

AIRSPEED LIMITATIONS (See Figure 2-1)

AIRSPEED LIMITATIONS TABLE

SPEED	KIAS	KCAS	REMARKS
Maximum Maneuvering Speed V _A (Knots)	167	167	Do not make abrupt control movements above this speed. See Figure 2-2.
Maximum Flap Extended Speed V _{FE} (Knots) T.O. and APPR Positions LAND Position	200 180	199 179	Do not exceed this speed with the given flap setting.
Maximum Gear Operating Speed V _{LO} (Knots)	180	179	Do not extend or retract landing gear above this speed.
Maximum Gear Extended Speed V _{LE} (Knots)	180	179	Do not exceed this speed with landing gear extended.
Air Minimum Control Speed (Wing Flaps In T.O. Position) - V _{MCA} (Knots)	91	92	This is the minimum flight speed at which the airplane is controllable with a bank of 5° toward operative engine with one engine inoperative and the remaining engine operating at takeoff power.
<div style="border: 1px solid black; padding: 5px;"> <p>NOTE</p> <p>Buffet can be encountered as high as 99 KIAS with the airplane at maximum takeoff weight and the wing flaps in the UP position.</p> </div>			
Best Single-Engine Rate-of-Climb Speed (Wing Flaps In UP Position) - V _y (Knots)	120	120	This speed delivers the greatest gain in altitude in the shortest possible time with one engine inoperative.
Maximum Operating Speed/Maximum Structural Cruise Speed V _{MO} (Knots) M _{MO} (Mach)	245 .55 Mach	243	Do not exceed this speed or mach.

Figure 2-1

Engine starts may be attempted 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 -12°C. The use of an APU at the colder temperatures is particularly important if the engines are serviced with Type II oil. Refer to Cold Weather Operation in this section when ambient temperature is below -12°C.

Before engine starting with the airplane batteries, check the voltmeter for a minimum of 24 volts. After starting the left engine, allow the generator charge rate to decrease below 200 amperes and voltmeter to reach 28 volts before starting the right engine.

It is recommended to start the left engine first, particularly during cold weather. Two starting cables are provided for the left engine, thus more electrical power will be available to the left engine starter than to the right engine starter.

Before initiating the start, set the power levers to FLIGHT IDLE. This starting position will provide normal starts while preventing the propellers from jumping their start locks.

As with all turbine engines, the operator must monitor EGT during each engine start to guard against a "hot" start. The operator must be ready to immediately stop the start if EGT exceeds 770°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 RPM or normal fuel flow with insufficient RPM. The latter is usually the problem which is caused by attempting a start with low battery voltage or starting an engine which has excessive drag. The excessive drag can be a result of not using engine preheat when recommended, not having the start locks engaged during the start, or initiating a start on a low-time engine (within 10 to 45 minutes of the previous shutdown) without checking the propeller for freedom of movement. If the EGT maintains 770 to 776°C for 1 second but less than 3 seconds, perform a takeoff power check to determine satisfactory engine operation. If EGT maintains 770 to 776°C for more than 3 seconds, abort the flight and take appropriate maintenance action.

BEFORE TAXIING

1. Pressurization and Temperature Controls - SET.
 - a. Altitude Control - SET to destination field pressure altitude plus 200 feet (outer scale) or cruise altitude plus 500 feet (inner scale) which ever gives the highest cabin altitude.
 - b. Rate Control - SET to reach selected cabin altitude at approximately the same time the airplane reaches cruise altitude.
 - c. Auto Temp Selector - SET for automatic temperature control.
 - d. Cabin Fan - AS REQUIRED.
2. Fuel Low Pressure Lights - CHECK OFF.

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3. Fuel Boost Pumps - OFF momentarily. Check AUX BOOST ON annunciator lights off and FUEL PRESS LOW annunciator lights on.
- a. Fuel Boost Pumps - MAIN. Check AUX BOOST ON and FUEL PRESS LOW annunciator lights off.

NOTE

If engine(s) continues to operate on the auxiliary fuel pump(s), as evidenced by illumination of the AUX BOOST ON annunciator light(s), momentarily position the fuel boost pump(s) to OFF then back to MAIN.

