TASK ANALYSIS OF PILOT, COPILOT, AND FLIGHT ENGINEER POSITIONS FOR THE P-3 AIRCRAFT

Robert F. Browning, et al
Naval Training Equipment Center
Orlando, Florida
July 1973
Task Analysis of Pilot, Copilot, and Flight Engineer Positions for the P-3 Aircraft

Focus on the Trained Man

Naval Training Equipment Center
Orlando, Florida 32813
Technical Report: TAEG REPORT NO. 7

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ABSTRACT

This report provides a task analysis of the pilot, copilot, and flight engineer positions in the P-3 aircraft and delineates the method employed in translating task analysis data into an improved training system.

Appendix A, Task Analysis, identifies the behavioral activities of the pilot, copilot, and flight engineer during normal, abnormal, and emergency operation of the P-3 aircraft in accordance with NATOPS procedures.

Appendix B, Training Analysis Application, contains the method for translation of task analytic data into syllabi, lesson guides, and lesson plans. Both the Task Analysis and the Training Analysis are essential ingredients of a systems approach to training.

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Task Analysis of Pilot, Copilot, and Flight Engineer Positions for the P-3 Aircraft

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NAVTAEQUIPCEN TAEG REPORT 7

TASK ANALYSIS OF PILOT, COPILOT, AND FLIGHT ENGINEER POSITIONS FOR THE P-3 AIRCRAFT

JULY 1973

JAMES J. O'NEGAN
Director, Training Analysis and Evaluation Group

P. C. STONE, CAPT, USN
Chief of Naval Training, Program Development
This report is the second in a series of three planned reports concerned with improving P-3 aircraft pilot and flight engineer training at the Replacement Squadron level. The substance of the report is a detailed job task analysis of the P-3 flight crew positions. An objective of this study was to make this information available to the P-3 Replacement Squadrons for use in the current training program.

The detailed task analysis provided here serves several purposes: it is a primary source of information for the development or modification of current P-3 training programs, it may be employed directly by squadron personnel in structuring and controlling training, and it provides a "handbook" of information to the students undergoing transition training to the P-3 aircraft.

The report was prepared by Mr. R. F. Browning, Education Specialist; Dr. J. K. Lauber, Psychologist; and Mr. P. G. Scott, Engineering Technician, of the Training Analysis and Evaluation Group, Naval Training Equipment Center.

Patrol Squadrons 30 and 31 provided the subject matter expertise essential to the successful outcome of the task analysis. Particular appreciation is expressed to LCDR R. S. Hopewell and ADJCS R. L. Quarton of VP-30 and AE1 R. Dorrhaim of VP-31.
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SECTION I
INTRODUCTION

A program for improving ongoing training of P-3 pilots and flight engineers was initiated in February 1972. A three-phase study effort was undertaken to achieve the objectives of this program.

Phase I of the study involved a comprehensive analysis of P-3 pilot training at the Replacement Patrol Squadron (RVP) level. This work was completed in June 1972, and published as TAEG REPORT No. 5, Training Analysis of P-3 Replacement Pilot Training, dated 1972. The report presented an assessment of the current P-3 curriculum, the instructional media, and the devices utilized in support of pilot training.

The Phase II effort, which is the subject of this report, developed a job task analysis of the pilot, copilot, and flight engineer positions. Appendix A of this report contains the complete task analysis. In addition, a training analysis based on the P-3 task data was conducted and the existing synthetic and in-flight training syllabi were modified for subsequent school tryout during Phase III of the program. The method employed in translating the task data into a program of instruction is summarized in Section III of this report. Appendix B describes the application of the training analysis methodology and includes examples and appropriate forms.

The Phase III effort, which is currently underway, is concerned with an indepth evaluation to determine what effects the employment of the revised syllabi (Cockpit Familiarization Trainer (CFT),
Operational Flight Trainer (OFT), and flight portions) developed during Phase II will have on training outcomes. Emphasis will be placed on measuring the effects of training resulting from more efficient use of Devices 2F69D and 2C23 in conjunction with in-the-air training. Concurrently, an evaluation of the present flight engineer training curriculum will be conducted, utilizing the task analysis developed during Phase II as a baseline. At the conclusion of the third phase, an economic analysis will be made to determine the optimum methods-media mix (academic, CFT, OFT, aircraft) as a function of the resources expended and benefits to be gained. This will provide a cost-effective training model.
SECTION II
TASK ANALYSIS

A task analysis was accomplished describing the activities performed in the pilot and flight engineer positions for the P-3 aircraft. The analysis identified and organized in a systematic way the sequential and the interactive activities performed by the flight crew in the phases of flight. It is a critical step in training system design, for it serves as a basis for making decisions about those characteristics desired in a training system. The task analysis serves as a major data source for the subsequent analytic operations described in this report.

Considerable effort was expended on the development of the task analytic methodology employed in this study. Much of this initial work was concerned with an appraisal of existing task analysis techniques and with identifying those techniques which seemed to be of potential benefit to the P-3 pilot, copilot, and flight engineer task analysis. The analytic procedure finally selected incorporates basic elements of several previously used approaches, although it is difficult (and probably useless) to identify specific sources for specific elements. Certainly, much credit should go to the USAF C-130 task/training analysis program being conducted at Little Rock Air Force Base, Arkansas, and also to the work done by several of the major air carriers and aircraft manufacturers. The bibliography contains references to papers and articles consulted during the course of this study, and the reader interested in the broader aspects of task and training analyses should consult these references.
The resulting analytic procedure adopted for use is, from a theoretic point of view, inelegant. No esoteric behavior taxonomies were used, nor was any attempt made to develop a generalized task analytic method which could be applied to a variety of training situations. In essence, the technique used here is a "brute force" method, requiring large amounts of manpower and time, but one which is likely to produce a useful product. An examination of appendix A of this report indicates quickly the amount of work involved in such an undertaking.

The basic organizational scheme employed in the P-3 task analysis is that of "Phase of Flight." Eleven major phases, ranging from 1.0 (Mission Preparation) to 11.0 (Post-Mission) cover all normal P-3 mission profiles; two additional phases are used to organize Abnormal and Special Procedures (12.0) and Emergency Procedures (13.0). Thus, every segment of P-3 operations, whether normal or emergency, is covered in these 13 mission phases. It should be noted here that Tactical Operations (Section 6.0) was not within the scope of the present study. The analysis of tactical crew positions and tactical operations should be the subject of future study.

Further refinement of the overall organization of the task analysis is imposed by the use of subdivisions of each of the major Phases of Flight. Typically, each Phase of Flight is divided into three subphases, although some phases (5.0 and 7.0) are, from a behavioral point of view, so simple that further breakdown into subphases is not required. On the other hand, each identifiable Abnormal/ Special and Emergency Procedure is treated as a subphase, thus resulting in many more than three subphases for these sections.
Detailed descriptions of each of the mission phases can be found in the introductory section of appendix A to this report.

The third-level breakdowns of the P-3 mission profile were at the "Perform Checklist" level, i.e., functional groupings of related activities with some identifiable goal. Examples of this third-level breakdown include: "Start Engines," which occurs during the Systems Activation subphase of the Pre-Takeoff mission phase (and is numbered 2.2.1); and "Perform Takeoff Checklist," which is performed during the Taxi subphase of the Pre-Takeoff mission phase (and is numbered 2.3.1). It should be noted that these schematics serve only to impose structure on the task analysis, thus helping to organize the collection, treatment, and presentation of the data. Some other organizational scheme could have been used with equal success.

The task statements were constructed at a functional level. That is, the statements described specific, identifiable behaviors of a crewmember with reference to a specific control or indicator in the aircraft itself. Thus, the task analysis is basically a chronologically organized, functional description of the man-machine interface as viewed from the "man" side of that interface. The format of the task analysis is straightforward. Some crewmember (pilot, copilot, or flight engineer) does something (verifies, selects, observes, etc.) to something in the aircraft (power levers, synch servo switch, turbine inlet temperature indicator, etc.). The sequence in which these behaviors are performed determines the sequence of the task statements, except for contingent (or branched) behavior which is described in the form: "if some condition is true, then perform A, otherwise perform B." Allowable deviations
from the sequence as it appears in the task description are indicated by appropriate notes or remarks, which are also used to discuss other relevant information which does not appear in a task descriptive statement (for example, operating limits, etc.). The task analysis provided in appendix A, is a compilation of this kind of information; it contains a complete description of the behaviors required of each crewmember throughout a P-3 mission, including normal and emergency procedures. In a sense, it contains the specifications for the product of any crewmember training program in that this is what the graduate of such a program must be able to do if he is to successfully perform his role in the P-3 mission.

Task data collection was accomplished as follows. Typically, one or two TAEG team members would meet with a P-3 instructor pilot and a P-3 flight engineer instructor. Following the outline provided by Phase of Flight organization, and using various combinations of the NATOPS manual, Device 2C23 (the cockpit familiarization trainer), and the P-3 aircraft itself, all of the procedures were "talked through," one task at a time. The function of the TAEG team was to elicit the appropriate kind of information from the pilots and flight engineers who served as subject matter experts, and to ensure that the level of the task analysis became neither too detailed (thus making the information trivial), nor too global (precluding the utilization of the resulting data in the subsequent training analysis).

Following the initial data collection sessions, the task descriptions were edited and formatted. Then began a review and revision period, as appropriate, which served to correct mistakes and also to identify
practices which were squadron-specific (so-called "technique" items). Finally, the results of the task analysis were reviewed by personnel from both P-3 RVP squadrons to insure that the statements accurately reflected current operating practices and procedures.
SECTION III
TRAINING ANALYSIS

This section outlines the method employed in translating the job task statements into the requisite components of a training system. This involves the identification and the organization of all relevant training events, the media, and the evaluation sequences appropriate to the P-3 replacement flight crew training program.

In essence, fundamental reasoning which guided the development of our approach is as follows: before the "how" of training can be determined, the "what" of training must be known. In order to specify what must be trained, it is necessary to obtain a detailed, comprehensive description of the behaviors required of the human operators of the selected man-machine system.

Task analysis provides the means for identifying the "need-to-know" and separates it from the "nice-to-know" skill and knowledge requirements. It also provides a means for identifying the simulation capabilities required in flight simulators and serves as a basis for developing effective procedures for simulation utilization. Based on the job task data, the analysis continues with a definition of the tasks to be trained, where trained (ground school, simulator, and in the air), and in what sequences; and the development of performance evaluation procedures. In essence, this involves deriving the skills and knowledge requirements including "need-to-know" information not explicitly identified in the task statements, e.g., normal operating limitations of the aircraft, instrument markings, and general knowledge items, such as knowledge of Federal Aviation Regulations and OPNAV instructions pertaining to the operation of Naval aircraft.
On the media decisions, the intent was to specify the least expensive device or method for achieving the behavioral objective. For example, general knowledge items may be economically taught in the classroom or individual study carrel, while manual control skills relating to aircraft control must be taught in the OFT (or in the aircraft in the event of insufficient simulation capabilities). Procedural items can be taught more efficiently in the CFT or OFT. Certainly the CFT is the most effective means for teaching the location of cockpit controls and indicators.

In the TAEG P-3 approach, consideration of media allocation is given to introductory, consolidation, and proficiency stages of learning. Typically, the initial exposure to any subject area can be most effectively provided using the "traditional" pedagogical techniques of lecture, motion pictures, sound/slide programs, and textbooks or other written material. Effective consolidation of the information gathered during the introductory sessions is achieved using training devices, including CFT(s), OFT(s), and part-task trainers of various types. Final skill consolidation is best accomplished in "mission" simulators which replicate closely the real world situation. Finally, the maintenance of a high level of proficiency imposes certain demands regarding training devices and methods. For example, maintenance of manual control skills requires a blending of both aircraft and OFT training while general knowledge "refresher" packages utilizing sound/slide programs have proven very effective for the maintenance of non-motor (or cognitive) skills.

Considerable attention was given to the methods and standards required for performance evaluation. Conventionally, the recommended trainee evaluation procedures involve performance tests in which
the trainee is required to perform some task or series of tasks either in the aircraft or in a training device. In this initial TAEG effort, much use has been made of the traditional "instructor looking over the shoulder" method. This technique, although lacking precision, is a compromise between ease of implementation and efficacy as a measurement technique. Currently, considerable research is devoted to performance measurement and evaluation, especially to automated measurement systems in OFT(s). However, a number of problems must be solved before a viable objective measurement capability can be implemented.

Training Requirements Summary. The training analysis outlined above is iterative in nature, successively breaking the job to be trained into more detailed task components and into skills and knowledges required in performing these activities. The behavioral objectives determined in the earlier stages of the training analysis are included in broader "subject areas" - groups of behavioral objectives related along some dimension and further organized according to whether best taught in classroom/carrel, CFT, OFT, or aircraft and according to whether the trainee will be a First- or Second-Tour P-3 pilot. These "clusters" of behavioral objectives can be used directly by the lesson plan writer to develop lesson plans and to organize training courses.

Program of Instruction. In the development of the training analysis each task statement was analyzed to determine the training requirements and the appropriate media for instruction. Experimental syllabi were then developed, in conjunction with VP-30 personnel, for CFT, OFT, and in-flight training. On-site validation of these syllabi will be accomplished during Phase III of the program.
The development of syllabi for the academic phases of pilot and flight engineer training was not undertaken since this requires manpower in excess of that allocated to "3 training analysis studies and is beyond the scope of the task approved by the Chief of Naval Training.
SECTION IV
CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of the conclusions and recommendations developed during this phase of the P-3 Replacement Pilot Training Analysis. A brief discussion and rationale accompanies each finding. The results reaffirm the conclusions reported in the Phase I report of this program (NAVTRAEQUIPCEN, 1972). Continued liaison has been maintained with the RVP(s) and pertinent data from the task analysis have been furnished both squadrons.

CONCLUSIONS

Based on the task analysis data and on-site observations, the following conclusions were derived:

1. The training provided is inconsistent with the skills and knowledge required of P-3 pilots upon assignment to an operational squadron, particularly first-tour pilots. Examination of the curriculum and observation of various academic sessions and in-flight training, indicates that a "shotgun" approach is being used. The material being presented and the skills being trained encompass most of the need-to-know skills and knowledge, but also include an abundance of nice-to-know information. This information may be of value to an instructor or to maintenance personnel as background material, but it is not needed by the pilot to recognize normal and abnormal situations or to take appropriate action using the controls and indicators engineered into the system.

2. The stated objective of first-tour pilot training—to provide trained copilots—is not being met. The duties of the copilot as
identified by task analysis are perhaps the least demanding of the three cockpit crew positions. However, the copilot is not being trained to acquire the skills and knowledge required of the copilot position, but instead is being trained in those required of the plane commander position.

3. Accepting the traditional concept of training the copilot in the duties of the plane commander, the depth of training is inconsistent with the responsibilities of the first-tour pilot when he arrives in an operational squadron.

4. The practice of providing the P-3 experienced second-tour pilot the same training as that received by the first-tour pilot is not cost effective. The second-tour pilot receives the same academic, synthetic, and flight training as the first-tour pilot. Provisions are not made for identifying entering skills and knowledge and then prescribing a course of instruction that will provide for deficiencies.

5. The number of memory items for procedures not involving imminent danger appears to be excessive and might well be handled with properly indexed flight manuals (job aids) based on the task analysis. (This approach is used by the commercial airlines.) In all probability there would be less likelihood of omission of steps in a given check.

RECOMMENDATIONS

The recommendations which follow are based upon the observations and data obtained to date in the TAEG P-3 program. They are primarily within the framework of the present organization and training assets, and are not expected to change with succeeding reports but possibly may be increased in scope upon completion of the Phase III studies. It is recommended that the squadrons do the following:
1. Screen the task analysis document for currency and give consideration to issuing a copy to each trainee and instructor. The document identifies what the trainee will be required to know and perform at the completion of the familiarization/instrument phase of training at VP-30 or VP-31. It identifies who does what, when, where, and why. The P-3 team, in modifying the present training syllabus, used the document with facsimiles of all cockpit panels to test the procedures and to time the exercises.

2. Develop a program of instruction for use in the classroom or carrel, based on the identified need-to-know material derived from the task analysis.

3. Develop, at the earliest practical time, an individualized instructional program for second-tour pilots utilizing current audio-visual assets supplemented by locally developed sound/slide programs.

4. Request professional assistance in development of individualized instructional programs based on the task analysis.

5. Institute proficiency based individualized instruction programs for first-tour pilots as professionally prepared programs are developed.

6. Use the behavioral objectives derived from the training analysis and interviews to establish entering skill and knowledge levels for second-tour pilots. The curriculum for each pilot should be tailored to meet his individual requirements. The present lock step method is inefficient and delays the trainee in rejoining his operational squadron.
BIBLIOGRAPHY


APPENDIX A

JOB TASK ANALYSIS OF THE
PILOT, COPILOT, AND FLIGHT ENGINEER POSITIONS
FOR THE P-3 AIRCRAFT
P-3 TASK ANALYSIS

INTRODUCTION

The following task analysis is designed to provide a concise but comprehensive description of the behavioral activities of the pilot, copilot, and flight engineer of P-3A/B and P-3C aircraft. The purpose is twofold: (1) The task analysis forms the foundation of the training analysis which will be used to design a modern and efficient P-3 pilot and flight engineer training program, and (2) The task analysis will serve a direct training role in that it provides a systematic picture of the duties and responsibilities of each crew member during a P-3 mission and thus serves as a reference document for instructors and students alike. The task analysis identifies the who, what, why, when, and where of the crewmember's job. The task analysis provides the vehicle for doing a training analysis. It will be used to determine: (a) the tasks for which training is required, (b) the crewmember's required knowledge of other crewmember tasks, e.g., knowledge needed by the pilot or flight engineer tasks, (c) the most effective media to be used for training, and (d) the most effective trainee performance evaluation methods.

The present task analysis is limited in two ways: (1) The listing below deals only with the pilot, copilot, and flight engineer - no attempt has been made to include other P-3 crewmembers, and (2) the present analysis does not include a behavioral description of the pilot, copilot, and flight engineer during any tactical operations of the P-3 weapon system.
The task listing below is organized according to "Phase of Flight" structure as shown on the MISSION PHASES INDEX and on the TASK ANALYSIS INDEX. Definitions and description of each Mission Phase and Segment appear below. It should be noted that these Phases and Segments are arbitrarily defined. However, because they serve only to impose structure to the analysis, their arbitrary nature does not detract from their usefulness.
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<td>ROT</td>
<td>ROTATE</td>
</tr>
<tr>
<td>RPM</td>
<td>REVOLUTION PER MINUTE</td>
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<tr>
<td>RY</td>
<td>RUNWAY</td>
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<td>SAR</td>
<td>SEARCH AND RESCUE</td>
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<tr>
<td>SHP</td>
<td>SHAFT HORSEPOWER</td>
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<tr>
<td>SID</td>
<td>STANDARD INSTRUMENT DEPARTURE</td>
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<td>SOP</td>
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<td>SPL WPN</td>
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<td>SWITCH</td>
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<td>SYSTEM</td>
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<td>TACCO</td>
<td>TACTICAL COORDINATOR</td>
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<td>TACHOMETER</td>
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<tr>
<td>TD</td>
<td>TEMPERATURE DATUM</td>
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<tr>
<td>TIT</td>
<td>TURBINE INLET TEMPERATURE</td>
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<tr>
<td>TO</td>
<td>TAKEOFF</td>
</tr>
<tr>
<td>TR</td>
<td>TRANSFORMER RECTIFIER</td>
</tr>
<tr>
<td>V</td>
<td>SPEED</td>
</tr>
<tr>
<td>VER</td>
<td>VERIFY</td>
</tr>
<tr>
<td>VHF</td>
<td>VERY HIGH FREQUENCY</td>
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</table>
**LIST OF ABBREVIATIONS USED IN APPENDIX A (CONT)**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>VIDS</td>
<td>VISUAL INTEGRATED DISPLAY SYSTEM (MAINTENANCE WRITEUP FORM OPNAV 4790/1)</td>
</tr>
<tr>
<td>VMC AIR</td>
<td>MINIMUM CONTROL SPEED IN AIR</td>
</tr>
<tr>
<td>VMC GD</td>
<td>MINIMUM CONTROL SPEED ON GROUND</td>
</tr>
<tr>
<td>VOR</td>
<td>VHF OMNI RANGE</td>
</tr>
<tr>
<td>VRO</td>
<td>ROTATION SPEED</td>
</tr>
<tr>
<td>VS</td>
<td>STALL SPEED</td>
</tr>
<tr>
<td>WH</td>
<td>WHEEL</td>
</tr>
<tr>
<td>WT</td>
<td>WEIGHT</td>
</tr>
<tr>
<td>YELLOW SHEET</td>
<td>OPNAV FORM 3760/2 NAVAL AIRCRAFT FLIGHT RECORD</td>
</tr>
<tr>
<td>&gt;</td>
<td>GREATER THAN</td>
</tr>
<tr>
<td>&lt;</td>
<td>LESS THAN</td>
</tr>
<tr>
<td>≥</td>
<td>GREATER THAN OR EQUAL TO</td>
</tr>
<tr>
<td>≤</td>
<td>LESS THAN OR EQUAL TO</td>
</tr>
</tbody>
</table>
1.0 MISSION PREPARATION - Phase 1 of the P-3 mission begins when the aircraft commander receives word that a mission has been ordered (typically, when the flight schedule is posted), and ends when all crew members have boarded the aircraft for that mission. All tactical planning, flight planning, and pre-flight inspections and readiness checks are accomplished during this mission phase.

2.0 PRE-TAKEOFF - After all crew members are aboard the aircraft, the PRE-TAKEOFF phase of flight begins. This phase ends when the aircraft receives takeoff clearance from the control tower (or any other appropriate local traffic control authority). Thus, engine starting and other systems activation procedures occur during this phase, as well as taxiing the aircraft from the parking ramp to the active runway.

3.0 TAKEOFF - All activities which take place between the time the aircraft has received clearance to take-off and the time that the aircraft is "safely airborne" (in the NATOPS sense), are considered to occur during the TAKEOFF mission phase.

4.0 CLIMB-DEPARTURE - When the pilot calls "Gear up", the climb-departure phase is considered to have begun. This particular phase of flight ends when the aircraft is established on course, at cruise altitude. Included here, as in some of the earlier mission phases, are navigation and communication tasks in addition to basic aircraft control tasks.

5.0 CRUISE-OUT - This phase of flight covers all aircraft operations which occur between the time the aircraft has been established on course in cruise configuration, and the time when tactical operations
are begun. Autopilot operation is included here, even though it is recognized that pilots may use the autopilot during Climb-Departure operations.

6.0 TACTICAL OPERATIONS - All aircraft operations relating to the tactical mission of the P-3 weapons system are to be covered during this phase of flight. As noted earlier, however, the present task description does not treat this phase.

7.0 CRUISE BACK - Once the tactical mission of the P-3 has been accomplished, and the aircraft is established on the homeward bound course, we have entered the Cruise-Back phase of flight. Most of the procedures here, of course, are identical to the earlier Cruise-Out mission phase and are not repeated.

8.0 DESCENT/APPROACH - When the aircraft has received an appropriate descent clearance from ATC (or other appropriate authority), the Descent/Approach phase begins. All procedures and operations which occur from the time the clearance is received until the aircraft reaches MDA/DH on the final approach are covered in this section of the task description.

9.0 FINAL APPROACH/LANDING/MISSED APPROACH - Once DH or the Missed Approach point has been reached, the aircraft will either transition to a visual landing or will execute a missed approach. In the event that the landing can be made, all activities which occur until the aircraft rolls clear of the duty runway are covered under this heading. If a missed approach is required, then all activities which occur between the point where the missed approach is begun and the time when clearance to proceed to the alternate airport is received will be listed in this section. (At this point, of course, we would enter Climb/Departure again.)
10.0 POST-LANDING - All procedures and operations which occur between the time the aircraft leaves the duty runway and the time the Secure Checklist has been completed are described in this section of the task listing.

11.0 POST-MISSION - Included under this heading are post-flight inspections and logging procedures. Any debriefings which may be required will also be described here.

12.0 ABNORMAL AND SPECIAL PROCEDURES - The previous, Post-Flight, phase of course terminates the chronologically organized description of the P-3 crew duties and responsibilities. All other procedures, except emergencies, are covered in Section 12.0. This includes operations such as a Three Engine Ferry Takeoff, and some training maneuvers, e.g., the Ram Effect Demonstration and Approaches to Stall.

13.0 EMERGENCIES - A complete description of the activities of the pilot, copilot, and flight engineer during emergency operations (per NATOPS) can be found in this section.
NOTES: FORMAT OF THE TASK DESCRIPTION

1. Crewmember positions always appear first in each task descriptive statement. These are abbreviated as P, CP and FE for pilot, copilot and flight engineer respectively.

2. A verbal response or command of any crewmember is always placed within quotation marks.

3. Selected control positions and/or indicator readings are always underlined.

4. Checklist items are not numbered, but are lettered instead.

5. If several (but not all) crewmembers are to perform a given item, then the letters indicating which are separated by a comma, as:

   01 P,CP CHECK HSI

   If one or the other (but not necessarily both) are to perform a given item, then:

   01 P/CP CHECK EXTERIOR LIGHTS
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8.2 APPROACH NAV/COM  88
8.3 TRANSITION TO FINAL  
9.0 FINAL APPROACH AND LANDING/MISSED APPROACH  94
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9.2 FINAL APPROACH NAV/COM  
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10.3 SHUTDOWN  102
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<td>12.10</td>
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<td>RECOVERY FROM UNUSUAL ATTITUDE</td>
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<td>12.12</td>
<td>FUEL GOVERNOR PITCH LOCK AND REVERSE HORSEPOWER CHECK</td>
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<td>EMERGENCY PROCEDURES</td>
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1.1 MISSION PLANNING (TACTICAL)

TO BE COVERED IN POST PHASE II STUDY
### 1.2 FLIGHT PLANNING

<table>
<thead>
<tr>
<th>Step</th>
<th>Code</th>
<th>Activity Description</th>
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<tbody>
<tr>
<td>01</td>
<td>P/CP</td>
<td>Determine Aircraft Model and Tail Number from Flight Schedule</td>
</tr>
<tr>
<td>02</td>
<td>P/CP</td>
<td>Examine V/MC Book for Review of Aircraft Malfunction/Fix History</td>
</tr>
<tr>
<td>03</td>
<td>CP</td>
<td>Prepare Flight Plan (DD-175 or ICAO)</td>
</tr>
<tr>
<td>04</td>
<td>P</td>
<td>Verify and Sign Flight Plan</td>
</tr>
<tr>
<td>05</td>
<td>ANY</td>
<td>Receive Weather Brief Not More Than 2 Hrs Prior to Mission. HWD Package is Optional*</td>
</tr>
<tr>
<td>06</td>
<td>CP</td>
<td>Brief Navigator on Weather, Flight Plan, etc.*</td>
</tr>
<tr>
<td>07</td>
<td>CP</td>
<td>Pick Up Environmental Package and Deliver to TACCO*</td>
</tr>
<tr>
<td>08</td>
<td>CP</td>
<td>File Flight Plan at Base Ops</td>
</tr>
</tbody>
</table>

*NOTE: If Aircraft Commander Holds Special Instrument Card, the "Approving Authority" Signature by Base Ops Is Not Required*

END OF 1.2 FLIGHT PLANNING

*All items so marked are representative only. Normally, the weather brief, environmental package, etc. are received by all crewmembers during the tactical brief.*
1.3 INSPECTIONS AND READINESS CHECKS

01 FE COMPLETE WEIGHT AND BALANCE FORM (DD365F)

02 FE COMPLETE AIRCRAFT PERFORMANCE COMPUTATIONS
   A. 80 KIAS PREDICTED SHAFT HP
   B. V DECISION
   C. V REFUSAL
   D. V ROTATE
   E. V LIFT-OFF
   F. LIFT-OFF DISTANCE
   G. V 50°
   H. V 50°

03 FE COMPLETE PREFLIGHT INSPECTION IAW (IN ACCORDANCE WITH) NAVAIR 75-PAA-6-1

04 FE COMPLETE "YELLOW SHEET" OPNAV FORM 3760/2
   (NAVAL AIRCRAFT FLIGHT RECORDS)

05 FE COMPLETE "PREFLIGHT/DAILY/IN-FLIGHT MAINT RECORD
   OPNAV FORM 4790/38

06 FE PREPARE FUEL LOG (IF REQUIRED)

07 P COMPLETE PILOT'S "WALKAROUND" OF THE AIRCRAFT

END 1.3 INSPECTIONS & READINESS CHECKS
## 2.0 PRE-TAKEOFF

### 2.1 READINESS CHECK

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Description</th>
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<tbody>
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<td>2.1.1</td>
<td>VERIFY SYSTEMS READINESS</td>
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<td>2.1.2</td>
<td>PERFORM BEFORE START CHECKLIST</td>
<td>46</td>
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<tr>
<td>2.1.3</td>
<td>PREPARE TO START ENGINES</td>
<td>56</td>
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</table>

### 2.2 SYSTEMS ACTIVATION

<table>
<thead>
<tr>
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<tr>
<td>2.2.1</td>
<td>START ENGINES</td>
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<tr>
<td>2.2.2</td>
<td>PERFORM AFTER START CHECKLIST</td>
<td>61</td>
</tr>
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<td>2.2.3</td>
<td>PREPARE FOR TAXI</td>
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### 2.3 TAXI

<table>
<thead>
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<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>PERFORM TAKEOFF CHECKLIST</td>
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<td>2.3.2</td>
<td>PERFORM OPTIONAL CHECKS</td>
<td></td>
</tr>
<tr>
<td>2.3.3</td>
<td>NAVIGATION/COMMUNICATION</td>
<td></td>
</tr>
<tr>
<td>2.3.4</td>
<td>PREPARE FOR TAKEOFF</td>
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</table>
## 2.1.1 Verify Systems Readiness

<table>
<thead>
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<th>Role</th>
<th>Task Description</th>
<th>Reference</th>
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</thead>
<tbody>
<tr>
<td>01</td>
<td>P</td>
<td>Verify Preflight Inspection Completed by FE</td>
<td>A3-3; C3-13</td>
</tr>
<tr>
<td>02</td>
<td>P</td>
<td>Verify and Sign Weight and Balance Form (DD 365F)</td>
<td>A3-2; C3-2</td>
</tr>
<tr>
<td>03</td>
<td>P</td>
<td>Verify and Sign &quot;Yellow Sheet&quot;, Part A (OPNAV Form 3760/2; Naval Aircraft Flight Record)</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>ANY</td>
<td>Deliver forms completed in 02, 03, &amp; 04 to Lineman</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>ALL</td>
<td>Check Personal Survival Gear</td>
<td>OPNAV 3710.7/700</td>
</tr>
<tr>
<td>06</td>
<td>FE</td>
<td>Brief Crew and Any Passengers on Ditching Stations (as assigned during preflight and posted)</td>
<td>A5-24/5-36, C5-16/5-25</td>
</tr>
<tr>
<td>07</td>
<td>P</td>
<td>Brief Crew and Any Passengers on Mission, Weather, and Ground Emergencies</td>
<td>A3-1; C3-1</td>
</tr>
<tr>
<td>08</td>
<td>ALL</td>
<td>Verify Miscellaneous Equipment Stowed</td>
<td>A, C Sect 9</td>
</tr>
<tr>
<td>09</td>
<td>ALL</td>
<td>Take Seats, Adjust Seats, Rudders, and Harness</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>P,CP</td>
<td>Perform Smoke Mask Check (Optional)</td>
<td>A1-121/122, C1-52/54</td>
</tr>
</tbody>
</table>

**References:**
- A3-3; C3-13
- A3-2; C3-2
- OPNAV 3710.7/700
- A5-24/5-36, C5-16/5-25
- A3-1; C3-1
- A, C Sect 9
- A1-121/122, C1-52/54
2.1.1 VERIFY SYSTEMS READINESS (CONTINUED)

04 SELECT OXYGEN DILUTOR 100%
05 SELECT OPERATE/TEST SWITCH TO TEST
06 VERIFY CONTINUOUS OXYGEN FLOW
07 SELECT OPERATE/TEST SWITCH TO OPERATE
08 PLACE MASK ON FACE, CHECK FIT BY PINCHING HOSE
   OR BY TURNING REGULATOR OFF
09 VERIFY BLINKER OPERATION WHILE BREATHING
10 SELECT ICS SWITCH TO SMOKE MASK
11 DEPRESS YOKE MIKE SWITCH TO CHECK ICS OPERATION
12 SELECT ICS SWITCH TO NORMAL
13 SELECT OXYGEN REGULATOR SWITCH TO OFF
14 STOW MASKS

11 ALL DON HEADSETS AND TEST ICS OPERATION
12 P INITIATE "BEFORE START CHECKLIST"

END OF SECTION 2.1.1

REFERENCES

A1-105/109;
C1-66/78
2.1.2 PERFORM BEFORE START CHECKLIST

NOTE: A/EU STARTED DURING PREFLIGHT (FE)

A. LANDING GEAR

01 P VERIFY HANDLE IN DOWN DETENT
02 P VERIFY DOWN POSITION INDICATOR
03 P VERIFY HANDLE LIGHTS OUT
04 P RESPOND "DOWN"

B. PARKING BRAKES

01 P VERIFY BRAKE HANDLE OUT AND HORIZONTAL
02 P VERIFY PRESSURE APPLIED TO SINGLE PEDAL
   DOES NOT RELEASE BRAKES
03 P RESPOND "SET"

C. CHOCKS

01 P RECEIVE VERIFICATION FROM LINEMAN THAT CHOCKS
   ARE REMOVED
02 P RESPOND "REMOVED"

D. CIRCUIT BREAKERS

01 FE RESPOND "SET" (NOTE: ALL BREAKERS ARE CHECKED DURING
   PREFLIGHT)
2.1.2 PERFORM BEFORE START CHECKLIST (CONTINUED)

E. LIGHTS (INTERIOR AND INSTRUMENT PANEL)

01 P,CP,FE SET LIGHTS AS DESIRED. P AND CP AOA INDEXER INTENSITY CHECKED BEFORE EACH FLIGHT

02 P,CP,FE RESPOND "CHECKED AND SET"

F. BLEED AIR/ICE CONTROL PANEL

01 FE SELECT OPEN ON BLEED AIR VALVE SWITCHES AND FUSELAGE BLEED AIR SHUTOFF VALVE SWITCHES.

02 FE VERIFY OPEN INDICATOR LIGHTS ON

03 FE VERIFY WING DE-ICE, BOMB BAY HEAT, ENGINE ANTI-ICE, PROP DE-ICE, EMPENNAGE DE-ICE SWITCHES ALL OFF

04 FE RESPOND "SET"

G. WINDSHIELD, PITOT AND AOA HEAT

01 FE SELECT LOW ON P, CP, AND CENTER WINDSHIELD HEAT SWITCHES

02 FE SELECT ON ON SIDE WINDSHIELD HEATER SWITCHES
   (IF APPLICABLE)

03 FE SELECT ON ON PITOT HEAT SWITCH

04 FE VERIFY LEFT AND RIGHT PITOT HEATER OUT LIGHTS ARE OFF

REFERENCES

A1-70/71; CI-103/105
A1-112/114; CI-136/137
A1-119/120A; CI-142/143

2.1.2 BEFORE START CHECKLIST
2.1.2 PERFORM BEFORE START CHECKLIST (CONTINUED)

05 FE SELECT ON ON AOA HEAT SWITCH
06 FE RESPOND "LOW AND ON"

*H. FUEL AND IGNITION

01 FE VERIFY RESIDUAL TIT LESS THAN 200° C
02 FE VERIFY NO ENGINE ROTATION (OZ RPM)
03 FE SELECT ON FOR ALL FUEL AND IGNITION SWITCHES
04 FE RESPOND "ON"

*I. RPM SWITCHES

01 FE VERIFY ENGINE RPM SWITCHES SET AS FOLLOWS:

  NO. 2 ENG: NOR  
  NO. 1,3,4 ENG: LOW

NOTE: 2,1,3,4 IS THE NORMAL ENGINE STARTING SEQUENCE, BUT THIS CAN  
   VARY AS DESIRED. FIRST ENGINE SHOULD BE STARTED IN NOR RPM,  
   AND THE REST IN LOW RPM

02 FE RESPOND "SET"

J. FIRE DETECTORS

01 FE RESPOND "CHECKED"

*NOTE: THESE ARE CHECKED DURING PREFLIGHT INSPECTION.

