Boeing PT17 Stearman Pilot Training Course

Big Easy Wing

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November 2018

Airplane.

General

The PT-17 Airplane is a two-place open biplane, manufactured by Boeing Airplane Company and powered with a Continental 220 hp air-cooled engine coupled to an 8'6" diameter wood blade, fixed pitch propeller. The wings are of internally braced wooden construction, with aluminum alloy leading and trailing edges. Both the empennage and fuselage are welded tubular steel structures, provided with aluminum alloy fairing. The ailerons are a riveted structure of formed aluminum alloy. With the exception of the engine and fuselage cowling, the wings, fuselage, empennage and ailerons are fabric covered. The landing gear is of the fixed cantilever type with hydraulic brakes. Overall dimensions of the airplane are as follows:

Wingspan:
Upper: 32' 2"
Lower: 31' 2"
Length: 25'
Height: 9' 5"

Gross Weight: 2950 lbs.

Maximum speed: 124 mph

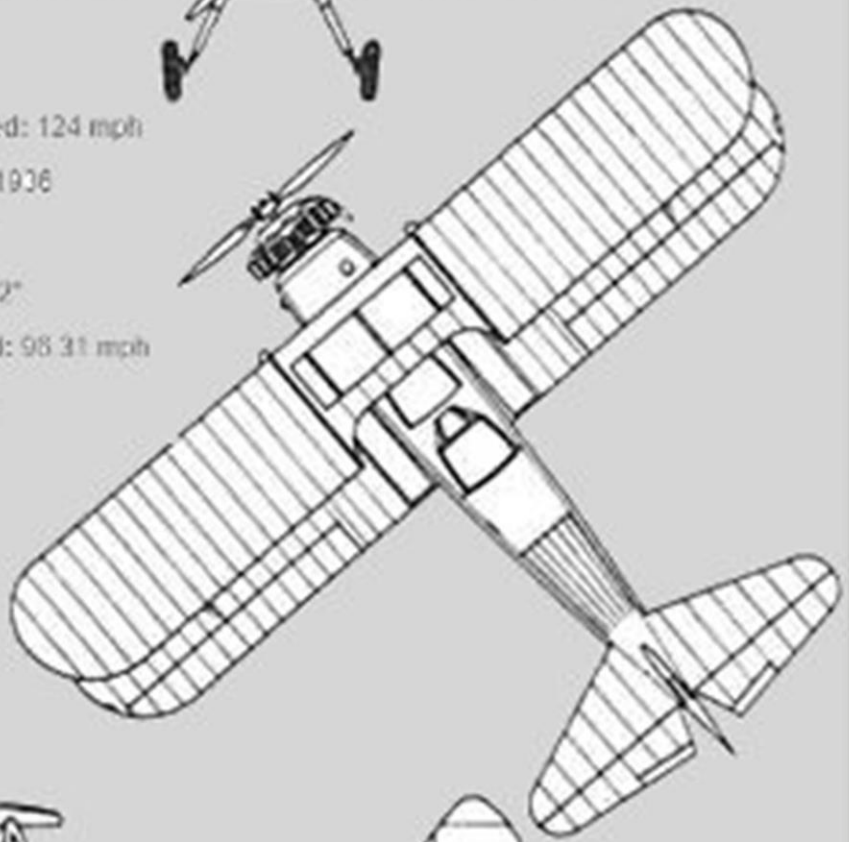
Maiden flight: 1936

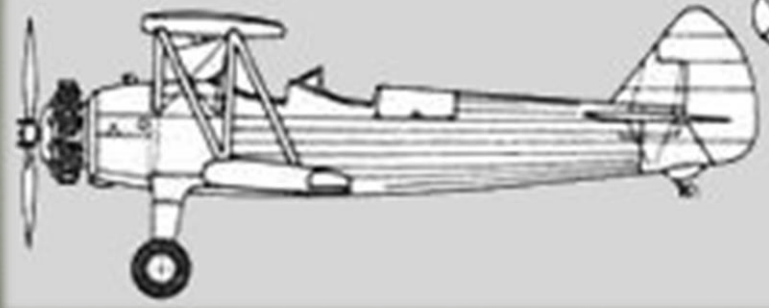
Length: 24' 9"

Wingspan: 32' 2"

Cruising speed: 98 31 mph

Passengers: 2





2. Power Plant

The PT-17 Airplane is powered with a Continental W-670-6 Air-cooled engine, rated at 220 hp, at 2075 rpm at sea level. Max Allowable flight rpm is 2075. Compression ratio is 5.4:1, direct drive.

Fuel – Oil The fuel tank is located in the center section of the upper wing and has a capacity of 46 U.S. gallons with an expansion space of 1.4 U.S. gallons. The fuel system is of the gravity feed type.

The oil tank is mounted on the forward side of the firewall in the engine compartment and has a capacity of 4.4 U.S. gallons with an expansion space of 1.4 gallons.

3. Controls and Operational Equipment.

A. Cockpit Seats.

Pilot's seats are *of* Standard Air-Corps Types, in both front and rear cockpits. The seats may be adjusted through five inches, in increments of one half inch. To raise or lower the seat, pull the release lever on the right side of the seat, upward, and move the seat up or down to the desired height. When released, the handle is returned to the locked position by a spring. If the locking pin, attached to the release lever will not engage, move the seat slightly upward or downward until the pin slides in place.

B. Aileron and Elevator Control

The ailerons and elevators are controlled, by inter-connected control sticks in each cockpit, through a series of push-pull tubes and bell cranks, Pushing the stick forward, deflects the elevator down against the air stream, causing the nose of the airplane to drop; pulling the stick back, deflects the elevator upwards and causes the nose of the airplane to raise.

If the stick is pushed to right or left, the ailerons are deflected in opposite directions, causing the airplane to roll about the longitudinal axis in the direction the stick is moved.

C. Elevator Trim Tab Control -

Elevator trim tab controls are mounted on the left side of each cockpit and control the trim tabs through a system of cables and pulleys. The tab control is fitted with a dial that indicates in degrees the displacement of the tab with respect to the elevator. The control is moved aft to correct for a nose heavy condition and pushed forward to correct for a tail-heavy condition.

D. Rudder Controls –

The rudder is controlled through a system of cables and pulleys, by two pedals in each cockpit. Pushing the right pedal forward, turns the rudder to the right, into the airstream, causing the airplane to turn to the right; pushing the left pedal forward, turns the rudder to the left, causing the airplane to turn to the left. Toe type brake controls are incorporated with the rudder pedals.

Toe pressure, when applied to the top of the pedals, serves to actuate the braking system. Independent brake control is thus obtained on each wheel.

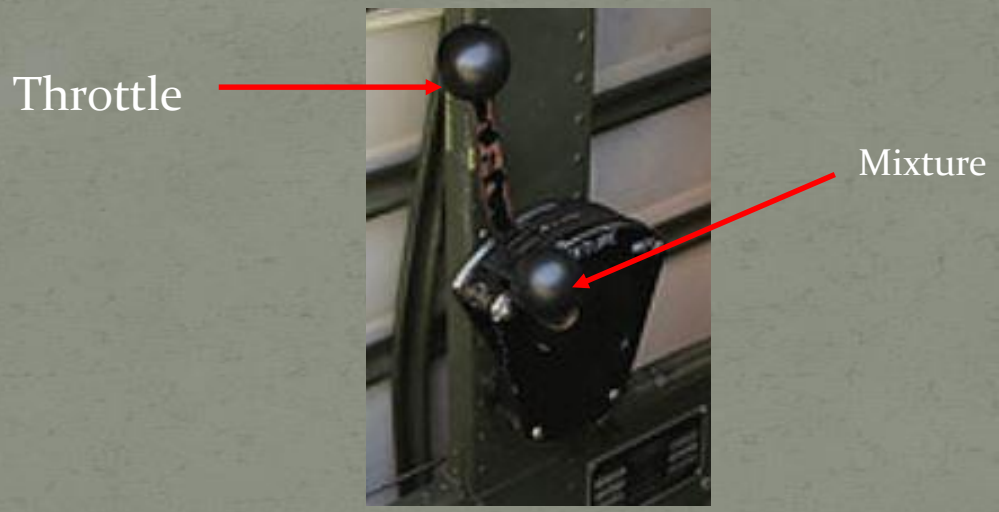
E. Tail Wheel. - The tail wheel is the steerable, free-swiveling type, mounting a 10" smooth contour tire. A shock absorber of the air-oil type is provided.

F. Fuel Tank Gage - A sight type fuel gage extends from the bottom of the tank and is visible to both members of the crew. It is calibrated in fourths of capacity and must be read with the airplane in level flight.

K. Fuel Valve - A fuel shut-off valve, remotely operated by control handles mounted on the left side, below the instrument panel in both cockpits, controls the flow *of fuel to the engine.*

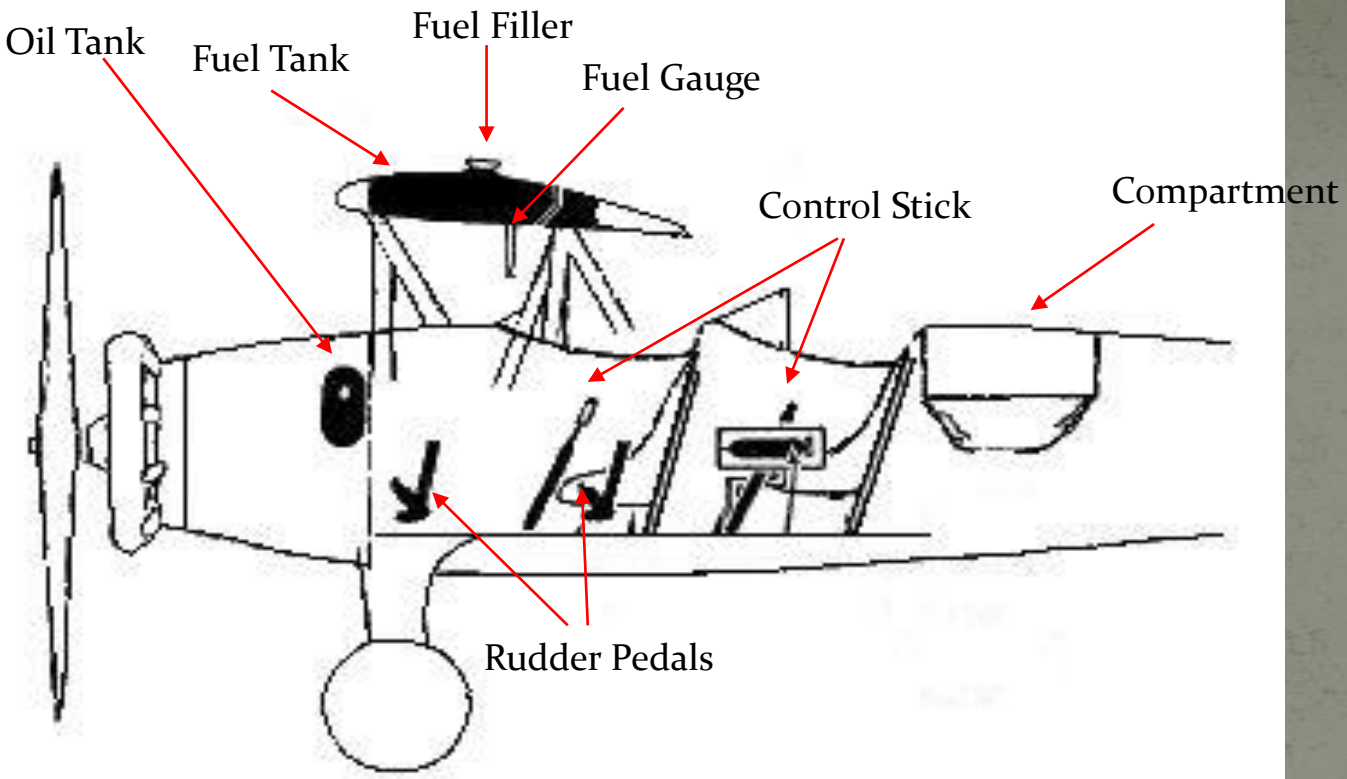
J. Engine Controls.

