CESSNA CARAVAN I PILOT TRAINING MANUAL

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NOTICE

The material contained in this training manual is based on information obtained from the aircraft manufacturer's Pilot Manuals and Maintenance Manuals. It is to be used for familiarization and training purposes only.

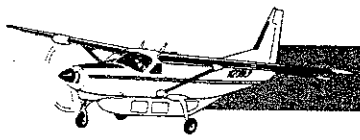
At the time of printing it contained then-current information. In the event of conflict between data provided herein and that in publications issued by the manufacturer or the FAA, that of the manufacturer or the FAA shall take precedence.

We at FlightSafety want you to have the best training possible. We welcome any suggestions you might have for improving this manual or any other aspect of our training program.

FOR TRAINING PURPOSES ONLY

CONTENTS

Chapter 1	AIRCRAFT GENERAL
Chapter 2	ELECTRICAL POWER SYSTEMS
Chapter 3	LIGHTING
Chapter 4	MASTER WARNING SYSTEM
Chapter 5	FUEL SYSTEM
Chapter 6	POWERPLANT
Chapter 7	ICE AND RAIN PROTECTION
Chapter 8	LANDING GEAR AND BRAKES
Chapter 9	FLIGHT CONTROLS
Chapter 10	AVIONICS
Chapter 11	MISCELLANEOUS SYSTEMS
Chapter 12A	PERFORMANCE/WEIGHT AND BALANCE (208 AND 208A)
Chapter 13	CHECKLIST
Appendix A	GENERAL PILOT INFORMATION
Appendix B	ANNUNCIATORS
Appendix C	ANSWERS TO QUESTIONS



CHAPTER 1
AIRCRAFT GENERAL

CONTENTS

	Page
INTRODUCTION	1-1
GENERAL	1-1
MODEL DIFFERENCES	1-2
STRUCTURES	1-2
Fuselage	1-2
Wings	1-2
Empennage	1-2
AIRPLANE SYSTEMS	1-7
General	1-7
Electrical System	1-7
Lighting	1-7
Warnings and Annunciators	1-7
Fuel System	1-7
Powerplant	1-7
Ice and Rain Protection	1-7
Landing Gear and Brakes	1-8
Flight Controls	1-8
Oxygen System	1-8
LIMITATIONS AND SPECIFICATIONS	1-8
Engine	1-8
Propeller	1-10

Fuel 1-10
Oil 1-11
Maximum Certificated Weights 1-13
Standard Airplane Weights 1-13
Specific Loadings 1-13
Airspeed Limitations 1-14
Instrument Markings 1-15
Center-of-Gravity Limits 1-18
Maneuver Limits 1-18
Flight Load Factor Limits 1-18
Flight Crew Limits 1-18
Kinds of Operation Limits—Required Equipment 1-18
Maximum Operating Altitude Limits 1-20
Outside Air Temperature Limits 1-20
Maximum Passenger Seating Limits 1-21
Flap Limitations 1-21
Placards 1-21
WALKAROUND W-1

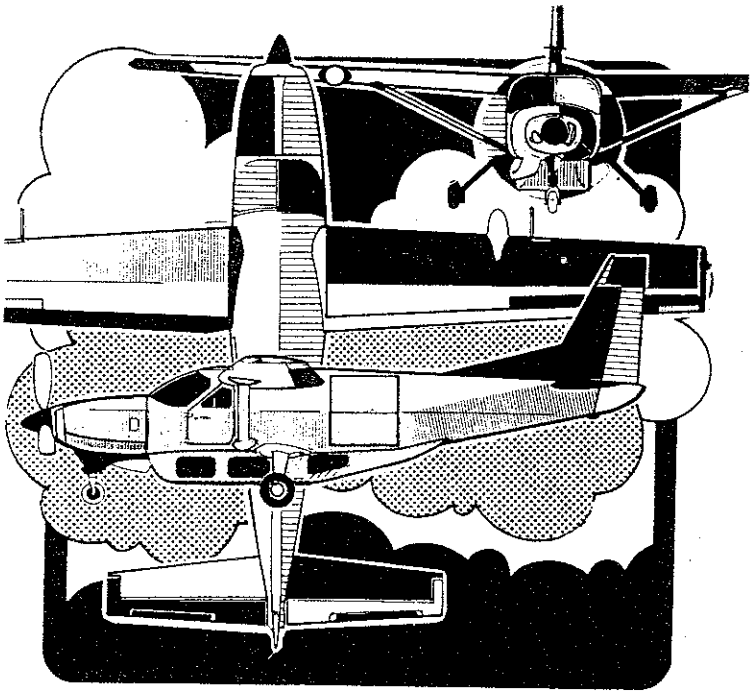
ILLUSTRATIONS

Figure	Title	Page
1-1	Cessna Caravan I	1-2
1-2	Exterior Dimensions—208 and 208A	1-3
1-3	Exterior Dimensions—208B	1-4
1-4	Minimum Turning Radius—208 and 208A	1-5
1-5	Minimum Turning Radius—208B	1-6

TABLES

Table	Title	Page
1-1	Engine Operating Limits	1-9
1-2	Approved Fuel Grades (Specifications)	1-10
1-3	Fuel Capacity	1-12
1-4	Fuel Limitations	1-12
1-5	Maximum Certificated Weights	1-13
1-6	Standard Airplane Weights	1-13
1-7	Specific Loadings	1-13
1-8	Airspeed Limitations	1-14

CHAPTER 1
AIRCRAFT GENERAL



INTRODUCTION

This training manual provides a description of the major airframe and engine systems installed in the Cessna Caravan I. No material is meant to supercede or substitute for any of the manufacturer's system or operating manuals. The material presented has been prepared from the basic design data, and all subsequent changes in airplane appearance or system operation will be covered during academic training and subsequent revisions to this manual.

This chapter covers the structural makeup of the airplane and gives a general description of the systems as well as operating limitations.

Appendix B displays all light indications; page B-1 should be folded out for reference while studying this manual.

GENERAL

The airplane is an all-metal, high-wing, single-engine airplane equipped with tricycle landing gear and designed for general utility purposes. A composite cargo pod is installed as standard equipment but may be removed, if desired, for increased performance and useful load (Figure 1-1).

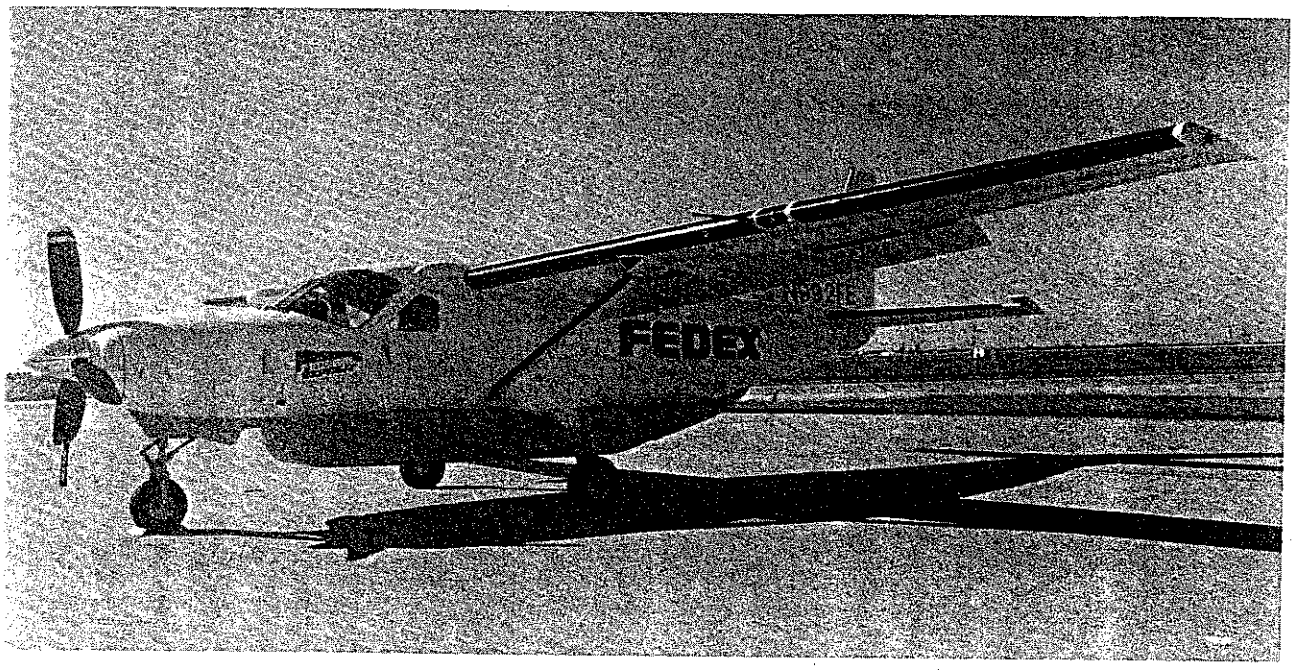


Figure 1-1. Cessna Caravan I

MODEL DIFFERENCES

The Caravan I is produced as the Model 208, 208A, and 208B. The major differences are the presence or absence of passenger windows and the length of the fuselage. Figures 1-2 and 1-3 illustrate the aircraft dimensions for the various models, and Figures 1-4 and 1-5 show the different minimum turning radii.

STRUCTURES

FUSELAGE

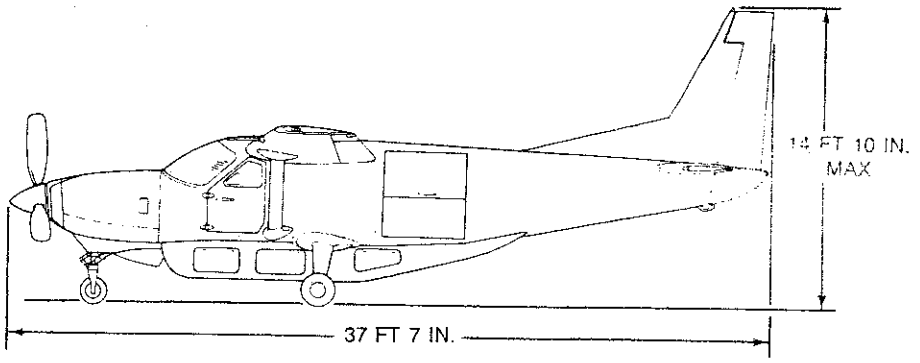
The construction of the fuselage is of a conventional formed sheet metal bulkhead, stringer, and skin design referred to as semimonocoque. Major items of structure are the front and rear carry-through spars to which the wings are attached, a bulkhead and forgings for main landing gear attachment, and a bulkhead with attaching plates at its base for the strut-to-fuselage attachment of the wing struts.

WINGS

The externally braced wings, having integral fuel tanks, are constructed of a front and rear spar with formed sheet metal ribs, doublers, and stringers. The entire structure is covered with aluminum skin.

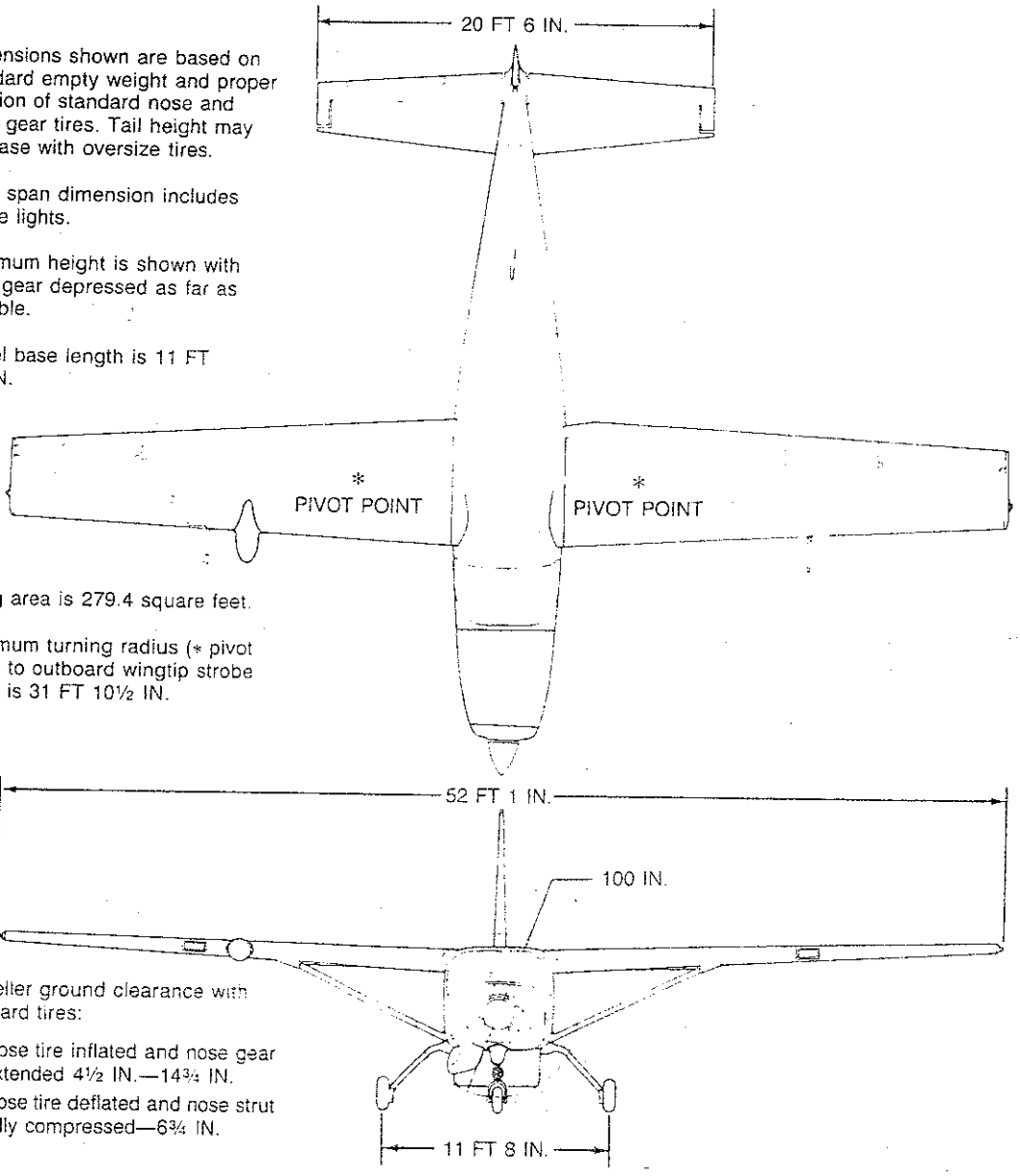
EMPENNAGE

The empennage consists of a conventional vertical stabilizer, rudder, horizontal stabilizer, and elevator. The top of the rudder incorporates a leading-edge extension which contains a balance weight. An elevator trim tab is attached to the trailing edge of each elevator by full-length piano hinges. Both elevator tip leading-edge extensions provide aerodynamic balance and incorporate balance weights. A row of vortex generators on the top of the horizontal stabilizer just forward of the elevator enhances nosedown elevator and trim authority.



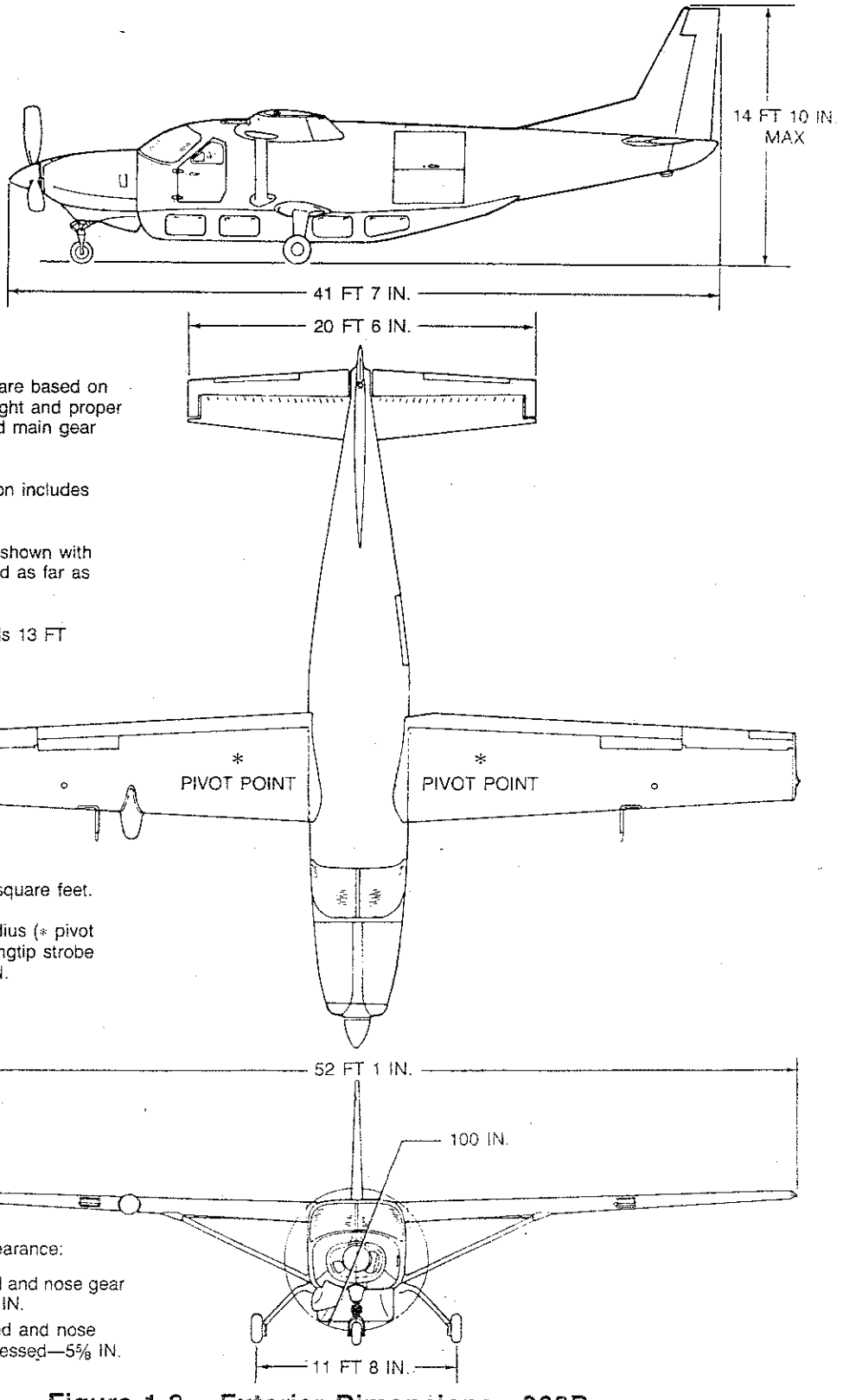
NOTES:

1. Dimensions shown are based on standard empty weight and proper inflation of standard nose and main gear tires. Tail height may increase with oversize tires.
2. Wing span dimension includes strobe lights.
3. Maximum height is shown with nose gear depressed as far as possible.
4. Wheel base length is 11 FT 7½ IN.



5. Wing area is 279.4 square feet.
6. Minimum turning radius (* pivot point to outboard wingtip strobe light) is 31 FT 10½ IN.
7. Propeller ground clearance with standard tires:
   - Nose tire inflated and nose gear extended 4½ IN.—14¾ IN.
   - Nose tire deflated and nose strut fully compressed—6¾ IN.

Figure 1-2. Exterior Dimensions—208 and 208A



NOTES:

1. Dimensions shown are based on standard empty weight and proper inflation of nose and main gear tires.
2. Wing span dimension includes strobe lights.
3. Maximum height is shown with nose gear depressed as far as possible.
4. Wheel base length is 13 FT 3½ IN.
5. Wing area is 279.4 square feet.
6. Minimum turning radius (* pivot point to outboard wingtip strobe light) is 32 FT 8⅝ IN.
7. Propeller ground clearance:
   - Nose tire inflated and nose gear extended—18⅛ IN.
   - Nose tire deflated and nose strut fully compressed—5⅝ IN.

Figure 1-3. Exterior Dimensions—208B

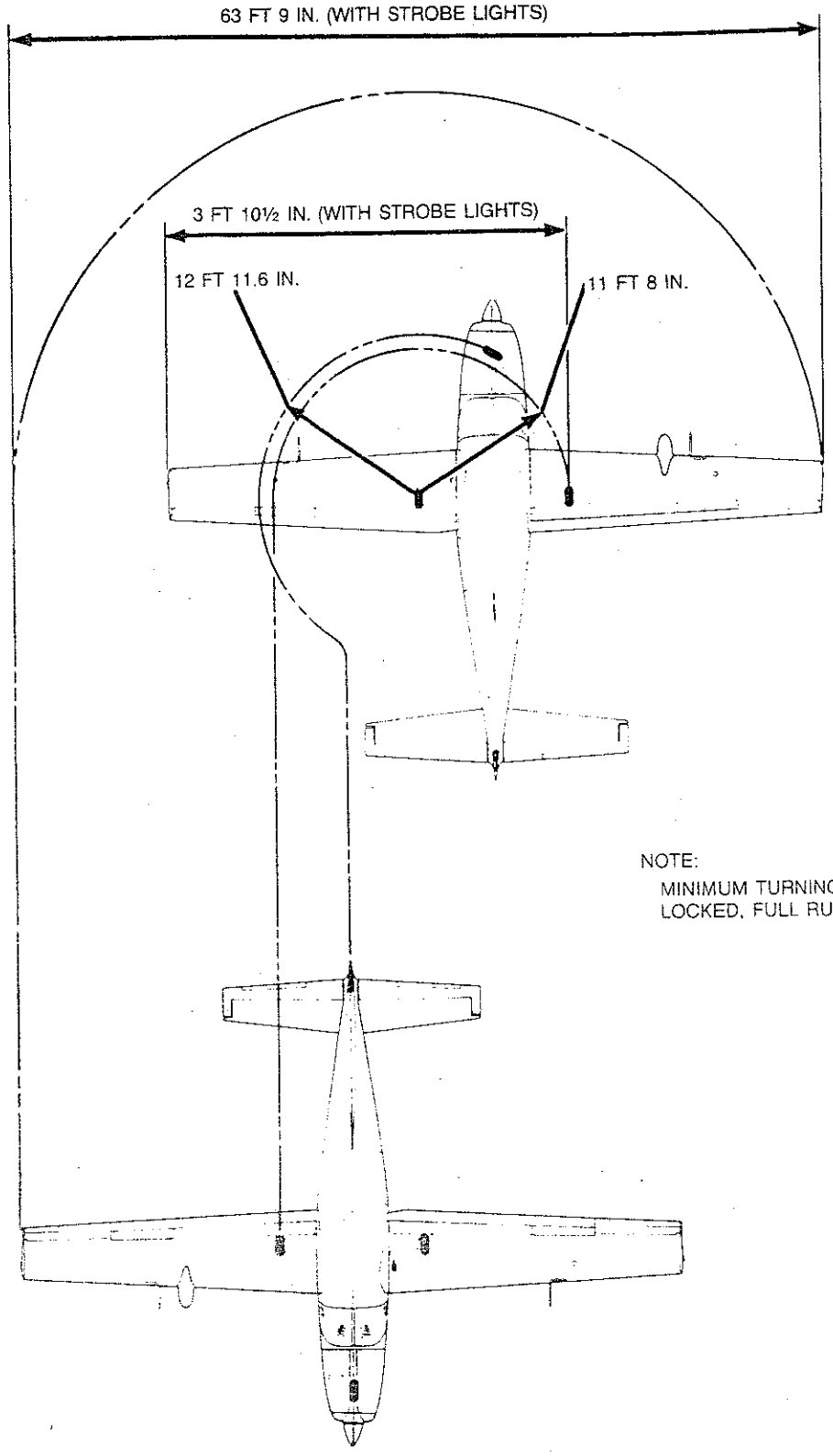


Figure 1-4. Minimum Turning Radius—208 and 208A

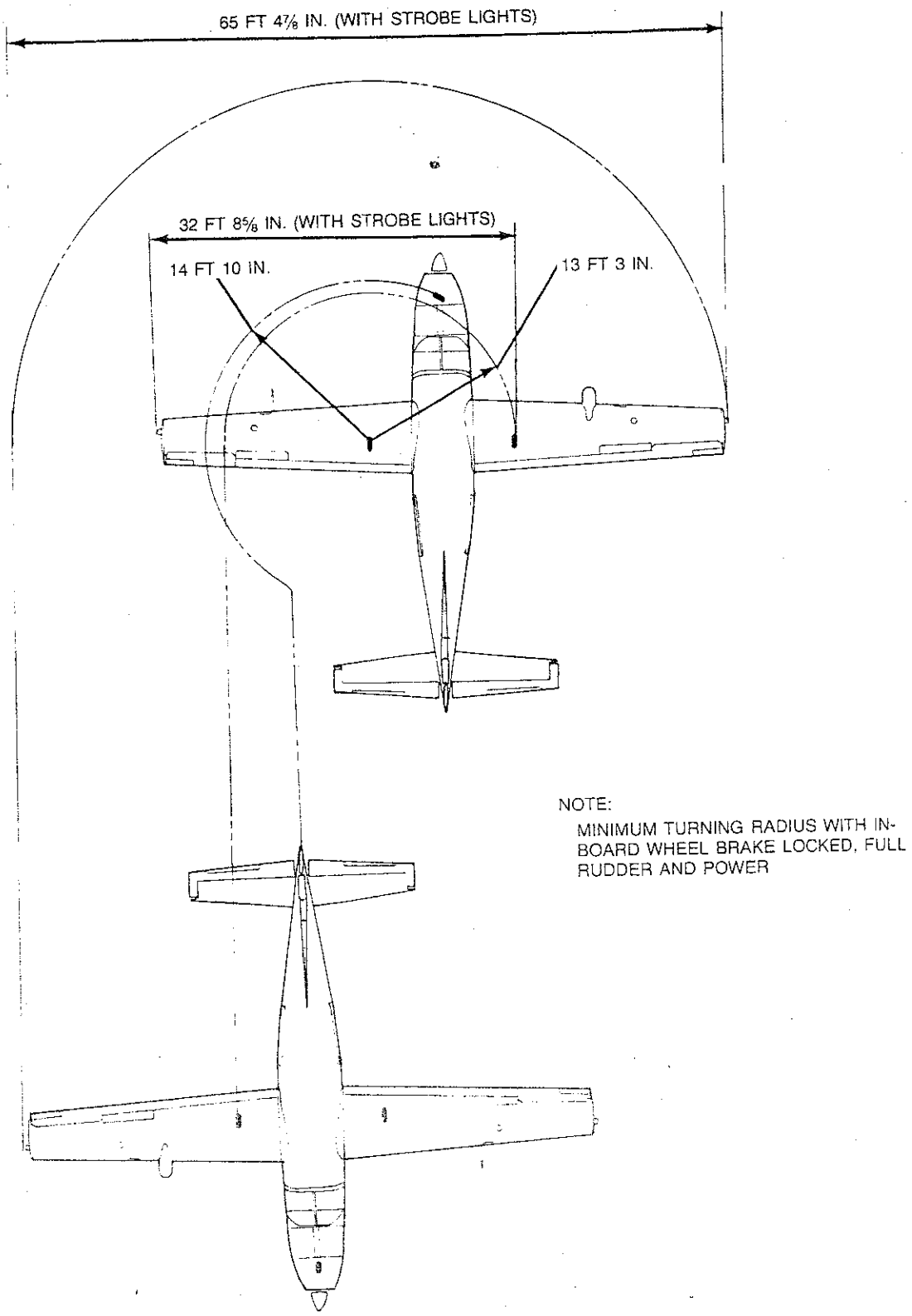


Figure 1-5. Minimum Turning Radius—208B

AIRPLANE SYSTEMS

GENERAL

The following is a brief overview of the airplane systems installed in the Cessna Caravan I. Detailed descriptions of these systems are contained within the individual chapters of this training manual.