REFERENCES

A1-12/C1-89

2.1.2 BEFORE START CHECKLIST
2.1.2 PERFORM BEFORE START CHECKLIST (CONTINUED)

K. TD SWITCHES
   01 FE VERIFY TEMP DATUM SWITCHES IN NULL
   02 FE SELECT NOR ON TD SWITCHES (COMPLETES CYCLE)
   03 FE RESPOND "CYCLED"

L. AHRS, INERTIAL AND HSI (P3A/B ONLY)
   01 P VERIFY AHRS MODE SWITCH IN SLAVE
   02 P CHECK/SET LATITUDE
   03 P CHECK/SET HEMISPHERE (N OR S)
   04 P VERIFY SYNCH INDICATOR NEEDLE CENTERED
   04a P DEPRESS PUSH-TO-SYNCH SWITCH AND HOLD UNTIL NEEDLE CENTERED
   05 CP VERIFY I-D ON INCP MODE SWITCH
   06 CP VERIFY ALIGN LIGHT OUT
   IF ALIGN LIGHT NOT OUT
   06a CP CONTACT NAVIGATOR TO ACCEPT SYSTEM ALIGNMENT
   OTHERWISE NAVIGATOR UNABLE TO ACCEPT SYSTEM ALIGNMENT
   07 CP MOMENTARILY SELECT CAGE ON INERTIAL NAVIGATOR PANEL (INCP)
2.1.2 PERFORM BEFORE START CHECKLIST (CONTINUED)

08 CP SELECT FAST ERECT ON INCP MODE SWITCH

08a CP VERIFY ALIGN LIGHT OUT WITHIN THREE MINUTES

08b CP MAY PUSH SYNCH BUTTON DURING 08a

09 CP SELECT SLAVE ON INCP MODE SWITCH

10 CP CHECK AND SETS LATITUDE

11 CP VERIFY SYNC INDICATOR CENTERED

11a CP DEPRESS AND HOLDS SYNCH BUTTON UNTIL NEEDLE CENTERED

12 CP SELECT STANDBY GYRO ON HSI ATTITUDE CONTROL SWITCH

13 P,CP MONITOR NN4 INDICATORS FOR PROPER OPERATION

14 P SELECT AHRS ON HSI ATTITUDE CONTROL SWITCH

15 P MONITOR NN4 FOR PROPER OPERATION

16 CP SELECT INERTIAL ON HSI ATTITUDE CONTROL SWITCH

17 CP MONITOR NN4 FOR PROPER OPERATION

18 P,CP OBSERVE INDICATED HEADING ON HSI USING PRIMARY INPUT

18a P SELECT AHRS ON HEADING SWITCH

18b CP SELECT INERTIAL ON HEADING SWITCH

18c P,CP OBSERVE HEADING INDICATION
2.1.2 PERFORM BEFORE START CHECKLIST (CONTINUED)

19  P,CP  OBSERVE INDICATED HEADING ON HSI USING SECONDARY INPUT
19a P   SELECT INERTIAL ON HEADING SWITCH
19b CP  SELECT AHRS ON HEADING SWITCH
19c P,CP COMPARE HEADING INDICATIONS FOR PRIMARY AND SECONDARY INPUTS

20  P,CP  SELECT PRIMARY SOURCE FOR HSI HEADING INPUT
21  P   CHECK STANDBY COMPASS FOR ACCURACY
22  P,CP  REPLY "CHECKED"
P-3C ONLY

INERTIAL #1 & #2, HSI

01 P VERIFY INERTIAL NO. 1 MODE SW IN INERTIAL POSITION
02 P VERIFY LOCAL LATITUDE SET IN LAT BACKUP WINDOW
03 P VERIFY NO. 1 ON LIGHT ON
04 CP VERIFY INERTIAL NO. 2 MODE SW IN INERTIAL POSITION
05 CP VERIFY LOCAL LATITUDE SET IN LAT BACKUP WINDOW
06 CP VERIFY NO. 2 ON LIGHT ON
07 P SELECT INERTIAL NO. 2 FOR HEADING INPUTS
08 P VERIFY HSI HEADING
09 P SELECT INERTIAL NO. 1 FOR HEADING INPUTS
10 P VERIFY HSI HEADING
11 P SELECT STANDBYgyro FOR ATTITUDE INPUTS
12 P MONITOR FDS DISPLAY FOR PROPER INDICATION
13 P SELECT INERTIAL NO. 1 FOR ATTITUDE INPUTS
14 P MONITOR FDS DISPLAY FOR PROPER INDICATION
15 P VERIFY AN/ASA66 (PILOT'S TACTICAL DISPLAY) POWER SW OFF
16 P CHECK STANDBY COMPASS READING WITH HSI READING

2.1.2
BEFORE START CHECKLIST
<table>
<thead>
<tr>
<th></th>
<th>CP</th>
<th>SELECT INERTIAL NO. 1 FOR HEADING INPUTS</th>
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</thead>
<tbody>
<tr>
<td>18</td>
<td>CP</td>
<td>VERIFY HSI HEADING</td>
</tr>
<tr>
<td>19</td>
<td>CP</td>
<td>SELECT INERTIAL NO. 2 FOR HEADING INPUTS</td>
</tr>
<tr>
<td>20</td>
<td>CP</td>
<td>VERIFY HSI HEADING</td>
</tr>
<tr>
<td>21</td>
<td>CP</td>
<td>SELECT STANDBY GYRO FOR ATTITUDE INPUTS</td>
</tr>
<tr>
<td>22</td>
<td>CP</td>
<td>MONITOR FDS DISPLAY FOR PROPER OPERATION</td>
</tr>
<tr>
<td>23</td>
<td>CP</td>
<td>SELECT INERTIAL NO. 2 FOR ATTITUDE INPUTS</td>
</tr>
<tr>
<td>24</td>
<td>CP</td>
<td>MONITOR FDS DISPLAY FOR PROPER OPERATION</td>
</tr>
<tr>
<td>25</td>
<td>P/CP</td>
<td>RESPOND &quot;CHECK&quot;</td>
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**M**

<table>
<thead>
<tr>
<th></th>
<th>P &amp; CP</th>
<th>SELECT ON</th>
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<tbody>
<tr>
<td>01</td>
<td>P &amp; CP</td>
<td>RESPOND &quot;ON&quot;</td>
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**N**

<table>
<thead>
<tr>
<th></th>
<th>FE</th>
<th>RESPOND &quot;XXX POUNDS&quot;</th>
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**O**

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<thead>
<tr>
<th></th>
<th>FE</th>
<th>ENSURE CROSSFEED VALVES CLOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>FE</td>
<td>ENSURE MAIN TANK VALVES OPEN</td>
</tr>
</tbody>
</table>
03   FE  SELECT ON FUEL BOOST PUMP SWITCHES
04   FE  VERIFY ASSOCIATED INDICATOR LIGHTS OUT
05   FE  VERIFY TANK 5 TRANSFER PUMPS OFF AND TRANSFER VALVES CLOSED
06   FE  RESPOND "SET"

P   ARM PANEL AND BOMB BAY DOORS
P3A/B:
01   P   VERIFY ALL SWITCHES OFF OR AFT ON ARMAMENT PANEL
02   P   VERIFY DOORS AND OPEN LIGHTS OUT
03   P   RESPOND "OFF AND CLOSED"

P3C:
01   P   VERIFY MASTER ARM OFF
02   P   VERIFY BOMB BAY DOORS SW CLOSED
03   P   VERIFY SRCH PWR SW OFF
04   P   VERIFY SEL WPN SEL OFF
05   P   VERIFY DROP-HOLD SW HOLD
06   P   RESPOND "OFF AND CLOSED"

A-FO12/FO19; G8-58/67, G8-277/208

2.1.2
BEFORE START
CHECKLIST
Q  FLAPS  A1-86/87; C1-117/118
01  CP SELECT FLAPS AS DESIRED (NORMALLY SET TO TAKEOFF/APPROACH)
    NOTE: VERIFY FLAP HANDLE CORRESPONDS WITH FLAP INDICATOR
02  CP RECEIVE CLEARANCE FROM LINEMAN PRIOR TO CHANGING FLAP
    POSITION
03  CP RESPOND "SET T/O APPROACH" (OR OTHERWISE IF APPROPRIATE)

R  AUTOPILOT  A1-98/102; C1-125/136
01  P  VERIFY GND POWER SWITCH OFF
02  P  RESPOND "GROUND POWER OFF"

S  GROSS WEIGHT & CG  A1-PART IV; C1-PART IV
01  FE  RESPOND WITH "GROSS WEIGHT & CG LIMITS" (ON DD 365 F)

T  TACTICAL CREW CHECKLIST
01  CP  RECEIVE VERIFICATION FROM TACCO THAT TACTICAL CREW
    CHECKLIST "COMPLETE"
02  CP  RESPOND "COMPLETE"

U  ROT. BCN
01  FE  SELECT MASTER AND ROTATING BCN LIGHT SWITCHES ON
02  FE  RESPOND "ON"

END OF BEFORE START CHECKLIST
2.1.3 PREPARE TO START ENGINES

01 P BRIEF CP TO MONITOR OUTSIDE OBSERVER FOR NO. 3 AND NO. 4 ENGINE STARTS

02 P BRIEF CP TO BACK UP FE FOR NO. 1 AND NO. 2 ENGINES

03 P BRIEF CP THAT PILOT WILL MONITOR OUTSIDE OBS FOR NO. 1 AND NO. 2 ENGINE STARTS

04 P BRIEF CP THAT PILOT WILL BACK UP FE FOR NO. 3 AND NO. 4 ENGINES

05 P BRIEF CP THAT P/CP WILL ANNOUNCE PROP ROTATION FOR ENGINES BEING STARTED

06 CP RADIO CHECK WITH GROUND CONTROL

07 P ASSIGN RESPONSIBILITY FOR TIMING ALL ENGINE STARTS

08 P/CP OBTAIN VISUAL CLEARANCE FROM OUTSIDE OBS FOR FIRST ENGINE START (NORMALLY NO. 2)

09 P/CP VISUALLY CHECK ENGINE CLEAR
2.2.1 START ENGINES - NOR APU START

01 P CALL "START NO. 2"

02 FE SELECT 2 ON ENGINE START SELECTOR

03 FE VERIFY (SUFFICIENT)\textsuperscript{1} AIR PRESS ON AIR MANIFOLD PRESS GAGE

\textsuperscript{1}NORMALLY APPROX 50# BEFORE ENGINE START

04 FE DEPRESS START BUTTON

05 FE MONITOR FUEL & IGN SW (STANDBY TO SECURE)

06 FE OBSERVE AIR PRESS DROP ON AIR MANIFOLD PRESS GAGE

07 P CALL PROP ROTATION

08 P/CP START CLOCK

09 FE VERIFY ROTATION ON ENG TACH

10 FE VERIFY FUEL FLOW AT 16% ON FUEL FLOW GAGE

11 FE VERIFY MIN. 25 PSI AT 16% ON AIR MANIFOLD PRESS GAGE

12 FE VERIFY ENGINE LIGHT-OFF ON TIT GAGE BETWEEN 16 & 33% RPM (ESSENTIAL FY 33%)

13 FE OBSERVE RISING OIL PRESS IN GEAR CASE AND POWER SECTION GAGES. (ESSENTIAL BY 35%)
2.2.1  START ENGINES - NOR APU START (CONTINUED)

14  FE  VERIFY EDC LIGHT OUT BY 65% (ENG 2 & 3 ONLY)

15  FE  VERIFY FUEL PUMP PARALLEL LIGHT ON BY 65% (NORMALLY 16%-65%)

16  FE  VERIFY START BUTTON OUT BY 64% (NORMALLY OUT BY 57-64%)

17  FE  VERIFY AIR PRESSURE RISE ON AIR PRESSURE MANIFOLD GAGE WHEN STARTER BUTTON POPS. WILL RISE TO ORIGINAL VALUE, THEN CONTINUE TO RISE

18  FE  MONITOR TIT FOR 850° C. MAX
     (NOTE: IF TIT > 830° < 850° RECORD OVER TEMP ON VIDS)

19  FE  MONITOR TACH FOR STABLE RPM
     ENG RPM SWITCH IN NOR, RPM 96.3-99.1%
     ENG RPM SWITCH IN LOW, 71.0-73.8%

20  FE  VERIFY OIL PRESSURE; VALUES SHOWN BY RPM.
     GEAR CASE  130-250 PSI HI RPM
                50-250 PSI LO RPM
     POWER SECTION  50-60 PSI HI RPM
     ANY PRESSURE LO RPM
     PRESSURES MAY EXCEED HI PSI LIMITS DURING OIL TEMP WARM-UP

21  FE  RECHECK EDC PRESSURE. LOW LIGHT OUT (ENG NO. 2 ONLY)

2.2.1
START ENGINES
NOR APU START
2.2.1  START ENGINES - NOR APU START (CONTINUED)

84  P  CALL "START NO. 4"

85  FE  SELECT 4 ON ENGINE START SELECTOR SWITCH

86-110  SAME AS 03-26 EXCEPT AS NOTED

111  FE  ANNOUNCE "NORMAL START ON NO. 4"

112  P  CALL "AFTER START CHECK LIST"

113  FE  SELECT OFF ENGINE START SELECTOR SWITCH

114  FE  SELECT CLOSE ON BLEED AIR VALVE SWITCHES AND FUSELAGE
       BLEED AIR SHUTOFF SWITCHES

115  FE  SELECT OFF ON APU ON/OFF/START SWITCH
       (NOTE: APU MAY BE LEFT ON DURING RUN AROUND FEEDER CHEK AS
       LONG AS APU GEN SW OFF. THIS WAY IF CHECK IS UNSAT, THEN
       MAINT WOULD BE CALLED AND APU WOULD NOT NEED BE RESTARTED)

116  FE  MONITOR APU TACH & EGT FOR NORMAL SHUTDOWN

117  FE  SELECT ON GND AIR CONDITIONING SWITCH

REMARKS:

NORMAL ENGINE START SEQUENCE IS 2, 1, 3, 4; HOWEVER, THIS IS COMPLETELY FLEXIBLE, IF USING APU.

IF USING EXT. PWR, NO. 2 SHOULD ALWAYS BE STARTED FIRST.
2.2.2 PERFORM AFTER START CHECKLIST

A ENGINE START SELECTOR SW

01 FE  VERIFY SW OFF
02 FE  RESPOND "OFF"

B BLEED AIR VALVES/FUSELAGE BLEED AIR SHUTOFF

01 FE  VERIFY VALVE OPEN LIGHTS OUT
02 FE  VERIFY BLEED AIR MANIFOLD PRESSURE IS DECREASING
03 FE  RESPOND "OFF"

C DOORS AND HATCHES

01 FE  VERIFY DOOR OPEN LIGHTS OUT
02 FE  RESPOND "CLOSED"

D RUNAROUND RELAY CHECK (AIRCRAFT W/O AFC 202)

01 FE  PLACE NO. 3 RPM SW TO NORM
02 FE  VERIFY NO. 3 RPM AT 96.3-99.1%
03 FE  VERIFY NO. 3 TIT 445-645°
04 FE  VERIFY NO. 3 PWR SECT OIL PRESS 50-60 PSI
PERFORM AFTER START CHECKLIST (CONTINUED)

05 FE VERIFY NO. 3 GEARCASE OIL PRESS: 130-250 PSI
06 FE VERIFY NO. 3 GENERATOR OFF LIGHT OUT
07 FE VERIFY APU OFF OR APU GEN OFF
08 P SELECT WHITE ON DOME LTS SW - NOT A PART OF THE CHECK
       BUT AIDS FE
09 FE PROCEED TO MAIN ELECTRICAL LOAD CENTER
10 FE PULL ESS (ESSENTIAL) BUS CRKT BKR (ON MAIN AC BUS A)
11 FE PULL NO. 3 RUNAROUND FEEDER CRKT BKR
12 P/CP OBSERVE LEFT PITOT HEATER OUT LT OFF AND TIT OFF
       FLAGS NOT DISPLAYED
13 FE RESET NO. 3 RUNAROUND FEEDER CRKT BKR AND PULL NO. 2
       RUNAROUND FEEDER CRKT BKR
14 P/CP OBSERVE AS PER NO. 12
15 FE RESET NO. 2 RUNAROUND FEEDER CRKT BKR AND ESS BUS CRKT BKR
16 FE RETURN TO FLIGHT STATION & FASTEN HARNESS
17 P MOVE DOME LT SW TO OFF
18 P/E ANNOUNCE "RUNAROUND CHECK COMPLETE"
19 FE SECURE APU IF NOT OFF.
       TURN SWITCH OFF - VERIFY RPM AND EGT INDICATORS DECREASING

2.2.2
2.2.2 PERFORM AFTER START CHECKLIST (CONTINUED)

E

HYDRAULIC PANEL

01 FE PLACE #1 AND #2 HYD PUMP SW'S ON (GENERALLY SPACES THESE A FEW SECONDS APART) (5 secs approx.)

02 FE OBSERVE #2 HYD PRESS AT 2960-3200 PSI

03 FE OBSERVE HYDRAULIC PRESSURE SYSTEM ANNUNCIATOR LTS OUT/and rudder power light out

04 FE RESPOND "SET"

F

P3A/B ONLY MAD AND DOPPLER POWER

01 P RECEIVE VERIFICATION FROM TACTICAL CREW THAT MAD POWER ON AND DOPPLER PWR SW STANDBY

02 P RESPOND "ON, STANDBY"

F-A

P3C ONLY MAD AND DVAR (DOPPLER VELOCITY ALTIMETER RADAR SET AN/APN-187)

01 P RECEIVE VERIFICATION FROM TAC CREW THAT MAD PWR IS ON AND DVAR PWR IS TEST

02 P RESPOND "ON, TEST"

G

IFN

01 CP MOVE IFF MASTER SW TO STANDBY

02 CP RESPOND "STANDBY"
2.2.2 PERFORM AFTER START CHECKLIST (CONTINUED)

H

FUEL TRANSFER

01 FE IF FUSELAGE FUEL AVAILABLE (TANK 5) PLACE FWD AND AFT TRANSFER PUMP SW'S ON

02 FE OBSERVE FWD AND AFT TRANSFER PUMP PRESSURE LOW LIGHTS OUT

03 FE PLACE TRANSFER VALVE SW'S FOR TANKS 1, 2, 3 & 4 TO OPEN

04 FE RESPOND "SET"

I CP ANNOUNCE "AFTER START CKLST COMPLETE"
2.2.3  PREPARE FOR TAXI

01  CP  COPY ATIS INFO (IF AVAILABLE) OR COPY INFORMATION FROM CONTROL TOWER
01A CP  CONTACT GND FOR TAXI CLEARANCE
02  P/CP VISUALLY CHECK CLEAR SIDES
03  P  RECEIVE TAXI SIGNAL FROM LINEMAN
04  P  RELEASE BRAKE - START ROLL
05  P  VERIFY EVEN OPERATION OF BRAKES
06  P  FOLLOW LINEMAN SIGNALS UNTIL CLEAR OF CONGESTED AREA
07  FE INFORM P ENGINE ANTI-ICE/WING DE-ICE CHECKS IN PROGRESS

01  FE  RPM SW'S AS DESIRED
02  FE  VERIFY TIT STABILIZED
03  FE  PLACE ENGINE ANTI-ICE SW'S TO ON
04  FE  VERIFY TIT INCREASE FOR EACH ENGINE
05  FE  VERIFY ANTI-ICING LIGHTS ON
06  FE  PLACE ENGINE ANTI-ICE SW'S OFF
07  FE  VERIFY DECREASE IN TIT
08  FE  VERIFY ANTI-ICING LIGHT OUT

A3-8/9; C3-23/24
03 FE PERFORM WING DE-ICE CHECK

01 FE VERIFY BLEED AIR SHUTOFF VALVES CLOSED

02 FE VERIFY NO. 2 ENGINE RPM IN NORMAL AND STABLE TIT

03 FE SELECT OPEN ON NO. 2 ENGINE BLEED AIR VALVE SW
VERIFY NO. 2 BLEED AIR LIGHT ON

04 FE CHECK TIT FOR LITTLE OR NO RISE NOTE: TIT VALVE

05 FE SELECT IN SEQUENCE LEFT INBOARD CENTER AND OUTBOARD ON SELECTOR SW AND MONITOR TEMPERATURE GAGE FOR NO RISE

06 FE SELECT ON WITH OUTBOARD WING DE-ICE SW

07 FE MONITORS NO. 2 TIT FOR MIN 10° RISE

08 FE SELECT OFF ON OUTBOARD WING DE-ICE SW

09 FE VERIFY RISING TEMPERATURE ON LEADING EDGE TEMPERATURE GAGE

10 FE VERIFY TIT NEAR ORIGINAL VALVE

11 FE SELECT CENTER ON TEMPERATURE SELECT SW

12 FE SELECT ON ON CENTER WING DE-ICE SW

13 FE MON TIT FOR 10° RISE

14 FE SELECT OFF ON CENTER WING DE-ICE SW

15 FE VERIFY RISE IN LEADING EDGE TEMPERATURE GAGE

16 FE VERIFY TIT NEAR ORIGINAL VALVE

17 FE SELECT INBOARD ON TEMPERATURE SELECT SW

18 FE SELECT ON WITH INBOARD DE-ICE SW

19 FE MON TIT FOR 10° RISE
20 FE SELECT OFF WITH INBOARD DE-ICE SW
21 FE VERIFY RISE IN LEADING EDGE TEMPERATURE GAGE
22 FE VERIFY TIT NEAR ORIGINAL VALVE
23 FE CLOSE NO. 2 BLEED AIR VALVE AND VERIFY NO. 2 BLEED AIR VALVE LIGHT OUT
24 FE RECHECK TIT NEAR ORIGINAL VALVE
25 FE REPEAT STEPS 02 THRU 24 WITH NO. 3 ENGINE FOR R. TF WING
2.3  TAXI

PERFORM TAKE-OFF CHECKLIST

A

01  P  CALL FOR "T.O. CK LIST"

01  CP  ANNOUNCE "SET COND 5" ON ICS-PA

BRAKES

01  P  VERIFY PROPER BRAKE OPERATION

02  P  RESPOND "CHECKED"

B

TURN IND, COMPASSES & ALT.

01  P/CP  VERIFY NEEDLE, BALL, & COMPASS TRACKING DURING GROUND
      TURNS (NEEDLE WITH TURN, BALL OPPOSITE TURNS)

02  P/CP  SET BARO PRESSURE ON ALTIMETER

03  P/CP  VERIFY INDICATED ALTITUDE - ± 75' OF FIELD ELEVATION

04  P/CP  RESPOND "CHECKED"

C

SYNCH SERVOS

01  FE  VERIFY SYNCH MASTER & SYNCH SERVO SWITCHES OFF

02  FE  RESPOND "OFF"

D

FUEL GOVERNOR CHECK SWITCHES

01  FE  VERIFY SWITCHES IN NOR

02  FE  RESPOND "NORMAL"

2.3.1  PERFORM TAKEOFF CHECKLIST
### 2.3.1 PERFORM TAKE-OFF CHECKLIST (CONTINUED)

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<tbody>
<tr>
<td>E</td>
<td>AUTO FEATHERING</td>
<td></td>
<td>A1-30/C1-101/102</td>
</tr>
<tr>
<td>01</td>
<td>FE</td>
<td>ARM AUTO-FEATHER SWITCHES IF P DESIRES, VERIFY 4 LIGHTS ON</td>
<td></td>
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<tr>
<td>02</td>
<td>FE</td>
<td>RESPOND &quot;ARMED&quot;</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>TRIM</td>
<td>A1-86, A3-12; C1-117/118, C3-26</td>
</tr>
<tr>
<td>01</td>
<td>CP</td>
<td>SET 10° UP ELEVATOR TRIM</td>
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<tr>
<td></td>
<td></td>
<td>3-4° RIGHT RUDDER TRIM</td>
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<td></td>
<td></td>
<td>0° AILERON</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>P</td>
<td>VERIFY ABOVE SETTINGS, RESPOND &quot;SET&quot;</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>WING FLAPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>CP</td>
<td>SET FLAP LEVER TO T.O./APP IF NOT ALREADY AT TO/APP POSITION</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>CP</td>
<td>VERIFY FLAP SETTING ON INDICATOR</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>P/CP</td>
<td>RESPOND &quot;T.O.&quot;</td>
<td></td>
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<tr>
<td>H</td>
<td>FLIGHT CONTROLS</td>
<td></td>
<td>A3-12; A1-84/86; C1-114/117, C3-26</td>
</tr>
<tr>
<td>01</td>
<td>P</td>
<td>VERIFY ALL 3 AXES OF FCS FREE</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>P</td>
<td>MOVE CONTROL SURFACES ONE AT A TIME</td>
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<tr>
<td>03</td>
<td>P</td>
<td>RESPOND &quot;CHECKED&quot;</td>
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2.3.1
PERFORM TAKEOFF CHECKLIST
2.3.1 PERFORM TAKEOFF CHECKLIST (CONTINUED)

1

REM

01 P CALL FOR "NOR RPM"

02 FE VERIFY OIL COOLER FLAPS LESS THAN 100%

03 FE SELECT NOR RPM (ONE ENGINE AT A TIME)

04 FE VERIFY TIT & RPM STABILIZED WITHIN LIMITS

05 FE VERIFY GEAR CASE & POWER SECTION OIL PRESSURE
 WITHIN LIMITS

06 FE VERIFY #3, #4 GEN OFF LIGHTS OUT

07 FE RESPOND "NOR"

J

ELECTRICAL PANEL

01 FE VERIFY ALL GEN OFF LIGHTS OUT

02 FE VERIFY ALL TR OVERHEAT LIGHTS OUT

03 FE RESPOND "CHECKED"

K

APU, DOORS LIGHT

01 FE DEPRESS LIGHT TEST SWITCH

02 FE VERIFY OPERATION OF APU DOORS LIGHT

03 FE VERIFY APU OFF BY CHECKING RPM AND EGT INDICATORS

04 FE RESPOND "OFF AND OUT"
2.3.1 PERFORM TAKEOFF CHECKLIST (CONTINUED)

L

01 P,CP SET INITIAL OUTBOUND COURSE ON THE HSI COURSE WINDOW

IF VOR IS PRIMARY DEPARTURE NAV AID

O2 P SELECT VOR 1 (TUNED AND IDENTIFIED) FOR HSI BEARING AND COURSE

O3 CP SELECT VOR 2 (TUNED AND IDENTIFIED) FOR HSI BEARING AND COURSE

O4 CP VERIFY TACAN (TUNED AND IDENTIFIED) IS AVAILABLE FOR DME AND

BACKUP TO VORS

O5 P,CP SELECT UHF NO. 1 PRIMARY RADIO

(NOTE: UHF NO. 2 AVAILABLE AS BACKUP)

O6 CP SETUP INTERSECTIONS USING VOR NO. 2

OTHERWISE VOR IS NOT PRIMARY DEPARTURE NAV AID

O2 P,CP SELECT AS REQUIRED INPUTS FOR HSI BEARING AND COURSE

O3 P,CP SET COMM FREQ IN ACCORD WITH SID OR ASSIGNED DEP FREQS
2.3.1 PERFORM TAKEOFF CHECKLIST (CONTINUED)

M

WATER INJ (P3A ONLY)

01 P (IF WATER INJ DESIRED) VERIFY "FULL LIGHT" ON

(NOTE: H2O INJ NOT RECOMMENDED WHEN OAT LESS THAN
100°C, AND ELEVATION LESS THAN 1000 FT. IF FULL
LIGHT OUT, NO H2O INJ)

02 P SELECT ON WATER INJ

03 P VERIFY PUMP LOW PRESS OUT

04 P RESPOND APPROPRIATELY

N

HARNESS

01 P/CP/FE NO"AALLY LOCKED.

(NOTE: IF UNABLE TO REACH ALL CONTROLS, THE INERTIAL
REEL NEED NOT BE LOCKED)

02 P/CP/FE RESPOND "SET"

O

ICE CONTROL PANEL

01 FE IF NO ICING CONDITIONS EXIST, VERIFY PROP, EMP, WING
AND ENG ANTI/DE-ICE SW OFF

02 FE IF ICING CONDITIONS EXIST, TURN ON ENG AND PROP ANTI/
DE-ICE SW (EMP & WING OFF)
TAEG REPORT NO. 7

2.3.1 PERFORM TAKEOFF CHECKLIST (CONTINUED)

01 FE SELECT ON ENG ANTI-ICE
02 FE VERIFY RISE IN TIT CORRESPONDING
03 FE VERIFY ASSOCIATED LIGHT ON - DO SEQUENTIALLY FOR EACH ENGINE
04 FE SELECT ON PROP DE-ICE
05 FE VERIFY PROP DE-ICE NOT WORKING

P

01 CP RECEIVE VERIFICATION OF COND 5 FROM CABIN (USUALLY GIVEN
02 CP REPORT CONDITION 5

Q

01 CP INFORM PILOT THAT COND 5 HAS BEEN REPORTED
02 CP SELECT ASSIGNED CODE, MODE, AND Nor/Low

R

01 CP OIL COOLERS
02 CP OIL COOLER FLAPS LESS THAN 100%
01 CP VERIFY OIL COOLER FLAPS AT 70 DEGREES, AND RISING IN ORDER

(NOTE: ACTUAL OIL TEMP DETERMINED BY OIL COOLER FLAP
SETTING. OIL TEMP MUST BE ≥400 AND RISING IN ORDER
TO USE MAX THRUST WITH NO GEAR BOX FLUCTUATIONS
3.0 TAKE-OFF

