

4.21 BEFORE TAKEOFF (4.5g)

After all aspects of the takeoff are considered, a before takeoff check procedure must be performed.

Verify that the battery master and alternator switches are ON. Check and set all of the night instruments as required. Check the fuel selector to make sure it is on the proper tank (fullest). Turn ON the electric fuel pump. Check the engine gauges. The alternate air should be in the CLOSED position.

All seat backs should be erect.

The mixture and propeller control levers should be set and the seat belts and shoulder harness fastened. Fasten the seat belts snugly around the empty seats.

Exercise and set the flaps and trim. The Emergency Gear Extension Lever should be in the up position to permit normal gear operation. If the Emergency Gear Extension Lever is not in the fully up position prior to gear retraction, the landing gear may not retract when the landing gear switch is selected up. Ensure proper movement and response of all flight controls.

All doors should be properly secured and latched.

On air conditioned models, the air conditioner must be OFF to ensure normal takeoff performance.

4.23 TAKEOFF (4.5h)

4.23a Normal Technique (4.5h)

The normal takeoff technique is conventional for the Arrow. Flaps should be up and the trim should be set slightly aft of neutral, with the exact setting determined by the loading of the airplane. Allow the airplane to accelerate to 65 to 75 KIAS, depending on the weight of the aircraft, and ease back on the control wheel to rotate to climb attitude.

4.23b Short Field, Obstacle Clearance And Soft Field Techniques (4.5h)

The procedure used for a short field takeoff with an obstacle clearance or a soft field takeoff differs slightly from the normal technique. The flaps should be lowered to 25 \dot{P} (second notch). Allow the aircraft to accelerate to 50 to 60 KIAS depending on the aircraft weight and rotate the aircraft to climb attitude. After breaking ground, accelerate to 55 to 65 KIAS, depending on aircraft weight and select gear up. Continue to climb while accelerating to the gear up rate of climb speed, 90 KIAS if no obstacle is present or 78 KIAS if obstacle clearance is a consideration. Slowly retract the flaps one notch at a time while climbing out.

4.25 CLIMB (4.5i)

On climb-out after takeoff, it is recommended that the best angle of climb speed (78 KIAS) be maintained only if obstacle clearance is a consideration. The best rate of climb speed (90 KIAS) should be maintained with full power on the engine until adequate terrain clearance is obtained. At lighter than gross weight these speeds are reduced somewhat. An en route climb speed of 104 KIAS or higher is also recommended. This increased climb speed provides better engine cooling, less engine wear, reduced fuel consumption, lower cabin noise level, and better forward visibility.

When reaching the desired altitude, the electric fuel pump may be turned OFF.

To obtain the performance presented in the Performance Section of this handbook, full power (full throttle and 2700 rpm) must be used.

4.27 CRUISE (4.5j)

Following level-off for cruise, the airplane should be trimmed.

The cruising speed of the Arrow is determined by many factors, including power setting, altitude, temperature, loading and equipment installed in the airplane.

The normal maximum cruising power is 75% of the rated horsepower of the engine. When selecting cruising rpm below 2400, limiting manifold pressure for continuous operation, as specified by the appropriate Avco-Lycoming Operator's Manual, should be observed.

To obtain the desired power, set the manifold pressure and rpm according to the power setting table in this manual.

Use of the mixture control in cruising flight reduces fuel consumption significantly, especially at higher altitudes. The mixture should be leaned during cruising operation when 75% power or less is being used. If any doubt exists as to the amount of power being used, the mixture should be in the full RICH position for all operations.

4.27 CRUISE (4.5j) (Continued)

To lean the mixture, disengage the lock and pull the mixture control until the engine becomes rough, indicating that the lean mixture limit has been reached in the leaner cylinders. Then enrich the mixture by pushing the control towards the instrument panel until engine operation becomes smooth. The fuel flow meter will give a close approximation of the fuel being consumed. The low side of the power setting, as shown on the fuel flow meter, indicates best economy for that percent of power while the high side indicates best power.

If the airplane is equipped with the optional exhaust gas temperature (EGT) gauge, a more accurate means of leaning is available to the pilot. For this procedure, refer to the Avco-Lycoming Operator's Manual.

The pilot should monitor weather conditions while flying and should be alert to conditions which might lead to icing. If induction system icing is expected, place the alternate air control in the ON position.

During flight, keep account of time and fuel used in connection with power settings to determine how the fuel flow and fuel quantity gauging systems are operating. If the fuel flow indication is considerably higher than the fuel actually being consumed, a fuel nozzle may be clogged and require cleaning.

There are no mechanical uplocks in the landing gear system. In the event of a hydraulic system malfunction, the landing gear will free fall to the gear down position. The true airspeed with gear down is approximately 75% of the gear retracted airspeed for any given power setting. Allowances for the reduction in airspeed and range should be made when planning extended flight between remote airfields or flight over water.

In order to keep the airplane in best lateral trim during cruise flight, the fuel should be used alternately from each tank at one hour intervals.

Always remember that the electric fuel pump should be turned ON before switching tanks, and should be left on for a short period thereafter. To preclude making a hasty selection, and to provide continuity of flow, the selector should be changed to another tank before fuel is exhausted from the tank in use. The electric fuel pump should be normally OFF so that any malfunction of the engine driven fuel pump is immediately apparent. If signs of fuel starvation should occur at any time during flight, fuel exhaustion should be suspected, at which time the fuel selector should be immediately positioned to a full tank and the electric fuel pump switched to the ON position.