ELECTRICAL SYSTEM

The airplane is equipped with a 28-VDC electrical system. The system uses a 24-volt, 40-ampere-hour nicad battery or a 24-volt, 45-ampere-hour lead-acid battery as a source of electrical energy and a 200-amp, engine-driven starter-generator to maintain the battery's state of charge. Power is supplied to most general electrical and all avionics circuits through two general buses, two avionics buses, and a battery bus.

A standby electrical system, which consists of an engine-driven alternator and separate busing system, is also installed in the airplane.

LIGHTING

Exterior lighting consists of three navigation lights, two landing lights, two taxi/recognition lights, two strobe lights, a flashing beacon, and two underwing courtesy lights. All exterior lights are controlled by toggle switches located on the lighting control panel on the left side of the instrument panel.

Instrument and control panel lighting is provided by integral flood and post lights. Four concentric dual lighting control knobs are grouped together on the lower part of the instrument panel to the left of the control pedestal.

WARNINGS AND ANNUNCIATORS

The annunciator panel is located at the top edge of the instrument panel directly in front of the pilot. The panel contains separate indicator lamps which illuminate green, amber, or red when a specific condition occurs in the associated airplane system. A green-colored lamp is illuminated to indicate a normal or safe condition in the system. An illuminated amber lamp indicates that a cautionary condition exists which may or may not require immediate corrective action. When a hazardous condition exists requiring immediate corrective action, a red lamp illuminates.

FUEL SYSTEM

The airplane fuel system consists of two vented, integral fuel tanks with shutoff valves, a fuel-selectors-off warning system, a fuel reservoir, an ejector fuel pump, an electric auxiliary boost pump, a reservoir manifold assembly, a firewall shutoff valve, a fuel filter, an oil-to-fuel heater, an engine-driven fuel pump, a fuel control unit, a flow divider, dual manifolds, and 14 fuel nozzle assemblies. A fuel can and drain are also provided.

Fuel flows from the tanks through the two fuel tank shutoff valves at each tank. The fuel tank shutoff valves are mechanically controlled by two fuel selectors located on the overhead panel. By manipulating the fuel selectors, the pilot can select either left or right fuel tanks or both at the same time. Normal operation is with both tanks on.

POWERPLANT

The airplane is powered by a Pratt and Whitney of Canada, Ltd. PT6A-114 free-turbine, two-shaft engine flat-rated at 600 shaft horsepower. The engine drives a constant-speed, full-feathering, reversible, hydraulically actuated, composite, three-bladed propeller manufactured by Hartzell Propeller Products.

ICE AND RAIN PROTECTION

An optional equipment package is available which allows penetration of icing conditions as defined by the FAA. The package includes pneumatic deicing boots on the wings, wing struts, and horizontal and vertical stabilizer leading edges, electrically heated propeller blade anti-ice boots, a detachable electric windshield anti-

ice panel, pitot-static heat systems, and a standby electrical system. The wing, strut, and stabilizer deice system includes an ice detector light and a deice pressure annunciator. This package is designed to provide adequate in-flight protection during normally encountered icing conditions produced by moisture-laden clouds. It will not necessarily provide total protection under abnormally severe conditions such as those which exist in areas of heavy cloud moisture content.

LANDING GEAR AND BRAKES

The tricycle landing gear has a steerable nosewheel and two main wheels. Shock absorption is provided by the tubular spring-steel main landing gear struts, an interconnecting spring-steel tube between the two main landing gear struts, and the nose gear oil-filled shock strut and spring-steel drag link. Each main gear wheel is equipped with a hydraulically actuated single-disc brake on the inboard side of each wheel.

FLIGHT CONTROLS

The airplane's flight control system consists of conventional aileron, elevator, and rudder control surfaces and a pair of spoilers mounted above the outboard ends of the flaps. The control surfaces are manually operated through mechanical linkage, using a control wheel for the ailerons, spoilers, and elevator and rudder-brake pedals for the rudder. The wing spoilers improve lateral control of the airplane at low speeds by disrupting lift over the appropriate flap.

Manually operated aileron, elevator, and rudder trim systems are provided. Aileron trimming is achieved by a trimmable servo tab attached to the right aileron. Elevator trimming is accomplished through two elevator trim tabs controlled by a vertically mounted trim control wheel on the top left side of the control pedestal. Rudder trimming is accomplished through the nosewheel steering bungee connected to the rudder control system and a trim control wheel mounted on the control pedestal.

OXYGEN SYSTEM

An oxygen system is available to provide supplementary oxygen necessary for continuous flight at high altitude. On the standard 208 it is a ten-port system with a 116.95-cubic-foot capacity. On the 208A and 208B it is a two-port system with a 50.67-cubic-foot capacity. The oxygen cylinder is located in the tail cone and is equipped with a pressure regulator which reduces the cylinder pressure to an operating pressure of 70 psi. Cylinder pressure is indicated by a pressure gage located on the overhead console. The regulator is equipped with a shutoff valve which is controlled by a remote shutoff valve control lever located in the overhead console.

LIMITATIONS AND SPECIFICATIONS

ENGINE

Number of engines.....One

Engine manufacturer..... Pratt and Whitney of Canada, Ltd.

Engine model number PT6A-114

Engine type:
Free turbine, two-shaft engine utilizing a compressor section having three axial stages and one centrifugal stage, an annular reverse-flow combustion chamber, a one-stage compressor turbine, a one-stage power turbine, and a single exhaust. The power turbine drives the propeller through a two-stage planetary gearbox at the front of the engine.

Horsepower..... Flat-rated at 600 shaft horsepower

Engine control operating limits ..... Flight operation with the power lever retarded below the IDLE position is prohibited.

Engine starting cycle limits:

Using the airplane battery, the starting cycle shall be limited to the following intervals and sequence:

30 seconds on, 60 seconds off
30 seconds on, 60 seconds off
30 seconds on, 30 *minutes* off
Repeat the above cycle as required.

Using external power, the starting cycle shall be limited to the following intervals and sequence:

20 seconds on, 120 seconds off
20 seconds on, 120 seconds off
20 seconds on, 60 *minutes* off
Repeat the above cycle as required.

Table 1-1. ENGINE OPERATING LIMITS

POWER SETTING	TORQUE (FT - LB) (1)	MAXIMUM ITT (° C)	GAS GENERATOR RPM (% N_g) (2)	PROPELLER RPM	OIL PRESSURE (PSI) (3)	OIL TEMP (° C) (7)	SHAFT HORSEPOWER
Takeoff and Maximum Continuous	1658	805	101.6	1900	85 to 105	10 to 99	600
Maximum Climb	1658 1970 (4)	765	101.6	1900	85 to 105	0 to 99	600
Maximum Cruise	1658 1970 (4)	740	101.6	1900	85 to 105	0 to 99	600
Idle	- - -	685	52 (Minimum)	- - -	40 (Minimum)	– 40 to 99	- - -
Maximum Reverse (5)	1658	805	101.6	1825	85 to 105	0 to 99	600
Transient	2200 (6)	850 (6)	102.6 (6)	2090	- - -	0 to 99	- - -
Starting	- - -	1090 (6)	- - -	- - -	- - -	– 40 (Minimum)	- - -

(1) Maximum permissible sustained torque is 1970 ft-lb. Propeller rpm must be set so as not to exceed power limitations.

(2) For every 10° C (18° F) below – 30° C (– 22° F) ambient temperature, reduce maximum allowable N_g by 2.2%.

(3) Normal oil pressure is 85 to 105 psi at gas generator speeds above 72% with oil temperature between 60° and 70° C (140° and 185° F). Oil pressures below 85 psi are undesirable and should be tolerated only for the completion of the flight, preferably at a reduced power setting. Oil pressures below normal should be reported as an engine discrepancy and should be corrected before the next takeoff. Oil pressures below 40 psi are unsafe and require that either the engine be shut down or a landing be made as soon as possible using the minimum power required to sustain flight.

(4) If maximum torque is used, propeller rpm must be set so as not to exceed power limitations.

(5) Reverse power operation is time-limited to one minute.

(6) These values are time-limited to two seconds.

(7) For increased oil service life, an oil temperature between 74 and 80° C (165 and 176° F) is recommended. A minimum oil temperature of 55° C (130° F) is recommended for fuel heater operation at takeoff power.

PROPELLER

Propeller manufacturer ..... Harzell Propeller Products

Propeller model number HC-B3MN-3M10083

Number of blades ..... Three

Propeller diameter:
Maximum ..... 100 inches
Minimum ..... 100 inches (no cutoff approved)

Propeller type ..... Constant-speed full-feathering, reversible, hydraulically actuated composite-bladed propeller

Propeller blade angle at 40-inch station:
Feathered ..... 78.4°
Low pitch ..... 9°
Maximum reverse ..... −18°

Propeller system operating limits ..... An overspeed governor check shall be performed before the first flight of the day, after engine control system maintenance, or if adjustment has been made.

FUEL

Approved Fuel Grades (Specifications)

See Table 1-2 for approved fuel grades (specifications).

Alternate Emergency Fuels

Aviation fuel (all grades of military and commercial aviation gasoline)

CAUTION

Aviation gasoline is restricted to emergency use and shall not be used for more than 150 hours in one overhaul period; a mixture of one part aviation gasoline and three parts of Jet A, Jet A-1, JP-1, or JP-5 may be used for emergency purposes for a maximum of 450 hours per overhaul period.

Approved Fuel Additives

The following additives are required for anti-icing protection:

- Phillips PFA 55 MB
- Ethylene Glycol Monomethyl Ether (MIL-I-27686)

CAUTION

JP-4 and JP-5 fuel per MIL-T-5624 and JP-8 fuel per MIL-T-83133A contain the correct premixed quantity of an approved type of anti-icing fuel additive, and ***no additional anti-ice compounds should be added.***

Table 1-2. APPROVED FUEL GRADES (SPECIFICATIONS)

FUEL GRADE (SPECIFICATION)		MINIMUM FUEL TEMPERATURE FOR TAKEOFF
Jet A	ASTM-D1655	−31° C
Jet A-1	ASTM-D1655	−31° C
Jet B	ASTM-D1655	−54° C
JP-1	MIL-L-5616	−54° C
JP-4	MIL-T-5624	−54° C
JP-5	MIL-T-5624	−31° C
JP-8	MIL-T-83133A	−31° C
Aviation gasoline	(all grades)	−54° C

If additional antistatic protection is desired, the following additives are approved for use:

- Shell ASA3
- Dupont Stadis 450

If additional biocidal protection is desired, the following additive is permitted for use in certain conditions:

- Sohio Biobor JF

Refer to Section 8 of the *POH* for allowable concentrations of the above additives and additional information.

Fuel Capacity

See Table 1-3 for fuel capacities.

NOTE

To achieve full capacity, fill fuel tank to the top of the filler neck. Filling fuel tanks to the bottom of the fuel filler collar (level with flapper valve) allows space for thermal expansion and results in a decrease in fuel capacity of 4 gallons per side (8 gallons total).

Fuel Limitations

See Table 1-4 for fuel limitations.

With low fuel reserves (FUEL LOW annunciator[s] on), continuous uncoordinated flight with the turn-and-bank "ball" more than one-quarter ball out of center position is prohibited. Unusable fuel quantity increases when more severe sideslip is maintained.

Due to possible fuel starvation, maximum full rudder sideslip duration time is three minutes.

Maximum fuel imbalance in flight is 200 pounds.

OIL

Oil Grade (Specification)

Oil conforming to Pratt and Whitney Engine Service Bulletin No. 1001, and all revisions or supplements thereto, ***must be used***. Refer to Section 8 of the *POH* for a listing of approved oils.

Total Oil Capacity

14 U.S. quarts (including oil in filter, cooler, and hoses)

Drain and Refill Quantity

Approximately 9.5 U.S. quarts

Oil Quantity Operating Range

Fill to within 2 quarts of MAX HOT or MAX COLD (as appropriate) on dipstick. Quart markings indicate U.S. quarts low if oil is hot. For example, a dipstick reading of 3 indicates the system is within 2 quarts of MAX if the oil is cold and within 3 quarts of MAX if the oil is hot.

NOTE

To obtain an accurate oil level reading, it is recommended the oil level be checked either within ten minutes after engine shutdown while the oil is hot (MAX HOT marking) or prior to the first flight of the day while the oil is cold (MAX COLD marking). If more than ten minutes has elapsed since engine shutdown and the engine oil is still warm, perform an engine dry motoring run before checking the oil level.

Table 1-3. FUEL CAPACITY

		MODIFIED WITH SK 208-52
Total capacity	335 U.S. gallons	335.6 U.S. gallons
Total capacity each tank	167.5 U.S. gallons	167.8 U.S. gallons
Total usable	332 U.S. gallons	

Table 1-4. FUEL LIMITATIONS

		MODIFIED WITH SK 208-52
Two standard tanks	167.5 U.S. gallons each	167.8 U.S. gallons each
Total fuel	335 U.S. gallons	335.6 U.S. gallons
Usable fuel: Both tanks on Single tank on	 332 U.S. gallons per tank 165 U.S. gallons per tank	
Unusable fuel: Both tanks on Single tank on	 3 U.S. gallons total 2.5 U.S. gallons per tank	 3.6 U.S. gallons 2.8 U.S. gallons per tank

MAXIMUM CERTIFICATED WEIGHTS

See Table 1-5 for maximum certificated weights.

Table 1-5. MAXIMUM CERTIFICATED WEIGHTS

	208 AND 208A	208B
Ramp	8,035 lb	8,785 lb
Takeoff	8,000 lb	8,750 lb
Landing	7,800 lb	8,500 lb
Known icing operation weight		8,000 lb

STANDARD AIRPLANE WEIGHTS

See Table 1-6 for standard airplane weights.

Table 1-6. STANDARD AIRPLANE WEIGHTS

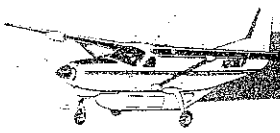
	208	208A	208B
Standard empty weight	3,835 lb	4,253 lb	4,570 lb
Maximum useful load	4,200 lb	3,782 lb	4,215 lb

SPECIFIC LOADINGS

See Table 1-7 for specific loadings.

Table 1-7. SPECIFIC LOADINGS

	208 AND 208A	208B
Wing loading	28.6 lb/sq ft	31.3 lb/sq ft
Power loading	13.3 lb/shp	14.6 lb/shp



AIRSPEED LIMITATIONS

See Table 1-8 for airspeed limitations.

Table 1-8. AIRSPEED LIMITATIONS

MODELS 208-208A

	SPEED	KCAS	KIAS	REMARK
V_{MO}	Maximum Operating Speed	175	175	Do not exceed this any operation.
V_A	Maneuvering Speed: 8,000 pounds 6,300 pounds 4,600 pounds	 150 133 114	 150 134 115	Do not make full o control movements this speed.
V_{FE}	Maximum Flap-Extended Speed: To 10° flaps 10–20° flaps 20–30° flaps	 175 150 125	 175 150 125	Do not exceed the with the given flap
	Maximum Window Open Speed	175	175	Do not exceed thi with window open

MODEL 208B

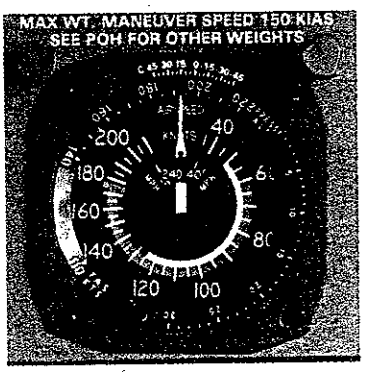
	SPEED	KCAS	KIAS	REMAR
V_{MO}	Maximum Operating Speed	175	175	Do not exceed th any operation.
V_A	Maneuvering Speed: 8,750 pounds 7,500 pounds 6,250 pounds 5,000 pounds	 148 137 125 112	 148 137 125 112	Do not make full control movemer this speed.
V_{FE}	Maximum Flap-Extended Speed: To 10° flaps 10–20° flaps 20–30° flaps	 175 150 125	 175 150 125	Do not exceed tl with the given fl
	Maximum Window Open Speed	175	175	Do not exceed t with window ope

MARKINGS

ator Markings

..... 50 to 125 KIAS

ge. Lower limit is maxi-
nding configuration. Up-
eed permissible with flaps



..... 63 to 175 KIAS

ge. Lower limit is maxi-
st forward CG with flaps
is maximum operating

..... 175 KIAS

ll operations.

rument

mit
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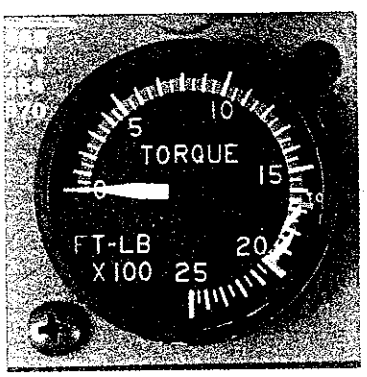
imit

..... 0 to 1,658 ft-lb
.. 1,658 to 1,970 ft-lb[2]
..... 1,970 ft-lb

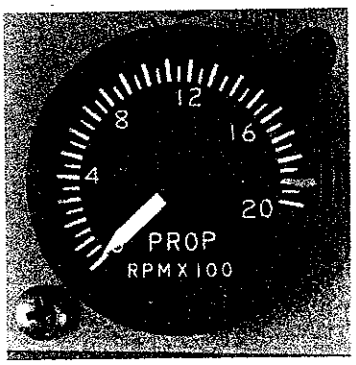
e and T.O. at 1,658 ft-lb
f position

e set so as not to exceed
above 1.658 ft-lb.



Propeller RPM Indicator

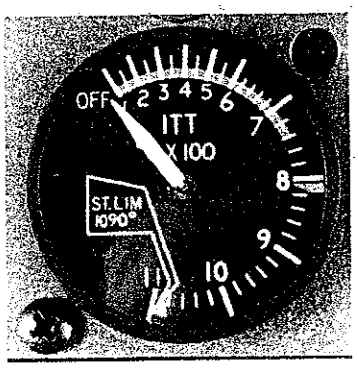
Green arc ..... 1,600 to 1,900 rpm
Red line..... 1,900 rpm



Interturbine Temperature (ITT) Indicator[3]

Green arc..... 100 to 740° C
Red line..... 805° C

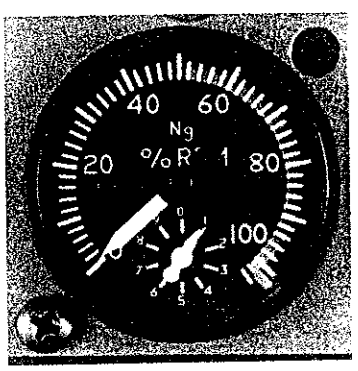
[3] Incorporates red triangle at 1,090° C and starting temperature limitation box labeled "ST. LIM 1,090°"



Gas Generator % RPM Indicator[4]

Green arc ..... 52 to 101.6%
Red line..... 101.6%

[4] 100% N_G is 37,500 rpm.

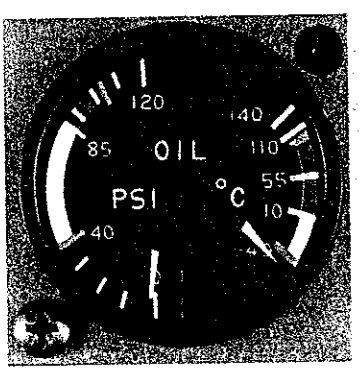


Oil Pressure Gage

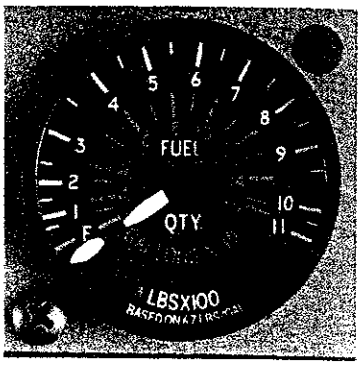
Red line ..... 40 psi
Yellow arc ..... 40 to 85 psi
Green arc ..... 85 to 105 psi
Red line ..... 105 psi

Oil Temperature Gage

Red line ..... −40° C
Yellow arc..... −40 to +10° C
Green arc ..... +10 to +99° C
Red line ..... +99° C



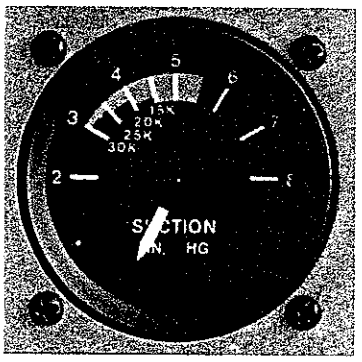
Miscellaneous Instrument Markings



Fuel Quantity Indicators[1]

Red line (minimum) ..... E (2.5 gallons unusable each tank)

[1] Total unusable when operating with both tanks on is 3 U.S. gallons.

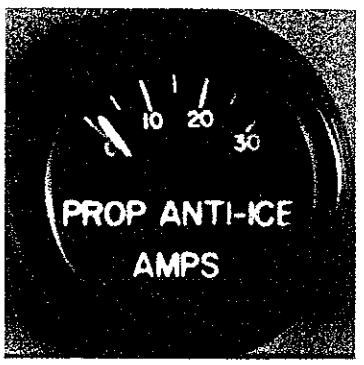


Suction Gage[2]

Green arc:
- To 15,000 feet ..... 4.5 to 5.5 in. Hg
- To 20,000 feet ..... 4.0 to 5.5 in. Hg
- To 25,000 feet ..... 3.5 to 5.5 in. Hg
- To 30,000 feet[3] ..... 3.0 to 5.5 in. Hg

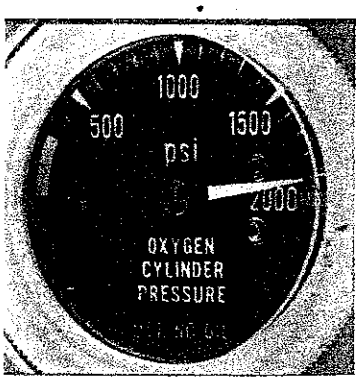
[2] Incorporates stepped green arc with 15K, 20K, 25K, and 30K markings at the appropriate step locations to indicate the altitude (in thousands of feet) at which the lower limit of that arc segment is acceptable

[3] Not applicable to model 208B



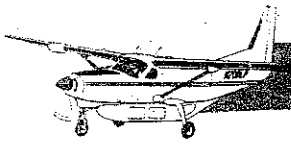
Propeller Anti-ice Ammeter

Green arc ..... 20 to 24 amps



Oxygen Pressure Gage

Yellow arc ..... 0 to 300 psi
Green arc ..... 1,550 to 1,850 psi
Red line ..... 2,000 psi



CENTER-OF-GRAVITY LIMITS

Models 208 and 208A

Center-of-gravity range:

Forward..... 162.41 inches (7.29% MAC) aft of datum at 4,200-pounds or less with straight line variations to 174.06 inches (24.83% MAC) aft of datum at 8,000 pounds

Aft..... 184.35 inches (40.33% MAC) aft of datum at all weights up to 8,000 pounds

Reference datum.... 100 inches forward of front face of firewall

Mean aerodynamic chord (MAC)..... The leading edge of the MAC is 157.57 inches aft of the datum. The MAC length is 66.40 inches.

Model 208B

Center-of-gravity range:

Forward..... 79.60 inches (3.06% MAC) aft of datum at 5,500 pounds or less, with straight line variation to 193.37 inches (23.80% MAC) aft of datum at 8,000 pounds and straight line variation to 199.15 inches (32.50% MAC) aft of datum at 8,750 pounds

Aft..... 204.35 inches (40.33% MAC) aft of datum at all weights up to 8,750 pounds

Reference datum.... 100 inches forward of front face of firewall

Mean aerodynamic chord (MAC)..... The leading edge of MAC is 177.57 in aft of the datum. MAC length is 6 inches.

MANEUVER LIMITS

This airplane is certificated in the nc category. The normal category is applicat aircraft intended for nonaerobatic operat These include any maneuvers incidental tc mal flying, stalls (except whip stalls), eights, chandelles, and turns in which the of bank is not more than 60°.

Aerobatic maneuvers, including spins, a approved.

FLIGHT LOAD FACTOR LIM

Flight load factors:

Flaps up..... +3.8 g, −1.52

Flaps down (all settings)..... +2.4 g

NOTE

The design load factors are 150% of the above, and in all cases, th structure meets or exceeds desig loads.

FLIGHT CREW LIMITS

One pilot in left seat is required.

KINDS OF OPERATION LIMITS—REQUIRED EQUIPMENT

This airplane is equipped for day VFR be equipped for night VFR and/or IF tions and for flight into known icing c The operating limitations placard re limits applicable at the time of Airv Certificate issuance.

wing equipment lists identify the sys- equipment upon which type certifica- ach kind of operation was predicated. stems and equipment items must be in- id operable for the particular kind of indicated. Reference should also be the equipment list furnished with the for additional equipment information. is responsible for determining the air- s of his airplane for each flight and for compliance with current operating

FR

indicator (1)
(1)*
boost pump system
Y HOT and BATTERY OVERHEAT
ors (nicad batteries only)
rim system (manual)
nition system
or (1)
ion indicator
ESS LOW annunciator
tity indicators (2)
tor-off warning system

parator system
ator
compass
I indicator
S LOW annunciator
re gage
ature gage
temperature gage
(airspeed) warning system
governor
erating Handbook/AFM
system (1)
RPM indicator
(each occupant)
arnesses (front seats)
ndicator (1)

Stall warning system
Torque indicator
Trim position indicators (3)
Voltammeter

* When a servoed altimeter is installed, a functioning pneumatic altimeter is also required.

Night VFR

All equipment required for day VFR
Instrument lights
Navigation lights (3)
Strobe lights (2)

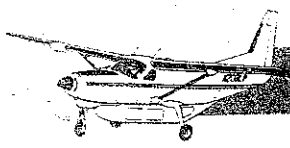
IFR

All equipment required for day VFR
All equipment required for night VFR (if a night flight)
Attitude indicator (gyro stabilized) (1)
Clock
Communications radio (VHF) (1)
Directional indicator (gyro stabilized) (1)
Navigation radios (as required)
Sensitive altimeter (1)*
Suction gage (if gyros are vacuum-powered)
Turn-and-bank indicator or turn coordinator (1)

* When a servoed altimeter is installed, a functioning pneumatic altimeter is also required.

