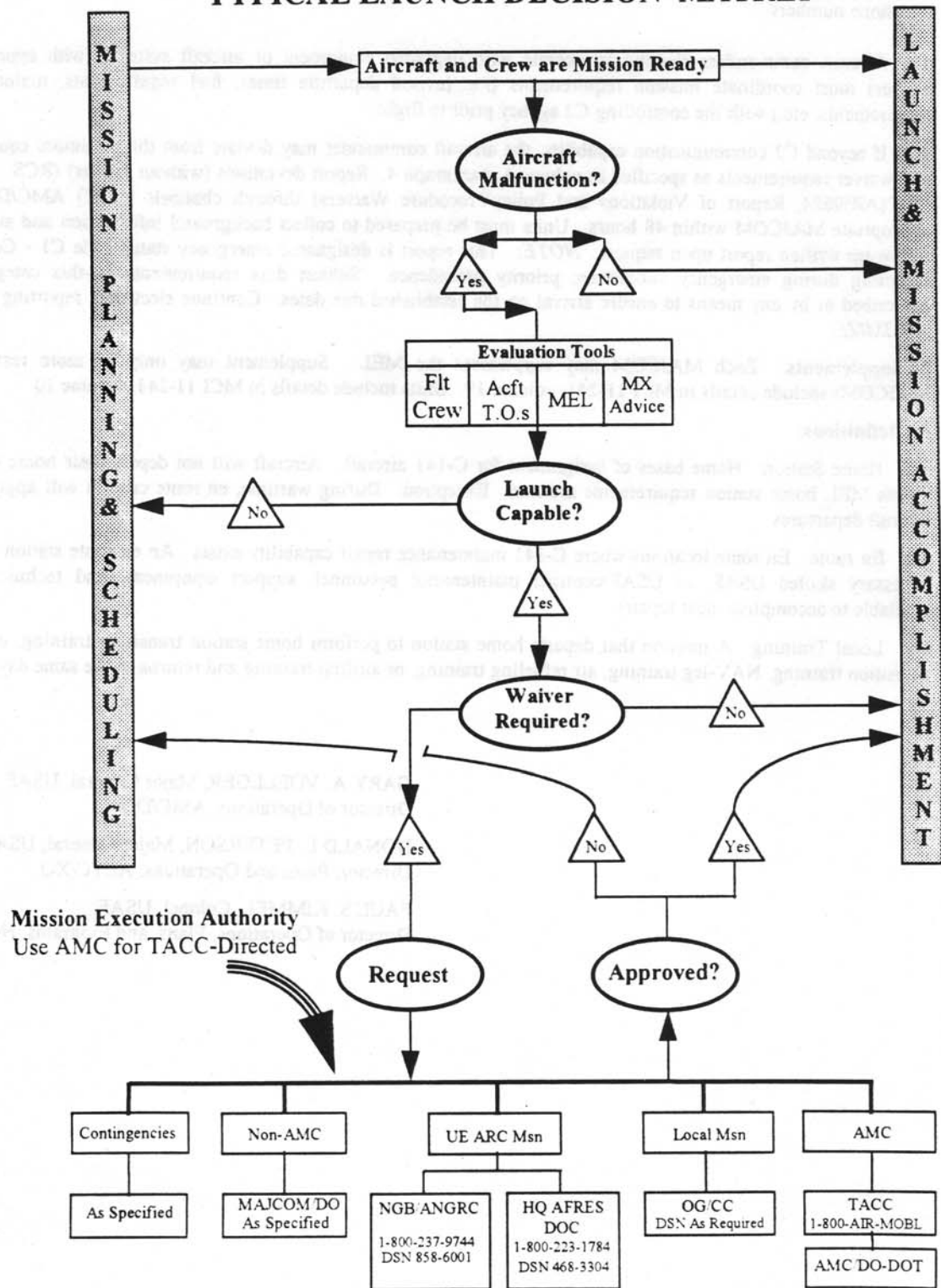
GARY A. VOELLGER, Major General, USAF  
Director of Operations, AMC/DO

DONALD L. PETERSON, Major General, USAF  
Director, Plans and Operations, AETC/XO

PAUL S. KIMMEL, Colonel, USAF  
Director of Operations, Plans, and Programs, NGB/XO



# TYPICAL LAUNCH DECISION MATRIX



MELFLOW6 PPT



## C-141 OPERATIONS

### MINIMUM EQUIPMENT LIST (MEL)

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**A2.1. Policy.** This attachment supports MCI 11-241, volume 4 and lists the minimum equipment and systems to launch the aircraft under normal conditions. The MEL represents MAJCOM restrictions only and does not include all equipment or systems essential to airworthiness, e.g., rudder, elevator, flaps, ailerons, tires, etc. See volume 4 for further information including objectives, policy, and waiver protocol.