(1) Throttle Control - The throttle control lever, mounted on the left side of each cockpit, controls the throttle valve through a system of rods and bell cranks. Pushing the throttle lever forward, increases the rpm of the engine; pulling the lever aft, decreases the rpm.



(2) Mixture Control - A mixture control lever, mounted adjacent to the throttle lever in each cockpit, controls the carburetor mixture valve through a system of rods and bell cranks. Forward movement of the control lever, richens the carburetor mixture--aft movement leans the mixture.

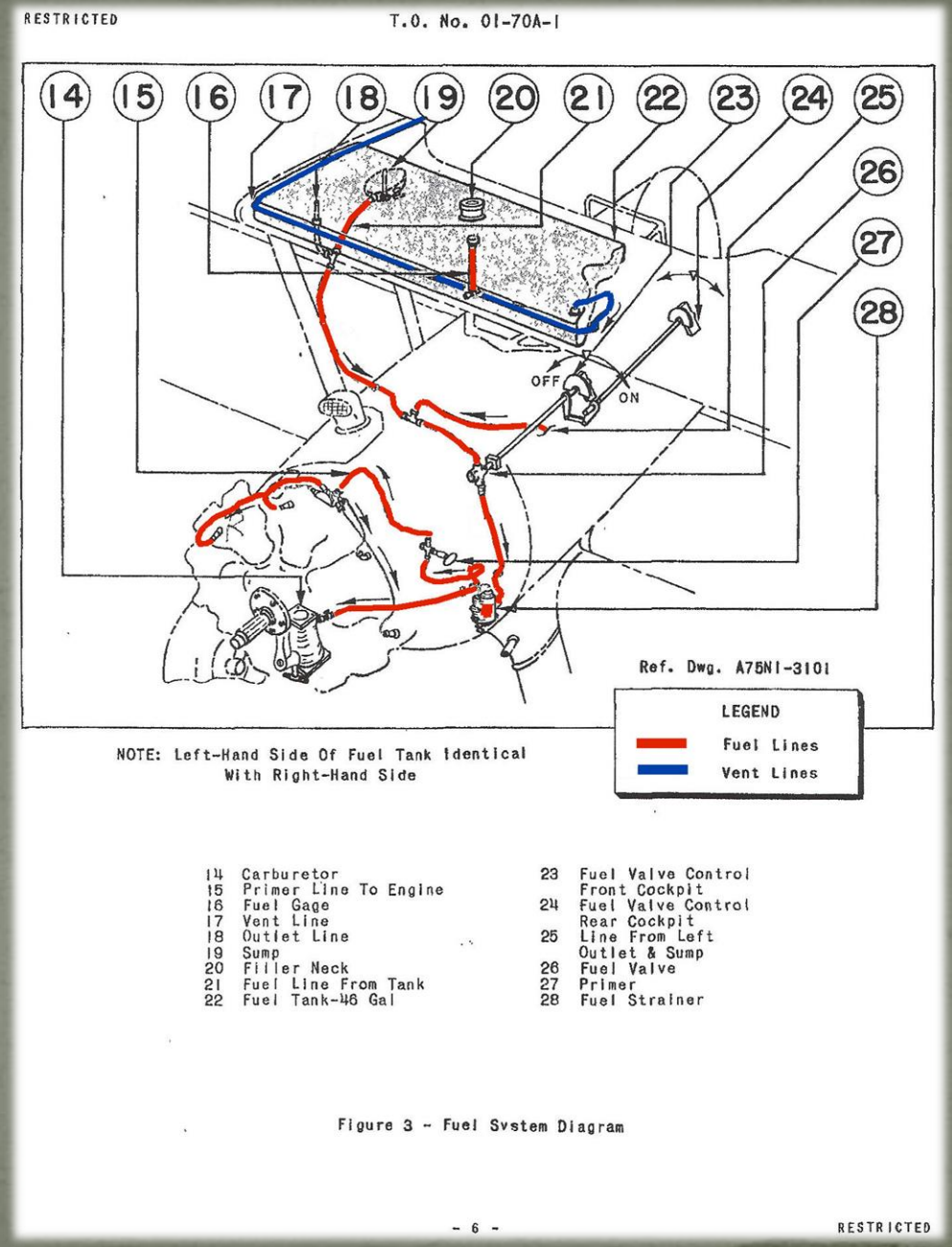
(3) Carburetor Air Control - The control for admitting heated air into the carburetor is located on the right side of the airplane between the front and rear cockpits and is accessible to both pilots. A spring latch on the control lever keeps it locked in the desired position. In the full forward position, cold air only, goes into the carburetor, Moving the control aft, increases the proportion of heated air, until, in the full aft position, only heated air is admitted into the carburetor.


Oil Tank
Fuel Tank
Fuel Filler
Fuel Gauge
Control Stick
Compartment
Rudder Pedals

The fuel system is a gravity feed type fuel system including an aluminum alloy tank, fuel strainer, fuel valve and aluminum alloy fuel lines. The fuel tank mounted In the upper wing center section has a 46-gallon Capacity with a 1.4-gallon expansion space. Supply Lines are attached to each corner of the fuel tank to Insure continuous fuel flow in all flight attitudes.

Sumps are provided at the two aft corners incorporating Cocks to drain accumulated sediment and water. The Sight type fuel gage extending from the underside of the tank incorporates a drain for drawing off collected sediment.

The fuel strainer is located at the lowest point in the fuel system just ahead of the firewall and is easily accessible for servicing. A fuel valve controlled by a control unit in either cockpit is installed in the fuel line at the firewall.



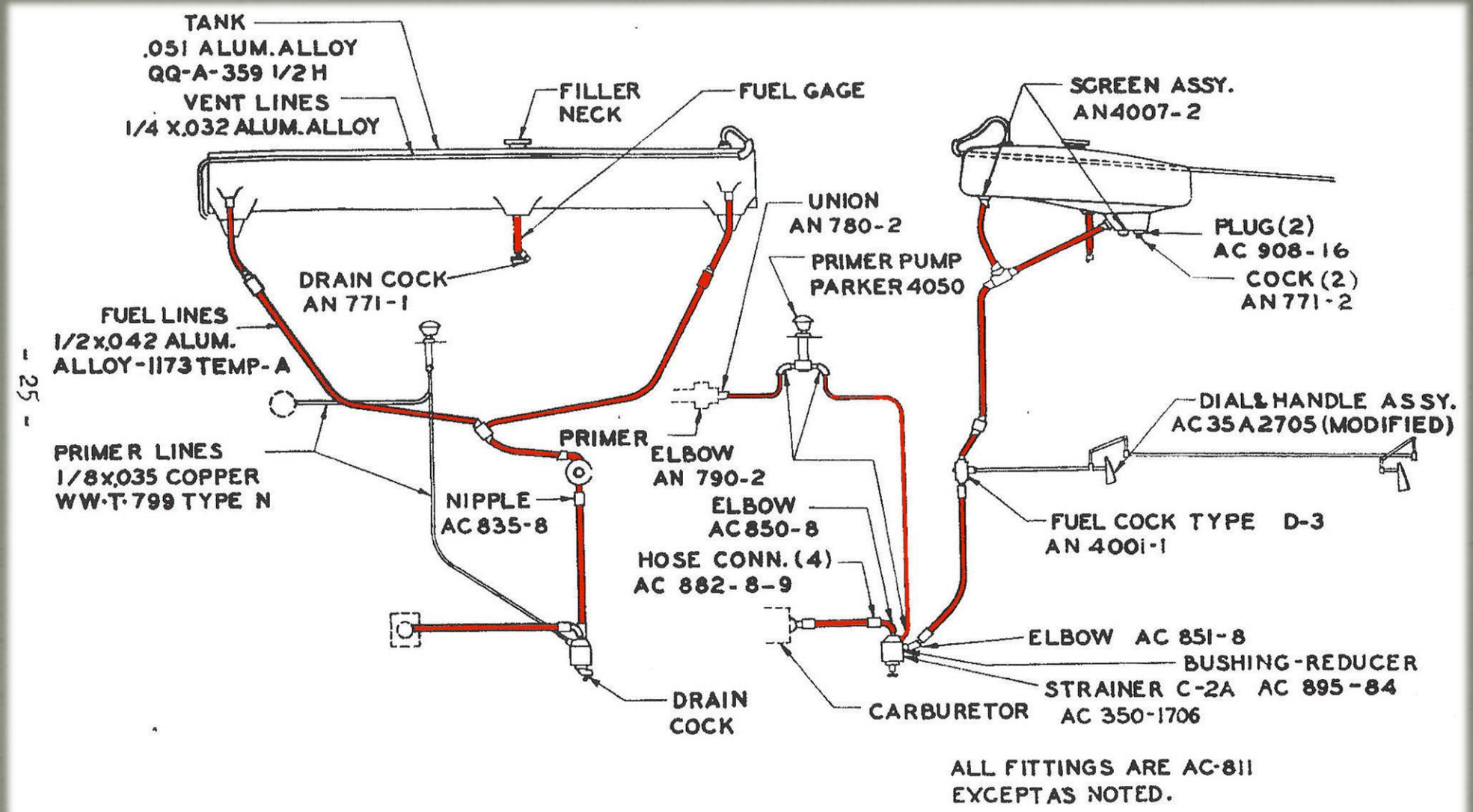
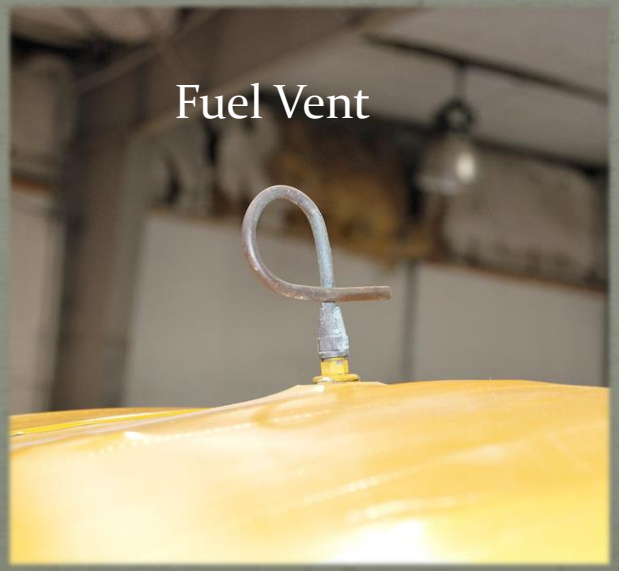


