

DESCENT

1. When making a high speed descent (200 to 230 MPH) (174-200 knots) maintain engine speed at 2200 RPM or higher.

BEFORE LANDING CHECK.

1. Safety belts - FASTENED.
2. Auxiliary fuel pump switches - TAKEOFF AND LAND position.
3. Mixture - FULL RICH.
4. Check landing gear warning horn before extending landing gear.
5. Landing gear - DOWN.

CAUTION

Airspeed must be below 180 MPH (156 knots).

6. Check landing gear position indicators and main gear visually; warning horn silent.
7. Brakes and hydraulic pressure - CHECK.
8. Flaps - DOWN 1/2 (20°) below 150 MPH (130 knots).
9. Desired landing pattern speed 100 MPH (87 knots).

FINAL APPROACH

1. Reduce power - Propeller controls FULL FORWARD.
2. Flaps - AS DESIRED (normally full down).

AFTER LANDING CHECK

1. Auxiliary fuel pump switches - OFF.
2. Flaps - UP. Leave flap handle in up position.
3. Gear safety lock - LOCKED.

STOPPING ENGINES

1. Parking brake - SET.
2. With engines idling, turn ignition switch off momentarily to check magneto grounding.
3. Mixture control on left engine - IDLE CUTOFF.
4. Pump brakes numerous times to ensure operation of right engine hydraulic pump.
5. Mixture control on right engine - IDLE CUTOFF.
6. Fuel valves - CLOSED.
7. Starting at upper right hand switch panel, turn all switches to OFF position.
8. Install control locks and pitot covers.

PROPELLER

The Aero COMMANDER Model 500A is equipped with HC-A2XF-2B/8433-4 (2 blade) 80-inch diameter propellers. These propellers are completely self contained and have no external oil lines. Oil is supplied to the propellers through a drilled shaft by a constant speed governor located on the engine nose case. Blade angles are measured at the 30-inch radius. The low pitch setting is 12.5° and the feathered pitch setting is 81°.

FEATHERING PROCEDURE

1. Throttle - CLOSED (inoperative engine).
2. Mixture control - IDLE CUTOFF (inoperative engine).

FEATHERING PROCEDURE (Cont.)

3. Fuel valves - CLOSED (inoperative engine).
4. Ignition switch - OFF (inoperative engine).
5. Propeller control - FEATH RANGE.

NOTE

The above feathering procedure is for normal operation.
For emergency use, propeller may be feathered first.

UNFEATHERING PROCEDURE

1. Place propeller control lever in high pitch (low RPM) position.
2. Turn generator off on operating engine before starting. This is to prevent overload on generator from starter.
3. Start engine. (Refer to Engine Starting Procedures.)
4. When engine starts, propeller will unfeather in approximately seven seconds.
5. Warm up engine at 2000 RPM - 13 inches Hg.

CAUTION

AVOID CONTINUOUS OPERATION BELOW 2000 RPM.

OPTIONAL EQUIPMENT - PROPELLER UNFEATHERING SYSTEM

An optional unfeathering system may be installed to assist in the unfeathering of the propellers. This system consists of an electric motor-driven pump mounted in each engine section, a three position switch spring-loaded to OFF, oil hoses and electrical wiring. Holding the switch to either left or right depending on which propeller requires unfeathering, permits the pump to supply engine oil at high pressure through the propeller governor to the propeller piston, causing the propeller blades to rotate toward the low pitch (high rpm) position. As the propeller blades leave the feathered position, the propeller will start windmilling making it unnecessary to engage the starter for in-flight engine starting.

Unfeathering Procedure (Optional Unfeathering System Installed.)

1. Fuel booster pump - ON.
2. Fuel selector valves on desired tank.
3. Magneto switch on BOTH.
4. Throttle open approximately 1/2 inch.
5. Place propeller control lever just forward of feathering detent into OPER-RANGE.
6. Place unfeathering pump switch to L (left) or R (right), depending on which propeller requires unfeathering until propeller is windmilling.
7. Release switch and place mixture control lever to NORMAL (full forward).

OPTIONAL EQUIPMENT - DE-ICER BOOT INSTALLATION (B. F. Goodrich, Type 23)

Description

The de-icer system consists of inflatable rubber boots, cemented to the leading edge of the wing and empennage. The boots are pressurized by exhaust air from the engine-driven vacuum pumps and are deflated by suction created in the inlet ports of the vacuum pumps. An electronically controlled timer regulates the de-icers when the de-icer switch is placed in the "AUTO" position. Single cycle operation may be obtained by placing the de-icer switch in the "SINGLE" position momentarily. The switch is spring-loaded to "OFF" from this position. A pressure gage, mounted on the instrument panel, indicates the pressure as the boots are cycled and provides a means of checking system operation. Frequent application of B. F. Goodrich Icx No. 6 to the boots will improve their efficiency. See airplane maintenance manual for Icx application instructions.

