PIPER

Super Cub

PA-18

150 HP
For 1974 and Later

NOTICE

THIS HANDBOOK IS NOT DESIGNED, NOR CAN ANY HANDBOOK SERVE, AS A SUBSTITUTE FOR ADEQUATE AND COMPETENT FLIGHT INSTRUCTION, OR KNOWLEDGE OF THE CURRENT AIRWORTHINESS DIRECTIVES, THE APPLICABLE FEDERAL AIR REGULATIONS, AND ADVISORY CIRCULARS. IT IS NOT INTENDED TO BE A GUIDE OF BASIC FLIGHT INSTRUCTION, NOR A TRAINING MANUAL.

THE HANDBOOK IS DESIGNED:

1. TO HELP YOU OPERATE YOUR SUPER CUB WITH SAFETY AND CONFIDENCE.
2. TO MORE FULLY ACQUAINT YOU WITH THE BASIC PERFORMANCE AND HANDLING CHARACTERISTICS OF THE AIRPLANE.
3. TO MORE FULLY EXPLAIN YOUR SUPER CUB'S OPERATION THAN IS PERMISSIBLE TO SET FORTH IN THE AIRPLANE FLIGHT MANUAL.

IF THERE IS ANY INCONSISTENCY BETWEEN THIS HANDBOOK AND THE AIRPLANE FLIGHT MANUAL APPROVED BY THE F.A.A., THE AIRPLANE FLIGHT MANUAL SHALL GOVERN.

Issued: February 1975
Revised: September 18, 1981

SECTION I

GENERAL SPECIFICATIONS

SECTION I

GENERAL SPECIFICATIONS

PERFORMANCE

Published figures are for standard airplanes flown at gross weight under standard conditions at sea level, unless otherwise stated. Performance for a specific airplane may vary from published figures depending upon the equipment installed, the condition of the engine, airplane and equipment, atmospheric conditions and piloting technique.

Takeoff Run (ft)	200*
Takeoff Run over 50 ft barrier	500*
Best Rate of Climb Speed (mph)	75
Rate of Climb (ft per min)	960
Best Angle of Climb Speed (mph)	45
Best Angle of Climb (Ratio)	1 to 5
Service Ceiling	19,000
Absolute Ceiling	21,300
Top Speed (mph)	130
Cruising Speed (75% power mph)	115
Cruising Range (75% power)	460
Fuel Consumption (gph) (75% power)	9
Stalling Speed (mph)	43*
Landing Roll (ft)	350

WEIGHTS

Gross Weights (lbs)	1750
Empty Weight (standard) (lbs)	998
USEFUL LOAD (lbs)	752

*Flaps extended.

POWER PLANT

Engine	Lyc. O-320
Rated Horsepower	150
Rated Speed RPM	2700
Bore, inches	5-1/8
Stroke, inches	3-7/8
Displacement, cubic inches	319.8
Compression Ratio	7:1
Fuel Consumption (75% power gph)	9
Oil Sump Capacity (qts)	8
Fuel, Aviation Grade,	
Minimum Octane	80/87
Specified Octane	80/87
Alternate Fuels	Refer to Fuel Requirements, Sec. IV - Page 35

FUEL AND OIL

Fuel Capacity (gal)	36
Oil Capacity (qts)	8

BAGGAGE

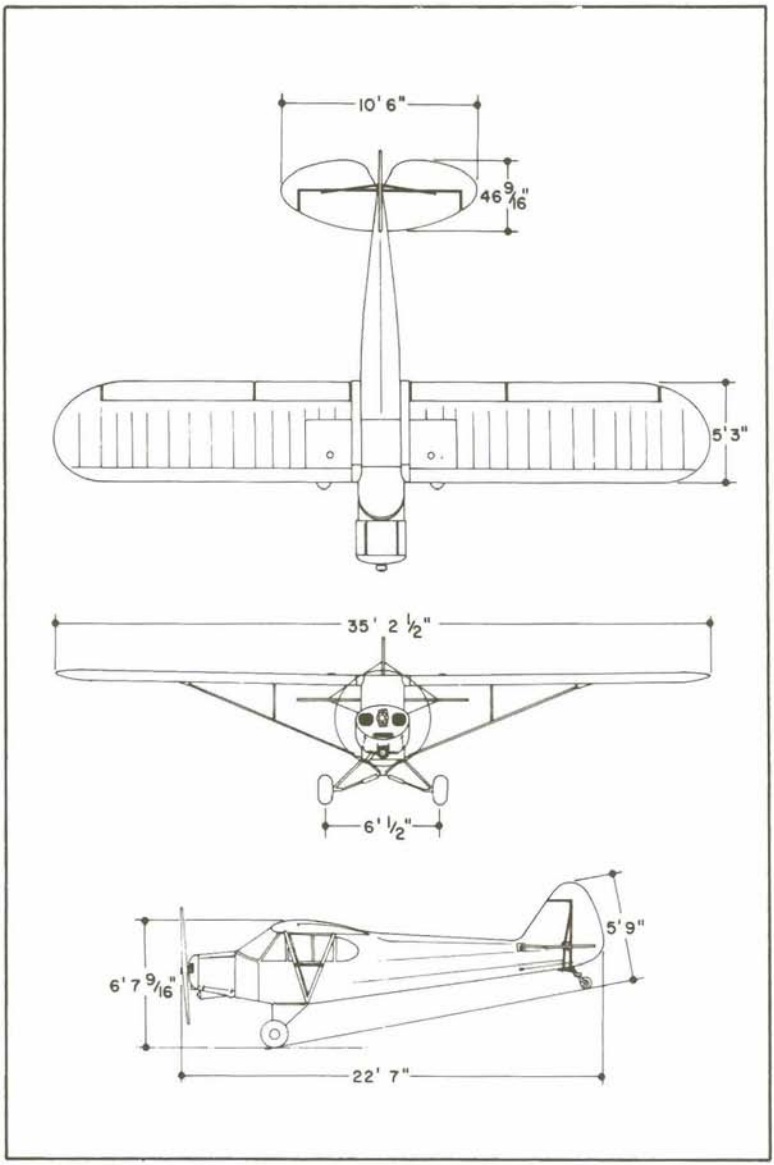
Maximum Baggage (lbs)	50
Baggage Space (cubic ft)	18

DIMENSIONS

Wing Span (ft)	35.3
Wing Area (sq ft)	178.5
Wing Loading (lbs per sq ft)	10
Length (ft)	22.5
Height (ft)	6.7
Power Loading (lbs per hp)	11.6
Propeller Diameter (max. in.)	74

LANDING GEAR

Tire Pressure (psi)	18
Tire Size (four ply rating)	8.00 x 4


10' 6"
46 9/16"
5' 3"
35' 2 1/2"
6' 1/2"
5' 9"
6' 7 9/16"
22' 7"

SECTION II

DESIGN INFORMATION

SECTION II

DESIGN INFORMATION

ENGINE AND PROPELLER

The Super Cub 150 is powered by a Lycoming O-320 engine, with a rated horsepower of 150 at 2700 RPM. The standard installation of this engine is without an electrical system, which is available optionally.

On the 150, the standard propeller is the Sensenich metal design 74-DM-56. In general, propeller designs selected for the Super Cub emphasize takeoff, climb and economical cruising performance rather than high speed cruising. If propellers with higher pitches are used, the cruising speed can be increased somewhat.

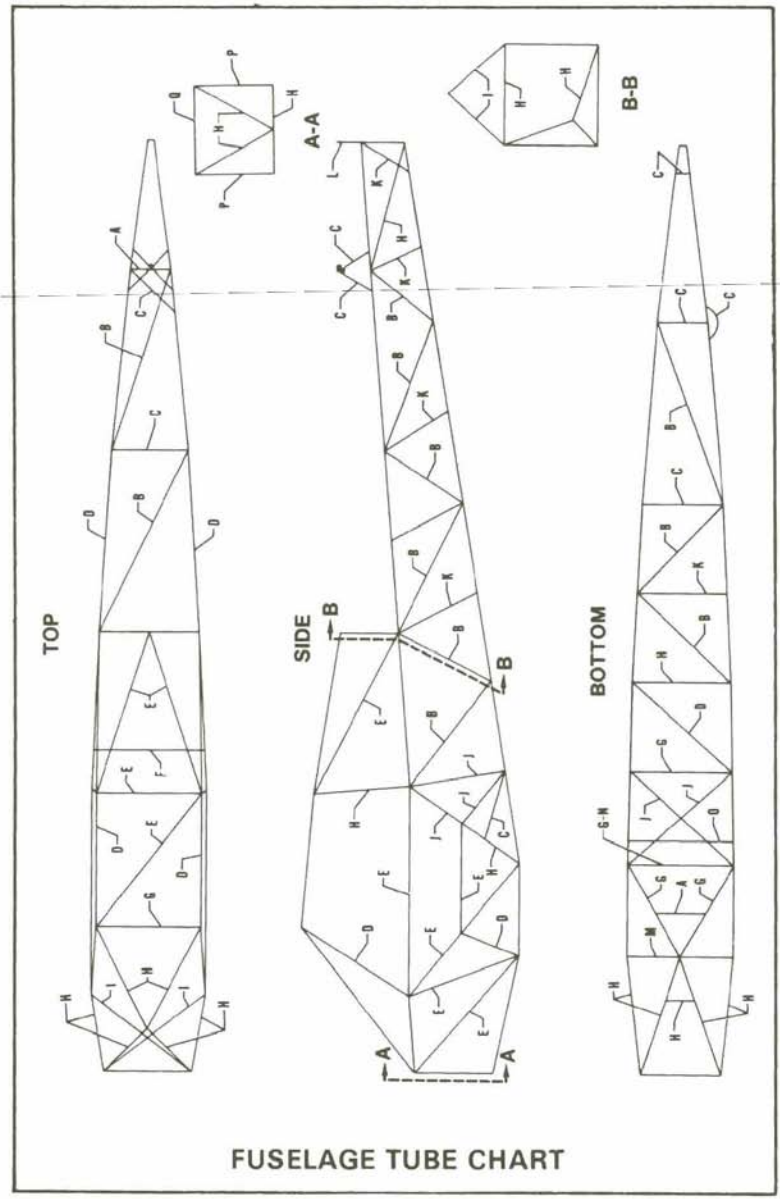
A stainless steel cross-over exhaust system is employed to scavenge exhaust gases effectively. This permits the use of an efficient muffler without any loss in engine power output due to exhaust back-pressure. The muffler is shrouded to provide sources of heat for the cabin and carburetor heating systems.