Flight into Known Icing Conditions

All equipment required for day VFR, night VFR, and/or IFR, as applicable
Generator
Horizontal stabilizer deice boots
Ice detector light (for night flight)
Propeller anti-ice boots
Pitot-static tube heat system
Standby electrical system
Stall warning system heater
Vertical stabilizer deice boot
Windshield anti-ice panel
Wing and wing strut deice boots



MAXIMUM OPERATING ALTITUDE LIMITS

Models 208 and 208A

Certificated maximum operating altitude ..... 30,000 feet

Model 208B

Certificated maximum operating altitudes:

Nonicing conditions ..... 25,000 feet

Icing conditions (if so equipped)..... 20,000 feet

Any conditions with any ice on the airplane..... 20,000 feet

OUTSIDE AIR TEMPERATURE LIMITS

Airplanes with Standard-Capacity Oil Cooler

Models 208 and 208A

Cold day..... −54° C from sea level to 25,300 feet, then straight-lined to 30,000 feet at −63° C. Refer to Figure 5-4, ISA Conversion and Operating Temperature Limits chart, in the *POH*.

Hot day..... +53° C for ground operations to 5,000 feet; ISA +37° C for ground operations between 5,000 and 12,000 feet; ISA +30° C above standard temperature for all flight operations from sea level to 30,000 feet

Ground operations... +53° C from sea to 5,000 feet; +37° C above feet

Flight operations..... +42° at sea le +22° C at 15,00 with straight-line ation between p ISA +37° C 15,000 to 25,00

Model 208B

Cold day ..... −54° C from sea to 25,000 feet

Hot day:

Ground operations ..... +53° from sea to 5,000 feet; +37° C above feet

Flight operations... +42° at sea le +22° C at 15,0 with straight-lin ation between ISA +37° C 15,000 to 25,0

Airplanes with Large-Capa Oil Cooler

Cold day..... −54° C from s to 25,000 feet

Hot day:

Ground operations ..... +53° C from s to 5,000 fee +37° C above feet

Flight operations... +50° C at sea +38° C at 7,(with straight-li ation between ISA +37° C 7,000 to 25,(

MUM PASSENGER ING LIMITS

num of nine seats, in addition to the pi- t, may be installed in the Standard 208.

mum of one seat, in addition to the pi- t, may be installed in the Cargomaster.

mum of one seat, in addition to the pi- at, may be installed in the 208A and

FLAP LIMITATIONS

Approved takeoff range..... 0 to 20°

Approved landing range ..... 0 to 30°

PLACARDS

The following information must be displayed in the form of composite or individual placards or markings.

1. In full view of the pilot on the sunvisor or windshield trim-strip:

The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane in the Normal Category. Other operating limitations which must be complied with when operating this airplane in this category are contained in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

No acrobatic maneuvers, including spins, approved.

This airplane is approved for flights into icing conditions if the proper optional equipment is installed and operational.

This airplane is certified for the following flight operations as of date of original airworthiness certificate.

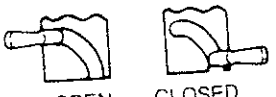
DAY - NIGHT - VFR - IFR

2. On control lock:

CAUTION!
CONTROL LOCK
REMOVE BEFORE STARTING ENGINE

3. On left sidewall below and forward of instrument panel and on right sidewal and forward of instrument panel:

STATIC SOURCE DRAIN



OPEN CLOSED

MUST BE CLOSED
FOR FLIGHT

4. On sunvisor or windshield trim-strip:

ALTERNATE STATIC SOURCE CORRECTION

CLIMBS AND APPROACHES: NO CORRECTION REQUIRED.

CRUISE: CORRECTIONS VARY WITH VENTS OPEN OR CLOSED. REFER TO SECTION 5 OF PILOT'S OPERATING HANDBOOK.

5. Near airspeed indicator:

EARLY SERIAL NUMBERS:	LATER SERIAL NUMBERS AND SPARES
MANEUVER SPEED 150 KIAS	MAX WT. MANEUVER SPEED 150 KIAS SEE POH FOR OTHER WEIGHTS

6. Near torque indicator:

RPM	MAX TORQUE
1900	1658
1800	1751
1700	1854
1600	1970

7. A calibration card must be provided to indicate the accuracy of the magnetic compass in 30° increments.

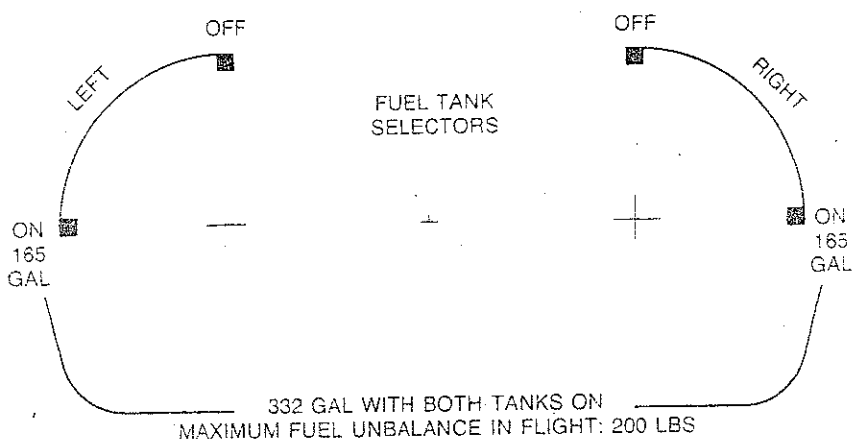
8. Near wing flap position indicator:

UP to 10°	175 KIAS	(Partial flap range with dark blue color code; also mechanical detent at 10°)
10° to 20°	150 KIAS	(Light blue code; also, mechanical detent at 20°)
20° to FULL	125 KIAS	(White color code)

9. Below power lever:

CAUTION
USE BETA AND REVERSE ONLY
WITH ENGINE RUNNING AND
PROPELLER OUT OF FEATHER

10. On fuel tank selector:



11. a. Adjacent to each fuel tank filler cap:

JET-A-FUEL

TOTAL CAPACITY 167.5 U.S. GALLONS

ANTI-ICE ADDITIVE REQUIRED. SEE PILOT'S OPERATING HANDBOOK FOR OTHER APPROVED FUELS, QUANTITY AND TYPE OF ADDITIVE.
—GROUND TO WING TIE-DOWN FITTING.—

b. Adjacent to each fuel tank filler cap (aircraft modified with SK208-52):

JET-A-FUEL

TOTAL CAPACITY 167.8 U.S. GALLONS

ANTI-ICE ADDITIVE REQUIRED. SEE PILOT'S OPERATING HANDBOOK FOR OTHER APPROVED FUELS, QUANTITY AND TYPE OF ADDITIVE.
—GROUND TO WING TIE-DOWN FITTING.—

12. Adjacent to each inboard fuel tank filler cap (when installed):

JET-A-FUEL

TOTAL INBD CAPACITY 120.0 U.S. GALLONS

ANTI-ICE ADDITIVE REQUIRED. SEE PILOT'S OPERATING HANDBOOK FOR OTHER APPROVED FUELS, QUANTITY AND TYPE OF ADDITIVE.
—GROUND TO WING TIE-DOWN FITTING.—

CAUTION

DO NOT OPEN WHEN FUEL QUANTITY IS IN EXCESS OF 120.0 U.S. GALLONS.

13. Adjacent to fuel filter:

FUEL FILTER
DRAIN DAILY

14. Adjacent to EPA fuel reservoir can:

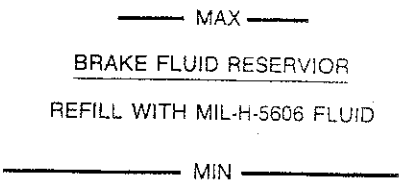
EPA CAN - DRAIN
PROPERLY DISPOSE

15. On the brake fluid reservoir:

EARLY SERIAL NUMBERS:

BRAKE FLUID RESERVOIR
REFILL WITH MIL-H-5606 FLUID WHEN RESERVOIR REACHES ½ FULL. REFILL TO WITHIN ¾" OF .098 DIA. VENT HOLE.

LATER SERIAL NUMBERS AND SPARES



16. Adjacent to oil dipstick/filler cap (on inertial separator duct):

ENGINE OIL

TOTAL CAPACITY 14 U.S. QUARTS
DRAIN & FILL 9.5 U.S. QUARTS

TYPE: SEE PILOT'S OPERATING HANDBOOK FOR APPROVED OILS. DO NOT MIX BRANDS.

SERVICED WITH: _____

17. On battery tray:

CAUTION 24 VOLTS D.C.

THIS AIRCRAFT IS EQUIPPED WITH GENERATOR AND A NEGATIVE GROUND SYSTEM

OBSERVE PROPER POLARITY

REVERSE POLARITY WILL DAMAGE ELECTRICAL COMPONENTS

18. Near ground service plug receptacle:

EXTERNAL POWER
28 VOLTS D.C. NOMINAL
800 AMP
STARTING CAPACITY MIN.
DO NOT EXCEED 1700 AMPS

19. On bottom of right wing, just forward of aileron:

FLUX VALVE
USE NON-MAGNETIC
TOOLS AND SCREWS

20. On each side of nose strut fairing, near tow limit marking:

WARNING
MAXIMUM
TOW
LIMIT

CAUTION

DO NOT TOW AIRCRAFT

WITH RUDDER LOCK

ENGAGED

21. Adjacent to left crew door inside door handle:

LOCK OVERRIDE:

TO UNLOCK
PULL & ROTATE
KNOB

TO LOCK
PULL & ROTATE
KNOB

22. a. Adjacent to upper passenger door inside door handle (Standard 2(

DOOR OPERATION:

TO OPEN
PULL HANDLE
INBD & ROTATE

TO CLOSE
ROTATE HANDLE
& STOW

b. Adjacent to upper passenger door outside pushbutton and door 208 only):

DOOR OPERATION:

TO OPEN
PUSH BUTTON &
ROTATE
HANDLE

TO CLOSE
ROTATE
HANDLE

23. At center of lower passenger door on inside and outside (Standa

WARNING

OUTSIDE PROXIMITY OF
LOWER DOOR MUST BE
CLEAR BEFORE OPENING

29. On left and right sides of cabin in appropriate zones:

208 AND 208A	208B
ZONE 1 MAX LOAD 1410 LBS	ZONE 1 MAX LOAD 1780 LBS
ZONE 2 MAX LOAD 1430 LBS	ZONE 2 MAX LOAD 3100 LBS
ZONE 3 MAX LOAD 1410 LBS	ZONE 3 MAX LOAD 1900 LBS
ZONE 4 MAX LOAD 1380 LBS	ZONE 4 MAX LOAD 1380 LBS
ZONE 5 MAX LOAD 1270 LBS	ZONE 5 MAX LOAD 1270 LBS
ZONE 6 MAX LOAD 320 LBS	ZONE 6 MAX LOAD 320 LBS

30. On inside of cargo pod doors:

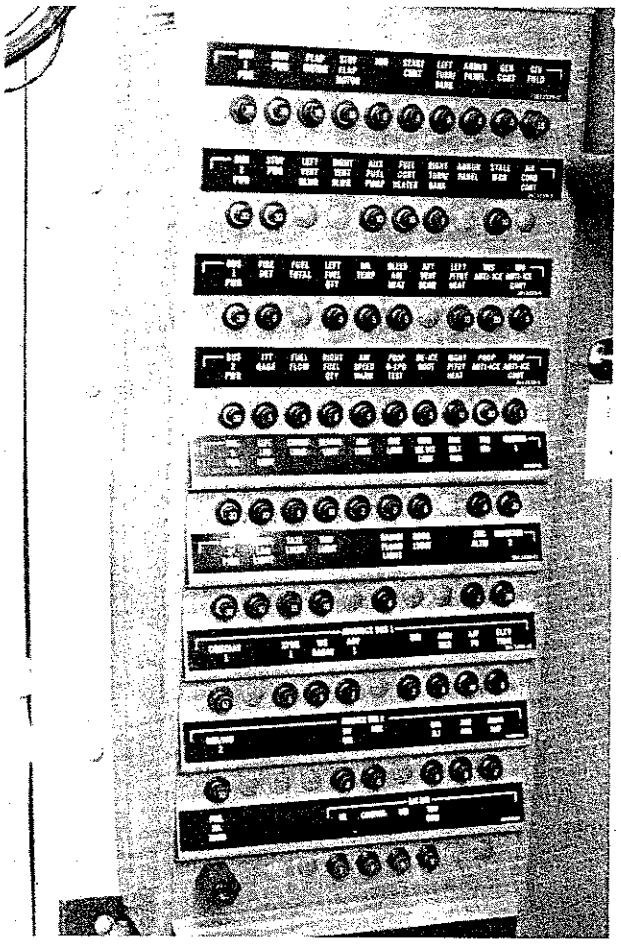
208 AND 208A	208B
FWD. COMPARTMENT MAX. WEIGHT 230 LBS. MAX. FLOOR LOADING 30 LBS. PER SQ. FT. NO SHARP EDGES	FWD. COMPARTMENT MAX. WEIGHT 230 LBS. MAX. FLOOR LOADING 30 LBS. PER SQ. FT. NO SHARP EDGES
CTR. COMPARTMENT MAX. WEIGHT 310 LBS. MAX. FLOOR LOADING 30 LBS. PER SQ. FT. NO SHARP EDGES	CTR. COMPARTMENT - FWD MAX. WEIGHT 310 LBS. MAX. FLOOR LOADING 30 LBS. PER SQ. FT. NO SHARP EDGES
AFT. COMPARTMENT MAX. WEIGHT 280 LBS. MAX. FLOOR LOADING 30 LBS. PER SQ. FT. NO SHARP EDGES	CTR. COMPARTMENT - AFT MAX. WEIGHT 270 LBS. MAX. FLOOR LOADING 30 LBS. PER SQ. FT. NO SHARP EDGES
	AFT COMPARTMENT MAX. WEIGHT 280 LBS. MAX. FLOOR LOADING 30 LBS. PER SQ. FT. NO SHARP EDGES

31. At each sidewall and ceiling anchor plate (SNs 208B0001 through 208B0039 incorporating Service Kit SK208-46 and SNs 208B0040 and subsequent):

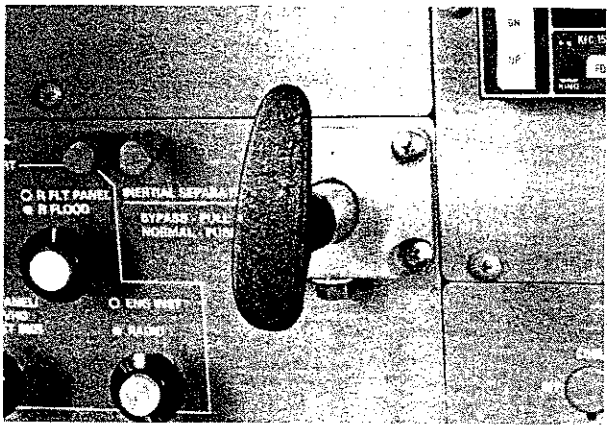
WALKAROUND

The following section is a pictorial walkaround. It shows each item called out in the exterior power-off preflight inspection. The fold-out page at the beginning of the walkaround section should be unfolded before starting to read. See Figure 13-1 for pre-flight diagram.

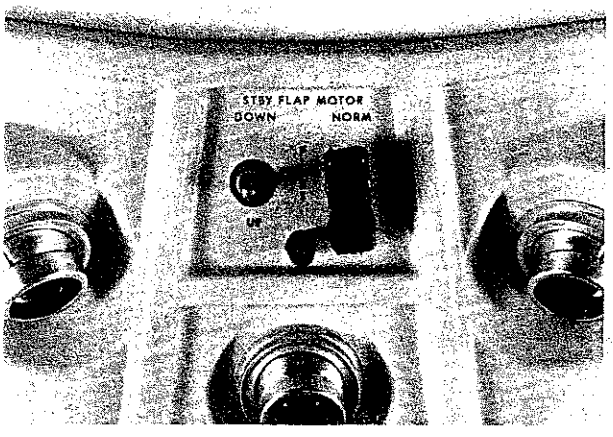
The general location photographs do not specify every checklist item. However, each item is portrayed on the large-scale photographs that follow.



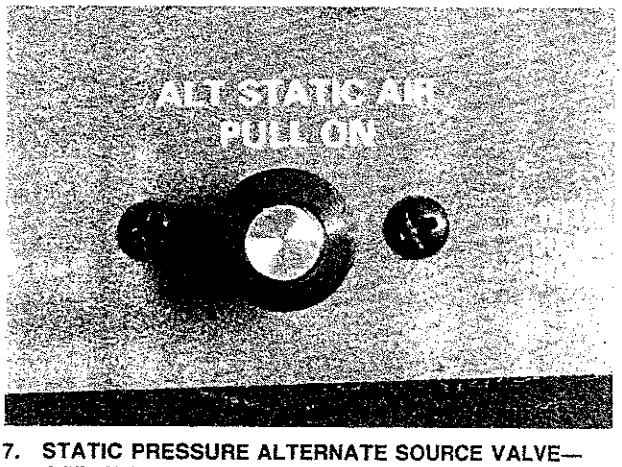
6. **ALL CIRCUIT BREAKERS**—IN



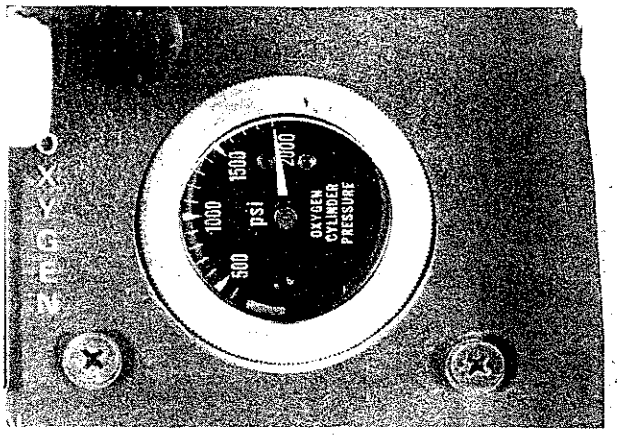
8. **INERTIAL SEPARATOR T-HANDLE**—NORMAL



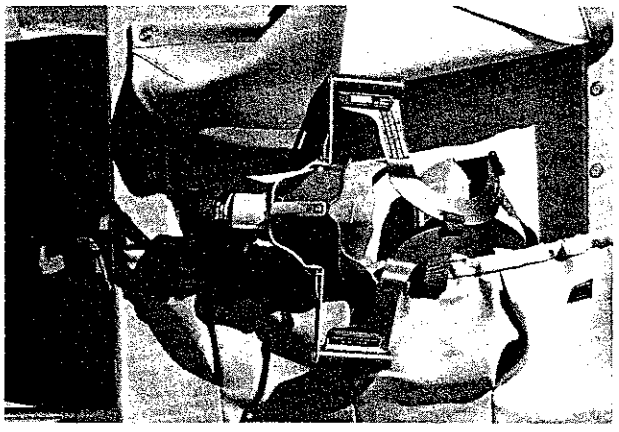
9. **STANDBY FLAP MOTOR SWITCH (OVERHEAD)**—GUARDED NORM



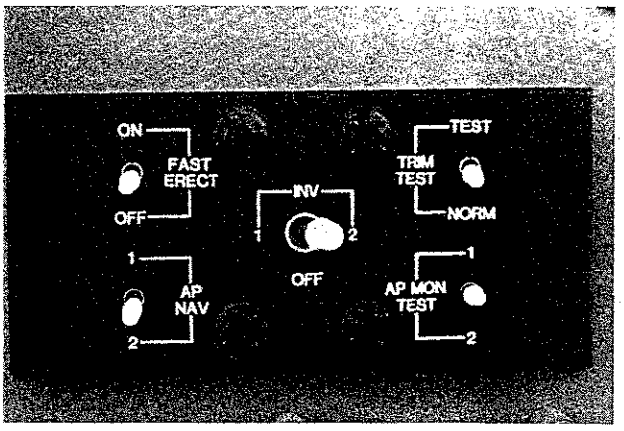
7. **STATIC PRESSURE ALTERNATE SOURCE VALVE**—OFF (FULLY IN)



