



AEROSTAR TRAINING MATERIALS

AEROSTAR OWNERS ASSOCIATION

VERSION 2.1

9/28/2017

FOR TRAINING PURPOSES ONLY



Aerostar
Owners
Association



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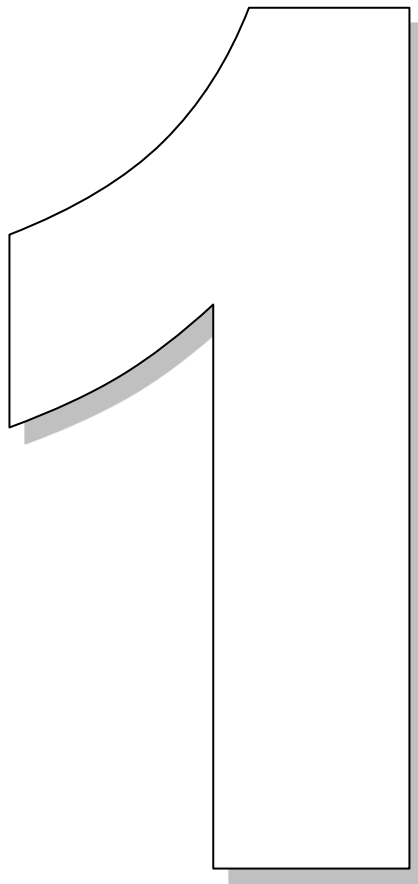
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1. FAMILIARIZATION

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CHAPTER 1

FAMILIARIZATION

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CHAPTER 1

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INTRODUCTION

The original FAA type designator for the Aerostar was PA60, but it was later changed to AEST. It is an all metal, six place, fully retractable tricycle gear, mid-wing, twin engine mono-plane of semi-monocoque construction.

The airframe of the Aerostar is of conventional all metal design, utilizing no unusual materials or processes in its construction. Major structural components are of semi-monocoque design, using relatively thick skins which result in more uniform contours and fewer stiffener type parts. All external skins are flush riveted, with the exception of portions of the control surfaces and flaps which employ a "low profile" type rivet.

FUSELAGE

The fuselage structure is designed to provide a uniform cross-section for the length of the cabin, meaning the rear seats have as much room as the front. The primary structure of the cabin area is frame-longeron, stiffened sheet aluminum with skin doublers and gussets at cutouts and discontinuities.

The cabin doors and emergency exits are reinforced for pressurization loads and incorporate redundant locking pins. Early models had only belts but later models have shoulder belts for pilot and co-pilot. An upgrade is available to add shoulder

belts to the early models.

Windows and windshield are of "stretched" acrylic composition for resistance to cracking or crazing.

WINGS

Flight and ground loads on the wings are carried primarily by two main spars which extend full span and are continued through the fuselage by means of a wing carry-thru center section. An additional rear spar extending from the wing root to tip provides mounting points for aileron and flap surfaces. The wings are attached to the fuselage-wing carry-thru structure by means of bolted multi-lug fittings. The wing structure outboard of the nacelle from the leading edge to the rear spar is sealed to provide integral fuel tanks. Wing flaps are of the single slotted Fowler type, supported at three points. Each "Frise" type aileron has three hinge points.

EMPENNAGE

The vertical and horizontal assemblies are of an interchangeable design. Each assembly is attached to the fuselage with two bolted fittings. Each control surface has three hinge points. A nonstructural fiberglass dorsal fin incorporating the heater air intake scoop is attached to the vertical stabilizer and aft fuselage.

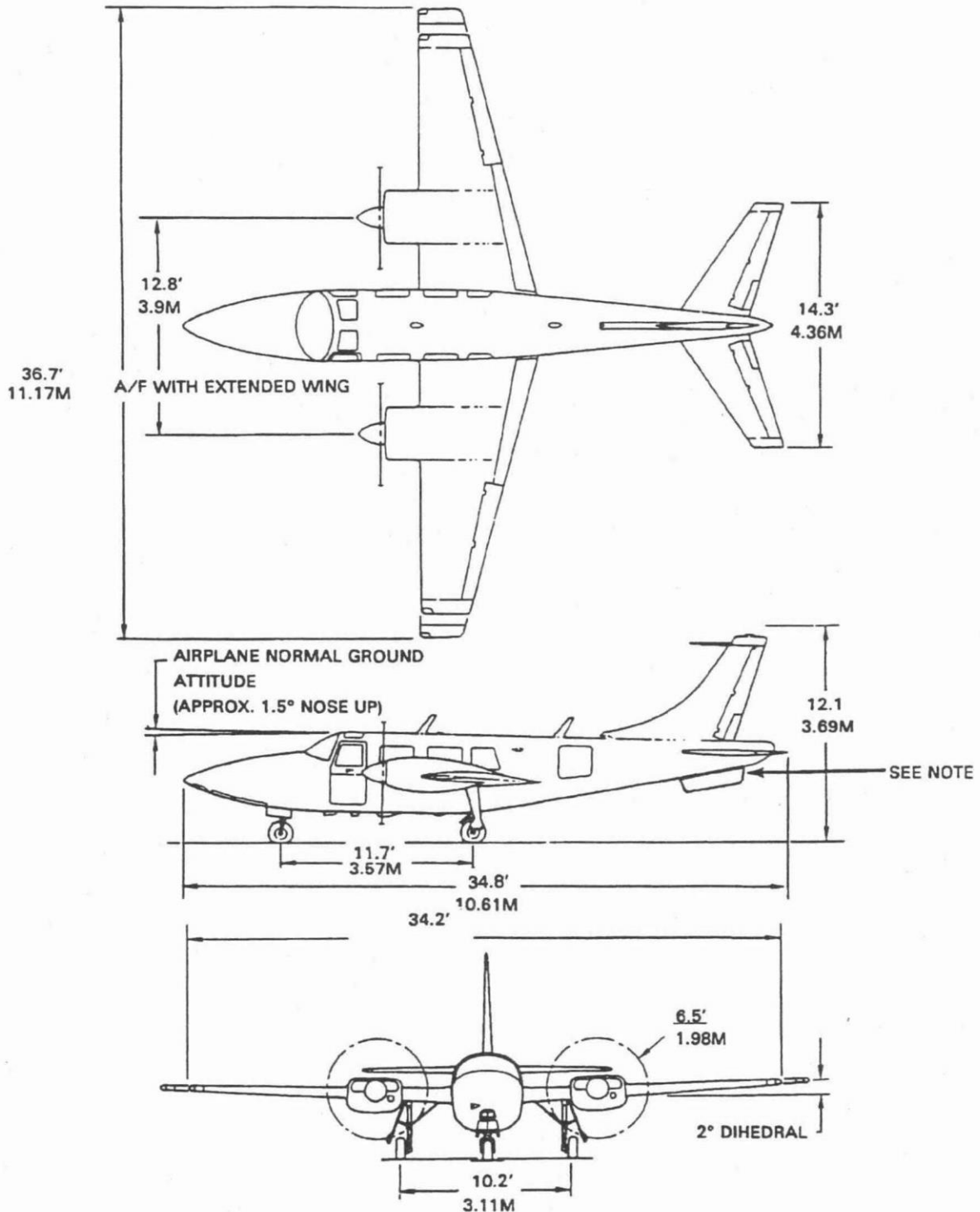
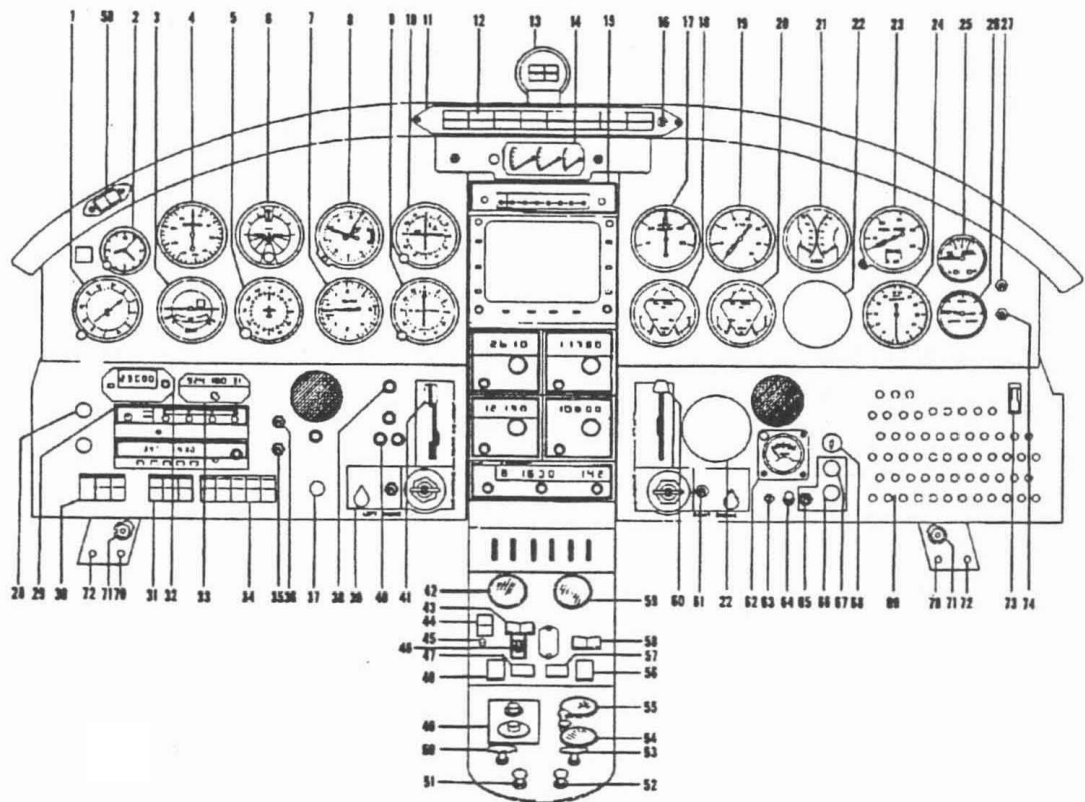


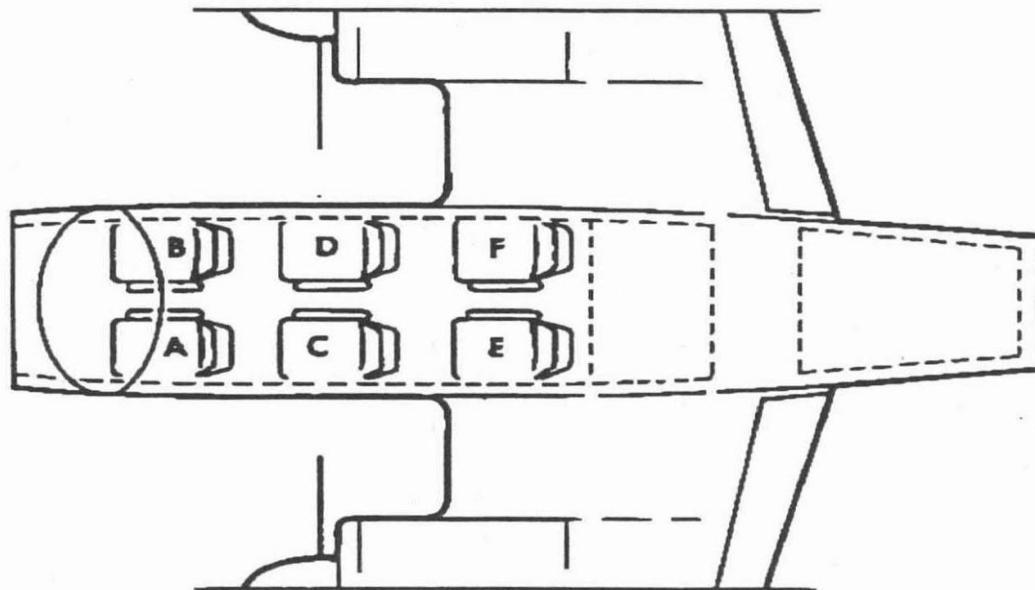
FIGURE 1-1: THREE VIEW



- | | |
|--------------------------------------|--------------------------------------|
| 1 ADF INDICATOR | 38 GEAR UP LIGHT |
| 2 CLOCK | 39 LEFT ENGINE SWITCH GROUPING |
| 3 TURN COORDINATOR | 40 GEAR DOWN LIGHTS |
| 4 AIRSPEED INDICATOR | 41 LANDING GEAR HANDLE |
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| 36 WINDSHIELD DE-ICE SWITCH | 73 AUX. RADIO MASTER |
| 37 RADIO AND POST LIGHTS RHEOSTAT | 74 AUXILIARY HYDRAULIC SWITCH |

FIGURE 1-2: INSTRUMENT PANEL

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STANDARD ARRANGMENT (SHOWN)	OPTIONAL ARRANGEMENTS
A Pilot B Copilot (reclining) C Passenger (reclining) D Passenger (reclining) E Passenger (reclining) F Passenger (reclining)	A Vertically Adjusting B Vertically Adjusting C Writing Table D Swivel Seat E Bench Seat (reclining) F Bench Seat (reclining)

FIGURE 1-3: SEATING ARRANGEMENT



V-SPEEDS ALL MODELS

All speeds taken from the appropriate flight manual and listed in KIAS.

Note: Decrease V_{NO} and V_{NE} by 4 KIAS for each 1,000 feet above 24,000 feet.

	600A	601B/601P	602P	700P
V_{MC} - Min. Single Engine Control Speed	84	84	84	85
V_Y - Best all-engine rate of climb	122	117	117	116
V_{YSE} - Best single engine rate of climb	113	109	117	116
V_X - Best all-engine angle of climb	100	100	101	101
V_A - Maneuvering speed	162	166	166	160
Maximum cross-wind component	15	15	15	15
V_{LE} - Maximum speed for gear extended	156	156	156	153
V_F - Maximum speed for lowering flap	148	148	148	148
V_{F20° - Maximum speed for lowering 20° of flaps	174	174	174	188
V_{S1} - Stall Clean	83	86	86	75
V_{SO} - Stall Flaps and Gear down	74	77	77	71
V_{NO} - Maximum Structural cruising speed	215	215	215	215
V_{NE} - Never exceed speed	241	241	241	244

Acrobatic maneuvers, including spins, unauthorized.

Flight Load Factor - The positive limit load factors are as follows:

Flaps Retracted - 4.0 g's
Flaps Extended - 2.0 g's

Flaps Retracted - 3.8 g's for 700P



POWERPLANT LIMITATIONS-600A

- Engines.....2 Lycoming IO-540-G1B5, IO-540-K1F5, IO-540-K1J5, IO-540-S1A5 or
..... IO-540-P1A5
- Fuel.....100/130 or 100LL Min. Grade Aviation Fuel
- Takeoff and Maximum Continuous Power290 BHP @ 2575 rpm (No Time Limit)
- Maximum Normal Operating Power
(Top of Tachometer Green Arc)284 BHP @ 2575 rpm (No Time Limit)
- Maximum Cylinder Head Temperature260°C
- Maximum Oil Temperature118°C
- Oil Pressure
- Normal..... 55-95 psi
- Minimum (idling)..... 25 psi
- Maximum (starting) 115 psi
- Fuel Pressure
- Normal..... 18-40 psi
- Idling 12-18 psi
- Minimum (idling)..... 12 psi
- Maximum..... 40 psi
- Propellers.....2 Hartzell HC-C3YR-2/C8468-8R
.....or HC-C3YR-2UF/FC8468-8R Full Feathering



WEIGHT AND CENTER OF GRAVITY LIMITATIONS-600A

Maximum Ramp Weight.....	5525 lbs
Maximum Takeoff Gross Weight.....	5500 lbs
Maximum landing Gross Weight	5500 lbs
Fuel (165.5 gals usable)	993 lbs
Oil (6gals).....	45 lbs
Baggage Compartment	240 lbs

CENTER OF GRAVITY

Forward	157.66	to 4600 lbs *
.....	159.58	@5500 lbs (Max Takeoff)*
.....	159.63	@5525 lbs (Max Ramp)*
Aft	167.88	@3400 lbs *
.....	167.88	@5500 lbs (Max Takeoff)*
.....	167.88	@5525 lbs (Max Ramp)*

* Straight line variation between points



POWERPLANT LIMITATIONS-601B/601P

Engines.....2 turbocharger equipped Lycoming IO-540-S1A5 or IO-540-P1A5 to incorporate turbo-superchargers in accordance with STC-SE81WE

Fuel 100/130 or 10OLL Min. Grade Aviation Fuel

Takeoff and Maximum Continuous Power 290 BHP @ 29.5 in. Hg. MAP and 2575 rpm

Maximum Normal Operating Power
(Top of Tachometer Green Arc) 290 BHP @ 29.5 in. Hg. MAP and 2575 rpm

No leaning fuel mixture above 75% power permitted. Refer to Chapter 12 for RPM-Manifold Pressure Envelope for Continuous Operation.

Maximum Cylinder Head Temperature 260°C

Maximum Oil Temperature 118°C

Oil Pressure

- Normal 55-95 psi
- Minimum (idling).....25 psi
- Maximum (starting)115 psi

Fuel Pressure

- Normal 18-40 psi
- Idling 12-18 psi
- Minimum (idling).....12 psi
- Maximum40 psi

Propellers2 Hartzell HC-C3YR-2/C8468-8R or
HC-C3YR-2UF/FC8468-8R Full Feathering



WEIGHT AND CENTER OF GRAVITY LIMITATIONS-601B/601P

Maximum Ramp Weight	6025 lbs
Maximum Takeoff Gross Weight.....	6000 lbs
All weight in excess of 5900 lbs must be fuel in the wings	
Maximum landing Gross Weight	6000 lbs
Fuel (165.5 gals usable)	993 lbs
Oil (6gals)	45 lbs
Baggage Compartment.....	240 lbs

CENTER OF GRAVITY

Forward	157.66	to 4600 lbs *
.....	160.67	@6000 lbs (Max Takeoff)*
.....	160.72	@6025 lbs (Max Ramp)*
Aft	167.88	@3600 lbs *
.....	167.88	@6000 lbs (Max Takeoff)*
.....	167.88	@6025 lbs (Max Ramp)*

* Straight line variation between points



POWERPLANT LIMITATIONS-602P

Engines 2 turbocharger equipped Lycoming IO-540-AA1A5

Fuel100/130 or 100LL Min. Grade Aviation Fuel

Takeoff and Maximum Continuous Power 290 BHP @ 37.0 in. Hg. MAP and 2425 rpm

No leaning fuel mixture above 75% power permitted. Refer to Chapter 12 for RPM-Manifold Pressure Envelope for Continuous Operation.

Maximum Cylinder Head Temperature 260°C

Maximum Oil Temperature 118°C

Oil Pressure

Normal.....55-95 psi

Minimum (idling).....25 psi

Maximum (starting)115 psi

Fuel Pressure

Normal.....21-40 psi

Idling12-40 psi

Minimum (idling).....12 psi

Maximum.....40 psi

Propellers..... 2 Hartzell HC-C3YR-2/C8468-8R or
HC-C3YR-2UF/FC8468-8R Full Feathering

Engine Alternate Air - Alternate induction air must be closed with bleed air on.



WEIGHT AND CENTER OF GRAVITY LIMITATIONS-602P

Maximum Ramp Weight 6029 lbs

Maximum Takeoff Gross Weight 6000 lbs

All weight in excess of 5900 lbs must be fuel in the wings

Maximum landing Gross Weight..... 6000 lbs

Fuel (165.5 gals usable) 993 lbs

Oil (6gals) 45 lbs

Baggage Compartment 240 lbs

CENTER OF GRAVITY

Forward	157.66	to 4600lbs *
.....	160.67	@6000 lbs (Max Takeoff)*
.....	160.73	@6000 lbs (Max Ramp)*
Aft	166.00	@3600 lbs *
.....	166.00	@6000 lbs (Max Takeoff)*
.....	166.00	@6029 lbs (Max Ramp)*

* Straight line variation between points



POWERPLANT LIMITATIONS - 700P

Engines 2 Lycoming - LTIO-540-U2A (Left) & TIO-540-U2A (Right)

Fuel100/130 (Green) or 100LL (Blue) Minimum Grade Aviation Fuel

Takeoff & Maximum Continuous Power350 BHP @ 42 in Hg. MAP and 2500 RPM

Maximum Normal Operating Power
(Top of Tachometer Green Arc)350 BHP @ 42 in Hg. MAP and 2500 RPM

No leaning fuel mixture above 75% power permitted. Refer to Chapter 12 for RPM-Manifold Pressure Envelope for Continuous Operation.

Maximum Cylinder Head Temperature260°C

Maximum Oil Temperature.....118°C

Oil Pressure

- Normal..... 55-95 psi
- Minimum (idling) 25 psi
- Maximum (starting)..... 115 psi

Fuel Pressure

- Normal..... 29-65 psi
- Idling 12-29 psi
- Minimum (idling) 12 psi
- Maximum..... 65 psi

Propellers 2 Hartzell HC-C3YR-2LUF/FJC7451(B) or
HC-C3YR-2UF/FC7451(B) Full Feathering



WEIGHT AND CENTER OF GRAVITY LIMITATIONS - 700P

Maximum Ramp Weight	6356 lbs
Maximum Takeoff Gross Weight	6315 lbs
All weight in excess of 6050 lbs must be fuel in the wings	
Maximum Landing Gross Weight.....	6000 lbs
Fuel (165.5 gals usable)	993 lbs
Oil (6 gals)	45 lbs
Baggage Compartment.	240 lbs

CENTER OF GRAVITY

Forward	157	to 5400 lbs
.....	161.7	@ 6315 lbs (Max. Takeoff)
Aft	161.7	@ 6356 lbs (Max. Ramp)
.....	167.88	@ 6315 lbs (Max. Takeoff)
.....	167.88	@ 6356 lbs (Max. Ramp)



SYSTEMS DATA SHEET

RESERVOIR	U.S. GALLONS (X 1.000)	IMPERIAL GALLONS (X.83268)	METRIC LITERS (3.785)	NAME, NUMBER OR TYPE
FUEL				100/130 Octane Aviation Fuel or 100 Octane Low Lead(100LL) per Mil-G-5572 or ASTM D910 Option #244
Left Wing Tank	65.00	54.12	246.03	
Right Wing Tank	65.00	54.12	246.03	
Fuselage Tank	43.50	36.22	164.65	
Total Fuel Capacity	173.50	144.47	656.70	
Left Wing Tank Usable	62.00	51.63	234.67	
Right Wing Tank	62.00	51.63	234.67	
Fuselage Tank Usable	41.50	34.56	157.08	
Total Usable Fuel	165.50	137.81	626.42	
Aux Fuel Tank Usable	45.00	37.47	170.34	
Sump Capacity				
Left Wing Tank	0.25	0.21	0.95	
Right Wing Tank	0.25	0.21	0.95	
Fuselage Tank	0.50	0.42	1.90	
ALCOHOL	3.00	2.50	11.35	Isopropyl Alcohol (Anhydrous) Conforming to TT-1-735 A(2)
HYDRAULIC				MIL-H-5606A or AeroShell Fluid 4 (Shell Oil Co.)
Reservoir	1.75	1.46	6.62	
System	0.25	0.21	0.95	
Total Hydraulic Fluid	2.00	1.66	7.57	
OIL (ENGINE)				See Oil Select- ion Chart on Page 5-6
Per Engine	3.00	2.50	11.35	
Both Engines	6.00	5.00	22.71	



TIME LIMITS

COMPONENT OVERHAUL/REPLACE HOURS AND/OR YEARS

Note – Limits can vary by model, age of part and specific part number. Do not use this list as an authoritative list for a specific aircraft. Additionally, there may be Part 135 limits which might not be listed.

A. PROPELLER GROUP

1. Propeller (varies by aircraft, age and part) 2400 Hours or 7 years
2. Propeller Governor At Engine O/H
3. Propeller Governor Screen Engine O/H or whenever Governor is Removed

B. ENGINE GROUP

1. Engine IO-540-G1B5 1400 Hours
 - IO-540-K1F5 2000 Hours
 - IO-540-K1J5 2000 Hours
 - IO-540-P1A5 1400 Hours
 - IO-540-S1A5 1800 Hours
 - IO-540-AA1A5 1800 Hours
 - TIO-540-J2BD 1600 Hours
 - TIO-540-U2A 1800 Hours
2. Turbo-Charger 2000 Hours
 - Actuator At Engine O/H
 - Controller At Engine O/H



- 3. Engine Isolator MountsAt Engine O/H
- 4. Oil Cooler Replace if Contaminated
- 5. Fuel PumpAt Engine O/H
- 6. Scavenge PumpAt Engine O/H
- 7. Magnetos.....At Engine O/H
- 8. Starter.....At Engine O/H
- 9. AlternatorAt Engine O/H
- 10. Hoses in Engine Compartment..... At Engine O/H or 5 Years
- 11. Servo Fuel Injector.....At Engine O/H
- 12. Induction Filter 100 Hours
- 13. Oil Filter 50 Hours

Note – Owners with turbocharged aircraft might consider 35 hours for Oil Change Limit.

C. HYDRAULIC GROUP

- 1. Hydraulic Pump At Engine O/H
- 2. Actuator, Flap3000 Hours
 - MLG 3000 Hours
 - MLG Door 3000 Hours
 - NLG 3000 Hours
 - NLG Steering 3000 Hours
- 3. NLG Steering Valve 3000 Hours



- 4. Control Valve, Flap 3000 Hours
- MLG 3000 Hours
- MLG Door 3000 Hours

- 5. Hydraulic Fluid 3000 Hours

D. BRAKES

- 1. Master Cylinder 5000 Hours

E. PNEUMATIC

- 1. Pump 1000 Hours
- 2. Inlet Filter, Engine 500 Hours
- 3. In Line Filter, Cabin 500 Hours

F. FUEL

- 1. Wing Tank Relief Valve 3000 Hours
- 2. Fuel Carrying Hose, Wing Root
to Firewall At Engine O/H or 5 Years
- 3. Fuel Filler Cap "O" Rings One (1) Year

G. HEATER

- 1. Heater 500 Hours of Heater Operation
- 2. Combustion Blower Brushes 500 Hours of Heater Operation
- 3. Vent Blower Brushes 500 Hours of Heater Operation
- 4. Fuel Pump 2000 Hours of Heater Operation



H. OXYGEN

- 1. Regulator Assembly3000 Hours or 5 Years
- 2. Oxygen Cylinder, 11 Cu. Ft.
 (Hydrostatic Test) 3 Years
- 3. Oxygen Cylinder, 115 Cu. Ft.
 (Hydrostatic Test) 5 Years
 Replace15 Yrs or 4,380 Pressurizations

I. INSTRUMENTS

- 1. Altimeter 2 Years

J. WINDSHIELD AND WINDOWS (PRESSURIZED MODELS)

- 1. Windshield 4,860 Hours
- 2. Windows 16,000 Hours

K. Pressurization Controller.....3000 Hours or 5 Years

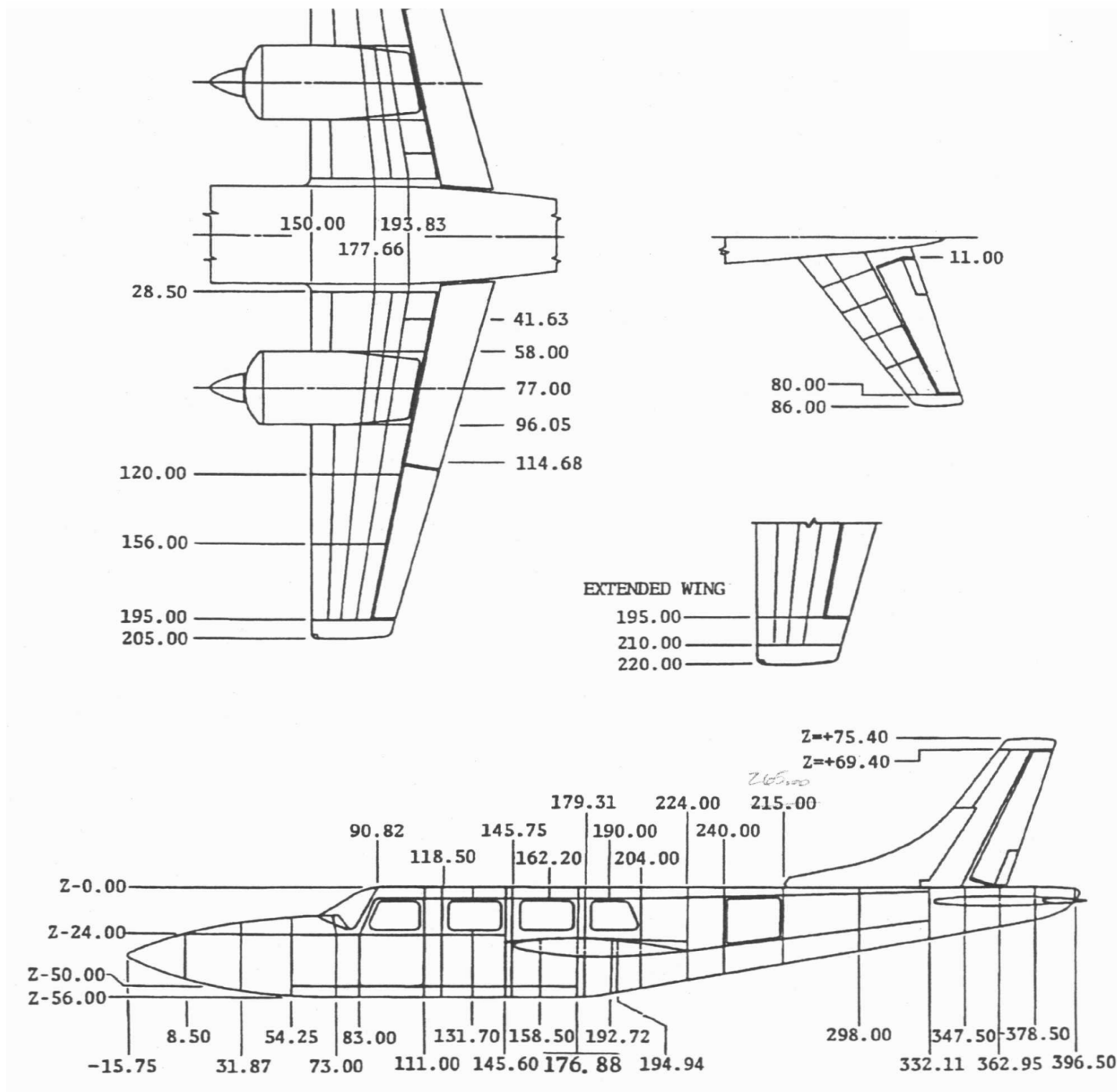


FIGURE 1-4: STATION REFERENCE LINES



CONTROL LOCK (OPTIONAL EQUIPMENT)

A control lock is available which, when installed, holds the control surfaces in locked position. To install the control lock, proceed as follows: Extend the telescoping tube with the welded "J" shaped coupler to its full length. Unfold the two attaching arms until they lock forming a "Y" shape. Hook the "J" shaped coupler around the bolt heads

on the inboard sides of both rudder pedals. Loop the "Y" shaped attaching arms around the control wheel and pull up on the "T" shaped handle until movement of the control wheel is completely restricted. To remove the control lock, loop index finger around the binding tab lock and pull upward until the attaching arms clear the control wheel. Unlock the "J" shaped coupler from the rudder

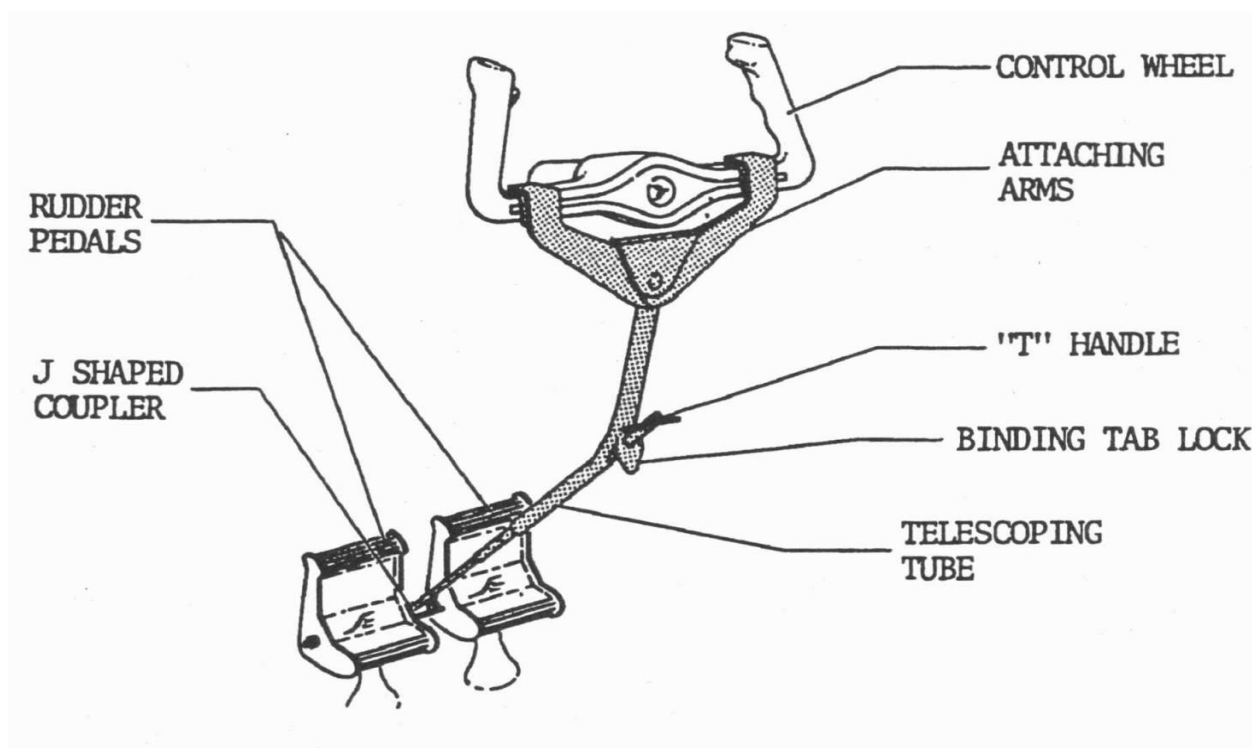
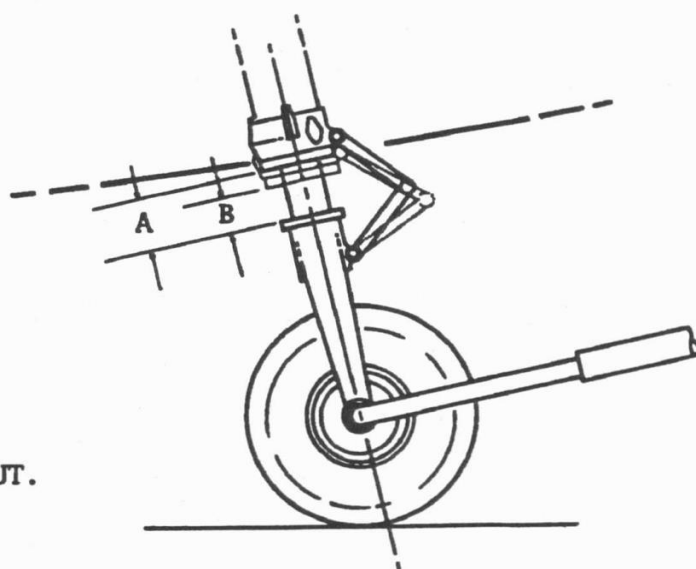
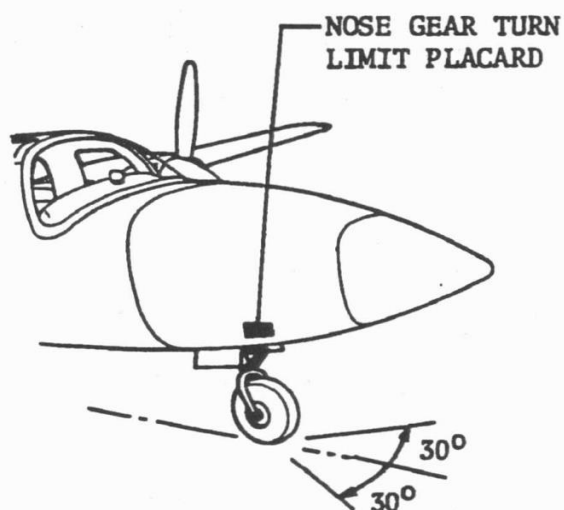


FIGURE 1-5: CONTROL LOCK



NOSE STRUT EXTENSION

CAUTION
DO NOT ATTEMPT TO TURN
NOSE WHEEL IF STRUT IS EX-
TENDED MORE THAN 6.5".



A - MAXIMUM STRUT EXTENSION
7.5 INCHES FOR A/F 0001-0610
8.5 INCHES FOR A/F 0611 & UP
& A/F WITH P/N 450500 NLG STRUT.