STRUCTURES

The fuselage frame of the Super Cub is constructed of steel tubes welded together to form a rigid structure. A number of highly stressed members are of chromemolybdenum steel (4130). Other members are of 1025 steel.

Repairs to the fuselage can be made in the manner approved by the FAA Advisory Circular 43.13-1, and repair facilities for this type of construction are available universally.

The metal fuselage frame is made corrosion resistant by the application of a coat of zinc chromate, followed by a sealer coat of nitrocellulose lacquer. A third coat of dope proof lacquer is sprayed on the fuselage members wherever fabric comes in contact with the structure. If the airplane is to be used in salt water areas, the tubing can be specially treated prior to applying the dope, and the interior of the metal tubing coated with linseed oil to prevent internal corrosion.

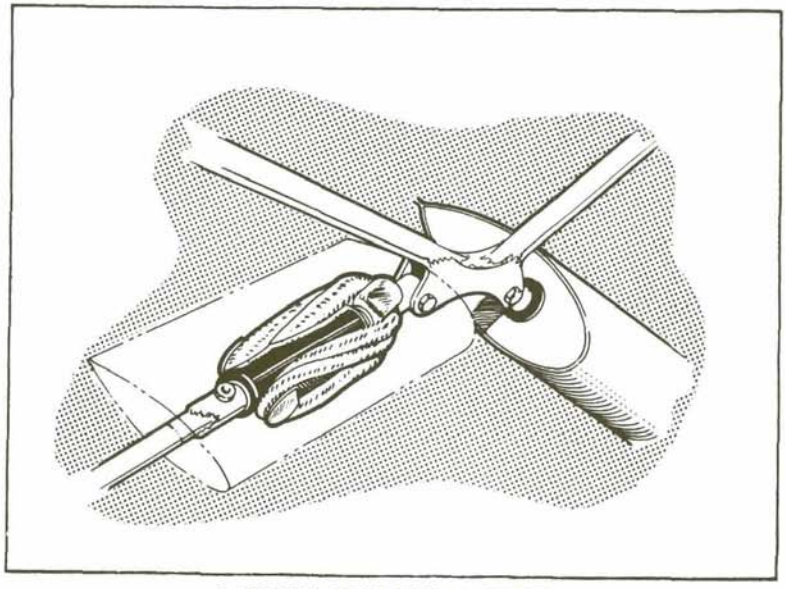


FUSELAGE TUBE CHART

LETTER	MATERIAL	TUBE OUTSIDE DIAMETER & WALL THICKNESS
A	4130 STEEL	3/4 x .049
B	1025 STEEL	5/8 x .028
C	1025 STEEL	1/2 x .028
D	1025 STEEL	3/4 x .035
E	4130 STEEL	7/8 x .035
F	1020 STEEL (.020 thick)	.843 x .843
G	4130 STEEL	1 x .049
H	1025 STEEL	5/8 x .035
I	4130 STEEL	5/8 x .035
J	4130 STEEL	3/4 x .035
K	1025 STEEL	3/8 x .028
L	4130 STEEL	7/8 x .049
M	4130 STEEL	1 1/8 x .049
N	1025 STEEL	.020
O	4130 STEEL	1 x .035
P	1025 STEEL	1/2 x .035
Q	4130 STEEL	1/2 x .035

The wing framework consists of riveted aluminum ribs mounted on extruded aluminum spars with tubular drag and compression struts and high strength stainless steel drag wires. Aluminum sheet is used to form the leading edge and the aileron false spar. An ash wing tip bow provides a light tough member which can withstand considerable wing tip shock without failing.

The wings are attached to the fuselage at the wing hinge fittings on upper fuselage members, and by means of the lift struts which bolt to the lower fuselage members and to the wing spar fittings. The lift struts can be adjusted in length by turning in or out the forked fittings at the lower ends. This adjustment is used to set the rigging of the wings. To prevent bending the struts, any lifting of the airplane should be done at the extreme end of the strut and not in the center.



LANDING GEAR SHOCK STRUTS

LANDING GEAR

The Super Cub landing gear is the well proven maintenance-free shock cord type, which employs two shock rings on each shock strut. The only maintenance required on this gear is occasional greasing of the hinge bolts and shock strut members, and inspection of the steel hinge bolt bushings, which can be replaced if worn.

Hydrosorb shock units, which consist of automotive type oleo struts combined with light shock cords, are available.

The 6-inch steerable full-swivel tail wheel is provided as standard equipment on the Super Cub. An 8-inch steerable tail wheel is offered as optional equipment. The main wheels carry 8.00 x 4 four ply tires. The tire inflation of 18 psi must be maintained reasonably consistant to prevent tire slippage on the wheel and to produce even wear.

CONTROL SYSTEMS

The units which make up the empennage are the fin, rudder, stabilizers and elevators. They are all constructed of tubular steel with steel channel ribs. The control surface hinges have bronze bushing inserts which should be oiled occasionally with light oil. Stainless steel tie rods brace the stabilizer to the fin and fuselage. The tail brace wires should not be used for lifting or handling the airplane; a handle on the right rear side of the fuselage is provided for this purpose.

Dual flight controls and dual throttles are provided in the Super Cub. The flap control is located for front seat operation only. Solo operation is normally from the front seat.

The flap lever can be set in any one of three positions, for full up flap, half flap, or full down flap. Full flap is recommended for minimum speed landings. Half or full flap can be applied to reduce takeoff run, the more flap used the shorter the run. A minimum takeoff distance is obtained by beginning the takeoff with flaps up, then applying full flaps when takeoff speed (30-35 MPH) has been reached. The best angle of climb is attained with full flap. The best rate of climb is without flaps extended.

The stabilizer adjustment crank is located on the left cabin panel adjacent to the front seat. A permanently automatic tension adjustment, which consists of an idler pulley held in place near the rear main pulley by a tension spring, maintains correct tension on the stabilizer cable and prevents cable slippage. This system normally requires no attention except for lubrication and inspection. Do not lubricate cables.

FUEL SYSTEM

Up to 36 gallons of fuel may be carried in the two 18 gallon fuel tanks, one in each wing.

A small (approximately 2 quarts) header tank, which serves to maintain constant fuel flow to the engine, is included in the installation of each fuel tank. The header tank for the left fuel tank is located forward of the instrument panel. The header tank for the right tank is concealed behind the headlining aft of the rear seat.

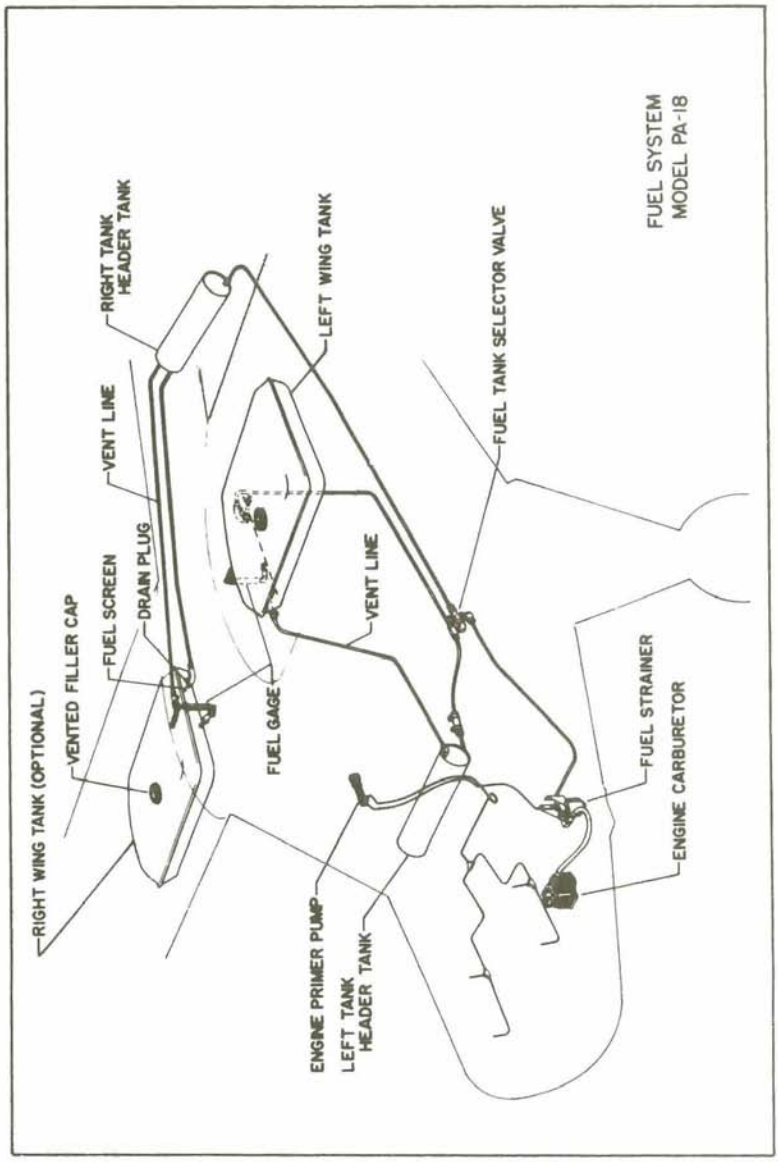
Fuel indicator sight gauges are installed in the upper cabin side panels and are easily discernible from either seat. The fuel shut-off valve is in the left cabin panel near the front seat. Electric fuel gauges are available as optional equipment.