A2.1.1. The aircraft commander is responsible to exercise the necessary judgment to ensure **no aircraft is dispatched with multiple items inoperative** that may result in an unsafe degradation and/or an undue increase in crew workload. The exposure to additional failure during continued operation with inoperative systems or components must also be considered. This volume is not intended to promote continued operation of the aircraft for an indefinite period with systems/subsystems inoperative.

A2.1.2. For instruments with both analog and digital displays, either the analog or digital presentation is acceptable.

A2.1.3. System components required to complete emergency procedures as specified by the flight manual (i.e. fire handles, emergency generator, aileron tabs, etc.) and associated warning systems will be operational. All emergency equipment (i.e., portable oxygen bottles, first aid kits, etc.) as specified in AMCR 55-4 (MCI 11-202) will be installed unless specifically exempted by mission requirements/directives (ex. depot inputs with minimum survival kits).

#### **A2.2. Spoiler System.**

A2.2.1. Aircraft will not depart from home station with any quadrant/panel inoperative. At enroute stations, if no more than two spoiler panels on one side of the system are affected by a malfunction, the mission may continue. If spoiler problems occur at a CONUS base, the aircraft will be flown to a facility having repair capability prior to departure for an off-shore station.

A2.2.2. Procedures for continuing a mission or recovery to a CONUS base follow:

A2.2.2.1. When securing a panel, the symmetrical panel on the opposite wing will be secured. At en route stations, where AMC maintenance capability is not available, flight engineers will supervise required deactivation of the spoiler system. Spoiler panel deactivation will be accomplished in accordance with procedures contained in TO 1C-141B-2-27JG-00-1.

A2.2.2.2. Blow down characteristics are affected. For this reason, with any spoiler panels deactivated, do not exceed the adjusted maximum spoiler operating speed Mach 0.75-250 KCAS.

A2.2.2.3. Do not exceed the maximum crosswind component of 20 knots when any spoiler panels have been deactivated.

A2.2.2.4. If more than two spoiler panels on one side fail or any malfunction renders the complete system inoperative, including hydraulic actuator leakage in excess of limits, the aircraft will be repaired or flown directly to the nearest repair facility by the shortest available routing.

A2.2.3. Procedures for continuing a mission or recovery with complete system inoperative:

A2.2.3.1. Spoiler control lever will be kept in "CLOSED" position, disarmed, and EREO switch will be in the "EMERGENCY OFF" position.

A2.2.3.2. Do not carry passengers above FL250.

A2.2.3.3. Do not take off on wet or icy runway with spoilers deactivated due to unsafe rejected takeoff situations.....

A2.2.3.4. Do not land or take off from airfields with less than 7,000 ft of runway due to increased stopping distance.

### A2.3. Doors and Ramp System:

A2.3.1. Do not fly the aircraft pressurized unless all locking and safety devices are properly installed.

A2.3.2. Malfunction in the pressure, ramp and petal door locking system (not the indicating system)--Do not attempt takeoff:

A2.3.2.1. With a ramp or petal door lock malfunction.

A2.3.2.2. And pressurize with a pressure door lock malfunction.

**NOTE:** Aircraft with a pressure door lock malfunction may be flown on local training flights, unpressurized (with the pressure door up and locked), pending receipt of parts for repair of the pressure door locking mechanism. These flights may be scheduled only after the specific malfunction in the pressure door locking mechanism has been identified, and it is determined unpressurized flight will not jeopardize safety of flight.

A2.3.2.3. From home station when the use of hydraulic override feature is required to lock/unlock the pressure door, ramp or petal doors.

**EXCEPTION:** Aircraft may depart stations where maintenance capability is not available, when the use of override is required to lock the pressure door, ramp or petal doors. Make a positive visual check of all locks in this case. Additionally, aircraft may depart stations where maintenance capability is not available, when the use of override is required to unlock the pressure door, ramp, or petal doors provided a cargo jettison capability is not required.