**B - MAXIMUM STRUT EXTENSION FOR
TURNING NOSE WHEEL**
5.5 INCHES FOR A/F 0001 - 0610
6.5 INCHES FOR A/F 0611 & UP &
A/F WITH P/N 450500 NLG STRUT.

FIGURE 1-6: NOSE STRUT EXTENSION



TIRE PRESSURES

AEROSTAR MODEL	AIRPLANE GROSS WEIGHT	NOSE GEAR IN- FLATION P.S.I. TIRE SIZE 6.00-6	MAIN GEAR INFLATION PRESSURE P.S.I.*		
			TIRE SIZE 7.00-6 8PR	TIRE SIZE 6.50-8 8PR	TIRE SIZE 19.5X6.75X8
600	5,500	40	50	63	63
601	5,700	52	65	65	—
	6,000	40	—	70	70
601P	5,700	40	—	65	65
	6,000	40	—	70	70
602P	6,000	40	—	70	70
700P	6,300	40	—	73	—

* NOTE: PRESSURES GIVEN ARE FOR UNLOADED CONDITION. ADD 2 P.S.I. FOR LOADED CONDITION.

STRUT EXTENSION

Nose Landing Gear OAS 5462-5 Ozone 1 - 3 inches

Nose Landing Gear P/N 450500 Weibel 2 - 4 inches

Main Landing Gear 3 - 5 inches (Varies with load condition and outside air temperature.
Consult with your maintenance advisor.)



TOWING

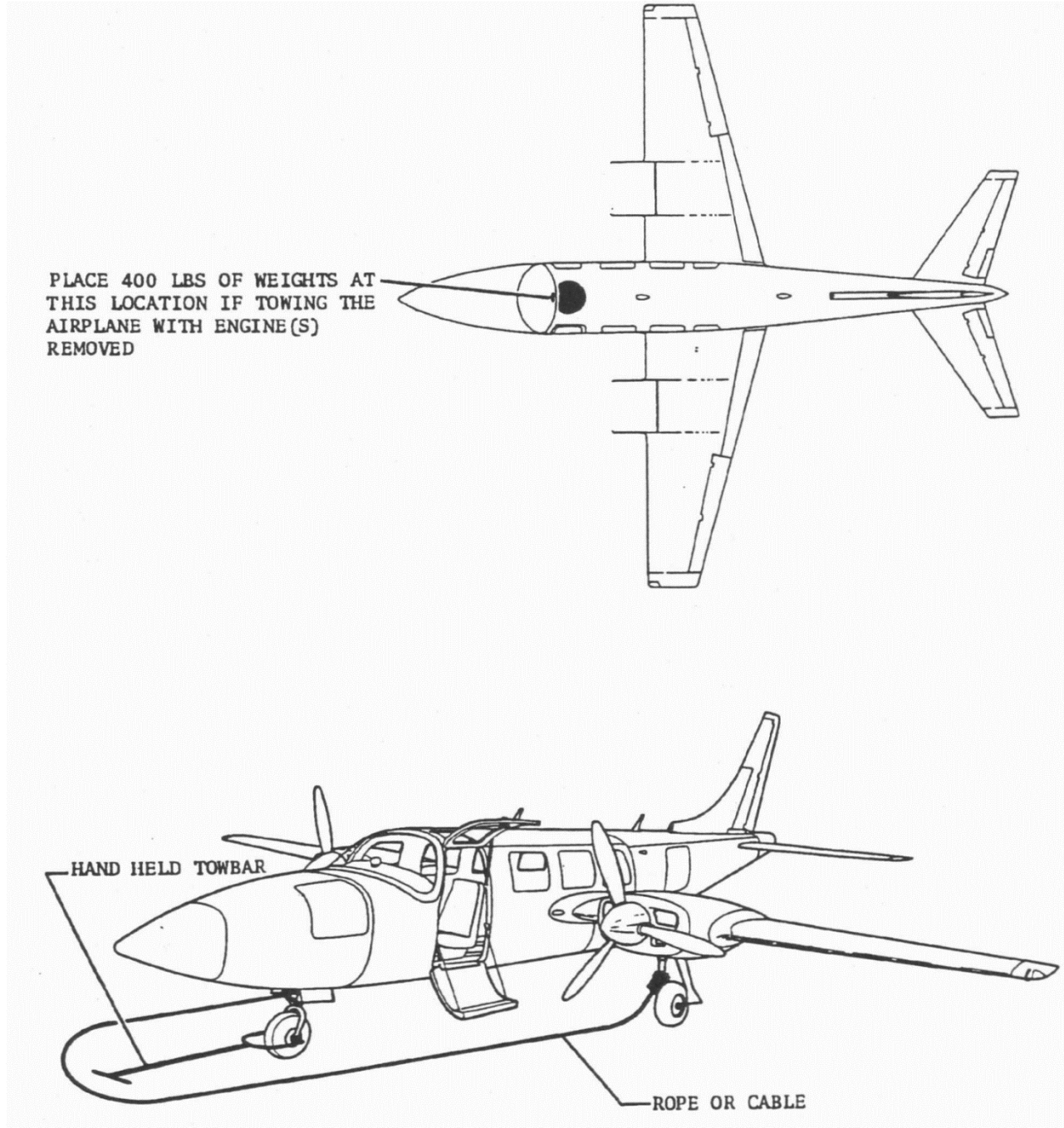


FIGURE 1-7: TOWING



TURN TOW LIMITS AND RADIUS

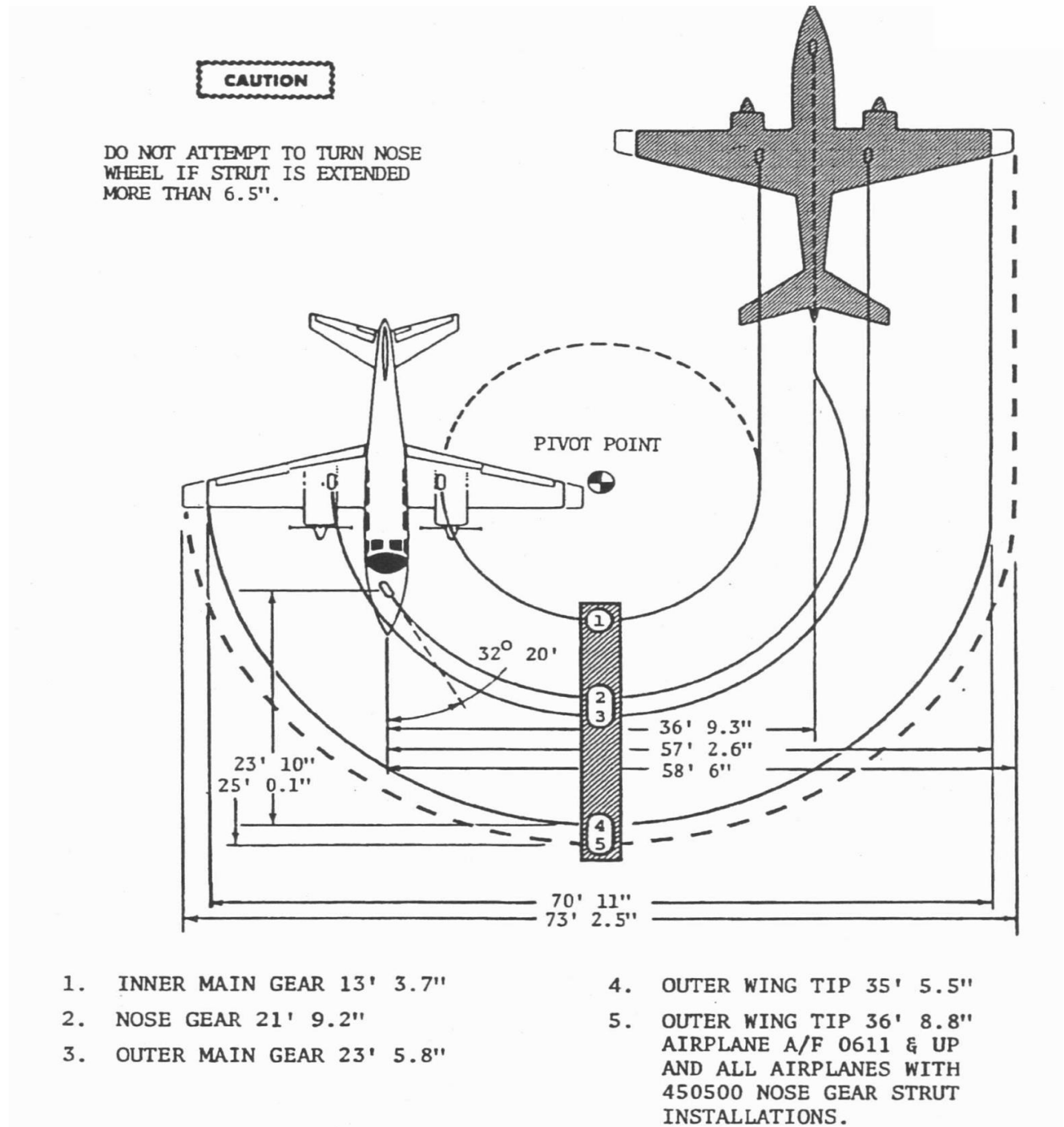


FIGURE 1-8: TURN TOW LIMITS AND RADIUS



TIE DOWN

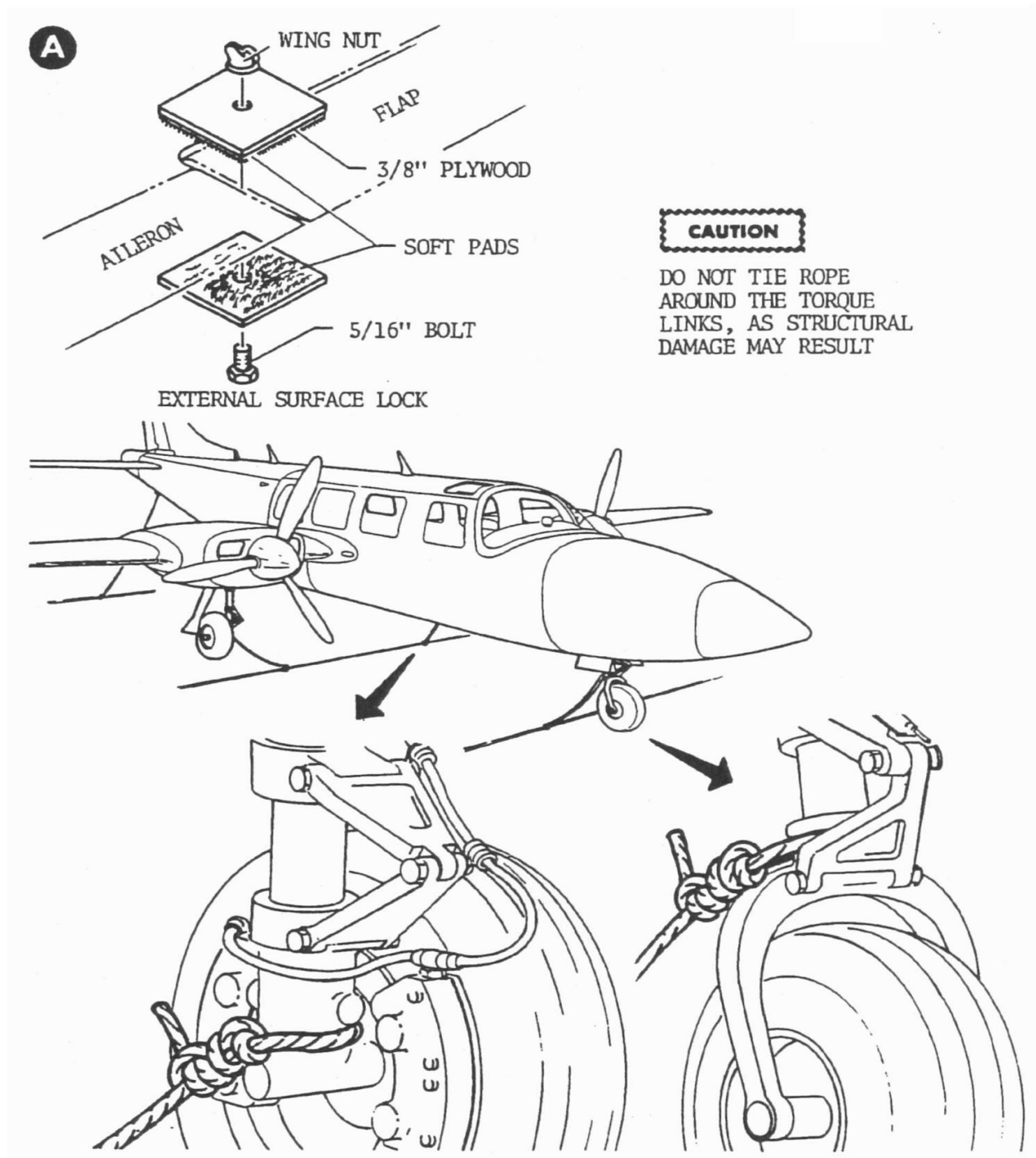


FIGURE 1-9: TIE DOWN



JACKING LOCATIONS

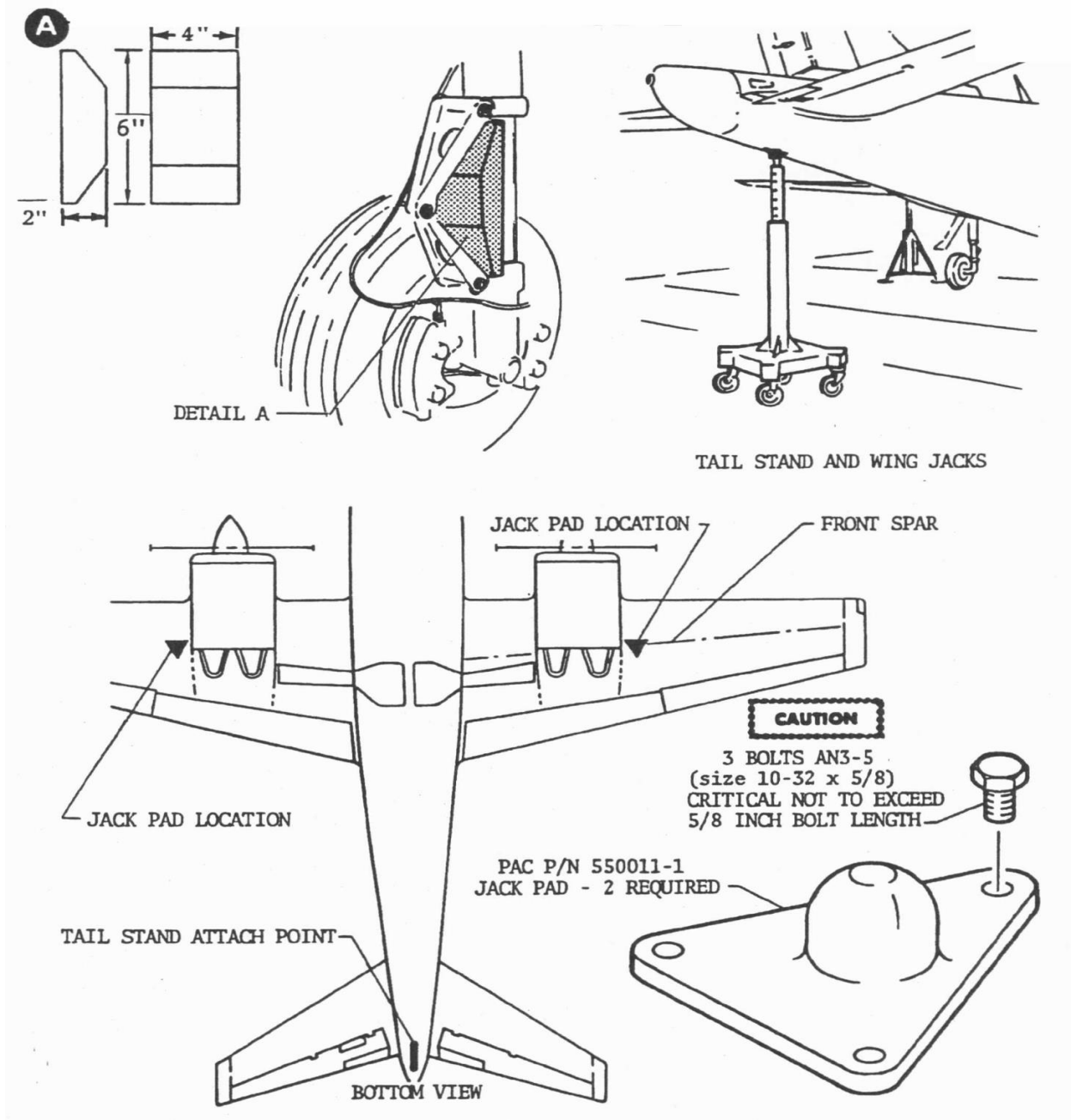
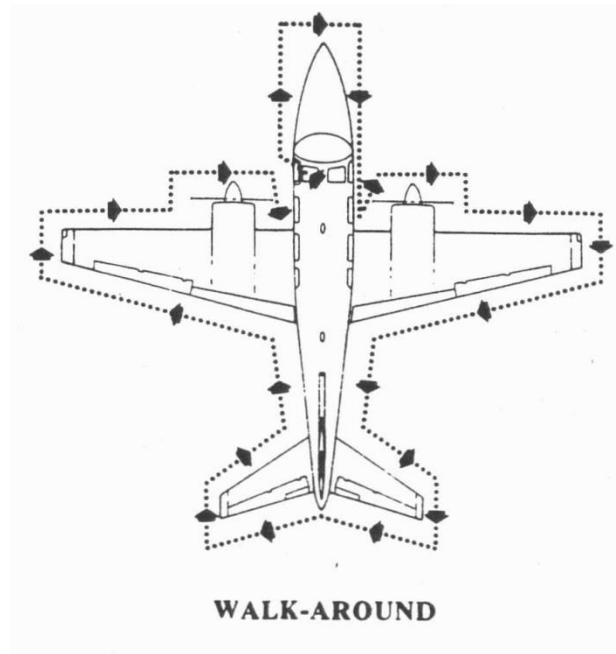


FIGURE 1-10: JACKING LOCATIONS



CHECKLIST



PREFLIGHT

CHECK COCKPIT

Control lock	remove and stow
Static source selector	normal
Airplane papers	check
Emergency exit	secure
Oxygen masks	check
Oxygen system	proper quantity and flow
Gear handle	DOWN, in detent
Flap handle	U P
Magneto switches	OFF
Switches	all OFF
Hydraulic shutoff valve	OPEN
Hydraulic pressure	check
Aux. hydraulic (if installed)	OFF
Brake pedals	check



Parking brake set

WARNING

No braking will occur if handle is pulled
prior to brake application.

Battery ON
Gear down lights 3 green ON
Fuel quantity indicators check
Trim tabs (elevator and rudder) neutral
Battery OFF

NOSE SECTION

Entry door and window check
Windshield check
Static openings (left and
right side) clear
Landing lights check
Nose gear tire check
Nose gear strut check
Steering collar, cylinder and lines check
Nose gear squat switch check
Nose gear doors check

RIGHT WING

Surface condition (top and bottom) check
Bleed air scoop clear
Bleed air overboard discharge clear
Main gear tire check
Main gear strut check
Brake linings and disc check
Brake lines check
Strut door check
Wheel well door check

CAUTION

Do not pull outward on wheel well door, with
or without hydraulic system pressure, as this
will damage main gear door linkage.



Main gear actuator	check
Wheel well area and plumbing lines	check
Piton' static drain valves (if installed)	drain
Lower engine compartment	check
Exhaust stacks (Shake the tailpipes)	check
Oil level	check
Oil filler cap	secure
Propeller and spinner	check
Engine inlets and cowling	check
Wing leading edge	check
Nav and strobe light	check
Positive pressure relief valve	clear
Wing fuel level and color	check
Filler cap "O" ring	check
Filler cap receptacle	check
Filler cap locking tab	lock

CAUTIONS

Wing filler caps that do not form a proper seal will cause uneven or reduced fuel feeding and/ or siphoning from tanks and prematurely deplete the fuselage tank.

When opening a wing filler cap in a warm environment use caution as the fuel may be under pressure.

Aileron	check
Flap	check
Flap track	check
Flap actuator attachment and rollers	secure

FUSELAGE (RIGHT SIDE)

Fuselage fuel tank vent	clear
Heater intake and exhaust	clear

EMPENNAGE

Dorsal fin intake.....	clear
Piton/ static boom ports	clear
General condition	check
Elevator free play, rudder and trim tab hinges	check



- Hinge bolts and actuator rodscheck
- Batterycheck
- Nay and strobe light check

FUSELAGE (LEFT SIDE)

- Baggage compartmentcheck
- Control lockstow
- Tow barstow
- ELT ARM
- Hydraulic fluid levelcheck
- Empennage (internal)check
- Baggage compartment door close and lock
- Fuselage fuel level and colorcheck
- Filler cap secure
- Fuselage fuel tank vent clear
- Fuel sump drains drain and check for water, sediment, and proper fuel
- Fuel vent system drain (forward) clear
- Fuselage tank compartment drain (aft) clear

CAUTION

Any evidence of fuel leaking at the aft drain may indicate rupture/puncture of fuselage rubber fuel tank.

- Oxygen discharge disccheck
- Heater and hydraulic overboard drains clear

CAUTION

If fuel leak is observed at heater drain, heater should not be used.

LEFT WING

Check as for right wing.

NOTE

If night flight is planned, check operation of all lights, and make sure a flashlight with fresh batteries is available.



CHAPTER ONE - QUIZ

1. Maximum operating altitude for the 601P and 700P is:

- a. 18,000'
- b. 35,000'
- c. 21,000'
- d. 25,000'

2. Maximum power for all operations in the 601P and 601B is:

- a. 28"/2200
- b. 27"/2300
- c. 31.5"/2700
- d. 29.5"/2575

3. It is not permitted to lean the mixture at power above:

- a. 55%
- b. 65%
- c. 75%
- d. Not applicable; fuel mixture may be leaned at any time.

4. Gross weight is limited to _____ for the 600, and _____ for the 601, 601P and the 602P without any options.

- a. 5500 and 6000 lbs.
- b. 5500 and 5700 lbs.
- c. 6000 and 6200 lbs.
- d. 5700 and 6000 lbs.



5. Adjustment of power after takeoff for climb is (602P):

- a. 33"/2400 RPM
- b. 35"/2300 RPM
- c. 23.5"/2425 RPM
- d. No adjustment required.

6. Blue line on the 602P is:

- a. 109 KT
- b. 113 KT
- c. 117 KT
- d. 120 KT

7. Maximum power for all operations on the 602P is:

- a. 28"/2200 RPM
- b. 29.5"/2575 RPM
- c. 37"/2425 RPM
- d. 40"/2425 RPM

8. Landing gear extension speed on the 600A, 601B, 601P, and 602P is:

- a. 174 KIAS
- b. 100 KIAS
- c. 156 KIAS
- d. 180 KIAS

9. Maximum demonstrated crosswind velocity is:

- a. 15 knots
- b. 22 knots
- c. 12 knots
- d. 18 knots



10. Maximum power for all operations in the 700P is:

- a. 35"/2500 RPM
- c. 42"/2500 RPM
- b. 29.5"/2575 RPM
- d. 34"/2700 RPM

11. Blue line on the 700P is:

- a. 100 KIAS
- c. 130 KIAS
- b. 113 KIAS
- d. 116 KIAS

12. Landing gear extension speed for the 700P is:

- a. 100 KIAS
- c. 153 KIAS
- b. 170 KIAS
- d. 160 KIAS

13. Maximum takeoff weight for the 700P is:

- a. 6315 lbs.
- c. 7215 lbs.
- b. 6000 lbs.
- d. 5930 lbs.

14. VMC on the 700P is:

- a. 74 KIAS
- c. 85 KIAS
- b. 90 KIAS
- d. 80 KIAS





2

2. HYDRAULICS, LANDING GEAR & FLAPS

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 2

HYDRAULICS, LANDING GEAR & FLAPS

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FOR TRAINING PURPOSES ONLY



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CHAPTER 2

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FOR TRAINING PURPOSES ONLY



HYDRAULIC SYSTEM

The hydraulic system provides pressure for operation of the landing gear, main landing gear doors, flaps, and nose wheel steering. A hydraulic reservoir located just aft of the baggage compartment supplies hydraulic fluid to the hydraulic pump installed on the right engine. An electrically operated shutoff valve is installed in the fluid supply line to shut off fluid flow to the engine driven pump in the event of an engine fire. It also, facilitates maintenance of the system. The shutoff valve switch is located on the right instrument panel. Operation of the right engine with the hydraulic valve closed will cause damage to the hydraulic pump and the drive shaft to shear. (See Figure 2.1.)

PRESSURE REGULATOR

Hydraulic pressure is controlled by a pressure regulator for an operating pressure of 900 - 1100 psi. The operating limits can vary by model. A relief valve prevents system pressure from exceeding a 1300 psi. An accumulator protects the system from pulsations and provides a limited pressure source, should the pump fail. A direct read-out pressure gauge is located on the right instrument panel. (See Figure 2.5.)

Hydraulic fluid level is checked with power off and the gear handle in the down position. Cycle the flap handle until the hydraulic pressure drops to zero. To get an accurate reading, the flaps must be in the full up position.

The nitrogen charge of the accumulator can be checked while bringing the hydraulic pressure to zero with the flap handle. The pressure should drop as the flaps move and, at some point, fall to zero. That is the charge in the accumulator. If there is no fall off, the charge is zero. There are two accumulator types in use on the Aerostar – an older bladder type and a newer piston type. Today most are the newer type and should be charged with dry nitrogen to between 400 and 500 psi. A low charge can be a contributor to slow nose landing gear retraction.

NOSE WHEEL STEERING

Nose wheel steering is accomplished with a console and/or glareshield mounted, split type rocker switch, spring loaded to the center position.

Depressing this rocker switch left or right electrically energizes the nose wheel steering solenoid and the solenoid shutoff valves simultaneously. The steering solenoid valve directs hydraulic pressure to a combination steering actuator/ shimmy dampener mounted on the nose gear. The solenoid shutoff valve allows fluid flow to return to the hydraulic reservoir. Steering rate is controlled by hydraulic flow valves downstream of the steering solenoid valve. Releasing the switch causes the steering solenoid and the solenoid shutoff valves to close simultaneously. An orifice allows the steering to slowly center but retain some pressure to both sides of the steering actuator for shimmy dampening.



A centering cam inside the nose gear strut automatically centers the nose wheel when the strut fully extends such as: after rotation at takeoff, raising the nose when lowering the tail for hangar door clearance, and raising the aircraft on jacks. The centering cam starts engaging during approximately the last 2 inches of extension of the strut, at which point the wheel turning angle becomes continuously smaller as the strut continues to extend. The split rocker switch feature is provided as a fail-safe device. The steering system will not activate unless BOTH halves of the switch are depressed simultaneously.

CAUTION

You should check the nose steering system by pressing each rocker half and side independently during taxi, the "Four Corners Test". If the steering system can be actuated with only one-half of the switch, the system is defective and must be repaired. The flight should be discontinued.

The steering system is automatically de-energized when the nose landing gear is not in the full down and locked position by the squat switch.

If hydraulic power is lost, steering can be accomplished by asymmetrical power and/or brake application.

CAUTION

Always check position of the landing gear handle prior to starting engines. If hydraulic system pressure is low, it is possible for the gear to be down and locked even though this handle may be in the UP position. For aircraft equipped with auxiliary hydraulic pump, check that handle position is DOWN and pump switch is OFF prior to turning battery switch ON.

AUXILIARY HYDRAULIC PUMP

In the event of failure of the primary, right engine driven hydraulic system pump, the most Aerostars have an optional auxiliary hydraulic pump. This option should be considered essential. In the ARMED position, it will supply hydraulic system pressure as soon as the pressure drops below 700+/-100 psi on the 700P and 600+/-100 psi on all other models. The auxiliary pump will run, and the amber annunciator light will be on, until the hydraulic system pressure is increased to 1000 + 50, - 100 psi on the 700P and 900 + 50, - 100 psi on all other models.

The Aux Hydraulic system should be turned off before and after flight to verify the function of the primary engine driven hydraulic pump. The function of the Aux Hydraulic pump should be verified by cycling the flaps with the right engine off.



LANDING GEAR

The hydraulically actuated tricycle landing gear is fully retractable and is of the air-oil oleo type. Wheel well doors fully enclose the landing gear when in the UP position and partially enclose the wheel wells when the gear is DOWN, to help protect those areas from water spray, mud splatter, and melting snow or ice thrown up during taxi, takeoff, and landing.

The landing gear handle, located on the pilot's lower instrument panel, is mechanically linked to the landing gear control valve under the cabin floor. Selecting UP or DOWN position directs hydraulic system pressure to the appropriate side of the landing gear actuating cylinders and to the main landing gear door control valves.

On some models, a spring-loaded solenoid prevents the gear handle from being moved to the gear UP position when the airplane is on the ground. The solenoid is energized to unlock the handle by a squat switch mounted on the nose landing gear scissors.

The squat switch is activated as soon as the nose gear strut is extended such as rotation at takeoff, or if the airplane is on jacks. Should the solenoid fail, a small tab protruding through the handle slot allows the pilot to override the locking feature by pushing the tab to the right as the handle is activated to the gear UP position.

CAUTION

The gear handle safety lock may also become unlocked if the airplane is sitting on the ground in an extreme tail-down position which could extend the nose gear strut and allow the squat switch to actuate the solenoid when the battery switch is turned ON.

The door control valves are actuated by the main landing gear mechanical linkage and direct system pressure to the main landing gear door actuating cylinders to hold the wheel well doors closed when the gear is in either the fully extended or fully retracted position.

SQUAT SWITCH FUNCTIONS

1. Gear horn
2. Dump valve
3. Solenoid tab on gear handle
4. Nose wheel steering
5. Hobbs meter

In the event of a hydraulic system pressure loss, the landing gear will drop from the full UP position due to gravity and the fact that all three landing gears are spring-loaded to the DOWN position. However, to insure the gear is down and locked, the gear handle must be placed in the DOWN position.



Four landing gear position lights are installed on the left instrument panel. A single amber light is located above a cluster of three green lights. The lights are push-to-test type with adjustable iris shutters. The amber light illuminates and stays on when all three landing gears are in the full UP position.

The three (3) green lights are arranged in a cluster with the nose gear light on top, and the respective main landing gear lights below. Each green light will only illuminate when its respective landing gear is in the full DOWN and LOCKED position. Time delay for a gear light to illuminate indicates the respective landing gear is in a transient position.

The nose landing gear green light is wired to a switch installed on the gear handle mechanism; for this light to illuminate, it is necessary that the nose landing gear be in the down and locked position and the gear handle also be in the full DOWN position.

The gear horn will sound if the battery switch is ON and the gear handle is not in the full DOWN position when the airplane is on the ground. This system is activated by the nose landing gear switch.

On some models, a parallel electric circuit also connects the throttle gear horn switches to a red gear warning light on the annunciator panel which will illuminate if either throttle is reduced to below approximately. 13 - 15 inches MAP and the

gear is not down and locked. This light will illuminate even if there is a malfunction of the gear horn.

The gear horn will also sound if the squat switch fails or is misaligned and the gear handle is brought out of the DOWN position.

There are two nose landing gear types. The Ozone system was used from early on until about 1976 on approximate air frame numbers 1 to 610. After that the Weibel system was used. Pilots should know which they have. Care should be taken while towing either system as they can be easily damaged. Additionally, the nose wheel should be turned slowly from side to side to allow fluid movement through an orifice and limited to 30° left or right of center.

A nose wheel shimmy or loose feeling on taxi can indicate the collar bolt has been broken (Ozone) or sheer pin sheered (Weibel). Additionally, on the Weibel system, the nose gear door can be found hanging down, indicating a sheered pin. Pilots should carry spare collar bolts (Ozone) and sheer pins (Weibel) as this is a no-go item.

There should be a slight sag in the nose landing gear door to allow for proper NLG cycling. The main gear doors will sag if hydraulic pressure is zero. Never pull on gear doors for any reason. Proper gear rigging is critical and should only be performed by qualified personnel.



WING FLAPS

Fowler type flaps are operated by two hydraulic actuating cylinders. The control valve for these cylinders is actuated by the panel mounted flap selector handle which allows selection of 10°-20°, 30°-45° as desired.

The wing flap handle on the instrument panel is mechanically linked to a control valve under the cabin floor, which, in turn directs fluid to the flap actuating cylinders. A neutral position allows the pilot to stop the flaps at any intermediate setting. Flow control valves are installed in the flap system to provide equal fluid flow to the left and right flap actuators, thereby ensuring symmetrical flap extension and retraction.

A restrictor is also located at each cylinder's downline port to prevent a rapid asymmetric condition from occurring, should the downline rupture when the flaps are extended. Actuation of the flaps results in minimal trim change. The panel mounted flap position indicator receives electrical input from a flap position transmitter linked to the left flap actuator

CAUTION

Failure of potentiometer is a no-go item. Flap position will be unknown. No flap takeoff permitted in all PA60's, except the 700P model.

BRAKE SYSTEM

The Aerostar incorporates hydraulically actuated, dual floating caliper, fixed disc brakes. The brake system is completely independent of the hydraulic system and incorporates independent wheel brake systems and a common brake fluid reservoir. Each rudder/toe brake pedal has its own brake master cylinder to generate pressure to the appropriate wheel brake.

There are two brake systems in use. The Goodyear system and a Cleveland or 6 puck system. Both provide good service and braking. The heavier duty Cleveland system provides better stopping power with less force and is available as Option 246-1 700-6 Wheel Brake System.

Care should be taken to not ride the brakes during taxi so the brakes do not overheat. Adjust taxi speed with the throttle. Do not brake hard on landing unless necessary. This will ensure a long service life of the brakes.

CAUTION

Leaks that may sometimes occur in brake master cylinders can cause fluid to be dumped overboard in a pressurized environment. Always check pedal pressure before touchdown, for resistance



A parking brake handle, located outboard below the pilot's instrument panel, is mechanically linked to the parking brake valve. To set the parking brake apply brakes, pull out the parking brake handle and rotate in either direction to lock. To release parking brake, rotate handle in opposite direction of locking and push handle fully forward.

BRAKE SERVICE

The brake reservoir is located on the aft bulkhead of the nose avionics compartment. It is accessible through the large access cover on the left side of the nose. The reservoir should be checked regularly to ensure it is filled to the full line. Service when required with (red) hydraulic fluid, MIL-H-5606 only.

There are two reservoir sizes, an earlier small one and a later larger one. Soft or spongy brakes which go to the floor indicate low brake fluid.