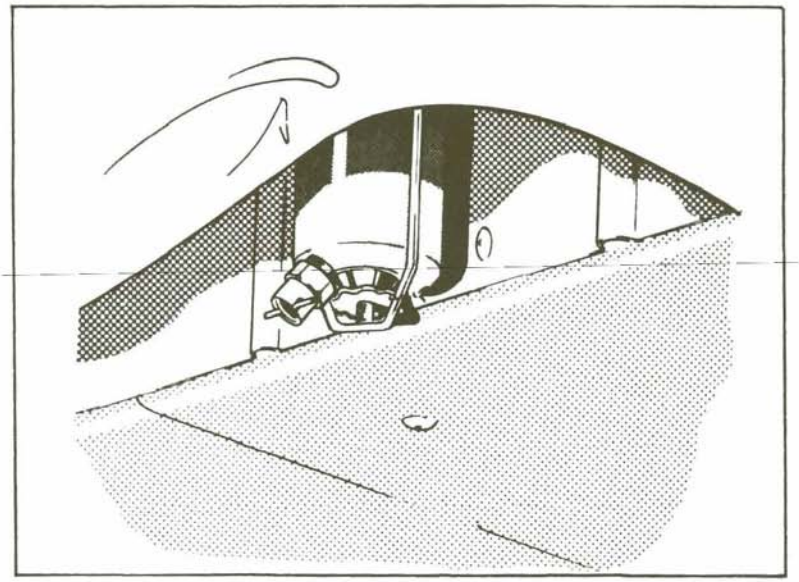
The fuel strainer, on the lower left side of the fire wall in the engine compartment is installed to trap water or sediment that may collect in the fuel system. It should be drained before each flight. Fuel screens are provided at each tank outlet, in the strainer, and at the carburetor.

The engine primer pump on the right side of the instrument panel takes fuel from the top of the fuel strainer and pumps it directly to all four cylinders on the engine. The primer should be locked in at all times, except when in use, to prevent malfunctioning of the engine.

An idle cut-off is incorporated in the carburetor so that full extension of the mixture control stops the flow of fuel at the carburetor. The cut-off should always be used to stop the engine.

Use fuel alternately from the left and right tanks, about one hour each time, to maintain lateral trim.


FUEL SYSTEM
MODEL PA-18
RIGHT WING TANK (OPTIONAL)
VENTED FILLER CAP
FUEL SCREEN
DRAIN PLUG
VENT LINE
RIGHT TANK
HEADER TANK
LEFT WING TANK
FUEL TANK SELECTOR VALVE
FUEL GAGE
VENT LINE
ENGINE PRIMER PUMP
LEFT TANK
HEADER TANK
FUEL STRAINER
ENGINE CARBURETOR



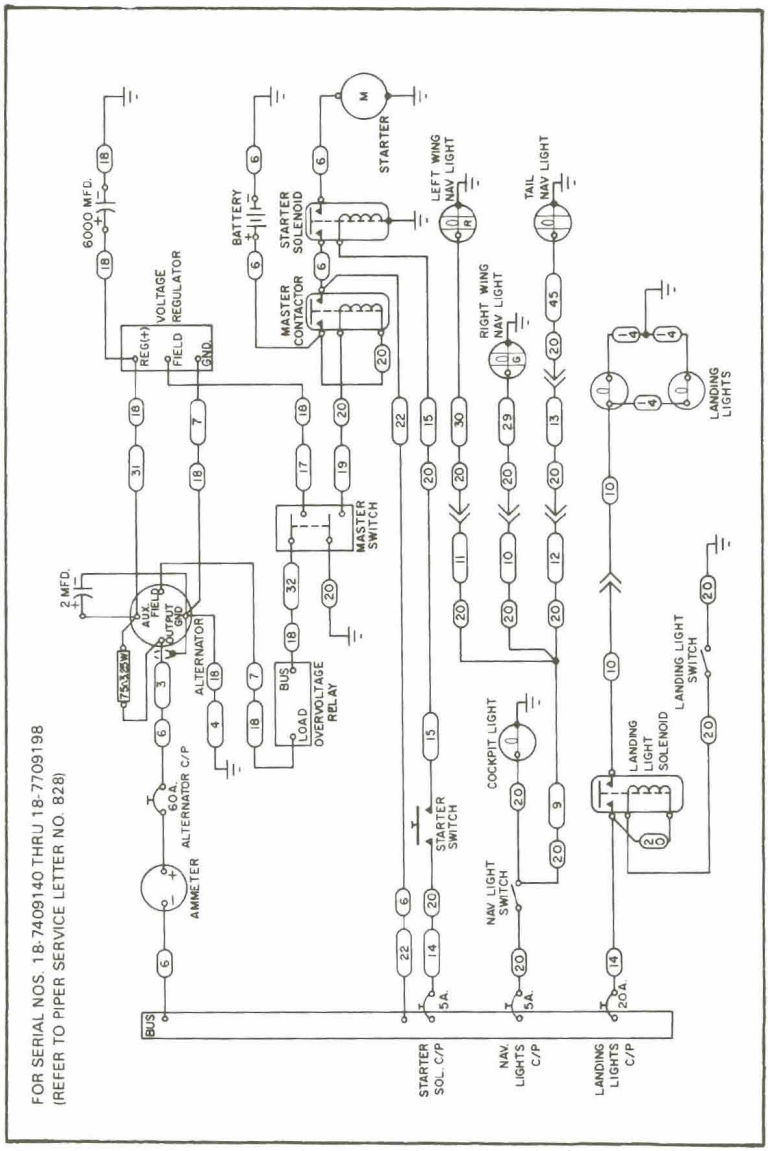
FUEL STRAINER AND DRAIN

ELECTRICAL SYSTEM

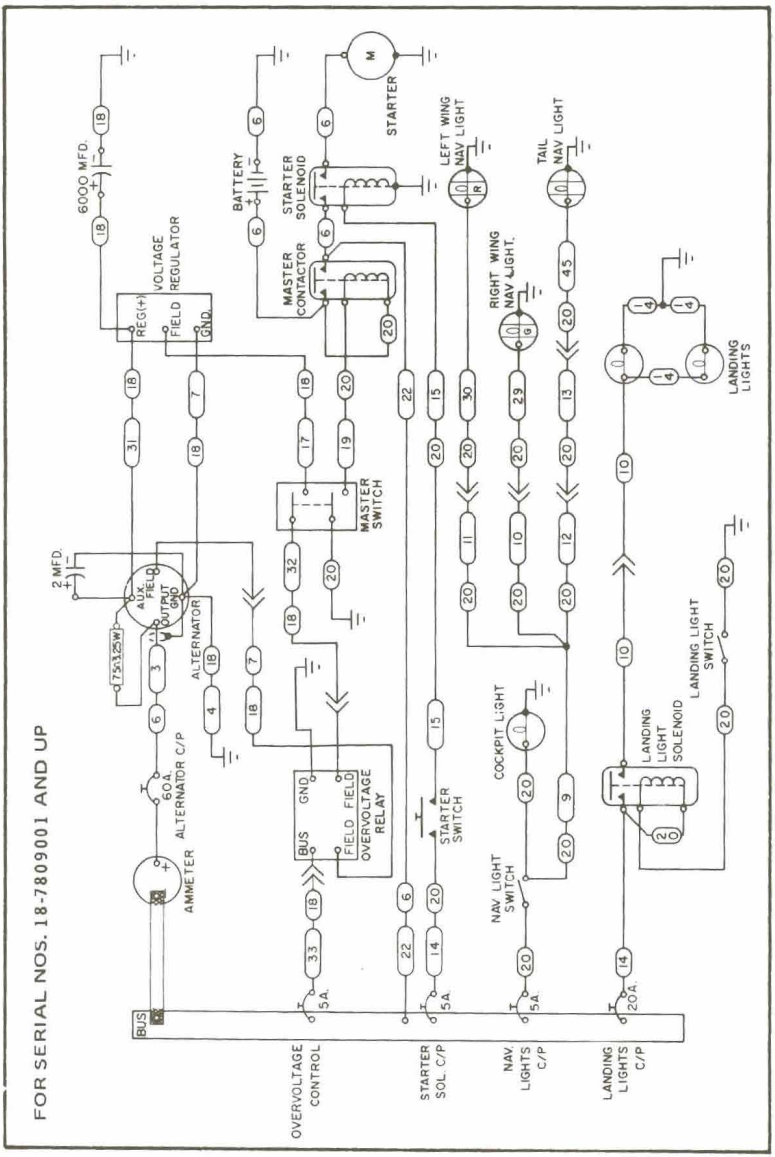
An electrical system, consisting of starter, alternator, battery, voltage regulator, ammeter, starter solenoid, circuit breakers, fuses, switches and related wiring is optional equipment.

A 12 volt, 23-ampere hour battery is mounted in the fuselage aft of the baggage compartment. A master switch and circuit breakers are located on a panel over the right door. The circuit breakers automatically break the electrical circuits if an overload is applied. To reset the circuit breakers simply push in the buttons. A continuous popping of the circuit breakers indicates a short and should be investigated.

The master switch is connected to a master contactor, located near the battery box. The starter solenoid is also mounted near this box.



ELECTRICAL SYSTEM SCHEMATIC



ELECTRICAL SYSTEM SCHEMATIC

A voltage regulator attached to the engine side of the fire wall is incorporated in the system to maintain the required voltage of the battery. Position and instrument panel lights (optional equipment) are operated with the same switch on the electrical panel.

An overvoltage relay protects the electrical system from an overvoltage condition. If an electrical failure occurs and the overvoltage relay has opened, it may be reset. On earlier aircraft serial nos. 18-7409140 thru 18-7709198, the master switch should be turned off for one second then on. On later aircraft serial nos. 18-7809001 and up, the overvoltage control circuit breaker located next to the master switch should be pulled and reset.

FINISH

The Duraclad finish on the Super Cubs consists of fire resistant butyrate plastic material on the fabric surfaces, and enamel on metal surfaces. Duraclad provides, in addition to the fire resisting qualities, a high-luster, attractive finish which has a much longer life than earlier nitrate finishes.

All of the covering material, inside and outside, on the Super Cub is treated with butyrate plastic over two primer coats of nitrate dope. All of the exterior metal surfaces are finished with enamel. The Duraclad finish must not be covered over or repaired with any incompatible material. The use of different materials from those originally applied will damage the finish.

CABIN FEATURES

The standard instrument group in the Super Cub includes the following: sensitive altimeter, airspeed, compass, oil temperature and pressure gauge, and recording tachometer. Special panels which provide complete instrumentation are available as optional equipment.

The front seat is adjusted fore and aft by lifting a lever on the left side of the seat frame. To remove the seat entirely, remove the forward stop pin on the left rear corner, then release the adjustment lever and slide the seat forward off its mounting channels.

