SECTION 4
NORMAL PROCEDURES

TABLE OF CONTENTS

Introduction ........................................................................................................... 3
Airspeeds For Normal Operation ........................................................................ 3
Preflight Preparation .......................................................................................... 4
Preflight Inspection .......................................................................................... 4
  1. Cockpit .................................................................................................... 5
  2. Cowling, Engine Propeller ..................................................................... 5
  3. Forward Fuselage, Right ...................................................................... 6
  4. Right Wing, Leading Edge ..................................................................... 6
  5. Right Wing, Trailing Edge .................................................................... 6
  6. Aft Fuselage, Right .............................................................................. 7
  7. Empennage ............................................................................................ 7
  8. Aft Fuselage, Left ................................................................................. 7
  9. Left Wing, Trailing Edge ...................................................................... 8
 10. Left Wing, Leading Edge .................................................................... 8
 11. Fwd Fuselage, Left ............................................................................. 8
Before Starting Engine ..................................................................................... 9
Starting Engine ................................................................................................. 10
  Before Taxiing ............................................................................................. 12
  Taxiing ....................................................................................................... 12
  Before Takeoff (Before Engine Run-up) .................................................. 13
  Engine Run-up .......................................................................................... 13
  Before Takeoff (After Engine Runup) ........................................................ 15
Takeoff ............................................................................................................... 16
  Normal Takeoff .......................................................................................... 16
  Soft/Rough Field Takeoff ......................................................................... 16
  Short Field Takeoff ................................................................................... 17
  Climb ......................................................................................................... 17
  Cruise ....................................................................................................... 17
  Descent ..................................................................................................... 17
  Before Landing .......................................................................................... 18
Landing .............................................................................................................. 18
  Normal Landing ........................................................................................ 18
  Short Field Landing .................................................................................. 18
  Soft/Rough Field Landing .................................................................... 19
  Crosswind Landing ................................................................................ 19
  Balked Landing ........................................................................................ 19
  After Landing ........................................................................................... 20
Shutdown ......................................................................................................... 20
Securing Airplane ............................................................................................ 21
INTRODUCTION
This section includes amplified information and procedures considered essential for normal operation of the Liberty XL-2 airplane.

WARNING

DO NOT ENTER OR EXIT THE AIRCRAFT WITH THE PROPELLER RUNNING.

AIRSPEEDS FOR NORMAL OPERATION
Unless otherwise noted, the following speeds are based on a maximum weight of 1653 lbs, and may be used for any lesser weights.

✓ Takeoff Rotation Speed (Vr):
  ➤ Flaps 20° 55 KIAS
✓ Takeoff Climb Speed: (To clear a 50 ft obstacle)
  ➤ Flaps 20° (At 50 ft) 65 KIAS
✓ Enroute Climb, Flaps Up:
  ➤ Normal, sea level 80 - 85 KIAS
  ➤ Normal, 10,000 feet MSL 75 - 80 KIAS
✓ Best Rate of Climb Speed, Flaps Up (V_y):
  ➤ Sea level 80 KIAS
  ➤ 10,000 ft 75 KIAS
✓ Best Angle of Climb Speed, Flaps Up (V_x):
  ➤ Sea level 70 KIAS
  ➤ 10,000 ft 65 KIAS
✓ Normal Approach Speed:
  ➤ Flaps Up 80 - 85 KIAS
  ➤ Flaps 20° 70 - 75 KIAS
  ➤ Flaps 30° 65 - 70 KIAS
✓ Balked Landing Climb Speed:
  ➤ Wide Open Throttle, Flaps 30° 65 KIAS
✓ Maximum Recommended Turbulent Air Penetration (V_a):
  ➤ 1653 lbs 100 KIAS
✓ Maximum Demonstrated 90° Crosswind Velocity:
  ➤ Takeoff or Landing 15 Knots

NOTE
The maximum demonstrated crosswind velocity reflects the greatest crosswind available during certification tests and is not considered a limitation.
PREFLIGHT PREPARATION

Airplane................AIRWORTHY, REQD DOCUMENTS ON BOARD
Weather .................................................................SUITABLE
Baggage ..............................WEIGHED, STOWED, SECURE
Weight and C.G. ..........................WITHIN LIMITS
Navigation.......................................................PLANNED
Charts and Navigation Equipment..........................ON BOARD
Performance and Range ..................COMPUTED AND SAFE

PREFLIGHT INSPECTION

Preflight inspection path, starting in cockpit, then out and around aircraft in clockwise direction, ending back in the cockpit.