HYDRAULIC SYSTEM SCHEMATIC

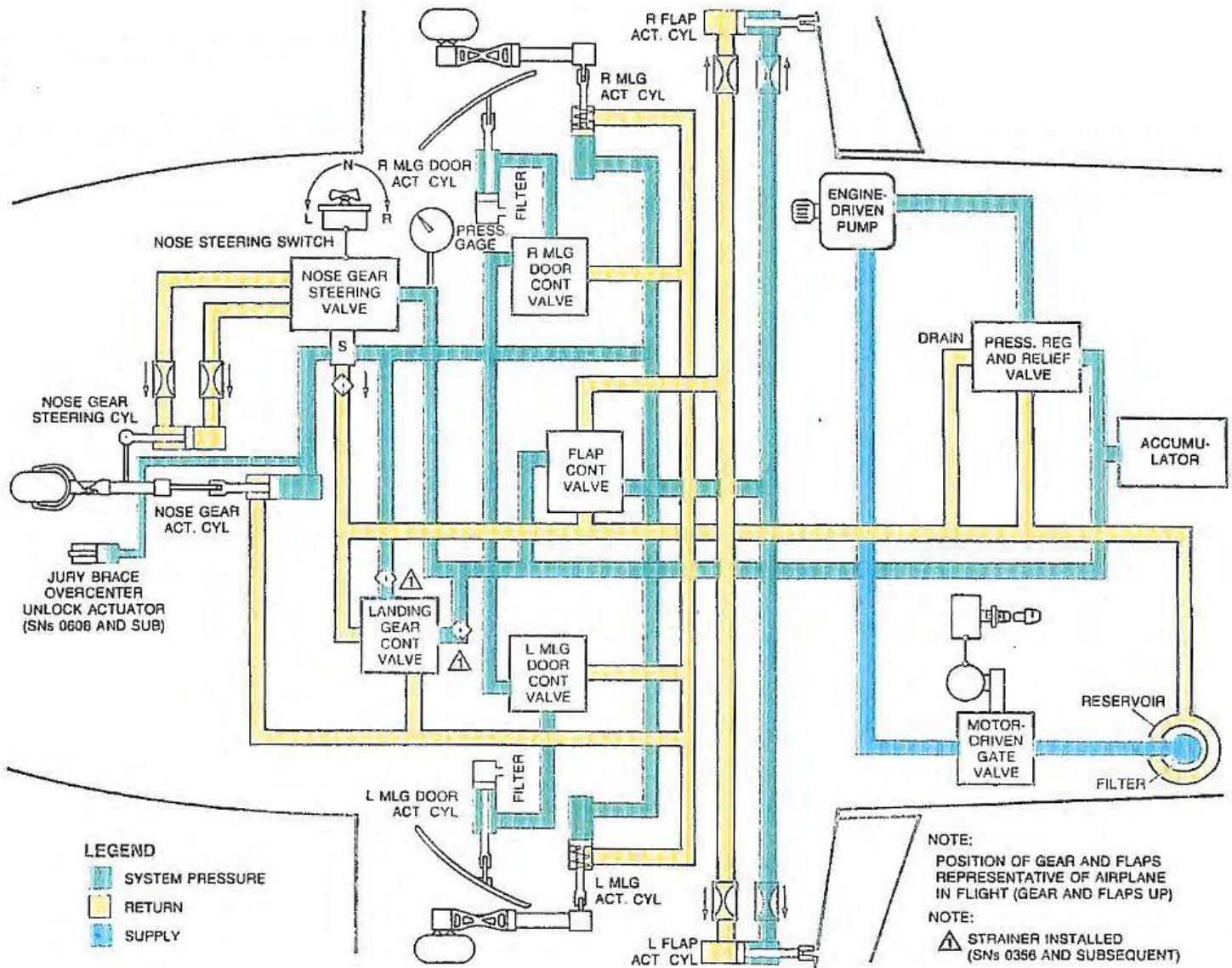


Figure 2-1: HYDRAULIC SYSTEM SCHEMATIC



PRESSURE REGULATOR & RELIEF VALVE

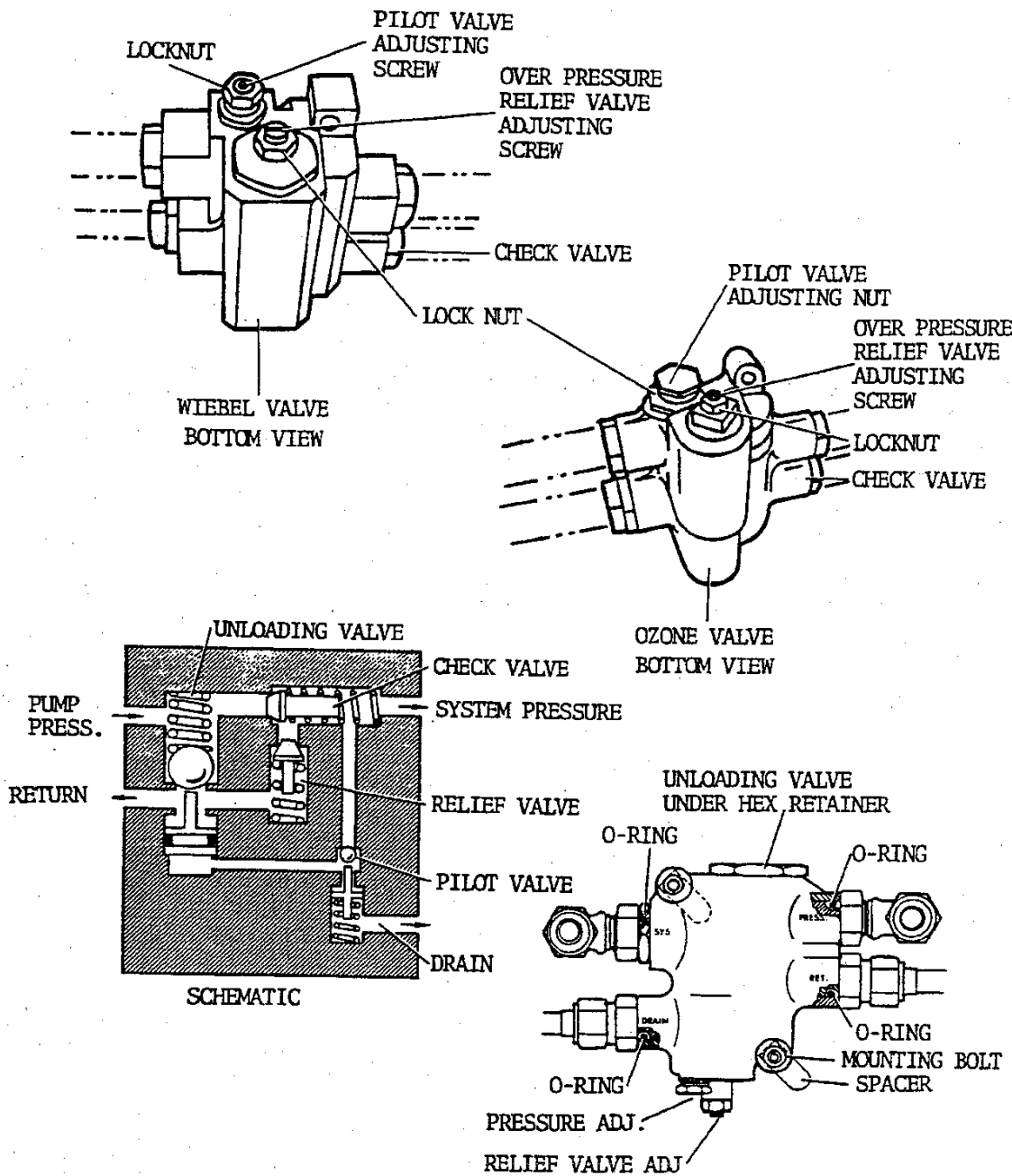


FIGURE 2-2: PRESSURE REGULATOR & RELIEF VALVE



HYD. RESERVOIR REGULATOR & RELIEF VALVE

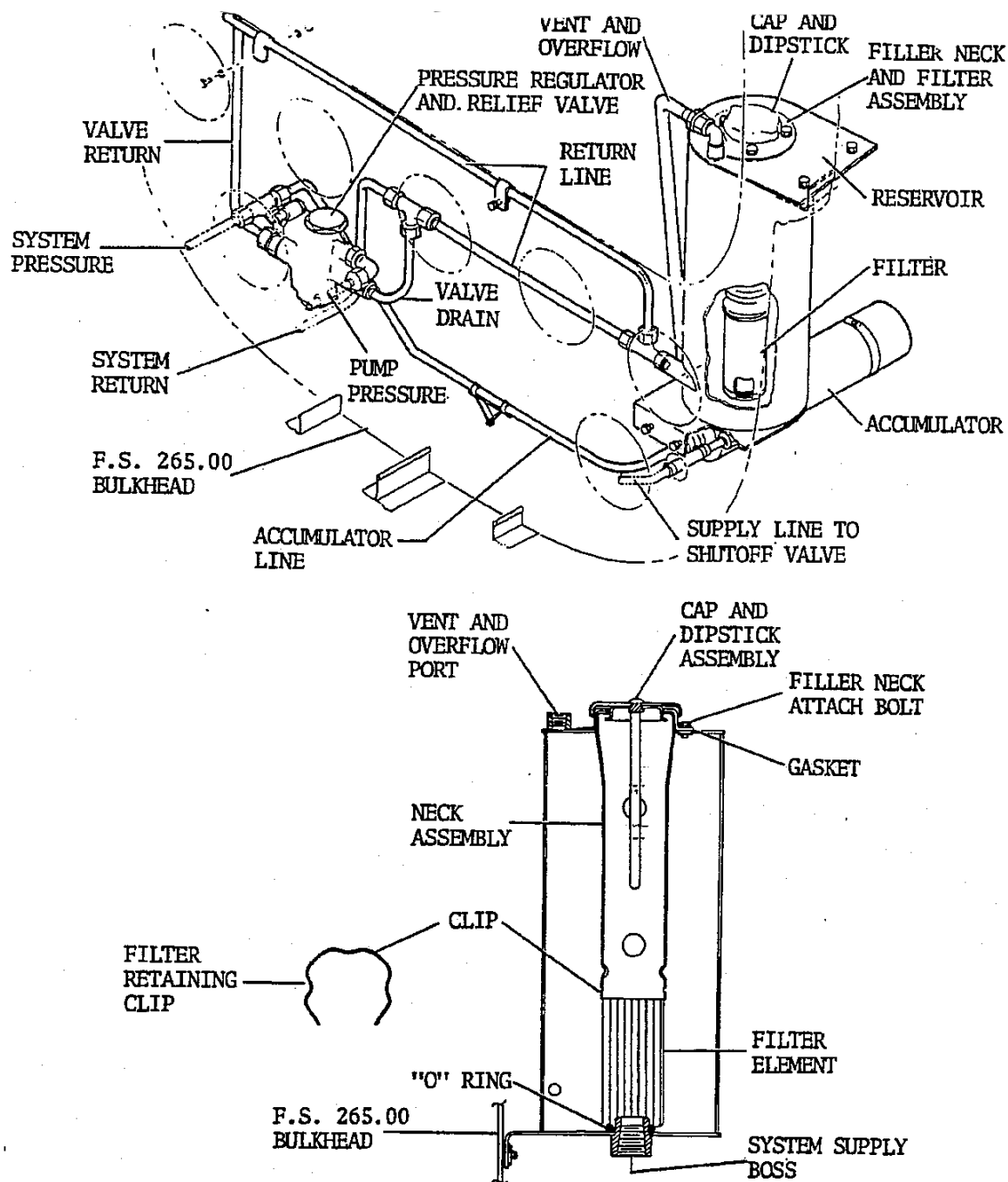


FIGURE 2-3: HYD. RESERVOIR REGULATOR & RELIEF VALVE



HYDRAULIC SYSTEM COMPONENTS LOCATION

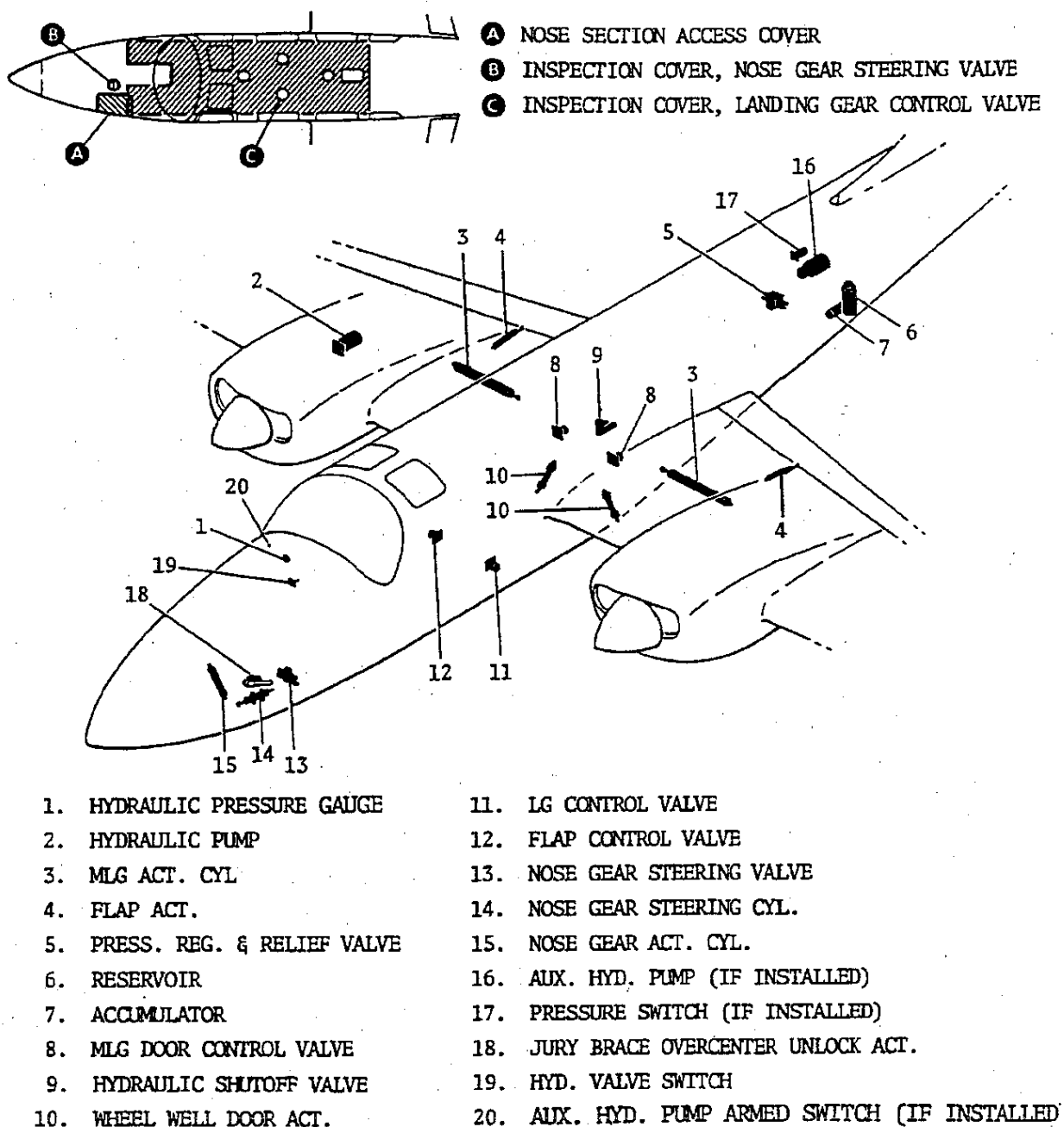


FIGURE 2-4: HYDRAULIC SYSTEM COMPONENTS LOCATION



HYDRAULIC SYSTEM INSTALLATION

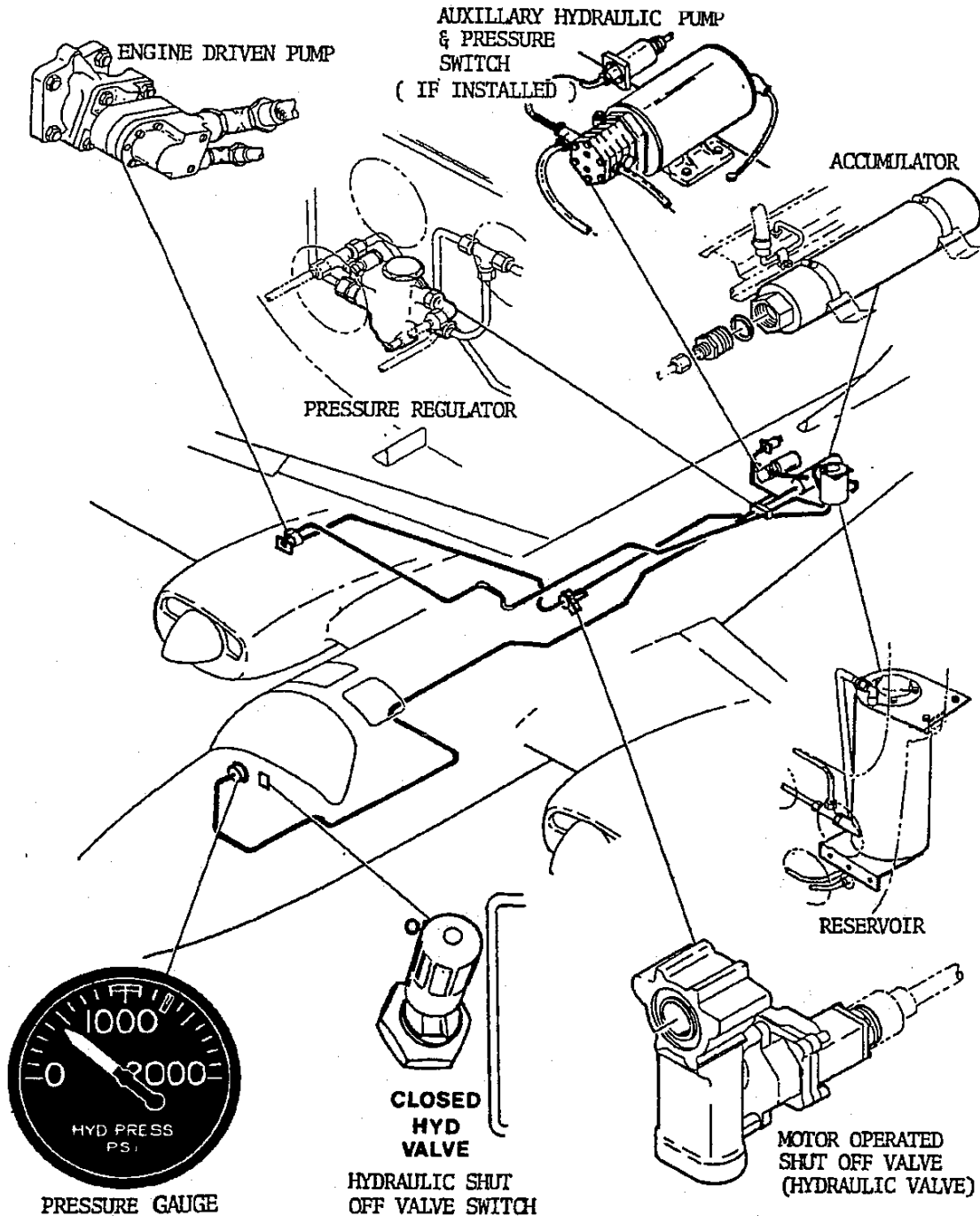


FIGURE 2-5: HYDRAULIC SYSTEM INSTALLATION



MAIN LG & DOOR CONTROL VALVES

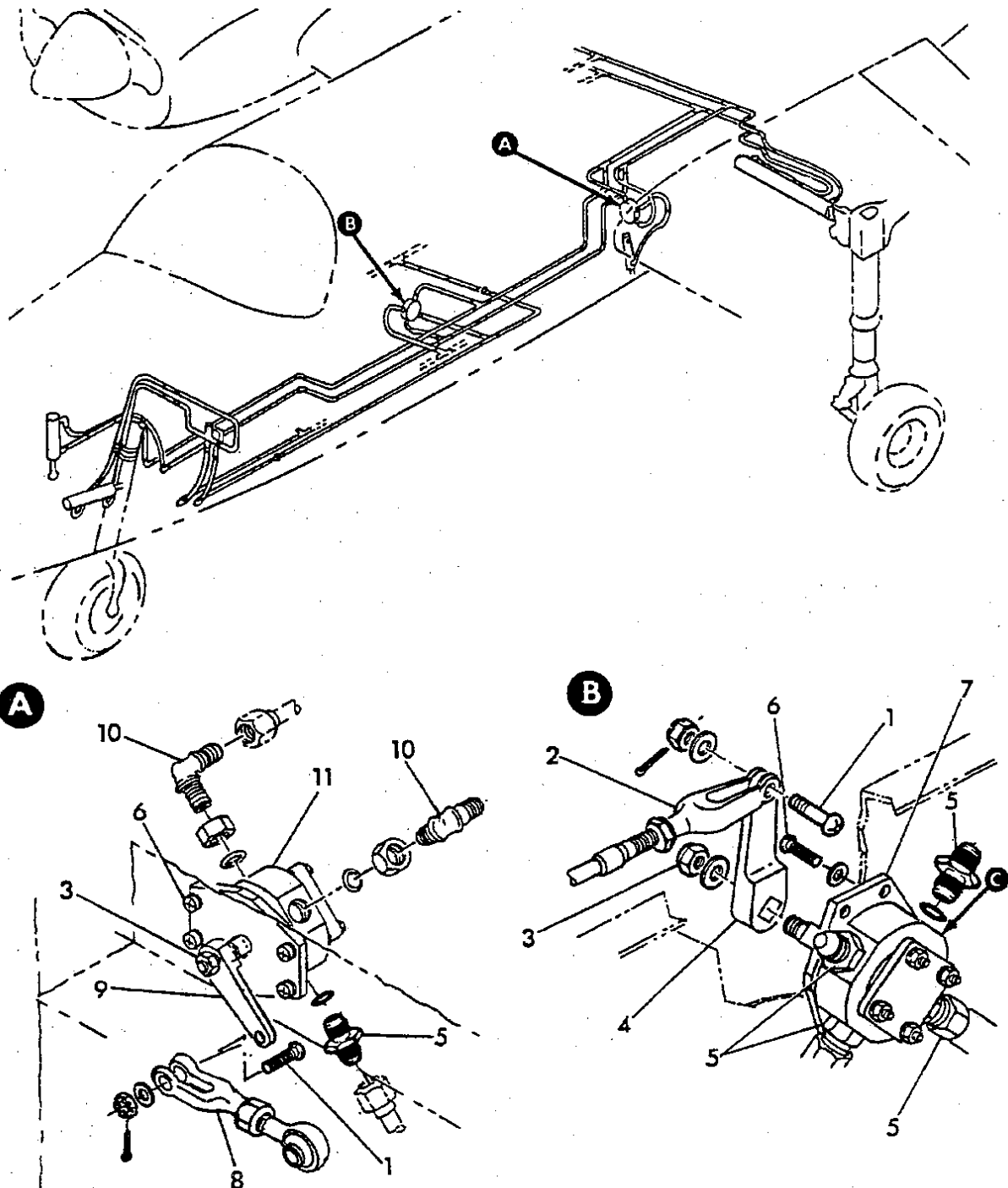


Figure 2-6: MAIN LG & DOOR CONTROL VALVES



LANDING GEAR INDICATION SYSTEM

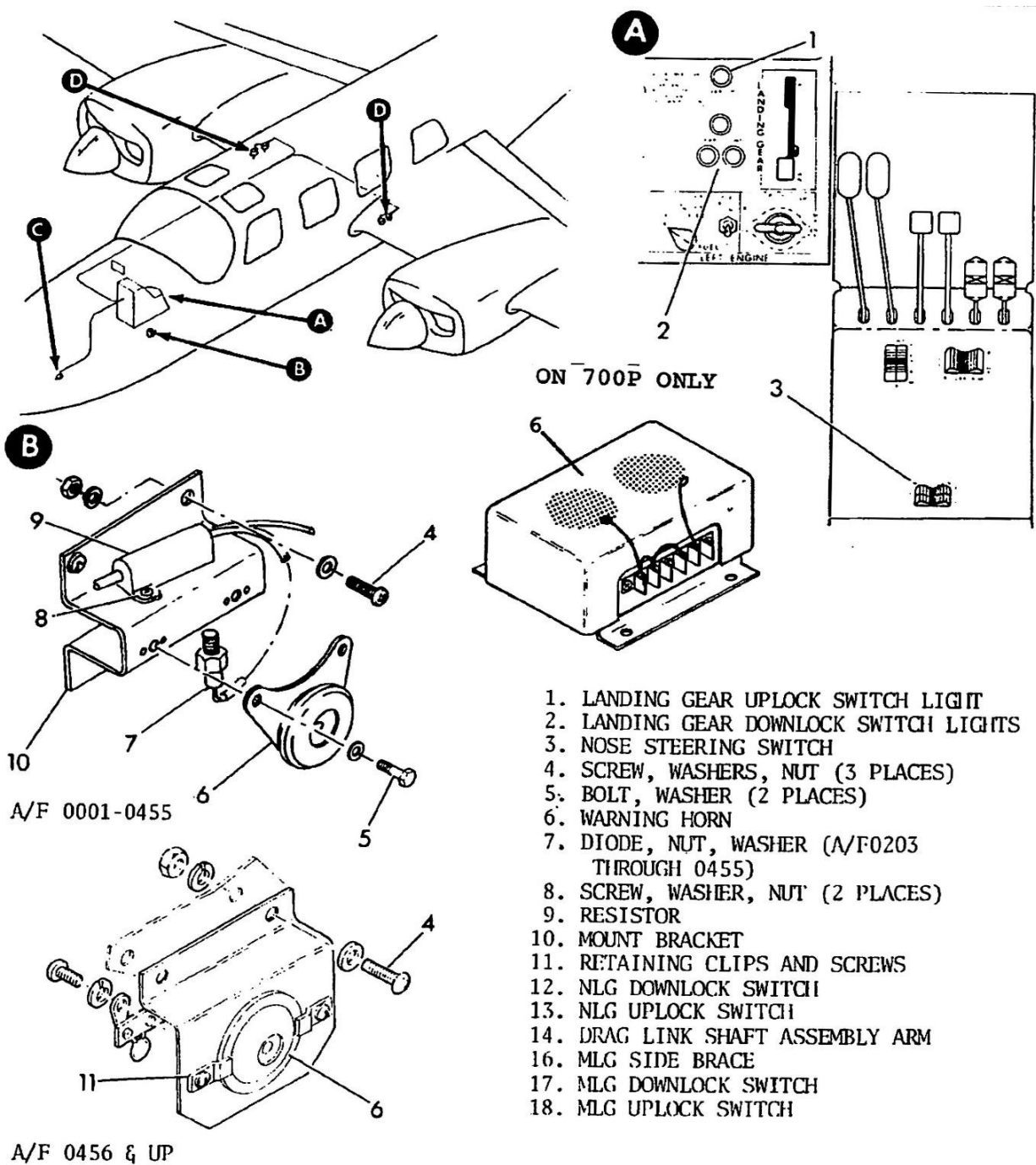


FIGURE 2-7: LANDING GEAR INDICATION SYSTEM



LANDING GEAR INDICATION

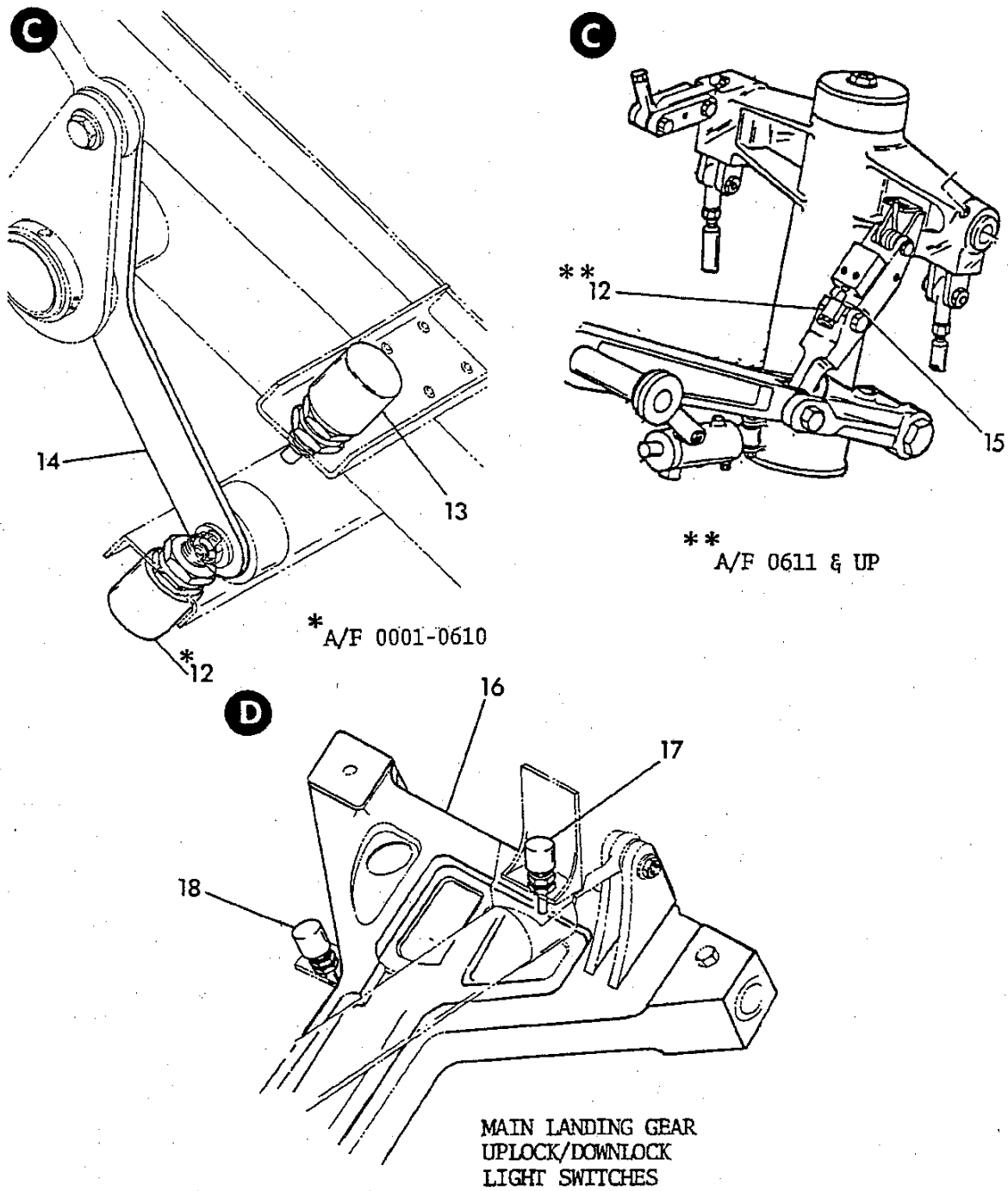
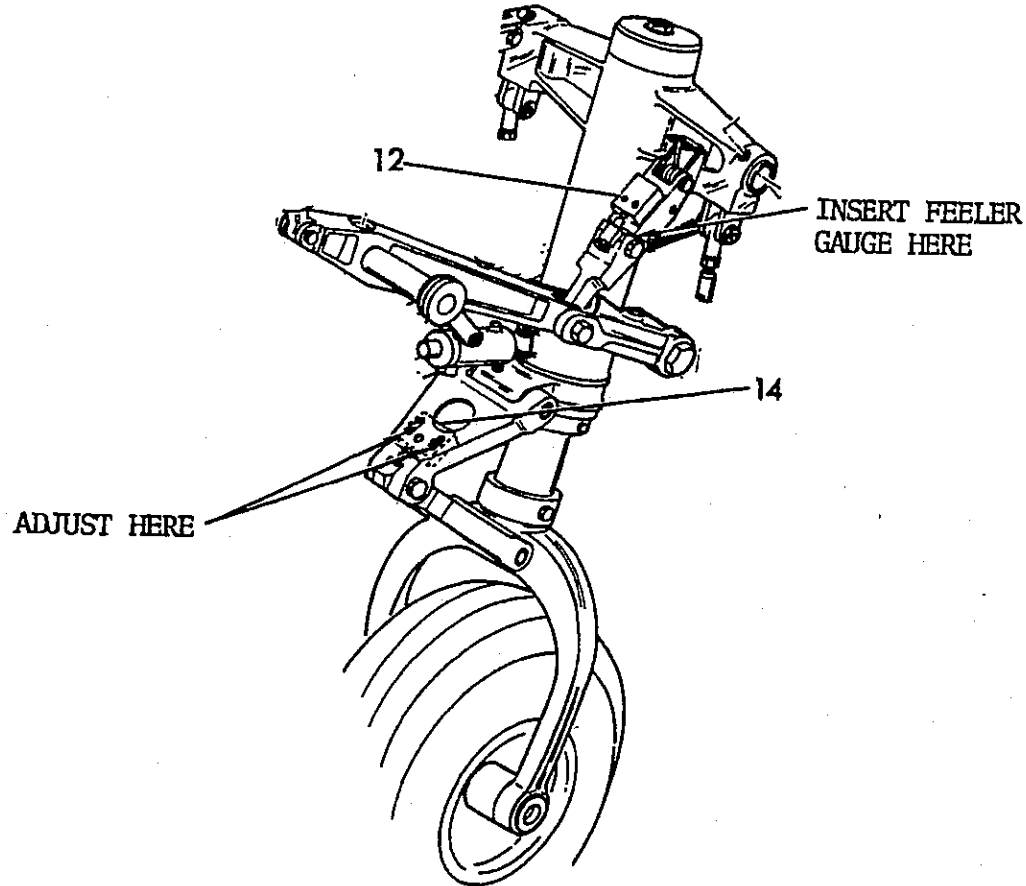


FIGURE 2-8: LANDING GEAR INDICATION



WIEBEL NLG ASSEMBLY



WIEBEL NLG ASSY

- | | |
|---|-----------------------------------|
| 1. ACTUATOR
(NOM. LENGTH FULLY EXTENDED 10.0") | 7. NOSE GEAR STRUT |
| 2. BUNGEE-SPRING UNIT
(NOM. LENGTH 9.72") | 8. ROD ASSY
(NOM LENGTH 9.02") |
| 3. SWITCH (UP LIGHT) | 9. AFT NLG DOOR |
| 4. ROD ASSY
(NOM. LENGTH 13.88 IN) | 10. DRAG STRUT |
| 5. BELLCRANK | 11. FORWARD NLG DOOR |
| 6. ROD ASSY
(NOM LENGTH 5.86") | 12. SWITCH (DOWN LIGHT) |
| | 13. JURY BRACE |
| | 14. SQUAT SWITCH |

FIGURE 2-9: WIEBEL NLG ASSEMBLY



WIEBEL NLG ASSEMBLY

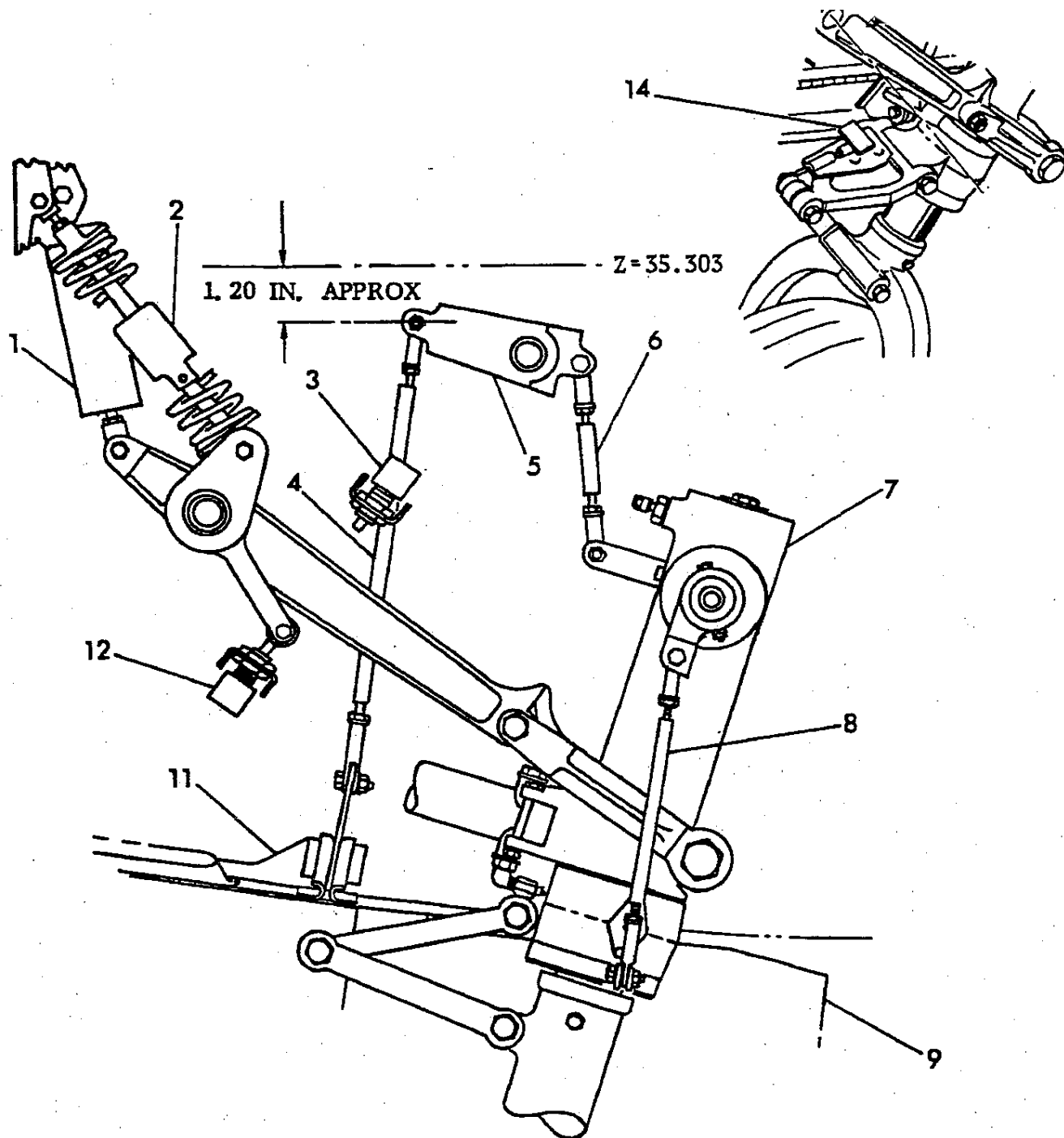
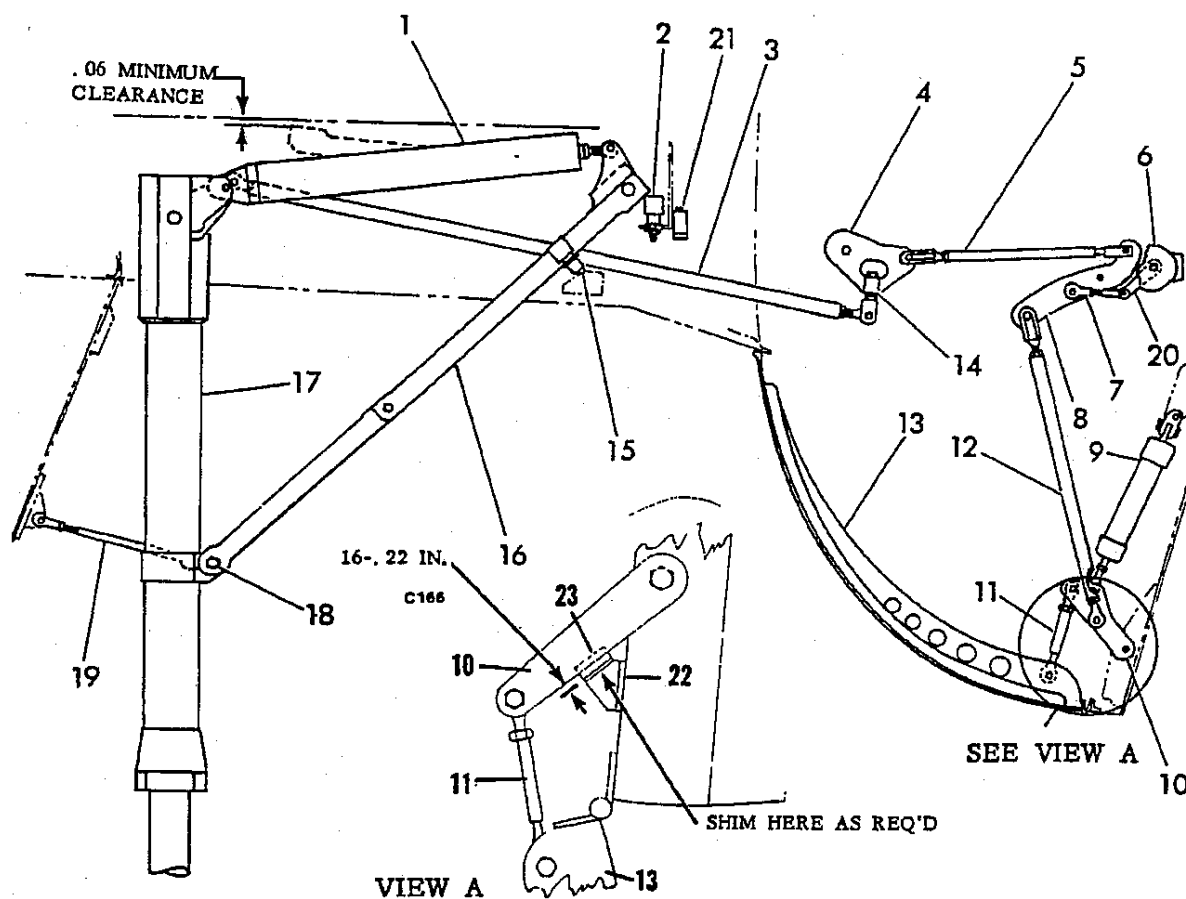


FIGURE 2-10: WIEBEL NLG ASSEMBLY



MAIN LANDING GEAR LINKAGE



NO.	NOMENCLATURE	NOMINAL LENGTH	NO.	NOMENCLATURE	NOMINAL LENGTH
1.	MLG ACTUATOR	20.12"	12.	PUSH ROD ASSY	16.80"
2.	SWITCH, UP-LIGHT	-	13.	MLG DOOR	-
3.	ROD ASSY	33.38"	14.	WASHERS (3 EACH)	-
4.	BELLCRANK	-	15.	SWITCH, DOWN LIGHT	-
5.	PUSH ROD ASSY	11.44"	16.	SIDEBRACE	-
6.	CONTROL VALVE	-	17.	MLG STRUT	-
7.	CLEVIS	2.77"	18.	BOLT	-
8.	BELLCRANK	-	19.	ROD ASSY	-
9.	MLG DOOR ACTUATOR	-	20.	ARM	-
10.	IDLER	-	21.	BUMPER	-
11.	ROD ASSY. (A/F 0001-0824)	4.78"	22.	STOP ASSY. (A/F 0825 AND UP)	-
	ROD ASSY. (A/F 0825 AND UP)	4.50"	23.	CUSHION (A/F 0825 AND UP)	-

FIGURE 2-11: MAIN LANDING GEAR LINKAGE



NEW MLG TORQUE LINKS

These new type of torque links, Kit #765-155V offer heavier metal construction, plus a means of adjusting toe-in and toe-out for better alignment and tire wear.