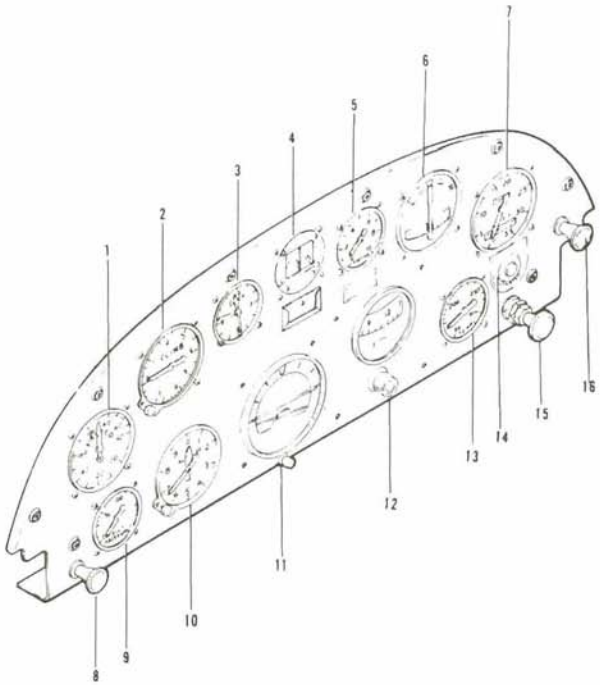
To increase the space available for cargo carrying, the rear seat back can be easily removed. First pull out the spring clips at the top of and behind the seat back, which hold the seat back in place. Then lift the back out of its lower sockets.

Shoulder harnesses are provided for both seats of the Super Cub.

The flow of hot air for heating the cabin is obtained through the use of the cabin heat control in the left side panel control box. Cooling air is admitted through the sliding windows on the left side of the cabin. For special purpose flights, such as photography, the right door and window may be opened in flight. Care should be taken not to impose high air loads on the window in the open position, and a check should be made to insure that both occupants have their seat belts and shoulder harnesses fastened before the door or window is opened.

SERVICE LIFE LIMIT

Replace lift strut forks manufactured with rolled threads prior to the accumulation of 1000 hours in service if used at any time on float-equipped aircraft, and prior to the accumulation of 2000 hours in service if used on land planes. Per F. A. A. Airworthiness Directive 80-22-15.



1. AIRSPEED INDICATOR
2. RATE OF CLIMB INDICATOR
3. CLOCK
4. COMPASS
5. SUCTION GAUGE
6. TURN AND BANK INDICATOR
7. RECORDING TACHOMETER
8. MIXTURE CONTROL
9. OIL PRESSURE GAUGE
10. SENSITIVE ALTIMETER
11. GYRO HORIZON
12. DIRECTIONAL GYRO
13. OIL TEMPERATURE GAUGE
14. STARTER
15. PRIMER
16. CABIN VENT

TYPICAL INSTRUMENT PANEL WITH OPTIONAL INSTALLATIONS

FIRE EXTINGUISHER (PORTABLE)*

A portable fire extinguisher is mounted to the floor beneath the rear seat. The extinguisher is suitable for use on liquid or electrical fires. It is operated by aiming the nozzle at the base of the fire and squeezing the trigger grip. Releasing the trigger automatically stops further discharge of the extinguishing agent. Read the instructions on the nameplate and become familiar with the unit before an emergency situation. The dry powder type extinguisher is fully discharged in about 10 seconds, while the Halon 1211 type is discharged in 15 to 20 seconds.

WARNING

The concentrated agent from extinguishers using Halon 1211 or the by-products when applied to a fire are toxic when inhaled. Ventilate the cabin as soon as possible after fire is extinguished to remove smoke or fumes. Use oxygen, if necessary, and available.

*Optional equipment

SECTION III

OPERATING INSTRUCTIONS

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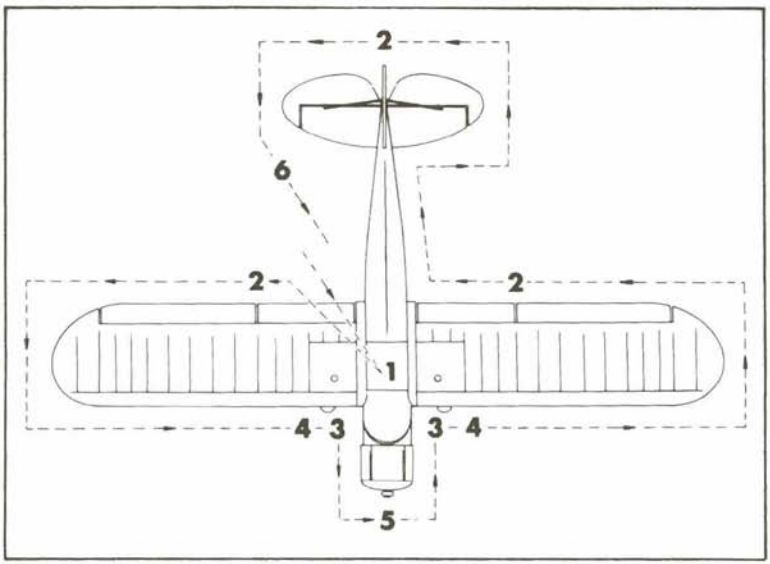
OPERATING INSTRUCTIONS

PREFLIGHT

The following safety procedure instructions must become an integral part of the aircraft owner's operational routine and preflight inspection.

Before each flight visually inspect the airplane and determine that:

1. a. Ignition and battery switches "OFF."
   b. Mixture to idle cut-off
2. a. There is no external damage or operational interference to the control surfaces, wings, or fuselage.
   b. There is no snow, ice, or frost on the wings or control surfaces.
3. a. The fuel supply is checked.
   b. The caps are secured.



4. a. The tires are satisfactorily inflated.
   b. Tires are not excessively worn or cut.
5. a. The cowling and inspection covers are secured.
   b. The windshield is clean and free of defects.
   c. The propeller is free of detrimental nicks and there are no cracks in the propeller spinner.
   d. There are no obvious fuel or oil leaks.
   e. The engine oil is at the proper level.
   f. The fuel strainer is drained.
6. a. Upon entering the airplane, all controls operate normally.
   b. All the required papers are in order and are in the airplane.
   c. The cabin door is closed and secured.
   d. Seat belts and shoulder harnesses are fastened.

STARTING

When the engine is cold, prime three to five strokes after turning fuel valve to the proper tank. Push mixture control to full rich, carburetor heat off, and open throttle about one-eighth of an inch or until the intake of air at the carburetor can be heard when the engine is pulled through by hand. Engine should be pulled through at least four times.

Next turn the ignition switch to "Both" and with brakes set, have engine pulled through by hand or engage starter if installed. If the engine does not start in the first few revolutions, open the throttle while the engine is turning over with ignition on. When engine starts, reduce throttle.

Manual starts must be accomplished with great care. To avoid accidents, both the person at the controls and the person at the propeller must be acquainted with manual starting techniques.

If the above procedure does not start the engine, reprime and repeat process. Continue to load cylinders by priming or unload by turning over the engine with the throttle open.

If engine still does not start, check for malfunctioning of ignition or carburetor system.

When the engine is warm, do not prime, but turn ignition switch to "Both" before pulling propeller through. Engine should start after it has been rotated through four compression strokes. If turned over more than four times the engine will frequently "load up" after which it should be started with the throttle well advanced.

WARM-UP AND GROUND CHECK

As soon as the engine starts, the oil pressure should be checked. If no pressure is indicated within thirty seconds stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get an oil pressure indication.

Warm up the engine at 800 to 1000 RPM, for not more than two minutes in warm weather, four minutes in cold weather. The magnetos should be checked at 1800 RPM; the drop should not exceed 100 RPM. The engine is warm enough for takeoff when the throttle can be opened without engine faltering.

Carburetor heat should be checked during the warm-up to make sure the heat control operation is satisfactory and to clear out the engine if any ice has formed. It should also be checked in flight occasionally when outside air temperatures are between 20° and 70° to see if icing is occurring in the carburetor. In most cases when the engine loses speed without apparent cause, the use of carburetor heat will correct the condition.

TAKEOFF, CLIMB AND STALLS

The stabilizer adjustment should be set approximately in the neutral position for takeoff. Fuel selector should be on the correct tank, carburetor heat off, mixture full rich, except a minimum amount of leaning is permitted for smooth engine operation when taking off at high elevation. The flaps can be lowered if desired, but should be retracted as soon as climbing airspeed has been reached to achieve maximum rate of climb. The best rate of climb airspeed at gross load is 75 MPH. At lighter weights, the best climbing airspeed will be reduced proportionally.

The gross weight power off stalling speed with full flaps in the Super Cub 150 is 43 MPH; with flaps up the stalling speed increases about 4 MPH.

CRUISING

The cruising speed of the Super Cub at 75% of rated engine power, at gross load under standard sea level conditions, is approximately 115 MPH. Cruising airspeed and engine RPM will depend on the propeller installed on the airplane.

Normally the Super Cub should cruise at 2400 to 2450 RPM, but the 75% of power RPM (low altitudes) can be determined as follows:

1. Fly the aircraft as near sea level as practicable at full throttle until maximum speed is reached. Note RPM at top speed, level flight.

2. Reduce the maximum RPM by 10% and cruise at 90% of full RPM. The correct cruising RPM will result in a cruising airspeed of 115 MPH with a fuel consumption of approximately 9 gallons per hour. If the airplane is slowed down to about 100 MPH, approximately 5 gallons per hour will be used. See fuel consumption chart.

The metal propeller with which the Super Cub 150 is equipped as standard equipment is, unless specified otherwise, a 56 inch pitch propeller that favors takeoff and climb rather than cruising speed. For training and other purposes which do not require use of full power settings to obtain satisfactory performance, this propeller may be operated, during takeoff, climb, and cruise, at 2200 RPM or less. This will still provide more performance than was formerly available in 65 HP trainers, and will reduce fuel consumption and engine wear very appreciably.

The fuel consumption chart should be consulted to determine most economical cruising RPM for specific requirements.