FIG. 12 FUEL SYSTEM DIAGRAM

MODELS: N2S-1 N2S-2 N2S-3

Fuel
Drains

Fuel Gauge



Fuel Vent

Fuel Cap

The oil system consists of an oil tank, “Y” drain, oil temperature wells and incorporates an oil dilution system.

The oil tank is fabricated of aluminum alloy and has an oil capacity of 4.4 gallons with an additional 1.4 gallon expansion space. A standpipe sump in the bottom of the tank prevents sediment in the oil tank from flowing into the engine. A hopper installed within the tank in conjunction with the oil dilution system aids in starting and warm-up of the engine.

The oil dilution system consists of an oil dilution solenoid valve with a fuel line extending to the “Y” drain in the oil-in line of the oil system. The oil dilution valve is controlled by a toggle switch mounted on the left side of the instrument panel in the front cockpit.

Oil Dilution should be employed when starting the engine in cold weather, and before stopping the engine when a cold weather start is anticipated.

- See Pilot’s Operating Instructions for detail of oil dilution operations.

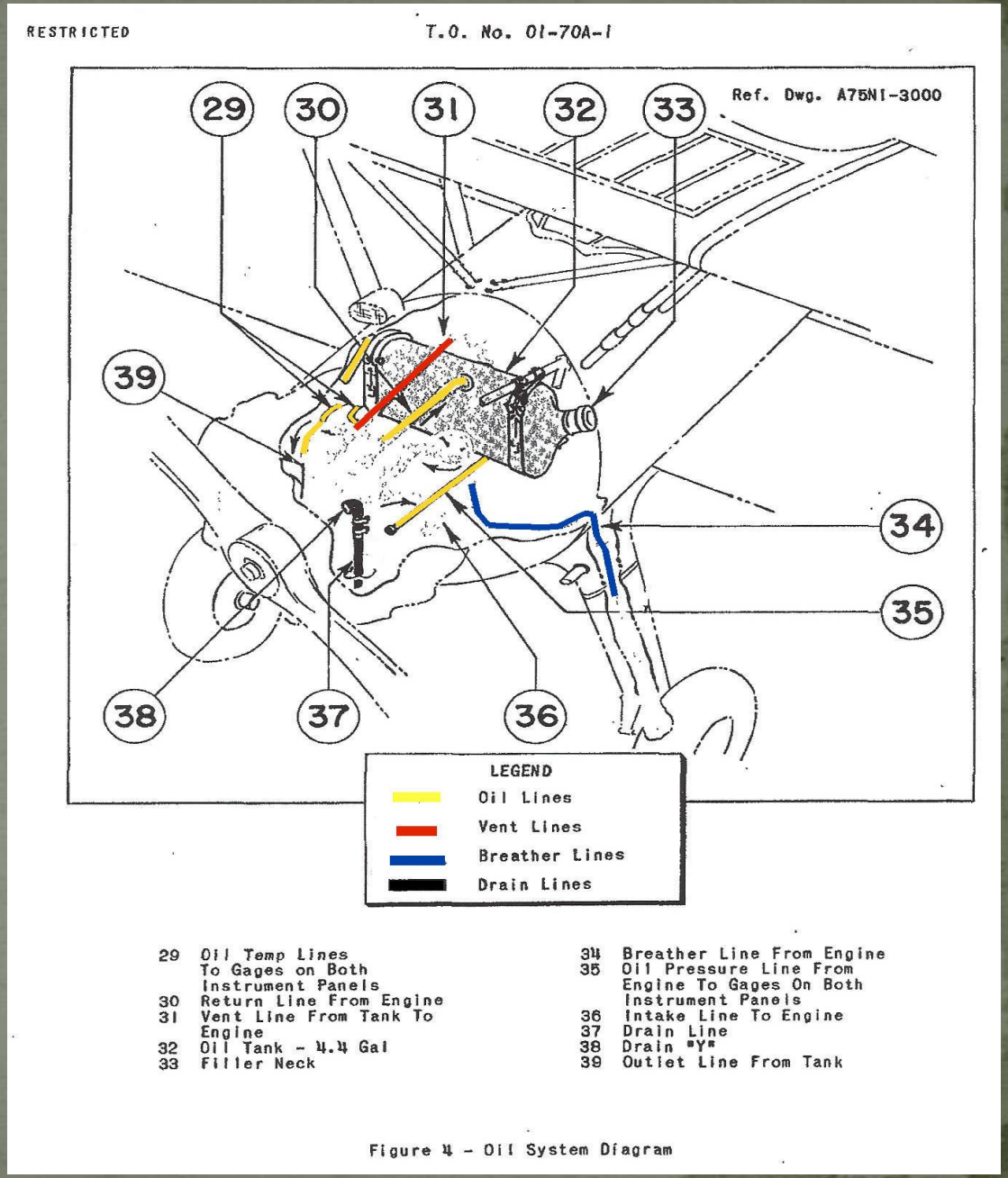
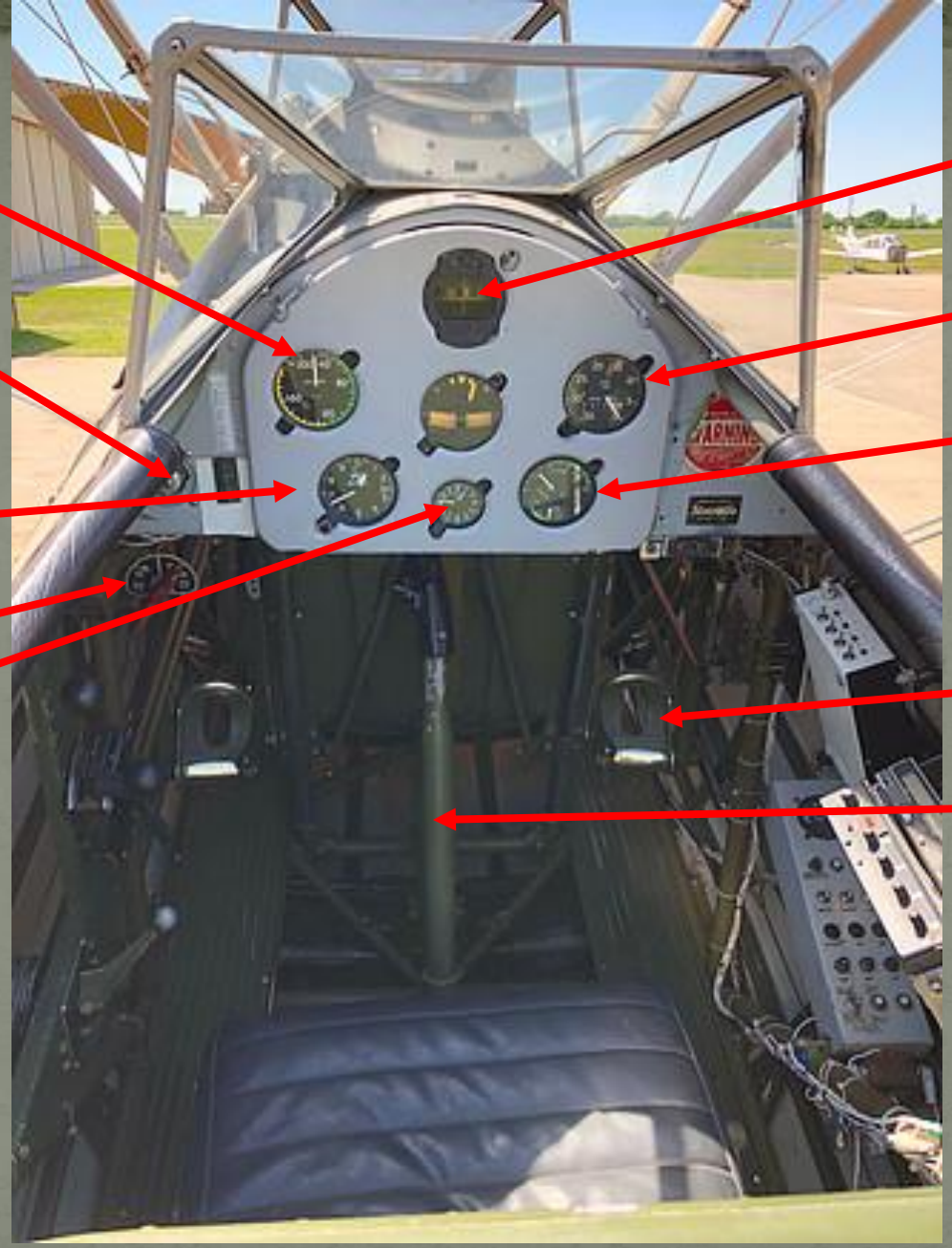
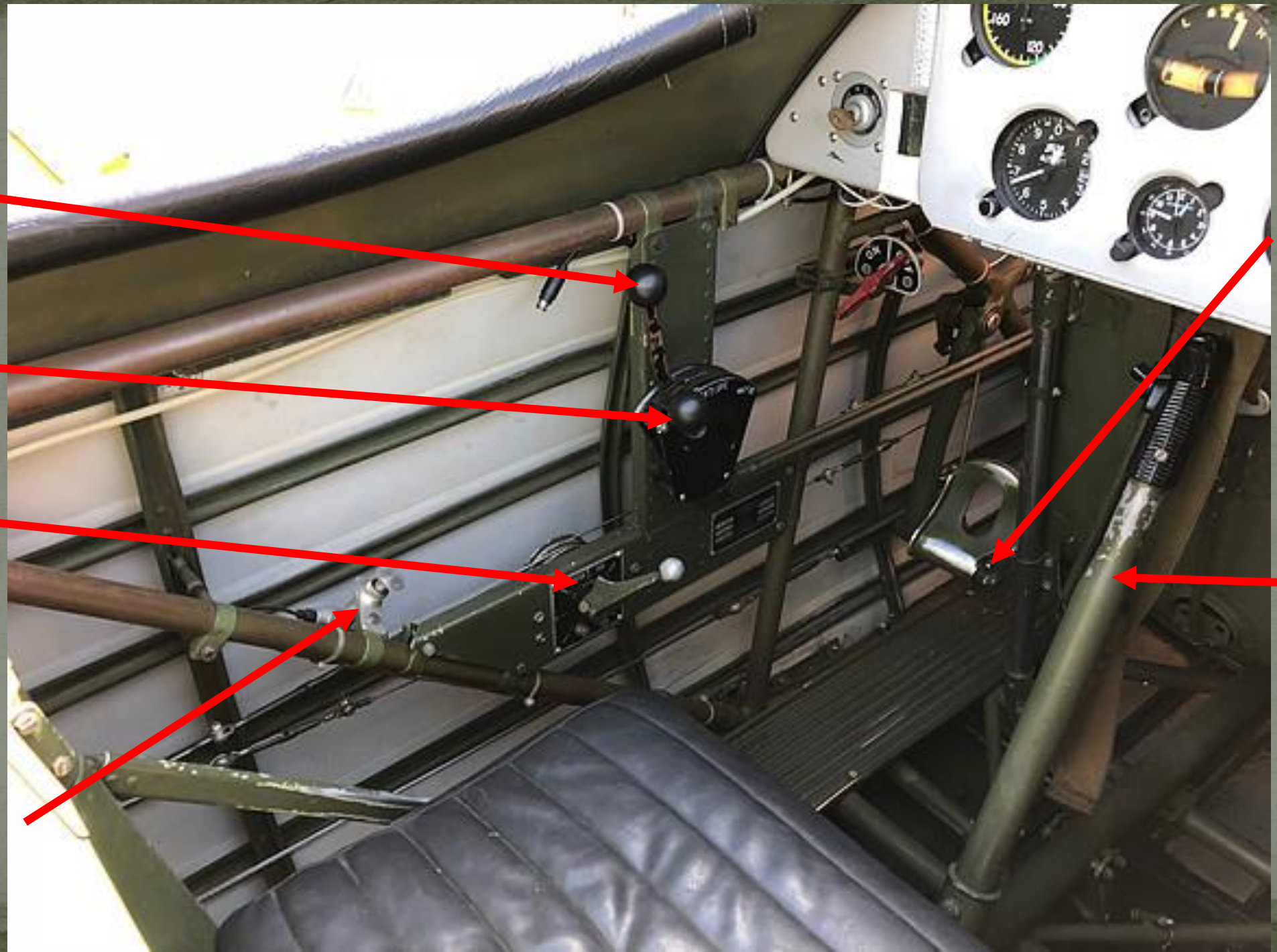


