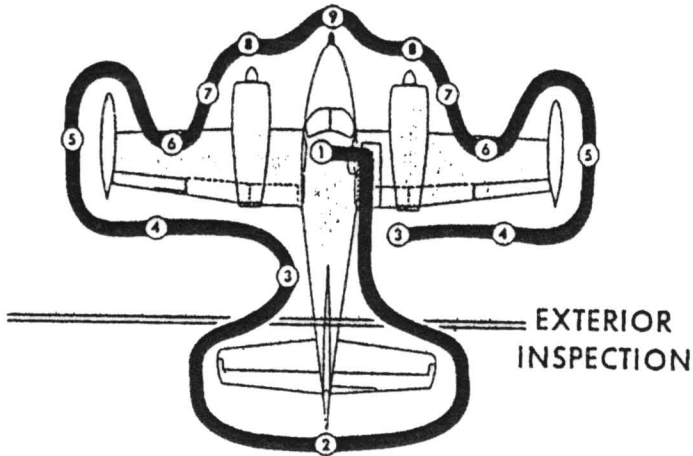


CESSNA 310
CHECK LIST

NORMAL PROCEDURES
AIRSPEEDS FOR SAFE OPERATION

	<u>MPH</u>
Never Exceed (glide or dive, smooth air)	248
Maximum Structural Cruise (level flight or climb)	210
Design Maneuvering Maximum Speed	164
Flaps Extended 15°	160
Flaps Extended 15° - 45°	140
Maximum Speed - Gear Extended	140
Maximum - Landing Light Extended	160
Maximum Pilot's Window Open	130
Cruising Climb	130 to 140
Best Twin Engine Rate of Climb	
Sea Level	119
15,000 Feet	114
Best Twin Engine Angle of Climb	
Sea Level	97
15,000 Feet	106
Minimum Control Speed	80
One Engine Minimum Safe Climb	95
One Engine Best Angle of Climb	95
One Engine Best Rate of Climb (Flaps Up)	111
Stall Speeds	
Gear, Flaps Up	84
Gear Down, Flaps 15°	80
Gear Down, Flaps 45°	74



- ① a. Remove controls lock.
b. Momentarily turn on battery switch, and check fuel quantity gages. Check oxygen pressure.
- ② a. Remove external surface locks, if installed.
b. Check general condition of elevator, rudder and trim tab hinges, hinge bolts and actuator rod bolts.
c. Remove tie-down.
- ③ a. Check static pressure source hole for obstruction.
b. Open baggage door and check that oxygen masks and hoses are available. Check cylinder shut-off valve (rear system).
c. Close baggage door and check for security.
- ④ a. Check aileron and tab hinges, and hinge and actuator rod bolts.
- ⑤ a. Check main fuel tank filler cap and fairing cover for security. On first flight of day, drain sump.

6.
 - a. Check auxiliary tank filler cap for security.
 - b. Check battery compartment cover panel for security (left side only).
 - c. Check anti-ice fluid supply. Check reservoir cover panel for security (right side only).
 - d. Check auxiliary tank vent for obstruction.
 - e. Check landing light for damage.
 - f. Remove wing tie-down.
 - g. On first flight of day, drain auxiliary tank sump.
7.
 - a. Check oil level. Minimum 9 quarts; fill to 12 quarts for extended flight.
 - b. Check main landing gear strut and tire inflation. Check gear door for security.
 - c. On first flight of the day, drain two ounces of fuel from the strainer.
8.
 - a. Check propeller and spinner for nicks, cracks and security.
 - b. Check oil filler cap for security through cooling air inlet in cowl nose cap.
 - c. Check cowl access doors for security.
9.
 - a. Check nose gear strut and tire inflation, nose gear doors for security.
 - b. Check oxygen cylinder shutoff valve (forward system).
 - c. Check pitot tube opening for obstructions.
 - d. Check taxi light for damage.
 - e. Remove tie-down.

Repeat steps "4" through "8."

BEFORE ENTERING THE AIRPLANE.