A2.3.3. Failure of the pressure door, ramp, and petal doors to open (or close) electrically during in-flight operations.

A2.3.3.1. Do not unlock and open cargo doors and ramp using manual override in-flight unless emergency jettisoning of cargo is required.

**A2.3.3.3. Subsequent in-flight unlocking and opening of the cargo doors ramp using normal electrical procedures and in-flight closing and locking using manual override procedures is authorized.**

**A2.3.4.1. Do not fly aircraft pressurized from home station when the use of bypass is required to extinguish the annunciator lights for the pressure door or ramp.**

**A2.3.4.2. Aircraft may depart en route stations pressurized with a malfunction in the indicating system when maintenance capability is not available and it is determined the pressure door, ramp, and petal doors are locked,**

**A2.3.4.3. Aircraft may be scheduled for local flights unpressurized with a malfunction in the indicating system if it is determined that the ramp and petal doors are locked.**

**A2.3.5. Do not perform aeromedical evacuation missions when nonambulatory patients are carried unless both troop doors are fully operational.**

**Table A2.1. Engines/Auxiliary Power Unit (APU).**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Engines	4	4	Do not take off with nonstandard aircraft configuration or power unless a hostile threat to the aircraft and/or crew makes it imperative. a. Do not take off unless all four engines will achieve takeoff power settings. b. Do not perform no-flap takeoffs or three-engine takeoffs.
Thrust Reversers--Home Station	4	4	
Thrust Reversers--En route	4	0	If a malfunction occurs requiring thrust reverser deactivation, the affected thrust reverser and its symmetrical counterpart on the opposite wing will be deactivated IAW T.O. 1C-141B-2-78JG-00-1. No exceptions.
			If malfunctions require deactivation of all four thrust reversers, the mission may continue to a station where repair capability exists.
			If all 4 thrust reversers must be deactivated and less than 8 brakes are operational, ensure landing distance (corrected for partial braking capability) is less than runway available for each stop/alternate airfield.
Thrust Reversers--Local Training	4	2	If a malfunction occurs requiring thrust reverser deactivation, the affected thrust reverser and its symmetrical counterpart on the opposite wing will be deactivated IAW T.O. 1C-141B-2-78JG-00-1. No exceptions.
APU	1	0	Will be operational if the APU is required per the mission tasking or FRAG order.
			If required, all associated equipment (accumulators, EGT gauge, etc.) will be operational.
EPR Gauge	4	0	May be inoperative provided respective N1 RPM indicator is operative.
N1 RPM Indicator	4	0	May be inoperative provided respective EPR Gauge is operative.
N2 RPM Indicator	4		See Notes 1 and 2.
Fuel Flow Indicator	4		See Notes 1 and 2.
EGT Indicators	4		See Notes 1 and 2.
Low Oil Quantity Lights	4	0	If inoperative, associated oil tank will be fully serviced prior to takeoff. Closely monitor oil pressure and temperature throughout flight.
Engine Vibration Indicators	4	0	
Oil Temperature Indicator	4	4	Must be functional on all operational engines.
Oil Pressure Indicator	4	4	Must be functional on all operational engines.

**NOTE 1** (Home Station): All indicators will be operational.

**NOTE 2** (En route and Local Training): The fuel flow indicator at flight engineer's panel may be inoperative provided the corresponding indicator on the pilots' center instrument panel is operative. N2 RPM and EGT indicators may be inoperative on the pilots' center instrument panel provided no more than one of these instruments (fuel flow, N2 RPM, or EGT) for each engine is inoperative, and the corresponding indicator on the flight engineer's panel is operative. If an EGT channel is operative with only one of its two indicators operating, a lower reading will result. The amount of error will be approximately 8 percent of the actual correct readings for the channel. Use/observe 510°C as the maximum allowable EGT when operating with one indicator.