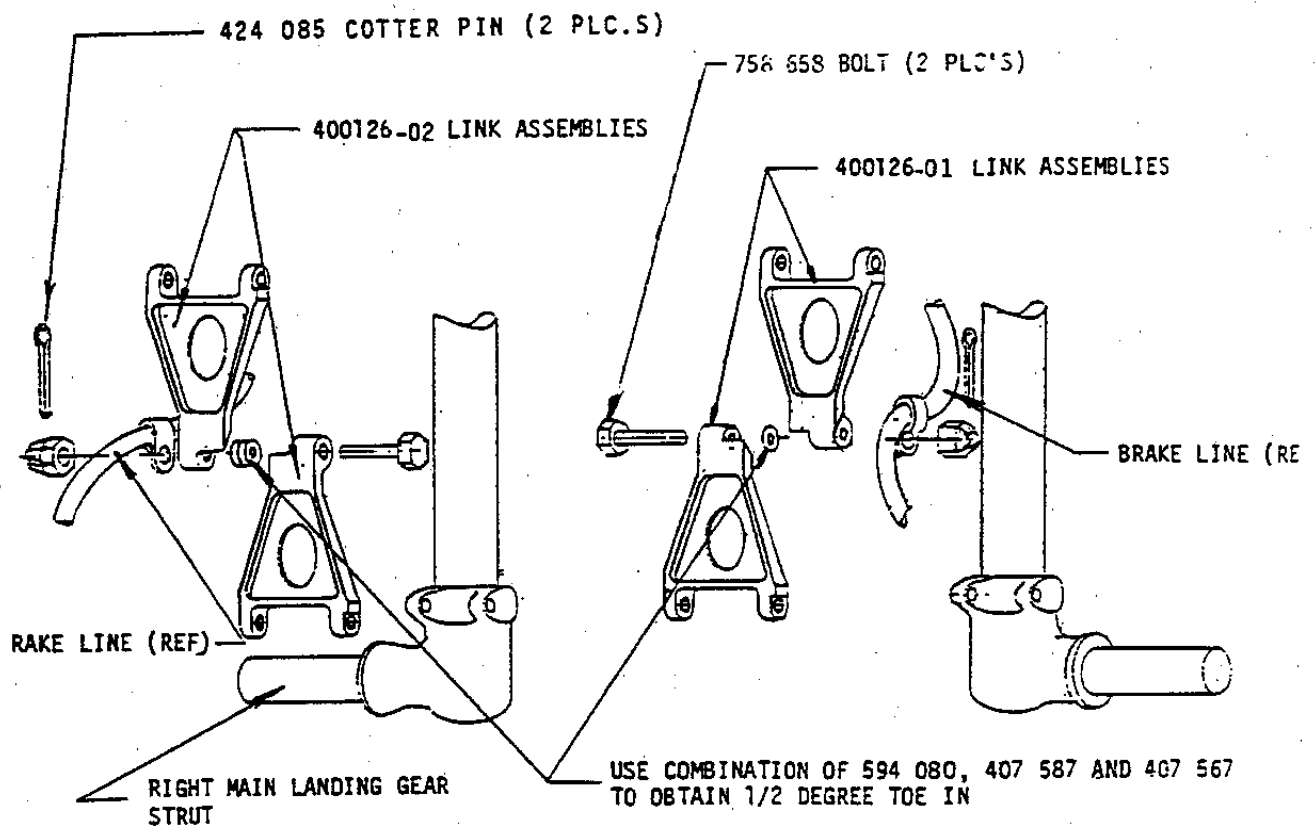
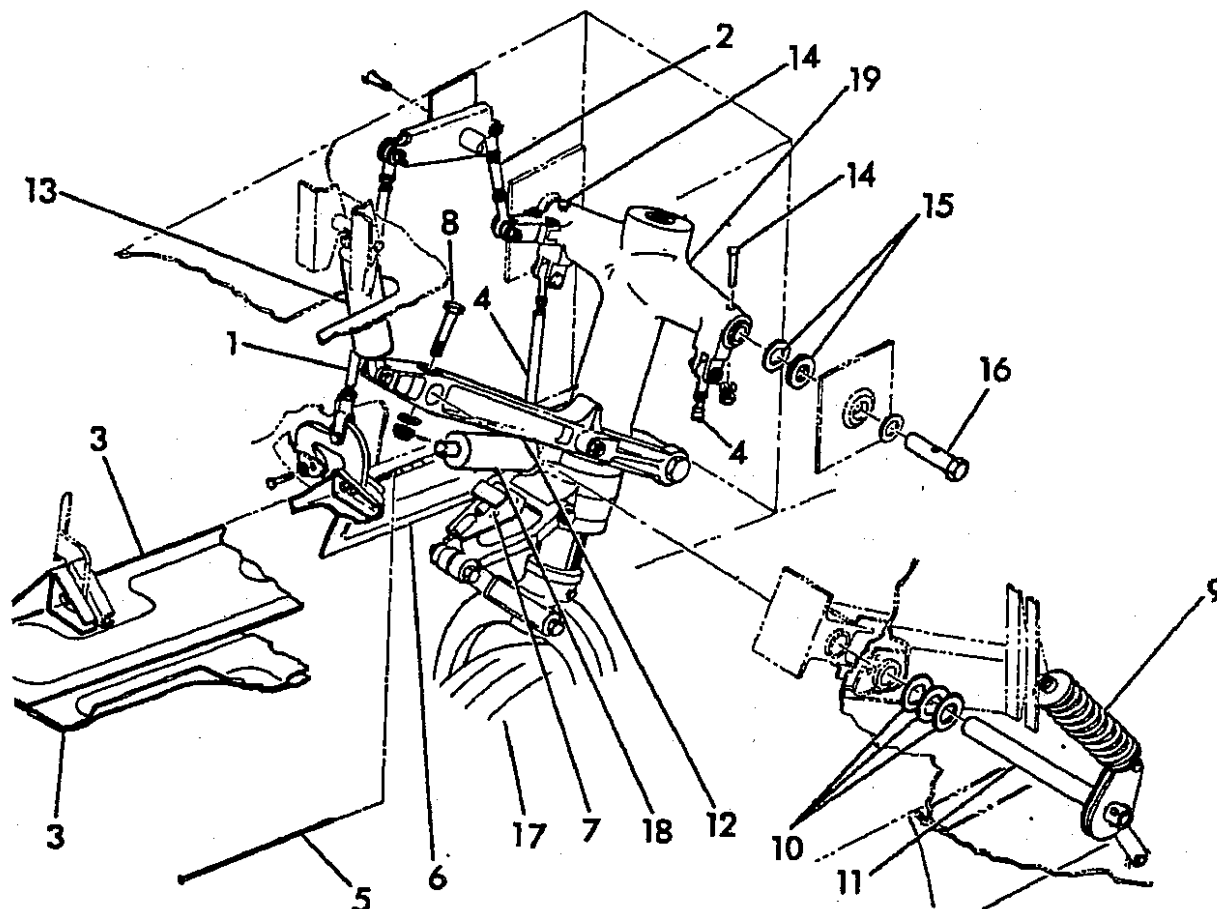


FIGURE 2-12: NEW MLG TORQUE LINKS



OZONE NLG ASSEMBLY



- | | |
|--------------------------------------|--------------------------------|
| 1. FORWARD DOOR CONTROL ROD (2 EACH) | 11. SHAFT ASSEMBLY |
| 2. FORWARD DOOR ACTUATING ROD | 12. DRAG BRACE ASSEMBLY |
| 3. FORWARD DOOR | 13. NOSE GEAR ACTUATOR |
| 4. AFT DOOR CONTROL ROD | 14. BOLT, WASHER, NUT |
| 5. HINGE PIN | 15. WASHERS (AS REQUIRED) |
| 6. AFT DOOR | 16. BOLT, WASHER, RETAINER PIN |
| 7. SQUAT SWITCH & ACTUATOR PIN | 17. TIRE AND WHEEL ASSEMBLY |
| 8. BOLT, WASHER, NUT | 18. STEERING ACTUATOR |
| 9. BUNGEE ASSEMBLY | 19. NOSE LANDING GEAR ASSEMBLY |
| 10. WASHER (AS REQUIRED) | |

FIGURE 2-13: OZONE NLG ASSEMBLY



BRAKE SYSTEM INSTALLATION

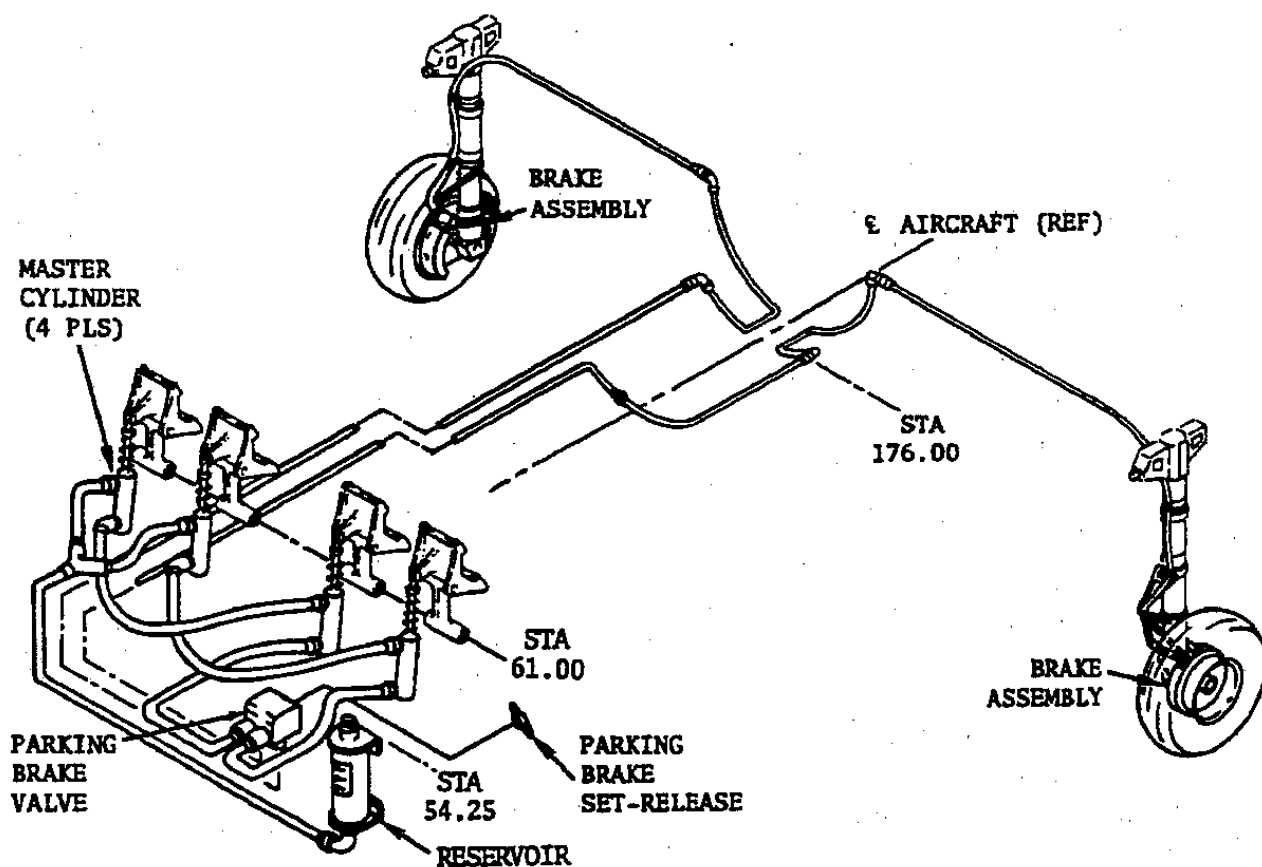


FIGURE 2-14: BRAKE SYSTEM INSTALLATION



BRAKE RESERVOIR

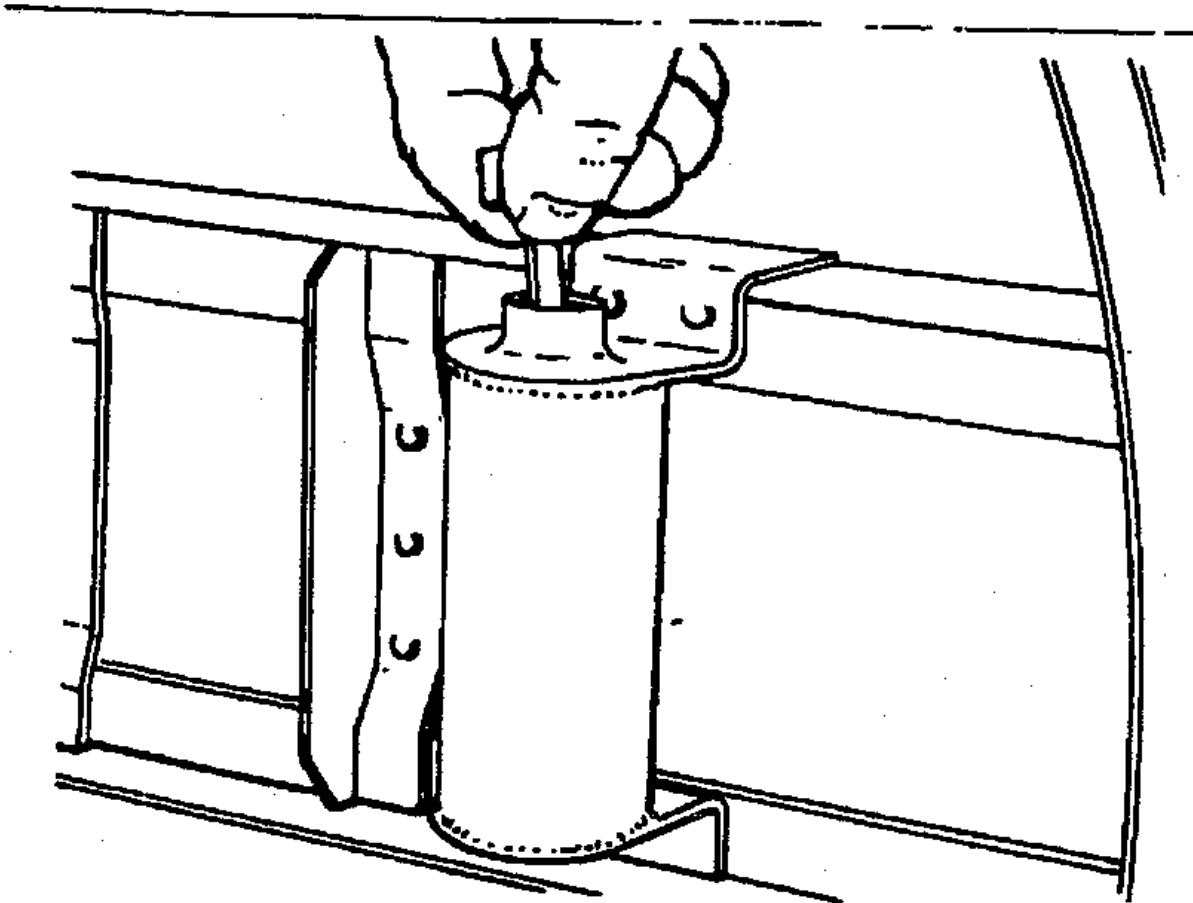


FIGURE 2-15: BRAKE RESERVOIR



CHAPTER 2 - QUIZ

- 1) For normal operations, the hydraulic valve should be:
 - a) in the open position.
 - b) in the closed position when using the aux hydraulic pump.
 - c) closed for landing and takeoff.
 - d) open only when hydraulic pressure is below 1000 psi.
- 2) The hydraulic fluid reservoir is located:
 - a) behind the aft baggage compartment curtain.
 - b) in the right gear well.
 - c) in the right forward nose compartment.
 - d) against the left engine firewall.
- 3) If the right engine is feathered in an aircraft not equipped with an aux hydraulic pump:
 - a) the gear may be retracted once extended with the prop feathered.
 - b) gear will not free fall when gear down is selected due to trapped pressure.
 - c) a split-flap condition is apt to occur.
 - d) The gear will free fall, but cannot be retracted.



- 4) During taxi, if either half of the nose wheel steering switch independently produces a response, the:
- a) switch is operating normally.
 - b) hydraulic pressure may be low
 - c) system is malfunctioning and the flight should be aborted.
 - d) fail-safe system is effectively providing back-up steering.
- 5) Should an engine fire occur in the right engine, the hydraulic shutoff valve should be:
- a) open.
 - b) neutralized.
 - c) closed.
 - d) armed.
- 6) In the event of hydraulic failure evidenced by a slight drop in hydraulic pressure:
- a) the flap handle should immediately be placed in the full down position.
 - b) the flap handle should be raised immediately.
 - c) the flap handle should be placed in the neutral position, preventing any fluid pressure drop in the system.
 - d) The gear should not be extended above 124 KIAS.



- 7) To lower the landing gear with partial or no hydraulic pressure, the landing gear lever should:
- a) be placed in the up position, as gear will free fall anyway.
 - b) be placed in the down position, then cycled up and down.
 - c) be left in a neutral position
 - d) Not be touched once three green lights show.
- 8) The landing gear warning horn will sound when the gear is in the up position and:
- a) a complete loss of hydraulic pressure is experienced.
 - b) either throttle is retarded below 15" - 13".
 - c) both throttles are retarded below 18".
 - d) the amber gear-up light fails to illuminate.
- 9) The brake system on the Aerostar:
- a) is hydraulically actuated using the same fluid reservoir as the gear and flaps.
 - b) incorporates electrically actuated, dual floating caliper fixed discs.
 - c) incorporates hydraulically actuated, dual floating caliper fixed discs.
 - d) has only one master cylinder.



- 10) The brake system fluid reservoir is located:
- a) behind the baggage compartment.
 - b) Has no reservoir, as the brake system is electrical.
 - c) in the nose compartment.
 - d) None of the above.





3

3. FLIGHT CONTROLS



FOR TRAINING PURPOSES ONLY



CHAPTER 3

FLIGHT CONTROLS

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CHAPTER 3

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PRIMARY CONTROL SYSTEM

The Aerostar incorporates dual primary flight controls utilizing conventional elevator, aileron and rudder systems. The primary moveable control surfaces are operated by means of a system of push-pull tubes, torque tubes and bellcranks. No cables are used anywhere in the system. All bearings within the system are permanently lubricated and require no servicing, and no adjustments

should ever be required after the airplane leaves the factory.

A preflight walk around should include checking the free play between the left and right elevator control surfaces. Grab each elevator outside of the trim tab and lift one side up while holding the other still. There should be no more than 1/4 inch of free play. If there is more, the universal joint is worn or the rivets worn or holes elongated.

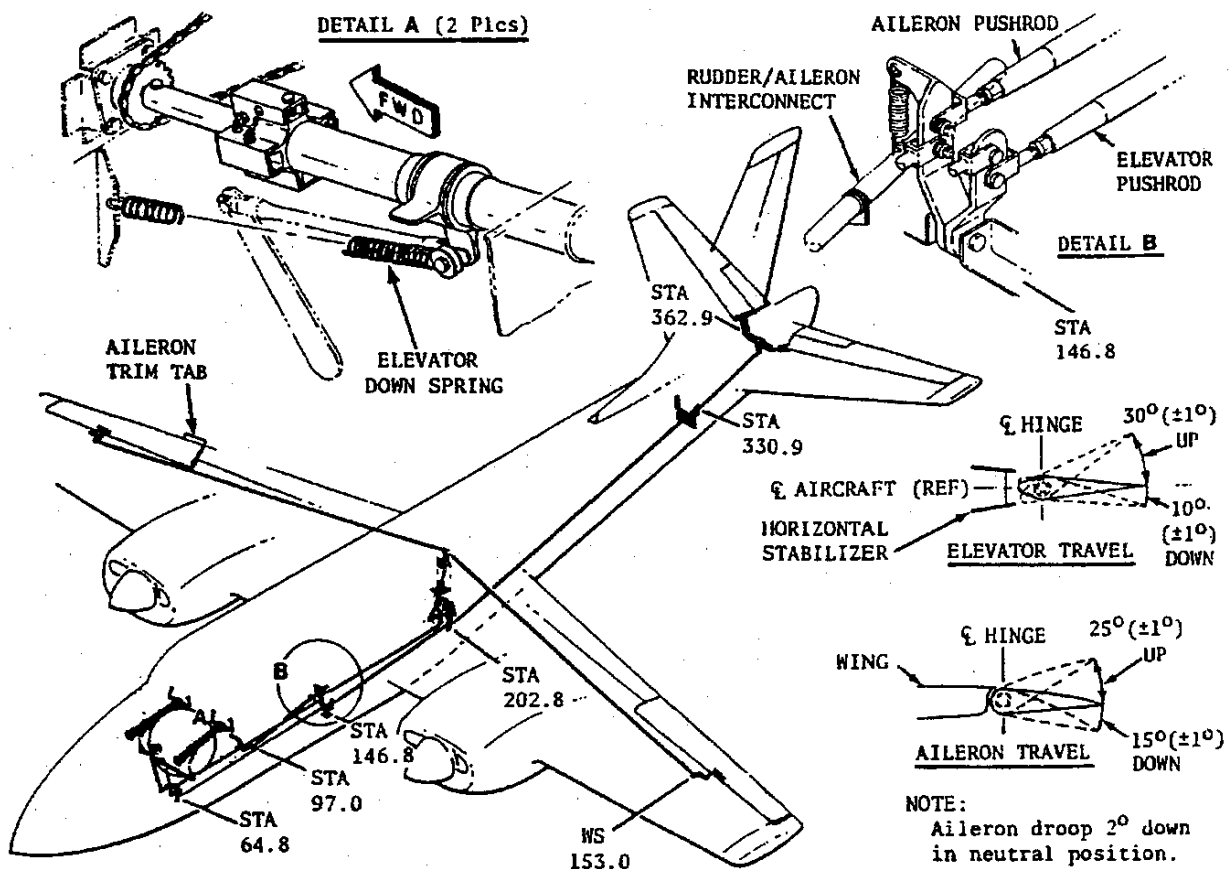


FIGURE 3-14-1: PRIMARY CONTROL SYSTEM



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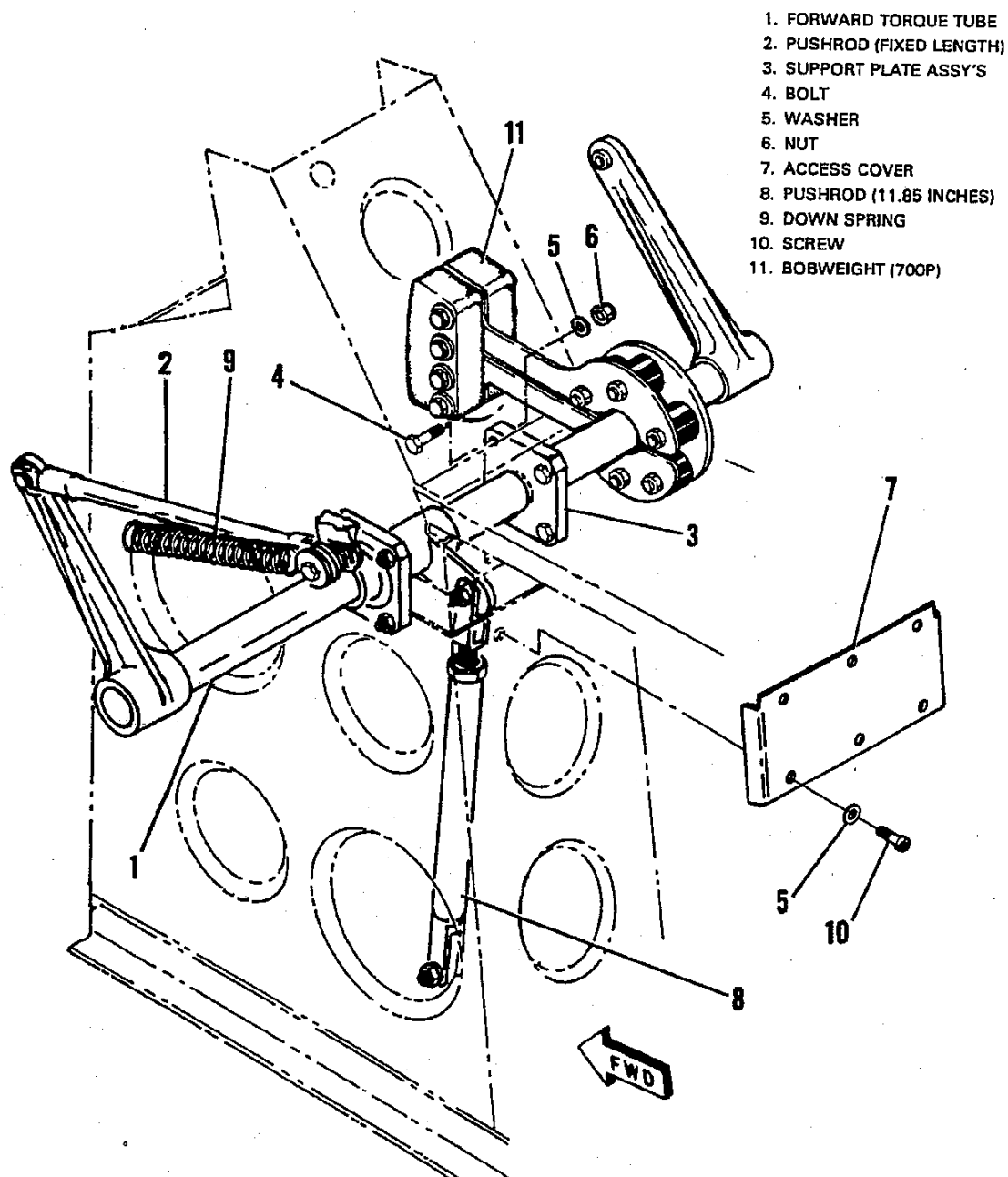


FIGURE 3-1-2: BOBWEIGHT & DOWN SPRING

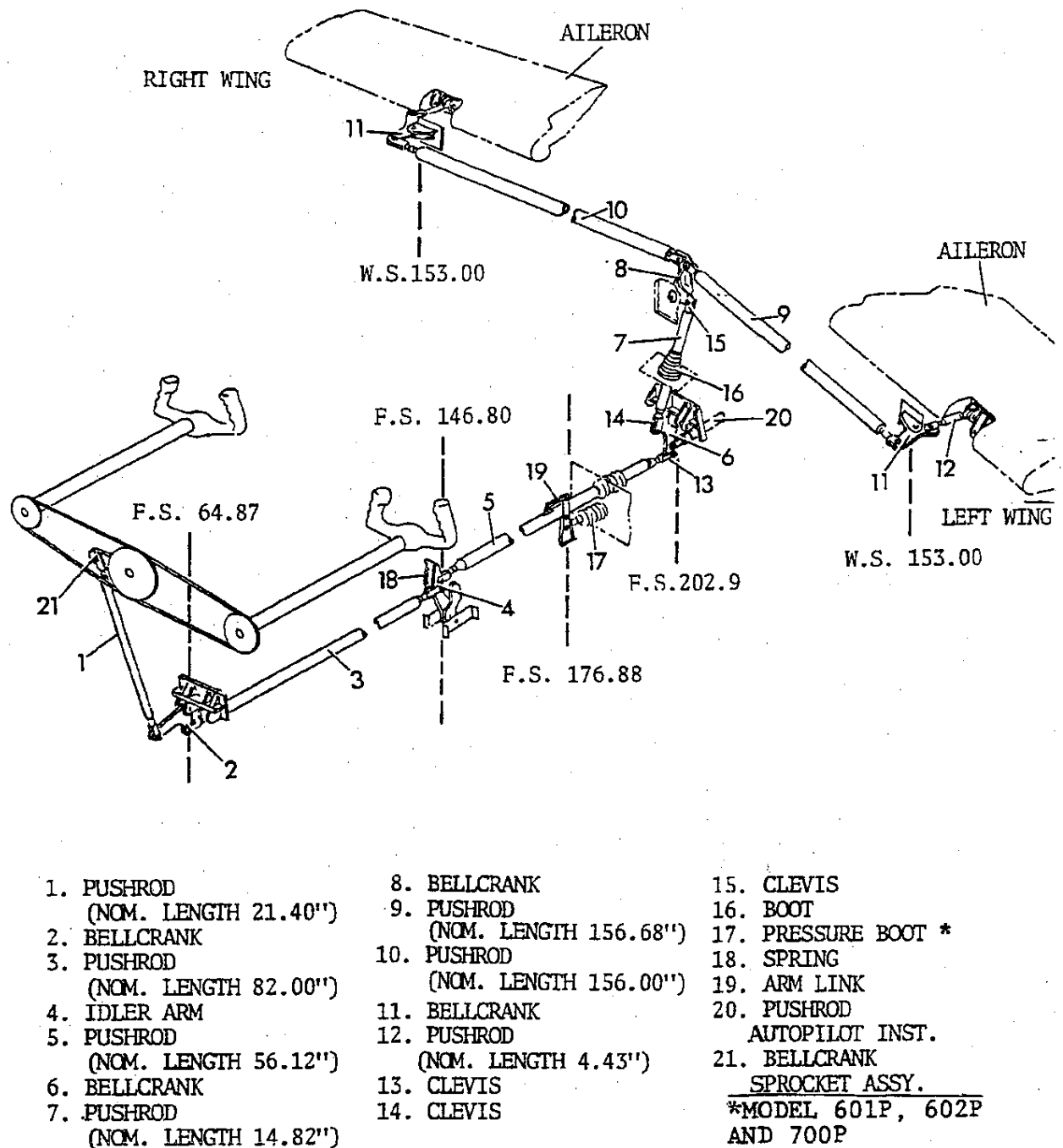


FIGURE 3-1-3: AILERON CONTROL LINKAGE

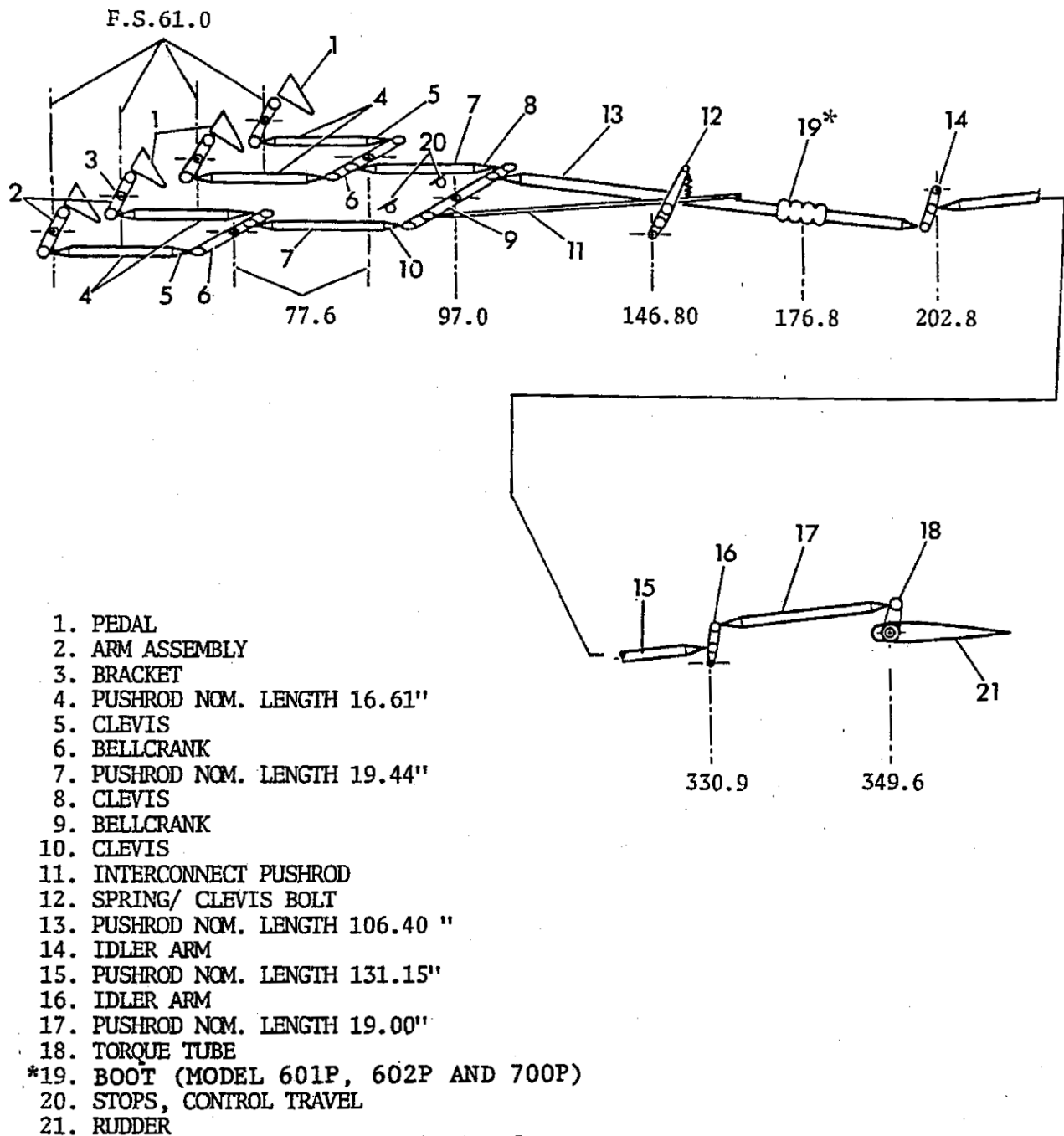


FIGURE 3-1-4: RUDDER CONTROL LINKAGE



RUDDER/AILERON INTERCONNECT

The ailerons and rudder are interconnected through a spring system which is activated only when controls are

out of harmony. In normal coordinated flight, the system is inactive.