- (1) Perform an exterior inspection, following the procedure given in the diagram.

BEFORE STARTING ENGINES.

- (1) Adjust and lock seats in a comfortable position, and fasten safety belts.

IMPORTANT

After a seat is moved either forward or aft, it should be tested to see that the latching pins are locked securely.

- (2) Lock cabin door.
- (3) Check controls lock removed.

- (4) Check landing gear switch — DOWN.
- (5) Battery switch — ON.

NOTE

When using an external power source, do not turn on the battery until external power is disconnected, to avoid a weak battery draining off part of the current being supplied by the external source.

- (6) Generator switches — ON.

NOTE

If 50-ampere generators are installed, turn on one at a time as the engines are started.

- (7) Check circuit breaker panel for faulty circuits.
- (8) Landing gear lights — push to test (check iris - open).
- (9) Check fuel quantity indicators.
- (10) Check left fuel selector valve handle — LEFT MAIN; right fuel selector valve handle — RIGHT MAIN (valves in proper detents).
- (11) Adjust elevator trim tab position indicator to TAKE-OFF range.
- (12) Adjust rudder trim tab position indicator to neutral position.
- (13) Adjust alleron trim tab position indicator to neutral and check tab position visually.
- (14) Set altimeter and clock.
- (15) Turn off all radio switches.
- (16) Release parking brake and test-operate brakes, noting any spongy action or excessive brake pedal travel.
- (17) Check flight controls for free and correct movement.
- (18) Set parking brake.
- (19) For night flying, test-operate all lights except landing lights. Make sure an operating flashlight is aboard.

STARTING ENGINE (Left Engine First).

- (1) Turn ignition switches ON.
- (2) Open throttle approximately 1/2 inch.
- (3) Set propeller pitch lever full forward for HIGH RPM.
- (4) Set mixture lever full forward for FULL RICH.
- (5) Clear the propeller.
- (6) Turn the auxiliary fuel pump switch to PRIME position.

NOTE

Avoid leaving the auxiliary fuel pump switch in either the PRIME or ON position for more than a few seconds unless the engine is running.

- (7) Press starter button when fuel pressure reaches 2 to 2.5 PSI.

NOTE

If the engines are hot, press starter button first, then turn auxiliary fuel pump switch to PRIME.

- (8) Turn off auxiliary fuel pump switch when engine runs smoothly.

NOTE

During very hot weather, if there is an indication of vapor in the fuel system (fluctuating fuel pressure) with the engine running, turn the auxiliary fuel pump switch to ON until the system is purged.

- (9) Check for an oil pressure indication within 30 seconds in normal weather and 60 seconds in cold weather. If no indication appears, shut off engine and investigate.
- (10) Disconnect external power source, if used.

WARM-UP AND GROUND TEST (During Taxiing).

- (1) Set both engines at 800 to 1000 RPM.
- (2) For night flight, check landing lights.
- (3) Turn on radios if required.
- (4) Continue the warm-up while taxiing out to the active runway.
- (5) Stop airplane at the run-up location with nosewheel straight, and set parking brake. To avoid propeller tip abrasion, do not run-up engines on loose cinders or gravel.
- (6) Advance throttle to 1700 RPM with control wheel neutral or forward.
- (7) Check engine instruments for operation and indication.
- (8) Check generator operation by turning off each generator switch individually and noting amperage.
- (9) Check magnetos (125 RPM maximum allowable drop).
- (10) Check induction air heat source operation by noting RPM and manifold pressure drop.

- (11) Place each propeller pitch lever in the FEATHER position until engine speed drops to 1200 RPM, then return to full forward position.

NOTE

If propeller operation has been unusually sluggish or erratic, feather propeller twice to 800 RPM in run-up, retarding throttle as necessary to avoid excessive manifold pressure at low RPM. Exercising the propeller in this manner insures optimum propeller governing in flight.

- (12) Check operation of each vacuum pump and amount of suction to the gyros, with the vacuum selector test valve knob.
- (13) If each engine accelerates smoothly and oil pressure remains steady at some value between 30 and 60 PSI, the engines are warm enough for take-off.

