INTRODUCTION

Section 4 provides procedures and amplified instructions for normal operations using standard equipment. Normal procedures associated with optional systems can be found in Section 9, Supplements.

AIRSPEEDS FOR NORMAL OPERATION

Unless otherwise noted, the following speeds are based on a maximum weight of 3600 pounds (1633 kg) and may be used for any lesser weight. At weights less than maximum certificated gross weight, the indicated airspeeds are different. The pilot should refer to Section 5, Performance, for specific configuration data.

TAKEOFF

Normal Climb, FLAPS UP . . . . . 110 KIAS
Short Field Takeoff, FLAPS T/O, Speed at 50 Feet . . . . . 80 KIAS

ENROUTE CLIMB, FLAPS UP

Normal, (Best Engine Cooling) . . . . . 110 KIAS
Best Rate of Climb, Sea Level to 10,000 Feet . . . . . 110 KIAS
Best Angle of Climb, Sea Level. . . . . 82 KIAS
Best Angle of Climb, 10,000 Feet . . . . . 86 KIAS

LANDING APPROACH

Normal Approach, FLAPS UP. . . . . 105 - 110 KIAS
Normal Approach, FLAPS LDG . . . . . 85 - 90 KIAS
Short Field Approach, FLAPS LDG. . . . . 82 KIAS

BALKED LANDING

Maximum Power, FLAPS T/O . . . . . 90 KIAS
Maximum Power, FLAPS LDG . . . . . 82 KIAS

MAXIMUM RECOMMENDED TURBULENT AIR PENETRATION SPEED

3600 POUNDS (1633 kg), FLAPS UP . . . . . 162 KIAS
2600 POUNDS (1179 kg), FLAPS UP . . . . . 138 KIAS

MAXIMUM DEMONSTRATED CROSSWIND VELOCITY*

FLAPS T/O or LDG . . . . . 23 KNOTS

* The maximum demonstrated crosswind velocity assumes normal pilot technique and a wind with a fairly constant velocity and direction. The maximum demonstrated crosswind component of 23 knots is not considered limiting.

BEFORE LANDING

1. Pilot and Front Passenger Seat Backs - MOST UPRIGHT POSITION
2. Seats and Seat Belts - SECURED and LOCKED
3. Fuel Selector Knob - LEFT or RIGHT
4. MIXTURE Control - RICH
5. PROPELLER Control - HIGH RPM (push full in)
6. LDG Light Switch - ON
7. Taxi Lights

   Airplanes 411159 and T24002001 thru T24002048

   a. TAXI Light Switch - ON

   Airplanes 411088 and T24002049 and On

   a. TAXI/RECOG Light Switch - ON (during daylight hours)
8. RUDDER HOLD Switch - OFF
9. Autopilot - OFF

LANDING

NORMAL LANDING

1. Approach Airspeed - CHECK
   a. Wing FLAPS UP 95 - 100 KIAS
   b. Wing FLAPS T/O 90 - 95 KIAS
   c. Wing FLAPS LDG 85 - 90 KIAS
2. Elevator and Aileron Trim Controls - ADJUST
3. Touchdown - MAIN WHEELS FIRST
4. Landing Roll - LOWER NOSEWHEEL GENTLY
5. SPD BRK Switch - UP (as desired)
6. Braking - MINIMUM REQUIRED

SHORT FIELD LANDING

1. Wing FLAPS - LDG (below 117 KIAS)
2. Initial Approach Speed - 90 KIAS
3. Airspeed - 82 KIAS (until flare)
4. Elevator and Aileron Trim Controls - ADJUST
5. Power - REDUCE TO IDLE (at flare point)
6. Touchdown - MAIN WHEELS FIRST
7. Landing Roll - LOWER NOSEWHEEL (smoothly and quickly)
8. Brakes - APPLY HEAVILY
9. Wing FLAPS - UP
10. SPD BRK Switch - UP (as desired)

LANDING (Continued)

BALKED LANDING

1. THROTTLE Control - FULL (push full in)
2. PROPELLER Control - 2600 RPM
3. MIXTURE Control - RICH (push full in)
4. SPD BRK Switch - DN
5. Wing FLAPS - RETRACT to T/O
6. Climb Airspeed - 82 KIAS (establish positive rate of climb)
7. Wing FLAPS - RETRACT SLOWLY (400 feet AGL and airspeed 95 KIAS or greater)

AFTER LANDING

1. Wing FLAPS - UP
2. SPD BRK Switch - DN
3. PITOT HEAT or PITOT/STALL HT Switch - OFF
4. PROP HEAT Switch (if installed) - OFF
5. DOOR SEALS Switch - OFF
6. STROBE Light Switch - AS DESIRED

NOTE

Strobe lights may be left on during daylight operations for better recognition.