3.1 TAKE-OFF (VISUAL)  
A-3-12/14, C-3-26, C-1-120

01 P STEER A/C VIA NOSEWHEEL STEERING. LINE UP A/C WITH  
CENTERLINE OF RUNWAY

02 P VERIFY NOSEWHEEL STEERING CENTERED

IF "POSITION AND HOLD" T.O. THEN

03A P SET PARKING BRAKE

OTHERWISE

03 P SET PWR LEVERS TO APPROXIMATELY 2000 SHP

04 FE MONITOR FUEL FLOW (INCREASE) AND RPM (STABILIZATION)

05 P CALL "MAX POWER"

06 FE CONTINUE TO SET CP POWER LEVERS TO MAX POWER

07 FE VERIFY "MAX POWER" ON HP AND/OR TIT

08 FE SCAN HP/TIT/RPM/FF INDICATORS FOR NORMAL INDICATIONS

09 P BACK UP FE ON POWER LEVERS AND MAINTAIN CENTERLINE

10 CP BACK UP FE ON ENG GAUGES AND HOLD YOKE (SEE NOTE 1)

1 NOTE CP MAY MAKE CORRECTIVE INPUTS TO YOKE DURING STRONG  
CROSSWIND CONDITIONS
3.0 TAKE-OFF

3.1 TAKE-OFF (VISUAL)(CONTINUED)

IF POSITION AND HOLD T.O., THEN

11 A P RELEASE BRAKES

OTHERWISE

11 P STEER VIA NOSEWHEEL STEERING
12 P RELEASE NOSEWHEEL STEERING AT 50 TO 60 KTS
13 P TAKE YOKE WITH LEFT HAND
14 P STEER VIA RUDDER
15 CP CALL "80 KTS"
16 FE VERIFY PREDICTED "IP AT 80 KTS"
17 CP CALL "REFUSAL" (SEE NOTE 2)
18 P RELEASE POWER LEVERS
19 P MOVE RIGHT HAND TO YOKE
20 CP CALL "ROTATE" (SEE NOTE 3)
21 P ROTATE A/C TO 5\(^\circ\) NOSE UP
22 P VERIFY SAFELY AIRBORNE

2 NOTE: REFUSAL A/S CALCULATED DURING PREFLIGHT

3 NOTE: UNDER CONDITIONS OF LIGHT LOAD, LONG RY, ETC., V ROTATE AND V REFUSAL MAY BE IDENTICAL

3.0 TAKE-OFF (VISUAL)
4.0. CLIMB-DEPARTURE

4.1 CLIMB CONFIGURATION MGMT.

P  CALL "GEAR UP"
02 CP  SELECT UP ON GEAR HANDLE
03 CP  VERIFY BARBER POLE AND GEAR HANDLE LIGHTS ON
04 CP  CALL "GEAR COMING UP"
05 CP  VERIFY GEAR UP INDICATIONS AND HANDLE LIGHTS EXTINQUISHED
06 CP  CALL "GEAR UP"

07 P  VERIFY 140 KTS AND POSITIVE RATE OF CLIMB
08 P  CALL "FLAPS UP"
09 CP  SELECT FLAPS UP
10 CP  CALL "FLAPS COMING UP"
11 CP  VERIFY FLAPS UP
12 CP  CALL "FLAPS UP"
13 P  MAINTAIN 5° NOSE-UP UNTIL REACHING 220 KTS A/S

(CLIMB SCHEDULE A/S - 220 KTS HELD UNTIL 10,000;
THEN DECREASE 2KTS/1000)
4.1 CLIMB CONFIGURATION MGMT (CONTINUED)

14 P CALL FOR "NORMAL RATED POWER"

15 P/FE SET NOR RATED POWER
<table>
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<tr>
<th>4.2</th>
<th>DEPARTURE NAV/COMM (VISUAL)</th>
<th>01</th>
<th>P</th>
<th>RECEIVE TAKEOFF CLEARANCE (PRIOR TO POSITION AND HOLD)</th>
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<td>02</td>
<td>P/CP</td>
<td>SET DEPARTURE COM FREQUENCY</td>
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<td>03</td>
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<td>NOTIFY DEP CONTROL WHEN AIRBORNE</td>
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<td>04</td>
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<td>RECEIVE INSTRUCTIONS FROM DEPARTURE CONTROL</td>
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<td>05</td>
<td>P</td>
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<td>RECEIVE ASSIGNED CONTROL AGENCY FREQ FROM DEP CONT</td>
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<td>CP</td>
<td>RECEIVE, COPY AND RECORD CLEARANCE INSTRUCTIONS. INSURE PILOT UNDERSTANDS CLEARANCES</td>
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<td>09</td>
<td>CP</td>
<td>SET NAV/COMM FREQS</td>
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<td>10</td>
<td>CP</td>
<td>SET IFF/SIF AS REQUIRED, TRANSMIT AS REQUIRED</td>
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<td>11</td>
<td>P</td>
<td>SET HSI COURSE SELECT AS REQUIRED</td>
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<td>12</td>
<td>P</td>
<td>MANEUVER AC AS REQUIRED TO ADHERE TO CLEARANCE</td>
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<td>13</td>
<td>P/CP/FE AT 18K ALT RESET BARO SETTING ON ALTIMETER TO 29.92</td>
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</tbody>
</table>
CALL "CLimb Cklst" AND "Set Cond 4"

LANDING GEAR

VERIFY GEAR UP

RESPOND "UP"

FLAPS

VERIFY FLAPS

RESP "UP"

LANDING, TAXI LIGHTS

VERIFY LANDING LIGHTS RETRACTED AND OFF, TAXI LTS OFF

RES "RETRACTED & OFF"

AUTO FEATHERING

TURN OFF

RES "OFF"

A O'LY - WATER INJ

RES "OFF"

PRESSURIZATION

INSURE EDC'S OPERATING PROPERLY (LTS & INDICATORS)

VERIFY CABIN IS BEING PRESSURIZED. FE RES "SET"
4.3 CLIMB (CONTINUED)

GOVERNOR INDEXING

(Note: CKLST may be stopped prior to governor index item to perform NTS check. NTS check must be performed below 8000' alt and at 170 KTS indicated. P slow A/C by pitch control)

01 FE CHECK ALL SYNCH SERVO SW'S OFF

02 FE SELECT #2 OR #3 AS MASTER

(Note: picks eng with rpm closest to 100 percent)

03 FE HOLD RE-SYNCH SW AND SEL SYNCH SERVO SW'S TO NORMAL FOR 3 SLAVED ENGS.

04 FE MAINTAIN RE-SYNCH SW AT RE-SYNCH POS FOR APPROX 4 SECONDS, THEN RELEASE TO NORMAL

05 FE CONTINUOUSLY MON ENG'S RPM INDICATOR'S DURING SYNCH PROCEDURE

06 FE HOLD RE-SYNCH SW TO RE-SYNCH POS

07 FE SEL OTHER ENG (#2 OR #3) ON SYNCH MASTER SW

08 FE PLACE SYNCH SERVO SW OF INBOARD SLAVE TO "NORMAL"
4.3 CLIMB (CONTINUED)

09 FE CONTINUOUSLY MON ENG'S RPM INDICATORS DURING SYNCH PROCEDURE

10 FE HOLD RE-SYNCH SW TO RE-SYNCH FOR APPROX 4 SECONDS

11 FE RELEASE RE-SYNCH SW TO NORMAL

12 FE RES "SET"

G CP ANNOUNCE "CKLST COMPLETE"

C3 CP SET COND 4 - ANNOUNCE ON ICS OR PA C-9-1/2

04 CP VERIFY TO P COND 4 SET

05 P CALL "SET COND 3" C-9-1/2

06 CP SET COND 3, ANNOUNCE ON ICS OR PA

07 CP VERIFY TO P COND 3 SET

07A FE RECORD TAKEOFF TIME ON FUEL LOG C-3-29

08 P/CP NAVIGATE IN ACCORDANCE WITH DEPARTURE CONTROL.

CP SET ALL NAV EQUIP/COMM. CP MAKE ALL TRANSMISSIONS

09 FE MONITOR ENG INST/FUEL PANEL. SET PRESSURIZATION

FE MUlse ALT

4.3 CLIMB
4.3 CLIMB (CONTINUED)

10  P  LEVEL AC AT CRUISE ALT.  AC ACCELERATES TO 5-10 KTS
     ABOVE SELECTED CRUISE AS

11  FE  DETERMINE MAX RANGE PERFORMANCE DATA FROM NATOPS
     OR TABLES (SECT XI OR XII)

12  F   CALL "CRUISE PWR"

13  FE  SET CRUISE PWR USING FUEL FLOW

14  FE  READ OUTSIDE AIR TEMP.  DETERMINE HP SETTING FOR
     MAX RANGE

15  FE  SET CRUISE PWR USING HP GAUGES

16  FE  RECORD TOP OF CLIMB FUEL GAUGE READING ON FUEL LOG
     (NOTE:  FE WILL RECORD HOURLY OR IN 5,000 POUND
     INCREMENTS, WHICHEVER IS MORE SUITABLE)
5.0 CRUISE OUT

01 P/CP MANEUVER AC AS NECESSARY TO CONFORM TO FLIGHT PLAN

02 CP CHANGE COMMUNICATION FREQUENCIES AS DIRECTED

03 CP CHANGE NAV FREQ AS NECESSARY

04 CP CHANGE IFF CODES AS DIRECTED

05 CP ASSIST P AS DIRECTED

06 FE MONITOR ALL AIRCRAFT SYSTEMS FOR NORMAL OPERATION

5.1 AUTOPILOT OPERATION

01 P MANUALLY TRIMS AIRCRAFT

02 P OBSERVES ALIGNMENT ON 3 AXIS TRIM INDICATOR
   (CP INST PANEL)

03 P GUARD DISENGAGE BUTTON

04 P PLACE ENGAGE/OFF SW TO ENGAGE

05 P SELE LECTS BARO ALT HOLD POSITION

06 P IF DESIRED SELECTS PRE-SELECT HEADING

07 P VERIFY AUTOPILOT LIGHT AND AUTO TRIM LIGHT OUT

08 P CHECK ALIGNMENT OF 3 AXIS TRIM INDICATOR FOR PROPER
   ALIGNMENT

5.0 CRUISE OUT
8.0 DESCENT/APPROACH

8.1 DESCENT
(NOTE: IF CABIN ALT IS GREATER THAN 5000 FEET AT
NIGHT 100% OXY SHOULD BE USED BY P/CP/FE FOR 15 MIN
OUT OF THE LAST 45 MIN. PRIOR TO COMMENCING AN APPROACH.
THIS SHOULD BE DONE ONE CREW MEMBER AT A TIME. GENERAL
PRACTICE IS FOR P TO ANNOUNCE SMOKING LAMP "OUT"
DURING OXY USE)

01 CP RECEIVE CLEARANCE, RECORD ALL CLEARANCES AND INSTRUCTIONS

02 CP INSURE PILOT UNDERSTANDS ALL CLEARANCES AND INSTRUCTIONS
(NOTE: IF NO DESCENT CLEARANCE RECEIVED PRIOR TO REACHING
A DISTANCE EQUAL TO 2.5 NM PER 1000 FEET ALT P/CP SHOULD
REQUEST DESCENT CLEARANCE)

03 P CALL "DESCENT CHECKLIST"

A CREW ALERTED

01 CP ALERT CREW ON ICS/PA

02 CP RECEIVE VERIFICATION CREW ALERTED

03 CP RES "CREW ALERTED"
DESCENT/APPROACH (CONTINUED)

B  ALTIMETERS
  01 P/CP/FE SET ALTIMETERS PASSING THRU 18,000 TO PROPER SETTING
  C2 P/CP/FE RES "SET"

C  FUEL PANEL
  01 FE  VERIFY FUEL PANEL SET AS REQUIRED
  C2 FE  RES "SET"

D  PRESSURIZATION
  01 FE  VERIFY PRESSURIZATION PANEL SET AS REQUIRED
  C2 FE  RES "SET"

E  RAMS A/C CB

    (NOTE: NORMALLY HELD AT THIS ITEM. SEE PAGE 63 FOR CONTINUATION OF CHECKLIST.)

G.  P  POSITION 4 PWR LEVERS TO FLT IDLE

    (NOTE: IF DESIRED CP CANCELS WHEELS WARNING LIGHT BY
    DEPRESSING WH WARN LIGHT OVERRIDE BUTTON)

8.0 DESCENT/
    APPROACH
8.0 DESCENT/APPRAOCH (CONTINUED)

05 FE DURING DESCENT MONITOR ALL AIRCRAFT SYSTEMS AND
INSURE THAT ENGINE HORSEPOWER DOES NOT GO NEGATIVE.

06 P MANEUVER A/C FOR APPROX 2000' MIN RATE OF DESCENT WITH
A/S 250-260 KTS.

(NOTE: ENGINE OPERATIONAL DESCENT FROM NATOPS
CAN BE USED. IN CONUS 250 KTS BELOW 10K ALT IS MAX.)

07 P CALL CONTINUE DESCENT CHECKLIST

E RAW A/C CB

01 FE TER RAW A/C CB AS REQUIRED

02 FE RES "AS REQUIRED"

03 CP RES "DESCENT CKLST COMPLETE"
8.2 APPROACH NAV/CONN

01 P MANEUVER AC TO LEVEL FLIGHT. MAX A/S LESS THAN 250 KTS BELOW 10K ALT. PWR CHANGES AS REQ. (FE BACKS UP PILOT)

02 CP RECEIVE CLEARANCE/FREQ FROM CONTROL CTR TO CONTACT APPROACH CONTROL

03 CP SELECT APPROACH FREQ AND GET RADIO CONTACT WITH APPROACH CONTROL (NOTE: CP REQUESTS WEATHER, ALTIMETER SETTING, LANDING RUNWAY AND CLEARANCE FOR APPROACH)

04 CP RECEIVE, RECORD CLEARANCE; INSURE P UNDERSTANDS CLEARANCE (NOTE: DURING DESCENT P/CP FAM WITH APP PLATE)

05 P CONFIG. CONTROL, PWR AS REQ AT INITIAL APP. FIX, HI STATION OR DOWNWING LEG ON GCA FOR A/S 140-170 KTS, FLAPS AT TAKEOFF/APPROACH

06 CP MAKE FLAP SETTINGS, AS INSTRUCTED BY PILOT, INFORM PILOT OF IN-TRANSIT AND WHEN FLAPS AT SETTING (NOTE: DOWNWIND/OUTBOUND A/S DETERMINED USING GROSS WT/AIRSPEED CHART LOCATED ON OVERHEAD PANEL ON P3A/B)

07 P BRIEF CP TO ALLOW ANYTIME A/S < SPECIFIED ON FINAL APP SEGMENT

8.2 APPROACH
8.2 APPROACH NAV/COM (CONTINUED)

01 CP TO CALL OUT "CONTACT" AND RUNWAY LOCATION (LEFT - RIGHT, ETC.)
WHEN VISUAL CONTACT EST.

02 CP TO CALL MDA OR DH

07 P MANEUVER AC AS REQ TO CONFORM TO CLEARANCE (CONTINUOUS CONTROL)

08 P CALL "LANDING CHECKLIST"

A CREW REPORT

01 CP SET COND 5 ON ICS/PA

02 CP REC VER COND 5 SET FROM CREW

03 CP RES "COND 5 SET"

B MASTER ARM/SEARCH PWR

01 P VER MASTER ARM/SEARCH PWR OFF

02 P RES "OFF"

C LANDING WEIGHT/SPEEDS

01 FE COMPUTE LANDING WT USING FUEL WT FROM LOG OR TOTALIZER,
ADDED TO BASIC AC WT

02 FE OBTAIN 2 SPEEDS FROM CHART

03 FE RESPOND WITH LANDING WT IN LBS AND 1.35 VS & 1.3 VS
(NOTE: DOWNWIND A/S IS 160 KTS)
8.2 APPROACH NAV/COMM

D  SYNC SERVOS

01 FE  TURN OFF MASTER, THEN IND SYNC SERVO SW'S

02 FE  RES "OFF"

E  FLAPS

01 CP  VERIFY FLAP POS

02 CP  RESPOND "FLAPS AT APPROACH" (NOTE OTHER SET AT P DISC)

F  LANDING GEAR

01 CP  CALL "LANDING GEAR"
  (NOTE: NORMALLY CHECKLIST HELD AT THIS ITEM; SEE PAGE 68 FOR CONTINUANCE OF
   LANDING CHECKLIST)

09 P  MAINTAIN PWR AS NEC & MANEUVER AC
  (NOTE: ALL TURNS ON APPROACH UNTIL FINAL ARE STANDARD RATE
   TURNS, ANGLE OF BANK 30° OR LESS.
   GCA APPROACH (DOWNWIND LEG 140-170 KTS IND))

10 CP  RECORD AND READ BACK TO P ALL HEADINGS/ALTS WHILE UNDER
   RADAR CTR EXCEPT ON GCA FINAL.

01 CP  DET NIN'S FROM ENROUTE SUPPLEMENT

02 CP  DETERMINE GLIDE SLOPE DEGREES FROM ENROUTE SUPP. APPLY
   PUBLISHED GS/EST GS ON FINAL APPROACH TO DET R/D. (FOUND IN
   APP. PLATES BOOKLET)
8.2 APPROACH NAV/COMM (CONTINUED)

03 CP REC/ACKNOWLEDGE, RECORD LOST COMM. PROC.

04 CP INSURE P UNDERSTANDS

05 P/CP PLACE HAT ON RAD ALT.

(NOTE: IT IS SUGGESTED WHILE EXEC GCA THAT P/CP HAVE ALL
NAVAIDS TUNED/SET TO LANDING POINT FAC. AN APPROACH PLATE
FOR LANDING RUNWAY SHOULD BE DISP BY P/CP

06 P/CP SELECT INBOUDED COURSE PUB ON APP PLATE COURSE SELECT
WINDOW

(NOTE: IF NO PUB APP PLATE, RUNWAY HEADING MAY BE SELECTED
HSI COURSE SEL WINDOW)

11 P REC HEADING CHANGES FROM GCA

(NOTE: HE MAY CHANGE PRESELECT HEADING AS AN AID IN
REMEMBERING HEADING CHANGES)

12 P REC INST TO TURN ON "BASE LEG" FROM GCA

13 CP RECEIVE/ACK/RECORD MISSED APPROACH PROC FROM GCA
& INSURE P UNDERSTANDS

14 P REC INST TO FINAL APPROACH COURSE GCA

01 P MANEUVER AC WITH HALF STANDARD RATE TURNS ON FINAL APPROACH

8.2 APPROACH
8.2 APPROACH NAV/COM (CONTINUED)

15 P CALL FOR "GEAR DOWN" AND "LANDING CHECKLIST"

F LANDING GEAR

01 CP MOVE GEAR HANDLE TO DOWN
02 CP CALL "GEAR COMING DOWN"
03 P/CP CHECK WHEEL INDICATORS FOR DOWN & LT OUT IN GEAR HANDLE
04 CP CHECK GEAR HANDLE IN DETENT
05 FE VERIFY HYD QTY SYS #1 AND SYS #2 NORMAL
06 P/CP RESPONDS "GEAR DOWN & LOCKED"

(NOTE: ALTHOUGH NOT REQUIRED, SUGGEST THAT FE VERIFY GEAR DOWN AND LOCKED)

G BRAKES

01 P DEP BRAKE PEDALS
02 P/CP/FE VER FLUCT BRAKE ACCUM PRESS
03 P/CP RES "CHECKED"

H HARNESS

01 P/CP/FE "SET"

(NOTE: IF ALL CONTROLS CAN BE REACHED INERTIAL RFPL MAY BE LOCKED)

02 CP RESPOND "LANDING CHECKLIST COMPLETE"
8.2 APPROACH NAV/COM (CONTINUED)

16 P SLOW AC TO 1.35 VS + 5 KTS (NOT LESS THAN 130 KTS)

17 P NOTIFIED BY GCA THAT GLIDE PATH IS BEING INTERCEPTED

01 P ADJUST POWER TO EST PRE-DETERMINED RATE OF DESCENT
(≈700' MIN R/D)

02 FE BACK UP P (MAY BE DIRECTED TO SET PWR)

03 FE MONITOR AC SYS

04 CP MONITOR AIRSPEEDS/ALT/HEADING. SCAN VOR VISUAL CONTACT

05 P MAINTAIN CONSTANT A/S AND AOA THROUGHOUT APPROACH BY
ADJUSTING AC PITCH ANGLE. (WHEN THE DESIRED A/S, GLIDE
PATH AND R/D ARE BEING MAINTAINED NOTE THE PWR, ALTITUDE
& VERT SPEED AS A GUIDE FOR THE REMAINDER OF THE APPROACH)

18 CP CALL VISUAL CONTACT AT OR PRIOR TO REACHING DECISION HEIGHT.
TRANSITION TO FINAL APP/LANDING
9.0 FINAL APPROACH AND LANDING

1 A/C CONFIGURATION
   01 P TRANSITION TO VISUAL
   02 P CALL LANDING FLAPS (IF DESIRED)
   03 CP RESPOND "FLAPS COMING TO LANDING"
   04 CP WHEN AT LANDING POS, CALL "FLAPS AT LANDING"
   04 P ADJUST ELEV TRIM AS REQ (RUNS IN BACK TRIM)
   05 P POINT NOSE OF AC AT POINT OF INTENDED LANDING
       (NORMALLY FIRST THIRD OF RUNWAY). A/S SHOULD BE TAPERED
       TO REACH 1.3 VS DURING FLARE TRANSITION
       (NOTE: GENERALLY A PWR REDUCTION IS NOT REQUIRED TO
       REACH 1.3 VS)

2 NAV/COMM
9.3 VISUAL TOUCHDOWN

1. 
P  AT ENTRY OF FLARE SHIFTS SCAN TO END OF RUNWAY TO INCREASE
   DEPTH PERCEPTION. (ADJ. PWR AS NECESSARY DURING FLARE
   TRANSITION)

2. 
P  WHEN MAIN MOUNTS ON DECK, RETARD PWR LEVERS TO FLT IDLE
   AND FLY NOSE GEAR TO DECK

3. 
P  BRING ALL PWR LEVERS OVER RAMP INTO REVERSE (BETA) RANGE

4. 
FE  OBSERVE TO INSURE THAT BETA LIGHTS ARE ON

5. 
P  WHEN A/S LESS THAN 135 KTS (NOTE: WHEN A/S LESS THAN 125 RETARD PWR LEVERS TO
   REVERSE WITHOUT ELECTRICAL POWER)
   (NORMALLY TO GROUND IDLE) = 90% OF MAX REV.

6. 
FE  MONITOR REM/HP/TIT FOR NORMAL OPERATION

7. 
P  STEER AC USING RUDDER, AND ASYMMETRIC PWR

8. 
P  TRANSITION STEERING NGS AT 50-60 KTS

9. 
CP  ASSIST P AS REQ.

   WHEN SAFE TAXI SPEED REACHED AND CLEARANCE REC, AC WILL
   TAXI CLEAR OF THE ACTIVE RUNWAY

9.3 VISUAL TOUCHDOWN
9.4 MISSED APPROACH

IF VISUAL CONTACT HAS NOT BEEN ESTABLISHED AT THE
SPECIFIED DISTANCE (APPROACH MINIMUMS) FROM THE
FACILITY, A MISSED APPROACH WILL BE EXECUTED

1 CP CALL APPROACHING MINIMUMS AND AT MINIMUMS

(MINIMUMS ARE DETERMINED BY TYPE OF APPROACH

2A PRECISION APPROACH: AT 1/2' MISSED APPROACH WILL BE
EXECUTED IF NO VISUAL

2B NON-PRECISION: AT MISSED APPROACH FIX POINT MISSED APPROACH WILL
BE EXECUTED IF NO VISUAL CONTACT. MDA (MIN DESCENT ALT)

3 P APPLY SUFFICIENT PWR FOR POS R/C

4 FE MAY BE DIRECTED TO SET PWR

5 FE MONITOR HP, TIT AND Rvi, AND FF INDICATORS

6 P ASSURE APPROACH FLAPS SET

01 CP SET OR VERIFY FLAPS SET

7 P INSTRUCT CP TO RAISE GEAR

8 CP RAISE GEAR HANDLE, CALL "GEAR UP" WHEN INDICATORS UP
AND LIGHT IN HANDLE OUT

9.4 MISSED APPROACH
### 9.4 MISSED APPROACH (CONTINUED)

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<td>P/CP</td>
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9.4 MISSED APPROACH
10.0 POST-LAND

10.1 TAXI

01 CP CONTACT GROUND CONTROL ON PUBLISHED FREQ FOR
TAXI INST AND CLOSE OUT FLIGHT PLAN

02 P/CP REC TAXI INST

03 P TAXI A/C PER INST

04 P CALL "AFTER LANDING" CHECKLIST

05 CP READ CHECKLIST

A CREW RELEASED FROM DITCH STATIONS

01 P RESPOND "RELEASED"

B IFF

01 CP RESPOND "OFF"

C OIL COOLERS

01 FE SET FOR DESIRED OIL TEMP (600-900)

02 FE RESPOND "SET"
10.0 POST-LAND (CONTINUED)

D  FLAPS
  01  P  CALL FOR DESIRED FLAP SETTING
        (NOTE: NORMALLY AT TAKEOFF/APPROACH EXCEPT FOR
         WASH RACK THEN FULL DOWN)
  02  CP  SET FLAPS AND RES "AS DESIRED"

E  ICE CONTROL PANEL SW'S
  01  FE  TURN OFF ALL SW'S NOT REQ FOR GROUND OPERATION.
  02  FE  RESPOND "OFF"

F  NTS/FEATHER VALVE SW
  01  FE  VERIFY SW IN NTS POS.
  02  FE  RESPOND "NTS"

G  FUEL BOOST PUMPS
  01  FE  NORMALLY TURNS OFF 1, 3, 4. NO. 2 PUMPS ON FOR APU
  02  FE  RESPOND "OFF"
        (NOTE: ANY 3 MAY BE TURNED OFF WITH CROSSFEED SET
         FOR APU OPERATION)
10.0 POST-LAND (CONTINUED)

H

01 FE

APU START

02 FE

START APU (SEE PRESTART CKLST FOR DETAILS)

(NOTE: APU MAY BE STARTED ANY TIME DURING TAXI BUT REC
THAT APU BE STARTED CLOSE TO PARKING SPOT TO EXTEND LIFE)

03 CP

RESPOND "START"

06 P

CALL "AFTER LANDING CHECKLIST COMPLETE"

01 FE

AT HIS DISCRETION CALL FOR #1, 3 AND 4 ENG'S SHIFT TO
LOW RPM. (IF APU STARTED #2 CAN ALSO BE SHIFTED TO LOW RPM)

02 P

VERIFY OIL COOLER DOORS LESS THAN 100 PERCENT

03 FE

ASSURE PWR LEVERS FOR ENG'S BEING SHIFTED ARE AT START POS

03 FE

POS RPM PADDLE SW'S (ONE AT A TIME) TO LOW RPM GUARDING
FUEL AND IGN SW'S DURING SHIFT

04 FE

MONITOR RPM DEC (71.0 - 73.8) NON TIT FOR LESS THAN 850° C.
DUR SHIFT

07 P

AT HIS DISCRETION CAN INSTRUCT FE TO SHUT DOWN #1 AND #4
AFTER LOW RPM PROC COMP (ONE AT A TIME IN ANY SEQUENCE)

01 FE

VERIFY OIL COOLER DOORS LESS THAN 100 PERCENT & PWR LEVER
AT START POS

10.0 POST-LAND
10.0 POST-LAND (CONTINUED)

H

APU START

01 FE START APU (SEE PRESTART CKLST FOR DETAILS)

(NOTE: APU MAY BE STARTED ANY TIME DURING TAXI BUT REC
THAT APU BE STARTED CLOSE TO PARKING SPOT TO EXTEND LIFE)

02 FE RESPOND "START"

03 CP CALL "AFTER LANDING CHECKLIST COMPLETE"

06 P (AT HIS DISCRETION) CALL FOR #1, 3 AND 4 ENG'S SHIFT TO
LOW RPM. (IF APU STARTED #2 CAN ALSO BE SHIFTED TO LOW RPM)

01 FE VERIFY OIL COOLER DOORS LESS THAN 100 PERCENT

02 P ASSURE PWR LEVERS FOR ENG'S BEING SHIFTED ARE AT START POS

03 FE POS RPM PADDLE SW'S (ONE AT A TIME) TO LOW RPM GUARDING
FUEL AND IGN SW'S DURING SHIFT

04 FE MONITOR RPM DEC (71.0 - 73.8) NON TIT FOR LESS THAN 850° C.
DUR SHIFT

07 P AT HIS DISCRETION CAN INSTRUCT FE TO SHUT DOWN #1 AND #4
AFTER LOW RPM PROC COMP (ONE AT A TIME IN ANY SEQUENCE)

01 FE VERIFY OIL COOLER DOORS LESS THAN 100 PERCENT & PWR LEVER
AT START POS
POST-LAND (CONTINUED)

02 FE PLACE FUEL AND IGNITION SW TO OFF

03 FE MONITOR RPM AND TIT DURING COASTDOWN.

04 FE VERIFY NTS LIGHT ON WHEN FUEL/IGN SW IS POS OFF
   (NOTE: IF LIGHT DOES NOT COME ON, RESTART ENG AND
   SHUTDOWN FROM NOR RPM, IF NO LIGHT)

08 P DURING TAXI IN LINE AREA NO LONGER USES REV THRUST FOR
   SPEED CONTROL, USES BRAKES!

09 P REC INST FROM LINEMAN FOR PARKING

01 CP VISUAL CHK FOR CLEARANCE ON RT

02 P CK FOR CLEAR ON LEFT

10 P REC INST TO STOP IN ASSIGNED PARKING SPOT

11 P SET PARKING BRAKE
   (NOTE: DO NOT TWIST HANDLE)
10.3 SHUTDOWN

01 P CALL FOR "SECURE CHECKLIST"
02 CP READ SECURE CHECKLIST

A PARK BRAKE SET
01 P RESPOND "SET"

B WINDSHIELD/PITOT/AOA HEAT
01 FE TURN OFF ALL WS HEAT, PITOT, AOA HEAT SW'S
02 FE RESPOND "OFF"

C HYD PUMP 1 AND 2
01 FE TURN OFF 1 AND 2
02 FE RESPOND "OFF"

D OIL COOLERS
01 FE RESPOND "LESS THAN 100 PERCENT"

E ASW EQUIP
01 CP CALL TACCO TO SECURE ASW EQUIP
02 P/TACCO RESPOND "SECURED"

F ENGINES
01 P DIRECT FE TO SECURE 2 AND 3
02 FE ASSURE #2 AND #3 IN LOW RPM AND POS FUEL/IGN TO OFF
10.3 SHUTDOWN

03 FE NON RPM/TIT DURING COASTDOWN
04 FE RESPOND "SHUTDOWN" WHEN FUEL IGN SW OFF
05 FE MONITOR NTS LIGHTS DURING SHUTDOWN

(NOTE: NTS LIGHT COMES ON WHEN FUEL/IGN SW TURNED OFF)

G CHOCS

01 P/CP GIVE SIGNAL TO POSITION CHOIC
02 LINEMAN PLACES CHOCS
03 P RESPOND "IN PLACE"

H HYD PUMP 1A

01 FE TURN OFF PUMP
02 FE RESPOND "OFF"

I UTILITY LIGHTS

01 P/CP CHECK INDIVIDUAL LIGHTS OFF
02 P/CP RESPOND "OFF"

J START SELECTOR

01 FE VERIFY START SEL OFF

(NOTE: DURING SHUTDOWN WITH EXT PWR OR BATT, SELECT ANY ENGINE ON START SEL SW TO PROVIDE START AC AND DC PWR DURING COASTDOWN IN THE EVENT OF EXTERNAL PWR FAILURE)
10.3 SHUTDOWN (CONTINUED)

02 FE RESPOND "OFF"

K
ROTATING BEACON

01 FE TURN OFF MASTER SW AND ROT BCN SW

02 FE RESPOND "OFF"

L
RADIO/RADAR ALT

01 F/CP TURN OFF RAD ALT'S AND SECURE ALL RADIO/NAV AIDS

02 P/CP RESPOND "OFF"
 (NOTE: UHF #1 MAY BE LEFT ON FOR COMM WITH TOWER DURING
 REFUELING OR WITH SQDN MAINT PERSONNEL)

M
APU

01 FE MAY SECURE, OR LEAVE IT ON FOR REFUELING MAINTENANCE IF
DESIRED. (REFER TO TAKEOFF CHECKLIST FOR SECURING PROCEDURE)

N
START ESS AC CRKT BRKR/APN 141 CRKT BRKR

01 FE PULL START AC CRKT BRKR OUT (LOC ON MON ESS AC BUS PANEL)

02 FE PULL APN 141 CRKT BRKR. (FLT ESS AC BUS)

03 FE RESPOND "OUT"

O CP ANNOUNCE "SECURE CHECKLIST COMPLETE"
POST MISSION

01 P        FILL OUT YELLOW SHEET (TIMES, MALFUNCTIONS, DISCREPANCIES
01 P        SIGN YELLOW SHEET, TURN IT OVER TO MAINT
02 P/CP/ASW CREW DEBRIEF WITH APPROPRIATE CONTROL AGENCY (OPCON,
            WING, ETC.)
03 CREW     RETURN NECESSARY EQUIP (CLASSIFIED MATERIAL, NAV BAG,
            SEKTANT, ETC.)
04 FE/2ND MECH POST FLIGHT AC PER MRC CARDS

(NOTE: LOCAL S)P'S WILL DETERMINE DETAILS OF DEBRIEF)
12.0 ABNORMAL AND SPECIAL PROCEDURES

12.1 SAR DROP

01  P  REC DIRECTIVE FOR AIR-DROP SAR MISSION

02  P  MANEUVERS A/C TO LOCATION OF SURVIVORS. DET WIND DIR

        AND VEL

        (NOTE: ATTEMPT TO DETERMINE CONDITION OF SURVIVORS TO

        RETRIEVE SAR KIT AND TO BOARD RAFTS)