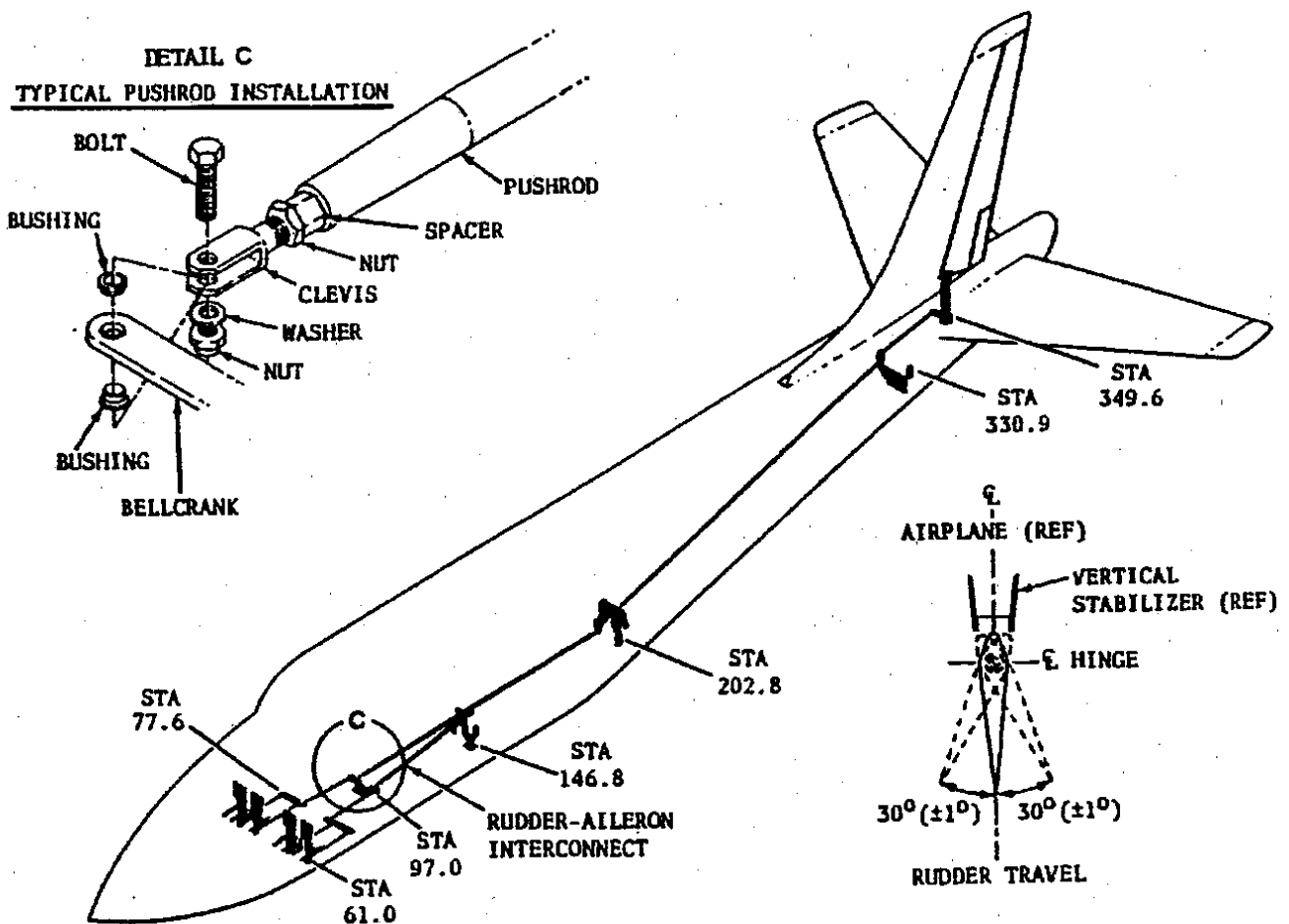
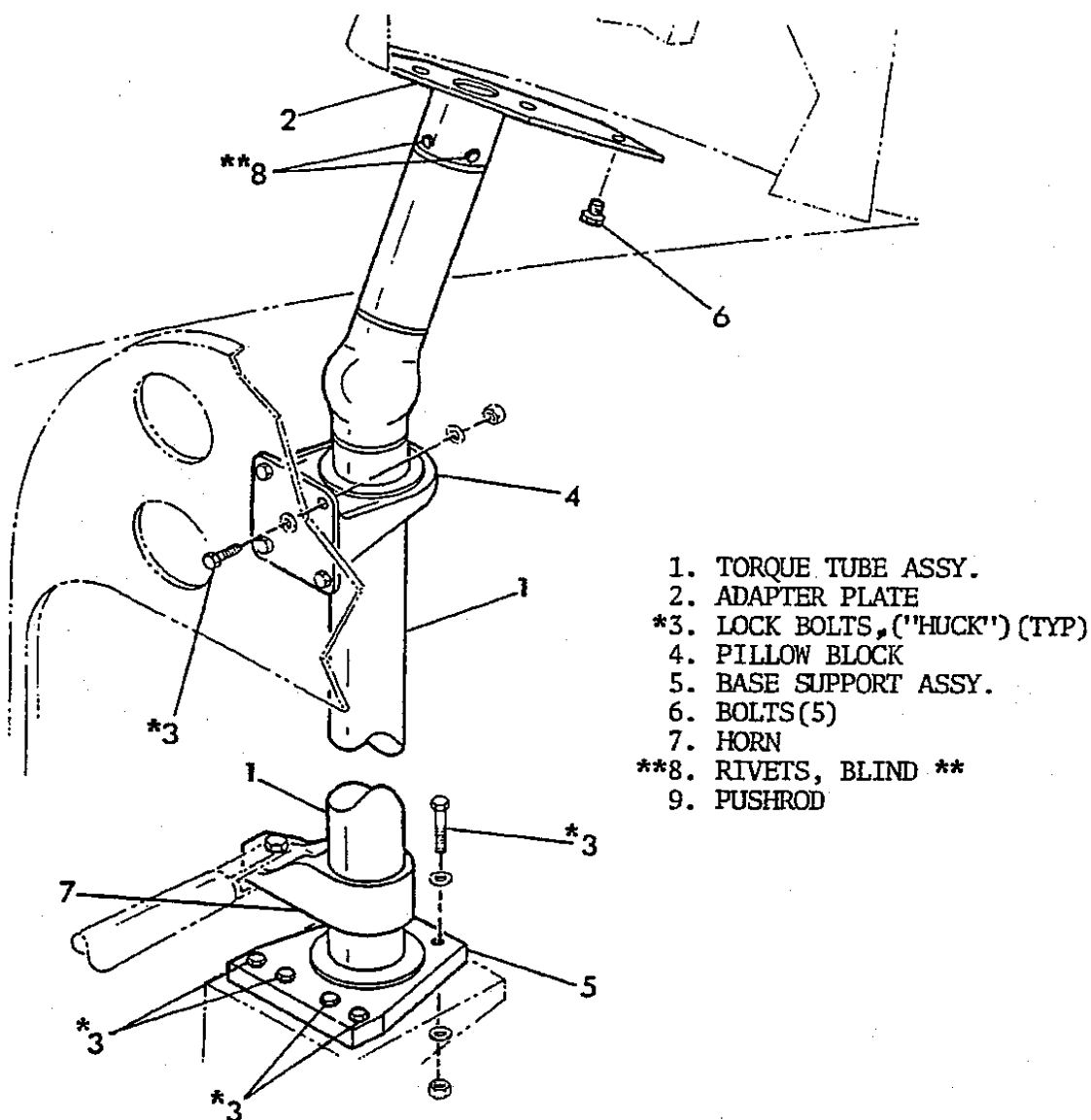


FIGURE 3-1-5: RUDDER AILERON INTERCONNECT



NOTE: * REPLACE "HUCKS"; WITH AN173 BOLTS, AN WASHERS, AND MS NUTS.

NOTE ** FOR REPLACEMENT, RIVETS ONE DIAMETER LARGER ARE APPROVED. SPOTFACE HOLES, AS REQUIRED, TO SEAT RIVETS.

FIGURE 3-1-6: RUDDER TORQUE TUBE INSTALLATION



TRIM CONTROL SYSTEM

The elevator and rudder trim tabs are operated by 28V D.C. trim motors which are actuated by pedestal mounted, spring-loaded rocker switches. The left elevator trim tab has an electric motor, the right elevator trim tab is driven by a flex cable interconnecting the two trim tabs. The aileron trim tab is a fixed type and is factory adjusted

for level cruise flight. No readjustment of this tab should be required after the airplane leaves the factory.

An electric aileron trim control system called Aero-Trim is available and installed on many Aerostars. It is convenient but should not be a substitute for balanced fuel loading and coordinated flight.

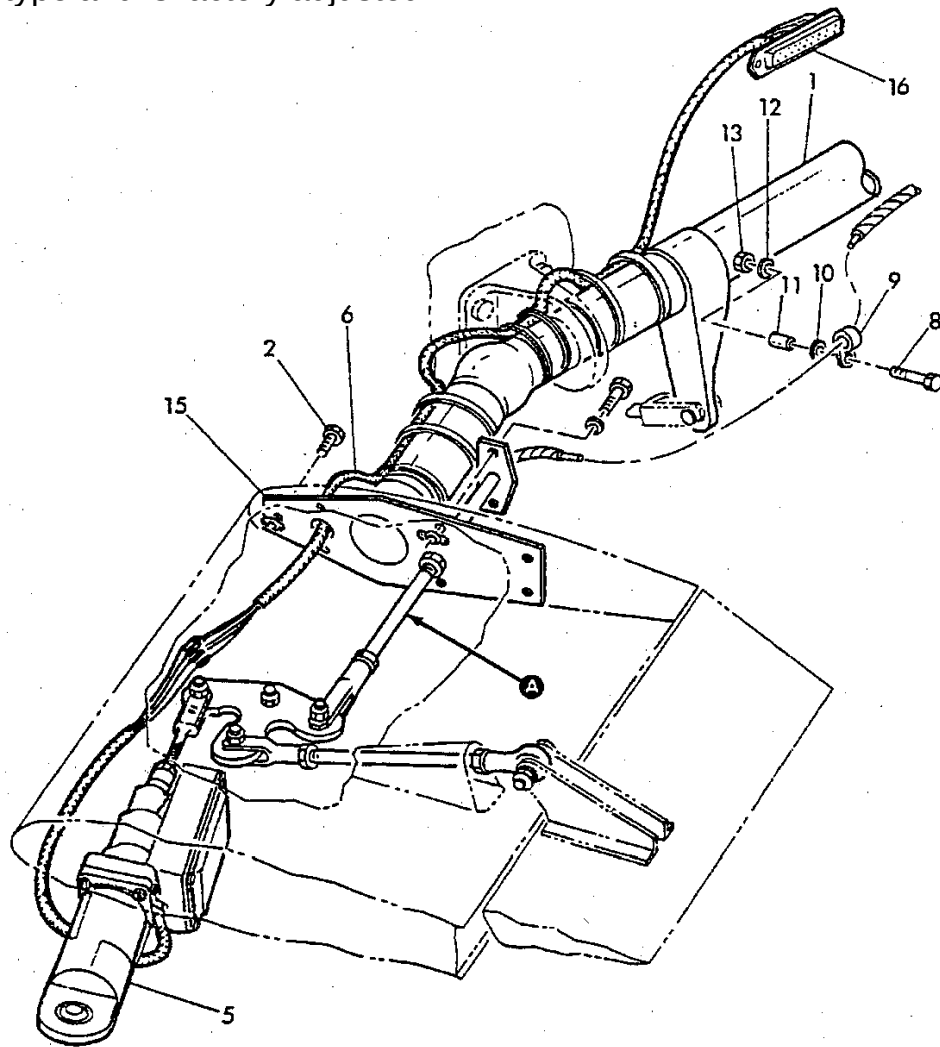


FIGURE 3-1-7: TRIM CONTROL SYSTEM

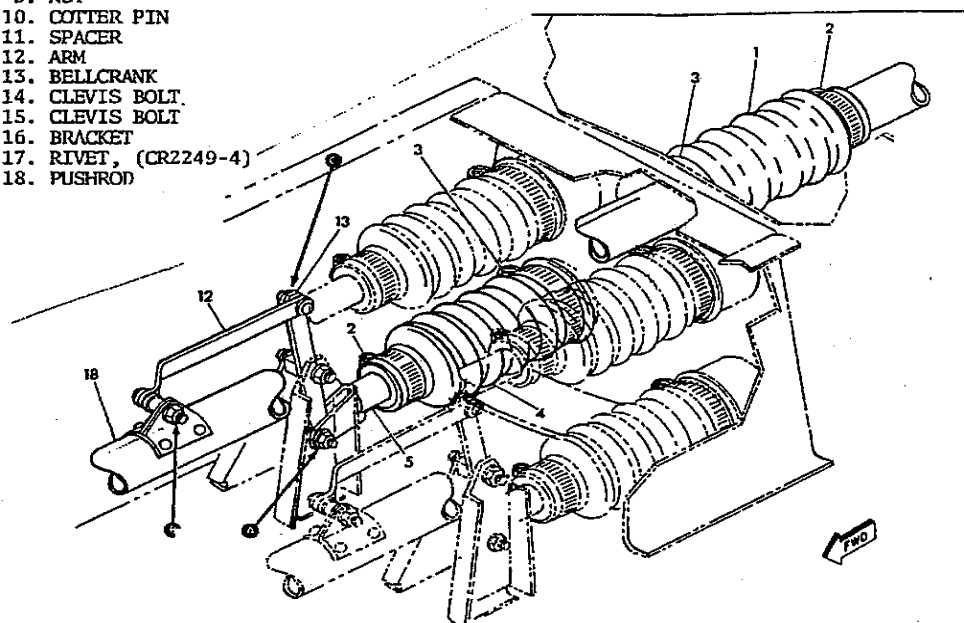


PRESSURE BALANCE TUBES

In pressurized models, the flight control pushrods are sealed at the point where they exit the pressurized cabin area, by means of bellows type boots. This method of sealing would result in additional loads applied to the control system when the cabin is pressurized. To offset this load, idler

(balance) tubes which also penetrate the pressurized cabin area, and are sealed with similar boots, are linked by means of a bellcrank to the aileron and elevator control push rods, which automatically produces a counter-balancing force.

1. BOOT, PRESSURE*
2. CLAMP
3. CLAMP
4. BOOT, BALANCE
5. TUBE
6. CLEVIS BOLT
7. WASHER
8. WASHER
9. NUT
10. COTTER PIN
11. SPACER
12. ARM
13. BELLCRANK
14. CLEVIS BOLT
15. CLEVIS BOLT
16. BRACKET
17. RIVET, (CR2249-4)
18. PUSHROD



*FOR AILERON PUSH ROD ONLY. ALL OTHER BOOTS MOUNTED ON FRONT OF BULKHEAD.

Fig. 3.8

FIGURE 3-1-8: PRESSURE BALANCE TUBES



CHAPTER 3 - QUIZ

1. The primary moveable control surfaces in the aircraft are operated by:
 - a. control cables and pulleys.
 - b. bellcrank-actuated cables.
 - c. hydraulic pressure.
 - d. push-pull rods, torque tubes, and bellcranks.

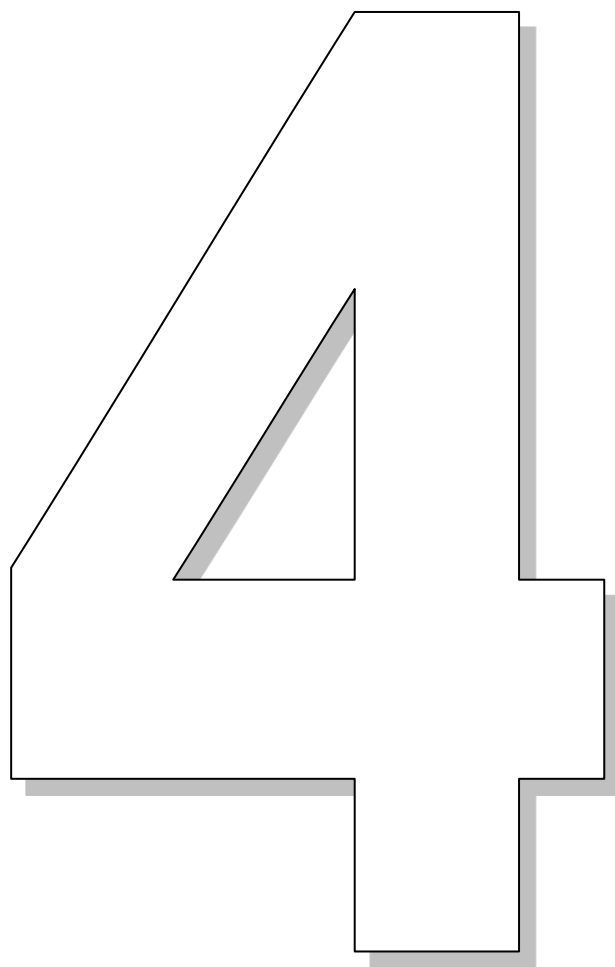
2. A runaway elevator or rudder trim can be deactivated by:
 - a. depressing the appropriate trim switch in the opposite direction to that of the malfunction.
 - b. manually holding pressure against the erratic trim.
 - c. turning off the battery switch.
 - d. pulling the alternator and battery circuit breakers.

3. The push-pull rod bearings for the flight control (aileron and rudder) should be lubricated:
 - a. each 100 hours of flight time.
 - b. each 1000 hours of flight time.
 - c. Bearings within the system are permanently lubricated and require no servicing.
 - d. All of the above.

4. The elevator trim system is operated by:



- a. two 28 DC trim motors.
 - b. one 28 DC trim motor and manual trim.
 - c. one 28DC trim motor on left elevator with a flex cable interconnecting two trim tabs.
 - d. None of the above.
5. The aileron trim tab is a:
- a. system operated by two 24 DC motors in each aileron.
 - b. fixed type and is factory adjusted for level cruise.
 - c. fixed tab on the L/H aileron.
 - d. None of the above



4. FUEL SYSTEM

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 4

FUEL SYSTEM

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CHAPTER 4

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FUEL TANKS

Fuel is stored in large area, shallow, integral wet wing tanks located outboard of the engine nacelle, and a deep rectangular bladder-type fuselage fuel tank located between the rear cabin bulkhead and the forward bulkhead of the baggage compartment. Total capacity of this interconnected system is 173.5 gallons (165.5 gallons usable). Each wet wing fuel tank has a capacity of 65 gallons (62 gallons usable when fueled to 0.6 in. below filler neck). The fuselage fuel tank has a capacity of 43.5 gallons (41.5 gallons usable).

A multiple sump assembly is installed below the fuselage fuel tank. The center sump is the low point for the fuselage tank, and the two wing sumps are the low points of each wet wing tank. Each sump can be drained by depressing its respective drain valve located on the left lower side of the fuselage, just aft of the wing. Fuel is fed to the left and right-wing sumps through check valve assemblies. There are two check valves installed in each sump. With the fuel selector in the ON mode, the fuselage tank and wing tanks feed simultaneously through all check valves, each wing tank to its respective engine, with the fuselage tank feeding to both engines. The check valves prevent backflow of fuel from one tank to another. A fuel strainer is located at the outlet of each wet wing tank on the

inboard tank rib at approximately mid chord and the fuselage tank strainer is located in the center sump. A fuel filter is installed in each engine fuel supply line between boost pump and engine.

With the aircraft laterally level (dihedral angle is a nominal 2°), as fuel is depleted the common head of atmospheric pressure on all three fuel tanks will cause them to seek a common level. For example, if a flight is begun with a full fuselage tank and ten gallons in each wing tank, the fuel fed to the engines will initially come from the fuselage tank (assuming both fuel selectors are ON) until such time as its fuel level reaches the same level (head pressure) as the fuel in the wing tanks. At that point, each engine will then be fed simultaneously from its respective wing tank, and from the fuselage tank. Once the ten gallons in each wing tank is depleted, all fuel will be fed only from the fuselage tank. The system is designed so that under normal operation conditions, the wing fuel should be depleted when approximately 12-16 gallons remains in the fuselage tank.

It is possible, however, with both fuel selectors in the ON position, to have an uneven fuel depletion between left and right-wing tanks due to uncoordinated flight especially during prolonged wing low constant heading flight (e.g. heading or NAV coupled autopilot operation),



with an unsecured (leaky) wing tank fuel filler cap, uneven fueling of the tanks or uneven engine fuel burn. Premature exhaustion of either wing tank is undesirable as the engine that was obtaining fuel from the exhausted wing tank will now obtain its total fuel supply from the fuselage tank. In the event an uneven fuel depletion between left and right-wing tanks is noted, X-FEED (crossfeed) is provided and must be used to re-establish wing fuel balance. The fuselage tank fuel supply is the least sensitive to aircraft attitude and maneuvering and must be available for takeoff, climb, descent, approach, landing and uncoordinated flight maneuvers or engine power loss due to fuel starvation may occur.

An Auxiliary Fuel tank is available as Option #244 from Aerostar Aircraft. It adds 45 gallons of usable fuel. It is installed in the front portion of the baggage compartment. It adds a fuel vent and sump drain as well. Its use is not automatic as fuel is transferred with a panel activated switch once space in the fuselage tank is available.

FUEL VENT EXPANSION SYSTEM

The three fuel tanks are vented through a dual, interconnected vent system. The airspace above the fuselage tank fuel level is vented to

atmosphere on each side of the

fuselage. The wing tanks are vented through dual interconnected lines opening into the fuselage tank airspace and overboard at the bottom of the fuselage. These wing vent lines are connected to a float type check valve located at each wing tip to prevent excessive fuel (under expansion pressure) from flowing overboard through the vent lines.

The airspace between the fuselage bladder cell and the aircraft structure is vented to atmosphere on each side of the fuselage, and also has an overboard drain located on the bottom.

A pressure relief valve is located in each wing tip housing that allows fuel to drain overboard if the pressure in that respective tank reaches a preset pressure due to thermal expansion.

There is an upgraded fuel vent system (SB600-126) available to address some possible issues with the original vent system. It adds a sump drain just fore of the other three fuel sump drains. It is different in that it should be drained until empty.



NOTE

Observe caution when opening a wing fuel filler cap, especially in a warm environment, as the fuel could be under pressure.

If the airplane is going to be parked for an extended period in the sun, or if fueled outside on a cold day and brought into a warm hangar, it is recommended that wing tanks only be fueled to within one inch from the bottom of the filler neck, and parked with the airplane laterally level. This will reduce the amount of fuel that can flow overboard through the pressure relief valve due to thermal expansion. One might consider waiting to fully fill the fuel tanks until just before the flight on a hot day to limit fuel expansion.

The approximate wing tank usable fuel quantity when fueled to a depth of one inch below the filler neck rim is 60 gallons and when filled to a depth of 0.6 inch below the filler neck is 62 gallons.

BOOST PUMPS

The original system incorporated one electric boost pump installed in each engine fuel supply line to provide fuel pressure for starting and to insure

uninterrupted fuel supply to the engines at any other time (takeoff, landing, climb above 10,000 feet), and serves as backup for the engine-driven fuel pump.

The controlling switch for each pump is mounted on the instrument panel in each engine switch grouping. Boost pumps are to be turned ON at first indication of fluctuating or low (21 psi), fuel pressure/fuel flow, or climb above 10,000 feet. Engine operation, at other than idle conditions, in 12 to 21 psi fuel pressure range can result in an unacceptable fuel/air ratio and could result in shorter engine life, engine damage, or engine failure.

Later models have a high/low fuel boost pump system which operates in a similar manner. Consult the POH for actual operating instructions as they vary by model.

FUEL SHUTOFF VALVES

Four fuel shutoff valves are mounted on the fuel sump assembly. The operation of the valves is controlled by two fuel selector switches (one for each engine) mounted on the instrument panel in each engine switch grouping. Prior to engine start, the valves should be checked for function by switching from OFF to ON to XFEED to ON, allowing time for full operation and listening for proper sounds.



CROSSFEED SYSTEM

The fuel system incorporates a X-FEED (Crossfeed) supply system to correct fuel imbalance and lateral trim, and to utilize fuel from an inoperative engine wing tank for prolonged single engine operation. Crossfeed is selected by rotating either fuel selector switch to the X-FEED position. Crossfeed selection allows an engine to draw its total fuel directly from the opposite wing tank bypassing the sump check valves.

A bad O-ring in one or more fuel caps can cause uneven fuel consumption as well due to the low air pressure above the wing during flight. There are two O-rings in each fuel cap which should be replaced annually.

Double X-FEED (Crossfeed) must not be selected except in an emergency, when the LOW FUEL warning light is illuminated. (This would only apply if there is fuel remaining in the wings.) The fuel selector X-FEED position is to be used in level coordinated flight only. Each operating engine fuel selector must be in the ON position for takeoff, climb, descent, approach and landing.

If the airplane is not in a level coordinated flight attitude, engine power interruptions may occur on one or both engines when the fuselage tank is empty or single or double X-FEED is selected, due to unporting of the respective

engine's fuel supply intake port. Should a power interruption occur, immediately re-establish a level coordinated flight attitude. Power will surge and should recover fully within approximately 10 seconds after fuel is restored.

Should it be determined or suspected that the fuselage tank fuel quantity has been depleted, maximum usable wing fuel is obtained in coordinated flight at a level or slightly nose up attitude. Avoid nose down descents (up to 22 gallons unusable in each wing with approximately 14° nose down attitude). Avoid uncoordinated flight (power interruptions and surging can be experienced with up to 42 gallons in one wing in uncoordinated flight).

NOTE

The fuel selector switches have detents at each of the three positions; however, when changing selection, a visual verification is required to assure proper positioning. The valves provide a positive means of shutting off fuel flow to the respective engines in case of engine fire, and by opening or closing a certain combination of valves, it is possible to select different fuel sources for either engine.

Keep turn and bank indicator as closely centered as possible and avoid rapid throttle movements.



The X-FEED warning light will illuminate if the landing gear is extended when one or both of the fuel selector switches are inadvertently left in the X-FEED position.

FUEL QUANTITY INDICATOR

A capacitance type fuel indicating system is installed. The system is comprised of a probe in each fuel tank, a signal conditioner and an indicator incorporating an individual display for each of the three tanks (left wing, fuselage and right wing). The indicator, usually located in the center of the panel, displays fuel quantity in U.S. gallons.

Wing tank fuel quantities above 50 gallons are ungaugable. The fuselage fuel quantity gauge scale has a yellow arc from 0 to 12 gallons. Takeoff is prohibited with the fuselage tank indicated quantity within the yellow arc.

The fuel quantity system is designed and calibrated for highest accuracy when the airplane is in a normal cruise attitude. For this reason, when reading fuel quantity, the airplane should be in a laterally and longitudinally level coordinated attitude (approximately 2° nose up) for the fuel indicator to read accurately. The wing fuel tank quantity readings are extremely sensitive to airplane attitude and turbulence. During uncoordinated flight, the low wing may read a lesser quantity than the high wing,

even if the actual fuel quantity in the low wing is greater.

Some airplanes are equipped with an optional digital display fuel flow totalizer system which can be manually selected to indicate total fuel used or fuel remaining. For the system to display fuel remaining, the pilot must first input his estimated total fuel load and then the totalizer electronically subtracts fuel consumed from the initial quantity entered. Regardless of the system accuracy as a fuel consumed totalizer, it should never be used as a primary fuel quantity indicator because of the following:

- A. The displayed remaining fuel quantity on the totalizer is based on the initial estimated fuel load.
- B. The totalizer only shows estimated total remaining fuel load and not how the fuel load is distributed between the different fuel tanks.
- C. The totalizer only subtracts fuel consumed by the engines and consequently cannot indicate fuel that was mistakenly not added or fuel lost due to possible fuel system leaks.



LOW FUEL WARNING LIGHT

A panel mounted LOW FUEL warning light, activated by a float switch located in the fuselage tank, is provided as standard equipment. Takeoff is prohibited with LOW FUEL warning light illuminated or inoperative. If the low fuel warning light illuminates during flight, an immediate landing should be made if possible.

The LOW FUEL warning light first illuminates continuously when 12 gallons of fuel remain in the fuselage fuel tank and the light will remain on as fuel is depleted until the fuselage fuel tank is again serviced above 12 gallons. In turbulence or during climbs and descents, intermittent illumination may occur when the fuselage fuel tank has slightly more than 12 gallons of fuel remaining.

The LOW FUEL warning system operates independent of the primary fuel quantity indicating system. Power for the LOW FUEL warning light is provided through the annunciator panel circuit breaker.

FUEL SYSTEM LIMITATIONS

Do not add fuel to wing tanks unless fuselage tank is full. Caution should be exercised during fueling. Uneven ground or wing conditions can result in uneven fuel loading. Additionally, as it fills a wing can drop resulting in possible fuel spillage.

NOTE

If all tanks are to be filled to capacity, fueling sequence is optional. However, it is strongly suggested that fuselage tank be filled first at all times.

HEATER FUEL SYSTEM

The cabin heater obtains its total fuel supply from the fuselage fuel tank. When operating, the heater fuel consumption is approximately 0.6 gallons per hour.

