SECTION 4
NORMAL PROCEDURES

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SYSTEMS CHECKS

AMPLIFIED PROCEDURES

INTRODUCTION

Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated with optional systems can be found in Section 9.

WARNING

THERE IS NO SUBSTITUTE FOR PROPER AND COMPLETE PREFLIGHT PLANNING HABITS AND THEIR CONTINUAL REVIEW IN MINIMIZING EMERGENCIES. BE THOROUGHLY KNOWLEDGEABLE OF HAZARDS AND CONDITIONS WHICH REPRESENT POTENTIAL DANGERS, AND BE AWARE OF THE CAPABILITIES AND LIMITATIONS OF THE AIRPLANE.

SPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 8000 pounds and may be used for any lesser weight. However, to achieve the performance specified in Section 5 for takeoff distance, climb performance, and landing distance, the speed appropriate to the particular weight must be used.

Takeoff:
- Normal Climb Out . . . . . 85-95 KIAS
- Short Field Takeoff, Flaps 20°, Speed at 50 Feet . . . . . 82 KIAS
- Type II, Type III or Type IV Anti-ice Fluid Takeoff (Flaps 0°) . 89 KIAS

Enroute Climb, Flaps Up:
- Cruise Climb . . . . . 115-125 KIAS
- Best Rate of Climb, Sea Level . . . . . 106 KIAS
- Best Rate of Climb, 10,000 Feet . . . . . 103 KIAS
- Best Rate of Climb, 20,000 Feet . . . . . 93 KIAS
- Best Angle of Climb . . . . . 86 KIAS

Landing Approach:
- Normal Approach, Flaps Up . . . . . 95-110 KIAS
- Normal Approach, Flaps 30° . . . . . 78-85 KIAS
- Short Field Approach, Flaps 30° . . . . . 78 KIAS

Balked Landing:
- Takeoff Power, Flaps 20° . . . . . 80 KIAS

Maximum Recommended Turbulent Air Penetration Speed:
- 8000 Lbs . . . . . 150 KIAS
- 6300 Lbs . . . . . 134 KIAS
- 4600 Lbs . . . . . 115 KIAS

Maximum Demonstrated Crosswind Velocity:
- Takeoff or Landing . . . . . 20 KNOTS

PREFLIGHT INSPECTION WARNINGS

WARNING

- **VISUALLY CHECK AIRPLANE FOR GENERAL CONDITION DURING WALK-AROUND INSPECTION AND REMOVE ANY INLET, EXIT OR EXHAUST COVERS. IF CARGO POD IS INSTALLED, CHECK ITS INSTALLATION FOR SECURITY DURING THE WALK-AROUND INSPECTION. USE OF A LADDER WILL BE NECESSARY TO GAIN ACCESS TO THE WING FOR VISUAL CHECKS, REFUELING OPERATIONS, CHECKS OF THE STALL WARNING AND PITOT HEAT, AND TO REACH OUTBOARD FUEL TANK SUMP DRAINS.**
- **IT IS THE PILOT'S RESPONSIBILITY TO ENSURE THAT THE AIRPLANE'S FUEL SUPPLY IS CLEAN BEFORE FLIGHT. ANY TRACES OF SOLID CONTAMINANTS SUCH AS RUST, SAND, PEBBLES, DIRT, MICROBES, AND BACTERIAL GROWTH OR LIQUID CONTAMINATION RESULTING FROM WATER, IMPROPER FUEL TYPE, OR ADDITIVES THAT ARE NOT COMPATIBLE WITH THE FUEL OR FUEL SYSTEM COMPONENTS MUST BE CONSIDERED HAZARDOUS. CAREFULLY SAMPLE FUEL FROM ALL FUEL DRAIN LOCATIONS DURING EACH PREFLIGHT INSPECTION AND AFTER EVERY REFUELING.**
- **IT IS ESSENTIAL IN COLD WEATHER TO REMOVE EVEN SMALL ACCUMULATIONS OF FROST, ICE, SLUSH, OR SNOW FROM WING, TAIL, AND CONTROL SURFACES (EXERCISE CAUTION TO AVOID DISTORTING VORTEX GENERATORS ON HORIZONTAL STABILIZER WHILE DEICING). ALSO, MAKE SURE THAT CONTROL SURFACES CONTAIN NO INTERNAL ACCUMULATIONS OF ICE OR DEBRIS. PRIOR TO ANY FLIGHT IN ICING CONDITIONS, CHECK THAT PITOT/STATIC SOURCE AND STALL WARNING HEATERS ARE WARM TO TOUCH WITHIN 30 SECONDS WITH APPROPRIATE SWITCHES ON. IF THESE REQUIREMENTS ARE NOT PERFORMED, AIRCRAFT PERFORMANCE WILL BE DEGRADED TO A POINT WHERE A SAFE TAKEOFF AND CLIMB OUT MAY NOT BE POSSIBLE.**
- **IF A NIGHT FLIGHT IS PLANNED, CHECK OPERATION OF ALL LIGHTS, AND MAKE SURE A FLASHLIGHT IS AVAILABLE AND PROPERLY STOWED.**

CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

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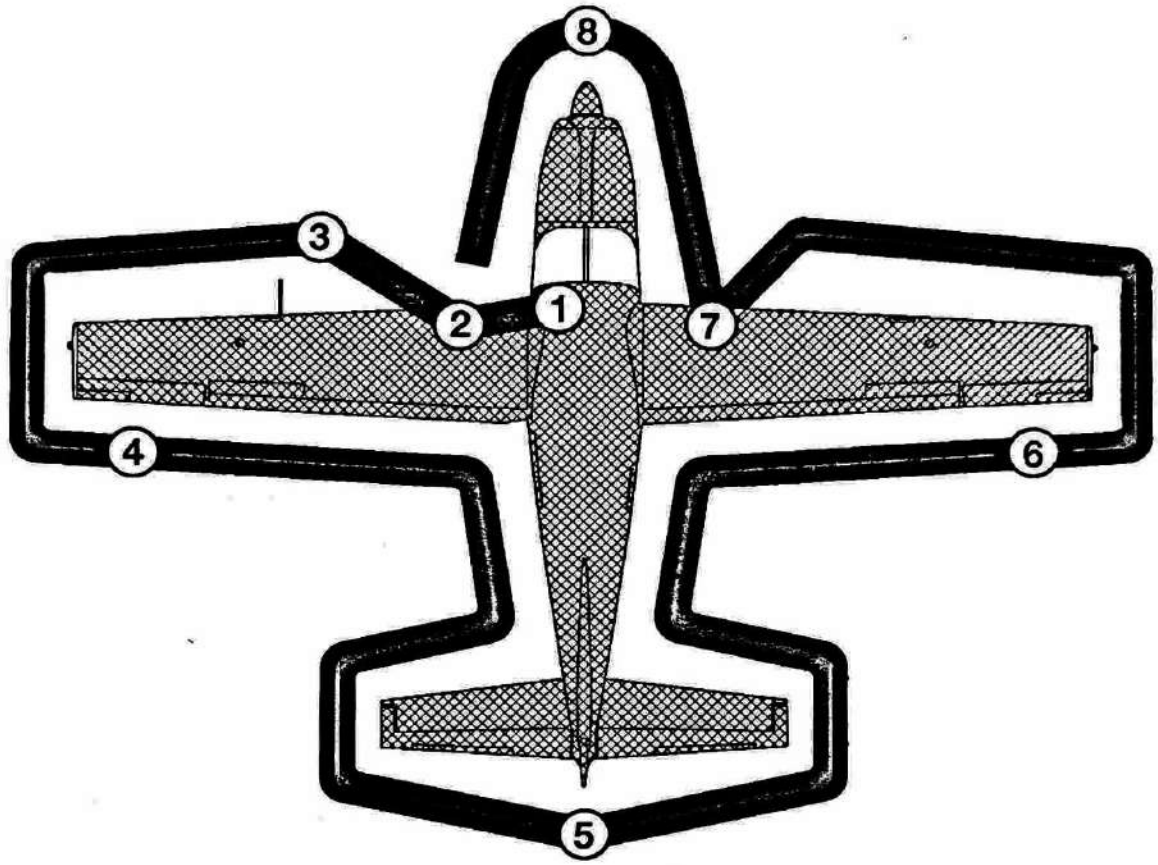

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Figure 4-1. Preflight Inspection

① CABIN

1. Pilot's Operating Handbook and Other Required Documents - AVAILABLE IN THE AIRPLANE.
2. Control Locks - REMOVE (DISENGAGE rudder lock, if installed).
3. Parking Brake - SET.

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PREFLIGHT INSPECTION (Continued)

CABIN (Continued)

4. All Switches - OFF.
5. All Circuit Breakers - IN.
6. Static Pressure Alternate Source Valve - OFF.
7. Inertial Separator T-Handle - NORMAL.
8. Standby Flap Motor Switch (Overhead) - GUARDED NORM.
9. Oxygen Supply Pressure (if installed) - CHECK.
10. Oxygen Masks (if installed) - CHECK AVAILABLE.
11. Fuel Selector Valves - CHECK ON and FEEL AGAINST STOPS.
12. Fuel Totalizer (if installed) - RESET as required.
13. Radar (if installed) - OFF.
14. Air Conditioner (if installed) - OFF.
15. Inverter Switch (if installed) - OFF.
16. Bleed Air Heat Switch - OFF.
17. Emergency Power Lever - NORMAL, and if applicable, copper witness wire present and intact.
18. Trim Controls - SET.
19. Fuel Shutoff - ON.
20. Cabin Heat Firewall Shutoff Control - CHECK IN.
21. Battery Switch - ON.
22. Avionics Power Switch No. 2 - ON. Check audibly that avionics cooling fan is operating.
23. Avionics Power Switch No. 2 - OFF.
24. Fuel Quantity Indicators - CHECK QUANTITY.
25. Wing Flaps - FULL DOWN.
26. Pitot/Static and Stall Heat Switches - ON for 30 seconds, then OFF. (Ensure pitot/static tube covers are removed.)
27. Battery Switch - OFF.

② LEFT SIDE

1. Fuel Reservoir Drain (bottom of fuselage or left side of cargo pod) - DRAIN (using fuel sampler) to check for water, sediment, and proper fuel before each flight and after each refueling. If water is observed, take further samples until clear. Take repeated samples from **all** fuel drain points (see Section 7 Fuel System Schematic for all **nine** drain locations) until all contamination has been removed.

NOTE

Properly dispose of fuel samples from all fuel drains. Aviation turbine fuel will deteriorate asphalt surfaces.

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PREFLIGHT INSPECTION (Continued)

LEFT SIDE (Continued)

2. Main Landing Gear - CHECK proper tire inflation and condition of gear.
3. Inboard Fuel Tank Sump and External Sump Quick-Drain Valves - DRAIN (using fuel sampler) to check for water, sediment, and proper fuel before each flight and after each refueling. If water is observed, take further samples until clear. Take repeated samples from **all** fuel drain points until all contamination has been removed.

③ LEFT WING Leading Edge

WARNING

IT IS ESSENTIAL IN COLD WEATHER TO REMOVE EVEN SMALL ACCUMULATIONS OF FROST, ICE, SNOW, OR SLUSH FROM THE WING AND CONTROL SURFACES. TO ASSURE COMPLETE REMOVAL OF CONTAMINATION, CONDUCT A VISUAL AND TACTILE INSPECTION (UP TO TWO FEET BEHIND THE DEICING BOOT AT ONE LOCATION ALONG THE WING SPAN AS A MINIMUM). ALSO, MAKE SURE THE CONTROL SURFACES CONTAIN NO INTERNAL ACCUMULATIONS OF ICE OR DEBRIS. PRIOR TO ANY FLIGHT IN ICING CONDITIONS, CHECK THAT PITOT/ STATIC SOURCE AND STALL WARNING HEATERS ARE WARM TO TOUCH AFTER TURNING PITOT/ STATIC AND STALL HEAT SWITCHES ON FOR 30 SECONDS, THEN OFF. MAKE SURE THE PITOT COVERS ARE REMOVED.