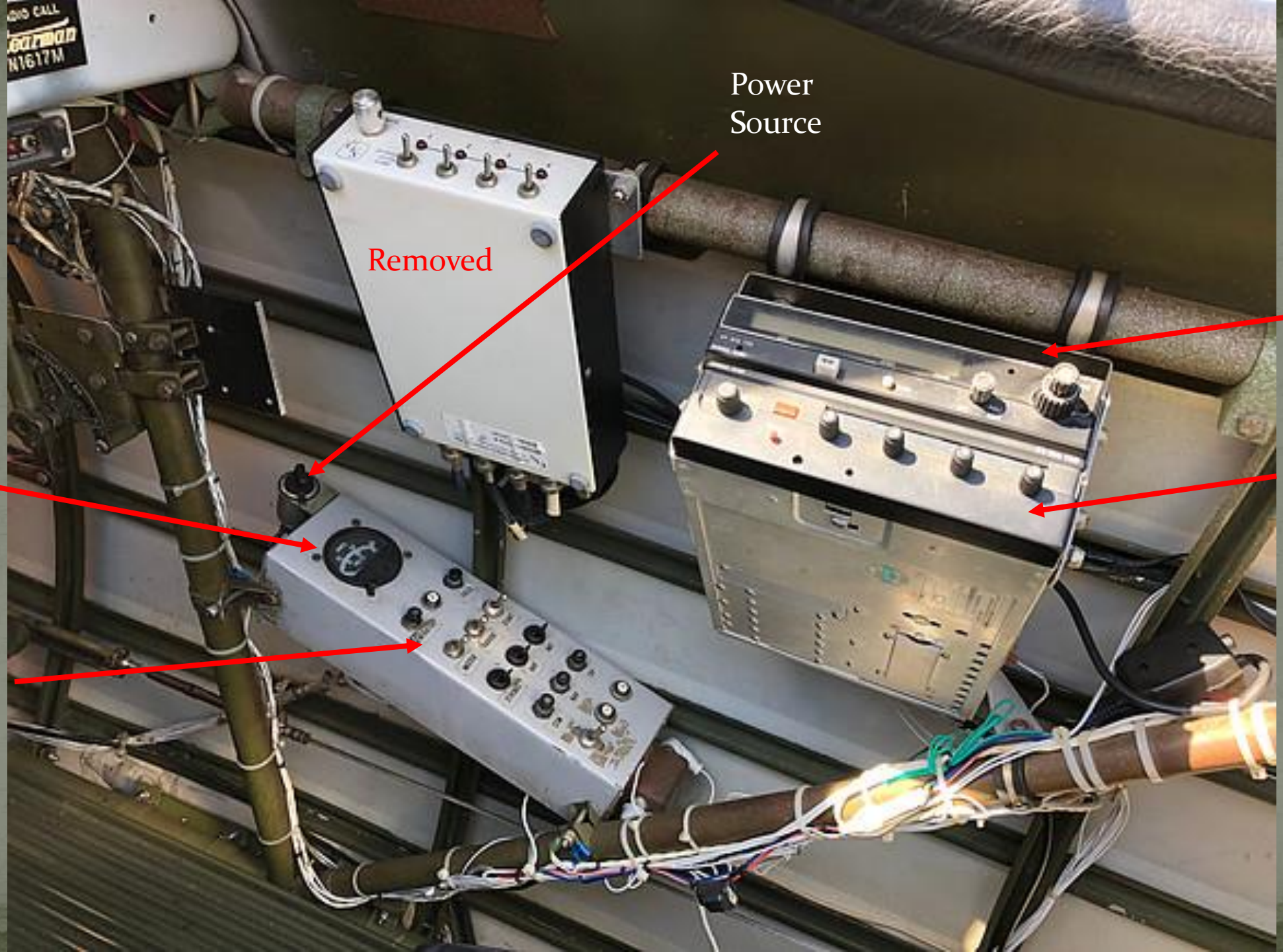
Figure 4 - Oil System Diagram

Oil Tank

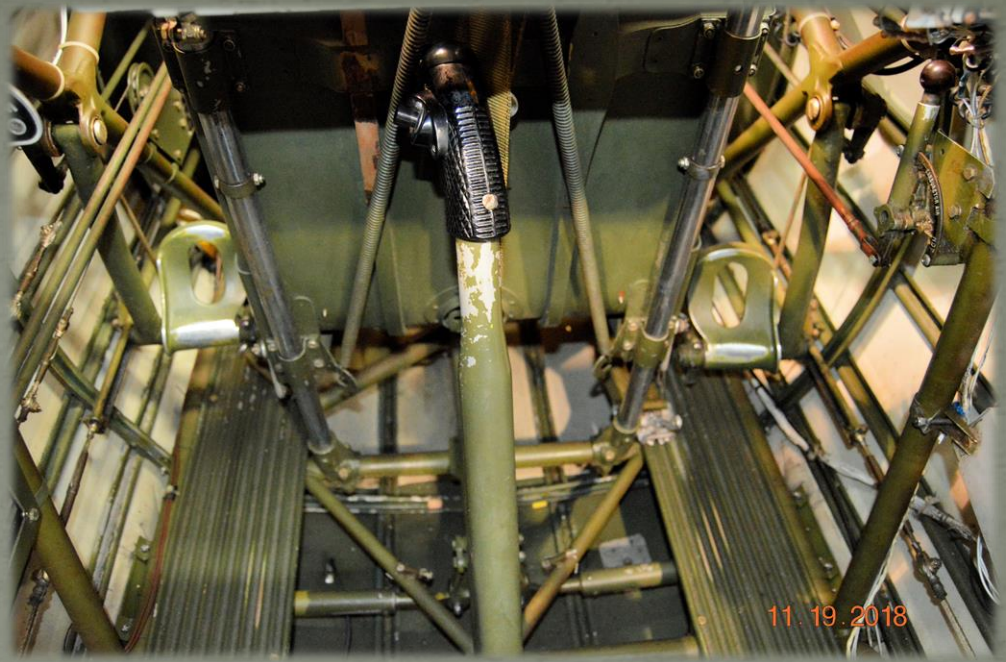


Rear Cockpit


Throttle
Mixture
Elevator Trim
Fuel Primer
Rudder Adjustment Lever
Control Stick


Power
Source
Removed
Radio
Amp
Meter
Transponder
Circuit
Breakers
& Switches

REAR COCKPIT

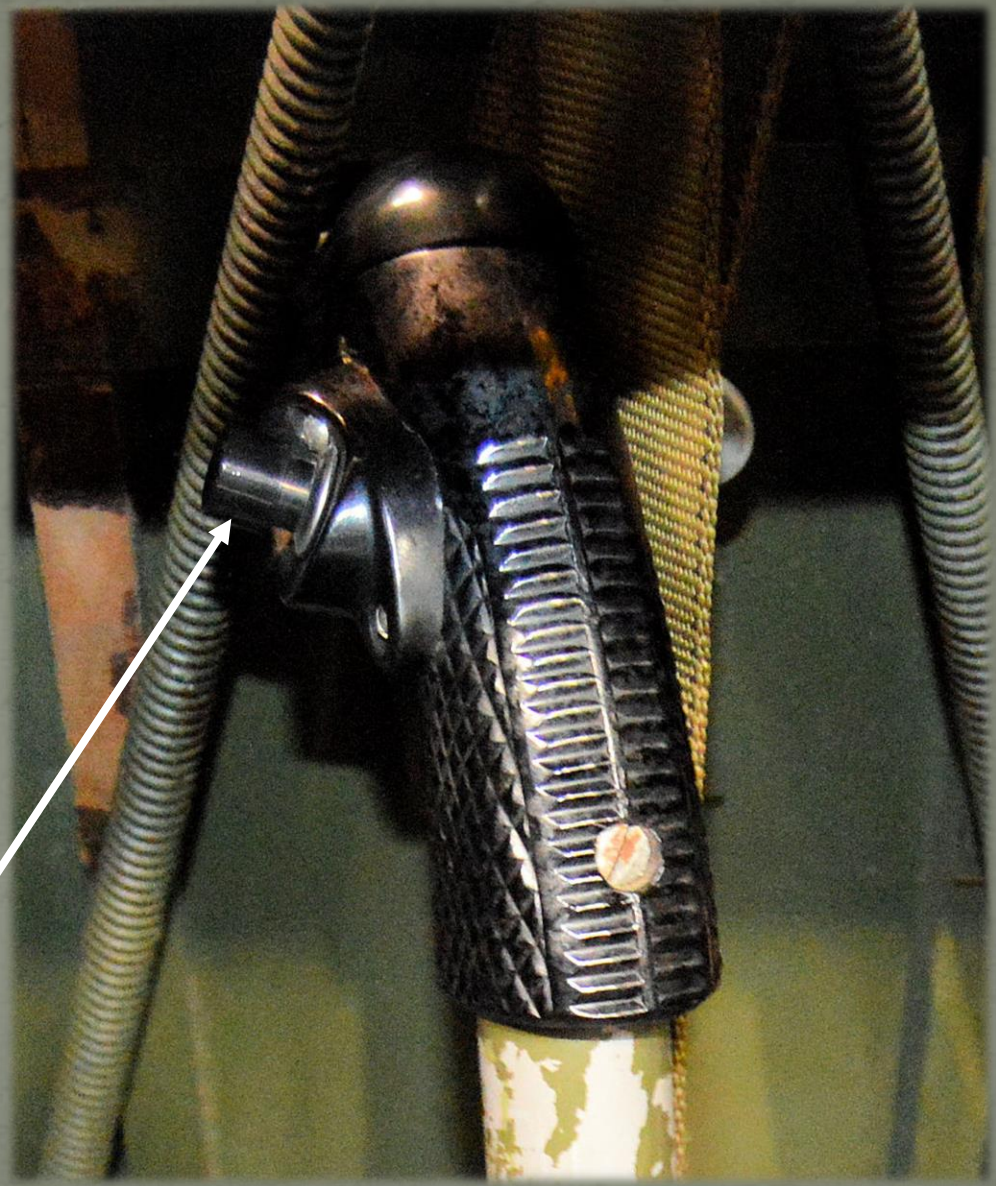


Comm

Transponder

Remote ELT Switch

Radio/Intercom Switch
Up for Transmit & Down
For Intercom



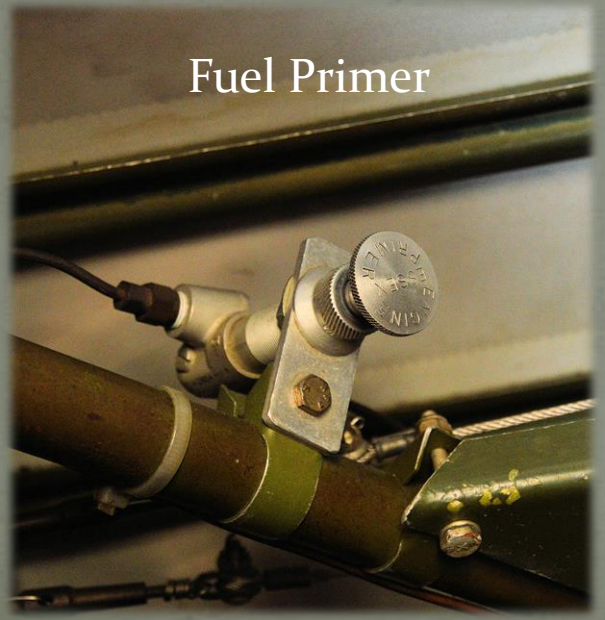
Push to Talk Switch for Intercom & transmitting

Fuel
ON/OFF
Valve

Mag
Switch

Height Adj
Lever on right
side of Seat

Shoulder Harness
Lock on left side of
Seat



Fuel Primer

ELT Behind Rear Seat on Right Side

Front Cockpit is same as Rear minus Mag Switch.

The Push to Talk Switch is on right side of cockpit and works in conjunction with the transmit switch in the rear.

Suit Case Handle

When assisting passenger ingress: **Do NOT** to put knee pressure on the side of the fuselage as this is known to “pop” the tape along the stringer there. It will dent the stringer as well!

Also, the “suit case” handles (lower aft fuselage) are for **PULLING NOT PUSHING** for the same reason!!

AIRPLANE MODEL
PT-17

SPECIFIC ENGINE FLIGHT CHART

ENGINE MODELS
W-670-6

CONDITION	FUEL PRESSURE LB/SQ IN	OIL PRESSURE LB/SQ IN	OIL TEMP °C	COOLANT TEMP °C			
DESIRED	GRAVITY FEED	75	70	AIR COOLED			
MAXIMUM		90	90				
MINIMUM		60	40				
IDLING		30	20				

MAX. PERMISSIBLE DIVING RPM – 2490

CONDITION	ALLOWABLE OIL CONSUMPTION
MAX CONTINIOUS	5.0 IMP PT/HR 3.0 US QT/HR
ECONOMICAL	4.17 IMP PT/HR 2.5 US QT/HR
MIN SPECIFIC	4.17 IMP PT/HR 2.5 US QT/HR
OIL GRADE: (S) 1120	(W) 110.0

OPERATING CONDITION	RPM	MANIFOLD PRESSURE	HORSE POWER	CRITICAL ALTITUDE (FEET)	MIXTURE CONTROL POSITION	FUEL FLOW GAL/HR	MAXIMUM CYL. TEMP °C	MAXIMUM CYL. TEMP °F	MAXIMUM DURATION (MINUTES)	REMARKS
TAKEOFF	FULL THROTTLE	NO MANIFOLD SUPERCHARGER ON THIS AIRPLANE	220	SEA LEVEL	FULL RICH	21.2	260	500	5	CYLINDER HEAD TEMPERATURES SHOWN ARE INFORMATION ONLY. NO CYLINDER HEAD TEMP. GAGE INSTALLED IN PT-17
EMERGENCY MAXIMUM	FULL THROTTLE		220	SEA LEVEL	FULL RICH	21.2	260	500	5	
MAXIMUM CONTINUOUS	1900		165	SEA LEVEL	FULL RICH	14.5	245	475	NO LIMIT	
ECONOMICAL MAXIMUM	1750		130	SEA LEVEL	SMOOTH OPERATION	12.2	235	455	NO LIMIT	
MINIMUM SPECIFIC CONSUMPTION	1900		165	SEA LEVEL	SMOOTH OPERATION	14.3	245	475	NO LIMIT	
MINIMUM CRUSING	1750		130	SEA LEVEL	SMOOTH OPERATION	12.2	235	455	NO LIMIT	
CONDITIONS TO AVOID	**ENGINE SPEEDS OF 1500 TO 1750 RPM ARE TO BE AVOIDED**									

TAKE-OFF, CLIMB & LANDING CHART

TAKE–OFF DISTANCE (IN FEET)

GROSS WEIGHT	HEAD WIND		HARD SURFACE RUNWAY						SOD-TURF RUNWAY						SOFT SURFACE RUNWAY					
