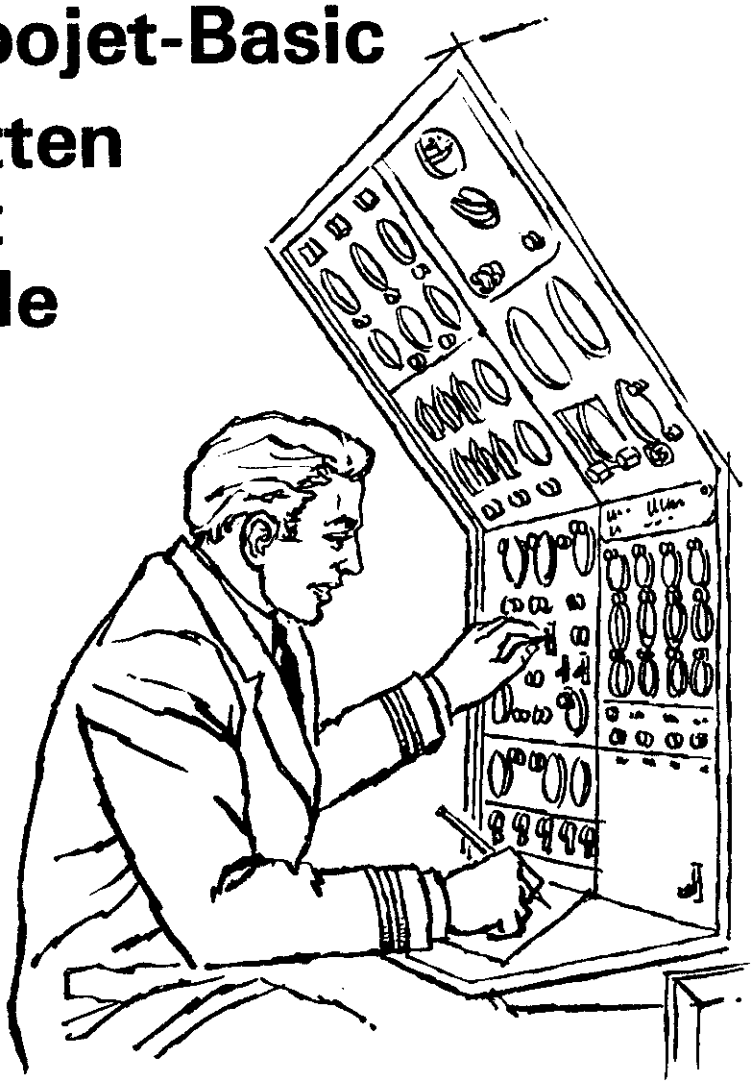
AC-63-3

FLIGHT ENGINEER

Turbojet-Basic Written Test Guide



U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

FLIGHT ENGINEER—Turbojet-Basic Written Test Guide

PREFACE

This written test guide has been developed by the Flight Standards Service, Federal Aviation Administration, Department of Transportation, as Advisory Circular 63-3, to assist applicants who are preparing for the Flight Engineer-Turbojet Basic-Written Test. It supersedes the Flight Engineer Written Test Guide, AC 63-1B, issued in 1971.

This guide outlines the scope of knowledge covered in the test, lists reference materials for study, and presents questions representative of those contained in the official test.

Comments regarding this publication should be directed to the Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

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Acting Director
Flight Standards Service

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Turbojet-Basic
Written Test Guide

1977

U.S. DEPARTMENT OF TRANSPORTATION
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FLIGHT ENGINEER TURBOJET—BASIC
WRITTEN TEST GUIDE

INTRODUCTION

The Flight Standards Service of the Federal Aviation Administration has issued this Flight Engineer Turbojet-Basic Written Test Guide as Advisory Circular 63–3 to provide information to prospective flight engineers and others interested in this certification area. It cancels the previous edition, AC 63-1B, Flight Engineer Written Test Guide. The new guide contains information about certification requirements and describes the type and scope of the written test. It lists appropriate study and reference material and presents questions representative of those found in the official written test book.

As a further convenience to the applicant, those portions of the present Federal Aviation Regulations concerning general eligibility and aeronautical experience requirements have been included. Applicants should be aware, however, that regulations are subject to amendment. Any questions regarding the currency of these quoted excerpts should be checked with the appropriate FAA office.

The written tests are designed to measure the aeronautical knowledge of the prospective flight engineer on an air carrier aircraft. The flight engineer is primarily a technical expert, who must be thoroughly familiar with the operation and function of various components of the aircraft. Specific duties vary with different aircraft and with different air carriers. The flight engineer written tests place major emphasis on the normal and emergency duties of an air carrier flight engineer and on the knowledge required to understand systems and components related to a particular powerplant class aircraft.

CERTIFICATION REQUIREMENTS

The following excerpts from the Federal Aviation Regulations, Part 63, pertaining to eligibility, are given for the convenience of the applicant:

"§ 63.31 Eligibility requirements: general

To be eligible for a flight engineer certificate, a person must—

(a) Be at least 21 years of age;

(b) Be able to read, speak, and understand the English language, or have an appropriate limitation placed on his flight engineer certificate;

(c) Hold at least a second-class medical certificate issued under Part 67 of this chapter within the 12 months before the date he applies, or other evidence of medical qualification accepted for the issue of a flight engineer certificate under § 63.42; and

(d) Comply with the requirements of this Subpart that apply to the rating he seeks.

"§ 63.37 Aeronautical experience requirements.

(a) Except as otherwise specified therein, the flight time used to satisfy the aeronautical experience requirements of paragraph (b) of this section must have been obtained on an airplane—

(1) On which a flight engineer is required by this chapter; or

(2) That has at least three engines that are rated at least 800 horsepower each or the equivalent in turbine-powered engines.

(b) An applicant for a flight engineer certificate with a class rating must present, for the class rating sought, satisfactory evidence of one of the following:

(1) At least three years of diversified practical experience in aircraft and aircraft engine maintenance (of which at least one year was in maintaining multiengine aircraft with engines rated at least 800 horsepower each, or the equivalent in turbine engine powered aircraft),

and at least five hours of flight training in the duties of a flight engineer.

(2) Graduation from at least a two-year specialized aeronautical training course in maintaining aircraft and aircraft engines (of which at least six calendar months were in maintaining multiengine aircraft with engines rated at least 800 horsepower each, or the equivalent in turbine engine powered aircraft), and at least five hours of flight training in the duties of a flight engineer.

(3) A degree in aeronautical, electrical, or mechanical engineering from a recognized college, university, or engineering school; at least six calendar months of practical experience in maintaining multiengine aircraft with engines rated at least 800 horsepower each, or the equivalent in turbine engine powered aircraft; and at least five hours of flight training in the duties of a flight engineer.

(4) At least a commercial pilot certificate with an instrument rating and at least five hours of flight training in the duties of a flight engineer.

(5) At least 200 hours of flight time in a transport category airplane (or in a military airplane with at least two engines and at least equivalent weight and horsepower) as pilot in command or second in command performing the functions of a pilot in command under the supervision of a pilot in command.

(6) At least 100 hours of flight time as a flight engineer.

(7) Within the 90 day period before he applies, successful completion of an approved flight engineer ground and flight course of instruction provided in Appendix C of this Part." [Part 63.]

TYPE OF WRITTEN TEST

An applicant for a flight engineer certificate must pass a Basic Written Test and a Class Rating Written Test (or a Combined Test) appropriate to the class of aircraft on which a rating is desired.

The Flight Engineer Basic Written Test consists of items pertaining to:

Federal Aviation Regulations
Theory of Flight and Elementary Aerodynamics
Basic Meteorology with respect to engine operations
Center of Gravity Computations

The Flight Engineer Class Rating Written Tests are related to a particular powerplant class of airplane and are titled:

Flight Engineer—Reciprocating Engine Written Test
Flight Engineer—Turboprop Written Test
Flight Engineer—Turbojet Written Test

The Class Rating Written Test consists of items pertaining to:

Airplane Systems and Equipment
Powerplant Systems and Equipment
Normal Operating Procedures
Emergency Procedures

The Combined Test (e.g., Turbojet-Basic) consists of items found on the Flight Engineer-Basic Written Test and on the appropriate class rating (e.g., Turbojet) written test.

Test items are multiple-choice, similar to those included in this guide. Questions are designed to determine whether the applicant has an adequate knowledge of fundamental principles and whether that knowledge can be applied to problems encountered in flight operations. Many items are based upon charts, graphs, and diagrams similar to those found in this study guide.

The tests are based upon aircraft which are used for the preponderance of initial Flight Engineer training by Civil United States Air Carriers. The aircraft are:

Turbojet—Boeing 727
Turboprop—Lockheed L–188
Reciprocating Engine—Douglas DC–6

In addition, special tests are available to accommodate applicants who have had training on several other aircraft such as:

Boeing 707
Douglas DC–8
Lockheed L–382 (C–130)

Applicants who have experience or training on these aircraft should request the special tests at the local FAA District Office.

TAKING THE WRITTEN TEST

The written tests may be taken at FAA Air Carrier and General Aviation District Offices.

The FAA has adopted a question book method of testing in the Flight Engineer-Turbojet and Basic areas. The Question Book features a single book containing 1,000 questions plus all the necessary supplementary information (performance charts, illustrations, etc.) that is applicable to the test questions. Applicants will be directed to answer specific questions contained in the Question Book. Each applicant is issued a Question Book, a Question Selection Sheet, and the standard Airman Written Test Application, AC Form 8080–3. For each question on the answer sheet, the applicant is directed by the Question Selection Sheet to a numbered question in the Question Book. After selecting a response, the appropriate space on the answer sheet is filled in.

The Flight Engineer Turbojet-Basic Question Book is designed to meet a variety of applicant needs through use of the appropriate Question Selection Sheet. The book can be used to administer tests in these areas:

(a) Flight Engineer Turbojet (FEJ)—containing questions based on any one of three airplanes: 727, 707, or DC–8. An applicant is given the option of taking a test based on the airplane in which training or experience has been received.

(b) Flight Engineer Basic (FEB)—containing basic questions for all FE applicants (including those with Turboprop and Reciprocating Engine training).

(c) Flight Engineer Turbojet-Basic (FEX)—containing a combination of FEJ and FEB questions based upon any one of three airplanes: 727, 707, or DC–8. An applicant is given the option of taking a test based on the airplane in which training or experience has been received.

A minimum grade of 70 percent is required to pass a Flight Engineer Written Test.

The applicant is notified of the test grade on the Airman Written Test Report, AC Form 8080–2. The report also contains coded indications of the subject matter involved in test items which the applicant missed. A Written Examination Subject Matter Outline is provided to relate the codes to specific topics. The study outline contained in this guide is similar to the Subject Matter Outline the applicant receives with AC Form 8080–2. An applicant who receives a failing grade must present the appropriate AC Form 8080–2 when appearing for reexamination. A test must be started in sufficient time to permit its completion during the normal working day. To save time, applicants should plan to use a computer or portable electronic calculator in solving weight and balance problems and in performing other computations. After completing the test, the applicant must surrender the question book, question selection sheet and answer sheet to the proctor, together with any papers used for computations or notations, before leaving the examination room.

When taking the test, the applicant should keep the following points in mind:

(a) Each question or problem should be read carefully before looking at the possible answers. The applicant should clearly understand the problem before attempting to solve it.

(b) After formulating an answer, the applicant should determine which of the alternative answers most nearly corresponds with that answer. The answer chosen should completely resolve the problem.

(c) From the answers given, it may appear that there is more than one possible answer; however, there is only one answer that is correct and complete. The other answers are either incomplete or derived from popular misconceptions.

(d) If a particular test item proves difficult, it is best to proceed to another question. After the less difficult questions have been answered, the others should then be reconsidered.

(e) The applicant may mark on the Question Selection Sheet. No marks are allowed to be made on the Question Book.

SCOPE OF THE WRITTEN TESTS

All test items used in official Flight Engineer Written Tests are related to topics in the study outline in this guide. An applicant who is thoroughly prepared in the subject matter and who follows the procedures recommended in this guide should have no difficulty in satisfactorily completing the written tests. The suggested topics for study are directly associated with the normal and emergency flight engineer duties.

When studying the topics listed in the outline, the prospective flight engineer should be concerned primarily with basic principles underlying the performance and operation of transport aircraft.

Each question in this guide is identified with a three-character subject matter code which can be used as a reference to the study outline topics. It is advisable to use the subject matter codes to identify question and subject groups and make your study more systematic.

RECOMMENDED STUDY MATERIALS

The publications listed in this section will be helpful to persons studying for the flight engineer written tests. A variety of additional textual material which can be helpful in preparing for the written test is available from various publishers, manufacturers, and operators. Textbook publishers will usually furnish a listing of their available publications in a specific area of information. Most public and institutional libraries maintain technical reference sections and will assist interested persons in locating material for study. Flight manuals, operation manuals, maintenance manuals, and technical booklets concerning transport category airplanes and equipment are also good information sources.

It is the responsibility of applicants to obtain study materials appropriate to their needs.

FEDERAL AVIATION REGULATIONS

Part 1. Definitions and Abbreviations—This part lists the official abbreviations and definitions used in the Federal Aviation Regulations.

Part 63. Certification: Flight Crewmembers Other Than Pilots—The applicant should be thoroughly familiar with the provisions of this part pertaining to the flight engineer.

Part 121. Certification and Operations: Air Carriers and Commercial Operators of Large Aircraft—This part provides the source material for most of the test items on Federal Aviation Regulations appearing in the tests.

To obtain the latest information regarding FAR prices, number of changes, and ordering information, send for a free copy of "Advisory Circular 00–44, Status of Federal Aviation Regulations" from the address given below.

U.S. Department of Transportation
Publications Section, TAD–443.1
Washington, D.C. 20590

STUDY MANUALS

Pilot's Weight and Balance Handbook, Advisory Circular 91–23. This publication provides instruction on weight and balance terms, methods, and theory. It contains information relating to the control of loading of large aircraft. Practical examples are used throughout the text including problems similar to those used in this guide.

Aviation Weather, Advisory Circular 00–6A. This joint FAA-National Weather Service publication provides an authoritative text on meteorology for the aircrew member. It gives the prospective engineer a practical understanding of those meteorological principles important to aviation and to aircraft operations.

AIRPLANE FLIGHT MANUALS

Flight manuals prepared by the manufacturer or by an airline are the best source of information concerning the knowledge required by the flight engineer. These manuals are generally controlled items and are not for sale to the public. Flight manuals which are prepared for military transport aircraft also are a good reference source for those who have access to such publications.

FLIGHT ENGINEER TURBOJET—BASIC STUDY OUTLINE

Applicants for a Flight Engineer Certificate need to be familiar with construction features and component functions; normal operations; trouble analysis; and isolation and correction of faults in the airplane and powerplant systems relevant to the Class Rating they seek. They also need to know the proper procedures for ground and inflight emergencies, as well as the reasons for operating in an approved manner and the possible effects if improper methods are used.

A. *GENERAL & FLIGHT ENGINEER REGULATIONS*

A10. *Definitions, Abbreviations, Symbols—FAR 1*
- A11. Define terms
- A12. Define abbreviations

A20. *Certification—FAR 63*
- A21. General certificate rules
- A22. Certificate validity
- A23. Application & change of certificates
- A24. Class ratings
- A25. Written tests
- A26. Experience requirements
- A27. Retake of tests

B. *CERTIFICATION AND OPERATION OF AIR CARRIERS—FAR 121*

B10. *General Air Carrier & Operating Rules*
- B11. Manual rules
- B12. Airplane performance

B20. *Special Airworthiness Requirements*
- B21. Cabin areas
- B22. Fire precautions
- B23. Powerplant equipment
- B24. Cargo in passenger compartment
- B25. Landing gear/flap horn

B30. *Instrument & Equipment Requirements*
- B31. Flight instruments
- B32. Emergency equipment
- B33. Emergency exits & lights
- B34. Miscellaneous equipment
- B35. Oxygen rules
- B36. Overwater flight
- B37. Flight recorder
- B38. Radio & radar
- B39. Voice recorder

B40. *Airmen & Crewmember Requirements*
- B41. Maintenance responsibility
- B42. Flight Engineer requirements
- B43. Emergency evacuation
- B44. Training—general
- B45. Emergency training
- B46. Ground, flight training
- B47. Recurrent & hazardous material training

B50. *Crewmember Qualification*
- B51. Flight Engineer

B60. *Flight Time Limitations*
- B61. Domestic air carriers
- B62. Flag air carriers

B70. *Flight Operations*
- B71. Crewmember at station
- B72. Admittance to flight deck
- B73. Crew equipment and mechanical irregularities
- B74. Passenger information
- B75. Passengers in cargo aircraft
- B76. Security

B80. *Dispatch & Flight Release*
- B81. Minimum equipment list, misc.
- B82. Required fuel supply

B90. *Records & Reports*
- B91. Dispatch release
- B92. Load manifest
- B93. Mechanical reliability & interruption
- B94. Airworthiness release
- B95. Crewmember certification

C. *THEORY OF FLIGHT & AERODYNAMICS*

C10. *Basic Aerodynamics*
- C11. Definitions
- C12. Lift and drag
- C13. Angle of attack
- C14. Controls and trim

C20. *Airspeed Measurement*
- C21. Airspeed limits
- C22. IAS, CAS, EAS
- C23. True airspeed
- C24. Mach number

C30. *Characteristics of Jet Aircraft*
- C31. Critical Mach
- C32. Design features

C40. *High Lift Devices*
- C41. Function
- C42. Design features

C50. *Takeoff & Climb Performance*
- C51. Weight effects
- C52. Configuration effects
- C53. Runway length, slope, condition
- C54. Wind speed & component
- C55. V speeds

C60. *Cruise Performance*
- C61. Speed & power
- C62. Range
- C63. Endurance
- C64. Specific range
- C65. Maneuvering
- C66. Speed & trim

C70. *Descent & Landing Performance*
- C71. Approach & landing speeds
- C72. Configuration effects
- C73. Touchdown, stop, & taxi

C80. *Turbulence; Gust, & Load Factors*
- C81. Wake turbulence
- C82. Load factors

D. *BASIC METEOROLOGY*

D10. *Altitude & Altimeter Setting*
- D11. Pressure altitude
- D12. Density altitude
- D13. True altitude
- D14. Standard atmosphere & altimeter setting

D20. *Effect of Pressure, Temperature & Humidity on Performance*
- D21. Density effects
- D22. Humidity effects

D30. *Icing Conditions & Effects*
- D31. Conditions for icing
- D32. Effect on performance

D40. *Weather & Atmosphere*
- D41. Atmosphere definitions
- D42. Temperature standards
- D43. Inversion

D50. *Speed of Sound*
- D51. Mach & temperature
- D52. Speed of sound & temperature
- D53. Effect of altitude change

E. *WEIGHT AND BALANCE*

E10. *Weight & Balance Definitions*
- E11. Weight terms
- E12. Moment, arm, CG terms

E20. *Changing Weights*
- E21. Adding weights
- E22. Removing weights

E30. *Fuel and CG*
- E31. Effect of dumping fuel
- E32. Effect of burning fuel

E40. *Shifting Weight*
- E41. Direction of shift
- E42. Effect of shifting on CG
- E43. Weight shift to correct CG

E50. *Weight and CG Limits*
- E51. Weight limits
- E52. Floor load limits
- E53. CG limits

E60. *Stabilizer Trim*
- E61. CG & stab trim

E70. *Loading Tables*
- E71. CG from tables

F. *AIRPLANE GENERAL*

F10. *Basic Airframe*
- F11. Fuselage
- F12. Wings
- F13. Tail surfaces
- F14. Landing gear
- F15. Powerplants

F20. *Airplane Lighting*
- F21. Cockpit lights
- F22. Passenger cabin lights
- F23. Emergency lights
- F24. External lights

F30. *Doors and Stairs*
- F31. Main cabin doors
- F32. Air stairs

F40. *Furnishings*
- F41. Cockpit furnishings
- F42. Cabin furnishings

F50. *Preflight Checks*
- F51. Exterior safety inspection
- F52. Cockpit safety inspection
- F53. Preliminary cockpit preparation
- F54. Exterior inspection
- F55. Cockpit preparation
- F56. Before starting

F60. *After Landing Checks*
- F61. After landing procedure
- F62. Parking procedure
- F63. Shutdown procedure
- F64. Maintenance

G. *AIR CONDITIONING AND PRESSURIZATION*

G10. *Pressurization Sources*
- G11. Bleed air
- G12. Turbocompressor

G20. *Pressurization System Components*
- G21. Outflow valves
- G22. Relief valves
- G23. Distribution system

G30. *Pressurization Controls*
- G31. Controller—auto
- G32. Controller—standby
- G33. Controller—manual
- G34. Instruments & indicators
- G35. Miscellaneous controls

G40. *Air Conditioning System Components*
- G41. Temperature controls
- G42. Pack controls
- G43. Air distribution system
- G44. Instruments & indicators

G50. *Cooling System*
- G51. Freon system
- G52. Air cycle machine
- G53. Heat exchangers
- G54. Water separator

G60. *Heating System*
- G61. Bleed air, T/C air
- G62. Electric heaters
- G63. Overheat protection

G70. *Normal Operations*
- G71. Preflight
- G72. Takeoff & climb
- G73. Cruising
- G74. Descent & landing
- G75. Terminate & shutdown

G80. *Abnormal Operations*
- G81. Failure of automatic temperature control
- G82. Aft cabin temperature overheat light on
- G83. Duct overheat light illuminated
- G84. Off-schedule descent light illuminated
- G85. Failure of automatic pressure control
- G86. Failure of automatic & standby pressure control
- G87. Unscheduled cabin pressure change
- G88. No equipment cooling light illumination
- G89. Miscellaneous faults

G90. *Emergency Operations*
- G91. Rapid depressurization
- G92. Emergency descent
- G93. Air conditioning smoke
- G94. Auto pack trip
- G95. Pack trip lights illuminated
- G96. T/C overspeed trip
- G97. T/C overheat

H. *AUTO FLIGHT*

H10. *Auto Pilot*
- H11. Auto pilot controls
- H12. Auto pilot system
- H13. Instruments & indicators
- H14. Normal operations
- H15. Stabilizer out of trim light illuminated
- H16. Elevator low pressure light illuminated

H20. *Yaw Damper*
- H21. Yaw damper components
- H22. Instruments & indicators
- H23. Normal operation
- H24. Yaw damper inoperative

H30. *Flight Director*
- H31. Instruments & indicators
- H32. Normal operation

H40. *Mach Trim*
- H41. Mach trim components
- H42. Instruments & indicators
- H43. Normal Operation

H50. *Auto Throttle*
- H51. Auto throttle components
- H52. Normal operation

I. *AUXILIARY POWER UNIT*

I10. *APU Components*
- I11. Gas turbine
- I12. Bleed air
- I13. A.C. Generator
- I14. Fuel system
- I15. Fire protection

I20. *Controls and Indicators*
- I21. Cockpit controls
- I22. Remote controls
- I23. Annunciators

I30. *Normal & Abnormal Operations*
- I31. Starting procedure
- I32. Electrical & pneumatic operation
- I33. Shutdown procedure
- I34. APU start malfunctions
- I35. APU operating malfunctions
- I36. APU annunciator light on after shutdown

I40. *Emergency Operations*
- I41. APU fire

J. *ELECTRICAL*

J10. *Electrical Theory*
- J11. D.C. electricity
- J12. A.C. electricity

J20. *Battery & Ground Power*
- J21. Battery
- J22. Battery charger
- J23. Ground power unit

J30. *D.C. Power System*
- J31. Transformer-rectifiers
- J32. D.C. bus power system
- J33. D.C. meters

J40. *A.C. Power System & CSD*
- J41. A.C. generator
- J42. Constant speed drive

J50. *A.C. Controls & Indicators*
- J51. Generator drive
- J52. Frequency control & meters
- J53. Generator field
- J54. Generator breaker
- J55. Generator tie breaker
- J56. Essential power
- J57. A.C. meters
- J58. Annunciators & warning

J60. *A.C. Electrical Circuits*
- J61. Bus distribution
- J62. Circuit breaker panels

J70. *Normal Operations*
- J71. Preliminary cockpit preparation
- J72. Electrical power transfer
- J73. Taxi procedures
- J74. Before takeoff
- J75. Climb & cruise procedure
- J76. Descent & landing
- J77. After landing procedure
- J78. Taxi-in and park

J80. *Abnormal Operations*
- J81. One generator inoperative departure
- J82. Generator faults
- J83. Abnormal KW/KVAR
- J84. Bus faults
- J85. Manual paralleling
- J86. Essential power failure
- J87. Generator drive faults
- J88. Disconnect generator drive
- J89. D.C. system faults

J90. *Emergency Operations*
- J91. Electrical smoke or fire
- J92. Loss of all generators
- J93. One generator inoperative
- J94. Two generators inoperative
- J95. Engine fire

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- K11. 0^2 bottles, indicators
- K12. Regulators, masks
- K13. Portable 0^2
- K14. Preflight

K20. *Passenger Oxygen*
- K21. 0^2 bottles, indicators
- K22. Auto mask deploy system
- K23. Portable 0^2
- K24. System operation

K30. *Portable Fire Extinguishers*
- K31. Types & use
- K32. Preflight
- K33. Operating procedures

K40. *Emergency Lighting*
- K41. Cabin emergency lights
- K42. Exterior emergency lights

K50. *Evacuation Equipment*
- K51. Escape slides & straps
- K52. Emergency exits
- K53. Passenger evacuation
- K54. Ditching

L. *FIRE PROTECTION*

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- L11. Engine and strut
- L12. Wheel well
- L13. Test system
- L14. System coverage
- L15. Preflight

L20. *Fire Extinguishing System*
- L21. Bottles, equipment
- L22. Indicators, controls

L30. *Emergency Operations*
- L31. Engine fire procedure
- L32. Wheel well fire procedure
- L33. Brake fire procedure

M. *FLIGHT CONTROLS*

M10. *Primary Controls*
- M11. Ailerons
- M12. Spoilers
- M13. Elevators
- M14. Rudders & yaw dampers
- M15. Gust locks
- M16. Priority system
- M17. Normal operations

M20. *Speed Brakes*
- M21. Speed brake system
- M22. Controls & indicators
- M23. Taxi check
- M24. Before T.O. check
- M25. Before landing check

M30. *Stabilizer*
- M31. Stabilizer system
- M32. Auto pilot & electric trim
- M33. Manual trim & brake
- M34. Preflight checks

M40. *High Lift Devices*
- M41. Trailing edge flaps
- M42. Leading edge devices
- M43. Controls & indicators
- M44. Flap systems

M50. *Abnormal & Emergency Operations*
- M51. Rudder or elevator light
- M52. Yaw dampers inoperative
- M53. Spoiler float
- M54. Alternate flap operation
- M55. Runaway or jammed stabilizer
- M56. Abnormal flight controls
- M57. Flap asymmetry
- M58. Leading edge device inoperative
- M59. Flaps up landing

N. *FLIGHT INSTRUMENTS*

N10. *Instrument Systems*
- N11. Instrument power sources

N20. *Pitot-Static & Air Data*
- N21. Pitot-static sources
- N22. Airspeed instruments
- N23. Altimeters
- N24. Vertical speed
- N25. Air data system

N30. *Mach-Airspeed Warning*
- N31. Warning system
- N32. Test system
- N33. Limitations

N40. *Altitude Alerting*
- N41. Altitude alert system

N50. *Temperature Indicating*
- N51. Total temperature indicator
- N52. Static temperature indicator

N60. *Flight Recorder*
- N61. Recorder & inputs
- N62. Controls & indicators

O. *FUEL*

O10. *Fuel System Components*
- O11. Fuel feed system
- O12. Controls and indicators
- O13. Fuel vent system
- O14. Fueling, defueling, transfer

O20. *Fuel Dump System*
- O21. Components
- O22. Controls and indicators

O30. *Normal Operations*
- O31. Preflight
- O32. Starting
- O33. Takeoff
- O34. Inflight management
- O35. Landing and shutdown
- O36. Ground transfer

O40. *Abnormal and Emergency Operations*
- O41. Inoperative fuel quantity indicator
- O42. Inoperative fuel crossfeed valve
- O43. Fuel unbalance
- O44. Fuel boost pump failure
- O45. Minimum fuel go-around
- O46. Fuel dumping

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P10. *Hydraulic Power System*
- P11. System components
- P12. Controls and indicators

P20. *Landing Gear*
- P21. Gear components
- P22. Controls and indicators

P30. *Brake and Anti-skid*
- P31. Braking system
- P32. Controls and indicators
- P33. Anti-skid
- P34. High speed braking

P40. *Nose Gear Steering*
- P41. Steering system
- P42. Controls and indicators

P50. *Normal Operations*
- P51. Safety inspection
- P52. Preflight preparation
- P53. Ground operation
- P54. Takeoff
- P55. Inflight operation
- P56. Descent and landing
- P57. After landing
- P58. Parking

P60. *Abnormal Operations*
- P61. Overheat lights on
- P62. Low pressure light on
- P63. Brake pressure zero
- P64. Gear lever latch release fail
- P65. Gear lights not green
- P66. Anti-skid inoperative light on
- P67. Tail-skid annunciator on
- P68. Manual gear extension
- P69. Hydraulic system leak

Q. *ICE AND RAIN PROTECTION*

Q10. *Wing Anti-Ice*
- Q11. Wing AI System
- Q12. Controls and indicators

Q20. *Engine Anti-Ice*
- Q21. Engine AI System
- Q22. Controls and indicators

Q30. *Pitot-Static Heat*
- Q31. Controls and indicators
- Q32. Probe heaters

Q40. *Window Heat*
- Q41. Heating system
- Q42. Controls and indicators

Q50. *Rain Removal*
- Q51. Windshield wipers
- Q52. Liquid repellant system
- Q53. Air bleed system
- Q54. Controls and indicators

Q60. *Normal Operations*
- Q61. Preflight
- Q62. Takeoff
- Q63. Landing
- Q64. Engine anti-ice
- Q65. Wing anti-ice
- Q66. Windshield protection

Q70. *Abnormal and Emergency Operations*
- Q71. Inoperative wing AI components
- Q72. Anti-ice duct overheat
- Q73. Wing AI auto trip
- Q74. Window overheat
- Q75. Inoperative engine AI valve
- Q76. Window failure

R. *NAVIGATION—COMMUNICATIONS*

R10. *Controls & Indicators*
- R11. Integrated flight system
- R12. Compass system
- R13. Attitude system
- R14. VHF navigation system
- R15. Approach progress display
- R16. Speed attitude command system
- R17. Ground proximity warning system
- R18. Radio altimeter

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R20. *Weather Radar*
- R21. Radar system
- R22. Radar operation

R30. *Interphone*
- R31. Flight interphone
- R32. Service interphone

R40. *PA System*
- R41. System components
- R42. Controls and indicators

R50. *Voice Recorder*
- R51. Controls and indicators
- R52. System operation

R60. *VHF, HF, SELCAL*
- R61. VHF Com
- R62. HF Com
- R63. SELCAL

S. *PNEUMATICS*

S10. *Engine Bleed System*
- S11. Engine bleed source
- S12. System components
- S13. Controls and indicators

S20. *APU Bleed*
- S21. APU bleed source
- S22. Flow multiplier
- S23. System components
- S24. Controls and indicators

S30. *Overheat Protection*
- S31. Overheat detection system
- S32. Controls and indicators

S40. *Normal Operations*
- S41. Preflight
- S42. Takeoff
- S43. After landing, parking

S50. *Abnormal and Emergency Operations*
- S51. Engine bleed trip
- S52. Bleed air high temperature
- S53. APU bleed annunciator light on
- S54. Lower aft body overheat
- S55. Engine strut overheat
- S56. Manifold light on

T. *POWERPLANTS*

T10. *Basic Engine*
- T11. Basic components
- T12. Cooling system
- T13. Cowling, pods, and struts

T20. *Controls and Indicators*
- T21. Controls
- T22. Indicators
- T23. Instrument power sources

T30. *Engine Fuel System*
- T31. Fuel system components
- T32. Controls and indicators

T40. *Oil System*
- T41. Oil system components
- T42. Oil system indicators

T50. *Start System*
- T51. Start system components
- T52. Controls and indicators
- T53. Ignition system

T60. *Reverse System*
- T61. Reverse system components
- T62. Controls and indicators

T70. *Normal Operation*
- T71. Preflight
- T72. Engine start
- T73. Battery, X-bleed start
- T74. Taxi, takeoff
- T75. Use of fuel heat
- T76. Climb, cruise
- T77. Landing go-around
- T78. After landing
- T79. Shut down

T80. *Abnormal Procedures*
- T81. Fuel heat valve fail
- T82. High engine vibration
- T83. Duct access light on
- T84. Aborted start and fail
- T85. Low oil pressure, high oil temperature
- T86. Thrust reverser stuck
- T87. Windmilling engine
- T88. Manual start
- T89. Engine overtemp and others

T90. *Emergency Operations*
- T91. Engine fire, severe damage, separation
- T92. Engine failure and shutdown
- T93. Inadvertent reverse thrust in flight
- T94. Inflight start
- T95. One engine inoperative landing
- T96. Two engine inoperative landing

U. *PERFORMANCE COMPUTATIONS*

U10. *Takeoff*
- U11. EPR, N_1

U12. V speeds
U13. Stabilizer trim
U14. Takeoff performance
U15. Oxygen requirements

U20. *Climb*
U21. Climb EPR
U22. Climb time
U23. Cabin rate of climb
U24. Climb fuel

U30. *Cruise*
U31. Cruise procedures
U32. Cruise EPR
U33. Fuel burn
U34. Altitude capability
U35. Total temperature

U40. *Maneuvering*

U50. *Descent*
U51. Descent performance
U52. Holding
U53. Cabin rate of descent
U54. Fuel dump time

U60. *Landing*
U61. EPR, N_1
U62. V speeds
U63. Landing performance
U64. Go-around
U65. Brake cooling

APPENDIX 1

FLIGHT ENGINEER TEST
TURBOJET -- BASIC

Questions in this guide are used for these tests:

Flight Engineer-Basic
Flight Engineer-Turbojet 727
Flight Engineer-Turbojet 707
Flight Engineer-Turbojet DC-8
Flight Engineer-Turbojet/Basic 727
Flight Engineer-Turbojet/Basic 707
Flight Engineer-Turbojet/Basic DC-8

1. A23 Which is an eligibility requirement for the issuance of a Flight Engineer Certificate by the Federal Aviation Administration?

1- Be 21 years of age or older.
2- Hold a Second- or Third-Class Medical Certificate.
3- Be a citizen of the United States of America.
4- Have a fluent command of the English language.

2. A23 To be eligible for a Flight Engineer Certificate, with no limitations, a person must

1- hold a First-Class Medical Certificate issued no later than 6 months prior to the date of application.
2- pass a written test on airplane procedures and operations of reciprocating and jet aircraft engines.
3- hold either a pilot or a mechanic certificate.
4- be able to read, speak, and understand the English language.

3. A23 Which is grounds for revoking a Flight Engineer's Certificate?

1- Flying 1,200 hours in 12 calendar months but logging only 1,000 hours.
2- Failure of a recurrent emergency procedures flight test.
3- Operating during a physical deficiency.
4- Alteration of the certificate.

4. A24 A flight engineer who has completed all of the required written tests and completed the practical test in a Boeing 727 is entitled to which aircraft class rating?

1- Turbojet powered
2- Boeing 727
3- Three-engine jet
4- Turbojet, three or more engines

5. A21 The possession of which combination of certificates permits an airman to perform as a flight engineer?

1- A Commercial Pilot Certificate with Instrument Rating and a Second-Class Medical Certificate.
2- A special purpose Flight Engineer Certificate and a Third-Class Medical Certificate.
3- A temporary medical certificate and a limited Flight Engineer Certificate.
4- A temporary Flight Engineer Certificate and a Second-Class Medical Certificate.

6. A21 Which of the following is grounds for the revocation of a Flight Engineer Certificate by the FAA?

1- Failure to pass a First- or Second-Class Medical Examination every 12 months.
2- Conviction on any charge of misdemeanor.
3- Smuggling of depressant or stimulant drugs.
4- Failure to reapply for Flight Engineer Certificate renewal before the 24-month expiration date.

7. A11 The term "crewmember" relative to provisions of the Federal Aviation Regulations means

1- United States citizens assigned to duty on an air carrier engaged in international air commerce.
2- a person assigned to perform duty in an aircraft during flight time.
3- only a pilot, flight engineer, or flight navigator assigned to duty in an aircraft during flight time.
4- any person assigned to duty in an aircraft during flight except a pilot or flight engineer.

8. A21 Unless the order of revocation provides otherwise, a person whose Flight Engineer Certificate is revoked may not apply for the same kind of certificate for

1- 6 months after the date of revocation.
2- 30 days after the date of revocation.
3- 90 days after the date of revocation.
4- 1 year after the date of revocation.

9. A24 Which of the following is an aircraft class rating appropriate for a Flight Engineer Certificate?

1- Multi-engine land
2- Propeller driven
3- Turbojet powered
4- Three or four engine, fanjet

10. A26 Which minimum aeronautical experience qualifies an applicant to obtain a Flight Engineer Certificate with a class rating?

1- 200 hours of flight time as a pilot in command in a transport category airplane.
2- At least 24 months of practical experience in aircraft and engine repair.
3- At least 50 hours as a flight engineer on the same class airplane for which the rating is sought.
4- Within 60 days prior to application, successful completion of an approved flight engineer ground school.

11. A11 What is the name of an upward sloping plane beyond the end of a runway which does not contain obstructions and can be considered when calculating takeoff performance of turbine powered aircraft?

1- Clearway
2- Prohibited area
3- Stopway
4- Obstruction clearance plane

12. A11 What is the definition of the term "critical engine"?

1- The outboard engine on the right side.
2- The engine whose failure would most adversely affect airplane performance or handling qualities.
3- The engine which carries the greatest accessory load during takeoff.
4- Either outboard engine.

13. A12 Which speed symbol is correctly defined?

1- V_{MF} means maximum flap extended speed.
2- V_{LE} means maximum landing gear operating speed.
3- V_{MO} means minimum control speed with the critical engine inoperative.
4- VS means the stalling speed or the minimum steady flight speed at which the airplane is controllable.

14. A26 The pilot in command or second in command time used to satisfy the aeronautical experience requirements for the flight engineer certificate must have been obtained on

1- a four-engine aircraft.
2- at least a three-engine transport, if turbojet powered.
3- an airplane on which a flight engineer is required.
4- a transport category airplane or equivalent military airplane.

15. A12 Which is a definition of V_2 speed?

1- Takeoff safety speed.
2- Speed for the best rate of climb.
3- Critical engine failure speed.
4- Minimum takeoff speed.

16. A23 To be eligible for a Flight Engineer Certificate, a person must

1- pass a written test on airplane procedures and operations of reciprocating and jet powered engines.
2- hold a First- or Second-Class Medical Certificate issued within the 12 months before the date of application.
3- be able to read, speak, and write the English language.
4- be the holder of a pilot certificate or mechanic certificate.

17. A24 Which of the following is an aircraft class rating appropriate for a Flight Engineer Certificate?

[illegible] Jet powered
[illegible] engine
[illegible]

[illegible] the maximum speed for operation with leading edge flaps extended.
3- V_{MC} means minimum control speed with the critical engine inoperative.
4- V_{S1} means the stalling speed or the minimum steady flight speed in the landing configuration.

19. A12 Which speed symbol indicates the higher airspeed for a transport category airplane?

1- V_A
2- V_{LE}
3- V_{MO}/M_{MO}
4- V_{LO}/M_{LO}

20. A21 During the period a Flight Engineer Certificate is suspended by the FAA, a certificated flight crewmember may not (without special FAA authorization)

1- take a written test at an FAA office.
2- exercise the privileges of a Commercial Pilot Certificate in passenger flight operation under FAR Part 121.
3- apply for any certificate issued by the FAA.
4- have a rating added to the certificate.

21. A21 Which current certificates must a flight crewmember possess to act as a flight engineer on a DC-8 aircraft in passenger service for a Domestic U.S. Air Carrier?

1- Flight Engineer Certificate with appropriate rating, or a foreign flight engineer license and a Second- or Third-Class Medical Certificate.
2- Flight Engineer Certificate with appropriate rating, or a Commercial Pilot Certificate with Instrument Rating and a Second-Class Medical Certificate.
3- Flight Engineer Certificate with DC-8 rating, and a First- or Second-Class Medical Certificate.
4- Flight Engineer Certificate with turbojet rating, and a First- or Second-Class Medical Certificate.

22. [illegible] Which procedure applies for a flight engineer who has an increase in physical deficiency beyond the limits of the [illegible] medical certificate as [illegible] The engineer

1- [illegible] a recheck by an FAA [illegible]
2- may not legally perform flight engineer duties.
3- may continue to perform as a flight engineer until the expiration date of the medical certificate.
4- must return (surrender) the medical certificate to an FAA inspector.

23. A23 The alteration of a Flight Engineer Certificate or the falsification of required records by an airman is the basis for

1- suspending any airman or ground instructor certificate held by the person.
2- revocation and cancellation of the Flight Engineer Certificate.
3- surrender of all FAA certificates held by the flight engineer.
4- a special flight check and reexamination on the rules of FAR Part 63 by an FAA inspector.

24. A11 Which is a definition of the term "flight crewmember" according to the FARs?

1- Any person, including a stewardess, assigned to duty in an aircraft during flight time.
2- A certificated airman assigned to flight deck duty during flight time.
3- A pilot, flight engineer, or flight navigator assigned to duty in an aircraft during flight time.
4- A pilot or flight engineer assigned to flight deck duty but no other air carrier employees.

25. A11 What is an area identified by the term "stopway"?

1- An area, at least the same width as the runway capable of supporting an airplane during a normal takeoff.
2- An area not as wide as the runway able to support an airplane during an aborted takeoff.
3- An area with an upward slope not to exceed 1.2 percent of the runway gradient.
4- An area designated for use in decelerating an airplane during an aborted takeoff.

26. A22 Unless suspended or revoked, a Flight Engineer Certificate

1- expires at the end of the 24th month following the month of issuance or renewal.
2- expires the same date as the expiration of the required First-Class Medical Certificate.
3- is issued without a specific expiration date.
4- expires 1 year after the month of issuance.

27. A22 Assume an airman has lost a Flight Engineer Certificate. The privileges of the certificate may be exercised when possessing

1- a valid medical certificate but only for a period of 90 days.
2- a confirming telegram from the FAA.
3- a copy of a passing written test grade report.
4- a temporary certificate issued by a designated flight engineer examiner.

28. A11 What is a definition of the term "flammable" with respect to a fluid or gas?

1- Not susceptible to burning violently when ignited.
2- Not susceptible to propagating a flame after the ignition source is removed.
3- Susceptible to violent burning and rapid spread of flame when ignited.
4- Susceptible to igniting readily or exploding.

29. A11 A material which is not susceptible to burning violently when ignited is defined as

1- flash resistant.
2- flame resistant.
3- fireproof.
4- non-inflammable.

30. A21 Which current certificates must a flight crewmember possess to act as a flight engineer on a Boeing 747 aircraft in passenger service for a Domestic U.S. Air Carrier?

1- Flight Engineer Certificate with appropriate rating or a Commercial Pilot Certificate with Instrument Rating and a Second-Class Medical Certificate.
2- Flight Engineer Certificate with appropriate rating or a foreign flight engineer license and a Second- or Third-Class Medical Certificate.
3- Flight Engineer Certificate with B-747 rating and a First- or Second-Class Medical Certificate.
4- Flight Engineer Certificate with turbojet rating and a Second-Class (or higher) Medical Certificate.

31. B32 During preflight inspection, the flight engineer finds that one hand fire extinguisher is missing in the passenger cabin. Which factor determines the minimum number of hand fire extinguishers required for flight under FAR Part 121?

1- Number of passengers aboard.
2- Number of required crewmembers.
3- Number of installed passenger seats.
4- Type of cabin wall lining and upholstery material.

32. B32 The required hand fire extinguishers for a passenger transport airplane must be of a type suitable for combatting

1- type A, B, and C fires.
2- the kind of fire likely to occur in the compartment where the extinguisher is to be used.
3- type A and type C fires only.
4- fires which may occur in rugs or fire resistant upholstery.

33. B31 On large turbojet aircraft, a third artificial horizon indicating system must be installed. Which is an operational requirement of this system?

1- It must be powered from the main electrical generating system.
2- Operation must be in conjunction with one of the other attitude indicating systems.
3- Reliable indication must be presented for 15 minutes after its source of power fails.
4- It must be operational without selection after failure of the electrical generating system.

34. B22 Which class cargo compartment(s) require the installation of remote indicating fire or smoke detectors but do not require the installation of a built-in fire extinguisher system?

1- B only
2- B, C, and E
3- B, C, and D
4- B and E only

35. B24 Which of the following rules apply when cargo is carried in the passenger compartment ahead of the foremost seated passengers?

1- The cargo must not restrict access to a regular exit or to an emergency exit.
2- The cargo must be secured to the floor with approved cargo tie-down straps.
3- The cargo must be in a passenger seat and secured by a safety belt.
4- The cargo must be carried in approved cargo bins.

36. B22 Which class compartment may be found only in airplanes designed for the carriage of cargo in the cabin?

1- Class D
2- Class C
3- Class E
4- Class B

37. B61 Flight time limitations for domestic air carrier operations require that a flight engineer be

1- relieved of all duty for at least 24 consecutive hours in any 7 consecutive days.
2- limited to a maximum of 40 hours aloft in any 7 consecutive days.
3- limited to a maximum of 1,200 hours duty aloft in any calendar year.
4- relieved of all duty for at least 48 consecutive hours in any 7 consecutive days.

38. B71 During which part of the flight must the flight engineer keep the required seat belt fastened?

1- During the entire time when seated at the FE panel.
2- At all times during flight.
3- During the time the "Fasten Seat Belt" sign is on, but not necessary during cruising flight.
4- Only during takeoff, landing, and when in turbulent air.

39. B31 On airplanes requiring a third gyroscopic bank-and-pitch indicator, which is a requirement with regard to the instrument or system's operation?

1- Operation must be dependent on the captain's attitude indicating system.
2- The power source must provide reliable operation for 30 minutes after total failure of the electrical generating system.
3- The power source must be manually selected to prevent an inadvertent failure during an automatic power transfer.
4- The power source must provide reliable operation for the duration of the flight after failure of the alternating current electrical system.

40. B44 What is the term for the training required for flight crewmembers who have not qualified and served in the same capacity on another airplane of the same group (e.g. turbojet powered)?

1- Upgrade training
2- Transition training
3- Primary training
4- Initial training

41. B32 Which requirement applies to emergency equipment (fire extinguishers, megaphones, first aid kits, and crash ax) installed in aircraft operated under FAR Part 121?

1- Cannot be located in the flight deck, all must be located in the passenger compartment.
2- Cannot be located in a compartment or area where it is not immediately visible to a flight attendant in the passenger compartment.
3- Must be clearly marked to indicate its method of operation.
4- Must be replaced every 6 months to reduce possibilities of failure when needed.

42. B22 Which is a required feature of a Class A cargo compartment?

1- Any fire in the compartment must be readily discernible to a member of the crew while at his or her duty station.
2- The compartment must contain an approved fire extinguishing system controllable from the flight engineer's station.
3- There must be a means to shutoff ventilating airflow to the compartment.
4- There must be a means to exclude hazardous quantities of smoke or noxious gases from entering the crew compartment.

43. B44 What is the term for the training required for flight crewmembers who have qualified and served in the same capacity on another airplane of the same group (e.g. turbojet powered)?

1- Transition training
2- Differences training
3- Upgrade training
4- Programmed training

44. B22 Which class cargo compartments require operable remote indicating fire or smoke detectors to give a warning at the pilot or flight engineer station?

1- A, B, and C
2- B, C, and D
3- C, D, and E
4- B, C, and E

45. B22 In which class compartment must sufficient access be available to allow a member of the crew to reach all of the compartment for the purpose of fire fighting?

1- A, B, and E
2- A and E only
3- B and E only
4- A and B only

46. B22 Which of the following statements is true regarding cargo compartment classification?

1- Class B compartment--one which is <u>not</u> equipped with an approved smoke or fire detection system.
2- Class C compartment--one which is equipped with an approved, built-in fire extinguishing system.
3- Class D compartment--one which is <u>not</u> provided with a fire resistant lining.
4- Class E compartment--one in which there is no way of confirming smoke, flame, or noxious gases.

47. B33 If there is a required emergency exit located in the flight crew compartment, the door which separates the compartment from the passenger cabin shall

1- not be locked during flight.
2- be locked at all times except during emergency landings.
3- be locked at all times except during any emergency declared by the pilot in command.
4- not be locked during takeoff and landing.

48. B34 In the event of an engine emergency, the use of a cockpit check procedure by the flight crew is

1- discouraged because of possible failure of the cockpit lighting system.
2- not recommended because of excess time involved in its proper utilization.
3- recommended by the FAA as a doublecheck after the memorized procedure has been followed.
4- required by regulations to prevent reliance upon memorized procedures.

49. B32 Where should the portable battery-powered megaphone be located if only one is required on a passenger carrying airplane?

1- In the passenger cabin near the over-wing emergency exit.
2- The most forward location in the passenger cabin.
3- The most rearward location in the passenger cabin.
4- On the flight deck, readily accessible to the flight crewmembers.

50. B32 An airplane used in domestic air carrier operations has a seating capacity for 65 passengers. What is the minimum number of fire extinguishers and megaphones which must be located in the cabin when 55 passengers are carried? (FAR Part 121)

1- Two hand fire extinguishers and two megaphones.
2- One hand fire extinguisher and two megaphones.
3- One hand fire extinguisher and one megaphone.
4- Two hand fire extinguishers and one megaphone.

51. B35 Passengers must be instructed on the necessity of using oxygen in the event of cabin depressurization before flight is conducted above a minimum flight altitude of

1- FL 250.
2- FL 350.
3- 14,000 feet.
4- 8,000 feet.

52. B35 A flight engineer, when on flight deck duty in a pressurized aircraft, must start using supplemental oxygen if the

1- aircraft is operating above flight level 250 for a period exceeding 30 minutes.
2- cabin pressure is above 10,000 feet for a period exceeding 30 minutes.
3- cabin pressure is above 10,000 feet for any period of time.
4- aircraft is operating at or above flight level 250 for any period of time.

53. B34 Which item of required night flying lighting equipment may also be required to have a means of controlling the intensity of illumination?

1- Landing lights
2- Anti-collision lights
3- Position lights
4- Instrument lights

54. B35 The supplemental oxygen requirements for passengers when a flight is operated up to flight level 250 is dependent upon the airplane's ability to make an emergency descent to a flight altitude of

1- 10,000 feet within 4 minutes.
2- 12,000 feet within 4 minutes or at a minimum rate of 2,500 FPM, whichever is quicker.
3- 14,000 feet within 4 minutes.
4- 8,000 feet at a minimum rate of 3,000 FPM.

55. B22 In passenger-carrying airplanes, which class cargo and baggage compartment(s) require the installation of an approved smoke or fire detector system to give warning at the pilot or flight engineer stations and also have an approved built-in fire-extinguisher system controlled from this station?

1- C only
2- B and D only
3- B only
4- B, C, and D

56. B22 Hand fire extinguishers must be used to combat fires in certain locations. Which class compartments are protected from fire by the use of hand-fire extinguishers?

1- A, B, and E
2- A and B only
3- B and E only
4- B, C, and E

57. B24 Any piece of cargo or carry-on baggage in the passenger compartment ahead of the foremost seated passengers must be

1- carried in an approved cargo bin.
2- secured with approved tie-down straps or net.
3- secured in a passenger seat with a safety belt.
4- packaged or covered in a manner to avoid possible injury to passengers.

58. B24 Which class compartments require the loading of cargo so as to allow a crewmember, when fighting a fire, to effectively reach all parts of the compartment with the contents of a hand fire extinguisher?

1- Class C, D, and E compartments.
2- Class A and B compartments only.
3- Class B and C compartments.
4- Class A, B, and E compartments.

59. B24 The carriage of cargo aft of the rearmost seated passengers in the passenger compartment is

1- not permissible.
2- permissible if carried either in a cargo bin or tied securely to the floor and properly wrapped.
3- not permissible if the aircraft is used on a domestic or flag carrier route.
4- permissible only if the cargo is carried in an approved cargo bin.

60. B24 All cargo or carry-on baggage in the passenger compartment must be carried in approved cargo bins if located

1- in an area above the passenger seats.
2- in a passenger seat.
3- aft of the foremost seated passengers.
4- forward of the foremost seated passengers.

61. B24 Which cargo in the passenger compartment need not be carried in an approved cargo bin?

1- Cargo carried aft of the rearmost seated passengers.
2- Cargo carried forward of the foremost seated passengers.
3- Cargo carried aft of the foremost seated passengers.
4- Any cargo carried alongside a seated passenger.

62. B36 Which equipment items are required for extended overwater operations?

1- A portable emergency radio signaling device for each crewmember.
2- Liferafts in number such that there will be one liferaft for each four seats in the airplane, plus rafts to accommodate the crew aboard the airplane.
3- A survival kit for each life preserver.
4- A life preserver equipped with a survivor locator light for each occupant of the airplane.

63. B31 The calibration of each airspeed indicator, each airspeed limitation, and each item of related information in the Airplane Flight Manual or on pertinent placards must be expressed in

1- equivalent airspeed.
2- statute miles per hour.
3- knots.
4- percent of Mach.

64. B37 Which factors must be recorded by the approved flight recorder?

1- Airspeed, time, altitude, vertical acceleration, and heading.
2- Time, true altitude, calibrated airspeed, vertical speed, and heading.
3- Elapsed time, airspeed, altitude, vertical acceleration, and magnetic course.
4- Calibrated airspeed, time, pressure altitude, vertical acceleration or deceleration, and true course.

65. B61 Which is a flight time limitation for a flight engineer on a domestic air carrier according to FAR Part 121?

1- 100 hours in any 30 consecutive days.
2- 32 hours in any 7 consecutive days.
3- 30 hours in any calendar week.
4- 100 hours in any calendar month.

66. B61 Each domestic air carrier must relieve any flight crewmember engaged in scheduled air transportation from all duties (flight or ground) for at least

1- 48 continuous hours during any 7-day period.
2- 24 consecutive hours during any 7 consecutive days.
3- 24 continuous hours during any calendar week.
4- 48 consecutive hours in any calendar week.

67. B61 Flight time limitations for all flight crewmembers are established for operations under FAR Part 121. Which phrase correctly identifies the flight time that is included in these limits?

1- Flight time in FAR Part 121 operations only.
2- Only commercial flying in the flight crew position in which FAR Part 121 operations are conducted.
3- All flight time in any flight crew position.
4- All commercial flying in any flight crew position.

68. B62 Which is a flight time limitation for a flight engineer on a flag air carrier where only one engineer is required?

1- 300 hours during any 120-day period.
2- 300 hours during any 60-consecutive days.
3- 120 hours during any 30-consecutive days.
4- 900 hours during any 12 calendar-month period.

69. B44 Crewmembers who have served as flight engineer on a particular type airplane (e.g. Boeing 727-100), may serve as second in command upon completing which training program?

1- Upgrade training
2- Recurrent training
3- Transition training
4- Differences training

70. B32 How many portable battery powered megaphones are required on an air carrier airplane with a seating capacity of 150 passengers on a trip segment when 75 passengers are carried? (FAR Part 121)

1- Two; one located near or accessible to the flight crew, and one located near the center of the passenger cabin.
2- One at the most rearward location in the passenger cabin.
3- One located near the center of the passenger cabin.
4- Two; one at the forward end, and the other at the most rearward location of the passenger cabin.

71. B22 Which is a primary feature of a class D compartment?

1- Fire therein will not endanger airplane safety.
2- Has a separate smoke or fire detection system.
3- Has a built-in fire extinguishing system.
4- Completely sealed so no fire can occur therein.

72. B33 Which event must cause the lighting of interior emergency exit lights?

1- Opening of the emergency exit.
2- Interruption of the airplane's normal electric power.
3- Actuation of the emergency exit equipment.
4- Interruption of the airplane's emergency electric power.

73. B43 If a flight engineer is a required flight crewmember of an airplane, which of the following is true regarding flight engineer emergency evacuation duties?

1- The flight engineer must demonstrate the ability to accomplish emergency evacuation functions, in an airplane or simulator, at least once each 6 months.
2- A flight engineer must receive recurrent emergency evacuation training each 6 months.
3- Flight engineer emergency evacuation duties require the opening of all emergency exits.
4- Flight engineer emergency evacuation duties must be described in the air carrier's operation flight manual.

74. B33 Interior emergency exit lights should be checked for operation. Federal Aviation Regulations require that these lights

1- must operate automatically when subjected to a negative "G" load.
2- must be operable from the flight deck.
3- be armed or turned on during ground operation and all flight operations.
4- must be operable manually.

75. B22 Which is a required feature of a class E cargo compartment?

1- Any fire in the compartment must be readily visible to a crewmember while at his or her station.
2- The compartment must contain an approved built-in fire extinguisher system controlled from the pilot or flight engineer station.
3- There must be a means to shut off ventilating airflow to or within the compartment.
4- Enough access must be provided to enable a member of the crew to fight all fires with a hand fire extinguisher.