1. Wing Strut De-ice Boots (if installed) - CHECK for tears, abrasion and cleanliness.
2. Wing Tie-Down - DISCONNECT.
3. Wing De-ice Boots (if installed) - CHECK for tears, abrasion and cleanliness.
4. Stall Warning Vane - CHECK freedom of movement, audible warning and warmth. (For airplanes equipped with a stall warning ground disconnect switch, check audible warning with elevator control off forward stop).
5. Pitot/Static Tube - CHECK security, openings for stoppage and warmth.
6. Landing and Taxi Lights - CHECK condition and cleanliness.

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PREFLIGHT INSPECTION (Continued)

LEFT WING Leading Edge (Continued)

7. Fuel Quantity - VISUALLY CHECK. See Figure 4-2 for fuel quantity versus depth if using Universal XL Fuel Gage.
8. Fuel Filler Cap - SECURE.
9. Outboard Fuel Tank Sump Quick-Drain Valve (if installed and airplane parked with one wing low on a sloping ramp) - DRAIN (using fuel sampler) to check for water, sediment and proper fuel before each flight and after each refueling. If water is observed, take further samples until clear. Take repeated samples from **all** fuel drain points until all contamination has been removed.
10. Navigation and Strobe Lights - CHECK for condition and cleanliness.

④ LEFT WING Trailing Edge

1. Fuel Tank Vent - CHECK for obstructions.
2. Aileron and Servo Tab - CHECK condition and security.
3. Static Wicks - CHECK condition.
4. Spoiler - CHECK condition and security.
5. Flap - CHECK condition and security.

⑤ EMPENNAGE

WARNING

IT IS ESSENTIAL IN COLD WEATHER TO REMOVE EVEN SMALL ACCUMULATIONS OF FROST, ICE, SNOW, OR SLUSH FROM THE TAIL AND CONTROL SURFACES. TO ASSURE COMPLETE REMOVAL OF CONTAMINATION, CONDUCT A VISUAL AND TACTILE INSPECTION OF ALL SURFACES. EXERCISE CAUTION TO AVOID DISTORTING VORTEX GENERATORS ON THE HORIZONTAL STABILIZER WHILE DEICING. ALSO, MAKE SURE THE CONTROL SURFACES CONTAIN NO INTERNAL ACCUMULATIONS OF ICE OR DEBRIS.

1. Baggage - CHECK SECURE through cargo door.

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Universal XL Fuel Gage	Fuel Quantity	
Gage Scale	Gal	Lbs
0.50	87.4	585
0.75	91.1	610
1.00	94.7	634
1.25	98.2	658
1.50	101.8	682
1.75	105.2	705
2.00	108.6	727
2.25	111.9	750
2.50	115.1	771
2.75	118.3	793
3.00	121.5	814
3.25	124.5	834
3.50	127.5	855
3.75	130.5	874
4.00	133.4	894
4.25	136.2	912
4.50	138.9	931
4.75	141.6	949
5.00	144.3	966
5.25	146.8	984
5.50	149.3	1000
5.75	151.8	1017
6.00	154.1	1033
6.25	156.5	1048
6.50	158.7	1063
6.75	160.9	1078
7.00	163.0	1092
7.25	165.0	1106

Generic Fuel Gage-Inches	Fuel Quantity	
Inches	Gal	Lbs
0.50	88.4	592
0.75	92.6	621
1.00	96.7	648
1.25	100.8	675
1.50	104.7	702
1.75	108.6	727
2.00	112.4	753
2.25	116.1	778
2.50	119.7	802
2.75	123.2	826
3.00	126.7	849
3.25	130.1	871
3.50	133.4	894
3.75	136.6	915
4.00	139.7	936
4.25	142.8	956
4.50	145.7	976
4.75	148.6	996
5.00	151.4	1015
5.25	154.1	1033
5.50	156.8	1050
5.75	159.3	1068
6.00	161.8	1084
6.33	165.0	1105

Figure 4-2*. Measured Fuel Depth vs. Fuel Quantity

PREFLIGHT INSPECTION (Continued)

EMPENNAGE (Continued)

2. Cargo Door - CLOSED and LATCHED.
3. Tail Tie-Down - DISCONNECT.
4. De-ice Boots (if installed) - CHECK for tears, abrasion and cleanliness.
5. Rudder Gust Lock (if installed) - DISENGAGE.
6. Control Surfaces and Elevator Trim Tabs - CHECK condition, security, freedom of movement and tab position.
7. Static Wicks - CHECK condition.
8. Passenger Entry Door (if installed) - CLOSED and LATCHED.

⑥ RIGHT WING Trailing Edge

1. Flap - CHECK condition and security.
2. Spoiler - CHECK condition and security.
3. Aileron and Trim Tab - CHECK condition and security.
4. Static Wicks - CHECK condition.
5. Fuel Tank Vent - CHECK for obstructions.

⑦ RIGHT WING Leading Edge

WARNING

IT IS ESSENTIAL IN COLD WEATHER TO REMOVE EVEN SMALL ACCUMULATIONS OF FROST, ICE, SNOW OR SLUSH FROM THE WING AND CONTROL SURFACES. TO ASSURE COMPLETE REMOVAL OF CONTAMINATION, CONDUCT A VISUAL AND TACTILE INSPECTION OF ALL SURFACES. ALSO, MAKE SURE THE CONTROL SURFACES CONTAIN NO INTERNAL ACCUMULATIONS OF ICE OR DEBRIS.

1. Navigation and Strobe Lights - CHECK condition and cleanliness.
2. Fuel Quantity - VISUALLY CHECK. See Figure 4-2 for fuel quantity versus depth if using Universal XL Fuel Gage.
3. Fuel Filler Cap - SECURE.

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

RIGHT WING Leading Edge (Continued)

4. Outboard Fuel Tank Sump Quick-Drain Valve (if installed and airplane parked with one wing low on a sloping ramp) - DRAIN (using fuel sampler) to check for water, sediment and proper fuel before each flight and after each refueling. If water is observed, take further samples until clear. Take repeated samples from **all** fuel drain points until all contamination has been removed.
5. Pitot/Static Tube - CHECK security, openings for stoppage and warmth.
6. Landing and Taxi Lights - CHECK condition and cleanliness.
7. Wing De-ice Boots (if installed) - CHECK for tears, abrasion and cleanliness.
8. Radome (if installed) - CHECK condition and security.
9. Wing Tie-Down - DISCONNECT.
10. Wing Strut De-ice Boots (if installed) - CHECK for tears, abrasion, and cleanliness.
11. Inboard Fuel Tank Sump and External Sump Quick-Drain Valves - DRAIN (using fuel sampler) to check for water, sediment, and proper fuel before each flight and after each refueling. If water is observed, take further samples until clear. Take repeated samples from **all** fuel drain points until all contamination has been removed.
12. Main Landing Gear - CHECK proper tire inflation and condition of gear.

⑧ NOSE

WARNING

IT IS ESSENTIAL IN COLD WEATHER TO REMOVE EVEN SMALL ACCUMULATIONS OF FROST, ICE, SNOW, OR SLUSH FROM THE PROPELLER BLADES AND SPINNER, AND THE AIR INLETS (STARTER/ GENERATOR, OIL COOLER AND ENGINE INLETS). TO ASSURE COMPLETE REMOVAL OF CONTAMINATION, CONDUCT A VISUAL AND TACTILE INSPECTION OF ALL SURFACES.

1. Exhaust Cover (if installed) - REMOVE.
2. Cowling - OPEN right side of upper cowling for access and CHECK condition and security.
3. Engine (right side) - CHECK for general condition, security, fuel and oil leakage and damage to any components.

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

NOSE (Continued)

WARNING

AVOID TOUCHING THE OUTPUT CONNECTORS OR COUPLING NUTS OF IGNITION EXCITOR WITH BARE HANDS.

4. Battery - CHECK condition and security, and power cables secure.
5. Exhaust System - CHECK condition, security, cracks, distortion and damage.
6. Cowling - CLOSE and LATCH right side.
7. Air Inlet Covers - REMOVE.
8. Air Inlets - CHECK starter/generator blast tube opening and oil cooler inlet (right) and engine induction air inlet (left) for condition, restrictions, and debris.
9. Propeller Anchor - REMOVE.
10. Propeller - CHECK blades for nicks, gouges, looseness of material, erosion, cracks and debonds. Also, inspect blades for lightning strike (darkened area near tips), Anti-ice boots for security, and evidence of grease and oil leaks.
11. Propeller Spinner - CHECK condition and security.
12. Nose Wheel Strut and Tire - CHECK for condition, red overtravel indicator block and cable intact (not fallen into view), and proper inflation of tire.
13. Cowling - OPEN left side of upper cowling for access and CHECK condition and security.
14. Engine (left side) - CHECK for general condition, security, fuel and oil leakage and damage to any components.
15. Inertial Separator Bypass Outlet - CHECK CLOSED and duct free of debris.
16. Oil Dipstick/Filler Cap - CHECK oil level, then check dipstick/filler cap SECURE. Fill to within 1 1/2 quarts of MAX HOT or MAX COLD (as appropriate) on dipstick. Markings indicate U.S. quarts low if oil is hot.

WARNING

MAKE SURE THE OIL DIPSTICK CAP IS SECURELY LATCHED DOWN. OPERATING THE ENGINE WITH LESS THAN THE RECOMMENDED OIL LEVEL AND WITH THE DIPSTICK CAP UNLATCHED WILL RESULT IN EXCESSIVE OIL LOSS AND EVENTUAL ENGINE STOPPAGE.

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PREFLIGHT INSPECTION (Continued)

NOSE (Continued)

17. Fuel Filter - CHECK FUEL FILTER BYPASS FLAG for proper location (flush).
18. Brake Fluid Reservoir - CHECK LEVEL.
19. Cowling - CLOSE and LATCH left side.
20. Fuel Filter Quick-Drain Valve - DRAIN (using fuel sampler) to check for water, sediment, and proper fuel before each flight and after each refueling. If water is observed, take further samples until clear. Take repeated samples from **all** fuel drain points until all contamination has been removed.
21. Fuel Drain Can - DRAIN until empty.
22. Fuel Pump Drain Reservoir (if installed) - DRAIN until empty.

BEFORE STARTING ENGINE

1. Preflight Inspection and Weight and Balance Check - COMPLETE.
2. All Key Locking Cabin Doors - UNLOCKED (except cargo configured aircraft. Cargo door may be locked if no passengers occupy cargo section of airplane).
3. Passenger Briefing - COMPLETE.
4. Cabin Doors - LATCHED (check aft doors).
5. Left Crew Door Lock Override Knob and Right Crew Door Inside Lock - UNLOCKED.
6. Parking Brake - SET (pull control out and depress brake pedals).
7. Control Lock - REMOVED and DISENGAGED.
8. Seats, Seat Belts, Shoulder Harnesses - ADJUST and SECURE (crew seat lock indicator pin(s) extended).

WARNING

FAILURE TO CORRECTLY USE SEAT BELTS AND SHOULDER HARNESSES COULD RESULT IN SERIOUS OR FATAL INJURY IN THE EVENT OF AN ACCIDENT.

9. Switches - OFF.
10. Ignition Switch - NORM.
11. Circuit Breakers - CHECK IN.
12. Fuel Tank Selectors - LEFT ON, RIGHT ON.
13. Radar (if installed) - OFF.
14. Air Conditioner (if installed) - OFF.