			@ S.L.		@3000 FT		@6000 FT		@ S.L.		@3000 FT		@6000 FT		@ S.L.		@3000 FT		@6000 FT	
	MPH	KNOTS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS	GROUND RUN	TO CLEAR 50' OBS
2810	0	0	475	975	630	130	840	1820	560	106	765	1330	120	2185	785	1285	1100	1765	1680	2660
	17	15	235	580	310	0	410	1090	280	0	380	840	0	1275	390	735	330	1010	840	1515
	34	30	85	275	115	770	150	525	95	620	130	405	595	575	125	315	175	450	270	640
	51	45	10	45	15	390	20	85	15	285	20	70	205	95	20	55	25	75	35	105
						65				50			25							
2450	0	0	360	695	480	900	635	1215	425	755	580	1000	915	1495	595	925	835	1255	1275	1855
	17	15	175	405	235	525	310	710	210	440	290	580	465	860	300	525	415	705	640	1035
	34	30	65	190	85	260	115	335	75	200	100	270	155	375	95	220	135	305	205	425
	51	45	5	30	10	40	15	55	10	35	15	45	20	60	15	40	20	50	25	65
	0	0																		
	17	15																		
	34	30																		
	51	45																		

NOTE: INCREASE DISTANCE 10% FOR EACH 10°C ABOVE 0° C 10% FOR EACH 20°F ABOVE 32°F ENGINE LIMITS FOR TAKE-OFF **Full Throttle** RPM

CLIMB DATA

COMBAT MISSIONS USE: Full Throttle RPM **FERRY MISSIONS USE:** Full Throttle RPM

GROSS WEIGHT	TYPE OF CLIMB	S.L. TO _____ FEET				3000 FT. ALT					6000 FT. ALT					9000 FT. ALT					11,600 FT. ALT				
		BEST I.A.S.		FT/MIN	TIME FROM S.L.	BEST I.A.S.		FT/MIN	TIME FROM S.L.	FUEL FROM S.L. (GALS)	BEST I.A.S.		FT/MIN	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.		FT/MIN	TIME FROM S.L.	FUEL FROM S.L.	BEST I.A.S.		FT/MIN	TIME FROM S.L.	FUEL FROM S.L.
		MPH	KNOTS			MPH	KTS				MPH	KTS				MPH	KTS				MPH	KTS			
2810	COMBAT FERRY	77	67	710	---	76	66	550	5	5	73	63	400	11	6	69	60	240	21	8	67	58	100	37	11
2450	COMBAT FERRY	77	67	1070	---	76	66	870	4	4	73	63	680	7	5	69	60	490	12	7	67	58	320	19	8

NOTE: INCREASED ELAPED CLIMBING TIME 5% FOR EACH 10°C ABOVE 0°C FREE AIR TEMPERATURE (10% FOR EACH 20°F ABOVE 32°F) 3.0 FUEL INCLUDED WARM-UP AND TAKE-OFF ALLOWANCE

LANDING DISTANCE (IN FEET)

GROSS WEIGHT	BEST I.A.S APPROACH		HARD DRY SURFACE						FIRM DRY SOD						WET OR SLIPPERY					
			AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT		AT SEA LEVEL		AT 3,000 FT.		AT 6,000 FT	
	MPH	KTS	50' OBST	GND ROLL	50' OBST	GND ROLL	50' OBST	GND ROLL	50' OBST	GND ROLL	50' OBST	GND ROLL	50' OBST	GND ROLL	50' OBST	GND ROLL	50' OBST	GND ROLL	50' OBST	GND ROLL
2810	85	74	1123	440	1200	485	1275	525	1170	490	1245	530	1330	580	1710	1025	1835	1120	1975	1225
2450	85	74	1053	415	1120	455	1180	495	1095	455	1165	500	1240	545	1585	945	1760	1095	1825	1130

NOTE: FOR GROUND TEMPERATURES ABOVE 35°C (95°F) INCREASE APPROACH I.A.S. 10% AND ALLOW 20% INCREASE IN GROUND ROLL.