76. B33 Interior emergency exit lights must operate manually and must be armed and turned on during

1- ramp operations, taxiing, and takeoff.
2- takeoff, landing, and turbulent air operations.
3- taxiing, takeoff, and landing.
4- descents, landings, and during emergency descents.

77. B61 Duty and rest period rules for domestic air carrier operations require that the flight engineer

1- not be assigned to any duty with the air carrier during a required rest period.
2- not be on duty aloft for more than 90 hours in any calendar month.
3- be relieved of all duty for at least 48 hours during any 7 consecutive days.
4- not be assigned to any duty for a period of at least 18 hours if the engineer had been on duty aloft for 9 hours.

78. B61 What is the limitation regarding time spent by a flight engineer in "dead head" air transportation returning to a home station?

1- Must be considered part of the engineer's duty aloft.
2- Cannot be considered part of the engineer's required rest period.
3- Is considered part of the engineer's total commercial flying.
4- May be considered when determining the engineer's annual flight time requirement.

79. B92 Which information must be entered on the load manifest for a domestic air carrier flight?

1- Make, model, and registration number of the aircraft.
2- The predicted landing weight.
3- Evidence that the center of gravity is within approved limits.
4- Names of passengers.

80. B90 Which documents are required to be carried aboard each domestic air carrier flight conducted under FAR Part 121?

1- Load manifest and flight release.
2- Dispatch release, load manifest, and flight plan.
3- Dispatch release and weight and balance release.
4- Maintenance release, weight and balance release, and flight plan.

81. B95 A crewmember certificate may be issued by the FAA to flight crewmembers on U.S. registered aircraft engaged in

1- intrastate operations only.
2- supplemental air carrier operations.
3- flight crewmember training only.
4- international air commerce.

82. B71 The flight engineer is required by regulations to be at the flight engineer station

1- at all times unless absence is necessary in the performance of flight engineer duties, or to meet physiological needs.
2- only during takeoff and landing.
3- during takeoff and landing, but may be relieved by one of the pilots during cruising flight.
4- only during takeoff and landing and during emergencies.

83. B71 Which flight crewmembers may leave their stations during cruising flight to perform normal duties?

1- One pilot and the flight engineer together when required.
2- Either pilot or the flight engineer, but only one crewmember at a time.
3- One pilot or the flight engineer if the flight engineer station is occupied by a pilot.
4- Either pilot but not the flight engineer.

84. B35 When operating under FAR 121, a flight engineer on flight deck duty must use supplemental oxygen

1- continuously when the aircraft is above flight level 250 regardless of the cabin altitude.
2- continuously during night flight when the cabin altitude is above 8,000 feet.
3- continuously when the cabin altitude is 10,000 feet or more.
4- only after the cabin altitude has been between 10,000 and 12,000 feet for 30 minutes.

85. B35 Above which cabin altitude must oxygen be provided for all persons during the entire flight?

	All Crewmembers	All Passengers
1-	10,000 ft.	12,000 ft.
2-	10,000 ft.	15,000 ft.
3-	14,000 ft.	14,000 ft.
4-	12,000 ft.	15,000 ft.

86. B37 Which information must be retained by the required flight recorder?

1- Data from which time of radio transmissions with ATC can be determined.
2- All radio and intercom communications.
3- Altitude, groundspeed, and heading.
4- Voice communications of the three required flight crewmembers.

87. B37 When a flight recorder is required and installed, it shall

1- be operated continuously from the instant the airplane begins the takeoff roll to completion of the landing roll.
2- be painted bright red for easy identification.
3- record heading, altitude, airspeed, aircraft weight, and vertical acceleration.
4- be in a container so constructed that it will not sink in the event of a water ditching.

88. B39 Cockpit voice recorders shall be operated from the start of

1- the before starting check to the end of the secure cockpit check.
2- the before takeoff check to the end of the after landing check.
3- the takeoff roll to the end of the landing roll.
4- departure from the ramp to the next full stop at a ramp.

89. B35 Each air carrier flight deck crewmember on flight deck duty must be provided with a quick-donning type oxygen mask when operating at flight altitudes above flight level

1- 250.
2- 200.
3- 120.
4- 180.

90. B35 Assume a passenger aircraft is cruising at FL 390 and all flight crewmember stations are provided with approved quick-donning type oxygen masks. Under which conditions must a flight crewmember put on and use an oxygen mask?

1- When the flight engineer leaves the flight engineer station, one pilot must use a mask.
2- When the captain leaves the left seat, the other pilot and flight engineer must use their masks.
3- When one pilot leaves the flight deck, the other pilot must use a mask but other crewmembers need not.
4- When any flight crewmember leaves the flight deck, all other flight crewmembers must use their masks.

91. B73 Each crewmember shall have available for individual use on <u>each</u> flight a

1- pyrotechnic signaling device.
2- flashlight in good working order.
3- hand fire extinguisher suitable for combatting type A, B, and C fires.
4- quick-donning oxygen mask.

92. B73 Who is responsible for entry into the maintenance log of any inflight mechanical irregularity that is noted by the flight engineer?

1- The air carrier or their delegates.
2- Flight engineer.
3- Equal responsibility between the pilot in command and the flight engineer.
4- Pilot in command.

93. B25 An aural landing gear warning device which operates in relation to flap position,

1- may have a manual shutoff located at the pilot or flight engineer station.
2- may be used instead of a throttle actuated warning device.
3- must sound continuously when the flaps are extended beyond the maximum approach climb configuration if the gear is not down and locked.
4- must have the flap position sensor located on the flap selector cable.

94. B82 When computing fuel required for a scheduled air carrier flight, which factor must be considered?

1- Fuel to the destination, then to the alternate, plus 1 hour at normal cruise.
2- Fuel to the destination plus fuel for 45 minutes' operation at METO power.
3- Fuel for one instrument approach and a possible missed approach at the destination.
4- Fuel for 45 minutes at maximum endurance holding, after reaching the most distant alternate.

95. B82 The required fuel supply for a flag air carrier turbojet airplane consists of fuel to fly to destination and to hold at the alternate (if specified) before landing. What type holding operation is planned in the fuel supply calculations?

1- 45 minutes at traffic pattern altitude.
2- 30 minutes at the most economical altitude regarding fuel consumption at holding speed.
3- 45 minutes at minimum holding altitude.
4- 30 minutes at 1,500 feet AGL.

96. B35 If either pilot of an air carrier airplane leaves the duty station while flying at flight level 310, the other pilot

1- shall put on and use an oxygen mask.
2- must have a quick-donning type oxygen mask available.
3- and the flight engineer shall put on and use their oxygen masks until the other pilot returns.
4- must select emergency oxygen and put on an oxygen mask.

97. B35 How much supplemental oxygen must pressurized air carrier transport airplanes carry for each flight crewmember on flight deck duty?

1- A minimum of 30-minute's supply.
2- Sufficient for the duration of the flight above 10,000 feet flight altitude.
3- Sufficient for the duration of the flight above 8,000 feet cabin pressure altitude.
4- A minimum of 2-hour's supply.

98. B72 The pilot in command has the authority to exclude any and all persons from admittance to the flight deck

1- as an emergency action in the interest of safety.
2- with the exception of any certified FAA inspector.
3- except those persons who have specific authorization of the certificate holder management and the FAA.
4- unless that person has a seat available in the passenger compartment.

99. B72 The pilot in command has emergency authority to exclude people from the flight deck. Those who may be excluded from this area include

1- anyone except an FAA air carrier inspector.
2- anyone except a federal law enforcement officer who presents proper credentials.
3- any person regardless of their official status.
4- all persons except those specifically designated by the certificate holder as essential crewmembers.

100. B51 Which requirement must be met by all flight engineers every 6 months before they can serve on an air carrier flight under FAR Part 121?

1- Upgrade training.
2- 50 hours of flight time or a flight check.
3- Line check or route check.
4- Recurrent flight and ground training.

101. B35 When cruising at FL 350, which rule applies to the flight engineer's supplemental oxygen equipment?

1- The mask must be worn at all altitudes above FL 250.
2- The oxygen regulator must be set to the 100% position.
3- The mask must be located within immediate reach of the flight engineer's duty station.
4- The mask must be worn if one pilot leaves the flight deck.

ight engineer must receive recurrent
ning on emergency procedures at least
each

- 6 calendar months.
- 24 calendar months.
- 12 calendar months.
- 18 calendar months.

ng which preceding time period must a
member have completed an established
ning program in order to perform
es associated with handling of
erous articles and magnetized
rials?

- 12 calendar months
- 6 months
- 18 calendar months
- 24 months

much flight time as a flight engineer
an airman obtain in a 6-months'
od to remain qualified to perform in
irplane without taking a flight check?

- 50 hours minimum in the airplane type.
- 50 hours in transport category airplanes.
- 50 hours minimum and 500 hours maximum.
- 50 hours minimum and 600 hours maximum.

function of the minimum equipment
is to indicate required items which

- cannot be missing from the aircraft for any air carrier flight.
- are required to be operative when the aircraft is used on domestic passenger scheduled flights.
- may be inoperative while permitting a ferry flight to a maintenance terminal.
- may be inoperative for a flight beyond a terminal point.

reserve fuel supply for a domestic
carrier flight in a turbojet air-
t shall be enough fuel for

- 30 minutes at normal cruising fuel consumption.
- 45 minutes at normal cruising fuel consumption.
- 45 minutes at holding fuel consumption 1,500 feet above the alternate airport.
- 30 minutes at holding fuel consumption 1,500 feet above the destination or alternate airport.

107. B62 For flag air carrier operations (overseas) in which the flight crew consists of two pilots and one flight engineer, the engineer may not be scheduled for more than

1- 8 hours in any 24 consecutive hours.
2- 30 hours during any 7 days.
3- 100 hours in any 30 consecutive days.
4- 300 hours in any 90 consecutive days.

108. B51 Under which conditions may an approved synthetic trainer be used by the carrier to perform the flight check required for a flight engineer who has not received 50 hours of flight time in the previous 6 months?

1- If the preflight inspection check is accomplished on the actual aircraft.
2- If the air carrier cannot provide an aircraft for flight check purposes.
3- If the emergency procedure check is accomplished in the actual aircraft.
4- If the engineer has previously qualified in the type of aircraft.

109. B45 A drill which the flight engineer must perform as a part of emergency training, is one utilizing the proper equipment and procedures concerning

1- fire extinguishing and smoke control.
2- abnormal situations, such as hijacking.
3- emergency descent following rapid decompression.
4- emergency dumping of fuel.

110. B47 To serve as a required flight crewmember on an air carrier airplane, a flight engineer must have satisfactorily completed recurrent ground and flight training for that airplane within the preceding

1- 6 calendar months.
2- 12 calendar months.
3- 18 calendar months.
4- 24 calendar months.

111. B44 What is the term for the training required for flight crewmembers who have qualified and served on a particular type airplane (e.g. Boeing 727-100) before they may serve in the same capacity on a particular variation of that airplane?

1- Programed training
2- Transition training
3- Upgrade training
4- Differences training

112. B45 The flight engineer must perform, as part of emergency training, drills utilizing the proper equipment and procedure concerning

1- discharge of fire extinguishers in engine nacelles.
2- emergency descent.
3- operation and use of emergency exits and evacuation chutes.
4- dumping of fuel down to undumpable fuel level.

113. B45 The air carrier must give instruction on such subjects as "respiration, hypoxia, and decompression" to each crewmember on pressurized airplanes operated above

1- 10,000 feet.
2- 20,000 feet.
3- 12,000 feet.
4- 25,000 feet.

114. B39 The information recorded by a required cockpit voice recorder may be erased or otherwise obliterated no sooner than

1- 30 minutes after recording.
2- 60 days after the end of the flight.
3- 48 hours after the end of the flight.
4- 15 minutes after recording.

115. B42 If the flight engineer becomes incapacitated, who may perform flight engineer duties during an IFR flight conducted under FAR Part 121?

1- A pilot crewmember but only if flight engineer certificated.
2- Either pilot but only if qualified to perform flight engineer functions.
3- Any crewmember designated by the pilot in command.
4- The pilot second in command only.

116. B42 On each air carrier flight requ
flight engineer, at least one
crewmember, other than the flig
engineer, must be qualified to
emergency performance of the f
engineer's functions. This fl
member

1- is not required to have
engineer's certificate.
2- must have flown 50 hou
flight engineer, within
6 months.
3- must be the pilot in co
perform flight engineer
4- must have a flight engi
certificate.

117. B42 Under which condition is a flig
engineer required as a flight
on a turbojet airplane used in
121 operations?

1- If the airplane is carr
passengers or live carg
2- If the airplane's takeo
weight is above 80,000
3- If the airplane is powe
more than two engines.
4- If required by the airp
type certificate.

118. B74 In addition to the required ora
before each takeoff, FAR Part 1
requires that certain informati
be made available to each passe
printed cards. This informatio

1- rules about smoking du
2- the procedure for admin
first aid oxygen.
3- rules concerning the co
of alcoholic beverages.
4- diagrams and methods of
the emergency exits.

119. B74 Which passenger announcement mu
after each takeoff?

1- The location and use of
gency exits.
2- How to don and inflate
preserver.
3- The emergency use of th
ger oxygen system.
4- To keep seat belts fast
seated.

120. B75 Which rule applies when a passenger is seated in the cabin of an all-cargo aircraft?

1- The passenger must be reserved a seat on the flight deck.
2- The pilot in command may authorize the passenger to be admitted to the crew compartment.
3- The passenger must remain seated with seat belt fastened at all times during flight.
4- Crew-type oxygen equipment must be provided for the passenger.

121. B95 Under what conditions must a flight engineer's crewmember certificate be surrendered to the FAA for cancellation?

1- Each year when the flight engineer takes a recurrent flight check.
2- At each renewal of the flight engineer's medical certificate.
3- When the flight engineer is no longer assigned to international air commerce by the carrier.
4- When the flight engineer is reassigned to duty as a pilot, second in command.

122. B91 Among the required items of information on the dispatch release of a domestic air carrier is the

1- name of the pilot in command.
2- weight and balance data.
3- airplane make and model.
4- minimum fuel supply.

123. B35 Above which cabin altitude must oxygen be provided for all passengers during the entire flight?

1- 10,000 feet
2- 12,000 feet
3- 14,000 feet
4- 15,000 feet

124. C82 Which has the effect of increasing load factor?

1- Vertical gusts.
2- Increased airplane weight.
3- Increased air density.
4- Rearward CG location.

125. C62 An airplane is flying at a constant flight level and at a power schedule which produces maximum air miles per pound of fuel. In this event, as the weight of the airplane reduces, engine power setting or fuel flow is

1- held constant to simplify fuel consumption computations.
2- reduced to maintain the best constant airspeed.
3- reduced to maintain the best L/D ratio flight conditions.
4- increased to allow flight at maximum efficient airspeed relative to tailplane drag.

126. C62 Which maximum range factor decreases as weight decreases?

1- Specific range.
2- Maximum range angle of attack.
3- Maximum range altitude.
4- Maximum range airspeed.

127. C41 The use of a slot in the leading edge of the wing enables the airplane to land at a slower speed because it

1- changes the camber of the wing.
2- increases the ground effect.
3- decelerates the upper surface boundary layer air.
4- delays the stall to a higher angle of attack.

128. C41 The primary purpose of high lift devices is to increase the

1- L/D_{max}.
2- lift at slow speeds.
3- drag and reduce airspeed.
4- approach and landing speeds.

129. C41 What is the primary function of the leading edge flaps in landing configuration during the flare before touchdown?

1- Increase profile drag.
2- Prevent flow separation.
3- Prevent ground effect.
4- Decrease rate of sink.

130. C71 Variations in V_{REF} for a particular airplane are primarily a function of

1- landing weight.
2- takeoff weight, wind component, and runway length.
3- number of engines operating and flap configuration.
4- gross weight, pressure altitude, and ambient temperature.

131. C71 The landing speed, in terms of TAS, for a particular weight and configuration of the aircraft will

1- increase as relative humidity is decreased.
2- decrease as atmospheric pressure is decreased.
3- remain constant regardless of altitude.
4- increase as altitude is increased.

132. D14 What is the relationship between altitudes when the altimeter setting is higher than standard while flying at 15,000 feet indicated altitude?

1- Indicated altitude is higher than true altitude.
2- Indicated altitude is lower than true altitude.
3- Indicated altitude is higher than pressure altitude.
4- Indicated altitude is lower than pressure altitude.

133. D21 Which airplane performance change takes place as air density or density altitude changes?

1- Climb performance improves with an increase in density altitude.
2- Required landing distance decreases as air density decreases.
3- Takeoff performance improves as density altitude decreases.
4- Final approach indicated airspeed (V_{REF}) is reduced as air density decreases.

134. D22 The relative humidity of the air is 100%. This is an indication that

1- the temperature and dewpoint are equal.
2- an inversion has formed.
3- precipitation (rain or snow) is occurring.
4- the vapor pressure is zero.

135. D43 An inversion can be identified by the

1- pressure lapse rate.
2- tropopause location.
3- jetstream location.
4- temperature lapse rate.

136. D51 The speed of sound in the atmosphere normally increases

1- as temperature becomes warmer.
2- with an increase in pressure.
3- as altitude increases.
4- as temperature becomes colder and pressure decreases.

137. D52 An airplane is climbing at Mach .78 during an enroute climb. In this case, the true airspeed would

1- remain the same throughout the climb.
2- increase as pressure decreases.
3- increase with altitude.
4- decrease as the temperature decreases.

138. C12 Which factor causes the decreased pressure on the upper surface of the wing?

1- The curvature of the upper surface causes the air to burble and break away from the upper surface, leaving an area of lower pressure.
2- The curvature of the upper surface of the wing tends to deflect the air away from the upper surface, thereby decreasing the pressure on the upper surface.
3- Air flowing over the upper surface of the wing travels faster than the air passing beneath the wing.
4- Air flowing over the upper surface of the wing travels at a slower speed than the air beneath the surface of the wing due to the drag caused by the curvature of the upper surface.

139. C13 The angle of attack at which an airplane stalls

1- decreases with an increase in engine power.
2- remains constant regardless of gross weight.
3- increases with an increase in engine power.
4- varies with gross weight and density altitude.

140. C14 In many conventional airplanes, control about the lateral axis is obtained by the use of

1- elevators.
2- ailerons.
3- rudder.
4- sweepback.

141. C14 The trimming devices on a particular airplane include trailing edge tabs on the rudder and a movable horizontal stabilizer. If the airplane is trimmed to a more nose down and nose left position, the stabilizer leading edge will move

1- down and the rudder tab will move to the right.
2- down and the rudder tab will move to the left.
3- up and the rudder tab will move to the right.
4- up and the rudder tab will move to the left.

142. C52 The use of the recommended partial flap setting for takeoff in a transport category airplane increases performance in comparison to a flaps-up takeoff by reducing takeoff

1- distance and takeoff speed.
2- distance but not changing takeoff speed.
3- speed but not changing takeoff distance.
4- distance and increasing takeoff speed.

143. C53 What effect does an uphill runway slope have upon takeoff performance?

1- Increases takeoff distance.
2- Increases takeoff speed.
3- Decreases takeoff distance.
4- Decreases takeoff speed.

144. C50 Which has the effect of reducing critical engine failure speed?

1- Slush on runway or inoperative antiskid.
2- High gross weight.
3- Dry runway with uphill slope.
4- High density altitude.

145. D41 During a climb, the tropopause can be identified as the altitude where the

1- air density starts to increase as altitude increases.
2- atmospheric pressure becomes zero.
3- temperature lapse rate becomes zero.
4- jetstream winds are encountered.

146. D42 Which gauge reading is an indication of the coldest atmospheric temperature?

1- -35°C. Ram Air Temp (RAT)
2- -35°C. Ambient Air Temp
3- -35°C. Static Air Temp (SAT)
4- -35°C. Total Air Temp (TAT)

147. D41 Which of the following is true concerning the tropopause?

1- The polar tropopause is at a higher altitude than the tropical tropopause.
2- The tropopause is the dividing line between the atmosphere and the stratosphere.
3- The tropopause is higher in the summer than in the winter.
4- Above the tropopause, the oxygen content of the air drops to approximately 2%.

148. D11 To obtain pressure altitude during flight, adjust the altimeter to

1- the current altimeter setting and adjust this altitude by using correction factors found in a pressure altitude table.
2- the current altimeter setting and read pressure altitude directly from the altimeter.
3- 29.92 and read pressure altitude directly from the altimeter.
4- 29.92 and correct the indicated altitude for temperature.

149. D12 Which condition is indicated when density altitude is the same as pressure altitude?

1- Temperature is ISA standard.
2- Indicated altitude is the same as pressure altitude.
3- IAS and CAS are the same speed.
4- Engine performance is maximum for the pressure altitude.

150. C73 Under which condition during the landing roll are the main wheel brakes at maximum effectiveness?

1- When wing lift has been reduced.
2- At high groundspeeds.
3- When the wheels are locked and skidding.
4- When the emergency air brakes are applied.

151. C81 Wake turbulence produced by a large aircraft in flight is

1- primarily caused by jet engine exhaust.
2- greatest at low airspeeds.
3- greatest at high airspeeds.
4- caused by downwash over the tail surfaces.

152. C81 Which flight condition of a large jet airplane creates the most severe flight hazard by generating wingtip vortices of the greatest strength?

1- Heavy, slow, gear and flaps up.
2- Heavy, slow, gear and flaps down.
3- Heavy, fast, gear and flaps up.
4- Heavy, fast, gear and flaps down.

153. C13 The true airspeed at which an airplane stalls varies with

1- load factor, weight, and density altitude.
2- load factor and angle of attack.
3- density altitude, weight, and angle of attack.
4- groundspeed, load factor, and density altitude.

154. C13 The angle of attack which produces the highest lift-drag ratio

1- remains constant as weight is changed, but decreases as altitude is increased.
2- increases as weight or altitude is increased.
3- remains constant regardless of weight or altitude.
4- remains constant as altitude is changed, but decreases as weight is reduced.

155. C54 As compared to a no-wind condition, what effect would a 20-knot headwind component have upon takeoff performance?

1- Actual groundspeed at rotation will be greater than V_R.
2- The airplane will reach critical engine failure indicated airspeed at a lower groundspeed.
3- Critical engine failure speed and actual groundspeed will be the same as in a zero-wind condition.
4- The effect of wind on initial acceleration will result in a longer takeoff roll.

156. C55 Which has the effect of increasing critical engine failure speed?

1- Inoperative antiskid.
2- Increased takeoff weight.
3- Inoperative thrust reverser.
4- Slush on the runway.

157. C61 Which relationship is true at constant airspeed in level flight?

1- Lift equals total drag.
2- Lift exceeds airplane weight.
3- Drag equals total engine power output.
4- Thrust equals total drag.

158. C41 The minimum takeoff distance for a turbojet aircraft is obtained with which flap configuration?

1- Leading edge devices and trailing edge flaps partially down.
2- Leading edge devices full down and trailing edge flaps up.
3- Leading edge devices and trailing edge flaps full down.
4- Leading edge devices full down and trailing edge flaps partially down.

159. C51 The authorized maximum takeoff weight of a transport airplane, when less than the maximum certificated weight, is a factor which

1- is the sum total of the maximum zero fuel weight and the maximum allowable fuel load.
2- may not be more than 105% of the maximum landing weight.
3- varies with runway length, airport elevation, and ambient temperature.
4- may be increased by headwind components and higher than normal temperatures.

160. D41 The average altitude for 1/2 atmosphere (500 millibar pressure level) is

1- 18,000 feet.
2- 13,000 feet.
3- 10,000 feet.
4- 25,000 feet.

161. D41 Which of the following is true concerning the troposphere?

1- It contains all the free oxygen of the atmosphere.
2- It is the dividing line between the stratosphere and the atmosphere.
3- It is thicker over the equator than over the poles.
4- It extends to a uniform height at all latitudes.

162. Critical Mach number means the
C31

1- speed at which there is supersonic airflow over all parts of the aircraft.
2- speed at which the aircraft starts to "tuck" or buffet.
3- highest flight speed without supersonic flow over any part of the aircraft.
4- highest speed at which the aircraft is certificated for operation.

163. In comparing a straight wing and a
C32 sweptback wing of the same wing area and wing loading, the sweptback wing has the advantage of

1- lower stalling speed.
2- greater mean aerodynamic chord.
3- increased longitudinal stability.
4- higher critical Mach number.

164. Which adverse stability characteristic
C32 is caused by sweepback?

1- Increase of dutchroll tendency.
2- Increase of longitudinal static stability.
3- Increase of Mach tuck tendency.
4- Increase of critical Mach number.

165. A decrease of one inch of mercury (baro-
D11 metric pressure) would cause a change in the altimeter reading of approximately

1- minus 1,000 feet.
2- plus 1,000 feet.
3- plus 100 feet.
4- minus 100 feet.

166. What effect, if any, would a change in
D21 ambient temperature or air density have on gas turbine engine performance?

1- As air density decreases, thrust increases.
2- As temperature increases, thrust increases.
3- No change occurs with either temperature or density altitude changes.
4- As temperature increases, thrust decreases.

167. Which statement is a definition of rela-
D22 tive humidity?

1- The relative point at which the air, being cooled, becomes saturated.
2- The ratio of actual water vapor in the air to the amount required for saturation.
3- The density of the water vapor in the air.
4- The ratio of the pressure exerted by the water vapor in the air to the standard vapor pressure.

168. Without the use of supplemental oxygen,
D41 crewmembers and passengers would suffer from hypoxia in high altitude unpressurized flight. This problem occurs because as altitude is increased,

1- nitrogen in the atmosphere and in the bloodstream expands.
2- the percentage of oxygen in the atmosphere is decreased.
3- oxygen partial pressure is decreased.
4- the percentage of nitrogen in the atmosphere is increased.

169. What is a characteristic of the constant
C62 Mach cruise control procedure?

1- Thrust is reduced as aircraft weight decreases.
2- True airspeed decreases as OAT increases.
3- EPR is increased as OAT increases.
4- EPR is increased as aircraft weight decreases.

170. The ratio of nautical miles per hour to
C60 fuel flow in pounds per hour identifies which item relating to airplane performance?

1- Specific fuel consumption
2- Specific fuel flow
3- Specific range
4- Specific endurance

171. Takeoff speed limits (V_1, V_R, and V_2)
C21 contained in performance charts and tables of the airplane flight manual, are to be observed on the captain's airspeed indicator. These speeds are classified as

1- equivalent airspeeds.
2- indicated airspeeds.
3- true airspeeds.
4- corrected airspeeds.

172. C14 The trimming devices on a particular airplane include trailing edge tabs on the rudder and ailerons. If the airplane is trimmed to a more nose right and right wing up position, the right aileron trim tab will move

1- down, and the rudder tab will move to the right.
2- down, and the rudder tab will move to the left.
3- up, and the rudder tab will move to the right.
4- up, and the rudder tab will move to the left.

173. C24 Mach number is commonly defined as the

1- ratio of equivalent airspeed to the speed of sound.
2- speed of sound under conditions of standard pressure and temperature.
3- calibrated airspeed corrected for position and instrument error.
4- ratio of true airspeed to the speed of sound.

174. D12 Density altitude may be determined by correcting

1- pressure altitude for temperature.
2- indicated altitude for atmospheric pressure and temperature.
3- true altitude for atmospheric pressure and temperature.
4- indicated altitude for temperature.

175. C65 During a coordinated turn in level flight at a constant airspeed, centrifugal force is counterbalanced by

1- the weight of the airplane.
2- the coordinated use of rudder control.
3- the increased speed of the high wing and decreased speed of the low wing.
4- a portion of the lift of the wing.

176. D53 An airplane is descending at a constant Mach .6. What would occur regarding the true airspeed?

1- Remain constant.
2- Decrease as pressure increases.
3- Decrease as altitude decreases.
4- Increase as temperature increases.

177. E43 Using the data given below, determine the minimum weight of cargo which must be shifted from the aft to the forward compartment to bring the CG within limits.

Total weight - 175,000 lbs.
MAC - Sta. 860.2 - 1040.9
CG - 33.8% MAC
Aft CG limit - 32.0% MAC
Cargo centroids - Fwd - 582"
Aft - 1028"

1- 1,142 lbs.
2- 1,277 lbs.
3- 1,602 lbs.
4- 1,335 lbs.

178. E11 The payload of a transport aircraft consists of

1- crew, passengers, baggage, cargo, and fuel only.
2- passengers, cargo, and fuel only.
3- all weights in excess of zero fuel weight (ZFW).
4- passengers, baggage, and cargo only.

179. E22 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 300,000 lbs.
CG position - 24.5% MAC
Length of MAC - Sta. 763.0 to 1035.3

If 5,000 lbs. of cargo is removed from an average location of Sta. 1170, what is the new CG position relative to MAC?

1- 24.3%
2- 26.6%
3- 22.4%
4- 21.7%

180. E12 The term "Mean Aerodynamic Chord" may be defined as the

1- distance from the leading edge to the trailing edge of the wing, measured at the wing root.
2- chord of an imaginary airfoil which has the same aerodynamic characteristics as the actual airfoil.
3- ratio of the average wing chord to its aerodynamic center of pressure.
4- total lift of an airfoil divided by its mean chord.

181. E21 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 290,000 lbs.
CG position - 20.5% MAC
Length of MAC - Sta. 795.8 to 1068.6

If 6,000 lbs. of cargo is added to an average location of Sta. 1320, what is the new CG position relative to MAC?

1- 25.1%
2- 24.0%
3- 22.6%
4- 20.2%

182. E51 What is the maximum payload under these conditions?

Basic operating weight - 102,000 lbs.
Maximum zero fuel weight - 138,000 lbs.
Maximum landing weight - 142,500 lbs.
Maximum takeoff weight - 184,200 lbs.
Fuel tank load - 54,500 lbs.
Estimated fuel
burn enroute - 47,500 lbs.

1- 27,700 lbs.
2- 34,700 lbs.
3- 29,300 lbs.
4- 36,000 lbs.

183. E51 What is the maximum payload under these conditions?

Basic operating weight - 101,500 lbs.
Maximum zero fuel weight - 138,000 lbs.
Maximum landing weight - 142,500 lbs.
Maximum takeoff weight - 184,200 lbs.
Fuel tank load - 52,000 lbs.
Estimated fuel
burn enroute - 45,500 lbs.

1- 27,700 lbs.
2- 34,200 lbs.
3- 30,700 lbs.
4- 36,500 lbs.

184. E12 The center of gravity of an airplane is normally located in the fuselage at a point expressed in

1- percentage of MAC aft of the leading edge of the wing.
2- inches from the leading edge of the wing.
3- percent of mean aerodynamic chord aft of LEMAC.
4- inches from the forward CG limit.

185. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 280,000 lbs.
Center of gravity - 28.8% MAC
MAC - 795.8" - 1068.6"
Compartment locations - Fwd - 440"
Aft - 1320"

Before takeoff, 3,250 lbs. of cargo is shifted from the aft to the forward compartment. What is the new center of gravity location?

1- 25.1% of MAC
2- 26.7% of MAC
3- 22.5% of MAC
4- 23.9% of MAC

186. E43 The gross weight of the aircraft is 328,000 pounds. How much weight must be moved from Station 1010 to Station 500 to move the CG forward 3.3 inches?

1- 1,987 lbs.
2- 2,300 lbs.
3- 2,123 lbs.
4- 2,215 lbs.

187. E43 The gross weight of the aircraft is 285,000 pounds. How much weight must be moved from Station 1030 to Station 600 to move the CG forward 2.3 inches?

1- 1,765 lbs.
2- 1,475 lbs.
3- 1,270 lbs.
4- 1,525 lbs.

188. E43 The gross weight of the aircraft is 328,000 pounds. How much weight must be moved from Station 1020 to Station 400 to move the CG forward 1.3 inches?

1- 597 lbs.
2- 688 lbs.
3- 1,270 lbs.
4- 834 lbs.

189. E43 A cargo aircraft loaded to maximum takeoff gross weight of 150,000 pounds is tail heavy. How many 150-pound boxes must be moved from the 1200-inch station to the 700-inch station to move the CG forward 3 inches?

1- 3 boxes
2- 6 boxes
3- 9 boxes
4- 12 boxes

190. E43 A cargo aircraft loaded to maximum takeoff gross weight of 165,000 pounds is tail heavy. How many 50-pound boxes must be moved from the 1200-inch station to the 710-inch station to move the CG forward 3.2 inches?

1- 21 boxes
2- 22 boxes
3- 23 boxes
4- 24 boxes

191. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 232,000 lbs.
Center of gravity - 20.7% MAC
MAC - 680" - 920"
Compartment locations - Fwd - 320.5"
Aft - 1116.0"

Before takeoff, 2,250 lbs. of cargo is shifted from the forward to the aft compartment. What is the new center of gravity location?

1- 24.7% of MAC
2- 23.9% of MAC
3- 22.5% of MAC
4- 25.3% of MAC

192. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 320,000 lbs.
Center of gravity - 20.7% MAC
MAC - 795.8" - 1068.6"
Compartment locations - Fwd - 440"
Aft - 1320"

Before takeoff, 4,250 lbs. of cargo is shifted from the forward to the aft compartment. What is the new center of gravity location?

1- 23.6% of MAC
2- 25.8% of MAC
3- 22.5% of MAC
4- 25.0% of MAC

193. E11 The maximum allowable aircraft weight above which all of the load must consist of disposable fuel is called

1- maximum payload weight.
2- basic operating weight.
3- maximum landing weight.
4- maximum zero fuel weight.

194. E21 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 310,000 lbs.
CG position - 29.5% MAC
Length of MAC - Sta. 795.8 to 1068.6

If 7,000 lbs. of cargo is added to an average location of Sta. 440, what is the new CG position relative to MAC?

1- 26.0% of MAC
2- 33.0% of MAC
3- 25.3% of MAC
4- 28.3% of MAC

195. E43 The gross weight of the aircraft is 175,000 pounds. How much weight must be moved from Station 1028 to Station 582 to move the CG forward 3.3 inches?

1- 1,075 lbs.
2- 1,295 lbs.
3- 1,270 lbs.
4- 2,300 lbs.

196. E43 The gross weight of the aircraft is 165,000 pounds. How much weight must be moved from Station 1028 to Station 582 to move the CG forward 2.3 inches?

1- 851 lbs.
2- 975 lbs.
3- 1,233 lbs.
4- 1,150 lbs.

197. E43 The gross weight of the aircraft is 155,000 pounds. How much weight must be moved from Station 1028 to Station 582 to move the CG forward 1.2 inches?

1- 352 lbs.
2- 516 lbs.
3- 418 lbs.
4- 585 lbs.

198. E43 Using the data given below, determine the minimum weight of cargo which must be shifted from the aft to the forward compartment to bring the CG within limits.

Total weight - 300,000 lbs.
MAC - Sta. 795 - 1068
CG - 31.5% MAC
Aft CG limit - 30.0% MAC
Cargo centroids - Fwd - 440"
Aft - 1320"

1- 1,235 lbs.
2- 1,511 lbs.
3- 1,103 lbs.
4- 1,397 lbs.

199. E43 Using the data given below, determine the minimum weight of cargo which must be shifted from the aft to the forward compartment to bring the CG within limits.

Total weight - 280,000 lbs.
MAC - Sta. 795 - 1068
CG - 32.0% MAC
Aft CG limit - 30.0% MAC
Cargo centroids - Fwd - 440"
Aft - 1320"

1- 2,217 lbs.
2- 1,843 lbs.
3- 636 lbs.
4- 1,738 lbs.

200. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 300,000 lbs.
Center of gravity - 25.8% MAC
MAC - 763.0" - 1035.3"
Compartment locations - Fwd - 500"
Aft - 1010"

Before takeoff, 5,500 lbs. of cargo is shifted from the forward to the aft compartment. What is the new center of gravity location?

1- 30.1% of MAC
2- 27.8% of MAC
3- 29.2% of MAC
4- 26.9% of MAC

201. E11 Which of the following weight factors determine ramp or taxi weight?

1- Zero fuel weight plus total fuel load.
2- Payload plus operating weight.
3- Takeoff weight minus taxi fuel.
4- Zero fuel weight plus payload, fuel, and oil.

202. E21 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 280,000 lbs.
CG position - 24.5% MAC
Length of MAC - Sta. 763.0 to 1035.3

If 5,000 lbs. of cargo is added to an average location of Sta. 500, what is the new CG position relative to MAC?

1- 24.7%
2- 21.2%
3- 22.4%
4- 26.6%

203. E21 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 230,000 lbs.
CG position - 20.5% MAC
Length of MAC - Sta. 763.0 to 1035.3

If 5,000 lbs. of cargo is added to an average location of Sta. 1010, what is the new CG position relative to MAC?

1- 21.1%
2- 23.5%
3- 19.0%
4- 22.0%

204. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 155,000 lbs.
Center of gravity - 30.7% MAC
MAC - 860.2" - 1040.9"
Compartment locations - Fwd - 582"
Aft - 1028"

Before takeoff, 4,500 lbs. of cargo is shifted from the aft to the forward compartment. What is the new center of gravity location?

1- 23.5% of MAC
2- 26.7% of MAC
3- 22.5% of MAC
4- 28.4% of MAC

205. E43 Using the data given below, determine the minimum weight of cargo which must be shifted from the aft to the forward compartment to bring the CG within limits.

Total weight - 150,000 lbs.
MAC - Sta. 860.2 - 1040.9
CG - 33.5% MAC
Aft CG limit - 32.0% MAC
Cargo centroids - Fwd - 582"
Aft - 1028"

1- 912 lbs.
2- 518 lbs.
3- 1,050 lbs.
4- 875 lbs.

206. E43 An airplane weighing 168,000 pounds when loaded for takeoff was found to have the CG 1 inch aft of the CG limits. How many boxes, each weighing 160 pounds, must be moved from Sta. 1110 to Sta. 630 to bring the CG within limits?

1- 1 box
2- 2 boxes
3- 3 boxes
4- 4 boxes

207. E43 Using the data given below, determine the minimum weight of cargo which must be shifted from the aft to the forward compartment to bring the CG within limits.

Total weight - 310,000 lbs.
MAC - Sta. 795 - 1068
CG - 31.8% MAC
Aft CG limit - 30.0% MAC
Cargo centroids - Fwd - 440"
Aft - 1320"

1- 635 lbs.
2- 1,732 lbs.
3- 1,602 lbs.
4- 1,843 lbs.

208. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 300,000 lbs.
Center of gravity - 25.5% MAC
MAC - 795.8" - 1068.6"
Compartment locations - Fwd - 440"
Aft - 1320"

Before takeoff, 3,500 lbs. of cargo is shifted from the forward to the aft compartment. What is the new center of gravity location?

1- 27.3% of MAC
2- 21.7% of MAC
3- 28.1% of MAC
4- 29.3% of MAC

209. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 250,000 lbs.
Center of gravity - 20.7% MAC
MAC - 763.0" - 1035.3"
Compartment locations - Fwd - 500"
Aft - 1010"

Before takeoff, 3,250 lbs. of cargo is shifted from the forward to the aft compartment. What is the new center of gravity location?

1- 23.1% of MAC
2- 23.9% of MAC
3- 22.5% of MAC
4- 24.7% of MAC

210. E22 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 175,000 lbs.
CG position - 29.5% MAC
Length of MAC - Sta. 860.2 to 1040.9

If 6,500 lbs. of cargo is removed from an average location of Sta. 1170, what is the new CG position relative to MAC?

1- 34.9%
2- 27.6%
3- 26.8%
4- 24.0%

211. E22 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 250,000 lbs.
CG position - 30.5% MAC
Length of MAC - Sta. 763.0 to 1035.3

If 5,000 lbs. of cargo is removed from an average location of Sta. 1010, what is the new CG position relative to MAC?

1- 28.4%
2- 29.3%
3- 27.5%
4- 31.7%

212. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 165,000 lbs.
Center of gravity - 20.7% MAC
MAC - 860.2" - 1040.9"
Compartment locations - Fwd - 582"
Aft - 1028"

Before takeoff, 2,250 lbs. of cargo is shifted from the forward to the aft compartment. What is the new center of gravity location?

1- 22.5% of MAC
2- 25.3% of MAC
3- 24.1% of MAC
4- 24.7% of MAC

213. E11 What is a definition of zero fuel weight?

1- Basic operating weight plus maximum capacity of passengers and cargo.
2- Empty weight plus passengers and cargo.
3- Basic operating weight plus payload.
4- Takeoff weight minus fuel to destination and alternate.

214. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 270,000 lbs.
Center of gravity - 32.7% MAC
MAC - 763.0" - 1035.3"
Compartment locations - Fwd - 500"
Aft - 1010"

Before takeoff, 6,500 lbs. of cargo is shifted from the aft to the forward compartment. What is the new center of gravity location?

1- 28.2% of MAC
2- 29.6% of MAC
3- 30.4% of MAC
4- 31.5% of MAC

215. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 175,000 lbs.
Center of gravity - 28.7% MAC
MAC - 860.2" - 1040.9"
Compartment locations - Fwd - 582"
Aft - 1028"

Before takeoff, 3,500 lbs. of cargo is shifted from the aft to the forward compartment. What is the new center of gravity location?

1- 23.8% of MAC
2- 26.5% of MAC
3- 29.3% of MAC
4- 21.0% of MAC

216. E21 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 165,000 lbs.
CG position - 30.5% MAC
Length of MAC - Sta. 860.2 to 1040.9

If 5,000 lbs. of cargo is added to an average location of Sta. 680, what is the new CG position relative to MAC?

1- 26.7%
2- 28.4%
3- 34.3%
4- 24.3%

217. E11 The "basic operating weight" of a transport airplane is the empty weight plus

1- fuel and oil.
2- required crew and standard operating items.
3- required crew.
4- fixed ballast, hydraulic fluid, undrainable fuel, and undrainable oil.

218. E22 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 320,000 lbs.
CG position - 20.5% MAC
Length of MAC - Sta. 795.8 to 1068.6

If 7,000 lbs. of cargo is removed from an average location of Sta. 440, what is the new CG position relative to MAC?

1- 23.9%
2- 17.1%
3- 22.2%
4- 21.5%

219. E22 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 250,000 lbs.
CG position - 28.5% MAC
Length of MAC - Sta. 795.8 to 1068.6

If 5,000 lbs. of cargo is removed from an average location of Sta. 1320, what is the new CG position relative to MAC?

1- 27.2%
2- 26.1%
3- 25.2%
4- 31.8%

220. E42 An aircraft is ready for takeoff with these loading conditions:

Takeoff weight - 300,000 lbs.
Center of gravity - 20.7% MAC
MAC - 763.0" - 1035.3"
Compartment locations - Fwd - 389"
Aft - 1170"

Before takeoff, 3,500 lbs. of cargo is shifted from the forward to the aft compartment. What is the new center of gravity location?

1- 21.0% of MAC
2- 17.4% of MAC
3- 22.5% of MAC
4- 24.0% of MAC

221. E21 Before a cargo change is made, the following is known about an airplane.

Aircraft weight - 155,000 lbs.
CG position - 24.5% MAC
Length of MAC - Sta. 860.2 to 1040.9

If 7,000 lbs. of cargo is added to an average location of Sta. 1170, what is the new CG position relative to MAC?

1- 25.4%
2- 31.6%
3- 26.7%
4- 30.8%

222. E43 Using the data given below, determine the minimum weight of cargo which must be shifted from the aft to the forward compartment to bring the CG within limits.

Total weight - 165,000 lbs.
MAC - Sta. 860.2 - 1040.9
CG - 34.0% MAC
Aft CG limit - 32.0% MAC
Cargo centroids - Fwd - 582"
Aft - 1028"

1- 1,032 lbs.
2- 740 lbs.
3- 1,338 lbs.
4- 1,410 lbs.

223. E51 What is the maximum payload under these conditions?

Basic operating weight - 150,000 lbs.
Maximum zero fuel weight - 230,000 lbs.
Maximum landing weight - 265,000 lbs.
Maximum takeoff weight - 340,000 lbs.
Fuel tank load - 102,000 lbs.
Estimated fuel burn enroute - 75,500 lbs.

1- 75,500 lbs.
2- 84,000 lbs.
3- 88,500 lbs.
4- 80,000 lbs.

224. E51 What is the maximum payload under these conditions?

Basic operating weight - 100,500 lbs.
Maximum zero fuel weight - 138,000 lbs.
Maximum landing weight - 142,000 lbs.
Maximum takeoff weight - 184,200 lbs.
Fuel tank load - 54,000 lbs.
Estimated fuel burn enroute - 40,000 lbs.

1- 30,500 lbs.
2- 37,500 lbs.
3- 27,500 lbs.
4- 33,000 lbs.

225. E51 What is the maximum payload under these conditions?

Basic operating weight - 150,000 lbs.
Maximum zero fuel weight - 230,000 lbs.
Maximum landing weight - 245,000 lbs.
Maximum takeoff weight - 330,000 lbs.
Fuel tank load - 95,000 lbs.
Estimated fuel burn enroute - 75,000 lbs.

1- 70,000 lbs.
2- 75,000 lbs.
3- 85,000 lbs.
4- 80,000 lbs.

TOGW WT ↓	Model DC-8-63F									Stabilizer Angle for Take-Off					
	FLAPS – 23°														
355	10.0	9.5	9.0	8.6	7.8	7.5	6.9	6.5	5.7	5.4	4.8	4.3	3.7	3.4	2.6
350	9.8	9.4	9.0	8.5	7.7	7.4	6.8	6.3	5.6	5.3	4.7	4.2	3.6	3.3	2.5
340	9.4	9.0	8.1	7.8	7.3	6.9	6.4	6.0	4.9	4.8	4.4	3.9	3.4	2.9	2.2
320	8.7	8.2	7.8	7.2	6.9	6.5	6.1	5.5	4.6	4.5	4.0	3.8	3.2	2.7	2.1
300	8.2	7.8	7.5	7.0	6.6	6.3	5.8	5.2	4.3	4.2	3.8	3.4	2.9	2.5	1.9
280	8.1	7.6	7.2	6.7	6.5	5.9	5.6	4.9	4.1	4.1	3.7	3.2	2.8	2.3	1.7
260	7.8	7.5	7.0	6.5	6.2	5.6	5.3	4.8	3.9	3.8	3.4	2.9	2.8	2.0	1.6
240	7.7	7.3	6.8	6.3	6.0	5.5	5.2	4.7	3.8	3.7	3.3	2.8	2.4	1.9	1.5
220	7.6	7.1	6.7	6.2	5.9	5.4	5.1	4.6	3.6	3.6	3.2	2.7	2.2	1.8	1.3
200	7.5	7.0	6.6	6.1	5.8	5.3	5.0	4.5	3.4	3.3	3.1	2.5	2.1	1.7	.9
MAC →	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	FLAPS – 18°														
355	10.0	9.9	9.4	9.0	8.4	7.8	7.3	6.8	6.2	5.6	5.3	4.7	4.1	3.4	2.8
350	10.0	9.8	9.3	8.9	8.3	7.7	7.1	6.7	6.1	5.5	5.2	4.6	4.0	3.3	2.7
340	9.8	9.3	8.9	8.4	7.9	7.3	6.7	6.3	5.8	5.3	4.8	4.2	3.7	3.2	2.6
320	9.0	8.8	8.3	7.7	7.1	6.7	6.3	5.9	5.3	4.9	4.3	3.9	3.3	2.9	2.4
300	8.8	8.5	7.9	7.2	7.0	6.5	6.1	5.6	5.1	4.5	4.1	3.7	3.1	2.7	2.2
280	8.4	7.9	7.6	7.0	6.6	6.1	5.6	5.3	4.6	4.4	3.9	3.3	2.8	2.4	1.9
260	8.1	7.6	7.2	6.7	6.2	5.7	5.4	5.0	4.3	4.2	3.7	3.1	2.6	2.2	1.8
240	7.9	7.3	7.1	6.4	6.1	5.5	5.2	4.8	3.9	3.8	3.4	3.0	2.3	2.0	1.6
220	7.8	7.0	6.8	6.1	5.7	5.4	4.9	4.4	3.8	3.6	3.2	2.7	2.2	1.7	1.1
200	7.1	6.4	6.2	5.6	5.3	5.2	4.6	3.9	3.6	3.4	2.8	2.4	1.8	1.2	.9
MAC →	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

FIGURE 1--DC-8 STABILIZER TRIM (TYPICAL)

CG % MAC	16	18	20	22	24	26	28	30	32	34	35
Units Nose Up	6 1/2	6	5 1/4	4 1/2	4	3 1/4	2 1/2	2	1 1/4	1/2	0

FIGURE 2--707 STABILIZER TRIM (TYPICAL)

226. E61 Determine the stabilizer trim setting for takeoff for the following conditions. (Fig. 1, page 26)

Takeoff weight - 265,000 lbs.
Takeoff total moment index - 2278.7
Reduction factor - 100,000
MAC - 272.8
LEMAC - Sta. 795.8
Flap setting - 23°

1- 4.4
2- 4.1
3- 3.9
4- 4.9

227. E61 Determine the stabilizer trim setting for takeoff for the following conditions. (Fig. 1, page 26)

Takeoff weight - 315,000 lbs.
Takeoff total moment index - 2695.8
Reduction factor - 100,000
MAC - 272.8
LEMAC - Sta. 795.8
Flap setting - 23°

1- 7.1
2- 6.8
3- 6.0
4- 4.2

228. E61 Determine the stabilizer trim setting for takeoff for the following conditions. (Fig. 1, page 26)

Takeoff weight - 290,000 lbs.
Takeoff total moment index - 2509.6
Reduction factor - 100,000
MAC - 272.8
LEMAC - Sta. 795.8
Flap setting - 18°

1- 5.1
2- 4.2
3- 4.5
4- 3.9

229. E61 What is the takeoff stabilizer trim setting within the nearest 1/4 unit under these conditions? (Fig. 2)

Takeoff weight - 280,000 lbs.
Takeoff index - 23293.1
MAC - 272.3
Leading edge of MAC - Sta. 763.0
Reduction factor - 10,000

1- 3 3/4 Units Nose Up
2- 4 Units Nose Up
3- 3 1/2 Units Nose Up
4- 3 1/4 Units Nose Up

230. E61 What is the takeoff stabilizer trim setting within the nearest 1/4 unit under these conditions? (Fig. 2)

Takeoff weight - 310,000 lbs.
Takeoff index - 25282.2
MAC - 272.3
Leading edge of MAC - Sta. 763.0
Reduction factor - 10,000

1- 5 1/4 Units Nose Up
2- 6 Units Nose Up
3- 5 3/4 Units Nose Up
4- 5 1/2 Units Nose Up

231. E61 What is the takeoff stabilizer trim setting within the nearest 1/4 unit under these conditions? (Fig. 2)

Takeoff weight - 265,000 lbs.
Takeoff index - 22296.2
MAC - 272.3
Leading edge of MAC - Sta. 763.0
Reduction factor - 10,000

1- 2 1/4 Units Nose Up
2- 2 3/4 Units Nose Up
3- 2 Units Nose Up
4- 2 1/2 Units Nose Up

232. E51 What is the maximum payload under these conditions?

Basic operating weight - 150,000 lbs.
Maximum zero fuel weight - 230,000 lbs.
Maximum landing weight - 245,000 lbs.
Maximum takeoff weight - 320,000 lbs.
Flight plan fuel required - 94,500 lbs.
Estimated fuel burn enroute - 71,500 lbs.

1- 80,000 lbs.
2- 84,000 lbs.
3- 75,000 lbs.
4- 72,000 lbs.

STAB. TRIM SETTING – UNITS AIRPLANE NOSE UP																			
	CG	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
FLAPS	5°	8-1/4	8	7-1/2	7	6-1/2	6	5-1/2	5	4-1/2	4-1/4	3-3/4	3-1/4	2-3/4	2-1/4	2	1-1/2	1
	15°	9	8-1/2	8	7-1/2	7	6-1/2	6	5-1/2	5	4-1/2	4	3-1/2	3	2-1/2	2	1-1/2	1
	25°	9-1/2	9	8-1/2	8	7-1/2	7	6-1/2	5-3/4	5-1/4	4-3/4	4-1/2	3-3/4	3	2-1/2	2	1-1/2	1

FIGURE 3--727 STABILIZER TRIM

233. E61 What is the takeoff stabilizer trim setting within the nearest 1/4 unit under these conditions? (Fig. 3)

Takeoff weight - 165,000 lbs.
Takeoff index - 15063.9
MAC - 180.7
Leading edge of MAC - Sta. 860.2
Reduction factor - 10,000
Flaps - 15°

1- 3 3/4 Units Nose Up
2- 4 Units Nose Up
3- 4 1/4 Units Nose Up
4- 4 1/2 Units Nose Up

234. E61 What is the takeoff stabilizer trim setting within the nearest 1/4 unit under these conditions? (Fig. 3)

Takeoff weight - 160,000 lbs.
Takeoff index - 14523.6
MAC - 180.7
Leading edge of MAC - Sta. 860.2
Reduction factor - 10,000
Flaps - 15°

1- 4 3/4 Units Nose Up
2- 4 1/2 Units Nose Up
3- 5 1/4 Units Nose Up
4- 5 Units Nose Up

235. E61 What is the takeoff stabilizer trim setting within the nearest 1/4 unit under these conditions? (Fig. 3)

Takeoff weight - 150,000 lbs.
Takeoff index - 13472.2
MAC - 180.7
Leading edge of MAC - Sta. 860.2
Reduction factor - 10,000
Flaps - 5°

1- 5 1/2 Units Nose Up
2- 5 3/4 Units Nose Up
3- 6 1/4 Units Nose Up
4- 6 Units Nose Up

236. E71 Determine the CG in percent of MAC. (Fig. 4, page 31)

Basic Operating Weight - 105,000 lbs.
Basic Operating Index - 92,827.0 (Moment/1,000)
MAC -- 860.2 -- 1040.9

	Weight/Lbs.
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	10,500
Tank 2- - - - - - - - - - - -	26,000
Cargo load:	
Fwd hold- - - - - - - - - -	2,500
Aft hold- - - - - - - - - -	1,500

Passenger load:
Fwd compt. -- Full
Aft compt. -- Full

1- 28.8% MAC
2- 27.7% MAC
3- 26.6% MAC
4- 25.5% MAC

237. E71 Determine the CG in percent of MAC. (Fig. 4, page 31)

Basic Operating Weight - 105,000 lbs.
Basic Operating Index - 92,827.0 (Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- 17
Aft compt. -- 75

	Weight/Lbs.
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	11,000
Tank 2- - - - - - - - - - - -	18,500
Cargo load:	
Fwd hold- - - - - - - - - -	1,800
Aft hold- - - - - - - - - -	800

1- 27.9% MAC
2- 25.3% MAC
3- 26.2% MAC
4- 27.1% MAC

238. E71 Determine the CG in inches aft of datum. (Fig. 4, page 31)

Basic Operating Weight - 105,000 lbs.
Basic Operating Index - 92,827.0 (Moment/1,000)
MAC - 860.2 - 1040.9

Passenger load:
Fwd compt. -- 27
Aft compt. -- 105

	Weight/Lbs.
Cargo load:	
Fwd hold- - - - - - - - - - -	1,800
Aft hold- - - - - - - - - - -	800
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	11,000
Tank 2- - - - - - - - - - -	Full

1- 911.4 inches
2- 907.6 inches
3- 908.2 inches
4- 910.8 inches

239. E71 What is the CG in inches aft of datum? (Fig. 4, page 31)

Basic Operating Weight - 105,000 lbs.
Basic Operating Index - 92,827.0 (Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- 12
Aft compt. -- 62

	Weight/Lbs.
Cargo load:	
Fwd hold- - - - - - - - - - -	1,150
Aft hold- - - - - - - - - - -	1,200
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	9,500
Tank 2- - - - - - - - - - -	9,500

1- 905.3 inches
2- 910.4 inches
3- 906.5 inches
4- 907.0 inches

240. E71 Determine the CG location in inches aft of LEMAC. (Fig. 4, page 31)

Basic Operating Weight - 105,000 lbs.
Basic Operating Index - 92,827.0 (Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- 25
Aft compt. -- 105

	Weight/Lbs.
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	12,000
Tank 2- - - - - - - - - - -	19,000
Cargo load:	
Fwd hold- - - - - - - - - - -	2,500
Aft hold- - - - - - - - - - -	1,750

1- 48.5 inches
2- 52.3 inches
3- 47.4 inches
4- 50.1 inches

241. E71 What is the CG in inches aft of datum? (Fig. 4, page 31)

Basic Operating Weight - 105,000 lbs.
Basic Operating Index - 92,827.0 (Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- 23
Aft compt. -- 91

	Weight/Lbs.
Cargo load:	
Fwd hold- - - - - - - - - - -	1,950
Aft hold- - - - - - - - - - -	700
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	11,500
Tank 2- - - - - - - - - - -	19,500

1- 907.9 inches
2- 908.4 inches
3- 910.2 inches
4- 906.5 inches

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242. E71 Determine the CG location in inches aft of LEMAC. (Fig. 4, page 31)

Basic Operating Weight -- 105,000 lbs.
Basic Operating Index -- 92,827.0
(Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- Full
Aft compt. -- 83

	Weight/Lbs.
Fuel load:	
Tanks 1 & 3 (Each)- - - -	12,000
Tank 2- - - - - - - - - -	Full
Cargo load:	
Fwd hold- - - - - - - - -	3,500
Aft hold- - - - - - - - -	2,000

1- 43.8 inches
2- 46.3 inches
3- 45.7 inches
4- 47.4 inches

243. E71 What is the CG in percent of MAC? (Fig. 4, page 31)

Basic Operating Weight -- 105,000 lbs.
Basic Operating Index -- 92,827.0
(Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- Full
Aft compt. -- 85

	Weight/Lbs.
Fuel load:	
Tanks 1 & 3 (Each)- - - -	11,500
Tank 2- - - - - - - - - -	27,000
Cargo load:	
Fwd hold- - - - - - - - -	1,750
Aft hold- - - - - - - - -	750

1- 26.6% MAC
2- 25.2% MAC
3- 27.1% MAC
4- 26.2% MAC

244. E71 Determine the CG in percent of MAC. (Fig. 4, page 31)

Basic Operating Weight -- 105,000 lbs.
Basic Operating Index -- 92,827.0
(Moment/1,000)
MAC -- 860.2 -- 1040.9

	Weight/Lbs.
Fuel load:	
Tanks 1 & 3 (Each)- - - -	Full
Tank 2- - - - - - - - - -	24,000
Cargo load:	
Fwd hold- - - - - - - - -	3,500
Aft hold- - - - - - - - -	1,200

Passenger load:
Fwd compt. -- Full
Aft compt. -- 105

1- 25.0% MAC
2- 26.0% MAC
3- 27.0% MAC
4- 28.0% MAC

245. E71 What is the CG in inches aft of datum? (Fig. 4, page 31)

Basic Operating Weight -- 105,000 lbs.
Basic Operating Index -- 92,827.0
(Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- 19
Aft compt. -- 66

	Weight/Lbs.
Cargo load:	
Fwd hold- - - - - - - - -	950
Aft hold- - - - - - - - -	775
Fuel load:	
Tanks 1 & 3 (Each)- - - -	10,500
Tank 2- - - - - - - - - -	24,500

1- 902.6 inches
2- 906.5 inches
3- 905.3 inches
4- 910.4 inches

PASSENGER LOADING TABLE

Number of Pass.	Weight Lbs.	Moment / 1000
FORWARD COMPARTMENT CENTROID—582.0		
5	850	495
10	1,700	989
15	2,550	1,484
20	3,400	1,979
25	4,250	2,473
29	4,930	2,869
AFT COMPARTMENT CENTROID—1028.0		
10	1,700	1,748
20	3,400	3,495
30	5,100	5,243
40	6,800	6,990
50	8,500	8,738
60	10,200	10,486
70	11,900	12,233
80	13,600	13,980
90	15,300	15,728
100	17,000	17,476
110	18,700	19,223
120	20,400	20,971
133	22,610	23,243

CARGO LOADING TABLE

Weight Lbs.	Moment / 1000 Forward Hold Arm 680.0	Moment / 1000 Aft Hold Arm 1166.0
6,000		6,966
5,000	3,400	5,830
4,000	2,720	4,664
3,000	2,040	3,498
2,000	1,360	2,332
1,000	680	1,166
900	612	1,049
800	544	933
700	476	816
600	408	700
500	340	583
400	272	466
300	204	350
200	136	233
100	68	117

NOTE: THESE COMPUTATIONS ARE TO BE USED FOR TESTING PURPOSES ONLY.