To lean the mixture, 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 toward the instrument panel until engine operation becomes smooth. The mixture should be leaned 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. Always enrich the mixture before increasing power settings. Use of the mixture control in cruising flight reduces fuel consumption significantly, especially at higher altitudes, and reduces lead deposits when the alternate fuels are used.

Unless icing conditions in the carburetor are severe, do not cruise with the carburetor heat on. Apply full carburetor heat only for a few seconds at intervals determined by icing severity.

APPROACH AND LANDING

During the approach, trim the plane with the stabilizer adjustment until no force is required on the stick to maintain a gliding speed of 70 MPH. Lower the flaps at an airspeed not to exceed 85 MPH. The mixture should be full rich, fuel valve on correct tank. The carburetor heat need not be used unless icing conditions prevail, but the engine should be cleared frequently by opening the throttle.

During the landing roll the steerable tail wheel should be used for directional control, and brakes should be used as little as possible to avoid excessive brake and tire wear.

Before shutting down the engine, set throttle to idle and turn the magneto switches off momentarily to check magneto grounding.

To stop the engine, after landing and when clear of the runway, pull the mixture control full out to idle cut-off. When using alternate fuels, the engine should be run up to 1200 RPM for one minute prior to shutdown to clean out any unburned fuel. After the engine stops, turn the ignition and master switch (if any) off, and retract the flaps.

WEIGHT AND BALANCE

For weight and balance data, see the weight and balance sheet that gives the exact weight of the airplane and permissible center of gravity conditions. When a heavy load, either passengers or cargo, is to be carried, the pilot is responsible for computing gross weight and center of gravity location.

EMERGENCY LOCATOR TRANSMITTER

The Emergency Locator Transmitter (ELT), when installed, is located in the fuselage just aft of the battery and is accessible through a removable plate on the upper right side of the fuselage. The ELT

meets the requirements of FAR 91.52. The transmitter operates on a self-contained battery.

A battery replacement date is marked on the transmitter lable. To comply with FAA regulations, the battery must be replaced on or before this date. The battery must also be replaced if the transmitter has been used in an emergency or if the accumulated test time exceeds one hour, or if the unit has been inadvertently activated for an undetermined time period.

When installed in the airplane, the ELT transmits through the antenna mounted on the fuselage. The unit is also equipped with an integral portable antenna to allow the locator to be removed from the airplane in an emergency and used as a portable signal transmitter.

The locator should be checked during the preflight ground check to make sure that it has not been accidentally activated. Check by tuning a radio receiver to 121.5 MHz. If there is an oscillating sound, the locator may have been activated and should be turned off immediately. Rearm the unit and then recheck.

NOTE

If for any reason a test transmission is necessary, the test transmission should be conducted only in the first five minutes of any hour and limited to three audio sweeps. If tests must be made at any other time, the tests should be coordinated with the nearest FAA tower or flight service station.

GARRETT 627674-1 OR 627810-1 OPERATION

On the unit itself is a three position selector switch placarded "OFF," "ARM" and "ON." The "ARM" position is provided to set the unit to the automatic position so that it will transmit only after impact and will continue to transmit until the battery is drained to depletion or until the switch is manually moved to the "OFF" position. The "ARM" position should be selected whenever the unit is in the airplane.

The "ON" position is provided so the unit can be used as a portable transmitter or in the event the automatic feature was not triggered by impact or to periodically test the function of the transmitter.

Select the "OFF" position when changing the battery, when

rearming the unit if it has been activated for any reason, or to discontinue transmission.

NOTE

If the switch has been placed in the "ON" position for any reason, the "OFF" position has to be selected before selecting "ARM." If "ARM" is selected directly from the "ON" position, the unit will continue to transmit in the "ARM" position.

A pilot's remote switch on the right overhead panel allows the transmitter to be controlled from the cockpit. This switch is placarded "ON," "ARM" and "OFF RESET." If the switch has been placed in the "ON" position for any reason, the "OFF RESET" position must be selected for one second before the switch is placed in the "ARM" position.

CCC CIR 11 OPERATION

On the unit itself is a three position selector switch placarded "OFF," "ARM" and "ON." The "ARM" position is provided to set the unit to the automatic position so that it will transmit only after impact and will continue to transmit until the battery is drained to depletion or until the switch is manually moved to the "OFF" position. The "ARM" position should be selected whenever the unit is in the airplane. The "ON" position is provided so the unit can be used as a portable transmitter or in the event the automatic feature was not triggered by impact or to periodically test the function of the transmitter.

Select the "OFF" position when changing the battery, when rearming the unit if it has been activated for any reason, or to discontinue transmission.

NOTE

If the switch has been placed in the "ON" position for any reason, the "OFF" position has to be selected before selecting "ARM." If "ARM" is selected directly from the "ON" position, the unit will continue to transmit in the "ARM" position.

A pilot's remote switch, located on the right overhead panel allows the transmitter to be controlled from inside the cabin. The pilot's remote switch is placarded "ON," "ARM" (Normal Flight Position), "RESET." If the pilot's remote switch has been placed in the "ON" position for any reason, the momentary "RESET" position must be selected for 3 seconds before allowing it to return to the "ARM" position. If for any reason the impact switch becomes inadvertently activated, it may be reset by selecting the momentary "RESET" position for 3 seconds before allowing it to return to the "ARM" position.

NARCO ELT 10 OPERATION

On the unit is a switch placarded "ON," "OFF" and "ARM." The "ARM" position allows the unit to be set to the automatic mode so that it will transmit only after activation by impact and will continue to transmit until the battery is drained to depletion or until the switch is manually moved to the "OFF" position. The "ARM" position should be selected whenever the unit is in the airplane. The "ON" position is provided so the unit can be used as a portable transmitter or in the event the automatic feature was not triggered by impact or to periodically test the function of the transmitter. The "OFF" position should be selected while changing the battery or to discontinue transmission after the unit has been activated.

A pilot's remote switch, located on the right overhead panel allows the transmitter to be controlled from inside the cabin. The pilot's remote switch is placarded "ON," "ARM." The "ARM" position should be selected for all normal flight operations. If activation occurs with the remote switch in the "ARM" position, the transmitter must be reset. A button labled "RESET" is located above the selector switch. To rearm the unit after it has been turned off or it has been activated, the "RESET" button should be pressed in after the selector switch has been placed in the "ARM" position. This will end transmission and rearm the unit.

SECTION IV

EMERGENCY PROCEDURES

SECTION IV

EMERGENCY PROCEDURES

INTRODUCTION

This section contains procedures that are recommended if an emergency condition should occur during ground operation, takeoff, or in flight. These procedures are suggested as the best course of action for coping with the particular condition described, but are not a substitute for sound judgement and common sense. Since emergencies rarely happen in modern aircraft, their occurrence is usually unexpected, and the best corrective action may not always be obvious. Pilots should familiarize themselves with the procedures given in this section and be prepared to take appropriate action should an emergency arise.

Most basic emergency procedures, such as power off landings, are a normal part of pilot training. Although these emergencies are discussed herein, this information is not intended to replace such training, but only to provide a source of reference and review, and to provide information on procedures which are not the same for all aircraft. It is suggested that the pilots review standard emergency procedures periodically to remain proficient in them.

ENGINE POWER LOSS DURING TAKEOFF

The proper action to be taken if loss of power occurs during takeoff will depend on circumstances.

1. If sufficient runway remains for a normal landing, land straight ahead.
2. If insufficient runway remains, maintain a safe airspeed and make only a shallow turn if necessary to avoid obstructions. Use of flaps depends on circumstances. Normally, flaps should be fully extended for touchdown.
3. If you have gained sufficient altitude to attempt a restart, proceed as follows:

a. MAINTAIN SAFE AIRSPEED
b. FUEL SELECTOR - SWITCH TO ANOTHER TANK CONTAINING FUEL.
c. MIXTURE - CHECK RICH
d. CARBURETOR HEAT - ON

NOTE

If engine failure was caused by fuel exhaustion, power will not be regained after tanks are switched until empty fuel lines are filled, which may require up to ten seconds.

If power is not regained, proceed with the POWER OFF LANDING procedures.

ENGINE POWER LOSS IN FLIGHT

Complete engine power loss is usually caused by fuel flow interruption, and power will be restored shortly after fuel flow is restored. If power loss occurs at low altitude, the first step is to prepare for an emergency landing (See POWER OFF LANDING). Maintain an airspeed of at least 70 MPH IAS, and if altitude permits, proceed as follows:

1. Fuel Selector - Switch to another tank containing fuel.
2. Mixture - Rich
3. Carburetor Heat - On
4. Engine Gauges - Check for an indication of the cause of power loss.
5. Primer - Check locked

When power is restored:

6. Carburetor Heat - Off

If the engine is producing partial power and time permits:

1. Ignition Switch - "L" then "R" then back to "BOTH."
2. Throttle and Mixture - Different settings. (This may restore power if problem is too rich or too lean a mixture, or a partial fuel system restriction.)

NOTE

If engine failure was caused by fuel exhaustion, power will not be regained after tanks are switched until empty fuel lines are filled, which may require up to ten seconds.

If power is not restored, proceed with POWER OFF LANDING procedures.

POWER OFF LANDING

If loss of power occurs at altitude, trim the aircraft for best gliding angle (70 MPH IAS), and look for a suitable field. If measures taken to restore power are not effective, and if time permits, check your charts for airports in the immediate vicinity; it may be possible to land at one if you have sufficient altitude. If possible, notify the FAA by radio of your difficulty and intentions. If another pilot or passenger is aboard, let them help.

When you have located a suitable field, establish a spiral pattern around this field. Try to be at 1000 feet above the field at the downwind position, to make a normal approach. Excess altitude may be lost by widening your pattern, using flaps or slipping, or a combination of these.

Touchdown should normally be made at the lowest possible airspeed, with full flaps.

When committed to landing:

1. Ignition - Off
2. Master Switch - Off
3. Fuel Selector - Off
4. Mixture - Idle Cut-Off
5. Seat Belt, Shoulder Harness - Snug

FIRE

The presence of fire is noted through smoke, smell, and heat in the cabin. It is essential that the source of the fire be promptly identified through instrument readings, character of the smoke, or other indications, since the action to be taken differs somewhat in each case.

