

NORMAL OPERATIONS

SECTION II

normal procedures

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BEFORE ENTERING THE AIRCRAFT.

FLIGHT RESTRICTIONS.

For flight restrictions on the aircraft, refer to Section V.

FLIGHT PLANNING.

Flight planning data, such as required fuel, airspeed, power settings, etc., necessary to complete the proposed mission, should be determined by using the operating data in the Appendix.

WEIGHT AND BALANCE.

Check the aircraft weight and balance (Handbook of Weight and Balance, T.O. 1-1B-40). Check the takeoff and anticipated landing gross weights. Make certain that the weight and balance clearance (Form F) is satisfactory. A load adjuster is stowed in the flight compartment (figure 1-2). Make certain that the weight grades of fuel, oil, and special equipment carried are suited to the mission to be performed. Refer to Section V for weight limitations of the aircraft.

TAKEOFF AND LANDING DATA CARDS.

Takeoff and landing data cards are contained in the Pilot's/Flight Mechanic's Flight Crew Checklist, T.O. 1C-118A-1CL-1. Compute the takeoff and landing data cards as illustrated in the mission planning section of the Performance Data (appendix), T.O. 1C-118A-1-1.

CHECKLISTS.

The Flight Manual contains only the amplified procedures. The checklists are contained in separate publications. The Pilots' and Flight Mechanic's checklists contain the Aircrew Visual Inspection through the Before Leaving Aircraft checklists, the applicable parts of the Emergency Procedures, the Takeoff and Landing Data Cards, and certain condensed performance data. See Section VIII for additional crew member procedures. On some aircraft a Scroll Checklist in a flight deck coordinator is mounted on the glareshield. The Scroll Checklist contains only the Before Starting Engines, through the Before Leaving Aircraft checklists.

Flight crew responsibilities shall consist of the following:

Using the appropriate checklist as necessary to insure accomplishment of prescribed actions during all phases of flight operation.

Being able to accomplish critical emergency actions without directly referring to the checklist.

The pilot is responsible for proper use of the checklists. Accomplishment of each item will be indicated by the proper response. Steps that require coordination between crewmembers are indicated by quotation marks around the statement; and the letter following the action taken indicates the crewmember performing the action (i. e., P). These steps will be completed by the challenge and reply method while all other steps will be completed silently by the flight mechanic.

When a checklist item is affected by changing conditions or hours of darkness, CLIMATIC or AS REQUIRED will be indicated on the checklist for the usual action entry. During accomplishment of the checklist, the actual position of the unit will be stated in response.

NOTE

On operational stops when no maintenance or servicing is performed and the pilot, copilot, or flight mechanic remains in the crew compartment, the following procedure is authorized (permitted). Complete the Engine Shutdown check and only those items marked by an asterisk on the Before Starting Engines, Phase I, and Engine Runup checks. All items on the Before Starting Engines, Phase II, Starting Engines, Before Taxi, Taxi, and Before Takeoff checks must be accomplished.

INTERPHONE PROCEDURES AND PHRASEOLOGY.

To implement standard interphone procedures and phraseology, the following will be used during all ground and air operations.

Nomenclature: Crewmembers are identified as follows:

- a. Pilot: Occupant of left seat in the cockpit regardless of his position on the crew.
- b. Copilot: Occupant of right seat in the cockpit regardless of his position on the crew. Frequently, during training, the instructor pilot or the student pilot will occupy the right seat; nevertheless, he will be referred to as the copilot.
- c. Flight mechanic: Crewmember seated aft of control pedestal and between the pilots.

Identification: The crewmember who is being called will be identified first, followed by the identification of the transmitter, for example, flight mechanic from pilot.

TERMINOLOGY.

To implement standard terminology, the following will be used:

Pilots will always state the unit they desire to be actuated first, and then state what is to be done second, for example:

1. Rpm: Twenty-three fifty, two thousand, etc.
2. Manifold: Two two, three zero, etc.
3. Flaps: Up, down, twenty degrees, thirty degrees, etc.
4. Gear up.

Acknowledgement: Prior to execution, every command will be repeated by the transceiver to ensure proper understanding of the transmission.

AIRCREW VISUAL INSPECTION.

Check Form 781 for status of the aircraft. It will be the responsibility of the pilot to ensure that an interior and exterior visual inspection is completed. It will also be the responsibility of the pilot to ensure that each crewmember has accomplished his individual inspection requirement as outlined in Sections II and VIII. See figure 2-1 for route to be followed.

NOTE

The aircrew visual inspection procedures described in this section are predicated on the assumption that maintenance personnel have completed all requirements of T.O. 1C-118A-6 for Preflight or Thru-flight; therefore, duplicate inspections and operational checks of systems by air crewmembers have been minimized, except for certain items required in the interest of flying safety.

When the aircraft is flown on assigned missions requiring intermediate stops, and flown by the same crew with no crew rest involved, it is unnecessary for the flight crew to perform all the normal inspections enroute. Under these conditions, only a portion of the normally required inspection is necessary for safe operation. Accordingly, for those instances when thru-flight will occur, only those items marked with an asterisk on the flight mechanic's preflight checklist must be performed or accomplished. Additional checks may be performed at the discretion of the flight crew.

FLIGHT MECHANIC'S PREFLIGHT CHECKLIST.

The flight mechanic will perform a complete preflight inspection prior to departure and determine whether the condition of the aircraft is satisfactory for the mission and report the condition of the aircraft to the pilot.

PRE-INSPECTION.

- *1. Landing gear pins and chocks - Checked.
 - a. Check landing gear pins installed (with red streamers installed).
 - b. Chocks in place.
- *2. Ground power unit - Properly positioned.
- 3. Ladder and fire extinguisher - Available.

(If not available, request necessary equipment to complete inspection.)

INTERIOR COCKPIT INSPECTION.

- *1. Form 781 - Checked.
- *2. Circuit breakers - As required.

Start, primer, and induction vibrator CB -OFF.
- *3. Ignition switches - OFF.
- 4. Engine selector switch - OFF.
- 5. Battery master switch - OFF.
- 6. Batteries - UP.