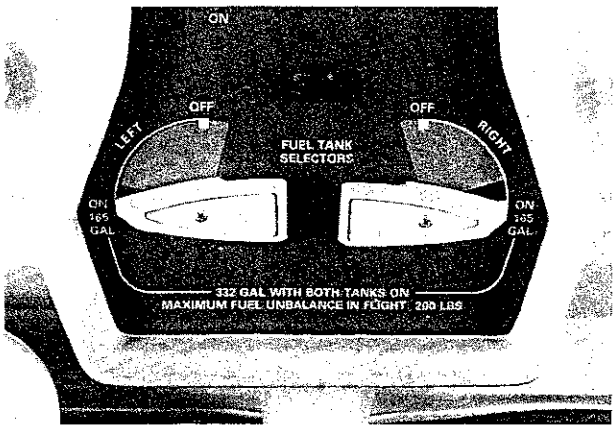
10. **OXYGEN SUPPLY PRESSURE**—CHECK



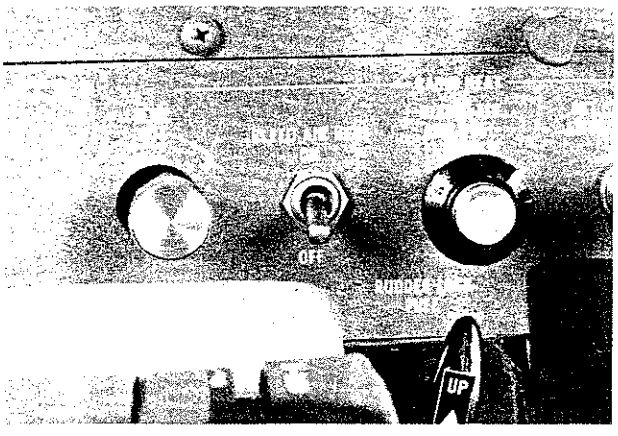
11. **OXYGEN MASKS**—CHECK AVAILABLE



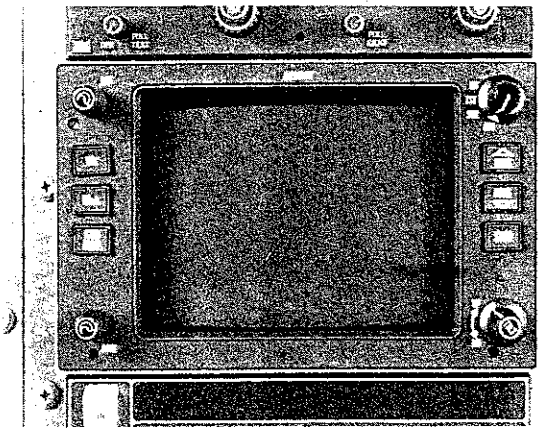
14. **INVERTER SWITCH (IF INSTALLED)**—OFF



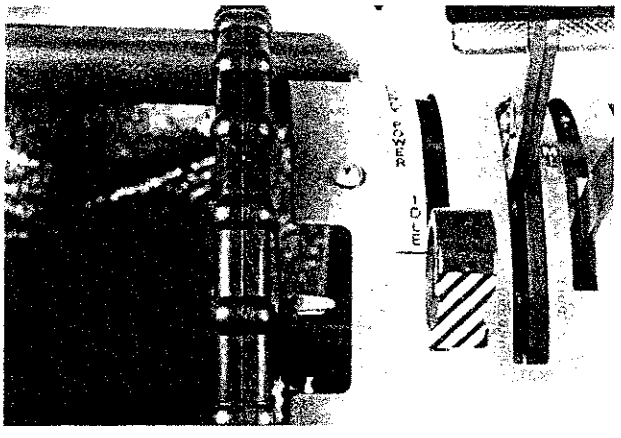
12. **FUEL SELECTOR VALVES**—CHECK ON AND FEEL AGAINST STOPS



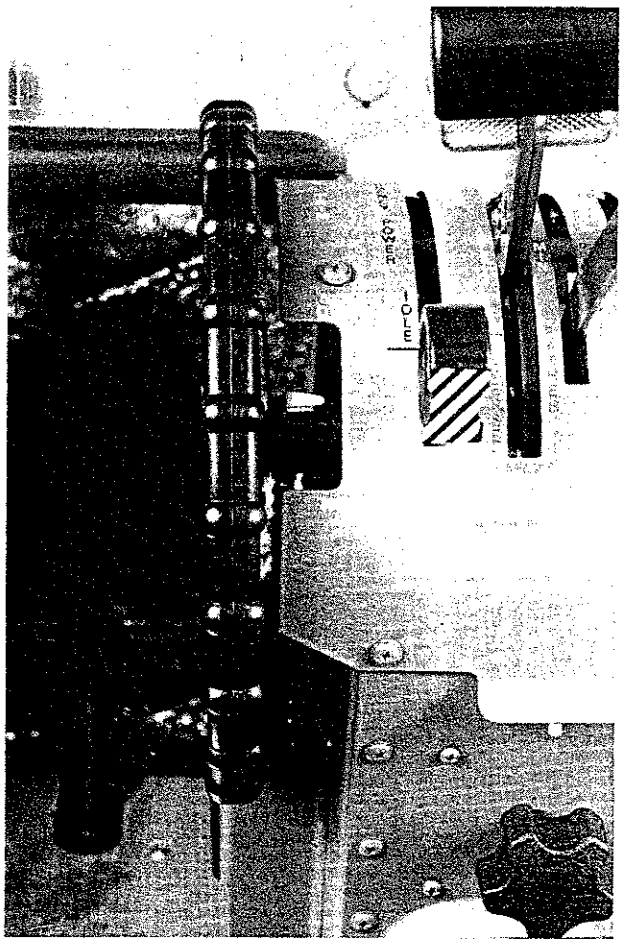
15. **BLEED-AIR HEAT SWITCH**—OFF

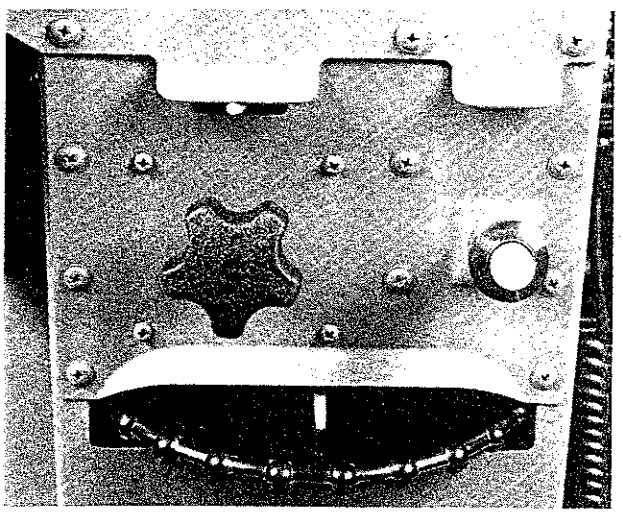


13. **RADAR**—OFF

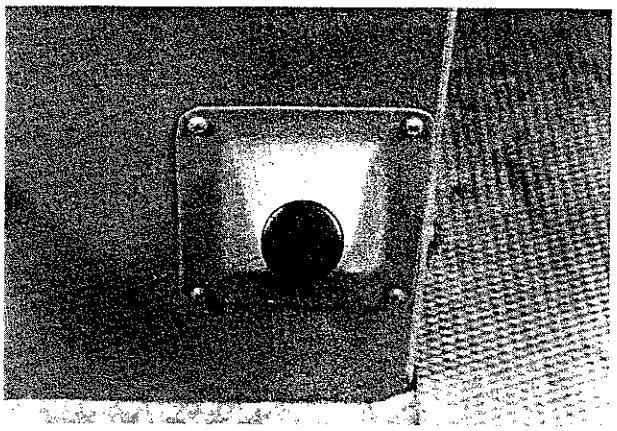


16. **EMERGENCY POWER LEVER**—NORMAL

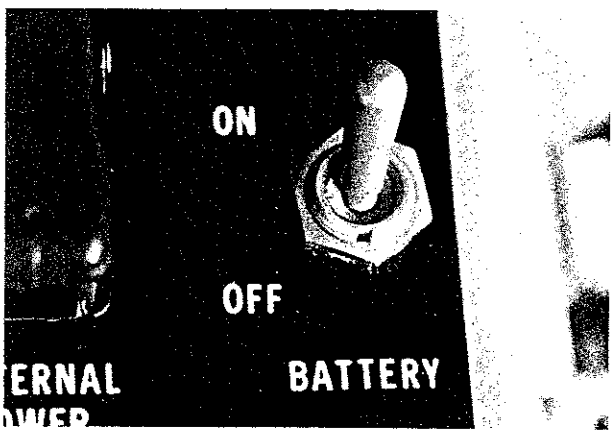




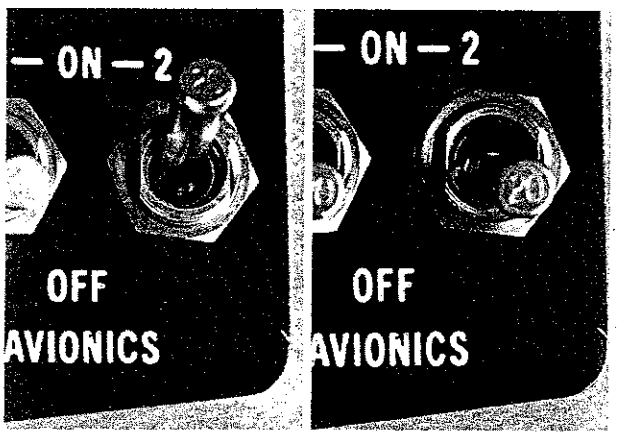
17. **TRIM CONTROLS**—SET
18. **FUEL SHUTOFF**—ON



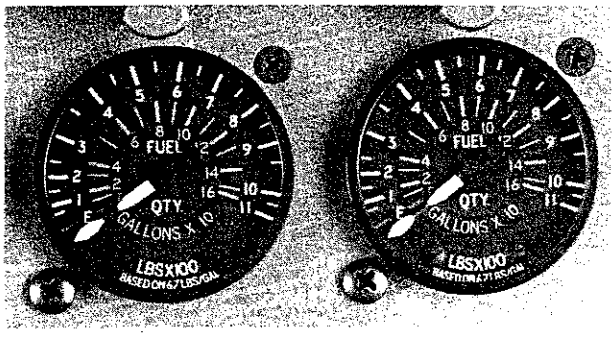
19. **CABIN HEAT FIREWALL SHUTOFF CONTROL**—CHECK IN



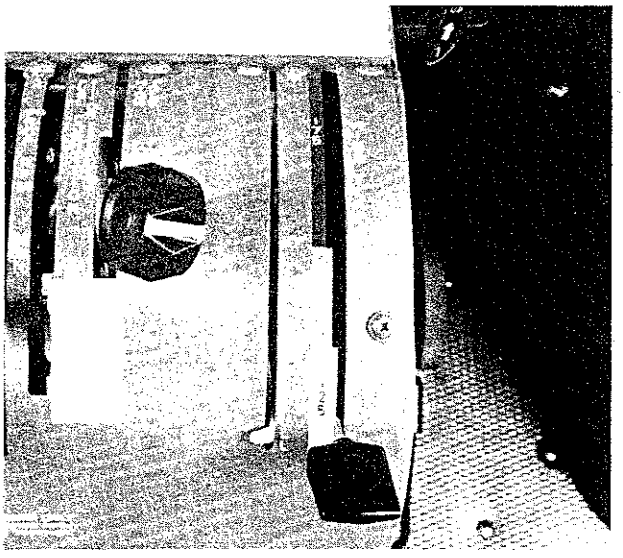
20. **BATTERY SWITCH**—ON



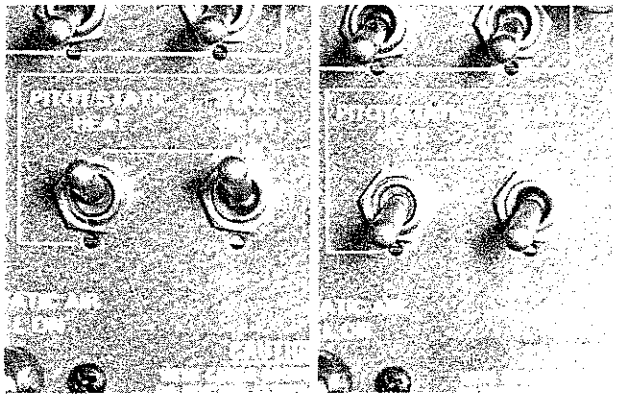
21. **NO. 2 AVIONICS POWER SWITCH**—ON
22. AVIONICS POWER SWITCH NO. 2—OFF



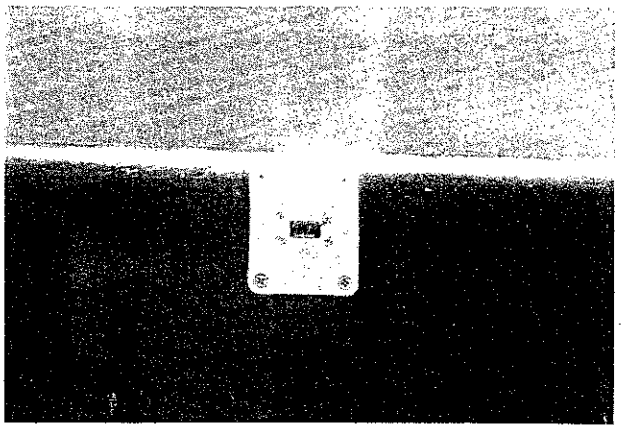
23. FUEL QUANTITY INDICATORS—CHECK QUANTITY



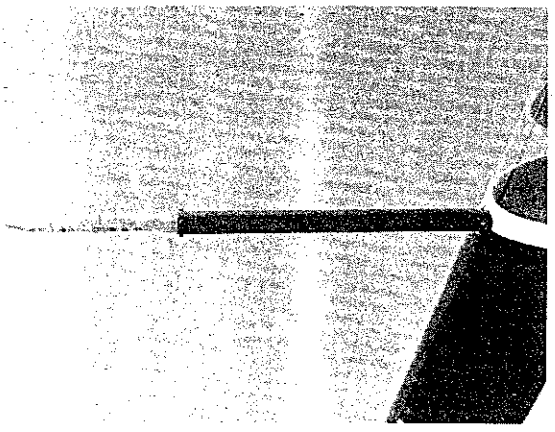
24. WING FLAPS—FULLY DOWN



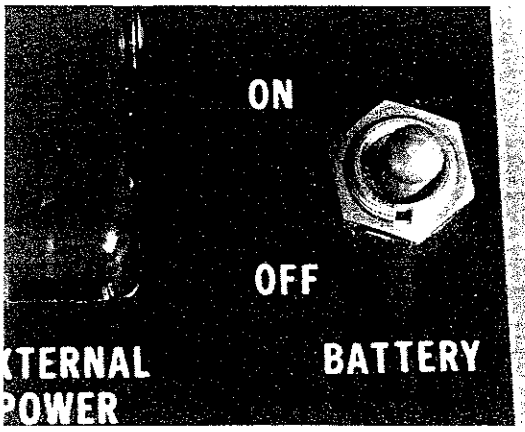
25. PITOT-STATIC AND STALL HEAT SWITCHES—ON FOR 30 SECONDS, THEN OFF



26. STALL WARNING VANE—CHECK FREEDOM OF MOVEMENT, AUDIBLE WARNING AND WARMTH

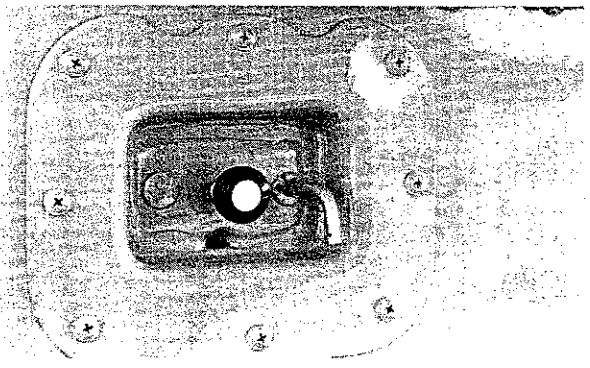


27. PITOT-STATIC TUBES—CHECK SECURITY, OPENINGS FOR STOPPAGE AND WARMTH

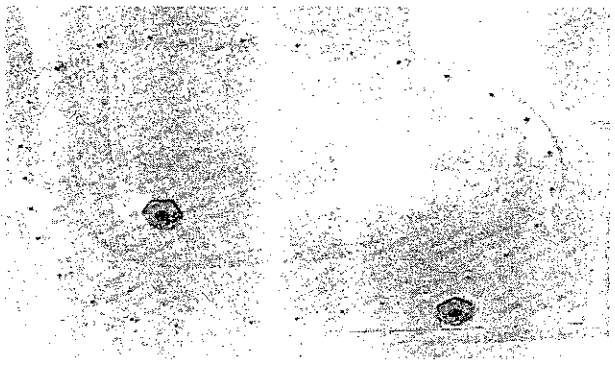


28. BATTERY SWITCH—OFF

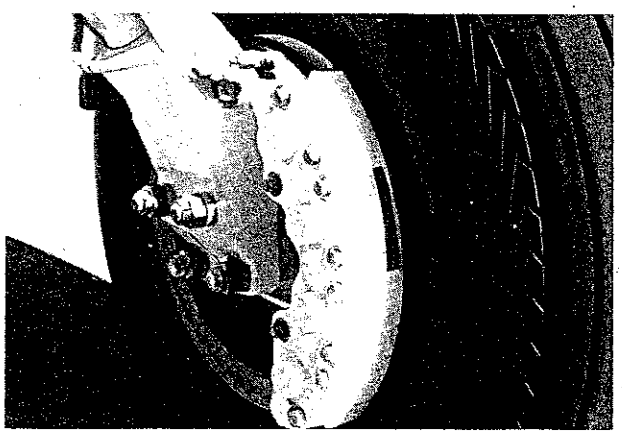
LEFT SIDE



29. **FUEL RESERVOIR DRAIN (BOTTOM OF FUSELAGE OR LEFT SIDE OF CARGO POD)**—DRAIN

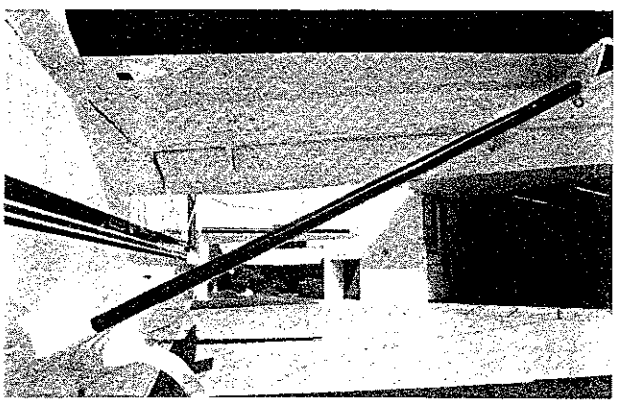


31. **INBOARD FUEL TANK SUMP AND EXTERNAL SUMP QUICK-DRAIN VALVES**—DRAIN

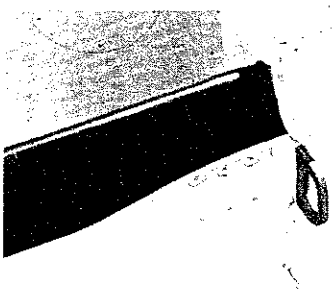


30. **MAIN LANDING GEAR**—CHECK PROPER TIRE INFLATION AND CONDITION OF GEAR

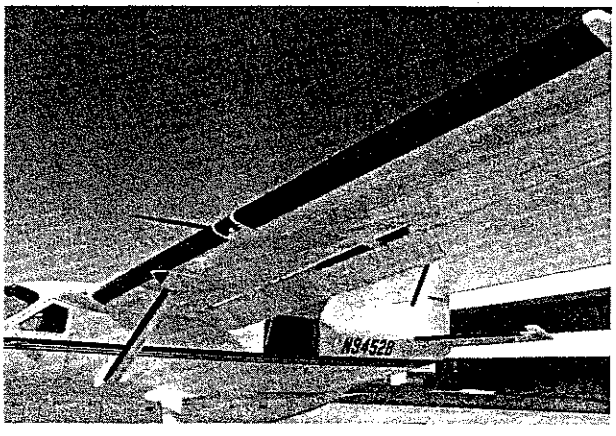
LEFT WING LEADING EDGE



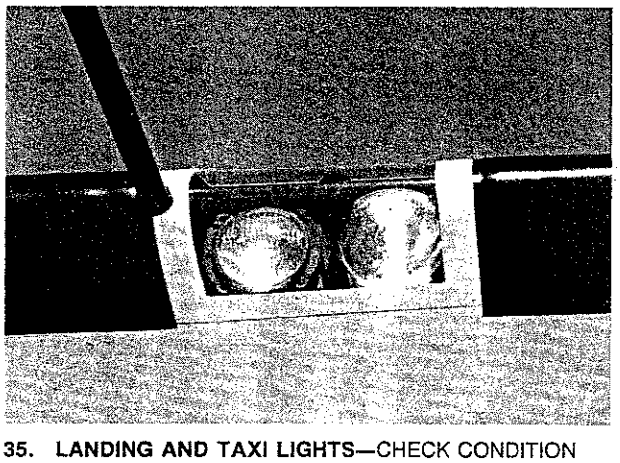
32. **WING STRUT DEICE BOOTS**—CHECK FOR TEARS, ABRASION, AND CLEANLINESS



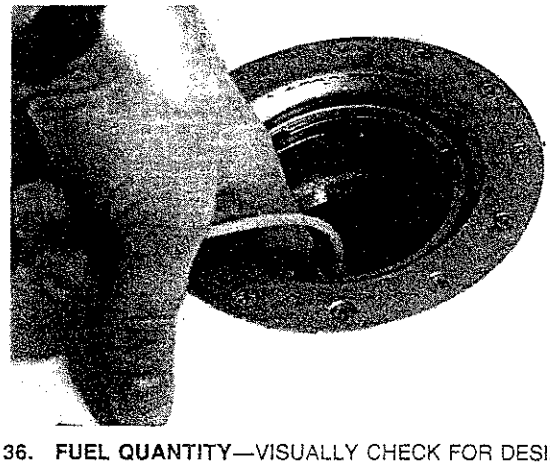
33. **WING TIEDOWN**—DISCONNECT



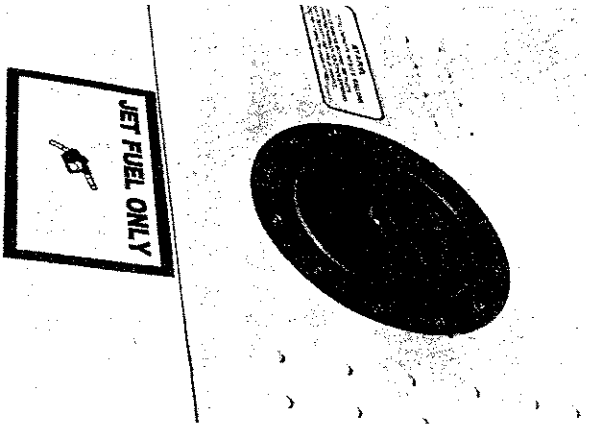
34. **WING DEICE BOOTS**—CHECK FOR TEARS, ABRASION, AND CLEANLINESS



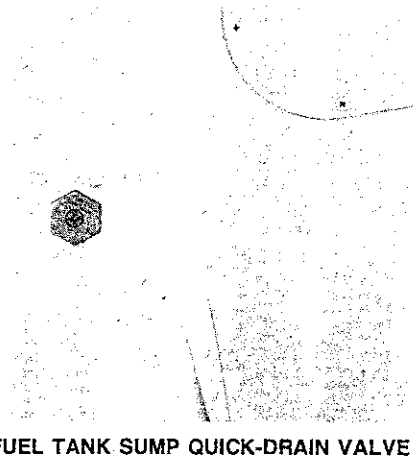
35. **LANDING AND TAXI LIGHTS**—CHECK CONDITION AND CLEANLINESS



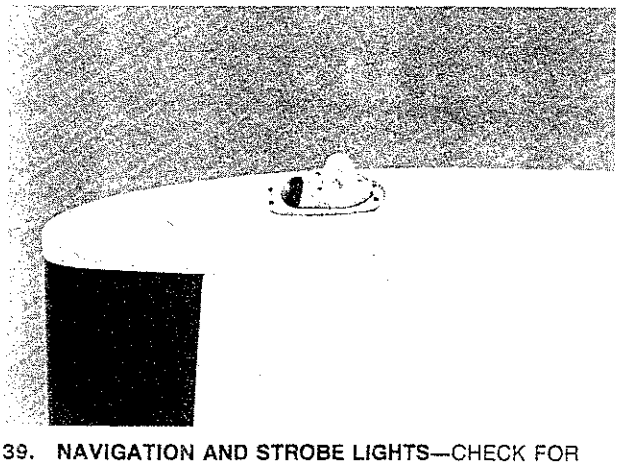
36. **FUEL QUANTITY**—VISUALLY CHECK FOR DESIRED LEVEL



37. **FUEL FILLER CAP**—SECURE

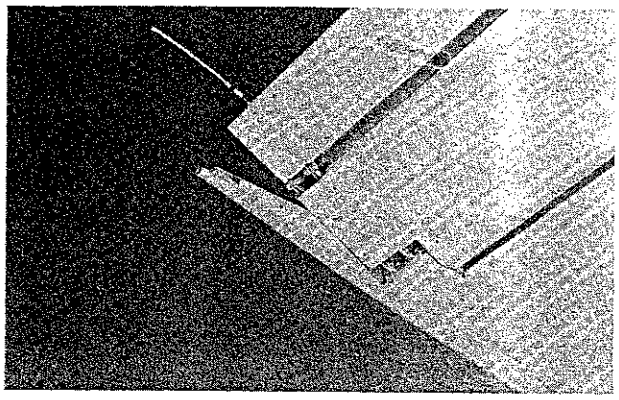


38. **OUTBOARD FUEL TANK SUMP QUICK-DRAIN VALVE (IF INSTALLED AND AIRPLANE PARKED WITH ONE WING LOW ON A SLOPING RAMP)**—DRAIN