4.29 APPROACH AND LANDING (4.5k)

Check to ensure the fuel selector is on the proper (fullest) tank and that the seat backs are erect. The seat belts and shoulder harness should be fastened and the inertia reel checked.

Turn ON the electric fuel pump. The mixture should be set in the full RICH position. Set the propeller at full INCREASE rpm to facilitate ample power for an emergency go-around.

Prior to landing gear operation, the Emergency Gear Extension Lever should be in the up position to permit normal gear extension or retraction in the event of a go-around. The landing gear may be extended at speeds below 129 KIAS. The airplane should be trimmed to a final approach speed of about 75 KIAS with flaps extended. The flaps can be lowered at speeds up to 103 KIAS, if desired. Turn OFF the air conditioner.

The mixture control should be kept in full RICH position to ensure maximum acceleration if it should be necessary to open the throttle again.

The amount of flap used during landings and the speed of the aircraft at contact with the runway should be varied according to the landing surface and conditions of wind and airplane loading. It is generally good practice to contact the ground at the minimum possible safe speed consistent with existing conditions.

Normally, the best technique for short and slow landings is to use full flap and enough power to maintain the desired airspeed and approach flight path. Mixture should be full RICH, fuel on the fullest tank, and the electric fuel pump ON. Reduce the speed during the flareout and contact the ground close to the stalling speed. After ground contact, hold the nose wheel off as long as possible. As the airplane slows down, gently lower the nose and apply the brakes. Braking is most effective when flaps are raised and back pressure is applied to the control wheel, putting most of the aircraft weight on the main wheels. In high wind conditions, particularly in strong crosswinds, it may be desirable to approach the ground at higher than normal speeds with partial or no flaps.

4.31 STOPPING ENGINE (4.5m)**CAUTION**

The flaps must be placed in the UP position for the flap step to support weight. Passengers should be cautioned accordingly.

At the pilot's discretion, the flaps should be raised.

4.31 STOPPING ENGINE (4.5m) (continued)

The electric fuel pump, air conditioner, radios, and all electrical switches should be turned OFF. Set the propeller in the full INCREASE position. Stop the engine by disengaging the mixture control lock and pulling the mixture control back to idle cut-off. The throttle should be left full aft to avoid engine vibration while stopping. Then the magneto, alternator, and battery master switches must be turned OFF.

4.33 MOORING (4.5n)

If necessary, the airplane should be moved on the ground with the aid of the nose wheel tow bar provided with each airplane and secured behind the rear seats. The flaps are locked when in the UP position and should be left retracted. The aileron and stabilator controls should be secured by looping the safety belt through the control wheel and pulling it snug.

Tiedowns can be secured to rings provided under each wing and to the tail skid. The rudder is held in position by its connections to the nose wheel steering and normally does not have to be secured.

4.35 STALLS

The stall characteristics of the Arrow are conventional. An approaching stall is indicated by a stall warning horn which is activated between five and ten knots above stall speed. Mild airframe buffeting and gentle pitching may also precede the stall.

The gross weight stalling speed of the Arrow with power off and full flaps is 55 KIAS. With the flaps up this speed is increased 5 KTS. Loss of altitude during stalls can be as great as 400 feet, depending on configuration and power.

NOTE

The stall warning system is inoperative with the battery master switch OFF.

During preflight, the stall warning system should be checked by turning the battery master switch ON, lifting the detector and checking to determine if the horn is actuated. The battery master switch should be returned to the OFF position after the check is complete.

4.37 TURBULENT AIR OPERATION

In keeping with good operating practice used in all aircraft, it is recommended that when turbulent air is encountered or expected, the airspeed be reduced to maneuvering speed to reduce the structural loads caused by gusts and to allow for inadvertent speed build-ups which may occur as a result of the turbulence or of distractions caused by the conditions.

4.39 LANDING GEAR

The pilot should become familiar with the function and significance of the landing gear position indicators and warning lights.

WARNING

The NAV LIGHT switch must be off to obtain full intensity gear lights during daytime flying. When aircraft is operated at night and NAV LIGHT switch is turned on, gear lights will automatically dim.

The red gear warning light on the instrument panel and the gear warning horn operate simultaneously in flight when the throttle is reduced to where the manifold pressure is approximately 14 inches of mercury or below, and the gear is not in the DOWN position. The red gear warning light and horn will also operate simultaneously on the ground when the battery master switch is ON, the gear selector switch is in the UP position, and the throttle is in the retarded position.

The three green lights on the instrument panel operate individually as each associated gear is locked in the extended position.

When the Emergency Landing Gear Extension Procedure (paragraph 3.31) is performed for training purposes, the hydraulic pump must be deactivated by pulling the LANDING GEAR PUMP circuit breaker in order for the procedure to extend the gear. Upon completion of the procedure, reset the LANDING GEAR PUMP circuit breaker to resume normal operation of the system. Verify that the Emergency Gear Lever is returned to the normal/up position.

4.41 WEIGHT AND BALANCE

It is the responsibility of the owner and pilot to determine that the airplane remains within the allowable weight vs. center of gravity envelope while in flight.

For weight and balance data, refer to Section 6 (Weight and Balance).

4.43 NOISE LEVEL

The noise level of this aircraft is 75.5 d B(A).

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.

The above statement notwithstanding the noise level stated above has been verified by and approved by the Federal Aviation Administration in noise level test flights conducted in accordance with FAR 36, Noise Standards - Aircraft Type and Airworthiness Certification. This aircraft model is in compliance with all FAR 36 noise standards applicable to this type.