FUEL LOADING TABLE

TANKS 1 & 3 (EACH) Weight Lbs.	Arm	Moment / 1000	TANK 2 (3 CELL) Weight Lbs.	Arm	Moment / 1000	Weight Lbs.	Arm	Moment / 1000
8,500	992.1	8,433	8,500	917.5	7,799	22,500	914.5	20,576
9,000	993.0	8,937	9,000	917.2	8,255	23,000	914.5	21,034
9,500	993.9	9,442	9,500	917.0	8,711	23,500	914.4	21,488
10,000	994.7	9,947	10,000	916.8	9,168	24,000	914.3	21,943
10,500	995.4	10,451	10,500	916.6	9,624	24,500	914.3	22,400
11,000	996.1	10,957	11,000	916.5	10,082	25,000	914.2	22,855
11,500	996.8	11,463	11,500	916.3	10,537	25,500	914.2	23,312
12,000	997.5	11,970	12,000	916.1	10,993	26,000	914.1	23,767
FULL CAPACITY			**(See note at lower left)			26,500	914.1	24,244
**Note: Computations for Tank 2 weights for 12,500 lbs. to 18,000 lbs. have been purposely omitted.			18,500	915.1	16,929	27,000	914.0	24,678
			19,000	915.0	17,385	27,500	913.9	25,132
			19,500	914.9	17,841	28,000	913.9	25,589
			20,000	914.9	18,298	28,500	913.8	26,043
			20,500	014.8	18,753	29,000	913.7	26,497
			21,000	914.7	19,209	29,500	913.7	26,954
			21,500	914.6	19,664	30,000	913.6	27,408
			22,000	914.6	20,121	FULL CAPACITY		

FIGURE 4--LOADING TABLES (TYPICAL)

246. E71 Determine the CG in percent of MAC. (Fig. 4, page 31)

Basic Operating Weight -- 105,000 lbs.
Basic Operating Index -- 92,827.0
(Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- 22
Aft compt. -- 95

	Weight/Lbs.
Cargo load:	
Fwd hold- - - - - - - - - -	1,950
Aft hold- - - - - - - - - -	900
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	11,500
Tank 2- - - - - - - - - - -	Full

1- 27.9% MAC
2- 27.1% MAC
3- 26.8% MAC
4- 26.2% MAC

247. E71 Determine the CG in inches aft of LEMAC. (Fig. 4, page 31)

Basic Operating Weight -- 105,000 lbs.
Basic Operating Index -- 92,827.0
(Moment/1,000)
MAC -- 860.2 -- 1040.9

Passenger load:
Fwd compt. -- 27
Aft compt. -- 90

	Weight/Lbs.
Fuel load:	
Tanks 1 & 3 (Each)- - - - -	11,000
Tank 2- - - - - - - - - - -	23,500
Cargo load:	
Fwd hold- - - - - - - - - -	2,200
Aft hold- - - - - - - - - -	2,000

1- 46.3 inches
2- 46.9 inches
3- 49.2 inches
4- 47.4 inches

248. F56 Just prior to starting the first engine, normal procedure is to place

1- all boost pump switches ON.
2- both packs and galley power OFF.
3- both system B pump switches OFF.
4- two engine bleed switches to CLOSE.

249. F10 Which airplane area contains a fire or overheat detection system but is not protected by a fire extinguishing system?

1- Wheel well.
2- Engine strut.
3- APU compartment.
4- Lower cargo compartments.

250. F56 Which action should be taken prior to starting the engines?

1- Verify that a minimum of 15 PSI duct pressure is available.
2- Shut off galley power, pack fans, and hydraulic pumps.
3- Verify that a minimum of 30 PSI duct pressure is available.
4- Place all fuel valves and pumps on.

251. F32 Which condition for the aft stair is indicated when the amber airstair light on the flight engineer lower panel is illuminated?

1- Down and locked.
2- Not up and locked.
3- Up and locked.
4- Supplied with hydraulic pressure.

252. F10 Which airplane area contains a fire detection system and is also protected by a fixed fire extinguishing system?

1- Engine nacelle.
2- Lower electrical compartment.
3- Engine hot section and wheel well.
4- Wheel well.

253. F54 Which device is designed to prevent boundary layer separation on control surfaces?

1- Yaw damper.
2- Balance panel.
3- Leading edge flap.
4- Vortex generator.

254. F55 When throttles are advanced for takeoff, if the speed brakes are not in takeoff position, the warning indication should be

1- an intermittent horn.
2- a steady horn.
3- a steady bell.
4- a red light in the flap handle.

255. E12 $\frac{\text{Weight x Arm}}{\text{Reduction Factor}}$ is the formula used to determine

1- total moments.
2- CG from LEMAC.
3- index units.
4- CG station of the main gear.

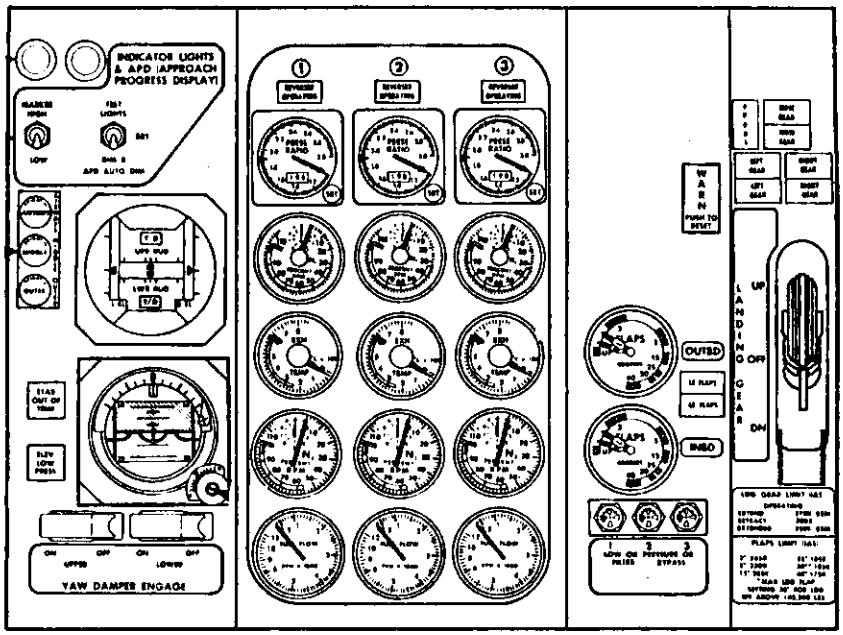


FIGURE 5--727 CENTER PANEL (TYPICAL)

256. F54 Which is appropriate if several vortex generators are observed to be missing from the airplane?

1- Have maintenance replace all missing generators prior to flight.
2- Check the Minimum Equipment List for applicable flight restrictions.
3- Fifty percent of the generators are allowed to be missing.
4- Flight is permitted if an equal number of generators are missing on each side of the airplane.

257. F54 What item should be checked at the main gear assembly during preflight?

1- Brake wear indicators.
2- Lockout cylinder air pressure preload.
3- Shock strut hydraulic fluid level.
4- Pneumatic brake pressure.

258. F32 The green AIRSTAIR light in the cockpit will illuminate when the airstair is

1- up and locked.
2- down and locked.
3- supplied with hydraulic pressure.
4- not up and locked.

259. F51 What safety check should be made when the landing gear doors are in the open position during the exterior inspection?

1- Check that hydraulic system A switches are in position to pressurize the system.
2- Ensure that the door cylinder is blocked open.
3- Check that hydraulic system B switches are in the unpressurized position.
4- Make sure the release handle is in the open detent.

260. F51 How should the landing gear doors be opened for preflight inspection?

1- Place the gear door ground release handles in OPEN position.
2- Turn manual extension hand crank three turns clockwise.
3- Place landing gear lever off to free fall doors.
4- Mechanically disconnect the door operation mechanism.

261. F54 On preflight inspection, the brake lockout debooster should be checked to assure the

1- pneumatic brake pressure is at least 1,000 PSI.
2- brake is applied and the lockout indicator is in the red band.
3- brake is not applied and pressure is reduced.
4- indicator shows adequate fluid between the lockout and the brake.

262. F53 Which precaution should be observed when performing the preliminary cockpit preflight?

1- Do not perform the pitot static heat system check while the aircraft is stationary.
2- Obtain ground clearance before applying electrical power to the aircraft.
3- Obtain ground clearance before actuating a hydraulic pump.
4- Do not perform the engine fire warning system check while using APU power.

263. G87 When can the horn cutout on the flight engineer's panel be used to silence the warning horn?

1- If any throttle has been closed, gear not down.
2- If the cabin altitude exceeds 10,000 feet.
3- When the wing flaps are extended beyond 35°, gear not down.
4- If the gear handle is out of the down detent, with the aircraft on the ground.

264. G52 Which action(s) would relieve the workload on an ACM following a pack trip?

1- Select a cooler temperature.
2- Select a warmer temperature.
3- Close the pack cooling doors and select a cooler temperature.
4- Open number 2 bleed air valve and push the reset button.

265. G52 The air cycle machine produces cold air by

1- routing conditioned air through the cooling fan.
2- passing heated air through a compressor which drops the temperature.
3- passing cold air through cooling coils containing freon.
4- extracting heat energy across the expansion turbine.

266. G33 If the cabin altitude is not climbing as fast as desired, the flight engineer should normally make a correction by adjusting the cabin (Fig. 6, page 35)

1- differential control to cause the pneumatic duct pressure to increase.
2- climb control to cause the relief valve to open faster.
3- rate selector knob to cause the outflow valves to close slower.
4- altitude selector to cause the turbocompressor to increase speed.

267. G74 Which condition of the pressurization system is desirable when landing at a 1,000-foot elevation airport? (Fig. 7, page 35)

1- Both pack switches--OFF.
2- Cabin pressure rate knob--ZERO.
3- All engine bleed switches--CLOSED.
4- Differential pressure--ZERO.

268. G74 How should the pressurization controls be set for landing?

1- Flight altitude--sea level.
2- Cabin altitude--airport elevation.
3- Differential pressure--.125 PSI.
4- Cabin rate--500 feet/minute.

269. G93 How can the rate of smoke removal be increased during pressurized flight?

1- Increase the cabin altitude.
2- Increase the cabin differential pressure.
3- Close the cabin side wall vents.
4- Open the wing anti-ice valves.

270. G42 Which event is one indication of normal operation as the air-conditioning packs are turned on while the aircraft is on the ground?

1- Immediate flow of cold air from the air-conditioning ducts.
2- Increase of fuel flow at constant N_2.
3- Increase of electrical a.c. power draw.
4- Increase of duct air pressure.

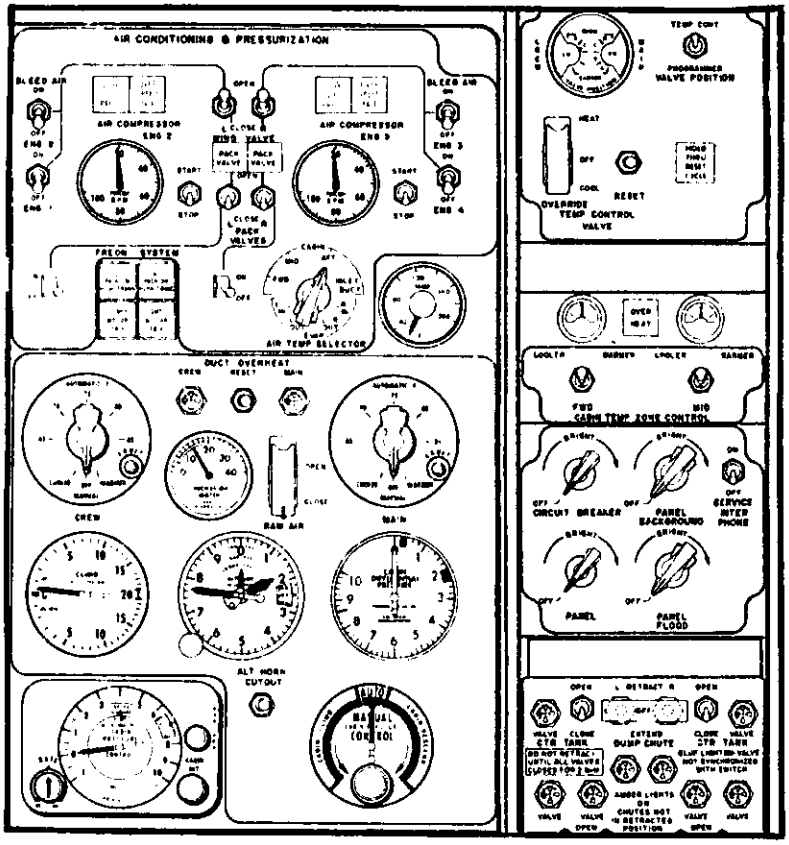
271. G43 Which position of the Passenger Cabin Air Distribution Selector provides the fastest heating of the cabin?

1- Flow multiplier ON
2- Sidewall
3- Gasper fan ON
4- Overhead

FIGURE 6

707 AIR CONDITIONING PANEL

(TYPICAL)



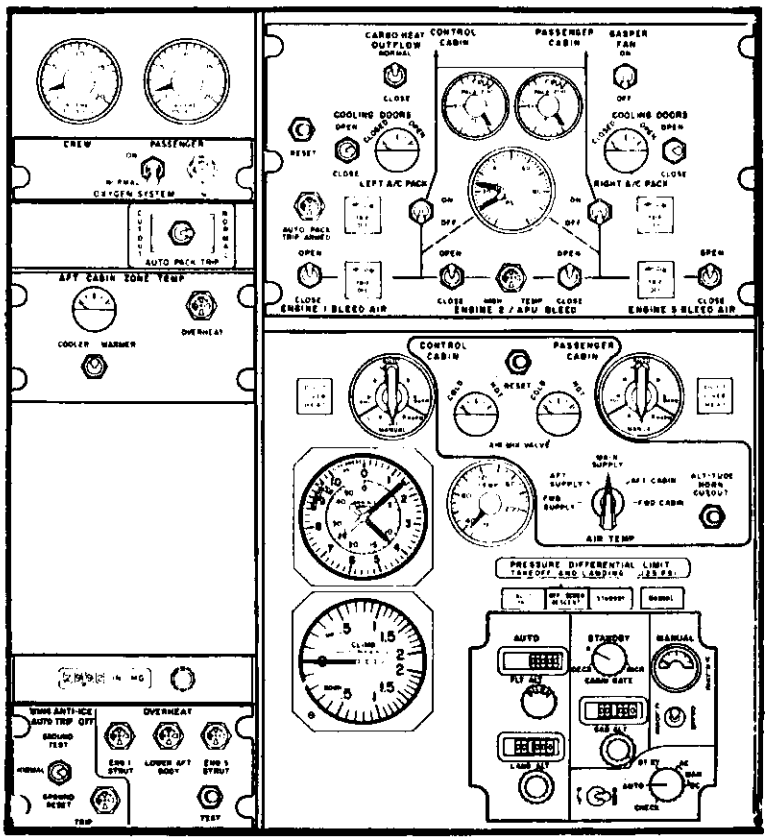


FIGURE 7

727 AIR CONDITIONING PANEL

(TYPICAL)

272. G42 Which is the correct sequence of components encountered by the cabin air as it flows through an air-conditioning pack and ACM?

1- Turbine, compressor, heat exchanger.
2- Heat exchanger, compressor, heat exchanger, turbine.
3- Compressor, heat exchanger, turbine, heat exchanger.
4- Compressor, evaporator, heat exchanger, turbine.

273. G41 The cabin temperature control is changed to a warmer automatic setting. The operation of which device is then automatically changed to increase the cabin temperature?

1- The outflow valve is closed slightly.
2- The air mix valve is moved to a hotter setting.
3- The gasper fan is turned on.
4- The pack valves are closed slightly.

274. G91 Which procedure should be accomplished in the event of rapid depressurization?

1- Cabin outflow valve--MANUALLY OPEN.
2- Engine bleed air switches--ALL CLOSED.
3- Pack switches--CHECK BOTH ON.
4- Gasper fan--OFF.

275. G88 Which action should be taken if the No Equipment Cooling Light illuminates in flight?

1- Deactivate unnecessary communications and navigation equipment.
2- Turn on the equipment cooling fan.
3- Reduce airspeed, then lower flaps to cause activation of the pack cooling fans.
4- Select manual cool on the control cabin temperature control.

276. G89 What is the maximum altitude for dispatch with one air-conditioning pack inoperative?

1- 25,000 feet
2- 20,000 feet
3- 15,000 feet
4- 10,000 feet

277. G41 When a pack switch is turned off, what position should the air mix valve assume?

1- Remain in last selected position.
2- Full hot.
3- Position to maintain 70° cabin temperature.
4- Full cold.

278. G41 Which adjustment should be made if the aft cabin is too cold while the forward cabin is normal temperature? (Fig. 7, page 35)

1- Select OVERHEAD on the passenger cabin air distribution selector.
2- Select COOLER on the zone temperature control.
3- Select SIDEWALL on the passenger cabin air distribution selector.
4- Select WARMER on the zone temperature control.

279. G41 What correction is made when the Aft Cabin Zone temperature control is moved to a COOLER position? (Fig. 7, page 35)

1- Additional cold air is directed to the aft cabin.
2- Additional warm air is supplied to the forward cabin.
3- Bleed air supply is reduced.
4- Air cycle machine output is increased.

280. G42 What is an advantage of the Auto Pack Trip System? (Fig. 7, page 35)

1- Causes an immediate reduction of bleed air use in event of thrust reduction during takeoff and climb.
2- Protects air-conditioning system against overtemperatures.
3- Protects ACMs against overspeed.
4- Prevents cabin pressurization bumps and rapid pressure changes during takeoff and initial climb.

281. G42 What is the purpose of a pack valve?

1- To regulate the degree of cooling produced by the freon pack.
2- To permit recirculation air to enter the air distribution system.
3- To permit turbocompressor air to pass through the heat exchangers into the cabin.
4- To mix hot and cold air prior to distribution in the cabin.

282. What is the function of a pack valve?
G42

1- Mix hot air, cold air, and cool air.
2- Control operation of the pack cooling fan.
3- Control output of the air cycle machine.
4- Admit bleed air to the air-conditioning system.

283. What is the normal procedure for pack
G74 operation during landing? (Fig. 7, page 35)

1- One pack on number 2 engine, with number 2 engine left bleed isolation valve closed.
2- Packs on numbers 1 and 3 engines, with number 2 engine bleed isolation valves open.
3- Packs on numbers 1 and 3 engines, with number 2 engine bleed isolation valves closed.
4- Packs on number 2 engine, with number 2 engine bleed isolation valves open.

284. What precaution should be observed when
G81 using the cabin temperature selector in the manual range? (Fig. 6, page 35)

1- Monitor cabin inlet duct temperature.
2- Pull the cabin heater circuit breakers when desired temperature is reached.
3- Monitor cabin ambient temperature.
4- Monitor cabin differential pressure.

285. Which method should be used to maintain
G95 maximum pressurization during one pack operation?

1- Open ram air inlet doors.
2- Close ram air inlet doors.
3- Close cargo heat outflow valve.
4- Open cargo heat outflow valve.

286. What happens when the pack trip light
G95 illuminates? (Fig. 7, page 35)

1- Pack valve closes and air mix valve drives full cold.
2- Air mix valve runs full cold and cooling doors drive full open.
3- Auto pack trip system actuates.
4- Pack valve closes and pack cooling doors open.

287. Which fault will cause the left pack to
G95 trip off? (Fig. 7, page 35)

1- Overspeed of the ACM turbine.
2- ACM compressor discharge overheat.
3- Excess airflow to the ACM.
4- Number 1 and number 2 engine bleed switches closed.

288. Which action should be taken if a Freon
G89 Compressor Motor Lockout (OFF) light illuminates in flight? (Fig. 9, page 39)

1- Place the associated turbocompressor switch to OFF.
2- Move the freon compressor switch to OFF.
3- Place the respective pack switch to OFF.
4- Move the freon compressor switch to RESET and then to NORMAL.

289. Which of the following turbocompressor
G90 trips cannot be reset in flight?

1- Turbocompressor underspeed.
2- Turbocompressor overpressure.
3- Turbocompressor underpressure.
4- Turbocompressor overspeed.

290. In the event of cabin decompression, the
G91 flight engineer should visually check to see that the passenger oxygen masks dropped when the cabin altitude reached approximately

1- 14,000 feet.
2- 12,000 feet.
3- 10,000 feet.
4- 8,000 feet.

291. How are the outflow butterfly and nozzle
G21 valves operated?

1- Auto control - pneumatic; manual control - mechanical.
2- Auto control - electric; manual control - pneumatic.
3- Auto control - electric; manual control - mechanical.
4- Auto control - pneumatic; manual control - pneumatic.

292. Which unit(s) of the freon air-condition-
G51 ing system make(s) use of ambient air?

1- Condenser.
2- Expansion valve.
3- Evaporator and compressor.
4- Evaporator and condenser.

293. How can the smoke evacuation rate be
G93 increased while in flight?

1- Turn all cabin compressors ON and decrease cabin altitude.
2- Turn all cabin compressors OFF and decrease cabin altitude.
3- Turn all cabin compressors ON and increase cabin altitude.
4- Turn all cabin compressors OFF and increase cabin altitude.

294. Which is an indication that the auto
G94 pack trip system has operated during initial climb? (Fig. 7, page 35)

1- Both pack trip lights ON and the engine fail lights ON.
2- One pack trip light ON and auto pack trip armed light OUT.
3- Both pack trip lights ON and a reduction on the duct pressure indicator.
4- Auto pack trip armed light OUT and a reduction of EPR on at least one engine.

295. What is the function of the cabin nega-
G22 tive pressure relief valve?

1- Prevent exceeding .125 PSI differential pressure when on the ground.
2- Prevent atmospheric pressure exceeding cabin pressure.
3- Prevent a pressure differential between the main cabin and the lower cargo compartments.
4- Prevent landing with a positive cabin pressure.

296. Which is a description of a basic cabin
G11 pressurization system?

1- Relatively constant engine bleed air input, controlled outflow valve output, and no cabin leaks or bleeds.
2- Relatively constant engine bleed air input, controlled outflow valve output, and variable cabin leaks and bleeds.
3- Variable engine bleed air input, constant outflow valve output, and completely sealed cabin.
4- Variable engine bleed air input, constant outflow valve output, and controlled cabin bleeds.

297. What is the function of a turbocompressor?
G12

1- Use engine or ground cart air to compress outside air for air-conditioning and pressurization.
2- Use engine bleed air to compress outside air for pressurization and heating.
3- Use engine turbine air to compress cabin air for high altitude operation.
4- Compress outside air and permit expansion through a turbine to create a temperature drop.

298. Which action should be taken if a rapid
G91 depressurization is indicated?

1- Pack switches--BOTH OFF.
2- Oxygen diluter lever--NORMAL.
3- Cabin outflow valve--MANUALLY OPEN.
4- Engine bleeds--CHECK TWO SOURCES ON.

299. How should the pressurization controls
G93 be positioned to remove smoke during pressurized flight?

1- Cabin altitude to ambient and rate selector to minimum rate.
2- Cabin altitude selector to 10,000 feet and rate selector to minimum rate.
3- Cabin altitude selector to 10,000 feet and rate selector to maximum rate.
4- Cabin altitude selector to sea level and rate selector to maximum rate.

300. If cabin pressure is increasing rapidly
G87 and cannot be controlled by either the automatic or standby pressurization controls, what procedure is recommended?

1- Position the cargo heat outflow switch to OPEN and turn the gasper fan OFF.
2- Stop the cabin pressure rise by positioning the ground venturi switch to ground.
3- Select MAN d.c. on the pressurization mode selector and place the outflow valve manual control switch to OPEN position.
4- Close the cargo heat outflow valve and open the ram air valve.

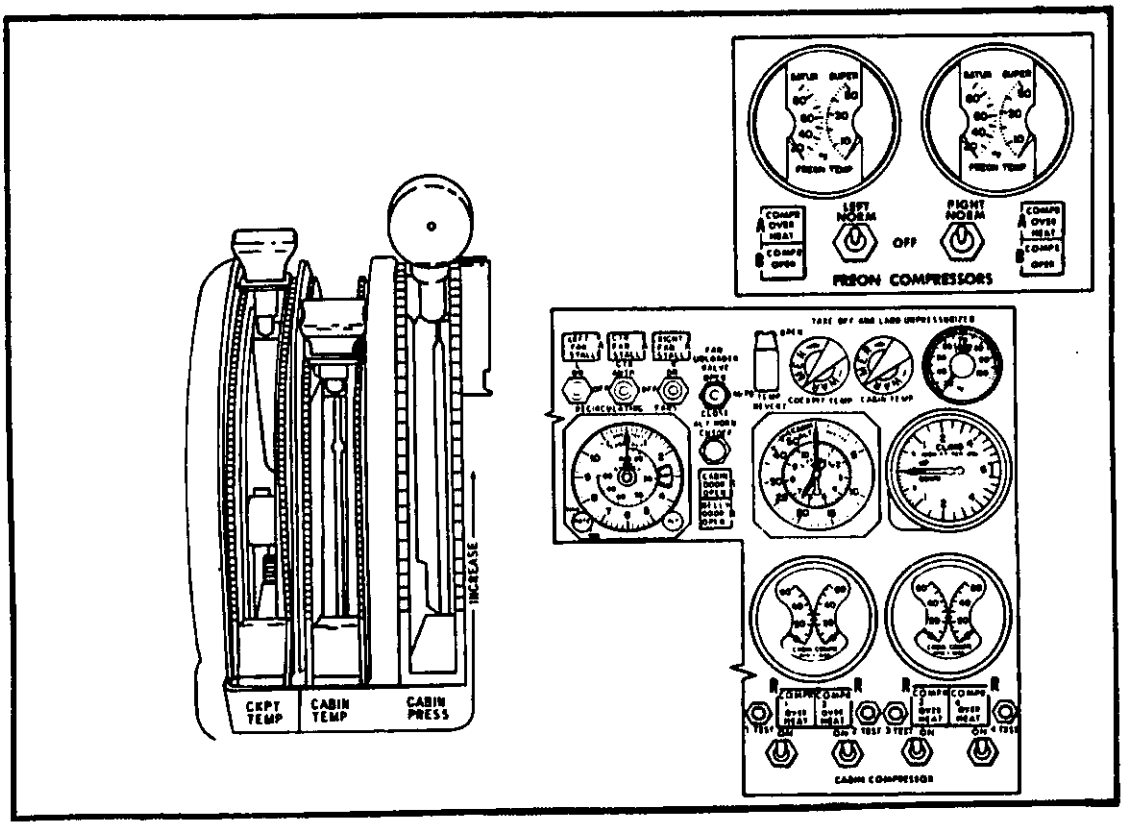


FIGURE 8--DC-8 AIR CONDITIONING PANEL (TYPICAL)

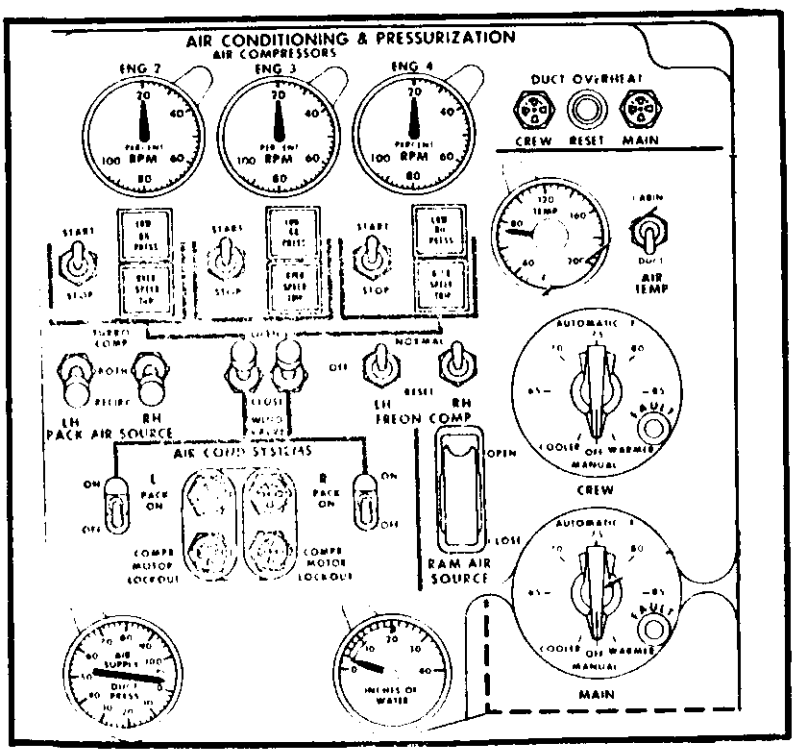


FIGURE 9--707 AIR CONDITIONING CONTROLS (TYPICAL)

301. G87 What should you check if a warning horn sounds intermittently while in cruise flight?

1- Stabilizer position.
2- Cabin altitude.
3- Differential pressure.
4- Outflow valve position.

302. G96 What is the maximum allowable RPM during the cabin compressor overspeed test?

1- 4,000 RPM
2- 15,000 RPM
3- 50,000 RPM
4- 20,000 RPM

303. G97 What is indicated by illumination of the cabin compressor overheat light?

1- High oil temperature in the cabin compressor.
2- Excessive temperature pneumatic system air.
3- High temperature turbocompressor discharge air.
4- High volume airflow from the cabin compressor.

304. G87 An intermittent warning horn while in cruise flight could be an indication that the

1- V_{MO}/M_{MO} speed has been reached.
2- airplane altitude is 200 feet above or below assigned cruise altitude.
3- cabin differential pressure limits have been exceeded.
4- cabin altitude has exceeded limits.

305. G72 What method is normally used to prevent pressurization pressure bumps during takeoff?

1- Set cabin rate control to FULL DECREASE.
2- Prepressurize the airplane approximately one-eighth PSI.
3- Set cabin altitude selector 2,000 feet above planned flight altitude.
4- Set 29.92 in the barometric scale and the cabin altitude pointer to 8.6 PSI differential.

306. G33 Which type component is operated when the pressurization manual control is used? (Fig. 7, page 35)

1- Bleed air valve.
2- Air-conditioning pack valve.
3- Cabin pressure relief valve.
4- Outflow valve.

307. G22 What is the function of the cabin pressure relief valve?

1- Prevent exceeding 8,000 feet cabin altitude.
2- Limit cabin differential pressure to a maximum of 9.6 PSI in flight.
3- Prevent external atmospheric pressure exceeding internal cabin pressure.
4- Limit cabin differential pressure to a maximum of 1.5 PSI on the ground.

308. G72 What should be the setting of the cabin pressure controller prior to takeoff?

1- Cruise flight level or slightly higher.
2- Cruise altitude or field elevation, whichever is lower.
3- To maintain a 500 FPM rate of climb.
4- To maintain 8.77 PSI differential.

309. G93 How can the rate of smoke removal be increased during pressurized flight?

1- Open the number 2 engine bleed valves.
2- Decrease the cabin differential pressure.
3- Close the engine bleed valves.
4- Increase the cabin differential pressure.

310. G85 During climb in automatic pressurization mode, the cabin altitude is not climbing as fast as desired. The flight engineer should select standby mode and make a correction by adjusting the cabin

1- rate selector to cause the outflow valves to close slower.
2- climb control to cause the relief valves to open faster.
3- differential control to cause the pneumatic duct pressure to increase.
4- altitude selector to cause the outflow valve to go full open.

311. G85 What action should correct cabin compressor surging while at high altitude cruise flight? (Fig. 8, page 39; Fig. 30, page 101)

1- Open the rain removal valve.
2- Place the pneumatic shutoff switches to LOW position.
3- Place the pneumatic shutoff switches to HIGH position.
4- Place the cabin compressor's manual controller in DECREASE position.

312. G34 How can positive control of the outflow valves be maintained? (Pneumatic controller)

1- Set 29.92 on the barometric control prior to reaching cruise flight altitude.
2- Set 8.6 PSI differential in the cabin altitude selector.
3- Set the cabin rate of change selector to full increase after climb power is established.
4- Set approximately 2,000 feet above flight altitude in the pressurization controller.

313. G35 What is a function of the cargo heat outflow valve? (Fig. 7, page 35)

1- When open, it controls the flow of pressurized air around the forward cargo compartment.
2- When closed, it changes the cargo compartment from a Class C to a Class D type.
3- When closed, it traps hot air in the compartment to permit live animal transportation.
4- When open, it directs hot air into the cargo compartment for normal operation.

314. G74 With sufficient pneumatic system pressure available, which condition would give the best results in aircraft cooling while taxiing in on a hot day? (Fig. 8, page 39)

1- Freon compressors OFF, recirculating fans ON, and mixing valves in port A.
2- Freon compressors ON, two cabin compressors ON, and mixing valves in port C.
3- Freon compressors ON, all recirculating fans in AUTO, two cabin compressors ON, and mixing valves in port A.
4- Freon compressors ON, all cabin compressors OFF, recirculating fans ON, and mixing valves in full port A.

315. G81 Which component should be monitored when using the manual mode of the cabin temperature control? (Fig. 7, page 35)

1- Cooling doors indicator.
2- Air mix valve indicator.
3- Outflow valve position indicator.
4- Pack temperature indicator.

316. G94 Which condition is necessary for operation of the auto pack trip system?

1- Flaps down.
2- Gear up.
3- Flaps up.
4- Gear down.

317. G94 What should be done in case an auto pack trip occurs? (Fig. 7, page 35)

1- Pack switches--OFF; reset switch--PUSH.
2- Auto pack trip switch--CUTOUT; engine bleed switches--CLOSED.
3- Engine bleed switches--CLOSED; cargo heat outflow--CLOSED.
4- Pack switches--ON; reset switch--PUSH.

318. G95 What action is required after the right pack trips due to an ACM overheat?

1- Select a cooler cabin temperature and reset.
2- Select a cooler zone temperature and reset.
3- Select a warmer cabin temperature and reset.
4- Operate on the left pack only for the remainder of the flight.

319. G42 What is the purpose of the AUTO PACK TRIP system? (Fig. 7, page 35)

1- To trip off any pack that overspeeds.
2- To trip off any pack whose discharge temperature exceeds a set value.
3- To trip off either pack if the respective pod engine loses thrust during takeoff.
4- To trip off both packs if any engine loses thrust during takeoff.

320. G43 Which position of the Cabin Air Distribution Selector should be used for a rapid cooling of the cabin?

1- Sidewall
2- Automatic
3- Overhead
4- Manual

321. G41 When the AC pack switch is off, the air mix valve position indicator for that pack should be

1- full cold.
2- open.
3- full hot.
4- closed.

322. G54 What purpose is served by the air-conditioning system water separator?

1- Prevent circulation of excessively dry air.
2- Remove condensed water caused by ACM operation.
3- Provide water for galley and lavatory uses.
4- Prevent freezing of the air filters.

323. G61 Which of the following is a normal source of heat for the air-conditioning system?

1- Engine turbine section heat exchanger.
2- Electric radiant ceiling panels.
3- Engine bleed air.
4- Jet heat pump.

324. G72 Which is an appropriate setting for pressurization controls when climb has been established? (Pneumatic controller)

1- Cabin altitude = 8,000 feet.
2- Cabin rate of climb = 500 ft./min.
3- Flight altitude = cruise level + 2,000 feet.
4- Barometric = 1013 millibar.

325. G72 How should the pack cooling doors be positioned for takeoff or landing in snow or slush? (Fig. 7, page 35)

1- Close doors before takeoff and before landing.
2- Open doors before takeoff and before landing.
3- Close doors after takeoff and open doors before landing.
4- Cycle doors open and closed at least two times after takeoff and after landing.

326. G72 When is the auto pack trip switch normally placed to cutout? (Fig. 7, page 35)

1- During landing gear retraction.
2- After the flaps are retracted or a specified altitude above the terrain.
3- After a positive rate of climb is established and the arming light is on.
4- After the aircraft reaches cruise altitude and has accelerated to cruise speed.

327. G96 What would be the cockpit indication if a cabin turbocompressor should overspeed?

1- Tachometer zero, overspeed warning light ON and then OUT, low pressure light ON.
2- Tachometer 100%, and overspeed warning light ON.
3- Tachometer below 20%, overspeed trip and low oil pressure lights ON.
4- Tachometer going off scale high, and overspeed warning light ON.

328. G96 Which action should be taken if number 2 cabin compressor shuts down because of an overspeed? (Fig. 8, page 39)

1- The compressor may be restarted by placing the number 2 cabin compressor switch OFF and then ON.
2- Place the number 2 cabin compressor switch OFF; a restart is not possible in the air.
3- Shut down number 1 cabin compressor.
4- The associated engine pneumatic system switch should be placed OFF.

329. G51 Which freon system component provides for a freon to cabin air heat exchange?

1- Evaporator
2- Expansion valve
3- Condenser
4- Compressor

330. G51 Which freon system component provides for a freon to ambient air heat exchange?

1- Evaporator
2- Expansion valve
3- Compressor
4- Condenser

331. G51 What would be indicated if the air-conditioning superheat gauge reading remains high (around 27°F.), during the entire flight? (Fig. 8, page 39)

1- The condenser fan is running at 1/4 speed.
2- Pneumatic duct pressure is low.
3- A loss of freon charge in the system.
4- The receiver drier diaphragm is ruptured.

332. G60 Which is the normal inflight source of hot air in the freon air-conditioning system?

1- Turbocompressor discharge air.
2- Engine turbine section air.
3- Engine fan air.
4- Electric heat exchanger.

333. G72 What is the maximum cabin differential pressure during takeoffs and landings?

1- 0.125 PSI
2- 0.36 PSI
3- 1.25 PSI
4- 2.0 PSI

334. G83 What action is required after the cabin duct overheat light illuminates?

1- Open the cooling doors for both packs.
2- Select a cooler cabin temperature and reset.
3- Select a warmer cabin temperature and reset.
4- Close both pack valves until the light goes out.

335. G83 Which action occurs automatically in event of a conditioned air overheat as indicated by illumination of a duct overheat light? (Fig. 7, page 35)

1- Engine bleed valves are closed.
2- Pack cooling fans are turned on.
3- Air mix valves are driven full cold.
4- Cooling turbine speed is increased.

336. G82 What occurs automatically when the Aft Cabin Temperature Overheat light illuminates? (Fig. 7, page 35)

1- Zone temperature valve moves to mid-position.
2- Air mix valve is driven full cold.
3- Pack valves are closed.
4- Bleed air supply is reduced.

337. H23 Which is an indication that the yaw damper is functioning to control dutch roll?

1- Automatic movement of the rudder pedals.
2- Absence of yaw damper warning flags.
3- Momentary deflection of the rudder position indicator.
4- Automatic movement of the control wheel to counteract roll.

338. H23 During taxi-out, how do you determine that the yaw dampers are functioning properly?

1- The rudder position indicators initially deflect opposite to direction of any turn.
2- The rudder position indicators initially deflect in the same direction of any turn.
3- System hydraulic pressure drops 1,000 PSI.
4- There is no deflection of the rudder position indicators during a turn.

339. H24 When yaw dampers are inoperative, which type flight limitations are applied?

1- Maximum and minimum speed.
2- Maximum altitude and maximum speed.
3- Maximum altitude and maximum bank angle.
4- Maximum climb attitude and maximum speed.

340. H14 What is the effect of placing the autopilot ground test switch (FE aux panel) to GRD TEST during flight?

1- Yaw damper will disengage.
2- Elevator position indicator will deflect.
3- Autopilot will disengage.
4- No effect on autopilot or yaw damper operation.

341. H15 What action should be taken if the stabilizer out of trim light is illuminated during flight on autopilot? (Fig. 5, page 33)

1- Disengage the autopilot.
2- Trim manually to the position determined for takeoff CG.
3- Trim manually to center the elevator position indicators.
4- Disengage the yaw damper.

342. H12 Which controls may be actuated by the autopilot?

1- Aileron control tabs and elevator trim tabs only.
2- Ailerons, elevators, and rudders only.
3- Spoilers and rudders only.
4- Ailerons, spoilers, elevators, and stabilizer only.

343. H13 What is indicated by a deflection of the elevator position indicators in level flight? (Fig. 5, page 33)

1- Hydraulic pressure available to the elevator power control or actuator.
2- Nose up or nose down trim setting of the stabilizer.
3- Amount of force the autopilot servos are applying to maintain attitude.
4- Degree of elevator tab movement.

344. H16 What action should be taken if the elevator low pressure light illuminates during flight on autopilot?

1- Place the autopilot servo elevator switch in alternate position.
2- Maintain attitude by manual trim.
3- Disengage the autopilot.
4- Disengage the yaw damper.

345. H21 The yaw damper system minimizes dutch roll by displacing

1- the upper rudder and the lower rudder only.
2- the upper rudder only.
3- the lower rudder and the spoilers only.
4- both rudders, the spoilers, and the inboard ailerons.

346. I34 When starting the APU, if light-off does not occur within the prescribed time limit, what should be done? (Fig. 11, page 45)

1- Release the master switch.
2- Press the bottle discharge switch.
3- Pull the fire switch.
4- Continue cranking for 1 minute with fuel off.

347. I41 Which event causes an automatic shutdown of an operating APU? (Fig. 11, page 45)

1- Voltage or differential fault.
2- External power connected and operating.
3- APU EGT in the caution (yellow band) range.
4- APU fire warning.

348. I31 Which condition must be met to start the APU? (Fig. 11, page 45)

1- Battery switch ON.
2- Automatic fire shutdown switch ARMED.
3- Number 2 fuel tank crossfeed ON.
4- Generator breaker switch CLOSED.

349. I32 When the APU becomes overloaded, what occurs automatically to prevent excessive EGT? (Fig. 11, page 45)

1- Electrical amperage output is reduced.
2- Bleed air output is reduced.
3- Generator breaker opens.
4- Bleed airflow is increased.

350. I41 Which event occurs automatically as a result of an auto fire shutdown of the APU? (Fig. 11, page 45)

1- Freon is discharged to the APU compartment.
2- The APU fire horn is silenced.
3- The fuel shutoff valve is closed.
4- The bottle discharge switch is armed.

351. I32 How is APU generator power applied to the sync bus when the APU is up to speed?

1- Close the APU generator field switch.
2- Close the bus tie switch.
3- Close the APU generator breaker switch.
4- Place the external power control switch ON.

352. I32 When the APU is up to speed, what will be the result if the APU generator breaker switch is closed? (Fig. 11, page 45)

1- All three bus tie breakers will trip.
2- Airplane generator breakers will automatically trip.
3- The APU bus tie breaker will close if the external power unit is not supplying electrical power.
4- The APU will automatically supply the sync bus with a.c. power which is in phase with the output of other generators supplying the sync bus.

353. I33 During taxi-out, which procedure is correct for APU shutdown? (Fig. 11, page 45)

1- Place the APU generator field switch in TRIP position prior to shutdown.
2- Place the APU power lever in idle position for 1 minute prior to shutdown.
3- Shutdown the APU by turning the fuel valve to the OFF position.
4- Remove pneumatic loads for at least 1 minute prior to shutdown.

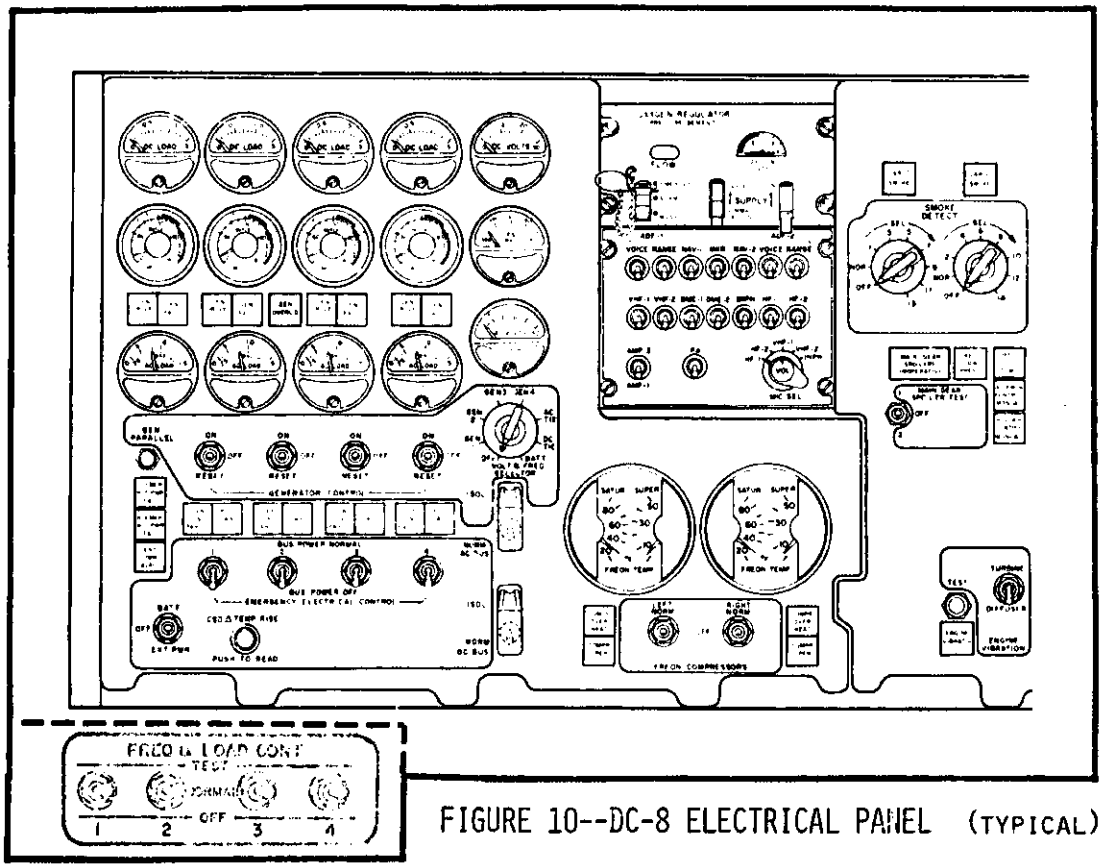


FIGURE 10--DC-8 ELECTRICAL PANEL (TYPICAL)

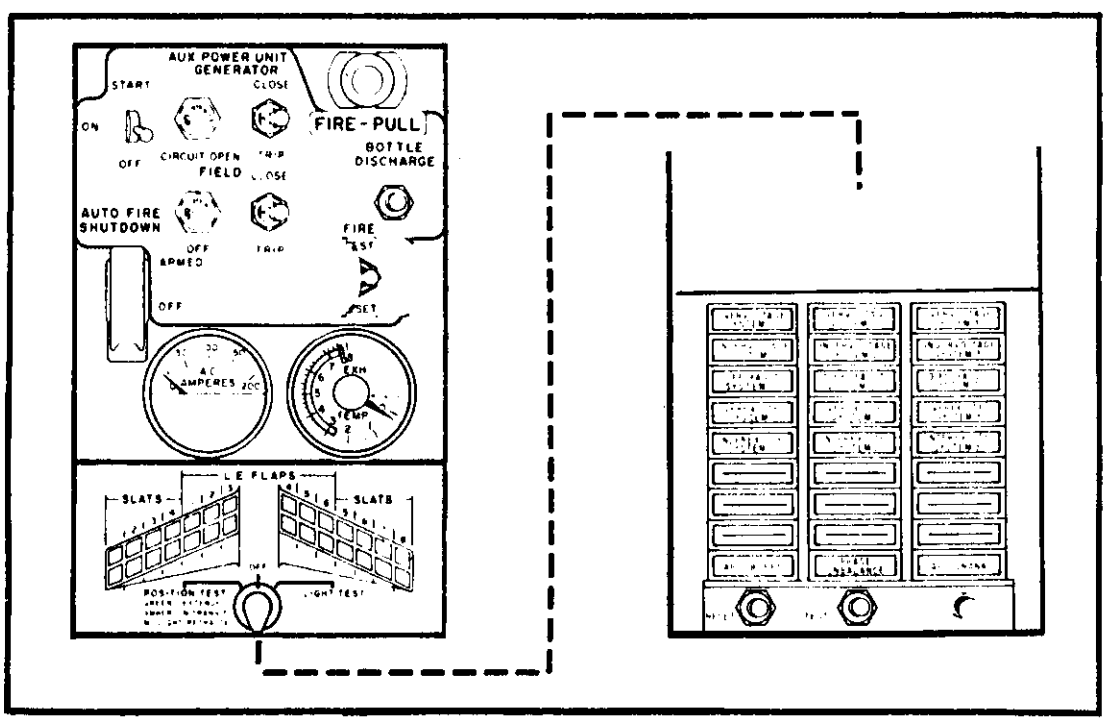


FIGURE 11--727 APU CONTROLS (TYPICAL)

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354. J32 Which condition results when the battery switch is placed to OFF? (Fig. 12, page 49)

1- The battery can receive no charge from the battery charger.
2- The battery powers the hot battery buses only.
3- Essential d.c. is lost.
4- All d.c. power, except essential d.c., is lost.

355. J32 Which function can only be obtained with the battery switch ON? (Fig. 12, page 49)

1- Charging of the battery.
2- Operation of d.c. powered instruments.
3- APU operation.
4- Parallel operation of ground power unit and airplane generators.

356. J72 On changing from external power to aircraft generators, when should the first generator breaker be closed? (Fig. 12, page 49)

1- As soon as voltage and frequency of No. 3 generator have stabilized.
2- Only after all generators have been paralleled.
3- Only after essential power is selected to an operating generator.
4- As soon as one generator is operating parallel to the external power generator.

357. J57 What action is required to obtain residual voltage?

1- Trip the generator breaker and press the residual volts switch.
2- Position the a.c. meters selector, trip the field switch, and press the residual volts switch.
3- Position the essential power selector, and trip the generator field relay.
4- Press the residual volts switch and monitor the KW/KVAR meter.

358. J23 What condition would be indicated, if the blue External Power Available Light illuminates when external power is plugged into the aircraft?

1- External power phase sequence is correct for the aircraft system.
2- External power voltage is within limits for the aircraft system.
3- External d.c. power voltage is correct for the aircraft system.
4- External power phase sequence, voltage, and frequency are all correct for the aircraft system.

359. J23 During preflight inspection you would probably check the output of the external power cart. Output should be approximately

1- 110 ± 5 volts and 400 ± 15 amps.
2- 400 ± 8 cps and 115 ± 5 volts.
3- 400 cps and 200 volts.
4- 28 ± 1 volt and 400 ± 15 amps.

360. J82 What will trip a field relay?

1- CSD underspeed or overspeed.
2- Closing the APU generator breaker.
3- Short or ground on the sync bus.
4- Pulling the engine fire switch.

361. J41 What is the maximum allowable load difference between generators?

1- 10 KVA
2- 7 KW or 3 KVAR
3- 50 KW
4- 5V, 5 KW, or 5 KVAR

362. J41 With one generator inoperative, what is the maximum allowable continuous electrical load on the other two generators?

1- 54 KW
2- 36 KVA
3- 115V, 50 amps
4- 102 KW (108 KVA)

363. J41 What are the normal frequency and voltage limits of the engine driven generator?

1- 400 plus or minus 5 cps; 120 plus or minus 10V.
2- 404 plus or minus 10 cps; 115-120V.
3- 400 plus or minus 8 cps; 115 plus or minus 5V.
4- 380-420 cps; 105-120V.

364. J61 Which unit converts 115 volts a.c. to 28 volts a.c. for normal aircraft lighting?

1- Transformer rectifier.
2- Step-down transformer.
3- Static inverter.
4- Reverse current contactor.

365. The operation of which component is
J85 associated with the manual paralleling procedure?

1- Generator field relay.
2- Bus tie breaker.
3- Generator breaker.
4- Essential power selector.

366. What is indicated by a flashing or
J87 intermittent generator drive oil warning light?

1- Loss of fluid in the generator drive unit.
2- High oil pressure in the generator drive unit.
3- The respective generator is not carrying a load.
4- The generator drive fluid temperature is in the caution range.

367. When is the battery switch required to
J32 be ON? (Fig. 13, page 49)

1- For supplying essential a.c.
2- For essential TR operation.
3- For operation of d.c. powered instruments.
4- For battery charging.

368. When using the airplane battery to start
J32 engine number 3, what should be the position of the bus power Emergency Electrical Control (EEC) switches? (Fig. 10, page 45)

1- All OFF.
2- 1 - 2 - 4 OFF; number 3 NORMAL.
3- All NORMAL.
4- 1 - 2 - 4 NORMAL; number 3 OFF.

369. Which d.c. amperage may be indicated on
J33 the flight engineer's panel when selected by the "d.c. meters" rotary switch?

A. Battery input
B. Battery output
C. T.R. input
D. T.R. output
E. Static inverter output

1- A, B, C, D, and E
2- B, C, and E only
3- A, B, and D only
4- A and D only

370. What are the possible sources of
J56 essential a.c. power in flight?

1- Any generator with its field relay closed or essential TR.
2- Any operating generator or the sync bus.
3- Any powered load bus.
4- Any operating generator.

371. What does the CSD temperature in the
J51 RISE position measure?

1- Outlet oil temperature.
2- Electrical power consumption.
3- CSD oil outlet minus inlet temperature.
4- Temperature rise of air passing through the oil cooler.

372. Which is an indication of generator
J57 drive output speed?

1- Voltage
2- Frequency
3- Amperage
4- N_2 RPM

373. The bus tie breaker light came on, and
J82 then after a time delay, the generator field relay and generator breaker lights came on. What is a probable trouble?

1- Underspeed trip and a subsequent undervoltage trip.
2- Negative sequence trip.
3- Excitation fault trip and an associated voltage fault.
4- Excessive KVA output trip.

374. If during cruise flight manual tripping
J82 of a generator field relay is required, how can it be accomplished?

1- Place the generator drive lever in the disengage position.
2- Place the fire shutoff lever in the intermediate position (the dot).
3- Hold the frequency and load control switch to low position until the fault system opens the GFR.
4- Hold the generator control switch in the open position for 10 seconds.

375. J12 Before two a.c. generators may feed a single bus in parallel operation, they should be performing with approximately equal

1- field current, generator speed, and phase angle.
2- voltage, amperage, and engine speed.
3- frequency, engine speed, and voltage.
4- voltage, generator speed, and phase angle.

376. J12 Which unit of electrical measurement indicates the real power output of an a.c. generator?

1- KVA
2- KVAR
3- KW
4- KWR

377. J12 Which unit of electrical measurement indicates the apparent power output and the output rating of an a.c. generator?