4. Gyro Inverter - ON.
5. Avionics - AS REQUIRED. Refer to applicable avionics system procedures in this section or Section 9.
 - a. Avionics Bus Switches - ON.
6. Instrument Air Pressure - CHECK.
7. Annunciator, Avionics and Monopole Monitor Lights - CHECK.

CAUTION

If the monopole monitor light(s) was on before the engine start, all operations for that engine(s) shall be conducted in manual mode. Refer to Abnormal Procedures for manual mode operating procedures.

8. Overspeed Governors - CHECK 103.5 to 105.5%. Check before the first flight of the day, if airtasks are planned, any maintenance in the engine control system has been performed or there is any indication of malfunction. Refer to System Check Procedures in this section for appropriate procedure.
9. Propeller Start Locks - DISENGAGE. Move power levers slowly toward reverse. If the BETA annunciator light(s) goes out, stop power lever movement until light(s) comes on again. Continue movement until a positive indication of reverse thrust is observed (rise in torque, fuel flow and EGT).
 - a. Power Levers - GRND IDLE.
10. Wing Flaps - SET to T.O. position.
11. Manual Mode Fuel Control Check - COMPLETE before the first flight of the day. Refer to System Check Procedures in this section.
12. Parking Brake - RELEASE. Pushing in the parking brake knob releases the trapped brake fluid, allowing the brakes to be released.

The airplane may be loaded to the maximum ramp weight of 9925 pounds if 75 pounds of fuel or more is anticipated to be used before initiating the takeoff roll.

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TAXIING

1. Power Levers - AS REQUIRED for taxiing.

NOTE

During ground operations in normal mode with engine speed below 80% RPM, compensated EGT is presented on the EGT indicators. When operating in these conditions, the inner green arc on the EGT indicator displays the normal operating range.

2. Brakes - CHECK.
3. Flight Instruments - CHECK.
4. Condition Levers - SET for 65 to 75% RPM. 75% RPM will provide the best ground heating and cooling.

NOTE

With the pressurization source selector positioned to GND, the increased bleed air flow will automatically be reduced to normal flow when engine speed exceeds 80% RPM. The BLEED AIR GROUND annunciator will remain illuminated as long as the source selector is in the GND position.

A steerable nosewheel, interconnected with the rudder system, provides positive directional control up to approximately 13° left or right, and free turning to approximately 57° for sharp turns during taxiing. Normal steering may be aided through use of differential power and differential braking on the main wheels. These aids are listed in the preferred order of use. Do not use excessive brake on the inboard side to effect a turning radius as decreased tire life will result.

NOTE

If the airplane is parked with the nosewheel casted in either direction, initial taxiing should be done with caution. To straighten the nosewheel, use full opposite rudder and differential power instead of differential braking. After a few feet of forward travel, the nosewheel will steer normally.

When taxiing near buildings or other stationary objects, observe the minimum turning radius limits as stated in Figure 7-11. No abnormal precautions are required when taxiing in conditions of high winds.

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At some time early in the taxi run, the brakes should be checked for any unusual reaction, such as uneven braking. The flight director indicator should be checked for normal erection. The horizontal situation indicator should be checked for normal slaving and cross-checked with the standby magnetic compass. Normal slaving is indicated by oscillations of the gyro slaving indicator about the null point (45° fixed reference line on the HSI).

Taxi speed can be reduced using normal braking or by retarding the power levers toward reverse as required. As the power levers are retarded from FLIGHT IDLE, the propeller blade angles reduce, allowing less thrust to be generated. If more rapid deceleration is desired, further retarding of the power levers will position the propellers in negative pitch, resulting in negative thrust being generated. The amount and direction of thrust generated is proportional to the power lever position. Minimize the use of reverse thrust on unprepared surfaces.

BEFORE TAKEOFF

1. Brakes - SET.
2. Power Levers - GRND IDLE.
3. Engine Instruments - CHECK.
4. Ice Protection Equipment - CHECKED and AS REQUIRED if visible moisture and OAT of -30°C to 4°C are anticipated. Refer to System Check Procedures in this section.
 - a. Heated Windshield - CHECKED. Avoid prolonged ground operation.
 - b. Stall Vane Heat - AS REQUIRED.
 - c. Propeller Anti-Ice - AS REQUIRED.
 - d. Pitot/Static Heat - AS REQUIRED.
 - e. Engine Inlet Heat Switches - AS REQUIRED.