BEFORE TAKE-OFF OR DURING TAXIING.

- (1) Recheck elevator trim tab position indicator for TAKE-OFF range.
- (2) Recheck rudder trim tab position indicator for neutral position.
- (3) Recheck aileron trim tab position indicator for neutral, and check tab visually.
- (4) Turn auxiliary fuel pump switches to ON.
- (5) Check induction air — COLD.
- (6) Check free and correct movement of flight controls.
- (7) Check that the cabin door and the pilot's window are closed and locked.
- (8) Check and set flight instruments and radio as necessary.

NORMAL TAKE-OFF.

- (1) Flaps 0°.
- (2) Apply full throttle smoothly to avoid propeller surging.
- (3) For maximum performance, set mixture for field elevation.

NOTE

Leaning during the take-off roll is normally not necessary; however, should maximum take-off or subsequent engine-out performance be desired, fuel pressure should be adjusted to match field elevation.

- (4) Maintain airplane in level attitude in take-off run.

- (5) Keep heels on floor to avoid dragging brakes.
- (6) Apply slight back pressure to raise nosewheel as airplane reaches 82 MPH (minimum single-engine control speed).
- (7) Plan to break ground at 95 MPH (minimum safe single-engine speed).
- (8) Apply brakes momentarily to stop wheel rotation.
- (9) Retract landing gear.
- (10) Accelerate to 111 MPH (best single-engine rate-of-climb speed) and climb to a safe single-engine maneuvering altitude.
- (11) Accelerate to 119 MPH (best twin-engine rate-of-climb speed).
- (12) Turn auxiliary fuel pumps OFF individually, checking final fuel pressure indications.

NOTE

During very hot weather, if there is an indication of vapor in the fuel system (fluctuating fuel pressure) turn the auxiliary fuel pump ON until cruising altitude has been obtained and the system is purged.

CLIMB (Twin Engine).

- (1) In normal operation, if no obstacle is ahead, climb out with flaps retracted at 130 - 140 MPH, with 24 inches of manifold pressure and 2450 RPM.
- (2) Mixture should be adjusted to the high-pressure side of the cruise power fuel pressure range for economical fuel consumption in cruising climb.
- (3) For maximum rate-of-climb, use full throttle and 2625 RPM at 119 MPH, decreasing climb speed to 115 MPH at 10,000 feet.
- (4) The mixture should be adjusted to the low-pressure side of the take-off and climb dial range for maximum climb performance.

CRUISING.

- (1) Select cruising power setting from range charts (see Section VII). Normal cruising power settings are 23 inches and 2300 RPM; and maximum cruising power settings are 24 inches and 2450 RPM.
- (2) After speed is stabilized, trim airplane.
- (3) Adjust mixtures to the low-pressure side of the dial range for normal operation at the desired power.
- (4) Adjust friction knob to prevent engine controls from creeping.

LET-DOWN.

- (1) Reduce power to obtain desired let-down rate at cruising speed.
- (2) Set mixture levers full forward (FULL RICH).
- (3) For steep let-downs, decrease speed to 160 MPH or less and extend flaps 15°. If necessary, for steeper let-downs, reduce speed to 140 MPH and extend landing gear.

NOTE

Avoid steep, power-off let-downs with low fuel.

BEFORE LANDING.

- (1) Check the left fuel selector valve handle — LEFT MAIN and the right fuel selector valve handle — RIGHT MAIN.
- (2) Check mixture levers full forward (FULL RICH).
- (3) Turn on auxiliary fuel pumps.
- (4) Check induction air — COLD.
- (5) Extend flaps to 15° in small increments below 160 MPH.
- (6) Extend landing gear below 140 MPH.
- (7) Check green landing gear position indicator light for illumination.
- (8) Set propeller pitch levers for 2625 RPM (full forward) for maximum power in case of a go-around.
- (9) Lower flaps to 30° — 45° below 140 MPH.
- (10) Approach at approximately 95 MPH with or without power.