Placard

The following placard will be mounted on the right switch panel:

DE-ICER TO BE OFF DURING TAKEOFF AND LANDING

EMERGENCY OPERATING PROCEDURES

BALKED LANDING

If it is necessary to execute a Go-Around just prior to landing:

1. Apply full power.
2. Establish best climb speed.
3. Retract landing gear.
4. Retract flaps slowly.
5. Follow normal takeoff procedures.

ENGINE FAILURE DURING TAKEOFF

Loss of engine before reaching 85 MPH (74 knots).

1. Close throttles and stop.

Loss of engine after 85 MPH (74 knots).

1. Prop controls - FULL FORWARD.
2. Throttles - FULL FORWARD.
3. Landing gear - UP.
4. Flaps - UP.
5. Maintain heading and airspeed.
6. Determine inoperative engine by throttle - SEPARATELY.
7. Dead engine propeller - FEATHER.
8. Establish best angle of climb speed - 100 MPH (87 knots).
9. Auxiliary fuel pump on operating engine - TAKEOFF AND LAND position.
10. Mixture control on operating engine - LEAN TO BEST POWER.
11. On the inoperative engine:
 - a. Mixture - IDLE CUTOFF.
 - b. Fuel valve - CLOSED.
 - c. Auxiliary fuel pump - OFF.
 - d. Ignition - OFF.
 - e. Generator - OFF.
 - f. Cowl flaps - CLOSED.
12. Trim aircraft.
13. Land as soon as possible.

ENGINE FAILURE DURING CRUISE

1. Correctly determine inoperative engine by checking with throttles.
2. Feather engine as outlined in Propeller Section of Normal Operating Procedures.
3. Maintain 70% power on operative engine for best cruise.

INJECTOR PUMP FAILURE - CRUISE (Auxiliary Fuel Pump 'OFF')

The failure of a fuel injector pump will be indicated by a loss of fuel pressure, followed by a complete loss of power from the engine. Placing the auxiliary fuel pump switch to the Takeoff and Land position will keep the engine running provided it is turned on before fuel pressure drops to zero. If the engine is lost before corrective action can be taken, follow this air start procedure:

1. Throttle - 1/8 OPEN.
2. Propeller control - HIGH PITCH (LOW RPM) position.
3. Mixture - IDLE CUTOFF.
4. Auxiliary fuel pump - TAKEOFF AND LAND position.
5. Push mixture control forward until 2.5 to 3.0 psi shows on fuel pressure gage.
6. Ignition switch - START position. (If required.)
7. When engine starts, release ignition switch.
8. Adjust fuel flow in accordance with power setting.
9. Land as soon as possible.

INJECTOR PUMP FAILURE - TAKEOFF OR BALKED LANDING CONDITION (Auxiliary Fuel Pump In The 'Takeoff And Land' Position)

Should the injection pump fail when the auxiliary fuel pump switch is in the "Takeoff and Land" position, the auxiliary fuel pump will automatically go into high boost and maintain engine power at 80% normal rated power or better. Reset mixture control to correspond to power setting. Indications of injection pump failure on the affected engine include: (1) Momentary loss of fuel pressure, (2) Reduced fuel flow and fuel pressure, (3) Momentary engine surge, (4) Reduced power output, and (5) Turning auxiliary fuel pump "Off" will result in fuel pressure drop and definite loss of engine power. Replace switch in "Takeoff and Land" position.

HYDRAULIC SYSTEM FAILURE

The Model 500A Aero Commander is equipped with two engine-driven hydraulic pumps. The failure of one hydraulic pump will not normally be noticed in the cockpit, since pressure will be maintained by the other pump. Since the brake and flap system pressure is registered on the hydraulic system pressure gage, the pilot always has a visible indication of the amount of pressure available for braking purposes. A check valve isolates the brake and flap system in the event of main hydraulic system failure, therefore a loss in main system pressure due to line rupture or defective engine-driven hydraulic pumps may not be immediately apparent. However, since the nose landing gear is held in the up position by hydraulic pressure only, lack of hydraulic pressure will cause it to droop and the red uplock indicator light on the gear indicators will be extinguished. This indicates the possibility of a ruptured hydraulic line. After lowering the flaps, the hydraulic system pressure gage reading should be observed and if this has fallen to the auxiliary pump pressure range of 470-600 psi, the pilot will know that he has only auxiliary hydraulic pressure for brake operation. For this reason he should avoid pumping the brakes and allowing fluid to escape through a ruptured line. Brake pressure, once applied on the ground, should be held evenly until the airplane has been brought to a complete stop.

If the auxiliary hydraulic pump will not replace the pressure, then the rupture exists in the brake lines or the auxiliary pump is inoperative. In either case, no brakes or flaps will be available for landing and complete hydraulic failure exists.

COMPLETE HYDRAULIC FAILURE - EMERGENCY GEAR EXTENSION

1. Slow the airplane to 95-100 MPH (83-87 knots).
2. Landing gear control handle - DOWN.

NOTE

The main landing gear will extend to down and locked position under the influence of air pressure from the landing gear emergency air storage cylinder. The nose gear will free fall to down and locked position.

CAUTION

Air storage cylinder pressure must be checked prior to each flight.