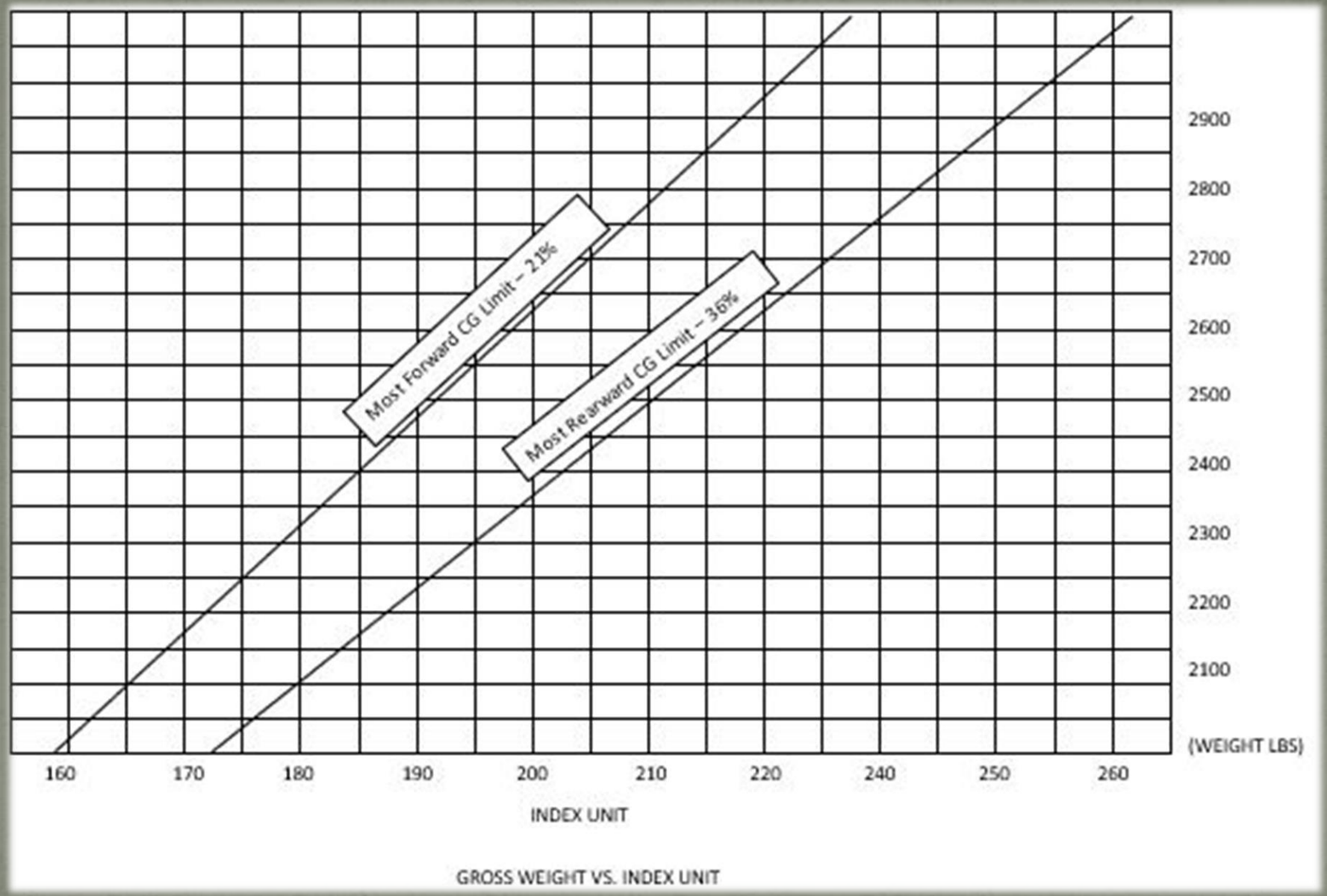

M.A.C.=60”
INSTRUCTOR/PASS
WEIGHT INDEX UNIT
200 LBS 20
BAGGAGE
10 LBS 1.7
20 LBS 3.3
30 LBS 5.0
40 LBS 6.6
50 LBS 8.3
60 LBS 10.0
100.0”
136.0”
166.0”
309
U.S.ARMY
PILOT
WEIGHT INDEX UNIT
200 LBS 27.2
REFERENCE
LINE

	Weight	Index Unit
Basic Weight	2075	164.1
Fuel (Full Tank 40 Gallons)	276.0	20.8
Oil (Full Tank 4.76 Gallons)	35.7	1.8

NOTE: REFER TO WEIGHT AND INDEX UNIT FOR SMALLER QUANTITIES OF FUEL & OIL

SPECIAL EQUIPMENT

ITEM	LOCATION	WEIGHT (LBS)	INDEX UNIT
ENGINE COVER	BAGGAGE	9.5	1.6
COCKPIT COVER	"	7.2	1.2
TOOL KIT	"	9.2	1.5
ENG MANUAL	DATA CASE	1.0	.3
PILOTS HANDBOOK		.7	.2
BATTERY		34.0	2.2



GROSS WEIGHT VS. INDEX UNIT

WEIGHT CORRECTION TABLE

THIS TABLE SHOWS THE VARIATION OF AIRSPEED WITH WEIGHT AT A CONSTANT POWER AND ALTITUDE

WEIGHT	TRUE AIRSPEED AND/OR INDICATED AIRSPEED IN KNOTS							I.A.S. FOR MAXIMUM RANGE-ENDURANCE	
2900	102	98	95	90	85	79	72	80	73
2800	102	99	95	90	85	80	74	79	71
2700	103	99	96	90	86	81	74	78	70
2600	103	100	96	91	86	81	74	76	69
2500	104	100	96	91	87	82	75	75	68
2400	104	100	96	92	87	82	76	73	66

Figure 36—Weight Correction Table

AIRSPEED ERROR

The Indicated Airspeeds on this graph include the inherent Airspeed Error of the PT-13D/N2S-5 Airspeed Meter installation. They vary from correct Indicated Airspeeds as follows:

CORRECT KNOTS	TYPE PT-13D/N2S-5 KNOTS	CALIBRATION FOR PLANE NO.
66	65	
71	70	
81	80	
91	90	
101	100	
112	110	
122	120	

Figure 37—Air-Speed Error

	N2S-1	N2S-2	N2S-3
Normal Gross Weight (lbs)	2682.7	2755.8	2726.7
Fuel Capacity (Gallons)	46	46	46
Wing Area (Feet)	297.6	297.6	297.6
Wing Span - Upper (Feet)	32' 2"	32' 2"	32' 2"
Wing Span - Lower (Feet)	31' 2"	31' 2"	31' 2"
Rated Power of Engine (B.H.P.)	220	220	220
Rated Altitude	SL	SL	SL
Wing Loading (Lbs./sq. ft)	9.03	9.26	9.16
Power Loading (Lbs./B.H.P.)	12.19	12.53	12.39
High Speed @ Sea Level (MPH)	124	124	124
(Knots)	107.8	107.8	107.8
Stalling Speed @ Sea Level (MPH)	53	54	54
(Knots)	46	46.9	46.9
Initial Rate of Climb (Ft/min.)	825	775	800
Service Ceiling (Feet)	13,300	12,800	13,000
Takeoff Distance (Calm Wind, Feet)	600	600	600
Cruising Speed (MPH)	96	102	96
(Knots)	83.5	88.5	83.5
Endurance @ Cruising Speed (Hrs)	4	4	4
Range @ Cruising Speed (Miles)	373	408	373
Endurance @ High Speed (Hrs)	2.2	2.2	2.2
Range @ High Speed (Miles)	272.8	272.8	272.8

Fuel Consumption

Altitude	RPM	Gal/Hr.
SL	1800	12.8
SL	1850	13.6
SL	1900	14.5
SL	1950	15.8
SL	2000	17.6
SL	2075	20.8

SECTION II

PILOT OPERATING INSTRUCTIONS

1. FLIGHT RESTRICTIONS.

Inverted flight.

Inverted spins.

Outside loops.

Snap rolls at more than 166 mph (92 knots).

Slow rolls at more than 124 mph (108 knots).

2. CHECK BEFORE ENTERING COCKPIT.

a. Gross weight—2810 pounds.

b. Operating limits (consult flight operation instruction charts, Appendix II).

c. Flight maneuvers. (See maneuvers prohibited.)

d. Flying characteristics. (Operating with other than normal load, Appendix II.)

3. CHECK ON ENTERING COCKPIT.

a. Ignition switch—"OFF."

b. Parking brake—"ON."

c. Controls—"LOCKED."

d. Throttle—"CLOSED."

e. Mixture control—"FULL LEAN."

f. Carburetor air control—"COLD."

g. Safety belt—"SECURE."

h. Shoulder harness—"SECURE."

i. Clock—"Wind and set with operations office time."

j. Altimeter—"Set with operations office barometric reading."

k. Fuel gage—"FULL."

4. FUEL SYSTEM MANAGEMENT.

a. OIL DILUTION SYSTEM.—An oil dilution system is installed on the PT-13D/N2S-5 airplane to facilitate cold weather starting.

When a cold weather start is anticipated, and oil dilution is desired, the lengths of the dilution periods should be specified each day by the engineering officer. They will be based on weather reports and the engineering officer's judgment for the needs of the engine in that particular locality. Oil dilution is more effective at low oil temperatures because of the low rate of evaporation of the fuel introduced into the oil. For this reason a shorter dilution period can be used if the engine is stopped until the oil cools to 40°C or 50°C (104°F or 122°F) and then restarted and dilution of the oil executed.

When stopping the engine in cold weather, the oil dilution switch should be in the "ON" position for approximately 2 to 4 minutes. The general procedure for diluting the oil before stopping the engine is as follows:

(1) The engine should be idled at 500 rpm.

(2) For ground temperatures from 5.0°C to —7°C (41°F to 19°F) the oil dilution switch should be held in the "ON" position for 4 minutes.