WARNING

Do not raise or lower aircraft batteries with external power connected and master switch on or GTPU operating.

- *7. Emergency inverter - Checked and OFF.

With the emergency inverter operating and the warning lights out, check main panel white lights, check the ac voltage and frequency and turn the emergency inverter OFF.

NOTE

Refer to Section V for inverter limits.

- *8. Battery master switch - ON.

Place battery selector switch to PLANE BATTERY position and check battery voltage.

- *9. Ground power - Connected and on.

Place battery selector switch to GROUND POWER position and check that GROUND POWER indicator light is on and that bus voltage is within limits.

NOTE

If the ground power supply cannot be monitored for any extended period of time, one battery should be lowered.

- *10. Fire warning system - Checked.
- 11. APU/GTPU (when utilized) - ON.

Place battery selector switch in PLANE BATTERY position: Start GTPU and turn generators ON.

- *12. Bus voltage - Checked.
- 13. Propeller deicing - Checked and OFF.

Check manual operation only.

- 14. Pitot heat - Checked and OFF.

Check pitot heaters and that scoop deicer amperage is within limits.

CAUTION

The maximum ground operating time of the pitot heater is one minute, due to lack of cooling airflow.

- 15. Emergency hydraulic pump and pressures - Checked.
- 16. Wing flaps - Set for exterior inspection, pressure relieved.

Actuate brake pedals until system pressure reads zero.

CAUTION

Visually check that the area below wing flaps is clear prior to lowering for inspection.

- 17. Oxygen system pressure - Checked.
- 18. Trim tabs and flight controls - Checked.

A visual check for the proper directional movement will be accomplished to insure that the

trim tab controls have been properly connected. The trim tabs operate in the opposite direction from the control movement. Also, with assistance of a ground crew member, check all flight controls for free and correct movement and return controls to the locked position.

19. Carburetor air doors - Checked.

Place controls in full HOT position and visually check door position. With controls in full COLD position, check to insure that doors are fully open.

20. Oil cooler doors - Check operation; set open for exterior inspection.

21. Cowl flaps - Check operation; set open for exterior inspection.

Manually close cowl flaps and visually check for fully CLOSED position. With rheostats in full OPEN position, place switches in POSITIONING and check for flap return to full OPEN position.

22. Windshield alcohol - Checked.

Check for operation and turn pump OFF. When flow has stopped, close metering valve.

23. Landing lights - Checked.

Check lights for operation; retract and turn OFF.

24. Cockpit lights - Checked.

25. Inverters and instrument switches - Checked. (Refer to Section VII.)

26. Cabin heater - Checked and OFF.

27. Heading indicators, RMI's, and magnetic compass - Checked.

Place pilot's S-2 compass switch in FREE GYRO position. Hold manual knob to increase and decrease positions and check S-2 compass heading changes accordingly. Return toggle switch to SLAVED GYRO position (check that navigator's S-2 compass indicates the same as pilot's S-2 compass). Repeat this procedure on copilot's S-2 compass. Cross reference all RMI cards, heading selector, and S-2 compasses to read the same as the magnetic compass. The magnetic compass must agree with the approximate heading of the parked aircraft. On aircraft with G-2 compass system installed, check the card against RMI heading and in remote compass position.

28. Altimeters - Checked.

WARNING

As a preflight check, special attention should be given to the altimeter to assure that the 10,000-foot pointer is reading correctly. It is possible for the correct reading to be set on the barometric scale while the altimeter reading is 10,000 feet in error.

29. Quantity gages - Checked.

Check fuel, oil, ADI, alcohol, and hydraulic quantity gage readings.

30. Emergency airbrake pressure - Checked.

31. Fuel system - Checked.

Check availability of fuel from all tanks to all engines, selector valve leakage, booster pump pressures, and warning lights. (Refer to Section VII.)

32. Inverters - OFF.

33. Press-to-test lights - Checked.

Check all warning and detection lights.

34. External lights - Checked and set.

a. Anticollision light - Checked and OFF.

b. Taxi light - ON (If night operation, check and OFF.)

c. Wheel well lights - ON.

d. Wing illumination lights - ON.

e. Navigation lights - FLASH.

EXTERIOR INSPECTION.

Exterior inspection will be accomplished in accordance with figure 2-1.

INTERIOR INSPECTION.

NOTE

The interior inspection will be performed by the pilot or designated crewmember.

CREW COMPARTMENT.

1. Forward cargo door - Check that latches are engaged and safety pin installed and secure. Check door actuating cylinder and lines for leaks.
2. Emergency escape ladder (if installed) - Secured.
3. Crash axe - Secured.
4. Portable oxygen bottles - Check pressure and secure.
5. Lights - Check operation.
6. Fire extinguishers - Checked and secured.
- *7. Circuit breakers and fuses - Checked.
8. Anticipate bulb desiccators (if installed) - Check for discoloration.
9. Compartment viewer - Clean and stowed.
10. Night curtains - Installed.
11. Aldis lamp (if installed) - Check operation and secure.
12. Smoke masks - Check for cleanliness and stowed.
13. Crew call - Checked.
- *14. Windshield and windows - Clean.
- *15. Condition of compartment - Checked.
16. Public address system - Checked.

MAIN CARGO COMPARTMENT OR PASSENGER CABIN.

1. Cargo compartment lights - Check entrance lights (bright and dim), impact lights, pilot's call and pressurization lights not obscured.
2. Pressure dome access plate - Secure.
3. Water filler valve - OFF.
4. Hand fire extinguisher - Checked and secured.
5. Aft cargo doors - Check latches engaged, safety pin installed and secure, cargo door crank stowed. Check actuating cylinders and lines for leaks.
6. Cabin door emergency release and hinges - Inspect condition of door hinges and cables. Check release handle down and secure.

7. Escape chute - Installed.
8. Emergency exits - Closed, handles horizontal and safetied.
9. Thermistor - Checked.
10. Crash axe - Stowed.

BEFORE STARTING ENGINES.