1- KVA
2- KVAR
3- KW
4- kHz

378. J53 What is a purpose of the generator field switch?

1- Deactivate the generator when tripped.
2- Connect the generator bus to the sync bus.
3- Connect the generator to its bus if the generator is up to speed.
4- Supply the generator field with residual voltage.

379. J50 The opening of which of these units would <u>not</u> remove a particular generator's power from its normal bus?

1- Field relay
2- Bus tie breaker
3- Generator breaker
4- CSD disconnect switch

380. J82 Which type fault can cause a single generator breaker light to be illuminated on the electrical panel?

1- Differential current fault.
2- Undervoltage.
3- CSD underspeed.
4- Overvoltage.

381. J82 Which indication shows that the generator is rotating when the field relay is tripped?

1- The field relay light remaining OUT.
2- The a.c. voltmeter reading 115 volts.
3- The CSD oil low pressure light and the synchronizing lights being OUT.
4- The a.c. voltmeter reading 12-15 volts when the residual switch is depressed.

382. J82 What condition is indicated by a generator's field light being ON?

1- The field relay is closed and the generator is delivering power to its load bus.
2- The generator's load bus is not receiving power.
3- The generator may be producing residual voltage only.
4- The generator may be producing power for the essential a.c. bus.

383. J31 What is a function of the transformer rectifier?

1- Charge the battery.
2- Rectify 115V a.c. to 24V d.c.
3- Transform 28V d.c. to 3-phase 115/120V a.c.
4- Convert 115V a.c. to 28V d.c.

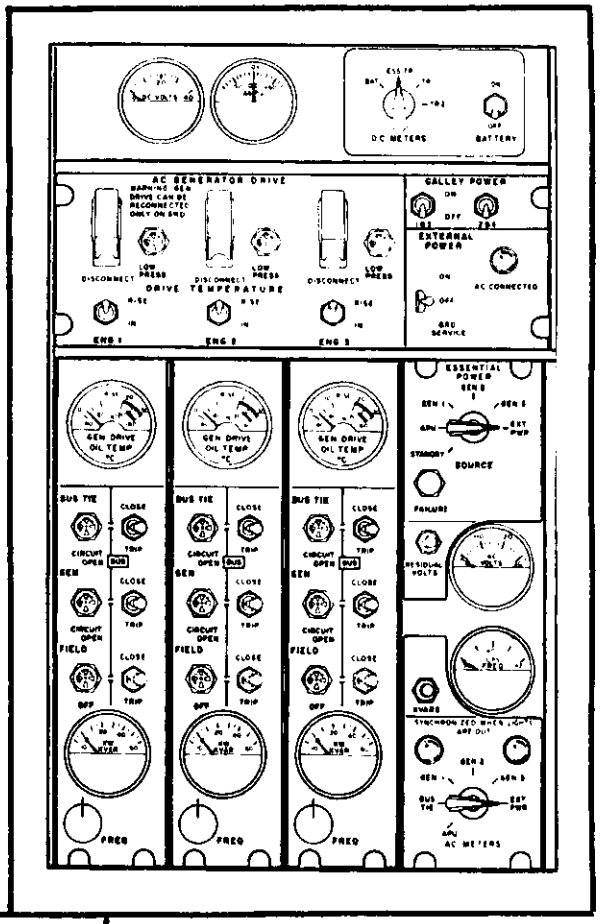
384. J31 With the TR units in isolated position, what is indicated on the d.c. loadmeters? (Fig. 10, page 45)

1- Current available at the corresponding TR unit in percentage of TR rating.
2- Current drawn from the corresponding TR unit in percentage of TR rating.
3- The generator or d.c. tie bus voltage available to the corresponding TR unit.
4- The average current drawn from the four TR units.

385. J31 What are permissible voltage tolerances when checking TR units?

1- 22.0 to 24.0 volts
2- 24.9 to 32.5 volts
3- 25.5 to 28.5 volts
4- 115 to 120 volts

FIGURE 12--727 ELECTRICAL PANEL
(TYPICAL)



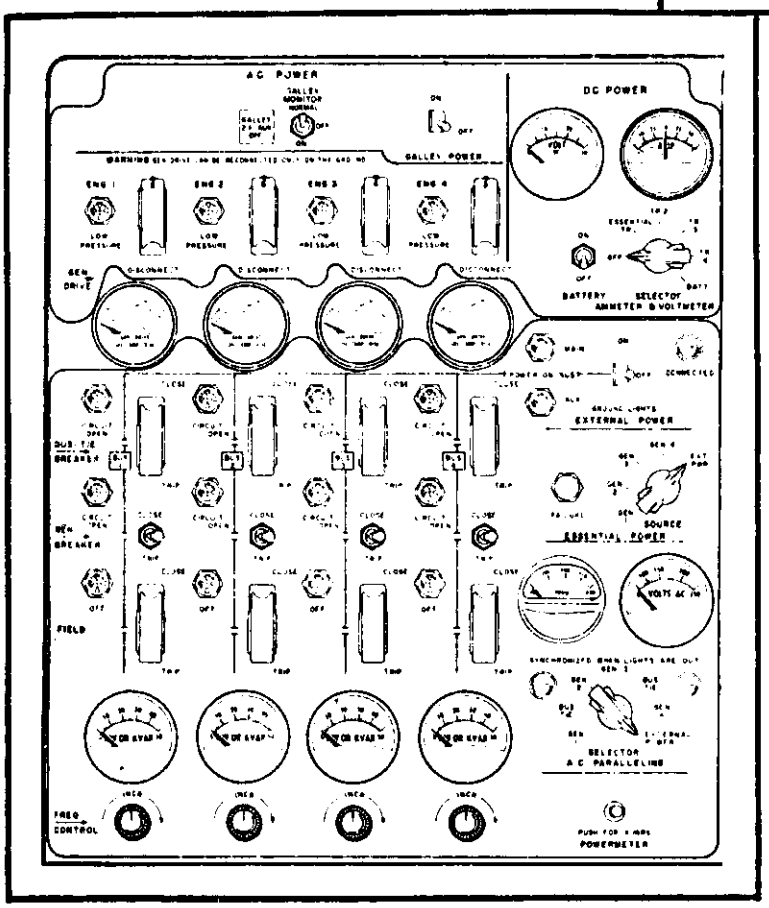


FIGURE 13--707 ELECTRICAL PANEL
(TYPICAL)

386. J12 Which unit of electrical measurement indicates the reactive power output of an a.c. generator?

1- KVA
2- KVAR
3- KW
4- kHz

387. J21 During preflight with all a.c. power off, what is the minimum allowable battery voltage?

1- 26 volts
2- 24 volts
3- 22 volts
4- 20 volts

388. J22 Which is an indication of a properly charged battery when the APU is supplying power and the meters selector is on BAT? (Fig. 12, page 49)

1- 26-30 volts and no current flow.
2- 25-28 volts and a pulsating amperage.
3- 24 volts and no current flow.
4- 22-24 volts and a pulsating amperage.

389. J84 Illumination of a bus power fail light would indicate opening of which relay?

1- BTR
2- LMR
3- GR
4- ACR

390. J82 If a differential fault trips a generator field relay, which other equipment will be immediately affected?

1- The generator breaker and bus tie for the affected generator.
2- The generator breaker for the affected generator.
3- The other two generator field relays.
4- All three bus tie breakers.

391. J84 All four bus tie breakers have tripped, and the essential a.c. power failure light did not come on. What is the first action that should be accomplished?

1- Close all bus tie breakers immediately.
2- Place freon and galley power switches ON if tripped.
3- Place cockpit and cabin temperature controls in MANUAL position.
4- Reduce electrical loads to prevent overloading the generators.

392. J85 If it is necessary to manually parallel the generators, how should the second generator be added to the common bus?

1- Close the generator breaker when both sync lights are out.
2- Close the bus tie when both sync lights are out.
3- Close the bus tie when both sync lights are on.
4- Close the generator breaker when sync lights are flashing alternately.

393. J87 What would a momentary or intermittent (blinking) CSD oil pressure light indicate?

1- The CSD fluid temperature is in the caution zone.
2- The respective generator is carrying a high voltage load.
3- Loss of fluid in the CSD unit.
4- High oil pressure in the CSD unit.

394. J22 Which is an indication that the battery is being charged?

1- Positive reading on the ammeter with the selector on TR 1.
2- Positive reading on the ammeter with the selector on BATT.
3- Negative reading on the ammeter with the selector on BATT.
4- Negative reading on the ammeter with the selector on TR 1.

395. J22 What condition is indicated when the d.c. ammeter shows plus 25 amps with the selector in battery position?

1- The battery is being charged.
2- The battery is being discharged.
3- The essential a.c. bus is unpowered.
4- The battery switch is OFF.

396. J23 Which light or meter reading is an indication that an external ground cart is supplying electrical power to the a.c. busses?

1- External power light illuminated.
2- Power indication on the number 3 generator KW meter.
3- Amperage indication on the APU ammeter.
4- Bus tie breaker lights ON.

397. J23 During preflight, with no engines running, what should be the readings on the d.c. and a.c. loadmeters when external a.c. is supplying electrical power? (Fig. 10, page 45)

1- D.c. loadmeters should indicate 24 volts, and a.c. loadmeters should indicate 115 volts.
2- All loadmeters should indicate some load.
3- All loadmeters should indicate zero.
4- D.c. loadmeters should indicate load, and a.c. loadmeters should indicate zero.

398. J30 How is power normally obtained to operate the 28V d.c. instruments before the engines are started if external electrical power is available?

1- From the aircraft's battery and inverter.
2- From the external power unit's battery.
3- From the aircraft's transformer rectifiers.
4- From the external power unit's d.c. generator.

399. J84 Which type fault can cause simultaneous tripping of all bus tie breakers?

1- Pulling an engine fire switch.
2- Short or ground on the sync bus.
3- Short or ground on a load bus.
4- Loss of essential d.c. power.

400. J78 Which condition of electrical panel lights is normal after an engine shut down on the ground with external power supplying all electrical loads?

	CSD	Bus Tie	Gen. Brkr.	Gen. Field
1-	ON	ON	ON	OFF
2-	OFF	OFF	OFF	ON
3-	ON	OFF	ON	OFF
4-	ON	OFF	ON	ON

401. J78 What electrical load should be reduced first for taxi to the ramp after landing?

1- Electric motor driven hydraulic pumps.
2- Left pack switch.
3- All fuel booster pumps.
4- Galley power switch.

402. J82 What type fault can cause one generator breaker light to become illuminated during descent?

1- Overvoltage.
2- Differential current fault.
3- Engine flame-out.
4- Phase unbalance.

403. J82 Which event will cause automatic tripping of the generator breaker?

1- Connecting the external power plug.
2- Tripping the field relay.
3- Opening the APU generator breaker.
4- Tripping the bus tie breaker.

404. J82 Assume a generator fault has caused the opening of the bus tie breaker, generator breaker, and field relay. What action should be taken first?

1- Reclose the bus tie breaker.
2- Disconnect the generator.
3- Reclose the generator breaker if frequency is within limits.
4- Trip the other three bus tie breakers.

405. J55 What is the function of the bus tie breaker?

1- To connect the generator to a common bus.
2- To control the RPM of the CSD output.
3- To disengage the generator from its drive mechanism in case of electrical emergencies.
4- To disconnect the generator from its bus when ground power is being utilized.

406. J56 With a generator's speed normal, what other condition(s) must be met for the generator to supply essential power when selected?

1- Both the generator field relay and the generator breaker closed.
2- Only the generator field relay closed.
3- Both the generator breaker and the bus tie breaker closed.
4- Only the generator breaker closed.

407. J72 Which sources require No. 3 bus tie to be closed to supply the essential a.c. bus?

1- External power and No. 3 generator.
2- APU and No. 3 generator.
3- Generators Nos. 1, 2, and 3; APU and external power.
4- External power and APU.

408. J92 During cruising flight, all generator breaker open lights are ON, all generator field off lights are ON, and the essential power failure light is ON. What action should be taken to restore minimum electrical power? (Fig. 12, page 49)

1- Rotate the essential power selector to STANDBY.
2- Close the bus tie breaker switches.
3- Start the APU and rotate the essential power selector to APU.
4- Close the generator breaker switches.

409. J93 When an abnormal indication appears on the flight engineer's electrical control panel, what is the first action that should be taken?

1- Check the KVAR loads.
2- Insure that essential a.c. is available.
3- Trip the bus tie breaker of the faulty generator.
4- Reduce the electrical load.

410. J92 What is the purpose of the STANDBY position of the essential power source selector? (Fig. 12, page 49)

1- To provide an automatic a.c. power source from another generator if the one in use fails.
2- To provide a standby source of power for the essential a.c. bus.
3- To provide a power source for the emergency exit lights system.
4- To provide power to essential flight instruments and radios from the battery.

411. J93 What should you do if a generator breaker light comes on in flight?

1- Check essential; open all bus tie breakers.
2- Check fault annunciator; check battery switch ON.
3- Check essential and reduce loads.
4- Open the bus tie breaker, then reclose the generator breaker.

412. J89 Which condition is indicated if, when the d.c. meter selector is set on ESS TR, the voltage is normal but the amperage is zero?

1- The battery charger is inoperative.
2- Essential d.c. power is not available.
3- Essential TR has failed.
4- All transformer-rectifiers are inoperative.

413. J57 Which components require use of the a.c. meters selector for valid operation?

1- Synchronizing lights, a.c. voltmeter, and essential power selector.
2- KW-KVAR meter, APU ammeter, and frequency meter.
3- Frequency meter, a.c. voltmeter, and synchronizing lights.
4- Frequency meter, a.c. voltmeter, and APU ammeter.

414. J50 Making corrections for unbalanced KW loads of paralleled generators is a function of the

1- frequency control knob.
2- voltage regulation system.
3- constant speed drive system.
4- synchronizing bus system.

415. J51 Which controls on the flight engineer panel have an effect on the CSD?

1- Field switch, generator drive disconnect switch, and residual volts switch.
2- CSD disconnect, frequency control, and KVAR switch.
3- Field switch, KVAR switch, and frequency meter selector.
4- Frequency control and generator drive disconnect switch.

416. J52 The test position of a frequency and load control switch is used (Fig. 10, page 45)

1- as an aid in paralleling generators.
2- when the generators are paralleled to test the fine frequency control.
3- to increase the frequency of a generator.
4- to lower and maintain the frequency of a generator.

417. J52 Under which condition does the frequency control have an effect on generator output?

1- When the synchronizing lights are out.
2- When the generator is isolated from the sync bus.
3- When adjusting frequency of the APU generator or external power generator.
4- When two or more generators are operating in parallel.

418. J72 What should be done if a generator frequency reads high immediately after engine start?

1- Reduce electrical load or decrease N_2.
2- Shut down the engine and have oil added to the CSD tank.
3- Allow time for the CSD oil to warm up before taking any action.
4- Close the bus tie breaker and equalize the load.

419. J78 When electrical power is changed to the ground power unit, which of the following will be tripped?

1- Bus tie breakers
2- Generator breakers
3- Generator field relays
4- Generator drive disconnects

420. J57 What should be done prior to checking residual volts of a generator?

1- Close the generator breaker.
2- Trip the bus tie breaker.
3- Trip the generator field relay.
4- Select the generator as the essential power source.

421. J57 Which condition is indicated when both a.c. generator synchronizing lights are on?

1- The selected generator is in phase with the synchronous bus.
2- The selected generator is out of phase with the synchronous bus.
3- The selected generator frequency is not the same as the synchronous bus.
4- The selected generator frequency is the same as the synchronous bus.

422. J57 If a generator "unparalleled" light illuminates during cruise flight, which indication can be used to determine if the generator relay or the bus tie relay had opened? (Fig. 10, page 45)

1- The voltage and frequency of the generator.
2- The CSD temperature drop for that generator.
3- The a.c. loadmeter reading for that generator.
4- The position of the generator control switch.

423. J88 What indications assure a generator drive has disconnected?

1- D.c. and a.c. voltage zero; generator unparalleled light ON.
2- Bus power fail light ON; generator drive oil light ON.
3- A.c. voltage zero, generator drive oil light ON, and frequency off-scale low.
4- A.c. voltage and amperage zero, generator fail light ON, and generator drive light ON.

424. J89 How will a failed TR unit be indicated?

1- Zero amps; negative volts.
2- Zero volts; normal current.
3- Zero volts; double normal amps.
4- Zero amps; normal bus volts.

425. J72 Which electrical switch should be actuated to place a generator on the sync bus for automatic paralleling and for manual paralleling?

1- Bus tie for automatic; generator breaker for manual.
2- Generator breaker for automatic; bus tie for manual.
3- Bus tie for either automatic or manual.
4- Generator breaker for either automatic or manual.

426. J72 In order to obtain external power on all a.c. buses, it is necessary to have the external power switch closed and all

1- reverse current relays closed.
2- generator breakers closed.
3- bus tie breakers closed.
4- generator disconnect switches in the open position.

427. J57 Which condition is indicated if the synchronizing lights are flashing alternately?

1- Normal condition; the generators may be paralleled.
2- Low frequency; operate the generator isolated.
3- Either low or high frequency; the generator should not be used.
4- Phase reversal; the generator should not be used.

428. J89 During cruising flight, TR-2 indicates zero amperage and 28 volts, while TR-3 indicates relatively high amperage and 28 volts. What trouble is probable?

1- TR-2 is not producing d.c. power.
2- TR-2 current is feeding a faulty TR-3.
3- TR-3 current is feeding a faulty TR-2 rectifier.
4- TR-2 ammeter circuit is faulty.

429. J91 In cruising flight, during the electrical fire procedure, the flight engineer trips all three generator breakers. Which electrical power system(s) will remain in service in this event?

1- Battery power only.
2- Essential a.c., all flight instruments, and transformer rectifiers.
3- Essential a.c., essential d.c., and battery power.
4- Battery power, emergency exit lights, and one VHF radio only.

430. J33 What should be the positions of the VOLT & FREQ SELECTOR and the BATT-EXT PWR switch to obtain the static voltage of the battery? (Fig. 10, page 45)

1- Selector to OFF; switch to BATT.
2- Selector to BATT; switch to BATT.
3- Selector to D.C. TIE; switch to EXT PWR.
4- Selector to BATT; switch to OFF.

431. J62 What action should be taken before resetting a tripped circuit breaker?

1- Position the associated control switch OFF.
2- Allow the breaker to cool for 30 seconds.
3- Trip the field switch of the affected generator.
4- Isolate all generators by tripping all bus tie breakers.

432. J41 What is the maximum continuous kilowatt load per generator?

1- 46 KW
2- 40 KW
3- 36 KW
4- 30 KW

433. J22 In event the airplane battery voltage is low, which selection will allow the battery to be charged? (Fig. 10, page 45)

1- BATT - EXT PWR switch in BATT and external a.c. electrical power supplying the d.c. tie bus.
2- BATT - EXT PWR switch in BATT and airplane electrical power supplying the d.c. tie bus.
3- BATT - EXT PWR switch OFF, selector switch in BATT, and external a.c. electrical power supplying the d.c. tie bus.
4- BATT - EXT PWR switch in EXT PWR, selector switch in BATT, and external d.c. power supplying the d.c. tie bus.

434. J23 What condition is indicated when the external power light illuminates as external power is plugged into the aircraft?

1- External power is handling all electrical demands.
2- External power voltage is within limits for the aircraft system.
3- External power phase sequence, voltage, and frequency are all correct for the aircraft system.
4- External power is available but not necessarily supplying the aircraft electrical system.

435. J33 What is the maximum d.c. load limit while the aircraft is on the ground?

1- 1.5
2- 1.3
3- 1.0
4- .5

436. J71 Just prior to starting the first engine, normal procedure is to place

1- both system B pump switches OFF.
2- all boost pump switches ON.
3- two engine bleed switches to CLOSE.
4- the galley power switch and both pack switches OFF.

437. J72 Which action may be required to power the essential a.c. bus when external power is on the sync bus? (Fig. 12, page 49)

1- Select GEN 3 on the essential power selector and close No. 3 generator breaker.
2- Select Ext. Pwr. on the essential power selector only.
3- Select Ext. Pwr. on the essential power selector and close No. 3 bus tie breaker if open.
4- Select APU on the essential power selector and close No. 2 bus tie breaker if open.

438. J41 During an engine start, which is the first normal indication of generator rotation?

1- Frequency meter indication more than minimum scale.
2- Generator drive oil temperature gauge in yellow range.
3- CSD oil pressure light out.
4- KW or KVAR meter indication more than minimum scale.

439. J42 What happens when the CSD switch is placed in the disconnect position?

1- The generator is disconnected from the CSD.
2- The generator drive shaft is sheared.
3- The CSD is disconnected from the engine.
4- The CSD shaft is sheared.

440. J82 Which type fault will trip a generator breaker?

1- Short or ground on the sync bus.
2- Loss of essential d.c. power.
3- CSD overspeed.
4- Illumination of CSD low oil pressure light.

441. J83 Which switch should be opened if one KW/KVAR meter indicates zero or negative during flight operations?

1- Generator field.
2- Bus tie breaker.
3- Generator breaker.
4- External power.

442. J42 What is the output speed of the constant speed drive?

1- 4,000 RPM
2- 115 Hz
3- 6,000 RPM
4- 400 cycles per minute

443. J87 What action is required if the CSD low oil pressure light and the generator breaker OPEN light for one generator are on?

1- Attempt to close the generator breaker.
2- Open the bus tie breaker, close the generator breaker, and manually parallel.
3- Disconnect the CSD, check for zero frequency, and open the bus tie breaker.
4- Disconnect the CSD, confirm the disconnect, and open the generator field switch.

444. J88 What action should be taken if a malfunctioning CSD will not disconnect?

1- Operate the engine at idle RPM.
2- Trip the associated field relay and generator breaker and continue engine operation.
3- Trip the associated bus tie breaker and continue engine operation.
4- Shut down the engine.

445. J42 What are functions of the generator constant speed drive?

1- Maintain constant frequency and voltage.
2- Maintain constant frequency and balance loads of parallel generators.
3- Produce constant generator speed and voltage; provide for disconnect of the generator from the engine.
4- Balance loads of isolated generators and compensate for variations of engine RPM.

446. J83 What action would normally be taken if a generator overload warning light illuminates while operating in parallel? (Fig. 10, page 45)

1- Switch off the EEC switches.
2- Unparallel the generators.
3- Place the a.c. isolate switch to ISOLATE.
4- Reduce the electrical loads.

447. J89 What is the indication when a TR unit is inoperative?

1- Amps negative; volts zero.
2- Amps zero; volts zero.
3- Amps zero; volts normal.
4- Amber warning light comes on.

448. J84 What steps should be taken to close a bus tie breaker that has tripped during paralleled operation when power is on both the sync bus and the load bus?

1- Trip the generator field relay prior to closing the bus tie breaker.
2- Check the generator frequency and, if it is within the auto-parallel range, close the bus tie breaker.
3- Trip the generator field relay, close the bus tie breaker, close the generator field relay, and then the generator breaker.
4- Adjust generator frequency for minimum sync flash rate, and close the bus tie breaker while both lights are out.

449. J42 Which factors determine CSD oil temperature in cruising flight?

1- Generator load, airspeed, and ambient temperature.
2- Voltage, frequency, and engine oil temperature.
3- Electrical power consumption only.
4- Engine oil temperature and airspeed.

450. J91 During the electrical fire procedure, which step should be taken before the generator breakers are tripped?

1- Fuel crossfeed selectors--OPEN.
2- Battery switch--OFF.
3- Cabin temperature control--MANUAL.
4- Hydraulic ground interconnect switch--OPEN.

451. J91 During the electrical fire procedure, the generator breaker switches and bus tie switches are tripped. What is a normal electrical power indication at this point in the procedure?

1- All KW/KVAR meters indicate zero power use.
2- One KW/KVAR meter indicates power use; two KW/KVAR meters indicate zero power use.
3- Each KW/KVAR meter indicates an equal share of the essential load.
4- Two KW/KVAR meters indicate a small power use; the defective generator KW/KVAR meter indicates zero power use.

452. J88 Because of a defective generator system, the generator field relay has been opened, the bus tie breaker has remained closed, and the generator drive has been disconnected. Which generator and CSD indications assure a positive disconnect of the drive?

1- CSD oil temperature decrease; CSD low oil pressure light on; residual volts 28 d.c.
2- Bus tie voltage zero; frequency off-scale low; CSD low oil pressure light on.
3- Residual volts zero; frequency 400 cps; CSD low oil pressure light out.
4- Residual volts zero; CSD low oil pressure light on.

453. J84 What would be a probable cause of all bus tie breakers tripping open during flight?

1- Loss of essential 28 volt a.c. power.
2- A differential fault on the essential a.c. bus.
3- A phase unbalance fault on the sync bus.
4- Underspeed of all generators.

454. J92 Which action should be accomplished first with the loss of all generators?

1- CSD switches--DISCONNECT.
2- All field switches--TRIP.
3- Essential power selector--STANDBY.
4- A.c. meters selector--BUS TIE.

455. K22 Which is a feature of the passenger oxygen deployment system?

1- The oxygen masks will automatically drop at 10,000 feet cabin altitude.
2- When masks are deployed automatically, an intermittent horn is energized in the cockpit.
3- The masks supply oxygen only when the user inhales.
4- The automatic system is bypassed by actuating a switch on the flight deck.

456. K31 Which type portable fire extinguisher is most desirable for use on galley fires?

1- Carbon dioxide.
2- Water with antifreeze agent.
3- Dry chemical.
4- Freon.

457. The oxygen supply valve at a passenger
K22 unit

1- will open at 14,000 feet cabin altitude.
2- is opened when the mask is pulled to the passenger's face.
3- is opened by actuating a switch on the pilot's overhead panel.
4- must be opened and closed by a flight attendant.

458. How do you operate a water fire
K33 extinguisher?

1- Remove the safety pin, direct the horn at the base of the fire, and squeeze the trigger.
2- Remove the safety pin, rotate the discharge nozzle 90°, and squeeze the trigger.
3- Rotate the handle clockwise and depress the trigger.
4- Squeeze the trigger and direct the water stream at the base of the fire.

459. What does the crew oxygen pressure gauge
K11 indicate?

1- Bottle pressure regardless of valve position.
2- Oxygen pressure between the individual regulator and the full face mask.
3- Oxygen pressure in the line between the oxygen bottle and the regulator.
4- Bottle pressure only if the valve is closed.

460. With the supply lever on, what condition
K12 of oxygen flow should be available when the selector on the regulator is placed in EMERGENCY?

1- 100% oxygen on demand.
2- Continuous undiluted oxygen flow.
3- Continuous diluted oxygen flow.
4- Diluted oxygen to a cabin altitude of 12,000 feet, then 100% oxygen.

461. What is a purpose of the TEST feature of
K14 the crew oxygen regulator?

1- To check the supply OFF valve for proper setting.
2- To check emergency operation of the regulator.
3- To provide an operational check of the regulator prior to takeoff.
4- To clear the mask of contaminants.

462. A ruptured or missing green disc asso-
K21 ciated with the oxygen system indicates that the

1- crew oxygen cylinder has been completely discharged of pressure.
2- oxygen cylinder pressure limit has been exceeded in both passenger bottles.
3- oxygen cylinder pressure limit has been exceeded in one crew or passenger bottle.
4- associated crew or passenger cylinder temperature limit has been exceeded.

463. Which actions should be taken to increase
K54 the buoyancy (watertight integrity) of the airplane for ditching?

1- Pressurize fuselage, lower flaps, and leave gear up.
2- Dump fuel, close outflow valve and cargo heat valve.
3- Close all fuel valves, depressurize fuselage, and lower flaps.
4- Dump fuel, open cargo heat valve, and leave flaps up.

464. What source provides power to operate
K41 the emergency exit lights?

1- The aircraft battery.
2- The essential a.c. bus.
3- Batteries contained in each light.
4- Dry cell battery packs located in each raft.

465. What will cause the emergency exit
K41 lights to come on with the switch in the ARMED position?

1- Use of APU or ground power unit current to supply the sync bus.
2- Turning on the NO SMOKING sign switch.
3- Loss of essential a.c. and essential d.c.
4- Loss of essential a.c.

466. What is indicated when the emergency
K41 exit lights UNARMED light on the overhead panel is illuminated? (Fig. 26, page 93)

1- The emergency exit light switch is not ON.
2- The emergency exit light switch is OFF.
3- An emergency exit light is removed from its receptacle.
4- The cabin attendant's emergency exit light switch is ON.

467. How should the flight controls be
K53 positioned to facilitate passenger evacuation through the overwing exits?

1- Speed brake lever up.
2- Flaps full down.
3- Flaps halfway down (25°).
4- Speed brake lever halfway up (20°).

468. During preflight inspection, the oxygen
K14 controls are placed in NORMAL with the supply lever OFF. What is an indication of proper operation when the oxygen mask is being checked?

1- No air or oxygen is available.
2- Oxygen is available upon inhalation.
3- Flight deck air is admitted through the regulator, but no oxygen.
4- Cabin air is admitted through the relief valve in the mask.

469. What is the intended use of the HIGH
K23 RATE outlet on the passenger cabin portable oxygen cylinder?

1- For use during a smoke evacuation procedure.
2- For cabin attendant use during cabin depressurization.
3- For use when entering an unpressurized compartment of the airplane.
4- For first aid oxygen.

470. What is a feature of the passenger oxygen
K24 system?

1- The masks drop and oxygen automatically flows through the masks any time cabin altitude exceeds 10,000 feet.
2- The green overboard discharge disc will be missing if the system has been used.
3- The system must be shut off and reset manually, regardless of the method of actuation.
4- The system cannot be actuated unless airplane altitude exceeds 14,000 feet.

471. Which selection of an oxygen control
K12 lever is used to prevent entrance of flight deck air into the crew oxygen regulator?

1- Supply lever - ON
2- Emergency lever - NORMAL
3- Supply lever - OFF
4- Diluter lever - 100%

472. After being turned ON, the passenger
K24 oxygen can be turned OFF only by

1- moving the oxygen system switch to NORMAL.
2- closing the oxygen bottle valves.
3- descending to a cabin altitude below 14,000 feet.
4- moving the actuation-reset handle to RESET, then OFF.

473. Which selection of an oxygen control is
K12 used to prevent entrance of flight deck air into the crew oxygen regulator?

1- Supply lever--OFF
2- Emergency (mask) lever - NORMAL
3- Oxygen (selector) lever--100%
4- Oxygen (selector) lever--NORMAL

474. Which action should be taken during the
K53 passenger evacuation procedure to facilitate opening of the escape hatches or doors?

1- Cabin altitude selector--field elevation plus 1,000 feet.
2- Outflow valve control switch--OPEN.
3- Cabin altitude selector--field elevation less 200 feet.
4- Outflow valve control switch--CLOSE.

475. What should be done regarding electrical
K53 system operation for the passenger evacuation procedure?

1- Disconnect the CSDs, place the emergency lights switch to ARMED, and assure the battery switch is ON.
2- Trip all generator field switches, rotate the essential switch to STANDBY, and place the battery switch to OFF.
3- Place the emergency lights switch to ON, and place the battery switch to OFF.
4- Trip all generator field switches; place emergency lights and battery switches to ON.

476. During preflight, what should be the
K24 position of the passenger oxygen actuation-reset handle? (Flight engineer aux. panel.)

1- ON
2- RESET
3- OPEN
4- OFF

477. How do you operate a carbon dioxide
K33 portable fire extinguisher?

1- Raise the nozzle upward, aim at the base of the fire, and press the trigger.
2- Turn the valve wide open and aim the CO_2 stream at the top of the fire.
3- Squeeze the trigger and aim the CO_2 stream at the base of the fire.
4- Rotate the handle clockwise and depress the trigger.

478. Which is an indication that the main
K51 entry escape slide is armed for automatic deployment and inflation?

1- The escape slide bottle pressure is 2,700-3,000 PSI.
2- The retainer bar is properly attached to the floor bracket.
3- The green airstair light is illuminated on the flight engineer's lower panel.
4- The inflation handle is visible at the door sill.

479. In the event of an emergency evacuation
K52 requirement, you should be aware that the

1- overwing escape hatches move inward and can be released from either inside or outside.
2- emergency exit doors and hatches cannot be opened unless the airplane is on the ground.
3- overwing escape hatches can only be released from the inside and have escape ropes available.
4- forward cabin entry door and the aft airstairs have escape slides and the galley doors have escape ropes.

480. Which precaution is advisable when
K33 using a portable CO_2 fire extinguisher?

1- Do not use on fires where flammable fluids or magnesium are burning.
2- Protect against inhaling CO_2, by using 100% oxygen.
3- Beware of shock when using for an electrical fire, because CO_2 is conductive.
4- Spray extinguishant at the top of the fire to prevent spreading.

481. What is indicated when the oxygen system
K24 amber light is ON?

1- The crew system has been depleted.
2- The passenger oxygen masks are being used.
3- The passenger system has been pressurized.
4- The interconnect valve between crew and passenger systems is open.

482. Which type oxygen flow can be obtained
K13 from the flight crew portable oxygen cylinder?

1- High rate or low rate continuous flow.
2- 100% or diluter demand.
3- Diluter demand only.
4- 100% demand with a full face smoke mask.

483. With the supply lever ON, what condition
K12 of oxygen flow should exist when the selector on the regulator is placed in EMERGENCY?

1- Continuous flow of diluted oxygen under positive pressure.
2- Continuous flow of 100% oxygen under positive pressure.
3- 100% oxygen available on demand.
4- Diluted oxygen available on demand.

484. When performing the cockpit preflight
K14 oxygen check, what condition should exist with the regulator in NORMAL and the supply lever ON?

1- Oxygen flow should be indicated only while inhaling.
2- Ambient air should be available when inhaling, but no oxygen flow should be indicated.
3- Ambient air only should be available if the altitude is below 5,000 feet.
4- Oxygen flow should be continuous until the regulator is placed in OFF position.

485. What is the indication of a thermally
L22 discharged extinguisher bottle with electrical power on?

1- Only the red disc is blown out.
2- The yellow disc is blown out and the bottle discharge light is on.
3- The red disc is blown out and the bottle discharge light is on.
4- Only the yellow disc is blown out.

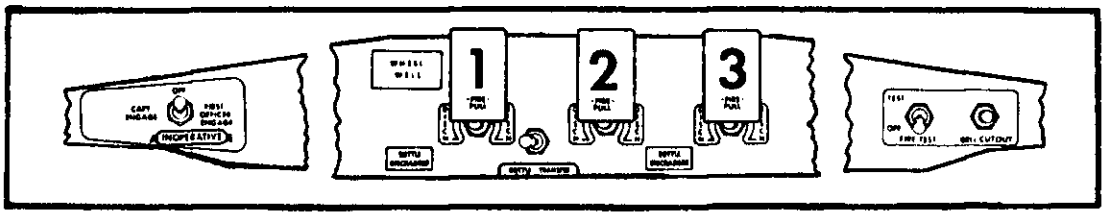


FIGURE 14--727 FIRE EXTINGUISHER CONTROLS (TYPICAL)

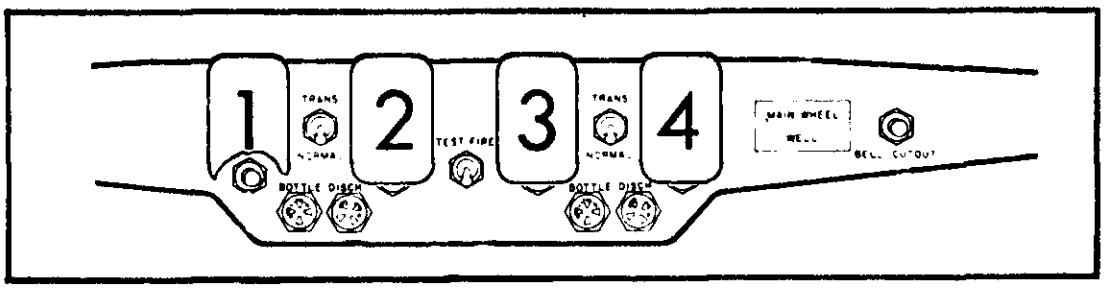


FIGURE 15--707 FIRE EXTINGUISHER CONTROLS (TYPICAL)

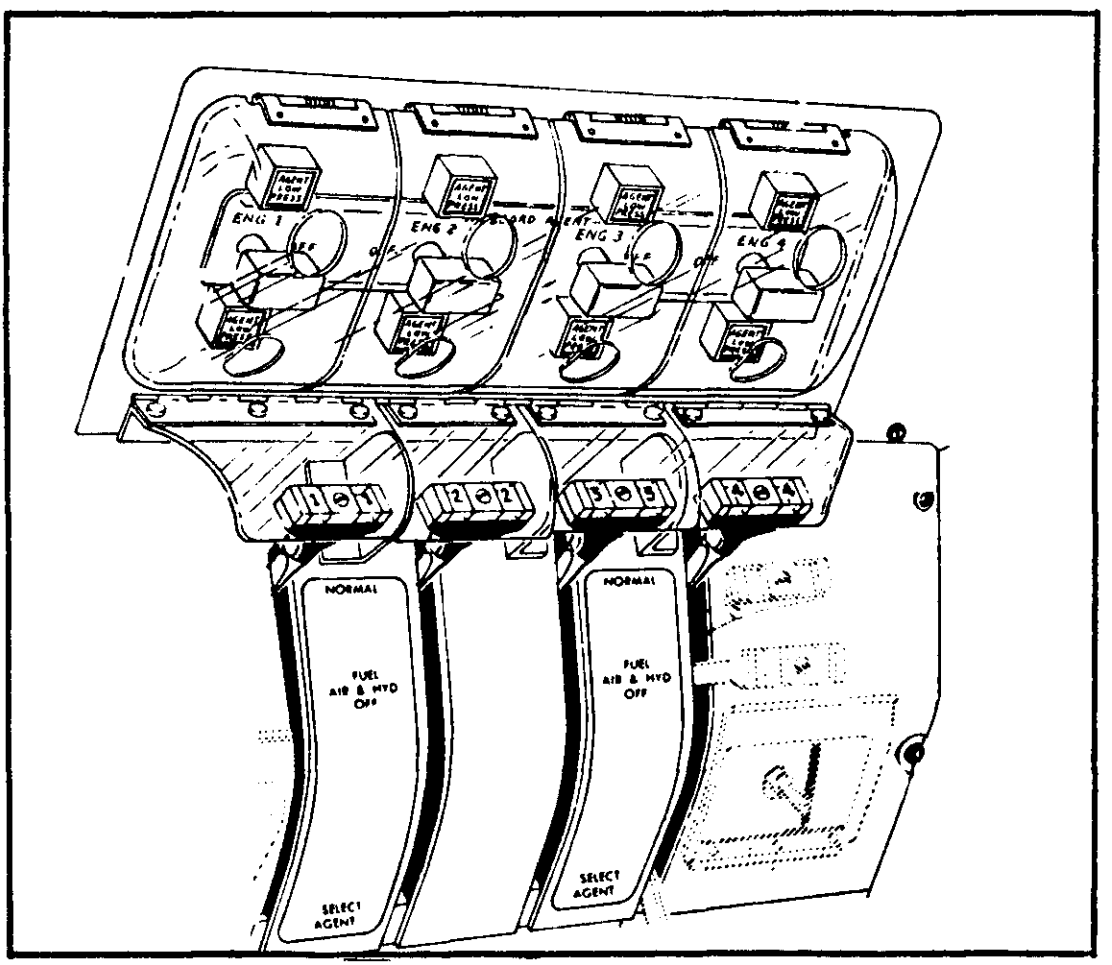
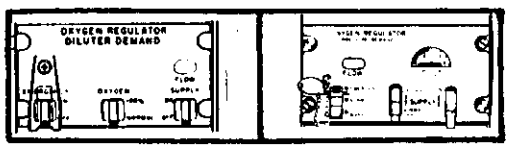


FIGURE 16--DC-8 FIRE EXTINGUISHER CONTROLS (TYPICAL)

486. K14 During the preflight check of the oxygen mask and regulator, what is an indication of proper operation with the regulator in 100% and the supply lever OFF?

1- No air or oxygen available.
2- Oxygen flow should be indicated while inhaling.
3- Ambient air is admitted through the regulator.
4- No oxygen flow, but filtered cockpit air is admitted through the regulator.



487. L31 If an engine fire occurs in flight, what should be the first flight engineer action?

1- Fire switch--PULL.
2- Essential power--CHECK.
3- Start lever--CUTOFF.
4- Oxygen panel--EMERGENCY.

488. L31 What is the proper sequence for discharging the fire extinguishing agent?

1- Switch bottle transfer; pull fire switch; pull discharge switch.
2- Press discharge switch; pull fire switch and hold 30 seconds.
3- Pull fire switch and hold out; press discharge switch; switch bottle transfer immediately.
4- Pull fire switch; press discharge switch and hold 1 second.

489. L13 What action should be taken while holding the fire warning test switch? (Fig. 14, page 60)

1- Press the master warning light cover after all engine warning lights come on.
2- Press the bell cutout after the warning lights come on.
3- Turn off essential a.c. to assure that fire warnings operate on battery power.
4- Pull the bell circuit breaker after the bell rings the first time.

490. L13 What occurs when the fire test switch is released? (Fig. 14, page 60)

1- The wheel well light goes out immediately.
2- The fire bell is silenced.
3- All warning lights stay on until the heaters cool down.
4- All warning lights go out after a 10-second delay.

491. L21 How many fixed fire extinguisher bottles are located on the aircraft?

1- Six
2- Four
3- Three
4- Two

492. L22 If a fire extinguisher bottle thermally discharges in flight, how can it be detected from the cockpit?

1- The bottle discharge light will illuminate.
2- The red seal will be ruptured.
3- The fire warning bell will ring.
4- The manifold pressurized light will illuminate.

493. L21 How many fixed fire extinguisher bottles are located on the aircraft?

1- Five
2- Four
3- Three
4- Two

494. L31 When should the second freon agent bottle be discharged to combat an engine fire if the fire warning light remains on?

1- 1 minute after the first one.
2- 30 seconds after the first one.
3- 15 seconds after the first one.
4- Immediately following the first one.

495. L31 How is the engine fuel shutoff valve closed during the engine fire procedure?

1- When the throttle is closed.
2- When the start lever is moved to cutoff.
3- When the extinguisher discharge switch is pressed.
4- When the fire switch is pulled.

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496. L22 What actions occur when number 1 engine fire switch is pulled? (Fig. 14, page 60)

1- Generator field relay tripped, engine bleed air closed, engine cowl TAI shutoff closed, and hydraulic fluid shutoff closed.
2- Generator field relay tripped, hydraulic fluid shutoff closed, engine bleed air closed, and wing shutoff closed.
3- Generator breaker tripped, wing shutoff closed, and hydraulic fluid shutoff closed.
4- Generator field and bus tie tripped, engine bleed air closed, and wing shutoff closed.

497. L21 During the preflight inspection, the engine fire extinguisher system should be checked for

1- volume of carbon dioxide in the container.
2- air preload pressure.
3- bottle pressure limits at ambient temperature.
4- flood control valve freedom of operation.

498. L21 A ruptured yellow fire extinguisher discharge disc indicates that

1- pressure limits have been exceeded in all fire extinguisher bottles.
2- at least one fire extinguisher bottle has been intentionally discharged from the cockpit.
3- at least one fire extinguisher bottle has been discharged from over-temperature.
4- all fire extinguisher bottles have been intentionally discharged.

499. L21 If two engine fire extinguisher bottles had thermally discharged, what would be the external indication?

1- Two red discs missing.
2- Two yellow discs missing.
3- One red disc missing.
4- One yellow disc missing.

500. L22 If a fire extinguisher bottle thermally discharges in flight, how can it be detected in the flight deck?

1- The fire warning bell will ring.
2- The fire shutoff handle light will illuminate.
3- The agent discharge light will illuminate.
4- The bottle pressure gauge will indicate low pressure.

501. L22 Which systems will be shut down when the fire shutoff lever for number 4 engine is pulled fully down? (Fig. 16, page 60)

1- Pneumatic, hydraulic, and fuel.
2- Electrical, pneumatic, fuel, and hydraulic.
3- Electrical, pneumatic, and fuel.
4- Electrical, pneumatic, fuel, hydraulic, and engine oil.

502. L11 When an engine fire warning occurs in flight, actuation of the cutout switch will

1- silence the bell and put the light out.
2- silence the bell but the light will remain on.
3- put the light out but the bell will continue to ring if the fire is still present.
4- reset the light and the bell circuits in preparation for a second fire.

503. L22 What is the function of the bottle transfer switch?

1- Selects freon bottle to be discharged.
2- Opens the engine selector control valves.
3- Arms the freon bottle for its second shot.
4- Selects the engine to which the freon is discharged.

504. L11 Which fire warning can be cut out by pressing the cutout switch? (Fig. 14, page 60)

1- Engine fire warning light.
2- Wheel well fire warning light.
3- APU fire warning light.
4- APU fire warning horn.

505. L22 The fire control panel switch is placed in the transfer position, the number 2 engine fire switch is pulled out, and the number 2 bottle discharge switch is actuated. Which bottle(s) will discharge? (Fig. 15, page 60)

1- Bottle number 2.
2- Bottles numbers 1 and 2.
3- Bottle number 3.
4- Bottle number 1.

506. L22 Which aircraft areas are protected by a fixed fire extinguisher system?

1- Engine strut, engine cowling, and APU area.
2- Engine nacelles, APU compartment, and wheel wells.
3- Engine hot section, engine accessory section, wheel wells, and ground power unit compartment.
4- Engine nacelles, main gear area, and lower cargo compartments.

507. L31 You have an engine fire warning. The fuel shutoff valve light fails to illuminate when the fire switch is pulled. With the captain's permission, what action should be taken?

1- Manually close the fuel shutoff valve with the manual close lever, and discharge the fire bottle.
2- Turn both boost pumps off in the respective fuel tank, close the crossfeed valve to that engine, and discharge the fire bottle.
3- Push the fire switch in, then close the fuel shutoff valve switch. Recheck valve position light and re-pull the fire switch.
4- Immediately discharge the fire bottle and close the fuel shutoff valve switch.

508. L31 Which is an indication that the engine fuel shutoff valve has closed during the engine fire procedure?

1- EGT reduces and pump lights illuminate.
2- Valve light comes ON momentarily, then goes OFF.
3- Fuel flow reduces to zero and engine shuts down.
4- Valve light comes ON and goes OFF only when switch is placed OFF.

509. L11 If an engine fire has occurred in flight, what happens when the master fire light cover is pressed?

1- The bell is silenced and the fire shutoff handle lights are extinguished.
2- The bell circuit is rearmed and the agent discharge handle lights are extinguished.
3- The bell sound volume is reduced and all fire lights are extinguished.
4- The bell is silenced, the master lights are extinguished, and the system is rearmed.

510. L11 What is indicated when a fire detector inoperative light is ON?

1- Completely inoperative fire detection system.
2- Short in one loop of the fire detection system.
3- Fire detection system is properly armed.
4- Fire extinguishing system for one engine is inoperative.

511. L13 Which warnings should operate when the fire test switch is positioned for System A and wheel well?

1- Wheel well warning, fire bell, and three engine warnings.
2- Engine fire warnings, wheel well warning, fire bell, and APU warning.
3- One engine fire warning, landing gear warning, engine strut overheat, and lower aft body overheat.
4- Three engine warnings, two engine strut overheats, three wheel warnings, and the fire bell.

512. L14 What fire detection means, if any, is provided for the lower cargo compartment?

1- No equipment is installed to detect a class D compartment fire.
2- The fire bell rings, but no warning light illuminates.
3- Flames can be observed through the viewing ports in the cabin floor.
4- Smoke detector tubes on the flight engineer's panel.

513. L32 Which action is appropriate for an overheat or fire indication in the main wheel well?

1- Shut off hydraulic pumps and air conditioning.
2- Close both wing anti-ice valves.
3- Depressurize and use CO_2 hand extinguishers.
4- Lower the gear to cool the area.

514. L33 Which is the preferred method of combating a brake fire on the ground?

1- Spray warm water fog over the wheel and brake assembly.
2- Keep the engine running to blow out the fire.
3- Use a dry chemical fire extinguisher.
4- Completely smother the gear with a foam extinguishing agent.

515. L21 If the fire extinguisher bottles had been discharged to engines Nos. 1 and 2 by normal methods, what would be the external indication?

1- Two red discs missing.
2- One red disc missing.
3- Two yellow discs missing.
4- One yellow disc missing.

516. L31 How can the possible fire area be located if the fire bell rings but no warning light illuminates?

1- Check the engine gauges for an abnormally high oil temperature.
2- Actuate the fire test switch; a defective warning light indicates the possible fire.
3- Press to test each warning light; an inoperative light indicates the possible fire.
4- Pull the fire handles one at a time; when the bell is silenced, the fire has been located.

517. L11 What happens when the fire bell cutout switch is pressed?

1- The bell is silenced but rings again if a fire is still present.
2- The bell is silenced and the fire warning light is extinguished.
3- The bell is cut out of the fire detection system.
4- The bell is silenced and the bell circuit is rearmed for a second fire.

518. L31 What action can be taken if the fire bell rings but no warning light illuminates?

1- Silence the bell and pull all detector CBs; reinstate CBs one at a time; the bell will ring when the CB for the area with the fire is reset.
2- Check the engine gauges for an abnormally high oil temperature.
3- Pull the detector CBs one at a time; the bell will be silenced when the CB for the area with the fire is pulled.
4- Pull the fire switches one at a time; when the bell is silenced, the fire has been located.

519. L22 What is accomplished by actuation of the fire extinguisher system transfer switch?

1- Extinguisher agent discharge is stopped by the closing of the bottle valve.
2- The engine fuel shutoff valve is closed.
3- An alternate freon bottle electrical circuit is armed.
4- The second engine fire extinguisher selector valve is opened.

520. L21 What would be the external indication if two engine fire extinguisher bottles had been discharged from the flight deck?

1- Two yellow discs missing.
2- One gray disc missing.
3- One yellow disc missing.
4- Two red discs missing.

521. L21 In the fire extinguishing system, a blown red indicator disc reveals that the

1- manifold to the engine has been pressurized.
2- maximum temperature at the bottle has been exceeded.
3- nitrogen pre-charge is low.
4- contents of all bottles have been discharged.

522. L31 What condition is necessary for arming an engine fire extinguisher?

1- The fire switch must be pulled out.
2- A fire signal must be present.
3- The battery switch must be on.
4- The bottle discharge button must be depressed.

523. What would the absence of one red fire
L21 extinguisher indicator disc indicate?

1- Discharge of one freon bottle by actuation of the discharge switch.
2- Thermal discharge of two freon bottles due to high temperature.
3- The extinguishing system has been actuated and one or both bottle(s) is(are) empty.
4- Thermal discharge of one freon bottle due to high temperature.

524. With an inflight engine fire, when
L31 should the second fire extinguisher bottle be discharged?

1- Thirty seconds after the first one, if the fire warning light is still on.
2- Fifteen seconds after the first one, if the fire warning bell rings again.
3- Immediately following the first one to ensure complete smother and cooling.
4- At least 1 minute after the first one, if the fire warning light is still on.

525. What is the indication of an electrically
L21 discharged extinguisher bottle?

1- Only the red disc is blown out.
2- The red disc is blown out and the bottle discharge light is on.
3- Only the yellow disc is blown out.
4- The yellow disc is blown out and the bottle discharge light is on.

526. What causes the bottle discharge light
L22 to illuminate?

1- Pressing the discharge switch.
2- Complete depletion of the CO_2 charge.
3- Low pressure in the bottle.
4- Extinguishing of the engine fire.

527. Which valves are closed when the Engine
L22 No. 3 fire switch is pulled? (Fig. 14, page 60)

1- Engine fuel shutoff and hydraulic fluid shutoff.
2- Engine fuel shutoff and engine bleed air.
3- Engine fuel control, hydraulic fluid shutoff, and engine anti-icing.
4- Engine fuel control, engine anti-icing, and engine bleed air.

528. What indication can the flight crew
L31 observe to assure that fire extinguishing agent has discharged to the engine?

1- Engine fire switch light illuminated.
2- Bottle discharge light illuminated.
3- Yellow indicator disc missing.
4- Engine temperature gauges suddenly decrease.

529. How should the landing gear be extended
L32 and the doors opened during the wheel well fire procedure?

1- Landing gear lever down, pull the landing gear control circuit breaker, then landing gear lever up.
2- Lower the main gear only by manual system.
3- Wheel well doors opened manually, discharge extinguisher, then wheel well doors closed manually.
4- Landing gear lever down, then momentarily up, then off.

530. When will a fire warning light go out
L11 once it has been illuminated by a fire?

1- When the fire switch is pulled.
2- When the fire is extinguished.
3- When the bottle low pressure light illuminates.
4- When the bell silencing button is depressed.

531. The purpose of the priority valve during
M16 all flight operations is to

1- provide main system pressure to the flaps and gear down locks.
2- maintain hydraulic system pressure between 1,175--1,500 PSI.
3- insure adequate pressure to the flight controls when heavy demands are placed on the hydraulic system.
4- give priority to the flight spoilers when needed.

532. Which type operation would result if
M31 the suitcase handles were "split"?

1- The stabilizer could be operated electrically.
2- The stabilizer could not be operated.
3- The stabilizer could be operated manually.
4- The pitch trim compensator could move the stabilizer.

533. What is the function of the balance
M10 panels?

1- Maintain boundary layer flow over the top of trailing edge flaps.
2- Assist primary flight control movement.
3- Prevent excessive control movement at high airspeeds.
4- Provide artificial feel for powered controls.

534. Which control devices are affected by
M44 position of the outboard flaps?

1- Outboard ailerons, outboard spoilers, and leading edge devices.
2- Outboard ailerons, inboard ailerons, and rudder load limiter.
3- Leading edge devices, outboard ailerons, and rudder load limiter.
4- Leading edge devices, inboard ailerons, and lower rudder.

535. What is accomplished by the rudder load
M14 limiter?

1- Reduces pressure to both rudders in high speed flight.
2- Reduces pressure to both rudders in low speed flight.
3- Reduces pressure to the lower rudder in low speed flight.
4- Reduces pressure to the lower rudder in high speed flight.

536. During an approach, the rudder throw
M14 and hydraulic pressure available is increased when the

1- landing gear is extended for landing.
2- standby rudder pump is started to assure adequate pressure.
3- wing flaps are extended 10 degrees or more.
4- auxiliary hydraulic pump switch is placed ON.

537. The gust lock system <u>mechanically</u> locks
M15 the

1- rudder.
2- elevators.
3- ailerons.
4- elevators and rudder.

538. What is the basic procedure to be
M57 followed if an asymmetric flap condition occurs in flight?

1- Move the flaps to the full UP position electrically and leave them up.
2- Alternate flap operation of the inoperative set of trailing edge flaps should not be attempted.
3- Attempt to get the flaps to the selected position by any means possible.
4- Synchronize the flaps hydraulically, then position them electrically for landing.

539. How can an asymmetric flap condition be
M57 detected on the ground?

1- By a split needle indication on the flap position indicator.
2- The takeoff warning horn will always sound.
3- The affected set of flaps will automatically stop before the asymmetric condition becomes pronounced.
4- The flap lever will be immovable.

540. With inoperative yaw damper(s), what
M52 restrictions are normally imposed?

1- Altitude only.
2- Speed only.
3- Altitude and speed.
4- Climb attitude, altitude, and speed.

541. How should the inboard flaps be operated
M54 if they stop before reaching the selected setting, but there is no indication of an asymmetrical condition?

1- That set of flaps may be positioned by the alternate flap switches.
2- That set of flaps must not be raised or lowered by any means.
3- Pull the flap position indicator circuit breaker and continue with normal flap extension.
4- Place the alternate flap master switch to the ON position and continue normal flap extension with the flap lever.

542. When throttles are advanced to the
M43 takeoff range, an intermittent horn signal indicates that possibly

1- the gear handle is not in the down position.
2- a door is not secured.
3- the horizontal stabilizer is in the green area.
4- the flaps are up.

543. Which flight controls can be operated
M11 by manual reversion?

1- Ailerons, elevators, rudder, and spoilers.
2- Upper rudder, lower rudder, and ailerons.
3- Elevators, inboard ailerons, and outboard ailerons.
4- Ailerons, spoilers, elevators, and trim tabs.

544. What is indicated by illumination of the
M51 Rudder Load Limiter light?

1- The rudder load limiter has been bypassed.
2- Hydraulic pressure to the upper rudder is too low.
3- Hydraulic pressure to the lower rudder is not appropriate for the flap setting.
4- Loss of hydraulic pressure to the rudder system which placed the system in manual reversion mode.

545. How is operation of the flight controls
M44 adjusted for high speed flight?

1- Rudder hydraulic pressure is increased.
2- Spoilers are locked out in faired position.
3- Outboard ailerons are locked out when flaps are up.
4- Pitch control reverts to the stabilizer with a fixed elevator.

546. The position of the wing flaps has an
M44 effect on the

1- ailerons and horizontal stabilizer.
2- rudder and slots.
3- elevator and slots.
4- horizontal stabilizer and slots.

547. Which is indicated when the rudder load
M51 limiter light illuminates on the flight engineer's panel with flaps down?

1- Lower rudder is operating mechanically from the rudder pedals.
2- Yaw dampers are inoperative.
3- Low hydraulic pressure to the lower rudder.
4- Excessive hydraulic power to the lower rudder.