Source of fire - Check

1. Electrical Fire (smoke in cabin):
   a. Master Switch - Off
   b. Land as soon as possible.

2. Engine Fire In Flight:
   a. Fuel Selector - Off
   b. Mixture - Idle Cut-Off
   c. Heater - Off (In all cases of fire)
   d. Prepare for forced landing.

The possibility of an engine fire in flight is extremely remote. The procedure given above is general and pilot judgment should be the deciding factor for action in such an emergency.

3. Engine Fire During Start:
   a. If engine has not started
      (1) Mixture - Idle Cut-Off
      (2) Throttle - Open
      (3) Turn engine with starter (This is an attempt to pull the fire into the engine.)
   b. If engine has already started and is running, continue operating to try pulling the fire into the engine.
   c. In either case stated in a. and b., if the fire continues longer than a few seconds, the fire should be extinguished by the best available external means.
   d. If external fire extinguishing is to be applied:
      (1) Fuel Selector - Off
      (2) Mixture - Idle Cut-Off

Engine fires during start are usually the result of over priming. The procedure above is designed to draw the excess fuel back into the induction system.

LOSS OF OIL PRESSURE

Loss of oil pressure may be either partial or complete. A partial loss of oil pressure usually indicates a malfunction in the oil pressure regulating system, and a landing should be made as soon as possible to investigate the cause and prevent engine damage.

A complete loss of oil pressure indication may signify oil exhaustion or may be the result of a faulty gauge. In either case, proceed toward the nearest airport, and be prepared for a forced landing. If the problem is not a pressure gauge malfunction, the engine may stop suddenly. Maintain altitude until such time as a dead stick landing can be accomplished. Don't change power settings unnecessarily, as this may hasten complete power loss.

Depending on the circumstances, it may be advisable to make an off airport landing while power is still available, particularly if other indications of actual oil pressure loss, such as sudden increases in temperatures, or oil smoke, are apparent, and an airport is not close.

If engine stoppage occurs, proceed to POWER OFF LANDING.

HIGH OIL TEMPERATURE

An abnormally high oil temperature indication may be caused by a low oil level, an obstruction in the oil cooler, damaged or improper baffle seals, a defective gauge, or other causes. Land as soon as practical at an appropriate airport and have the cause investigated.

A steady, rapid rise in oil temperature is a sign of trouble. Land at the nearest airport and let a mechanic investigate the problem. Watch the oil pressure gauge for an accompanying loss of pressure.

ALTERNATOR FAILURE

Loss of alternator output is detected through a zero reading on the ammeter. Before executing the following procedure, insure that the reading is zero and not merely low by actuating an electrically powered device, such as the landing light. If no increase in the ammeter reading is noted, alternator failure can be assumed.

1. Reduce Electrical Load.
2. Alternator Circuit Breaker - Check
3. Master Switch - Off (for 1 second), Then On (for aircraft with serial nos. 18-7409140 thru 18-7709198)
   Overvoltage Control Circuit Breaker - Pull, Then Reset (for aircraft with serial nos. 18-7809001 and up)

If the ammeter continues to indicate no output, or alternator circuit breaker will not stay reset, maintain minimum electrical load and land as soon as practical. All electrical load is being supplied by the battery.

ENGINE ROUGHNESS

Engine roughness may be due to carburetor icing, ignition trouble, incorrect mixture, or an unlocked primer and may be accompanied by serious power loss. This power loss may be evidenced by a loss of RPM and by a slight loss of airspeed or altitude. If too much carburetor ice is allowed to accumulate, restoration of full power may not be possible; therefore, prompt action is required.

Carburetor Heat - On (See Note) RPM will decrease slightly and roughness will increase. Wait for a decrease in engine roughness or an increase in RPM, indicating ice removal. If no change in approximately one minute, return carburetor heat to COLD. If the engine is still rough, try steps below.

1. Mixture - Adjust for maximum smoothness. Engine will run rough if the mixture is too rich or too lean.

2. Fuel Selector - Change tanks to see if fuel contamination is the problem.

3. Engine Gauges - Check for abnormal readings. If any gauge readings are abnormal, proceed accordingly.

4. Magneto Switch - "L" then "R" then back to "BOTH." If operation is satisfactory on either magneto, proceed on that magneto at reduced power, with mixture full rich, to a landing at the first available airport.

5. Primer Pump - Check locked.

If roughness persists, prepare for a precautionary landing at pilot's discretion.

NOTE

Partial carburetor heat may be worse than no heat at all, since it may partially melt the ice, which will refreeze in the intake system. When using carburetor heat, therefore, always use full heat and when ice is removed, return the control to the full cold position.

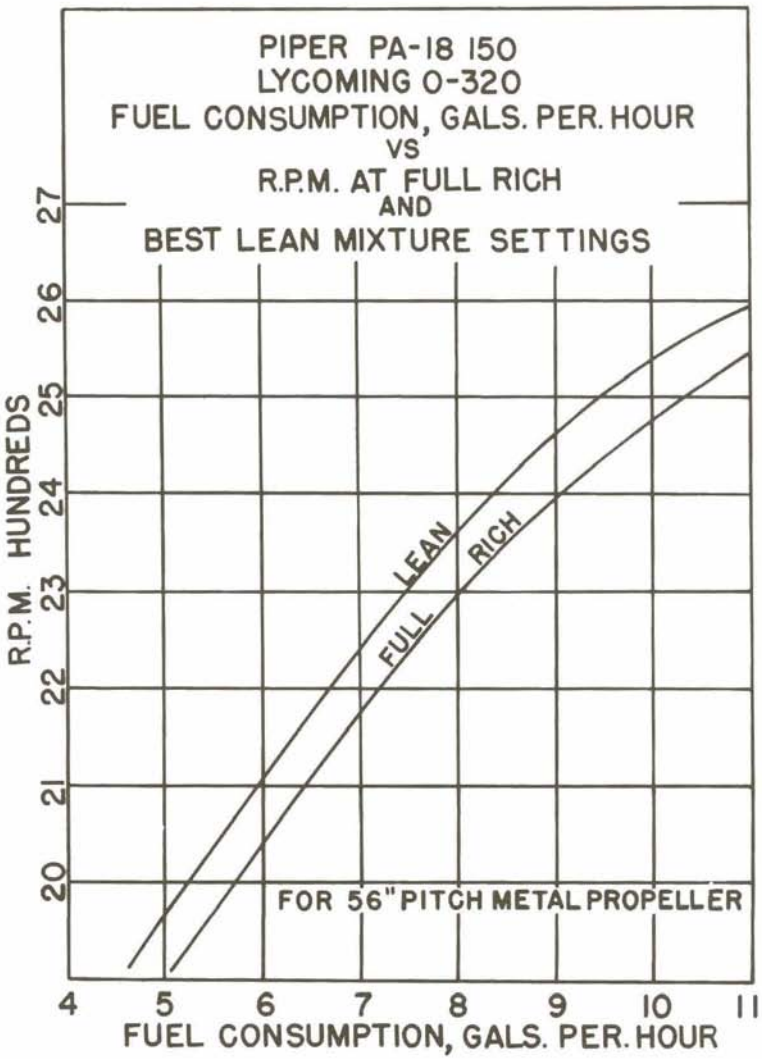
SPINS

1. THROTTLE - IDLE
2. RUDDER - FULL OPPOSITE TO DIRECTION OF ROTATION
3. CONTROL STICK - FORWARD OF NEUTRAL AS REQUIRED TO BREAK STALL
4. RUDDER - NEUTRAL (WHEN ROTATION STOPS)
5. CONTROL STICK - AS REQUIRED TO SMOOTHLY REGAIN LEVEL FLIGHT ATTITUDE

NOTES

SECTION V

PERFORMANCE CHART


PIPER PA-18 150
LYCOMING O-320
FUEL CONSUMPTION, GALS. PER. HOUR
VS
R.P.M. AT FULL RICH
AND
BEST LEAN MIXTURE SETTINGS
R.P.M. HUNDREDS
20
21
22
23
24
25
26
27
LEAN
FULL
RICH
FOR 56" PITCH METAL PROPELLER
4
5
6
7
8
9
10
11
FUEL CONSUMPTION, GALS. PER. HOUR

NOTES

SECTION VI

GENERAL MAINTENANCE

SECTION VI

GENERAL MAINTENANCE

ENGINE ACCESS

The steel tubular engine mount on the Super Cub models is mounted to the fuselage at the fire wall on hinges, so that the rear of the engine can readily be made accessible for service. To hinge the motor mount, first remove the top, side and bottom engine cowl panels, which are quickly detachable by means of cowl fasteners. Next detach the rear end of the cowl support channels from their fire wall brackets, extract the right hand hinge bolts, disconnect the tachometer shaft at the engine and swing the right side of the engine forward until the stop mechanism is extended.

TIRE INFLATION

For maximum tire service, keep the tires inflated to the proper pressure, which is 18 pounds on the Super Cub. Reverse the tires on the wheels, if necessary, to produce even wear.

BATTERY SERVICE

A 12-volt, 33-ampere hour battery is installed with the electrical equipment as optional equipment. The battery should be checked frequently for proper fluid level. Do not fill the battery above the baffle plates. Be sure all connections are clean and tight. If battery is not up to proper charge, recharge, starting with a charging rate of four amps and finishing with two amps. If a quick charge is desired for the battery, be sure master switch is off while charging. The battery should always be removed before charging.

CARE OF WINDSHIELD AND WINDOWS

The windshield and windows are made of plexiglas and a certain amount of care is required to keep them clean and clear. The following procedure is suggested:

1. Wash with clean water and dislodge excess dirt, mud, etc. with your hand.
2. Wash with mild soap and warm water. Use a soft cloth or sponge. (Do not rub.)
3. Remove oil, grease or sealing compounds with a cloth soaked in kerosene.

NOTE

Do not use gasoline, alcohol, benzene, carbon tetrachloride, lacquer thinner, or window cleaning sprays.

4. After cleaning, apply a thin coat of hard polishing wax. Rub lightly with soft dry cloth.
5. A severe scratch or mar can be removed by using jewelers rouge to rub out scratch; then smooth on both sides and apply wax.