Figure 1 - Walk Around

CAUTION

Do not step on flap when entering or leaving the cockpit. Use the footstep if installed.
1. Cockpit

1. Seat Belt .RELEASE, IF USED TO SECURE CONTROL STICK
2. Airplane Flight Manual ......................... AVAILABLE IN AIRPLANE
3. Required Airplane Documents ........ AVAILABLE IN AIRPLANE
4. Weight and Balance .............................................. CHECK
5. Ignition Switch .......................................................... OFF
6. FADEC PWR A and B switches ......................... OFF
7. Avionics Master Switch ........................................ OFF
8. Fuel Boost Pump Mode Switch .............. OFF (center position)
9. Battery Master Switch ........................................... ON
10. Fuel Quantity Indicator ....... CHECK (fuel sufficient for flight)
11. Pitot Heat Switch ................................................. ON
12. Flaps ................................................................ EXTEND
13. Fuel Selector Valve .......... ON (check positive ON safety detent)
14. Lights .................................................. CHECK OPERATION
15. Pitot Blade ............................................................... CHECK WARM
16. Stall Warning Vane ...... PULL UP (check audible voice warning)
17. Pitot Heat Switch .................................................... OFF
18. Battery Master Switch ............................................. OFF
19. Fire Extinguisher ................................ AVAILABLE IN AIRPLANE
20. Emergency Egress Hammer ......... AVAILABLE IN AIRPLANE

**WARNING**

ENSURE THAT THE AIRPLANE MASTER SWITCH, FADEC PWR A AND B SWITCHES, AND IGNITION SWITCH ARE OFF BEFORE APPROACHING OR MOVING PROPELLER. ENGINE MAY START IF ANY OR ALL OF ABOVE SWITCHES ARE ON AND PROPELLER IS MOVED.

2. Cowling, Engine Propeller

1. Upper and Lower Cowling Fasteners ..................... SECURE
2. Propeller .................................................. CONDITION, SECURITY
3. Spinner .................................................. CONDITION, SECURITY
4. Landing Light .............................................. CONDITION, SECURITY
5. Nose Landing Gear Leg ...................................... CONDITION
6. Nose Wheel Steering Bearing .............................. SECURITY
7. Nose Wheel Tire ............................................ CONDITION, PROPER INFLATION
8. Engine Drains and Breathers ...... NO EVIDENCE OF LEAKAGE
9. Engine Air Filter .............................................. CONDITION
10. Cowling Right/Left Air Intakes ......................... CLEAR
11. Alternator Belt ................................................ CONDITION, TENSION
12. Engine Oil ............................................. CHECK QUANTITY (5 QTS MIN)
13. Oil Filler Cap ................................................ SECURE
14. Oil Door ..................................................... CLOSE, SECURE
15. Exhaust .................................................. CONDITION, SECURITY
16. Windshield ............................................ CONDITION, CLEANLINESS

3. Forward Fuselage, Right
   1. Right Cabin Air Intake .................................................. CLEAR
   2. Fwd Fuselage .................................................. CONDITION, CHECK FOR DAMAGE
   3. Right Cabin Door, Window, Vent Window .................. CONDITION
   4. Right Door Gas Spring, Fwd .................. CONDITION, SECURITY
   5. Right Door Seals, Latch Plate, Fwd .......... CHECK CONDITION
   6. Fuselage Belly Faring .............................. FASTENERS SECURE
   7. Right Main Landing Gear Leg .......................... CONDITION
   8. Brakes .................................................. CONDITION, NO EVIDENCE OF LEAKS
   9. Tire .......................................................... CONDITION, PROPER INFLATION
  10. Chocks .......................................................... REMOVE

4. Right Wing, Leading Edge
   1. Wing/Fuselage Fairing ............................................. CONDITION
   2. Leading Edge, Right Wing .................................. CONDITION
   3. Stall Strip .......................................................... SECURE
   4. Right Wing (top and underside) ....................... CONDITION
   5. Inspection Access Panels (underside) ... FASTENERS SECURE
   6. Tie-down Rope .................................................. REMOVE
   7. Right Wingtip .................................................. CONDITION, SECURITY
   8. Strobe, Position/Nav Light, and Lens ... CONDITION, SECURITY