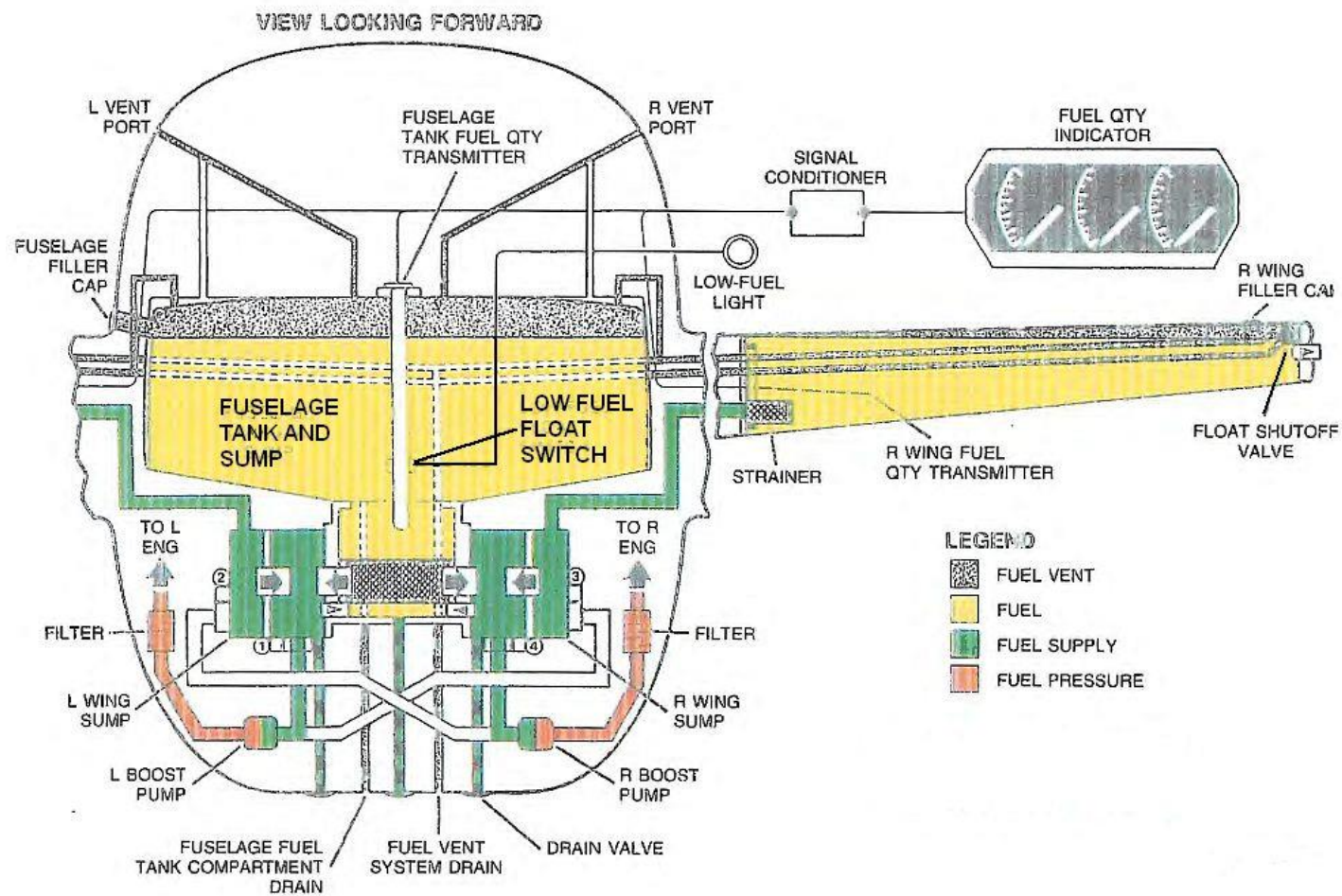


FIGURE 4-1: FUEL SYSTEM NORMAL

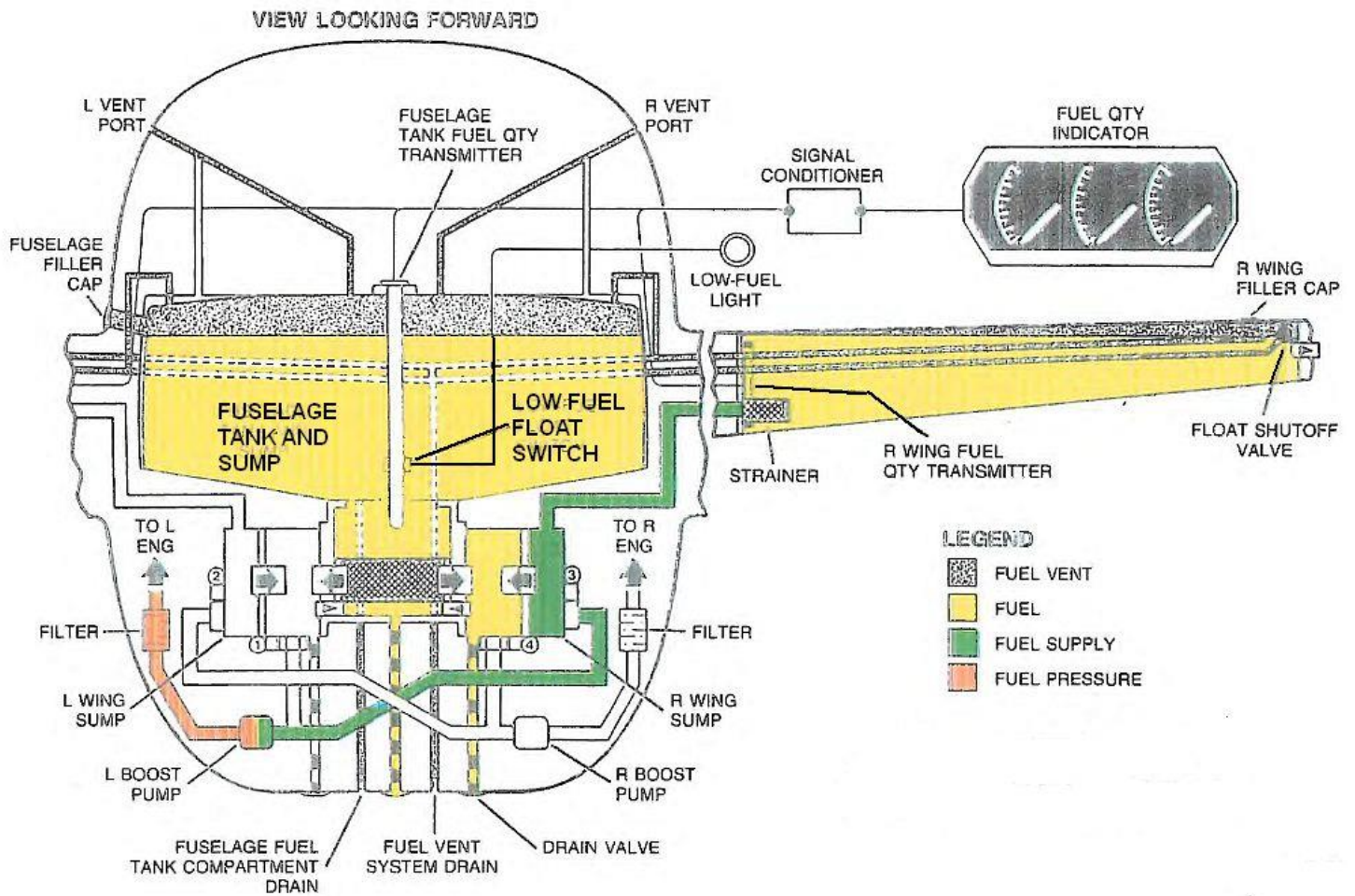


FIGURE 4-2: FUEL SYSTEM SINGLE CROSSFEED

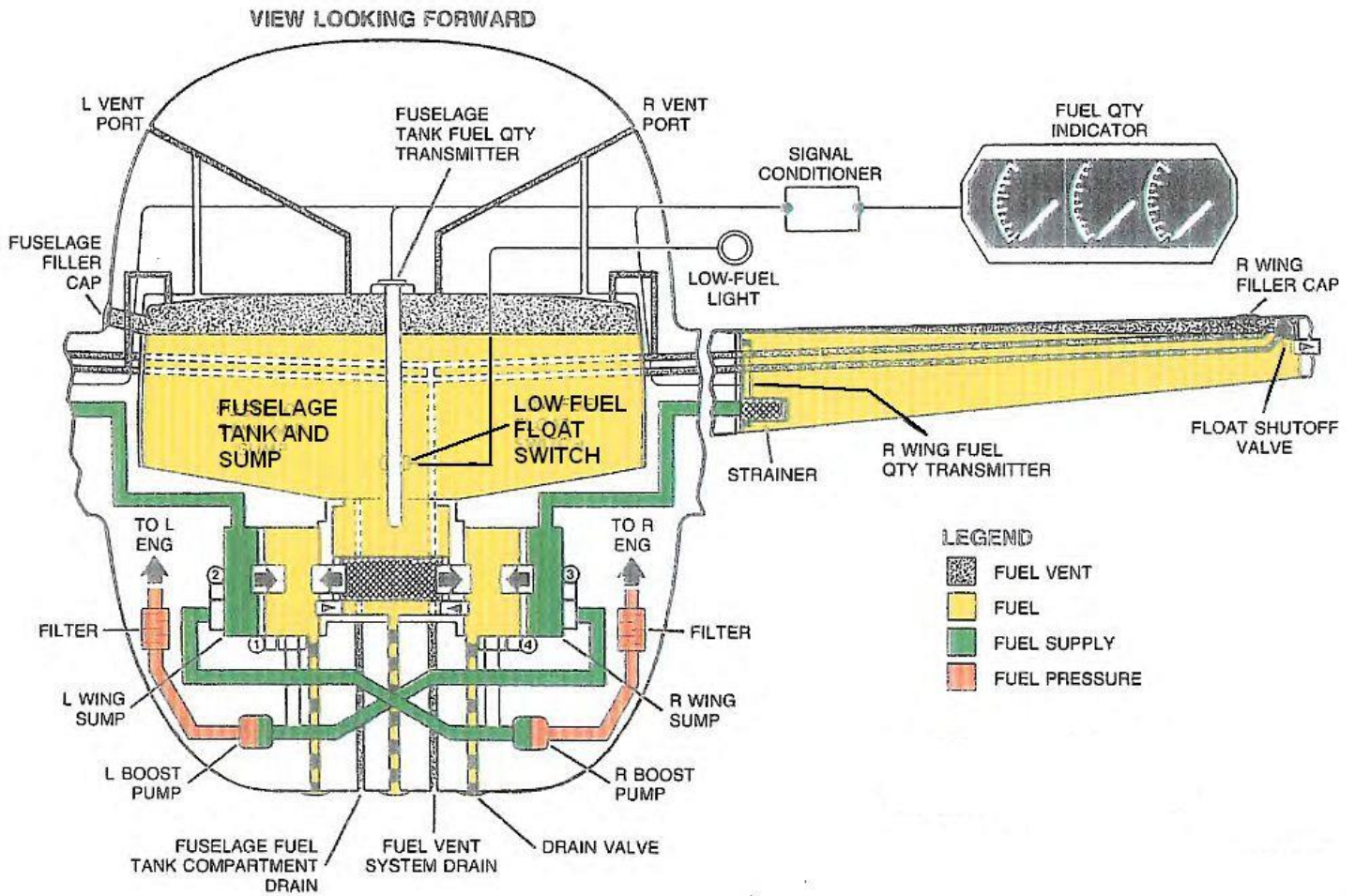


FIGURE 4-3: FUEL SYSTEM DOUBLE CROSSFEED



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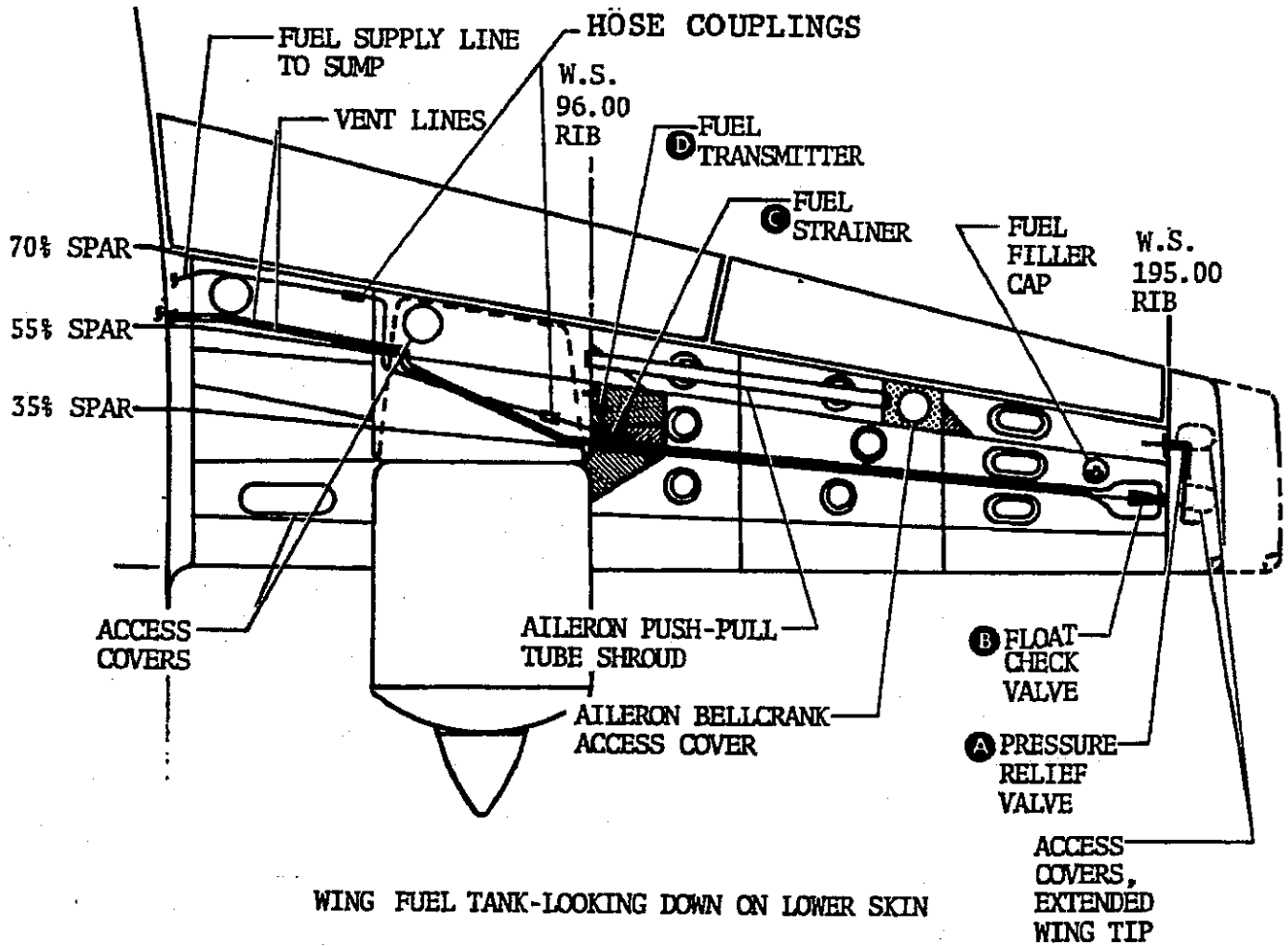


FIGURE 4-4: WING TANK

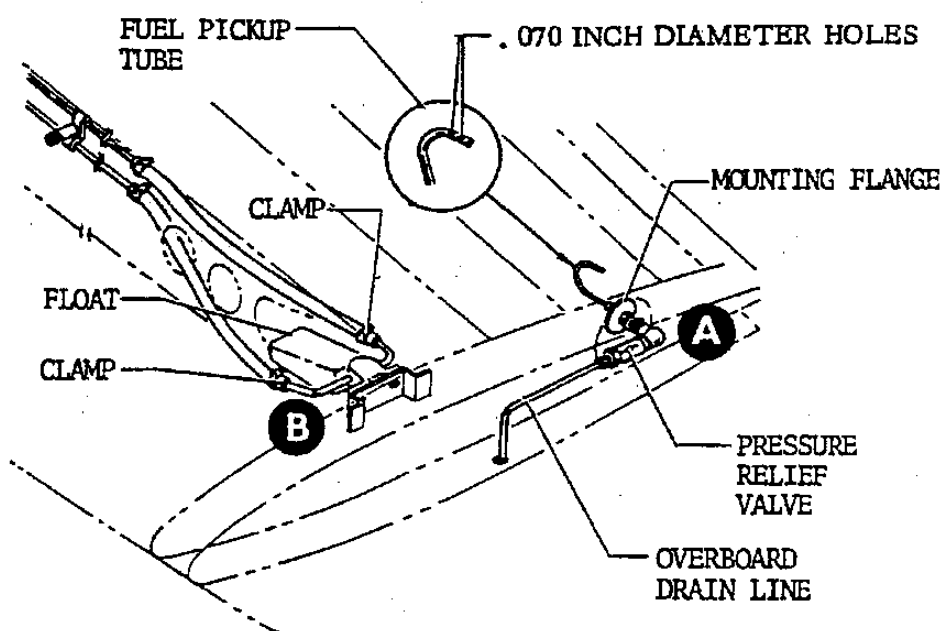
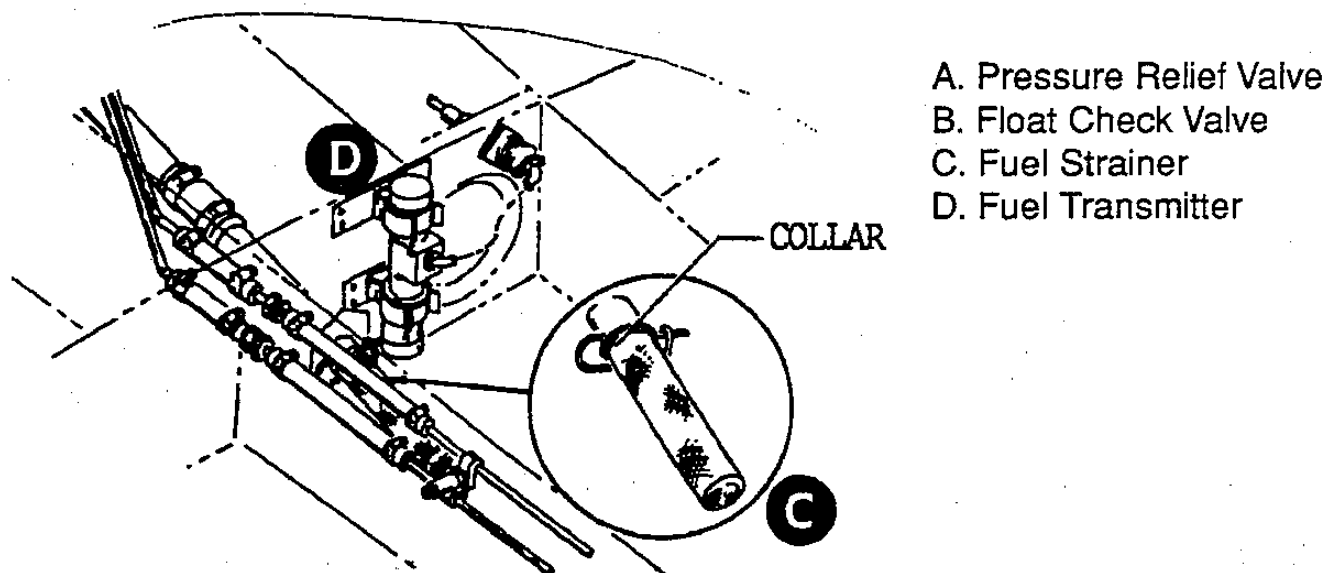


FIGURE 4-5: FUEL SYSTEM COMPONENTS



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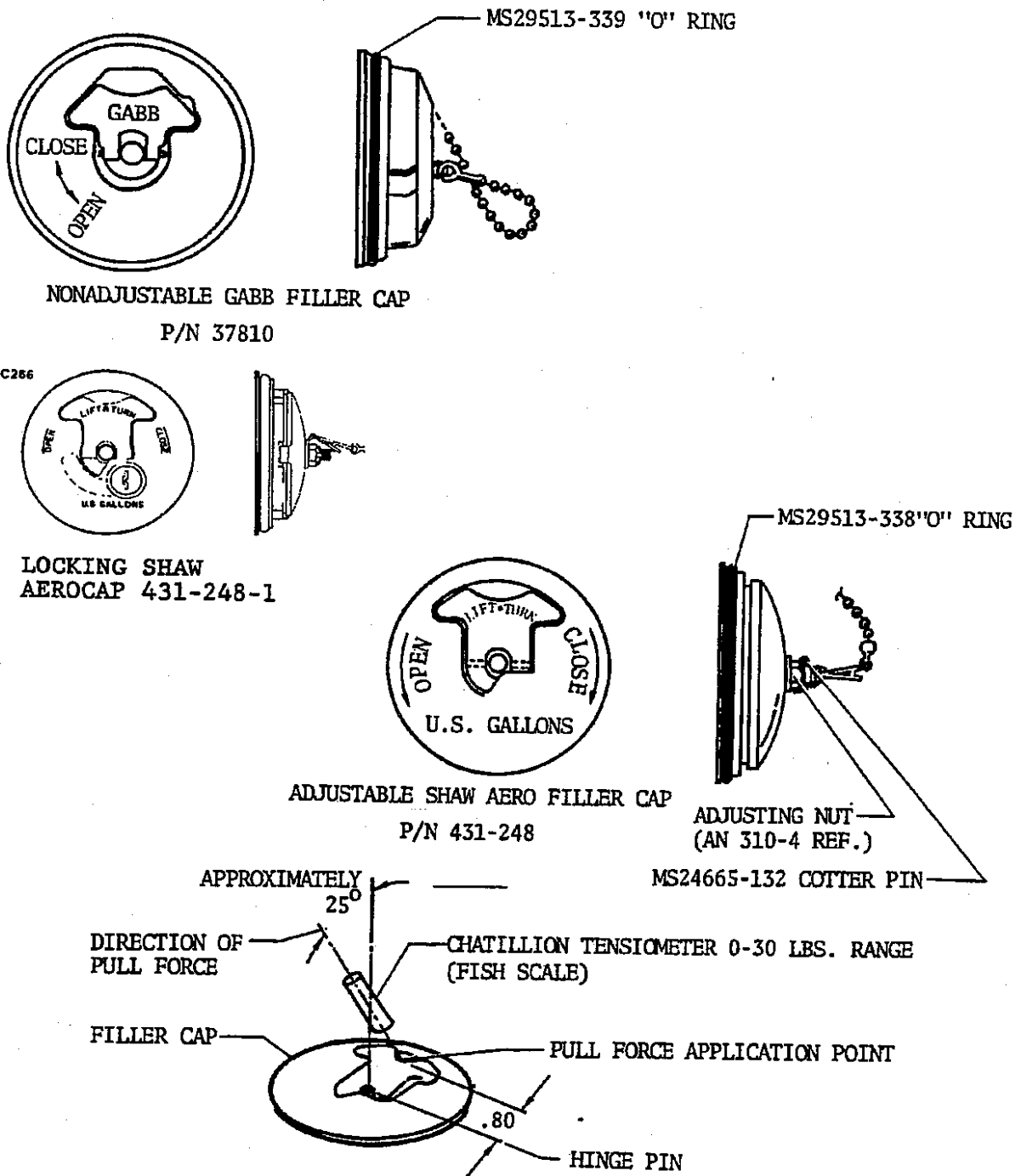


FIGURE 4-6: FUEL CAP

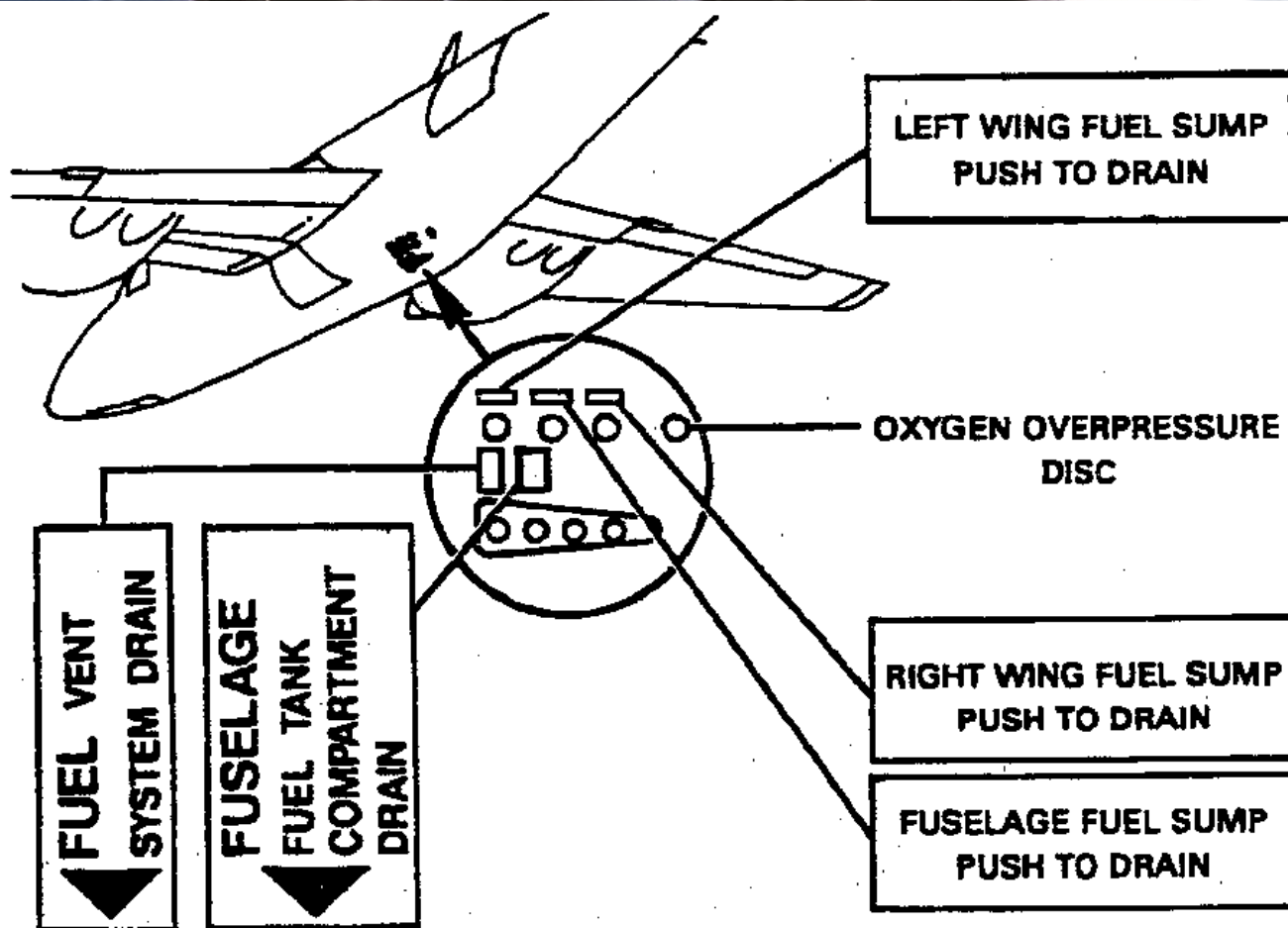


FIGURE 4-7: DRAIN VALVES & VENT DRAINS

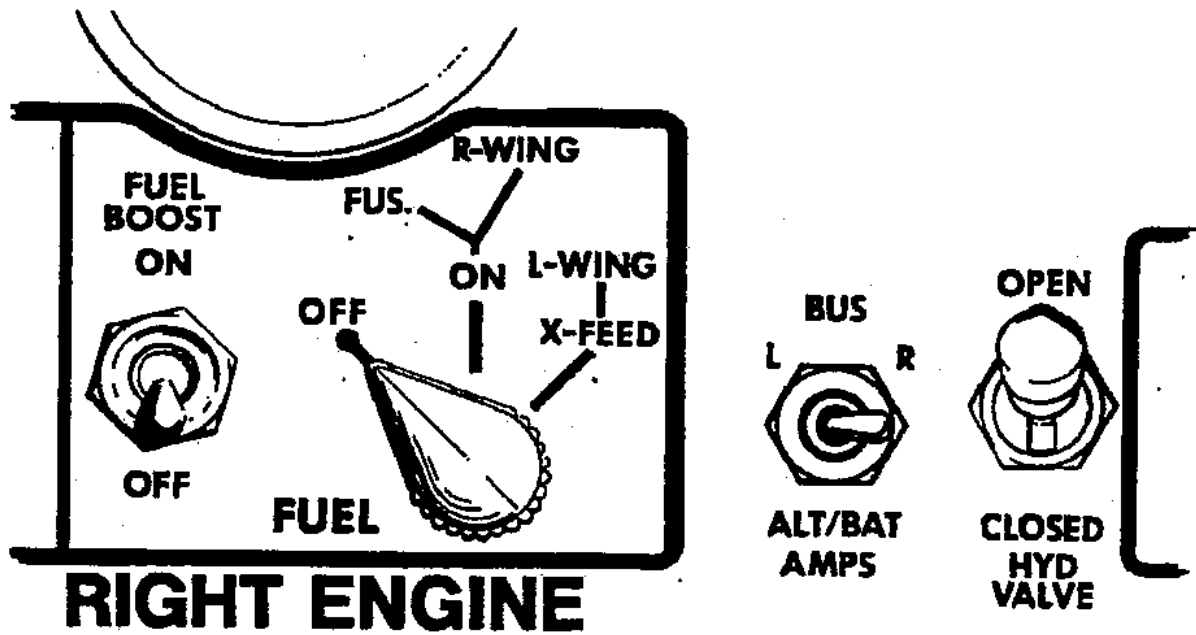


FIGURE 4-8: FUEL TANK SELECTOR



CHAPTER 4 - QUIZ

- 1) When fueling the aircraft, unless all tanks are to be fueled to capacity:
 - a) wing tanks must be filled first.
 - b) fuselage tank must be filled first.
 - c) the fuselage tank will contain 8.0 gallons of unusable fuel.
 - d) each wing will contain 8.0 gallons of unusable fuel.

- 2) Wing filler caps that do not form a proper seal will:
 - a) be easier to open and close, and should be lobed regularly.
 - b) cause uneven or reduced feeding and/or siphoning.
 - c) have no effect on the fuel system.
 - d) increase fuel flow from the wing tanks.

- 3) The low fuel warning light is set to illuminate when fuel remaining in the fuselage tank is 12 gallons or less, and:
 - a) is a new option.
 - b) is a no-go item when illuminated or inoperative.
 - c) will not illuminate when wing tank fuel equals 18 gallons or more.
 - d) will only illuminate in straight and level flight.



- 4) With X-FEED selected, the engine is obtaining its fuel supply:
- a) from the opposite wing tank only.
 - b) from the fuselage tank only.
 - c) from both wing tanks.
 - d) from the opposite wing tank and the fuselage tank simultaneously.
- 5) When the aircraft is in uncoordinated flight:
- a) the new individual fuel gauges will not reflect momentary changes in wing fuel levels.
 - b) fuselage fuel indications will tend to be extremely high.
 - c) due to location of probes, wing tank fuel indications will be unaffected.
 - d) uneven fuel depletion can occur between left and right-wing tanks.
- 6) Uneven fuel depletion from the wing tanks and possible premature depletion of the fuselage tank are most apt to occur:
- a) during prolonged wing-low constant-heading flight.
 - b) when the aircraft is flown manually over a varied course.
 - c) whenever the autopilot is engaged, regardless of the position of the ball in the turn coordinator.
 - d) during procedure turn on an instrument approach.



- 7) In the event that an uneven fuel depletion between wing tanks is noted:
- a) small amounts of opposite rudder will return lateral trim.
 - b) the rudder-aileron interconnect will automatically compensate for deviations in lateral trim, and restore even fuel flow.
 - c) X-FEED should be used to restore lateral trim.
 - d) a slight slip will enable the gate valve on the fuselage sump to open and increase fuel flow from the heavy wing.
- 8) . If the low fuel warning light illuminates during flight:
- a) low MAP/high RPM settings should be used to minimize fuel consumption.
 - b) an immediate landing should be made if possible.
 - c) flight can be safely continued for up to 50 minutes with proper leaning technique.
 - d) a skid should be initiated to check the wing tanks for remaining fuel.





5. POWERPLANT

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 5

POWERPLANT

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CHAPTER 5

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ENGINE

The numerical designator for an Aerostar is largely determined by the engines and resultant horsepower. The 700P has two 350 horsepower engines. The letter at the end designates A for normally aspirated, B for turbocharged or P for pressurized. One of the outstanding features of the Aerostar is that virtually every option can be added to any airframe. So, a 601P can be upgraded to a 700P for example.

The 700P has two Avco Lycoming TIO-540 series, 350 horsepower engines installed on the airplane. They are six cylinder, counter rotating, low compression, horizontally opposed, direct drive, turbocharged, wet sump, fuel injected engines, driving Hartzell three-bladed, constant speed, full feathering propellers. Manually controlled cowl flaps are installed to provide control of engine cooling. Cooling air enters the cowl, is directed around the cylinders by cylinder baffles, through the accessory section, and is exhausted through exhaust chutes. Two blast tubes direct cooling air to the magnetos. One blast tube is on the rear baffle, and the second is on the intercooler ramp.

All 600 series have two Avco Lycoming IO-540 series, 290 horsepower engines installed on the airplanes. They are six

cylinder, horizontally opposed, direct drive, wet sump, fuel injected engines, driving Hartzell three-bladed, constant speed, full feathering propellers. The engine installation meets all certification cooling requirements without the aid of cowl flaps. Cooling air enters the cowl, is directed around the cylinders by baffles, through the accessory section, and is exhausted through exhaust chutes. Two blast tubes, mounted on the rear baffle, direct cooling air to the magnetos.

There are variation in compression ratios and boost level of the turbo-charger due to options and upgrades offered by Machen, Inc which is now Aerostar Aircraft Corporation.

ENGINE CONTROLS

All power plant controls are located on the control pedestal. The lever knobs are shaped to standard configurations, and the control levers are of different lengths, so they can be readily identified by touch.

AIR INDUCTION SYSTEM

(700P)

Induction air is directed to the fuel injection regulator via two filtered turbocharger inlets mounted on the rear engine baffles which feed compressed (turbocharged) air to a common intercooler mounted on the engine firewall. The intercooler cools the



compressed air prior to entering the fuel injection regulator by drawing free stream air from over the top of the engine and exhausting it through the intercooler tunnel exit over the trailing edge of the wing.

Two manually operated alternate air doors are located in the intercooler tunnel aft of the intercooler. Each door supplies warmed air to its respective turbocharger inlet downstream of the filter. There is no need to close the bleed air valve when alternate air is selected, since the air is drawn from an uncontaminated source.

(602P)

Induction air is directed through two wire mesh screens on the rear engine baffles, to the turbochargers (where it is compressed), then to a common air filter housing mounted on the firewall, before entering the fuel injection regulator. A manually operated alternate air door is installed on each turbocharger inlet. Should the primary air inlet screens become restricted, selecting alternate air will simultaneously open the inlet to warmed air in the engine accessory compartment, and shut off the primary inlet. The corresponding engine bleed air must be closed when the manual alternate air doors are open, due to the possibility of introducing contaminated air into the cabin. Additionally, an automatic alternate air door is installed on the filter housing, downstream of the filter, to allow normally aspirated engine

operation, should the air filter become blocked.

(601, 601P)

These models have an induction similar to the 602P, except they incorporate a mode door in the turbocharger inlet. The purpose of the mode door is to allow cool ram air to bypass the turbocharger in certain flight conditions. The wire mesh inlet screens and alternate air doors are installed only on airplanes equipped for flight into known icing. The alternate air doors on these models are sliding doors which do not incorporate the primary air positive shut-off feature. Piper offers a kit to replace these inlet airboxes with 602P style inlet airboxes deleting the mode door and sliding alternate air door. Many 601Ps have added intercoolers as a valuable improvement.

(600)

This normally aspirated model takes induction air through inlets on each rear engine baffle directly to the filter housing mounted on the firewall, then to the fuel injection regulator. The filter housing incorporates an automatic alternate air door downstream of the filter to allow continued engine operation, should the filter become blocked.



TURBOCHARGING SYSTEM

The PA-60-700P turbocharging system provides engine capability to maintain the takeoff manifold pressure of 42 in. Hg. to approximately 16,500 feet while providing bleed air to pressurize the cabin and the magnetos.

The PA-60 turbocharging system provides engine capability to maintain the takeoff manifold pressure of 37 in. on the 602P and 29.5 on the 601P and 601B to approximately 20,000 feet while providing bleed air to pressurize the cabin.

The turbochargers are exhaust-gas driven engine accessories which raise the pressure of the induction air delivered to the engine. There is one turbocharger unit for each engine exhaust stack. Each unit consists of a compressor and a turbine connected by a common shaft; the compressor supplies pressurized air to the engine for high altitude operation and to the cabin for pressurization. The turbine utilizes the flow of exhaust gases to drive the compressor. Turbocharging is controlled by means of an automatic turbo control system consisting of a controller and an actuator.

This slope controller senses the engine manifold pressure selected and compressor discharge pressure across the diaphragm, then actuates an oil metering

valve that regulates oil pressure within the actuator. The actuator is mechanically linked to the waste gate valves located in each exhaust stack. The pilot gives the controller the first input by moving the engine throttle control to the desired manifold pressure. As this is being accomplished, the controller senses a ratio change between manifold pressure and compressor discharge pressure. The controller is programmed to maintain a certain ratio.

Therefore, the internal diaphragm of the controller now moves seeking this ratio, which in turn moves the oil metering valve allowing oil pressure to reposition the waste gate valves. As the waste gate valves move toward the closed or open position, more or less exhaust gases are diverted to the turbochargers causing the turbines to increase or decrease RPM accordingly. Since the turbines are directly connected to the compressors, the compressor discharge pressure will raise or lower until the desired programmed pressure ratio is obtained. The actuator is provided with an oil drain line which returns engine oil to the sump in the event of leakage around the actuator piston seals. The actuator is also spring-loaded to move the waste gates to the non-turbocharged mode as a fail-safe system.

Some early systems had both manual and electric wastegate actuators.



FUEL INJECTION SYSTEM

The engine-driven fuel pump supplies fuel under pressure to the fuel injection servo, which meters the correct proportion of fuel to the flow divider. The flow divider then directs the fuel to each of the individual cylinder injection nozzles.

The Bendix RSA-10ED1 fuel injection system is based on the principle of measuring air flow and using the air flow signal in a stem-type regulator to convert the air-force into a fuel-force. This fuel-force (fuel pressure differential), when applied across the fuel metering section (jetting system) makes fuel flow proportional to air flow. Fuel vaporization takes place at the intake ports.

A fuel vent system provides a common reference vent pressure to the fuel flow gauge (NF 0001-0266), fuel pressure gauge, engine-driven fuel pump and injection nozzles. The vent source is taken downstream of the turbochargers on all turbocharged models, to ensure proper vent pressure during normal aspiration or turbocharger operation.

FLOW DIVIDER

The flow divider is mounted on the upper engine surface and serves to channel fuel to each nozzle. Metered fuel is delivered from the fuel injector to the flow divider. The

fuel is kept under pressure by the flow divider to assure positive shutoff of fuel to the nozzles when the injector is placed in idle cutoff.

Metered fuel enters the flow divider assembly through a fuel line from the injector assembly and flows through the inside diameter of the flow divider valve and through a passage to the lower side of the diaphragm. At idle the fuel pressure from the injector must, through force against the diaphragm, overcome the flow divider spring to open the valve and pass fuel to the nozzles through ports drilled in the hollow valve. The fuel is divided equally by ports machined in the valve bushing. Since the injector meters and delivers a fixed amount of fuel to the flow divider, the valve will open only as far as required to pass this amount of fuel to the nozzles. At idle, the valve opening required is very small and discharge nozzle pressure negligible, thus the fuel to individual cylinders is divided at this point by the flow divider. As fuel flow through the injector is increased above idle requirements, fuel pressure builds up in the nozzle lines, fully opens the flow divider valve, and fuel distribution to the cylinders becomes a function of the pressure drop across the discharge nozzles.



ENGINE OIL SYSTEM

The engine employs a full pressure, wet sump lubrication system. The sump is filled through a combination dipstick oil filler cap. Lubricating oil is drawn through the oil sump inlet screen by the engine oil pump and directly to the oil cooler and thermostatic bypass valve. When engine oil is cold, the thermostatic bypass valve (Vernatherm valve) will open allowing oil to flow directly to the full flow oil filter bypassing the cooler. As the oil warms up, the bypass valve will close, thereby forcing more oil to circulate through the cooler prior to entering the oil filter. From the oil filter, the oil passes through an oil pressure relief valve which regulates system oil pressure. The regulated oil is then routed through the main oil galleries to the various engine bearings and piston oil cooling nozzles, valve mechanisms, and moving parts. Gravity returns the oil to sump.

The turbochargers are also lubricated by the regulated oil from the engine system. Oil circulated through the turbochargers is returned to the sump by a scavenge pump attached to the hydraulic pump accessory pad. Oil from the oil pump is also supplied directly to the waste gate control system.

The engine oil system utilizes a drawn cup type large capacity oil cooler

mounted on the nose cowling for temperature control.

IGNITION SYSTEM

The ignition consists of dual magnetos, high tension harness, spark plugs and a magneto switch. Additionally, a vibrator is used to provide an intensified spark for easier starting at low cranking RPM.

Each engine is provided with a combination magneto/starter switch. Moving the switch to the spring loaded "START" position grounds the right magneto, activates the starting vibrator, retards the left magneto, and engages the starting motor. When the engine starts, release of the switch allows it to spring back to the "BOTH" (magnetos) position, disengages the starting motor and removes the vibrator from the starting circuit. The right magneto is simultaneously ungrounded and both magnetos will be in full advance.

The induction type starting vibrators provide an interrupted D.C. current to the left magneto high tension coil through the ignition switch and the "Retard" set of points. When the engine is cranked to the retard timing position, the vibrator output is applied to the high-tension coil to produce the spark to start the engine.