CAUTION

Operate windshield and engine inlet heat for check purposes only (maximum of 10 seconds) if outside air temperature is above 4°C.

NOTE

All flight operations in visible moisture with outside air temperature below 4°C shall be completed with engine inlet heat switches ON.

5. Fuel Quantity and Balance - CHECK. Do not exceed 300 pounds asymmetric fuel loading.
6. Fuel Crossfeed Selector - CYCLE, then OFF. When selector is in the left and right positions, check annunciator panel for proper light illumination.
7. Trim Tabs - SET elevator, aileron and rudder tabs in the takeoff range.
8. Wing Flaps - CHECK T.O. position.

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9. Flight Instruments and Avionics - SET. Refer to applicable avionics systems procedures in this section or Section 9.
 - a. Electric Elevator Trim Disengage Check - COMPLETE. Refer to System Check Procedures in this section for additional information.
 - b. Autopilot Preflight Check - COMPLETE. Refer to System Check Procedures in this section for additional information.
10. Propeller Synchrophaser - OFF (Optional System).
11. Pressurization Source Selector - BOTH.
12. Cabin Pressurization Switch - PRESS (Guard Closed).
13. EGT/Torque Limiting Switches - AUTO (Optional System).
14. Flight Controls - CHECK, free and correct.
15. Anti-Collision Lights - ON.
16. Passenger Advisory Lights - ON.
17. Cabin Door and Windows - CLOSE.
18. Annunciator Panel - CLEAR except for L and R BETA lights.
 - a. Monopole Monitor Lights - OFF.
19. Seat Belts and Shoulder Harness - SECURE.
20. Brakes - RELEASE.

Insure the Before Takeoff Checklist is followed to prevent missing an important item.

The electric elevator trim disengage check and autopilot preflight check should be performed before each flight. If the disconnect check does not perform correctly, the system should be checked before inflight use of the autopilot. Do not press the autopilot PREFLIGHT TEST button in flight. Inflight actuation of the test button with the autopilot engaged will disengage the autopilot.

The flight and engine instruments should be checked for normal indications with no warning flags visible. All avionics should be set and checked for correct frequencies or operational modes. The altimeters should be set to reported field pressure, then cross-checked with each other and against field elevation.

A mental review of all engine inoperative speeds, procedures and field length requirements should be made before takeoff. Also, review the normal speeds and power limits (torque, EGT and fuel flow). In addition, review the manual mode EGT limits so that a possible overtemperature condition can be averted in the unlikely event of a fuel computer failure during takeoff or climb.

NOTE

Insure weight does not exceed 9850 pounds before takeoff.

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3. Wing Flaps - T.O.

NOTE

● Experience indicates that retracting the landing gear during an operational VFR go-around, when an immediate landing is contemplated, has been conducive to gear up landings.

● Always follow the Before Landing Checklist.

4. Landing Gear - RETRACT during IFR go-around or simulated IFR go-around after establishing a positive rate of climb.
5. Trim airplane for climb.
6. Wing Flaps - UP as soon as all obstacles are cleared and airspeed is above 115 KIAS.

AFTER LANDING

1. Power Levers - GRND IDLE. Operate at this power setting at least 3 minutes prior to shutdown.
2. Condition Levers - START AND TAXI.
3. Ice Protection Equipment - OFF.

NOTE

Windshield anti-ice will normally have been automatically shut down by this time as evidenced by illumination of the W/S AIR O'HEAT annunciator. Turn off windshield anti-ice switch as soon as practical after landing to prevent windshield overheat protection system from cycling.

4. Anti-Collision Lights - OFF.
5. Wing Flaps - T.O.
6. Pressurization Source Selector - BOTH or GND. The GND position will provide increased cabin air flow for ground ventilation.