7. LDG Light Switch - OFF
8. TAXI or TAXI/RECOG Light Switch - AS REQUIRED

LANDING

NORMAL LANDING

Landings under normal conditions are performed with the flaps set to the landing position (LDG). The landing approach speed is 85 to 90 KIAS depending on gross weight and wind conditions. The approach can be made with or without power; however, power should be reduced to idle before touchdown. The use of forward and sideslips are permitted if required to dissipate excess altitude. Remember that the slipping maneuver will increase the stall speed of the airplane, and a margin for safety should be added to the approach airspeed.

CAUTION

- AVOID SIDESLIPS WITH FULL FLAPS, AS THERE IS POTENTIAL FOR THE AIRPLANE TO PITCH DOWN UNINTENTIONALLY.
- AVOID RAPID THROTTLE MOVEMENT IN ORDER TO REDUCE MANIFOLD PRESSURE OVERBOOST. SMOOTH THROTTLE MOVEMENTS ALLOW THE TURBOCHARGERS TO KEEP PACE WITH THE ENGINE OPERATING CONDITIONS.

(Continued Next Page)

LANDING (Continued)

NORMAL LANDING (Continued)

The landing attitude is slightly nose up so that the main gear touches the ground first. After touchdown, the back-pressure on the elevator should be released slowly so the nose gear gently touches the ground. Brakes should be applied gently and evenly to both pedals. Avoid skidding the tires or holding brake pressure for sustained periods.

CAUTION

AT FORWARD CG WITH FLAPS IN LANDING POSITION, AVOID RAPID FORWARD STICK MOVEMENT AS THIS CAN CAUSE AN UNEXPECTED NOSE-DOWN PITCH RESULT.

At forward cg, with the flaps fully extended, rapid forward movement of the stick may lead to airflow separation on the elevator, increasing the airplane pitchdown rate beyond what was commanded. Holding the stick in one position or pulling it back will immediately restore the airflow over the elevator and arrest the pitchdown.

WARNING

IF TIRE SKIDDING OCCURS, IMMEDIATELY REDUCE BRAKE PEDAL PRESSURE. IF TIRE SKIDDING IS ALLOWED TO CONTINUE, A SEVERE OSCILLATORY YAWING MOTION, "WHEEL WALKING", COULD DEVELOP. IF THIS SEVERE OSCILLATORY YAWING MOTION OCCURS, AN AFT FUSELAGE INSPECTION MUST BE PERFORMED IN ACCORDANCE WITH THE AIRPLANE MAINTENANCE MANUAL BY AN APPROPRIATELY RATED MECHANIC PRIOR TO FURTHER FLIGHT.

LANDING (Continued)

SHORT FIELD LANDING

In a short field landing, the important issues are to land just past the beginning of the runway at minimum speed. The initial approach should be made at 85 to 90 KIAS and reduced to 82 KIAS when full flaps are applied. A low-power descent, from a slightly longer than normal final approach, is preferred. It provides more time to set up and establish the proper descent path. If there is an obstacle, cross over it at 82 KIAS and maintain that speed all the way down to landing. Maintain power on approach until just prior to touchdown. Do not extend the landing flare; rather, allow the airplane to land in a slight nose up attitude on the main landing gear first. Lower the nosewheel smoothly and quickly, and initiate braking immediately.

Braking should be initiated with light brake pedal pressure immediately after nosewheel touchdown. The pressure should then be increased at a rate that does not skid the tires but reaches maximum pressure on the brakes around 55 KIAS depending on airplane weight. Maximum pressure can continue until the airplane comes to a stop or runway exit is made. The achievement of maximum pressure may have to be delayed until a lower speed for landings at lighter weights. As the airplane decelerates into the lower speed range, a shudder may be felt in the landing gear. This response is normal and decreases in magnitude as the airplane slows.

(Continued Next Page)

LANDING (Continued)

SHORT FIELD LANDING (Continued)

Any indication of a skidding tire (audible 'chirp' from the main wheel area) should cause the pilot to immediately reduce the brake pedal pressure, after which the brake pedal pressure may be slowly increased again to maximum pressure. Braking response is improved if the flaps are retracted after nosewheel touchdown and back pressure is maintained on the stick throughout the landing roll.