548. What precaution should be observed
M34 during the stab trim check?

1- Do not operate manual trim with electric power on the airplane.
2- Do not operate the main electric trim with the autopilot engaged.
3- Do not operate the stab cruise trim with the autopilot engaged.
4- Do not operate the captain's and first officer's main electric trim switches in opposite directions simultaneously.

549. When performing the pitch trim compen-
M34 sator preflight test, what should be indicated with the switch in the OVERRIDE position?

1- The indicator should extend and the control column should move forward.
2- The PTC EXTEND FAIL light should come on and the copilot's column should move aft.
3- The indicator should retract and the PTC EXTEND FAIL light should go off.
4- The PTC EXTEND FAIL light should go off, the indicator retract, and the control column move aft.

550. How does the pitch trim compensator
M13 correct for aerodynamic changes in high speed flight?

1- Applies a forward force on the control column.
2- Applies a back pressure on the control column.
3- Applies an upward force on the stabilizer leading edge.
4- Applies a downward force on the stabilizer leading edge.

551. M13 What is the purpose of the pitch trim compensator?

1- Provide automatic stabilizer trim setting for takeoff and landing.
2- Prevent excessive elevator tab displacement during autopilot flight.
3- Compensate for a nose down pitch change as airspeed approaches critical Mach.
4- Compensate for a rearward movement of the CG as airspeed approaches the speed of sound.

552. M10 Which flight control systems are operated directly by hydraulic power cylinders but automatically revert to manual control in event of hydraulic system failure?

1- Rudder, ailerons, and elevators only.
2- Rudder and ailerons only.
3- Rudder only.
4- Rudder, ailerons, elevators, and leading edge slots.

553. M10 What causes manual reversion of the flight controls?

1- Lowering the flaps to landing configuration.
2- Actuation of the ground sensing switch on the landing gear.
3- Selection of the standby hydraulic system.
4- Loss of hydraulic pressure in both system A and system B.

554. M41 What could cause the flaps to stop when using the alternate flap switches? (Fig. 22, page 83)

1- Loss of hydraulic pressure.
2- Excessive airspeed.
3- Asymmetric condition.
4- Loss of hydraulic fluid.

555. M56 What will cause the intermittent warning horn to sound on the ground as the throttles are advanced for takeoff?

1- Stab trim not takeoff, flaps not down, or speed brakes not centered.
2- Flaps up, stab trim not takeoff, or low engine power.
3- Speed brake not zero, flaps not takeoff, or stab trim not in green band.
4- Auto pack trip not armed, flaps not takeoff, or stab trim not set for takeoff.

556. M58 If a hydraulic malfunction occurs, requiring the use of fluid from the emergency reservoir, what will be the effect upon flap and slot operation?

1- The flap position indicator and wing slots light will be inoperative.
2- The slots will remain closed when flaps are extended.
3- The slots will remain open when flaps are retracted.
4- The inboard flaps and inboard slots, only, will be operational.

557. M11 Which devices provide roll control in landing configuration?

1- Inboard ailerons, inboard spoilers, and ground spoilers.
2- Inboard and outboard ailerons; inboard and outboard spoilers.
3- Ailerons, spoilers, and speed brakes.
4- Outboard ailerons and all spoilers.

558. M11 When is the aileron control tab actuated?

1- Whenever the aileron trim wheel is rotated.
2- Whenever the control wheel is rotated.
3- When either the aileron trim or the control wheel is rotated with hydraulic power on.
4- When either the aileron trim or the control wheel is rotated with hydraulic power off.

559. M12 Which condition will prevent operation of the ground spoilers?

1- Left main shock strut is not compressed.
2- Spoiler - system A switch is in the OFF position.
3- Speed brake handle is not fully aft.
4- Main gear wheels are not turning above 15 knots.

560. M55 How is the stabilizer brake actuated to stop a runaway stabilizer?

1- By an electrical signal from the autopilot.
2- By an opposing motion of the control column.
3- By automatic reversal of stabilizer jack screw loading.
4- By release of the brake shoe when the trim switch is held on.

561. M55 Which action should the flight engineer take to deactivate electric trim in the event of a runaway stabilizer that cannot be controlled by the stabilizer trim cutout switches?

1- Pull the stabilizer trim circuit breakers.
2- Turn the battery switch OFF.
3- Rotate the essential power selector to STANDBY.
4- Open all generator breaker switches.

562. M12 At what point during a normal landing approach should pressure be indicated on the spoiler hydraulic system gauge?

1- When the flaps extend past 23°.
2- When the nose gear strut is compressed.
3- Immediately after the gear goes to the DOWN position.
4- Within 30 seconds after the flight spoiler switch has been placed to the ON position.

563. M10 Which control surface is manually operated by cables?

1- Rudder
2- Elevator
3- Aileron
4- Horizontal stabilizer

564. M10 What flight controls would be inoperative if system B hydraulic pressure were lost?

1- Outboard spoilers.
2- Inboard ailerons.
3- Inboard spoilers.
4- Outboard ailerons.

565. M55 Which action should be taken to provide nose up trim in a jammed stabilizer situation?

1- Deactivate outboard spoilers and inboard flaps.
2- Deactivate outboard spoilers and extend inboard spoilers.
3- Manually trim elevators to nose up condition.
4- Deactivate inboard spoilers and extend outboard spoilers.

566. M12 If a loss of the auxiliary hydraulic system occurs, what spoilers are operative?

1- Outboard spoilers.
2- Inboard spoilers.
3- Inboard and outboard spoilers.
4- Inboard spoilers but limited to 20°.

567. M56 Which is an operating feature of the rudder system after loss of the main system hydraulic fluid?

1- The rudder can be powered hydraulically by placing the rudder standby switch in start position and observing the Rudder Control Manual light going out.
2- The rudder can be powered hydraulically by placing the selector lever to Bypass/ General System and turning the auxiliary pump ON.
3- The rudder would be operable only by manual control.
4- The rudder would automatically revert to standby electric boost in event of main system hydraulic fluid loss.

568. M12 What would be the purpose of placing the Ground Spoiler Power switch in the ALT position? (Fig. 23, page 86)

1- To open the interconnect valve and allow use of main system pressure in flight for spoiler extension.
2- To arm the spoiler system for automatic extension of ground spoilers when the nose strut is compressed.
3- To provide main system hydraulic pressure for ground spoiler extension.
4- To override the spoiler pump control and start pump operation.

569. M50 What precaution should be taken when landing in snow or slush?

1- Do not use reverse thrust below 80 knots IAS.
2- Turn engine fuel heat ON prior to landing.
3- Leave flaps down until they can be checked.
4- Turn wing anti-ice ON prior to landing.

570. M54 If hydraulic system A fails, which units would be operative by using the standby pump and alternate flap system controls? (Fig. 22, page 83)

1- Leading edge devices; ailerons; nose brakes; trailing edge flaps.
2- Nose gear steering; ground spoilers; lower rudder.
3- Leading edge devices down; lower rudder; trailing edge flaps.
4- Lower rudder; outboard spoilers; leading edge devices.

571. M41 What is the purpose of the flap asymmetry protection system?

1- To lock out all trailing edge flaps if one set moves asymmetrically.
2- To lock out only the set of trailing edge flaps (inboard or outboard) not moving symmetrically.
3- To bypass hydraulic pressure so electrical flap extension is possible.
4- To lock out the trailing edge or leading edge set of flaps (inboard or outboard) that are not moving symmetrically.

572. M54 The trailing edge flaps have been operated by the alternate method. What should be done with the switches?

1- Emergency Flap Master Switch remains ON; Emergency Flap Switches OFF.
2- All Emergency Flap Switches OFF to ensure that flaps remain in the selected position.
3- Turn off the Emergency Flap Master Switch and position the Emergency Flap Switches to UP.
4- Emergency Flap Master Switch OFF; Emergency Flap Switches in desired flap position.

573. M42 What would be the result, if the standby hydraulic system pressure was lost after it had been used to extend the leading edge devices? (Fig. 22, page 83)

1- Electrical actuators will keep the leading edge devices extended.
2- The leading edge devices would tend to blow up, as they do not lock down.
3- The leading edge devices would remain extended until retracted by the alternate flap system.
4- The leading edge devices would remain extended because they mechanically lock down.

574. M42 What is indicated when an amber leading edge flap light is illuminated? (Fig. 11, page 45)

1- One or more leading edge device is not in agreement with the LED switch position.
2- Leading edge devices are fully extended.
3- Leading edge devices are fully retracted.
4- A leading edge device is in transit or not in agreement with the flap lever.

575. M43 During takeoff, if flaps are not in takeoff position when throttles are advanced to takeoff range, the warning indication should be

1- a steady bell.
2- an intermittent horn.
3- a steady horn.
4- a red light in the flap handle.

576. M13 What are functions of the elevator tabs?

1- Trim tabs; balance tabs in normal operation and in manual operation.
2- Trim tabs; control tabs in manual operation and normal operation.
3- Control tabs in manual operation and balance tabs in normal operation.
4- Balance tabs in manual operation and control tabs in normal operation.

577. M13 Which units are operated when the control column is moved back and forth on the ground?

1- The trim tabs and the elevators.
2- The control tabs only.
3- The control tabs and the elevators.
4- The aerodynamic tabs and the stabilator.

578. M32 When will the electric trim operating light come on?

1- Any time power is supplied to the main electric trim motor.
2- Any time the stabilizer is being positioned.
3- Any time power is supplied to either the main electric trim motor or the autopilot/Mach trim motor.
4- Any time the stabilizer is being operated by the autopilot.

579. M33 How can the horizontal stabilizer be actuated with a complete electrical failure?

1- By using the suitcase handles.
2- By movement of the control column.
3- By rotating the manual trim wheel.
4- By autopilot action only.

580. N62 Which is an indication of proper flight recorder operation when the switch is placed in test position?

1- Meter indicating in normal range.
2- Green light OUT; amber light ON.
3- Amber light OUT.
4- Steady tone in cockpit speaker.

581. N62 What is the purpose of the REPEAT button on the flight recorder panel?

1- To recycle encoder.
2- To playback a previously recorded event.
3- To rewind tape.
4- To allow recorder to operate on APU power.

582. N25 The Air Data Computers (KIFIS) provide information for the

1- altimeter, TAS indicator, and RAT indicator.
2- altimeter, TAS indicator, and SAT indicator.
3- altimeter, TAS indicator, and Machmeter.
4- altimeter, IAS indicator, and RAT indicator.

583. N21 Both the ram air input passage and the drain hole of a pitot system are blocked by ice. What erroneous indication will appear on the Machmeter when descending at a constant thrust setting?

1- Remains fixed at a constant value.
2- Mach number gradually decreases.
3- Mach number gradually increases.
4- Drops to the minimum value shown on the indicator.

584. N22 Which source operates the Machmeter?

1- Computed data from SAT/TAS indicator.
2- Air data computer.
3- Pitot-static pressure only.
4- Pressure altitude and ambient temperature corrections applied to indicated airspeed data.

585. N23 If you set the altimeter to field elevation, the barometric scale should read

1- field barometric pressure.
2- standard barometric pressure corrected for temperature.
3- 29.92 inches of mercury.
4- altimeter setting.

586. N51 Which type of temperature indication is provided by the total air temperature gauge?

1- Ambient air temperature.
2- Ram air temperature corrected for ram rise.
3- OAT plus ram rise.
4- OAT corrected for static system error.

587. N52 What is the relationship between Static Air Temperature and Ram Air Temperature in cruising flight at high altitude?

1- Static Air Temperature is always lower (colder) than Ram Air Temperature.
2- Static Air Temperature minus Ram Air Temperature equals True Air Temperature.
3- Ram Air Temperature plus True Air Temperature equals Static Air Temperature.
4- Ram Air Temperature is always lower (colder) than Static Air Temperature.

588. N21 In addition to the flight instruments, with which systems are the static ports associated?

1- Cabin pressure control, air data computer, and cabin altimeter.
2- Cabin pressure control, flight recorder, and cabin altimeter.
3- Air data computer, flight recorder, and cabin pressure warning switch.
4- Air data computer, cabin pressure control, and flight recorder.

589. N25 Which instruments in the captain's KIFIS system would be completely inoperative without electrical power?

1- Altimeters and Machmeters.
2- Airspeed indicators and true airspeed indicator.
3- Altimeters and static air temperature.
4- True airspeed indicator and static air temperature.

590. N31 Which signal alerts the flight crew if the V_{MO} or M_{MO} is exceeded?

1- A steady bell will ring.
2- An intermittent horn will sound.
3- An intermittent bell will ring.
4- A steady horn will sound.

591. N31 Which is a feature of the Mach/airspeed warning system?

1- The limiting Mach (M_{MO}) increases with altitude.
2- The limiting airspeed (V_{MO}) increases with altitude.
3- The warning can be silenced by a cutout switch.
4- The warning can be cut off by activating the yaw damper system.

592. N31 Which indication signifies that the Mach/airspeed limit has been exceeded?

1- A steady bell rings.
2- An intermittent horn will sound.
3- A wailing horn (siren) will sound.
4- A clacker will sound.

593. N33 What should be the setting of the maximum speed needle on the airspeed indicator during preflight inspection with electrical power ON?

1- V_{REF}
2- M_{MO}
3- V_{MO}
4- Zero

594. N50 What is the relationship between True Outside Air Temperature and Indicated Outside Air Temperature in cruising flight at high altitude?

1- Indicated temperature is always higher (hotter) than true temperature.
2- Indicated temperature is always lower (colder) than true temperature.
3- Indicated and true temperatures are equal at Mach 1.0.
4- Indicated and true temperatures are equal at the tropopause.

595. N61 The flight recorder automatically records the airplane's

1- airspeed, altitude, time, heading, and rate of climb or descent.
2- acceleration, indicated altitude, Mach, and compass heading.
3- course, altitude, Mach, vertical acceleration, and flight time.
4- indicated airspeed, pressure altitude, heading, vertical acceleration, and elapsed time.

596. N61 Which power source is required to initiate operation of the flight recorder?

1- APU
2- Airplane generators
3- External power
4- Battery

597. N23 What is the effect of placing the altimeter selector switch (servo switch) OFF?

1- The altimeter becomes completely inoperative.
2- Autopilot data is removed from the altimeter.
3- Altimeter pressure is obtained from the pitot system.
4- Air data computer corrections are removed.

598. N25 What is the main function of the KIFIS system?

1- Correct the airspeed indicators for static system errors.
2- Correct the Machmeter for static system errors.
3- Correct the vertical speed indicator for inertia errors.
4- Correct the altimeters for scale error and static system error.

599. N21 Which false reading would occur if the pitot system and its water drain were blocked by ice while the static system was unobstructed during a climb?

1- Indicated airspeed would decrease at constant power.
2- Indicated airspeed would increase at constant power.
3- Vertical speed indicator would remain at zero.
4- Altimeter indication would remain constant.

600. N21 What would be the indication on the Vertical Speed Indicator (VSI) during entry into a 500 FPM actual descent from level flight if the static ports were iced over?

1- The initial indication would be a climb, then descent at a rate in excess of 500 FPM.
2- The VSI pointer would indicate a descent, but at a rate less than 500 FPM.
3- The VSI pointer would remain at zero regardless of the actual rate of descent.
4- The indication would be in reverse of the actual rate of descent (500 FPM climb).

601. What is the function of the maximum
N33 airspeed pointer?

1- Indicates V_{MO} and continuously increases with altitude.
2- Displays V_{MO}/M_{MO} as set by the cursor (bug) control.
3- Displays maximum operating Mach number and airspeed.
4- Indicates maximum airspeed up to the tropopause and maximum Mach above the tropopause.

602. During preflight, you check the static
N21 ports for being open and clean. With which systems are these ports associated?

1- Flight instruments, cabin pressure control, autopilot, and cabin altimeter.
2- Flight instruments, autopilot, cabin pressure control, and flight recorder.
3- Flight instruments, autopilot, flight recorder, and cabin altimeter.
4- Flight instruments, cabin pressure control, flight recorder, and cabin altimeter.

603. Which instruments or systems require an
N21 input of pitot pressure in addition to static pressure?

1- Altimeter, Machmeter, and flight recorder.
2- Vertical speed indicator, airspeed indicator, and Machmeter.
3- Altimeter, rate of climb indicator, Machmeter, flight recorder, airspeed indicator, and V_{MO}/M_{MO} warning switch.
4- Mach/airspeed indicator, flight recorder, and V_{MO}/M_{MO} warning switch.

604. Which item requires an input of normal
N21 static pressure only?

1- Instantaneous vertical speed indicator.
2- Cabin differential pressure switch.
3- Mach airspeed warning switch.
4- Airspeed/Machmeter.

605. What is indicated by illumination of a
012 Feed Pump Pressure light on the flight engineer panel?

1- Tank boost pump and tank feed pump are both OFF.
2- Fuel is entering the associated tank from another tank.
3- Associated feed pump is energized but its output is low.
4- No fuel can be drawn from the associated alternate tank.

606. An alternate tank boost pump is placed
012 ON when supplying the engine with alternate tank fuel and also when

1- main tank fuel is being transferred to the alternate tank.
2- transferring fuel to the main tank.
3- transferring fuel to the auxiliary tank.
4- auxiliary tank fuel is being transferred to the alternate tank.

607. Which is a requirement for operation of
014 the underwing fueling system?

1- Crossfeed valves OPEN.
2- Fuel quantity indicator bugs set for desired tank fuel level.
3- Fuel boost pumps ON.
4- External power connected or APU power available.

608. Which procedure should be used to
041 maintain an equal fuel balance when a fuel quantity gauge is inoperative?

1- All crossfeed valves--OPEN.
2- Adjust thrust as necessary to maintain even fuel flow readings.
3- Vary crossfeed valve position and boost pump operation to maintain balanced fuel flow readings at even EPR settings.
4- All boost pump switches--OFF.

609. Crossfeed procedures are used to
034 equalize laterally unbalanced fuel loads. Which action should be used to stop the flow of fuel from a tank with a low fuel level?

1- Fore and aft boost pumps OFF.
2- Crossfeed valve CLOSED.
3- Tank valve CLOSED.
4- Engine fuel valve CLOSED.

610. 043 How should tanks be equalized if tank 1 has greater quantity than tank 3?

1- All crossfeed selectors OPEN; all boost pumps 1 and 2 ON; one boost pump 3 OFF.
2- Tanks 1 and 3 crossfeed selectors OPEN; tank 2 crossfeed selector OFF; all boost pumps 1 and 2 ON; all boost pumps 3 OFF.
3- All crossfeed selectors OPEN; one boost pump 1 ON; one boost pump 2 ON; one boost pump 3 OFF.
4- Tanks 1 and 3 crossfeed selectors OPEN; tank 2 crossfeed selector CLOSED; all boost pumps 1 and 2 ON; one boost pump 3 ON.

611. 034 Which procedure is used to feed center tank fuel to Number 1 engine? (Fig. 18, page 75)

	NO. 1 TANK BOOST PUMP	CENTER TANK BOOST PUMP	NO. 1 MANI-FOLD VALVE	NO. 1 RESERVE TRANSFER VALVE
1-	Both off	Left pump on	Closed	Open
2-	Both on	Both on	Closed	Closed
3-	One on	One on	Open	Open
4-	One on	Both on	Open	Closed

612. 022 If the cable system to the fuel dump chute has failed, what would be the indication?

1- The selector switch would be in the DRAIN position.
2- A red warning flag on the bottom surface of each wing.
3- A tripped circuit breaker for the fuel dump actuator motor.
4- The handcrank would be mechanically locked in the RETRACT position.

613. 031 What should be the indication when the test button of a fuel quantity indicator (FE panel) is depressed? (Fig. 19, page 77)

1- Quantity indication should not change.
2- Indication should fluctuate between 100 and 200 lbs.
3- Indication should move toward ZERO.
4- Indication should move toward FULL.

614. 012 Which valves in the fuel system are electrically operated?

1- Crossfeed valves.
2- Tank selector valves.
3- Fill valves.
4- Defueling valve.

615. 012 The fuel quantity indicator for the number 1 tank indicates the

1- pounds of usable fuel in the tank based upon fuel temperature of 59°F.
2- total pounds of fuel in the tank regardless of fuel density.
3- pounds of usable fuel in the tank regardless of fuel density.
4- total gallons of fuel in the tank based upon 6.7 lbs./gal. fuel density.

616. 012 What temperature may be read on the fuel temperature gauge?

1- Tank No. 4 only.
2- Tank No. 1 only.
3- All main fuel filters and tank No. 1.
4- All fuel filters only.

617. 046 What is the correct sequence of switch positions to dump fuel?

1- Boost pumps OFF; dump nozzle valve switches OPEN; dump valve switches OPEN.
2- Dump chute EXTEND; valve OPEN; chute DRAIN; chute RETRACT.
3- Boost pumps ON; dump valve switches OPEN; nozzle valve switches OPEN.
4- Nozzle switches OPEN; crossfeeds OPEN; dump valve switches OPEN.

618. 046 Which action should be taken if during dumping the fuel tank quantity decreases below 3,500 lbs.?

1- Close the associated fuel dump nozzle switch.
2- Manually terminate dumping before the tank quantity reaches 2,500 lbs.
3- Transfer fuel to the low tank by crossfeeding.
4- Turn off all boost pump switches for the tank.

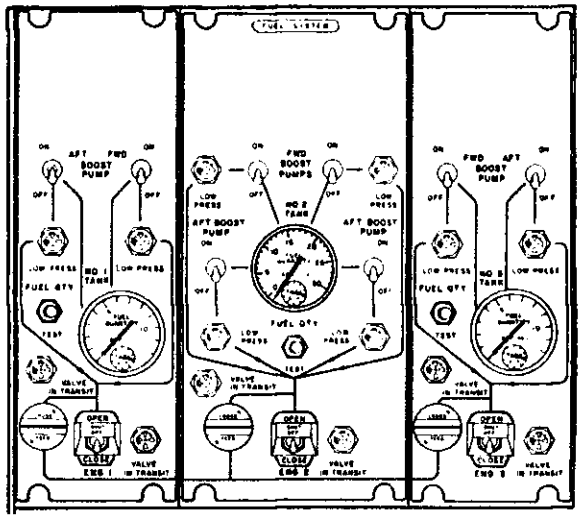


FIGURE 17--727 FUEL PANEL (TYPICAL)

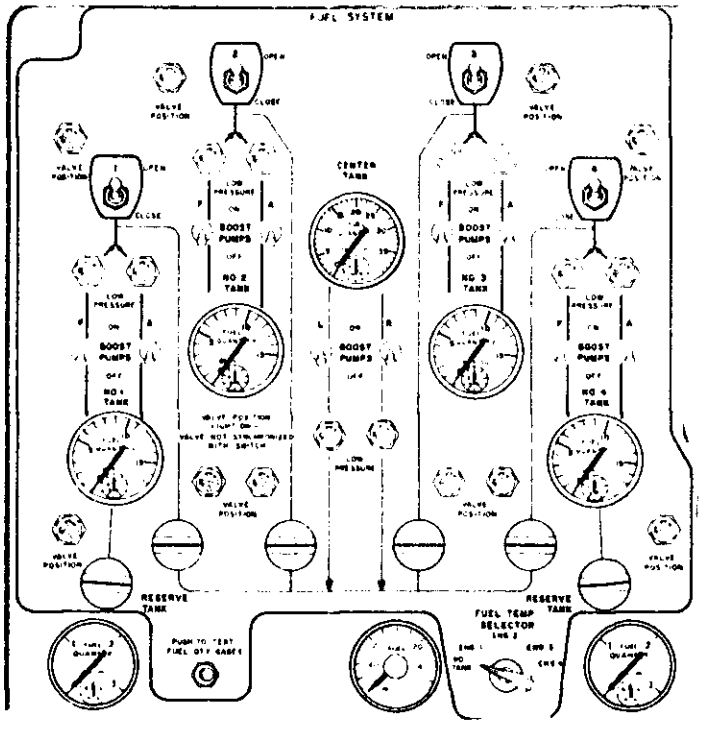


FIGURE 18--707 FUEL PANEL (TYPICAL)

619. 034 What is the effect of having all boost pumps ON and all crossfeed selectors OPEN? (Override pumps installed)

1- High pressure fuel from tank 2 will prevent fuel flow from tanks 1 and 3.
2- Fuel from tank 2 will enter tanks 1 and 3.
3- Each tank will feed its respective engine because check valves prevent reverse fuel flow.
4- Pump output from tanks 1 and 3 will override the output of tank 2 and feed all engines.

620. 034 How is fuel in the alternate tanks ordinarily consumed? (Fig. 19, page 77)

1- By gravity feed to the associated engine.
2- By transfer to the center tank.
3- By transfer to adjacent main tank.
4- By crossfeed to either two or four engines at a time.

621. 034 What will happen during fuel transfer, if the tank quantity indicator needle reaches the "bug" setting? (Fig. 19, page 77)

1- Fuel level control valve will close electrically.
2- Fuel transfer valve will close.
3- Alternate tanks low level lights will illuminate.
4- Fill valve will close.

622. 012 Which pressure sources are indicated on the fuel pressure gauge? (Fig. 19, page 77)

1- Tank boost pump and engine boost pump.
2- Engine boost pump and tank feed pump.
3- Tank boost pump and tank feed pump.
4- Engine boost pump, tank boost pump, and tank feed pump.

623. 014 Fuel tank boost pump pressure is a requirement for which operations?

1- Engine operation, tank to tank transfer, and pressure fueling.
2- Fuel dumping and tank to tank transfer.
3- Engine operation, APU operation, and suction defueling.
4- APU operation, fuel dumping, and pressure fueling.

624. 044 What action should be taken i
boost pump light comes ON whe
switch is ON and usable fuel
tank?

1- Reset tripped circuit bre
if it retrips, place pump
switch OFF, and then all cross
feed valves OPEN.
2- Crossfeed CLOSED; operate tank to engine on other boost pump; leave affected pump switch ON if circuit breaker has tripped.
3- Crossfeed OPEN; pump switch OFF; reset tripped circuit breaker; pump switch ON; if breaker retrips, place pump switch OFF
4- Pump switch OFF; reset tripp
circuit breaker, and hold ON
required for high power setting

625. 044 Which is an indication of an inoperative tank boost pump? (Fig. 19, page 77)

1- Fuel boost pump low pressure light ON.
2- Low pressure on the fuel pressure gauge.
3- Feed pump pressure light ON.
4- Fuel flow indicator reading low for EPR being used.

626. 031 During preflight inspection of the flight engineer's panel with external ground power available, you turn the fuel crossfeed selectors from OPEN to CLOSED and then back to OPEN for each tank. When should the blue light associated with the crossfeed valve be ON during this check?

1- When the valve and selector are synchronized in any position.
2- When the valve is OPEN and the selector is in OPEN position.
3- When the valve is changing to either OPEN or CLOSED.
4- When the valve is CLOSED and the selector is in CLOSED position.

627. 030 When should the No. 1 fuel crossfeed valve normally be open? (Fig. 18, page 75)

1- Only when starting or crossfeeding.
2- For starting and for all normal operation when main tanks are supplying their respective engines.
3- Only when feeding all engines from the center tank.
4- When crossfeeding and when transferring fuel from the No. 1 reserve tank.

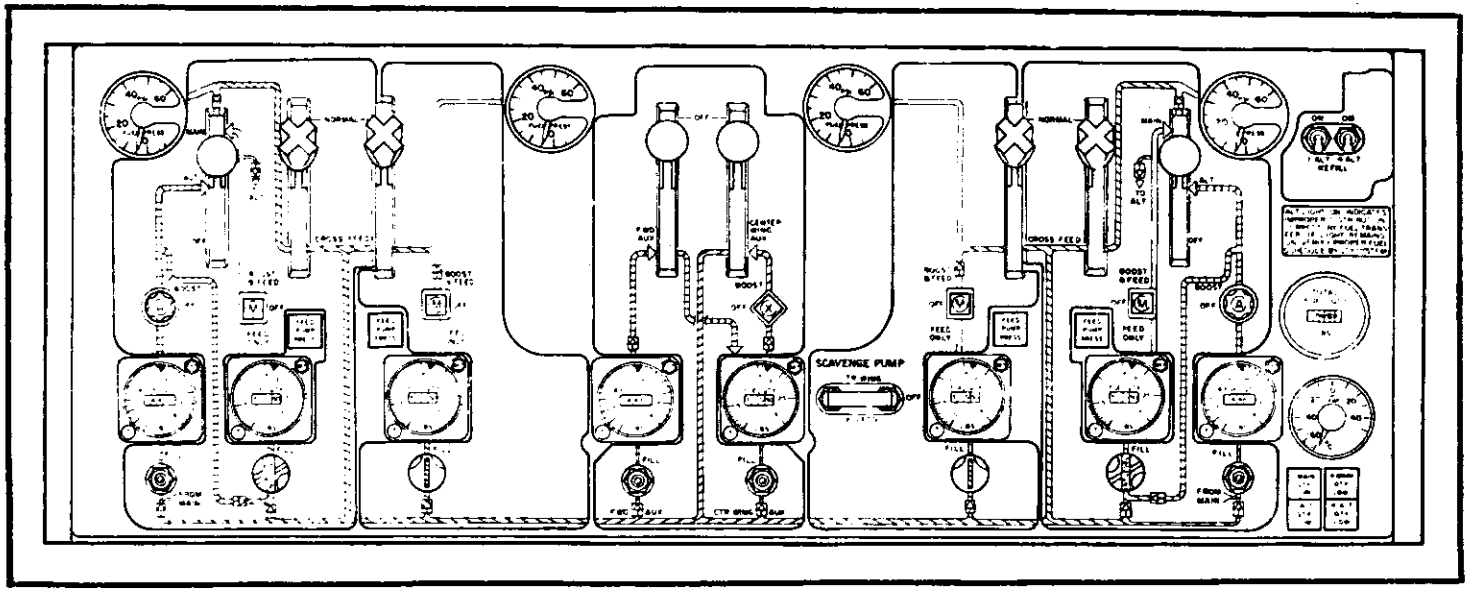


FIGURE 19--DC-8 FUEL PANEL (TYPICAL)

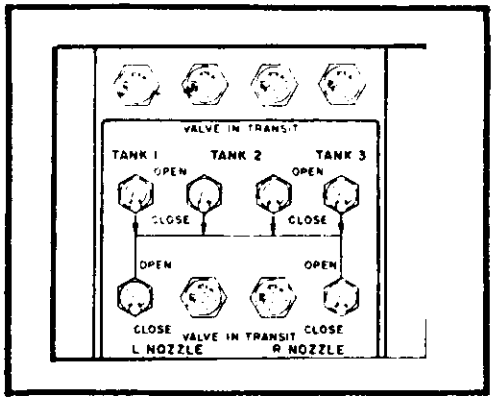


FIGURE 20--727 FUEL DUMP CONTROLS (TYPICAL)

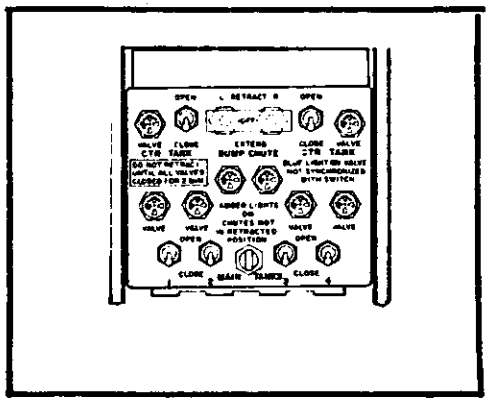


FIGURE 21--707 FUEL DUMP CONTROLS (TYPICAL)

628. 012 What temperature(s) may be read on the fuel temperature gauge?

1- All main fuel filters and tank No. 1.
2- All fuel filters only.
3- Tank No. 3 only.
4- Tank No. 1 only.

629. 012 Which location is monitored by the fuel temperature gauge?

1- Tank No. 1 only.
2- Tank No. 4 only.
3- All fuel filters only.
4- All main fuel filters and tank No. 4.

630. 012 What is indicated by lights on the fuel panel? (Fig. 17, page 75)

1- Pump light ON indicates pump is ON; valve light ON indicates valve is in transit.
2- Pump light ON indicates low pump pressure; valve light ON indicates valve is CLOSED.
3- Pump light ON indicates pump is ON; valve light ON indicates valve and switch positions agree.
4- Pump light ON indicates low pump pressure; valve light ON indicates valve and switch positions disagree.

631. 033 What configuration should be used when setting the fuel panel for takeoff with an equal fuel load in each tank? (Fig. 17, page 75)

1- All boost pumps ON, and all crossfeed valves CLOSED.
2- One boost pump ON in each tank, and all crossfeed valves OPEN.
3- All boost pumps ON, and No. 2 crossfeed valve OPEN.
4- All boost pumps ON in No. 2 tank, and all crossfeed valves OPEN.

632. 033 What is the normal fuel system configuration for takeoff? (Fig. 18, page 75)

1- All main pumps ON; No. 1 crossfeed OPEN; others CLOSED.
2- All main pumps ON; No. 2 crossfeed OPEN; others CLOSED.
3- All aft pumps ON; all crossfeeds OPEN.
4- All boost pumps ON; all crossfeeds CLOSED.

633. 046 How much fuel should remain in each tank when automatic fuel shutoff occurs during fuel dumping?

1- 1,250 pounds
2- 2,500 pounds
3- 3,000 pounds
4- 3,500 pounds

634. 046 Which control setting is required during the fuel dumping procedure?

1- Boost pump switches--OFF.
2- Fuel feed--TANK TO ENGINE.
3- Flaps--UP.
4- Crossfeed selectors--ALL OPEN.

635. 046 What is the correct sequence of switch positions to dump fuel and then retract the dump chutes?

1- Fuel Dump - Retract.
2- Fuel Dump - Drain - Retract.
3- Extend - Fuel Dump - Drain - Retract.
4- Extend - Fuel Dump - Retract.

636. 014 Which procedure is used to transfer fuel from tank 1 to tank 2?

1- Tank 2 pumps OFF; 1 and 2 crossfeed valves OPEN; tank 1 pumps ON.
2- Tank 2 pumps OFF; all crossfeed valves OPEN; defueling valve OPEN.
3- Tank 2 pumps OFF; defueling valve OPEN; tank 2 crossfeed valve OPEN; tank 1 dump valve OPEN; tank 1 pump ON.
4- Tank 2 pumps OFF; defueling valve OPEN; tank 1 crossfeed valve OPEN; tank 2 fueling valve OPEN; tank 1 pump ON.

637. 014 Which is an indication of proper operation when the Fueling Quantity Indicator Test Switch at the fueling station control panel (right wing) is placed to the ON position?

1- All fuel quantity indicators drive toward zero.
2- Fueling station quantity indicators drive up scale; indicators on flight engineer panel drive toward zero.
3- All fuel quantity indicators drive up scale.
4- Fueling station quantity indicators drive toward zero; indicators on flight engineer panel drive up scale.

638. 044 Which operation is not possible in the event of the malfunction of both boost pumps in number 3 tank?

1- Use of number 3 tank fuel for tank to engine operation.
2- Fuel transfer to number 3 tank.
3- Use of number 3 tank fuel for number 2 engine.
4- Operation of number 3 engine from number 2 tank.

639. 044 What action should be taken if a fuel boost pump light comes ON?

1- Place the affected boost pump switch OFF.
2- Crossfeed the affected engine from any tank with two operating pumps.
3- Check the fuel temperature for icing conditions; apply fuel heat if required.
4- Press to test the light; if it goes out, only the light circuit is faulty.

640. 046 What procedure is used to dump fuel if the right nozzle valve fails to open?

1- Dump fuel from all tanks through the left nozzle.
2- Dump fuel from tanks 1 and 2, but not tank 3.
3- Dump fuel from tank 2, but not tanks 1 and 3.
4- Do not dump fuel.

641. 014 Which tank(s) has(have) filler ports for overwing fueling?

1- 1, 2, and 3.
2- 2 only.
3- 1 and 3 only.
4- 1 and 2 only.

642. 014 Which procedure is normally used to partially fill number 2 main tank while using the underwing refueling system? (Fig. 19, page 77)

1- Manually close the fill valve when the desired level is reached.
2- Set the number 2 fuel quantity indicator pointer to the desired level.
3- Close the selector valve to number 2 main tank when fuel reaches the desired level.
4- Close the tank fill valve at the underwing refueling panel when the desired level is reached.

643. 034 Which tank or tanks will supply the engines when all crossfeeds are OPEN and all boost pumps are ON? (Override pumps installed)

1- Each tank feeds its own engine.
2- All tanks supply fuel equally.
3- All fuel will flow from the center tank.
4- All tanks feed all engines.

644. 034 What is the normal fuel system selection when feeding all four engines from the center tank?

1- Both center pumps ON and all main tank pumps ON.
2- Both center pumps ON and one in each main tank ON.
3- Both center pumps ON and all main tank pumps OFF.
4- Right and left pumps ON and all fore and aft pumps OFF.

645. 046 Which is the correct procedure after fuel has been dumped?

1- Move the fuel dump switch and the handle to the RETRACT position and visually check that all dump valves have closed.
2- Pull the handle and move the fuel dump switch to the DRAIN position and leave for 5 minutes.
3- Move the fuel dump switch to the RETRACT position.
4- Move the fuel dump switch to the DRAIN position and leave for 5 minutes.

646. 046 What is the correct sequence of switch positions to dump fuel? (Fig. 21, page 77)

1- All boost pumps ON; dump valve switches OPEN; nozzle valve switches OPEN.
2- Dump chute EXTEND; valve OPEN; chute RETRACT; chute DRAIN.
3- Main boost pumps ON; dump chute switches EXTEND; dump valve OPEN.
4- Dump chute EXTEND; crossfeeds OPEN; dump valve OPEN.

647. Which is an indication that fuel dumping
022 from number 3 tank has cut off as number 3 dump valve switch is placed to CLOSED? (Fig. 20, page 77)

1- Number 3 fuel quantity stops decreasing at a high rate.
2- Number 3 flowmeter returns to a normal usage rate.
3- Fuel discharge from the number 3 dump chute stops.
4- Right nozzle valve in-transit light extinguished.

648. What are the uses of the fuel dump
022 controls? (Fig. 20, page 77)

1- Fuel dump valve OPEN allows fuel to be drawn from the tank during defueling.
2- Fuel dump valve OPEN allows fuel to enter the dump manifold.
3- Fuel dump nozzle valve OPEN allows fuel to enter the dump manifold.
4- Fuel dump nozzle valve OPEN allows fuel to be drawn from the tank during ground transfer.

649. What is indicated by illumination of
P61 the hydraulic oil temperature light?

1- Overheated fluid in the system return lines.
2- Mechanical failure of one engine driven pump.
3- High fluid temperature in the main reservoir.
4- Overheated fluid in either the main or emergency reservoirs.

650. Which events can cause the system A low
P62 pressure light to illuminate?

1- Pump pressure low, fluid shutoff switch CLOSED, or pump switch ON.
2- Pump failure, pump switch OFF, or fluid shutoff switch CLOSED.
3- Engine fire switch PULLED, pump pressure low, or pump switch OFF.
4- Pump failure, pump switch ON, or engine fire switch PULLED.

651. What should the utility system pressure
P12 gauge indicate with the engines OFF and system interconnect closed?

1- Zero
2- 750 PSI
3- 2,000 PSI
4- 3,000 PSI

652. What is the effect of opening the system
P12 interconnect with utility pumps ON and auxiliary pumps OFF? (Fig. 24, page 86)

1- The auxiliary system would not be pressurized.
2- Hydraulic power would be supplied only to the inboard spoilers.
3- Hydraulic brake pressure would increase to 3,000 PSI.
4- The rudder and inboard spoilers would be supplied with hydraulic power.

653. If system A hydraulic pressure is lost
P60 during flight, how can the landing gear be extended? (Fig. 22, page 83)

1- Normal system B operation or manual extension.
2- Manual extension procedures only.
3- Opening the ground interconnect valve to obtain system B pressure, and placing the gear lever down.
4- Opening the brake interconnect valve to obtain system B pressure, and placing the gear lever down.

654. How can the brake accumulator precharge
P52 be checked on preflight?

1- Check the pressure gauge attached to the accumulator on the external preflight inspection.
2- Hold the brake pedals ON and observe the pressure immediately before a sudden drop to zero.
3- Repeatedly actuate the brake pedals until brake pressure drops to a stabilized reading.
4- Observe the pressure with all pumps OFF and brakes OFF.

655. Which condition is required before check-
P52 ing the lockout de-boost valve for proper servicing?

1- Brake gauge above precharge pressure and brakes OFF.
2- Brake gauge above precharge pressure and parking brake SET.
3- Main antiskid switch OFF and brakes OFF.
4- Parking brake light ON and antiskid switch OFF.

656. What is the source of pressure to the
P53 brakes when the interconnect valve is opened prior to engine start?

1- Either utility pump.
2- Rudder auxiliary pump.
3- Either auxiliary pump.
4- Rudder and spoiler auxiliary pump.

657. If the long lever of the landing gear
P22 control dual lever becomes jammed in the UP position, what would be the indications when the gear is extended by use of the short lever?

1- Red gear warning light will remain ON with the gear down and locked.
2- Gear light indications will be normal.
3- Green gear lights will be ON before the gear locks down.
4- Gear light indication will be normal, but the engine thrust brake lights will be inoperative.

658. What is the function of a fusible
P31 plug on a landing gear?

1- Reduce hydraulic system pressure for use in the brakes.
2- Separate the hydraulic and pneumatic brake systems.
3- Prevent loss of system fluid if a brake leaks.
4- Allow tire to deflate due to brake overheating.

659. While performing the preflight cockpit
P32 inspection, you observe the parking brake light ON and brake pressure gauge reading 500 PSI. What does this indicate?

1- Hydraulic pressure is applied to the brakes.
2- Both brake pedals on one side are in the parked position.
3- One or both brake pedals on one side are depressed to the parked position, and 500 PSI hydraulic prssure is applied to the brakes.
4- The parking brake lever is in the parked position.

660. What trouble is probable if a hydraulic
P32 system pressure gauge indicates zero pressure during cruising flight?

1- Hydraulic pump failure.
2- Total loss of all fluid.
3- Loss of accumulator precharge.
4- Loss of bleed air reservoir pressurization.

661. When should the auxiliary hydraulic
P12 pump switch be held in start position?

1- To provide added pressure for landing gear operation.
2- Only to overcome a thermal cutout during emergencies.
3- To overcome the opening of the circuit breaker if the pump motor draws excessive current.
4- Only to overcome a high fluid temperature during emergency gear extension.

662. During cruise flight, the brake pressure
P32 gauge indicates zero. Other hydraulic system gauges have normal indications and no amber or red indicator lights are on. What condition is indicated?

1- Electrical power to both hydraulic pumps has been interrupted.
2- Accumulator preload has been lost.
3- Landing gear retraction has shut off system pressure to the brakes in the normal manner.
4- Fluid has been lost to the point that all lockout cylinders have bottomed out.

663. What is the pressurization source for
P11 the system A reservoir?

1- Engines 2 and 3 bleed air.
2- Pneumatic system pressure.
3- System B return fluid.
4- Engines 1 and 2 bleed air.

664. What is indicated by illumination of
P61 hydraulic system A and B overheat lights?

1- Return fluid overheat in system A; one or both system B pumps overheated.
2- Fluid overheat in system A reservoir.
3- Difference between outlet and inlet fluid temperature at cooler excessive.
4- Fluid overheat in system A reservoir; one or both system B pumps overheated.

665. During manual landing gear extension,
P68 where should the landing gear handle be placed?

1- Manual down.
2- Down.
3- Bypass.
4- Off.

666. P63 What maintenance action is required after the air brake system has been used to stop the airplane?

1- Recharge the air pressure bottle, re-safety the emergency air brake control handle, and reset the flapper valve.
2- The complete hydraulic system must be purged of all air and the brake air pressure bottle recharged.
3- The brake system downstream of the lockout cylinders must be purged of all air.
4- The only maintenance action required is recharging the bottle with nitrogen.

667. P61 What is indicated by illumination of the hydraulic oil overheat light? (Fig. 24, page 86)

1- Overheated utility return fluid or faulty auxiliary pump.
2- Overheated fluid in a utility or auxiliary system pressure line.
3- Overheated fluid in a return line to a reservoir.
4- Overheated fluid in the utility system heat exchanger.

668. P68 How can the main gear be stopped halfway up when doing the landing gear inflight inspection procedure?

1- Rudder spoiler pump OFF.
2- Depressurize the utility pumps.
3- Landing gear lever OFF.
4- Manually crank each gear halfway.

669. P58 Which setting of the hydraulic pump switches is required at termination of the flight? (Fig. 22, page 83)

1- B pumps on - A pumps off.
2- A pumps on - B pumps off.
3- All pumps on.
4- All pumps off.

670. P58 When the aircraft is parked and the engines are shut down, what should be the position of the engine driven hydraulic pump switches?

1- ON, to avoid valve sticking that could shear the pump shaft in cold weather.
2- ON, to prevent overheating of the depressurization solenoids.
3- OFF, to prevent fluid from filling the pump cavity.
4- OFF, to prevent continuous energizing of the pump valve solenoid.

671. P21 What action takes place regarding the main landing gear system when the landing gear lever is placed in the UP position?

1- Wheel rotation is stopped by automatic braking, the gear is retracted, then the doors are closed by bungee strut action.
2- The gear doors free fall open, the gear retracts and mechanically pulls the gear doors closed when the gear contacts the up-lock.
3- Sequence valves direct hydraulic pressure to open the gear doors, retract the gear, and then close the gear doors.
4- Wheel rotation is stopped by automatic braking, the gear is retracted, the gear doors are then closed hydraulically and locked by the lockout cylinders.

672. P21 Which is a mechanical ground function of the ground shift mechanism?

1- Place the pneumatic crossfeed valve to the OPEN position.
2- Aircraft depressurization by opening the outflow valve.
3- Make nosewheel accumulator pressure available for nose-wheel steering.
4- Place the pneumatic system in low pressure bleed for ground operation.

673. P31 Which item prevents system pressure loss in the event of brake line failure at the inlet to the shuttle valve?

1- Antiskid valve.
2- Lockout debooster.
3- Power brake control.
4- Gear down sequence valve.

674. P31 From where does the brake system normally receive pressure?

1- Utility hydraulic system.
2- Trapped air pressure.
3- Brake accumulator.
4- Auxiliary hydraulic system.

675. P69 Which is an indication of low fluid supply in the emergency reservoir?

1- Hydraulic quantity gauge below 1/2 full.
2- Auxiliary pump low pressure light on.
3- Illumination of the low level light.
4- Spoiler hydraulic pressure zero.

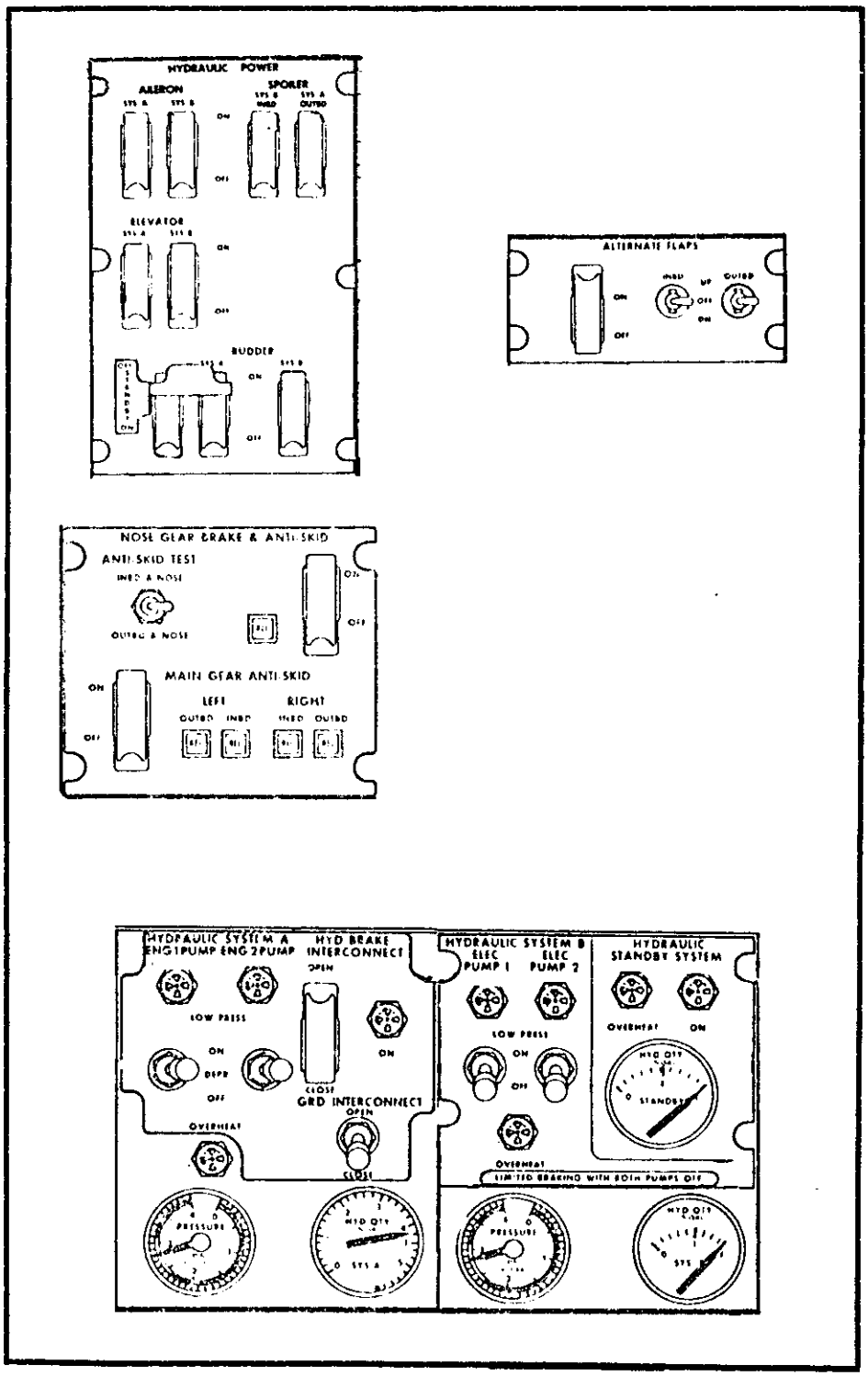


FIGURE 22--727 HYDRAULIC CONTROLS (TYPICAL)

676. What must be accomplished if there is a
P68 hydraulic fluid loss after the landing gear has been extended and locked down?

1- Manual extension procedure for the main gear to assure they remain locked down.
2- Manual extension procedure for both main gear and nose gear.
3- Manual extension procedure for the nose gear.
4- Manual extension procedure only if the nose gear does not have a down and locked indication.

677. Which condition is indicated if the
P68 orange indicators are protruding approximately 1/4-inch above the top aft portion of the wing surface after free falling the landing gear?

1- The main gear is down and locked.
2- The main gear did not lock in the down position.
3- The main gear doors are closed.
4- The gear cannot be raised until the mechanical locks are removed.

678. What is an indication of a leak in the
P69 auxiliary hydraulic system? (Fig. 24, page 86)

1- Quantity dropping below 3 gallons.
2- Quantity dropping to approximately 3 gallons.
3- Both utility pump low pressure lights on.
4- Both auxiliary system pump low pressure lights on.

679. Which is a feature of the pneumatic
P31 emergency brake system?

1- Differential braking is available with the pneumatic system.
2- The pressure to the brakes cannot be regulated with the pneumatic system.
3- Pneumatic braking locks all the main gear wheels.
4- The antiskid system is not effective when pneumatic braking is utilized.

680. What is the pressurization source for
P11 the utility reservoir?

1- Pneumatic system pressure.
2- 1,000 PSI dry air or nitrogen precharge.
3- Engines 1 and 2 bleed air.
4- Engines 2 and 3 bleed air.

681. What action should be taken when the
P41 airplane is being towed with the torsion links connected?

1- Open the bus tie breakers so each generator is on its respective load bus.
2- Depressurize both system B hydraulic pumps.
3- Depressurize both system A hydraulic pumps.
4- Open the brake interconnect valve.

682. If braking is initiated in excess of
P34 120 knots during a rejected takeoff, what action is required?

1- Immediately use fog or foam extinguishant on the wheels for cooling.
2- Obtain a maintenance release prior to the next departure.
3- Continue a fast taxi down the runway for brake cooling.
4- Use emergency air brakes to stop and park the airplane.

683. What would be the indication in the
P22 cockpit if the landing gear control lever was separated and the gear locked down by placing the long handle to the DOWN position?

1- The antiskid inop light and the red landing gear unsafe light would remain ON.
2- The red landing gear unsafe light would remain ON.
3- All indicators would show an unsafe gear condition.
4- All indications would be normal.

684. Which events can cause the Engine 2
P62 hydraulic pump low pressure light to illuminate?

1- Engine fire switch PULLED, pump pressure low, or pump switch OFF.
2- Pump failure, pressure below 1,200 PSI, or fluid supply switch CLOSED.
3- Pump failure, pump switch ON, or engine fire switch PULLED.
4- Pressure below 1,200 PSI fluid supply switch CLOSED, or pump switch ON.

685. P22 Which is an indication, in addition to the green lights, that the main landing gear is locked down?

1- Antiskid indicators showing REL.
2- Landing gear door warning light(s) off.
3- Nose wheel steering system is pressurized.
4- Landing gear door warning light(s) on.

686. P22 Which is the normal indication of the tailskid light when the landing gear selector is placed to the down position?

1- On, then out.
2- Out, then on.
3- Remains on.
4- Remains out.

687. P60 What would cause an intermittent warning horn when throttles are advanced during ground operation?

1- Either right or left emergency bus power failure.
2- Landing gear control lever is out of the DOWN detent position.
3- Ground spoilers not fully retracted.
4- Gust lock system still in the latched position.

688. P32 Which control position applies automatic braking to the main gear wheels?

1- Landing gear lever--UP.
2- Parking brake lever--PULL.
3- Antiskid switch--ON.
4- Hydraulic brake interconnect--OPEN.

689. P33 During flight with the landing gear and landing gear lever down, the antiskid system

1- permits automatic brake application.
2- permits full brake application by use of the brake pedals.
3- prevents brake application.
4- prevents full brake application but permits sufficient pressure to prevent wheel rotation.

690. P11 What is normal hydraulic system pressure and relief valve full open pressure?

1- 2,000 PSI and 3,000 PSI
2- 3,000 PSI and 3,500 PSI
3- 3,000 PSI and 4,000 PSI
4- 3,250 PSI and 3,500 PSI

691. P33 Which is an indication of proper operation of the antiskid system during preflight with the antiskid switch ON, and the test switch placed to INBD?

1- Outboard indicators--ON; inboard indicators--BLANK.
2- Inboard indicators--REL; outboard indicators--BLANK.
3- Inboard indicators--ON; outboard indicators--BLANK.
4- Outboard indicators--REL; inboard indicators--BLANK.

692. P52 The hydraulic accumulator has a nitrogen pressure precharge of 1,000 PSI. The system pressure gauge is located on the nitrogen side of the accumulator. What is the indication on the gauge when the pumps supply hydraulic pressure at 3,000 PSI to the accumulator?

1- 4,000 PSI
2- 3,000 PSI
3- 2,000 PSI
4- 1,000 PSI

693. P21 How can hydraulic DOWN pressure be applied to the nose gear brake when the aircraft is being towed before engines are started with the APU operating? (Fig. 22, page 83)

1- By system A through the standby hydraulic system.
2- By system B through the ground interconnect.
3- By system B through the brake interconnect.
4- By system A through the manual bypass.

694. P21 Which condition prevents moving the landing gear lever to the UP position after takeoff?

1- The nose gear shock strut not extended.
2- One main gear shock strut not extended.
3- A main gear wheel assembly out of level position.
4- Loss of hydraulic pressure to the gear up mechanism.

695. P69 During the hydraulic system leak procedure, the system A fluid shutoff switches are closed. Which part of the system is shut off by this step?

1- Output from all pumps.
2- Return line to the reservoir.
3- Input to the engine-driven pumps.
4- Main pressure line to the using units.