After leaving the active runway, the wing flaps should be retracted and condition levers positioned to START AND TAXI. Be sure the wing flaps switch is identified before retracting the wing flaps. The wing flaps are positioned to T.O. before the engines are shut down to allow a thorough preflight inspection of the flaps system before the next flight. Before retarding the condition levers to START AND TAXI, insure the power levers are retarded to GRND IDLE. If the power levers are forward of GRND IDLE, the fuel control computers may switch to manual mode which will allow the engine speed to increase to manual mode ground idle RPM. Cycling of the FUEL COMPUTER switches would then be required to regain normal mode operation and the corresponding lower ground idle engine speeds.

SHUTDOWN

NOTE

Allow engines to operate a minimum of three minutes with the power levers in GRND IDLE position before shutdown to insure proper EGT stabilization. Taxi time may be included in the three-minute period.

1. Fuel Boost Pumps - OFF.
2. Avionics Bus and Gyro Inverter Switches - OFF.

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3. Engine Stop Buttons - PUSH and hold for 5 seconds.
 - a. Condition Levers - GUARD until certain that engine stop buttons are terminating engine operation.

CAUTION

When the engine stop buttons are pushed, a slight rise in RPM and EGT followed by an immediate drop in fuel flow should occur. If the immediate drop does not occur, immediately position the condition lever to EMER SHUT-OFF to prevent the possibility of an engine compartment fire.

4. Power Levers - REVERSE and hold until engine RPM decreases below 30% RPM to insure start locks engage.
5. Power Levers - GRND IDLE after propellers stop.

NOTE

If the indicated fuel quantity is less than 580 pounds on either or both sides, the operational status of the L and/or R X-FER PUMP FAIL annunciator can be checked. The applicable X-FER PUMP FAIL light should illuminate within one to two minutes after turning off the fuel boost pumps.

6. All Other Switches - OFF.
7. Parking Brake - SET if brakes are cool.

A fuel purge system is installed to remove fuel from the engines during shutdown. Upon shutdown, compressed air stored in the purge canister, blows out all fuel remaining in the engine downstream of the fuel control unit. This purged fuel is burned by the engine during the shutdown. The purge cycle is actuated by pressing and holding the engine stop button for five seconds. The compressed air is pressurized bleed air supplied by the engine. To charge the purge canister, the engine must have operated at 90% RPM or more since the previous shutdown.

If dusty conditions exist or if the last flight of the day has been completed, install engine inlet and exhaust covers to protect the engines from debris. The covers may be installed after the engines have cooled down (EGT indicators showing "off scale" temperatures).

SYSTEM CHECK PROCEDURES

ENGINE RESTART WITHIN 10 TO 45 MINUTES AFTER SHUTDOWN

If engine starting is anticipated within 10 to 45 minutes after shutdown, park the airplane into the wind. If a restart is attempted on a warm engine with winds blowing up the engine eductor pipe, the probability of a false start is greatly increased. During these false starts, the engine will accelerate to an abnormally low value and stop accelerating while EGT continues to increase. This will necessitate terminating the start with the engine stop button.

During a period of 10 to 45 minutes after shutdown, low-time engines may not rotate freely. This is due to differences in the cooling rates of various internal components which create temporary tightness at the labyrinth seals.

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On the ground, if engine restarts are anticipated within 10 to 45 minutes after shutdown, slowly move the propeller until the compressor has rotated one-half revolution. This propeller rotation should occur approximately 10 minutes before engine starting. The compressor will have rotated one-half revolution when the aft edge of the propeller spinner has rotated 1-3/8 inches relative to the fixed engine cowling. One and three-eighths inches is equal to one-half of the distance between any two of the spinner attach screws. If propeller rotation is normal, a restart may be initiated. Should abnormal noises and/or high drag occur, indicating an abnormally tight fit of some engine components, rotate the propeller until the engine feels free.

ELECTRONIC FUEL CONTROL HIGH-POWER MONITOR CHECK

When operating in normal mode, this check is to be performed before engine starting on the first flight of the day or after performance of any maintenance, periodic inspection or adjustment involving the engine control system.