(3) For temperatures from —7°C to —30°C (19°F to —22°F) oil should be diluted for a second 4-minute period 15 minutes after the first dilution.

(4) For temperatures below —30°C (—22°F) the oil should be diluted for a third 4-minute period, 15 minutes after second dilution.

(5) When diluting the oil, the engine should be stopped in the normal manner with the oil dilution switch "ON" until the engine stops turning.

CAUTION

While the oil dilution switch is "ON," note that oil pressure remains normal or has but a small drop.

WARNING

Excessive dilution may increase the amount of fluid in the complete lubrication system to a quantity greater than the capacity of the oil tank. The excess oil and fuel overflows from the oil tank into the accessory drive housing and can easily find its way into the distributor, causing hard starting and injury to distributor parts.

5. ENGINE GROUND OPERATION.

a. REGULAR STARTING AND WARMING UP PROCEDURE.

(1) Ignition switch—"OFF."

(2) Fuel supply—"ON."

(3) Engine should be pulled through several revolutions with the throttle closed in order to suck the fuel mixture into the cylinders and to insure that cylinders are not partially filled with oil or liquid fuel.

(4) Throttle—"OPEN" approximately half. Retard to three quarters inch open as soon as the engine starts.

(5) Mixture control—"FULL RICH."

(6) Carburetor air control—"COLD."

(7) Primer—"Normally 2 strokes in fairly warm weather and 4 strokes in cold weather.

CAUTION

Avoid excessive priming as it has a tendency to wash the oil off the cylinder walls causing scoring of the barrels or seizing of the pistons.

(8) Energize starter.

(9) Ignition switch—"ON."

(10) Engage engine starter clutch.

(11) Set throttle to attain an indicated engine speed of from 700 to 800 rpm for warm-up.

CAUTION

If oil pressure gage does not register within 30 seconds, stop engine.

(12) Begin taxiing when oil temperature is at least 20°C (68°F) with an oil pressure of 50 pounds per square inch and engine does not misfire when accelerated rapidly.

NOTE

Oil pressure during warm-up should not exceed 80 pounds per square inch maximum.

CAUTION

Excessive ground operation should be avoided as engine will become too hot for take-off.

b. FAILURE OF ENGINE TO START.

(1) Excessive priming is probably the most general cause of difficulty in starting and often results in damage to the engine. Should the engine be overprimed, open the throttle and pull the engine through backwards several revolutions with the ignition switch "OFF" to clear the cylinders of excess fuel.

(2) If the engine does not start the first attempt, another attempt should be made without additional priming.

c. ENGINE AND ACCESSORY GROUND OPERATION TEST.

(1) After warm-up, as indicated by oil temperature of 20°C to 70°C (68°F to 158°F), the throttle should be advanced to obtain full ground rpm.

(2) Test the ignition by switching from "BOTH" to either magneto and back to "BOTH," allowing the engine to pick up loss in rpm. Each magneto should be tested in the same manner. Speed as indicated by tachometer should not be less than 1550 rpm or decrease more than 50 rpm when on either magneto.

WARNING

Never exceed 10 seconds on either magneto when testing.

(3) Oil pressure should be checked for 50 to 75 pounds per square inch.

(4) Oil temperatures should be checked for 20°C to 70°C (68°F to 158°F). Maximum temperature is 85°C (185°F).

6. TAXIING INSTRUCTIONS.

a. Unlock flight controls.

b. The airplane should be taxied in zig zag fashion at a moderate rate of speed. By swinging the nose from side to side, visibility directly ahead can be maintained, thus preventing collision with ground obstacles. The airplane should be taxied slowly in high wind. Brakes should be applied smoothly while making a turn; free swiveling of the tail wheel can be accomplished by applying full rudder in either direction.

7. TAKE-OFF.

a. PREFLIGHT CHECK.

(1) Flight controls—"UNLOCKED" (up).

(2) Elevator trim tab—"NEUTRAL."

(3) Mixture control—"FULL RICH."

(4) Carburetor air control—"COLD" (under icing conditions "HOT").

(5) Altimeter, clock and air-speed indicator: check for proper operation and indication.

(6) Throttle—take off on full throttle.

(7) Oil pressure—desired 50 to 75 pounds per square inch with a minimum of 35 pounds per square inch.

(8) Oil temperature desired 50°C to 70°C (122°F to 158°F) with absolute maximum of 85°C (185°F).

(9) If in warm weather the engine has been running for over 10 minutes continuous ground operation, the engine should be shut down and allowed to cool for 5 minutes before taking off.

8. ENGINE FAILURE DURING TAKE-OFF.

a. Close throttle.

b. Ignition switch should be turned to "OFF" position.

c. Nose should be lowered so that the airplane can maintain a gliding speed of approximately 75 mph (65 knots) straight ahead. Do not attempt to turn back into the field.

9. FLIGHT.

a. AFTER TAKE-OFF.—When obstructions are cleared after take-off, engine speed should be reduced to cruising rpm, 1785.

NOTE

Maximum cruising rpm, 1840; high speed rpm, 2100.

b. CLIMB.— Except in an emergency, a climbing air speed of at least 10 to 15 miles (8 to 13 knots) per hour faster than best climbing speed of the airplane should be maintained for satisfactory cooling. The climbing air speed should not be less than 90 miles per hour (76 knots).

c. ENGINE PERFORMANCE—CHECK.—The engine rpm, oil pressure and oil temperature give the most satisfactory indication of engine performance. If the indicators appear irregular, the engine should be throttled and if the cause cannot be eliminated, a landing should be made to investigate the trouble.

d. USE OF MIXTURE CONTROL.

(1) During take-off, climb (at or near maximum rate), and during high speed level flight, below 3000 feet altitude the mixture control should be maintained in "FULL RICH" position.

(2) All operations above 3000 feet altitude, mixture should be leaned sufficiently to maintain smooth engine operation and best power.

(3) Cruising operations at or below 70 percent normal rated power where low specific fuel consumption is of major importance the mixture may be leaned sufficiently to give a drop of 25 rpm in engine speed.

e. USE OF CARBURETOR AIR CONTROL.— The carburetor air control should be used in the following manner:

(1) Carburetor icing occurs when outside temperatures are between 0°C and 20°C (43°F and 68°F); thus carburetor heat should be used as required.

(2) When outside temperatures are below 0°C (43°F) use of heat is not necessarily required; however, it is recommended that carburetor heat be used, to prevent the possibility of ice forming in the carburetor venturi and to improve the vaporization and distribution of fuel to the cylinders.

(3) In warm weather the control should be kept in the full cold position to permit the engine to develop maximum power.

WARNING

Watch your tachometer. If the rpm is dropping even though the temperature is outside the specified limits, the probable cause is carburetor icing.

f. USE OF THROTTLE.

(1) After such maneuvers as a stall or spin, the engine should be cleared by opening the throttle. In a long glide the throttle should be opened at least every 250 feet of lost altitude or about every 20 seconds. A throttle between one-third and one-half open clears the spark plugs and develops sufficient heat to prevent overcooling of the engine.

10. CLIMB.

Initial rate of climb—710 feet per minute at sea level.

11. GENERAL FLYING CHARACTERISTICS.

a. Normally loaded, the airplane is stable about all axes.

b. Longitudinal control can be effected with trim tabs.

12. MANEUVERS PROHIBITED.

a. Inverted flight.

b. Inverted spins.

c. Outside loops.

d. Snap rolls at more than 106 mph (92 knots).

e. Slow rolls at more than 124 mph (108 knots).

WARNING

Do not exceed an indicated air speed of 186 mph (165 knots).

13. STALLS.

a. The airplane stalls at 55 mph (48 knots) with normal load.

b. The airplane stalls with power on at approximately 51 mph (44 knots).

14. SPINS.

Spin characteristics are normal.

15. DIVING.

a. Do not exceed a diving speed of 186 mph (163 knots) indicated air speed.

b. Maximum allowable diving rpm—2520.

16. APPROACH AND LANDING.

a. Preparatory to landing, controls should be set in the following manner:

(1) The mixture control—"FULL RICH."

(2) Care should be exercised to prevent overcooling of the engine during long glides.

(3) Airplane should normally be trimmed slightly tail heavy.

b. Avoid cross wind landings when possible.

c. To take off when landing is not completed, the airplane should be leveled off straight ahead and flying speed regained before the climb is started.

17. STOPPING ENGINE.

a. Gradually close the throttle to a normal idling position.

b. Dilute oil if cold weather start is anticipated. See "Fuel Management" of this section.

c. "Cut" the ignition switch and the instant the engine stops firing, open the throttle fully.

d. Close fuel supply line shut-off valve.

CAUTION

Do not attempt to line up the propeller while the engine is hot, since movement of the propeller may result in injury to personnel.

18. BEFORE LEAVING PILOT'S COCKPIT.

a. Fuel—"OFF."

b. Ignition switch—"OFF."

c. Parking brake—"SET."

d. Flight controls—"LOCKED."

19. MOORING.

Mooring eyes are provided underneath each lower wing panel.

CAF BIG EASY WING PT-17 STEARMAN CHECKLIST

ON ENTERING THE PILOT'S COMPARTMENT

a. Check for All Flights
   1. Ignition Switch – **OFF**
   2. Parking Brake – **ON**
   3. Controls – **LOCKED**
   4. Throttle – **CLOSED**
   5. Mixture – **FULL LEAN**
   6. Carb Heat – **COLD**

STARTING ENGINE

a. Ignition Switch – **OFF**
b. Pull propeller through several times to free combustion chambers of excess oil.
c. Fuel – **ON**
d. Carb Heat – **FULL COLD**
e. Mixture – **FULL RICH**
f. Throttle – **APPROX. ½ INCH OPEN**
g. Primer – **2 to 4 STROKES**
h. Mags - **ON BOTH**
i. Starter – **ENERGIZE**
j. Avionics - **ON**

ENGINE WARMUP

a. Set throttle **500- 700 RPM**
b. Oil Pressure – **RISE WITHIN 30 SECONDS**
c. Oil Temp –
   20°C – 40°C (68°F - 104°F) for Taxi
   0°C- 90°C (104°F - 194°F) for Takeoff
   MAX - 90°C (194°F) for Takeoff
   Continue warming engine during Taxi.
d. Carb Heat – **COLD**

ENGINE RUNUP GROUND TEST

a. Oil Temp - **40°C - 90°C (104°-194°F)**
b. Throttle – **1200 to 1500 RPM**
c. Mag Check – **50 RPM Drop or Less**
d. Oil Pressure – **60 to 90 psi**
e. Oil Temp - **40°C to 90°C (104°-194°F)**
f. Ammeter - **CHARGING**
g. Flight Controls – **UNLOCKED & FREE**
h. Trim Tab – **SET**
i. Mixture – **FULL RICH**
j. Carb Heat – **COLD**
k. Altimeter – **CHECK**