OIL SELECTION

Average Ambient Air Temperature (NOTE I)	MIL-L-6082 Spec. Grades (NOTE II)	MIL-L-22851 Spec. Ashless Dispersant Grades (NOTE III)
All Temperatures Above 80°F Above 60°F 30°F to 90°F 0°F to 70°F Below 10°F	SAE60 SAE50 SAE40 SAE30 SAE20	SAE15W-50 or 20W-50 SAE60 SAE40 or SAE50 SAE40 SAE40 or SAE30 SAE 30
Refer to latest revision of Lycoming Service Instruction No. 1014.		
NOTE I Average Temperatures The ambient ground air temperatures listed in the chart are meant only as a guide. Individual judgement must be used when selecting the seasonal grade of oil to put in the engine. For example, if a plane is to be flown into an area which is much warmer or colder, the operator must determine which condition will be the more significant in choosing the proper weight engine oil. When engine oil temperatures approach the maximum allowable during operation, it is a good indication that a higher viscosity oil should be considered. NOTE-II Single Viscosity Oils This classification of lubricating oils includes any aviation grade (straight mineral non-detergent, detergent and dispersant) that is designated by a single viscosity number. The SAE grades 20, 30, 40, 50 and 60 shown in the chart are equivalent to Commercial Grades 55, 65, 80, 100 and 120 and to Military Grades 1040, 1065, 1080, 1100 and 1120 respectively. NOTE III Ashless Dispersant Grades This classification contains additives, one of which has a viscosity stabilizing effect, which removes the tendency of the oil to thin out at high oil temperatures and thicken at low oil temperatures. The additives in these oils extend operating temperature range, improve cold engine starting and lubrication of the engine during the critical warm-up period, thus permitting flight through wider ranges of climatic changes without the necessity of changing oil. The ashless dispersant grades are recommended for aircraft engines subjected to wide variations of ambient air temperature, particularly the turbocharged series engines which require oil to activate the various turbo controllers. The SAE Grades 30, 40, 50 and 60 shown in the chart are equivalent to grades of 65, 80, 100 and 120 respectively. It must not be presumed however, that these oils will alleviate all of the problems encountered in extremely cold environments (below +10°F). At these temperatures preheating of the engine and the oil supply tank will be required regardless of the type of oil used.		



ENGINE INSTRUMENTS

Instrumentation for each engine consists of: mechanical oil pressure, electrical oil temperature and electrical cylinder head temperature presented on a 3-way combination gauge; mechanical fuel pressure gauge; electrical exhaust gas temperature gauge; electrical fuel flow gauge; electric tachometer and a mechanical manifold pressure gauge. The gauges are placarded as to their operating limitations.

PROPELLERS

The engines are equipped with Hartzell controllable, three-blade, constant speed, feathering propellers (models vary). The propellers utilize a combination air spring and counterweights on each blade to increase pitch and feather, opposed by oil pressure regulated by the propeller governor to reduce pitch. When the propeller control lever is pulled back to the limit of its travel, governor oil pressure is released, allowing the counterweights, feathering spring and cylinder air charge to feather the blades.

On airplanes equipped with a synchrophasor system, the standard F-6-35Z propeller governor on the right engine is exchanged for the F-8-45Z propeller governor with an electrically controlled

solenoid valve. For the 602P, an F-8-60Z is used.

The synchrophasor system installed in A/F 0494 and subsequent consists of a pulse generator driven by the tach drive output forward of each engine's tach generator, a computer mounted on the lower left side of the fuselage station 176.88 bulkhead, a solenoid type control valve on the right engine propeller governor, and a synchrophasor switch on the console, forward of the engine controls. In A/F 04550493 equipped with a dual tach installation, the tach generator also functions as a pulse generator and no separate pulse generators are installed. A/F prior to 0455 have a strobe sensor, unit in place of the right engine pulse generator.

PROPELLER SYNCHROPHASER

The synchrophasor system is designed to provide automatic propeller synchronization as well as propeller phasing. The system will hold synchrophasing throughout all normal aircraft maneuvers if the manual RPM and throttle control settings are not altered.

The system consists of two (2) electric pulse generators which sense engine RPM and compares this information through a computer and signals a solenoid control on the right engine governor, thereby



"slaving" the right engine propeller speed to the left engine.

The system is activated by a two position (MANUAL and PHASE) toggle switch mounted on the console just above the propeller controls. In the MANUAL position, the synchrophasor computer is not energized, but a small current is continuously applied to the right engine governor solenoid to hold it in a mean travel position. When PHASE is selected, the full synchrophasor system becomes functional. Regardless of switch position, pilot can manually override the synchrophasor system by using the propeller controls.

A panel mounted pull type circuit breaker, marked SYNC provides electrical system protection, and when out, it will completely deactivate the system.

NOTE

If the synchrophasor system becomes inoperative, the aircraft can be operated following basic. Airplane Flight Manual Procedures providing the right engine propeller governor is mechanically readjusted to prevent RPM above 2425, and SYNC circuit breaker is pulled to the out position.

For Starting Engines:

Set the synchrophasor switch to MANUAL

For Takeoff and Landing:

Check that the synchrophasor switch is in the MANUAL position.

For Climb/Cruise:

Set the throttle controls as desired.

Manually synchronize propeller controls.

Select PHASE position on synchrophasor switch.

NOTE

Engine RPM must be within 30 RPM before switching from MANUAL to PHASE or system will not synchronize propellers.

Prior to making power changes, select MANUAL position, select desired MAP and RPM, manually synchronize propellers and reselect PHASE position.

If the synchrophasor system loses synchronization during the flight, select the MANUAL position and manually synchronize propellers. Wait for 45 seconds minimum, then reselect PHASE position.

For all single engine operations, set the synchrophasor switch to the MANUAL position.



ENGINE FIRE DETECT LIGHT

The Engine Fire Detect option provides the pilot with the means to detect engine fires. It consists of a temperature sensing circuit in each engine accessory compartment which triggers a warning horn and indicator light inside the cockpit, in the event of excessive temperature level. The engine fire detect test switch on the copilot's upper panel is used to test the annunciator lights and warning horn. When either L or R position is selected, the warning horn and appropriate annunciator light should activate.

The system incorporates four heat sensors (two on each side) mounted on the firewall, just behind the tailpipes. The sensors are normally open and close at approximately 450°F triggering a horn and light in the cockpit.

NOTE

Service Bulletin 920 dealing with tailpipe inspection and fire detection system, must be complied with on all models as required.

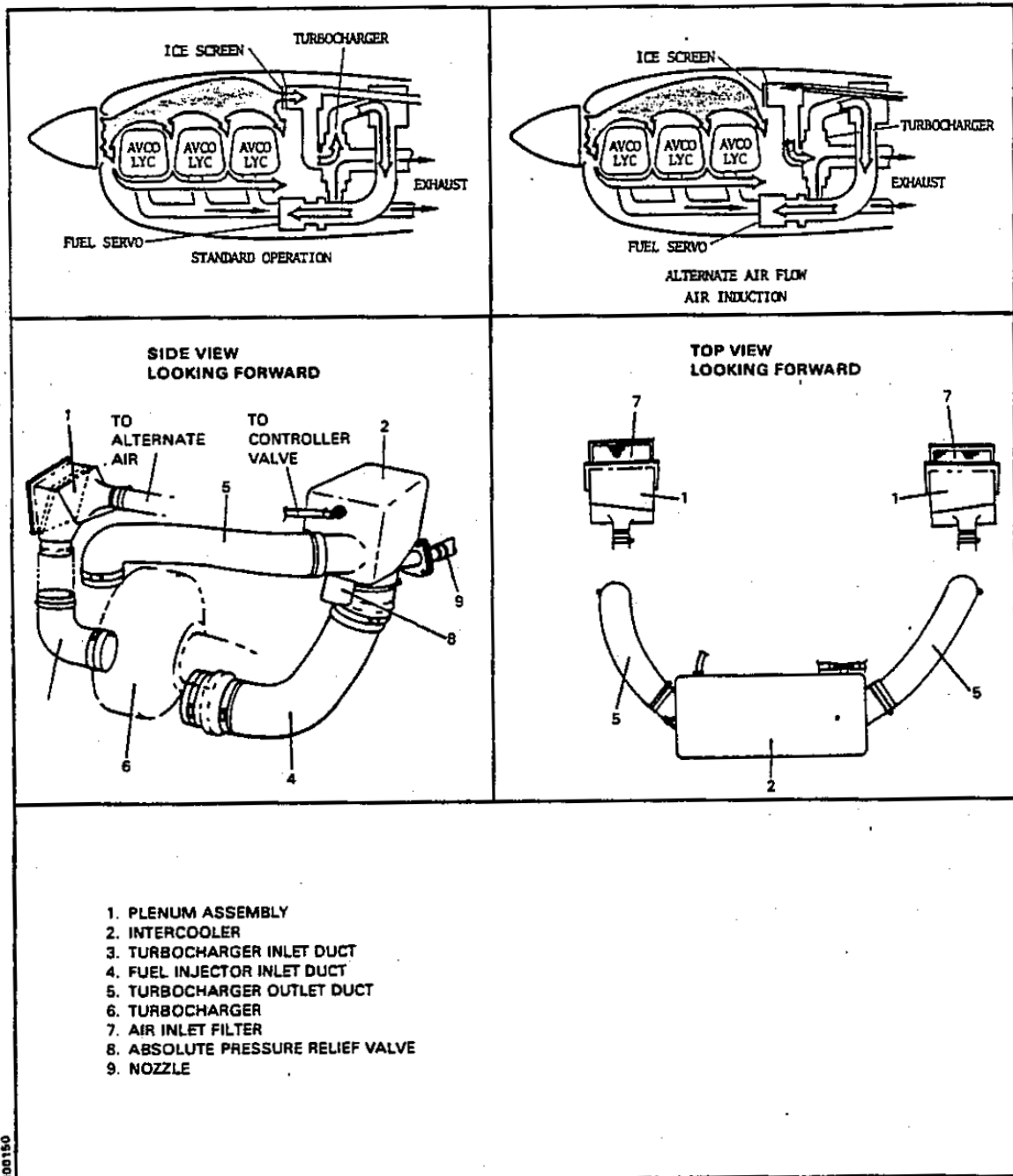


FIGURE 5-1: INDUCTION SYSTEM 700P

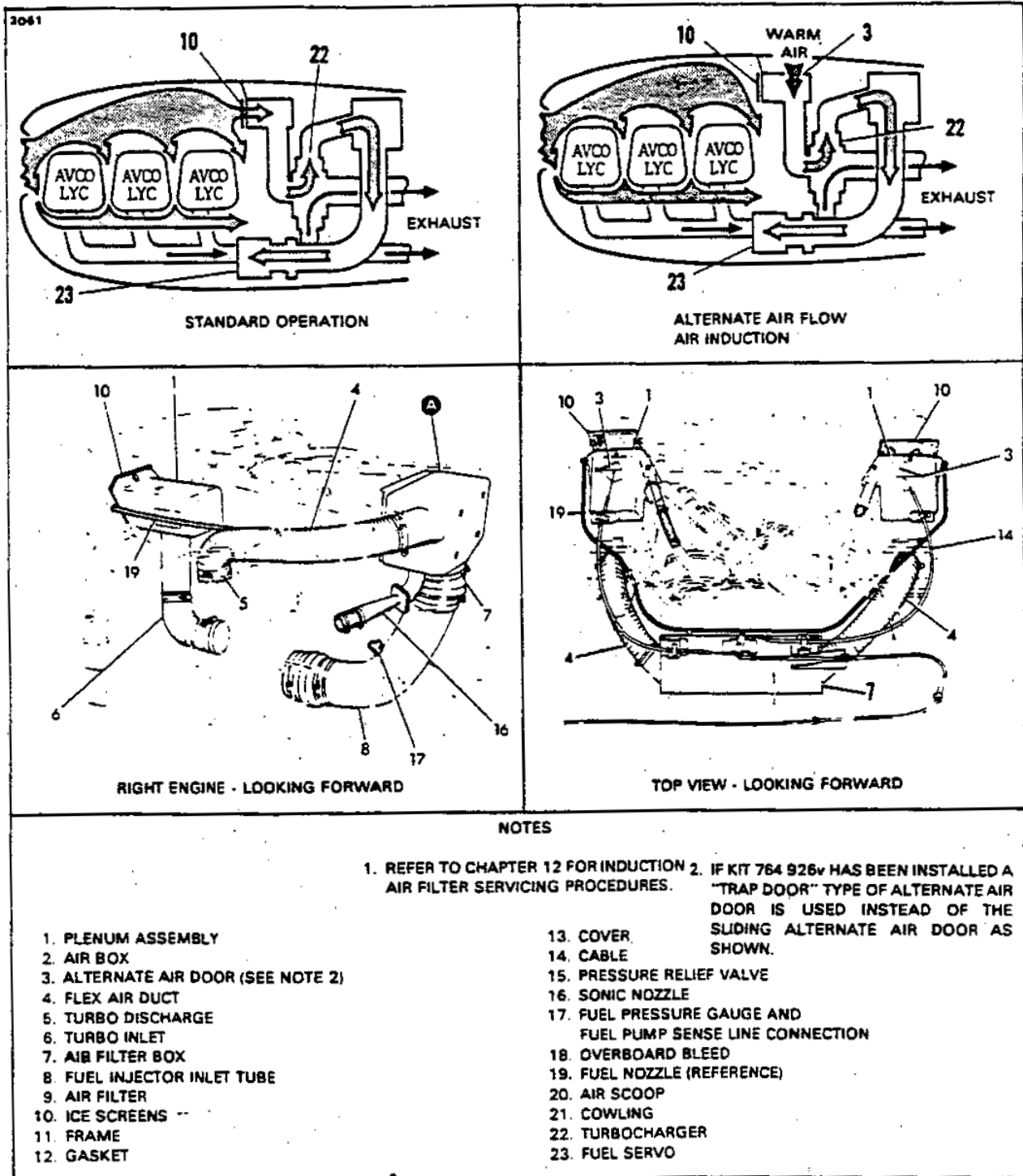


FIGURE 5-2: INDUCTION SYSTEM 602P

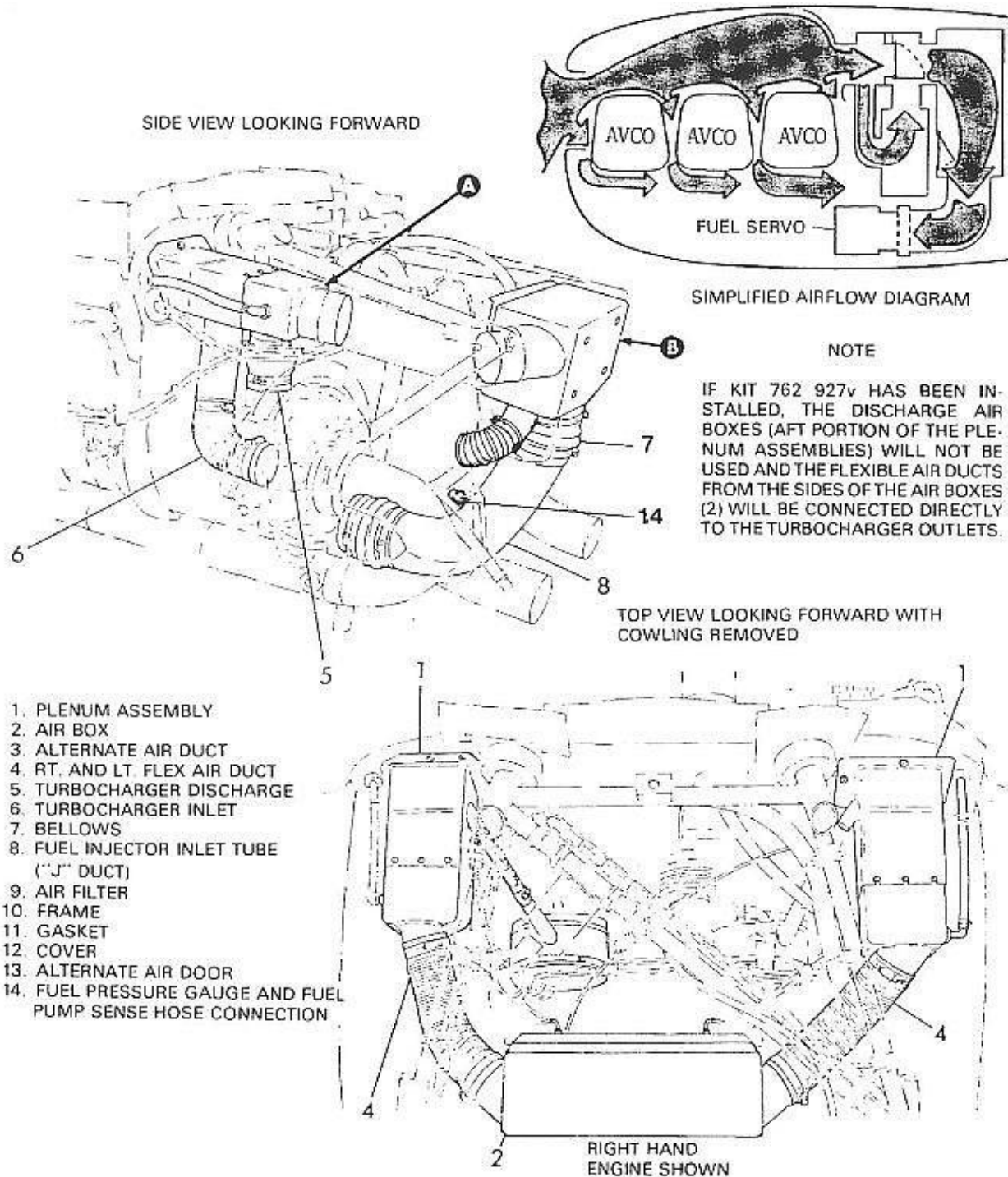


FIGURE 5-3: INDUCTION SYSTEM 601/601P

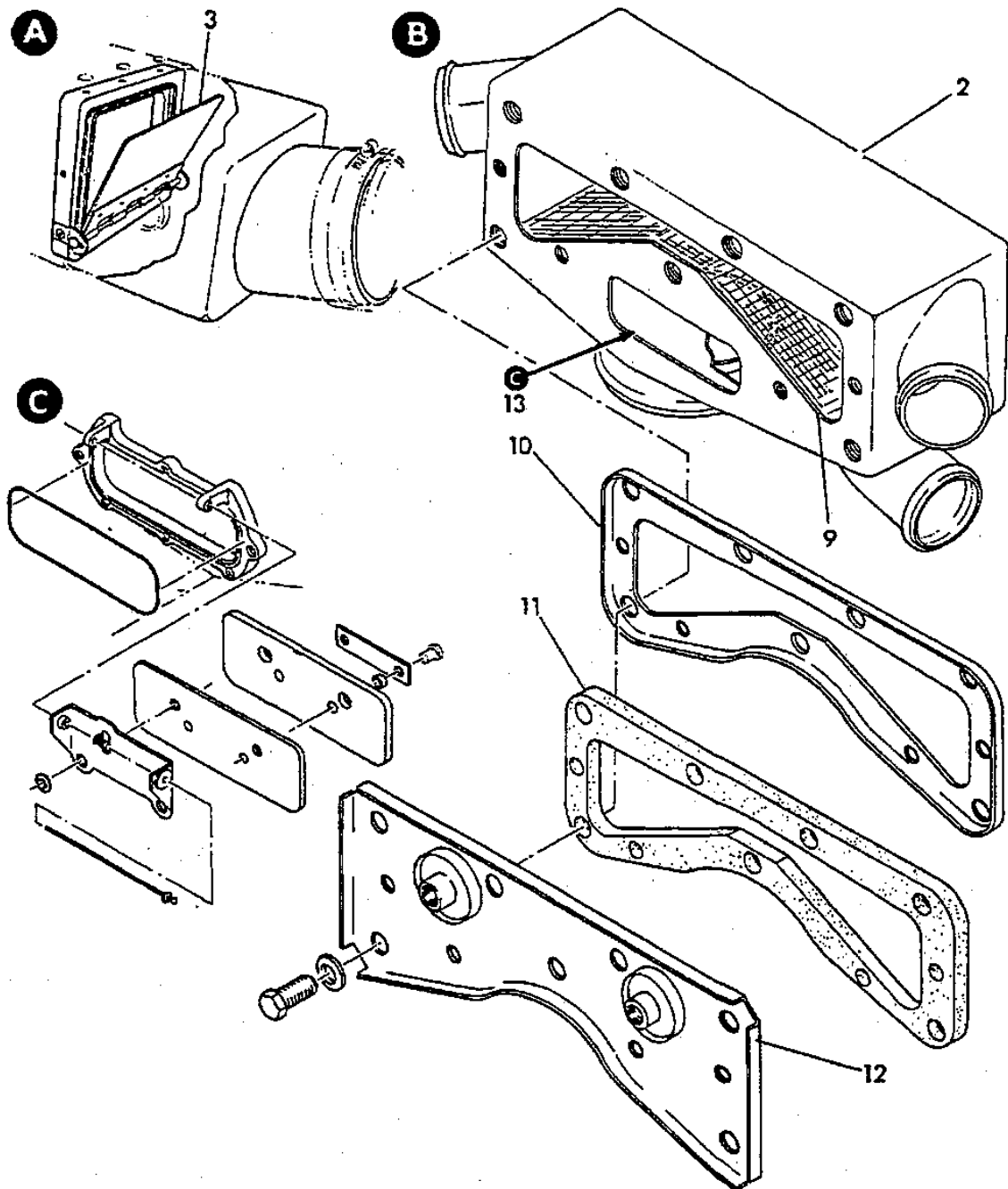
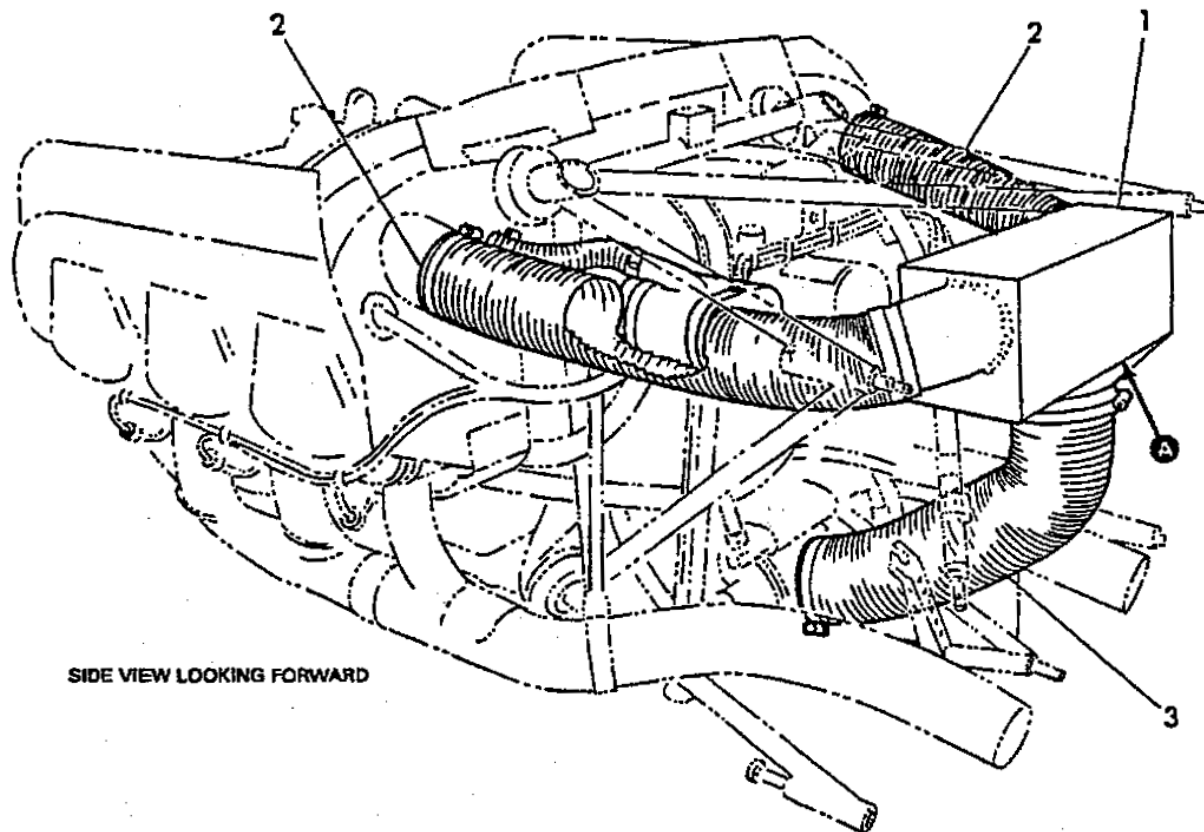
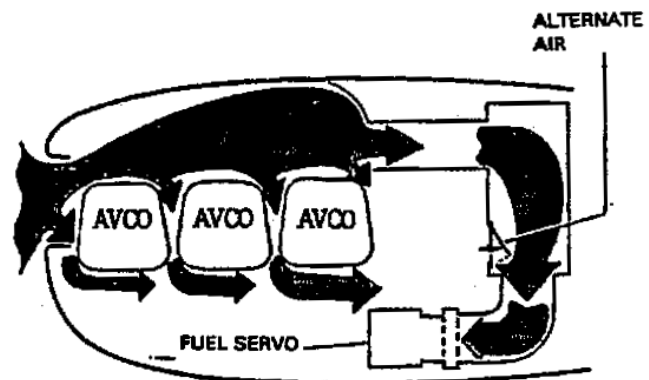


FIGURE 5-4: INDUCTION SYSTEM 601P



1. AIR BOX
2. RIGHT AND LEFT FLEXIBLE AIR DUCT
3. AIR FLEXIBLE DUCT TO FUEL INJECTOR SERVO
4. REMOVABLE AIR FILTER
5. AIR BOX COVER
6. ALTERNATE DOOR
7. DOOR DETAIL



SIMPLIFIED AIRFLOW DIAGRAM

FIGURE 5-5: INDUCTION SYSTEM 600



SYSTEM SHOWN IN CONTROLLED PARTIALLY
TURBOCHARGED CONFIGURATION

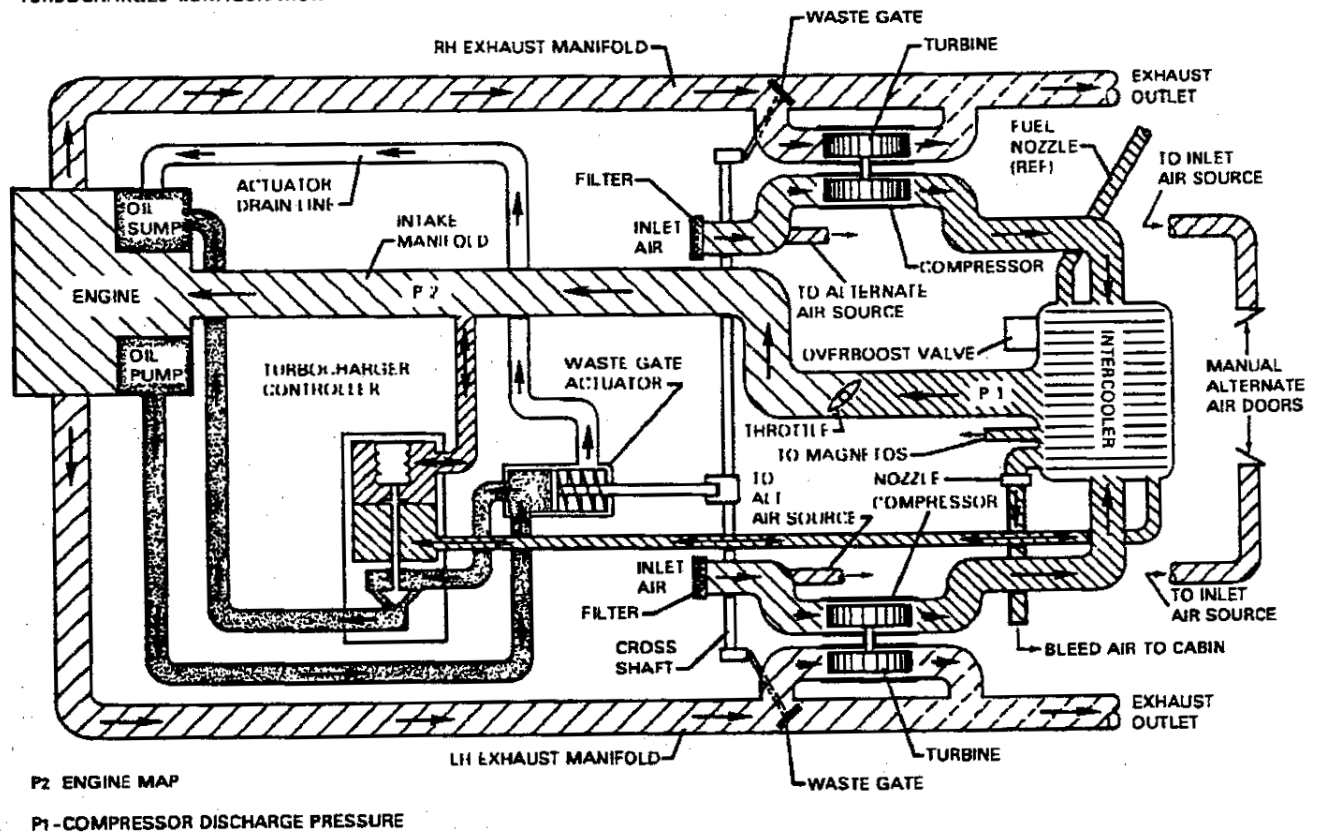


FIGURE 5-6: TURBOCHARGING SYSTEM 700P

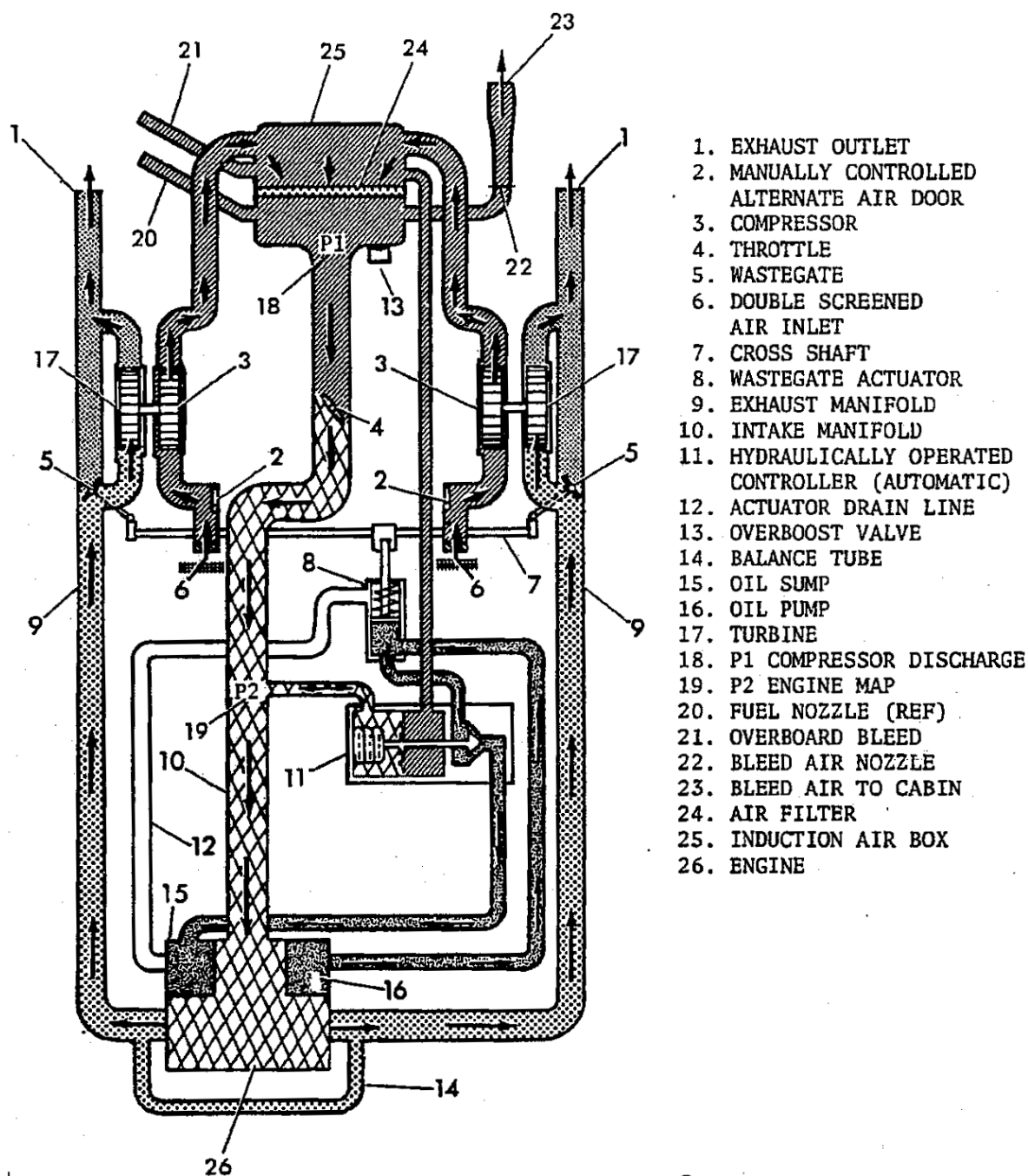


FIGURE 5-7: TURBOCHARGING SYSTEM 602P

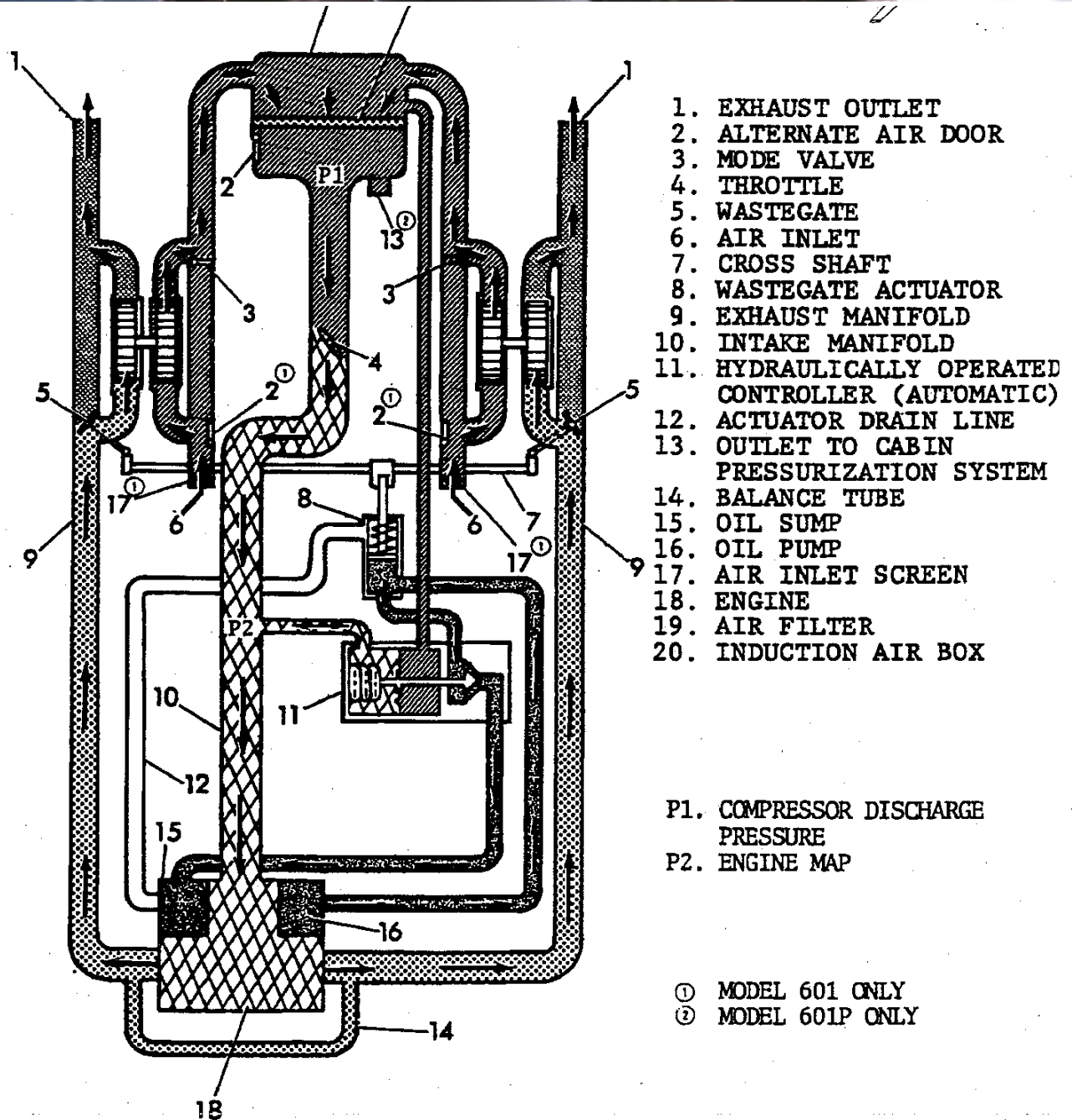
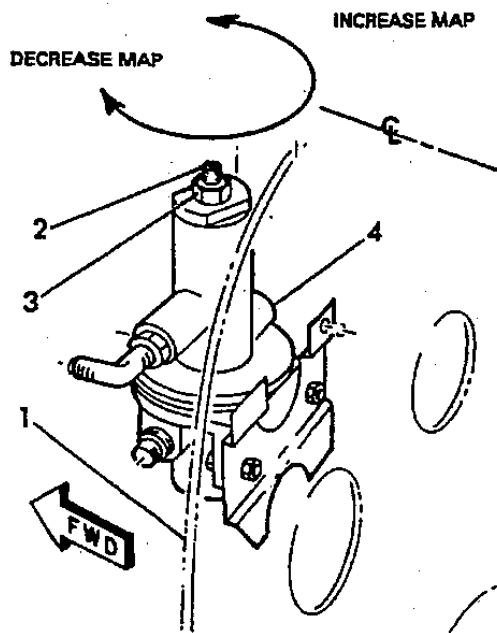