OIL REQUIREMENTS

The oil capacity of the O-320 series engine is 8 quarts, and the minimum safe quantity is 2 quarts. It is recommended that the oil be changed every 50 hours and sooner under unfavorable operating conditions. Intervals between oil changes can be increased as much as 100% on engines equipped with full flow cartridge type oil filters, provided the element is replaced each 50 hours of operation and the specified octane fuel is used. Should fuel other than the specified octane rating for the power plant be used, refer to the latest issue of Lycoming Service Letter No. L185 and Lycoming Service Instruction No. 1014 for additional information and recommended service

procedures. The following grades are recommended for the specified temperatures:

Temperatures above 60° F	SAE 50
Temperatures between 30° F to 90° F	SAE 40
Temperatures between 0° F to 70° F	SAE 30
Temperatures below 10° F	SAE 20

Either mineral oil or anti-dispersant oil may be used, but the two types of oil may never be mixed.

FUEL REQUIREMENTS

The minimum aviation grade fuel for the PA-18-150 is 80/87. Since the use of lower grades can cause serious engine damage in a short period of time, the engine warranty is invalidated by the use of lower octanes.

Whenever 80/87 is not available, the lowest lead 100 grade should be used. (See Fuel Grade Comparison Chart, next page.) Refer to the latest issue of Lycoming Service Instruction No. 1070 for additional information.

The continuous use, more than 25% of the operating time, of the higher leaded fuels can result in increased engine deposits, both in the combustion chamber and in the engine oil. It may require increased spark plug maintenance and more frequent oil changes. The frequency of spark plug maintenance and oil drain periods will be governed by the amount of lead per gallon and the type of operation. Operation at full rich mixture requires more frequent maintenance periods; therefore it is important to use proper approved mixture leaning procedures.

Reference the latest issue of Lycoming Service Letter No. L185 for care, operation and maintenance of the airplane when using the higher leaded fuel.

A summary of the current grades as well as the previous fuel designations are shown in the following chart:

FUEL GRADE COMPARISON CHART

Previous Commercial Fuel Grades (ASTM-D910)			Current Commercial Fuel Grades (ASTM-D910-75)			Current Military Fuel Grades (MIL-G-5572E) Amendment No. 3		
Grade	Color	Max. TEL ml/U.S. gal.	Grade	Color	Max. TEL ml/U.S. gal.	Grade	Color	Max. TEL ml/U.S. gal.
80/87	red	0.5	80	red	0.5	80/87	red	0.5
91/98	blue	2.0	*100LL	blue	2.0	none	none	none
100/130	green	3.0	100	green	**3.0	100/130	green	**3.0
115/145	purple	4.6	none	none	none	115/145	purple	4.6

* Grade 100LL fuel in some over seas countries is currently colored green and designated as "100L."

** Commercial fuel grade 100 and grade 100/130 (both of which are colored green) having TEL content of up to 4 ml/U.S. gallon are approved for use in all engines certificated for use with grade 100/130 fuel.

The fuel gauge glass should be cleaned occasionally so that the fuel level indicator will always be readily seen. To clean or replace the fuel gauges, first remove lower wing butt fairings. Pinch the rubber line to the lower gauge fitting so that fuel cannot drain from the tank. Then remove the fuel gauges by pulling the fittings from the connecting rubber tubes.

CARBURETOR AIR FILTER

1. Visual Inspection

A visual inspection of the paper cartridge should be made at intervals not exceeding eight (8) hours of operation or at any time after the filter has been subjected to severe dust conditions. This inspection should be made to determine if there has been a rupture of the paper cartridge, damage to the outer screen or end seals, or blockage of the air flow due to leaves, paper, etc.

2. Cleaning

Remove cartridge and clean by tapping against a hard surface to remove grit, sand and dirt. Do not wash or blow out with an air hose.

3. Replacement

If the present cartridge is found to be in good condition and is not obstructed after being properly cleaned (see paragraphs 1 and 2), the following check should be made:

a. Operate engine to static RPM at full throttle and note RPM.

b. Remove filter cartridge and repeat operation in paragraph 3a.

If an increase of 50 RPM or greater is noted, a new cartridge should be installed.

BRAKE SERVICE

The brake system is filled with MIL-H-5606 hydraulic brake fluid. This should be checked at every 100 hour inspection, and replenished if necessary.

Use only MIL-H-5606 petroleum base brake fluid when refilling the system. When it is necessary to refill brake system, or when the brakes seem spongy, probably due to air in the lines, the following procedures are to be followed:

1. To fill the brake system, remove filler plugs on right wheel brake master cylinder. Remove bleeder screw from tee on right wheel brake unit and attach line from brake fluid pressure can. Fill system until master cylinders are full. Repeat procedure for left wheel brake. If pressure can is not available, an open can with line attached may be used, providing can is held higher than master cylinders. When two master cylinders are full, replace filler plugs and bleeder screws. Check brakes for satisfactory operation.

2. Air in the brake lines cause faulty operation which can be corrected by bleeding the brake system as follows:

a. Check entire system for breaks or leaks.

b. Remove bleeder screw from particular brake unit and insert bleeder hose. Place free end in a clean receptacle.

c. Remove filler plug from master cylinders of the particular brake which is being bled.

d. Fill master cylinders with MIL-H-5606 hydraulic fluid and keep cylinders full during bleeding process.

e. Work the brake pedal rapidly to force fluid through bleeder hose into receptacle. Pinch hose shut during return of pedal to off position. Release pressure on hose, and push pedal rapidly on again. While fluid is flowing, restrict bleeder hose and allow brake pedal to return slowly to off position. Continue this process until no more air bubbles are observed coming through bleeder hose. The system is then properly bled.

f. Replace bleeder screw; check to see that master cylinders are full, and replace filler plugs. Check brakes for satisfactory operation.

HAYES INDUSTRIES AND B. F. GOODRICH:

No adjustment of the brake clearances is necessary on the Super Cub brakes. If, after extended service, the brakes become less effective, the brake segments can be easily replaced as follows: Remove the wheels to expose the brake shoe blocks, then slip blocks from their retainer clips with a screwdriver. Replace with new brake segments and reinstall the wheels.

Wheels are quickly removed by taking off the hub caps, removing the cotter pin from the hub nut and unscrewing the nut. The wheel can then be pulled freely from the axle.

Tires are dismounted from the wheels as follows:

1. Deflate tubes.
2. Remove safety clevis pin from outer wheel flange.
3. Extract lock ring which holds the outer flange in place.
4. Slide slange, tire and tube from the hub.

CLEVELAND:

No adjustment of the brake lining clearance is necessary as they are self-adjusting. Inspection of the lining is necessary, and it may be inspected visually while installed on the airplane. The linings are of the riveted type and should be replaced if the thickness of any one segment becomes worn below 0.099 of an inch or unevenly worn.

Check the brake disc for grooves, scratches, pits or coning. Coning beyond .015 in either direction would be cause for replacement. A single groove or isolated grooves up to 0.031 of an inch deep would not necessitate replacement, but a grooving of the entire surface would reduce lining life and should be replaced. If a powdery rust appears on the disc, one or two taxi-braking applications should clear the rust up. Heavier rust may require removal of the disc to wire brush it. Then finish sand with 220 grit sandpaper.

Lining may be remove from the backing plates by drilling or punching out the old rivets and installing a new set using the proper rivets and a rivet set that will properly stake the lining and form a correct flare of the rivet. (A rivet setting kit is available through Piper Dealers under part number 754 165.)

To service the tires and/or brakes, place the airplane on jacks. To remove the main wheel, remove the two cap bolts that join the brake cylinder housing and the lining back plate assemblies. Remove the back plate from between brake disc and wheel. Remove the cover and the cotter pin that safeties the wheel nut, remove the wheel nut and slide the wheel from the axle. The wheel halves may be separated by first deflating the tire. With the tire sufficiently deflated, remove the wheel through bolts. Pull the wheel havlves from the tire by removing the inner half from the tire first, and then the other half.

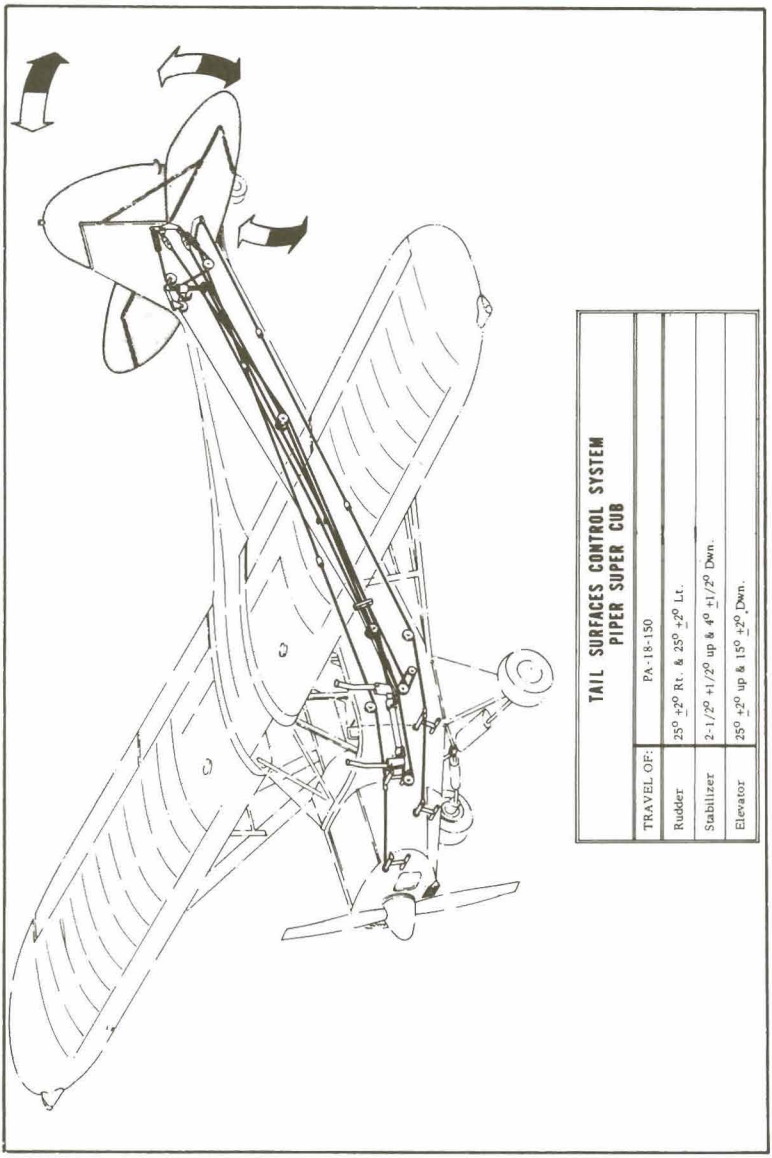
LANDING GEAR SERVICE

The landing gear shock cords, which are enclosed in streamlined shock cord covers, should be inspected regularly for signs of wear. Shock struts and landing gear hinge bolts should be kept properly lubricated with light grease or oil.