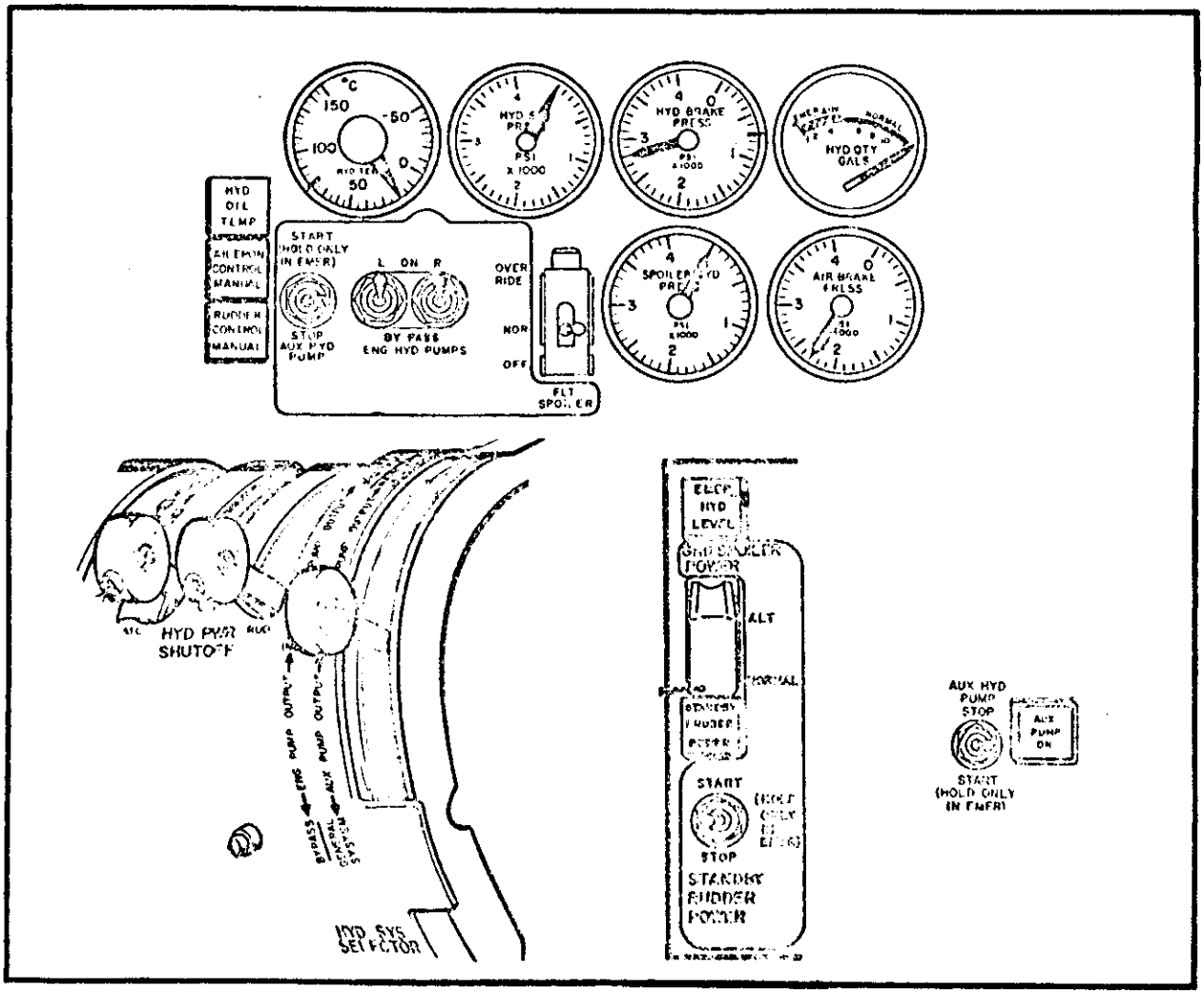


FIGURE 23--DC-8 HYDRAULIC CONTROLS (TYPICAL)

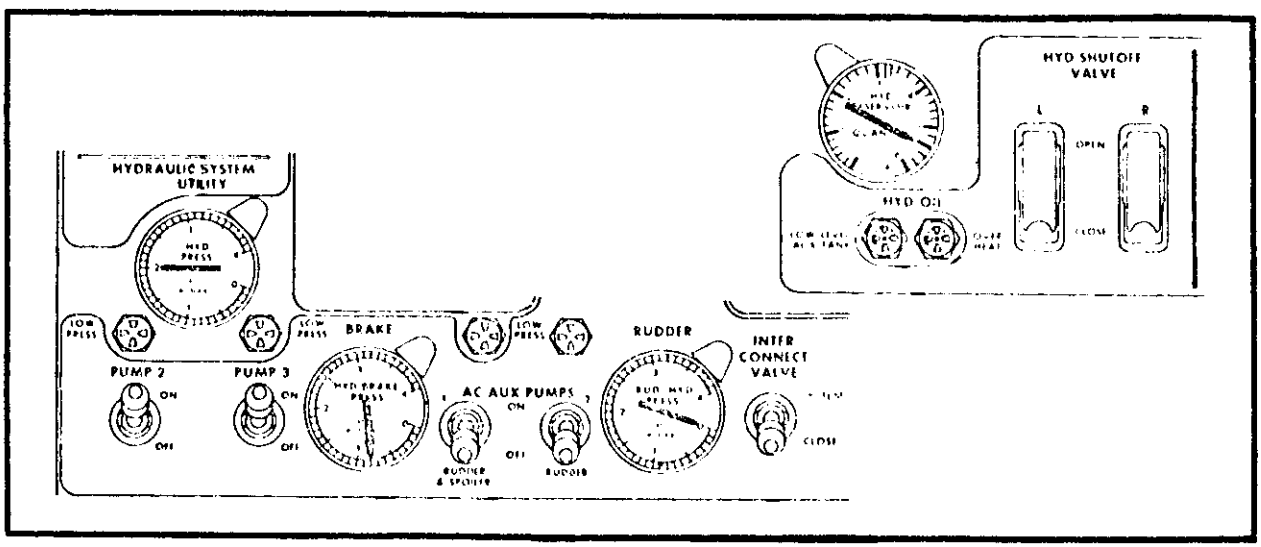


FIGURE 24--707 HYDRAULIC CONTROLS (TYPICAL)

696. If there is a loss of hydraulic fluid
P69 during cruise flight, which action may help minimize the loss?

1- Place the hydraulic system selector lever in general system (2).
2- Decrease altitude to 15,000 feet or below.
3- Turn off the autopilot.
4- Turn off the flight spoiler switch.

697. What would be the first indication of a
P69 leak in hydraulic system B? (Fig. 22, page 83)

1- Drop on system B quantity indicator.
2- Drop on system A quantity indicator.
3- Illumination of system A low pressure light.
4- Illumination of system B low pressure light.

698. How is hydraulic pressure provided when
P12 the hydraulic system selector lever is placed in the full down (bypass/general) position? (Fig. 23, page 86)

1- The engine driven pumps provide reduced pressure to the general system.
2- The auxiliary pump using fluid from the main reservoir provides pressure to the general system.
3- The auxiliary pump provides pressure to the flaps and gear locks only.
4- The engine driven pumps provide pressure to the general system, and the auxiliary pump using auxiliary reservoir fluid provides pressure to the flaps and gear locks.

699. How can the standby hydraulic pump be
P12 turned ON? (Fig. 22, page 83)

1- Rotate the essential power switch to STBY.
2- Turn ON the rudder system B hydraulic power switch, or select an inboard or outboard alternate flap switch DOWN.
3- Turn OFF the rudder system A hydraulic power switch, or turn ON the alternate flap master switch.
4- Turn both system B pump switches OFF and turn OFF the rudder system B power switch.

700. How is hydraulic fluid cooled in systems
P11 A and B?

1- System A--fuel cooled heat exchanger; system B--pressurized reservoir.
2- System B--fuel cooled heat exchanger; system A--pressurized reservoir.
3- Systems A and B--pressurized reservoir.
4- Systems A and B--fuel cooled heat exchanger.

701. Which condition is required for the
P12 opening of the hydraulic ground interconnect valve? (Fig. 22, page 83)

1- Engine driven hydraulic pump producing normal pressure.
2- APU on bus or external power plugged in.
3- Electric motor driven hydraulic pump producing normal pressure.
4- Landing gear down, in the air or on the ground.

702. When can the pilot's warning horn cutout
P22 be used to silence the warning horn?

1- If the gear handle is out of the DOWN detent, with the aircraft on the ground.
2- If any thrust lever has been closed; gear not down.
3- When the wing flaps are extended beyond 35°; gear not down.
4- If the cabin altitude exceeds 10,000 feet.

703. If the flaps are extended to final
P22 landing configuration but the gear is not down and locked, the warning horn will sound

1- intermittently and cannot be silenced by the cutout.
2- steadily, until silenced by the cutout.
3- steadily, and cannot be silenced by the cutout.
4- intermittently, until silenced by the cutout.

704. Which rule applies to the flap-operated
P22 landing gear warning device?

1- May not use part of the throttle actuated system.
2- Must have a horn silencing switch on the control pedestal.
3- Must actuate only when at least one throttle is moved to idle position.
4- May not have a manual shutoff.

705. P11 Which engines drive variable displacement hydraulic pumps?

1- Engines 1 and 2
2- Engines 2 and 3
3- Engines 1, 2, and 3
4- Engines 1 and 3

706. P21 The landing gear safety lock will prevent gear control lever movement to the UP position unless the

1- airplane is airborne, and wheel rotation has been stopped.
2- hydraulic pressure is up and nose wheels are centered.
3- main gear shock struts are extended.
4- airplane is airborne, all gear doors are open, and nose wheel is centered.

707. P42 Which condition would ensure the availability of maximum rudder pedal steering control of the nose wheel during taxi?

1- The flaps must be at least 10° down and hydraulic rudder power must be available.
2- The rudder and ailerons must be hydraulically powered.
3- The auxiliary hydraulic pump must be operating.
4- The flaps must be between the 5° and 25° positions.

708. P63 The hydraulic pressure reading is taken from the air side of a 1,000 PSI charged hydraulic accumulator. What would the cockpit gauge read if the accumulator lost all of its air charge with normal (3,000 PSI) pressure on the system?

1- Zero
2- 1,000 PSI
3- 3,000 PSI
4- 4,000 PSI

709. P61 Which action should be taken in the event of a system A hydraulic fluid overheat indication? (Fig. 22, page 83)

1- Use manual gear extension procedures and prepare for a flaps-up landing.
2- Place the hydraulic pump switches in LOW.
3- Turn off the associated engine driven pump.
4- Increase the fuel flow through the fluid to fluid heat exchanger (cooler).

710. P61 Which action should be taken if the hydraulic system B overheat light is illuminated?

1- Turn off both electric-driven pumps.
2- Turn off one pump; if the light goes out, do not turn off the other pump.
3- Turn off one pump; if the light goes out, turn off the other pump.
4- Increase fuel flow through the fluid to fluid heat exchanger (cooler).

711. P22 Which is the normal position of the landing gear lever and condition of the gear hydraulic system during cruise flight?

1- Gear lever UP; hydraulic pressure is maintained in the gear system.
2- Gear lever OFF; hydraulic pressure to the gear system is removed.
3- Gear lever OFF; hydraulic pressure is blocked to the gear system, except to the inflight brakes.
4- Gear lever UP; hydraulic pressure to the gear system is removed.

712. P22 What would the gear warning light indication be after landing gear extension, if the left main gear and door remained locked up?

1- Right gear and nose gear green lights on, and red door light on.
2- Only right gear and nose gear green lights on.
3- Right gear and nose gear green lights on, and left gear red light on.
4- Right gear and nose gear green lights on; red door light and left door amber light on.

713. P68 When the landing gear is extended by the manual system, the

1- main gear doors will remain open after gear extension.
2- main gear doors will close after gear extension.
3- gear handle should be placed in the OFF position after the gear is locked down.
4- gear handle should be placed in the neutral position after the gear is locked down.

714. P68 After manual landing gear extension, how is the safety of the nose gear checked?

1- Check for emergency down lock pin engagement by use of the handcrank.
2- Close No. 3 throttle; if the horn does not sound, the nose gear is safe.
3- Push to test the nose gear green light; if the light goes out, the gear is safe.
4- Visually check the position of the nose gear emergency down lock pin.

715. P56 Which is the normal indication of the amber annunciator lights (flight engineer's lower panel) when the airplane is in landing configuration?

1- Gear door lights out; tailskid light out.
2- Gear door lights on; tailskid light on.
3- Gear door lights out; tailskid light on.
4- Gear door lights on; tailskid light out.

716. P56 What is the indication that the landing gear is safe and the antiskid is prepared for the landing?

1- Red door lights ON, green gear lights ON, and antiskid annunciators REL.
2- Red door lights OUT, green gear lights OUT, and antiskid annunciators ON.
3- Red door lights OUT, green gear lights ON, and antiskid annunciators REL.
4- Red door lights ON, green gear lights ON, and antiskid annunciators ON.

717. P12 With the auxiliary pump ON, and the selector in position to use fluid from the emergency hydraulic reservoir, what would be the reading on the hydraulic system pressure gauge?

1- Normal system operating pressure.
2- One-half normal pressure.
3- Static or zero pressure.
4- Higher than normal pressure, up to relief valve setting.

718. P12 What is the effect of placing the hydraulic system selector lever in the FULL UP (emergency) position? (Fig. 23, page 86)

1- The engine driven pump output is bypassed to the reservoir.
2- The engine driven pumps use fluid from the emergency reservoir.
3- Auxiliary pump output is directed to the gear down locks and wing flaps.
4- Fluid from the main reservoir is used by the auxiliary pump for gear and flap operation.

719. P62 What does an illuminated low pressure light on the hydraulic panel indicate?

1- Hydraulic system pressure is low.
2- Hydraulic pump output is low.
3- Air precharge on the accumulator is lost.
4- Air charge in the reservoir is lost.

720. P31 How is braking action accomplished when using the emergency pneumatic system?

1- By positioning the brake interconnect valve on the flight engineer's panel to emergency and using the brake pedals as usual.
2- By positioning the pneumatic brake control valve full open and allowing the antiskid system to relieve excess pressure.
3- By opening the pneumatic brake control valve and using the brake pedals as usual.
4- By opening the pneumatic brake control valve and metering pressure to all brakes.

721. P31 When the emergency brake handle is in the ON position, air pressure is supplied to which brakes?

1- Left or right main wheels as selected.
2- All eight main wheels.
3- Outboard main wheels only.
4- Inboard main wheels and nose wheels.

722. P11 Which engines drive variable displacement hydraulic pumps?

1- Engines 1 and 3
2- Engines 1 and 2
3- Engines 1, 2, 3, and 4
4- Engines 2 and 3

723. How is main landing gear wheel rotation
P32 normally stopped after takeoff?

1- Tires contact friction bands in wheel wells.
2- Toe pedals are applied before gear retraction.
3- Automatic braking when gear lever is placed OFF.
4- Automatic braking when gear lever is placed UP.

724. Why should the windshield rain removal
Q53 control levers be in the OFF position when the engines are not operating?

1- To prevent rain from entering the cockpit area.
2- To prevent rain from entering the cabin compressor turbine.
3- To eliminate the possibility of overheating a windshield when the engines are started.
4- To assure adequate manifold pressure for engine starting.

725. How may the wing anti-icing system be
Q61 tested before takeoff? (Fig. 25, page 93)

1- Place the switch ON and note a duct temperature rise as engine power is advanced above idle.
2- Hold the switch to GROUND TEST and note the overheat light is ON; release switch and note the light goes out.
3- Hold the switch to GROUND TEST and note duct temperature rise for each pylon.
4- Place the switch ON and note an immediate duct temperature rise for each engine.

726. Which is an indication that the wing
Q12 anti-ice system valves are operating properly when anti-ice switches are turned ON? (Fig. 26, page 93)

1- Both valve lights extinguish and re-illuminate.
2- Increase of temperature on the wing AI temperature gauge.
3- Momentary drop of duct air pressure.
4- Slight decrease of EPR on all engines.

727. Which is an indication that a wing anti-
Q12 ice valve has opened? (Fig. 25, page 93)

1- Amber valve position light is ON.
2- In-transit light is ON then OUT.
3- Increase in duct temperature.
4- Momentary illumination of the overheat light.

728. When engine icing is suspected during
Q64 flight, normal procedure is to

1- turn anti-icing on, then turn engine ignition on.
2- turn engine ignition on, then turn anti-icing on.
3- limit the use of anti-icing for a maximum of 10 minutes.
4- turn engine ignition off after 10 minutes of operation.

729. What is indicated by the illumination
Q72 of the wing anti-ice overheat light?

1- One wing anti-ice valve has closed and cannot be reset inflight.
2- The wing leading edges are overheating; the control switch should be turned OFF.
3- All engine bleed air valves have closed.
4- All wing anti-ice valves have closed.

730. Which condition causes illumination of
Q73 the wing anti-ice automatic trip-off light (flight engineer's upper panel)?

1- Increase of cabin pressure due to ruptured anti-ice ducting.
2- Thrust loss of any engine with the airplane in takeoff configuration.
3- Overheat in the wing anti-ice duct.
4- Rapid increase of cabin temperature due to an anti-ice air leak in a pressurized area.

731. What happens if the wing anti-ice auto-
Q73 matic trip-off system actuates?

1- Three engine bleed shutoff valves close.
2- Wing anti-ice switches trip to CLOSED position.
3- All wing anti-ice valves close.
4- The automatic trip-off light goes out.

732. What is the function of the nacelle
Q22 anti-icing valve selector switch? (Fig. 25, page 93)

1- Select the engine which is to be anti-iced.
2- Select the engine indicated on the anti-ice temperature gauge.
3- Select the valve to be indicated by the valve light.
4- Select the valve to be opened when the anti-ice switch is turned ON.

733. Q31 Normal operation of pitot heat is

1- OFF until airborne, then ON for the remainder of the flight.
2- ON from before takeoff to after landing.
3- ON from takeoff to 10,000 feet, then OFF.
4- ON if OAT is below 5°C. (41°F.) with visible moisture, otherwise OFF.

734. Q64 Which are indications that ice may be forming in the engine inlet?

1- Ice detector light ON or decreasing fuel flow.
2- Ice forming on unheated cockpit windows or surging N_1 RPMs.
3- Ice forming on the windshield wiper components or erratic EPRs.
4- Ice forming on the windshield wiper blade or low EPRs.

735. Q65 When is overheat protection provided for the wing anti-ice system?

1- When the wing anti-ice switch is ON.
2- During ground test.
3- When airspeed is below 150 knots.
4- When the wing anti-ice valves are FULL OPEN.

736. Q65 What happens in flight with airfoil deicing ON when the landing gear is placed DOWN?

1- Wing and tail deicing continues on the long cycle.
2- Tail deicing is shut off.
3- Wing slot deicing cycle is tripled.
4- Flap deicing valves are opened.

737. Q11 Which component(s) is(are) protected by the wing anti-ice system in addition to the wing leading edges, slats, and certain leading edge flaps?

1- Aft flap leading edges.
2- Upper VHF antenna.
3- Empennage.
4- Engine cowling leading edges.

738. Q31 Which is an indication that the pitot anti-icing system is operating properly?

1- Illumination of the pitot operating light.
2- An indication of current draw on the pitot amps gauge.
3- An increased reading on the Ram Air Temperature gauge.
4- The Htr. INOP amber light going OUT when the selector switch is moved from OFF position.

739. Q75 What is the recommended procedure if a left or right engine anti-ice valve fails to open in flight and icing conditions are encountered?

1- Operate the affected engine at idle RPM.
2- Operate the affected engine at highest practicable power until clear of icing conditions.
3- Operate the affected engine at minimum cruise power during icing penetration.
4- Shut down the affected engine until clear of icing conditions and all nacelle ice has dissipated.

740. Q75 What action should be taken if a nose cowl valve fails to open when the nacelle anti-ice switch is turned ON with ice accumulated on the cowl?

1- Increase thrust to a minimum of 80% N_1.
2- Reduce thrust until ice accumulation is ingested.
3- Hold the anti-ice switch in the MANUAL ON position until ice is melted.
4- Shut down the engine to prevent compressor damage.

741. Q41 For what purposes are the windows in the flight compartment heated?

1- Deicing, defogging, and increased resistance to cabin pressures.
2- Anti-icing, bird proofing, and increased resistance to external dynamic air pressures.
3- Anti-icing, defogging, and bird proofing.
4- Deicing, anti-fogging, and preventing flight compartment heat radiation to the atmosphere.

742. Q42 What happens when the windshield heat switch is placed to the OFF/RESET position? (Fig. 26, page 93)

1- Power removed, and circuit breaker reset.
2- Overheat light OUT, and circuit breaker reset.
3- Overheat light OUT, power light ON, and power ON.
4- Power removed, overheat light OUT, and system reset.

743. Q75 In the event electrical power is lost to the engine anti-ice system, the anti-icing valves will

1- operate pneumatically if ice covers the impact tube.
2- go to the OPEN position.
3- go to the CLOSED position.
4- remain in the position last selected.

744. Q75 Which action should be taken if the engine anti-ice cowl valve fails OPEN when operating at a TAT of 10°C. or greater?

1- Maintain a minimum thrust of 75% N_1 on the affected engine.
2- Limit thrust of the affected engine to 80% N_1.
3- Close the engine bleed air switches.
4- Trip the circuit breaker associated with the failed valve to permit the valve to close by pneumatic pressure.

745. Q11 Which surfaces are protected when the airfoil deicing system is placed ON?

1- Wing leading edges, slots, horizontal tail, and vertical tail.
2- Wing leading edges, slots, flaps, and horizontal tail.
3- Slots, wing leading edges, and horizontal tail.
4- Leading edge flaps, tank vent scoops, and vertical tail.

746. Q51 Which position of the windshield wiper switch is used to stow the blade away from the line of vision?

1- OFF
2- RESET
3- PARK
4- RETRACT

747. Q52 Which statement is appropriate for aircraft utilizing the liquid type rain repellent system? (Fig. 26, page 93)

1- Do not use rain repellent while windshield heat is in "high" position.
2- If rain repellent is inadvertently applied to a dry windshield, do not operate the wipers.
3- Depress both rain repellent buttons simultaneously and hold until flow starts.
4- Do not use while aircraft is on the ground.

748. Q52 When should rain repellent be used?

1- If temperature plus dewpoint is 78°F. or less.
2- Only when wipers are inoperative.
3- When wipers are inadequate to remove water.
4- If rain is heavy, only once each hour.

749. Q52 Which precaution should be used when applying rain repellent during medium or heavy rain?

1- Apply to second windshield only after repellency is established on the first windshield.
2- Do not use windshield wipers after repellent has been applied.
3- Use wipers at the slowest speed and apply to all windshields simultaneously.
4- Do not apply repellent to a windshield more than once per flight.

750. Q31 How is normal operation of the pitot-static heat system verified? (Fig. 26, page 93)

1- Pitot-static heat light is illuminated when all elements are receiving electrical power.
2- Observe current flow indications on the left and right pitot-static ammeters.
3- Observe d.c. voltage drop when the switch is turned ON.
4- Pitot-static instruments fluctuate when the switch is turned ON.

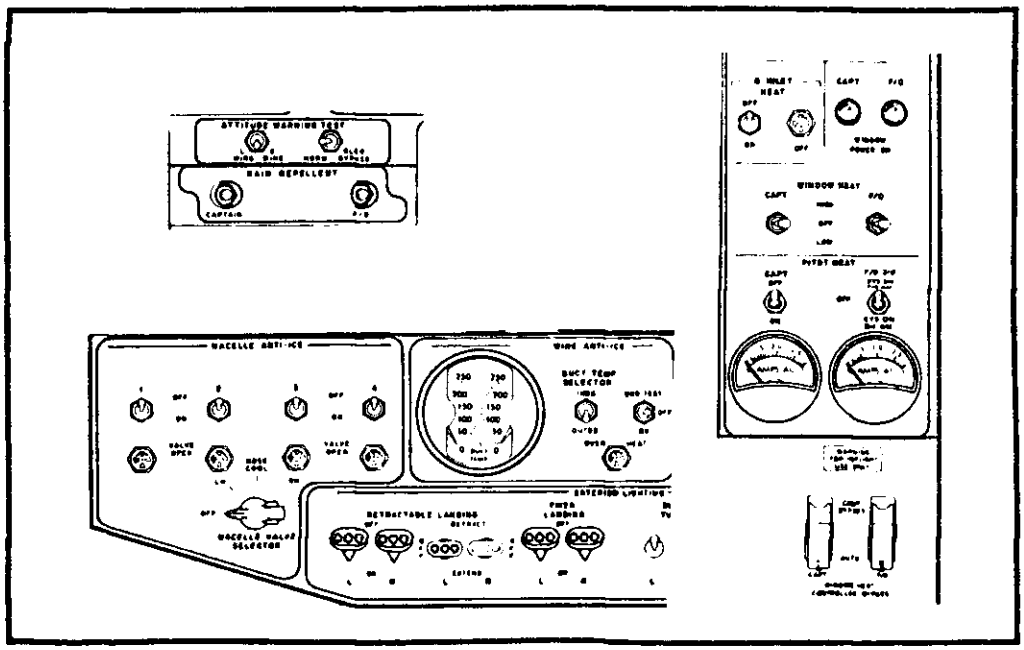


FIGURE 25--707 ICE & RAIN PROTECTION (TYPICAL)

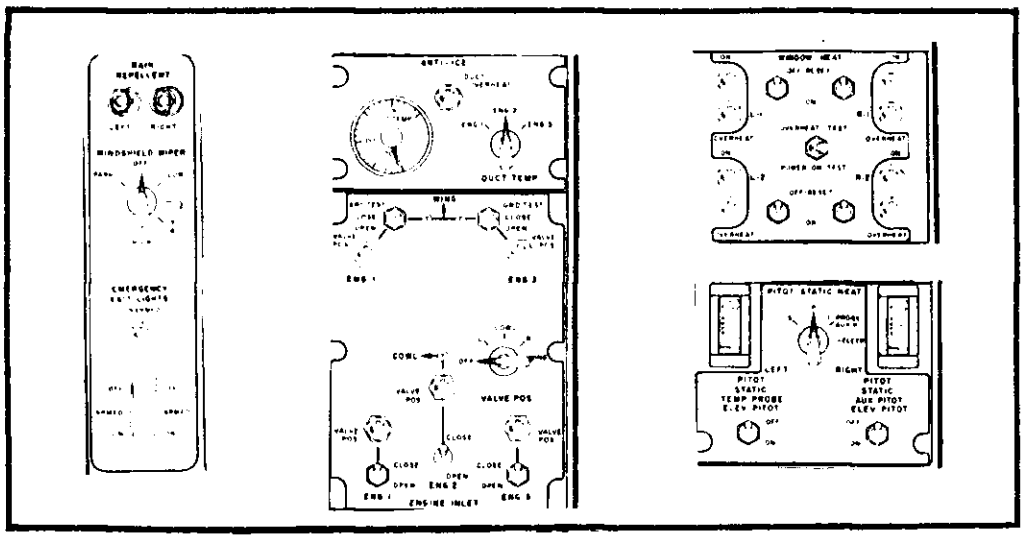


FIGURE 26--727 ICE & RAIN PROTECTION (TYPICAL)

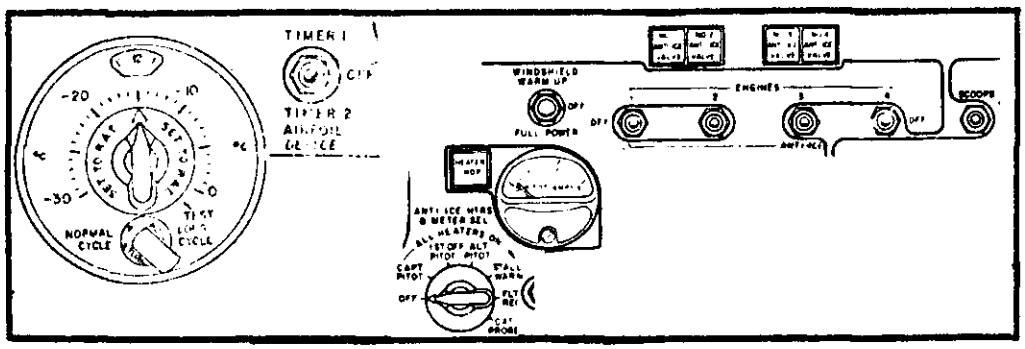


FIGURE 27--DC-8 ICE PROTECTION CONTROLS (TYPICAL)

751. Q31 Which instrument is affected when the pitot-static heat system is turned on during the preflight check?

1- Static Air Temperature.
2- Mach/airspeed Indicator.
3- Instantaneous Vertical Speed Indicator.
4- Total Air Temperature.

752. Q32 What does the Q inlet heat amber light indicate when illuminated? (Fig. 25, page 93)

1- The heater is operating.
2- The switch is OFF.
3- The heater valve has failed closed.
4- There is no electric power to the heater.

753. Q72 What is indicated when the anti-ice duct overheat light is ON? (Fig. 26, page 93)

1- Excessive temperature in the pneumatic system duct.
2- Excessive temperature in a wing duct; or engine 2 cowl duct.
3- Excessive temperature in a wing duct; or engine 1, 2, or 3 cowl duct.
4- Excessive temperature in the duct indicated by the duct temperature selector.

754. Q72 What are indications of a wing anti-icing duct overheat? (Fig. 25, page 93)

1- Wing anti-icing overheat light illuminated in the air only.
2- Duct temperature gauge above 95°C. in the air only.
3- Duct overheat light illuminated on the ground only.
4- Duct temperature gauge off-scale HIGH on the ground only.

755. Q31 Which units are protected when the pitot-static heat system is turned ON?

1- Pitot tubes, static ports, elevator pitot probes, and temperature probe.
2- Pitot-static probes, rudder and elevator pitot probes, and fluid drains.
3- Pitot tubes, static ports, elevator pitot-static probes, and fluid drains.
4- Pitot tubes, static ports, rudder static probe, and temperature probe.

756. Q41 What is the purpose of heating cockpit windows prior to all takeoffs?

1- Heat removes moisture from between the vinyl layers thereby improving visibility.
2- The application of heat removes the frost and ice accumulation from all cockpit windows.
3- Heat is applied prior to takeoff because the cold window would crack if heat were applied at altitude.
4- The application of heat assists in making the windows shatterproof.

757. Q65 Which temperature selection should be made on the airfoil deice timer?

1- Standard air temperature for the altitude.
2- True air temperature.
3- Ram air temperature.
4- Duct air temperature.

758. Q71 Which action should be taken if Engine 3 wing anti-ice valve fails closed when wing anti-ice must be used?

1- Limit thrust on Engine 3 to 80% N_1.
2- Maintain a minimum thrust on Engine 3 of 75% N_1.
3- Maintain a minimum thrust on Engine 1 of 75% N_1.
4- Limit thrust on Engine 1 to 80% N_1.

759. Q71 If the right manifold fail light is ON and, through tests, it is determined that the manifold has failed, which statement describes the resultant system's operating condition?

1- By closing the crossfeed valve, right wing deicing could be used.
2- The tail deice system would still be available.
3- Wing deicing would not be affected with the crossfeed valve open.
4- The right wing and tail deice systems would be inoperative.

760. Q53 In the event certain systems are found in the ON position during the engine prestart procedure, which may be closed without the aid of a.c. electrical power?

1- Scoops anti-ice.
2- Engine anti-ice.
3- Cabin compressors.
4- Windshield rain removal.

761. Q61 What occurs when the airfoil deicing timers are positioned to TEST during preflight? (Fig. 27, page 93)

1- The valves open for 20 seconds if the timer is in the LONG cycle position.
2- The timers will run but the valves will remain closed.
3- The valves open for 10 seconds if the timer is in the NORMAL cycle position.
4- All valves open and close at rapid cycle speed.

762. Q74 What is indicated when a cockpit window overheat light illuminates?

1- The window has overheated and power should be removed.
2- The window has overheated and power has been removed.
3- A window is reaching the maximum heat limits and power to that window should be reduced.
4- A window is reaching the maximum heat limits and power to all windows should be reduced.

763. Q74 What action should be taken if the cockpit window POWER ON light remains illuminated when the window heat switch is turned OFF? (Fig. 25, page 93)

1- Nothing, this is a normal indication with the switch OFF.
2- Check that the cockpit windows are latched.
3- Place both window heat switches to LOW position.
4- Pull the system circuit breaker.

764. Q12 What is indicated on the anti-ice duct temperature gauge when selected to engine 3? (Fig. 26, page 93)

1- Temperature of the engine 3 cowl anti-ice air.
2- Temperature of the wing anti-ice right supply duct.
3- Temperature of the engine 3 inlet anti-ice air.
4- Temperature of the right pneumatic manifold air.

765. Q21 Which component is protected by air from the pneumatic system when the engine anti-ice switch is placed ON?

1- Inlet guide vanes.
2- Nose cowl.
3- Bullet nose.
4- PT-2 probe.

766. Q22 What is indicated by the illumination of an engine anti-ice valve position light?

1- The selected valve is OPEN or CLOSED, not in agreement with the switch position.
2- The selected valve is OPEN.
3- The selected valve is CLOSED.
4- The selected valve is OPEN or CLOSED, in agreement with the switch position.

767. Q61 How should the window heat system be checked on preflight?

1- Switch on LOW, press overheat light--light ON; switch OFF--light OUT.
2- Press to test overheat light; switch on LOW--power light ON; switch on RESET--lights OUT.
3- Switch on HIGH, press overheat light--light ON; switch OFF--light OUT.
4- Press to test power and overheat lights; switch on HIGH--power light ON; switch on RESET--overheat light ON; switch OFF--lights OUT.

768. Q63 Which action removes anti-ice protection from the air-conditioning inlet scoops while the scoops switch is ON?

1- Actuation of the ground shift mechanism on landing.
2- Placing the deicing timer in LONG CYCLE.
3- Placing the landing gear lever DOWN.
4- Actuation of the rain removal system.

769. Q76 What procedure is recommended if the inner and outer layers are broken in one windshield panel?

1- Remove heat from that window and continue the flight without restriction.
2- Place the heat switch to LOW and increase cabin altitude to match airplane altitude.
3- Remove heat from that window and reduce cabin pressure.
4- Remove heat from all windows on that system.

770. Q76 Under which condition should the cockpit window heat be OFF during flight?

1- During takeoff with ambient temperature 80°F. or hotter.
2- When an inner pane of glass has been cracked.
3- At all times below 10,000 feet.
4- When cruising with ambient temperature 10°C. above standard or hotter.

771. Q76 Which pressurization limitations are applicable for a cracked windshield?

1- Outer pane only--5 PSI; inner pane only--NORMAL OPERATION; both panes--2 PSI.
2- Outer pane only--NORMAL OPERATION; inner pane only--NORMAL OPERATION; both panes--1 PSI.
3- Outer pane only--NORMAL OPERATION; inner pane only--5 PSI; both panes--2 PSI.
4- Outer pane only--5 PSI; inner pane only--2 PSI; both panes--1 PSI.

772. Q64 To protect against engine flameout during engine icing conditions, which action should be taken?

1- Place ignition override switch in all engines position.
2- Place start switches to ground start position.
3- Place start switches to flight start position.
4- Place ignition override switch to anti-ice position.

773. Q72 Which action should be taken if the anti-ice duct overheat light is ON while not in actual icing conditions? (Fig. 26, page 93)

1- If No. 1 temperature indication is high--No. 1 engine anti-ice OFF.
2- If No. 2 temperature indication is high--No. 2 engine anti-ice OFF.
3- If No. 2 temperature indication is high--No. 2 wing anti-ice OFF.
4- If No. 3 temperature indication is high--No. 3 engine anti-ice OFF.

774. Q76 What is the approximate maximum altitude to maintain a 10,000-foot cabin altitude when pressurization is limited because the inner pane of the windshield is cracked?

1- 30,000 feet
2- 25,000 feet
3- 20,000 feet
4- 15,000 feet

775. Q76 What is the approximate maximum altitude to maintain a 10,000-foot cabin altitude when pressurization is limited because both the inner and outer panes of the windshield are cracked?

1- 25,000 feet
2- 20,000 feet
3- 15,000 feet
4- 10,000 feet

776. Q12 What is indicated by illumination of the engine 1 wing anti-ice valve position light? (Fig. 26, page 93)

1- Both wing anti-ice valves in engine 1 agree with the engine 1 wing anti-ice switch.
2- Both wing anti-ice valves in engine 1 are moving to the selected position.
3- One wing anti-ice valve is not in agreement with the engine 1 wing anti-ice switch.
4- All wing anti-ice valves in engine 1 are OPEN.

777. Q12 The pulling of which engine fire switch(es) will close a wing anti-icing shutoff valve?

1- Engines 1, 2, or 3 fire switches.
2- Engines 1 or 2 fire switches only.
3- Engine 2 fire switch only.
4- Engines 1 or 3 fire switches only.

778. Q64 What precaution should be observed prior to turning on engine anti-ice during icing conditions?

1- Turn off continuous ignition.
2- Place the starter switch to NORMAL.
3- Turn on continuous ignition.
4- Reduce power until engine RPM stabilizes.

779. Q64 Which procedure is recommended if engine icing conditions are encountered during flight?

1- Place the ignition override switch in the ALL ENGINES position after actuation of the engine anti-icing system.
2- Place the ignition override switch in the ALL ENGINES position prior to actuation of the engine anti-icing system.
3- Place the ignition override switches ON for each engine and leave ON for a minimum of 3 minutes.
4- Place continuous ignition ON for all engines prior to actuation of the engine anti-icing system.

780. Q76 In the event of arcing at the captain's windshield, the windshield anti-ice system should be turned off. In addition, the airspeed should be restricted if flying

1- below 10,000 feet.
2- above 20,000 feet.
3- in freezing rain or sleet.
4- at altitudes where ambient temperature is 5°C. or less.

781. Q73 What action should be taken if the wing anti-ice automatic trip-off light illuminates? (Fig. 28, page 101)

1- Reset the wing AI switches; if they trip again, leave OFF.
2- Monitor the duct temperature gauge in the engine 1 and 3 positions; close the switch of the engine with high temperature.
3- Cargo heat outflow switch--CLOSE; monitor cabin altitude for a pressure loss.
4- Cabin outflow valve--MANUAL OPEN; all engine and wing AI switches--CLOSE.

782. Q74 Which restriction is applicable when the window heat switch is placed OFF because of an uncontrollable window overheat condition?

1- Reduce cabin differential pressure to zero.
2- Reduce airspeed to 250 knots above 14,000 feet.
3- Reduce airspeed to 250 knots below 10,000 feet.
4- Increase cabin pressure to 10,000 feet.

783. Q52 What procedure applies to using the liquid type rain repellent system?

1- Depress the right and left buttons together and hold until flow starts on both windshields.
2- Do not use on a dry windshield or when the rain is slight.
3- Operate wipers, then depress and hold either right or left button until rain clears from the windshield.
4- Do not use while the aircraft is on the ground.

784. Q53 One caution regarding the windshield rain removal system is, do not turn on

1- when the manifold pressure is above 25 PSIG.
2- while the bleed system is in HIGH pressure.
3- while the liquid rain repellent system is in use.
4- when a ground pneumatic source is supplying air above 200°F.

785. Q72 What would be the first required action if the anti-ice duct overheat light illuminated during cruise flight?

1- Retard all throttles until the light goes out.
2- Check temperatures on the duct temperature gauge.
3- Discontinue use of engine anti-ice.
4- Discontinue use of wing anti-ice.

786. Q22 What is indicated by illumination of an engine anti-ice light? (Fig. 27, page 93)

1- One or more anti-ice valves for the engine are CLOSED.
2- All anti-ice valves for the engine are in agreement with the switch.
3- All anti-ice valves for the engine are OPEN.
4- One or more anti-ice valves for the engine are not in agreement with the switch.

787. Q22 Which engine anti-ice valves are closed by pulling an engine fire switch?

1- Cowl anti-ice valve--engine 1, 2, or 3.
2- Cowl anti-ice valve--engine 2 only.
3- Right and left inlet anti-ice valves--engine 1, 2, or 3.
4- Right and left inlet anti-ice valves--engine 2 only.

788. Q42 With window heat switches ON, which indication is correct for the window heat preflight check when the test switch is placed in OVERHEAT? (Fig. 26, page 93)

1- Power lights OFF and overheat lights ON.
2- Window heat switches trip OFF; all lights ON.
3- Power lights ON and overheat lights ON.
4- Window heat switches trip OFF; all lights OFF.

789. Q42 Which position of the window heat switch is required when using the window heat test switch? (Fig. 26, page 93)

1- ON for overheat test; OFF for power on test.
2- OFF for overheat test; ON for power on test.
3- ON for both overheat test and power on test.
4- OFF for both overheat test and power on test.

790. Q71 When the landing gear is down and the wing deice valves are open, what will be the position of the deice valves if electrical power to the valves fails?

1- Open position.
2- Open, as long as pneumatic power is available.
3- Half-closed position; airflow reduced.
4- Closed position.

791. R52 When can you erase the voice recorder tape?

1- When the airplane is parked with external power ON.
2- Any time d.c. power is available.
3- Only when the emergency a.c. bus is powered.
4- Only after the parking brake is set and controls are locked.

792. R10 Which system provides a warning when the airplane has an altitude loss after takeoff before reaching 700 feet AGL?

1- Altitude alert system.
2- Ground proximity warning system.
3- Radio altimeter.
4- Instrument comparator warning system.

793. R31 Selecting "Flight Interphone" on the flight engineer's Audio Selector Panel provides communication with

1- ground service personnel and all crewmembers.
2- flight deck crewmembers and cabin attendants.
3- flight deck crewmembers.
4- cabin attendants and mechanics.

794. R22 The radar is required for entry into instrument conditions in 5 minutes; where should the radar mode selector be positioned?

1- MAP
2- OFF
3- WARM-UP
4- STANDBY

795. R22 Which positions of the weather radar mode selector are safe to use during refueling or in congested ramp areas?

1- STANDBY or CONTOUR.
2- TEST or STANDBY.
3- STANDBY, NORMAL, or TEST with antenna tilt 15° DOWN.
4- NORMAL, CONTOUR, or MAP with antenna tilt 15° UP.

796. R22 Which radar mode selection is used to monitor heavy storm areas?

1- TEST
2- MAP
3- CONTOUR
4- STANDBY

797. R32 Which signal is generated when the ground crew call button is depressed?

1- Flashing light in the main gear well.
2- Horn in the nose gear well.
3- Alarm bell in the main gear well.
4- Flashing light and chime in the nose gear well.

798. R52 Which is a feature of the cockpit voice recorder?

1- The last 1 hour of recording is retained on the tape.
2- The airplane must be on the ground with the parking brake set to completely erase the tape.
3- The tape automatically erases when external electrical power is connected to the airplane system.
4- To test the recorder, press the monitor button and listen to the recording for 5 seconds.

799. R51 Which inputs are recorded on the voice recorder?

1- Captain, first officer, and flight engineer microphones; passenger address (PA) handset; and flight attendant handsets.
2- Both pilot microphones, ATC communications, and all general flight deck conversation.
3- All flight deck crewmember audio panels and passenger address (PA) microphones.
4- Captain, first officer, and flight engineer audio panels; and cockpit area microphone.

800. R32 Which control position is necessary to communicate with ground maintenance personnel from the cockpit?

1- Ground crew call button must be held ON.
2- One VHF NAV COM must be ON with 121.5 MHz selected.
3- Service interphone switch on the flight engineer's panel must be ON.
4- Audio selector panel must be set for FLIGHT INTERPHONE.

801. R10 After loss of all generators, what electrically-driven flight instrument(s) would be available prior to switching essential to STBY?

1- Turn and bank indicator.
2- Standby horizon.
3- Horizontal situation indicator.
4- Airspeed/Machmeter and altimeter.

802. R18 Which adjustment can be made on the radio altimeter?

1- Altimeter setting.
2- Barometric pressure.
3- Airport elevation.
4- Decision height.

803. R17 Which flight condition causes the ground proximity warning system to provide aural and visual warnings?

1- Off the localizer on an ILS approach.
2- Low on the glide slope.
3- Airplane attitude approaching a stall.
4- Descent below the Minimum Descent Altitude (MDA).

804. R52 The flight compartment voice recorder system

1- automatically erases upon landing when the nose gear is compressed.
2- retains only the last 1/2 hour of recording.
3- retains the total flight recording up to 6 hours.
4- may be erased in flight by depressing the erase switch for 7 seconds.

805. R52 Which statement is true regarding the flight compartment voice recording system?

1- Voice recording is interrupted during the test sequence of the recorder.
2- Voice recording is <u>not</u> interrupted during the test sequence of the recorder.
3- The tape can be erased any time the nose gear shock strut is extended.
4- The last 1/2 hour of recording can be erased when the gear is retracted.

806. R11 What is the purpose of the instrument comparator warning system?

1- Provide visual and aural warnings when the airplane departs from a selected altitude.
2- Provide a visual light signal when there is a significant difference between certain instrument indications.
3- Provide a visual light signal which shows which of two instruments (captain's or first officer's) are in error beyond tolerance.
4- Provide an aural warning when any flight or navigation instrument has lost power.

807. S54 Which action should be taken if an overheat condition in the lower aft body is indicated? (Fig. 28, page 101)

1- Aft cabin zone temperature switch--OFF.
2- Cargo heat outflow switch--OPEN.
3- Engine No. 2 inlet anti-ice switch--CLOSE.
4- Lower cargo fire extinguisher--DISCHARGE.

808. S55 What action should be taken during the engine No. 1 strut overheat procedure? (Fig. 28, page 101)

1- No. 1 engine fire switch--PULL.
2- Right pack switch--OFF.
3- Both wing anti-ice switches--OPEN.
4- No. 1 engine bleed air switch--CLOSE.

809. S55 What action should be taken if No. 3 engine strut overheat light remains on after the wing anti-ice is turned off and the bleed valve has been closed?

1- Increase engine RPM to move more N_1 cooling air.
2- Discharge a fire extinguisher to the affected area.
3- Close the throttle; if the light remains ON, use the engine failure procedure.
4- Shut down the engine by closing the throttle.

810. S12 Which unit uses engine fan air as a heat exchange medium?

1- Bleed air precooler.
2- Air-conditioning pack heat exchanger.
3- Hydraulic fluid heat exchanger.
4- Constant speed drive oil cooler.

811. S41 How should the pneumatic system be set to use a ground cart source to start the engines? (Fig. 28, page 101)

1- Engines 1 and 3 bleed switches OPEN; engine 2 bleed switches RIGHT--OPEN; LEFT--CLOSED.
2- All engine bleed switches CLOSED; one or both pack switches ON.
3- Engine bleed switches OPEN one at a time as the engine is selected for starting; others CLOSED.
4- All engine bleed switches OPEN; both pack switches OFF.

812. S40 Which type pack operation is <u>not</u> a recommended procedure?

1- Operating both packs from a ground cart source.
2- Using the APU and flow multiplier to supply both packs.
3- Using number 2 engine bleed to operate the right pack.
4- Operating one pack from two bleed sources.

813. S12 Which engine bleed system(s) use(s) a precooler?

1- All three engines.
2- Engine 2 only.
3- Engines 1 and 2 only.
4- Engines 1 and 3 only.

814. S12 What is the purpose of the engine blow-away jet system?

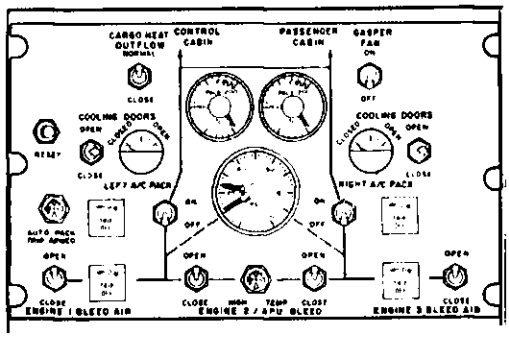
1- Provides supplemental cooling air for the electrical and electronic equipment.
2- Provides high velocity engine bleed air for generator ground cooling.
3- Helps prevent foreign objects from being pulled into the engine.
4- Helps prevent bird ingestion into the engines during takeoff and approach.

815. S12 What is a function of the wing valves of the pneumatic system?

1- Isolate a leaking wing duct in flight.
2- Prevent the use of turbo-compressor air for wing anti-icing.
3- Prevent the use of number 2 turbocompressor air in the right pack.
4- Isolate the air-conditioning pack valves from each other.

816. S24 Which action will make use of pneumatic air from an operating APU?

1- Engine 1 or engine 3 bleed valve OPEN, and start switch to GROUND.
2- One (left or right) engine 2 bleed switch OPEN and either pack ON.
3- Both packs ON and engines 1 and 3 bleed valves OPEN.
4- Both engines 1 and 3 bleed switches OPEN and wing AI switches OPEN.



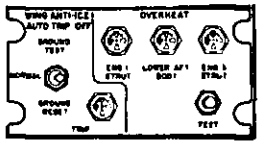
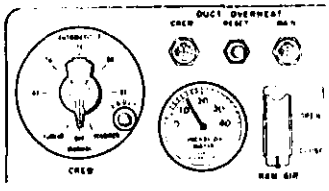


FIGURE 28--727 PNEUMATIC CONTROLS (TYPICAL)



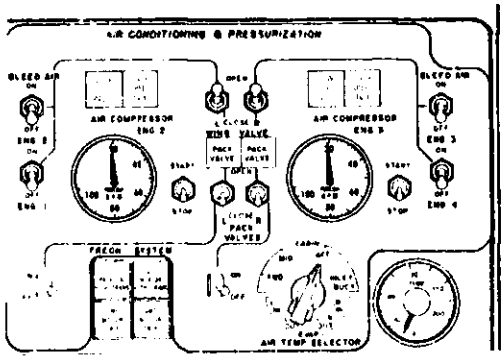


FIGURE 29--707 PNEUMATIC CONTROLS (TYPICAL)

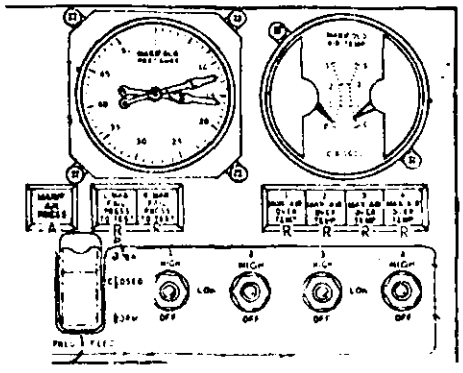


FIGURE 30--DC-8 PNEUMATIC CONTROLS (TYPICAL)

817. S31 The pneumatic duct overheat protection system is designed to detect which fault?

1- Excessive pneumatic system bleed air temperature.
2- Pneumatic system or wing anti-ice system leaks.
3- Excessive wing anti-ice system bleed air temperature.
4- Wing anti-ice system or engine anti-ice system leaks.

818. S56 What would be a probable cause, if the manifold air pressure indicating light is ON with the left and right air pressure indicator in normal range?

1- Faulty overpressure switch.
2- All relief valves failed--CLOSED.
3- One relief valve failed--OPEN.
4- Both underpressure switches faulty.

819. S56 Which condition is indicated by illumination of the RIGHT MANIFOLD FAIL light? (Fig. 30, page 101)

1- High temperature in the right wing leading edge.
2- Ruptured or leaking pneumatic duct in the right wing.
3- Leak from the right pneumatic duct into its protective shroud.
4- Low pressure in the right pneumatic manifold.

820. S55 What action should be taken by the flight engineer if the engine No. 1 strut overheat light illuminates?

1- Engine 1 inlet anti-ice switch--CLOSE.
2- Cargo heat outflow switch--CLOSE.
3- Engine 1 fire switch--PULL.
4- Wing anti-ice switches--CLOSE ALL SWITCHES.

821. S52 Which action should be taken if the APU bleed annunciator light is ON?

1- APU fire switch--PULL.
2- Pack switches--BOTH OPEN.
3- Engine 2/APU bleed switches--CLOSE.
4- Cabin temperature control--MANUAL COOL.

822. S52 What indications would be apparent in the cockpit if number 3 engine's pneumatic output temperature exceeded the manifold limits? (Fig. 30, page 101)

1- Manifold overtemperature light ON, master warning light ON, and the right scale of the dual temperature indicator reading HIGH.
2- Right and left manifold fail lights ON and the master warning light ON.
3- Manifold air overtemperature light ON, master warning light ON, and number 3 engine pylon temperature indicator reading HIGH.
4- Right manifold fail light ON and the right manifold air overtemperature light ON.

823. S12 What is normal for operation of the pneumatic crossfeed valve?

1- Automatically opens in the air.
2- Automatically opens on the ground.
3- Should be opened in the air by placing the pneumatic crossfeed switch to NORMAL.
4- Should be opened on the ground by placing the pneumatic crossfeed switch to OVERRIDE.

824. S12 What pneumatic system factor is indicated by the low pressure duct indicator?

1- Pressure in the center section between the wing valves.
2- Pressure in the cabin side wall ducts.
3- Difference between engine bleed pressure and pneumatic duct pressure.
4- Difference between cabin inlet duct pressure and cabin pressure.

825. S41 What systems can be operated from a ground cart pneumatic source?

1- Engine starting and wing anti-ice.
2- Engine starting and air-conditioning packs.
3- Engine starting, engine anti-ice, wing anti-ice, and air-conditioning packs.
4- Engine anti-ice and air-conditioning packs.

826. S41 How should the pneumatic system be set to use the APU for engine starting?

1- Engine bleed switches OPEN one at a time as the engine is selected for starting; others CLOSED.
2- All engine bleed switches OPEN; both pack switches OFF.
3- Engines 1 and 3 bleed switches OPEN; engine 2 bleed switches RIGHT--CLOSED; LEFT--OPEN.
4- All engine bleed switches OPEN; both pack switches ON.

827. S32 When the reset switch is depressed, which systems will reset if temperatures have decreased below the trip-off point?

1- Engine 2 bleed and anti-ice.
2- Engines 1, 2, and 3 bleeds.
3- Engines 1 and 3 bleeds; anti-ice and the packs.
4- Engines 1 and 3 bleeds and the packs.

828. S41 How can the manifold pressure decay check be accomplished?

1- With engines running, pressurize the manifold to 40 PSIG, place the engine anti-ice switch ON, and observe a maximum of 8 PSI drop.
2- Pressurize the manifold and observe the time for the pressure to decay from 30 to 20 PSIG.
3- Depress and hold the left manifold failure warning light and observe the left light and the master warning light ON.
4- With a ground pneumatic source, pressurize the left manifold and then the right manifold individually, and observe approximately a 2 PSI increase in pressure as each engine anti-ice valve is placed in the OFF position.

829. S22 When does the flow multiplier operate?

1- Any time two air-conditioning packs are being used.
2- If two packs are being supplied with air from the APU.
3- Only if the flow multiplier switch is ON and either pack is supplied with air from the APU.
4- Any time either pack is supplied with air from the APU or a ground air-conditioning source.

830. S24 Which action should be taken to close the APU bleed air valve with the APU running?

1- Position the left engine 2/APU bleed switch--CLOSED.
2- Position both engine 2/APU bleed switches--CLOSED.
3- Position either the left or right engine 2/APU bleed switch--CLOSED.
4- Position both pack valve switches--CLOSED.

831. S24 Which action would cause the flow multiplier to stop supplying air for the air-conditioning system?

1- Placing both pack switches ON.
2- Placing one engine 2/APU bleed switch to CLOSE.
3- Disconnecting the external pneumatic cart hose.
4- Placing one pack switch OFF.

832. S42 When should the ground cooling and blow-away jet shutoff switches be placed in the OFF position?

1- After takeoff power is reduced to climb power.
2- Prior to final setting of takeoff EPR.
3- Prior to advancing throttles for takeoff.
4- After gear retraction or 200 feet altitude.

833. S42 What action should be taken in event the engine ground cooling and blow-away jet shutoff valve fails to close after takeoff?

1- Maintain adequate electrical generator loads to assure minimum CSD oil temperature.
2- Adjust EPR to compensate for increased engine bleed.
3- Pull the related circuit breakers.
4- Recycle the nose gear to actuate the nose gear strut switch.

834. S53 Which action must be taken to reset the APU system after the APU bleed annunciator illuminates?

1- Press the APU bleed light cover.
2- All engine bleed switches and pack switches OFF.
3- Press the pneumatic system reset button.
4- Both engine 2/APU bleed switches CLOSE.

835. S52 What is indicated when the engine 2/APU bleed high temperature light comes ON? (Fig. 28, page 101)

1- Excessive engine 2 bleed or APU bleed air temperature.
2- Excessive engine 2 bleed air temperature only.
3- Engine 2 bleed valve has been closed to correct a high temperature.
4- Engine 2 and APU bleed valves have been closed to correct a high temperature.

836. S11 When will 13th-stage bleed air be supplied to the air-conditioning system?

1- Any time number 2 engine bleed is used to supply one pack.
2- When number 1 or 3 engine bleed systems are being used to provide anti-ice as well as air-conditioning air.
3- Any time number 2 engine bleed is used to supply both packs.
4- When number 1 or 3 engine 8th-stage bleed air is insufficient for normal pack operation.

837. S51 What is indicated when the engine number 1 bleed air trip-off light is illuminated? (Fig. 28, page 101)

1- The left pack valve has closed.
2- The air mix valve has gone full cold.
3- The engine number 1 bleed valve has closed.
4- Engine number 1 bleed air is excessively hot and the valve should be manually closed.

838. S43 Which is the primary use of engine number 2 bleed air?

1- Operate one pack when engine 1 or 3 bleed system is off.
2- Operate either pack during normal ground operation.
3- Operate both packs simultaneously in the air.
4- Assist either engine 1 or 3 to provide double bleed pressure to one pack.

839. S51 It has been determined that a rapid decompression was caused by a bleed trip. What is the corrective action?

1- Turn off both pack switches.
2- Open the cargo heat outflow switch.
3- Select at least two operating bleed air sources.
4- Open, then close the tripped pack switch.

840. S55 Which condition is indicated when an engine strut overheat light is illuminated? (Fig. 28, page 101)

1- Excessive pressure in the engine bleed air system.
2- Excessive temperature in the engine fan air supply.
3- Fire in the engine pylon area.
4- Pneumatic or anti-ice system duct leakage.

841. T72 At sea level, what is the minimum duct pressure for engine start?

1- 22 PSI
2- 30 PSI
3- 45 PSI
4- 60 PSI

842. T72 What is an indication of engine "light-off" during an engine start?

1- Rise of fuel pressure.
2- Rise of RPM.
3- Rise of EGT.
4- Rise of oil pressure.