The Before Starting Engines Checklist consists of Phases I and II. Phase I may be performed by the FM or CP.

PHASE I.

1. Propeller deicers - OFF.
2. Pitot and scoop heaters - OFF.
3. Battery master switch - As required.
4. Inverter circuit breakers - ON.
5. Tachometer isolation switch - NORMAL.
6. Emergency propeller deicers - OFF.
7. Oil transfer - OFF.
- *8. Oil coolers - AUTOMATIC.
- *9. Cowl flap switches - POSITIONING.
10. ADI - OFF.
11. Booster pump circuit breakers - ON.
12. Booster pumps - OFF.
- *13. Navigation, cockpit, and SEAT BELT and NO SMOKING lights - Set.
14. Ignition switches - OFF.
15. Engine selector - OFF.
16. Generators - ON.
17. Cockpit temperature - Set.
18. Windshield heat - Set.
19. Radome anti-icing - OFF.
- *20. Fire warning - Tested.

NOTE

If the aircraft has not been flown since preflight inspection was performed, this item may be omitted.

21. Wing heater CO₂ selector - LEFT BANK.
22. Heater control panel - Set.
- *23. Landing lights - Set.
24. Blowers - LOW.
25. Turbine switch - OFF.
26. Cabin temperature control - Set.
27. Emergency cabin altitude control - Set.
28. Cabin superchargers - Set.
- *29. Fuel and oil pressure warning light isolation switches - ON.
30. Firewall selectors - IN.
31. Emergency airbrakes - OFF/Safetied.
32. Static selectors - NORMAL.
- *33. Fuel selectors - MAIN.
- *34. Crossfeeds - OFF.
35. Propeller master lever and engine selector switch - FORWARD and on No. 3.
36. Throttles - Set.
37. Mixtures - IDLE CUTOFF.
38. Gear lever - DOWN.
39. Gear safety solenoid - Visually checked.
40. Carburetor air doors - OPEN.
41. Wing flap lever - Set.

NOTE

Set flap lever to correspond with flap position indicator.

PHASE II.

1. "Phase I check completed." FM
2. Forms 781 and 365F - "Checked and signed".
P
3. Oxygen regulators - "Checked and set." P, CP, FM, N

Regulator will be checked and set to 100%, and oxygen/smoke mask connected.
4. Battery master switch - ON.

5. APU/GTPU - ON.
6. Bus voltage - 26 to 29 volts.
7. Emergency inverter - Checked and OFF.
8. Inverter and instrument switches - NORMAL.
9. Circuit breakers - Set.
10. VHF/UHF radio - "ON." CP
11. Emergency hydraulic pump and pressure - "CHECKED." CP

Flight mechanic will place hydraulic selector in general system position.
12. Parking brakes - "Set." P

Pilot shall hold brake pedals depressed until system pressure is attained before setting the brakes.
13. Gear safety pins - Remove.
14. Hydraulic bypass lever - DOWN.
15. Hydraulic selector - BRAKES.
16. Quantity gages - "Checked." P
17. Cowl flaps - "Open." P-CP
18. Cabin pressure controls - "Set." FM
19. Manifold pressure - "Checked." P
20. Heading indicator - "Set." P-CP
21. Autopilot - "Set and OFF." P
22. Servos - Disengaged.
23. Gear safety pins - "Aboard." FM
24. Antiskid brakes - "OFF." P
25. AIMS/IFF - "STANDBY." CP
26. Passenger briefing - "Completed." P
27. Before Starting Engines check - "Completed." FM

STARTING ENGINES.

1. Door warning lights - "OUT." P
2. Chocks - "In place." P-CP
3. Ground power unit - "Positioned." P

4. Fire guard - "Posted". P/CP

The pilot and copilot will visually check to ensure that propellers and adjacent areas are clear of personnel and obstacles, and state "Fire guard posted, No. ____ clear." (3-4-2-1)

5. Start engines - "Start No. ____." P; "Turning No. ____." FM

Upon the pilot's command "Start No. ____," the flight mechanic places applicable booster pump to LOW, engine selector switch to engine being started, and states "Turning No. ____." He then depresses safety and start switches, checking voltage drop. If voltage is less than 24 volts, he turns inverter switches OFF and advises pilot. Crew responsibilities are as follows:

- a. Pilot and copilot will inform flight mechanic of propeller rotation by counting nine blades (3, 6, 9) while watching for evidence of hydraulic locks (rotation also preoils engine).

NOTE

Engines that have been operated within the previous hour, may be started after 6 blades.

- b. Upon count of "nine blades," the flight mechanic will place the ignition switch to BOTH, hold ignition boost switch to ON, and prime as required.
- c. After engine starts, flight mechanic will continue constant priming until 800 to 1000 rpm is stabilized with throttle. He then moves mixture control to AUTO RICH and releases the primer switch at the initial drop of rpm.
- d. Copilot will monitor throttle to maintain 800 to 900 rpm for warmup.
- e. If inverter was turned OFF in step 5, flight mechanic will place inverter switch to ON position.
- f. After engine is operating normally, flight mechanic will turn booster pump OFF, check oil pressure and fuel pressure within limits. On inboard engine check hydraulic pressure and outboard engine check su-

percharger oil pressure and airflow within limits. At this time he will call ready to start No. ____.

- g. Repeat steps 4 through 5f for starting engines No. 4, 2, and 1.

CAUTION

Maximum cranking time during engine start is one minute. If the engine fails to start in one minute, allow one minute for cooling. If engine fails to start on the second attempt, allow five minutes for cooling.

CAUTION

If oil pressure does not rise within 30 seconds after engine start, shut down engine and investigate.

NOTE

Cowl flaps will normally be in the full open position during ground operation. Aircraft batteries may be used for starting only when generator or external power is not available. Maximum cranking time when using the aircraft batteries is 30 seconds. Turn off all unnecessary electrical equipment before attempting a battery start. When engine starts, generator must be operating properly before attempting to start another engine.

- h. After No. 3 and 4 engines are started, external power unit shall be disconnected and removed prior to starting No. 2 engine.