NORMAL LANDING.

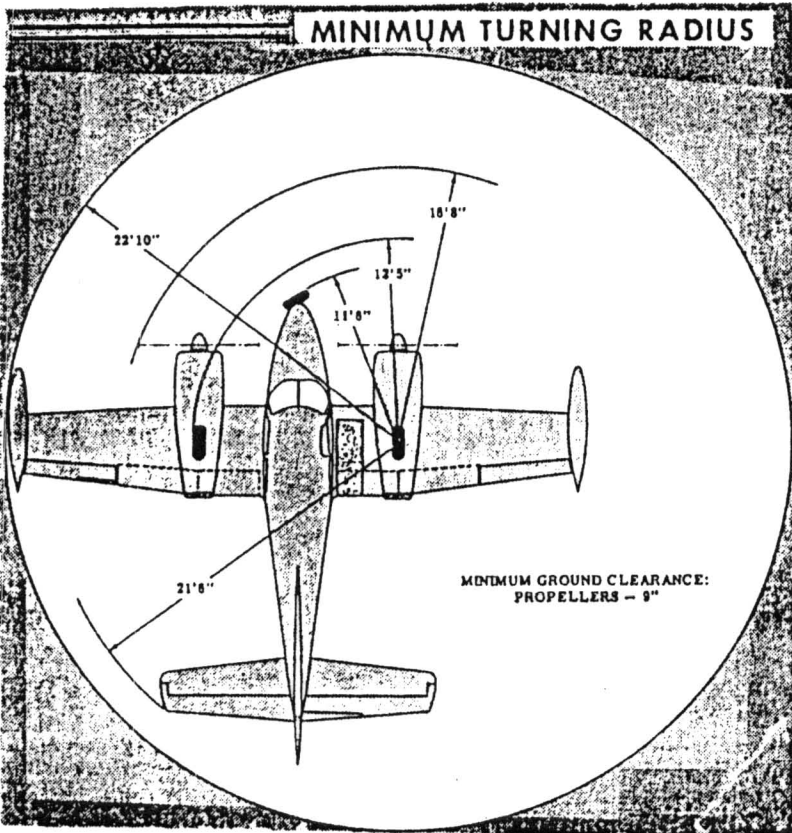
- (1) Land on main wheels first.
- (2) Lower nosewheel gently to runway after speed is reduced.
- (3) Avoid excessive braking unless obstacle is ahead.

GO-AROUND (Twin Engine).

- (1) Apply full throttle and increase engine speed to 2625 RPM, if necessary.
- (2) Reduce flap setting to 15°.
- (3) Trim airplane for climb.
- (4) Retract flaps as soon as all obstacles are cleared and a safe altitude and airspeed are obtained.

AFTER LANDING.

- (1) Retract flaps.
- (2) Park with nosewheel aligned straight ahead if possible. If gusty wind conditions prevail, caster the nosewheel to the extreme right or left position, to protect the rudder from wind damage.
- (3) Turn off auxiliary fuel pumps.
- (4) Stop engines by putting mixture levers in IDLE CUT-OFF.
- (5) After engines stop, turn ignition switches OFF.
- (6) Turn all switches OFF.
- (7) Set parking brakes.
- (8) Install controls lock, if required.



EMERGENCY PROCEDURES

ENGINE FAILURE.

ENGINE FAILURE DURING TAKE-OFF BELOW 95 MPH.

- (1) Cut power on operative engine and decelerate to a stop.

NOTE

The airplane can be accelerated from a standing start to 95 MPH on the ground, and then decelerated to a stop with heavy braking within 2500 feet of the starting point of the take-off run at sea level, and within 3300 feet of the starting point at 5000 feet altitude (zero wind, hard surface runway, standard conditions, full gross weight).

ENGINE FAILURE AFTER TAKE-OFF ABOVE 95 MPH WITH ROUGH TERRAIN AHEAD.