843. T72 Which step activates ignition during a normal start procedure on the ground?

1- Moving the start lever out of cutoff position.
2- Closing the starter switch.
3- N_2 RPM reaching 10%.
4- Placing the ignition switch in the GROUND position.

844. T52 In order to complete the electrical circuit to the engine starting switches (buttons), which of the following switches must be off?

1- Freon compressors and cabin compressors.
2- Galley power and recirculating fans.
3- Freon compressors and recirculating fans.
4- Cabin compressors and galley power.

845. T84 Which action should be taken if a start is aborted because of excessive EGT?

1- Move the start lever to CUTOFF and leave the continuous ignition ON.
2- Move the start lever to CUTOFF and hold the start switch in GROUND.
3- Move the start lever to IDLE and hold the start switch in GROUND for 20 seconds, then change both to OFF.
4- Place the start switch OFF, then move the start lever to CUTOFF after 20 seconds.

846. T84 Which action should be taken if, during a start, the fuel flow exceeds the starting limit (e.g., 1,100 lbs./hr.) prior to starter cutout?

1- Decrease fuel flow by momentarily placing the start lever in CUTOFF, then back to START as necessary.
2- Place the start lever in CUTOFF and continue to motor the engine until fuel flow and EGT decrease.
3- If EGT is within limits, continue the start regardless of other indications.
4- Place the start lever in CUTOFF and release the engine start switch.

847. T80 Which procedure can be used to start an engine with an inoperative start valve?

1- Crossbleed from an operating engine.
2- Place engine start switch in FLIGHT position.
3- Ground crewman opens the valve manually.
4- Place start lever in IDLE before placing engine start switch in GROUND.

848. T85 What action should be taken if the engine has stabilized at idle RPM and the oil pressure is indicating 30 PSI with the Oil Pressure Warning light illuminated?

1- Operate the engine for 1 more minute; recheck and, if indications are the same, shut down the engine.
2- Shut down the engine immediately.
3- Pull the fire switch and discharge the freon.
4- Increase RPM to 80%; if oil pressure does not increase, shut down the engine.

849. T85 What action is required by the crew if the low oil pressure light comes ON in flight with normal indicated oil pressure?

1- Retard the throttle; if the light goes out, shut down the engine.
2- Shut down the engine.
3- Continue to operate the engine until the oil pressure drops.
4- Retard the throttle; if the light does not go out, shut down the engine.

850. T91 What is the first event which occurs in the electrical generating system when the engine fire switch is pulled?

1- The generator is disconnected from the CSD.
2- The generator breaker is tripped.
3- The bus tie breaker is tripped.
4- The generator field relay is opened.

851. T92 If, during cruise flight, a precautionary shutdown is required for reasons other than fire, which procedure should be followed?

1- Place the hydraulic pump switch OFF and the start lever to CUTOFF.
2- Allow the engine to stabilize at idle speed prior to shutdown.
3- Switch essential power to an operating generator and pull the engine fire switch.
4- Place the bleed air switch to CLOSE and the start lever to CUTOFF.

852. T31 What trouble is indicated and what action should be taken if the fuel pressure on No. 2 engine reads 0 to -5 PSI while in cruise flight?

1- The tank boost pump has failed and the circuit breaker should be pulled out.
2- The second stage of the engine driven pump has failed and all controls should be placed in proper position for a windmilling engine.
3- The engine driven boost pump has failed and the tank boost pump should be turned ON.
4- The first stage of the engine driven pump has failed and the engine should be shut down.

853. What indication warns the crew that
T85 the main oil filter is clogged?

1- A gradual increase in oil temperature with normal oil pressure.
2- A gradual decrease in oil pressure.
3- The low oil pressure or filter bypass light ON with low oil pressure.
4- The low oil pressure or filter bypass warning light ON with normal oil pressure.

854. Which is the source of power for
T61 mechanical actuation of the thrust reverser system?

1- Hydraulic pressure.
2- High pressure bleed air.
3- Low pressure bleed air.
4- Engine lubrication system pressure.

855. Which air is diverted when the forward
T61 reverser is in reverse thrust position?

1- 16th stage bleed air
2- Jet exhaust air
3- N_1 air
4- Fan air

856. Which is a precaution regarding the use
T61 of inflight thrust braking?

1- Wing flaps must be completely retracted.
2- Do not use below 250 knots IAS.
3- The maximum speed should not exceed 300 knots IAS.
4- Only use engines 1 and 4 for inflight thrust braking.

857. If an engine is started by manually
T88 opening the start valve, which precaution must be observed?

1- Leave the ignition switch in ground start until after the valve has been manually closed.
2- Release the start switch at 30% N_2 to prevent starter overspeed while the start valve is being closed manually.
3- Closely monitor N_1 and N_2 RPMs since the engine will come up to starter cutout speed much faster than normal.
4- Do not accelerate the engine above idle RPM until all personnel are clear of the engine.

858. What action is required if any engine
T89 EGT limit is exceeded?

1- Pull the fire switch out.
2- Close the fuel shutoff valve.
3- Record peak EGT and length of time at that limit.
4- Place the start lever in CUTOFF position.

859. How are ice particles in the fuel kept
T31 from forming in the fuel strainer and fuel control passages?

1- By the fuel temperature regulator using N_1 compressor air as a heat source.
2- By fuel temperature regulators using engine scavenge oil as a heat source.
3- By the fuel temperature regulator using N_2 compressor air as a heat source.
4- By fuel tank heaters maintaining fuel temperature above -40°C.

860. Which is a normal indication on the
T42 engine oil temperature gauge as engine power is changed?

1- Temporary decrease of temperature when thrust is reduced.
2- Temperature following thrust changes with no lag.
3- Temperature remaining absolutely steady despite large thrust changes.
4- Temporary increase of temperature when thrust is reduced.

861. Which RPM indication is to be observed
T72 when the start lever is placed in "Start"?

1- N_2 rotating; N_1 zero.
2- N_1 15%; N_2 rotating.
3- N_2 15%; N_1 rotating.
4- N_2 20%; N_1 15%.

862. If the fuel tank temperature is 0°C. or
T75 below, which action should be taken?

1- Turn fuel heat ON for 1 minute prior to takeoff.
2- Turn fuel heat ON and leave on until fuel temperature reaches +5°C.
3- Turn fuel tank heaters ON for takeoff and climb.
4- Turn fuel tank heaters ON to maintain fuel temperature above 0°C.

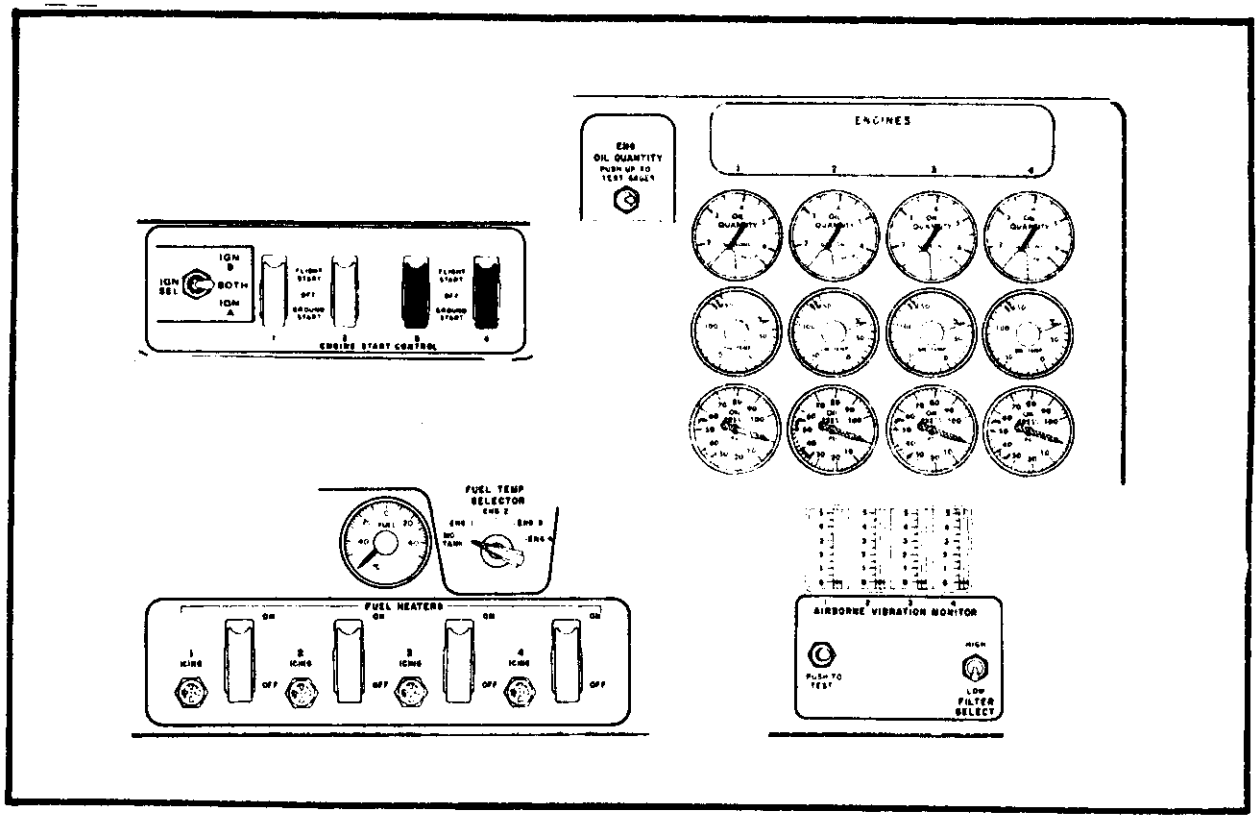


FIGURE 31--707 POWERPLANT CONTROLS (TYPICAL)

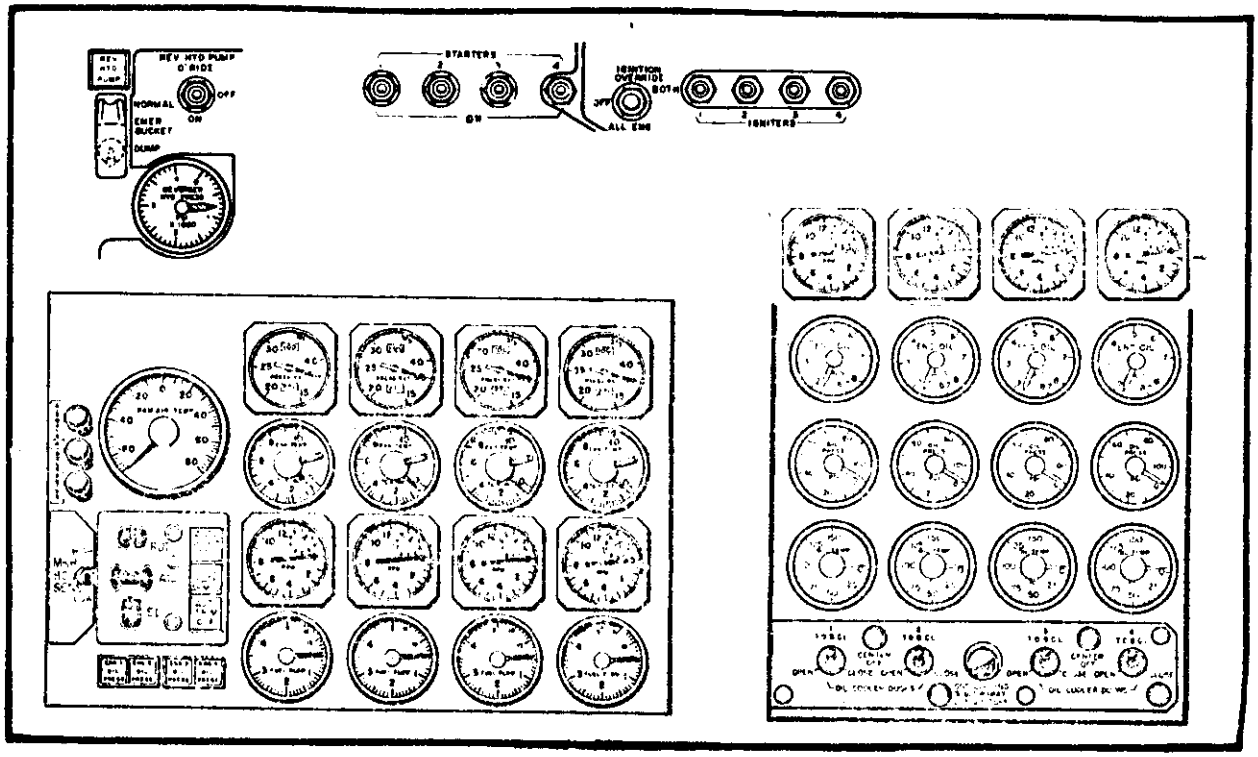


FIGURE 32--DC-8 POWERPLANT CONTROLS (TYPICAL)

863. What action should be taken if one fuel
T75 icing light comes ON in flight?

1- Turn ON all fuel heaters until the icing light goes OUT.
2- Turn ON only the affected engine fuel heater and leave ON.
3- Turn ON all fuel heaters for 1 minute and repeat after 30 minutes if the light does not go OUT.
4- Turn ON only the affected engine fuel heater for 1 minute and repeat after 1 minute if the light does not go OUT.

864. Which action should the flight engineer
T72 take immediately before the engines are started?

1- All fuel boost pumps ON.
2- Galley power OFF; a.c. packs OFF.
3- Generator switches ON.
4- Start levers IDLE.

865. What is the indication of the start
T72 valve closing after engine start?

1- An increase of duct pressure.
2- Start valve OPEN light going out, with a decrease of duct pressure.
3- N_1 at 40% and an increase of bleed air pressure.
4- An increase of APU EGT indication.

866. How are the N_1 and N_2 engine
T11 compressors driven?

1- N_1 driven by 1st and 2nd stage turbines, N_2 driven by the aft stage turbines.
2- N_1 driven by the aft stage turbines, N_2 driven by 1st and 2nd stage turbines.
3- N_1 and N_2 driven together by all turbines through an interconnect drive gear.
4- N_1 driven by the aft stage turbines, N_2 driven by the 1st stage turbine.

867. The engine pressure ratio gauge indi-
T22 cates which of the following comparisons?

1- Combustor discharge pressure to inlet guide vane pressure.
2- Turbine discharge differential pressure to turbine inlet differential pressure.
3- Turbine discharge pressure to engine inlet pressure.
4- Combustor discharge gauge pressure to engine inlet gauge pressure.

868. If an engine start valve fails to open
T84 during start, when the OAT is below freezing, what action should be taken to free the valve?

1- Have ground personnel direct warm external air into the engine inlet.
2- Hold the start switch in GROUND so that hot air may melt the ice in the valve.
3- Open and close the throttle several times to crack the ice, then attempt another start.
4- Increase the manifold pressure to help overpower the valve.

869. What action should be taken if the
T84 start valve remains open after engine start?

1- Recycle the engine start switch ON, then OFF.
2- Recycle the bleed valve for the affected engine ON, then OFF.
3- Request manual closing of the valve by ground personnel.
4- Close the bleed valve for the affected engine and shut down the engine.

870. What action, if any, should be taken
T85 if engine oil pressure drops below 35 PSI during cruise?

1- Place the engine throttle in idle position.
2- Shut down the engine.
3- Continue operation if oil pressure stays above 30 PSI.
4- Reduce thrust and continue use of the engine until the first landing.

871. Which is indicated by illumination of
T62 the reverser operating light on the center instrument panel?

1- The clam shell doors are closed in reverse position.
2- Reverse power is being applied.
3- The reverser deflector door is unlocked.
4- The reverser system has operated inadvertently.

872. What would be an indication that the
T31 first stage of the two-stage engine driven fuel pump has failed?

1- Slow acceleration during start.
2- No increase in oil temperature when fuel heat is being used.
3- Unable to develop takeoff EPR.
4- No fuel flow indication after start.

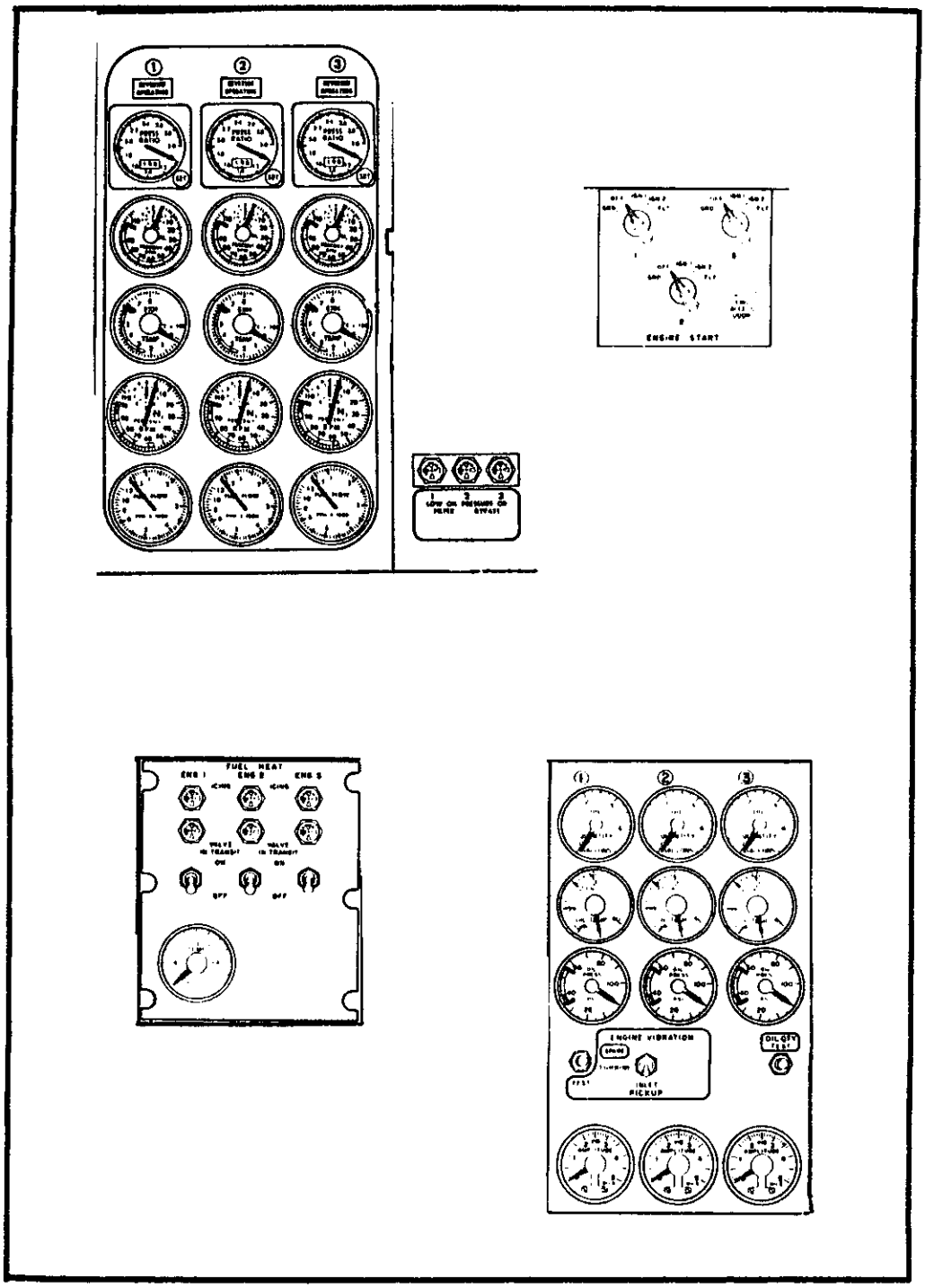


FIGURE 33--727 POWERPLANT CONTROLS (TYPICAL)

255-383 O - 78 - 9

873. T92 Which action is required for the inflight shutdown of No. 2 engine during the engine failure procedure (no fire)?

1- Hydraulic pump switch--CLOSE.
2- Engine fuel shutoff--CLOSE.
3- Essential power--SELECT #1.
4- Fire switch--PULL.

874. T92 Which action is required if No. 3 engine must be shut down while the flaps are down?

1- Flap lever--immediately to 2° position.
2- Essential power--STANDBY.
3- Right pack switch--OFF.
4- Cargo heat outflow switch--OPEN.

875. T75 In addition to valve intransit light operation, what is an indication that the fuel heat valve has opened?

1- Engine oil temperature increase.
2- Engine EPR increase.
3- Engine EGT increase.
4- Engine fuel temperature increase.

876. T76 Climb power is normally maintained until

1- within approximately 500 feet of cruise altitude.
2- exceeding cruise Mach by at least .05.
3- reaching cruise Mach or slightly higher.
4- reaching cruise altitude, then power is immediately set to cruise EPR.

877. T83 Which precaution is necessary if the engine access door amber light is ON before starting the engines? (Fig. 33, page 109)

1- Do not start the APU.
2- Do not start No. 2 engine.
3- Assure that cowling doors are closed on the pod engines.
4- Close the aft stair door before taxiing.

878. T53 What are some characteristics of the continuous duty ignition system?

1- 115 volt a.c. source; low intensity spark in two burner cans.
2- 115 volt a.c. source; low intensity spark in one burner can.
3- 28 volt d.c. source; high intensity spark in two burner cans.
4- 28 volt d.c. source; low intensity spark in one burner can.

879. T23 Which engine indications are available during a battery start?

1- EPR and fuel flow.
2- N_1 and N_2 only.
3- Oil pressure gauges only.
4- N_1, N_2, and EGT.

880. T51 Duct air is supplied to the starter through

1- an electrically controlled and hydraulically operated valve.
2- an electrically controlled and pneumatically operated valve.
3- a pneumatically controlled and operated valve.
4- an electrically controlled and operated valve.

881. T52 If an engine is started with the N_2 tachometer inoperative, which means should be used to assure N_2 rotation?

1- Fuel flow indication.
2- Observation of turbine rotation by maintenance personnel.
3- Oil pressure indication or CSD low oil pressure light out.
4- Light off and EGT rise.

882. T93 An engine thrust reverser operating light illuminates in flight and the forward thrust lever is in idle position. Which procedure should be followed?

1- Shut down the engine, then place the reverse lever in reverse idle position.
2- Place the reverse lever in reverse idle position and close all engine airbleeds.
3- Operate the aircraft at high forward speed to help close the clamshell doors.
4- If the forward thrust lever cannot be advanced, shut down the engine.

883. T72 During a normal engine start, what is a visual indication of starter cutout?

1- Fluctuation of starter control system amperage.
2- Reduction of starter speed.
3- Increase of duct pressure.
4- Oil pressure light going out.

884. T94 Assume that an engine has been shut down. Later, a requirement arises for the use of that engine's power. Which of the following is correct concerning the decision of whether or not to restart that engine?

1- Do not restart if the EGT has dropped to ambient.
2- Do not restart an engine that has been shut down due to fire or fire warning.
3- The engine may not be restarted if it is windmilling within the air start range.
4- The engine may be restarted but is limited to 5 minutes' operation.

885. T23 Which system would be operative prior to putting an a.c. generator on the line if an engine is started using the airplane battery?

1- Fire detection.
2- Manifold pressure.
3- Fuel flow.
4- Oil pressure.

886. T31 What may excessive use of fuel heat cause?

1- Fuel flow fluctuations.
2- Fuel temperature exceeding limits.
3- High or fluctuating oil pressure.
4- Higher than normal oil temperature.

887. T53 What are features of the fan engine continuous duty ignition system?

1- 115 volt a.c.; high intensity spark to two ignitors.
2- 115 volt a.c.; low intensity spark to one ignitor.
3- 28 volt d.c.; high intensity spark to two ignitors.
4- 28 volt d.c.; low intensity spark to one ignitor.

888. T23 During a battery start, which features are available?

1- EGT and RPM indicators; high energy ignition.
2- Duct pressure, EGT, and RPM indicators; high energy ignition.
3- Oil pressure and EGT indicators; low energy ignition.
4- EPR, EGT, and RPM indicators; low energy ignition.

889. T74 During takeoff and final approach, which system should not be used?

1- Engine anti-ice.
2- Fuel heater.
3- Rain repellent.
4- Continuous ignition.

890. T94 What use is made of the air start envelope?

1- Determine if N_1 and N_2 RPMs are within limits for the indicated airspeed and pressure altitude.
2- Determine the RPM to which the starter must accelerate the engine prior to moving the start lever out of CUTOFF.
3- Determine the desired idle RPM for an indication of the correct time to activate inflight ignition.
4- Determine if sufficient air is available in the air start bottle for the altitude and airspeed.

891. T87 When an engine is shut down by pulling the fire handle, for reasons other than fire, and the engine is windmilling above 25% N_2, why should the fire handle be returned to normal position periodically?

1- To prevent engine bearing overheat and possible seizure.
2- To prevent heat buildup in the engine fuel system.
3- To open the pneumatic shutoff valve for bleed of internal engine pressure.
4- To prevent heat buildup in the hydraulic pumps.

892. T52 During start, when should the start lever be moved to the START position on an engine with an inoperative N_2 tachometer?

1- After the CSD oil pressure light is extinguished.
2- After fuel pressure indicates about 8 to 10 PSI.
3- At the first N_1 indication.
4- After oil pressure indicates 20 PSI.

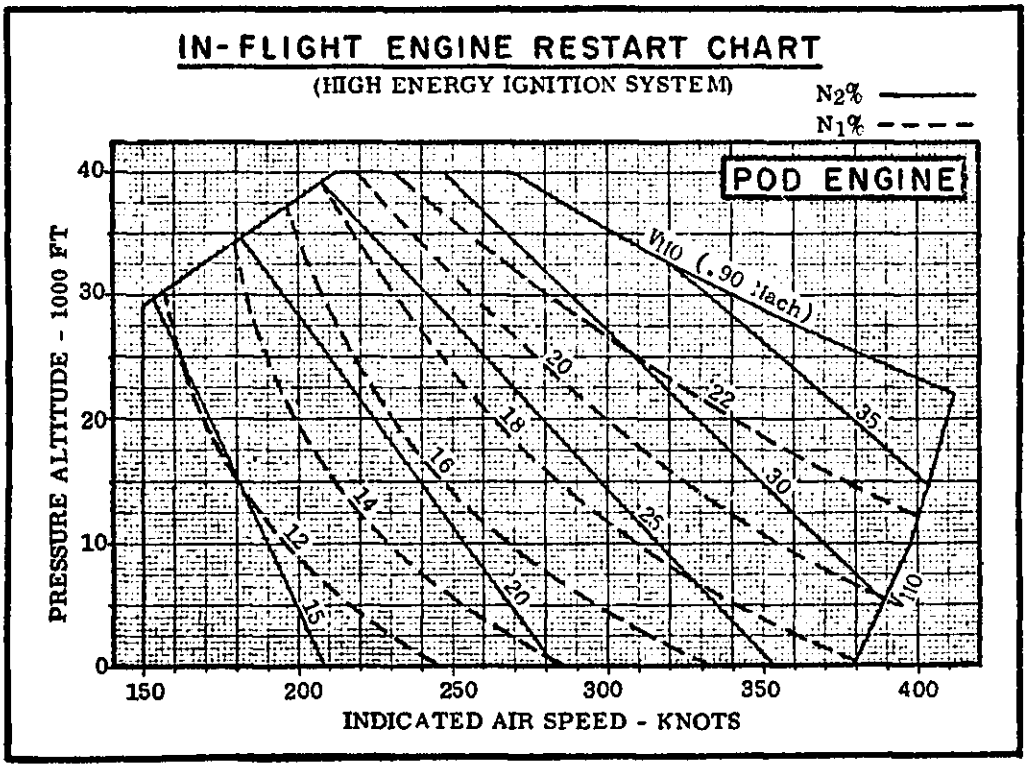


FIGURE 34--INFLIGHT START ENVELOPE (TYPICAL)

INFLIGHT ENGINE START ENVELOPE

IAS KNOTS		PRESSURE ALTITUDE 1000 FT								
		0	5	10	15	20	25	30	35	40
V_{MO}/M_{MO}	$N_1\%$	18	20	22	23	25	26	26	26	27
	$N_2\%$	27	29	32	34	37	37	35	34	33
400					23	25				
					34	36				
380		18	19	21	22	24	26			
		27	28	30	32	34	37			
360		17	18	20	21	23	25			
		25	27	28	30	32	34			
340		16	17	19	20	21	24	26		
		24	25	27	28	30	33	35		
320		15	16	18	19	20	22	25		
		22	23	25	27	28	31	33		
300		14	16	17	18	19	21	23	26	
		21	22	23	25	27	29	31	33	
280		13	15	16	17	18	20	22	24	
		19	20	22	23	25	27	29	31	
260		13	14	15	16	17	18	20	22	26
		18	19	20	21	23	25	26	29	31
240		12	13	14	15	16	17	18	20	23
		17	17	18	19	21	23	24	26	29
220		11	12	13	14	15	16	17	18	20
		15	16	17	18	19	21	22	24	26

NOMINAL WINDMILLING RPM
TOLERANCE ± 3%

FIGURE 35--INFLIGHT START ENVELOPE (TYPICAL)

893. T52 Which switch or control position is always required to activate the engine ignition system?

1- Starter switch in FLIGHT or GROUND.
2- Continuous ignition switch ON.
3- Start lever out of CUTOFF position.
4- Forward thrust lever in IDLE position.

894. T94 What action should be taken if an engine is windmilling at 21% N_1 and 25% N_2 when operating at FL 280 and 270 knots? (Fig. 34, page 112)

1- The engine may be started only after decreasing airspeed.
2- The engine may be started only after decreasing altitude.
3- The engine should not be started.
4- The engine may be started at the existing airspeed.

895. T94 What action should be taken if an engine is windmilling at 20% N_1 and 25% N_2 when operating at FL 300 and 260 knots? (Fig. 35, page 112)

1- The engine should not be started because the N_2 RPM is out of tolerance.
2- The engine should not be started because the N_1 RPM is out of tolerance.
3- The engine may be started at the existing airspeed.
4- The engine may be started if RPM is increased by the starter.

896. T72 One cockpit indication of the starter valve closing after engine start would be

1- the start valve open light OUT, with no change in manifold pressure.
2- an increase in manifold pressure.
3- a decrease in starter RPM.
4- an increase in engine RPM, EGT, and fuel flow.

897. T84 What are indications of an impending "hot start"?

1- Turbine temperature above limits and high fuel flow.
2- EGT rising rapidly; low fuel flow; slow acceleration.
3- EGT rising slowly; low fuel flow; rapid acceleration.
4- EGT rising rapidly; high fuel flow; slow acceleration.

898. T85 The yellow arc marking on the engine oil pressure gauge indicates a precautionary range for operating

1- at reduced thrust.
2- when the low oil pressure light is ON.
3- during descent only.
4- on the ground.

899. T94 What action should be taken if an engine is windmilling at 19.5% N_1 and 25.5% N2 when operating at FL 350 and 240 knots? (Fig. 35, page 112)

1- The engine should not be started because the N_1 and N_2 RPMs are out of tolerance.
2- The engine should not be started because the N_2 RPM is out of tolerance.
3- The engine may be started under the existing conditions.
4- The engine may be started if the airspeed is reduced.

900. T94 What action should be taken if an engine is windmilling at 21% N_1 and 28% N_2 when operating at FL 270 and 280 knots? (Fig. 34, page 112)

1- The engine should not be started at any airspeed or altitude.
2- The engine may be started only after decreasing airspeed.
3- The engine may be started only after decreasing altitude.
4- The engine may be started at the existing airspeed.

901. T94 What action should be taken if an engine is windmilling at 24% N_1 and 32% N_2 when operating at FL 320 and Mach .90? (Fig. 34, page 112)

1- The engine may be started after increasing N_2 RPM with the starter.
2- The engine may be started after increasing N_1 RPM with the starter.
3- The engine should not be started.
4- The engine may be started under the existing conditions.

902. T94 What action should be taken if an engine is windmilling at 20% N_1 and 29% N_2 when operating at FL 250 and 300 knots? (Fig. 35, page 112)

1- The engine should not be started because the N_2 RPM is out of tolerance.
2- The engine should not be started because the N_1 RPM is out of tolerance.
3- The engine may be started at the existing airspeed.
4- The engine may be started if RPM is increased by the starter.

903. T31 While in cruise flight, one circuit breaker for a tank-mounted boost pump tripped and cannot be reset. Which answer is correct for this condition?

1- The output of the pump will be satisfactory for normal requirements.
2- The d.c. circuit breaker should be pulled to prevent the control relay from overheating.
3- The pump motor will fail unless the remaining breakers are pulled immediately.
4- The pump will be inoperative.

904. T87 If a precautionary engine shutdown is made while in cruise flight, what action should be taken to prevent damage to the windmilling engine and components?

1- Open the hydraulic supply valve to prevent overheating of the engine driven hydraulic pump.
2- Restore fuel flow to the engine a minimum of 3 minutes each 30 minutes to prevent the fuel control from overheating.
3- Open the pneumatic relief valve to bleed internal engine pressures.
4- Restore the engine oil supply to prevent bearing overheat and possible seizure.

905. T92 During an emergency engine shutdown in flight, the throttle is closed; at idle RPM, the start lever is placed in cutoff and the fuel shutoff valve is closed. Which is an indication of a clean shutdown?

1- Fuel pump warning light ON.
2- N_2 RPM less than 30%.
3- EGT decrease.
4- Oil pressure light ON.

906. T84 What should be done if the start lever is inadvertently moved to the IDLE position before the light-off occurs?

1- Move the start lever back to START position.
2- Leave the start lever in IDLE position and continue the start.
3- Move the start lever to CUTOFF, then release the start switch.
4- Release the start switch, then move the start lever to CUTOFF.

907. T84 What should be done if a start switch is inadvertently released during engine starting?

1- Immediately reengage the start switch.
2- Allow the engine to spin down to zero N_2 before reengaging the start switch.
3- Wait until the engine spins down below 35% N_2 before reengaging the start switch.
4- Wait until there is an indication of zero N_1 and then repeat the entire starting sequence.

908. U11 Determine the normal takeoff EPR for these conditions. (Fig. 36, page 115)

Pressure altitude- - - -	2,000 feet
OAT- - - - - - - - - - -	47°F.
Assumed temp.- - - - - -	95°F.
Cabin compressors- - - -	OFF
Rain removal - - - - - -	OFF

1- 1.91
2- 1.90
3- 1.81
4- 1.80

909. U11 Determine the normal takeoff EPR for these conditions. (Fig. 36, page 115)

Pressure altitude- - - -	4,500 feet
OAT- - - - - - - - - - -	15°F.
Assumed temp.- - - - - -	50°F.
Cabin compressors- - - -	Two ON
Rain removal - - - - - -	ON

1- 1.88
2- 1.89
3- 2.00
4- 2.01

NORMAL TAKEOFF THRUST

1. Determine Max EPR from the Maximum Takeoff Thrust table.
2. Using Assumed Temperature and MAX EPR, determine Normal EPR.

EPR is valid when set at 40 - 80 knots, two cabin compressors are on, blowaway jets are off.

ASSUM TEMP °F	MAX EPR											
	1.86	1.87	1.89	1.90	1.91	1.93	1.95	1.96	1.97	1.99	2.00	2.01
	NORMAL EPR											
120	1.75	1.76	1.78	1.79	1.80	1.82	1.84	1.85	1.86	1.88	1.89	1.90
115	1.75	1.76	1.78	1.79	1.80	1.82	1.84	1.85	1.86	1.88	1.89	1.90
110	1.75	1.76	1.78	1.79	1.80	1.82	1.84	1.85	1.86	1.88	1.89	1.90
105	1.75	1.76	1.78	1.79	1.80	1.82	1.84	1.85	1.86	1.88	1.89	1.90
100	1.77	1.77	1.78	1.79	1.80	1.82	1.84	1.85	1.86	1.88	1.89	1.90
95	1.80	1.80	1.80	1.80	1.80	1.82	1.84	1.85	1.86	1.88	1.89	1.90
90	1.82	1.82	1.82	1.82	1.82	1.82	1.84	1.85	1.86	1.88	1.89	1.90
85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.86	1.88	1.89	1.90
80	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.88	1.89	1.90
75	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.88	1.89	1.90
70	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.88	1.89	1.90
65	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.88	1.89	1.90
60	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.88	1.89	1.90
55	1.86	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.88	1.89	1.90
50	1.86	1.87	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.90
45	1.86	1.87	1.89	1.90	1.91	1.91	1.91	1.91	1.91	1.91	1.91	1.91
40	1.86	1.87	1.89	1.90	1.91	1.93	1.93	1.93	1.93	1.93	1.93	1.93
35	1.86	1.87	1.89	1.90	1.91	1.93	1.95	1.95	1.95	1.95	1.95	1.95
30	1.86	1.87	1.89	1.90	1.91	1.93	1.95	1.96	1.96	1.96	1.96	1.96
25	1.86	1.87	1.89	1.90	1.91	1.93	1.95	1.96	1.97	1.97	1.97	1.97

ADJUSTMENTS:

1. All cabin compressors off, add .01.
2. Rain removal on, subtract .01.

MAXIMUM TAKEOFF THRUST

OAT °F	PRESSURE ALTITUDE (1,000 feet)					
	SL	1	2	3	4	Above 4
75	1.86	1.86	1.86	1.86	1.86	1.86
70	1.86	1.86	1.86	1.86	1.86	1.86
65	1.86	1.86	1.86	1.86	1.86	1.86
60	1.86	1.86	1.86	1.86	1.86	1.86
55	1.86	1.87	1.87	1.87	1.87	1.87
50	1.86	1.89	1.89	1.89	1.89	1.89
47	1.86	1.90	1.90	1.90	1.90	1.90
45	1.86	1.90	1.91	1.91	1.91	1.91
40	1.86	1.90	1.93	1.93	1.93	1.93
35	1.86	1.90	1.95	1.95	1.95	1.95
33	1.86	1.90	1.95	1.95	1.95	1.95
30	1.86	1.90	1.95	1.96	1.96	1.96
25	1.86	1.90	1.95	1.97	1.97	1.97
20	1.86	1.90	1.95	1.99	1.99	1.99
16	1.86	1.90	1.95	2.00	2.00	2.00
15	1.86	1.90	1.95	2.00	2.01	2.01
10	1.86	1.90	1.95	2.00	2.02	2.02
5	1.86	1.90	1.95	2.00	2.03	2.03
0	1.86	1.90	1.95	2.00	2.04	2.04
–5	1.86	1.90	1.95	2.00	2.05	2.05

FIGURE 36--DC-8 NORMAL TAKEOFF THRUST (TYPICAL)

MAX TAKEOFF EPR

0 – 60 KNOTS

ENG 1 & 3 AIRBLEED ON
ENG 2 NO AIRBLEED

PRESS ALT FT		OAT °F / °C	–67 TO – 9 / –55 TO –23	–4 / –20	5 / –15	14 / –10	23 / –5	32 / 0	41 / 5	50 / 10	59 / 15	68 / 20	77 / 25	86 / 30	95 / 35	104 / 40	113 / 45	120 / 49
–1000	ENG	1 & 3	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.03	1.99	1.94	1.91
		2	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.05	2.00	1.96	1.92
S.L.		1 & 3	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.08	2.03	1.99	1.94	1.91
		2	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.11	2.10	2.05	2.00	1.96	1.92
1000		1 & 3	2.15	2.15	2.15	2.15	2.15	2.15	2.13	2.12	2.12	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.16	2.16	2.16	2.16	2.16	2.16	2.15	2.13	2.13	2.12	2.10	2.05	2.00	1.96	1.92
2000		1 & 3	2.21	2.21	2.21	2.21	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.22	2.22	2.22	2.22	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92
3000		1 & 3	2.26	2.26	2.25	2.23	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.28	2.28	2.27	2.24	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92
3856 & ABOVE		1 & 3	2.31	2.29	2.27	2.25	2.23	2.20	2.17	2.14	2.14	2.14	2.11	2.08	2.03	1.99	1.94	1.91
		2	2.32	2.31	2.29	2.27	2.24	2.21	2.18	2.16	2.16	2.15	2.12	2.10	2.05	2.00	1.96	1.92

EPR BLEED CORRECTIONS	ENG 1 & 3	ENG 2
AIR CONDITIONING	OFF + .04	–
ENGINE ANTI-ICE ON	–	–.03

FIGURE 37--727 MAXIMUM TAKEOFF EPR (TYPICAL)

MAX TAKEOFF N_1

PRESS ALT FT	OAT °F / °C	–65 / –54	–49 / –45	–40 / –40	–31 / –35	–22 / –30	–13 / –25	–4 / –20	5 / –15	14 / –10	23 / –5	32 / 0	41 / 5	50 / 10	59 / 15	68 / 20	77 / 25	86 / 30	95 / 35	104 / 40	113 / 45	120 / 49
–1000		83.2	84.8	85.7	86.5	87.4	88.3	89.2	90.1	91.0	91.9	92.7	93.5	94.3	95.2	95.9	96.7	97.5	98.1	97.2	96.3	95.6
S.L.		84.7	86.3	87.2	88.1	89.1	90.0	90.9	91.8	92.7	93.6	94.4	95.3	96.1	96.9	97.8	98.5	99.0	98.1	97.2	96.3	95.6
1000		86.4	88.0	88.9	89.9	90.8	91.7	92.7	93.6	94.5	95.4	96.3	97.1	97.4	97.8	98.6	99.2	99.0	98.1	97.2	96.3	95.6
2000		88.1	89.8	90.8	91.7	92.7	93.6	94.6	95.5	96.4	97.3	97.9	97.8	97.7	98.5	99.2	99.2	99.0	98.1	97.2	96.3	95.6
3000		89.8	91.6	92.6	93.5	94.5	95.5	96.5	97.4	98.0	98.0	97.9	97.8	97.7	98.5	99.2	99.2	99.0	98.1	97.2	96.3	95.6
3856 & ABOVE		91.2	93.1	94.1	95.1	96.1	97.1	97.7	97.8	98.0	98.0	97.9	97.8	97.7	98.5	99.2	99.2	99.0	98.1	97.2	96.3	95.6

N_1 BLEED CORRECTIONS	ALL ENGINES
	OFF + 1.3

FIGURE 38--727 MAXIMUM TAKEOFF N_1 (TYPICAL)

MAX TAKEOFF EPR

300B/C IMPROVED COWL
JT3D-3B(1/C)

DRY		OAT °F / °C	–58 / –50	–40 / –40	–31 / –35	–22 / –30	–13 / –25	– 4 / –20	5 / –15	14 / –10	23 / –5	32 / 0	41 / 5	50 / 10	59 / 15	68 / 20	77 / 25	86 / 30	95 / 35	104 / 40	122 / 50
E	T/C	ON	2.07	2.05	2.04	2.03	2.02	2.01	1.99	1.98	1.96	1.93	1.89	1.87	1.83	1.83	1.83	1.82	1.77	1.73	1.63
P		OFF	2.12	2.10	2.09	2.08	2.06	2.05	2.03	2.01	1.99	1.96	1.92	1.89	1.85	1.85	1.85	1.84	1.79	1.75	1.65
R	T/C	ON	2.06			2.02			1.98		1.93		1.88		1.83			1.78			
		OFF	2.11			2.06			2.01		1.96		1.91		1.85			1.80			
40 TO 80 KTS			5000			4000			3000		2000		1000		SL			–1000			
ENG A/I ON OR OFF																					

MAX EPR FOR COLDER TEMPS AT PRESS ALT

FIGURE 39--707 MAXIMUM TAKEOFF EPR (TYPICAL)

910. Determine the normal takeoff EPR for
U11 these conditions. (Fig. 36, page 115)

Pressure altitude- - - -	3,000 feet
OAT- - - - - - - - - - -	60°F.
Assumed temp.- - - - - -	105°F.
Cabin compressors- - - -	Two ON
Rain removal - - - - - -	OFF

1- 1.87
2- 1.86
3- 1.76
4- 1.75

911. Determine the maximum takeoff power
U11 settings for the following conditions.
(Fig. 37 & 38, page 116)

Pressure altitude- - - -	-1,000 feet
Ambient temp. (OAT)- - -	+59°F.
AC bleed - - - - - - - -	ON
Engine A.I.- - - - - - -	OFF
No. 3 engine EPR gauge -	INOPERATIVE

	Eng. 1	Eng. 2	Eng. 3
1-	2.08	2.06	94.3
2-	2.08	2.03	96.9
3-	2.04	2.06	95.2
4-	2.12	2.13	97.4

912. Determine the maximum takeoff power
U11 settings for the following conditions.
(Fig. 37 & 38, page 116)

Pressure altitude- - - -	1,000 feet
Ambient temp. (OAT)- - -	+5°F.
AC bleed - - - - - - - -	ON
Engine A.I.- - - - - - -	ON
No. 3 engine EPR gauge -	INOPERATIVE

	Eng. 1	Eng. 2	Eng. 3
1-	2.04	2.00	90.1
2-	2.19	2.16	97.1
3-	2.10	2.08	94.5
4-	2.15	2.13	93.6

913. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 39, page 116)

Pressure altitude- -	2,000 feet
OAT- - - - - - - - -	59°F.
Turbocompressors - -	Nos. 2 & 3 ON; No. 4 OFF
Engine A.I.- - - - -	OFF

	Eng. 1	Eng. 2	Eng. 3	Eng. 4
1-	1.88	1.91	1.91	1.88
2-	1.85	1.83	1.83	1.85
3-	1.83	1.83	1.83	1.85
4-	1.91	1.88	1.88	1.91

914. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 39, page 116)

Pressure altitude - -	Sea level
OAT - - - - - - - - -	-10°C.
Turbocompressors- - -	Nos. 2 & 3 ON; No. 4 OFF
Engine A.I. - - - - -	ON

	Eng. 1	Eng. 2	Eng. 3	Eng. 4
1-	1.83	1.83	1.83	1.85
2-	1.85	1.83	1.83	1.85
3-	2.01	1.98	1.98	2.01
4-	1.98	1.98	1.98	2.01

915. Which factor is assumed when selecting a
U11 REDUCED THRUST (NORMAL) TAKEOFF power setting?

1- Temperature is colder than actual OAT.
2- Temperature is hotter than actual OAT.
3- Runway is longer than actual length.
4- Runway is shorter than actual length.

916. Determine the maximum takeoff power
U11 settings for the following conditions.
(Fig. 37 & 38, page 116)

Pressure altitude - - -	Sea level
Ambient temp. (OAT) - -	15°C.
AC bleed- - - - - - - -	1 OFF; 2 & 3 ON
Engine anti-ice - - - -	OFF
No. 2 engine EPR gauge-	INOPERATIVE

	Eng. No. 1	No. 2	No. 3
1-	2.12	98.2	2.10
2-	2.10	92.7	2.14
3-	2.14	96.9	2.10
4-	2.10	2.11	98.2

917. Determine the normal takeoff EPR for
U11 these conditions. (Fig. 36, page 115)

Pressure altitude - - -	5,000 feet
OAT - - - - - - - - - -	40°F.
Assumed temp. - - - - -	80°F.
Cabin compressors - - -	Two ON
Rain removal- - - - - -	ON

1- 1.85
2- 1.86
3- 1.92
4- 1.93

918. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 39, page 116)

Pressure altitude- - - 3,000 feet
OAT- - - - - - - - - - 0°F.
Turbocompressors - - - No. 3 OFF;
Nos. 2 & 4 ON
Engine A.I.- - - - - - ON

	Eng. 1	Eng. 2	Eng. 3	Eng. 4
1-	2.04	2.00	2.04	2.00
2-	1.98	1.98	2.01	1.98
3-	2.01	1.98	2.01	1.98
4-	1.96	1.93	1.96	1.93

919. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 37, page 116)

Pressure altitude- - - 2,000 feet
OAT- - - - - - - - - - 10°C.
AC packs - - - - - - - OFF
Engine A.I.- - - - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.14	2.16
2-	2.18	2.13
3-	2.25	2.27
4-	2.10	2.13

920. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 37, page 116)

Pressure altitude- - - 3,000 feet
OAT- - - - - - - - - - -5°C.
AC packs - - - - - - - OFF
Engine A.I.- - - - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.17	2.18
2-	2.23	2.24
3-	2.27	2.21
4-	2.21	2.21

921. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 39, page 116)

Pressure altitude- - 4,000 feet
OAT- - - - - - - - - 0°F.
Turbocompressors - - Nos. 3 & 4 ON;
No. 2 OFF
Engine A.I.- - - - - ON

	Eng. 1	Eng. 2	Eng. 3	Eng. 4
1-	2.04	2.04	2.00	2.00
2-	2.02	2.06	2.02	2.02
3-	1.96	1.96	1.93	1.93
4-	2.00	2.03	2.03	2.00

922. Determine the maximum takeoff power
U11 settings for the following conditions.
(Fig. 37 & 38, page 116)

Pressure altitude- - - - 3,000 feet
Ambient temp. (OAT)- - - +50°F.
AC bleed - - - - - - - - OFF
Engine A.I.- - - - - - - OFF
No. 2 engine EPR gauge - INOPERATIVE

	Eng. 1	Eng. 2	Eng. 3
1-	2.14	98.0	2.14
2-	2.20	2.16	97.7
3-	2.18	99.0	2.18
4-	2.16	97.7	2.20

923. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 37, page 116)

Pressure altitude- - - - 4,000 feet
OAT- - - - - - - - - - - 35°C.
AC packs - - - - - - - - OFF
Engine A.I.- - - - - - - OFF

	Eng. 1 & 3	Eng. 2
1-	2.03	2.05
2-	2.07	2.05
3-	2.14	2.16
4-	2.10	2.13

924. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 37, page 116)

Pressure altitude- - - 2,000 feet
OAT- - - - - - - - - - 5°C.
AC packs - - - - - - - OFF
Engine A.I.- - - - - - OFF

	Eng. 1 & 3	Eng. 2
1-	2.25	2.22
2-	2.17	2.18
3-	2.21	2.15
4-	2.21	2.18

925. Determine the maximum takeoff EPR for
U11 these conditions. (Fig. 37, page 116)

Pressure altitude- - - 1,000 feet
OAT- - - - - - - - - - 20°C.
AC packs - - - - - - - OFF
Engine A.I.- - - - - - OFF

	Eng. 1 & 3	Eng. 2
1-	2.18	2.13
2-	2.10	2.13
3-	2.08	2.06
4-	2.16	2.13

TAKEOFF SPEEDS

PRESS. ALT – 1,000 FT		OAT			
9 TO 10	°F			–65 TO 5	6 TO 82
	°C			–54 TO –15	–14 TO 28
7 TO 9	°F		–65 TO – 7	– 6 TO 37	38 TO 94
	°C		–54 TO –22	–21 TO 3	4 TO 34
5 TO 7	°F	–65 TO –22	–21 TO 31	32 TO 89	90 TO 101
	°C	–54 TO –30	–29 TO – 1	0 TO 32	33 TO 38
3 TO 5	°F	–65 TO 23	24 TO 56	57 TO 104	105 TO 108
	°C	–54 TO – 5	– 4 TO 13	14 TO 40	41 TO 42
1 TO 3	°F	–65 TO 50	51 TO 97	98 TO 115	
	°C	–54 TO 10	11 TO 36	37 TO 46	
–1 TO 1 →	°F →	→ TO	TO	TO	
	°C	–54 TO 34	35 TO 45	46 TO 50	

GROSS WT – 1,000 LB	V_1 V_R V_2	V_1 V_R V_2	V_1 V_R V_2	V_1 V_R V_2
340	150 156 171			
330	148 153 168	150 155 168		
320	145 150 166	147 152 166		
310	142 147 163	145 149 163		
300	139 144 161	142 146 161	144 148 160	
290	136 141 158	139 143 158	141 145 158	
280	133 138 155	135 140 155	138 142 155	
270	130 135 153	132 137 153	135 139 152	138 141 152
260	126 132 150	129 134 150	131 136 140	135 137 149
250	123 128 147	125 130 147	128 132 147	131 134 146
240	123 125 145	122 127 144	124 129 144	127 131 144
230	123 142	118 123 142	121 125 141	124 128 141
220	139	118 120 139	117 122 138	120 124 138
210	136	118 136	113 118 135	116 120 135
200	133	133	113 114 132	112 116 132
190	130	130	113 129	108 112 129
180		126	126	108 108 125
170			122	122
160			119	119

V_1 ADJUSTMENTS

WIND

ADD 1 KT PER 18 KTS HEADWIND

SUBTRACT 1 KT PER 3-½ KTS TAILWIND

SLOPE

ADD 1 KT PER .4% UPSLOPE

SUBTRACT 1 KT PER .4% DOWNSLOPE

FIGURE 40--707 TAKEOFF SPEEDS (TYPICAL)

926. U11 Determine the maximum takeoff EPR for these conditions. (Fig. 37, page 116)

Pressure altitude- - - -1,000 feet
OAT- - - - - - - - - - -10°C.
AC packs - - - - - - - - ON
Engine A.I.- - - - - - - ON

	Eng. 1 & 3	Eng. 2
1-	2.04	2.06
2-	2.13	2.12
3-	2.04	2.03
4-	2.15	2.13

927. U11 Determine the maximum takeoff power settings for the following conditions. (Fig. 37 & 38, page 116)

Pressure altitude - - - 2,000 feet
Ambient temp. (OAT) - - +40°F.
AC bleed- - - - - - - - OFF
Engine A.I. - - - - - - ON
No. 3 engine EPR gauge- INOPERATIVE

	Eng. 1	Eng. 2	Eng. 3
1-	2.17	2.18	97.2
2-	2.03	1.97	97.9
3-	2.21	2.15	97.8
4-	2.22	2.15	97.2

928. U11 Determine the maximum takeoff EPR for these conditions. (Fig. 39, page 116)

Pressure altitude- 1,000 feet
OAT- - - - - - - - - 5°F.
Turbocompressors - Nos. 2, 3 & 4 ON
Engine A.I.- - - - ON

	Eng. 1	Eng. 2	Eng. 3	Eng. 4
1-	1.91	1.88	1.88	1.88
2-	1.92	1.88	1.88	1.92
3-	1.89	1.89	1.89	1.89
4-	2.03	1.99	1.99	1.99

929. U12 Determine the takeoff speeds for these conditions. (Fig. 41, page 121)

Gross weight - - - 175,000 lbs.
Flaps- - - - - - - - 15°
Airport PA/T°C.- - 5,100 ft./15°C.

	V_1 & V_R	V_2
1-	140	152
2-	143	152
3-	137	147
4-	151	160

930. U12 Determine the takeoff speeds for these conditions. (Fig. 41, page 121)

Gross weight - - - 165,000 lbs.
Flaps- - - - - - - - 15°
Airport PA/T°C.- - Sea level/15°C.

	V_1 & V_R	V_2
1-	134	148
2-	140	152
3-	137	147
4-	142	152

931. U12 Determine the takeoff speeds for these conditions. (Fig. 40, page 119)

Takeoff weight - - 315,000 lbs.
Pressure altitude- 1,500 feet
OAT- - - - - - - - - 15°C.
Wind - - - - - - - - 18-knot headwind
Slope- - - - - - - - .4% UP

	V_1	V_R	V_2
1-	143	148	161
2-	145	148	164
3-	148	151	165
4-	146	151	165

932. U12 Determine the takeoff speeds for these conditions. (Fig. 40, page 119)

Takeoff weight - - - 275,000 lbs.
Pressure altitude- - 6,000 feet
OAT- - - - - - - - - - 32°F.
Wind - - - - - - - - - 4-knot headwind
Slope- - - - - - - - - 1.0% UP

	V_1	V_R	V_2
1-	136	139	154
2-	137	141	153
3-	139	141	154
4-	135	138	153

933. U12 Determine the takeoff speeds for these conditions. (Fig. 42, page 123)

Takeoff weight - - 310,000 lbs.
Pressure altitude- 4,500 feet
OAT- - - - - - - - - 50°F.
Flaps- - - - - - - - 15°
Wind - - - - - - - - 15-knot headwind

	V_1	V_R	V_2
1-	142	155	165
2-	140	151	157
3-	144	156	166
4-	140	155	166

TAKEOFF SPEEDS

PRESSURE ALT – 1000 FT		OAT									
9 TO 11	°F	(Above Certified Altitude)				−65 TO −54	25 TO −4	26 TO − 3	87 TO 31		
	°C										
7 TO 9	°F			−65 TO −54	9 TO −13	10 TO −12	75 TO 24	76 TO 25	104 TO 40		
	°C										
5 TO 7	°F	−65 TO −54	−10 TO −23	− 8 TO −22	42 TO 5	43 TO 6	97 TO 36	98 TO 37	111 TO 44		
	°C										
3 TO 5	°F	−65 TO −54	32 TO 0	33 TO 1	90 TO 32	91 TO 33	113 TO 45	114 TO 46	120 TO 49		
	°C										
1 TO 3	°F	−65 TO −54	83 TO 28	84 TO 29	106 TO 41	107 TO 42	120 TO 49				
	°C										
−1 TO 1	°F → TO	−65 TO −54	99 TO 37	100 TO 38	120 TO 49						
	°C ↓										
FLAPS	CROSS WEIGHT 1000 LB	$V_1 = V_R$	V_2	$V_1 = V_R$	V_2	$V_1 = V_R$	V_2	$V_1 = V_R$	V_2		
5	210	165	175	166	175						
	200	160	171	162	171						
	190	155	167	157	167	158	167				
	180	150	163	152	163	154	163				
	170	144	159	147	159	149	159	150	158		
	160	140	154	141	153	143	153	145	153		
	150	135	149	136	149	138	149	140	148		
	140	129	145	130	145	132	144	134	144		
	130	124	140	125	139	126	138	128	138		
	120	119	135	120	134	120	134	121	133		
15	210	156	166	157	166						
	200	151	162	153	162						
	190	146	158	148	158	149	158				
	180	141	154	143	154	145	154				
	170	136	150	138	150	140	150	141	149		
	160	132	146	133	145	135	145	137	145		
	150	127	141	128	141	130	141	132	140		
	140	122	137	123	137	124	136	126	136		
	130	117	133	118	132	118	131	120	131		
	120	112	128	113	127	113	127	115	126		
25	210	146	157	147	157						
	200	141	153	143	153						
	190	137	149	138	149	139	149				
	180	132	145	134	145	136	145				
	170	127	141	129	141	131	141	132	140		
	160	123	137	124	137	126	137	128	136		
	150	119	133	120	133	122	133	124	132		
	140	114	129	115	129	116	128	118	128		
	130	109	125	110	124	110	124	112	123		
	120	105	120	106	120	106	119	108	118		

FIGURE 41--727 TAKEOFF SPEEDS (TYPICAL)

934. U12 Determine the takeoff speeds for these conditions. (Fig. 41, page 121)

Gross weight - - - 185,000 lbs.
Flaps- - - - - - - 25°
Airport PA/T°C.- - 3,100 ft./15°C.