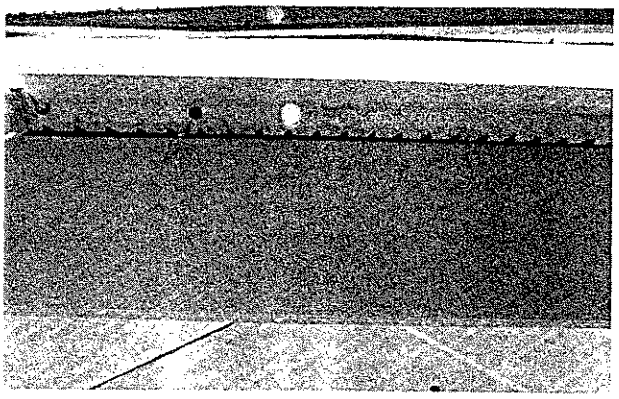


39. **NAVIGATION AND STROBE LIGHTS**—CHECK FOR CONDITION AND CLEANLINESS

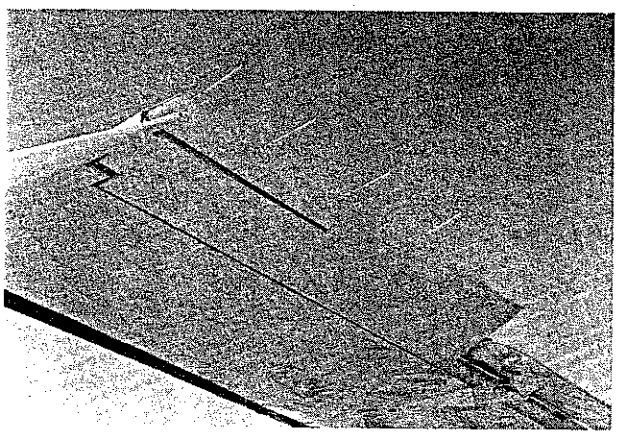
LEFT WING TRAILING EDGE



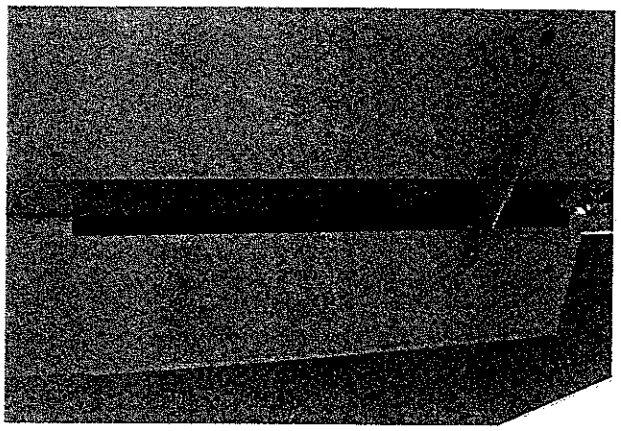
40. FUEL TANK VENT—CHECK FOR OBSTRUCTIONS



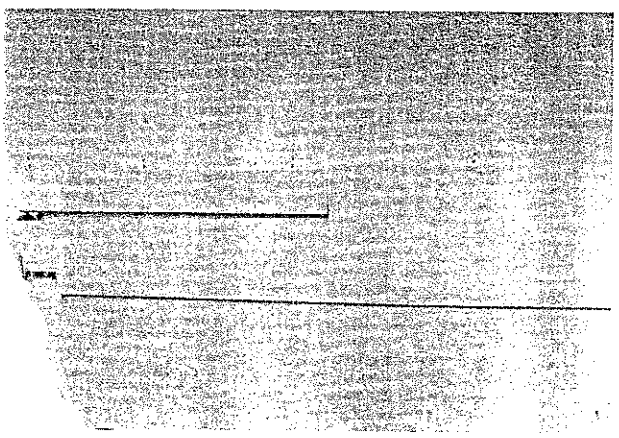
43. SPOILER—CHECK CONDITION AND SECURITY



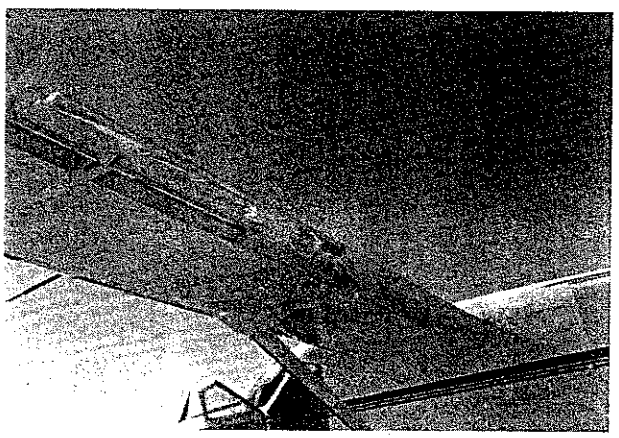
41. AILERON AND SERVO TAB—CHECK CONDITION AND SECURITY



44. FLAP LEADING-EDGE VORTEX GENERATORS—CHECK FOR SECURITY

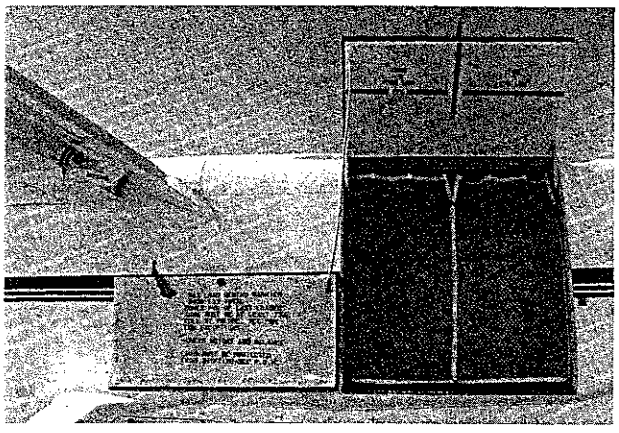


42. STATIC WICKS—CHECK CONDITION

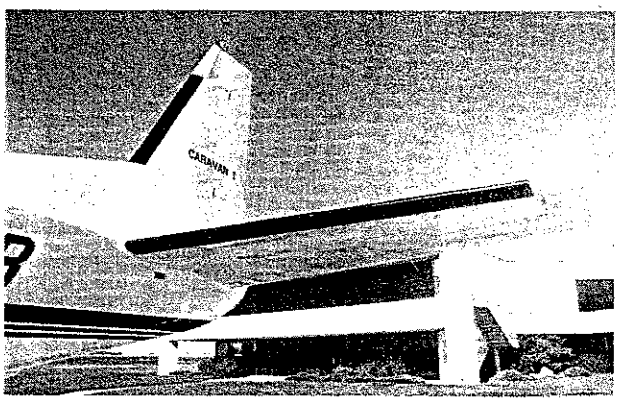


45. FLAP—CHECK CONDITION AND SECURITY

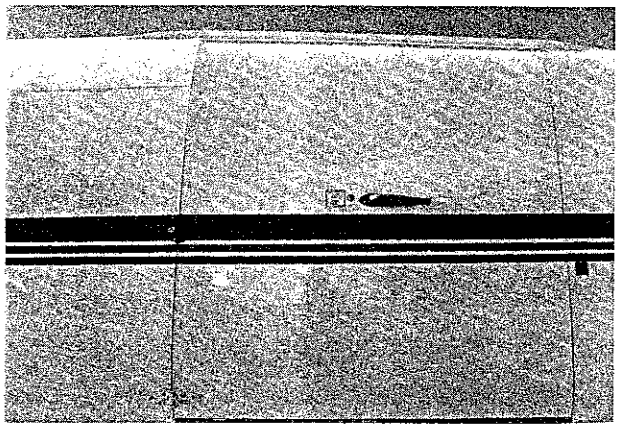
EMPENNAGE



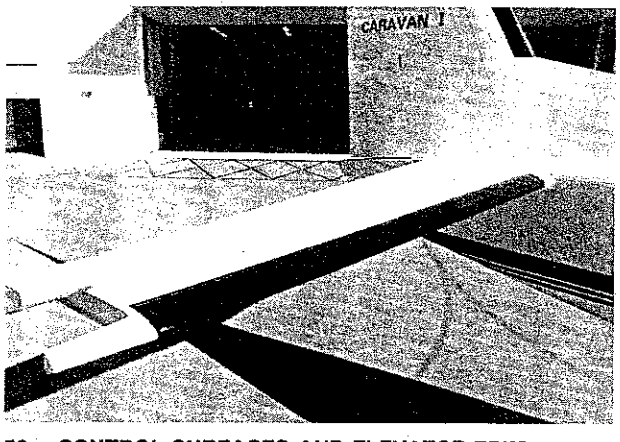
46. **CARGO**—CHECK SECURE THROUGH CARGO DOOR



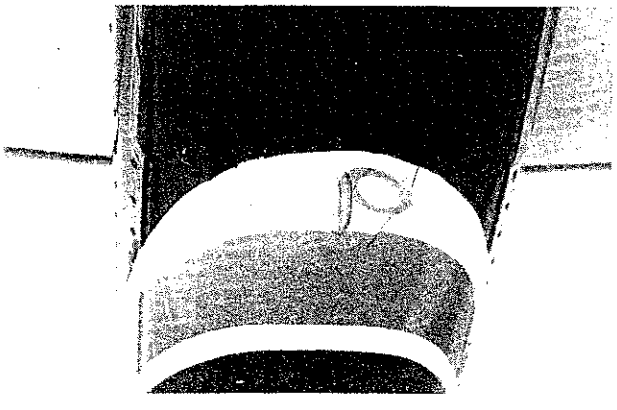
49. **DEICE BOOTS**—CHECK FOR TEARS, ABRASION, AND CLEANLINESS



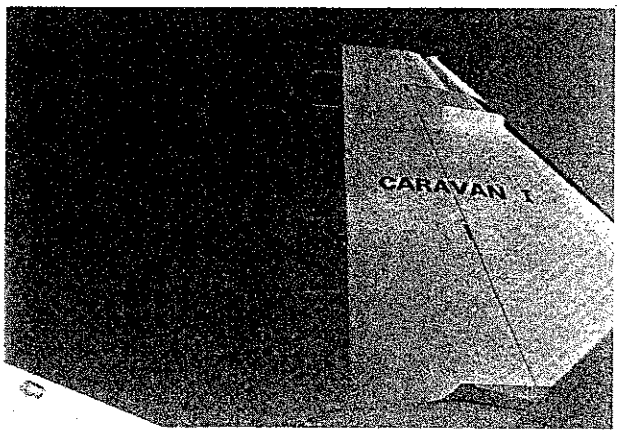
47. **CARGO DOOR**—CLOSED AND LATCHED



50. **CONTROL SURFACES AND ELEVATOR TRIM TABS**—CHECK CONDITION, SECURITY, FREEDOM OF MOVEMENT, AND TAB POSITION

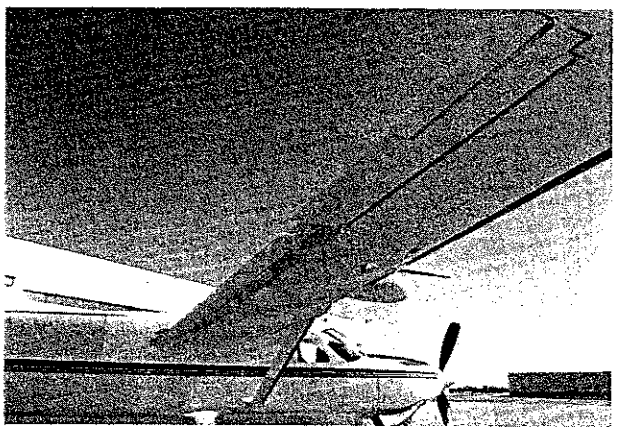


48. **TAIL TIEDOWN**—DISCONNECT

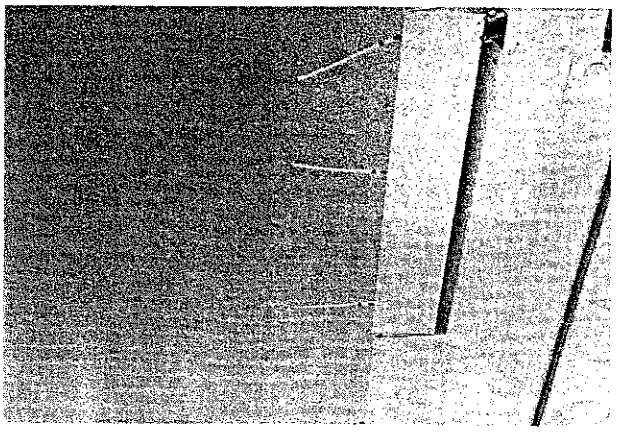


51. **STATIC WICKS**—CHECK CONDITION

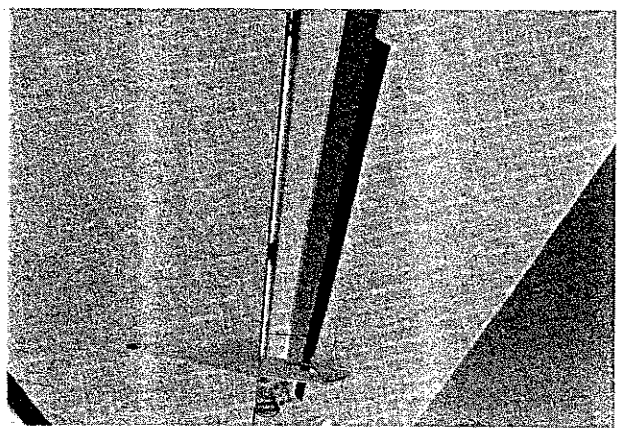
RIGHT WING TRAILING EDGE



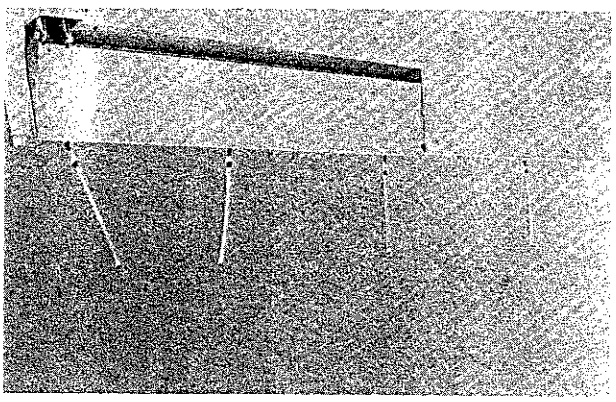
52. **FLAP**—CHECK CONDITION AND SECURITY



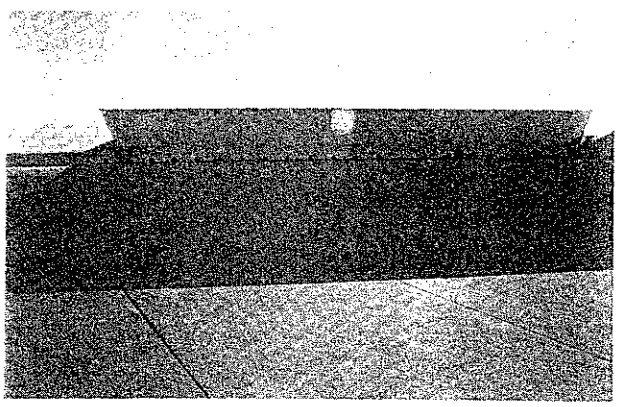
55. **AILERON AND TRIM TAB**—CHECK CONDITION AND SECURITY



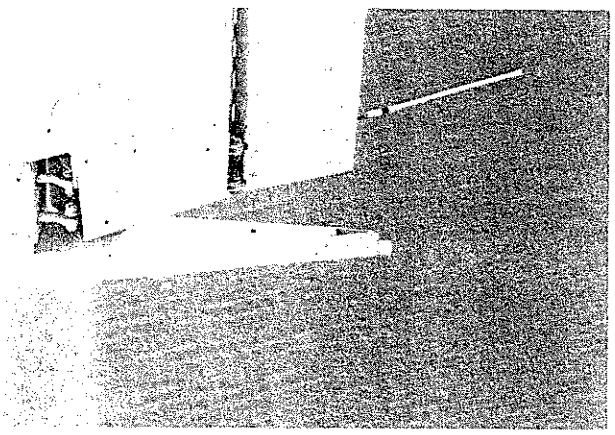
53. **FLAP LEADING-EDGE VORTEX GENERATORS**—CHECK FOR SECURITY



56. **STATIC WICKS**—CHECK CONDITION

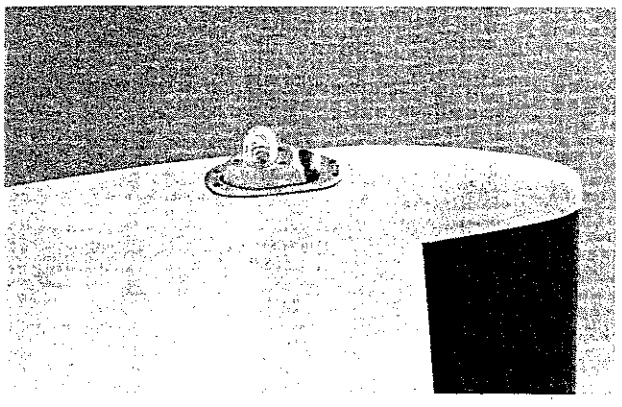


54. **SPOILER**—CHECK CONDITION AND SECURITY

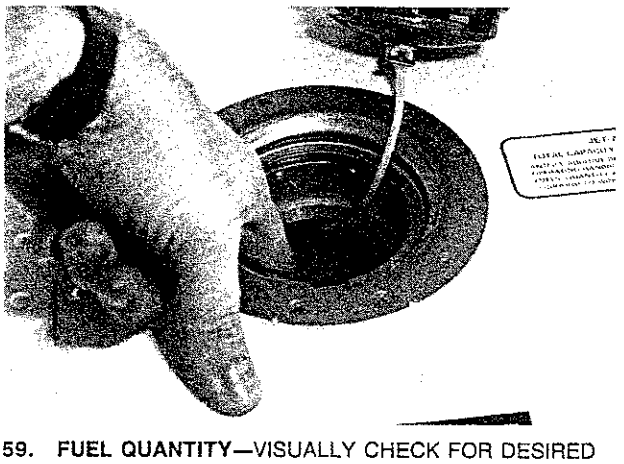


57. **FUEL TANK VENT**—CHECK FOR OBSTRUCTIONS

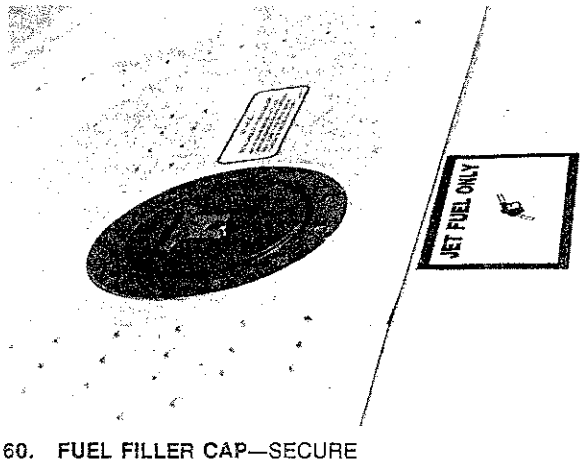
RIGHT WING



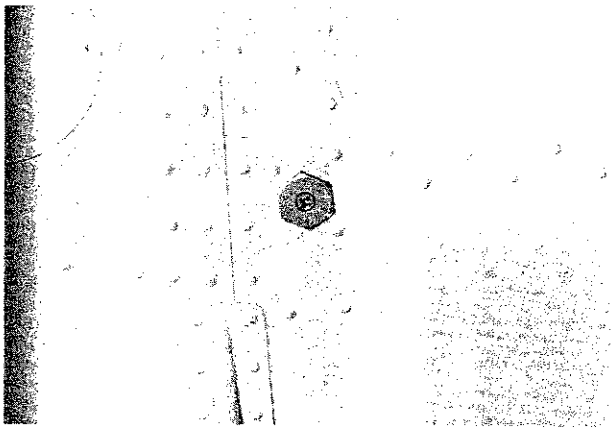
58. **NAVIGATION AND STROBE LIGHTS**—CHECK CONDITION AND CLEANLINESS



59. **FUEL QUANTITY**—VISUALLY CHECK FOR DESIRED LEVEL

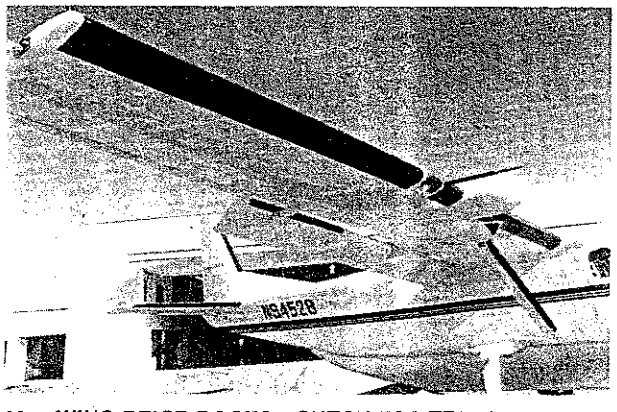


60. **FUEL FILLER CAP**—SECURE

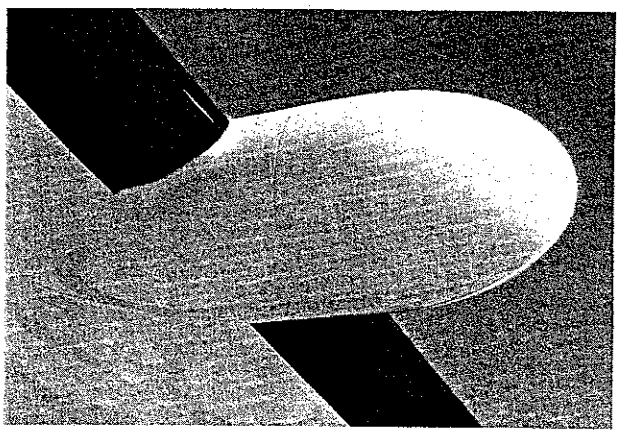


61. **OUTBOARD FUEL TANK SUMP QUICK-DRAIN VALVE (IF INSTALLED AND AIRPLANE PARKED WITH ONE WING LOW ON A SLOPING RAMP)**—DRAIN

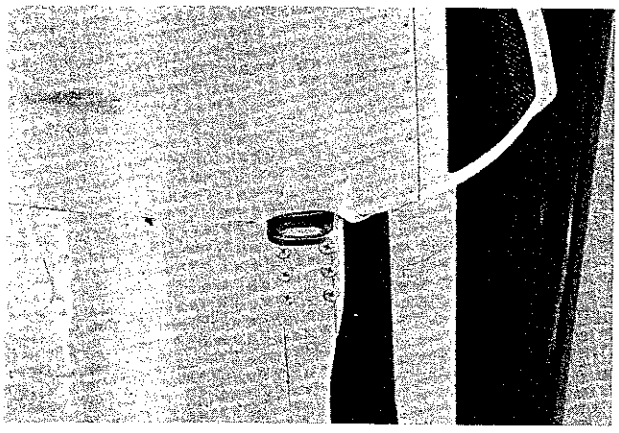
62. **LANDING AND TAXI LIGHTS**—CHECK CONDITION AND CLEANLINESS



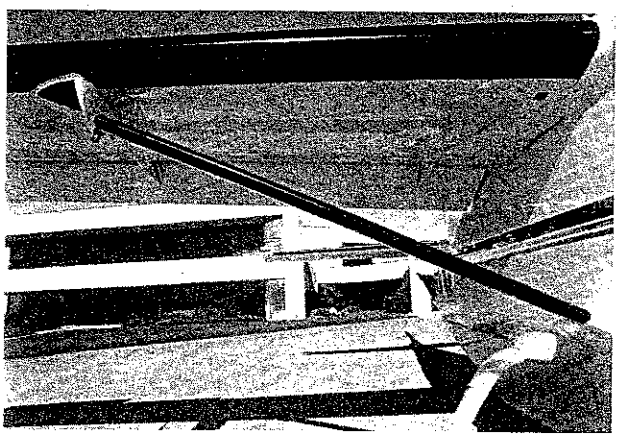
63. **WING DEICE BOOTS**—CHECK FOR TEARS, ABRASION, AND CLEANLINESS



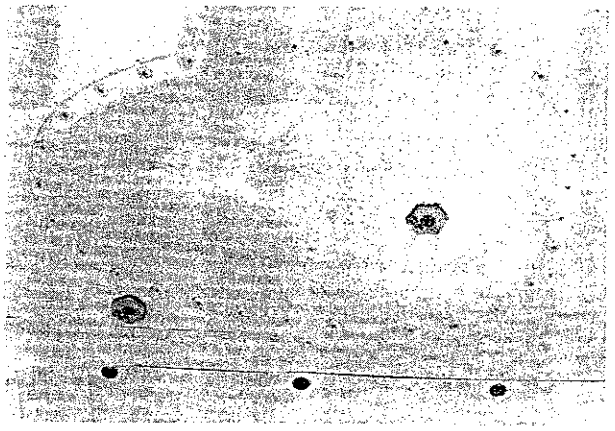
64. **RADOME**—CHECK CONDITION AND SECURITY



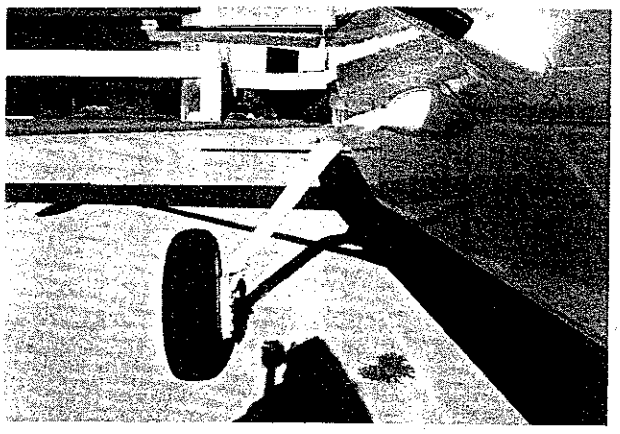
65. **WING TIEDOWN**—DISCONNECT



66. **WING STRUT DEICE BOOTS**—CHECK FOR TEARS, ABRASION, AND CLEANLINESS

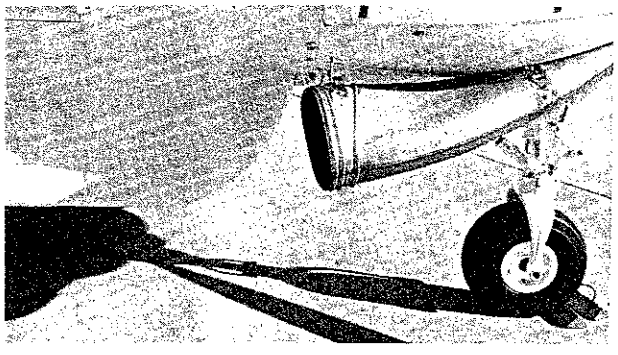


67. **INBOARD FUEL TANK SUMP AND EXTERNAL SUMP QUICK-DRAIN VALVES**—DRAIN

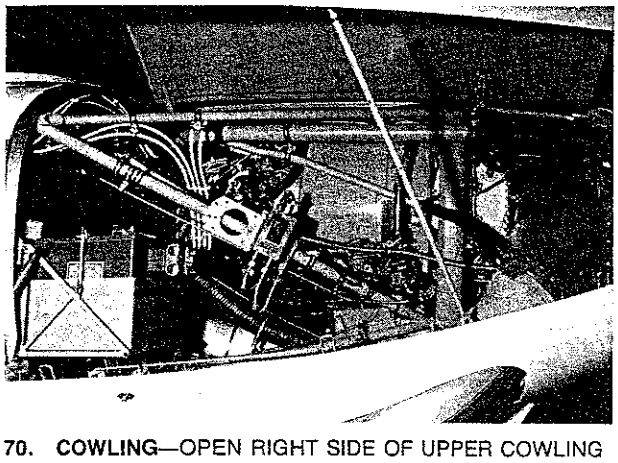


68. **MAIN LANDING GEAR**—CHECK PROPER TIRE INFLATION AND CONDITION OF GEAR

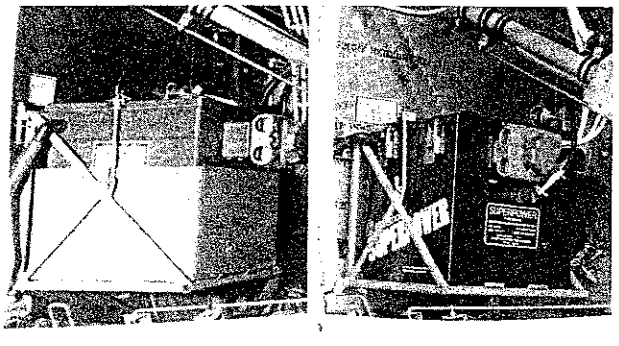
NOSE



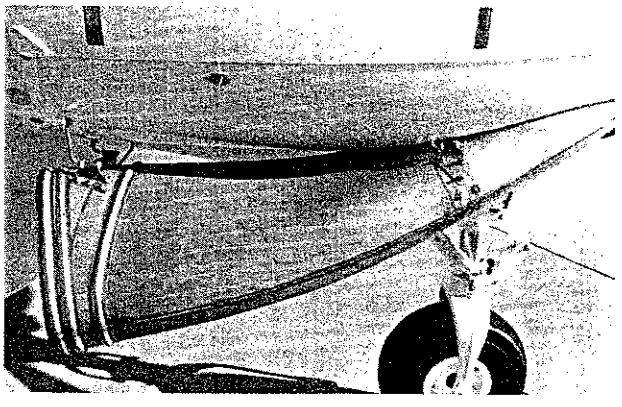
69. **EXHAUST COVER (IF INSTALLED)**—REMOVE



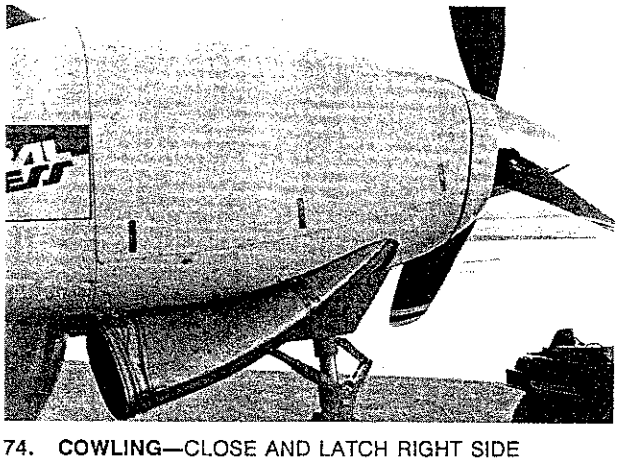
70. **COWLING**—OPEN RIGHT SIDE OF UPPER COWLING FOR ACCESS AND CHECK CONDITION AND SECURITY
71. **ENGINE (RIGHT SIDE)**—CHECK FOR GENERAL CONDITION, SECURITY, FUEL AND OIL LEAKAGE, AND DAMAGE TO ANY COMPONENTS