5. Right Wing, Trailing Edge
   1. Aileron .................................................. CONDITION, FREE AND CORRECT MOVEMENT
   2. Aileron Hinges (2) ................................................. CONDITION, SECURITY
   (hinge pins secured at both ends)
   3. Aileron Mass Balance Weights ..... UNOBSTRUCTED, SECURE
   4. Aileron Pushrod .................................. CHECK JAMNUT SECURE
   5. Flap .......................................................... CONDITION
   6. Flap Slot .......................................................... CLEAR
   7. Flap Hinges (3) .................................. CONDITION, SECURITY (cotter pins installed)
6. Aft Fuselage, Right

1. Fuselage Belly Faring ....................................... FASTENERS SECURE
2. Marker Beacon Antenna (underside) .......... CONDITION, SECURITY
3. Right Door Gas Spring, Aft ......................... CONDITION, SECURITY
4. Right Door Seals, Latch Plate, Aft .............. CHECK CONDITION
5. Aft Fuselage ...................................... CONDITION, CHECK FOR DAMAGE
6. Fuselage Mounted Antennas (top) ...... CONDITION, SECURITY

7. Empennage

1. Right Stabilator Pin, Nut, and Cotter Pins .......... SECURED
2. Right Stabilator ........................................ CONDITION, SECURITY, FREE MOVEMENT
3. Right Trim Tab ........................................ CONDITION, SECURITY, FREE AND CORRECT MOVEMENT
   (hinge pins secured at both ends)
4. Vertical Stabilizer ................................................ CONDITION
5. Rudder Gust Lock ................................................ REMOVE
6. Rudder ....................................................... CONDITION, FREE MOVEMENT
7. Rudder Trim Tab (if installed) ................. CONDITION, SECURITY
8. Rudder Hinge and Pin ............................. CONDITION, SECURITY
   (hinge pin secured at both ends)
9. Tie-down Rope ............................................. REMOVE
10. Left Trim Tab ........................................ CONDITION, SECURITY, FREE AND CORRECT MOVEMENT
    (hinge pins secured at both ends)
11. Left Stabilator ........................................ CONDITION, SECURITY, FREE MOVEMENT
12. Left Stabilator, Pin, Nut, and Cotter Pins ................. SECURED

**NOTE**

Stabilator trim tab should deflect in same direction as stabilator trailing edge (upward when trailing edge is deflected upward, downward when trailing edge is deflected downward) and should be fairied with trailing edge when stabilator is in mid-range position.

8. Aft Fuselage, Left

1. Aft Fuselage ........................................ CONDITION, CHECK FOR DAMAGE
2. Fuel Filler Cap ........................................ CLOSED AND LOCKED
3. Left Door Gas Spring, Aft ......................... CONDITION, SECURITY
4. Left Door Seals, Latch Plate, Aft ............... CHECK CONDITION
5. Fuel Vent (underside) ..................................... UNOBSRTUCTED
6. Transponder Antenna (underside) ................. CONDITION, SECURITY
7. Outside Air Temp Probe (underside) .............. ATTACHMENT
8. Fuselage Belly Fairing .................................. FASTENERS SECURE
9. Left Wing, Trailing Edge

1. Flap .......................................................... CONDITION
2. Flap Slot .................................................. CLEAR
3. Flap Hinges (3) .................................. CONDITION, SECURITY (cotter pins installed)
4. Aileron .......... CONDITION, FREE AND CORRECT MOVEMENT
5. Aileron Trim Tab (if installed) ........ CONDITION, SECURITY
6. Aileron Hinges (2) ................................. CONDITION, SECURITY (hinge pins secured at both ends)
7. Aileron Mass Balance Weights ....... UNOBRSTUCTED, SECURE
8. Aileron Pushrod ....................... CHECK JAMNUT SECURE
9. Left Wingtip ........................................... CONDITION, SECURITY
10. Strobe, Position/Nav Light, and Lens... CONDITION, SECURITY

10. Left Wing, Leading Edge

1. Leading Edge, Left Wing........................ .. CONDITION
2. Left Wing (top and underside) .................. CONDITION
3. Pitot-Static Blade ................... CONDITION, OPENINGS CLEAR
4. Inspection Access Panels (underside) ... FASTENERS SECURE
5. Tie-down Rope ........................................ REMOVE
6. Stall Warning Vane ......................... CONDITION, SECURITY
7. Stall Strip .................................................. SECURE
8. Wing/Fuselage Fairing .......................... CONDITION