- (1) Throttles — FULL FORWARD.
- (2) Propeller pitch levers — FULL INCREASE RPM.
- (3) Landing gear switch — UP.
- (4) Determine the inoperative engine (idle engine same side as idle foot).
- (5) Propeller pitch lever — FEATHER (inoperative engine).
- (6) Climb out at 95 MPH.
- (7) Trim tabs — Adjust for climb with airplane banked 3° — 5° toward operative engine.
- (8) Accelerate to 111 MPH after obstacle is cleared.
- (9) Flaps switch — UP (if extended) in small increments.
- (10) Secure dead engine by turning OFF auxiliary fuel pump switch, generator switch, ignition switches, mixture lever, fuel selector valve handle.
- (11) Fuel selector valve handle (operative engine) — Select tank to maintain lateral balance.

SINGLE-ENGINE CLIMB.

- (1) Throttle — FULL FORWARD.
- (2) Propeller pitch lever — FULL INCREASE RPM.
- (3) Mixture lever — Adjust fuel pressure to low side of dial range.
- (4) Landing gear switch — UP (If not previously retracted).
- (5) Wing flaps switch — UP (In small increments, if used).
- (6) Climb at 111 MPH if no obstacles are ahead.
- (7) Climb at 95 MPH with obstacles ahead.

NOTE

For maximum single-engine climb, bank the airplane 5° toward the operating engine. Refer to Section VII for single-engine climb data.

ENGINE FAILURE DURING FLIGHT.

At once:

- (1) Throttles — FULL FORWARD.
- (2) Propeller pitch levers — FULL INCREASE RPM.
- (3) Mixture levers — Adjust fuel pressure to low-pressure side of dial range.
- (4) Determine inoperative engine (Idle engine same side as idle foot).
- (5) Trim rudder for single-engine flight.

Before securing inoperative engine:

- (1) Check fuel pressure; if deficient, turn on auxiliary fuel pump.

NOTE

If fuel selector valve handle is on AUXILIARY TANK, switch to MAIN TANK.

- (2) Check fuel quantity and switch to opposite tank if necessary.

- (3) Check oil pressure and oil temperature indications. Shut down engine if oil pressure is low.
- (4) Check ignition switches.

If proper corrective action was taken, engine will restart. If it does not, secure it as follows:

- (1) Mixture lever — IDLE CUT-OFF.
- (2) Propeller lever — FEATHER.
- (3) Turn off auxiliary fuel pump, generator, ignition switches and fuel selector valve.
- (4) To conserve battery power, turn off sufficient electrical equipment to eliminate a negative ammeter reading.
- (5) Select cruise power settings on operative engine.
- (6) Trim airplane 3° - 5° wing-low on the side of the operative engine.
- (7) Land at the nearest suitable airport.

RESTARTING ENGINE IN FLIGHT (After Feathering).

- (1) Check fuel selector valve handle on MAIN.
- (2) Advance throttle until gear warning horn is silent.
- (3) Advance propeller pitch lever forward of feathering detent.
- (4) Set mixture lever full forward for FULL RICH.
- (5) Turn ignition switches ON.
- (6) Turn auxiliary fuel pump switch to PRIME position.
- (7) Depress starter button when fuel pressure reaches 2 to 2.5 PSI.
- (8) In cold weather, turn auxiliary fuel pump switch ON, if required.
- (9) After engine starts, turn off auxiliary fuel pump.

NOTE

If start is unsuccessful, turn ignition and auxiliary fuel pump switch to OFF, retard mixture lever to IDLE CUT-OFF, open throttle fully, and engage starter for several revolutions. Then repeat air start procedure.

- (10) Increase power slowly until cylinder head temperature reaches 200°F.

MAXIMUM GLIDE.

In the event of failure of both engines, maximum gliding distance can be obtained by feathering both propellers, and maintaining 107 MPH with the landing gear and wing flaps up.

FORCED LANDING (Precautionary Landing With Power).