72. **BATTERY**—CHECK CONDITION AND SECURITY, AND POWER CABLES SECURE

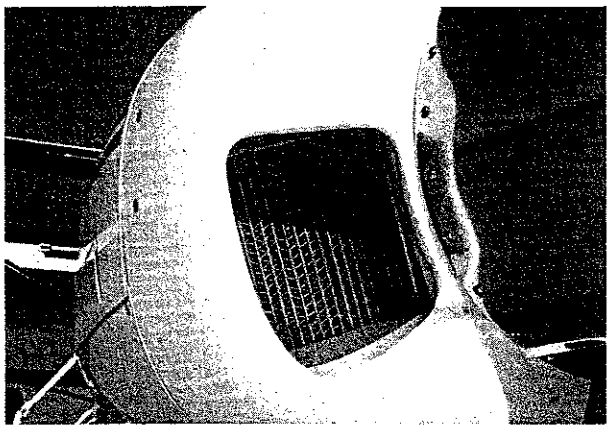


73. **EXHAUST SYSTEM**—CHECK CONDITION, SECURITY, CRACKS, DISTORTION, AND DAMAGE

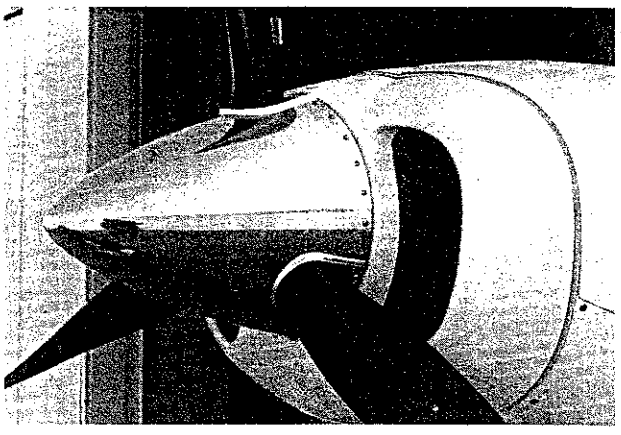


74. **COWLING**—CLOSE AND LATCH RIGHT SIDE

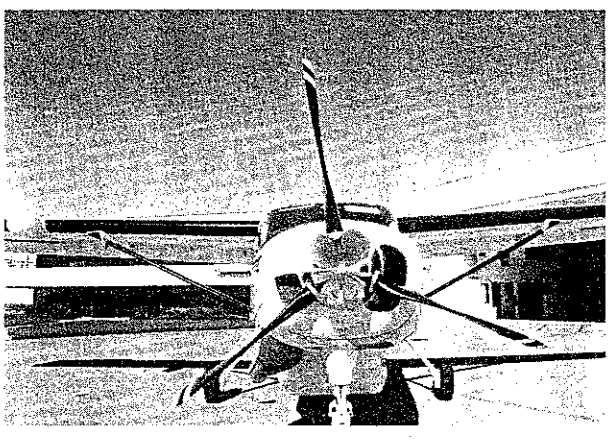
75. **AIR INLET COVERS**—REMOVE



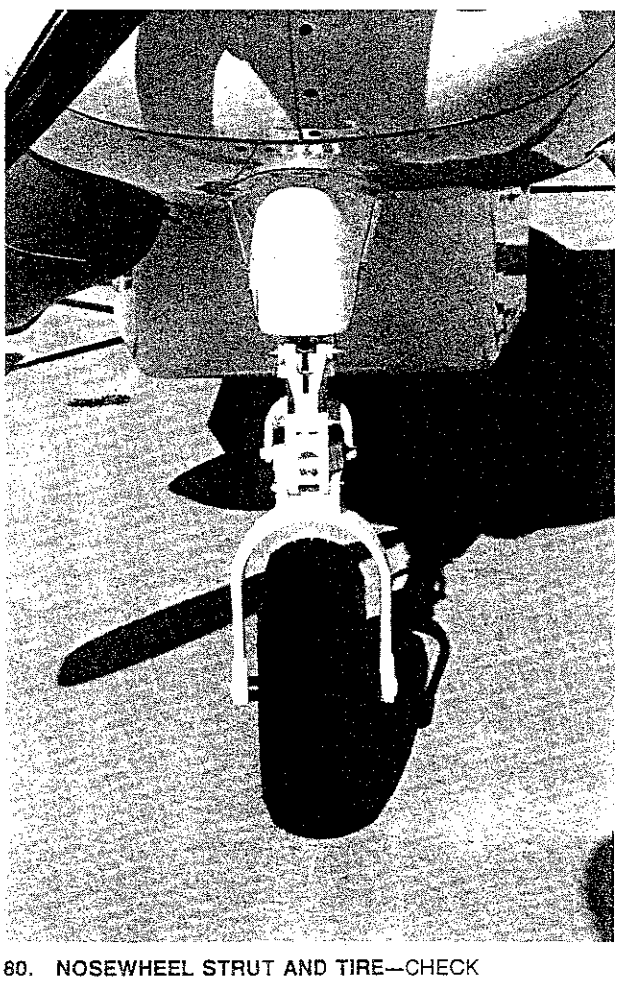
76. **AIR INLETS**—CHECK

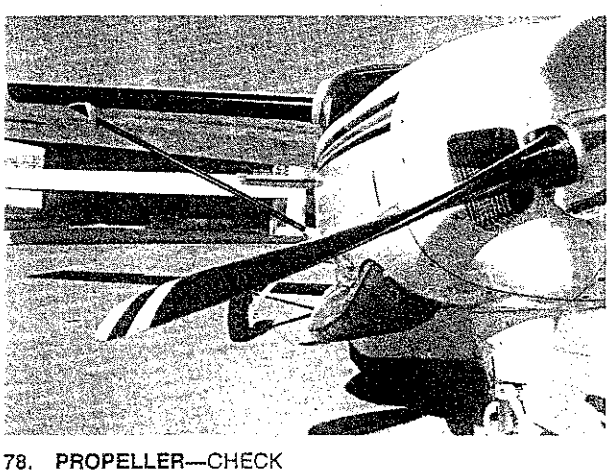


79. **PROPELLER SPINNER**—CHECK CONDITION AND SECURITY



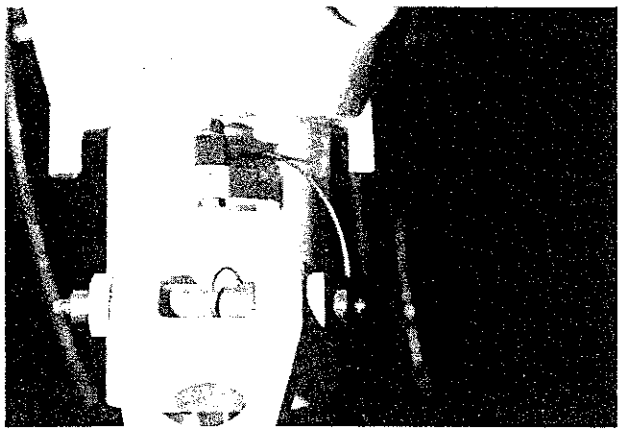
77. **PROPELLER ANCHOR**—REMOVE



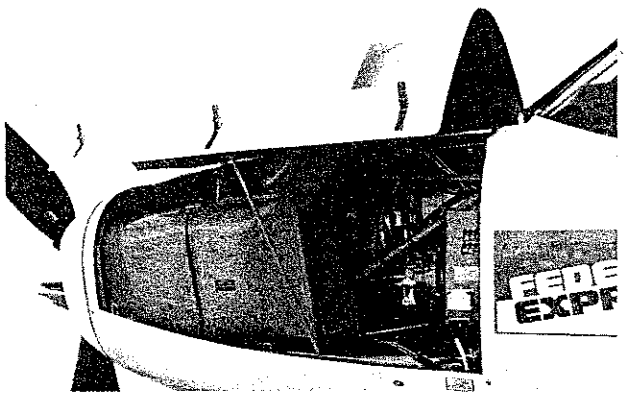


78. **PROPELLER**—CHECK

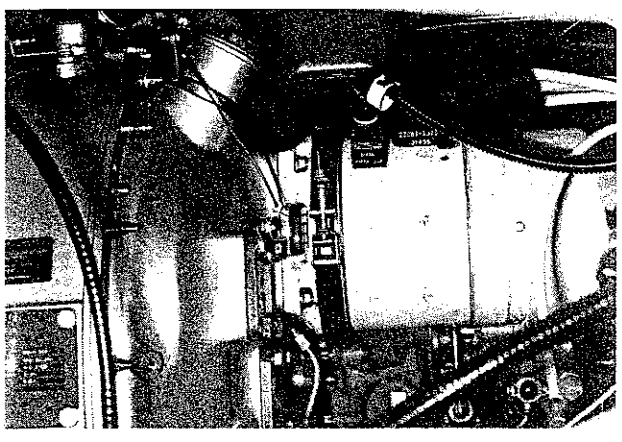
80. **NOSEWHEEL STRUT AND TIRE**—CHECK



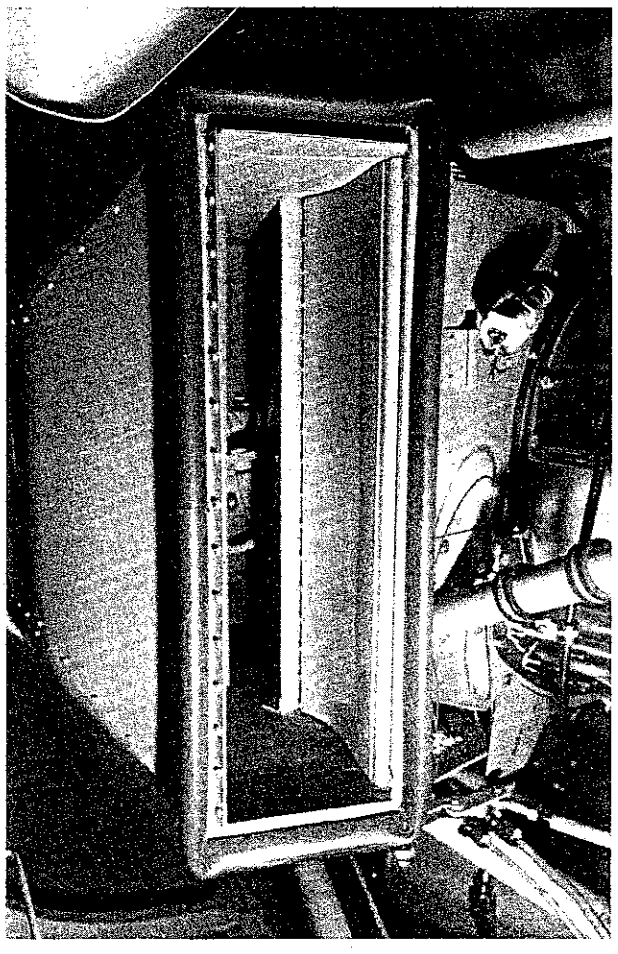
81. **RED OVERTRAVEL INDICATOR BLOCK AND CABLE**—CHECK



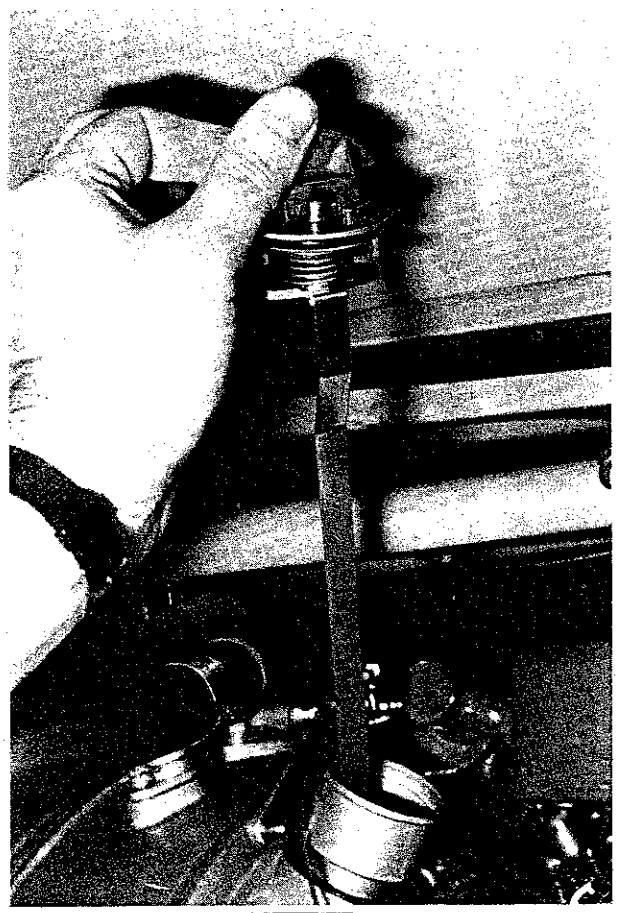
82. **COWLING**—OPEN LEFT SIDE OF UPPER COWLING FOR ACCESS AND CHECK CONDITION AND SECURITY

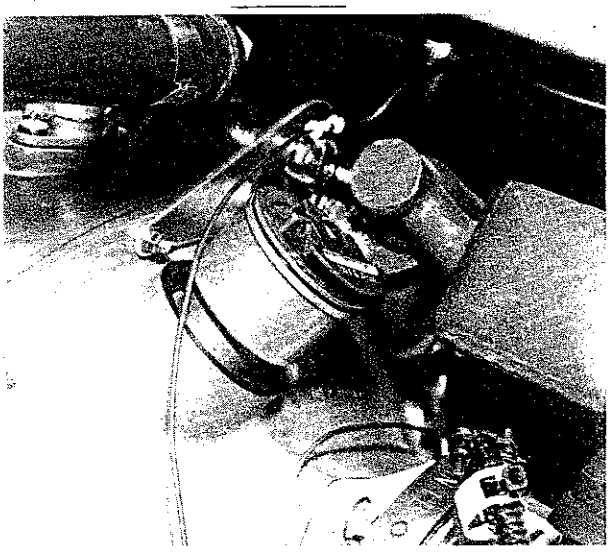


83. **ENGINE (LEFT SIDE)**—CHECK FOR GENERAL CONDITION, SECURITY, FUEL AND OIL LEAKAGE, AND DAMAGE TO ANY COMPONENTS

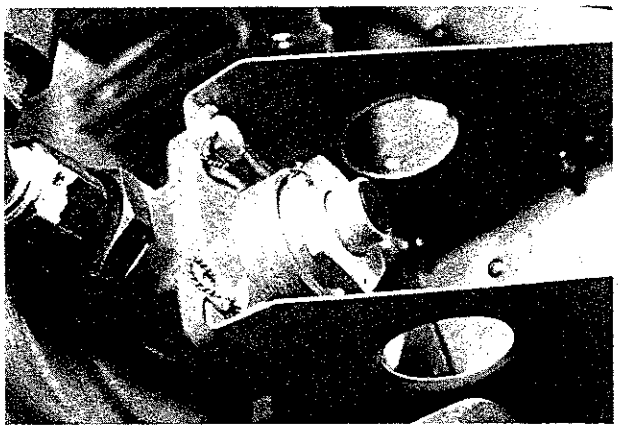


84. **INERTIAL SEPARATOR BYPASS OUTLET**—CHECK CLOSED AND DUCT FREE OF DEBRIS

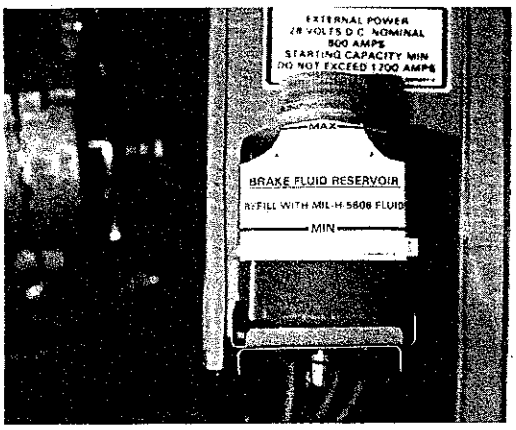




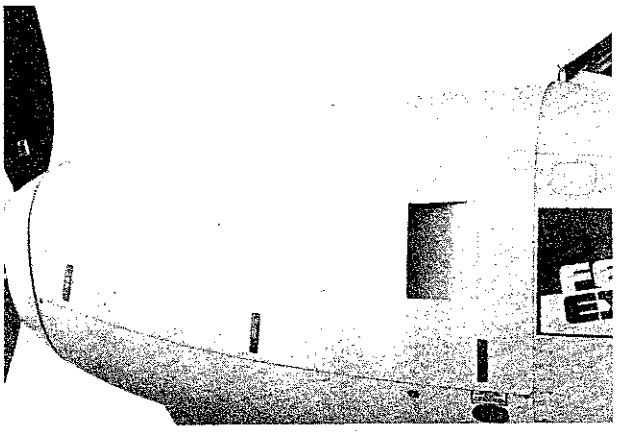
85. **OIL DIPSTICK/FILLER CAP**—CHECK OIL LEVEL, THEN CHECK DIPSTICK/FILLER CAP—SECURE



86. **FUEL FILTER**—CHECK FUEL FILTER BYPASS FLAG FOR PROPER LOCATION (FLUSH)



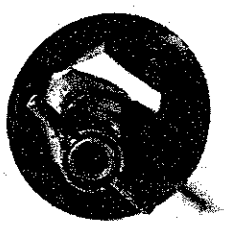
87. **BRAKE FLUID RESERVOIR**—CHECK LEVEL



88. **COWLING**—CLOSE AND LATCH LEFT SIDE

89. **FUEL FILTER QUICK-DRAIN VALVE**—DRAIN

91. **FUEL CONTROL UNIT OIL DRAIN CAN (IF INSTALLED)**—DRAIN UNTIL EMPTY



90. **FUEL DRAIN CAN**—DRAIN UNTIL EMPTY

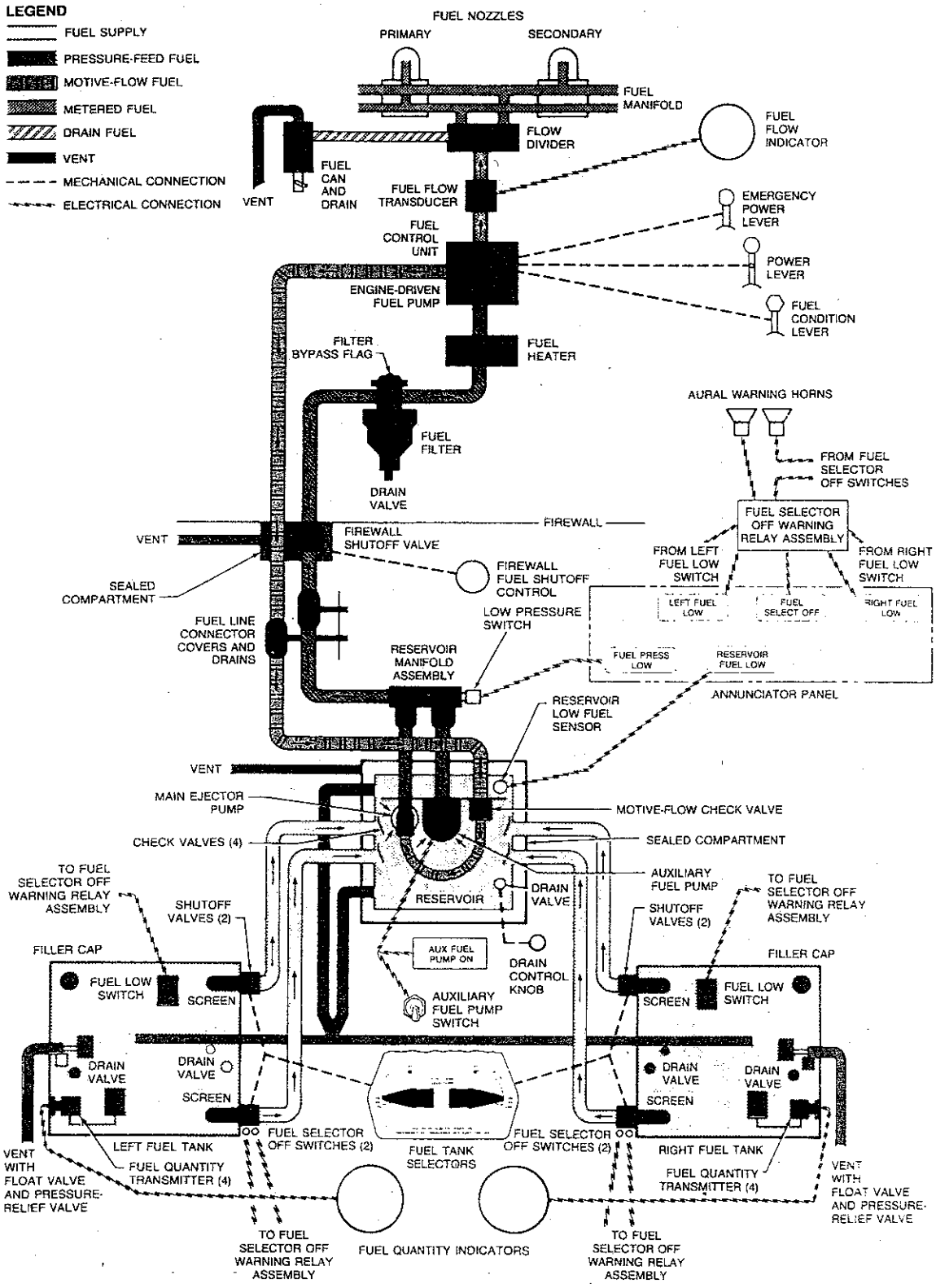


Figure 5-1. Fuel System

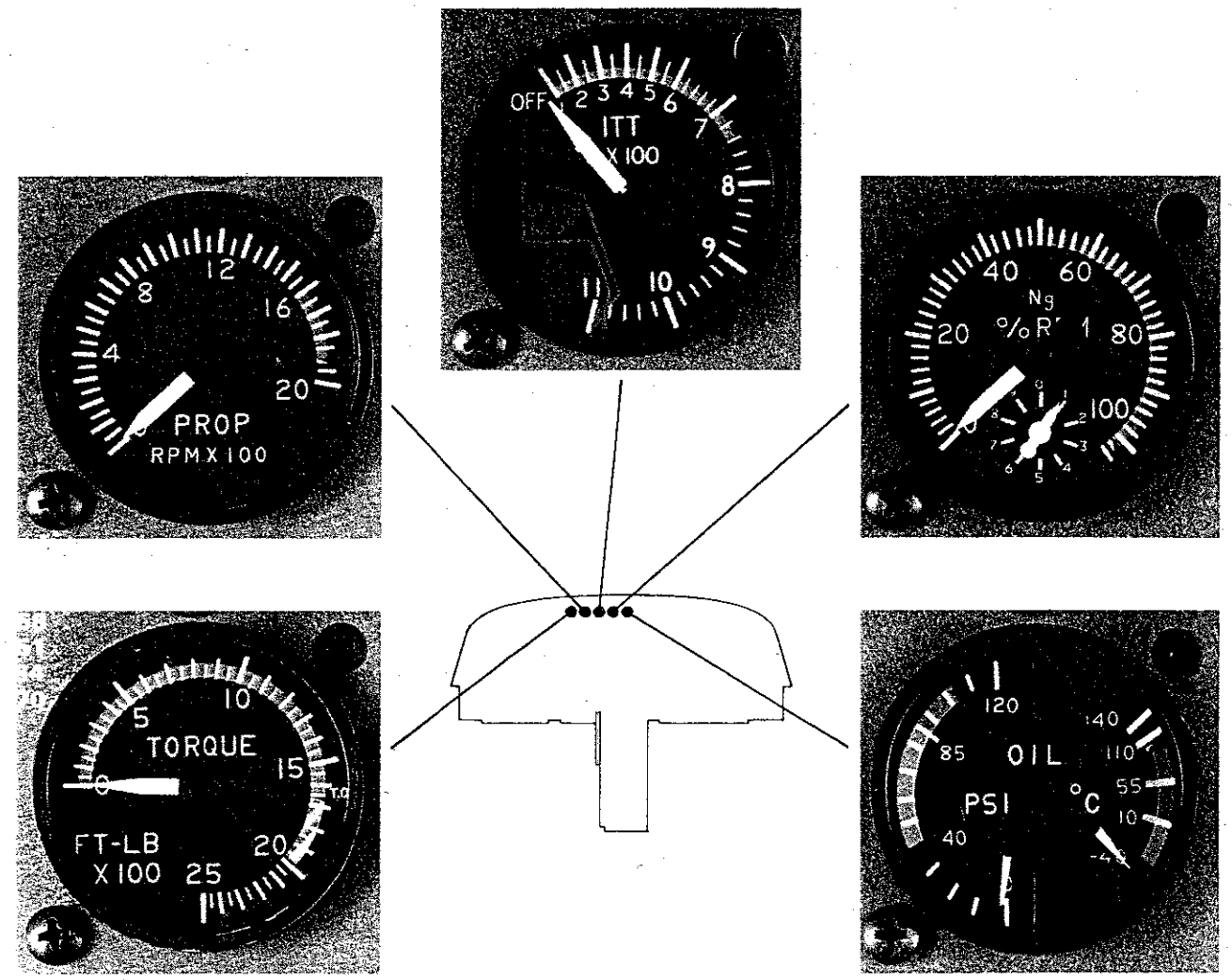


Figure 6-4. Engine Instruments

TORQUE INDICATOR

The torque indicator is located on the upper portion of the instrument panel and indicates the torque being produced by the engine. On the standard 208B, the torque indicator is electrically powered and indicates torque in foot-pounds. It is powered through a circuit breaker labeled "TRQ IND," located on the circuit-breaker panel. On the Super Cargomaster, the torque indicator is pressure-actuated.

Instrument markings indicate that the normal operating range (green arc) is from 0 to 1,658 foot-pounds, the alternate power range (striped green arc) is from 1,658 to 1,970 foot-pounds, and maximum torque (red line) is 1,970 foot-pounds. Maximum takeoff torque is denoted by "T.O." and a red wedge at 1,658 foot-pounds.

PROPELLER RPM INDICATOR

The propeller rpm indicator is located on the upper portion of the instrument panel. The instrument is marked in increments of 50 rpm and indicates propeller speed in revolutions per minute. The instrument is electrically operated from the propeller tachometer-generator, which is mounted on the right side of the front case. Instrument markings indicate a normal operating range (green arc) of from 1,600 to 1,900 rpm and a maximum (red line) of 1,900 rpm.

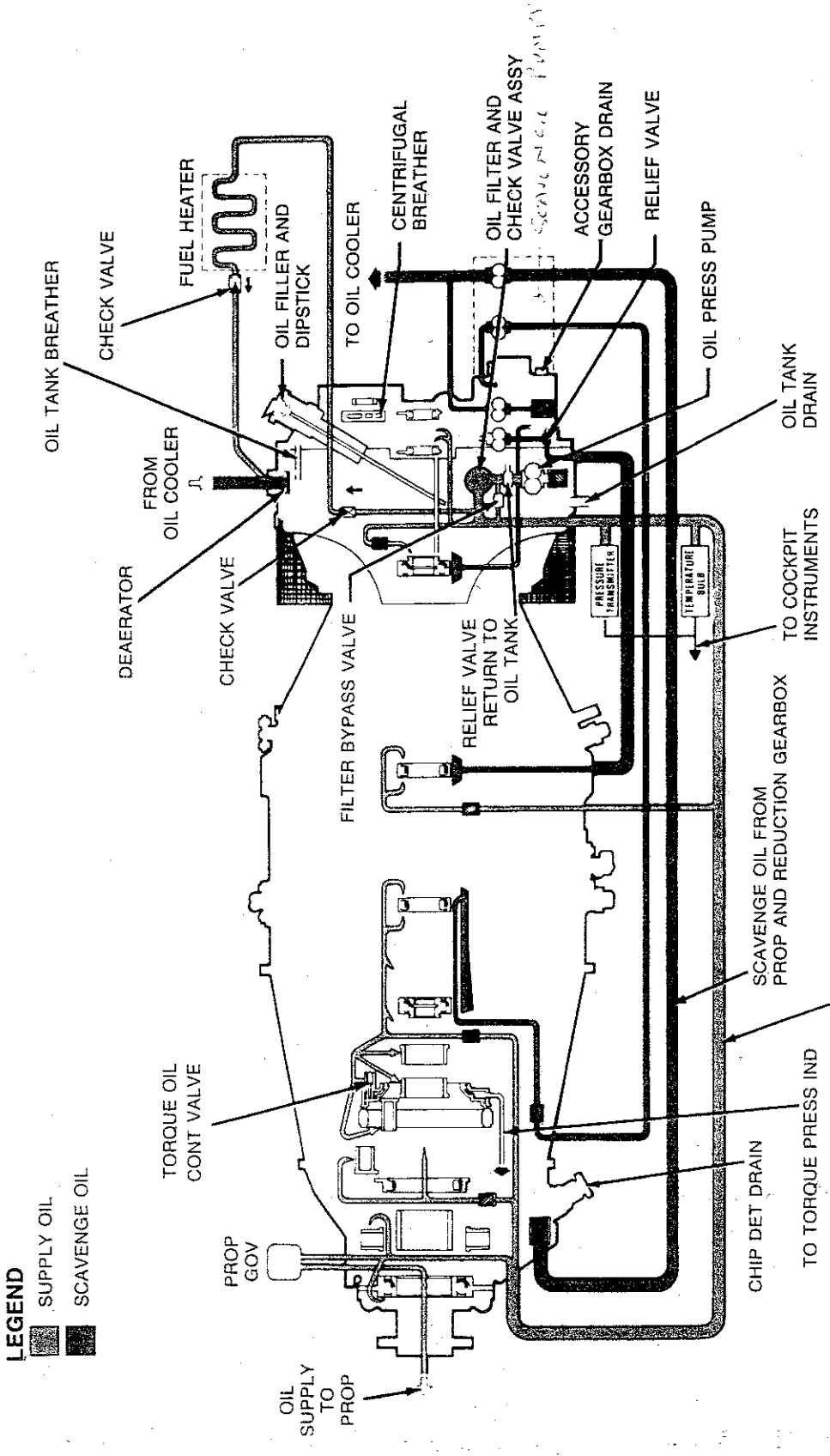


Figure 6-5. Oil System Schematic

An oil dipstick/filler cap is located at the rear of the engine on the left side and is accessible when the left side of the upper cowling is raised (Figure 6-6). The oil tank capacity is 9.5 U.S. quarts, and total system capacity is 14 U.S. quarts. The top five quarts can be measured by the dipstick (Figure 6-7). The oil level should be maintained to within 2 quarts of MAX HOT or MAX COLD as appropriate.

NOTE

To obtain an accurate oil level reading, it is recommended that the oil level be checked either within ten minutes after engine shutdown while the oil is hot (MAX HOT marking) or prior to the first flight of the day while the oil is cold (MAX COLD marking). If more than ten minutes has elapsed since engine shutdown, and engine oil is still warm, perform an engine dry motoring run before checking the oil level.