CAUTION

Do not exceed 1200 rpm until oil temperature reaches 40°C. Engine oil pressure must not exceed 110 psi.

6. Starter selector - "OFF." FM
7. Starting Engines check - "Completed." FM

BEFORE TAXI.

1. Hydraulic pressure - Checked.

The flight mechanic will monitor hydraulic pressure and quantity during all phases of ground operation.

2. External power - "Removed." P
"APU/GTPU on line." FM
3. Battery selector switch - PLANE BATTERY.
4. Navigational radios - "ON." CP
5. Engine analyzer - ON.
6. Cabin - "Secure." FM/FT
 - a. Passenger door and crew door handles - Straight up against internal stops.
 - b. Door latch indices - Aligned with guide marks.
 - c. Emergency window exit handle - Horizontal and safetied.

NOTE

If after the above check, a warning light is on, the malfunction must be corrected, or the aircraft returned to maintenance. If it is definitely established as a warning system malfunction, flight may be continued unpressurized.

- d. Passengers secured.
7. Altimeters and radio altimeters - "Set." P-CP-N

Local barometric pressure should be set into the altimeter at field elevation using the baro-set knob on the front of the altimeter. A field elevation check should be made after barosetting. Each altimeter should agree with + 75 feet of each indicator and field elevation. If errors exceed these limits, discontinue operation until the altimeter is re-zeroed or replaced by the appropriate personnel.

CAUTION

During normal use of the baroset knob, momentary locking of the barocounters may be experienced. If this occurs, do not force the setting. Application of force may cause internal gear disengagement and result in excessive altitude errors. If locking occurs, the required setting may sometimes be established by rotating the knob a full turn in the opposite direction and approaching the setting again with caution.

8. Chocks - "Removed." P

9. Before Taxi check - "Completed." FM

TAXI.

Normal taxiing is accomplished with all operating engines set at 800 to 900 rpm, depending upon generator requirements. Turn by using nosewheel steering (figure 2-2). Use full flaps and as little power as necessary when moving away from the ramp to avoid dusting personnel and equipment. Avoid high taxiing speeds and excessive movement of the nosewheel. Begin a turn with a slight change in direction of the nosewheel and gradually increase until the desired rate of turn is established. Use the same technique to straighten out the turn. The rolling inertia of the aircraft resists turning that may cause sidewise skipping and skidding of the nosewheel, especially when the surface is slick. In this case, and only in this case, may outboard engines be used in turning. Avoid sharp turns at high speeds. Sudden acceleration or deceleration of engines should be avoided to prevent backfiring, which imposes severe stress on engines and mounts. Always stop the aircraft with the nosewheel straight; otherwise, severe side loads and strain will be placed on the nosewheel tire and strut during engine runup. In stopping, depress the brake pedal, and, as the aircraft slows, gradually release brake pressure so that when the aircraft stops very little pressure is applied to the pedals. Make certain the aircraft has stopped prior to setting the parking brakes.

NOTE

During ground operations in high gust conditions with control-surface locks on, any tendency of the control wheel to move may be resisted by holding the wheel in neutral. Restraint should not be applied by holding the wheel against the stops.

NOTE

When operating on airfields at high altitude, or during prolonged periods of ground operation, it is permissible to use mixture settings leaner than AUTO RICH.

Pilot checks brake pedal pressure as power is applied to leave blocks, then when clear of the congested area, calls for taxiing check.

1. Brakes - "Checked." P
2. Wing flaps - "Flaps UP." P;
"Flaps UP." CP
3. Flight instruments - "Checked." P-CP-N

While taxiing, the pilot, copilot, and navigator will observe the heading indicators for operation and the attitude indicators for erection. They also will check the turn needle deflection in both right and left turns.