- (1) Drag over selected field with flaps 15° and 95 MPH airspeed, noting type of terrain and obstructions.
- (2) Plan a wheels-down landing if surface is smooth and hard (pasture, frozen lake, etc).
- (3) Execute a normal short-field landing, keeping nosewheel off ground until speed is decreased.
- (4) If terrain is rough or soft, plan a wheels-up landing as follows:
 - (a) Approach with flaps down 20° at 95 MPH.
 - (b) Turn off all switches except ignition switches.
 - (c) Unlatch cabin door prior to flare-out.

IMPORTANT

Be prepared for mild tail buffet as cabin door is opened.

- (d) Reduce power to a minimum during flare-out.
- (e) Prior to contact, turn off ignition switches.

IMPORTANT

If flare-out is sustained with moderate power, cutting power suddenly will result in a hard landing. To avoid this, reduce power to a minimum in flare-out before turning off ignition switches.

- (f) Land in a slightly tail-low attitude.
- (g) Hold wheel fully back in initial slide to keep nacelles from possibly "digging in" in rough terrain.

NOTE

Airplane will slide straight ahead about 500 feet on smooth sod with very little damage.

FORCED LANDING (Complete Engine Failure).

- (1) Feather propellers and rotate them to a horizontal position with starter if time permits.
- (2) Mixture levers in IDLE CUT-OFF.
- (3) Fuel selector valve handles - OFF.
- (4) All switches OFF except battery switch.
- (5) Approach at 105 MPH.
- (6) If field is smooth and hard, extend landing gear within gliding distance of field.
- (7) Extend flaps as necessary within gliding distance of field.

IMPORTANT

The glide path is extremely steep with flaps and gear down and propellers windmilling.

- (8) Turn battery switch OFF.
- (9) Make a normal landing, keeping nosewheel off ground as long as practical.
- (10) If terrain is rough or soft, plan a wheels-up landing as follows:
 - (a) Approach at 105 MPH with gear and flaps retracted.
 - (b) Extend flaps to 20° within gliding distance of field.
 - (c) Turn battery switch OFF.
 - (d) Unlatch cabin door prior to flare-out.
 - (e) Land in a slightly tail-low attitude.
 - (f) Attempt to hold tail low throughout slide.

SINGLE-ENGINE LANDING.

- (1) Approach at 105 MPH with excess altitude.
- (2) Delay extension of landing gear until within gliding distance of field.
- (3) Avoid use of flaps until landing is assured.
- (4) Decrease speed below 95 MPH only if landing is a certainty.

NOTE

When speed drops below 95 MPH, the airplane is usually committed to land because an immediate climb-out is often difficult at any speed lower than the minimum safe single-engine climb speed.

- (5) Land with some excess speed to allow for gusts, poor technique, etc.
- (6) Maintain enough momentum to turn off the active runway without power because single-engine taxi is difficult at slow speed in certain wind conditions.

GO-AROUND (Single-Engine).

- (1) If absolutely necessary and speed is above 95 MPH, apply full throttle and increase engine speed to 2625 RPM.
- (2) Retract landing gear.
- (3) Reduce flap setting to 15°.
- (4) Climb at 111 MPH (95 MPH with obstacles directly ahead).
- (5) Trim airplane for single-engine climb.
- (6) Retract flaps as soon as all obstacles are cleared and a safe altitude and airspeed are obtained.

SYSTEM EMERGENCY PROCEDURES.

FUEL SYSTEM-EMERGENCY OPERATION.

In the event of an engine-driven fuel pump failure, turn the auxiliary fuel pump switch (on the inoperative side) to ON. This pump will supply sufficient fuel for take-off power; however, mixture control must be reset.

IMPORTANT

If both an engine-driven fuel pump and an auxiliary fuel pump fail, fuel may be supplied to the failing engine by feeding it from the

tank with the operative auxiliary fuel pump. The engine with the operative engine-driven fuel pump should be fed from the tank containing the inoperative auxiliary fuel pump. This will permit all fuel to be used from the main tanks. However, it is impossible to use fuel from the auxiliary fuel tank on the same side as the inoperative engine-driven fuel pump.

Land as soon as practical if fuel pressure indication remains below normal.