**Table A2.2. Fuel Systems.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Fuel Quantity Indicators-- Home Station	10	10	
Fuel Quantity Indicators-- En route	10	8	If en route repair capability does not exist, the aircraft may depart with one inoperative fuel quantity indicator for each wing, provided: a. The tank with the inoperative indicator is dipped IAW TO 1C-141B-2-00GE-00-1 and b. The same indicator on the other wing is operative.
Main Tank Fuel Boost Pumps-- Home Station	8	8	
Main Tank Fuel Boost Pumps-- En route	8	7	If en route repair capability does not exist, the aircraft may depart with one main tank fuel boost pump inoperative. If one main tank boost pump is inoperative, all auxiliary and extended range tank boost pumps will be operational in all fuel tanks required (fueled) for flight. If one main tank boost pump is inoperative, suction feeding will be necessary should the second boost pump fail in-flight.
Auxiliary/Extended Range Tank Fuel Boost Pumps--Home Station	12	12	
Auxiliary/Extended Range Tank Fuel Boost Pumps--En route	12	11	If en route repair capability does not exist, the aircraft may depart with one auxiliary tank or inboard extended range tank fuel boost pump inoperative. If one auxiliary or extended range tank boost pump is inoperative in any fuel tanks required (fueled) for flight, all main tank boost pumps will be operational. If one auxiliary tank boost pump is inoperative, fuel within that tank will be trapped should the second boost pump fail. Fuel balancing with the opposite wing tank will then be necessary resulting in a reduction of usable fuel.
Fuel Dip Stick	1	1	
Fuel Inlet Temperature Gauge	1	1	
Fuel Inlet Temperature Switch	1	1	
Fuel Enrichment System	1	1	All system subcomponents will be operative.
Fuel Heat System	1	1	All system subcomponents will be operative.

**Table A2.3. Electrical System.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Generators, Engine-Driven	4	3	Four generators will be operational on all missions departing the CONUS. CONUS mission aircraft and overseas en route aircraft may have one generator inoperative provided the bus tie system for the inoperative generator is operable and the associated CSD is disconnected.
Constant Speed Drives	4	3	See Note.
Transformer Rectifiers	2	2	
APU Generator	1	1	May be inoperative provided the APU is not specifically required by the FRAG or mission directive.
Constant Speed Drive Overheat Warning Light	4	3	See Note.
Generator Fail Lights	4	3	See Note.
AC Loadmeter	4	3	See Note.

**NOTE:** All associated equipment and indicators will be operational for each operative engine-driven generator (i.e., generator control panel, voltage regulator, CSD, CSD overheat warning light, generator fail light, AC loadmeter, etc.)

**Table A2.4. Hydraulics.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Engine-driven Hydraulic Pumps	4	4	
Engine-driven Hydraulic Pump Pressure Low Lights	4	4	
System No. 1 & 2 Hydraulic System Pressure Indicators	2	2	Direct reading gauge in cargo compartment may be inoperative.
System No. 1 Hydraulic Suction Boost Pump	1	1	
System No. 2 Hydraulic Suction Boost Pump	2	1	Electrically-driven suction boost pump may be inoperative provided failure is electrical and hydraulic suction boost pump is operational. One time flight to repair facility.
System No. 1 & 2 Suction Boost Pump Pressure Low Lights	2	2	
System No. 3 Electrically-driven Hydraulic Pumps	2	2	
System No. 3 Hydraulic System Pressure Indicator	1	1	Direct reading gauge in cargo compartment may be inoperative.
System No. 3 Pressure ON Light	1	0	May be inoperative provided System No. 3 Hydraulic Pressure Indicator is operative.

**Table A2.5. Air Conditioning, Pressurization and Bleed Air.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Air Conditioning Pack	2	2	Both air conditioning packs shall be operational for special weapons missions.
			Left air conditioning pack will be operational for all flights.
			Right pack may be inoperative for pressurized flight. If passengers/patients are carried, the flight will be limited to FL 250. Lower altitude may be required to maintain a specific cabin altitude.
Cargo Compartment Temperature Control System	2	1	Automatic system may be inoperative provided manual temperature control for the cargo compartment is operable.
			Manual system may be inoperative provided automatic temperature control is operable.
Flight Station Temperature Control System	2	1	Automatic system may be inoperative provided manual temperature control for the flight station is operable.
			Manual system may be inoperative provided automatic temperature control is operable.
Floor Heat System	1	1	May be inoperative provided both air conditioning packs are operational, regulation of cargo compartment temperature is not a mission requirement, and passengers/patients are not carried.
Cabin Pressure Controllers	2	1	Automatic controller may be inoperative for pressurized flight provided the manual controller is operative.
			Manual controller may be inoperative for unpressurized flight.
Cabin Altimeter and Differential Pressure Indicator	2	1	Flight engineer's indicator must be operative for pressurized flight.
Cabin Rate of Climb Indicator	1	0	May be inoperative except when patients are carried.
Cabin Altitude Override Limit Switch	1	1	May be inoperative for unpressurized flight.
Emergency Pressurization Switch	2	1	Right emergency pressurization switch may be inoperative if the right air conditioning pack is inoperative.
Cabin Pressure Low Light	2	1	