WARNING

- **CAREFUL ADHERENCE TO SHORT FIELD LANDING PROCEDURE MUST BE ESTABLISHED EARLY IN THE APPROACH TO ASSURE ACHIEVING THE PUBLISHED LANDING DISTANCE. THE PROPER LANDING SPEED SHOULD BE ESTABLISHED EARLY DURING FINAL APPROACH AND STABILIZED DOWN TO 50 FT. HEIGHT. CARRYING EXTRA AIRSPEED, EVEN 3-4 KIAS, WILL RESULT IN SIGNIFICANTLY LONGER LANDING DISTANCES.**
- **IF TIRE SKIDDING OCCURS, IMMEDIATELY REDUCE BRAKE PEDAL PRESSURE. IF TIRE SKIDDING IS ALLOWED TO CONTINUE, A SEVERE OSCILLATORY YAWING MOTION, “WHEEL WALKING”, COULD DEVELOP. IF THIS SEVERE OSCILLATORY YAWING MOTION OCCURS, AN AFT FUSELAGE INSPECTION MUST BE PERFORMED IN ACCORDANCE WITH THE AIRPLANE MAINTENANCE MANUAL BY AN APPROPRIATELY RATED MECHANIC PRIOR TO FURTHER FLIGHT.**

LANDING (Continued)

CROSSWIND LANDING

When landing in a strong crosswind, use a slightly higher than normal approach speed, and avoid the use of landing flaps unless required because of runway length. If practicable, use an 85 to 90 KIAS approach speed with the flaps in the takeoff position. A power descent, from a slightly longer than normal final approach, is preferred. It provides more time to set up and establish the proper crosswind compensation. Maintain runway alignment either with a crab into the wind, a gentle forward slip (upwind wing down), or a combination of both. Touch down on the upwind main gear first by holding aileron into the wind. As the airplane decelerates, increase the aileron deflection. Apply braking as required. Raising the flaps after landing will reduce the lateral movement caused by the wind and also improves braking.

Sideslipping the airplane will cause the airspeed to read up to 5 knots higher or lower, depending on the direction of the sideslip. This occurs because the static air source for the airplane is only on one side of the fuselage.

The maximum allowable crosswind velocity is dependent upon pilot capability as well as airplane limitations. Operation in direct crosswinds of 23 knots has been demonstrated.

BALKED LANDING (GO-AROUND)

In a balked landing or a go-around, the primary concerns are to maximize power, minimize drag, and establish a climb. Initiate a go-around by the immediate but smooth full application of power. If the flaps are in the LDG position, reduce them to the T/O position once a positive rate of climb is established at 80 KIAS. Increase airspeed to 110 KIAS. When the airplane is a safe distance above the surface and airspeed at 106 KIAS or higher, retract flaps to the UP position.

SHORT FIELD LANDING DISTANCE
AT 3420 POUNDS

CONDITIONS:

Flaps LDG
Power Idle
Paved, Level, Dry Runway
Maximum Braking
Zero Wind
Speed at 50 ft: 82 KIAS

Press Altitude (ft)	0°C		10°C		20°C		30°C		40°C	
	Ground Roll (ft)	Dist. Over 50 ft Obs. (ft)	Ground Roll (ft)	Dist. Over 50 ft Obs. (ft)	Ground Roll (ft)	Dist. Over 50 ft Obs. (ft)	Ground Roll (ft)	Dist. Over 50 ft Obs. (ft)	Ground Roll (ft)	Dist. Over 50 ft Obs. (ft)
S. L.	1198	2585	1237	2661	1275	2732	1307	2794	1353	2882
1000	1239	2663	1275	2732	1317	2813	1354	2884	1400	2972
2000	1279	2740	1312	2803	1360	2895	1401	2974	1447	3062
3000	1322	2824	1357	2890	1406	2985	1453	3074	1499	3162
4000	1366	2907	1403	2978	1453	3074	1506	3175	1551	3263
5000	1413	2997	1455	3079	1506	3175	1551	3263	1606	3367
6000	1460	3087	1508	3179	1558	3275	1597	3350	1660	3472
7000	1514	3192	1562	3283	1611	3378	1659	3470	--	--
8000	1569	3296	1617	3388	1665	3480	1721	3589	--	--

NOTE

- Short field technique as specified in Section 4.
- Increase ground roll distance by 1% for every 0.1° (0.2%) runway downhill slope.
- Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 7% for each 2 knots.
- For operation on a dry, grass runway, increase distances by 60% of the "Ground Roll" figure.

Figure 5-13

SPEED BRAKES

The speed brake system is installed to provide expedite descents at low cruise power, glide path control on final approach, airspeed reduction, and an aid to the prevention of excessive engine cooling during descent. The speed brakes can be extended at speeds up to V_{NE}.

WARNING

IF ICING IS ENCOUNTERED WITH SPEED BRAKES EXTENDED, RETRACT SPEED BRAKES IMMEDIATELY. DO NOT EXTEND SPEED BRAKES WHEN FLYING IN AREAS OF POTENTIAL STRUCTURAL ICING.

The system consists of wing mounted electric speed brake cartridges. A central logic-switching unit interconnects each cartridge electronically and a panel mounted switch controls deployment. The speed brakes receive electrical power through a pull type circuit breaker labeled SPEED BRAKES connected to the X-FEED bus.