11. Fwd Fuselage, Left

1. Left Main Landing Gear Leg ....................... CONDITION
2. Brakes ........................................ CONDITION, NO EVIDENCE OF LEAKS
3. Tire .................................................. CONDITION, PROPER INFLATION
4. Chocks ................................................. REMOVE
5. Fuselage Belly Fairing ......................... FASTENERS SECURE
6. Fuel Tank Sump ...... SAMPLE, CHECK FOR CONTAMINATION
7. Fuel Strainer ............... SAMPLE, CHECK FOR CONTAMINATION
8. Left Cabin Air Intake .................................. CLEAR
9. Left Cabin Door, Window, Vent Window .... CONDITION
10. Left Door Gas Spring, Fwd ................. CONDITION, SECURITY
11. Left Door Seals, Latch Plate, Fwd ....... CHECK CONDITION
BEFORE STARTING ENGINE

Avionics master switch must be off during engine start to prevent possible damage to the avionics.

1. Preflight Inspection .................................................. COMPLETE
2. Passenger Briefing................................................... COMPLETE
3. Seat Belts and Harnesses ............................ ADJUST, SECURE
4. Rudder Pedals .................................................. ADJUST AS DESIRED
5. Doors .......................................................... AS REQUIRED
6. Fuel Boost Pump Mode Switch................................. OFF
7. Brakes ............................................................ SET PARKING BRAKE
8. Fuel Selector Valve .................................................. CHECK ON
9. Circuit Breakers .......................................................... CHECK IN
10. Avionics Master Switch ....................................................... OFF
11. Ignition Switch .......................................................... OFF
12. All Other Electrical Switches .............................................. OFF

In calm wind conditions, doors may be left open for engine start and taxi at low power only. Close doors if there are gusty wind conditions or if high power is required for taxi.
STARTING ENGINE

If the aircraft has been exposed to temperatures below -7°C / 20°F for more than 2 hours, preheating is required. If engine does not start on the first try, allow 2 minutes for the starter to cool before trying again.

**WARNING**

*IF AN ABNORMAL HSA INDICATION IS OBSERVED DURING ANY OPERATIONAL CHECK, TAKEOFF IS PROHIBITED. ABORT FLIGHT AND NOTIFY MAINTENANCE. DO NOT ATTEMPT FLIGHT UNTIL THE DISCREPANCY HAS BEEN CORRECTED.*

1. Brakes .................................... CONFIRM PARKING BRAKE ON
2. Fuel Selector Valve ............................................................ VERIFY ON
3. Master (battery and alternator) Switch ................................. ON
4. Strobes ............................................................................ ON
5. FADEC PWR A and B Switches ......................................... ON

The FADEC PWR A and B switches are “lever lock” type. The switch handle must be pulled slightly away from the instrument panel to allow the switch to be moved.

6. Fuel Boost Pump Mode Switch ........................................... ON
7. Fuel Boost Pump .................................................. LISTEN FOR OPERATION
8. Fuel Boost Pump Mode Switch ........................................... AUTO
9. Fuel Boost Pump .... LISTEN AND CONFIRM NOT RUNNING
10. HSA FUEL PUMP Annunciator ............... CHECK OFF (see note)

The FUEL PUMP annunciator lamp may illuminate and the Fuel Boost Pump may operate after starting the engine, when the Fuel Boost Pump Mode Switch is in the AUTO position, until automatically deactivated by the FADEC System when the engine’s fuel pressure reaches acceptable levels.
11. Throttle.............................................................FULL FORWARD
12. WOT Annunciator ..................................................... CHECK ON
13. Throttle.......................................................... 1/2 INCH FORWARD OF IDLE
14. WOT Annunciator ................................................... CHECK OFF
15. Propeller Area ......................................................... CLEAR

When the Fuel Boost Pump Switch is in the AUTO position, the Fuel Boost Pump will automatically be activated by the FADEC System when the ignition switch is placed in the L or BOTH position in the next step.

16. Ignition Switch................................................................. R (right)
17. Fuel Boost Pump .................................................. CONFIRM NOT RUNNING
18. Ignition Switch................................................................. L (left)
19. Fuel Boost Pump ..................................................... LISTEN FOR OPERATION
20. Ignition Switch ................................................................. BOTH
21. Fuel Boost Pump ..................................................... LISTEN FOR OPERATION

A minimum of 30 psi of fuel pressure is required to ensure that fuel lines to the injectors are purged of air.