**Table A2.6. Anti-Ice/De-Ice and Rain Removal.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Ice Detection System	1	1	
Pitot-Static Tube Anti-Icing System	2	1	One system may be inoperative for flights in VMC. Both must be operational for IMC.
Engine RAM Pressure Probe Anti-Ice System	4	0	May be inoperative provided corresponding N1 RPM indicator is operational.
Wing Anti-Icing System	1	1	
Wing Anti-Icing Overheat Indicating System	1	1	
Engine Anti-Icing System	4	4	
Windshield Heat System	3	3	
Windshield Rain Removal System	1	1	May be inoperative for VFR flights.

**Table A2.7. Brake Systems.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Wheel Brakes-- Home Station	8	8	
Wheel Brakes--En route	8	6	In an emergency situation or when a MLG brake leak occurs where brake change capability does not exist, it is permissible to "cap off" up to one brake for each landing gear for flight to where brake change capability exists. See Note.
			Several en route stops may be necessary and accomplished to position the aircraft for repair.
			Ensure landing distance (corrected for partial braking capability) is less than runway available for each stop/alternate airfield.
Wheel Brakes--Local Training	8	7	If local supply sources cannot provide a replacement brake assembly, it is permissible to "cap off" one brake for local training flights. See Note.
			Ensure landing distance (corrected for partial braking capability) is less than runway available.
			Zero flap landings are not authorized when flying a local training mission with brakes capped.
Anti-skid--Home Station	1	1	
Anti-skid--En route	1	0	Anti-skid may be inoperative for a one time flight to an airfield with repair capability.
			All wheel brakes shall be operative.
			Add 2,000 feet to the uncorrected landing distance.

**NOTE:** Anti-skid will be fully operational anytime a brake is capped (i.e., No DET OUT lights or anti-skid OFF lights).



**Table A2.8. Flight Recorder/Locating Systems.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Flight Data Recorder-- Home Station	1	1	
Flight Data Recorder--En route	1	0	If the flight data recorder fails en route, continue mission (Airland only) to a station where repair capability exists.
			Will be operational for airdrop and air refueling missions. Waivers not authorized except during wartime.
			If the flight data recorder is inoperative, the cockpit voice recorder will be operative.
Cockpit Voice Recorder-- Home Station	1	1	
Cockpit Voice Recorder-- En route	1	0	If cockpit voice recorder fails en route, continue mission (Airland only) to a station where repair capability exists.
			Will be operational for airdrop and air refueling missions. Waivers not authorized except during wartime.
			If the cockpit voice recorder is inoperative, the flight data recorder will be operative.
			Notice: If involved in a mishap/incident after landing (or if involvement is suspected), and the emergency is terminated, open the CVR power circuit breaker.
Emergency Locator Transmitter	1	1	
IFF/SIF	1	0	Comply with ATC and mission requirements.

**Table A2.9. Fire Protection.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Engine Fire Extinguisher System	2	2	Both bottles will be serviceable for each system.
Engine/Pylon Fire and Overheat Warning Systems	4	4	
Engine Fire Extinguisher Overboard Discharge Indicator	2	2	May be missing provided engine fire bottle gauges are checked for adequate pressure and associated annunciator light is operative.
APU Fire Extinguisher	1	1	May be inoperative provided APU is not required per mission FRAG/directive.
APU Fire Warning System	1	1	May be inoperative provided APU is not required per mission FRAG/directive.
Smoke Detector System	1	1	Smoke detectors in the cargo compartment may be inoperative provided an adequate number of personnel are positioned in the cargo compartment to monitor for the presence of smoke.