03  P/CREW DETERMINE IF FUEL OR OIL ON WATER SURFACE IN VICINITY

        OF SURVIVORS

        (NOTE: IF FLAMMABLE FUELS ARE PRESENT OR SUSPECTED DO

        NOT USE SMOKE LIGHTS OR MARKERS WHICH COULD IGNITE FUELS)

04  P  EST. ORBIT AROUND SURVIVORS

05  DM  (DROPMASTER) SIG. & HF IS READY TO OPEN MAIN CABIN DOOR

06  P  ORDER DOOR REMOVED AND STOWED

07  DM  REPORT "READY TO DROP" NOTE (ABOUT 5 MIN TIME RFQ.)

08  P  MANEUVER A/C TO 300 FT ALT., 130 KTS (DEF ON WT AND

        CONDITIONS)

        (NOTE: APPROACH FLAPS ARE RECOMMENDED)
12.0 ANOMALY AND SPECIAL PROCEDURES (CONTINUED)

09  P  ORDER CREW MEMBERS (EXCEPT DROPMaster) TO SUSPEND ICS
     COMM UNTIL AFTER SAR DROP

10  P  MAN A/C DIRECTLY OVER SURVIVORS ON A CROSSWIND APPROACH

11  P  ORDER DROPMaster TO LAUNCH A SMOKE LIGHT OR OTHER MARKER
     APPROX 1-2 SEC AFTER PASSING OVER SU**VIVORS

12  P  MANEUVER A/C INTO A 900-2700 PROCEDURE TURN TO ALIGN FLIGHT
     PATH TO PASS 50'-150' UPWIND OF SURVIVORS

13  P  ORDER SAR DROP WHEN ABEAM THE SMOKE CHARGE OR MARKER
12.2 THREE ENGINE FERRY T.O.

01 P REC CONSENT FROM CO FOR 3 ENG F.T.O.

02 P VER VFR COND AT TAKEOFF, LANDING POINT NOTE (ALTERNATE
LANDING AREAS BEING REPORTED AS VFR ARE ACCEPTABLE)

03 P VER OPERATING WT AT A MIN FOR THE MISSION
(NOTE: MAX REC TAKEOFF WT IS 100K LBS UNLESS FURTHER
RESTRICTED BY PERFORMANCE DATA, SEE SECT XI OF NATOPS)

04 P DET ALL NECESSARY PERFORMANCE DATA FROM NATOPS SEC XI OR SEC XII

05 P VER THAT ONLY ESS CREW FOR SAFE FLT ARE TO BE ABOARD

06 P/CP/FE COMPLETE NORMAL SYS ACT CHECKS (SEC 2.2), THEN START
THREE ENG FERRY T.O. CKLST

01 P CALL FOR CKLST

02 CP READ CKLST

01 P PROP ELDER ON INOP. ENG

01 FE RESPOND "FEATHERED" OR "REMOVED"
(NOTE: IF PROP IS REMOVED THEN FE VER THAT ENGINE INTAKE
PLUGGED AND PLATE INSTALLED TO PREVENT DAMAGE TO ENGINE
COWLING)

12.2 THREE ENGINE FERRY T.O.
12.2 THREE ENGINE FERRY T.O. (CONTINUED)

02 PROPELLER BRAKE

01 FE RESPOND "LOCKED"
(NOTE: IF BRAKE INOP PROP MUST BE REMOVED)

03 EMERGENCY SHUTDOWN HANDLE

01 FE RESPOND "IN"

04 POWER LEVER

01 FE RESPOND "FULL FORWARD POSITION"

05 FUEL BOOST PUMP OPERATION AND SWITCH

01 FE RESPOND "CHECKED, OFF"

06 FUEL CROSSFED VALVE SW'S

01 FE RESPOND "OFF"

07 GENERATOR SW (AFFECTED ENG)

01 FE RESPOND "OFF"

08 OIL COOLER FLAP (AFFECTED ENG)

01 FE RESPOND "FAIRED"

09 FUEL AND IGNITION SW (AFFECTED ENG)

01 FE RESPOND "OFF"
12.2 THREE ENGINE FERRY T.O. (CONTINUED)

10 OIL QUANTITY ALL TANKS
   01 FE RESPOND "NORMAL"

11 FUEL QUANTITY
   01 FE RESPOND "SYMMETRICAL" IF PROP FEATHERED
   (NOTE: IF PROP HAS BEEN REMOVED MAINTAIN APPROX. 1000 LB
   UNBALANCE TO ACCOUNT FOR PROP WT)

12 TRIM TABS
   01 P SET ELEV &AIL NORMAL, RUDDER AT P DISCREETION

07 TAKEOFF PROCEDURE
   01 P/CP INSURE THAT SEAT AND RUDDER PEDAL ADJ. FOR FULL RUDDER
   TRAVEL WITHOUT INADVERTENTLY APPLYING BRAKES

02 P LINE UP WITH RUNWAY AND HOLD BRAKES, APPLY MAX PWR ON
   SYMMETRICAL ENG'S

03 P REQ. FE TO MAINTAIN MAX PWR ON SYMMETRICAL ENGS USING
   CP PWR LEVERS

04 P PLACE PWR LEVER OF ASYMMETRIC OPER. ENG TO FLT IDLE
   AND RELEASE BRAKES
12.2 THREE ENGINE FERRY T.O. (CONTINUED)

05   P   APPLY FULL RUDDER TOWARD THE INOP ENG
06   CP  HOLD YOKE FWD AND DEFLECT AILERON TOWARD THE SIDE WITH
        TWO OPER ENG'S
07   P   STEER USING MILD NGS UNTIL RUDDER BECOMES EFFECTIVE AT
        OR NEAR 50 KTS.
01   P   ADVANCE PWR LEVER ON ASY ENG FROM FLT IDLE SMOOTHLY
        DURING ACCEL.
08   P   STEER USING RUDDER AND CONTINUE TO ADV PWR LEVER ON
        ASY ENG
        (NOTE: APP OF PWR SHOULD BE SUCH THAT A RESERVE OF RUDDER
        MOVEMENT IS ALWAYS AVAILABLE FOR HEADING CORRECTIONS. PWR
        APPLIED SHOULD BE SUCH THAT DIR. CONTROL CAN BE MAINTAINED
        WITH APPROX 25% LESS THAN FULL RUD TRAVEL)
        (NOTE: NO ATTEMPT SHOULD BE MADE TO APPLY MAX PWR ON
        ASY-METRIC ENG PRIOR TO VNC GR)
09   P/CP  KEEP NOSEWHEEL ON GND UNTIL ROTATION SPEED REACHED
10   FE    WHEN MAX PWR APP ON ASY ENG ASSIST P IN MAINTAINING PWR
        AS DIRECTED
12.2 THREE ENGINE FERRY T.O. (CONTINUED)

11  P  AT VRO RELEASE PWR LEVERS AND EST SMOOTH POSITIVE LIFT-OFF

12  P  BANK A/C APPROX 50° TOWARD OPERATING ENGINES TO REDUCE AMT
   OF RUDDER REQ FOR DIRECTIONAL CONTROL

13  P  CLIMB A/C AT TAKEOFF A/S AND EST POSITIVE R/C

14  P  CALL FOR GEAR UP WHEN POS R/C EST

15  P  RETRACT GEAR AND CALL "GEAR UP" WHEN INDICATORS SHOW UP
   AND LT IN GEAR HANDLE OUT
12.3 WINDMILL START PROCEDURES

1. GROUND RUN PROCEDURE

01 P SELECT APP RUNWAY CONSIDERING LENGTH, WIND (USE CROSSWIND TO ADVANTAGE IF AVAIL) AND SURFACE
(NOTE: LIMIT TO DRY SURFACES)

02 P/FE REDUCE FUEL LOAD TO MIN FOR INTENDED FLT

03 P/CP COMPUTE REALISTIC REFUSAL DISTANCE (REFER TO NATORP SECT XI OR SECT XII)

04 P/CP/FE COMPLETE TAKEOFF CLST (SEC 2.2 SYSTEMS ACTIVATION) EXCEPT

01 FE LEAVE FLAPS UP

02 FE FUEL/IGNITION SW ON

03 P/FE PWR LVR AT "FLIGHT START"
(NOTE: INSURE PWR LVR NOT AT GROUND START)

05 P BRIEF CP/FE

01 CP TO CALL AIRSPEED AT 50 KTS, 70 KTS AND 90 KTS

02 CP MONITOR TIT/HP ON OPERATIVE ENGINES

03 FE START UNFEATHER AT 50 KTS, INSURE NORMAL START SEQUENCE,
LIGHTOFF SHOULD OCCUR APPROX 24% RPM (USE PRIME FOR EARLIER START), ENSURE NO HUNG START (IF HUNG PULL E HANDLE AND INFORM PILOT), ANNOUNCE LIGHTOFF, 40% AND 70%

12.3 WINDMILL START PROCEDURES
12.3 WINDMILL START PROCEDURES (CONTINUED)

06 P LINE UP A/C ON END OF RUNWAY USING CROSSWIND TO BEST ADV

07 P HOLD BRAKES AND APPLY MAX PWR ON TWO SYMMETRIC ENG'S

08 P RELEASE BRAKES, APPLY PWR ON ASYMMETRIC OPER ENG
   (NOTE: TAKE CARE NOT TO MOVE 1NOP PWR LEVER OUT OF FLT START)

09 P MAINTAIN DIRC CONTROL USING NGS UNTIL 50 KTS THEN RUDDER

10 CP CALL 50 KTS

11 FE PULL FEATHER BUTTON OUT TO INITIATE START

12 CP CALL 70 KTS

13 FE OBSERVE ROTATION (10-15 PERCENT) ON RPM INDICATOR

14 CP CALL 90 KTS

15 FE OBSERVE LIGHTOFF AND RELEASE FEATHER BUTTON (MAY HAVE OCCURRED EARLIER)

16 P AT 90 KTS OR LIGHTOFF PULLS PWR LEVERS OF OPERATING ENGS TO FLT IDLE
   (NOTE: LEAVE PWR LVR OF ENG BEING STARTED AT FLT START)

17 P COASTS A/C UNTIL 40% RPM IS REACHED
12.3 WINDMILL START PROCEDURES

18 FE MAY PRESS CUTOUT OVERRIDE, IF USED NTS INOP LIGHT WILL
FLASH ONCE IF RELEASED PRIOR TO RELEASING FEATHER BUTTON.
IF NOT USED NTS INOP LT MAY FLASH SEVERAL TIMES WITH
FEATHER BUTTON OUT WHEN PROP BLADE CYCLES AT 45°.

19 P AT 40% RPM ON STARTING ENG PULL PWR LEVERS OF OPER ENGS
TO GND START POS
(NOTE: SOME REV THRUST MAY BE USED ON SYMMETRIC ENGS)

20 P/FE AT 70% RPM ON STARTING ENGINE MAY MOVE PWR LVR TO THE
FLIGHT IDLE POS

21 P COMMENCES BRAKING AND REVERSING ON NORMALLY OPERATING ENGS

22 P/FE MAY MOVE PWR LVR OF STARTING ENG TO GND START AFTER 70%
ANNOUNCED
(NOTE: SPEED SHOULD NOT BE IN EXCESS OF 50 KTS, AVOID

MAX REV ON STARTING ENG UNLESS ENG OIL IS HOT AND OIL TEMP AND OIL
PRESSURE ARE NORMAL)

23 TAXI CLEAR OF ACTIVE RUNWAY
12.3

2 STATIC START PROCEDURE

(Note: Static start procedure is based on a P-3 aircraft (or equivalent) providing the air blast; however, piston type tricycle landing gear A/C with suitable changes to the procedure can be used)

01 Q0 (Qualified operator (P/FE/*MP)) position P-3 A/C (or suitable A/C) on starting area facing into wind

02 Q0 Using applicable start and run procedures, run all engs to blast area clear

03 Q0 Shut down all engs

04 Q0 Direct visual search of starting area in front and behind P-3 to insure area is free of foreign objects and material

05 Q0 Direct positioning of A/C to be started.

(Note: A/C to be pos for max air blast to engine to be started and clearance between tail boom and nose of starting A/C)

*Maintenance personnel
12.3.2  STATIC START PROCEDURE (CONTINUED)

06  QO  OF BOTH A/C EST COMMUNICATION

07  QO  PERFORM NORMAL BEFORE STARTING ENGINE PROCEDURES
       (SEE SECT 2.2.01) EXCEPT AS FOLLOWS

01  QO  FEATHER PROP

02  QO  PWR LVR FLT START POS

03  QO  VERIFY TIT < 1000 °C.

08  QO  REQUEST FWD P-3 (OR OTHER A/C) TO START REQUIRED ENGINES
       (NOTE: ON P-3 A/C SET PWR 3000-3500 SHP)

09  QO  PULL FEATHER BUTTON TO UNFEATHER, HOLD UNTIL RPM REACHES
       10% THEN RELEASE TO NEUTRAL
       (NOTE: FE PULL E HANDLE IF ENG FAILS TO IGNITE OR RPM
       STAGNATES)

10  QO  MONITOR TIT AND RPM FOR NORMAL IND.
       (NOTE: IF ABNORMAL PULL E HANDLE)

11  QO  AT STAB. RPM MOVE PWR LVR TO GND START POS

12  QO  ADVISE FWD A/C OF COMPLETED ENG START AND TO TAXI OR TOW
       A/C FROM AREA
12.4 APPROACH TO STALL

01  P  VERIFY A/C CLEAN CONFIG, 10K ALT

02  P  PERFORM CLEARING TURNS TWO 90° OR 180°

03  P  NOTIFY CREW ON ICS/PA, ETC

04  P/CP/FE  ESTIMATE BUFFET SPEED FROM NATOPS PAGE 4-2 FOR 0° BANK ANGLE

05  P/FE  RETARD PWR LEVER TO FLT IDLE, MAINTAIN ALT AND HEADING

06  P  TRIM A/C TO MAINTAIN HEAD, ALT UNTIL 20 KTS ABOVE STALL

          BUFFET A/S

07  P  DECELERATES A/C TO EST BUFFET SPEED. NO TRIM CHANGES

08  P  LOWER NOSE AND APPLY PWR SMOOTHLY APPLY AIL AND RUD TO

          MAINTAIN WINGS LEVEL. MOVE CONTR. S SMOOTHLY AND AVOID

          ABRupt CONTROL MOVEMENTS

09  P  REPEAT 01-08 FOR

01  P  MANEUVER FLAPS

02  P  APPROACH FLAPS/GEAR DOWN

03  P  LANDING FLAPS/GEAR DOWN

10  P  INSTRUCT CREW TO INSPECT A/C FOR LOOSE EQUIP AFTER STALL

          PRACTICE
12.5  160 KNOT MANEUVER

01  P  ASSURE A/C ON ASSIGNED HEADING, ALTITUDE, CLEAN CONFIG, TRIMMED FOR HANDS OFF 160 KTS A/S

02  P  CALL FOR "MANEUVER" FLAPS CF SETS AND REG.

03  P  MAINTAIN 160 KTS, ALT, HEAD, NOTE TRIM CHANGE AND PWR CHANGE REQUIRED

04  P  CALL FOR APPROACH FLAPS

05  P  SAME AS 03 ABOVE

06  P  CALL "RAISE GEAR"

07  CP  SET, RESPOND

08  P  CALL "LAND" FLAPS

09  P  MANEUVER A/C, ACCELERATE TO CRUISE SPEED, SET PWR AS REQUIRED
12.6  RAC EFFECT

01  P  TRIM A/C FOR LEVEL FLIGHT AT 160 KTS, CLEAN CONFIG
02  P/FE  SET HP ALL ENGS TO 3000 SHP
03  P  MANEUVER A/C, RETRIM TO MAINTAIN ALTITUDE, PWR LEVERS NOT MOVED
04  P  NOTE TRIM CHANNELS REQUIRED FOR ALT CONTROL, NOTE INCREASE IN SHP AS A/S INCREASES.
     (NOTE: AS LIMITED TO 250 KTS BELOW 10,000 FT ALT)
05  P  WHEN A/C A/S STABILIZED, RETARD PWR LEVERS TO FLT IDLE
06  P  NOTE HP DROP AS A/S DECREASES. (150 KTS LOWEST AIRSPEED NORMALLY)
07  P  SET PWR AS REQUIRED FOR DESIRED CRUDE A/S
12.7   FUEL DUMP

01   P   MAINTAIN 140-220 KTS
02   P   VER FLAPS NOT AT LANDING, RECOMMENDED POS AT UP
03   P/CP/RO   VHF & HF RADIOS OFF
04   P/RAD OP   RADAR STANDBY OR OFF
05   FE   CLOSE FUEL TRANSFER VALVES
06   FE   FUEL DUMP SW ON
07   FE   MONITOR TANK 5 FUEL GAUGE - APPROX 1000 # MIN
08   FE   TURN OFF FUEL DUMP SW WHEN DUMP IS COMPLETE OR PRIOR TO LANDING
09   FE   TURN TANK 5 TRANSFER PUMP SW'S OFF
10   P/CP/RO/RAD OP - RADIOS & RADAR AS REQUIRED
12.8 AIR START APU (WITH AFC 165)  

1 P/CP VERIFY ALTITUDE \( \leq \) 20,000 FT  

2 P/CP VERIFY A/S \( \leq \) 225 KTS  

IF MAIN DC BUS FAILURE AND ESSENTIAL BUS MONITOR SW ON  

3 FE PULL CONTROL BOOST HANDLES  

4 FE PULL 3 PHASE POWER CB FOR TR #3 (MON BUS CB PANEL)  

OTHERWISE  

3 FE PLACE APU INFLIGHT ARM SW TO ARM  

4 FE VERIFY APU GENERATOR SW OFF  

5 FE PLACE APU START SW TO START  

6 FE MONITOR APU FOR STABILIZED RPM/EGT  

7 FE PLACE APU GEN SW TO ON
12.9 ENGINE AIR RESTART

1 ENGINE AIR RESTART, NO FAILURES

A P INSURE A/S \( \geq 170 \leq 210 \) KIAS
B FE VERIFY FUEL AND IGN SW OFF
C FE VERIFY SYNCH SERVO OFF
D FE VERIFY FUEL BOOST PUMP ON
E FE PUSH E HANDLE IN (IF OUT)
F FE VERIFY OIL TANK SHUTOFF CIRCUIT BREAKER SET
G FE VERIFY POWER LEVER TO FLT START
H FE VERIFY NTS/FEATHER VALVE SWITCH IN FEATHER VALVE POSITION
I FE VERIFY TEMP DATUM CONTROL IN NORMAL
J FE VISUALLY VERIFY FEATHER BUTTON IN
K FE TEST TIT INDICATOR (ON CENTER PANEL)
L FE GIVE AIRSTART BRIEF
01 FE PRESSURE CUTOUT OVERRIDE SWITCH FOR 10 SEC.
02 FE VERIFY LIGHT IN FEATHER BUTTON ON
03 FE VERIFY PROP PUMP LIGHT #1 OFF
04 FE RELEASE OVERRIDE SWITCH
05 FE VERIFY FEATHER BUTTON LIGHT OUT
06 FE VISUALLY VERIFY NO ROTATION

12.9 ENGINE AIR RESTART
ENGINE AIR RESTART (CONTINUED)

M
FE
PULL FEATHER BUTTON TO UNFEATHER

01
P, CP
VERIFY UNFEATHER BLADE-ANGLE/ROTATION

02
FE
VERIFY NTS LIGHT BLINKING

03
FE
CHECK FOR RPM INDICATION

04
FE
CHECK FOR NO FUEL FLOW AT 16% (IF FUEL FLOW RELEASE FEATHER BUTTON AT LIGHT OFF AND GUARD APPROPRIATE E HANDLE)

N
FE
VERIFY RISING OIL PRESSURE IN POWER SECTION AND GEAR BOX

O
FE
SELECT ON FUEL AND IGN SW. AFTER STABLE RPM

P
FE
RELEASE FEATHER BUTTON AT LIGHT OFF

01
FE
GUARD APPROPRIATE E HANDLE

Q
FE
VERIFY NORMAL OIL PRESSURE

R
FE
VERIFY OIL COOLER SET APPROPRIATELY

S
FE
CHECK ELECTRICAL PANEL (VERIFY APPROPRIATE OPERATION)

T
FE
SELECT NORMAL ON SYNCH SERVO SWITCH

(Note: Before selecting normal, FE DEPRESS RESYNCH SWITCH TO RESYNCH, then select nor on synch servo, then release resynch)

U
FE
SELECTS NTS POSITION ON NTS FEATHER VALVE SWITCH
12.9 ENGINE AIR RESTART (CONTINUED)

3 MALFUNCTIONS DURING AIR RESTART

01 FEATHER BUTTON LIGHT REMAINS ON AFTER PRESSURE CUTOFF

02 OVERRIDE SWITCH RELEASE

01 CYCLE APPROPRIATE E HANDLE

02 IF LIGHT GOES OUT, CONTINUE NORMAL START

OTHERWISE

03 PULL APPROPRIATE PROP FEATHER CB. DO NOT ATTEMPT RESTART

4 FEATHER VALVE LIGHT CEASE

NO ACTION REQUIRED

5 NTS INOP LIGHT ILLUMINATED

01 CONTINUE HOLDING OUT ON FEATHER BUTTON

02 PULL APPROPRIATE E HANDLE. NO RESTART

12.9 ENGINE AIR RESTART
12.9 ENGINE AIR RESTART (CONTINUED)

6 NO LIGHT-OFF WITHIN 10 SEC
01 FE PUSH FEATHER BUTTON
02 FE MAY ATTEMPT RESTART IF DESIRED, OTHERWISE, SECURE

7 EITHER FROP PUMP LIGHT REMAINS ON & RPM > 55%
01 FE PULL E HANDLE

8 NO OIL PRESSURE IND. BY 35%
IF LIGHT-OFF HAS OCCURRED
01 FE PULL E HANDLE

OTHERWISE

01 FE PUSH FEATHER BUTTON

9 TIT > 850°
01 FE PULL E HANDLE

10 STAGNATED START
01 FE PULL E HANDLE

11 RPM REMAINS OFF SPEED (103.5%)
01 FE PULL E HANDLE
12.9 ENGINE AIR RESTART (CONTINUED)

12.9 ENGINE AIR RESTART

12 IF NO ROTATION

01 FE PUSH FEATHER BUTTON IN. USE STARTER FOR ROT.

02 FE SELECT OPEN ON APPROPRIATE ENG BLEED AIR VALVES

03 FE OPEN APPROPRIATE FUSELAGE BLEED AIR VALVE

04 FE VERIFY PRESSURE IN BAMAP

05 FE SELECT APPROPRIATE ENG ON START SELECTOR

06 FE DEPRESS START BUTTON

07 P,CP,E (DEPENDING UPON SIDE) VERIFY DROP

08 P,CP CALL "ROTATION"

09 FE PULL FEATHER BUTTON OUT

10 FE PULL START BUTTON

11 P,CP,FE VERIFY BAMAP RISE

12 FE MONITOR RPM FOR STAB

13 FE SECURE BLEED AIR VALVES

01 FE SELECT OFF ON ENGINE START SELECTOR

14 PROCEED NORMAL AIR START
12.10 LOITER SHUTDOWN

IF NTS CHECK NOT PERFORMED ON CLIMB

1 ALL PERFORM NTS CHECK A-3

01 P MAINTAIN ALTITUDE ≤ 8000' AND IAS AT 170 KTS

02 FE SET ENGINE SHP AT MINIMUM OF 800

03 FE PLACE NTS-FEATHER VALVE SW TO FEATHER VALVE

04 FE PLACE SYNC MASTER SW OFF

05 FE PLACE SYNC SERVO SW'S OFF

06 FE PLACE L&R WING DE-ICE SW'S ON

07 FE PLACE APPROPRIATE ENGINE ANTI-ICE SW ON

08 FE PLACE APPROPRIATE ENGINE BLEED AIR SW OPEN

09 FE RETARD PWR LEVER SLOWLY OBSERVING HORSEPOWER INDICATOR FOR NTS ACTION.

(NOTE: NTS ACTION SHOULD OCCUR BETWEEN MINUS (150-500) FOR ENGS 1 & 4
100-500) FOR ENGS 2 & 3. DO NOT EXCEED MINUS 500.)

10 FE MONITOR FEATHER VALVE LIGHT FOR INTERMITTENT FLASHING

(NOTE: IF NO NTS ACTION BY 500 HP, ADVANCE PWR LEVER AND RECORD. DO NOT SHUT DOWN IF NO NTS.)

12.10 LOITER SHUTDOWN
12.10 LOITER SHUTDOWN (CONTINUED)

11 FE   PLACE ENGINE BLEED AIR VALVE SW TO CLOSE
12 FE   PLACE ENGINE ANTI-ICE SW OFF
13 FE   PERFORM NTS CHECK FOR OTHER ENGINE TO BE SHUT DOWN
14 FE   PLACE WING DE-ICE SW'S TO OFF
15 FE   PLACE NTS/FEATHER VALVE SW TO NTG

OTHERWISE

1  FE   PLACE APPROPRIATE SYNC SERVO SW OFF
   (NOTE: NORMALLY #1 & #4 FOR LOITER)
2  FE   PLACE NTS/FEATHER VALVE SW TO FEATHER VALVE
3  FE   SET PWR LEVER TO FLIGHT START
4  FE   PUSH FEATHER BUTTON
5  ALL  MONITOR ENGINE INSTRUMENTS AND PROPELLER FOR
       COMPLETE SHUTDOWN
       (NOTE: IF PROPELLER FAILS TO FEATHER, REFER TO 13.2.03)
6  FE   VERIFY THAT FEATHER BUTTON LIGHT OUT
7  FE   PLACE FUEL AND IGNITION SW OFF
8  FE   PLACE FUEL BOOST PUMP SW ON

12.10 LOITER
SHUTDOWN
12.11

1  RECOVERY FROM UNUSUAL ATTITUDE

01  P  INSURE A/C ON CONSTANT HEADING, ALTITUDE, CLEAN CONFIG.
    TRIMMED FOR HANDS OFF

02  P  TRANSFER A/C CONTROL TO CHECK PILOT OR INSTRUCTOR

03  *IP  ALERT CREW FOR STOWING ALL LOOSE GEAR. SET CONDITION 5

04  P  PLACE HEAD TOWARD KNEES, EYES CLOSED

05  IP  MANEUVER A/C THRU SERIES OF ATTITUDE CHANGES TO ESTABLISH
    PROPRIOCEPTIVE CUES

06  IP  DIRECT P TO ASSUME A/C CONTROL AND RECOVER FROM UNUSUAL
    ATTITUDE TO STRAIGHT AND LEVEL FLIGHT

07  P  ASSUME A/C CONTROL. RECOVER USING A/C INSTRUMENTS
    DISREGARDING THE FALSE PROPRIOCEPTIVE CUES

*INSTRUCTOR PILOT
12.12

1. FUEL GOVERNOR PITCH LOCK AND REVERSE HORSEPOWER CHECK

01 P POSITION AIRCRAFT INTO WIND
02 P SET PARKING BRAKE

NOTE: A PROPELLER GOVERNING INDEXING CHECK AT 1500 SHP SHOULD BE CONDUCTED PRIOR TO COMMENCING THIS CHECK

03 FE PLACE RPM SWITCHES - NORMAL
04 FE VERIFY TEMPERATURE DATUM CONTROL SWITCHES - NORMAL
05 FE VERIFY PROPELLER SERVO SWITCHES - NORMAL
06 FE VERIFY PROPELLER SYNC MASTER SWITCH - OFF

NOTE: PERFORM STEPS 07 THROUGH 14 ON TWO ENGINES AT A TIME (1 AND 4 OR 2 AND 3)

07 FE PLACE POWER LEVERS - FLIGHT IDLE
08 FE PLACE FUEL GOVERNOR CHECK SWITCHES FOR ENGINES BEING CHECKED - TEST
09 FE ADVANCE TWO POWER LEVERS TO MAXIMUM POWER POSITION AND OBSERVE FUEL GOVERNOR RPM (103.8 to 106.0 PERCENT)

NOTE: IF RPM IS BETWEEN 105.5 AND 106 PERCENT INVESTIGATE TO DETERMINE THAT PROPELLER GOVERNOR IS NOT CONTROLLING RPM

10 FE RETARD POWER LEVERS TO 100 PERCENT RPM: HORSEPOWER SHOULD BE 1500 MINIMUM

CAUTION: DO NOT PERMIT THE RPM TO DROP BELOW 95 PERCENT OR THE ENGINE BLEED VALVES MAY OPEN AND AN OVERTEMPERATURE OCCUR

11 FE PLACE FUEL GOVERNOR CHECK SWITCHES - NORMAL
12 FE ADVANCE POWER LEVERS TO A MINIMUM OF 900° C. AS POWER LEVER IS ADVANCED, TORQUE SHOULD INCREASE AND RPM SHOULD REMAIN FAIRLY CONSTANT.