22. Voltmeter................................................................. CHECK (11.7 V MIN)
23. Ignition Switch................................................................. START
   (10 sec. maximum, release after engine starts)
24. Starter Engaged Annunciator Lamp ......................... EXTINGUISHED
25. Throttle ................................................................. RETARD, SET 1000 - 1200 RPM

Avoid prolonged operation between 850-900 RPM in the idle position.

26. Oil Pressure ....................... CONFIRM RISING (within 30 sec. max.)
27. Ammeter ......................... CONFIRM DROPPING CURRENT
   (within 30 sec. max.)

Both the oil pressure and ammeter reading may be in the Yellow arc area right after engine start. However, both should be within the Green arc after a maximum of 30 seconds. A drop in the current reading is an indication of the battery coming up to full charge.
28. Engine Instruments ................................. CHECK & MONITOR
29. HSA Test Button ................................... PUSH, CHECK ALL LAMPS ILLUMINATED
30. HSA Test Button .............................................................. RELEASE
31. HSA Lights .............................................. CHECK EXTINGUISHED (see note)

**NOTE**

*If airplane has not been operated for an extended period, HSA PPWR FL and/or EBAT FL annunciators may remain illuminated before, and for a few minutes after engine start.*

32. Aircraft Annunciator Test Button ................................. PUSH

CHECK ALL LAMPS ILLUMINATED

33. Aircraft Annunciator Test Button ................................. RELEASE

34. Aircraft Annunciator Lights .................. CHECK EXTINGUISHED

**Before Taxiing**

1. HSA ........................................... CHECK ALL LAMPS EXTINGUISHED
2. Avionics Master Switch .............................................. ON
3. Radios/Avionics .............................................. AS REQUIRED
4. Lights .......................................................... AS REQUIRED
5. Air Vents ................................................... AS REQUIRED
6. Flaps ......................................................... UP (0°)
7. Seatbelts ..................................................... SECURED

**Taxiing**

When taxiing, maintain directional control using differential braking. Use the rudder only to assist during gusty wind conditions.

**NOTE**

*During all ground operations, a hand must be kept near the throttle controls. Keep all taxi speeds to a minimum. Never exceed a brisk walking pace.*

1. Parking Brake .............................................................. OFF
2. Brakes ................................................................. TEST
3. Taxi ................................................................. SLOWLY
4. Heading Indicator and Turn Coordinator ................. CHECK
5. Flight Controls ........ USE CROSSWIND TAXIING TECHNIQUE
Before Takeoff (Before Engine Run-up)

**WARNING**

*IF ANY ABNORMAL HSA INDICATIONS ARE OBSERVED AFTER ALL OPERATIONAL CHECKS ARE COMPLETE, TAKEOFF IS PROHIBITED. ABORT FLIGHT AND NOTIFY MAINTENANCE. DO NOT ATTEMPT FLIGHT UNTIL THE DISCREPANCY HAS BEEN CORRECTED.*

During cold weather operations the engine should be properly warmed up before takeoff. The minimum oil temperature for takeoff is 75°F.

1. Flight Controls........................................ FREE AND CORRECT
2. Lights .......................................................... AS REQUIRED
3. Ignition Switch ............................................. VERIFY BOTH
4. Flight Instruments ........................................ SET, CHECK

Engine Run-up

**WARNING**

*IF ANY RPM DROP OR ENGINE SURGE OCCURS DURING THE FADEC PRIMARY (PWR A) AND SECONDARY (PWR B) POWER TRANSFER CHECK, TAKEOFF IS PROHIBITED. ABORT FLIGHT AND NOTIFY MAINTENANCE. DO NOT ATTEMPT FLIGHT UNTIL DISCREPANCY HAS BEEN CORRECTED.*

1. Stop into Wind................................................. CLEAR BEHIND
2. Parking Brake ........ ON, CONFIRM AIRCRAFT NOT ROLLING
3. All VM1000FX Indicators ................................. CHECK IN GREEN
4. Canopy Doors (Both FWD pins and both AFT pins). ENGAGED AND SECURE
Prior to engine run-up and take-off, ensure the aircraft’s doors are properly closed, latched, and locked, by verifying each door pin (2 in each door) is seated in its respective receptacle by completing the following: for each door, with the door closed and handle in the fully closed position, apply pressure to the lower door frame (not the window glass), near the forward pin and then near the aft pin. If the applicable pin is seated in its receptacle, the door should not move and there should be no gap between the lower edge of the door and the fuselage. If movement or a gap is present, open and shut the door until each pin is properly seated in its receptacle.