(Continued Next Page)

BEFORE STARTING ENGINE (Continued)

15. Bleed Air Heat Switch - OFF.

CAUTION

LEAVING THE BLEED AIR HEAT SWITCH ON MAY RESULT IN A HOT START OR ABNORMAL ACCELERATION TO IDLE.

16. Cabin Heat Mixing Air Control - FLT-PUSH.
17. Emergency Power Lever - NORMAL.
18. Power Lever - IDLE.
19. Propeller Control Lever - MAX (full forward).
20. Fuel Condition Lever - CUTOFF.
21. Rudder Lock (if installed) - TURN and PUSH to unlock.
22. Fuel Shutoff - ON (push in).
23. Battery Switch - ON.
24. Wing Flaps - UP.
25. No Smoking/Seat Belt Sign Switches (if installed) - ON as required/desired.
26. Fire Detector Test Switch - PRESS-TO-TEST.
27. Annunciator Panel Lamp Test Switch - PRESS-TO-TEST (all annunciator lamps illuminate and both fuel selectors off warning horns are activated).
28. Annunciator Panel Day/Night Switch - SET.

STARTING ENGINE (BATTERY START)

1. Battery Switch - ON.
2. Volt/Ammeter - CHECK (24 volts minimum).
3. Emergency Power Lever - NORMAL (full aft) position (check EMERGENCY POWER LEVER annunciator OFF).

CAUTION

MAKE SURE THAT THE EMERGENCY POWER LEVER IS IN THE NORMAL (FULL AFT) POSITION OR AN OVER-TEMPERATURE CONDITION WILL RESULT DURING ENGINE START.

4. Propeller Area - CLEAR.

(Continued Next Page)

STARTING ENGINE (BATTERY START) (Continued)

5. Fuel Boost Switch - ON and OBSERVE.
   A. AUX FUEL PUMP ON Annunciator - ON.
   B. FUEL PRESS LOW Annunciator - OFF.
   C. No fuel flow.
6. Starter Switch - START and OBSERVE.
   A. IGNITION ON Annunciator - CHECK ON.
   B. Engine Oil Pressure - CHECK for indication.
   C. Ng - STABLE (12% minimum).
7. Fuel Condition Lever - LOW IDLE and OBSERVE.
   A. Fuel Flow - CHECK for 90 to 140 pph.
   B. ITT - MONITOR (1090°C maximum, limited to 2 seconds).

CAUTION

- IF ITT CLIMBS RAPIDLY TOWARDS 1090°C, BE PREPARED TO RETURN THE FUEL CONDITION LEVER TO CUTOFF.
- UNDER HOT OAT AND/OR HIGH GROUND ELEVATION CONDITIONS, IDLE ITT MAY EXCEED MAXIMUM IDLE ITT LIMITATION OF 685°C. INCREASE Ng AND/OR REDUCE ACCESSORY LOAD TO MAINTAIN ITT WITHIN LIMITS.

   C. Ng - 52% MINIMUM.
8. Starter Switch - OFF (check STARTER ENERGIZED annunciator OFF).
9. Engine Instruments - CHECK.
10. Generator - CHECK GENERATOR OFF annunciator OFF and battery charging.
11. Fuel Boost Switch - NORM (check AUX FUEL PUMP ON annunciator OFF).
12. Avionics No. 1 and No. 2 Power Switches - ON.
13. Navigation Lights and Flashing Beacon (if installed) - ON as required.
14. Suction Gage - CHECK.
15. Cabin Heating, Ventilating and Defrosting Controls - AS DESIRED.
16. Radios - AS REQUIRED.

STARTING ENGINE (AUXILIARY POWER START)

(24-28 Volt, Minimum 800 Amp and Maximum 1700 Amp Capacity)

1. Battery Switch - ON.
2. External Power Switch - OFF.
3. Volt/Ammeter - CHECK (20 volts minimum).
4. Battery Switch - OFF.
5. Auxiliary Power Unit - ENGAGE; then ON.
6. External Power Switch - BUS.
7. Volt/Ammeter - CHECK 24 -28.5 Volts.
8. Battery Switch - ON.
9. External Power Switch - STARTER.
10. Emergency Power Lever - NORMAL (check EMERGENCY POWER LEVER annunciator OFF).

CAUTION

MAKE SURE THAT THE EMERGENCY POWER LEVER IS IN THE NORMAL POSITION OR AN OVER-TEMPERATURE CONDITION WILL RESULT DURING ENGINE START.

11. Propeller Area - CLEAR.
12. Fuel Boost Switch - ON and OBSERVE.
    A. AUX FUEL PUMP ON Annunciator - ON.
    B. FUEL PRESS LOW Annunciator - OFF.
    C. No fuel flow.

CAUTION

IF THE AUXILIARY POWER UNIT DROPS OFF THE LINE, INITIATE ENGINE SHUTDOWN.

13. Starter Switch - START and OBSERVE.
    A. IGNITION ON Annunciator - CHECK ON.
    B. Engine Oil Pressure - CHECK for indication.
    C. N_g - STABLE (12% minimum).

(Continued Next Page)

STARTING ENGINE (AUXILIARY POWER START) (Continued)

14. Fuel Condition Lever - LOW IDLE and OBSERVE.
    A. Fuel Flow - CHECK for 90 to 140 pph.
    B. ITT - MONITOR (1090°C maximum, limited to 2 seconds).

CAUTION

- IF ITT CLIMBS RAPIDLY TOWARDS 1090°C, BE PREPARED TO RETURN THE FUEL CONDITION LEVER TO CUTOFF.
- UNDER HOT OAT AND/OR HIGH GROUND ELEVATION CONDITIONS, IDLE ITT MAY EXCEED MAXIMUM IDLE ITT LIMITATION OF 685°C. INCREASE Ng AND/OR REDUCE ACCESSORY LOAD TO MAINTAIN ITT WITHIN LIMITS.

    C. Ng - 52% MINIMUM.
15. Starter Switch - OFF (check STARTER ENERGIZED annunciator OFF).
16. Engine Instruments - CHECK.
17. External Power Switch - OFF.
18. Auxiliary Power Unit - OFF, then DISENGAGE.
19. Generator - CHECK GENERATOR OFF annunciator OFF and battery charging.
20. Fuel Boost Switch - NORM (check AUX FUEL PUMP ON annunciator OFF).
21. Avionics No. 1 and No. 2 Power Switches - ON.
22. Navigation Lights and Flashing Beacon (if installed) - ON as required.
23. Suction Gage - CHECK.
24. Cabin Heating, Ventilating and Defrosting Controls - AS DESIRED.
25. Radios - AS REQUIRED.

TAXIING

1. Brakes - CHECK.

NOTE

For improved brake life, propeller BETA range may be used during taxi with minimum blade erosion up to the point where Ng increases (against beta range spring).

2. Flight Instruments - CHECK.

BEFORE TAKEOFF

1. Parking Brake - SET.
2. Seats, Seat Belts, Shoulder Harnesses - CHECK SECURE.

WARNING

FAILURE TO CORRECTLY USE SEAT BELTS AND SHOULDER HARNESSES COULD RESULT IN SERIOUS OR FATAL INJURY IN THE EVENT OF AN ACCIDENT.

3. Flight Controls - FREE and CORRECT.
4. Flight Instruments - CHECK and SET.
5. Fuel Boost Switch - RECHECK NORM.
6. Fuel Tank Selectors - RECHECK BOTH ON.
7. Fuel Quantity - RECHECK.
8. Fuel Shutoff - RECHECK FULLY ON.
9. Elevator, Aileron, and Rudder Trim Controls - SET for takeoff.
10. Power Lever - 400 FT-LBS.
    A. Suction Gage - CHECK.
    B. Volt/Ammeter - CHECK and return selector to BATT position.
    C. Inertial Separator - CHECK. Turn control counterclockwise, pull to BYPASS position and check torque drop; move control back to NORMAL position and check that original torque is regained.
    D. Engine Instruments - CHECK (See Section 2, Limitations for minimum oil temperature required for flight).
11. Overspeed Governor - CHECK (stabilized at 1750 ±60 RPM) (See Systems Checks).

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BEFORE TAKEOFF (Continued)

12. Power Lever - IDLE.
13. Quadrant Friction Lock - ADJUST.
14. Standby Power (if installed) - CHECK (See Systems Checks).
15. Autopilot (if installed) - PREFLIGHT TEST (See Systems Checks).
16. Known Icing System (if installed) - PREFLIGHT COMPLETE (See Systems Checks) prior to any flight in icing conditions.
17. Pitot/Static Heat - ON when OAT is below 4°C (39°F).
18. Ice Protection (if installed)- AS REQUIRED.
19. Avionics and Radar (if installed) - CHECK and SET.
20. GPS/NAV Switch - SET.
21. Strobe Lights - AS REQUIRED.
22. Annunciators - EXTINGUISHED or considered.
23. Wing Flaps - SET for takeoff (10° normal, 20° short field).
24. Cabin Heat Mixing Air Control - FLT-PUSH.
25. Window - CLOSE.
26. Brakes - RELEASE.
27. Fuel Condition Lever - HIGH IDLE.
28. Standby Power Switch (if installed) - ON (Standby Power INOP Annunciator - OFF).

WARNING

- **WHEN GROUND ICING CONDITIONS ARE PRESENT, A PRE-TAKEOFF VISUAL AND TACTILE CHECK SHOULD BE CONDUCTED BY THE PILOT IN COMMAND WITHIN 5 MINUTES OF TAKEOFF, PREFERABLY JUST PRIOR TO TAXIING ONTO THE ACTIVE RUNWAY.**
- **TAKEOFF IS PROHIBITED WITH ANY FROST, ICE, SNOW, OR SLUSH ADHERING TO THE WINGS, HORIZONTAL STABILIZER, VERTICAL STABILIZER, CONTROL SURFACES, PROPELLER BLADES, AND ENGINE INLETS.**
- **EVEN SMALL AMOUNTS OF FROST, ICE, SNOW, OR SLUSH ON THE WING MAY ADVERSELY CHANGE LIFT AND DRAG. FAILURE TO REMOVE THESE CONTAMINANTS WILL DEGRADE AIRPLANE PERFORMANCE AND MAY PREVENT A SAFE TAKEOFF AND CLIMBOUT.**
- **MAKE SURE THAT THE ANTI-ICE FLUID (IF APPLIED) IS STILL PROTECTING THE AIRPLANE.**

TAKEOFF

NORMAL TAKEOFF

1. Wing Flaps - 0° to 20° (10° recommended).
2. Power - SET FOR TAKEOFF (observe Takeoff ITT and Ng limits). Refer to Section 5 for takeoff power.
3. Annunciators - CHECK.
4. Rotate - 70-75 KIAS.
5. Climb Speed - 85-95 KIAS.
6. Wing Flaps - RETRACT after reaching 90 KIAS.

SHORT FIELD TAKEOFF

1. Wing Flaps - 20°.
2. Brakes - APPLY.
3. Power - SET FOR TAKEOFF (observe Takeoff ITT and Ng limits). Refer to Section 5 for takeoff power.
4. Annunciators - CHECK.
5. Brakes - RELEASE.
6. Rotate - 70 KIAS.
7. Climb Speed - 82 KIAS until all obstacles are cleared. Refer to Section 5 for speeds at reduced weights.
8. Wing Flaps - RETRACT after reaching 90 KIAS.

TYPE II, TYPE III OR TYPE IV ANTI-ICE FLUID TAKEOFF

1. Wing Flaps - 0°.
2. Power - SET FOR TAKEOFF (observe Takeoff ITT and Ng limits) Refer to Section 5 for takeoff limits.
3. Annunciators - CHECK.
4. Rotate - 89 KIAS.
5. Climb Speed - 104 KIAS.