4. Taxi check - "Completed." FM

MINIMUM TURNING RADIUS

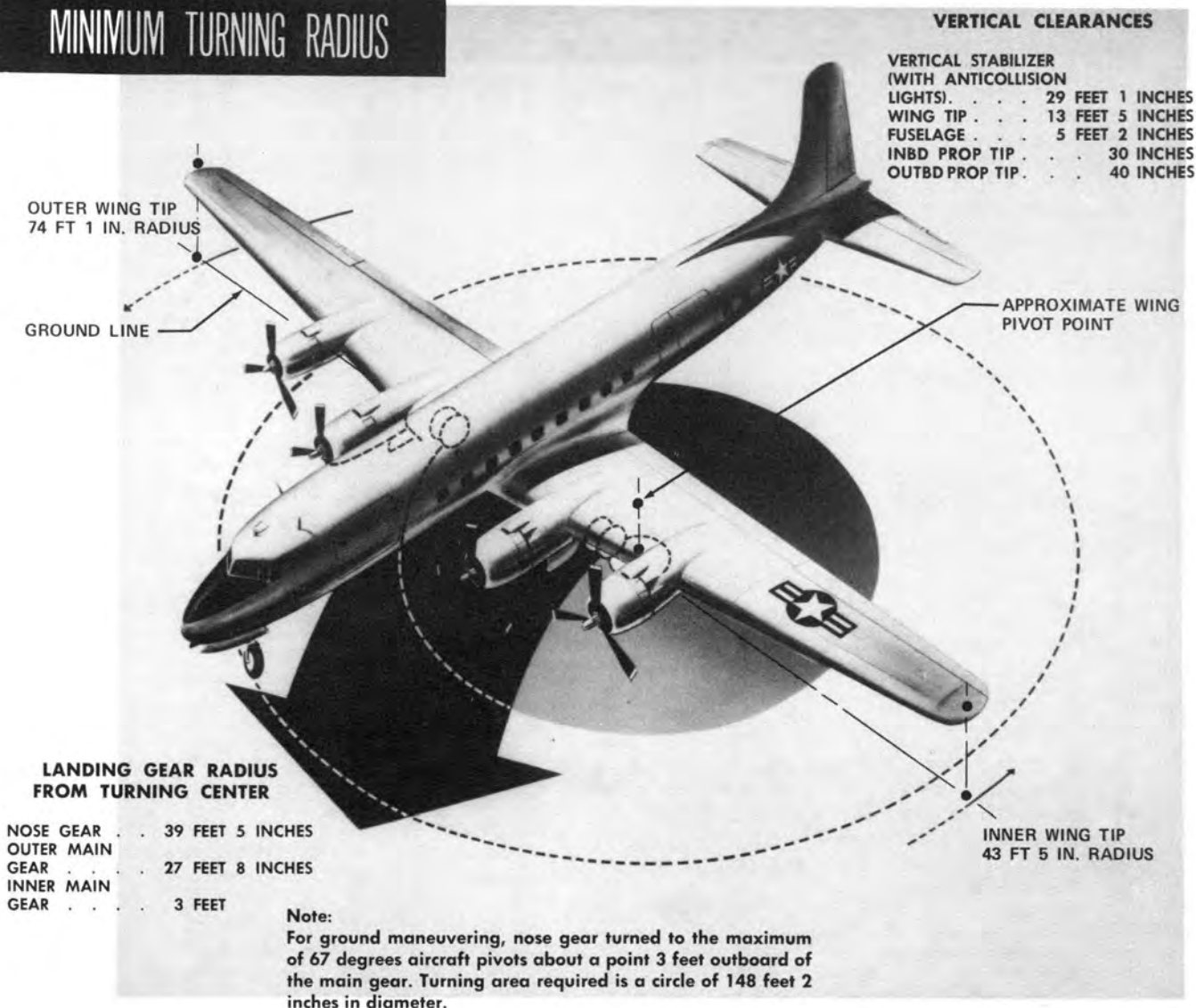


Figure 2-2

ENGINE RUNUP.

NOTE

On training flights and thru-flights after first complete engine runup, only those items marked by an asterisk need be accomplished. Items 6 and 11 may be deleted if reversing was not used after landing.

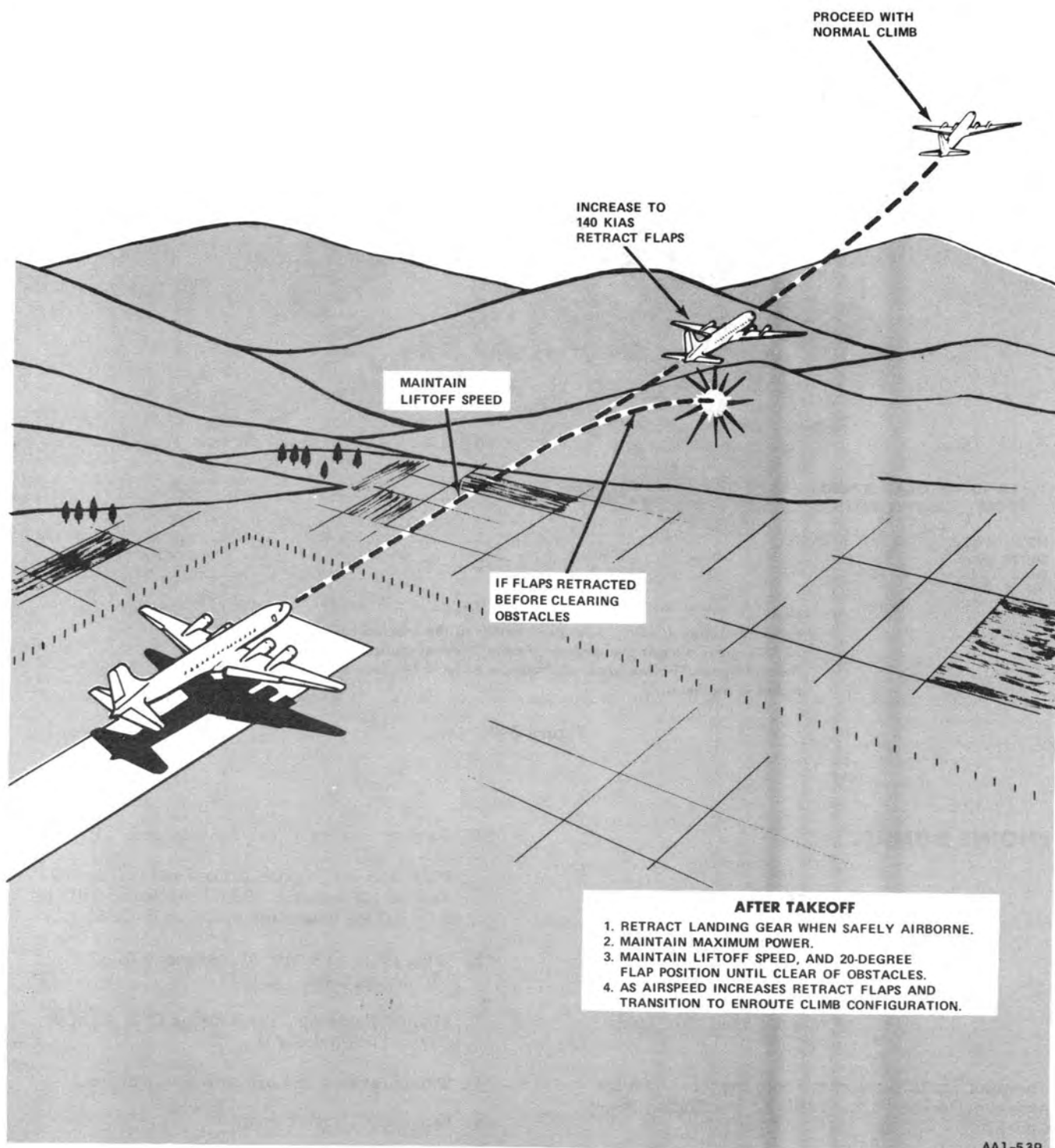
The pilot parks the aircraft into the wind with the nosewheel centered and calls for the Engine Runup Checklist.

- *1. Parking brakes - "Set/As required." P

Pilot will set parking brakes and call for 800 rpm on all engines. Flight mechanic will set APU/GTPU generator switches to OFF.