5. Throttle ........................................................APPROX 1700 RPM
6. Fuel Boost Pump Mode Switch .............................................OFF
7. HSA FUEL PMP Annunciator ............................................CHECK ON
8. Fuel Pressure .................................................................CHECK IN LIMITS
9. Fuel Boost Pump Mode Switch ............................................AUTO
10. HSA FUEL PMP Annunciator ............................................CHECK OFF
11. FADEC PWR B Switch .....................................................OFF
12. Engine .........................................................CHECK, NO RPM DROP OR SURGE
13. HSA EBAT FAIL Annunciator ............................................CHECK ON
14. FADEC PWR B Switch .....................................................ON
15. FADEC PWR A Switch .....................................................OFF
16. Engine .........................................................CHECK, NO RPM DROP OR SURGE
17. HSA PPWR FAIL Annunciator ............................................CHECK ON
   (EBAT FAIL may illuminate)
18. FADEC PWR A Switch .....................................................ON
19. Ignition Switch ............................................................R (right) POSITION
20. RPM Drop .................................................................10 RPM MIN, 150 RPM MAX
21. HSA ..........................................................CHECK FADEC CAUTION ILLUMINATED
22. Ignition Switch ............................................................BOTH
23. HSA ..........................................................CHECK ALL LAMPS EXTINGUISHED
24. Ignition Switch ............................................................L (left) POSITION
25. RPM Drop .................................................................10 RPM MIN, 150 RPM MAX
26. HSA ..........................................................CHECK FADEC CAUTION ILLUMINATED
27. Ignition Switch ............................................................BOTH
28. HSA ..........................................................CHECK ALL LAMPS EXTINGUISHED
If the ignition switch is in the R or L position for more than 30 seconds, the red FADEC WARN annunciator will illuminate. This does not represent a fault condition, but is a reminder to the pilot to return the ignition switch to the BOTH position before flight.

29. Engine Instruments/Ammeter .................. RECHECK, MONITOR
30. Alternate Induction Air Knob ............................................. PULL ON
31. Alternate Induction Air Knob ...................................... PUSH OFF
32. Throttle ..................................................................................... IDLE

Before Takeoff (After Engine Run-up)

1. Flaps ........................................................................................................... 20°
2. Fuel Boost Pump Mode Switch ............ VERIFY, AUTO

The normal configuration during all stages of flight for the Fuel Boost Pump Mode Switch is the AUTO position.

3. Trim .................................. SET FOR TAKEOFF POSITION
4. Fuel Selector Valve .................................. VERIFY, ON
5. Radios and Avionics .......................................................... SET
6. Transponder ........................................................................................ ALT
7. Canopy Doors (Both FWD pins and both AFT pins) .... ENGAGED AND SECURE

Prior to engine run-up and take-off, ensure the aircraft’s doors are properly closed, latched, and locked, by verifying each door pin (2 in each door) is seated in its respective receptacle by completing the following: for each door, with the door closed and handle in the fully closed position, apply pressure to the lower door frame (not the window glass), near the forward pin and then near the aft pin. If the applicable pin is seated in its receptacle, the door should not move and there should be no gap between the lower edge of the door and the fuselage. If movement or a gap is present, open and shut the door until each pin is properly seated in its receptacle.

8. Seat Belts & Harness .................................................. SECURE
9. Parking Brake Lever ....................................................... OFF
10. Brakes ........................................................................................ RELEASE
TAKEOFF

Power check: check the full-throttle engine operation early in the takeoff roll. The engine should run smoothly and all engine instruments should read in the green. Abort takeoff at any sign of rough engine operation, sluggish acceleration, or abnormal annunciation.

Flap setting: the only approved flap setting for takeoff is 20°. Takeoff data is only presented for flaps 20°.

Soft or rough field takeoffs are performed by lifting the airplane off the ground as soon as practical. For takeoff on gravel or other rough surface apply throttle slowly to allow for debris to be blown behind the propeller rather than pulled up into it.