ENROUTE CLIMB

CRUISE CLIMB

1. Ice Protection (if installed)- AS REQUIRED.
2. Pitot/Static Heat - ON when OAT is below 4°C (39°F).
3. Airspeed - 115-125 KIAS.
4. Propeller - 1600-1900 RPM.
5. Torque - SET (Refer to Maximum Climb Torque Chart in Section 5. Observe Maximum Climb ITT and Ng limits).

NOTE

Engine operations which exceed 740°C ITT may reduce engine life.

CAUTION

FOR EVERY 10° BELOW -30°C AMBIENT TEMPERATURE, REDUCE MAXIMUM ALLOWABLE Ng BY 2.2%.

MAXIMUM PERFORMANCE CLIMB

1. Ice Protection (if installed)- AS REQUIRED.
2. Pitot/Static Heat - ON when OAT is below 4°C (39°F).
3. Airspeed - 106 KIAS at sea level to 103 KIAS at 10,000 feet to 93 KIAS at 20,000 feet.
4. Propeller - 1900 RPM.
5. Torque - SET (Refer to Maximum Climb Torque Chart in Section 5. Observe Maximum Climb ITT and Ng limits).

NOTE

Engine operations which exceed 740°C ITT may reduce engine life.

CAUTION

FOR EVERY 10° BELOW -30°C AMBIENT TEMPERATURE, REDUCE MAXIMUM ALLOWABLE Ng BY 2.2%.

CRUISE

1. Ice Protection (if installed)- AS REQUIRED.
2. Pitot/Static Heat - ON when OAT is below 4°C (39°F).
3. Propeller - 1600 to 1900 RPM.
4. Power - SET per Cruise Power Tables (observe Maximum Cruise ITT and Ng limits).

NOTE

Engine operations which exceed 740°C ITT may reduce engine life.

CAUTION

FOR EVERY 10° BELOW -30°C AMBIENT TEMPERATURE, REDUCE MAXIMUM ALLOWABLE Ng BY 2.2%.

DESCENT

1. Ice Protection (if installed) - AS REQUIRED.
2. Pitot/Static Heat - ON when OAT is below 4°C (39°F).
3. No Smoking/Seat Belt Sign Switches (if installed) - AS REQUIRED.
4. Altimeter - SET.
5. GPS/NAV Switch - SET.
6. Power - AS REQUIRED to give desired rate of descent.

BEFORE LANDING

NOTE

Refer to Landing Distance table in Section 5 for anticipated ground roll and total distance requirements.

1. Seats, Seat Belts, Shoulder Harnesses - SECURE.

WARNING

FAILURE TO CORRECTLY USE SEAT BELTS AND SHOULDER HARNESSES COULD RESULT IN SERIOUS OR FATAL INJURY IN THE EVENT OF AN ACCIDENT.

2. Fuel Tank Selectors - LEFT ON, RIGHT ON.
3. Fuel Condition Lever - HIGH IDLE.
4. Propeller Control Lever - MAX (full forward).
5. Radar (if installed) - STANDBY or OFF.
6. Autopilot (if installed) - OFF.
7. Wing Flaps - AS DESIRED (0° to 10° below 175 KIAS, 10° to 20° below 150 KIAS, 20° to 30° below 125 KIAS).

LANDING

NORMAL LANDING

1. Airspeed - 95-110 KIAS (flaps UP).
2. Wing Flaps - AS DESIRED (flaps down preferred).
3. Airspeed - 75-85 KIAS (flaps FULL DOWN).
4. Touchdown - MAIN WHEELS FIRST.
5. Power Lever - BETA range after TOUCHDOWN.
6. Brakes - AS REQUIRED.

SHORT FIELD LANDING

1. Wing Flaps - FULL DOWN.
2. Airspeed - 78 KIAS (Refer to Section 5 for speeds at reduced weights).
3. Power Lever - REDUCE to IDLE after clearing obstacles.
4. Touchdown - MAIN WHEELS FIRST.
5. Power Lever - BETA range (lever against spring) after TOUCHDOWN.

NOTE

Further reduction of landing roll will result from use of reverse thrust (see Section 5).

6. Brakes - APPLY HEAVILY while holding elevator control full aft.
7. Wing Flaps - RETRACT for maximum brake effectiveness

BALKED LANDING

1. Power Lever - ADVANCE for takeoff power.
2. Wing Flaps - RETRACT to 20°.
3. Climb Speed - 77 KIAS until obstacles are cleared.
4. Wing Flaps - RETRACT after reaching safe altitude and 90 KIAS.

AFTER LANDING

1. Wing Flaps - UP.
2. Ice Protection Equipment (if installed) - OFF.
3. Standby Power Switch (if installed) - OFF.
4. Strobe Lights - OFF.
5. Landing and Taxi Lights - AS REQUIRED.
6. Fuel Condition Lever - LOW IDLE when clear of the runway.

CAUTION

IF THE FUEL CONDITION LEVER IS MOVED PAST THE **LOW IDLE** POSITION AND THE ENGINE NG FALLS BELOW 53%, MOVING THE LEVER BACK TO THE **LOW IDLE** POSITION CAN CAUSE AN **ITT** OVER-TEMPERATURE CONDITION. IF THE ENGINE HAS STARTED TO SHUTDOWN IN THIS SITUATION, ALLOW THE ENGINE TO COMPLETE ITS SHUTDOWN SEQUENCE, AND PROCEED TO DO A NORMAL ENGINE START USING THE "STARTING ENGINE" CHECKLIST.

SHUTDOWN AND SECURING AIRPLANE

1. Parking Brake - SET.
2. Avionics Switches - OFF.
3. Standby Power Switch (if installed) - OFF.
4. Fuel Boost Switch - OFF.
5. Bleed Air Heat, Ventilation Fans and Air Conditioner (if installed) - OFF.
6. Power Lever - IDLE.
7. ITT - STABILIZED at minimum temperature for one minute.
8. Propeller Control Lever - FEATHER.
9. Fuel Condition Lever - CUTOFF.
10. Oxygen Supply Control Lever (if installed) - OFF.
11. Lighting Switches - OFF.
12. Battery Switch - OFF.
13. Controls - LOCK.
14. Fuel Tank Selectors - LEFT OFF or RIGHT OFF.

(Continued Next Page)

SHUTDOWN AND SECURING AIRPLANE (Continued)

15. Tie-Downs and Chocks - AS REQUIRED.
16. External Covers - INSTALL.
17. Fuel Filter - CHECK FUEL FILTER BYPASS FLAG for proper location (flush).
18. Oil Breather Drain Can - DRAIN until empty.

NOTE

Possible delays of subsequent flights, or even missed flights, are often eliminated by routinely conducting a brief postflight inspection. Usually, a visual check of the airplane for condition, security, leakage, and tire inflation will alert the operator to potential problems, and is therefore recommended.

SYSTEMS CHECKS

OVERSPEED GOVERNOR CHECK

1. Overspeed Governor - CHECK (first flight of the day and after maintenance).
   A. Propeller Control Lever - MAX (full forward).
   B. Overspeed Governor Test Switch - PRESS and HOLD.
   C. Power Lever - ADVANCE (propeller should stabilize at 1750 ±60 RPM).
   D. Power Lever - IDLE.
   E. Overspeed Governor Test Switch - RELEASE.

AUTOPILOT CHECK (SPERRY) (If Installed)

Refer to Section 9, Supplement 95A, for complete information on the Sperry Autopilot check procedures.

NOTE

When autopilot is turned on while airplane is on the ground, the control wheel should be held to prevent ailerons from banging stops.

BEFORE TAKEOFF RELIABILITY TESTS

NOTE

Perform these steps prior to each flight.

1. Autopilot Automatic Disconnect check (with Engine Running and Gyros Erect) - PERFORM the following checks:
   A. PULL-TURN Knob - CENTER and PULL OUT.
   B. Autopilot Lateral TRIM Control - CENTER.
   C. Airplane Control Wheel - HOLD to reduce movement.
   D. AP ON-OFF Rocker Switch - ON.

NOTE

The roll servo will engage immediately. The pitch servo will engage after pitch synchronization as evidenced by the autopilot pitch command wheel coming to rest.

   E. Autopilot Disconnect TEST Prior to EA FLT Button - PUSH and HOLD.

(Continued Next Page)

AUTOPILOT CHECK (SPERRY) (Continued)

BEFORE TAKEOFF RELIABILITY TESTS (Continued)

F. Verify the following:
   (1) AP ON-OFF Rocker Switch - OBSERVE disengage to OFF position.
   (2) Autopilot DISC WARN Light - OBSERVE yellow illumination.
   (3) A/P OFF Annunciator - OBSERVE amber illumination.
   (4) Autopilot Disengage Horn - OBSERVE 1 to 2 second aural tone.

G. Airplane Control Wheel A/P TRIM DISC Push button - PRESS to turn off autopilot DISC WARN light and A/P OFF annunciator.

AUTOPILOT CHECK (KING KFC-150) (If Installed)

Refer to Section 9, STC Supplement K3E, for complete information.

NOTE

When autopilot is turned on while airplane is on the ground, the control wheel should be held to prevent ailerons from banging stops.

BEFORE TAKEOFF RELIABILITY TESTS

NOTE

Perform steps 1 thru 10 prior to each flight.

1. Gyros - Allow 3-4 minutes for gyros to come up to speed.
2. AVIONICS POWER 1 Switch - ON.
3. PREFLIGHT TEST Button - PRESS momentarily and NOTE:
   A. All annunciator lights on (TRIM annunciator flashing).
   B. All legends and digits are displayed on the KAS-297B Vertical Speed and Altitude Selector (Optional).
   C. After approximately 5 seconds, all annunciator lights off except AP, which will flash approximately 12 times and then remain off.

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AUTOPILOT CHECK (KING KFC-150) (Continued)

BEFORE TAKEOFF RELIABILITY TESTS (Continued)

NOTE

If TRIM warning light stays on, the autopilot did not pass the preflight test. The autopilot circuit breaker should be pulled (the autopilot and manual electric trim will be inoperative).

4. Manual Electric Trim - TEST as follows:
   A. Actuate left side of split switch unit to the fore and aft positions. The trim wheel should not move on its own. Rotate the trim wheel manually against the engaged clutch to check the pilot's trim overpower capability.
   B. Actuate right side of split switch unit to the fore and aft positions. The trim wheel should not move on its own and normal trim wheel force is required to move it manually.
   C. Press the A/P DISC/TRIM INTER switch down and hold. Manual electric trim should not operate either nose up or nose down.
5. Flight Director - ENGAGE by pressing FD or CWS button.
6. Autopilot - ENGAGE by pressing AP ENG button.
7. Yaw Damper (Optional) - ENGAGE by pressing YAW DAMP switch button.
8. Flight Controls - MOVE fore, aft, left, and right to verify that the autopilot/yaw damper can be overpowered.
9. A/P DISC/TRIM INTER Switch - PRESS. Verify that the autopilot and yaw damper (optional) disconnects and all flight director modes are canceled.
10. TRIM - SET to takeoff position.

AUTOPILOT CHECK (KING KAP-150) (If Installed)

Refer to Section 9, STC Supplement K3G, for complete information.

NOTE

When autopilot is turned on while airplane is on the ground, the control wheel should be held to prevent ailerons from banging stops.

BEFORE TAKEOFF RELIABILITY TESTS

NOTE

Perform steps 1 thru 9 prior to each flight.

1. Gyros - Allow 3-4 minutes for gyros to come up to speed.
2. AVIONICS POWER 1 Switch - ON.
3. PREFLIGHT TEST Button - PRESS momentarily and NOTE:
   A. All annunciator lights on (TRIM annunciator flashing).
   B. All legends and digits are displayed on the KAS-297B Vertical Speed and Altitude Selector (Optional).
   C. After approximately 5 seconds, all annunciator lights off except AP, which will flash approximately 12 times and then remain off.