1. Power Levers - GRND IDLE.
2. Condition Levers - TAKEOFF, CLIMB AND LANDING.
3. Power Levers - FLIGHT IDLE.

NOTE

The FUEL COMP OFF lights should illuminate, indicating the high-power monitor is operating properly. If the light(s) does not illuminate, a problem in the airplane power lever rigging and/or the fuel control computer monitoring circuit is indicated. All flights should be conducted in manual mode until the problem is corrected. Refer to Manual Mode Operations in Section 3.

4. Condition Levers - START AND TAXI.
5. Fuel Computer Switches - CYCLE from ON to OFF to ON. Check FUEL COMP OFF lights remain off when operating in ON position.

GROUND OPERATIONS ENGINE CLEARING PROCEDURE

Natural draining of fuel and fuel vapors from the engine will occur by allowing the engine to remain static for a minimum of three minutes.

If a motoring procedure is preferred:

1. Battery Switch - ON.
2. Starter Motor Switch - LIFT cover guard and hold switch in desired position until engine reaches 15% RPM.

CAUTION

DO NOT use STARTER MOTOR switch with engine operating. Switch actuation can result in starter damage and will shut off fuel to the selected engine.

3. Battery Switch - OFF.

NOTE

Do not attempt a restart until EGT is less than 200°C. Do not exceed starter duty cycle presented in Section 2.

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INFLIGHT ENGINE CLEARING PROCEDURE

WARNING

DO NOT use STARTER MOTOR switch in flight. Switch actuation can result in starter damage and will shut off fuel to the selected engine.

Natural draining of fuel and fuel vapors from the engine will occur by allowing the engine to remain static for a minimum of 30 seconds.

1. Unfeathering Pump Switch - ACTUATE and hold until 10 to 15% RPM is achieved.

CAUTION

Do not allow engine to continuously MTS between 18 and 28% RPM.

2. Condition Lever - EMER SHUTOFF.

NOTE

Do not attempt a restart until EGT is less than 200°C.

OVERSPEED GOVERNOR CHECK

This check should be made whenever air starts will be attempted intentionally. The check should also be accomplished if there is an indication of malfunction or if any maintenance has been performed on the engine control system. Before performing the check, set the parking brake, insure the propeller start locks are engaged and the area ahead of the airplane is clear.

1. Condition Levers - TAKEOFF, CLIMB AND LANDING.
2. Power Levers - ADVANCE until further motion causes no increase in fuel flows or RPMs. Engine speeds should be 103.5 to 105.5% RPM.

CAUTION

- Insure that the propellers have not "jumped" their start locks.
- Do not allow engine speeds to exceed 105.5% RPM.

3. Power Levers - GRND IDLE.

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1. Condition Levers - ADVANCE to attain approximately 75% RPM.
2. Fuel Computer Switches - OFF. Verify illumination of FUEL COMP OFF annunciator lights and engine speeds initially decrease then increase and stabilize at 85% \pm 10% RPM.

NOTE

If engine speeds decrease below 55% RPM, return the fuel computer switches to ON. Increase RPM to 85% using the condition levers and repeat the manual mode check.

3. Power Levers - ADVANCE slightly. Verify engine speed increases with power lever movement. Retard power levers to GRND IDLE.
4. Condition Levers - START AND TAXI.
5. Fuel Computer Switches - ON (Guards Down). Verify engine speeds decrease and FUEL COMP OFF annunciator lights go out.

START LOCK ENGAGEMENT PROCEDURE**CAUTION**

Do not attempt a ground engine start unless the start locks are engaged. If a start is attempted with the start locks disengaged, a hot start will result.

1. Power Lever - REVERSE.
2. Unfeathering Pump Switch - ACTUATE and hold until propeller is on the start locks.
3. Power Lever - SET one lever width aft of FLIGHT IDLE detent.

ELECTRIC ELEVATOR TRIM DISENGAGE CHECK

1. Electric Elevator Trim Switch - UP.
 - a. AP/TRIM Disengage Switch - DISCONNECT. Observe that manual trim wheel and indicator stop moving.
2. Electric Elevator Trim Switch - DN.
 - a. AP/TRIM Disengage Switch - DISCONNECT. Observe that manual trim wheel and indicator stop moving.
3. Elevator Trim - SET to takeoff range.