Normal Takeoff

1. Flaps .......................................................................................
20°
2. Heading Indicator .......................... VERIFY RUNWAY HEADING
3. Throttle .............................................................FULL FORWARD
4. WOT Annunciator................................. CHECK ON
5. Engine Instruments .................................CHECK
6. Brakes .............RELEASE (steer with rudder only/heels on floor)
7. Elevator Control ......................LIFT NOSE WHEEL (at 59 KIAS)
8. Climb Airspeed...............................ATTAIN (69 KIAS or greater)
9. Flaps ...................................... UP (at safe altitude and airspeed)
10. Climb Speed............................... ACCELERATE TO 80 - 85 KIAS

Soft/Rough Field Takeoff

1. Flaps .......................................................................................
20°
2. Heading Indicator .......................... VERIFY RUNWAY HEADING
3. Throttle .............................................................FULL FORWARD
4. WOT Annunciator................................. CHECK ON
5. Steer ..................................WITH RUDDER ONLY/HEELS ON FLOOR
6. Elevator Control .......................HOLD FULL BACK PRESSURE
7. When Airplane is Airborne ............. REDUCE PITCH ATTITUDE
   ACCELERATE TO 65 KIAS
8. Climb Speed ..............................65 KIAS (to clear 50 ft obstacle)
9. Flaps ...................................... UP (at safe altitude and airspeed)
10. Climb Speed ............................... ACCELERATE TO 80 - 85 KIAS
Short Field Takeoff

1. Flaps ................................................................. 20°
2. Heading Indicator .................. VERIFY RUNWAY HEADING
3. Throttle ..................... FULL FORWARD WHILE HOLDING BRAKES
4. WOT Annunciator .................. CHECK ON
5. Engine Instruments .............................. CHECK
6. Brakes ................. RELEASE (steer with rudder only/heels on floor)
7. Elevator Control ................. SLIGHT NOSE UP
8. Rotate ............................................. 55 KIAS
9. Climb Airspeed .......... ATTAIN 65 KIAS (to clear 50 ft obstacle)
10. Flaps .................................. UP (at safe altitude and airspeed)
11. Climb Speed .................. ACCELERATE TO 80 - 85 KIAS

Climb

1. Normal climbs are performed with full power and flaps up (0°) at speeds 5 - 10 knots faster than best rate-of-climb speed.
2. Throttle ............................................. FULL FORWARD
3. WOT Annunciator .................. CHECK ON
4. Airspeed ............................................. 80 - 85 KIAS

Cruise

Never cruise at full throttle (WOT annunciator illuminated). This will prevent engine fuel flow optimization and significantly reduce range and may cause engine and propeller over-speed.

1. Airspeed...MAINTAIN POWER WITHIN LIMITS UNTIL CRUISE AIRSPEED IS ATTAINED
2. Power ............................................. SET CRUISE POWER
3. Elevator Trim ................................ ADJUST AS REQUIRED
4. Fuel Boost Pump Mode Switch ................. CHECK AUTO
5. Engine Instruments and HSA .................. CHECK OFTEN

For optimum fuel economy, do not change the throttle position for approximately five minutes after setting cruise power.

Descent

1. Power ............................................. AS REQUIRED
2. Elevator Trim ................................ ADJUST AS REQUIRED
3. Engine Instruments and HSA .................. CHECK OFTEN
NORMAL PROCEDURES
XL-2 Airplane

Before Landing
1. Fuel Quantity.............................................CHECK SUFFICIENT
2. Fuel Boost Pump Mode Switch....................CHECK AUTO
3. Brakes ...................................... VERIFY PARKING BRAKE OFF
4. Fuel Selector Valve ..................................VERIFY ON
5. Flaps ......................................AS DESIRED (at 86 KIAS or less)
6. Lights............................................. AS REQUIRED
7. Seat Belts and Harnesses ..................................SECURED

LANDING

Final approach airspeed is based on flap setting, stall speed at that flap setting, and other considerations such as traffic flow, airfield length, and possible wind gust factors.

The throttle should be smoothly reduced to idle upon entering the landing flare, and touchdown should be made at minimum speed on the main wheels. Maintaining back pressure to hold the nose up will provide considerable aerodynamic braking, and will reduce wear on the main gear and brakes. Lower the nose gently to the runway when it begins to settle on its own accord, then use minimum required braking. Be prepared to use differential braking for ground steering.