CAUTION: IN THE EVENT OF A SERIOUS MALFUNCTION, SECURE THE RESPECTIVE ENGINE WITH THE FUEL/IGNITION SWITCH

13 FE RETARD POWER LEVERS TO MAX REVERSE (CHECK HORSEPOWER)

NOTE: THESE FOLLOWING NOMINAL VALUES ARE FOR SEA LEVEL, STANDARD DAY 15° C (59° F) CONDITIONS
   a. ENGINES 2 AND 3 SHOULD BE 1250 (+ - 150) HP
   b. ENGINES 1 AND 4 SHOULD BE 1150 (+ - 150) HP

INCREASE NOMINAL VALUES 5 HP FOR EACH 1° C DECREASE IN TEMPERATURES FROM 15° C
DECREASE NOMINAL VALUES 4 HP FOR EACH 1° C INCREASE IN TEMPERATURE FROM 15° C
DECREASE NOMINAL VALUES 40HP FOR EACH 1000 FEET INCREASE IN PRESSURE ALTITUDE FROM SEA LEVEL

14 FE ADVANCE POWER LEVERS TO - START

15 FE REPEAT STEPS 07 THROUGH 14 WITH THE REMAINING TWO ENGINES

NOTE: IF ABNORMAL INDICATIONS ARE OBTAINED DURING THIS CHECK, THE POSSIBILITY EXISTS THAT THE PROPellers HAVE BEEN MISINDEXED. IN THIS CASE, ADVANCE THE POWER LEVERS TO 800° C TIT, REINDEX THE PROPellers AND ATTEMPT THE CHECK A SECOND TIME
## 13.1 ENGINE FAILURES

### 1. STARTING

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>LOW BLEED AIR MANIFOLD AIR PRESSURE @ 16% RPM</td>
</tr>
<tr>
<td>02</td>
<td>ACCELERATION TIME &gt; 60 SEC TO LOW RPM</td>
</tr>
<tr>
<td>03</td>
<td>OVERTEMPERATURE</td>
</tr>
<tr>
<td>04</td>
<td>RPM STAGNATION/DECAY</td>
</tr>
<tr>
<td>05</td>
<td>NO LIGHT OFF</td>
</tr>
<tr>
<td>06</td>
<td>NO OIL PRESSURE</td>
</tr>
<tr>
<td>07</td>
<td>FUEL FROM NACELLE DRAIN</td>
</tr>
<tr>
<td>08</td>
<td>TORCHING</td>
</tr>
<tr>
<td>09</td>
<td>ABNORMAL VIBRATION</td>
</tr>
<tr>
<td>10</td>
<td>FIRE</td>
</tr>
<tr>
<td>11</td>
<td>NO BLEED AIR RISE ON STARTER BUTTON POP OUT</td>
</tr>
<tr>
<td>12</td>
<td>STARTER BUTTON DOES NOT POP (57-64%)</td>
</tr>
<tr>
<td>13</td>
<td>NO INDICATION OF BLEED AIR PRESSURE</td>
</tr>
<tr>
<td>14</td>
<td>STARTER BUTTON WILL NOT ENGAGE</td>
</tr>
<tr>
<td>15</td>
<td>STARTER BUTTON POP AND NO ROTATION</td>
</tr>
<tr>
<td>16</td>
<td>PREMATURE START BUTTON POP (REM 57% - 64%)</td>
</tr>
<tr>
<td>17</td>
<td>NO PARALLELING LIGHT</td>
</tr>
<tr>
<td>18</td>
<td>EDC LIGHT REMAINS ON</td>
</tr>
</tbody>
</table>
13.1.1

01  LOW BLEED AIR MANIFOLD AIR PRESSURE (BAMAP)

01  FE  VERIFY BAMAP < 25 P.S.I.G. @ 16% RPM

02  FE  PLACE FUEL AND IGNITION SW. TO OFF

03  FE  PULL STARTER BUTTON OUT

IF  01  FE  VERIFY NO RISE/SLOW RISE IN BAMAP, THEN

02  FE  PULL E HANDLE

OTHERWISE

04  FE  INFORM P OF DISCONTINUED START

05  FE  SELECT OFF ON ENGINE START SELECTOR SW.

06  ALL  COMPLETE NORMAL SHUTDOWN

07  P/FE  NOTIFY MAINTENANCE

08  P/FE  ENTER DISCREPANCY ON VIDS
          (CONNAVAIR PAC GEN-4790/1(2-70) OR OPNAV FORM 4790/1 (REV 10-71))
13.1.1

02  ENGINE ACCELERATION TIME > 60 SEC. TO LOW RPM

01  P/CP  OBSERVE 60 SEC ELAPSED TIME AND RPM NOT AT LOW RPM (71-73.3\%)

02  P/CP  INFORM FE

03  FE  SELECT OFF ON APPROPRIATE FUEL & IGN SW

IF

ENGINE LIGHT OFF HAS OCCURRED

04  FE  VERIFY START BUTTON OUT AFTER TIT \(< 200\degree C"

OTHERWISE

NO LIGHT OFF

04  FE  PULL START BUTTON OUT

05  FE  VERIFY BANAP RISE

06  FE  SELECT OFF ON ENG START SELECTOR

07  ALL  NORMAL SHUTDOWN

08  P/FE  NOTIFY MAINTENANCE

09  P/FE  ENTER DISCREPANCY ON VIDS
13.1.1

03 OVERTEMPERATURE

01 FE OBSERVE TIT - IF $>830^\circ <850^\circ$, LOGGED AS
HOT START ON VID3 (NO SHUTDOWN)

02 FE OBSERVE TIT $>830^\circ <965^\circ$

01 FE PLACE FUEL IGNITION SWITCH OFF

IF STARTER STILL ENGAGED

02 FE LEAVE STARTER ENGAGED UNTIL TIT $<200^\circ$

03 FE MANUALLY PULLS STARTER BUTTON OUT WHEN TIT $<200^\circ$

04 FE INSURE BLEED AIR MANIFOLD AIR PRESSURE (BAMAP)
RISE TO ORIGINAL VALUE

01 FE PULL E HANDLE IF NO RISE
(STARTER NOT ENGAGED)

OTHERWISE

02 FE VERIFY STARTER BUTTON OUT

03 FE INSURE BAMAP RISE TO ORIGINAL VALUE

01 FE PULL E HANDLE IF NO RISE

IF TIT $>200^\circ$

04 FE ENGAGE STARTER (AFTER OZ RPM) UNTIL TIT $<200^\circ$

13.1.1.03 OVERTEMP
13.1.1

OTHERWISE

05 P/FE ENTER HOT START ON VIDS

06 ALL PERFORM ABBREVIATED BEFORE START CKLST

-07 FE RESTART ENGINE

IF

TIT > 850° < 965° ON SECOND START

FE COMPLETE STEPS 13.1.01.03.02.01 thru .05 AS REQUIRED

OTHERWISE

NO SHUTDOWN - CONTINUE MISSION

03 FE OBSERVE TIT > 965° ON START

01 FE COMPLETE STEPS 13.1.01.03.02.01 THRU .05 AS REQUIRED

02 P/FE NOTIFY MAINTENANCE THAT OVERTEMP INSPECTION IS REQUIRED

03 ALL PERFORM NORMAL SHUTDOWN CKLST

04 P/FE ENTER DISCREPANCY ON VIDS
13.1.1 RPM STAGNATION/DECAY

04 RPM STAGNATION/DECAY

01 FE OBSERVE NO RPM INCREASE

02 FE PLACE FUEL IGNITION SW OFF

03 FE OBSERVE ENGINE MOTOR OVER UNTIL TIT < 200°

04 FE PULL START BUTTON

05 FE OBSERVE DAMAP RISE TO ORIGINAL VALUE

06 FE PULL E HANDLE IF NO RISE

07 FE PERFORM ABBREVIATED BEFORE START CKLST

08 FE RESTART ENGINE

IF SECOND START STAGNATED

01 FE PERFORM STEPS 1 THRU 5 THEN 8 THRU

OTHERWISE NO SHUTDOWN. CONTINUE MISSION

08 P/FE NOTIFY MAINTENANCE

09 ALL PERFORM NORMAL SHUTDOWN

10 P/FE ENTER DISCREPANCY ON VIDS
13.1.1

05 NO LIGHT OFF (A-3-7) (C-3-21)

01 FE OBSERVE NO TIT INCREASE PRIOR TO 33% RPM OR MAXIMUM STARTER ROTATING RPM

02 FE SECURE FUEL IGNITION SWITCH OFF

03 FE PULL START BUTTON OUT

04 FE OBSERVE BLEED AIR RISE TO ORIGINAL VALVE

01 FE PULL E HANDLE IF NO BLEED AIR RISE

05 FE SECURE START SELECTOR OFF

06 P/FE CALL MAINTENANCE

07 ALL PERFORM NORMAL SECURE CHECKLIST

08 P/FE ENTER DISCREPANCY ON VIDS

13.1.1.05
NO LIGHT OFF
13.1.1

FUEL FROM NACELLE DRAIN

07

01 P/CP RECEIVE INDICATION FROM LINEMAN OR AFT OBSERVER

02 P/CP NOTIFY FE

03 FE PULL APPROPRIATE E HANDLE

IF FIRE REFER TO 13.1.01.10 FIRE (ON GROUND)

OTHERWISE

04 P/FE NOTIFY MAINTENANCE

05 ALL PERFORM NORMAL SHUTDOWN CHECKLIST

06 F/FE LOG DISCREPANCY ON VIDS
<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>P/CP</td>
</tr>
<tr>
<td>02</td>
<td>P/CP</td>
</tr>
<tr>
<td>03</td>
<td>FE</td>
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<tr>
<td>04</td>
<td>FE</td>
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<tr>
<td>05</td>
<td>FE</td>
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<tr>
<td>06</td>
<td>FE</td>
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<tr>
<td>07</td>
<td>P/FE</td>
</tr>
<tr>
<td>08</td>
<td>ALL</td>
</tr>
<tr>
<td>09</td>
<td>P/FE</td>
</tr>
</tbody>
</table>

- P/CP: RECEIVE VERBAL INDICATION FROM AFT OBSERVER
- P/CP: NOTIFY FE
- FE: SECURE ENGINE
- FE: PLACE FUEL IGNITION SW OFF
- FE: PULL E HANDLE
- FE: INSURE STARTER BUTTON OUT
- FE: INSURE BLEED AIR RISE
- FE: TURN START SELECTOR OFF
- P/FE: NOTIFY MAINTENANCE
- ALL: PERFORM NORMAL SHUTDOWN CHECKLIST
- P/FE: LOG DISCREPANCY ON VIDS
### ABNORMAL VIBRATION (NO V SUAL INDICATION)

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>01</td>
<td>P/CP/FE NOTE ABNORMAL VIBRATION</td>
</tr>
<tr>
<td>02</td>
<td>FE PLACE FUEL IGNITION SWITCH OFF</td>
</tr>
<tr>
<td>03</td>
<td>FE INSURE STARTER BUTTON OUT</td>
</tr>
<tr>
<td>04</td>
<td>FE INSURE BLEED AIR RISE</td>
</tr>
<tr>
<td>05</td>
<td>FE TURN START SELECTOR SWITCH OFF</td>
</tr>
<tr>
<td>06</td>
<td>P/FE NOTIFY MAINTENANCE</td>
</tr>
<tr>
<td>07</td>
<td>ALL PERFORM NORMAL SECURE CHECKLIST</td>
</tr>
<tr>
<td>08</td>
<td>P/FE LOG DISCREPANCY ON VIDS</td>
</tr>
</tbody>
</table>
13.1.1

10 FIRE (ON-GROUND) (A-3-38)(C-5-28)

01 P/CP/FE RECEIVE/NOTE COCKPIT FIRE WARNING LIGHT AND HORN

   NOTE (P/CP CAN RECEIVE VERBAL/VISUAL NOTIFICATION
   FROM LINEMAN OR AFT OBSERVER)

02 ALL PERFORM ENGINE FIRE ON GROUND CHECKLIST

   A  FE  PULL APPROPRIATE E HANDLE
   B  FE  HRD BUTTON PUSH TO DISCHARGE
   C  FE  PULL STARTER BUTTON OUT
   D  P/CP NOTIFY CONTROL TOWER
   E  CP  VERIFY FLAPS AT TAKEOFF OR APPROACH

IF FIRE NOT OUT IN 10 SECONDS

   F  P/FE  HRD TRANSFER SW TO ALTERNATE
   G  P/FE  HRD BUTTON PUSH TO DISCHARGE
   H  E  PULL E HANDLES
   I  ALL  SECURE APU, EVACUATE AIRCRAFT AT DISCRETION OF PILOT

OTHERWISE

03 P/FE NOTIFY MAINTENANCE

04 ALL PERFORM NORMAL SECURE CKLST

05 P/FE LOG DISCREPANCY ON VIDS
13.1.1

11 NO BLEED AIR RISE ON START BUTTON POP OUT (A-3-7) (C-3-21)

01 FE NOTE NO VISUAL INDICATION OF BLEED AIR RISE ON MANIFOLD PRESSURE GAUGE AT 57% - 64% RPM

02 FE PULLS APPROPRIATE E HANDLE

03 FE VERIFY STARTER BUTTON OUT

04 P/FE NOTIFY MAINTENANCE

05 ALL PERFORM NORMAL SECURE CKLST

06 P/FE LOG DISCREPANCY ON VIDS
13.1.1

12 START BUTTON DOES NOT POP (57-64%) (A-3-6) (C-3-21)

01 FE NOTE ABSENCE OF STARTER BUTTON POP BY 64%

02 FE MANUALLY PULLS START BUTTON OUT

03 FE INSURE BLEED AIR RISE

IF NO BLEED AIR RISE

01 FE PULL E HANDLE

02 P/FE NOTIFY MAINTENANCE

03 ALL PERFORM NORMAL SECURE CKLST

OTHERWISE

04 P/FE LOC DISCREPANCY ON VIDS

05 ALL CONTINUE MISSION
### 13.1.1.1

**NO INDICATION OF BLEED AIR MANIFOLD AIR PRESSURE**

<table>
<thead>
<tr>
<th>Step</th>
<th>Code</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>01</td>
<td>FE</td>
<td>RECEIVE NO INDICATION ON MANIFOLD PRESSURE GAUGE</td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>CHECK APPROPRIATE CIRCUIT BREAKERS</td>
</tr>
<tr>
<td>01</td>
<td>FE</td>
<td>VERIFY START CONTROL C.B. IN</td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>VERIFY ESSENTIAL FEEDER C.B. IN</td>
</tr>
<tr>
<td>03</td>
<td>FE</td>
<td>CHECK INFLIGHT ARMING SWITCH OFF APU CONTROL PANEL</td>
</tr>
</tbody>
</table>

**IF** NO INDICATION OF BMAP

<table>
<thead>
<tr>
<th>Step</th>
<th>Code</th>
<th>Action</th>
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<tbody>
<tr>
<td>04</td>
<td>ALL</td>
<td>PERFORM NORMAL SECURE CHECKLIST</td>
</tr>
<tr>
<td>05</td>
<td>P/FE</td>
<td>NOTIFY MAINTENANCE</td>
</tr>
<tr>
<td>06</td>
<td>P/FE</td>
<td>LOG DISCREPANCY ON VIDS</td>
</tr>
</tbody>
</table>

**OTHERWISE**

<table>
<thead>
<tr>
<th>Step</th>
<th>Code</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>ALL</td>
<td>CONTINUE NORMAL ENGINE START CKLST</td>
</tr>
</tbody>
</table>

### 13.1.1.13

**NO INDICATION BLEED AIR**
13.1.1

14  STARTER BUTTON WILL NOT ENGAGE

01  FE  NOTE STARTER BUTTON WILL NOT ENGAGE

02  FE  CHECK APPROPRIATE CIRCUIT BREAKERS

01  FE  VERIFY START CONTROL C.B. IN

02  FE  VERIFY ESSENTIAL FEEDER C.B. IN

IF

CIRCUIT BREAKERS SET

03  ALL  PERFORM NORMAL SECURE CHECKLIST

04  P/FE  NOTIFY MAINTENANCE

05  P/FE  LOG DISCREPANCY ON VIDS

OTHERWISE

03  ALL  CONTINUE NORMAL ENGINE START CKLIST
13.1.1

15 STARTER BUTTON POP AND NO ROTATION

01 FE NOTE STARTER BUTTON POP OUT AND NO ROTATION

IF RAMAP DROP AND THEN RISE

02 ALL PERFORM NORMAL SECURE CHECKLIST

03 P/FE NOTIFY MAINTENANCE

04 P/FE LOG DISCREPANCY ON VIDS

OTHERWISE REFER TO 13.1.01.14
<table>
<thead>
<tr>
<th>Step</th>
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</thead>
<tbody>
<tr>
<td>01</td>
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<tr>
<td>02</td>
<td>FE</td>
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<tr>
<td>IF</td>
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<tr>
<td>01</td>
<td>FE</td>
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<tr>
<td>ELSE</td>
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<td>05</td>
<td>P/FE</td>
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<tr>
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<td>FE</td>
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<td>P/FE</td>
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</tr>
<tr>
<td>Step</td>
<td>Action</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>01</td>
<td>NO PARALLELING LIGHT</td>
</tr>
<tr>
<td>02</td>
<td>PLACE FUEL IGNITION SWITCH OFF</td>
</tr>
<tr>
<td>03</td>
<td>INSURE START BUTTON OUT WHEN TIT &lt; 200°</td>
</tr>
<tr>
<td>04</td>
<td>INSURE BLEED AIR RISE</td>
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<tr>
<td>05</td>
<td>PULL E HANDLE IF NO RISE</td>
</tr>
<tr>
<td>06</td>
<td>TURN START SELECTOR SWITCH OFF</td>
</tr>
<tr>
<td>07</td>
<td>PERFORM NORMAL SECURE CHECKLIST</td>
</tr>
<tr>
<td>08</td>
<td>LOG DISCREPANCY ON VIDS</td>
</tr>
<tr>
<td>09</td>
<td>PARALLELING LIGHT REMAINS ON WHEN REM &gt; 65%</td>
</tr>
<tr>
<td>10</td>
<td>PULL FUEL SHUTOFF C.B.</td>
</tr>
<tr>
<td>IF</td>
<td>VERIFY LIGHT OUT</td>
</tr>
<tr>
<td>11</td>
<td>LEAVE C.B. OUT</td>
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<tr>
<td>OTHERWISE</td>
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</tr>
<tr>
<td>12</td>
<td>VERIFY LIGHT ON</td>
</tr>
<tr>
<td>13</td>
<td>RESET C.B.</td>
</tr>
<tr>
<td>14</td>
<td>COMPLETE 17.1 STEPS 2 THRU 8</td>
</tr>
</tbody>
</table>
13.1.1

EDC PRESSURE LOW LIGHT REMAINS ON

(A-3-6) (C-3-21)

18

01 FE VERIFY EDC LIGHT NOT OUT PRIOR TO 65% RPM
02 FE VERIFY EDC DUMP SW IN NORMAL

VP-30 ONLY

01 ALL CONTINUE START

IF

VP-30 ONLY

02 FE VERIFY EDC LIGHT ON AT NORMAL STABILIZED RPM
03 FE PLACE FUEL IGNITION SW OFF
04 ALL PERFORM NORMAL SECURE CHECKLIST
05 P/FE NOTIFY MAINTENANCE
06 P/FE LOG DISCREPANCY ON VIDS

OTHERWISE

FE VERIFY EDC LIGHT OUT AT NORMAL STABILIZED RPM

VP-30 ONLY

03 ALL CONTINUE MISSION
04 P/FE LOG DISCREPANCY ON VIDS
13.1 ENGINE FAILURES

2 TAXI

01 FUEL PRESSURE LOW LIGHT
02 FILTER LIGHT ON
03 LOW OIL PRESSURE
04 TIT INDICATOR FAILURE
05 RPM FAILURE
06 ENGINE FIRE
07 OIL PRESSURE LIGHT
08 CHIPS LIGHT ON
09 GENERATOR MECHANICAL WARNING LIGHT
10 MASTER PRESSURE SYSTEM LIGHT ON
11 ENGINE ANTI-ICING LIGHT ON (SWITCH OFF)
12 OIL HOT LIGHT ON
13.1.2

01
01 ANY
IF
01 FE
02 FE
02 ALL
02 ALL

FUEL PRESSURE LOW LIGHT
NOTE FUEL PRESSURE LIGHT ON
ENGINE IN LOW RPM
SHIFT RPM SWITCH TO NORMAL
VERIFY FUEL PRESSURE LIGHT OUT
CONTINUE MISSION
RETURN TO LINE
PERFORM NORMAL SHUTDOWN
NOTIFY MAINTENANCE
LOG DISCREPANCY ON VIDS

13.1.2.1
FUEL PRESSURE
LOW LIGHT ON
TAEG REPORT NO. 7

13.1.2.2
FILTER LIGHT ON

A-1.79; C-1-109

FILTER LIGHT ON
ANY
NOTE
FILTER LIGHT ON
RETURN TO LINE
PERFORM NORMAL SHUTDOWN CHECKLIST
NOTIFY MAINTENANCE
P/F/E
LOG DISCREPANCY ON VIDS

13.1.2
01
02
03
04
05

155
13.1.2

03

FE

LOW OIL PRESSURE INDICATION (LOW RPM)

01

FE

NOTE OIL PRESSURE BELOW LIMITS (POWER SECTION
50 psi, GEAR BOX 2 50 psi)

1F

POWER SECTION 2 50 psi

01

FE

SHIFT RPM SWITCH TO NORMAL RPM AND RPM STAB AT 100%

02

FE

VERIFY POWER SECTION OIL PRESSURE 2 50 psi

03

ALL

CONTINUE MISSION

OTHERWISE

POWER SECTION 2 50 psi AT NORMAL OR GEAR BOX
50 psi AT LOW RPM OR 130 psi AT NORMAL

02

FE

PLACE FUEL AND IGNITION SW OFF

03

ALL

RETURN TO LINE

04

ALL

PERFORM NORMAL SECURE CHECKLIST

05

CP

NOTIFY MAINTENANCE

06

P/FE

LOG DISCREPANCY ON VIDS
13.1.2

04 FE TIT INDICATOR FAILURE
01 FE NOTE TIT INDICATOR FAILURE (OFF FLAG)
02 FE VERIFY START ESSENTIAL AC BUS CB LN
01 FE RESET CB IF OUT
IF TIT FLAG VISIBLE
03 FE PULL E HANDLE
04 ALL RETURN TO LINE
05 ALL PERFORM NORMAL SECURE CKLST
06 CP NOTIFY MAINTENANCE
07 P/FE LOG DISCREPANCY ON VIDS

OTHERWISE CONTINUE MISSION
13.1.2

05 RPM INDICATOR FAILURE

01 FE NOTE DECREASE IN TACHOMETER INDICATION

02 FE PLACE FUEL & IGNITION SW OFF

03 ALL RETURN TO LINE

04 ALL PERFORM NORMAL SECURE CKLST

05 CP NOTIFY MAINTENANCE

06 P/FE LOG DISCREPANCY ON VIDS
13.1.2

06 ENGINE FIRE

A-1-5-10,
C-1-5-28

01 ALL NOTE FIRE WARNING LIGHT ON AND HORN

02 ALL PERFORM ENGINE FIRE ON THE GROUND CKLST

A FE PULL E HANDLE

B P/FE DISCHARGE HRD

C FE VERIFY STARTER BUTTON OUT

D CP NOTIFY CONTROL TOWER

E CP INSURE FLAPS AT TAKEOFF OR APPROACH

NOTE P STOP AIRCRAFT DURING CKLST PROCEDURE AND
SET PARKING BRAKE

IF FIRE NOT OUT AFTER 10 SECONDS

F P/FE PLACE HRD TRANSFER SW TO ALTERNATE

G P/FE DISCHARGE HRD

H FE PULL REMAINING E HANDLES

I ALL SECURE APU, EVACUATE AIRCRAFT AT DISCRETION OF PILOT
13.1.2
OIL PRESSURE LIGHT (NORMAL RPM)

**NOTE:** PERMISSIBLE TO HAVE LIGHT ON IN LOW RPM

<p>| | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>01</td>
<td>ANY</td>
<td>NOTE OIL PRESSURE LIGHT ON</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>CHECK POWER SECTION AND GEAR BOX OIL PRESSURE</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>GAUGES TO FIND WHICH ONE IS LOW</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(POWER SECTION &lt; 40 psi; GEAR BOX &lt; 130 psi)</td>
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</tr>
<tr>
<td>03</td>
<td>FE</td>
<td>SECURE APPROPRIATE FUEL IGNITION SWITCH</td>
<td></td>
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<tr>
<td>04</td>
<td>ALL</td>
<td>RETURN TO LINE</td>
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</tr>
<tr>
<td>05</td>
<td>ALL</td>
<td>PERFORM NORMAL SHUTDOWN CHECKLIST</td>
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</tr>
<tr>
<td>06</td>
<td>CP</td>
<td>NOTIFY MAINTENANCE</td>
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<td>07</td>
<td>P/FE</td>
<td>LOG DISCREPANCY ON VIDS</td>
<td></td>
</tr>
</tbody>
</table>

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13.1.2.07
OIL PRESSURE LIGHT
13.1.2

08 CHIPS LIGHT ON

01 ANY NOTE CHIPS LIGHT ON

VP-30 02 FE SECURE APPROPRIATE FUEL IGNITION SWITCH

VP-31 02 FE PULL APPROPRIATE E HANDLE

03 ALL RETURN TO LINE

04 ALL PERFORM NORMAL SHUTDOWN CHECKLIST

05 CP NOTIFY MAINTENANCE

06 P/FE LOG DISCREPANCY ON VIDS
13.1.2

09

IF

01 ANY

02 FE

03 ALL

04 CP

05 ALL

06 P/FE

OTHERWISE

02 ALL

GENERATOR MECHANICAL WARNING LIGHT ON

NOTE GENERATOR WARNING LIGHT ON

AYC 314 NOT INSTALLED

PULL APPROPRIATE E HANDI-E

RETURN TO LINE

NOTIFY MAINTENANCE

PERFORM NORMAL SHUTDOWN CHECKLIST

RECORD DISCREPANCY ON VIDS

AYC 314 IS INSTALLED

CONTINUE MISSION IF REQUIRED

(NOTE: GENERATOR MAY BE OPERATED AS LONG AS 10 HOURS IF REQUIRED)

A-1-79; A-5-38;
C-1-109; C-5-33

13.1.2.09

GENERATOR MECHANICAL WARNING LIGHT ON
13.1.2

10

01

ANY

NOTE PRESSURIZATION SYSTEM LIGHT ON

02

FE

CHECK OVERHEAD PANEL FOR POSSIBLE CAUSES

(EDC PRESSURE LOW (2); OIL TEMP HIGH (2);
CABIN EXHAUST FAN LIGHT OUT; REFER
OVERHEAT LIGHT (2))

01

FE

VERIFY EDC PRESSURE LOW LIGHT ON

01

FE

PLACE APPROPRIATE EDC DISCONNECT/NORMAL
SW TO DISCONNECT

IF

02

FE

VERIFY LOSS OF SPREAD ON INLET/DISCHARGE
PRESSURE GAGE

03

FE

PLACE EDC NORMAL/DUMP SW TO DUMP

OTHERWISE

02

FE

VERIFY NO LOSS OF SPREAD ON INLET/
DISCHARGE PRESSURE GAGE

03

FE

PULL HANDLE

02

FE

VERIFY OIL TEMP LIGHT ON

01

FE

CHECK ENGINE OIL TEMP GAGE

02

FE

VERIFY OIL TEMP HIGH

13.1.2.10

MASTER PRESSURE
SYSTEM LIGHT ON
13.1.2

10

MASTER PRESSURE SYSTEM LIGHT ON (CONTINUED)

01 FE PLACE OIL COOLER FLAPS SW TO OPEN

IF
02 FE VERIFY OIL TEMP LIGHT OFF

03 FE VERIFY MASTER PRESSURE LIGHT OFF

04 ALL CONTINUE MISSION

OTHERWISE

REFER TO 13.1.2.12 C3 thru 08

A-1-123

03 FE VERIFY REFR OVERHEAD LIGHT ON

01 FE VERIFY EDC DELIVERING CONDITIONED AIR

02 FE PLACE EDC NORMAL/DUMP SW TO DUMP

IF
03 FE VERIFY REFR OVERHEAT LIGHT OFF

04 FE VERIFY MASTER PRESSURE LIGHT OFF

05 FE SELECT MANUAL TWO DOT POSITION

(OR WARMER) ON TEMP CONTROL

06 ALL CONTINUE MISSION

OTHERWISE

REFER TO 13.1.02.10 STEP 3-6

02 FE VERIFY APU DELIVERING CONDITIONED AIR

13.1.2.10
13.1.2.10  

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>FE</td>
<td>PLACE GND AIR CONDITIONING SW OFF</td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>VERIFY REFR OVHT LIGHT OFF</td>
</tr>
<tr>
<td>IF</td>
<td>03</td>
<td>VERIFY MASTER PRESS LIGHT OFF</td>
</tr>
<tr>
<td>04</td>
<td>FE</td>
<td>SELECT MANUAL TWO DOT (OR WARNER) ON TEMP CONTROL</td>
</tr>
<tr>
<td>05</td>
<td>FE</td>
<td>PLACE GND AIR COND SW ON</td>
</tr>
<tr>
<td>06</td>
<td>ALL</td>
<td>CONTINUE MISSION</td>
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<tr>
<td>OTHERWISE</td>
<td></td>
<td>REFER TO 13.1.02.10 STEPS 03 THRU 06</td>
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<tr>
<td>04</td>
<td>FE</td>
<td>VERIFY CABIN EXH'.UST FAN OUT LIGHT ON</td>
</tr>
<tr>
<td>01</td>
<td>FE</td>
<td>CHECKS CABIN EXHAUST FAN CB(S) (MAIN AC BUS B OR MAIN DC EXTENSION IN)</td>
</tr>
<tr>
<td>IF</td>
<td>02</td>
<td>VERIFY CABIN EXHAUST LIGHT OUT</td>
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<tr>
<td>03</td>
<td>FE</td>
<td>VERIFY MASTER PRESS LIGHT OUT</td>
</tr>
<tr>
<td>04</td>
<td>ALL</td>
<td>CONTINUE MISSION</td>
</tr>
<tr>
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<td>REFER TO 13.1.02.10 STEP 03 THRU 06</td>
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<tr>
<td>03</td>
<td>ALL</td>
<td>RETURN TO LINE</td>
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<tr>
<td>04</td>
<td>CP</td>
<td>NOTIFY MAINTENANCE</td>
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<td></td>
<td></td>
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<tr>
<td>01</td>
<td>ANY</td>
<td>NOTE ANTI-ICING LIGHT ON</td>
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<tr>
<td>02</td>
<td>FE</td>
<td>VERIFY ENGINE AIR SCOOP AND INLET VANES SW OFF</td>
</tr>
<tr>
<td>03</td>
<td>FE</td>
<td>PULL APPROPRIATE E HANDLE</td>
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<tr>
<td>04</td>
<td>ALL</td>
<td>RETURN TO LINE</td>
</tr>
<tr>
<td>05</td>
<td>CP</td>
<td>NOTIFY MAINTENANCE</td>
</tr>
<tr>
<td>06</td>
<td>ALL</td>
<td>COMPLETE NORMAL SECURE CKLST</td>
</tr>
<tr>
<td>07</td>
<td>P/FE</td>
<td>ENTER DISCREPANCY ON VIDS</td>
</tr>
</tbody>
</table>

**13.1.2**

11 ENGINE ANTI-ICING LIGHT ON (CONTROL SW OFF) A-1-77; C-1-108

---

**13.1.2.11**

ENGINE ANTI-ICE LIGHT ON
13.1.2

12 OIL HOT LIGHT ON (1000°C)
01 ANY NOTE OIL HOT LIGHT ON
02 FE PLACE OIL COOLER DOOR SW TO OPEN
IF 03 FE VERIFY OIL HOT LIGHT OUT (WITHIN 30 MINUTES)
04 FE VERIFY ENGINE OIL TEMP GAGE < 100°C
05 ALL CONTINUE MISSION

OTHERWISE
03 FE VERIFY OIL HOT LIGHT ON AFTER 30 MINUTES
04 FE PLACE FUEL AND IGNITION SW OFF
05 ALL RETURN TO LINE
06 CP NOTIFY MAINTENANCE
07 ALL PERFORM NORMAL SECURE CKLST
08 P/FE LOG DISCREPANCY ON VIDS

13.1.2.12
OIL HOT LIGHT ON
13.1 ENGINE FAILURES

3 TAKEOFF PRIOR TO V REFUSAL

01 ENGINE FIRE
02 HORSEPOWER INDICATOR FAILURE
03 TIT INDICATOR FAILURE
04 RPM FAILURE
05 FUEL FLOW INDICATOR FAILURE
06 OIL PRESSURE LIGHT
07 CHIPS LIGHT
08 RED GENERATOR MECHANICAL WARNING LIGHT
09 AUTO FEATHER
10 MASTER ELECTRICAL LIGHT
11 MASTER PRESSURE SYSTEM
12 INDICATION OF LOW POWER @ 80KTS IAS
13 OIL HOT LIGHT

13.1.3 TAKEOFF PRIOR TO V REFUSAL
13.1.3

ENGINE FIRE

01  ANY  NOTE FIRE LIGHT ON, HORN ON
02  FE  CALL OUT "FIRE ON NUMBER ___"
03  P   CALL "FEATHER AND ABORT"
04  FE  PULL APPROPRIATE E HANDLE TO FEATHER ENGINE AND HRD DISCHARGE
05  P   RETARD POWER LEVERS TO REVERSE
06  CP  NOTIFY TOWER OF ABORT AND REASON
07  ALL  PERFORM ENGINE FIRE ON GROUND CHECKLIST (REF 13.1.1.10)

IF

FIRE OUT

08  CP  CALL FOR TAXI CLEARANCE TO LINE
09  ALL  RETURN TO LINE
10  CP  NOTIFY MAINTENANCE
11  ALL  PERFORM SHUTDOWN CHECKLIST
12  P/FE LOG DISCREPANCY ON VIDS

OTHERWISE

FIRE NOT OUT

08  P   STOP AIRCRAFT
09  FE  SECURE ENGINES, APU
10  ALL  EVACUATE AIRCRAFT AT PILOT'S DISCRETION

13.1.3.01
ENGINE FIRE
TAEG REPORT NO. 7

13.1.3.02
HORSEPOWER INDICATOR FAILURE

A-3-14, C-3-28

HORSEPOWER INDICATOR FAILURE
NOTE AP INDICATOR FAILURE
FE REPORT FAILURE TO PILOT
FE CALL "ABORT"
P RETARD POWER LEVERS TO REVERSE
CP NOTIFY TOWER OF ABORT AND REASON
CP CALL FOR TAXI CLEARANCE
CP RETURN TO LINE
ALL NOTIFY MAINTENANCE
ALL PERFORM NORMAL SECURE CHECKLIST
P/FE LOG DISCREPANCY ON VIDS

172
<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>03</td>
<td>TIT INDICATOR FAILURE</td>
</tr>
<tr>
<td>01</td>
<td>FE</td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
</tr>
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<td>03</td>
<td>P</td>
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<td>04</td>
<td>P</td>
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<td>05</td>
<td>CP</td>
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<td>06</td>
<td>CP</td>
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<td>07</td>
<td>ALL</td>
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<td>08</td>
<td>CP</td>
</tr>
<tr>
<td>09</td>
<td>ALL</td>
</tr>
<tr>
<td>10</td>
<td>P/FE</td>
</tr>
</tbody>
</table>

A-3-14, C-3-28
13.1.3

04 RPM FAILURE

01 FE NOTE RPM FAILURE

02 FE REPORT FAILURE TO PILOT

03 P CALL "ABORT"

04 P RETARD POWER LEVER TO REVERSE

05 CP NOTIFY TOWER OF ABORT

06 CP CALL FOR TAXI CLEARANCE TO LINE

07 ALL RETURN TO LINE

08 CP NOTIFY MAINTENANCE

09 ALL PERFORM NORMAL SECURE CHECKLIST

10 P/FE LOG DISCREPANCY ON VIDS

A 3-14, C-3-28
13.1.3

FUEL FLOW FAILURE

05

01  FE  NOTE FUEL FLOW INDICATOR FAILURE
02  FE  NOTIFY PILOT OF FAILURE
03  P   CALL "ABORT"
04  P   RETARD POWER LEVERS TO REVERSE
05  CP  NOTIFY TOWER OF ABORT
06  CP  CALL FOR TAXI CLEARANCE TO LINE
07  ALL RETURN TO LINE
08  CP  NOTIFY MAINTENANCE
09  ALL PERFORM NORMAL SECURITY CHECKLIST

A-3-14, C-3-28

13.1.3.05
FUEL FLOW FAILURE
13.1.3

06
OIL PRESSURE LIGHT ON

01
FE
NOTE OIL PRESSURE LIGHT ON

02
FE
NOTIFY P "OIL PRESSURE LIGHT ON"

03
P
CALL "ABORT"

04
CP
NOTIFY TOWER OF ABORT AND REASON

05
P
RETARD POWER LEVERS TO REVERSE

06
FE
CHECK POWER SECTION & GEARBOX PRESSURE INDICATORS TO SEE WHICH IS LOW. (POWER SECTION < 40 psi; GEAR BOX < 130 psi)

07
P
CALL "SECURE ENGINE"

08
FE
SECURE APPROPRIATE FUEL IGNITION SWITCH

09
CP
CALL FOR TAXI CLEARANCE TO LINE

10
ALL
RETURN TO LINE

11
CP
NOTIFY MAINTENANCE

12
ALL
PERFORM NORMAL SHUTDOWN CHECKLIST

13
P/FC
LOG DISCREPANCY ON VIDS

13.1.3.06
OIL PRESSURE LIGHT ON
13.1.3

08

RED GENERATOR MECHANICAL WARNING LIGHT ON

A-1-79, A-5-28

C-1-109, C-5-33

01
FE
NOTE RED GENERATOR LIGHT ON

02
FE
NOTIFY PILOT GENERATOR LIGHT ON

AYC 314 NOT INSTALLED

CALL "FEATHER AND ABORT"