The SPD BRK switch is located next to the THROTTLE control in the center of the instrument panel. The SPD BRK switch must be positioned UP to deploy the speed brakes and positioned DN to retract the speed brakes. A white advisory SPEED BRAKES message will be displayed in the PFD annunciations window only if both speed brakes are successfully deployed. A failure of either cartridge will prevent speed brake deployment and annunciation.

If both speed brakes do not extend after the switch is toggled UP, it indicates a failure of one or both speed brake cartridge(s) and the SPD BRK switch should be toggled to the DN position. The system can be checked again for proper operation, but after the second attempt the SPD BRK switch should be left in the DN position. When the SPD BRK switch is toggled DN, the annunciation message will go out when both brakes are fully stowed in the wing.

The speed brakes will not automatically redeploy after an automatic stowage due to a asymmetric deployment, pulling of the SPEED BRAKES circuit breaker or a low voltage condition. If any of these events are encountered the SPD BRK switch must be toggled to the UP position to redeploy the speed brakes.

SPEED BRAKES

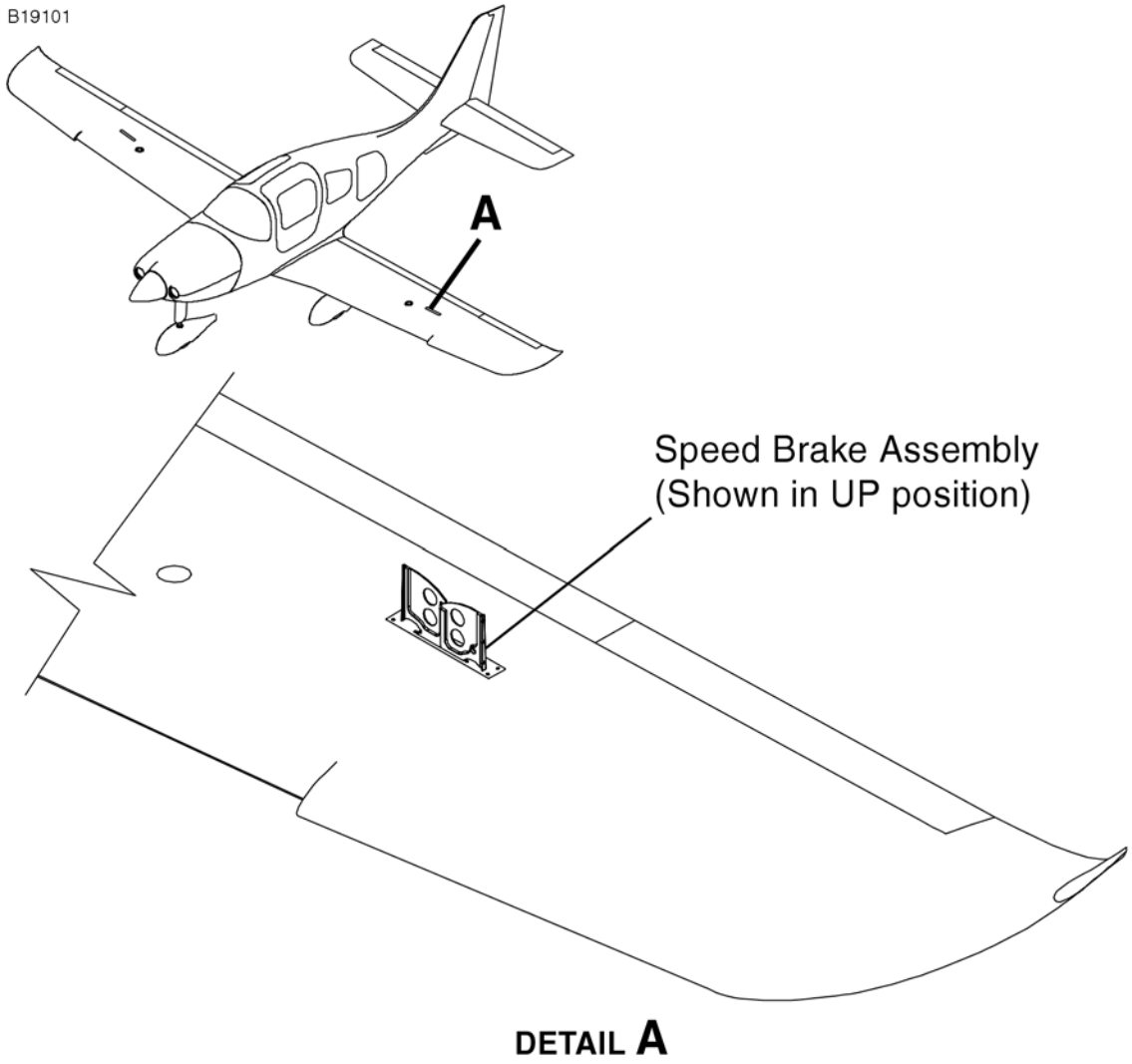

Figure 7-11*