Normal Landing
1. Airspeed .....................................................80 KIAS (flaps up)
2. Flaps ........................................ AS DESIRED (at 86 KIAS or less)
3. Airspeed .............................................75 KIAS (flaps 10°)
4. Airspeed Short Final..................................65 KIAS (flaps 30°)
5. Touchdown........................................ MAIN WHEELS FIRST
6. Elevator Control ................................ LOWER NOSE GENTLY
7. Brakes ......................................................AS REQUIRED

Short Field Landing
1. Flaps ..................................................30°
2. Airspeed .............................................65 KIAS UNTIL FLARE
3. Power ..................................................IDLE (after clearing any obstacles)
4. Touchdown........................................ MAIN WHEELS FIRST
5. Brakes ..................................................APPLY HEAVILY
6. Elevator Control ................................. MAINTAIN BACK PRESSURE
Soft/Rough Field Landing

1. Flaps ....................................................................................... 30°
2. Power .......................................................... AS REQUIRED FOR SOFT TOUCHDOWN
3. Touchdown .......................................................... MAIN WHEELS FIRST
4. Elevator Control .......................................................... MAINTAIN BACK PRESSURE
   (to hold the nose wheel off the ground as long as possible)
5. Brakes ..................................................................................... MINIMUM REQUIRED

Crosswind Landing

1. Airspeed ............................................................................. 80 KIAS
   (flaps up, during initial alignment with runway)
2. Flaps ....................................................................................... 20°
3. Final Approach ................. USE CRAB OR SIDE SLIP TECHNIQUE AS REQUIRED
4. Airspeed ............................................................................. 70 KIAS
5. During Landing ....................... LOWER UPWIND WING
   (to compensate for drift)
   (use rudder to align heading with runway)
6. Touchdown .......................................................... UPWIND MAIN WHEEL FIRST
7. Elevator Control .......................................................... LOWER NOSE GENTLY
8. Aileron, Rudder .......................................................... AS REQUIRED TO MAINTAIN STRAIGHT ROLLOUT
9. Brakes .......................................................... STEER WITH BRAKES AS RUDDER BECOMES INEFFECTIVE

Balked Landing

1. Throttle .......................................................... FULL OPEN
2. Airspeed ............................................................................. 65 KIAS
3. Positive Rate of Climb .................................................. ATTAIN/MAINTAIN
4. Flaps ..................................................................................... RAISE SLOWLY TO 10°
5. Best Angle of Climb Speed ..................................... ESTABLISH (69 KIAS)
6. Flaps (at safe altitude) .................................................. FULL UP
7. Climb Speed (at safe altitude) ................................ ACCELERATE 80 - 85 KIAS
After Landing

1. Flaps ................................ RETRACT (after clearing the runway)
2. Throttle ............................................ AS REQUIRED FOR TAXI

**NOTE**

Allow a minimum of 3 minutes at or near idle before engine shutdown. (Low speed taxi may be considered engine idle operation.)

3. Anti-collision/Navigation Lights ............................................... OFF
4. Landing Light ................................................................. AS REQUIRED
5. Trim ......................................................... BACK TO TAKEOFF POSITION

**NOTE**

During all ground operations, a hand must be kept near the throttle controls. Keep all taxi speeds to a minimum. Never exceed a brisk walking pace.

**SHUTDOWN**

**WARNING**

*IF ANY ABNORMAL HSA INDICATIONS ARE OBSERVED AFTER FLIGHT, OR IF THE ENGINE LOSES RPM WHEN THE FUEL BOOST PUMP MODE SWITCH IS TURNED OFF, ADVISE MAINTENANCE IMMEDIATELY. FURTHER FLIGHT IS PROHIBITED UNTIL THE DISCREPANCY HAS BEEN CORRECTED.*

1. HSA ............................................. CHECK ALL ANNUNCIATORS OFF
2. Fuel Boost Pump Mode Switch ............................................... OFF
3. Avionics Master Switch ....................................................... OFF
4. Ignition Switch ................................................................. OFF
5. FADEC PWR A and B Switches ............................................ OFF
6. All Light Switches .............................................................. OFF
7. All Electrical Switches .......................................................... OFF
8. Master Switch ................................................................. OFF

**CAUTION**

*If the secondary power (PWR B) switch is left in the ON position after engine shutdown, the aircraft’s backup battery will discharge and be drained of power. Be sure to turn the primary (PWR A) and secondary (PWR B) switches OFF after engine shutdown.*
SECURING AIRPLANE

1. Wheels .......................................................... CHOICKED
2. Control Stick ........................................... SECURED BY SEAT BELT
3. Pitot Cover ................................................ ON (as required)
4. Rudder Gust Lock ......................................... ON (as required)
5. Wings and Tail ............................................. TIE-DOWN
6. Doors ................................................... CLOSED AND LATCHED