LEVELING AND RIGGING

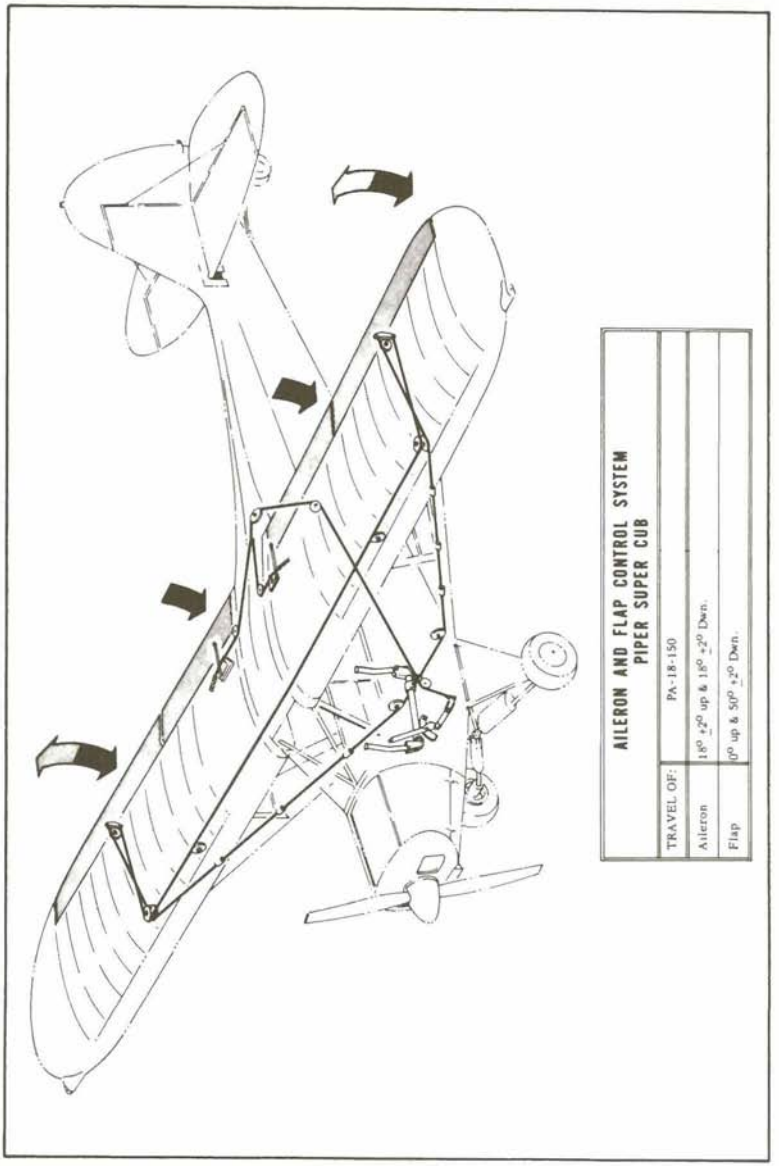
The airplane should be leveled as follows:

Suspend a plumb bob on a string from the hole in the rear of the upper door frame channel. The hole is exposed by removing the wing root fairing at this point. The airplane will be leveled longitudinally and



TAIL SURFACES CONTROL SYSTEM
PIPER SUPER CUB

TRAVEL OF:	PA-18-150
Rudder	25° ±2° Rt. & 25° ±2° Lt.
Stabilizer	2-1/2° +1/2° up & 4° +1/2° Dwn.
Elevator	25° ±2° up & 15° ±2° Dwn.



AILERON AND FLAP CONTROL SYSTEM
PIPER SUPER CUB

TRAVEL OF:	PA-18-150
Aileron	$18^{0} \pm 2^{0}$ up & $18^{0} \pm 2^{0}$ Dwn.
Flap	0^{0} up & $50^{0} \pm 2^{0}$ Dwn.

laterally when this plumb bob hangs directly over a depression in the horizontal door frame tube, about one inch ahead of its rearward end.

Lateral leveling: Place jacks or blocks under the inside portion of the axles, adjusting them until the plumb bob is roughly in line laterally with the mark on the door frame.

Longitudinal leveling: Support the tail on an adjustable jack or stand so that the airplane is approximately in level flight attitude. Adjust the jack until the plumb bob is in line longitudinally with the reference mark.

Next readjust the lateral leveling jacks until the plumb bob hangs directly over the designated mark. The airplane is then leveled on both axes.

Rigging of the aircraft is done as follows:

1. Dihedral angle: Place a block 3/8" high on one end of a 30" level. Hold the level between the jury strut and the main strut attachments under the front spar with spacer block outboard. When the bubble is centered, the front spars have an angle of 45 minutes off level.

Normally the correct dihedral will be obtained when about seven threads on the lift strut adjustment forks are exposed. (A maximum extension of 15 threads is permissible.) If proper rigging does not result from this procedure, check the fuselage for lateral leveling by holding a level between the front landing gear bolt heads, using this means to level the fuselage laterally, rather than the plumb bob. Then recheck for equal and proper dihedral of the wings.

2. Wash out: Place a 3/8" spacer block on top of a 30 inch level at one end. Working on the outboard aileron rib, hold the level fore and aft with the spacer block at the rear and the front end of the level under the front spar. The correct wash out will exist when the bubble is centered. Adjust the rear struts in or out to obtain this condition.

3. Tail assembly: With the airplane in level position, the stabilizers should be leveled at their rear spars by adjusting the rear set of tail brace wires while leaving the front set loose. The elevator hinge line should be straight and level from tip to tip. The fin should be vertical at the rudder post. After the rear set of wires are rigged, tighten up on the front set, being careful not to twist the fin or stabilizer. Hold a straight edge of 37.5 inches in length on the tail wire. Hook a spring scale onto the center of the tail wire. A pull of 10

pounds ± one pound on the scale perpendicular to the straight edge will cause a deflection of 7/16 ± 1/16 inches on a tail wire under proper tension. Adjust all wires to this tension.

SERIAL NUMBER PLATE

The serial number plate is located under the front seat on the floor. The serial number of the airplane should always be used when referring to the airplane in service or warranty matters.

AILERON BALANCING

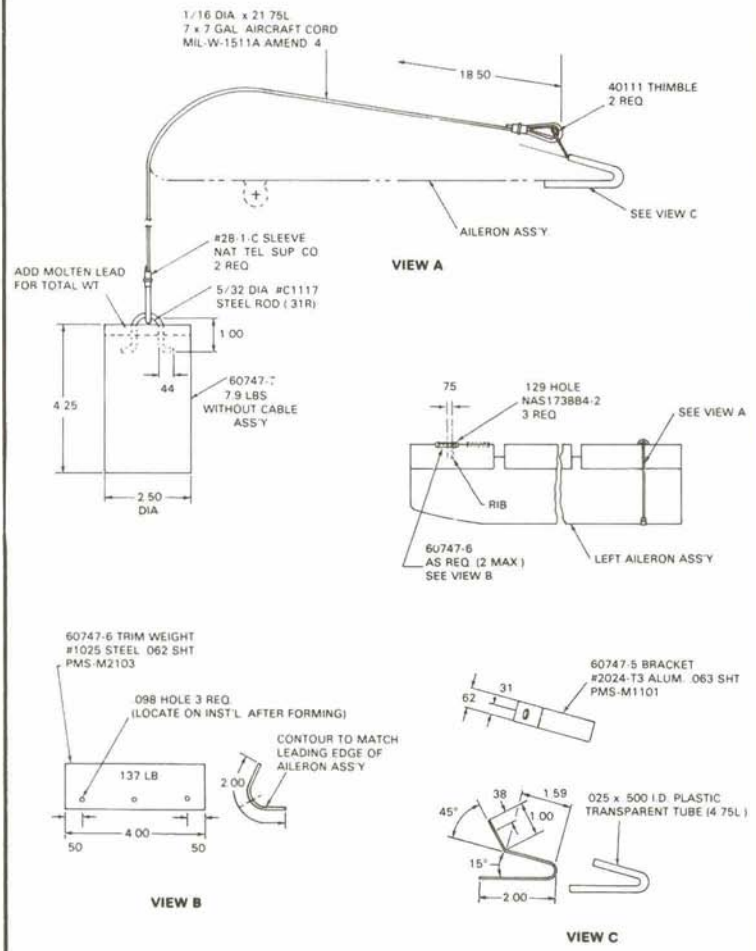
This procedure applies to PA-18 aircraft with metal ailerons,

1. Aileron assembly must be complete including paint, supported on hinge pins in a level position and free to rotate.
2. Hang test weight assembly 60747-7 over the leading edge of the aileron. Level the lower surface, then allow the aileron to rotate. If trailing edge rotates up or remains static with the lower surface level the aileron is balanced correctly.
3. If trailing edge rotates down add trim weight 60747-6 as required. (2 max.)
4. Maximum trailing edge heavy imbalance is 22 in-lbs.

CONTROL CABLE TENSION ADJUSTMENTS

Control cable tension should be adjusted as follows:

1. Elevator cable tension should be checked and set to a tension of 62 ± 2 pounds. (See Tail Surface Control System, page 40.)
2. Aileron cable tension should be checked and set to a tension of 40 ± 2 pounds. (See Aileron Flap Control System, page 41.)
3. Flap cable tension should be taunt and the left flap is set at 50° ± 2°, then bring the right flap to the same setting.
4. Rudder cable tension should be taunt and adjustment is made by setting the rudder at neutral, clamping the rudder pedals at neutral and connecting the cable with the rudder horn by aligning the cable end with the proper hole on the rudder horn.



METAL AILERON BALANCING

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INDEX (cont)