NOTE

If TRIM warning light stays on, the autopilot did not pass the preflight test. The autopilot circuit breaker should be pulled (the autopilot and manual electric trim will be inoperative).

4. Manual Electric Trim - TEST as follows:
   A. Actuate left side of split switch unit to the fore and aft positions. The trim wheel should not move on its own. Rotate the trim wheel manually against the engaged clutch to check the pilot's trim overpower capability.
   B. Actuate right side of split switch unit to the fore and aft positions. The trim wheel should not move on its own and normal trim wheel force is required to move it manually.
   C. Press the A/P DISC/TRIM INTER switch down and hold. Manual electric trim should not operate either nose up or nose down.

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AUTOPILOT CHECK (KING KAP-150) (Continued)

BEFORE TAKEOFF RELIABILITY TESTS (Continued)

5. Autopilot - ENGAGE by pressing AP ENG button.
6. Yaw Damper (Optional) - ENGAGE by pressing YAW DAMP switch button.
7. Flight Controls - MOVE fore, aft, left, and right to verify that the autopilot/yaw damper can be overpowered.
8. A/P DISC/TRIM INTER Switch - PRESS. Verify that the autopilot and yaw damper (optional) disconnects and all flight director modes are canceled.
9. TRIM - SET to takeoff position.

AUTOPILOT CHECK (KING KFC-250 ONLY) (If Installed)

Refer to POH Section 9, Supplements, for complete information.

NOTE

When autopilot is turned on while airplane is on the ground, the control wheel should be held to prevent ailerons from banging stops.

BEFORE TAKEOFF RELIABILITY TESTS

NOTE

Perform steps 1 thru 12 prior to each flight.

1. Inverter Switch - SELECT Inverter 1 or 2 as desired.
2. Avionics Power 1 Switch - ON.
3. Gyros - Allow 3-4 minutes for gyros to come up to speed.
4. All Autopilot/Flight Director Modes - DISENGAGE or check disengaged.
5. PRFLT TEST Button - PRESS and HOLD. All KFC-250 System mode annunciators should illuminate, including the marker lights on the KA-285 Mode Annunciator. In addition, the red TRIM failure light in the annunciator panel should flash at least four but not more than six times and be accompanied by an aural alert to indicate correct trim monitoring.

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AUTOPILOT CHECK (KING KFC-250 ONLY) (Continued)

BEFORE TAKEOFF RELIABILITY TESTS (Continued)

6. Electric trim - TEST as follows:
   A. Actuate left side of split switch unit to the fore and aft position. The trim wheel should not move on its own. Rotate the trim wheel manually against the engaged clutch to check the pilot's trim overpower capability.
   B. Actuate right side of split switch until to the fore and aft positions. Trim wheel should not move on its own and normal trim wheel force is required to move it manually.
   C. Run the electric trim in both the up and down directions checking the trim wheel for proper direction.
   D. Depress and hold the TRIM Test switch and run the electric trim both up and down. The trim warning light will illuminate and the warning horn sound.
   E. Press the AP DISC/TRIM INTER switch down and hold. The electric trim will not operate either up or down.
7. FD Mode Selector Button - PRESS to engage prior to AP engagement.
8. AP ON/OFF Switch - ON to engage autopilot.
9. Flight Controls - MOVE fore, aft, left and right to verify that the autopilot can be overpowered.
10. AP MON TEST Switch - ACTUATE and HOLD in the number 1 position for approximately 2 seconds. The autopilot will disconnect and the aural alert will sound. Reengage the autopilot. ACTUATE and HOLD the switch in the number 2 position. Again the autopilot will disconnect and the aural alert will sound. Reengage the autopilot.
11. AP DISC/TRIM INTER Switch - PRESS. Verify that the autopilot disconnects and all flight director modes cancel.
12. TRIM - SET to takeoff position.

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AUTOPILOT CHECK (KING KFC-250 ONLY) (Continued)

BEFORE TAKEOFF RELIABILITY TESTS (Continued)

NOTE

Perform steps 13 thru 18 prior to the first flight each day.

13. FLIGHT DIRECTOR and AUTOPILOT - ENGAGE.
14. AUTOTRIM - CHECK by first pressing and releasing the CWS button, and then inserting a pitch UP command using the vertical trim control (noting the upward command bar movement) and simultaneously restraining the control column against movement. After approximately a 3-second delay, observe autotrim movement in the nose-up direction. Press the CWS button momentarily and repeat the autotrim test in the nose-down direction.
15. HDG Mode - CHECK by pressing the HDG mode button and commanding left and right turns using the heading selector knob. Observe corresponding command bar and control wheel movement in the directions commanded.
16. FLIGHT DIRECTOR and AUTOPILOT - DISENGAGE.
17. MANUAL ELECTRIC TRIM - RUN from full nose-up to full nose-down positions.
18. TRIM - SET to takeoff position.

NOTE

If the autopilot fails the preflight test, the A/P FD circuit breaker should be pulled. Manual electric trim may still be used. If the electric trim fails preflight test, the ELEV TRIM circuit breaker should be pulled, and neither electric trim nor the autopilot should be used.

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AUTOPILOT CHECK (KING KFC-250 ONLY) (Continued)

BEFORE TAKEOFF RELIABILITY TESTS (Continued)

CAUTION

- IF THE **A/P FD** CIRCUIT BREAKER IS PULLED, THE RED TRIM FAILURE LIGHT ON THE MODE ANNUNCIATOR PANEL WILL BE DISABLED AND ONLY THE AUDIBLE WARNING WILL SOUND IF AN ELECTRIC TRIM MALFUNCTION SHOULD OCCUR. IN THIS EVENT, THE **ELEV TRIM** CIRCUIT BREAKER SHOULD BE PULLED AND INFLIGHT TRIM ACCOMPLISHED BY USING THE MANUAL PITCH TRIM WHEEL.
- OPERATION OF THE AUTOPILOT ON THE GROUND MAY CAUSE THE AUTOTRIM TO RUN BECAUSE OF BACK FORCE GENERATED BY STATIC ELEVATOR LOADS OR PILOT INDUCED FORCES. THEREFORE, DISENGAGE THE AUTOPILOT AND CHECK THAT THE AIRPLANE PITCH TRIM IS IN THE TAKEOFF POSITION PRIOR TO TAKEOFF.

STANDBY POWER CHECK
(If Standby Electrical System is Installed)

1. Standby Power - CHECK (first flight of the day and before all flights into known icing conditions).
   A. Standby Power Switch - ON.
   B. Generator - LOAD to approximately 30 amps (use taxi lights if required), but not more than 60 amps.
   C. Volt/Ammeter - SELECT ALT position and verify alternator output near zero.
   D. Generator Switch - TRIP.
   E. Volt/Ammeter - CHECK for alternator output and voltage approximately one volt less than with generator ON.

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STANDBY POWER CHECK

(If Standby Electrical System is Installed) (Continued)

NOTE

A fully charged battery will carry part of the electrical load when initially switching from generator to standby alternator power because of the generator's higher voltage regulation.

F. STBY ELECT PWR ON Annunciator - CHECK ON.
G. Generator Switch - RESET.
H. STBY ELECT PWR ON Annunciator - CHECK OFF.
I. Volt/Ammeter Selector Switch - RETURN to BATT position.
J. Standby Power Switch - OFF (STBY ELECT PWR INOP Annunciator - ON).

KNOWN ICING CHECK

(If Flight Into Known Icing Equipment Package is Installed)

PREFLIGHT INSPECTION

1. Windshield Anti-ice Panel - INSTALL. Check security and electrical connection.
2. Battery Switch - ON.
3. Wing Ice Detector Light Switch - ON and CHECK for illumination.
4. DAY/NIGHT Switch to NIGHT - Windshield Ice Detector Light (if installed) CHECK for illumination.
5. PITOT/STATIC and Stall Heat Switches - ON (for 30 seconds maximum, ensure pitot covers are removed).
6. LOW AIRSPEED ADVISORY SYSTEM (if installed) - CHECK for illumination when pitot heat is ON.
7. PITOT/STATIC and Stall Heat Switches - OFF.
8. Battery Switch - OFF.
9. Stall Warning Transducer - PERCEPTIBLY WARM.
10. Pitot/Static Tubes - CLEAR and VERY WARM.
11. Wing, Wing Strut, Main Landing Gear Leg (if installed), Cargo Pod Nosecap (if installed) and Stabilizer De-ice Boots (if installed) - CHECK for tears, abrasions and cleanliness.
12. Propeller Anti-ice Boots - CHECK condition of boots and heating elements.
13. Control Surface Static Dischargers - CHECK condition.

(Continued Next Page)

KNOWN ICING CHECK

(If Flight Into Known Icing Equipment Package is Installed) (Continued)

BEFORE TAKEOFF

CAUTION

TO PREVENT BLISTERING THE CARGO POD DE-ICE BOOT (IF INSTALLED), GROUND OPERATION IN A RIGHT HAND CROSSWIND OR OPERATING THE PROPELLER IN BETA OR FEATHER SHOULD BE KEPT TO A MINIMUM.

1. Windshield Anti-Ice Panels-
   A. Windshield Small Anti-ice Panel:
      (1) Windshield Anti-ice Switch - AUTO and MANUAL. Observe increase in generator output and illumination of WINDSHIELD ANTI-ICE annunciator in both switch positions.
   B. Windshield Large Anti-ice Panel:
      (1) PRIMARY Windshield Anti-ice Switch - AUTO.
      (2) SECONDARY Windshield Anti-ice Switch - AUTO and MANUAL.
      (3) PRIMARY Windshield Anti-ice Switch - MANUAL.

NOTE

For each switch movement, observe change in generator output and illumination of WINDSHIELD ANTI-ICE annunciator.

2. Prop Anti-ice Switch - AUTO.
3. Prop Anti-ice Ammeter - CHECK in green arc range and for periodic cycling. The ammeter should indicate 20 to 24 amps for 90 seconds, and 0 amps for 90 seconds.
4. Prop Anti-ice Switch - MANUAL.
5. Prop Anti-ice Ammeter - CHECK in green arc range.
6. Power Lever - ADJUST for 400 FT-LBS TORQUE.
7. Boot Press Switch - AUTO and release. Visually check inflation and deflation cycle of stabilizer, wing inboard, main landing gear leg, wing outboard and wing strut deicing boots.

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KNOWN ICING CHECK

(If Flight Into Known Icing Equipment Package is Installed) (Continued)

BEFORE TAKEOFF (Continued)

8. DE-ICE PRESSURE Annunciator - CHECK ON within three seconds and OFF after 18 seconds with approximate two seconds OFF periods after 6 and 12 seconds.
9. Boots - CHECK VISUALLY FOR COMPLETE DEFLATION to the vacuum hold-down condition.
10. Boot Press Switch - MANUAL and hold. Visually check inflation of all visible boots and illumination of DE-ICE PRESSURE annunciator within 6 seconds.
11. Inertial Separator - CHECK for torque drop between NORMAL and BYPASS modes. Return control to BYPASS if moisture is present below approximately 4°C (39°F).
12. Power Lever - IDLE.
13. Standby Power - CHECK.
14. Pitot/Static Heat - ON when OAT is below 4°C (39°F).
15. Stall Heat, Windshield Anti-ice and Propeller Anti-ice Switches, and Inertial Separator Control - AS REQUIRED for takeoff and climb out conditions.

CAUTION

DO NOT OPERATE PITOT/STATIC, STALL WARNING, AND PROPELLER ANTI-ICE HEATERS FOR PROLONGED PERIODS ON GROUND.

AMPLIFIED PROCEDURES

PREFLIGHT INSPECTION

The Preflight Inspection, described in Figure 4-1 and adjacent checklist, is recommended. If the airplane has been in extended storage, has had recent major maintenance, or has been operated from rough or unprepared surfaces, an extensive exterior inspection is recommended.