**Table A2.10. Landing Gear.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Landing Gear--General	1	1	Full stop landing only. If a landing gear malfunction was encountered, clear the discrepancy before further flight. Exception: If repair capability does not exist and a positive determination is made that further flight can be accomplished with the gear down, locked and pinned, the aircraft may be flown to a facility where repair capability exists.
Landing Gear Position Indicators	3	3	
Landing Gear Warning Light	1	1	
Bogie Position Indicator.	2	0	Full stop landing only. Exception: A bogie position indicator may be inoperative provided the landing gear is inspected and no broken or damaged components exist.
Parking Brake	1	1	
Landing Gear Pry Bar (with ledge protector).	1	1	
Nose Landing Emergency Hydraulic Extension Handpump Handle	1	1	

**Table A2.11. Flight Instruments.**

Item/System	Installed	Required	Remarks/Limitations/Exceptions
Mach-Airspeed Indicator	2	2	Mach indication may be inoperative on 1 indicator.
Altitude-Vertical Velocity Indicator	2	2	Vertical velocity indication may be inoperative on one indicator.
Flight Director Systems	2	1	Copilot's may be inoperative.
Navigation Selector Panels	2	2	
Attitude Director Indicator (ADI)	2	2	
Horizontal Situation Indicators	2	2	
BDHI	3	2	Both pilots BDHI will be operational.
Standby ADI	1	1	
Radar Altimeter	1	1	
True Airspeed Indicator	2	1	
Barometric Altimeters	2	1	Navigator's altimeter may be inoperative on missions that do not require navigator support.
Stall Prevention Systems	2	2	
Pitot Static Anti-Icing Systems	2	2	
Standard Central Air Data Computers (SCADC)	2	2	See Note.

**NOTE:** SCADC Replacement Actions. The following procedure is approved for a SCADC replacement when test equipment is not available, providing only one computer has been replaced and the pitot static system has not been disturbed beyond the computer connection:

1. The copilot will call out 80 knots during the takeoff roll;
2. The pilot will cross-check the indicated airspeed to ensure the difference does not exceed five knots;
3. Normal abort procedures will apply for differences exceeding five knots;
4. No further attempts will be made to take off following an abort due to excessive airspeed differences.

<b>Table A2.12. Navigation Systems.</b>			
<b>Item/System</b>	<b>Installed</b>	<b>Required</b>	<b>Remarks/Limitations/Exceptions</b>
Magnetic Compass	1	1	
INS	2	1	<p>Do not fly Cat I routes without INS 1, INS 2, AHRS, and operational pilot and copilot navigator selector panels.</p> <p>If repair capability does not exist, and flight is on airways (under radar control), mission may operate with one INS' INOP provided the attitude function of one INS, AHRS, and both navigation selector panels are operational.</p> <p>The FSAS/INS CDU is the recommended (preferred) control head for tactical missions.</p>
INS CDU WARN Light	2	2	
INS 10 NM DIFFERENCE Light	1	0	
NAV SELECTOR Panel	2	2	
VOR	2	0	As required for navigation or approach.
ILS	2	0	As required for approach.
TACAN	2	0	As required for navigation, approach, or rendezvous.
AN/APS-133 Radar	1	0	Required if flying at night or if known or forecast thunderstorms are expected along route of flight.
Weather Radar Repeater Scope at Navigator Station	1	0	
Station Keeping Equipment (SKE)			Required for formation airdrop/air refueling only.

<b>Table A2.13. Aircraft Lighting.</b>			
<b>Item/System</b>	<b>Installed</b>	<b>Required</b>	<b>Remarks/Limitations/Exceptions</b>
Landing Lights	2	2	<p>May be inoperative for daylight operations.</p> <p>Taxi light on same side will be operational.</p>
Taxi Lights	2	2	<p>May be inoperative for daylight operations.</p> <p>Landing light on the same side will be operational.</p>
Formation Lights	9	0	<p>Not required for daylight in-flight operations.</p> <p>Two lights per wing will be operational for night formation flights.</p>
Navigation Lights	3	3	One bulb per assembly may be inoperative while "en route" and for local training missions.
Anti-Collision/Strobe Lights	3	2	Lower fuselage strobe and one bulb in horizontal stabilizer anti-collision light will be operative.
Wing Leading Edge Lights	2	0	May be inoperative for daylight conditions.
Emergency Exit Lights Home Station	11	7	4 of the 7 lights will be located at the No. 1 escape hatch, crew entrance door, left troop door, and right troop door.
Emergency Exit Lights En route	11	4	Lights will be located at the No. 1 escape hatch, crew entrance door, left troop door, and right troop door.
Wheel Well Lights	3	0	Required for night operations.