- *2. Wing flaps - "Flaps 20 degrees." P;
"20 degrees set." CP
- 3. Manifold pressure lines (prior first flight of day) - "Purged." FM
- *4. Temperatures and pressures - Checked.
- *5. Mixtures - AUTO RICH.

MAXIMUM OBSTACLE CLEARANCE FLAP OPERATION



AA1-539

Figure 2-3

- *6. Engines - "RPM 1500." P-CP
- 7. Airfoil heaters and propeller deicers - Checked. (Refer to Section VII).

NOTE

Prior to the first flight of the day the flight mechanic will make a complete check of all airfoil heaters and propeller deicers. A check is not required at enroute stops if equipment was checked or used during the previous flight(s) and no crew change has been made.

- 8. Propellers - "Checked and on No. 3." P
 - a. Place master engine selector switch in MANUAL position; toggle propeller selector switches to DECREASE RPM and hold until 1200 ± 50 rpm is reached and limit lights illuminate.
 - b. Move propeller selector switches to INCREASE RPM until limit lights illuminate.
 - c. With master engine selector switch in No. 2 position, pull master rpm control levers to full DEC position and wait until 1200 ± 50 rpm is reached and limit lights illuminate.
 - d. Place master engine selector switch in No. 3 position, and push master rpm control lever to full INC position; make certain that 1500 rpm is reached and that limit lights illuminate.
- 9. Generators - "Checked." CP

Copilot will check generator bus voltage while pilot is checking propellers. Voltage should be 27.5 to 28.5 volts with APU/GTPU generators off. Amperage readings should be steady and within 10 percent of the average load and in no case should the difference between highest and lowest reading be greater than 30 amperes. Consideration should be given to warmup period for generator control circuit voltage regulators before considering the condition discrepant. It is only necessary to rotate the generator selector switch to determine which generator circuit is malfunctioning in the event of unbalanced amperage draw provided that the generator switch is turned off on the engine selected to check the generator voltage. If this generator switch is not turned off, then the voltage selected will read the average of all generators due to the equalizer circuit.
- 10. Propeller reverse (Before first flight of day) - "Checked." P

Check for proper indication of the propeller reversing lights.

- *11. Propeller feathering - "Checked." CP-P

Copilot will push in No. 4 propeller feathering button and then pull button out after noting drop of 200 to 300 rpm; repeat procedure for No. 3 engine. After copilot has checked No. 3 engine, pilot will push in No. 2 feathering button and pull button out after noting drop of 200 to 300 rpm; repeat procedure for No. 1 engine.

NOTE

If rpm increases and then decreases (or remains constant), the propeller was (or is), in reverse pitch.

- 12. Throttles - "FIELD BAROMETRIC." P

Pilot will advance throttles one at a time to field barometric pressure, normally beginning with No. 1 engine, and check for an rpm of 2070 to 2170 and fuel flow of 600 ± 50 pounds per hour and BMEP approximately 120 psi.

NOTE

A fuel flow or BMEP lower or higher than normal may be observed because of changes in temperature, humidity, pressure, and field elevation.

NOTE

RPM may vary with wind conditions. Add 2 rpm for each knot headwind and subtract 2 rpm for each knot tailwind.

Flight mechanic will make engine analyzer check for all engines, beginning check as soon as steady picture is indicated, and run through each engine left and right, on fast sweep to check for any ignition malfunction. When plug fouling is suspected, use technique described in Controlled Spark Plug Antifouling Procedures, Section VII.

Two engines may be run up simultaneously at the pilot's discretion.

- 13. Blowers - "Checked, and on LOW." CP

When checking the blower, switch the blower selector switch to HIGH. Manifold pressure should increase 1 to 2 inches Hg and BMEP should fluctuate. Switch blower selector to LOW. Manifold pressure should decrease 1 to 2 inches Hg and BMEP should fluctuate. Both manifold pressure and BMEP should return to previous setting observed before starting the blower check.

14. Magnetos - "Checked." P

After blowers are checked, pilot will call out, "Checking mags." Pilot individually positions the ignition switches from BOTH to R to BOTH, and BOTH to L to BOTH. Normal drop of each magneto is 50 to 75 rpm and should not exceed 100 rpm nor a maximum difference of 40 rpm between the left and right magnetos. The normal BMEP drop is 6 psi and the maximum is 12 psi. Flight mechanic will perform ground- ing and ignition performance check as follows:

- a. Cycle switch on slow sweep.
- b. Condition switch on left magneto.
- c. Pilot will check engine by placing ignition switch to R. Flight mechanic checks for grounded magneto side and switches to B position in order to check for normal ignition pattern. Flight mechanic will then call, "Checked."
- d. Pilot places ignition switch to BOTH.
- e. Pilot will continue checking engine by positioning ignition switch to L. Flight mechanic checks B position for normal ignition pattern and switches to R, checking for grounded magneto side. Flight mechanic will then call, "Checked."

*15. ADI - "As required." P/FM

When directed by the pilot, the flight mechanic will turn on ADI pump switches and check that the ADI warning lights go off, fuel flow drops approximately 100 pounds and ADI pressure is 27 to 32 psi. After the ADI check, the copilot returns the throttles to 800 rpm and monitors engine.

NOTE

With cooling turbine operating, maintain minimum of 1200 rpm on engines No. 1 and 4 to prevent stalling of supercharger.

NOTE

A visual inspection should be made for any leakage of fluids, excessive vibrations, and condition of the engines.

*16. Booster pumps - LOW.

*17. Trim tabs - "Set." P

*18. Radios - "Set." P-CP

Copilot sets radios as directed.

19. APU/GTPU - As required.

*20. Safety belt/shoulder harness - "Fastened." P-CP-FM

*21. Flight instruments - "Checked." P-CP-N-FM

The flight mechanic will state the magnetic compass reading.