	V_1 & V_R	V_2
1-	145	155
2-	151	160
3-	134	147
4-	136	147

935. U12 Determine the takeoff speeds for these conditions. (Fig. 42, page 123)

Gross weight- - - - 310,000 lbs.
Pressure altitude - 428 feet
OAT - - - - - - - - 96°F.
Flaps - - - - - - - 15°
Wind- - - - - - - - 15-knot headwind
Airport - - - - - - SEA R/W 16

	V_1	V_R	V_2
1-	139	157	166
2-	145	157	165
3-	143	155	166
4-	141	156	165

936. U11 Which condition prevents the use of REDUCED THRUST (NORMAL) TAKEOFF power settings?

1- Snow or slush covered runway.
2- Runway slope is downhill (negative).
3- Assumed temperature is hotter than actual temperature.
4- Assumed runway is longer than actual runway.

937. U12 Determine the takeoff speeds for these conditions. (Fig. 41, page 121)

Gross weight - - - 175,000 lbs.
Flaps- - - - - - - 5°
Airport PA/T°C.- - 5,100 ft./-5°C.

	V_1 & V_R	V_2
1-	152	161
2-	149	161
3-	137	147
4-	147	161

938. U12 Determine the takeoff speeds for these conditions. (Fig. 40, page 119)

Gross weight - - - - 305,000 lbs.
Pressure altitude- - Sea level
OAT- - - - - - - - - Standard
Wind - - - - - - - - 7-knot tailwind
Slope- - - - - - - - .4% UP

	V_1	V_R	V_2
1-	143	148	161
2-	138	144	161
3-	140	144	161
4-	140	146	162

939. U12 Determine the takeoff speeds for these conditions. (Fig. 42, page 123)

Gross weight - - - - 250,000 lbs.
Pressure altitude- - 428 feet
OAT- - - - - - - - - 80°F.
Flaps- - - - - - - - 25°
Wind - - - - - - - - 5-knot tailwind
Airport- - - - - - - SEA R/W 34

	V_1	V_R	V_2
1-	118	132	145
2-	117	133	144
3-	116	131	143
4-	120	154	165

940. U12 Determine the takeoff speeds for these conditions. (Fig. 42, page 123)

Gross weight - - - 290,000 lbs.
Pressure altitude- 3,100 feet
OAT- - - - - - - - 32°F.
Flaps- - - - - - - 25°
Wind - - - - - - - 10-knot tailwind

	V_1	V_R	V_2
1-	130	144	151
2-	129	143	152
3-	128	145	153
4-	131	142	153

941. U12 Which of these factors has the effect of reducing critical engine failure speed?

1- Slush on runway and inoperative antiskid.
2- Dry runway with no slope.
3- Dry runway with uphill slope.
4- High gross weight.

TAKEOFF SPEEDS

ALT. – 1000 FT.	AMBIENT TEMPERATURE – °F
6 to 7	– – – | – – – | –20 to 5 | 5 to 25 | 25 to 85
5 to 6	– – – | –20 to 5 | 5 to 25 | 25 to 45 | 45 to 95
4 to 5	–20 to – 5 | – 5 to 25 | 25 to 45 | 45 to 85 | 85 to 105
3 to 4	–20 to 15 | 15 to 35 | 35 to 55 | 55 to 95 | 95 to 105
2 to 3	–20 to 35 | 35 to 55 | 55 to 85 | 85 to 105 | 105 to 120
1 to 2	–20 to 55 | 55 to 85 | 85 to 95 | 95 to 120 | – – –
0 to 1	–20 to 85 | 85 to 95 | 95 to 105 | 105 to 120 | – – –

FLAP POS	WEIGHT – 1000 LBS.														
		V_1	V_R	V_2	V_1	V_R	V_2	V_1	V_R	V_2	V_1	V_R	V_2	V_1	V_R	V_2
25	325	140	154	162	141	154	161	142	154	161	144	155	161			
	320	138	153	160	139	153	160	141	153	160	143	154	160	145	154	160
	300	132	147	156	133	147	155	134	147	155	136	148	155	138	149	154
	280 V BASIC	126	141	151	127	142	151	128	142	151	130	142	150	131	143	150
	260	119	135	147	120	136	146	121	136	146	123	137	145	124	138	145
	240	112	128	142	113	129	141	114	129	141	116	130	140	117	131	140
	220	106	122	135	107	123	136	108	124	136	109	124	135	110	125	134
	200	99	120	136	100	118	133	100	115	130	102	117	130	103	118	129
	180	108	120	138	104	118	134	102	114	130	98	110	126	95	111	124
	V_1 Limit	108	–	–	104	–	–	102	–	–	99	–	–	–	–	–
15	325	143	159	169	144	160	169	145	161	169	144	160	169			
	320	142	157	168	142	158	168	144	160	168	146	159	168	143	161	167
	300 V BASIC	135	151	163	136	152	163	137	153	163	139	152	163	142	155	162
	280	129	145	158	129	146	158	131	147	158	132	146	157	135	149	157
	260	122	139	153	123	140	153	124	141	153	125	140	153	128	142	152
	240	115	132	148	116	133	148	117	134	148	118	134	147	121	136	146
	220	109	125	143	109	126	143	110	127	143	111	127	142	113	129	140
	200	108	120	140	102	119	137	103	120	137	104	119	136	106	122	135
	180	108	120	143	104	118	139	95	116	134	98	113	131	98	114	129
	V_1 Limit	108	–	–	104	–	–	102	–	–	99	–	–	–	–	–

Compare adjusted V_1 Basic speed with V_1 Limit speed and use the higher speed.

ADJUSTMENTS:

1. Headwind: For each 15 knots, increase V_1 Basic 1 knot.
2. Tailwind: For each 5 knots, decrease V_1 Basic 1 knot.
3. Airports BOS R/W 17, TAS R/W 1 & 7, SEA R/W 16, decrease V_1 Basic 3 knots.
4. Airports BOS R/W 35, TAS R/W 19 & 25, SEA R/W 34, increase V_1 Basic 3 knots.

FIGURE 42--DC-8 TAKEOFF SPEEDS (TYPICAL)

942. U12 Determine the takeoff speeds for these conditions. (Fig. 40, page 119)

Gross weight - - - - 265,000 lbs.
Pressure altitude- - 3,500 feet
OAT- - - - - - - - - 32°F.
Wind - - - - - - - - 7-knot tailwind
Slope- - - - - - - - .4% DOWN

	V_1	V_R	V_2
1-	124	132	159
2-	125	134	151
3-	127	136	152
4-	131	135	151

943. U15 Determine the normal oxygen duration under the following conditions. (Fig. 45, page 127)

Airplane cruise altitude--30,000 feet
Number of men breathing oxygen--4
Cabin pressure--1 PSIG
Oxygen cylinder pressure--1,200 PSIG

1- 187 minutes
2- 167 minutes
3- 151 minutes
4- 125 minutes

944. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 43, page 125)

Cabin altitude- - - - - 15,000 feet
Passengers- - - - - - - 145
Bottle pressure - - - - 1,500 PSI

1- 50 minutes
2- 48 minutes
3- 55 minutes
4- 60 minutes

945. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 44, page 125)

Cabin altitude- - - - - 25,000 feet
Passengers- - - - - - - 90
Bottle pressure - - - - 1,500 PSI

1- 11 minutes
2- 13 minutes
3- 14 minutes
4- 16 minutes

946. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 43, page 125)

Cabin altitude- - - - - 20,000 feet
Passengers- - - - - - - 110
Bottle pressure - - - - 1,250 PSI

1- 41 minutes
2- 37 minutes
3- 32 minutes
4- 29 minutes

947. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 44, page 125)

Cabin altitude- - - - - 20,000 feet
Passengers- - - - - - - 100
Bottle pressure - - - - 1,250 PSI

1- 16 minutes
2- 15 minutes
3- 17 minutes
4- 10 minutes

948. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 43, page 125)

Cabin altitude- - - - - 20,000 feet
Passengers- - - - - - - 165
Bottle pressure - - - - 1,500 PSI

1- 19 minutes
2- 21 minutes
3- 27 minutes
4- 30 minutes

949. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 43, page 125)

Cabin altitude- - - - - 25,000 feet
Passengers- - - - - - - 110
Bottle pressure - - - - 1,300 PSI

1- 20 minutes
2- 24 minutes
3- 22 minutes
4- 18 minutes

950. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 44, page 125)

Cabin altitude- - - - - 20,000 feet
Passengers- - - - - - - 75
Bottle pressure - - - - 1,200 PSI

1- 15 minutes
2- 17 minutes
3- 19 minutes
4- 23 minutes

The table below gives the approximate duration of the cabin oxygen system, based on a cylinder pressure of 1500 psi.

CABIN ALTITUDE	NUMBER OF PASSENGERS	*APPROX. DURATION
15,000	50	2 hrs. 29 mins.
	75	1 hr. 39 mins.
	110	1 hr. 12 mins.
	140	1 hr. 2 mins.
	170	53 mins.
20,000	50	1 hr. 17 mins.
	75	51 mins.
	110	37 mins.
	140	32 mins.
	170	27 mins.
25,000	50	50 mins.
	75	33 mins.
	110	24 mins.
	140	20 mins.
	170	18 mins.

For cylinder pressures less than 1500 psi, reduce duration by 8% for each 100 psi.

FIGURE 43--707 OXYGEN DURATION
(TYPICAL)

The table below gives the approximate duration of the cabin oxygen system, based on a cylinder pressure of 1500 psi.

CABIN ALTITUDE	NUMBER OF PASSENGERS	*APPROX. DURATION
15,000	50	62 mins.
	75	40 mins.
	100	28 mins.
	135	23 mins.
20,000	50	41 mins.
	75	26 mins.
	100	19 mins.
	135	16 mins.
25,000	50	27 mins.
	75	17 mins.
	100	12 mins.
	135	10 mins.

For cylinder pressures less than 1500 psi, reduce duration by 8% for each 100 psi.

FIGURE 44--727 OXYGEN DURATION
(TYPICAL)

951. U15 What is the approximate duration of the passenger oxygen system under these conditions? (Fig. 44, page 125)

Cabin altitude - - - - 15,000 feet
Passengers - - - - - - 120
Bottle pressure- - - - 1,500 PSI

1- 28 minutes
2- 25 minutes
3- 26 minutes
4- 23 minutes

952. U15 Determine the minimum oxygen cylinder pressure required under the following conditions. (Fig. 45, page 127)

Airplane cruise altitude- 25,000 feet
Number of men breathing oxygen- - - - - - - - - 4
Cabin pressure- - - - - - 1 PSIG
Time 100% oxygen required- - - - - - - - 72 minutes

1- 420 lbs. pressure
2- 520 lbs. pressure
3- 900 lbs. pressure
4- 1,050 lbs. pressure

953. U24 What is the predicted weight of a four-engine aircraft at the top of climb under these conditions?

Takeoff weight - - - - 260,000 lbs.
Takeoff airport elevation- - - - - - 2,000 feet
Fuel burn takeoff and initial climb to 1,500 feet above airport- - - - 2,000 lbs.
Average rate of climb- 1,100 ft./min.
Cruising altitude- - - FL 330
Average F/F per engine in climb - - - - - - 6,045 lbs./hr.

1- 241,500 lbs.
2- 244,700 lbs.
3- 247,200 lbs.
4- 249,300 lbs.

954. U31 What is a characteristic of the constant Mach cruise control procedure?

1- True airspeed decreases as OAT increases.
2- Thrust is reduced as aircraft weight decreases.
3- EPR is increased as aircraft weight decreases.
4- EPR is increased as OAT increases.

955. U24 What is the predicted weight of a three-engine aircraft at the top of climb under these conditions?

Takeoff weight - - - - 160,000 lbs.
Takeoff airport elevation- - - - - - 1,020 feet
Fuel burn takeoff and initial climb to 1,500 feet above airport- - - - 2,000 lbs.
Average rate of climb- 1,200 ft./min.
Cruising altitude- - - FL 370
Average F/F per engine in climb - - - - - - 6,000 lbs./hr.

1- 149,400 lbs.
2- 147,900 lbs.
3- 151,800 lbs.
4- 153,000 lbs.

956. U31 When cruise speed and power are set, it is determined that desired Mach is not obtainable because of high ambient temperature. In this event, which power setting is made?

1- Maximum cruise RPM.
2- Maximum cruise EGT.
3- Maximum cruise EPR.
4- Maximum continuous EPR.

957. U24 What is the predicted weight of a three-engine aircraft at the top of climb under these conditions?

Takeoff weight - - - - 165,000 lbs.
Takeoff airport elevation- - - - - - 2,020 feet
Fuel burn takeoff and initial climb to 1,500 feet above airport- - - - 2,000 lbs.
Average rate of climb- 1,500 ft./min.
Cruising altitude- - - FL 330
Average F/F per engine in climb - - - - - - 7,000 lbs./hr.

1- 154,830 lbs.
2- 156,120 lbs.
3- 157,300 lbs.
4- 157,770 lbs.

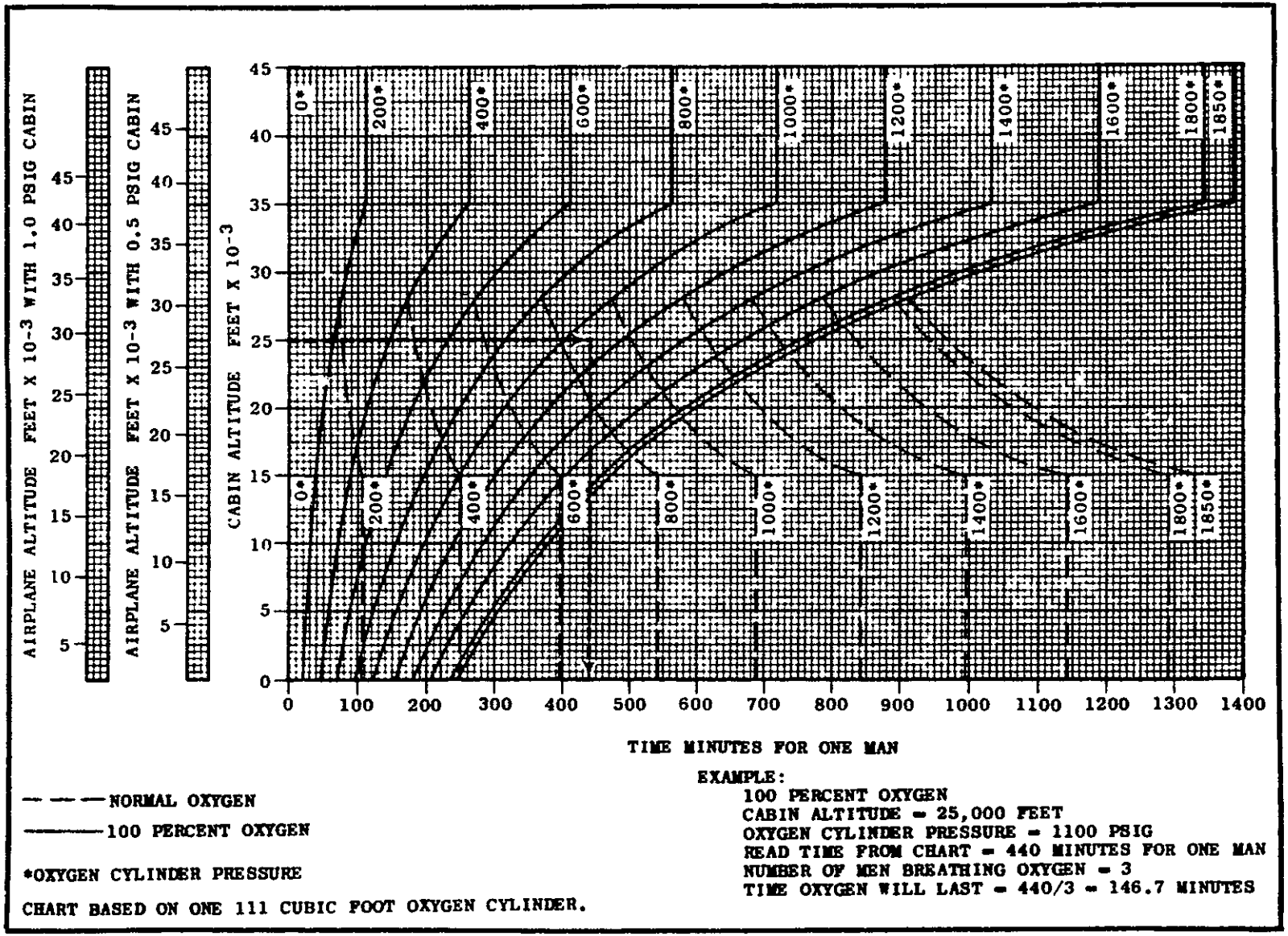


FIGURE 45--DC-8 OXYGEN DURATION (TYPICAL)

958. U24 What is the predicted weight of a four-engine aircraft at the top of climb under these conditions?

Takeoff weight - - - - 245,000 lbs.
Takeoff airport elevation- - - - - - 2,000 feet
Fuel burn takeoff and initial climb to 2,000 feet above airport- - - - 2,500 lbs.
Average rate of climb- 1,300 ft./min.
Cruising altitude- - - FL 310
Average F/F per engine in climb- - - 6,700 lbs./hr.

1- 230,890 lbs.
2- 231,190 lbs.
3- 233,220 lbs.
4- 234,360 lbs.

959. U24 What is the predicted weight of a three-engine aircraft at the top of climb under these conditions?

Takeoff weight - - - - 170,000 lbs.
Takeoff airport elevation- - - - - - 1,020 feet
Fuel burn takeoff and initial climb to 1,000 feet above airport- - - - 2,000 lbs.
Average rate of climb- 1,800 ft./min.
Cruising altitude- - - FL 370
Average F/F per engine in climb- - - 7,500 lbs./hr.

1- 163,000 lbs.
2- 162,350 lbs.
3- 161,150 lbs.
4- 160,720 lbs.

960. U24 What is the predicted weight of a four-engine aircraft at the top of climb under these conditions?

Takeoff weight - - - - 235,000 lbs.
Takeoff airport elevation- - - - - - 2,000 feet
Fuel burn takeoff and initial climb to 1,000 feet above airport- - - - 1,000 lbs.
Average rate of climb- 1,500 ft./min.
Cruising altitude- - - FL 350
Average F/F per engine in climb- - - 6,300 lbs./hr.

1- 224,300 lbs.
2- 225,050 lbs.
3- 226,950 lbs.
4- 227,500 lbs.

961. U24 What is the predicted weight of a three-engine aircraft at the top of climb under these conditions?

Takeoff weight - - - - 155,000 lbs.
Takeoff airport elevation- - - - - - 2,020 feet
Fuel burn takeoff and initial climb to 1,500 feet above airport- - - - 2,000 lbs.
Average rate of climb- 1,300 ft./min.
Cruising altitude- - - FL 350
Average F/F per engine in climb- - - 6,500 lbs./hr.

1- 143,340 lbs.
2- 145,130 lbs.
3- 147,200 lbs.
4- 148,620 lbs.

962. U33 Determine the total three-engine fuel burn during cruise using the .82 Mach cruise settings for these conditions. (Fig. 46, page 129)

Altitude - - - - - - - - FL 250
Beginning weight - - - 145,000 lbs.
TAT- - - - - - - - - - STD +10°C.
Cruise time- - - - - - 2 hours

1- 21,950 lbs.
2- 21,460 lbs.
3- 22,330 lbs.
4- 20,380 lbs.

963. U33 Determine the total fuel burn during cruise using the .82 Mach cruise settings for these conditions. (Fig. 46, page 129)

Altitude - - - - - - - - FL 230
Beginning weight - - - 165,000 lbs.
TAT- - - - - - - - - - STD -10°C.
Cruise time- - - - - - 2 hrs. 30 min.

1- 29,205 lbs.
2- 29,880 lbs.
3- 31,600 lbs.
4- 30,495 lbs.

964. U33 Determine the total three-engine fuel burn during cruise using the .82 Mach cruise settings for these conditions. (Fig. 46, page 129)

Altitude - - - - - - - - FL 300
Beginning weight - - - 155,000 lbs.
TAT- - - - - - - - - - STD +10°C.
Cruise time- - - - - - 2 hrs. 15 min.

1- 21,540 lbs.
2- 22,110 lbs.
3- 23,960 lbs.
4- 19,800 lbs.

AVG EPR REQUIRED
MAX TAT AT WHICH EPR CAN BE SET
ISA FUEL FLOW LB/HR/ENG

IND. MACH .82 CRUISE
ALL ENGINES 2 AIRBLEEDS
MAX CRUISE THRUST LIMITS

FLIGHT LEVEL 220 TO 310

FLIGHT LEVEL	IAS STD TAT	GROSS WEIGHT 1000 LB 165	160	155	150	145	140	135	130	125	120
310	305	1.94	1.91	1.89	1.87	1.86	1.84	1.82	1.81	1.79	1.78
	−16	2	4	6	7	9	10	11	13	14	15
		3274	3209	3146	3088	3033	2981	2932	2885	2842	2801
300	312	1.90	1.89	1.87	1.85	1.83	1.82	1.80	1.79	1.78	1.76
	−14	5	6	8	9	11	12	13	14	15	16
		3332	3270	3213	3159	3108	3059	3012	2969	2928	2889
290	319	1.88	1.86	1.84	1.83	1.82	1.80	1.79	1.77	1.76	1.75
	−11	7	9	10	11	12	13	14	16	17	17
		3410	3354	3301	3250	3201	3155	3112	3071	3032	2994
280	326	1.85	1.84	1.82	1.81	1.80	1.78	1.77	1.76	1.75	1.74
	−9	9	10	12	13	14	15	16	17	18	19
		3500	3447	3397	3348	3302	3260	3218	3179	3141	3105
270	333	1.83	1.82	1.81	1.79	1.78	1.77	1.76	1.75	1.74	1.73
	−7	11	12	13	14	15	16	17	18	19	20
		3597	3547	3499	3454	3412	3370	3331	3293	3257	3222
260	340	1.81	1.80	1.79	1.78	1.77	1.76	1.74	1.73	1.72	1.72
	−5	13	14	15	15	16	17	18	19	20	21
		3703	3655	3611	3568	3527	3488	3450	3413	3378	3344
250	347	1.80	1.78	1.77	1.76	1.75	1.74	1.73	1.72	1.71	1.71
	−2	14	15	16	17	18	19	20	20	21	22
		3816	3772	3730	3689	3650	3612	3575	3540	3506	3473
240	354	1.78	1.77	1.76	1.75	1.74	1.73	1.72	1.71	1.71	1.70
	−0	15	16	17	18	19	20	21	22	22	23
		3938	3898	3855	3817	3779	3743	3708	3674	3641	3609
230	361	1.77	1.76	1.75	1.74	1.73	1.72	1.71	1.70	1.70	1.69
	2	17	17	18	19	20	21	22	23	23	24
		4067	4028	3989	3952	3916	3881	3847	3814	3782	3752
220	368	1.75	1.74	1.74	1.73	1.72	1.71	1.70	1.70	1.69	1.68
	4	18	19	20	20	21	22	23	24	24	25
		4205	4168	4130	4094	4060	4026	3993	3961	3931	3902

MAX TAT NOT SHOWN WHERE EPR CAN BE SET IN ISA + 30°C CONDITIONS
INCREASE FUEL FLOW 1% PER 5°C ABOVE STANDARD TAT
DECREASE FUEL FLOW 1% PER 5°C BELOW STANDARD TAT
FOR ENGINE A/1 ON, DECREASE MAX TAT BY 15°C
FOR WING A/1 ON, DECREASE MAX TAT BY 18°C

MAX CRUISE EPR — ENG 1 & 3 A/C AIRBLEED ON; ENG 2 NO AIRBLEED											
FLIGHT LEVEL	ENG	TAT °C -50	-40	-30	-20	-10	0	10	20	30	40
100	1 & 3	2.24	2.22	2.19	2.15	2.09	1.99	1.86	1.74	1.65	1.56
200		2.23	2.21	2.18	2.14	2.08	1.98	1.85	1.73	1.64	1.55
300		2.22	2.20	2.17	2.13	2.07	1.97	1.84	1.72	1.63	1.54
400		2.19	2.17	2.15	2.11	2.04	1.94	1.82	1.70	1.60	1.52
420		2.19	2.17	2.14	2.11	2.04	1.94	1.82	1.69	1.60	1.52
0-420	2	2.25	2.23	2.21	2.17	2.10	2.01	1.89	1.76	1.67	1.59

EPR BLEED CORRECTIONS			ENG 1 & 3	ENG 2
AIR COND AIR BLEED		FL100	OFF + .04	ON − .04
		FL200	OFF + .05	ON − .05
		FL300	OFF + .06	ON − .06
		FL400	OFF + .08	ON − .07
		FL420	OFF + .08	ON − .07
ENG ANTI-ICE ON			− .08	− .11
ENG & WING ANTI-ICE	TWO	ENG BLD	− .16	− .11
	ONE		− .16	

FIGURE 46--727 MACH .82 CRUISE (TYPICAL)

965. U33 Determine the total fuel burn during cruise using the .82 Mach cruise settings for these conditions. (Fig. 46, page 129)

Altitude - - - - - - - - FL 290
Beginning weight - - - 160,000 lbs.
TAT- - - - - - - - - - - STD +10°C.
Cruise time- - - - - - 2 hours

1- 18,500 lbs.
2- 19,000 lbs.
3- 21,500 lbs.
4- 20,000 lbs.

966. U33 Determine the total three-engine fuel burn during cruise using the .82 Mach cruise settings for these conditions. (Fig. 46, page 129)

Altitude- - - - - - - - FL 290
Beginning weight- - - 160,000 lbs.
TAT - - - - - - - - - - STD -10°C.
Cruise time - - - - - 2 hrs. 30 min.

1- 25,650 lbs.
2- 24,645 lbs.
3- 25,155 lbs.
4- 23,930 lbs.

967. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Setting for these conditions. (Fig. 47, page 131)

Altitude - - - - - - - FL 350
Beginning weight - - 290,000 lbs.
TAT- - - - - - - - - - -20°C.
Cruise time- - - - - 2 hrs. 20 min.

1- 30,220 lbs.
2- 31,850 lbs.
3- 32,150 lbs.
4- 29,990 lbs.

968. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Settings for these conditions. (Fig. 47, page 131)

Altitude - - - - - - - FL 350
Beginning weight - - 280,000 lbs.
TAT- - - - - - - - - - -25°C.
Cruise time- - - - - 2 hrs. 30 min.

1- 29,070 lbs.
2- 31,010 lbs.
3- 30,150 lbs.
4- 32,070 lbs.

969. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Settings for these conditions. (Fig. 47, page 131)

Altitude - - - - - - FL 350
Beginning weight - 300,000 lbs.
TAT- - - - - - - - - -30°C.
Cruise time- - - - 2 hrs. 15 min.

1- 29,520 lbs.
2- 30,470 lbs.
3- 31,620 lbs.
4- 28,760 lbs.

970. U33 An airplane has been cruising for 2 hours 40 minutes at a speed of Mach .84. Total fuel consumed during this period has been 34,000 pounds. If Mach 1.0 is 590 knots, what has been the nautical air miles/1,000 pounds of fuel?

1- 42.5 NAM/1,000 pounds
2- 40.0 NAM/1,000 pounds
3- 38.1 NAM/1,000 pounds
4- 38.9 NAM/1,000 pounds

971. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Setting for these conditions. (Fig. 47, page 131)

Altitude - - - - - - - FL 350
Beginning weight - - 310,000 lbs.
TAT- - - - - - - - - - -35°C.
Cruise time- - - - - 2 hrs. 45 min.

1- 37,200 lbs.
2- 38,115 lbs.
3- 34,560 lbs.
4- 36,450 lbs.

972. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Setting for these conditions. (Fig. 48, page 132)

Altitude- - - - - - FL 290
Beginning weight- - 325,000 lbs.
Temp. - - - - - - - - STD -5°C.
Cruise time - - - - 2 hrs. 45 min.

1- 40,210 lbs.
2- 38,215 lbs.
3- 39,540 lbs.
4- 41,685 lbs.

4 ENGINE LONG RANGE CRUISE

All Engines 3 T/C
Maximum Cruise Thrust Limits

35,000 FT

*GROSS WEIGHT	TAT (°C)	-40	-35	-30	-25	-20	-15	-10
	LIMIT EPR TC/NO BLD	1.94/1.99	1.91/1.96	1.89/1.94	1.87/1.92	1.84/1.89	1.83/1.88	1.81/1.86
330,000 LB	MACH/IAS AVG EPR/FF	.797/270 LIM /3708						
320,000 LB	MACH/IAS AVG EPR/FF	.799/271 1.91/3563	.799/271 LIM /3601					
310,000 LB	MACH/IAS AVG EPR/FF	.801/272 1.87/3430	.801/272 1.87/3466	.801/272 1.87/3502	.801/272 LIM /3538			
300,000 LB	MACH/IAS AVG EPR/FF	.803/272 1.83/3316	.803/272 1.83/3351	.803/272 1.83/3386	.803/272 1.83/3421	.803/272 1.83/3455		
290,000 LB	MACH/IAS AVG EPR/FF	.804/273 1.80/3212	.804/273 1.80/3247	.804/273 1.80/3281	.804/273 1.80/3314	.804/273 1.80/3347	.804/273 1.80/3380	.804/273 LIM /3413
280,000 LB	MACH/IAS AVG EPR/FF	.806/274 1.77/3109	.806/274 1.77/3142	.806/274 1.77/3175	.806/274 1.77/3208	.806/274 1.77/3240	.806/274 1.77/3272	.806/274 1.77/3303
270,000 LB	MACH/IAS AVG EPR/FF	.807/274 1.74/3015	.807/274 1.74/3047	.807/274 1.74/3079	.807/274 1.74/3110	.807/274 1.74/3141	.807/274 1.74/3172	.807/274 1.74/3203
260,000 LB	MACH/IAS AVG EPR/FF	.807/274 1.71/2919	.807/274 1.71/2950	.807/274 1.71/2981	.807/274 1.71/3011	.807/274 1.71/3041	.807/274 1.71/3071	.807/274 1.71/3101
250,000 LB	MACH/IAS AVG EPR/FF	.807/274 1.68/2819	.807/274 1.68/2849	.807/274 1.68/2879	.807/274 1.68/2908	.807/274 1.68/2937	.807/274 1.68/2966	.807/274 1.68/2995
240,000 LB	MACH/IAS AVG EPR/FF	.806/274 1.65/2724	.806/274 1.65/2753	.806/274 1.65/2782	.806/274 1.65/2810	.806/274 1.65/2838	.806/274 1.65/2866	.806/274 1.65/2894
230,000 LB	MACH/IAS AVG EPR/FF	.804/273 1.62/2626	.804/273 1.62/2654	.804/273 1.62/2682	.804/273 1.62/2709	.804/273 1.62/2737	.804/273 1.62/2763	.804/273 1.62/2790
220,000 LB	MACH/IAS AVG EPR/FF	.801/272 1.59/2527	.801/272 1.59/2554	.801/272 1.59/2580	.801/272 1.59/2607	.801/272 1.59/2633	.801/272 1.59/2659	.801/272 1.59/2684
210,000 LB	MACH/IAS AVG EPR/FF	.797/270 1.56/2431	.797/270 1.56/2457	.797/270 1.56/2483	.797/270 1.56/2508	.797/270 1.56/2533	.797/270 1.56/2558	.797/270 1.56/2583
200,000 LB	MACH/IAS AVG EPR/FF	.792/268 1.53/2341	.792/268 1.53/2366	.792/268 1.53/2390	.792/268 1.53/2415	.792/268 1.53/2439	.792/268 1.53/2463	.792/268 1.53/2487
190,000 LB	MACH/IAS AVG EPR/FF	.784/266 1.50/2247	.784/266 1.50/2271	.784/266 1.50/2294	.784/266 1.50/2318	.784/266 1.50/2341	.784/266 1.50/2364	.784/266 1.50/2387
180,000 LB	MACH/IAS AVG EPR/FF	.776/262 1.47/2152	.776/262 1.47/2175	.776/262 1.47/2197	.776/262 1.47/2220	.776/262 1.47/2242	.776/262 1.47/2264	.776/262 1.47/2286
170,000 LB	MACH/IAS AVG EPR/FF	.765/258 1.44/2056	.765/258 1.44/2078	.765/258 1.44/2099	.765/258 1.44/2121	.765/258 1.44/2142	.765/258 1.44/2163	.765/258 1.44/2184
160,000 LB	MACH/IAS AVG EPR/FF	.753/254 1.41/1960	.753/254 1.41/1981	.753/254 1.41/2002	.753/254 1.41/2022	.753/254 1.41/2042	.753/254 1.41/2063	.753/254 1.41/2082
150,000 LB	MACH/IAS AVG EPR/FF	.739/249 1.38/1863	.739/249 1.38/1883	.739/249 1.38/1902	.739/249 1.38/1922	.739/249 1.38/1941	.739/249 1.38/1960	.739/249 1.38/1979

FIGURE 47--707 LONG RANGE CRUISE (TYPICAL)

4 ENGINE LONG RANGE CRUISE

EPR and NAM/1000# are for Mach Number. When operating in region left of heavy line, determine and set Max. Cruise EPR if less than listed value.

FLIGHT LEVEL STD. TEMP.		GROSS WEIGHT (1000 LBS)															
		345	335	325	315	305	295	285	275	265	255	245	235	225	215	205	195	185
410 −57°C	EPR														1.79	1.73	1.68	1.64
	M/TAS														.793/455		.786/451	
	NAM/1000#														47.4	50.2	52.8	54.9
390 −57°C	EPR												1.78	1.73	1.69	1.65	1.60	1.57
	M/TAS											.794/458			.792/454		.774/444	
	NAM/1000#												43.7	46.0	48.0	49.7	52.0	53.8
370 −57°C	EPR									1.83	1.77	1.72	1.68	1.64	1.61	1.58	1.54	1.52
	M/TAS								.800/454			.796/457			.780/448		.763/438	
	NAM/1000#									38.3	40.5	42.3	43.9	45.8	47.3	48.7	50.7	52.2
350 −54°C	EPR						1.64	1.79	1.74	1.70	1.66	1.64	1.61	1.57	1.55	1.53	1.49	1.47
	M/TAS					.799/461			.794/458			.785/453			.769/443		.750/432	
	NAM/1000#						34.4	36.3	37.9	39.9	40.8	41.9	43.1	44.8	46.0	47.2	48.9	50.1
330 −50°C	EPR			1.84	1.79	1.75	1.72	1.68	1.65	1.63	1.59	1.57	1.55	1.52	1.50	1.48	1.45	1.43
	M/TAS		.797/464			.795/463			.789/459			.771/449			.756/440		.783/426	
	NAM/1000#			31.3	32.8	34.2	35.3	36.0	37.6	38.5	40.0	41.0	42.0	43.4	44.4	45.3	47.0	48.3
310 −46°C	EPR	1.79	1.76	1.72	1.69	1.66	1.64	1.61	1.58	1.56	1.54	1.52	1.50	1.48	1.46	1.44	1.41	1.39
	M/TAS		.798/467			.789/463			.744/454			.763/448			.745/437		.726/426	
	NAM/1000#	30.0	31.1	32.1	33.2	34.0	34.8	36.0	36.9	37.7	38.8	39.6	40.4	41.6	42.6	43.6	45.1	46.4
290 −42°	EPR	1.69	1.66	1.64	1.61	1.59	1.57	1.55	1.53	1.52	1.49	1.48	1.46	1.43	1.41	1.40	1.37	1.36
	M/TAS		.789/467			.776/459			.765/453			.751/445			.734/439		.716/424	
	NAM/1000#	30.3	31.0	31.6	32.8	33.3	34.0	34.9	35.6	36.3	37.2	37.9	38.7	39.9	40.9	41.9	43.2	44.0
280 −40°C	EPR	1.65	1.63	1.61	1.58	1.56	1.55	1.52	1.51	1.49	1.47	1.45	1.44	1.41	1.39	1.38	1.36	134
	M/TAS		.783/466			.772/459			.760/452			.745/443			.729/433		.711/423	
	NAM/1000#	30.1	30.7	31.3	32.2	32.8	33.5	34.4	35.0	35.6	36.5	37.2	38.0	39.2	40.1	41.0	42.1	42.9

ADJUSTMENTS:

TAS (knots) is for standard temperature. Add 1 knot/°C above standard.

Subtract 1 knot/°C below standard

$$\text{Fuel consumption (1000\#/hr)} = \frac{\text{TAS for actual temperature}}{\text{NAM/1000\#}}$$

FIGURE 48--DC-8 LONG RANGE CRUISE (TYPICAL)

973. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Setting for these conditions. (Fig. 48)

Altitude - - - - - - FL 330
Beginning weight - - 295,000 lbs.
Temp.- - - - - - - - STD +5°C.
Cruise time- - - - - 2 hrs. 15 min.

1- 30,740 lbs.
2- 29,835 lbs.
3- 28,865 lbs.
4- 27,350 lbs.

974. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Setting for these conditions. (Fig. 48)

Altitude - - - - - FL 310
Beginning weight - 315,000 lbs.
Temp.- - - - - - - STD +10°C.
Cruise time- - - - 2 hrs. 30 min.

1- 35,630 lbs.
2- 34,450 lbs.
3- 49,800 lbs.
4- 33,260 lbs.

975. U33 An airplane has been cruising for 2 hours 15 minutes at a speed of Mach .82. Total fuel consumed during this period has been 27,250 pounds. If Mach 1.0 is 595 knots, what has been the nautical air miles/1,000 pounds of fuel?

1- 40.3 NAM/1,000 pounds
2- 46.4 NAM/1,000 pounds
3- 43.7 NAM/1,000 pounds
4- 53.3 NAM/1,000 pounds

976. U33 An airplane has been cruising for 2 hours 45 minutes at a speed of Mach .80. Total fuel consumed during this period has been 34,000 pounds. If Mach 1.0 is 589 knots, what has been the nautical air miles/1,000 pounds of fuel?

1- 46.4 NAM/1,000 pounds
2- 38.1 NAM/1,000 pounds
3- 43.7 NAM/1,000 pounds
4- 40.0 NAM/1,000 pounds

977. U33 An airplane has been cruising for 2 hours 35 minutes at a speed of Mach .81. Total fuel consumed during this period has been 27,850 pounds. If Mach 1.0 is 565 knots, what has been the nautical air miles/1,000 pounds of fuel?

1- 44.1 NAM/1,000 pounds
2- 40.0 NAM/1,000 pounds
3- 41.6 NAM/1,000 pounds
4- 42.5 NAM/1,000 pounds

978. U54 After the shutdown of one engine, how many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 280,000 lbs.
Maximum landing
weight - - - - - 247,000 lbs.
Average fuel flow
during dumping
and descent to
touchdown- - - - 4,200 lbs./hr./eng.
Time from start
dump to landing- 20 minutes
Fuel dump rate - - 3,660 lbs./min.

1- 9.5 minutes
2- 9.0 minutes
3- 7.9 minutes
4- 7.4 minutes

979. U54 After the shutdown of one engine, how many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 280,000 lbs.
Maximum landing
weight - - - - - 207,500 lbs.
Average fuel flow
during dumping
and descent to
touchdown- - - - 3,480 lbs./hr./eng.
Time from start
dump to landing- 30 minutes
Fuel dump rate - - 3,600 lbs./min.

1- 17.6 minutes
2- 18.7 minutes
3- 19.5 minutes
4- 20.1 minutes

980. U54 After the shutdown of one engine, how many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 311,000 lbs.
Maximum landing
weight - - - - - 240,000 lbs.
Average fuel flow
during dumping
and descent to
touchdown- - - - 3,300 lbs./hr./eng.
Time from start
dump to landing- 16 minutes
Fuel dump rate - - 5,000 lbs./min.

1- 11.7 minutes
2- 14.2 minutes
3- 13.7 minutes
4- 12.3 minutes

981. U33 An airplane has been cruising for 2.5 hours at a speed of Mach .82. Total fuel consumed during this period has been 26,900 pounds. If Mach 1.0 is 574 knots, what has been the nautical air miles/1,000 pounds of fuel?

1- 46.4 NAM/1,000 pounds
2- 43.7 NAM/1,000 pounds
3- 40.0 NAM/1,000 pounds
4- 38.1 NAM/1,000 pounds

982. U33 An airplane has been cruising for 2.5 hours at a speed of Mach .82. Total fuel consumed during this period has been 25,360 pounds. If Mach 1.0 is 574 knots, what has been the nautical air miles/1,000 pounds of fuel?

1- 40.0 NAM/1,000 pounds
2- 46.4 NAM/1,000 pounds
3- 43.7 NAM/1,000 pounds
4- 53.3 NAM/1,000 pounds

983. U33 Determine the total four-engine fuel burn during cruise using the Long Range Cruise Setting for these conditions. (Fig. 48, page 132)

Altitude - - - - - - FL 350
Beginning weight - - 285,000 lbs.
Temp.- - - - - - - - STD -10°C.
Cruise time- - - - - 2 hrs. 20 min.

1- 28,800 lbs.
2- 27,600 lbs.
3- 26,540 lbs.
4- 29,775 lbs.

984. U15 Determine the minimum oxygen cylinder pressure required under the following conditions. (Fig. 45, page 127)

Airplane cruise altitude- 25,000 feet
Number of men breathing oxygen- - - - - - - - - 4
Cabin pressure- - - - - - 0.5 PSIG
Time normal oxygen required- - - - - - - - 80 minutes

1- 650 lbs. pressure
2- 900 lbs. pressure
3- 550 lbs. pressure
4- 1,000 lbs. pressure

985. U54 After the shut down of one engine, how many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 270,000 lbs.
Maximum landing weight - - - - - 207,000 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 3,750 lbs./hr./eng.
Time from start dump to landing- 21 minutes
Fuel dump rate - - 3,660 lbs./min.

1- 21.0 minutes
2- 17.2 minutes
3- 14.9 minutes
4- 16.1 minutes

986. U54 After the shutdown of one engine, how many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 245,000 lbs.
Maximum landing weight - - - - - 185,000 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 3,100 lbs./hr./eng.
Time from start dump to landing- 24 minutes
Fuel dump rate - - 3,620 lbs./min.

1- 16.6 minutes
2- 15.5 minutes
3- 14.9 minutes
4- 13.2 minutes

987. U54 After the shutdown of one engine, how many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 302,000 lbs.
Maximum landing weight - - - - - 240,000 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 3,300 lbs./hr./eng.
Time from start dump to landing- 19 minutes
Fuel dump rate - - 4,500 lbs./min.

1- 11.6 minutes
2- 13.8 minutes
3- 12.3 minutes
4- 13.1 minutes

988. U54 How many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 169,225 lbs.
Maximum landing weight - - - - - 148,000 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 2,360 lbs./hr./eng.
Time from start dump to landing- 22 minutes
Fuel dump rate - - 2,300 lbs./min.

1- 9.0 minutes
2- 8.1 minutes
3- 10.1 minutes
4- 9.6 minutes

989. U54 How many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 169,000 lbs.
Maximum landing weight - - - - - 137,500 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 2,250 lbs./hr./eng.
Time from start dump to landing- 19 minutes
Fuel dump rate - - 2,300 lbs./min.

1- 14.6 minutes
2- 10.1 minutes
3- 9.2 minutes
4- 12.8 minutes

990. U54 How many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 175,500 lbs.
Maximum landing weight - - - - - 154,500 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 3,010 lbs./hr./eng.
Time from start dump to landing- 22 minutes
Fuel dump rate - - 2,300 lbs./min.

1- 6.8 minutes
2- 7.7 minutes
3- 8.5 minutes
4- 9.1 minutes

991. U54 How many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 171,000 lbs.
Maximum landing weight - - - - - 142,500 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 3,170 lbs./hr./eng.
Time from start dump to landing- 19 minutes
Fuel dump rate - - 2,300 lbs./min.

1- 12.4 minutes
2- 11.1 minutes
3- 10.1 minutes
4- 9.5 minutes

992. U54 After the shutdown of one engine, how many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 269,000 lbs.
Maximum landing weight - - - - - 237,500 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 2,250 lbs./hr./eng.
Time from start dump to landing- 19 minutes
Fuel dump rate - - 3,620 lbs./min.

1- 7.6 minutes
2- 9.2 minutes
3- 8.7 minutes
4- 8.1 minutes

993. U61 Determine the go-around EPRs for these conditions. (Fig. 49, page 137)

Pressure altitude - - - 2,000 feet
TAT°C.- - - - - - - - - - 10°C.
A/C bleeds- - - - - - - NORMAL
Anti-ice- - - - - - - - Engine ON; wing OFF

	Eng. 1 & 3	Eng. 2
1-	2.13	2.13
2-	2.13	2.16
3-	2.17	2.16
4-	2.04	2.11

994. U54 How many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 169,225 lbs.
Maximum landing weight - - - - - 142,500 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 2,970 lbs./hr./eng.
Time from start dump to landing- 24 minutes
Fuel dump rate - - 2,300 lbs./min.

1- 11.6 minutes
2- 10.9 minutes
3- 10.1 minutes
4- 9.6 minutes

995. U54 How many minutes of dump time would be required to reach maximum landing weight at the touchdown under the following conditions?

Cruise weight- - - 185,000 lbs.
Maximum landing weight - - - - - 154,500 lbs.
Average fuel flow during dumping and descent to touchdown- - - - 3,100 lbs./hr./eng.
Time from start dump to landing- 18 minutes
Fuel dump rate - - 2,300 lbs./min.

1- 12.1 minutes
2- 13.3 minutes
3- 11.6 minutes
4- 10.1 minutes

996. U61 Determine the go-around EPRs for these conditions. (Fig. 49, page 137)

Pressure altitude - - 2,000 feet
OAT°C.- - - - - - - - 18°C.
A/C bleeds- - - - - - Nos. 1 & 2 ON; No. 3 OFF
Anti-ice- - - - - - - OFF

	Eng. 1	Eng. 2	Eng. 3
1-	2.16	2.12	2.16
2-	2.12	2.11	2.16
3-	2.08	2.15	2.12
4-	2.11	2.08	2.07

997. U61 Determine the go-around EPRs for these conditions. (Fig. 49, page 137)

Pressure altitude - Sea level
TAT°C.- - - - - - - -10°C.
A/C bleeds- - - - - Normal
Anti-ice- - - - - - Engine and wing ON; 2 bleeds

	Eng. 1 & 3	Eng. 2
1-	1.98	2.06
2-	2.06	2.07
3-	2.07	2.09
4-	1.97	2.09

998. U61 Determine the go-around EPRs for these conditions. (Fig. 49, page 137)

Pressure altitude - 1,000 feet
TAT°C.- - - - - - - Zero
A/C bleeds- - - - - Nos. 2 & 3 ON; No. 1 OFF
Anti-ice- - - - - - Engine ON

	Eng. 1	Eng. 2	Eng. 3
1-	2.12	2.15	2.12
2-	2.16	2.11	2.16
3-	2.16	2.08	2.12
4-	2.12	2.11	2.08

999. U61 Determine the go-around EPRs for these conditions. (Fig. 49, page 137)

Pressure altitude - 4,000 feet
OAT°C.- - - - - - - -5°C.
A/C bleeds- - - - - Normal
Anti-ice- - - - - - Engine and wing ON; 2 bleeds

	Eng. 1 & 3	Eng. 2
1-	2.11	2.11
2-	2.12	2.20
3-	2.21	2.23
4-	2.14	2.22

1000. U61 Determine the go-around EPRs for these conditions. (Fig. 49, page 137)

Pressure altitude - 3,000 feet
TAT°C.- - - - - - - Zero
A/C bleeds- - - - - Normal
Anti-ice- - - - - - Engine and wing ON; 2 bleeds

	Eng. 1 & 3	Eng. 2
1-	2.20	2.22
2-	2.11	2.19
3-	2.10	2.19
4-	2.24	2.18

GO AROUND EPR

ENG 1 & 3
ENG 2

A/C ON
NO BLEED

PRESSURE ALTITUDE–FT		OAT °F	–82	–10	0	10	18	27	38	47	55	69	73	83	91	100	110	119
		°C	–63	–23	–18	–13	–8	–3	3	8	13	18	23	28	33	38	43	48
		TAT °C	–60	–20	–15	–10	–5	0	5	10	15	20	25	30	35	40	45	50
–1000	ENGINE	1 & 3	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	1.99	1.94	1.89
		2	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.01	1.97	1.91
SEA LEVEL		1 & 3	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.04	1.99	1.94	1.89
		2	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.09	2.06	2.01	1.97	1.91
1000		1 & 3	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.09	2.09	2.09	2.08	2.04	1.99	1.94	1.89
		2	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.12	2.12	2.12	2.10	2.06	2.01	1.97	1.91
2000		1 & 3	2.18	2.18	2.18	2.18	2.18	2.18	2.17	2.13	2.12	2.13	2.10	2.08	2.04	1.99	1.94	1.89
		2	2.20	2.20	2.20	2.20	2.20	2.20	2.19	2.16	2.15	2.15	2.13	2.10	2.06	2.01	1.97	1.91
3000		1 & 3	2.24	2.24	2.24	2.24	2.23	2.20	2.17	2.13	2.12	2.12	2.10	2.08	2.04	1.99	1.94	1.89
		2	2.27	2.27	2.27	2.27	2.25	2.22	2.19	2.16	2.15	2.15	2.13	2.10	2.06	2.01	1.97	1.91
3900 AND ABOVE		1 & 3	2.30	2.30	2.28	2.26	2.23	2.20	2.17	2.13	2.12	2.12	2.10	2.08	2.04	1.99	1.94	1.89
		2	2.32	2.32	2.30	2.28	2.25	2.22	2.19	2.16	2.15	2.15	2.13	2.10	2.06	2.01	1.97	1.91

EPR BLEED CORRECTIONS		ENG 1&3	ENG 2
A/C BLEEDS		OFF +.04	ON –.04
ENGINE ANTI-ICE ON		– –	–.03
ENGINE AND WING ANTI-ICE ON	TWO ENGINE BLEEDS	–.09	–.03
	ONE ENGINE BLEED	–.10	–.03

FIGURE 49--727 GO-AROUND EPR (TYPICAL)

SAMPLE

QUESTION SELECTION SHEET

TITLE	TEST NO.
FLIGHT ENGINEER -- BASIC	000001

NAME _____

IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	2	21	108
2	6	22	111
3	9	23	116
4	12	24	121
5	14	25	128
6	25	26	133
7	31	27	142
8	33	28	150
9	48	29	153
10	51	30	161
11	54	31	163
12	58	32	170
13	60	33	174
14	67	34	180
15	75	35	185
16	83	36	197
17	87	37	202
18	92	38	225
19	102	39	230
20	106	40	245

SAMPLE

QUESTION SELECTION SHEET

TITLE	TEST NO.
FLIGHT ENGINEER TURBOJET	000002

NAME _____

IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	249	21	455	41	733
2	262	22	464	42	776
3	273	23	471	43	782
4	283	24	488	44	783
5	307	25	512	45	785
6	315	26	521	46	795
7	318	27	527	47	801
8	319	28	541	48	825
9	342	29	553	49	829
10	351	30	571	50	845
11	365	31	595	51	851
12	375	32	603	52	865
13	383	33	617	53	866
14	403	34	630	54	916
15	406	35	631	55	930
16	409	36	690	56	951
17	419	37	708	57	959
18	420	38	710	58	965
19	438	39	711	59	989
20	447	40	720	60	1000

SAMPLE

QUESTION SELECTION SHEET

TITLE	TEST NO.
FLIGHT ENGINEER TURBOJET	000003

NAME _____

IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	253	21	487	41	719
2	257	22	493	42	732
3	268	23	513	43	734
4	281	24	525	44	749
5	289	25	529	45	754
6	301	26	539	46	774
7	333	27	566	47	800
8	337	28	569	48	803
9	360	29	593	49	824
10	369	30	595	50	843
11	379	31	604	51	845
12	400	32	611	52	858
13	421	33	615	53	880
14	434	34	639	54	884
15	438	35	652	55	921
16	443	36	662	56	938
17	448	37	665	57	944
18	459	38	670	58	953
19	470	39	673	59	979
20	480	40	685	60	982

SAMPLE

QUESTION SELECTION SHEET

TITLE	TEST NO.
FLIGHT ENGINEER TURBOJET	000004

NAME _____

IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	257	21	512	41	784
2	297	22	514	42	786
3	311	23	536	43	794
4	314	24	556	44	799
5	328	25	568	45	802
6	331	26	579	46	819
7	366	27	583	47	823
8	372	28	594	48	833
9	375	29	598	49	842
10	383	30	601	50	859
11	387	31	605	51	867
12	389	32	613	52	893
13	403	33	625	53	895
14	434	34	675	54	897
15	435	35	682	55	909
16	445	36	690	56	935
17	459	37	703	57	943
18	467	38	741	58	953
19	469	39	743	59	970
20	501	40	761	60	985

SAMPLE

QUESTION SELECTION SHEET

TITLE	TEST NO.
FLIGHT ENGINEER TURBOJET --BASIC	000005

NAME _____

IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	3	21	183	41	429	61	709
2	18	22	193	42	431	62	726
3	26	23	205	43	457	63	748
4	32	24	234	44	465	64	750
5	42	25	255	45	484	65	753
6	61	26	264	46	487	66	797
7	72	27	274	47	502	67	803
8	88	28	294	48	523	68	826
9	95	29	295	49	557	69	830
10	98	30	321	50	570	70	841
11	104	31	324	51	578	71	867
12	112	32	334	52	596	72	873
13	123	33	343	53	604	73	897
14	125	34	352	54	609	74	923
15	130	35	361	55	624	75	934
16	139	36	379	56	628	76	950
17	145	37	382	57	655	77	957
18	148	38	386	58	671	78	963
19	159	39	392	59	679	79	988
20	173	40	398	60	705	80	996

SAMPLE

QUESTION SELECTION SHEET

TITLE	TEST NO.
FLIGHT ENGINEER TURBOJET -- BASIC	000006

NAME _____

IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number
1	9
2	11
3	22
4	33
5	34
6	59
7	72
8	78
9	87
10	91
11	94
12	96
13	109
14	130
15	138
16	157
17	159
18	160
19	167
20	171
21	175
22	203
23	209
24	217
25	223
26	281
27	288
28	312
29	327
30	332
31	343
32	367
33	370
34	386
35	391
36	404
37	426
38	427
39	428
40	445
41	455
42	464
43	471
44	494
45	497
46	514
47	517
48	518
49	557
50	565
51	578
52	590
53	598
54	601
55	616
56	644
57	667
58	676
59	680
60	688
61	690
62	703
63	716
64	720
65	725
66	733
67	739
68	746
69	762
70	794
71	815
72	842
73	848
74	893
75	902
76	928
77	942
78	960
79	970
80	978

SAMPLE

QUESTION SELECTION SHEET

TITLE	TEST NO.
FLIGHT ENGINEER TURBOJET --BASIC	000007

NAME _____

IT IS PERMISSIBLE TO MARK ON THIS SHEET

On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number	On Answer Sheet For Item No.	Answer Question Number
1	1	21	180	41	461	61	756
2	19	22	188	42	493	62	760
3	28	23	219	43	516	63	772
4	35	24	223	44	530	64	790
5	41	25	252	45	536	65	792
6	42	26	268	46	549	66	797
7	74	27	301	47	550	67	805
8	88	28	303	48	558	68	818
9	89	29	329	49	586	69	828
10	99	30	332	50	592	70	876
11	104	31	358	51	597	71	885
12	105	32	384	52	599	72	887
13	112	33	386	53	620	73	891
14	127	34	414	54	635	74	902
15	132	35	422	55	642	75	903
16	140	36	423	56	649	76	936
17	142	37	430	57	683	77	939
18	146	38	446	58	720	78	958
19	152	39	455	59	722	79	973
20	170	40	456	60	745	80	992

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