LANDING GEAR SYSTEM-EMERGENCY OPERATION.

When the landing gear will not extend electrically, it may be extended manually in accordance with the following steps:

- (1) Before proceeding manually, check landing gear circuit breakers with landing gear switch DOWN. If circuit breakers are tripped, allow 3 minutes for them to cool before resetting.
- (2) If circuit breaker is not tripped, put landing gear switch in the OFF (middle) position.
- (3) Pull upward on the seat right adjustment handle and tilt seat back for easier hand cranking.
- (4) Remove handcrank from stowage clip.
- (5) Extend handcrank until hinged link is straight by rotating crank slightly clockwise to engage extension mechanism gear teeth.
- (6) Crank gear down approximately two turns past the point where the gear-down indicator light (green) comes on (approximately 60 turns of the handcrank).
- (7) Check gear-down indicator light and gear warning horn with throttle retarded.
- (8) Depress button on hinged crank link, and stow the handcrank in the stowage clip.
- (9) Readjust seat to the upright position, if desired, for landing.

NOTE

The landing gear should never be retracted with the manual system, as undue loads will be imposed and cause excessive wear on the cranking mechanism. If the gear will not retract electrically, land and have the malfunction corrected.

FLIGHT PROCEDURE WITH OPEN CABIN DOOR.

Airflow over the curved cabin door produces negative pressure over the door surface, resulting in an outward pull that increases with speed. Consequently, if the door should open accidentally in flight because it was not locked, it will float outward enough to disturb the airflow over the tail. This effect is shown by moderate buffeting of the tail. This buffeting attains its maximum with gear up, flaps 20°, and 80 MPH, and occasionally produces a noticeable nose-down pitch and possibly a slight roll as the door pops open. Although these motions are controllable, it is best to avoid this situation close to the ground. Therefore, it is important to make sure the door handle is in the LOCKED position before take-off.

LANDING EMERGENCIES (Except Ditching).

Landing emergencies, including landing with a flat main gear tire, flat nose gear tire, defective main gear, and defective nose gear, and the corrective action to be taken in each condition, are described in the following paragraphs. Under each condition, the landing approach is to be performed using normal throttle, mixture, and propeller pitch lever settings.

LANDING WITH FLAT MAIN GEAR TIRE.

If a blowout occurred during take-off, and the defective main gear tire is identified, proceed as follows:

- (1) Landing gear switch — UP.
- (2) Fuel selector valve handles — Turn to main tank on same side as defective tire. Proceed to destination, to reduce fuel load.

NOTE

Fuel should be used from this tank first to lighten the load on this wing prior to attempting a landing, if in-flight time permits. However, an adequate supply of fuel should be left in this tank so that it may be used during landing.

- (3) Fuel selector valve handles — RIGHT MAIN for right engine, LEFT MAIN for left engine (prior to landing).

- (4) Select a runway with a crosswind from the side opposite the defective tire if a crosswind landing is required.
- (5) Landing gear switch — DOWN (below 140 MPH).
- (6) Check landing gear down indicator light (green) for indication.
- (7) Flaps switch — DOWN. Fully extend flaps to 45°.
- (8) In approach, align airplane with edge of runway opposite the defective tire, allowing room for a mild turn in the landing roll.
- (9) Land slightly wing-low on side of inflated tire and lower nosewheel to ground immediately, for positive steering.
- (10) Use full alleron in landing roll, to lighten load on defective tire.
- (11) Apply brake only on the inflated tire, to minimize landing roll and maintain directional control.
- (12) Stop airplane to avoid further tire and wheel damage, unless active runway must be cleared for other traffic.

LANDING WITH FLAT NOSE GEAR TIRE.

If a blowout occurred on the nose gear tire during take-off, prepare for a landing as follows:

- (1) Landing gear switch — Leave DOWN.

IMPORTANT

Do not attempt to retract the landing gear if a nose gear tire blow-out occurs. The nose gear tire may be distorted enough to bind the nosewheel strut within the wheel well and prevent later gear extension.