3. Check gear safe lights, silent warning horn and main gear visually.

For a "flaps up" landing, a power-on approach at 80 to 85 MPH (70 to 74 knots) is recommended.

GENERATOR FAILURE

The Model 500A Aero Commander is equipped with dual generators. In the event of failure of one generator, place that generator switch in the OFF position.

ENGINE FIRE

In the event of a fire in either engine compartment:

1. Mixture - IDLE CUTOFF.
2. Fuel valve - CLOSED.
3. Hydraulic shutoff valve - CLOSED.
4. Auxiliary fuel pump - OFF.
5. Propeller - FEATHER.
6. Ignition - OFF.
7. Generator - OFF.

OPERATING LIMITATIONS

POWER PLANT LIMITATIONS

The Aero COMMANDER Model 500A is equipped with two Continental Engines Model IO-470-M.

The IO-470-M is a direct drive, horizontally opposed, six cylinder, air cooled, fuel injection engine, with a bore of 5.00 inches, stroke 4.00 inches, displacement 471 cubic inches, and compression ratio 8.6 to 1.

	HORSEPOWER	BHP	RPM	OIL TEMP. (MAX.)	CYLINDER HEAD TEMP. (MAX.)	TIME
Take-Off	Full Throttle	260	2625	107°C.	238°C.	No Limit
Max. Continuous at S/L	Full Throttle	260	2625	107°C.	238°C.	No Limit

Fuel - 100/130 Octane (Minimum Grade) - Usable Capacity - 156 Gallons.

Propellers - Hartzell HC-A2XF-2B/8433-4 (2 blade) 80-inch maximum and minimum diameter.

INSTRUMENT DIAL MARKINGS

	RED LINE MINIMUM	GREEN ARC NORMAL	RED LINE MAXIMUM
Tachometer		2000 - 2625 RPM	2625 RPM
Cylinder Head Temperature		100 - 238°C.	238°C.
Fuel Pressure	2.3 psi	5.4 - 18.3 psi	18.3 psi
Oil Pressure	30 psi	30 - 60 psi	60 psi
Oil Temperature		24 - 107°C.	107°C.
Vacuum	3.8" Hg	3.8 - 5.0" Hg	5.0" Hg
Hydraulic Pressure			1250 psi
Landing Gear Emergency Air Pressure (Gear Down)	275 psi	275 - 350 psi	350 psi

Airspeed (TIAS)	MPH	KNOTS	
	72 - 136	63 - 118	White Arc (Flap operating range)
	82 - 230	71 - 200	Green Arc (Normal)
	230 - 288	200 - 250	Yellow Arc - denotes range of speeds in which operation should be conducted with caution and only in smooth air.
	288	250	Red Line (Never exceed)

AIRSPPEED LIMITATIONS

	TRUE INDICATED AIRSPEED	
	MPH	KNOTS
1. Never exceed speed.	288	250
2. Maximum structural cruising speed.	230	200
3. Maneuvering speed.	145	126
4. Maximum speed for lowering full flaps.	136	118
5. Maximum speed for gear extension and extended.	180	156
6. Maximum speed for 1/2 flaps.	150	130
7. Minimum control speed - The minimum speed at which the airplane is controllable in flight, with sudden failure of one engine and takeoff power on the other engine.	70	61

FLIGHT LOAD FACTOR

The positive limit load factor is 3.80 G's.

NOTE

A minimum of 200 feet of altitude is required to recover from power off stalls with 6250 pounds at both forward and aft center of gravity.

GROSS WEIGHT & CENTER OF GRAVITY LIMITATIONS

Maximum Weight - 6250 pounds.

Center of Gravity

Forward - 168.1 inches (23% MAC) Gear Down
Rear - 174.4 inches (32% MAC) Gear Down

Moment due to gear retraction 10,073 In-Lbs. (See Weight and Balance Section of Manual for Loading Schedule.)

PLACARDS

1. THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY TYPE IN COMPLIANCE WITH THE AIRPLANE FLIGHT MANUAL. ACROBATICS AND INTENTIONAL SPINS ARE PROHIBITED.
2. MASTER SWITCH MUST BE ON TO OPERATE FUEL VALVES.
3. SHUT OFF LEFT ENGINE WHEN ENTERING AND LEAVING CABIN.
4. RELEASE SWITCH IF STARTER DOES NOT ENGAGE IMMEDIATELY.
5. MAXIMUM SPEED GEAR EXTENDED 180 MPH (156 Knots).
6. MINIMUM CONTROL SPEED ONE ENGINE 70 MPH (61 Knots).
7. MAXIMUM FULL MANEUVERING SPEED - 145 MPH (126 KNOTS).
8. PITOT & FUEL VENT HEAT GROUND CHECKS - 30 SECONDS MAXIMUM.

STALL SPEEDS

GROSS WEIGHT - 6250 POUNDS

		ANGLE OF BANK - DEGREES				
		0	20	40	50	60
Flaps UP	MPH	72	75	83	90	102
	Knots	63	64	72	78	89
Flaps DOWN	MPH	66	69	76	83	94
	Knots	57	60	66	72	82