03
P

04
FE
PULL RESPECTIVE E HANDLE

05
P
RETARD POWER LEVER TO REVERSE

06
CP
NOTIFY TOWER OF ABORT AND REASON

07
CP
CALL FOR TAXI CLEARANCE TO LINE

08
ALL
RETURN TO LINE

09
CP
NOTIFY MAINTENANCE

10
ALL
PERFORM NORMAL SECURE CHECKLIST

11
P/FE
LOG DISCREPANCY ON VIDS

IF

AYC 314 IS INSTALLED

OTHERWISE

03

ALL CONTINUE MISSION IF REQUIRED

(NOTE: GENERATOR CAN BE OPERATED UP TO 10 HOURS)
<table>
<thead>
<tr>
<th>10</th>
<th>FE</th>
<th>MASTER ELECTRICAL LIGHT</th>
<th>A-1-80, C-1-110</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>FE</td>
<td>NOTE MASTER ELECTRICAL LIGHT ON</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>REPORT LIGHT ON TO PILOT</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>P</td>
<td>CALLS &quot;ABORT&quot;</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>CP</td>
<td>NOTIFY TOWER OF ABORT AND REASON</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>P</td>
<td>RETARD POWER LEVERS TO REVERSE</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>CP</td>
<td>CALL FOR TAXI CLEARANCE TO LINE</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>ALL</td>
<td>RETURN TO LINE</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>FE</td>
<td>CHECK OVERHEAD PANEL FOR POSSIBLE CAUSES (GENERATOR LIGHTS (3); TR OVERHEAT LITES (3))</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IF 01</td>
<td>FE</td>
<td>VERIFY TR OVERHEAT LIGHT ON</td>
</tr>
<tr>
<td></td>
<td>01 FE</td>
<td>FE</td>
<td>PULLS RESPECTIVE CB</td>
</tr>
<tr>
<td></td>
<td>02 ALL</td>
<td>PROCEED TO 13.1.03.10.9 (NOTIFY MAINTENANCE)</td>
<td></td>
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<tr>
<td></td>
<td>OTHERWISE 02 FE</td>
<td>VERIFIES GENERATOR LIGHT ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>01 FE</td>
<td>PERFORMS OVERVOLTAGE RESET</td>
<td></td>
</tr>
</tbody>
</table>

13.1.3.10
MASTER ELECTRICAL LIGHT
13.1.3.10 MASTER ELECTRICAL LIGHT (CONTINUED)

01 FE PLACE GENERATOR SW TO RESET
02 FE MONITOR GENERATOR LIGHT

IF 03 FE VERIFY LIGHT OUT
04 ALL PROCEED TO 13.1.03.10.9 (NOTIFY MAINT)

OTHERWISE 03 FE VERIFY LIGHT ON STEADY
04 FE PROCEED TO 13.1.03.10.08.02.02 (UNDERVOLTAGE RESET)

IF 03 FE VERIFY LIGHT OUT MOMENTARILY AND COMES BACK ON
01 FE TURN GENERATOR SW OFF
04 ALL PROCEED TO 13.1.03.10.9 (NOTIFY MAINT)
02 FE PERFORM UNDERVOLTAGE RESET

01 FE PLACE GENERATOR SW OFF
02 FE PULL AND RESET RESPECTIVE GENERATOR CONTROL CIRCUIT BREAKER (ESS DC BUS)
03 FE PLACE GENERATOR SW ON

IF 04 FE VERIFY LIGHT OUT
05 ALL PROCEED TO 13.1.03.10.9
13.1.3.1c  MASTER ELECTRICAL LIGHT (CONTINUED)

**Otherwise**

04  FE  VERIFY LIGHT OUT MOMENTARILY AND COMES BACK ON
05  FE  PLACES GENERATOR SW OFF
06  ALL  PROCEED TO 13.1.03.10.9

**IF**

04  FE  VERIFY GENERATOR LIGHT ON STEADY
05  FE  TURN GENERATOR SW OFF

*(NOTE: LIGHT ON STEADY INDICATES FEEDER FAULT OR POSSIBLE GENERATOR MECHANICAL FAILURE)*

**IF**

*(NOTE: IF AYC 311 INSTALLED PERMISSIBLE TO LEAVE ENGINE OPERATING FOR UP TO 10 HOURS)*

01  FE  PULL E HANDLE AT PILOT'S DISCRETION
06  ALL  PROCEED TO 13.1.03.10.9

09  CP  NOTIFY MAINTENANCE
10  ALL  PERFORM NORMAL SECURE CHECKLIST
11  P/FE LOG DISCREPANCY ON VIDS

---

13.1.3.10  MASTER ELECTRICAL LIGHT
<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>FE</td>
<td>Note Master Pressure System Light On</td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>Notify Pilot Light On</td>
</tr>
<tr>
<td>03</td>
<td>P</td>
<td>Call &quot;Abort&quot;</td>
</tr>
<tr>
<td>04</td>
<td>CP</td>
<td>Notify Tower of Abort and Reason</td>
</tr>
<tr>
<td>05</td>
<td>P</td>
<td>Retard Power Levers to Reverse</td>
</tr>
<tr>
<td>06</td>
<td>P</td>
<td>Taxi Off Runway</td>
</tr>
<tr>
<td>07</td>
<td>FE</td>
<td>Perform Trouble Shooting to Determine</td>
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<tr>
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<td></td>
<td>Cause. Refer to 13.1.2.10 Steps 01 Thru 04</td>
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<tr>
<td>08</td>
<td>CP</td>
<td>Call for Taxi Clearance to Line</td>
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<tr>
<td>09</td>
<td>ALL</td>
<td>Return to Line</td>
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<tr>
<td>10</td>
<td>CP</td>
<td>Notify Maintenance</td>
</tr>
<tr>
<td>11</td>
<td>ALL</td>
<td>Perform Shutdown Checklist</td>
</tr>
<tr>
<td>12</td>
<td>P/FE</td>
<td>Log Discrepancy on VIDS</td>
</tr>
</tbody>
</table>
13.1.3

12

INDICATION OF LOW POWER ≤ 80 KTS IAS  

A-3-14, C-3-28

01

FE  

NOTICE LOW HP ON SHIP INDICATOR  

(NOTE: FORECASE POWER IS DETERMINED FROM  

FIG 11-19 AND 11-20 FOR -10 ENG AND FIG  

12-19 AND 12-20 FOR -14 ENG)

02

FE  

ADVISE PILOT OF LOW HP READING

03

P  

CALL "ABORT" AT PILOT'S DISCRETION

04

CP  

NOTIFY TOWER OF ABORT AND REASON

05

P  

RETARD POWER LEVERS TO REVERSE

06

P  

TAXI OFF RUNWAY

VP-30

07

FE  

SECURE APPROPRIATE FUEL IGNITION SWITCH  

AT P DISCRETION

VP-31

07

FE  

PULL E HANDLE - AT P DISCRETION

08

CP  

CALL FOR TAXI CLEARANCE TO LINE

09

ALL  

RETURN TO LINE

10

CP  

NOTIFY MAINTENANCE

11

ALL  

PERFORM SHUTDOWN CHECKLIST

12

P/FE  

LOG DISCREPANCY ON VIDS
## 13.1.3

### 13 OIL HOT LIGHT

<table>
<thead>
<tr>
<th>Step</th>
<th>Role</th>
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<tbody>
<tr>
<td>01</td>
<td>FE</td>
<td>NOTE OIL HOT LIGHT ON</td>
</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>ADVISE P OF OIL HOT LIGHT ON</td>
</tr>
<tr>
<td>03</td>
<td>P</td>
<td>CALL &quot;ABORT&quot;</td>
</tr>
<tr>
<td>04</td>
<td>P</td>
<td>RETARD POWER LEVERS TO REVERSE</td>
</tr>
<tr>
<td>05</td>
<td>P</td>
<td>TAXI OFF RUNWAY</td>
</tr>
<tr>
<td>06</td>
<td>FE</td>
<td>ACTIVATE OIL COOLER DOOR SWITCH TO OPEN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(NOTE: PERMITTED 30 MINUTES TO COOL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BEFORE HAVE TO SECURE)</td>
</tr>
<tr>
<td>IF</td>
<td></td>
<td>OIL HOT LIGHT GOES OUT</td>
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<tr>
<td>07</td>
<td>ALL</td>
<td>CONTINUE MISSION</td>
</tr>
<tr>
<td>IF</td>
<td></td>
<td>OIL HOT LIGHT DOES NOT GO OUT</td>
</tr>
<tr>
<td>07</td>
<td>FE</td>
<td>PULL E HANDLE</td>
</tr>
<tr>
<td>08</td>
<td>CP</td>
<td>CALL GROUND CONTROL FOR CLEARANCE BACK TO LINE</td>
</tr>
<tr>
<td>09</td>
<td>ALL</td>
<td>TAXI TO LINE</td>
</tr>
<tr>
<td>10</td>
<td>CP</td>
<td>NOTIFY MAINTENANCE</td>
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<td>11</td>
<td>ALL</td>
<td>PERFORM NORMAL SECURE CHECKLIST</td>
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<tr>
<td>12</td>
<td>P/FE</td>
<td>LOG DISCREPANCY ON VIDS</td>
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</tbody>
</table>
13.1.4

01 ENGINE FIRE

01 ANY NOTE FIRE LIGHT ON HORN ON
02 ANY NOTIFY PILOT, "FIRE ON NUMBER ___";
03 P CALL "FEATHER ENGINE NO. ___" AND "DISCHARGE HRD"
04 Fb PULL APPROPRIATE E HANDLE TO FEATHER ENGINE AND DISCHARGE HRD

IF

01 FE HRD TRANSFER SW TO ALTERNATE
02 P/FE HRD BUTTON TO DISCHARGE AT P DISCRETION

OTHERWISE

05 FE CHECK ENGINE INSTRUMENTS TO INSURE ENGINE FEATHERED
06 P/CP AS APPROPRIATE VISUALLY CONFIRM FEATHER
07 FE INSURE FEATHER BUTTON LIGHT IS OUT

IF

01 FE VERIFY FEATHER BUTTON LIGHT IS ON
02 FE PULL APPROPRIATE CONTROL CB

OTHERWISE

08 CP NOTIFY TOWER OR APPROPRIATE CONTROL AGENCY OF
ENGINE FIRE AND REQUEST PERMISSION TO RETURN
TO BASE

09 P CALL FOR EMERGENCY SHUTDOWN CHECKLIST (IF TIME PERMITS)
10 P CALL FOR LANDING CHECKLIST
<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>11</td>
<td>ALL</td>
<td>PERFORM LANDING CHECKLIST</td>
</tr>
<tr>
<td>12</td>
<td>ALL</td>
<td>LAND, TAXI TO LINE &amp; PERFORM NORMAL SHUTDOWN</td>
</tr>
<tr>
<td>13</td>
<td>CP</td>
<td>NOTIFY MAINTENANCE</td>
</tr>
<tr>
<td>14</td>
<td>P/FE</td>
<td>LOG DISCREPANCY ON VIDS</td>
</tr>
</tbody>
</table>
13.1.4

SHF INDICATOR FAILURE

02 FE NOTE SHF INDICATOR FAILURE

02 FE REPORT FAILURE TO P

03 FE CHECK APPROPRIATE CIRCUIT BREAKERS

IF PILOT'S DISCRETION

04 ALL CONTINUE MISSION

OTHERWISE 04 ALL RETURN TO BASE
13.1.4

03 TIT INDICATOR FAILURE

01 FE NOTE INDICATOR FAILURE
02 FE REPORT FAILURE TO P
03 FE CHECK APPROPRIATE CIRCUIT BREAKER

IF AT PILOT'S DISCRETION

04 ALL CONTINUE MISSION

OTHERWISE

04 ALL RETURN TO BASE
13.1.4

04 RPM INDICATOR FAILURE

01 FE NOTE RPM FAILURE

02 FE REPORT FAILURE TO PILOT

03 FE TURN OFF APPROPRIATE SYNCH SERVO SWITCH

IF

04 ALL CONTINUE MISSION AT PILOT'S DISCRETION

OTHERWISE

04 FE NOTE ABNORMAL RPM FLUCTUATIONS OR ENGINE
INSTRUMENT READINGS ABNORMAL

01 FE VERIFY SYNC SERVO SW. OFF

02 FE MOVE TEMP DATUM CONTROL TO NULL

IF

03 FE PULL E HANDLE IF PROP PUMP LIGHT OUT

OTHERWISE

03 FE VERIFY EITHER PROP PUMP LIGHT ON. DO NOT FEATHER.

04 CP NOTIFY TOWER OR APPROPRIATE CONTROL AGENCY
FOR RETURN TO BASE CLEARANCE

05 ALL RETURN TO BASE
13.1.4

05  FUEL FLOW INDICATOR FAILURE
01  FE  NOTE FUEL FLOW FAILURE
02  FE  NOTIFY P OF FAILURE
IF
01  ALL  CONTINUE TAKEOFF TO SAFELY AIRBORNE
03  FE  CHECK APPROPRIATE CIRCUIT BREAKER
IF
04  ALL  CONTINUE MISSION
OTHERWISE
04  ALL  RETURN TO BASE
13.1.4

06 OIL PRESSURE LIGHT

01 FE NOTES LIGHT ON

02 FE NOTIFY PILOT OIL PRESSURE LIGHT ON

03 ALL CONTINUE TAKEOFF TILL SAFELY AIRBORNE

04 FE CHECK POWER SECTION GAUGES > 40 psi

05 FE CHECK GEAR BOX GAUGES > 130 psi

06 P CALL "FEATHER ENGINE NO. _____"

07 FE PULL APPROPRIATE E HANDLE

08 P CALL FOR EMERGENCY SHUTDOWN CHECKLIST

09 ALL PERFORM EMERGENCY SHUTDOWN CHECKLIST

10 CP CALL TOWER OR APPROPRIATE CONTROL AGENCY FOR CLEARANCE

11 ALL RETURN TO BASE
13.1.4

07  CHIPS LIGHT

01  FE  NOTE CHIPS LIGHT ON

02  FE  NOTIFY PILOT

IF

01  ALL  CONTINUE TAKEOFF UNTIL SAFELY AIRBORNE

IF

01  ALL  CONTINUE TAKEOFF UNTIL SAFELY AIRBORNE

03  P  CALL "FEATHER ENGINE NO.____"

04  FE  FULL APPROPRIATE E HANDLE

05  P  CALL FOR EMERGENCY SHUTDOWN CHECKLIST

06  CP/FE  PERFORM EMERGENCY SHUTDOWN CHECKLIST

07  CP  NOTIFY TOWER OR APPROPRIATE CONTROL AGENCY

FOR RETURN TO BASE CLEARANCE
13.1.4

G3 GENERATOR MECHANICAL WARNING LIGHT

01 FE NOTE GENERATOR LIGHT ON
02 FE NOTIFY P LIGHT ON

IF ON TAKEOFF AFTER VR

01 ALL CONTINUE TAKEOFF TILL SAFELY AIRBORNE

IF AYC 314 NOT INSTALLED

03 P CALL "FEATHER ENGINE NO____"

04 FE PULL APPROPRIATE E HANDLE

05 P CALL FOR "EMERGENCY SHUTDOWN CHECKLIST" A-5-3, C-5-37

06 CP/FE PERFORM EMERGENCY SHUTDOWN CHECKLIST

07 CP CALL TOWER OR APPROPRIATE CONTROL AGENCY
FOR RETURN TO BASE CLEARANCE

OTHERWISE AYC 314 IS INSTALLED

03 ALL CONTINUE MISSION IF REQUIRED

(NOTE: GENERATOR MAY BE OPERATED UP TO 10 HOURS)
13.1.4

09  AUTO FEATHER

01  FE  NOTE APPROPRIATE ENGINE INSTRUMENTS STOP FUNCTIONING

02  FE  NOTIFY P OF ENGINE POWER LOSS

IF

01  P  CONTINUE TAKEOFF TILL SAFELY AIRBORNE

03  P  CALL "FEATHER ENGINE NO.______"

04  FE  PULL APPROPRIATE E HANDLE

05  P  CALL FOR EMERGENCY SHUTDOWN CHECKLIST

A-5-3, C-5-37

06  CP/FE PERFORM EMERGENCY SHUTDOWN CHECKLIST

07  CP  NOTIFY TOWER OR APPROPRIATE CONTROL AGENCY

FOR RETURN TO BASE CLEARANCE
13.1.4

10  MASTER ELECTRICAL LIGHT  A-1-80, C-1-110

01  FE  NOTE MASTER ELECTRICAL LIGHT ON

02  FE  REPORT LIGHT ON TO PILOT

IF  ON TAKEOFF AFTER VR

01  P  CONTINUE TAKEOFF TILL SAFELY AIRBORNE

03  FE  CHECK OVERHEAD ELECTRICAL PANEL FOR CAUSES:

          GENERATOR LIGHTS (3); TR OVERHEAT LIGHTS (3)

(NOTE: REFER TO 13.1.03.10.08 FOR TROUBLESHOOTING
   PROCEDURE)

04  CP  CALL TOWER OR APPROPRIATE AGENCY FOR RETURN

          TO BASE CLEARANCE AT PILOTS DISCRETION

05  ALL  RETURN TO BASE
13.1.4

11 MASTER PRESSURE SYSTEM

01 FE NOTE MASTER PRESSURE SYSTEM LIGHT ON

02 FE NOTIFY PILOT LIGHT ON

IF ON TAKEOFF AFTER VR

01 ALL CONTINUE TAKEOFF TILL SAFELY AIRBORNE

03 FE CHECK OVERHEAD PANEL FOR POSSIBLE CAUSE

(Note: Refer to 13.1.02.10.2 for troubleshooting procedure)

IF PILOT'S DISCRETION

04 ALL CONTINUE MISSION

OTHERWISE

04 CP CALL TOWER OR APPROPRIATE CONTROL AGENCY

FOR RETURN TO BASE CLEARANCE
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13.1.4

13 TD (TEMP DATUM) SYSTEM MALFUNCTION

01 ANY NOTE TIT, SHP, FUEL FLOW INDICATORS FLUCTUATING

02 FE PUT TD CONTROL SWITCH FOR AFFECTED ENGINE IN NULL

IF FLUCTUATIONS CEASE

03 ALL CONTINUE MISSION

OTHERWISE

03 FE VERIFY ENGINE INSTRUMENTS FLUCTUATIONS

04 P CALL FOR EMERGENCY SHUTDOWN CHECKLIST

05 CP/FE PERFORM EMERGENCY SHUTDOWN CHECKLIST

06 CP NOTIFY TOWER OR APPROPRIATE CONTROL AGENCY

OF SITUATION AND REQUEST RETURN TO BASE CLEARANCE

07 ALL RETURN TO BASE
13.2 PROPELLER MALFUNCTION

1 TAXI
   01 PROPELLER PUMP NO. 1 LIGHT ON
   02 PROPELLER PUMP NO. 2 LIGHT ON

2 TAKEOFF PRIOR TO REFUSAL
   01 PROPELLER MALFUNCTION

3 TAKEOFF AFTER REFUSAL
   01 PROPELLER MALFUNCTION

4 IN-FLIGHT
   01 PROPELLER FAILS TO FEATHER
   02 PROPELLER OVERSPEED
   03 PITCHLOCKED PROPELLER
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</table>
TAEG REPORT NO. 7

13.2.1.02
PROP PUMP NO. 2
LIGHT ON

01
FE
NOTE
PROP PUMP NO. 2;
LIGHT ON

02
FE
NOTIFY
PILOT

03
FE
PLACE
FUEL/IGNITION SW TO
OFF

04
CP
NOTIFY
MAINTENANCE

05
ALL
RETURN TO LINE

06
ALL
PERFORM
NORMAL
SECURE
CHECKLIST

07
P/FE
LOG
DISCREPANCY ON VIDS

203
13.2.2

01  PROPELLER MALFUNCTIONS PRIOR TO REFUSAL  A-5-7, C-5-30

01  FE  VERIFY PROP PUMP NO. 1 OR NO. 2 ON OR
      REN STABILIZES OVER 103.5%

02  FE  NOTIFY PILOT OF MALFUNCTION

03  P   CALL "FEATHER AND ABORT"

04  FE  PULL E HANDLE

05  P   RETARD POWER LEVERS

06  P   MAINTAIN DIRECTIONAL CONTROL WITH POWER AND
      BRAKES/NOSE GEAR STEERING

07  CP  NOTIFY TOWER OF ABORT AND REQUEST TAXI CLEARANCE

08  P   TAXI CLEAR OF ACTIVE

09  CP  NOTIFY MAINTENANCE

10  ALL  RETURN TO LINE

11  ALL  PERFORM NORMAL SECURE CHECKLIST

12  P/FE LOG DISCREPANCY ON VIDS

13.2.2.01
PROPELLER MALFUNCTION
PRIOR TO REFUSAL
13.2.3 TAKEOFF AFTER REFUSAL

01 PROPELLER MALFUNCTIONS

01 FE NOTE EITHER PROPELLER PUMP LIGHT ON OR RPM STABILIZED OVER 103.5%

02 FE NOTIFY PILOT

03 P CONTINUE TAKEOFF, MANEUVER AIRCRAFT NOT TO EXCEED 150 KTS IAS

04 P AT SAFE ALTITUDE DIRECTS ACTION AS PRESCRIBED in 13.2.04 PROCEDURES
13.2.4

01 PROPELLER FAILS TO FEATHER COMPLETELY

01 FE PULL E HANDLE
01 ALL VERIFY THAT PROPELLER CONTINUES TO ROTATE
02 P DECREASE AIRSPEED
03 FE VERIFY FEATHER BUTTON IN
04 FE PUSH E HANDLE IN

(NOTE: IF ENGINE HAS BEEN SECURED BECAUSE OF
ENGINE FIRE OR FUEL LEAK, CAREFUL CONSIDERATION
SHOULD BE GIVEN BEFORE PUSHING EMERGENCY SHUTDOWN
HANDLE BACK IN. TEMPERATURES MAY BE SUFFICIENTLY
HIGH TO CAUSE REIGNITION)

05 FE PULL OIL TANK SHUTOFF VALVE CIRCUIT BREAKER
06 FE PULL EMERGENCY SHUTDOWN HANDLE OUT
07 FE PUSH FEATHER PUMP PRESSURE CUTOUT OVERRIDE
08 FE IF THE LIGHT IN THE FEATHER BUTTON IS OUT, SELECT
 ALTERNATE BUS FOR PROPELLERS NO. 1 AND NO. 4
09 FE CHECK PROP FEATHER CIRCUIT BREAKERS IN

13.2.4.01
PROPELLER FAILS TO FEATHER
13.2.4

O2  FE  PUSH FEATHER BUTTON IN
O1  ALL  VERIFY THAT PROPELLER CONTINUES TO ROTATE
O2  P  DECREASE AIRSPEED
O3  FE  VERIFY FEATHER BUTTON IN
IF
Q4  FE  LIGHT IN BUTTON ON
PERFORM PROP FAILS TO FEATHER PROCEDURE (SEE 13.2.4.01.01)
 OTHERWISE
Q4  FE  LIGHT IN BUTTON OFF
ATTEMPT RESTART
IF
Q5  ALL  RESTART SUCCESSFUL
CONTINUE MISSION
 OTHERWISE
Q5  FE  RESTART NOT SUCCESSFUL
PERFORM PROP FAILS TO FEATHER PROCEDURE (SEE 13.2.4.01.01)

13.2.4.01
PROPPELLER FAILS TO FEATHER
13.2.4

PROPELLER OVERSPEED

02

FE

NOTE RPM INDICATOR > 103.5%

03

FE

VERIFY PROP PUMP 1 AND PROP PUMP 2 LIGHTS OUT

FE

PLACE APPROPRIATE SYNC SERVO SW OFF

IF

04

FE

VERIFY RPM INDICATION RETURNS TO NORMAL IN MECHANICAL GOVERNING

05

ALL

CONTINUE MISSION

OTHERWISE

04

FE

VERIFY RPM INDICATION REMAINS > 103.5%

05

FE

NOTIFY PILOT

06

P

CALL "FEATHER ENGINE NO. ___"

07

FE

PULL E HANDLE

(Note: If either prop pump light is on, do not feather, refer to operation with pitchlocked prop 13.2.04.3)
13.2.4

03 PITCHLOCKED PROPELLER

01 FE NOTE SYMPTOMS OF PITCHLOCKED PROPELLER (RPM
STABILIZED AT FUEL GOVERNING RPM, RPM VARIES
WITH POWER MOVEMENT, DECREASE IN ALTITUDE OR
AIRSPEED CAUSES RPM TO DECREASE AND HORSEPOWER
TO INCREASE)

IF 02 FE VERIFY RPM < 103.5%

03 P AT HIS DISCRETION CALLS FOR FEATHERING

04 FE PUSH APPROPRIATE FEATHER BUTTON OR FULL E HANDLE

OTHERWISE 02 FE VERIFY OVERSPEED RPM > 103.5%

03 FE ADVISE PILOT

04 FE PLACE PWR LEVER FULL FORWARD

05 FE VERIFY RPM > 103.5%

06 FE SELECT NORMAL ON PROP SYNC SERVO SW.

07 FE SELECT TEST ON FUEL GOVERNOR & PROP PITCH LOCK SW

13.2.4.03
PITCHLOCKED PROPELLER
13.2.4

03 PITCHLOCKED PROPELLER (CONTINUED)

08 FE MONITOR SHP INDICATOR TO INSURE SHP DOES NOT GO OR REMAIN NEGATIVE.

(NOTE: FE ADVISES P TO DECREASE TAS TO INCREASE SHP)

09 FE MINIMIZE USE OF BLEED AIR FROM AFFECTED ENGINE

10 CP CONTACT APPROPRIATE CONTROL AGENCY FOR CLEARANCE TO NEAREST SUITABLE AIRPORT

IF RANGE CRITICAL

11 P AT HIS DISCRETION MAY ELECT TO SHUT DOWN AN OPERATING ENGINE TO INCREASE RANGE

OTHERWISE 12 P MANEUVER AIRCRAFT TO SUITABLE AIRPORT

13 FE RETARD POWER LEVER AS REQUIRED SO AS NOT TO EXCEED SHP LIMITS

14 ALL PERFORM NORMAL DESCENT AND LANDING CHECKLISTS

15 FE PLACE FUEL AND IGNITION SW OFF WHEN AIRSPEED AND POWER LIMITS REDUCE RPM TO 95% BUT NOT LESS THAN 130 KTS

16 P MANEUVER AIRCRAFT TO COMPLETE LANDING
13.3 DECOUPLING IN FLIGHT

01 FE VERIFY ABNORMAL ENGINE INSTRUMENT READINGS

IF DECOUPLE DUE TO FUEL CUTOFF OR ENGINE FAILURE

01 FE VERIFY FUEL FLOW AND SHP INDICATORS READ ZERO
AND TIT DECREASING

02 FE NOTIFY PILOT

03 P CALL "FEATHER ENGINE NO._"

04 FE PULL E HANDLE

IF DECOUPLE DUE TO DECOUPLER FAILURE

01 FE VERIFY SHP READS ZERO, FUEL FLOW ABOUT 600 LBS/HR
AND TIT ABOUT 550° C, AND RPM APPROX 100%

02 FE NOTIFY PILOT

03 P CALL "FEATHER ENGINE NO._"

04 FE PULL E HANDLE

IF DECOUPLE DUE TO PROPELLER FAILURE

01 FE VERIFY SHP ZERO, TIT ABOUT 550°, FUEL FLOW ABOUT
600 LB/HR, RPM > 100%

02 FE NOTIFY PILOT
13.3.1 DECOUPLING IN FLIGHT (CONTINUED)

03 P CALL "FEATHER ENGINE NO.____"

IF 04 FE VERIFY PROP PUMP LIGHTS OFF
05 FE PULL E HANDLE

OTHERWISE

04 FE VERIFY PROP PUMP LIGHT ON
05 FE PLACE FUEL & IGNITION SW OFF
06 CP CALL APPROPRIATE CONTROL AGENCY OF EMERGENCY AND F/O.

CLEARANCE TO NEAREST SUITABLE AIRPORT

07 P ALERT CREW AND DIRECT EMERGENCY PROCEDURES AS REQUIRED
08 P MANEUVER AIRCRAFT TO AIRPORT
09 ALL COMPLETE DESCENT & LANDING CHECKLISTS
10 P LAND AIRCRAFT
13.4 FUSELAGE FIRE OR FIRE OF UNKNOWN ORIGIN

1 ANY DISCOVER SMOKE OR FIRE
2 ANY NOTIFY P
3 P CALL FOR FUS/ELECT FIRE OF UNK ORG CKLST

A CP/TACCO ALERT CREW, ACTIVE FIRE BILL AND RESPOND "ALERTED"

(NAVAIR 01-75PAA-1 page 5-11 Fig 5-3 OR
NAVAIR 01-75 PAC-1 page 5-2 and 5-3 FOR FIRE BILL)

01 ALL START SEARCH FOR ORIGIN

B FE TURN CABIN EXHAUST FAN OFF AND RESPOND "OFF"

(NOTE: RUNNER REPORTS IN PERSON OR ICS AFTER EACH
STEP AS TO ANY DISCOVERIES)

IF 

FIRE SOURCE IS NOT DETERMINED

C FE TURN BUS A SW OFF

D FE PULL BOOST LEVERS

E FE TURN BUS B SW OFF

F FE TURN GEN 2 & GEN 3 SW'S OFF

G P/CP/FE DON SMOKE MASKS IF REQUIRED

H FE PLACE EITHER LEFT OR RIGHT EDC DUMP SW TO DUMP

13.4.1 FUSELAGE FIRE OR FIRE OF UNKNOWN ORIGIN
13.4.1 FUSELAGE FIRE OR FIRE OF UNKNOWN ORIGIN (CONTINUED)

I P INITIATE EMERG DESCENT IF REQUIRED
(FLT IDLE, MIN DIFF ON CABIN PRESS, DUMP REMAINING EDC)
(NOTE: P MAY ELECT TO REMAIN AT ALT IF OXY IS PROVIDED
FOR ENTIRE CREW TO HELED IN COMBATING FIRE)

01 CP MAKE EMERG TRANSMISSION AS REQUIRED AND IF REQUIRED
JETTISON IS PERFORMED

J FE PLACE ESS BUS SW OFF (ICS NOW INOP, RADIOS INOP)

K FE PLACE START SEL SW TO ANY ENGINE (FOR START ESS AC/DC
PWR TO TIT GAUGE)
(NOTE: THIS STEP MAY NOT BE PERFORMED IF DISTANCE FROM
LANDING WOULD TAKE TIME SUFFICIENT TO DEplete BATTERY)
(FLT INSTRUMENTS AVAILABLE: PILOTS TURN & SLIP, A/S, ALT,
WET COMPASS, VSI)

IF FIRE PERSISTS

L FE TURN #4 GEN SW OFF
(NOTE: AT ANY TIME DURING KLST IF ORIGIN OF FIRE IS
DETERMINED CREW NOTIFIES P AS TO LOCATION/CAUSE. CHECKLIST
WOULd BE STOPPED WHEN CAUSE IS DETERMINED FOR APPROPRIATE ACTION

13.4.1 FUSELAGE FIRE OR FIRE OF UNKNOWN ORIGIN
13.4.1 FUSELAGE FIRE OR FIRE OF UNKNOWN ORIGIN (CONTINUED)

04 P AT HIS DISCRETION WILL RETURN TO BASE OR OTHER LANDING SITE
   (NOTE: IF SOURCE OF FIRE DETERMINED/CAUSE OF FIRE CORRECTED:

05 P CALL FOR "RESTORING ELECT PWR CKLST" OR SMOKE REMOVAL.

06 CP CALL APPROPRIATE CKLST

A ALL PLACE OXY SEL OFF, RESPOND "OFF"
B FE INSURE ALL AFFECTED EQUIP DISCONNECTED (IF POSSIBLE)
C ALL REDUCE ELECT LOAD TO MIN (RADIO, NAVAIDS, SYSTEMS OFF)
D FE TURN SYNCH SERVO SW'S OFF
E FE TURN GEN SW'S ON - ONE AT A TIME
   (NOTE: ALL OBSERVERS IN POSITION PER FIRE BILL TO VERIFY
   NO REOCURRENCE OF FIRE)
F FE BUS MONITOR SW'S ON, ONE AT A TIME
   (NOTE: ALL OBSERVERS IN POSITION PER FIRE BILL TO VERIFY NO REOCURRENCE OF FIRE)
G ALL RESTORE ELECT LOAD AS REQUIRED (RADIOs, NAV AIDS, SYSTEMS)
H FE VERIFY ENG START SEL OFF
I FE TURN CABIN EX SW ON
J FE PERFORM GOVERNOR INDEXING CHECK
K CP CALL "CKLST COMPLETE"
13.4
2 APU FIRE

01 ANY NOTE APU WARNING LIGHTS GLOW AND APU WARNING HORN SOUND
   (NOTE: APU SHUTDOWN AND FIRE EXTINGUISHING SEQUENCE IS
   AUTOMATIC)

IF REQUIRED

02 FE OPERATE MANUAL RELEASE SW

03 FE VERIFY APU SHUT DOWN

04 FE VERIFY APU INTAKE & EXHAUST DOORS LIGHT OUT
   (NOTE: 20 SECONDS AFTER OPERATING MANUAL RELEASE SW THE
   HRD WILL DISCHARGE IF EXHAUST DOOR DOES NOT CLOSE)
### 13.4