TAKE-OFF

a. Throttle – **FULL THROTTLE**
   Avoid 1500 – 1750 RPM
b. Oil pressure – 50 to 75 (Min 35)
c. Lift Off when speed sufficient
d. Climb – **77 mph (67kts)**

NORMAL FLIGHT

Power 1785 RPM (1840 Cruise)
Stall Speed (PWR OFF) – 55 mph (48kts)
Stall Speed (PWR ON) – 51 mph (44kts)
Max Dive Speed – 186 mph (163kts)
Max Dive RPM – 2520

APPROACH & LANDING

Speed – **70-75 mph (74kts)**
AVOID STRONG CROSSWINDS

SHUTDOWN

a. Idle at **500 RPM**
b. Mixture – **IDLE CUTOFF**
c. Fuel – **OFF**
d. Mags – **OFF**
e. Avionics – **OFF**
f. Electrical – **OFF**
g. Flight Controls - **SECURE**

Important Note:
If Ammeter is not Showing a charge, turn Avionics Switch OFF, Master Switch OFF, Master Switch ON VERIFY CHARGING Avionics Switch ON

FLIGHT RESTRICTIONS

NO INVERTED FLIGHT

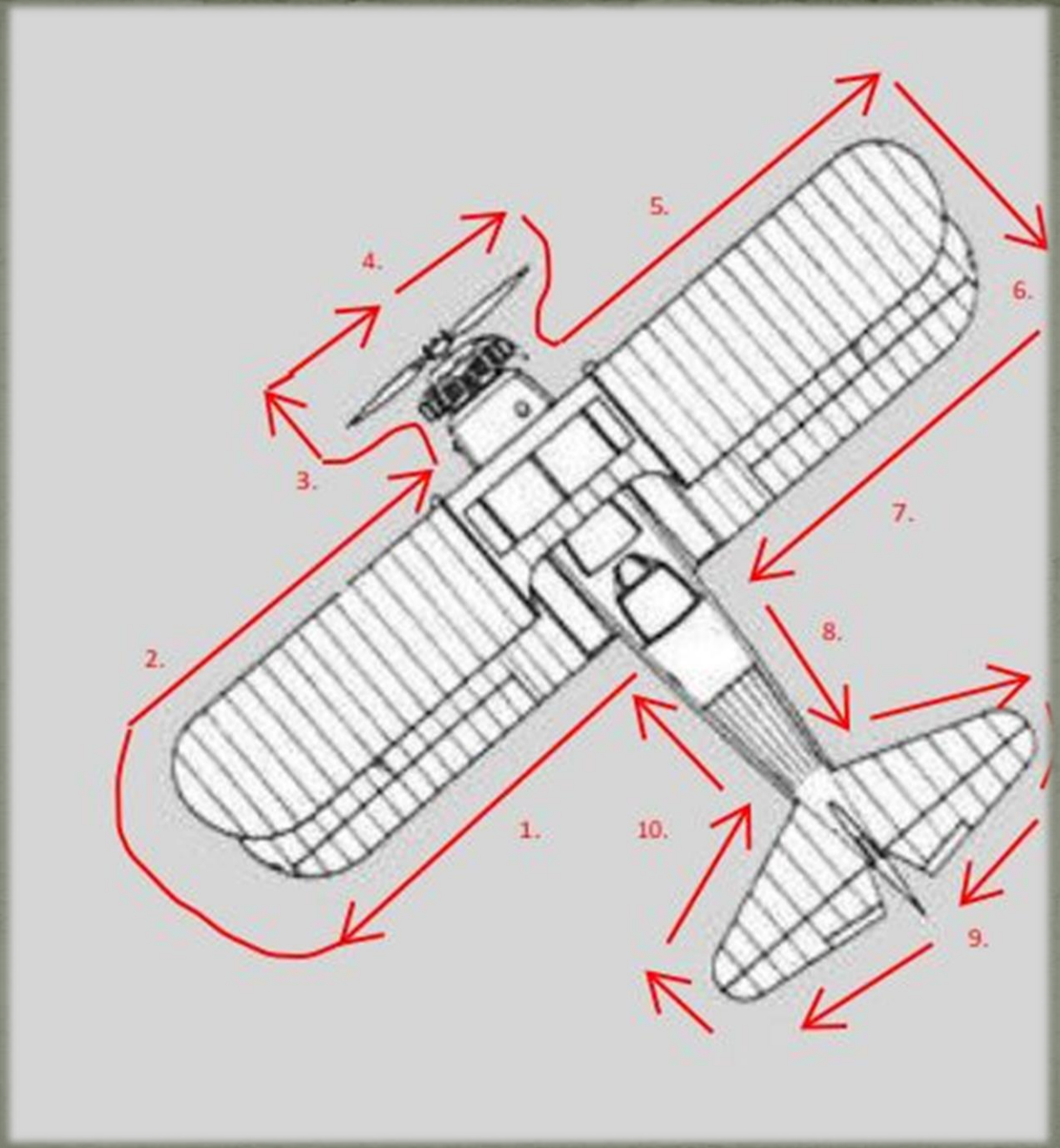
NO INVERTED SPINS

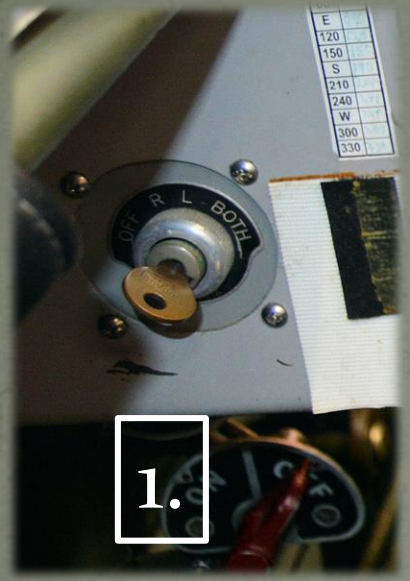
NO OUTSIDE LOOPS

NO SNAP ROLLS AT MORE THAT 106 MPH (92 KTS)

NO SLOW ROLLS AT MORE THAN 124 MPH (108 KTS)

Walk Around Inspection

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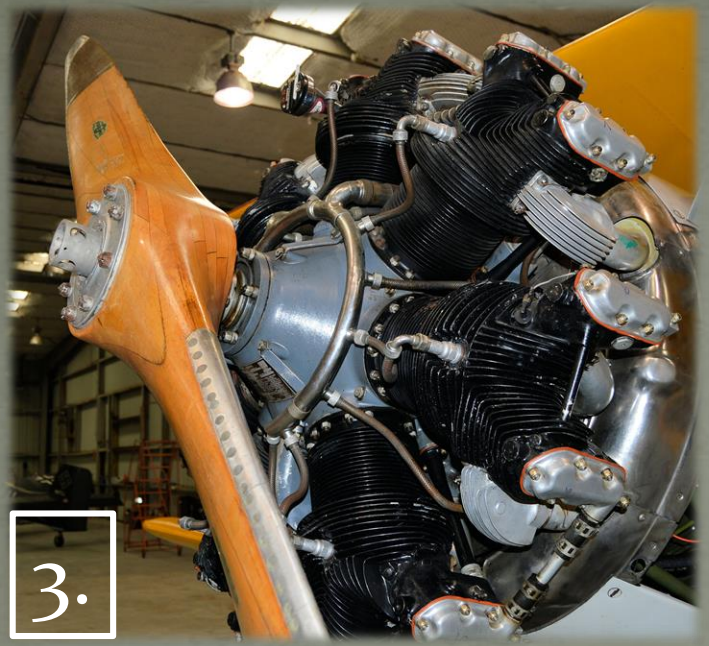

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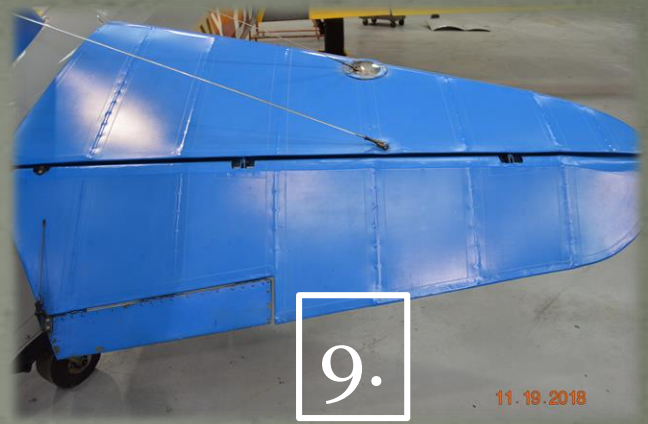
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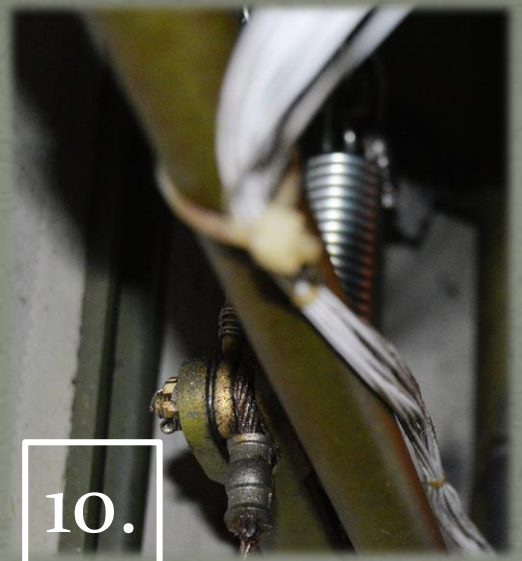

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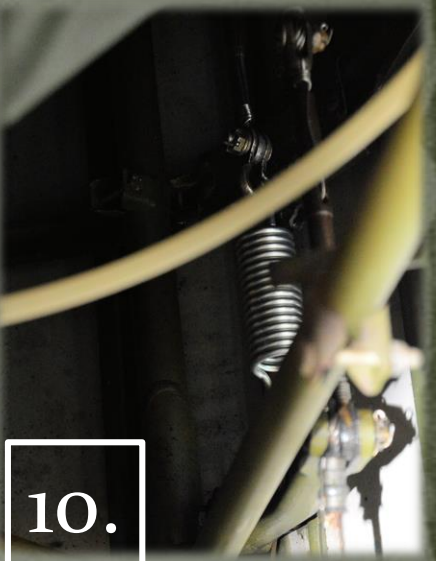

10.

Springs behind Rear Seat attached to Tailwheel for steering.

QUESTIONS ?

HAVE FUN AND FLY SAFE

Jim D. Helms