WARNING

FLIGHTS AT NIGHT AND IN COLD WEATHER INVOLVE A CAREFUL CHECK OF OTHER SPECIFIC AREAS DISCUSSED IN THIS SECTION.

After major maintenance has been performed, the flight and trim tab controls should be double-checked for free and correct movement and security. The security of all inspection plates on the airplane should be checked following periodic inspections.

If the airplane has been exposed to much ground handling in a crowded hangar, it should be checked for dents and scratches on wings, fuselage, and tail surfaces, as well as damage to navigation and anti-collision lights, and avionics antennas. Outside storage in windy or gusty areas, or tie-down adjacent to taxiing airplanes, calls for special attention to control surface stops, hinges, and brackets to detect the presence of wind damage.

If the airplane has been operated from an unimproved runway, check the propeller tips for stone damage and the leading edges of the horizontal tail for abrasion. Airplanes that are operated from rough fields, especially at high altitude, are subjected to abnormal landing gear abuse. Frequently check all components of the landing gear, tires, and brakes.

Outside storage may result in water and obstructions in airspeed system lines, condensation in fuel tanks, and dust and dirt in the engine air inlet and exhaust areas. If any water is suspected in the static source system, open both static source drain valves and thoroughly drain all water from the system.

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

WARNING

IF THE STATIC SOURCE DRAIN VALVES ARE OPENED, ASSURE BOTH VALVES ARE COMPLETELY CLOSED BEFORE FLIGHT.

If any water is detected in the fuel system, the inboard fuel tank sump and external sump quick-drain valves, fuel reservoir quick-drain valve, and fuel filter quick-drain valve should all be thoroughly drained until there is no evidence of water or sediment contamination. If the airplane is parked with one wing low on a sloping ramp (as evidenced by the ball of the turn and bank indicator displaced from center), draining of the outboard fuel tank sump quick-drain valves (if installed) is also recommended.

Prolonged storage of the airplane will result in a water buildup in the fuel which "leaches out" the fuel additive. An indication of this is when an excessive amount of water accumulates in the fuel tank sumps. Refer to Section 8 for fuel additive servicing.

To prevent loss of fuel in flight, make sure the fuel tank filler caps are tightly sealed after any fuel system check or servicing. Fuel system vents should also be inspected for obstructions, ice or water, especially after exposure to cold, wet weather.

The interior inspection will vary according to the planned flight and the optional equipment installed. Prior to high-altitude flights, it is important to check the condition and quantity of oxygen face masks and hose assemblies. The oxygen supply system (if installed) should be functionally checked to ensure that it is in working order and that an adequate supply of oxygen is available.

BEFORE STARTING ENGINE

WARNING

- **IT IS THE RESPONSIBILITY OF THE PILOT IN COMMAND TO ENSURE THAT THE AIRPLANE IS PROPERLY LOADED WITHIN THE WEIGHT AND CENTER OF GRAVITY LIMITS PRIOR TO TAKEOFF.**
- **FAILURE TO CORRECTLY USE SEAT BELTS AND SHOULDER HARNESSES COULD RESULT IN SERIOUS OR FATAL INJURY IN THE EVENT OF AN ACCIDENT.**

The Before Starting Engine checklist procedures should be followed closely to assure a satisfactory engine start. Most of the checklist items are self-explanatory. Those items that may require further explanation are noted in the following discussion.

When setting electrical switches prior to engine start, only those lighting switches that are necessary for a nighttime engine start should be turned ON. All other switches, including exterior lights, anti-ice, de-ice, ventilation blower and air conditioning (if installed) switches, should be turned OFF. The bleed air heat switch should be off to prevent excessive compressor bleed during the engine start. Also, the standby power switch (if installed) and avionics 1 and 2 switches should be off during engine starts.

CAUTION

LEAVING THE BLEED AIR HEAT SWITCH ON MAY RESULT IN A HOT START OR ABNORMAL ACCELERATION TO IDLE.

The generator switch is spring-loaded to the ON position. When the starter switch is placed in the START or MOTOR position, the generator control unit (GCU) opens the generator contactor. When the starter switch is returned to the OFF position after an engine start, the GCU closes the generator contactor, thereby placing the generator on the line.

The ignition switch is left in the NORM position for engine starting with the starter motor (non-windmilling start). In this position, the igniters are energized when the starter switch is placed in the START position. Ignition is automatically terminated when the starter switch is turned OFF.

(Continued Next Page)

BEFORE STARTING ENGINE (Continued)

CAUTION

IT IS ESPECIALLY IMPORTANT TO VERIFY THAT THE EMERGENCY POWER LEVER IS IN THE **NORMAL** POSITION (AFT OF THE **IDLE** GATE) DURING ENGINE STARTS. WITH THE LEVER FORWARD OF THIS GATE, EXCESSIVE QUANTITIES OF FUEL WILL BE DISCHARGED THROUGH THE FUEL NOZZLES WHEN THE FUEL CONDITION LEVER IS MOVED TO THE **LOW IDLE** POSITION AND A HOT START WILL RESULT.

Before starting the engine, the power lever is placed at the IDLE position (against the BETA gate), the propeller control lever is moved to the MAX RPM position (full forward), and the fuel condition lever is stowed in the CUTOFF position.

CAUTION

THE PROPELLER REVERSING LINKAGE CAN BE DAMAGED IF THE POWER LEVER IS MOVED AFT OF THE **IDLE** POSITION WHEN THE ENGINE IS NOT RUNNING AND THE PROPELLER IS FEATHERED.

STARTING ENGINE

The Starting Engine checklist procedures should be followed closely to assure a satisfactory engine start. With the fuel condition lever in the CUTOFF position, move the starter switch to the START position; verify that the STARTER ENERGIZED and IGNITION ON annunciators illuminate. Next, check for a positive indication of engine oil pressure. After Ng stabilizes (minimum of 12%), move the fuel condition lever to the LOW IDLE position and verify a fuel flow in the general range of 90 to 140 pph. After the engine "lights" and during acceleration to idle (approximately 52% Ng), monitor ITT and Ng. Maximum ITT during engine start is 1090°C, limited to 2 seconds. Typically, the ITT during start is well below this maximum value. After the engine has stabilized at idle, the STARTER ENERGIZED annunciator should be OFF. If this annunciator remains ON, it indicates the starter has not been automatically disengaged during the engine starting sequence due to a failed speed sensor.

(Continued Next Page)

STARTING ENGINE (Continued)

CAUTION

IF NO **ITT** RISE IS OBSERVED WITHIN 10 SECONDS AFTER MOVING THE FUEL CONDITION LEVER TO THE LOW IDLE POSITION, OR **ITT** RAPIDLY APPROACHES 1090°C, MOVE THE FUEL CONDITION LEVER TO CUTOFF AND PERFORM THE ENGINE CLEARING PROCEDURE IN THIS SECTION.

After the engine reaches idle (52% Ng or above), return the starter switch to the OFF position. With a cold engine or after making a battery start (high initial generator load into battery), it may be necessary to advance the power lever slightly ahead of the idle detent to maintain a minimum idle of 52% Ng. To assure maintaining the minimum Ng and ITT within limits, advance the power lever to obtain approximately 55% Ng before turning the starter switch OFF (the generator contactor closes when the starter switch is turned OFF).

CAUTION

UNDER HOT OAT AND/OR HIGH GROUND ELEVATION CONDITIONS, IDLE ITT MAY EXCEED MAXIMUM IDLE ITT LIMITATION OF 685°C. INCREASE Ng AND/OR REDUCE ACCESSORY LOAD TO MAINTAIN ITT WITHIN LIMITS.

NOTE

If the STARTER ENERGIZED annunciator fails to go out after the starter switch has been moved to the OFF position, the start contactor may be closed and the generator will not function. Perform an engine shutdown.

Engine starts may be made with airplane battery power or with an auxiliary power unit (APU). However, it is recommended that an APU be used when the ambient air temperature is less than 0°F (-18°C). Refer to Cold Weather Operation in this section when ambient temperature is below 0°F (-18°C).

(Continued Next Page)

STARTING ENGINE (Continued)

CAUTION

- IN THE EVENT THE AUXILIARY POWER UNIT DROPS OFF THE LINE DURING ENGINE START, A LOSS OF ELECTRICAL POWER TO THE STARTER WILL RESULT WHICH COULD CAUSE A HOT START. SHOULD A LOSS OF AUXILIARY POWER OCCUR, IMMEDIATELY PLACE THE FUEL CONDITION LEVER TO CUTOFF, MONITOR ITT, AND ENSURE THE ENGINE IS SHUTTING DOWN. TURN THE EXTERNAL POWER SWITCH OFF AND PLACE THE STARTER SWITCH TO THE MOTOR POSITION TO AID IN REDUCING ITT IF NECESSARY.
- WHEN AN AUXILIARY POWER UNIT IS USED, MAKE SURE THE UNIT IS NEGATIVELY GROUNDED AND REGULATED TO 28 VOLTS DC WITH A CAPABILITY OF PROVIDING A MINIMUM OF 800 AMPERES DURING THE STARTING CYCLE. AUXILIARY POWER UNITS WITH OUTPUT EXCEEDING 1700 AMPERES SHALL NOT BE USED.

Before engine starting with the airplane battery, check the voltmeter for a minimum of 24 volts. With turbine engines, the operator must monitor ITT during each engine start to guard against a "hot" start. The operator must be ready to immediately stop the start if ITT exceeds 1090°C or is rapidly approaching this limit. Usually, "hot" starts are not a problem if the normal starting procedures are followed. A "hot" start is caused by excessive fuel flow at normal revolutions per minute or normal fuel flow with insufficient revolutions per minute. The latter is usually the problem which is caused by attempting a start with a partially discharged or weak battery.

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STARTING ENGINE (Continued)

CAUTION

A MINIMUM BATTERY VOLTAGE OF 24 VOLTS IS NOT ALWAYS AN INDICATION THAT THE BATTERY IS NEAR FULL CHARGE OR IN GOOD CONDITION. THIS IS ESPECIALLY TRUE WITH THE OPTIONAL NI-CAD BATTERY WHICH MAINTAINS A MINIMUM NO-LOAD VOLTAGE OF 24 VOLTS EVEN AT A 50% (OR LESS) CHARGE CONDITION. THEREFORE, IF GAS GENERATOR ACCELERATION IN THE INITIAL PART OF THE START IS LESS THAN NORMALLY OBSERVED, RETURN THE FUEL CONDITION LEVER TO CUTOFF AND DISCONTINUE THE START. RECHARGE THE BATTERY OR USE AN AUXILIARY POWER UNIT BEFORE ATTEMPTING ANOTHER START.

If a cold engine does not quite idle at 52%, it is acceptable to advance the power lever or fuel condition lever slightly. If the starter accelerates the gas generator rapidly above 20%, suspect gear train decouple. Do not continue start. Rapid acceleration through 35% N_g suggests a start on the secondary nozzles. Anticipate a hot start.

After an aborted start for whatever reason, it is essential before the next start attempt to allow adequate time to drain off unburned fuel. Failure to drain all residual fuel from the engine could lead to a hot start, a hot streak leading to hot section damage, or the torching of burning fuel from engine exhaust on the next successful ignition.

A dry motoring, within starter limitations after confirming that all fuel drainage has stopped, will ensure that no fuel is trapped before the next start.

ENGINE CLEARING PROCEDURES (DRY MOTORING RUN)

The following procedure is used to clear an engine at any time when it is deemed necessary to remove internally trapped fuel and vapor, or if there is evidence of a fire within the engine. Air passing through the engine serves to purge fuel, vapor, or fire from the combustion section, gas generator turbine, power turbine, and exhaust system.