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**NOTES**

- NOTE SMOKE OR FIRE FROM WING SECTION
- VERIFY ENGINE FIRE WARNING LIGHTS OUT
- COMMAND SHUTDOWN OF ENGINES ON AFFECTED WING
- PERFORM ENGINE SHUTDOWN PROCEDURE
- MONITOR AFFECTED WING FOR EVIDENCE OF FIRE
- NOTIFY APPROPRIATE CONTROL AGENCY OF EMERGENCY
- SET IFF CONTROL FOR TRANSMITTING EMERGENCY
- ASSESS SITUATION - DECISION TO LAND, DITCH OR BAIL OUT AS SITUATION DICTATES

---

**References**

- C-5-42, C-5-5
- A-5-3, C-5-37
13.4

4 BRAKE FIRE

01 ANY DISCOVER EVIDENCE OF BRAKE FIRE

02 ANY NOTIFY FLIGHT STATION

03 CP REQUEST FIRE FIGHTING EQUIPMENT

04 P STOP AIRCRAFT USING REVERSE THRUST IF POSSIBLE WITHOUT BRAKES

05 P HOLD NOSE WHEEL STRAIGHT AHEAD

06 P RELEASE BRAKE ON BURNING WHEEL, OPPOSITE BRAKE ON, SET PARKING BRAKE

07 FE SET RPM SW FOR ENGINE OVER BRAKE FIRE TO NORMAL

08 P SET POWER ON ENGINE OVER BRAKE FIRE TO APPROXIMATELY 1000 SHP

09 CP SET WING FLAPS TO TAKEOFF OR APPROACH

10 FE PULL E HANDLES FOR ENGINES NOT BEING USED

11 ALL UNNECESSARY CREW MEMBERS EVACUATE A/C ON SIDE OPPOSITE FIRE AND PROCEED AFT OF A/C

UPON ARRIVAL OF FIRE FIGHTING EQUIPMENT

12 P/FE PULL REMAINING E HANDLES
13.4

5 SMOKE & FUME ELIMINATION A-5-12, C-5-3/4

01 ANY DETECT SMOKE OR FUMES

02 P CALL FOR FUS/ELECT FIRE UNK ORIGIN CKLST

03 ALL PERFORM FUSELAGE FIRE OR ELECTRICAL FIRE UNKNOWN ORIGIN CHECKLISTS (SEE 13.4.1)

IF FIRE EXISTS

WITH NON ESS BUS AVAIL

04 P,CP,FE SMOKE MASK ON

05 P/CP NOTIFY CREW TO USE WALKAROUND OXYGEN BOTTLES

SET TO 100% OXYGEN

06 P DESCENT TO SAFE ALTITUDE (DEPENDS UPON TERRAIN, ETC.)

07 FE SELECT OFF CABIN EXHAUST FAN SWITCH

08 FE OPEN AUX VENT SW. SELECT OPEN OUTFLOW VALVE SWITCH

(NOTE: IF AT A SAFE ALTITUDE)

09 FE SELECT DUMP EDC DUMP SWITCHES

10 FE CLOSE AUX VENT AT 1" CABIN PRESS DIFFERENTIAL

11 P REDUCE A/S TO ≤ 170 KTS

13.4.5
SMOKE & FUME ELIMINATION
13.4.5 SMOKE & FUMES ELIMINATION (CONTINUED)

12 FE OPEN RIGHT HAND OVER-WING EMERG. EXIT
(NOTE: A/S MUST BE MAINTAINED BELOW 170 KTS)

13 FE OPEN OVERHEAD SMOKE REMOVAL DOOR
(NOTE: NEVER OPEN FLIGHT STATION EMERGENCY EXIT UNTIL RIGHT HAND CABIN EMERGENCY EXIT IS OPEN)
13.5

1 EXPLOSIVE DECOMPRESSION C-5-4

01 ALL DON EMERG. O₂

02 P ASCERTAIN CAUSE

IF CAUSE CANNOT BE REPAIRED IN FLIGHT

03 P DECIDE TO CONTINUE MISSION OR DESCEND TO A SAFE ALTITUDE

(SEE 13.7 FOR EMERGENCY DESCENT)
13.6

EMERGENCY DEPRESSURIZATION

01 ELECTRICAL POWER AVAIL - (NON ESS BUS ON)

01 FE PLACE AUX VENT SW OPEN
02 FE PLACE OUTFLOW VALVE SW OPEN
03 FE PLACE EDC DUMP SW'S TO DUMP
04 FE CLOSE AUX VENT SW AT 1 INCH DIFFERENTIAL

02 WITHOUT ELECTRICAL POWER AVAILABLE

01 P MANEUVER A/C TO 12,000 FT OR BELOW
02 E SET CABIN ALTITUDE CONTROL TO 10,000 FT
03 FE SET BAR CORR KNOB TO 28 TN HG
04 FE SET RATE KNOB TO MAX

IF NECESSARY TO OPEN OVERWING HATCH

05 FE PULL E HANDLE FOR #2 OR #3 AS APPROPRIATE

13.6.1

EMERGENCY DECOMPRESSION
13.7  

**EMERGENCY DESCENT**

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**13.7.1**  

**EMERGENCY DESCENT**
13.8  APPROACH AND LANDING EMERGENCIES

1. ONE ENGINE INOPERATIVE LANDING
2. TWO ENGINES INOPERATIVE LANDING
3. TWO ENGINE INOPERATIVE WAVEOFF
4. BOOST OFF LANDING
5. EMERGENCY BRAKE OPERATION
6. UNSAFE LANDING GEAR INDICATION LANDING
7. UNLOCKED GEAR INDICATION LANDING
8. FLAT TIRE LANDING
9. LANDING WITHOUT ALL GEAR EXTENDED
10. SOFT GROUND OR UNPREPARED SURFACE LANDING
11. NO FLAP LANDING
12. NO BETA LIGHT AFTER LANDING
13.8

1     ONE ENGINE INOPERATIVE LANDING

     (NOTE: FOLLOW NORMAL PROCEDURES (SEE 8.2, 9.0, 9.3) WITH
     ADDITIONAL PROCEDURES AS FOLLOWS.)

     01  P  BRIEF CP/FE TO ASSIST DURING APPROACH AND LANDING AS REQUESTED

     02  P  FLY NORMAL TRAFFIC PATTERN

     IF

     CROSSWIND CONDITIONS

     01  P  PLAN LANDING TO POSITION INOP ENG UPWIND

     03  P  ADJUST POWER TO MAINTAIN DESIRED PATTERN AIRSPEED

     04  P  ADJUST RUDDER TRIM AS NECESSARY

     05  P  COMPLETE NORMAL LANDING

     06  P  WHEN NOSEWHEEL ON RUNWAY USE REVERSE AS DESIRED

     07  P  MAINTAIN DIRECTIONAL CONTROL WITH RUDDER & AILERON

     08  CP  HOLD CONTROL COLUMN FORWARD

     09  P  AS RUDDER EFFECTIVENESS DECREASES USE ASYMMETRIC POWER AND
           NOSE GEAR STEERING TO MAINTAIN DIRECTIONAL CONTROL

     13.8.1

     ONE ENGINE INOPERATIVE LANDING
13.8

2  TWO ENGINE INOPERATIVE LANDING  A-5-6, C-5-43

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<tbody>
<tr>
<td>01</td>
<td>P/CP</td>
<td>CONTACT APPROPRIATE CONTROL AGENCY FOR WEATHER AT INTENDED</td>
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<tr>
<td></td>
<td></td>
<td>LANDING SITE AND NOTIFY OF EMERGENCY</td>
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<tr>
<td>02</td>
<td>P</td>
<td>CLOSELY CHECK WEATHER</td>
<td></td>
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<tr>
<td>03</td>
<td>CP</td>
<td>REQUEST LANDING CLEARANCE ON LONGEST AVAILABLE RUNWAY</td>
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<tr>
<td>04</td>
<td>P</td>
<td>BRIEF CP/FE FOR REQUIRED ASSISTANCE DURING APPROACH AND</td>
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<td></td>
<td></td>
<td>LANDING</td>
<td></td>
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<tr>
<td>05</td>
<td>P</td>
<td>FLY NORMAL PATTERN USING POWER AS REQUIRED TO MAINTAIN</td>
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<tr>
<td></td>
<td></td>
<td>1.52 Vs (12 UNITS AOA) OR 160 KTS (WHICHEVER IS HIGHER)</td>
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<td>IN CLEAN CONFIGURATION</td>
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<td>06</td>
<td>P</td>
<td>CALL FOR TAKEOFF OR APPROACH FLAPS</td>
<td></td>
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<tr>
<td>07</td>
<td>CP</td>
<td>SET FLAPS AND RESPOND</td>
<td></td>
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<tr>
<td>08</td>
<td>P</td>
<td>ADJUST POWER AS REQUIRED TO MAINTAIN 145 KTS INDICATED</td>
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<td>(MINIMUM)</td>
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<tr>
<td>09</td>
<td>P</td>
<td>TRIM RUDDER AS REQUIRED</td>
<td></td>
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<tr>
<td>10</td>
<td>P</td>
<td>CALL FOR LANDING GEAR WHEN LANDING IS ASSURED</td>
<td></td>
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<tr>
<td>11</td>
<td>CP</td>
<td>PLACE GEAR HANDLE IN DOWN POSITION AND CALL &quot;GEAR DOWN&quot;</td>
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</tbody>
</table>

13.8.2

TWO ENGINE INOPERATIVE LANDING
13.8.2 TWO ENGINE INOPERATIVE LANDING (CONTINUED)

12 P  ADJUST POWER TO MAINTAIN 145 KTS (MINIMUM)

13 P  RETRIM RUDDER AS REQUIRED

14 P  MAINTAIN 145 KTS ON FINAL APPROACH, CALL FOR LANDING FLAPS
      IF DESIRED

15 CP SET DESIRED FLAPS

16 P  DECREASE SPEED TO 1.3 Vs WITH LANDING FLAPS OR 1.35 Vs WITH
      APPROACH FLAPS (12 UNITS AOA). SEE NATOPS FIG 5-2 OR FIG 5-9

17 P  LAND A/C, LOWER NOSEGEAR, APPLY REVERSE THRUST TO OPERATIVE
      ENGINES, MAINTAIN DIRECTIONAL CONTROL WITH RUDDER UNTIL NO
      LONGER EFFECTIVE, THEN NOSE GEAR STEERING.

18 P  TAXI IN NORMAL RPM
13.8

3 TWO ENGINE INOPERATIVE WAVEOFF

01 P MAINTAIN AIRSPEED--145 KNOTS MINIMUM

02 P/FE ADVANCE POWER LEVERS TO MAXIMUM POWER AS SOON AS DIRECTIONAL CONTROL IS GAINED

03 P MAINTAIN OPTIMUM CONTROL BY HOLDING FAILED ENGINES 5 DEGREES HIGH

04 CP SET WING FLAP LEVER--TAKEOFF OR APPROACH AT PILOT'S COMMAND

05 CP RETRACT LANDING GEAR LEVER--UP

06 CP SET WING FLAP LEVER UP (150 KNOTS MINIMUM) AT PILOT'S COMMAND

A-5-9, C-5-43
13.8.4
BOOST OFF LANDING

01 P FLY TRAFFIC PATTERN SLIGHTLY WIDER THAN NORMAL
02 FE DECIDES TO USE TAKEOFF OR APPROACH FLAPS
03 CP VERIFY CG NO FURTHER FORWARD THAN 25% MAC
04 P SET FLAPS AT TAKEOFF OR APPROACH
05 P FLY A/C ON FINAL SLIGHTLY FLATTER THAN NORMAL
06 P LAND A/C NOSE HIGH WITH POWER ON
07 P AT TOUCHDOWN LOWER NOSEGEAR
08 CP WHEN NOSEGEAR ON GROUND, APPLY REVERSE AS REQUIRED
       WHEN A/S < 135 KTS, < 125 IF NO ELECTRICAL POWER
09 ALL STEADY CONTROL COLUMN IN FORWARD POSITION
       COMPLETE NORMAL AFTER LANDING PROCEDURES

A-5-40, A-5-19-20,
C-5-44
A-3-
C-3-37 FIG 3-10

TAEC REPORT NO. 7

13.8
BOOST OFF LANDING
13.8

5 EMERGENCY BRAKE OPERATION

IF HYDRAULIC BRAKE PRESSURE IS AVAILABLE

01 FE PLACE 1B HYDRAULIC PUMP ON

(NOTE: ALLOW 3 MINUTES FOR 1B PUMP TO CHARGE ACCUMULATOR)

02 P/CP APPLY BRAKES AS REQUIRED

(NOTE: A MINIMUM OF 8 FULL BRAKE APPLICATIONS IS AVAILABLE)

OTHERWISE NO HYDRAULIC BRAKE PRESSURE IS AVAILABLE

01 P/CP PULL EMERGENCY HANDLE TO APPLY BRAKES

(NOTE: PULL HANDLE SLOWLY, DIFFERENTIAL BRAKING IS NOT AVAILABLE)
13.8

6 LANDING WITH UNSAFE LANDING GEAR INDICATION

01 ANY NOTE UNSAFE INDICATION WHEN GEAR IS EXTENDED (RED LIGHT IN GEAR HANDLE, UNLOCKED INDICATION OF LANDING GEAR INDICATORS OR FLASHING RED LIGHTS ON INSTRUMENT PANEL)

02 P/CP OPERATE GEAR THRU UP/DOWN CYCLE THRU SEVERAL CYCLES

IF SAFE GEA' INDICATION IS RECEIVED

03 P MAKE NORMAL LANDING

OTHERWISE UNSAFE INDICATION PERSISTS

03 P NOTIFY CREW, MAKE ALTERNATE PULLUPS AND PUSHOVERS TO INCREASE G FORCES ON THE LANDING GEAR

IF SAFE INDICATION IS RECEIVED

04 P MAKE NORMAL LANDING

OTHERWISE UNSAFE INDICATION PERSISTS

04 FE PLACE HYD PUMP NO. 1 AND 1A SWITCHES TO OFF

05 P INCREASE AIRSPEED TO 300 KTS FOR MAXIMUM AIRLOAD ON EXTENDED GEAR
13.8.6 LANDING WITH UNSAFE LANDING GEAR INDICATION (CONTINUED)

IF

SAFE INDICATION IS RECEIVED

06

FE PLACE HYD PUMP NO. 1 AND IA SWITCHES TO ON

07

P MAKE NORMAL LANDING

UNSAFE INDICATION PERSISTS

06

FE PLACE HYDRAULIC PUMP NO. 1 AND IA SWITCHES TO ON

07

P FLY AIRCRAFT BY THE TOWER OR REQUEST VISUAL INSPECTION

BY AN AIRCRAFT

Landing gear appears to be down but unsafe indication persists. Proceed to landing with unlocked gear procedure. SECTION 13.8.7

SECTION 13.8.6
TAEG REPORT NO. 7

13.8.7
UNLOCKED GEAR INDICATION LANDING

- A-5-15, C-5-46

7

01
P
MAKE NORMAL LANDING

02
P
NOSE GEAR INDICATES UNLOCKED

03
P
LOWER NOSE GEAR

04
P/CP
HOLD YOKE FORWARD

05
P
STOP A/C USING BRAKES AND POWER LEVERS AT IDLE

06
P
ALL MAINTAIN POSITIVE THRUST AND HOLD POSITION WITH THE BRAKES

07
P/CP
MAINTAIN HYDRAULIC PRESSURE

08
P
NOTIFY MAINTENANCE FOR INSERTION OF GEAR SAFETY PINS

09
P
MAINTAIN POSITION UNTIL SAFETY PINS ARE INSERTED

RETURN TO LINE
13.8

8 FLAT TIRE LANDING

IF NOSE GEAR TIRE FLAT

01 P/FE VERIFY AFT CG FOR LANDING
02 P MAKE NORMAL LANDING
03 P KEEP NOSEGEAR OFF RUNWAY AS LONG AS POSSIBLE
04 P USE MINIMUM BRAKING

IF ONE MAIN GEAR TIRE FLAT

01 P MAKE NORMAL LANDING
02 P LOWER NOSE GEAR AS SOON AS POSSIBLE
03 P STOP A/C USING REVERSE THRUST
04 P TAXI A/C SLOWLY

OTHERWISE BOTH TIRES ON ONE MAIN GEAR FLAT

01 P/FE VERIFY FWG CG FOR LANDING
02 P SELECT WIDEST AVAILABLE RUNWAY CONSISTENT WITH WIND CONDITIONS
03 P LAND A/C WITH APPROACH FLAPS IF POSSIBLE
04 P LAND A/C ON SIDE OF RUNWAY AWAY FROM FLAT TIRES
05 P LOWER NOSEGEAR AS SOON AS POSSIBLE
06 P/CP DEFLECT AILERON AWAY FROM FLAT TIRE SIDE

07 P MAINTAIN DIRECTIONAL CONTROL WITH ASYMMETRIC POWER AND NOSE GEAR STEERING

08 P STOP A/C ON SIDE WITH FLAT TIRES

09 P MAINTAIN POSITION ON RUNWAY (NOTE: DO NOT USE BRAKES ON SIDE WITH FLAT TIRES)

10 P/CP NOTIFY MAINTENANCE EVIDENCE OF FIRE, SEE SECTION 13.4.4 BRAKE FIRE
13.8

9  LANDING WITHOUT ALL GEAR EXTENDED  

IF THE NOSE GEAR IS DOWN AND LOCKED, AND ONE OR BOTH MAIN GEARS FAIL TO EXTEND, RETRACT ALL GEAR AS FAR AS POSSIBLE AND MAKE A WHEELS-UP LANDING.

01  ALL  SECURE OR STOW LOOSE EQUIPMENT

02  P  ORDER CREW TO FASTEN SEAT BELTS

03  FE  DEPRESSURIZE CABIN

04  P  ASSIGN A CREW MEMBER TO OPEN EMERGENCY EXITS AFTER A/C STOPS.

(NOTE: DO NOT OPEN AN EXIT IF FIRE EXISTS IN VICINITY)

(NOTE: FLIGHT CREW MAY ELECT TO REMOVE CERTAIN EMERGENCY EXITS PRIOR TO LANDING IF SPECIAL CIRCUMSTANCES INDICATE THIS IS CLEARLY ADVISABLE. IN THIS EVENT, REDUCE AIRSPEED TO 170 KNOTS PRIOR TO OPENING AN EXIT; DO NOT EXCEED THIS SPEED WHILE AN EXIT IS OPEN OVER THE WING)

05  FE  TURN ALL FUEL BOOST PUMPS OFF

06  FE  TURN FUEL AND IGNITION SWITCH ON ENGINES 2 AND 3 OFF

(NOTE: STEP 6 IS AN OPTIONAL BUT RECOMMENDED PROCEDURE WHICH WILL REDUCE ROTATIONAL ENERGY OF THE INBOARD PROPELLERS AND...
13.8.9 LANDING WITHOUT ALL GEAR EXTENDED (CONTINUED)

DECREASE EXPOSURE TO DAMAGE FROM PROPELLER FRAGMENTS. THIS
SHOULD BE DONE SUFFICIENTLY EARLY DURING FINAL APPROACH TO
ALLOW INBOARD PROPELLERS TO REACH A STABILIZED NTS WINDMILLING
CONDITION AND TO PERMIT PILOT TO REESTABLISH A SMOOTH APPROACH
USING POWER AS REQUIRED FROM ENGINES 1 AND 4.

07 CP EXTEND WING FLAPS TO LANDING POSITION AS SOON AS IT IS CERTAIN
THAT LANDING AREA CAN BE REACHED

08 P HOLD AIRCRAFT OFF AS IN NORMAL LANDING. MAKE CONTACT AT A SPEED
SLIGHTLY ABOVE STALL SPEED

(NOTE: STEP 9 SHOULD BE ACCOMPLISHED IMMEDIATELY ON CONTACT
WITH GROUND.)

09 FE PULL EMERGENCY SHUTDOWN HANDLES (ALL FOUR ENGINES)

10 P REMOVE HAND FROM POWER LEVERS AS RANDOM MOTION OF POWER LEVERS
AFTER GROUND CONTACT MAY CAUSE INJURY TO HAND

11 ALL EVACUATE AIRCRAFT IMMEDIATELY, USING ALL AVAILABLE EXITS.
13.8

10 LANDING ON SOFT GROUND OR UNPREPARED SURFACE

IF LANDING GEAR EXTENDED

01 P MAKE NORMAL LANDING

02 P RETARD POWER LEVERS TO FLT IDLE AS SOON AS POSSIBLE

03 P WHEN POWER NO LONGER REQUIRED FOR DIRECTIONAL CONTROL OR STOPPING, COMMANDS FUEL CHOP FOR 4 ENGINES

04 FL PLACE FOUR FUEL AND IGNITION SWITCHES TO OFF

05 FE VERIFY HYDRAULIC PUMP NO. 18 ON

OTHERWISE LANDING GEAR RETRACTED, SEE SECTION 13.8.9 FOR PROCEDURE
13.8

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Notes</th>
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<tbody>
<tr>
<td>01</td>
<td>P</td>
<td>VERIFY A/C GROSS WT. NO FLAP - MANEUVER FLAP LANDINGS ARE NOT RECOMMENDED AT GROSS WEIGHTS EXCEEDING 91,320 LBS FOR STANDARD A/C OR 103,880 LBS FOR HEAVY WEIGHT A/C.</td>
</tr>
<tr>
<td>02</td>
<td>P/CP</td>
<td>DETERMINE GROUND ROLL DISTANCE USING SECT XI OR XII PART 4 AND FIGURE A-5-6 OR C-5-10</td>
</tr>
<tr>
<td>03</td>
<td>P</td>
<td>SELECT APPROPRIATE RUNWAY FOR LANDING BASED ON STEP 2 AND WIND CONDITIONS</td>
</tr>
<tr>
<td>04</td>
<td>P</td>
<td>MAINTAIN ( V_\text{S} ) OR 160 KTS, WHICHEVER IS HIGHER ON DOWNWIND (NOTE: SEE A-11-17, A-12-17 OR C-11-17 FOR STALL SPEEDS)</td>
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<tr>
<td>05</td>
<td>P</td>
<td>CALL FOR LANDING CHECKLIST</td>
</tr>
<tr>
<td>06</td>
<td>ALL</td>
<td>COMPLETE CHECKLIST</td>
</tr>
<tr>
<td>07</td>
<td>P</td>
<td>SLOW A/C TO 1.2 ( V_\text{S} ) (MINIMUM OF 135 KTS)</td>
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<td>08</td>
<td>P</td>
<td>LAND A/C</td>
</tr>
<tr>
<td>09</td>
<td>P</td>
<td>VERIFY A/S ( \leq 135 ) KTS</td>
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<tr>
<td>10</td>
<td>P</td>
<td>SLOWLY RETARD POWER LEVERS INTO REVERSE RANGE</td>
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<tr>
<td>11</td>
<td>P</td>
<td>USE REVERSE THRUST AND BRAKING TO STOP A/C</td>
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13.8

12  NO BETA LIGHT DURING LANDING

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<tbody>
<tr>
<td>01</td>
<td>P</td>
<td>RETARD POWER LEVERS INTO GROUND OPERATING RANGE</td>
<td></td>
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</tr>
<tr>
<td>02</td>
<td>FE</td>
<td>NOTE BETA LIGHT OR LIGHTS FAIL TO ILLUMINATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>FE</td>
<td>ANNOUNCE NO BETA LIGHT ENG. NO. _____</td>
<td></td>
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<tr>
<td>04</td>
<td>P</td>
<td>IF SWERVE OCCURS, COMMAND FEATHER ENGINE NO. _____</td>
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<tr>
<td>05</td>
<td>FE</td>
<td>PULL E HANDLE</td>
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<tr>
<td>06</td>
<td>P</td>
<td>MAINTAIN DIRECTIONAL CONTROL AND STOP A/C USING REVERSE THRUST AND BRAKES</td>
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13.8.12
NO BETA LIGHT DURING LANDING
13.9

1   EMERGENCY EVACUATION

01  P   COMMAND CREW TO EVACUATE A/C

02  CP  LOWER FLAPS TO TAKEOFF - APPROACH

03  FE  PULL ALL E HANDLES

04  ALL  EVACUATE A/C USING OVERWING ESCAPE HATCHES
       (NOTE: DO NOT USE HATCH ON SIDE WHERE FIRE EXISTS)

05  ALL  PROCEED WELL TO THE REAR OF A/C
### 13.10

#### DITCHING

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<tbody>
<tr>
<td>01</td>
<td>P</td>
<td>ANNOUNCE INTENTION TO DITCH AND TIME UNTIL IMPACT OVER PA SYSTEM OR BY WORD OF MOUTH TO CREW</td>
</tr>
<tr>
<td>02</td>
<td>CP</td>
<td>SET IFF TO EMERGENCY (MODE 3, CODE 77)</td>
</tr>
<tr>
<td>03</td>
<td>CP</td>
<td>ESTABLISH VOICE COMMUNICATIONS</td>
</tr>
<tr>
<td>04</td>
<td>P/FE</td>
<td>REDUCE FUEL LOAD TO MINIMUM</td>
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<tr>
<td>05</td>
<td>FE</td>
<td>DEPRESSURIZE</td>
</tr>
<tr>
<td>06</td>
<td>P</td>
<td>JETTISON ALL EXTERNAL AND BOMB BAY STORES. LEAVE SW IN JETTISON</td>
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<tr>
<td>07</td>
<td>ALL</td>
<td>ADJUST SEAT BELT AND SHOULDERS HARNESS</td>
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<tr>
<td>08</td>
<td>P</td>
<td>DETERMINE SWELL AND WIND CONDITIONS</td>
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**IF**

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<th>Code</th>
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<tbody>
<tr>
<td>09</td>
<td>P</td>
<td>PLAN APPROACH TO DITCH PARALLEL TO AND NEAR CREST OF SWELL</td>
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**OTHERWISE**

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<tr>
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<tr>
<td>09</td>
<td>P</td>
<td>PLAN APPROACH TO DITCH INTO WIND ON UPSLOPE OF SWELL NEAR THE TOP</td>
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<tr>
<td>10</td>
<td>P/CP</td>
<td>VERIFY LANDING GEAR UP</td>
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<tr>
<td>11</td>
<td>P/CP</td>
<td>SET FLAPS AT LANDING</td>
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</table>
13.10.1 DITCHING (CONTINUED)

12 P FLY A/C ADJUSTING POWER AT APPROXIMATELY 300 FEET TO ESTABLISH VS + 10 KTS WITH R/D OF 100 FT/MIN TO CONTACT WATER IF FLAPS AT LANDING
(NOTE: REMOVE HAND FROM POWER LEVERS PRIOR TO IMPACT)

IF FLAPS AT TAKEOFF/APPROACH A/S = VS + 10 + 5

IF FLAPS AT ≤ TAKEOFF/APPROACH A/S = VS + 10 + 20

13 CREW AS DIRECTED BY P, REMOVE OVERWING EMERGENCY ESCAPE HATCHES

14 ALL EVACUATE AIRCRAFT
13.11

1  BAILOUT

01  P  COMMANDS "PREPARE TO BAILOUT" VERBALLY OR BY FOUR (4)
    SHORT RINGS ON THE COMMAND BELL

02  ALL  DON LIFE VESTS AND PARACHUTES

03  ALL  CARRY OUT ABANDON AIRCRAFT STATION PROCEDURES FOR THE
        STATION THEY OCCUPY

04  FE  DEPRESSURIZE

01  FE  PLACE AUX VENT SW TO OPEN

02  FE  PLACE OUTFLOW VALVE SW TO OPEN

03  FE  PLACE LEFT AND RIGHT EXC DUMP/NORMAL SW'S TO DUMP

04  FE  PLACE AUX VENT SW TO CLOSE WHEN CABIN DIFF PRESSURE
        AT ONE INCH DIFFERENTIAL

05  P  REDUCE A/S IF POSSIBLE

06  P  TRIM A/C SLIGHTLY NOSE DOWN

IF  OVER WATER OR UNINHABITED AREA

07  P  PLACE A/C IN PORT TURN AND ENGAGE AUTOPILOT

OTHERWISE

07  P  HEAD A/C TOWARD UNINHABITED AREA AND ENGAGE AUTOPILOT
13.11.1 BAILOUT (CONTINUED)

08 CP SET IFF TO EMERGENCY

09 CP ANNOUNCE ALTITUDE OVER PA AND OVERRIDE

10 CP ESTABLISH VOICE COMMUNICATIONS

11 CP ASSIST PILOT AS DIRECTED

12 P COMMAND "EXECUTE BAILOUT" VERBALLY OR BY ONE (1) LONG
   RING OF COMMAND BELL

13 ALL BAILOUT THROUGH MAIN CABIN DOOR
13.12

1 FUEL BOOST PUMP FAILURE IN CLimb

01 FE VERIFY "BOOST" PUMP INDICATOR ON
02 FE INFORM P OF FAILURE
03 P CONTINUE CLIMB
04 FE MONITOR HORSEPOWER, TIT, FUEL FLOW FOR POWER LOSS
05 FE VERIFY GRADUAL POWER LOSS
06 FE CROSSFEED ENGINE FROM ANOTHER TANK
07 P CONTINUE CLIMB TO MISSION-ASSIGNED ALTITUDE, SET CRUISE
   CONDITION
08 P MAINTAIN CRUISE CONDITION FOR SEVERAL MINUTES
09 FE MONITOR FUEL FLOW, TIT, HP AND SWITCH ENGINE BACK TO TANK
   WITH INOP BOOST PUMP

IF

ENGINE OPERATES SATISFACTORILY

10 ALL CONTINUE MISSION

OTHERWISE

ENGINE FAILS TO OPERATE SATISFACTORILY

10 FE SWITCH BACK TO CROSSFEED, WAIT A FEW MINUTES AND THEN
   SWITCH BACK TO TANK WITH INOP BOOST PUMP
13.12.1 FUEL BOOST PUMP FAILURE IN CLIMB (CONTINUED)

IF

10  ALL  CONTINUE MISSION

OTHERWISE

ENGINE FAILS TO OPERATE SATISFACTORILY

11  FE  SWITCH BACK TO CROSSFEED

12  P  MAKE DECISION TO DESCEND TO LOWER ALTITUDE FOR ENGINE OPERATION OR ABORT MISSION
13.12

1. TRANSFER PUMP FAILURE, TANK 5

2. FE

3. FE

4. FE

5. FE

NOTE TANK 5 FUEL LEVEL WITH OPERATING PUMP

CLOSE TRANSFER VALVES AND ALLOW FUEL QUANTITY IN EACH

WING TANK TO DROP 250 LBS.

OPEN ALL TRANSFER VALVES AND ALLOW TANK 5 TO DROP 1000 LBS

REPEAT STEPS 3 AND 4 UNTIL TANK 5 FUEL LEVELS EQUAL TANK 3.