*22. Crew briefing - "Completed." P-CP-N-FM

The pilot will brief the copilot and other crew members to assure that they know their duties during takeoff. The following items will be covered:

- a. The required performance data from the takeoff and landing data card.
- b. Pattern (or IFR route) to be followed in case an immediate landing is necessary after becoming airborne.
- c. Air traffic control clearance and route to be followed after normal departure.
- d. Any hazardous terrain or obstacles that might be a factor on departure.

The following standard items shall also be covered by a crew making its first flight together:

- a. If emergency occurs before refusal speed is attained, the takeoff will be discontinued. Any crew member may call, "Reject" up to refusal speed. The pilot will initiate the abort.
- b. In case of an emergency, the copilot and flight mechanic will accomplish the necessary procedures at the pilot's command.

*23. Anticollision/navigation lights - Set.

*24. Windows - "Closed and locked." P-CP

25. Engine Runup check - "Completed." FM

BEFORE TAKEOFF.

1. Controls - "Unlocked and free." P

Check full displacement of elevator, rudder, and aileron controls for freedom of movement.

2. Mixtures - AUTO RICH and locked.

3. Anti-icing and deicing equipment - "Climatic." P; "Set." FM

4. Antiskid brakes - "ON." P

5. Cowl flaps - Set plus 3 degrees.

6. AIMS/IFF - "Set." CP

7. Before Takeoff check - "Completed." FM

TAKEOFF.**PILOT****COPILOT****FLIGHT MECHANIC**

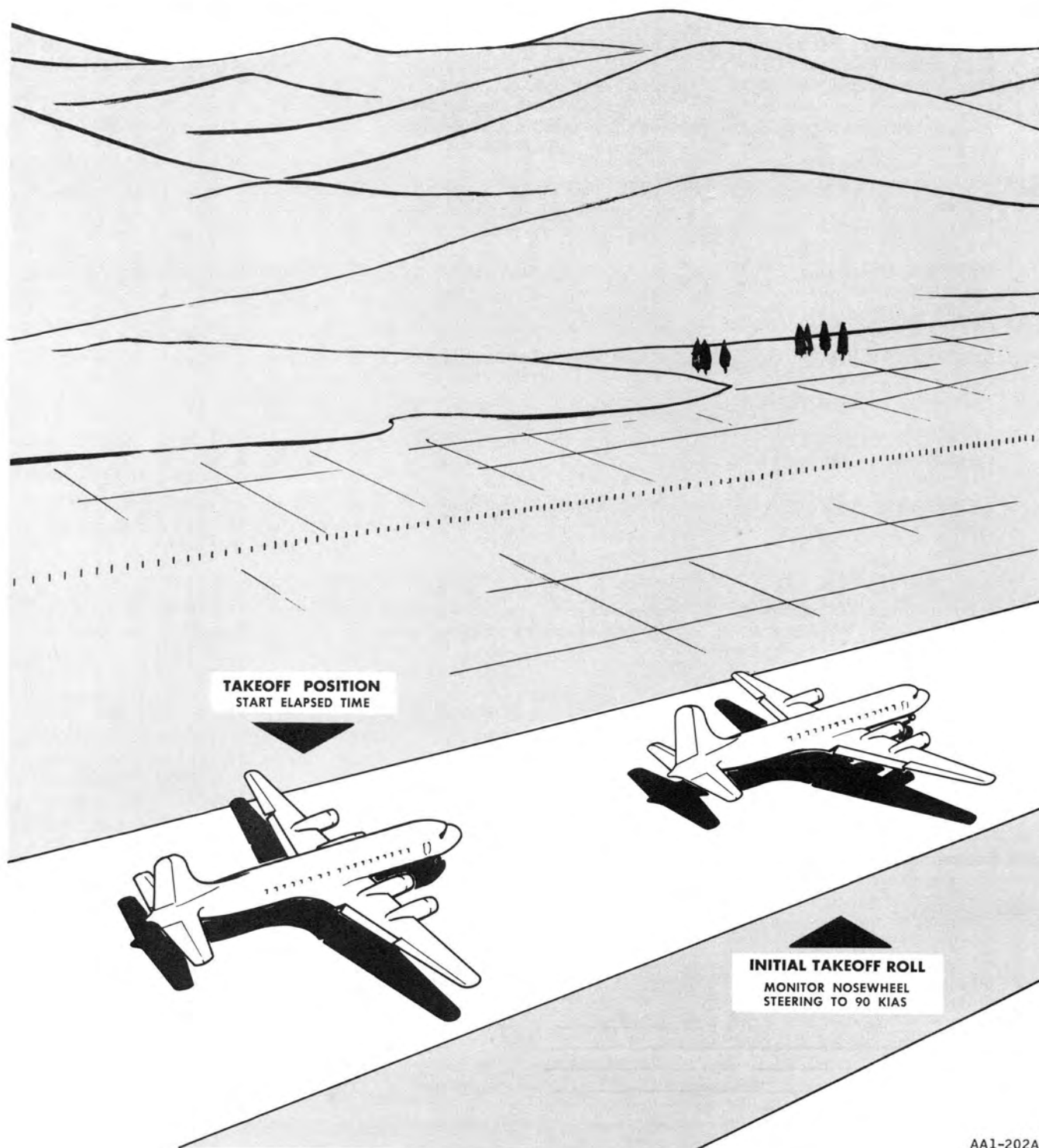
- | | | |
|---|--|---|
| a. Advances throttles, monitors with right hand, and calls for maximum power (figure 2-4). | a. Steadies control column, starts elapsed-time clock when takeoff roll begins. | a. Follows up on throttles and adjusts to maximum power. Observes engine instruments. |
| b. Maintain directional control by use of nosewheel steering until rudder becomes effective (approximately 60 knots). Passing 90 knots, shift left hand to yoke and apply slight back pressure. | b. Monitors acceleration by using copilot's airspeed. If airspeed is satisfactory at acceleration checkpoint, remains silent. If acceleration is below designated tolerance, he calls, "REJECT." | b. Monitors engine instruments and calls, "REJECT," when an unacceptable condition is observed. |
| c. Flies aircraft off runway at liftoff speed. | c. Calls "LIFTOFF" when liftoff speed is reached on copilot's instruments. | c. Monitors engine instruments. |
| d. When safely airborne, call out "GEAR UP" and give proper visual signal. | d. Acknowledges and actuates gear lever, stating, "Gear coming up." | d. Monitors engine instruments and gear retraction. |
| e. At 140 KIAS with positive climb established, calls, "Flaps up;" "Landing lights." | e. Acknowledges and actuates flap lever stating, "Flaps coming up." | e. Monitors engine instruments. Landing lights OFF and retracted. |
| f. At 150 KIAS calls out, "METO power; ADI off." | f. Monitors flight instruments. | f. Acknowledges and establishes METO power. Turns ADI off. |
| g. At 160 KIAS, calls "Climb power." | g. Monitors flight instruments. | g. Acknowledges and establishes climb power from appropriate performance chart. |
| h. Climbs at 160 KIAS and after reaching 1000 feet above field elevation, calls for After Takeoff Climb check (1000 feet minimum except when remaining in closed traffic pattern). | h. Scans outside area for other aircraft and completes radio communications as required. | h. Completes After Takeoff Climb checklist. States, "After Takeoff Climb check completed." |