1. Fuel Condition Lever - CUTOFF.
2. Ignition Switch - NORM.
3. Battery Switch - ON (to supply current for the starter motor).
4. Fuel Shutoff - OPEN (push in).
5. Fuel Boost Switch - ON (to provide lubrication for the engine-driven fuel pump elements) or OFF (if a fire is suspected).
6. Starter Switch - MOTOR.

CAUTION

- DO NOT EXCEED THE STARTING CYCLE LIMITATIONS; REFER TO SECTION 2.
- SHOULD A FIRE PERSIST, AS INDICATED BY SUSTAINED ITT, CLOSE THE FUEL SHUTOFF VALVE AND CONTINUE MOTORING THE ENGINE.

7. Starter Switch - OFF.
8. Fuel Boost Switch - OFF.
9. Fuel Shutoff - CLOSED (pull out).
10. Battery Switch - OFF.

Allow the required cooling period for the starter before any further starting operation is attempted.

ENGINE IGNITION PROCEDURES

For most operations, the ignition switch is left in the NORM position (aft). With the switch in this position, ignition is on only when the starter switch is in the START position.

NOTE

The use of ignition for extended periods of time will reduce ignition system component life.

However, the ignition switch should be turned ON to provide continuous ignition under the following conditions:

1. Emergency engine starts without starter assist (refer to Section 3, Airstarts).
2. Operation on water or slush covered runways.
3. Flight in heavy precipitation.
4. During inadvertent icing encounters until the inertial separator has been in BYPASS for 5 minutes (refer to Section 3, Icing).
5. When near fuel exhaustion as indicated by RESERVOIR FUEL LOW annunciator ON.

Refer to Section 7, Ignition System for further details regarding the ignition system.

ENGINE INERTIAL SEPARATOR PROCEDURES

An inertial separator system is built into the engine air inlet duct to prevent ice buildups on the compressor inlet screen. The inertial separator control should be moved to the BYPASS position prior to running the engine during ground or flight operation in visible moisture (clouds, rain, snow or ice crystals) with an OAT of 4°C (39°F) or less.

The BYPASS mode may also be used for ground operations or takeoffs with dusty, sandy field conditions to minimize ingestion of foreign particles into the compressor. Refer to the charts in Section 5 for performance changes associated with the inertial separator in the BYPASS mode.

The NORMAL mode is used for all other operating conditions, since it provides a substantial inlet ram recovery. This results in more efficient engine operation and higher critical altitude for a particular power setting.

Refer to Section 7, Air Induction System for further details regarding the inertial separator.

TAXIING

Power lever BETA range may be used during taxi to improve brake life. A leaf spring is installed in the control quadrant which the power lever contacts and provides the pilot with a noticeable "feel". With the power lever moved to this position in the BETA range, the propeller is near zero thrust in a static, 52% idle condition. Besides acting as a zero thrust reference during taxi, this power lever position (lever against spring) is used after landing to minimize brake wear. Further aft movement of the power lever will result in increased engine power and reverse thrust from the propeller blades.

CAUTION

- THE USE OF REVERSE THRUST SHOULD BE MINIMIZED, ESPECIALLY ON UNPREPARED SURFACES, TO PROTECT THE PROPELLER.
- TO MINIMIZE CARGO POD TEMPERATURES AND AVOID DAMAGE TO THE POD SURFACES, DO NOT LEAVE THE POWER LEVER IN THE BETA RANGE FOR EXTENDED PERIODS (GREATER THAN 30 SECONDS) WHEN PARKED WITH A RIGHT CROSSWIND.

NOTE

During low-speed taxi with a strong tailwind, or when stopped with a strong tailwind, a moderate vibration may occur as a result of reverse airflow through the propeller disk with the blades at a positive pitch angle. This vibration can be significantly reduced by placing the power lever in the BETA range, or it can be eliminated by turning the airplane into the wind.

Refer to Figure 4-3 for additional taxiing instructions.

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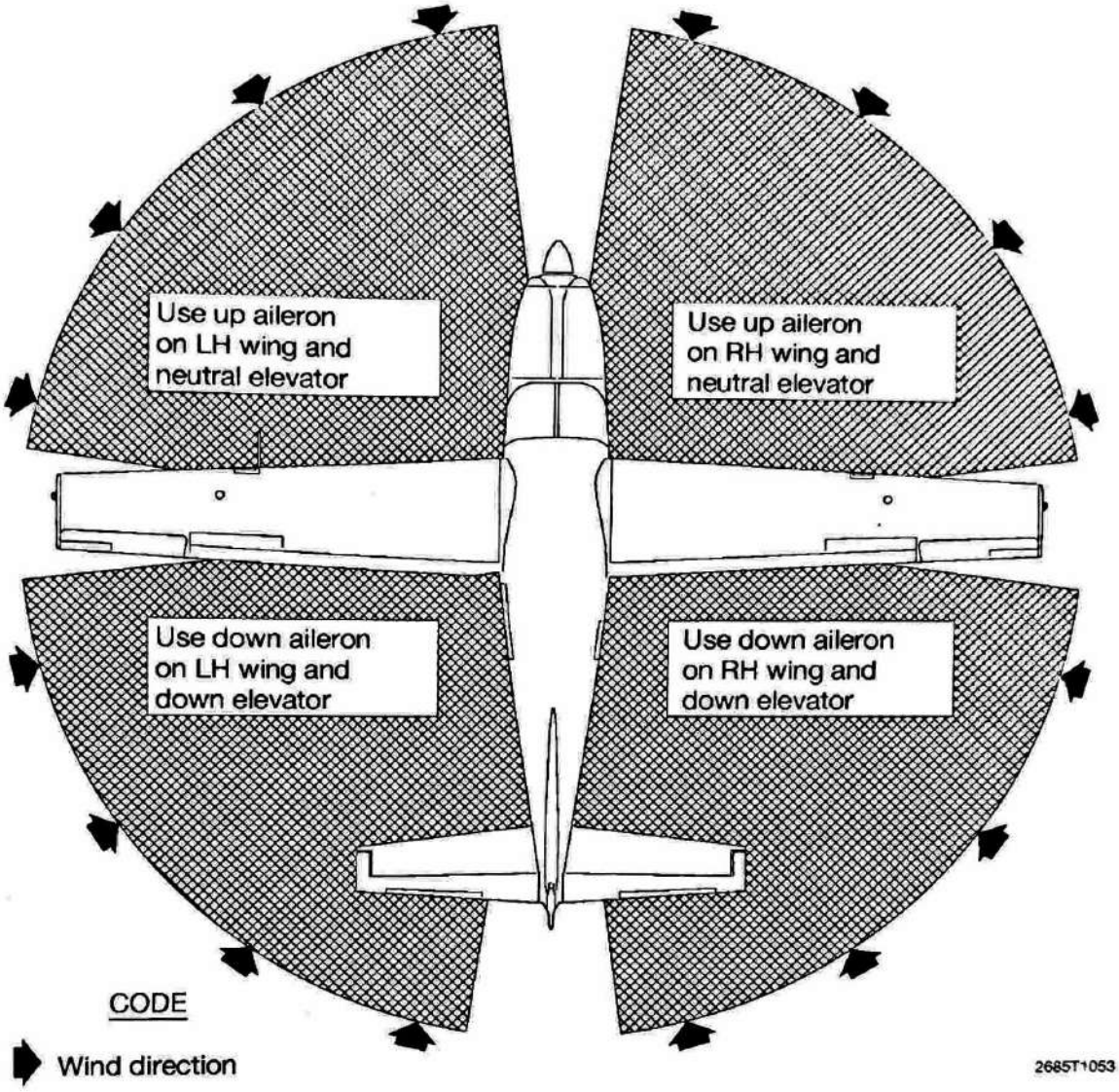

NOTE

Strong quartering tail winds require caution. Avoid excessive use of power and sharp braking when the airplane is in this attitude. Use the steerable nose wheel and rudder to maintain direction.

Figure 4-3*. Taxiing Diagram

TAKEOFF

POWER SETTING

Refer to the Takeoff Torque figure in Section 5 to determine the torque corresponding to the surface altitude and OAT conditions. This torque should be obtainable without exceeding 805°C ITT or 101.6% Ng.

Takeoff roll is most smoothly initiated by gradually advancing the power lever until propeller RPM nears 1900. Smoothly release the brakes and continue advancing the power lever until the takeoff torque (from Section 5) is reached.

NOTE

As airspeed increases during takeoff, an increase in torque at a fixed power lever position is normal and need not be reduced provided torque limit (1658 foot-pounds) is not exceeded.

WING FLAP SETTINGS

For normal takeoffs, 10° flaps is preferred since it results in easier nose wheel liftoff and lower initial climb attitude, as well as a reduction in ground roll and total distance over an obstacle compared to takeoff with flaps up.

For short field takeoffs, or takeoffs from soft or rough fields, use of 20° flaps is recommended since it will allow the safe use of slower speeds, resulting in a shorter ground roll and total distance over the obstacle.

Flap settings greater than 20° are not approved for takeoff.

SHORT FIELD TAKEOFF

If an obstruction dictates the use of a steep climb angle after liftoff, accelerate to and climb out at an obstacle clearance speed of 82 KIAS with 20° flaps. Takeoff performance data is shown in Section 5 based on this speed and configuration.

After clearing the obstacle, and reaching a safe altitude, the flaps may be retracted slowly as the airplane accelerates to the normal climb out speed.

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TAKEOFF (Continued)

SHORT FIELD TAKEOFF (Continued)

Minimum ground roll takeoffs are accomplished using 20° flaps by lifting the nose wheel off the ground as soon as practical and leaving the ground in a slightly tail-low attitude. However, the airplane should be leveled off immediately to accelerate to a safe climb speed.

TYPE II, TYPE III OR TYPE IV ANTI-ICE FLUID TAKEOFF

When Type II, Type III or Type IV anti-ice fluid is applied to the airplane, a rotation speed of 89 KIAS with 0° flaps is required. Use of 0° flaps allows the airplane to accelerate to a higher rotation speed without any liftoff tendencies, which is required for the Type II, Type III or Type IV anti-ice fluid to be effective. Takeoff performance data shown in Section 5 is based on this speed and configuration.

CROSSWIND TAKEOFF

Takeoffs into strong crosswinds normally are performed with 10° flaps. With the ailerons partially deflected into the wind, the airplane is accelerated to a speed higher than normal, and then pulled off abruptly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

ENROUTE CLIMB

Normally, maximum climb power is maintained during the climb to cruise altitude. Adjust the power lever as required to prevent exceeding 1658 foot-pounds torque, maximum climb ITT of 765°C, or maximum climb N_g of 101.6%, whichever occurs first.

NOTE

Engine operations which exceed 740°C ITT may reduce engine life.

(Continued Next Page)

ENROUTE CLIMB (Continued)

At lower altitudes and cool outside air temperatures (below approximately 10,000 feet), the engine will reach the torque limit before reaching the ITT or N_g limit. As the climb progresses and the torque is maintained by power lever advancement, the ITT and N_g will increase until an altitude is reached where ITT or N_g will dictate power lever positioning. When operating near the ITT limit, advance power lever slowly to allow the current ITT to be indicated. The rate of power (and temperature) increase of the engine is greater than the response rate of the ITT indicating system; therefore, a rapid power lever advance could allow an overtemperature condition to exist momentarily in the engine before the over-temperature would be indicated.

For maximum performance climb, the best rate-of-climb speed should be used with 1900 RPM and maximum climb power. This speed is 106 KIAS at sea level to 103 KIAS at 10,000 feet to 93 KIAS at 20,000 feet.