(NOTE: MANEUVERING A/C IN NOSE DOWN ATTITUDE WILL AID

IN RECOVERING FUEL FROM TANK 5)
13.12

3 BOTH TANK 5 TRANSFER PUMP FAILURE

01 FE NOTE BOTH TANK 5 PRESS LOW LIGHTS ON

02 FE COMPUTE NEW ZERO FUEL WEIGHT

03 P AT HIS DISCRETION COMMAND DUMP FUEL

04 FE PLACE FUEL DUMP SW TO ON AND JETTISON FUEL AS NECESSARY

TO REDUCE WEIGHT (SEE SEC 12.7 FOR FUEL DUMP PROCEDURE)

IF MAXIMUM ZERO FUEL WEIGHT IS STILL OVER MAXIMUM, DO NOT EXCEED

2.1 G, AVOID TURBULENT AIR PENETRATION, ABORT THE MISSION,

AND LAND

OTHERWISE IF ZERO FUEL WEIGHT IS NOT EXCEEDED, ADJUST THE MISSION AS

NECESSARY
13.13

OPERATION WITH ONE A/C GENERATOR

A-5-38, C-5-33

01 FE MONITOR ELECTRICAL LOAD CAREFULLY

02 ALL SECURE ALL NON-ESSENTIAL ELECTRICAL/ELECTRONIC EQUIPMENT

03 ALL SECURE ALL NON-ESSENTIAL CABIN LIGHTS AFT OF FLIGHT STATION

04 FE MONITOR DEICE OPERATION, USE ONLY AS DEICE

(NOTE: UNLESS ABSOLUTELY ESSENTIAL DO NOT USE PROP AND
EMPENNAGE SYSTEMS AT SAME TIME)

05 FE UNCOVER BOOST HANDLES

06 P/CP POSITION UTILITY LIGHTS AND TURN ON

07 P BRIEF CP TO TURN ESS BUS SW OFF IF GENERATOR FAILS

08 P/CP PLACE FLASHLIGHTS IN EASY GRASP

09 P CONTINUE FLIGHT IN VFR CONDITIONS IF POSSIBLE

10 P CHECK WEATHER AT DESTINATION

IF

11 P CONSIDER SELECTING ALTERNATE LANDING SITE
13.13

<table>
<thead>
<tr>
<th>2</th>
<th>OPERATION WITH FAILURE OF ALL GENERATORS</th>
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<tbody>
<tr>
<td>01</td>
<td>FE PULL BOOST HANDLES</td>
</tr>
<tr>
<td>02</td>
<td>CP PLACE ESS BUS MONITORING SW TO OFF</td>
</tr>
<tr>
<td></td>
<td>IF POWER CHANGES REQUIRED</td>
</tr>
</tbody>
</table>
| 03 | FE PLACE ENG START SEL SW TO ANY ENGINE OR PLACE INVERTER AND BATTERY TEST SW TO TEST
|    | (NOTE: PROVIDES POWER TO TIT GAGES)    |
|    | OTHERWISE                                |
| 04 | P SELECT NEAREST SUITABLE LANDING SITE |
| 05 | ALL PERFORM EMERGENCY EXTENSION OF LANDING GEAR |
| 06 | P APPROACH LANDING SITE CAUTIOUSLY, FLY PAST TOWER AND SIGNAL EMERGENCY WITH VERY PISTOL |
| 07 | P FLY BOOST OFF, FLAPS IN POSITION AT LOSS OF GENERATORS AND EMERGENCY BRAKE APPROACH AND LANDING |
| 08 | P WHEN $\frac{A/S}{\text{KTS}} < 125$ RETARD PWR LEVERS TO REVERSE |

13.13.2

OPERATION WITH FAILURE OF ALL GENERATORS
13.14  FAILURE OF THE NO. 1 AND NO. 2 HYDRAULIC SYSTEMS  

A-5-40, C-5-44

1  FE  VERIFY SYSTEM NO. 1 AND SYSTEM NO. 2 HYDRAULIC PRESSURE DECREASING TOWARD ZERO

2  FE  NOTIFY P

3  FE  PLACE HYDRAULIC PUMP SW'S 1, 1A AND 2 OFF

4  FE  PULL BOOST HANDLES FOR ELEVATOR, AILERON AND RUDDER

5  P  FLY BOOST OFF APPROACH AND LANDING

(NOTE: SEE SECTION 13.8.4 FOR PROCEDURE)
TAEG REPORT NO. 7

A-5-40-41, C-5-38

13.15.1
SHIFTING TO BOOST OFF

1
P
TURN AUTOMATIC PILOT OFF

2
P
CHECK TMAN TABS FOR NORMAL SETTING, RETRIM IF REQUIRED

3
FE
PULL BOOSTER SHIFT HANDLES TO OFF

(NOTE: DO NOT APPLY ANY FORCE TO CONTROLS DURING SHIFT)

4
FE
UNABLE TO SHIFT FOR ANY REASON

5
FE
SHUT OFF ALL A/C HYDRAULIC PUMPS

6
FE
FULL SHIFT CONTROL FOR VALUFUNCTIONING SYSTEM

7
FE
LEAVE HYDRAULIC PRESSURE OFF FOR REMAINDER OF FLIGHT

8
FE
RETURN OTHER TWO SYSTEMS TO BOOST ON

OTHERWISE

SHIFT COMPLETED

PLACE HYDRAULIC PUMPS ON

RETURN OTHER TWO SYSTEMS TO BOOST ON

254
13.15

2 LOSS OF CONTROL SURFACE CONTROL

1 P/CP VERIFY FLIGHT STATION CONTROL MOVEMENT HAS NO EFFECT ON A/C ATTITUDE

2 P PLACE AUTOMATIC PILOT ON

3 FE VERIFY FLIGHT CONTROL BOOSTERS ON

4 P LAND A/C USING AUTOPILOT AND TRIM TABS
13.16

1  LANDING GEAR EXTENSION WITHOUT HYDRAULIC PRESSURE

   1  CP  PLACE LANDING GEAR LEVER DOWN
   2  FE  PULL LANDING GEAR CONTROL CB
   3  FE  PULL MAIN LANDING GEAR EMER RELEASE HANDLE (HYDRAULIC
        SERVICE CENTER)
   4  CP  VERIFY MAIN GEAR INDICATIONS DOWN AND LOCKED
   5  FE  PULL NOSEGEAR EMER RELEASE HANDLE
   6  CP  VERIFY ALL GEAR DOWN AND LOCKED

13.16.1

   LANDING GEAR
   EXTENSION WITHOUT
   HYDRAULIC PRESSURE
13.16

2 LANDING GEAR EXTENSION OR RETRACTION (LOSS OF POWER IN ELECTRICAL CONTROL CIRCUIT)

1 FE FULL LANDING GEAR CONTROL CB
2 P LANDING GEAR HANDLE AS DESIRED
3 FE OPERATE LANDING GEAR SELECTOR VALVE
IF RAISING GEAR
4 FE HOLD SELECTOR VALVE IN UNTIL GEAR IS REPORTED UP AND LOCKED
IF EXTENDING GEAR WITH LOSS OF ELECTRICAL (MAIN DC FAILURE)
5 P RETARD ONE POWER LEVER TO FLT IDLE PRIOR TO OPERATING SELECTOR VALVE
6 P VERIFY WHEELS FLASHING LIGHT OPERATION
7 P VERIFY GEAR DOWN AND LOCKED WHEN FLASHING WHEELS LIGHT STOPS

13.16.2
LANDING GEAR EXTENSION OR RETRACTION (LOSS OF POWER IN ELECTRICAL CONTROL CIRCUIT)
13.17 AUTOMATIC PILOT DISCONNECT FOR MALFUNCTION

1. P/CP NOTE MALFUNCTIONING AUTOPilot

2. P/CP PRESS EITHER PILOT'S OR COPILOT'S DISCONNECT BUTTON
   ON CONTROL WHEEL (PB-20N) OR TO SECOND DETENT ON ASW-31

3. FE PULL AUTOPilot EMERGENCY DISCONNECT HANDLE

4. FE STOW HANDLE IN HORIZONTAL POSITION
   (NOTE: STOWING IN VERTICAL POSITION WILL PREVENT
   PULLING BOOST SHIFT LEVERS)
13.18

1. BOMB BAY DOOR OPERATION WITHOUT ELECTRICAL POWER

IF

DOORS ARE CLOSED

1. FE OPEN ACCESS DOOR NEAR TACCO SEAT FOR P3C RADIO SEAT FOR P3A/B
2. FE PLACE LOCAL REMOTE SW TO LOCAL
3. FE PULL UP ON CONTROL VALVE HANDLE

OTHERWISE

DOORS ARE OPEN

1. FE OPEN ACCESS DOOR NEAR TACCO SEAT FOR P3C RADIO SEAT FOR P3A/B
2. FE PLACE LOCAL REMOTE SW TO LOCAL
3. FE PUSH DOWN ON CONTROL HANDLE AND HOLD UNTIL DOORS ARE CLOSED
13.18

2 BOMB BAY DOOR OPERATION WITHOUT HYDRAULIC POWER

IF DOORS ARE CLOSED

(NOTE: TWO CREWMEMBERS ARE REQUIRED FOR THE FOLLOWING PROCEDURES)

1 FE OPEN ACCESS DOOR NEAR TACCO SEAT FOR P3C RADIO SEAT FOR P3A/B
2 CREW OPEN FUSELAGE FLOOR DOOR FOR ACCESS TO HAND PUMP AND SHUTOFF VALVE

3 CREW OPEN SHUTOFF VALVE
4 FE PLACE LOCAL REMOTE SW TO LOCAL
5 FE PULL UP CONTROL VALVE HANDLE
6 CREW REMOVE PUMP HANDLE, INSERT IN PUMP SOCKET
7 CREW OPERATE HAND PUMP UNTIL DOORS ARE OPEN AND CONTINUE PUMPING TO HOLD DOORS OPEN

OTHERWISE DOORS ARE OPEN

1 REPEAT STEPS 1 THRU 4 ABOVE
2 FE PUSH DOWN AND HOLD CONTROL VALVE HANDLE
3 CREW OPERATE HAND PUMP UNTIL DOORS ARE CLOSED

13.18.2 BOMB BAY DOOR OPERATION WITHOUT HYDRAULIC PRESSURE
13.18.2 BOMB BAY DOOR OPERATION WITHOUT HYDRAULIC POWER (CONTINUED)

4. FE RELEASE CONTROL VALVE HANDLE

5. FE PLACE LOCAL REMOTE SW TO REMOTE
13.19

FLIGHT WITH CRACKED WINDSHIELD

1. FE TURN OFF HEAT OF AFFECTED PANELS
2. ALL HELMETS ON, VISORS DOWN
3. ALL IF POSSIBLE, DETERMINE WHICH OF THE GLASS LAYERS IS
   CRACKED (REFER TO FIGURE 1-75). DEPENDING UPON WHICH
   LAYER IS DAMAGED, DO THE FOLLOWING:

IF

OUTER LAYER OF GLASS CRACKED

4. ALL CONTINUE FLIGHT
5. P INSURE A/S DOES NOT EXCEED 240 KTS BELOW 10,000 FT ALT.

OTHERWISE

MIDDLE (STRUCTURAL) LAYER OF GLASS CRACKED

4. ? REDUCE A/S TO 240 KTS
5. FE DEPRESSURIZE AS REQUIRED TO OBTAIN CABIN DIFFERENTIAL TO
   2.0 IN HG
6. P DESCENT TO 10,000 FT OR LOWER
7. ALL CONTINUE FLIGHT

IF

INNER LAYER OF GLASS CRACKED

1. P INSURE THAT IAS SHALL NOT EXCEED 246 KTS BELOW 10,000 FT
   WITH WINDSHIELD HEAT OFF
2. FE TURN WINDSHIELD HEAT ON AT PILOT'S DISCRETION
13.19

2 FLIGHT WITH CRACKED SIDE WINDSHIELD

1 FE TURN OFF DEFOGGING ON AFFECTED PANELS
   IF ONE Pane IS CRACKED

2 ALL CONTINUE FLIGHT
   IF UNABLE TO DETERMINE IF BOTH CRACKED OR BOTH ARE CRACKED

1 FE DEPRESSURIZE AS REQUIRED TO OBTAIN CABIN DIFFERENTIAL
   TO 2.0 IN. HG

2 P MAKE NORMAL DESCENT TO 10,000 FT OR LOWER

3 ALL CONTINUE FLIGHT

13.19.2 FLIGHT WITH CRACKED SIDE WINDSHIELD
13.19

3   FLIGHT WITH CRACKED CABIN WINDOWS

1   CREW DETERMINE IF CRACK IS IN OUTER PANES OR INNER PANES

IF
INNER PANE

2   ALL CONTINUE FLIGHT

OTHERWISE
OUTER PANES IS CRACKED

2   CREW EVACUATE FROM IMMEDIATE AREA IF OUTER PANES IS CRACKED
OR UNDETERMINED

3   FE DEPRESSURIZE AS NECESSARY TO OBTAIN CABIN DIFFERENTIAL
OF 2.0 IN HG

4   P MAKE NORMAL DESCENT TO 10,000 FT OR LOWER

5   ALL CONTINUE FLIGHT

13.19.3
FLIGHT WITH CRACKED CABIN WINDOWS
This appendix provides an application of the training analysis method described in Section III of this report. A four-step procedure is employed in the analysis. The sequence is as follows:

- Analysis of training tasks
- Compilation of tasks to be trained
- Grouping of tasks for instructional planning
- Development of program of instruction

The steps in the procedure, with examples of the appropriate forms completed, are described below.

**Analysis of Training Tasks:** Each statement in the job task description is analyzed and the skills and knowledge requirements, behavioral objectives, media requirements, and evaluation/methods/media are derived. This is the crucial analytic step in the preparations leading to the development of an instructional program. The training analysis work sheet, shown in figure 1, is used to organize this information. The mission phase selected from the task analysis is the "Before Start Checklist" (item 2.1.2). Twenty-two specific task items are identified. An example of one of these tasks (item 2.1.2.L) is provided in figure 1 to illustrate the procedure.

**Compilation of Tasks to be Trained:** Summaries of the data obtained from the training analysis work sheets are now compiled. These identify what must be taught for each system and phase of flight. A general summary for mission phase, "Before Start Checklist" (items 2.1.2 A through U), is shown in figure 2 to illustrate the content and format.
### 2.1.2 CHALLENGE - "AHRS, INERTIAL AND HSI"

**L.**  **P.**

**SKILLS:**

**KNOWLEDGES:**


**BEHAVIORAL OBJECTIVES:**


**INSTRUCTIONAL MEDIA:**

1. **INTRODUCTORY:** Sound/slide, Video, Cine, Lecture, CFT
2. **CONSOLIDATION:** CFT, OFT
3. **MAINTENANCE:** OFT

**EVALUATION METHODS/MEDIA:**

- OFT

**BASIC REFERENCES:**

**ALTERNATIVES:**

**REMARKS:**
P-3 second-tour pilot should only require short classroom or carrel period followed by OFT to refresh this function.

---

**Figure 1.** Sample of a Training Analysis Worksheet

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2.1.2 BEFORE START CHECKLIST

A-U

KNOWLEDGE REQUIREMENTS

CLASSROOM OR STUDENT CARREL

Landing Gear
- Location of gear handle, handle light. Warning lights on instrument panel and Annunciator light extinguisher button. Gear status indicator and barber pole. Pre-start check.

Parking Brakes
- Location. Procedure for setting or releasing. Pre-start check.

Circuit Breakers
- Location. Visual check. FE responsibility.

Lights
- Location of controls, lights. Limitations of operations. Pre-start check procedures.

Bleed Air and Icing
Control Panels
- Foul weather systems - overview.
  Ice detection system - purpose, location of probe. Static source to pilot and copilot instruments. Pitot tube inputs to pilot and copilot instruments. Heat switch, status light.

- Engine Anti-Ice System - purpose. Source of power. Location of switches and lights. Pre-start check.

- Wing De-ice/Anti-ice System - heat source. Wing sections heated. Location of switches and lights. Pre-start check.

- Bleed Air - purpose. Source Pre-start check

Figure 2. General Summary (Part 1 of 4)
- Propeller Ice Control System—Location of heating elements, cycling sequence. Source of power. Location of switches, indicators, and circuit breakers. Pre-start check and ground operation limitations.


- Windshield and Side Window Heat System—Panels heated. Location of switches. Pre-start check.


- Bomb Bay Heating System—Location of switch. Pre-start switch position.

Fuel and Ignition
- TIT max temperature for starting. RPM rotation verification/limitation for start. Location of instruments. Fuel Panel—location switches, and starting position.

RM Switches
- Location and starting position.

TD (Temperature Datum) Switches
- Location. Pre-start cycle.

AHRS, Inertial, and 4SI
- Attitude, Heading, Reference, System—Power source, modes, limitations. Pre-start latitude and hemisphere inputs and checks.

Figure 2. General Summary (Part 2 of 4)

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<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inertial Navigation Systems</td>
<td>Controls, lights, System alignment. Pre-start checks, switch positions and</td>
</tr>
<tr>
<td></td>
<td>latitude inputs.</td>
</tr>
<tr>
<td>- Horizontal Situation Indicator</td>
<td>Location of controls and switches. Modes, primary and secondary inputs.</td>
</tr>
<tr>
<td></td>
<td>Pre-start check.</td>
</tr>
<tr>
<td>- MM4, Attitude Indicator System</td>
<td>Primary and secondary systems. Pre-start monitor procedures.</td>
</tr>
<tr>
<td>- Standby Compass</td>
<td>Accuracy check.</td>
</tr>
<tr>
<td>Radar Altimeter</td>
<td>Location of instruments, source of power (bus). Procedure for test.</td>
</tr>
<tr>
<td></td>
<td>Procedure for test mode. Limit lights-ground sensing relay; flap handle switch.</td>
</tr>
<tr>
<td></td>
<td>Restriction on use of copilot indicator.</td>
</tr>
<tr>
<td>Fuel Quantity and Fuel Panel</td>
<td>Location of fuel control panel and total fuel gauge. Pre-start position of</td>
</tr>
<tr>
<td></td>
<td>crossfeed valves, main tank valves, boost pump switches and indicator lights.</td>
</tr>
<tr>
<td></td>
<td>Tank 5 transfer pumps and transfer valves.</td>
</tr>
<tr>
<td>Armament Panel and Bomb Bay</td>
<td>Location of Pilot's armament panel Switch positions for takeoff. Bomb bay</td>
</tr>
<tr>
<td></td>
<td>switch position and light.</td>
</tr>
<tr>
<td>Flaps</td>
<td>Location of flap handle, flap indicators Procedure for activation and takeoff</td>
</tr>
<tr>
<td></td>
<td>setting.</td>
</tr>
<tr>
<td>Autopilot</td>
<td>Location of autopilot control panel and AFCS ground test panel.</td>
</tr>
<tr>
<td></td>
<td>Pre-start procedure/switch settings.</td>
</tr>
<tr>
<td>Weight and Balance</td>
<td>Allowable gross weight for takeoff. Computation of CG/MAC. Use of</td>
</tr>
<tr>
<td></td>
<td>previously computed data. Pre-start procedure.</td>
</tr>
</tbody>
</table>

Figure 2. General Summary (Part 3 of 4)
Tactical Crew Checklist
- Teaching of tactical crew checklist should be deferred to ASW/tactical phase of training.

Rotating Beacon
- Location of Master switch, rotating beacon switch. Pre-start position.

Suggested Media
Video tape and or sound/slide programs for overview, nomenclature, and "need to know" system information essential for pre-start checks. Cockpit Familiarization Trainer integration of classroom or carrel information, checklists, and procedures. Device 4B28/11 Introduction to P-3B Aircraft (Pilot).

COCKPIT FAMILIARIZATION TRAINER
Pre-Start Check
- Identification and location of panels, switches, lights, controls, and gauges. Familiarization with Pre-start checklists, procedures and checks. Pilot demonstrates, by activating switches, touching controls and or instruments, and verbalizes the procedures and checks required to complete the Pre-start checklist without significant error prior to entering the OFT for further training.

OPERATIONAL FLIGHT TRAINER
Pre-Start Check
- Dynamic display of controls, switches, and instruments enabling completion of Pre-Start Checklist. Pilot demonstrates ability to perform Pre-start checks without error prior to first aircraft training flight.

AIRCRAFT
Pre-Start Check
- No aircraft training requirement.

End of Course Objective
Pilot demonstrates knowledge of pre-start check procedures, system checks, and switch/control positions. He performs pre-start check without error.

Figure 2. General Summary (Part 4 of 4)
Grouping of Tasks for Instructional Planning: Based on the previous two steps, an initial organization of the curriculum is undertaken, in terms of the general subject matter areas, the media requirements and the desired student proficiency levels. A summary of these training requirements is shown in figure 3. The example selected depicts the normal procedures involved in the first 12 phases of flight identified in the job task analysis. For each phase of flight, the media requirements are identified together with the appropriate level of proficiency required in each phase per media class. It should be noted that this summary serves as an aid to the understanding of our method; the content has not yet been validated. The proficiency levels recommended are more descriptive than those published in NATOPS, however, the NATOPS levels may be used if desired.

Program of Instruction: The final step in the procedure is the organization of the training material into a program of instruction. Section II of this appendix provides an example of a lesson plan developed using the four-step procedure described above. The training segment selected concern "Propeller Operation" which is a subsystem of Power Plants. Subject to manpower availability and authorization, the academic portion of the program of instruction for both pilots and flight engineers will be developed by TAEG.
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**NORMAL PROCEDURES**

<table>
<thead>
<tr>
<th>Mission Preparation</th>
<th>CLASS/CARREL</th>
<th>CPT</th>
<th>OPT</th>
<th>AIRCRAFT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IV</td>
<td>-</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Pre-Takeoff Readiness Check</td>
<td>IV</td>
<td>*</td>
<td>II A</td>
<td></td>
</tr>
<tr>
<td>Before Start Checklist</td>
<td>IV</td>
<td>II B</td>
<td>II A</td>
<td></td>
</tr>
<tr>
<td>Prepare to Start Engines</td>
<td>IV</td>
<td>II A</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Start Engines</td>
<td>IV</td>
<td>II B</td>
<td>II A</td>
<td>*</td>
</tr>
<tr>
<td>After Start Checklist</td>
<td>V</td>
<td>II B</td>
<td>II A</td>
<td>*</td>
</tr>
<tr>
<td>Prepare for Taxi</td>
<td>V</td>
<td>*</td>
<td>II A</td>
<td>*</td>
</tr>
<tr>
<td>Takeoff Checklist</td>
<td>V</td>
<td>II B</td>
<td>II A</td>
<td>*</td>
</tr>
<tr>
<td>Takeoff</td>
<td>II</td>
<td>II C</td>
<td>II B</td>
<td>II A</td>
</tr>
<tr>
<td>Climb</td>
<td>III</td>
<td>II B</td>
<td>II A</td>
<td>*</td>
</tr>
<tr>
<td>Cruise Out/Back</td>
<td>III</td>
<td>II B</td>
<td>II A</td>
<td>*</td>
</tr>
<tr>
<td>Descent/Approach</td>
<td>IV</td>
<td>II C</td>
<td>II B</td>
<td>II A</td>
</tr>
<tr>
<td>Final Approach/Landing/Missed Approach</td>
<td>IV</td>
<td>II C</td>
<td>II B</td>
<td>II A</td>
</tr>
<tr>
<td>Post Landing/Shutdown</td>
<td>V</td>
<td>II C</td>
<td>II B</td>
<td>II A</td>
</tr>
</tbody>
</table>

#Knowledge and skill levels are based upon the proficiency levels shown in figure 4.

*There is no training requirement for these procedures using this medium.

---

Figure 3. Training Requirement Summary
(P-3 Second Tour Pilot)
LEVEL | KNOWLEDGE
--- | ---
I | Recall without omission or error using normal cockpit cues. *(Emergency Checklist Mandatory Items.)*
II | Recall with use of cockpit cues and checklist without omission or error. *(Can explain essential functions and use checklist in accordance with prescribed NATOPS standard.)*
III | Recall with use of cockpit cues, checklists, and NATOPS manual. May require some prompting. *(Can explain essential relationships and locate information in NATOPS manual.)*
IV | Demonstrate a general knowledge of major items related to subject matter but not required to be able to perform task. *(Level expected at completion of academic phase.)*
V | Overview of subject matter. Trainee need only possess recognition (not recall) knowledge of the subject matter *(e.g., pilot knowledge of flight engineer tasks).*

SKILLS

A | Performance of entire task to NATOPS standard without prompting.
B | Performance of task to NATOPS standard with minor prompting. *(Tasks performance limited due to lack of simulation in OPT are included in this category, e.g., lack of visual simulation.)*
C | Performance of tasks with minor errors utilizing a static simulator or mockup, e.g., Cockpit Familiarization Trainer.

ABOVE ARE SUGGESTED FOR PROFICIENCY LEVELS. THE DEGREE OF QUALIFICATION CONTAINED IN NATOPS MANUAL MAY BE MORE DESIRABLE.

Figure 4. P-3 Task and Training Analysis Proficiency Levels
APPENDIX B

SECTION II

SAMPLE LESSON PLAN

PROPELLER OPERATION

RECOGNIZE PROPELLER CONTROLS

a. Power Levers
b. Synch Servo Switches
c. Synchrophaser Master Switch
d. Synchrophaser Master Trim Knob
e. Resync/Normal Switch
f. Pressure Cutout Override Buttons
g. Feather Valve/NTS Check Switch
h. Fuel Governor and Prop Pitch Lock Test/Normal Switches
i. Auto Feather System
j. Emergency Shutdown Handles
k. Ice Control System
l. Prop Pump No. 1 and No. 2 Warning Lights
m. Feather Switches
n. NTS (Negative Torque Sensing) System

PROPELLER DESCRIPTION

The four-bladed Hamilton Standard Propeller converts engine shaft horsepower to thrust. It is a constant speed, full feathering, reversing propeller, having the added features of pitchlock and a combination of synchronizing and synchrophasing.

Pitchlock is incorporated to prevent engine overspeed by preventing blade angle decrease. Synchronizing is an electronic refinement of
hydro-mechanical governing to provide a quicker, smoother, quieter governing system. Synchrophasing prevents blade tips from passing each other when parallel to the wing leading edge, reducing vibration and noise.

Propeller pitch changes are induced by hydraulic pressure from a self-contained hydraulic system within each propeller assembly. Propeller hydraulic pressure is provided by two gear driven pumps when the propeller is rotating.

**FUNCTION OF PROPELLER CONTROLS**

a. **Power Levers**

   (1) In the taxi range (BETA RANGE, POWER LEVERS AFT OF FLIGHT IDLE):

   (a) Controls propeller blade angle for forward or reverse thrust via mechanical linkage through the coordinator.

   (b) In effect, power lever movement causes a propeller pitch change in the TAXI (BETA) RANGE.

   (2) In the flight range (ALPHA RANGE, POWER LEVERS AT OR FORWARD OF FLIGHT IDLE):

   (a) Power lever linkage to the coordinator in the flight range causes coordinator to schedule fuel to the engine.

   (b) Advancing power levers in the flight range causes coordinator to change fuel control setting to increase fuel flow.

   (c) Increased fuel flow causes a corresponding increase in turbine inlet temperature and turbine rpm, which tends to cause the propeller to overspeed.
(d) Propeller flyweight governor senses the overspeed and increases pitch angle (bite), which holds the propeller rpm at its fixed speed.

(e) In effect, power lever adjustment changes power plant power output while the propeller governor maintains propeller rpm at 100 percent.

b. Function of Sync Servo Switches

(1) In NORMAL, electrical circuits act in conjunction with mechanical governing features to provide more stable and accurate rpm governing.

(2) In NORMAL, an electrical anticipator feature is incorporated in the system to hydraulically change blade angle to stabilize propeller rpm and prevent the propeller from underspeeding or overspeeding in case of rapid power lever movement.

(3) In OFF, electrical control of hydraulically actuated blade angle changes is deactivated and mechanical devices cause hydraulically actuated blade angle changes automatically.

c. Function of Synchrophaser Master Switch

(1) Selects either engine number 2 or number 3 as master to which other engines are slaved if their Sync servo switches are in NORMAL.

(2) Synchrophasing, electronically establishing optimum propeller blade phase angle relationships, minimizes propeller beat noise and minimizes vibrations caused when air is alternately compressed between the four rotating blade tips of two propellers on each wing and when air is compressed between the fuselage and the blade tips of
No. 2 and No. 3 propellers at the same time.

(3) OFF position deactivates the automatic synchrophasing feature.

d. **Function of Synchrophaser Master Trim Knob**

(1) Adjusts mechanical devices which hydraulically control propeller blades pitch angle thus effecting increases or decreases in the rpm of the master engine by approximately $\pm 1$ percent.

(2) In the OFF position, only engine No. 2 rpm will be affected.

e. **Function of Resync/Normal**

(1) Acts as a clutch to ensure proper phasing and engagement when the system is activated.

(2) Automatic resynchrophase mechanisms slightly increases or decreases the rpm of the propeller to synchronize the speed of the three slave props and synchrophase the blade angle relationship to the selected master.

(3) Depressing resynchrophase switch approximately four seconds then releasing the switch causes a propeller which is not synchrophased to either become synchrophased or to improve synchrophase relationship with master propeller.

(4) Each actuation improves propeller synchrophase relationship.

(5) Repeated actuations by depressing resynchrophase switch two seconds, releasing and waiting one minute, can result in changing the tachometer indication of a slave propeller a maximum of 2 percent each actuation.

(6) **NORMAL** position of the switch provides for automatic synchrophasing electronically through the synchrophaser.
f. Function of the Pressure Cutout Override Switches

(1) Depressing the pressure cutout override switch with the feather button in activates the auxiliary pump to repressurize the increase pitch side of the dome, lights the light in the feather button, the No. 1 propeller pump light goes out and energizes the feather valve solenoid which in turn positions the feather valve to the feather valve position.

(2) Depressing a switch with the emergency shutdown handle out activates the feather pump, lights the light in the feather button, and turns off the propeller pump No. 1 light.

(3) The pressure cutout override switch provides a means of overriding the propeller pressure cutout switch if the propeller does not go completely into feather using the E handle or the feather button.

g. Function of the Feather Valve/NTS Check Switch

(1) The NTS check position is the normal position of the switch except when performing NTS check or when restarting an engine airborne. If NTS occurs, the light will remain on with the switch in NTS check position.

(2) In Feather Valve check position checks linkage to the feather valve which routes hydraulic pressure to position the propeller toward the feather position. In flight with the switch in Feather Valve check, the NTS lights will blink when NTS occurs. The negative torque system drives the propeller toward feather but cannot completely feather the propeller.

(3) During ground operation, with switch in NTS check position, the NTS light must come on during engine shutdown. If shutting down
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from LOW RPM and light does not come on, restart engine and shutdown from NORMAL RPM. If no light when shutting down from NORMAL RPM write discrepancy up for maintenance action.

h. Function of the Fuel Governor and Prop Pitch Lock Test/Normal Switches

(1) These switches are provided to permit ground checking of the pitchlock and fuel topping governor functions.

(2) In the test position the propeller governor mechanism is reset to a speed of approximately 106 percent RPM to permit checking to insure that the fuel topping governor will limit engine speed if the propeller governor fails—also that the propeller pitchlock will engage to prevent blade angle decrease.

i. Auto Feather System

(1) The auto feathering system provides automatic feathering of one propeller in the alpha range. When the system is armed and the power levers are advanced for takeoff and a loss of engine power occurs which results in a large loss of propeller thrust (prop thrust drops to 500 or less pounds) auto feathering will occur for the affected engine.

j. Function of the Emergency Shutdown Handles in Relation to the Propeller

(1) Provides for electrically activating the feather pump and mechanically moves the feather valve to the feather position.

(2) Pulls in appropriate feather button and lights the feather button light.

k. Ice Control System

Propeller icing is controlled by electrically heating the spinners and blade cuffs. When the system is energized, the nose portion of each
spinner is continuously anti-iced (while the remainder is cyclically de-iced) by elements in the aft spinner (skirt), in the spinner’s four blade-root fairings (islands), and in the cuff covering the skank of each blade.

The controls and indicators for the propeller Ice Control System consist of a three position control switch (ON-OFF-Ground Test), an ammeter, and a three position rotary selector for the ammeter (1 and 4 Spinners, Cuffs and Islands, 2 and 3 Spinners).

More details of system operation will be covered in this course under P-3 ICE CONTROL SYSTEMS.

1. Prop Pump No. 1 and No. 2 Warning Lights

(1) Prop Pump No. 1 light illuminates when the Main (No. 1) pump pressure drops below a set minimum pressure. Illumination of Prop Pump No. 1 light is permissible during engine starting and with engine operation at LOW RPM.

(2) Prop Pump No. 2 light illuminates when the Standby (No. 2) pump pressure drops below a set minimum pressure. Normally Prop Pump No. 2 light will be out prior to reaching low RPM (57-64 percent).

m. Feather Switches

Four guarded feathering buttons, one for each engine, are located on the pilot’s overhead control panel. These buttons provide a method for feathering the propeller for loiter operation. Depressing the switch initiates the feathering cycle. Pulling out on the button initiates the unfeathering cycle for a feathered propeller.
n. **NTS System**

The NTS System automatically moves the propeller toward the feather position when a predetermined negative torque is sensed (propeller is driving the engine). The normal effect of the NTS is a cycling of SHP slightly below the preset negative torque limit.

**PROPELLER SAFETY FEATURES**

a. **Function of the pitchlock assembly**

   (1) Operates only in the flight range.

   (2) Prevents blade angle decrease if there is an overspeed by 103.5 percent RPM or if there is a loss of propeller oil pressure.

   (3) Allows blade angle increase but no decrease.

   (4) Pitchlock is blocked out at low blade angles (+17° to -14°) to allow for RPM surges during approach and landings and at high blade angles to permit unfeathering (57° to 86.65°).

   (5) Hazards of reversing with a malfunctioning propeller during takeoffs or landings.

      (a) Pitchlocked propeller cannot be reversed.

      (b) Directional control problems may be encountered when power levers are retarded to the ground idle.

      (c) Engine with malfunctioning propeller must be shutdown prior to positioning power levers below flight idle.

      (d) Failure of one or more propellers to reverse may result in complete loss of directional control.

b. **Function of low pitch stop assembly**

   (1) Mechanically limits blade angle to specific minimum settings during flight range operation.
(2) Power lever must be positioned from flight range to ground range to disengage low pitch stop and permit blade angle decrease and reversing.

c. **Function of the BETA Followup System**

(1) The BETA followup system programs a variable hydraulic stop as a function of power lever position to prevent excessive reduction in blade angle decrease if the NTS System fails.

d. **Function of the Safety Coupling (decoupler)**

The decoupler safety coupling will mechanically disconnect the gearbox and propeller from the engine turbine when the engine negative torque exceeds a set limit (approximately minus 1700 SHP). This device serves as a backup in case of NTS failure and is provided to reduce the loads imposed on the aircraft structure to an acceptable limit.

e. **Function of the propeller brake**

A propeller brake is provided to prevent windmilling when the aircraft is parked or when the propeller is fully feathered in flight. The brake is released by starter torque or by airloads when unfeathering in flight. The brake is held in the disengaged position by reduction gear oil pressure and engaged automatically by heavy springs.

Oil pressure is sufficient to hold the brake released when reduction gear RPM is above approximately 21 percent. Slight reverse propeller rotation locks the brake.

f. **Function of the NTS INOP Light**

If the blade angle decreases to the 45° position during unfeathering the "NTS INOP" warning light on the vertical annunciator panel will illuminate when the 45° blade angle switch operates and the blades will
automatically start toward the feather position. If the "NTS INOP" light illuminates during unfeathering it is essential to pull the Emergency Shutdown handle immediately while holding out on the feather button.