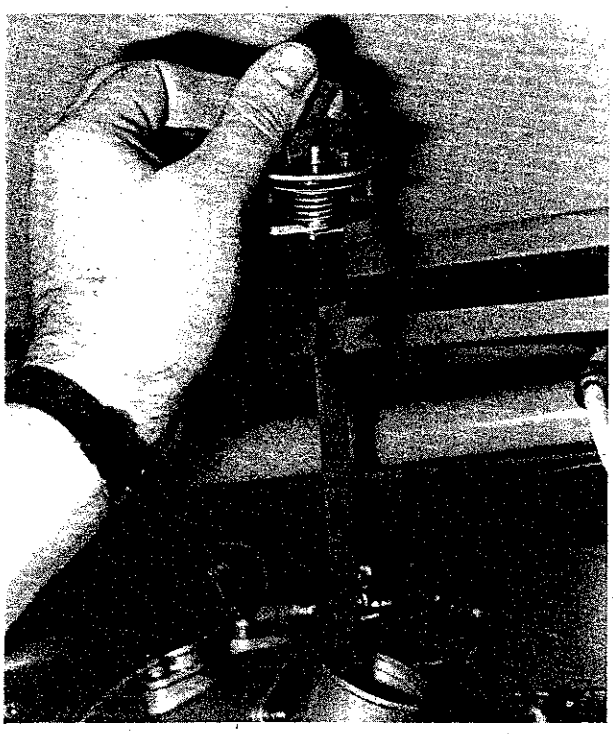


Figure 6-6. Oil Dipstick/ Filler Cap

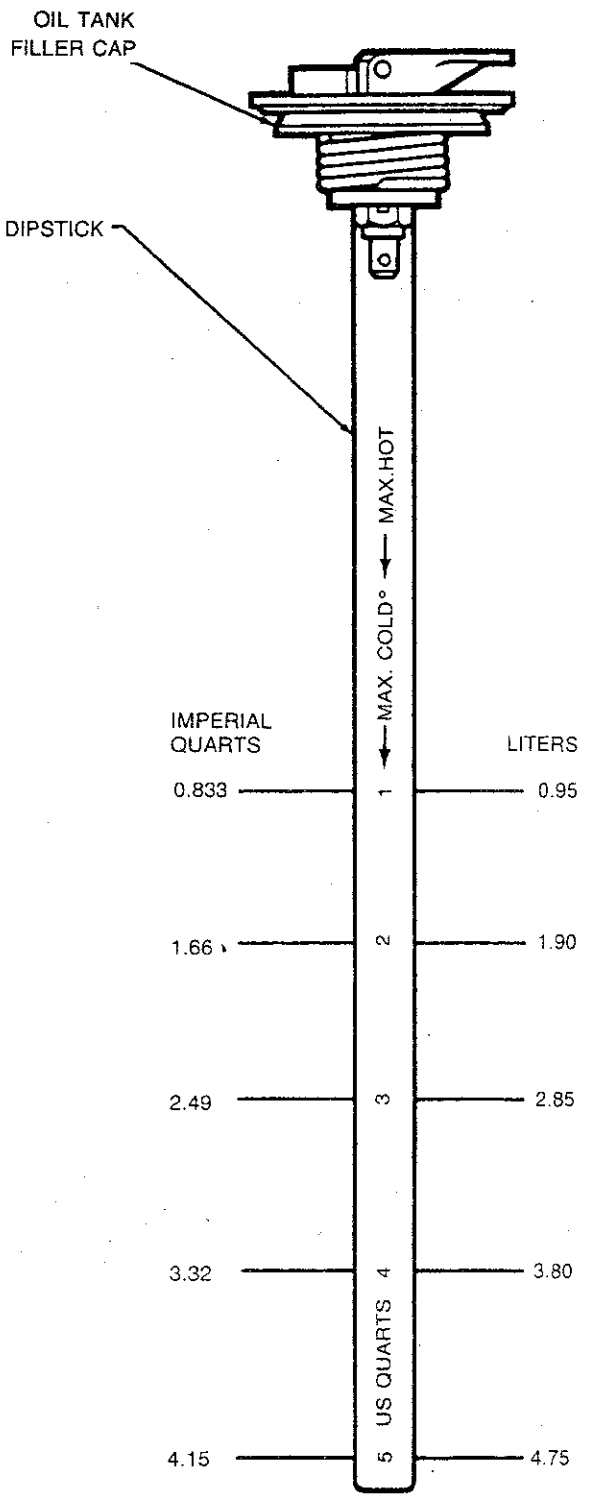


Figure 6-7. Oil Dipstick Markings

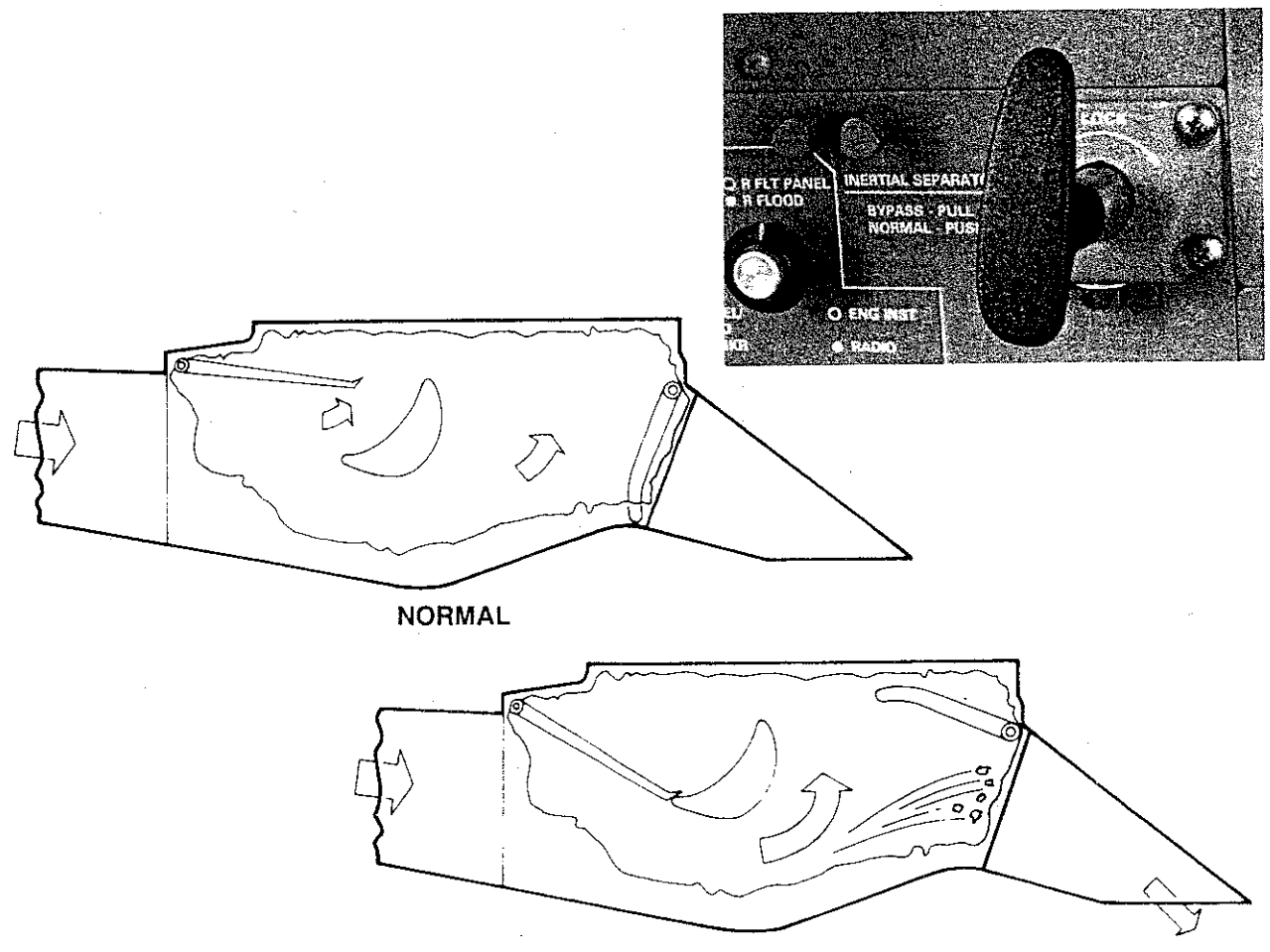


Figure 6-9. Inertial Separator and T-Handle

Inertial separator operation is controlled by a T-handle located on the lower instrument panel (Figure 6-9). The T-handle is labeled "BYPASS-PULL" and "NORMAL-PUSH." The BYPASS position should be used when flying through visible moisture such as clouds, rain, snow, and ice crystals with an outside air temperature of 4° C or less. It may also be used for ground operations or takeoffs from dusty, sandy field conditions to minimize ingestion of foreign particles into the compressor. The NORMAL position is used for all other operations.

The T-handle locks in the NORMAL position by rotating the handle clockwise one quarter turn to its vertical position. To unlock, push forward slightly and rotate the handle 90° counterclockwise. The handle can then be pulled into the BYPASS position. Once moved to the BYPASS position, airloads on the movable vanes hold them in position.

NOTE

When moving the inertial separator control from the BYPASS to the NORMAL position during flight, reduction of engine power will reduce the control forces. Care should also be taken to avoid allowing the separator vanes to slam from one position to the other under the force of the airloads. Maintain a firm grip on the T-handle when operating the inertial separator.

ENGINE FUEL SYSTEM

The engine fuel system consists of an oil-to-fuel heater, an engine-driven fuel pump, a fuel control unit, a flow divider and dump valve, a dual fuel manifold with 14 simplex nozzles, and two fuel drain lines (Figure 6-10). The system provides fuel flow to satisfy the speed and power demands of the engine.

Fuel from the airplane reservoir is delivered to the oil-to-fuel heater, which is essentially a heat exchanger which utilizes heat from the engine lubricating oil system to preheat the fuel in the fuel system (Figure 6-11). A fuel temperature-sensing oil bypass valve regulates the fuel temperature by allowing oil either to flow through the heater circuit or to bypass it to the engine oil tank.

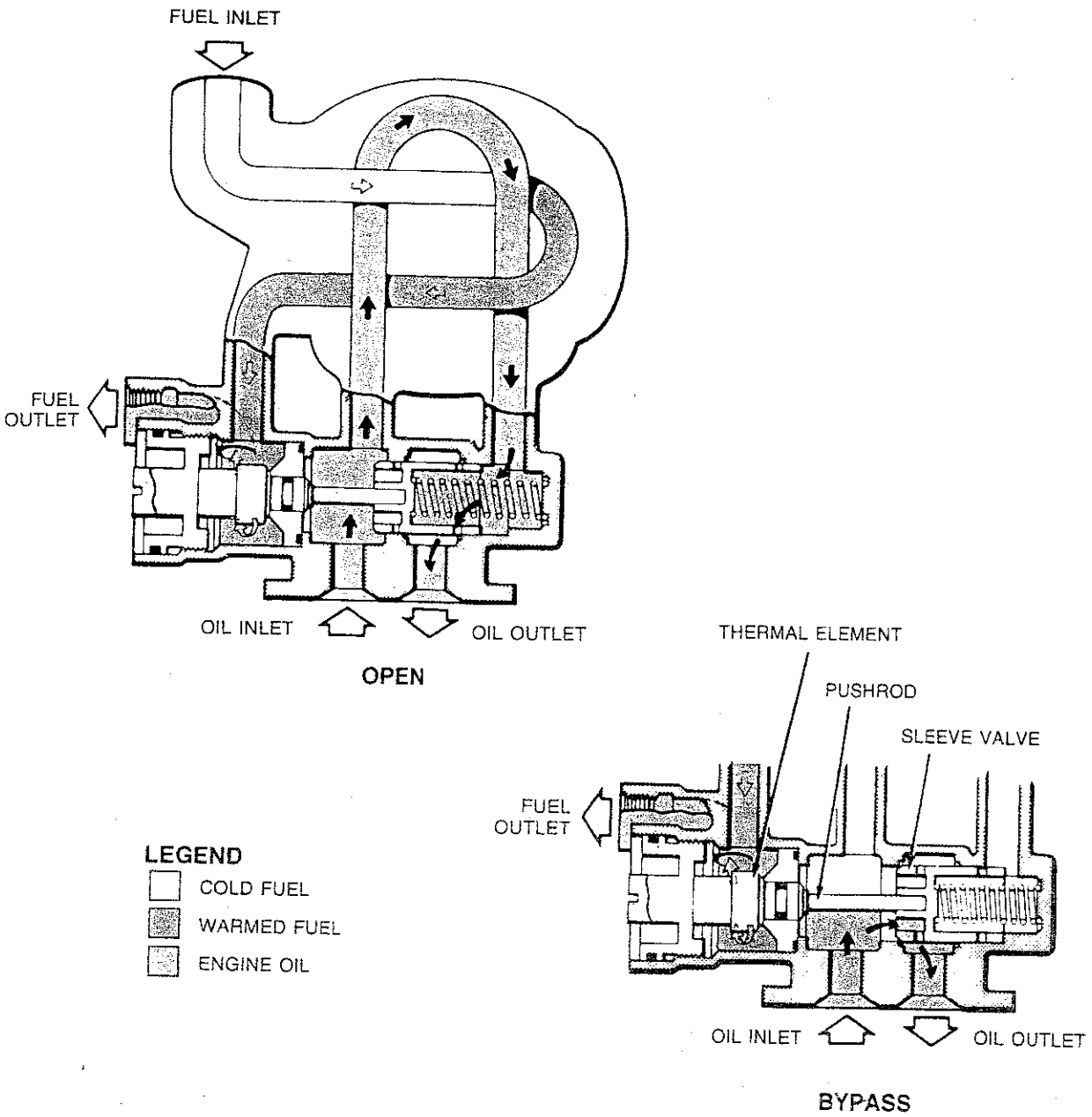


Figure 6-11. Oil-to-Fuel Heater

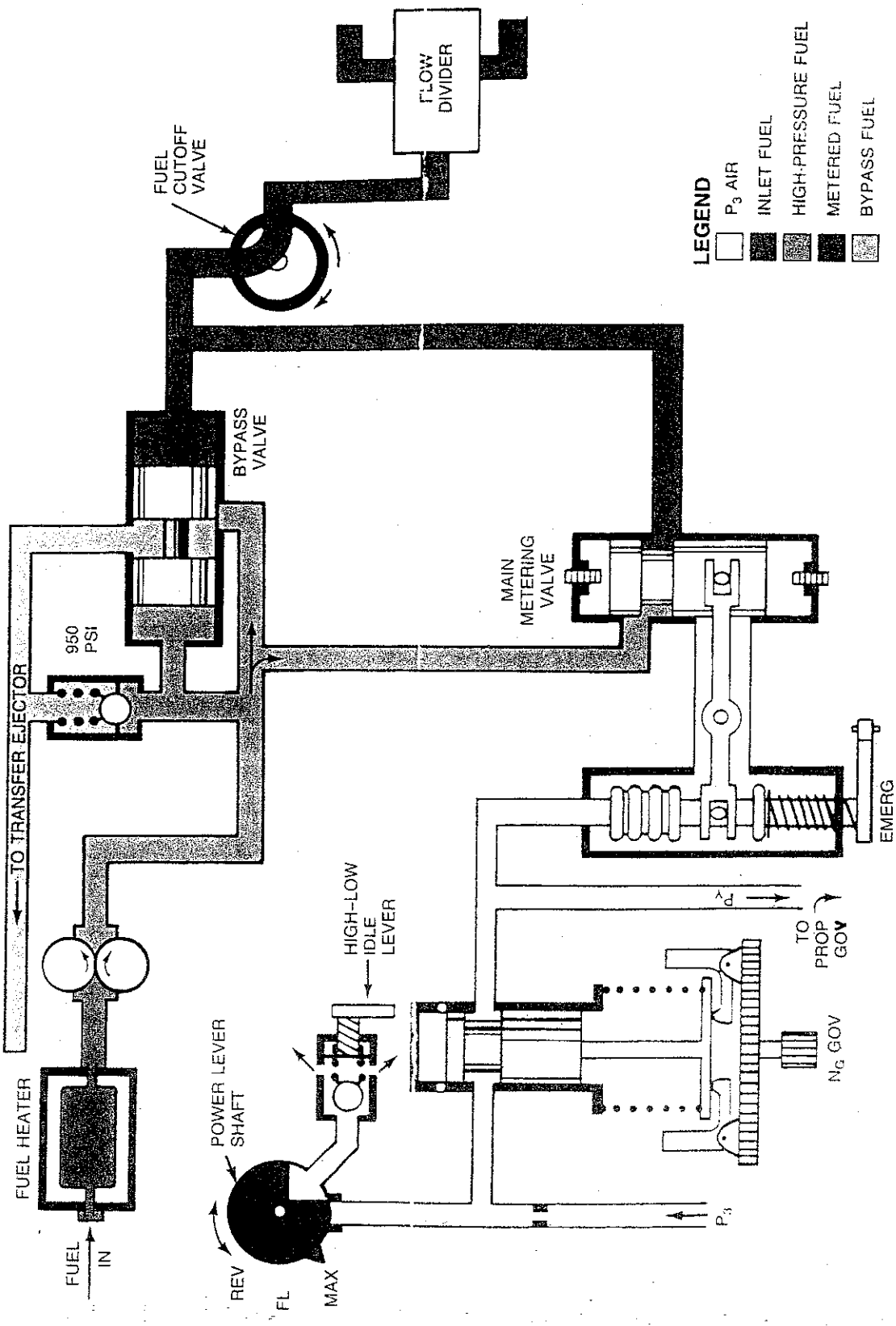


Figure 6-10. Engine Fuel System

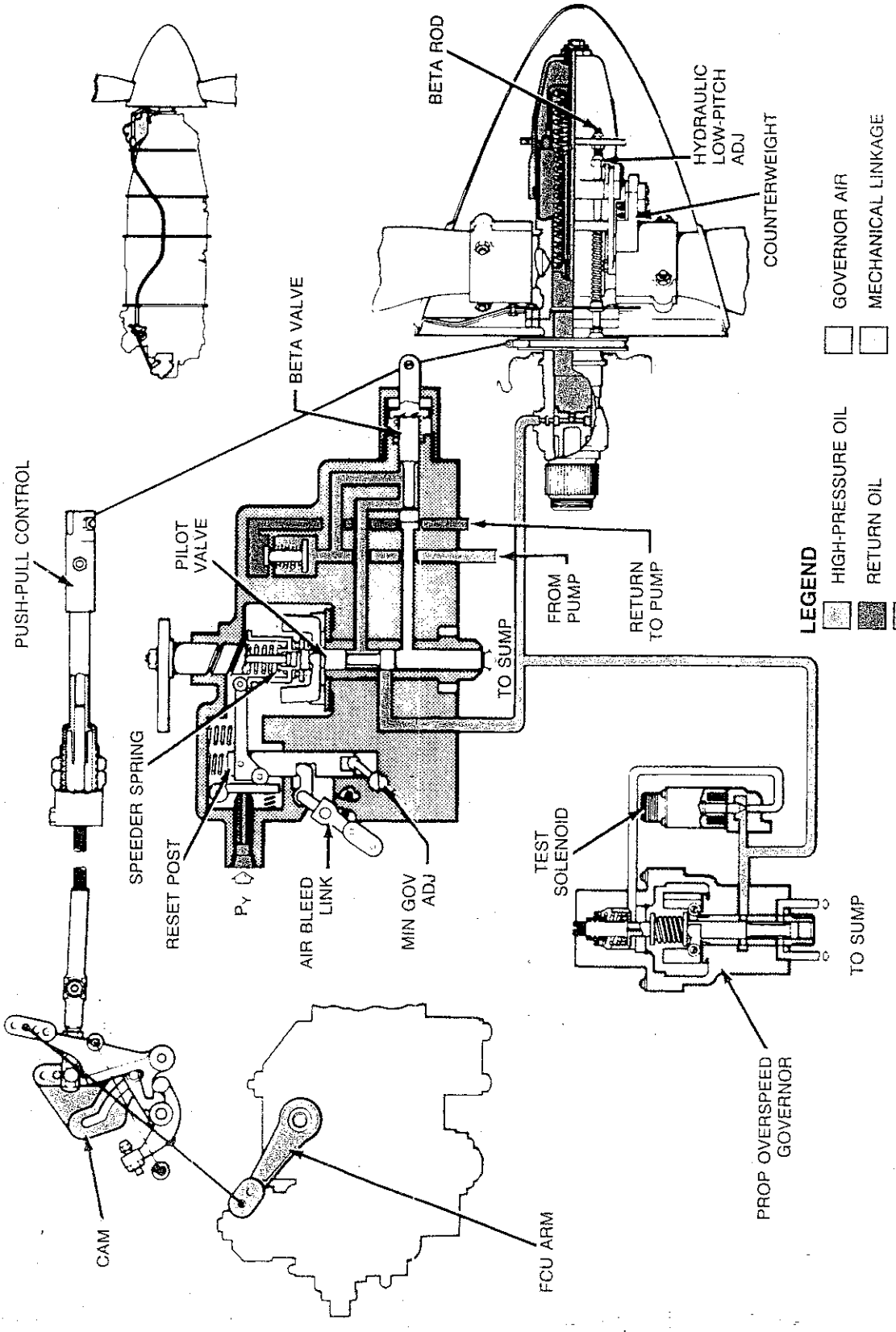


Figure 6-13. Propeller System (Cruise)

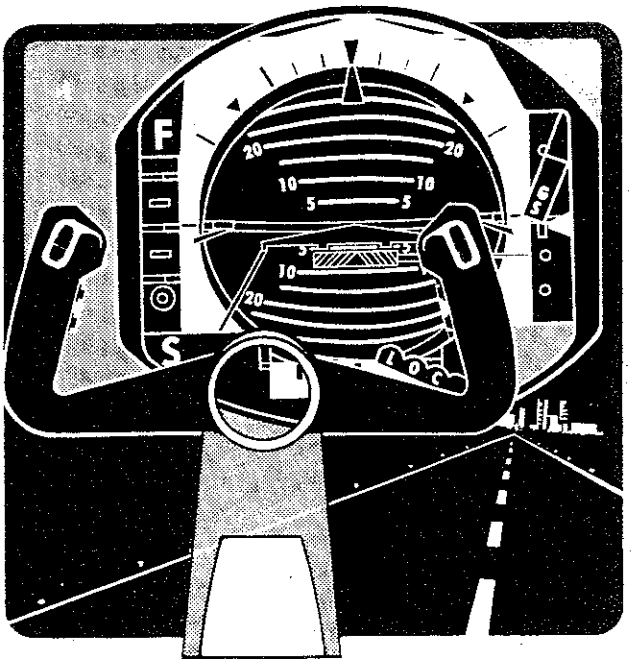
CHAPTER 9
FLIGHT CONTROLS
CONTENTS

	Page
GENERAL	9-1
WING SPOILERS	9-2
TRIM SYSTEMS	9-2
CONTROL LOCKS	9-3
STALL WARNING SYSTEM	9-4
WING FLAP SYSTEM	9-5
QUESTIONS	9-7

ILLUSTRATIONS

Figure	Title	Page
9-1	Wing Spoilers	9-2
9-2	Aileron Servo Tab	9-2
9-3	Aileron Trim Tab	9-2
9-4	Aileron Trim Knob	9-2
9-5	Elevator Trim Wheel	9-3
9-6	Control Wheel Lock	9-3
9-7	Rudder Lock	9-4
9-8	Stall Warning Vane	9-4
9-9	Wing Flap	9-5
9-10	WING FLAPS Selector and Position Indicator	9-5
9-11	Standby Flap System Controls	9-6

CHAPTER 9
FLIGHT CONTROLS



GENERAL

The flight control system on the Caravan I consists of conventional aileron, elevator, and rudder control surfaces and a pair of spoilers mounted above the outboard ends of the flaps. The control surfaces are manually operated through mechanical linkages, using a control wheel for the ailerons, spoilers, and elevator and rudder/brake pedals for the rudder.

WING SPOILERS

The wing spoilers improve lateral control of the airplane at low speeds by disrupting lift over the appropriate flap (Figure 9-1). The spoilers are interconnected with the aileron system through a pushrod mounted to an arm of the aileron bellcrank. While the movement of the spoilers begins simultaneously with the upward travel of the aileron, movement of the spoilers for the first 5° of aileron travel is negligible. Once the aileron has been deflected upward past the 5° point, the spoilers begin to deflect upward at a more proportional rate until they reach the fully up position. When the aileron is deflected downward, the spoiler is completely retracted. Aileron servo tabs provide reduced maneuvering control wheel forces (Figure 9-2).

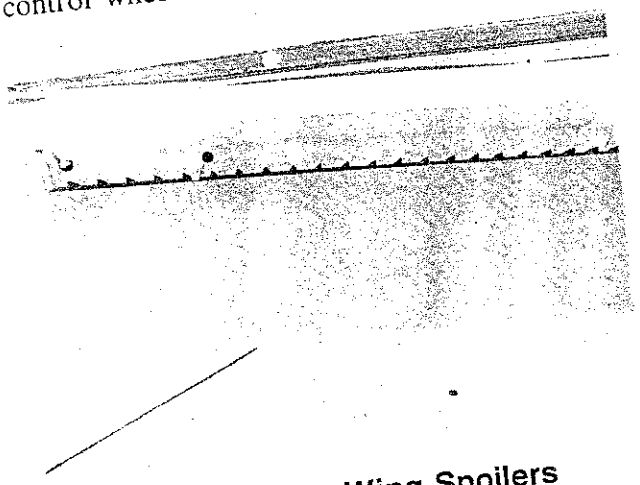


Figure 9-1. Wing Spoilers

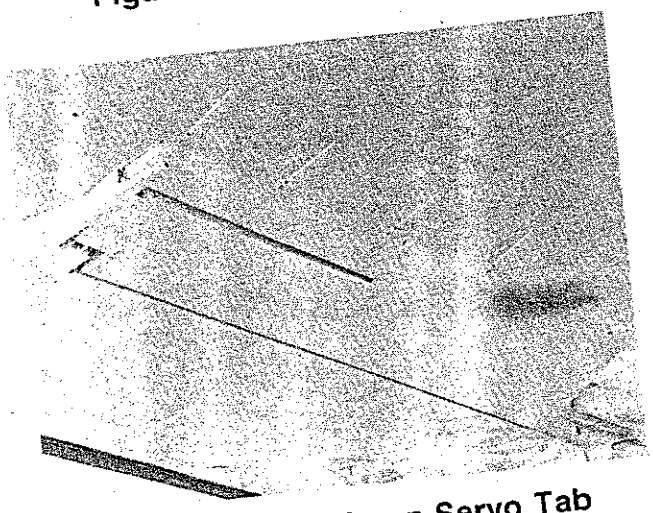


Figure 9-2. Aileron Servo Tab

TRIM SYSTEMS

Manually operated aileron, elevator, der trim systems are provided. Aileron is achieved by a trimmable servo tab to the right aileron (Figure 9-3). It is mechanically to a knob located on th pedestal (Figure 9-4). Rotating the tri the right (clockwise) trims the right w conversely, rotating the trim knob (counterclockwise) trims the left w

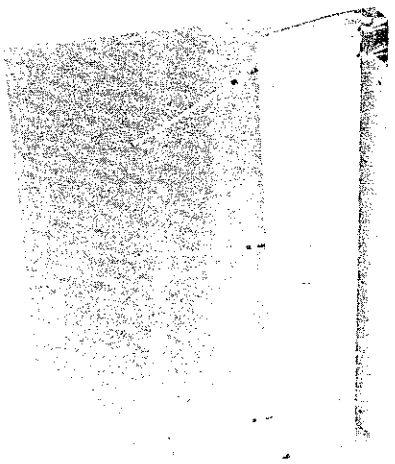


Figure 9-3. Aileron

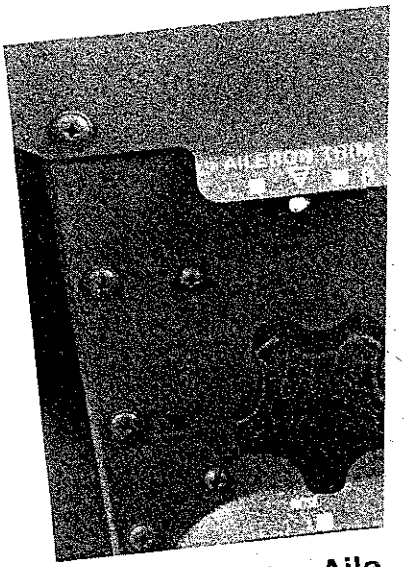


Figure 9-4. Aile

Elevator trimming is accomplished through two elevator trim tabs by utilizing the vertically mounted trim wheel on the top left side of the control pedestal (Figure 9-5).