For improved visibility over the nose, a cruise climb speed of 115-125 KIAS may be desirable at altitudes up to approximately 12,000 feet. Also, for improved passenger comfort, propeller RPM may be reduced to 1600, if desired. Adjust the power lever (in accordance with the following table) to prevent exceeding maximum torque for the corresponding RPM, maximum climb ITT of 765°C, or maximum Ng of 101.6%, whichever occurs first.

NOTE

Engine operations which exceed 740°C ITT may reduce engine life.

MAX RPM	TORQUE
1900	1658
1800	1751
1700	1854
1600	1970

If an obstruction dictates the use of a steep climb angle, climb with flaps retracted and maximum continuous power at 86 KIAS.

CRUISE

Normal cruising is performed using any desired power setting up to the maximum cruise power (observe ITT, torque, and Ng cruise limits). Do not exceed the maximum cruise torque shown in Section 5 for the particular altitude and temperature. Normally, a new engine will exhibit an ITT below 710°C when set to the maximum cruise torque.

The Sample Cruise Performance Table, Figure 4-4, illustrates the advantage of higher altitude on both true airspeed and nautical miles per pound of fuel. In addition, the beneficial effect of lower cruise power on nautical miles per pound at a given altitude can be observed. Charts are provided in Section 5 to assist in selecting an efficient altitude based on available winds aloft information for a given trip. The selection of cruise altitude on the basis of the most favorable wind conditions and the use of low power settings are significant factors that should be considered on every trip to reduce fuel consumption.

Pitot/static heat should be ON anytime the OAT is below 4°C (39°F). If icing conditions are encountered, ensure that the additional anti-icing systems (stall vane and inertial separator) are ON and in the BYPASS mode before encountering visible moisture below approximately 4°C (39°F). Windshield and propeller anti-ice systems should also be turned ON.

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SAMPLE CRUISE PERFORMANCE TABLE

PARAMETERS:

Standard Conditions
1900 RPM
Zero Wind

ALTITUDE (in Feet)	Maximum Cruise Power		Maximum Range Power	
	KTAS	NMPP	KTAS	NMPP
5000	177	0.46	156	0.49
10,000	181	0.50	156	0.55
15,000	178	0.57	160	0.61
20,000	170	0.65	159	0.67

(WITHOUT CARGO POD)

ALTITUDE (in Feet)	Maximum Cruise Power		Maximum Range Power	
	KTAS	NMPP	KTAS	NMPP
5000	169	0.44	149	0.46
10,000	172	0.48	149	0.52
15,000	168	0.54	153	0.57
20,000	159	0.61	152	0.62

(WITH CARGO POD)

Figure 4-4*. Sample Cruise Performance

These systems are designed to prevent ice formation, rather than remove it after it has formed. For those airplanes without the "Flight Into Known Icing" equipment, icing conditions should be avoided. Even if the airplane is equipped with the "Flight Into Known Icing" package, accumulation of some airframe ice is unavoidable; this will increase airplane weight and drag and decrease airspeed and general airplane performance. It is always wise to avoid icing conditions, if practical.

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CRUISE (Continued)

Fuel unbalance should be monitored to assure it does not exceed 200 pounds. Normally, both fuel tank selectors are left ON and fuel feeds approximately equal from each tank. If fuel unbalance approaching 200 pounds does occur, the fuel tank selector for the tank with less fuel should be turned OFF until the tanks become balanced. With one fuel tank selector OFF and fuel remaining in the tank being used less than approximately 25 gallons, the FUEL SELECT OFF annunciator will illuminate and a warning horn will be activated.

WARNING

IGNITION SHOULD BE TURNED ON WHEN FLYING IN HEAVY PRECIPITATION. REFER TO ENGINE IGNITION PROCEDURES IN THIS SECTION FOR FURTHER INFORMATION ON USE OF IGNITION.

CAUTION

PROLONGED ZERO OR NEGATIVE "G" MANEUVERS WILL STARVE THE ENGINE OIL PUMP AND RESULT IN ENGINE DAMAGE.

Supplemental oxygen should be used by all occupants when cruising above 12,500 feet. It is often advisable to use oxygen at altitudes lower than 12,500 feet under conditions of night flying, fatigue, or periods of physiological or emotional disturbances. Also, the habitual and excessive use of tobacco or alcohol will usually necessitate the use of oxygen at less than 10,000 feet.

WARNING

- **OPERATION UP TO THE MAXIMUM ALLOWABLE OPERATING ALTITUDE IS PREDICATED ON THE AVAILABILITY AND USE OF SUPPLEMENTAL OXYGEN ABOVE 12,500 FEET AS SPECIFIED BY FAR PART 91.211.**
- **PERMIT NO SMOKING WHEN USING OXYGEN. OIL, GREASE, SOAP, LIPSTICK, LIP BALM, AND OTHER FATTY MATERIALS CONSTITUTE A SERIOUS FIRE HAZARD WHEN IN CONTACT WITH OXYGEN. BE SURE HANDS AND CLOTHING ARE OIL-FREE BEFORE HANDLING OXYGEN EQUIPMENT.**

STALLS

The stall characteristics are conventional and aural warning is provided by a stall warning horn which sounds between 5 and 10 knots above the stall in all configurations.

Idle-power stall speeds at maximum weight for both forward and aft C.G. are presented in Section 5.

NOTE

Practice of stalls should be done conservatively and with sufficient altitude for a safe recovery.

LANDING

NORMAL LANDING

Normal landing approaches can be made with power-on or idle power with any flap setting desired. Use of flaps down is normally preferred to minimize touchdown speed and subsequent need for braking. For a given flap setting, surface winds and turbulence are usually the primary factors in determining the most comfortable approach speed.

Actual touchdown should be made with idle power and on the main wheels first, just slightly above stall speed. The nose wheel is then gently lowered to the runway, the power lever repositioned to the BETA range, and brakes applied as required. When clear of the runway, reposition the fuel condition lever from HIGH IDLE to LOW IDLE. This will reduce cabin and exterior noise levels as well as reduce braking requirements when the power lever is positioned ahead of the REVERSE range. Landings on rough or soft fields are accomplished in a similar manner except that the nose wheel is lowered to the runway at a lower speed to prevent excessive nose gear loads.

NOTE

The use of BETA range after touchdown is recommended to reduce brake wear. Generally, the power lever can be moved aft of the IDLE gate until it contacts a spring in the control quadrant without substantial propeller erosion from loose debris on the runway or taxiway.

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LANDING (Continued)

SHORT FIELD LANDING

For short field landings, make a power approach at 78 KIAS with the propeller control lever at MAX (full forward) and with full flaps. After all approach obstacles are cleared, reduce power to idle. Maintain 78 KIAS approach speed by lowering the nose of the airplane. Touchdown should be made with the power lever at IDLE, and on the main wheels first. Immediately after touchdown, lower the nose gear, reposition the power lever against the spring in the BETA range, and apply heavy braking as required.

For maximum brake effectiveness after all three wheels are on the ground, hold full nose up elevator and apply maximum possible brake pressure without sliding the tires.

CAUTION

WHEN THE SMALL HIGH-PRESSURE TIRES ARE INSTALLED AND WHEN FLYING AT LIGHT WEIGHTS, IT IS POSSIBLE TO SLIDE THE TIRES WITH ONLY MODERATE PRESSURE APPLIED TO THE BRAKE PEDALS. TAKE CARE TO PREVENT OVERBRAKING.

The landing performance in Section 5 is based on the above procedure. A reduction in ground roll of approximately 10% will result from the use of reverse thrust (power lever full aft to provide increased power from the gas generator and a reverse thrust propeller blade angle).

CAUTION

TO MINIMIZE PROPELLER BLADE EROSION OR POSSIBLE PROPELLER BLADE DAMAGE, REVERSE THRUST SHOULD BE USED ONLY WHEN NECESSARY TO SHORTEN THE GROUND ROLL. BRINGING THE PROPELLER OUT OF REVERSE BEFORE DECELERATING THROUGH APPROXIMATELY 25 KNOTS WILL MINIMIZE PROPELLER EROSION.

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LANDING (Continued)

CROSSWIND LANDING

For crosswind approaches, either the wing-low, crab or combination method may be used. A flap setting between 10° and 30° is recommended. Use a minimum flap setting for the field length. After touchdown, lower the nose wheel and maintain control. A straight course is maintained with the steerable nose wheel, ailerons, and occasional braking if necessary.

BALKED LANDING

In a balked landing (go-around) climb, the wing flap setting should be reduced to 20° after takeoff power is applied. After all obstacles are cleared and a safe altitude and airspeed are obtained, the wing flaps should be retracted.

AFTER SHUTDOWN

If dusty conditions exist or if the last flight of the day has been completed, install engine inlet covers to protect the engine from debris. The covers may be installed after the engine has cooled down (ITT indicator showing "off scale" temperature). Secure the propeller to prevent windmilling since no oil pressure is available for engine lubrication when the engine is not running.

COLD WEATHER OPERATION

Intentional flight into known icing conditions is prohibited unless a complete flight-into-known-icing equpement package is installed.

Special consideration should be given to the operation of the airplane fuel system during the winter season or prior to any flight in cold temperatures. Proper preflight draining of the fuel system is especially important and will eliminate any free water accumulation. The use of an additive is required for anti-ice protection. Refer to Section 8 for information on the proper use of additives.

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COLD WEATHER OPERATION (Continued)

Cold weather often causes conditions which require special care prior to flight. Operating the elevator and aileron trim tabs through their full travel in both directions will assure smooth operation by reducing any stiffness in these systems caused by the cold weather effects on system lubrication. Even small accumulations of frost, ice, snow or slush must be removed, particularly from wing, tail and all control surfaces to assure satisfactory flight performance and handling. Also, control surfaces must be free of any internal accumulations of ice or snow.

The use of an external pre-heater reduces wear and abuse to the engine and the electrical system. Pre-heat will lower the viscosity of the oil trapped in the oil cooler, prior to starting in extremely cold temperatures.

Use of an APU is recommended when ambient temperatures are below 0°F (-18°C). Assure that oil temperature is in the green arc (10°C to 99°C) prior to takeoff.

If snow or slush covers the takeoff surface, allowance must be made for takeoff distances which will be increasingly extended as the snow or slush depth increases. The depth and consistency of this cover can, in fact, prevent takeoff in many instances.

ENGINE COMPRESSOR STALLS

An engine compressor stall may be noted by a single or multiple loud "popping" noise from the engine compartment. This situation may be resolved by reducing the engine power to a point where the "popping" discontinues, and slowly advancing the throttle to the necessary setting for continued flight. The use of cabin bleed heat may also help eliminate engine compressor stalls if this situation is encountered.

NOISE CHARACTERISTICS

Increased emphasis on improving the quality of our environment requires renewed effort on the part of all pilots to minimize the effect of airplane noise on the public.

We, as pilots, can demonstrate our concern for environmental improvement, by application of the following suggested procedures, and thereby tend to build public support for aviation:

1. Pilots operating aircraft under VFR over outdoor assemblies of persons, recreational and park areas, and other noise-sensitive areas should make every effort to fly not less than 2000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.
2. During departure from or approach to an airport, climb after takeoff and descent for landing should be made so as to avoid prolonged flight at low altitude near noise-sensitive areas.

NOTE

The above recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgment, an altitude of less than 2000 feet is necessary for him to adequately exercise his duty to see and avoid other aircraft.

The certificated noise level for the Model 208 (600 SHP) at 8000 pounds maximum weight is 73.5 dB(A) when a Hartzell propeller is installed and 81.6 dB(A) when a McCauley propeller is installed. Since initial certification, noise level certification procedures were changed by regulation, and this will account for part of the difference in noise level between the two propellers. Initial noise level measurements with a Hartzell propeller installed were made based on a 1000 foot flyover profile, whereas the measurements with a McCauley propeller installed were made based on a takeoff profile. No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.