- (2) Move disposable load to baggage area and passengers to available rear seat space.
- (3) Flaps switch — DOWN. Extend flaps from 0° to 20° as desired.
- (4) Land in a nose high attitude with or without power.
- (5) Maintain back pressure on control wheel to hold nosewheel off the ground in landing roll.
- (6) Use minimum braking in landing roll.
- (7) Throttles — Retard in landing roll.
- (8) As landing roll speed diminishes, hold control wheel fully aft until airplane is stopped.
- (9) Avoid further tire damage by holding additional taxi to a minimum.

LANDING WITH DEFECTIVE MAIN GEAR.

Attempt to extend the gear manually using the procedure described in paragraph LANDING GEAR SYSTEM — EMERGENCY OPERATION. If a malfunction is then verified by observers in the control tower or another airplane, reduce the fuel load in the tank on the side of the faulty main gear as explained in paragraph LANDING WITH FLAT MAIN GEAR TIRE. When fuel load is reduced, prepare to land as follows:

- (1) Fuel selector valve handles — RIGHT MAIN for right engine and LEFT MAIN for left engine.
- (2) Select a wide, hard surface runway, or if necessary a wide sod runway. Select a runway with crosswind from the side opposite the defective landing gear, if a crosswind landing is necessary.
- (3) Landing gear switch — DOWN.
- (4) Flaps switch — DOWN. Extend flaps to 30°.
- (5) In approach, align airplane with edge of runway opposite the defective landing gear, allowing room for a ground-loop in landing roll.
- (6) Battery switch — OFF.
- (7) Land slightly wing-low toward the operative landing gear and lower the nosewheel immediately, for positive steering.
- (8) Mixture levers — IDLE CUT-OFF (both engines).
- (9) Use full aileron in landing roll to lighten the load on the defective landing gear.
- (10) Apply brake only on the operative landing gear to maintain directional control and minimize the landing roll.
- (11) Fuel selector valve handles — OFF.
- (12) Evacuate the airplane as soon as it stops.

LANDING WITH DEFECTIVE NOSE GEAR.

Attempt to extend the gear manually using the procedure described in paragraph LANDING GEAR SYSTEM - EMERGENCY OPERATION. If a malfunction is then verified by observers in the control tower or other aircraft, prepare for a wheels-down landing as follows:

- (1) Move disposable load to baggage area, and passengers to available rear seat space.
- (2) Select a smooth hard surface or sod runway.
- (3) Landing gear switch — DOWN.
- (4) Approach at 95 MPH with flaps down 20°.
- (5) All switches except ignition switches — OFF.
- (6) Land in a slightly tail-low attitude.
- (7) Mixture levers — IDLE CUT-OFF (both engines).
- (8) Ignition switches — OFF.
- (9) Hold nose off throughout ground roll.
- (10) Fuel selector valve handles — OFF.
- (11) Evacuate the airplane as soon as it stops.

DITCHING.

(1) Plan approach into the wind if wind is high and seas are heavy. With heavy swells and light wind, land parallel to swells, being careful not to allow a wing tip to hit first.

(2) Approach with the landing gear retracted, flaps 45°, and enough power to maintain approximately 300 ft/min. rate of descent at approximately 95 MPH at 3500 pounds, to 108 MPH at 4600 pounds gross weight.

(3) Maintain a continuous descent until touchdown to avoid flaring and touching down tail-first, pitching forward sharply, and decelerating rapidly. Strive for initial contact at fuselage area below rear cabin section (point of maximum longitudinal curvature of fuselage).

It is expected that the airplane will skip clear of the water once or twice using the optimum technique outlined above. If the final contact is made in the desired level attitude, the nose will submerge completely during two or three seconds of moderately abrupt deceleration, and then the airplane will float for a short time in a nearly level attitude. The length of floatation time will depend on the extent of damage to nose and main gear doors, tip tanks, nacelle firewalls, fuselage bottom and wings. However, it is believed that the airplane would settle rather slowly, especially with empty fuel tanks.