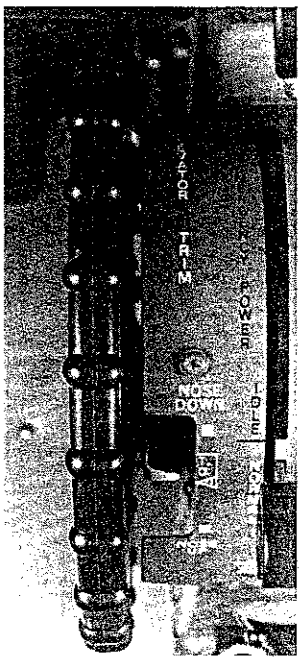


Figure 9-5. Elevator Trim Wheel

Rudder trimming is accomplished through the nosewheel steering bungee connected to the rudder control system and a trim control wheel mounted on the control pedestal by rotating the horizontally mounted trim control wheel either left or right to the desired trim position. Rotating the trim wheel to the right will trim nose-right; conversely, rotating it to the left will trim nose-left.

The rudder trimming system acts against the steering bungee to displace the rudder pedals and move the rudder itself. The ability to trim the rudder is dependent upon the nose gear extending fully and locking into the center position. If the nose gear is not locked in the center position, moving the trim wheel will only move the nosewheel left or right and will not affect the rudder. If several attempts to trim the rudder have no apparent effect on control forces, the pilot should consider centering the rudder trim control for the remainder of the flight and notifying maintenance upon landing.

CONTROL LOCKS

A control lock is provided to lock the aileron and elevator control surfaces to prevent damage to these systems by wind buffeting while the airplane is parked. The lock consists of a shaped steel rod and flag. The flag identifies it as a control lock and cautions about its removal before starting the engine (Figure 9-6). To install the control lock, align the hole in the right side of the pilot's control wheel shaft with the hole in the right side of the shaft collar on the instrument panel, and insert the rod into the aligned holes. Installation of the lock will secure the ailerons in a neutral position and the elevators in a slightly trailing-edge-down position. Proper installation of the lock will place the flag over the left sidewall switch panel.

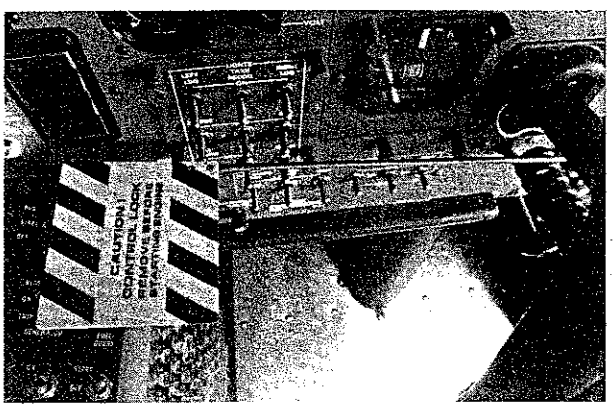


Figure 9-6. Control Wheel Lock

The airplane is equipped with a rudder lock which is operated by a spring-loaded T-handle located on the bottom of the instrument panel to the right of the control pedestal (Figure 9-7). The handle is labeled "RUDDER LOCK PULL" and, when pulled out, locks the rudder in the neutral position. An interlock between the rudder lock and the fuel condition lever prevents locking the rudder when the fuel condition lever is in any position other than CUTOFF. Should the rudder lock T-handle be left in the locked position inadvertently, moving the fuel condition lever out of CUTOFF, such as during the engine starting sequence, will automatically release the T-handle to the unlocked position. The T-handle is normally released from the locked position by rotating it 90° and allowing it to retract forward to the unlocked position.

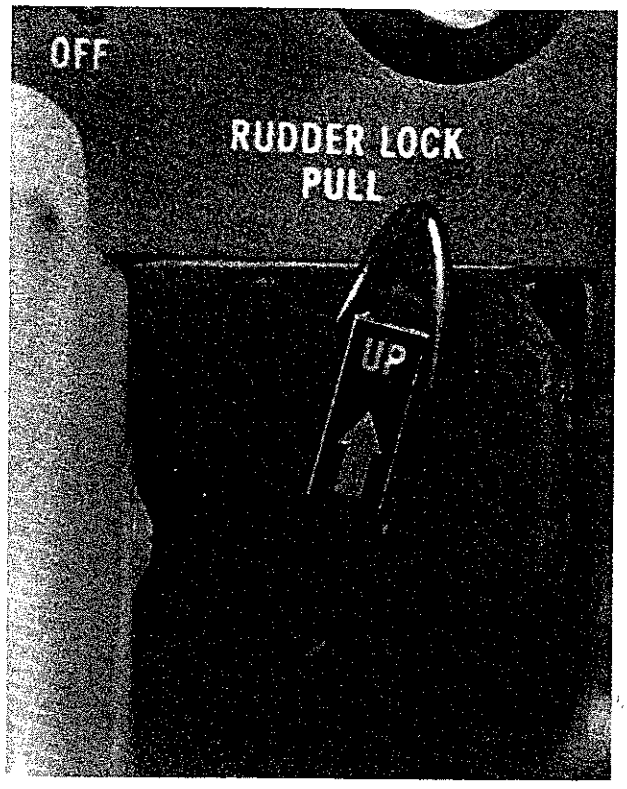


Figure 9-7. Rudder Lock

The control lock and any other type of locking device should be removed or unlocked prior to starting the engine.

STALL WARNING SYSTEM

The vane-type stall warning unit, which is installed in the leading edge of the left wing (Figure 9-8), is electrically connected to a stall warning horn located in the pilot's overhead panel. The vane in the wing senses the change in airflow over the wing and operates the warning horn at airspeeds of between 5 and 10 knots above the stall in all configurations.

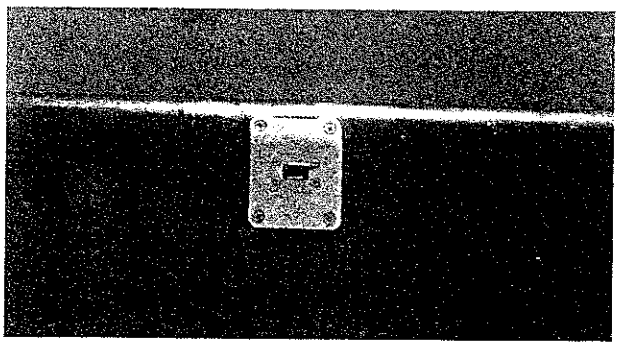


Figure 9-8. Stall Warning Vane

The stall warning system should be checked during the preflight inspection by momentarily turning the BATTERY switch on and actuating the vane in the wing. The system is operational if the warning horn sounds as the vane is pushed upward.

The stall warning system is protected by a circuit breaker labeled "STALL WRN," which can be pulled to shut off the warning horn in the event the vane sticks in the on position.

WARNING

This circuit breaker must be pushed in for landing.

The vane and sensor unit in the wing leading edge is equipped with a heating element. The heated part of the system is operated by the STALL HEAT switch on the DEICE/ANTI-ICE switch panel and is protected by the STALL WRN circuit breaker on the circuit-breaker panel.

WING FLAP SYSTEM

The wing flaps are large-span, single-slot and are driven by an electric motor (Figure 9-9). The wing flaps are extended or retracted by positioning the WING FLAPS selector lever on the control pedestal to the desired flap deflection position (Figure 9-10). The selector lever is moved up or down in a slotted panel that provides mechanical stops at the 10° and 20° positions. A white-tipped pointer on the left side of the selector lever provides a flap position indication. The system is protected by the FLAP MOTOR circuit breaker on the circuit-breaker panel.

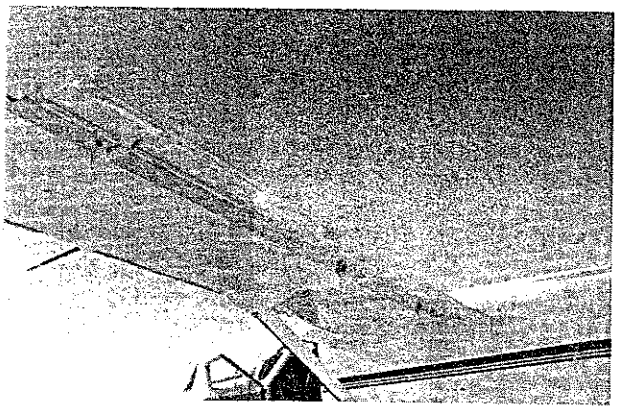


Figure 9-9. Wing Flap

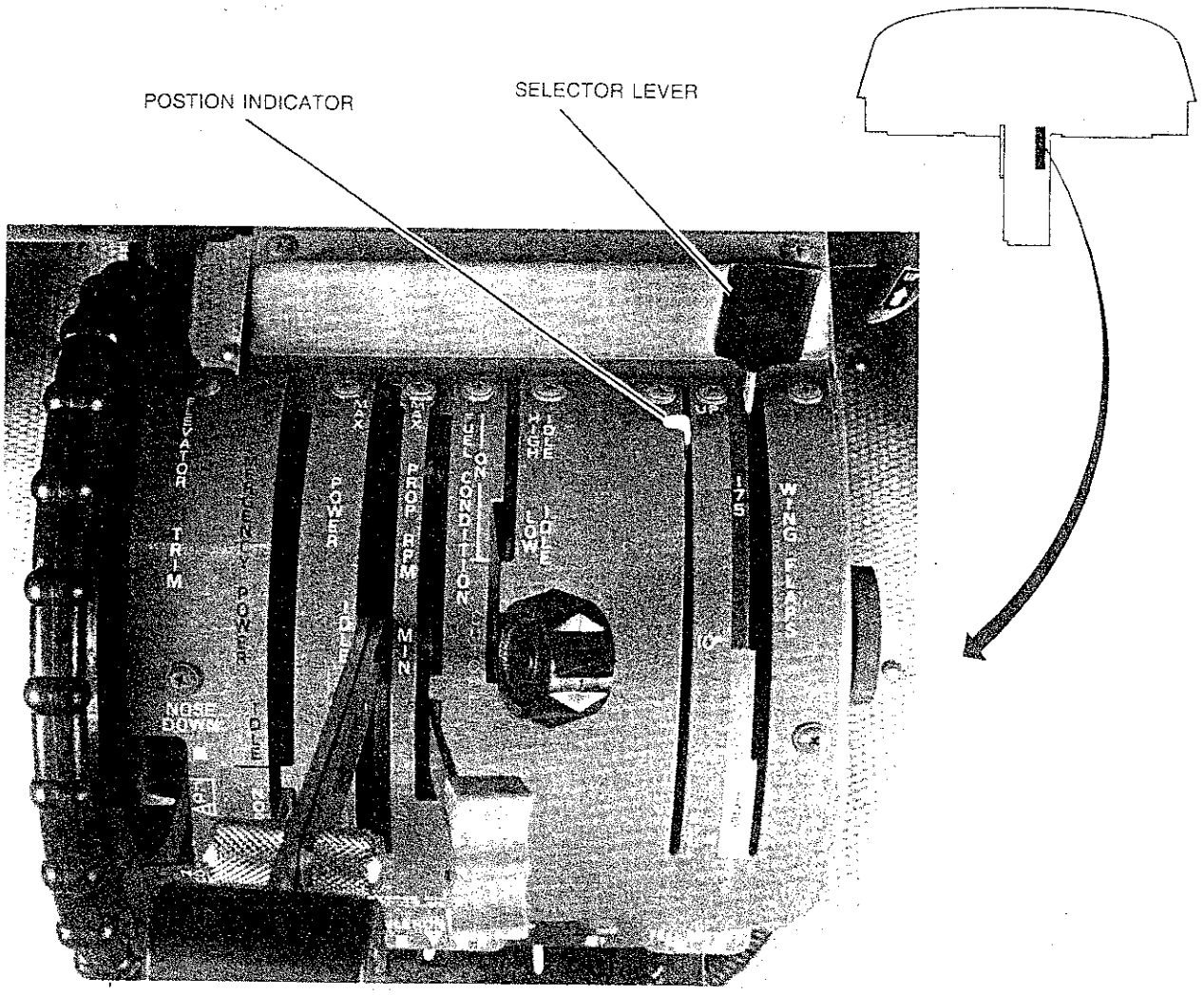


Figure 9-10. WING FLAPS Selector and Position Indicator

A standby system can be used to operate the flaps if the primary system malfunctions. The standby system consists of a standby motor, a guarded STBY FLAP MOTOR switch, and an UP-DOWN switch located on the overhead panel (Figure 9-11).

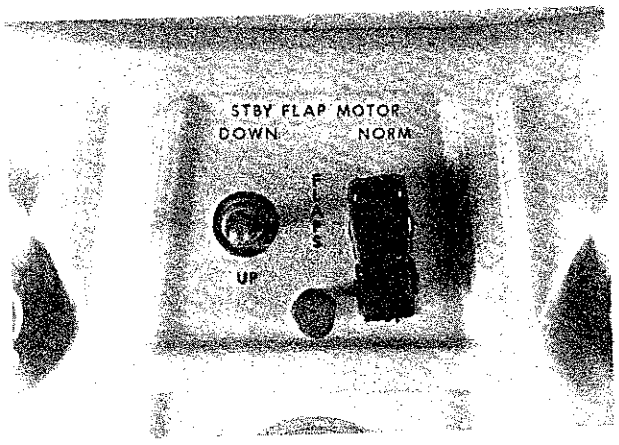


Figure 9-11. Standby Flap System Controls

The guarded STBY FLAP MOTOR switch has NORM and STBY positions. The guarded NORM position of the switch permits operation of the flaps using the selector on the control pe estal. The STBY position disables the dynan braking of the primary flap motor when t standby flap motor system is operated. The otl STBY FLAP MOTOR switch has UP, cent off, and DOWN positions.

To operate the flaps with the standby syste lift the guard and place the STBY FLAP M TOR switch in the STBY position; then actu the UP-DOWN switch momentarily to UP DOWN, as desired. It is very important to serve the flap position indicator while ope ing the standby system. Since the standby system does not have limit switches, actua of the STBY FLAP MOTOR UP-DO switch should be terminated when the flaps re full up or down travel; otherwise, damage tc standby flap motor mounts may result.

NOTE

Use of the standby flap system should be avoided with the KFC-250 autopilot engaged since this will cause the trim to run in the opposite direction to the autopilot inputs.

QUESTIONS

1. The wing spoilers on the Caravan I are designed to:
   A. Be used as speed reduction devices
   B. Improve lateral control of the airplane at low speeds
   C. Increase the effectiveness of the flaps
   D. Balance control forces in the aileron system

2. The rudder lock is operated by a T-handle which:
   A. Must be pulled out during engine start
   B. Must be pushed in to lock the rudder
   C. Is automatically released when the fuel condition lever is moved out of CUTOFF
   D. Is located on the center pedestal

3. The rudder trim system:
   A. Operates a trim tab on the rudder
   B. Is operated electrically
   C. Operates against the nosewheel steering bungee
   D. Is controlled by a knob on the instrument panel

4. The standby flap system is operated:
   A. Until the flaps reach their stops
   B. Until the flap position indicator reaches the desired setting
   C. By using the crank on the overhead panel
   D. Hydraulically

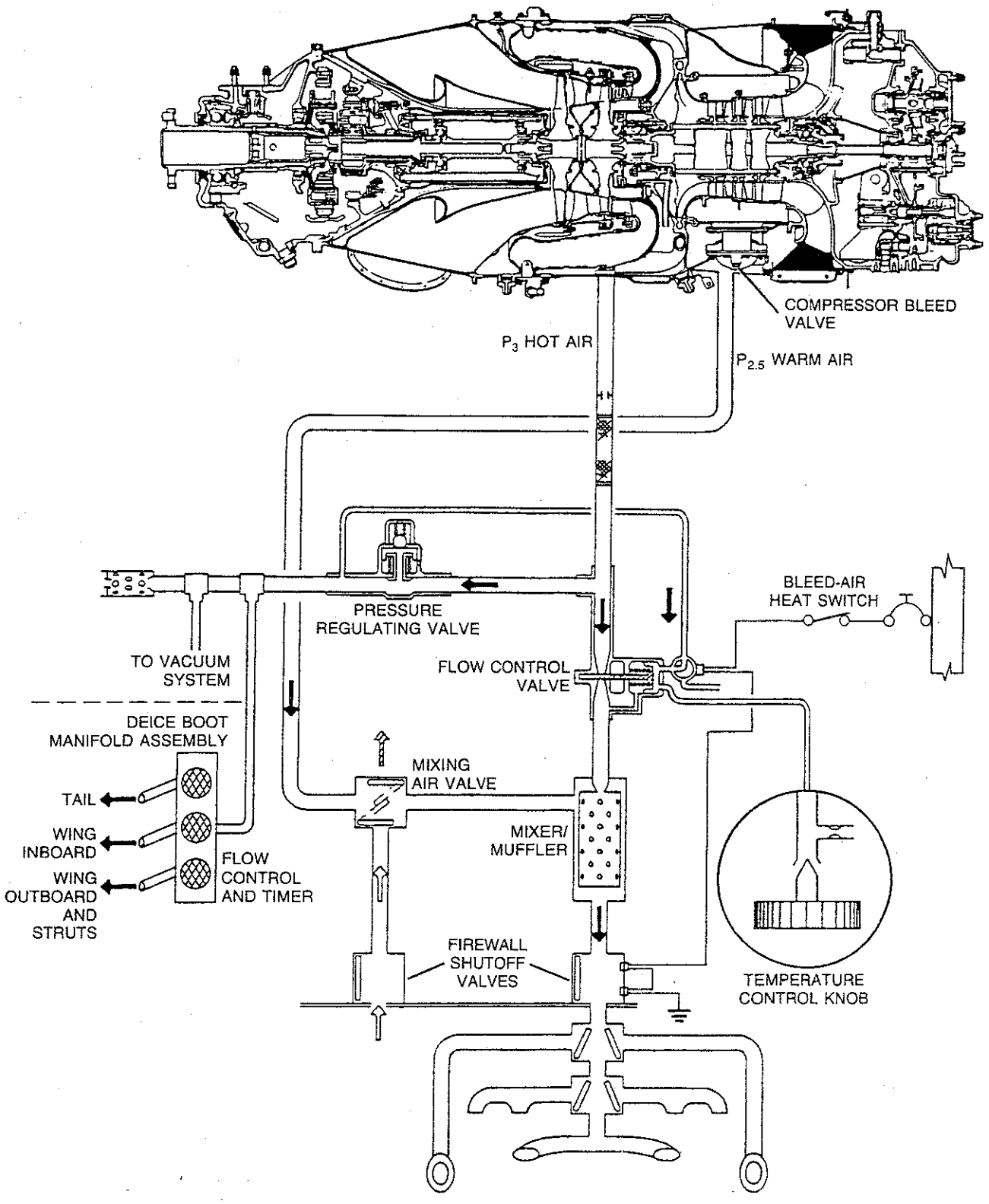


Figure 11-1. Cabin Heating, Ventilating, and Defrosting System

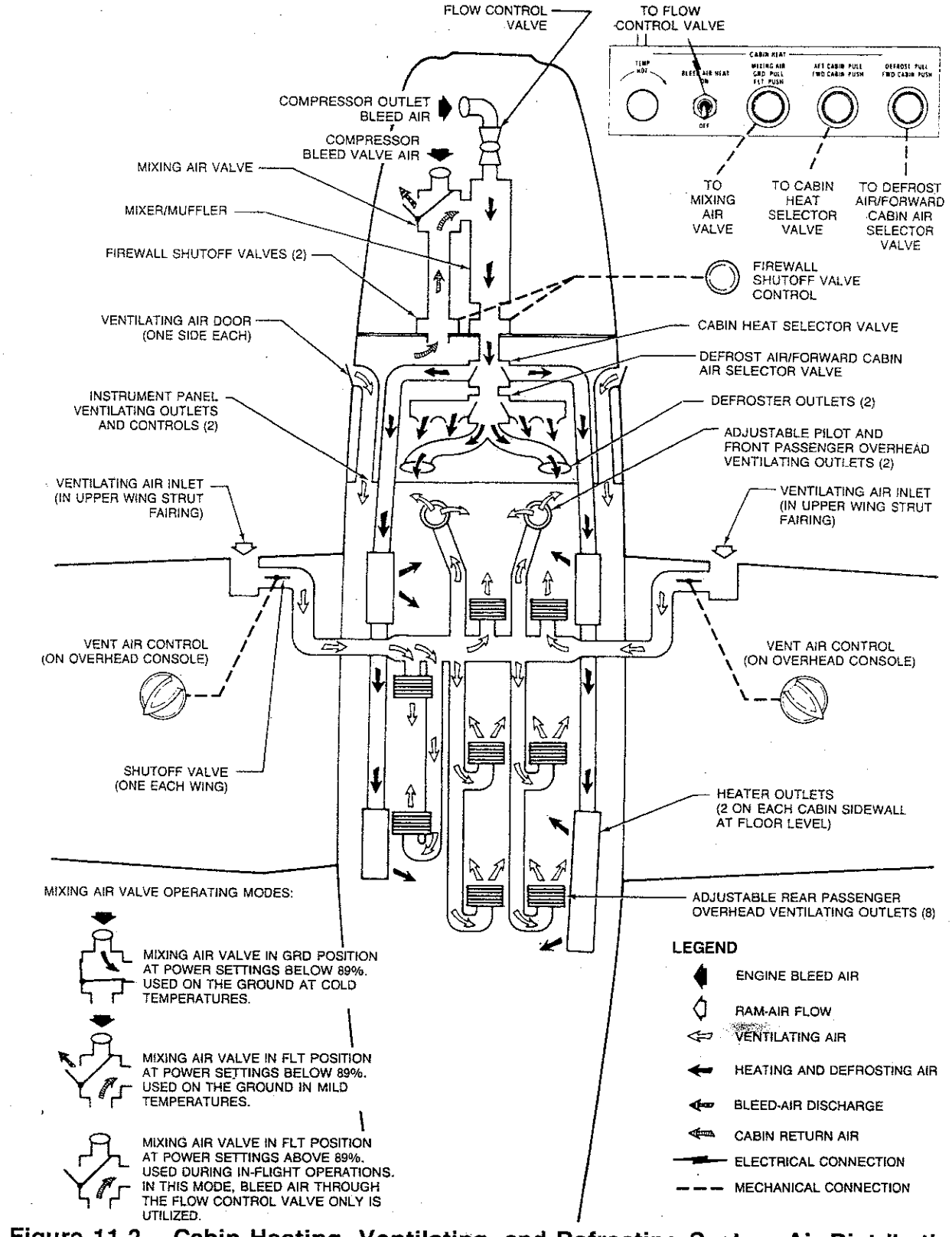


Figure 11-2. Cabin Heating, Ventilating, and Defrosting System Air Distribution (Standard 208)

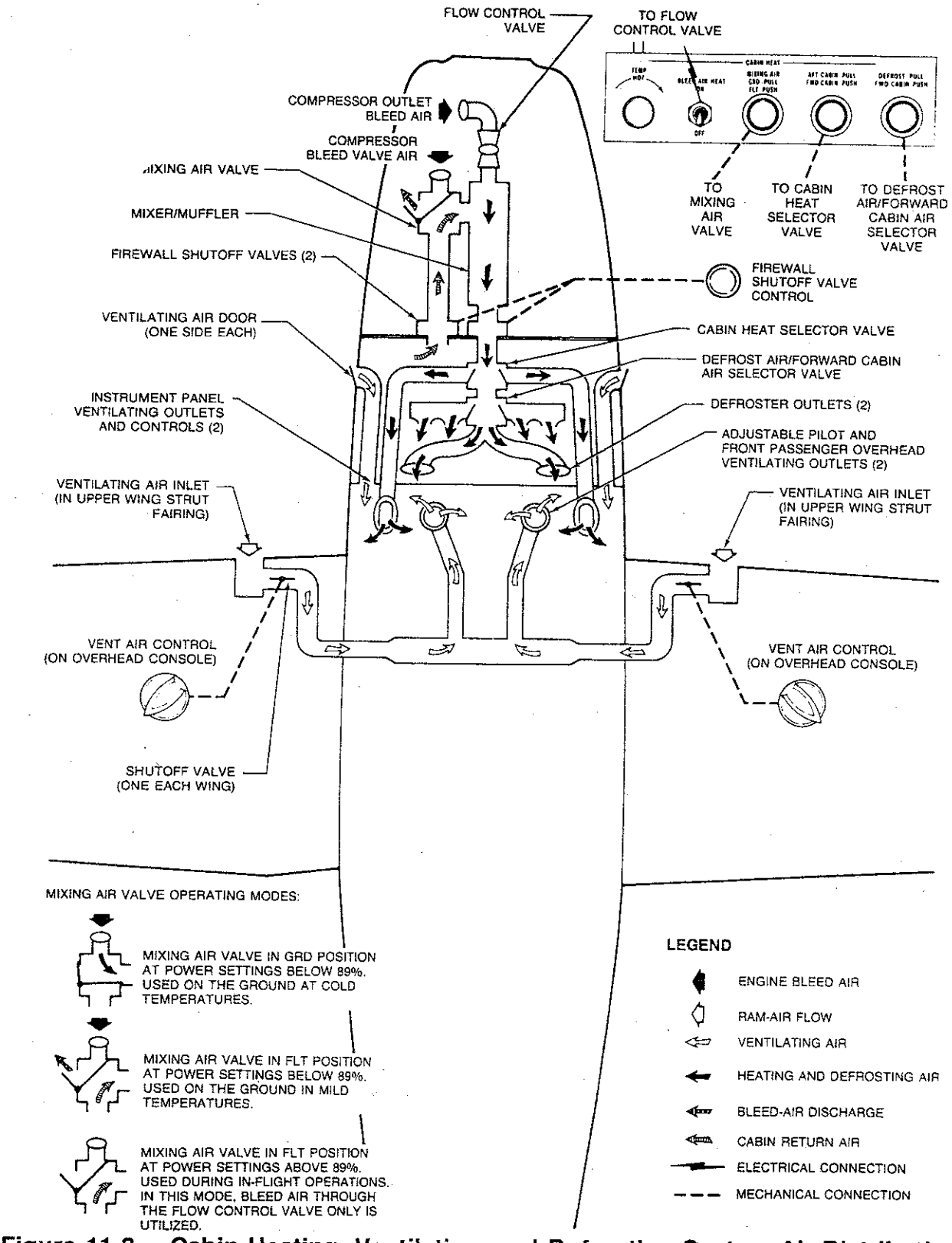


Figure 11-3. Cabin Heating, Ventilating, and Defrosting System Air Distribution (208A and 208B)