PRECAUTIONS.

- | | |
|--|--|
| a. <u>Manifold pressure or BMEP, whichever is reached first, will be the governing factor in establishing maximum power. As the aircraft accelerates during takeoff and up to the point of the first power reduction, increasing ram effect will cause a rise in manifold pressure of from 1 to 3 inches. This increase in manifold pressure</u> | sure should be anticipated to prevent exceeding limitations. |
| b. The copilot will report immediately any failure or suspected malfunction of flight instruments, particularly the pilot's instruments. | |
| c. If obstacle clearance is necessary immediately after takeoff, climb at liftoff speed until obstacles are cleared (gear up, flaps 20 degrees). | |

TAKEOFF AND

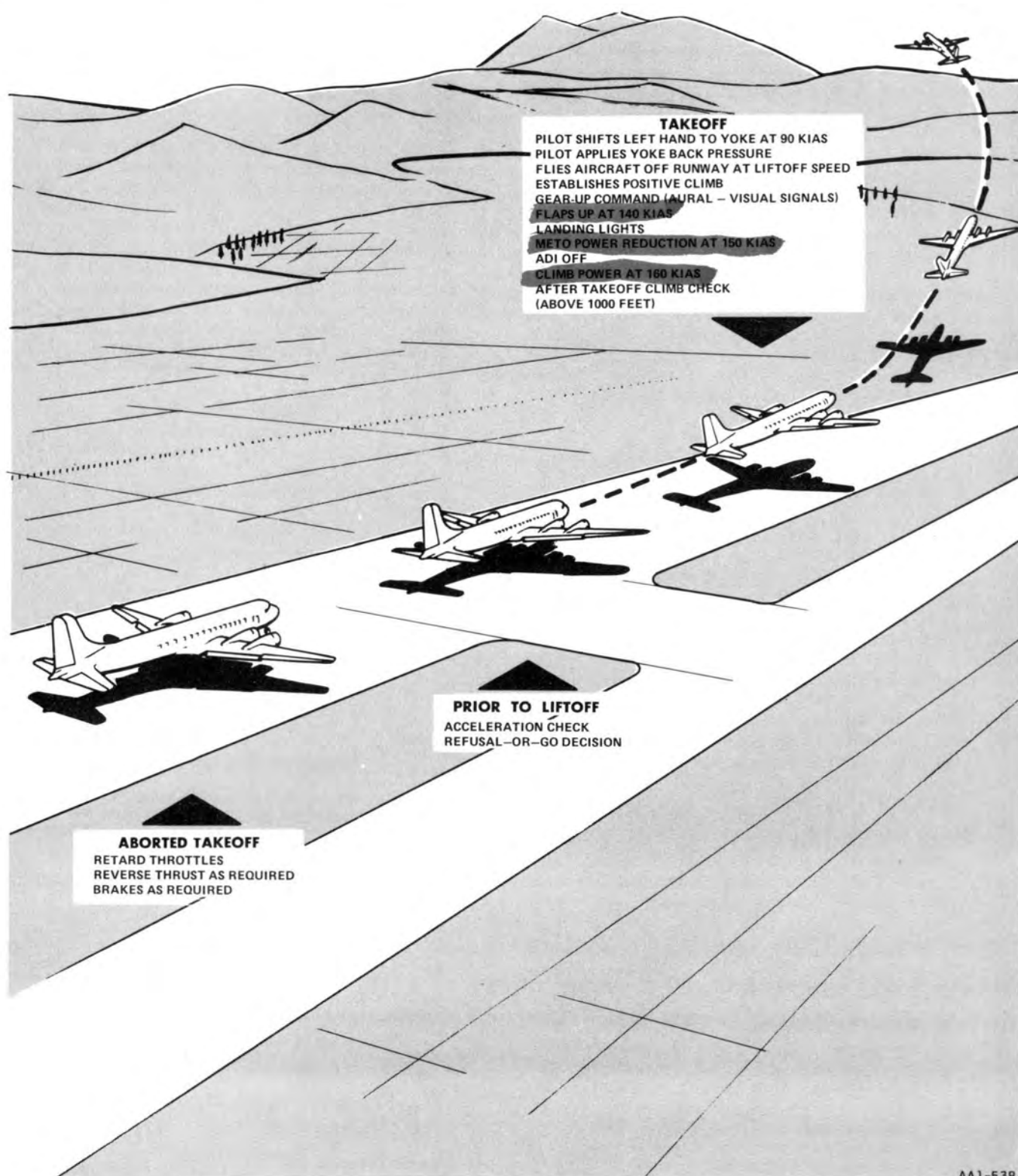
NOTE: PERFORMANCE FIGURES BASED ON
107,000 POUNDS WITH WATER
INJECTION.



AA1-202A

Figure 2-4 (Sheet 1 of 2)

CLIMB-Typical



AA1-538

Figure 2-4 (Sheet 2 of 2)