FIGURE 5-8: TURBOCHARGING SYSTEM 601/601P



1. MANIFOLD PRESSURE ADJUSTMENT
2. SERVO VALVE BODY
3. BALANCED PISTON VALVE ASSEMBLY
4. TURBO COMPRESSOR PRESSURE (P1)
5. DIAPHRAGM
6. ENGINE MANIFOLD PRESSURE (P2)
7. ANEROID BELLOWS (Pp)
8. SPACER
9. CONTROLLER HOUSING
10. JAM NUT

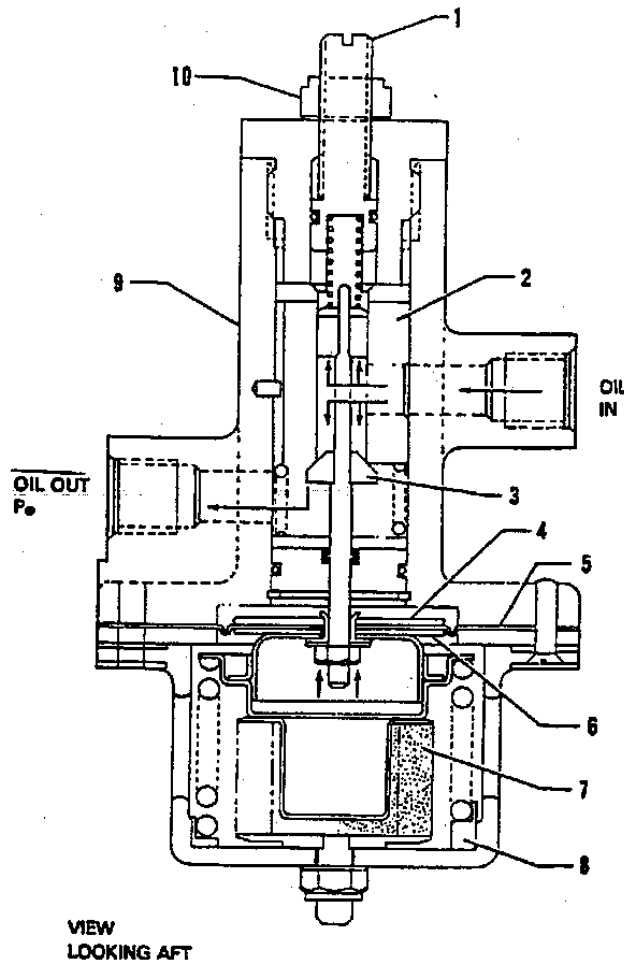
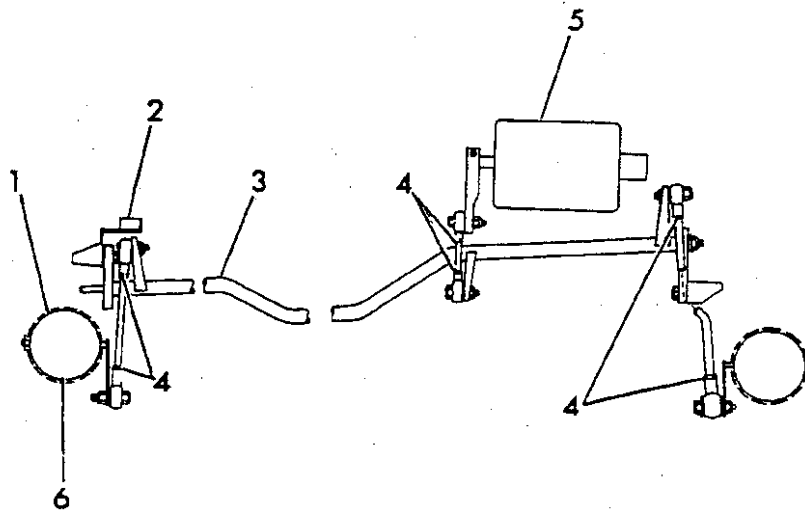
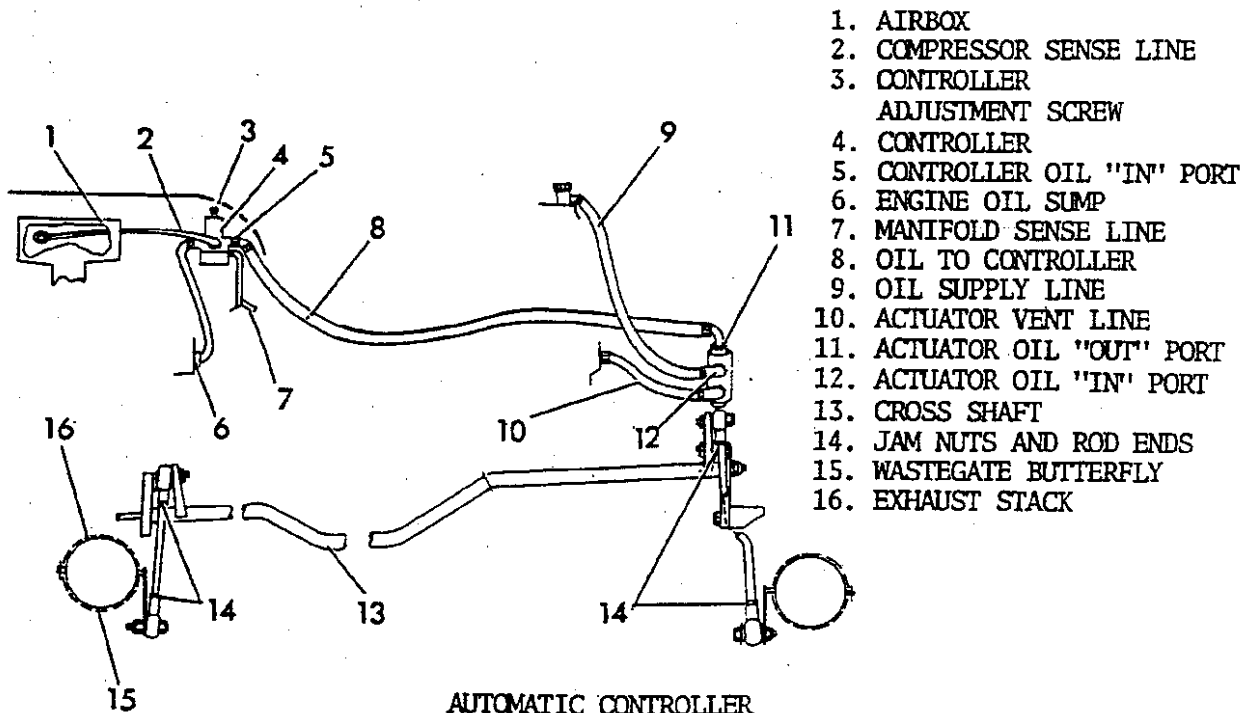


FIGURE 5-9: AUTOMATIC CONTROLLER



1. EXHAUST STACK
2. POSITION SWITCH
3. CROSS SHAFT
4. JAM NUT AND ROD END
5. ELECTRICALLY OPERATED WASTEGATE MOTOR
6. WASTEGATE BUTTERFLY

MANUALLY OPERATED



1. AIRBOX
2. COMPRESSOR SENSE LINE
3. CONTROLLER
4. CONTROLLER ADJUSTMENT SCREW
5. CONTROLLER OIL "IN" PORT
6. ENGINE OIL SUMP
7. MANIFOLD SENSE LINE
8. OIL TO CONTROLLER
9. OIL SUPPLY LINE
10. ACTUATOR VENT LINE
11. ACTUATOR OIL "OUT" PORT
12. ACTUATOR OIL "IN" PORT
13. CROSS SHAFT
14. JAM NUTS AND ROD ENDS
15. WASTEGATE BUTTERFLY
16. EXHAUST STACK

AUTOMATIC CONTROLLER

FIGURE 5-10: TURBO CONTROLS

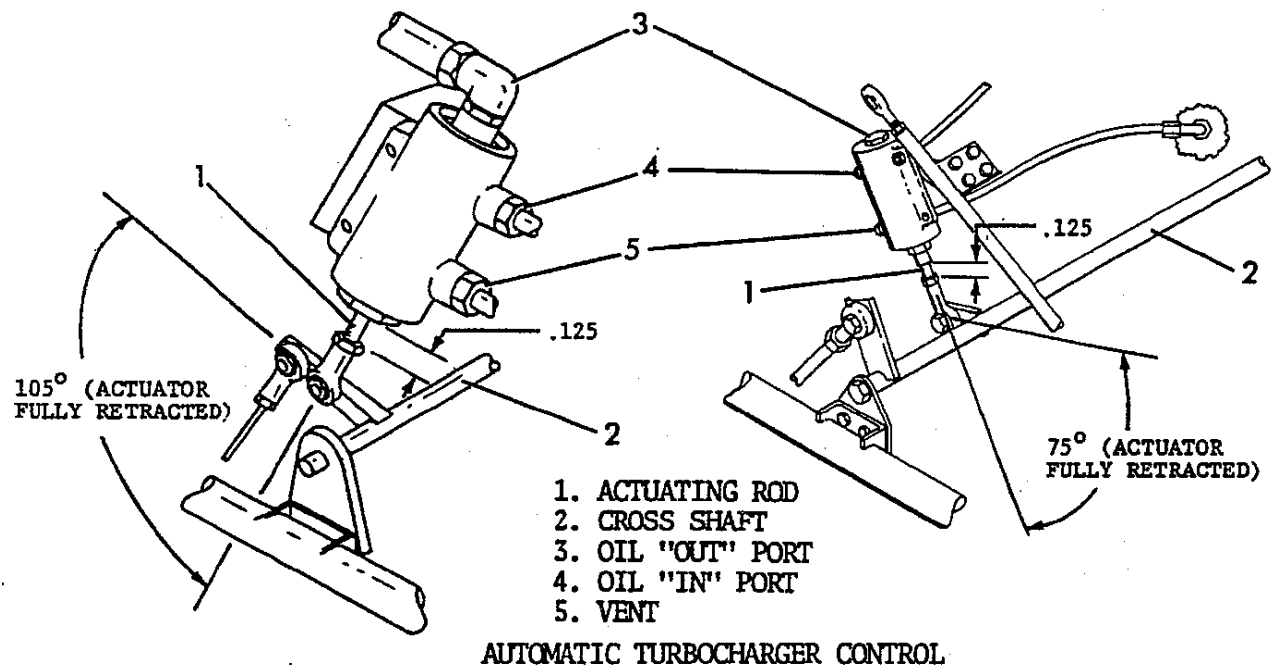


FIGURE 5-11: AUTOMATIC TURBO CONTROL

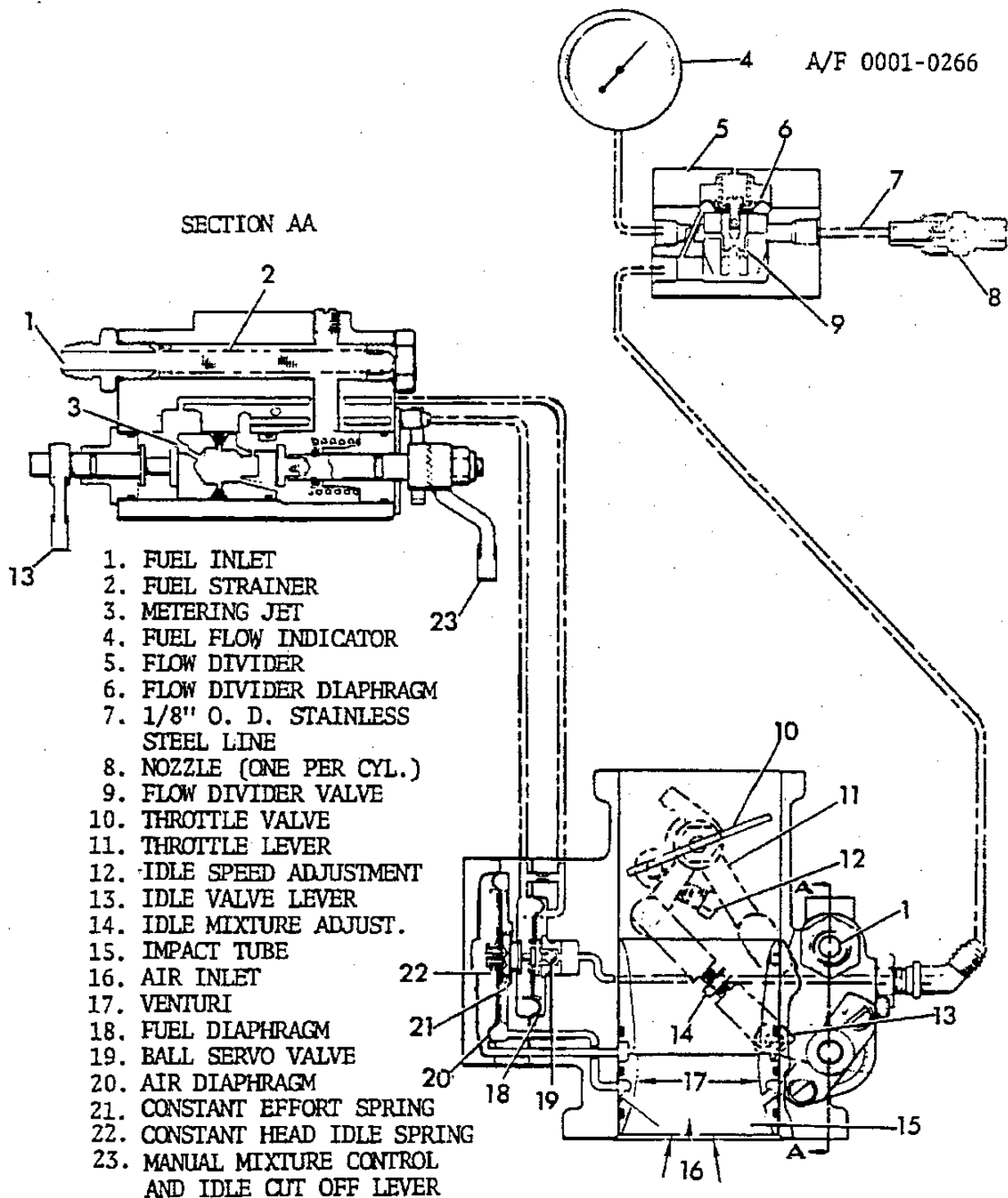


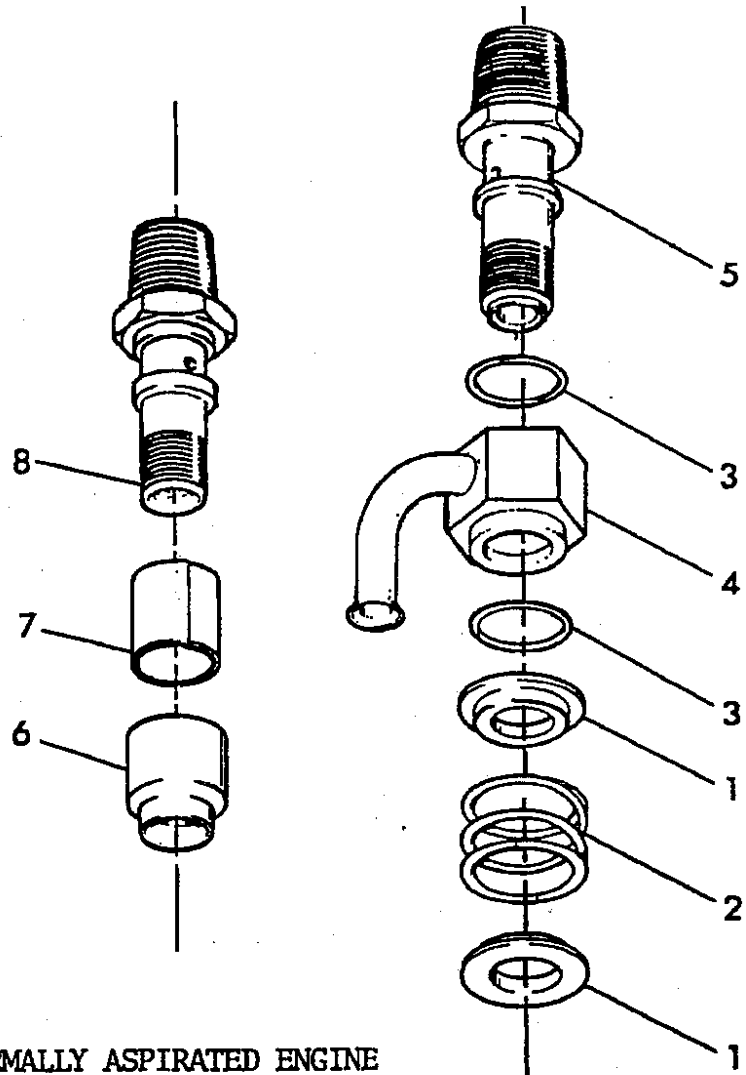
FIGURE 5-12: FUEL INJECTION SYSTEM



B (TYPICAL 6 PLACES)

AIR BLEED NOZZLE ASSEMBLY

1. HOLDER, SPRING
2. SPRING, HELICAL
3. PACKING
4. TUBE ASSY.
5. BODY ASSY.
6. SHIELD NOZZLE
7. SCREEN NOZZLE
8. NOZZLE



NORMALLY ASPIRATED ENGINE

TURBOCHARGED ENGINE

FIGURE 5-13: AIR BLEED NOZZLE ASSY

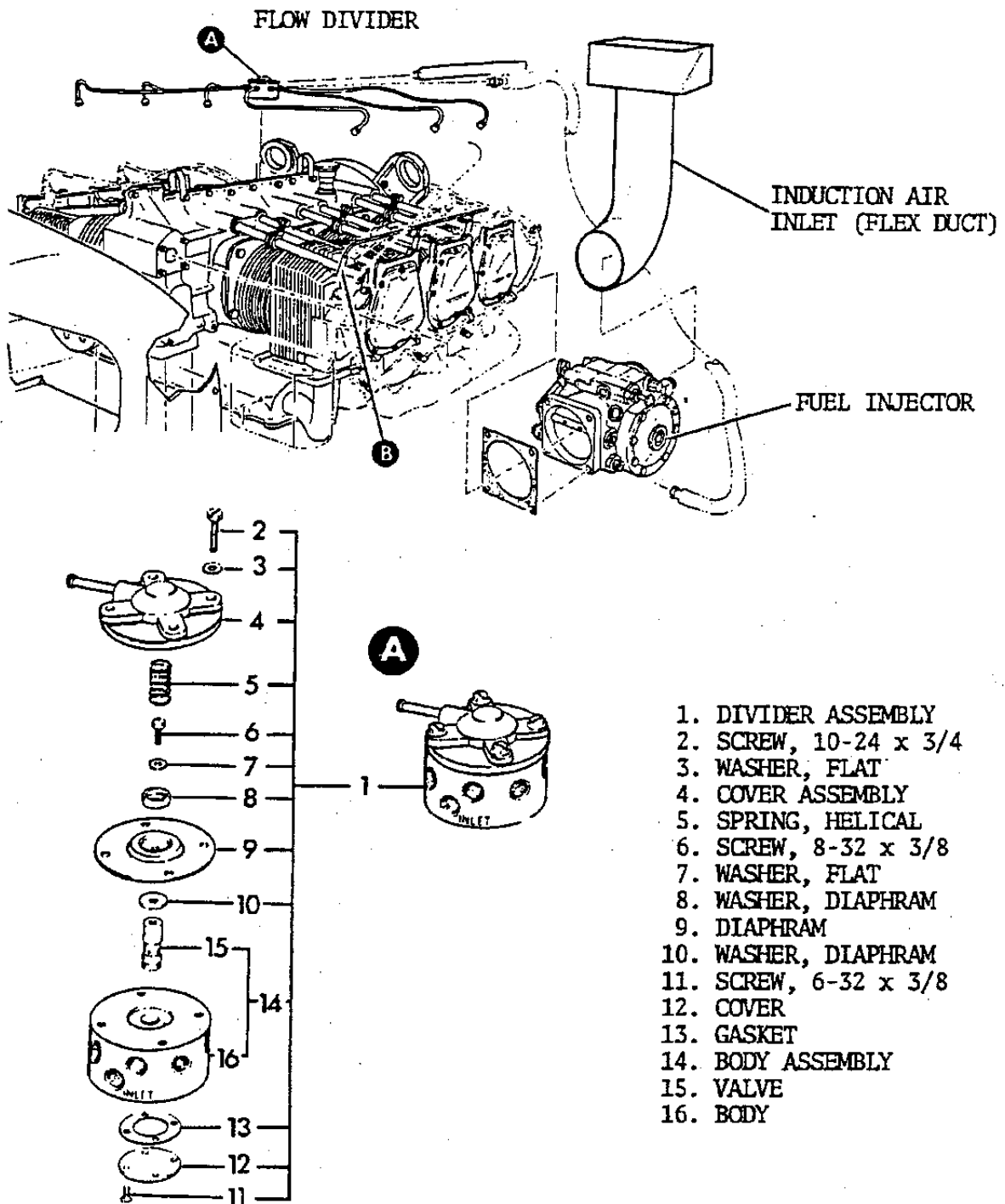
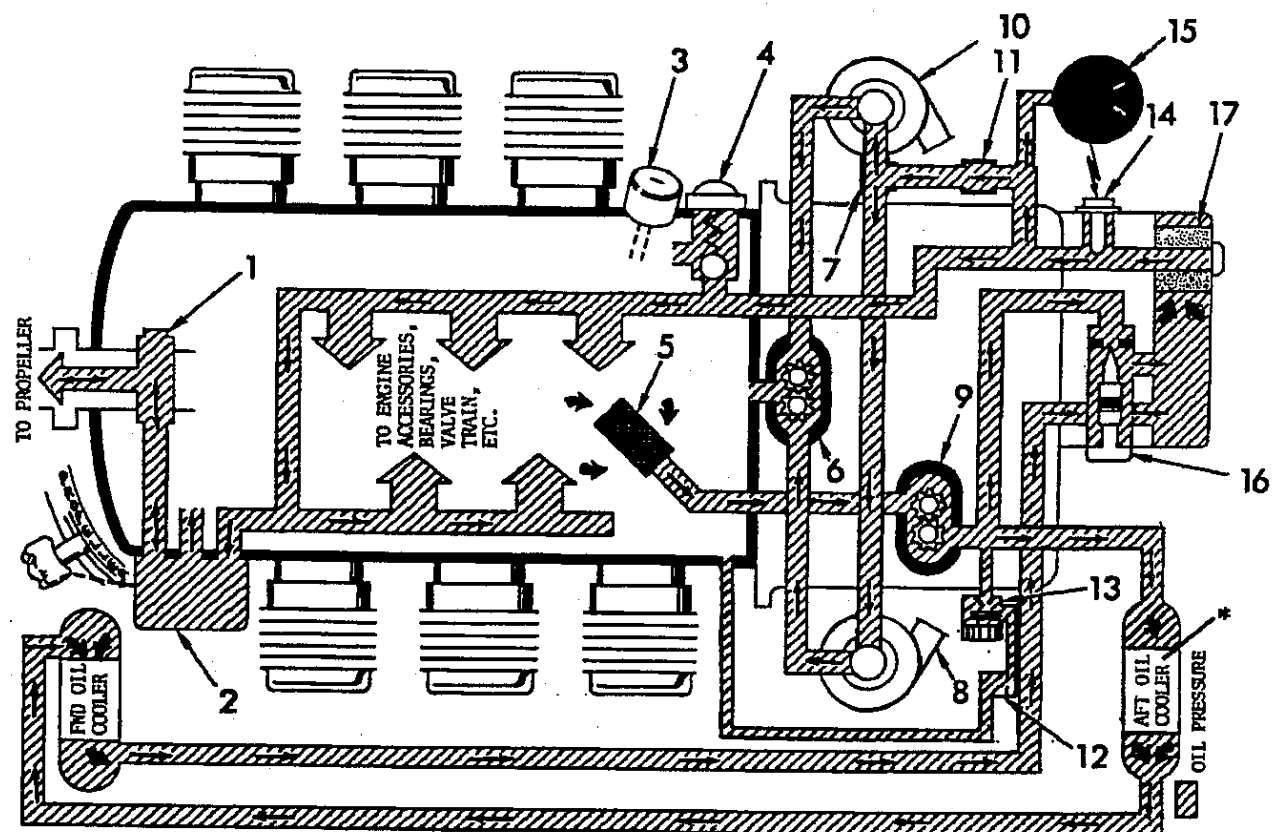


FIGURE 5-14: FUEL INJECTOR INSTALLATION



- | | |
|--------------------------|-----------------------------|
| 1. OIL TRANSFER RING | 10. RIGHT TURBOCHARGER |
| 2. PROPELLER GOVERNOR | 11. PRESSURE REGULATOR |
| 3. FILLER CAP/DIP STICK | 12. CONTROLLER |
| 4. PRESSURE RELIEF VALVE | 13. WASTE GATE ACTUATOR |
| 5. SUMP SCREEN | 14. TEMPERATURE BULB |
| 6. SCAVENGE PUMP | 15. ENGINE GAUGE UNIT |
| 7. RESTRICTOR TEE | 16. OIL COOLER BYPASS VALVE |
| 8. LEFT TURBOCHARGER | 17. FULL FLOW FILTER |
| 9. OIL PUMP | |

FIGURE 5-15: ENGINE OIL SYSTEM

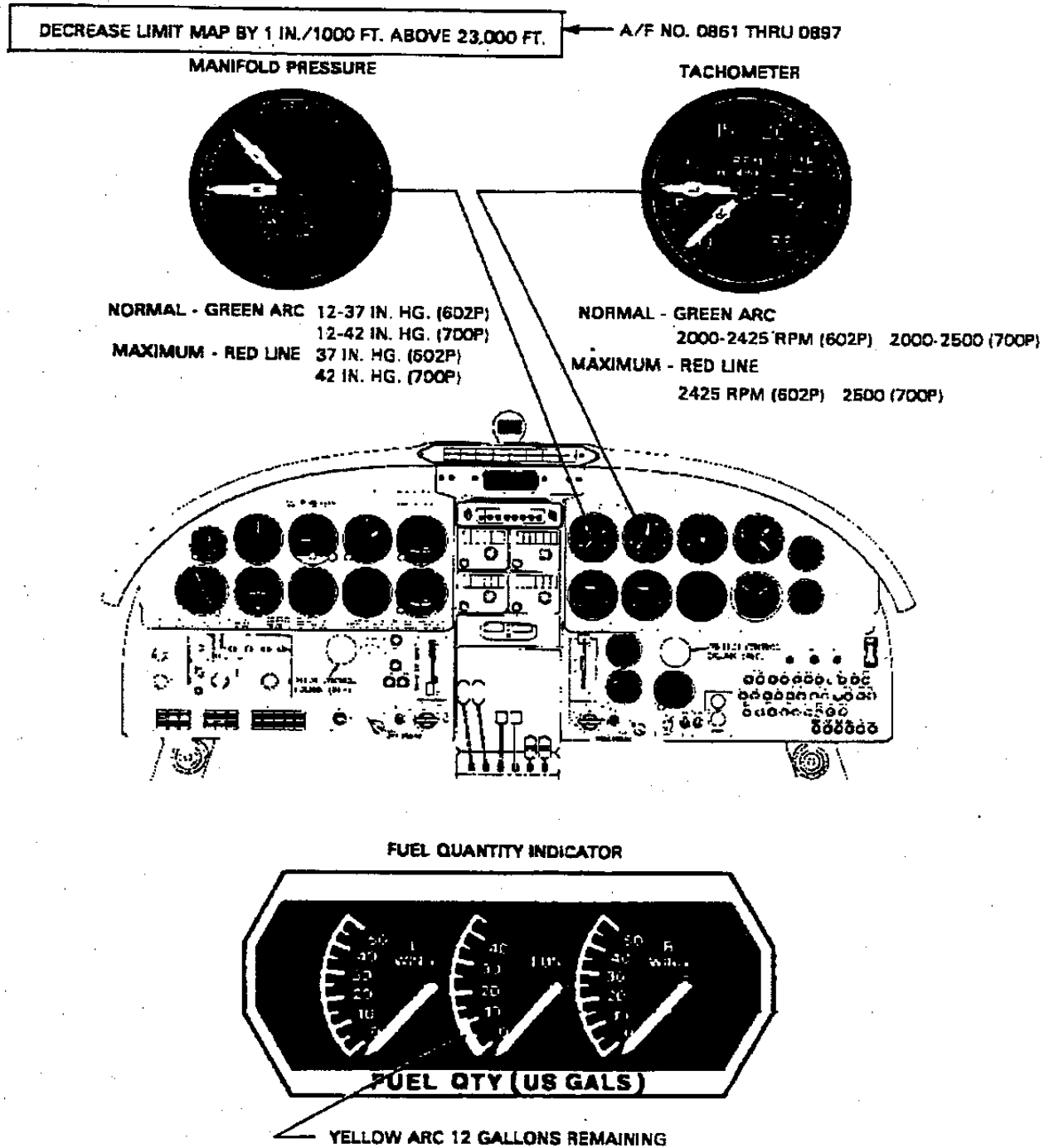


FIGURE 5-16: POWERPLANT INSTRUMENTS 700P



Aerostar
Owners
Association

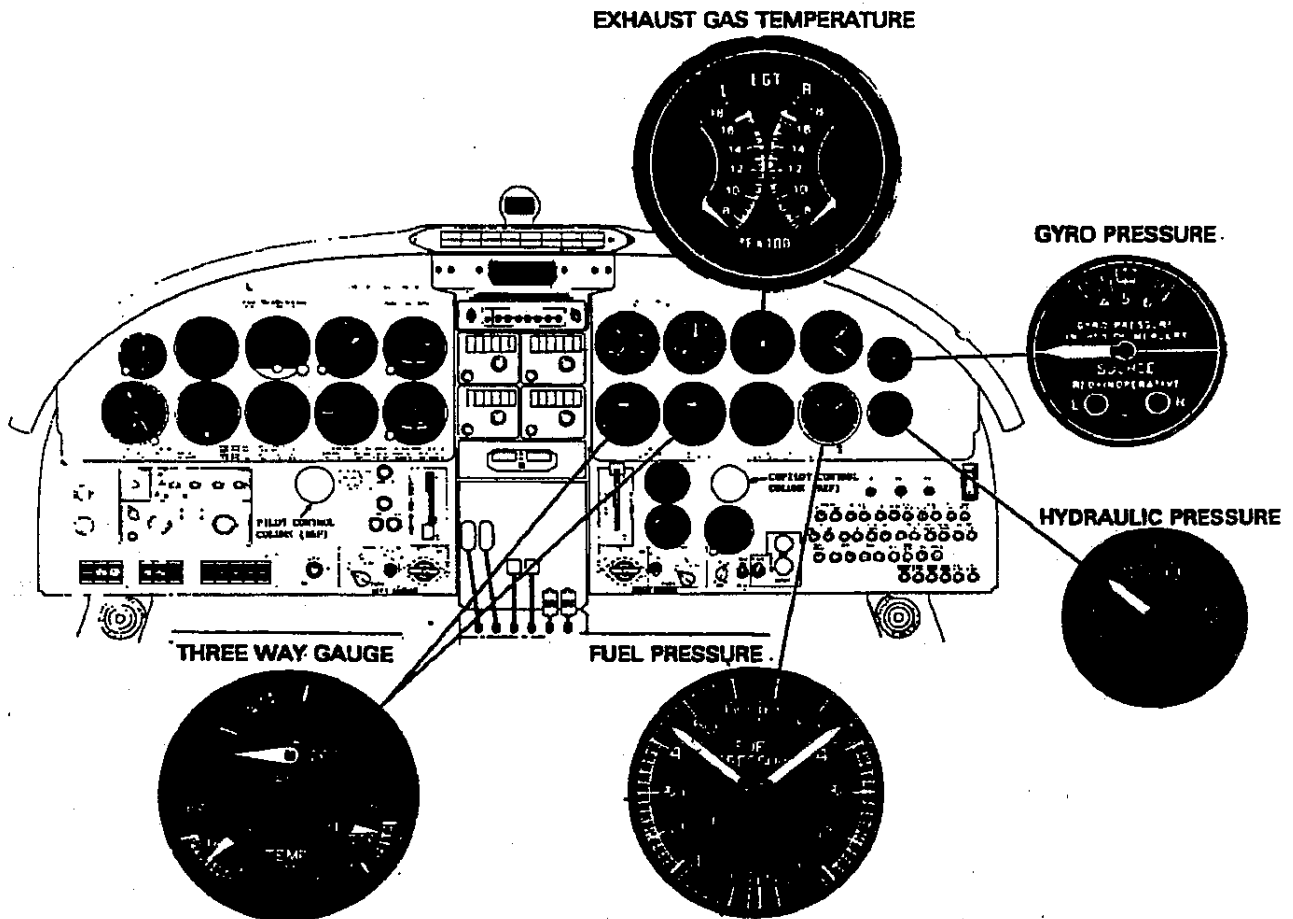
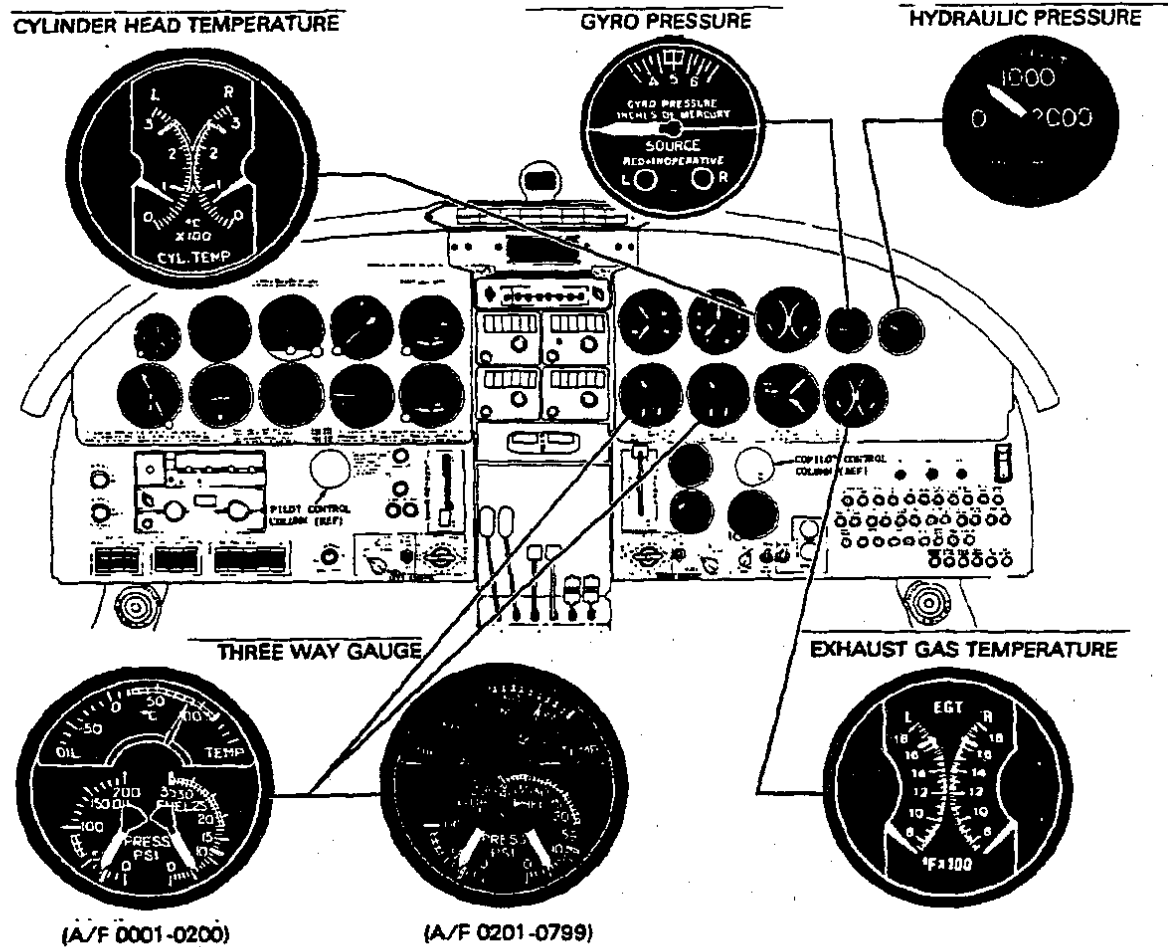


FIGURE 5-17: POWERPLANT INSTRUMENTS 602P

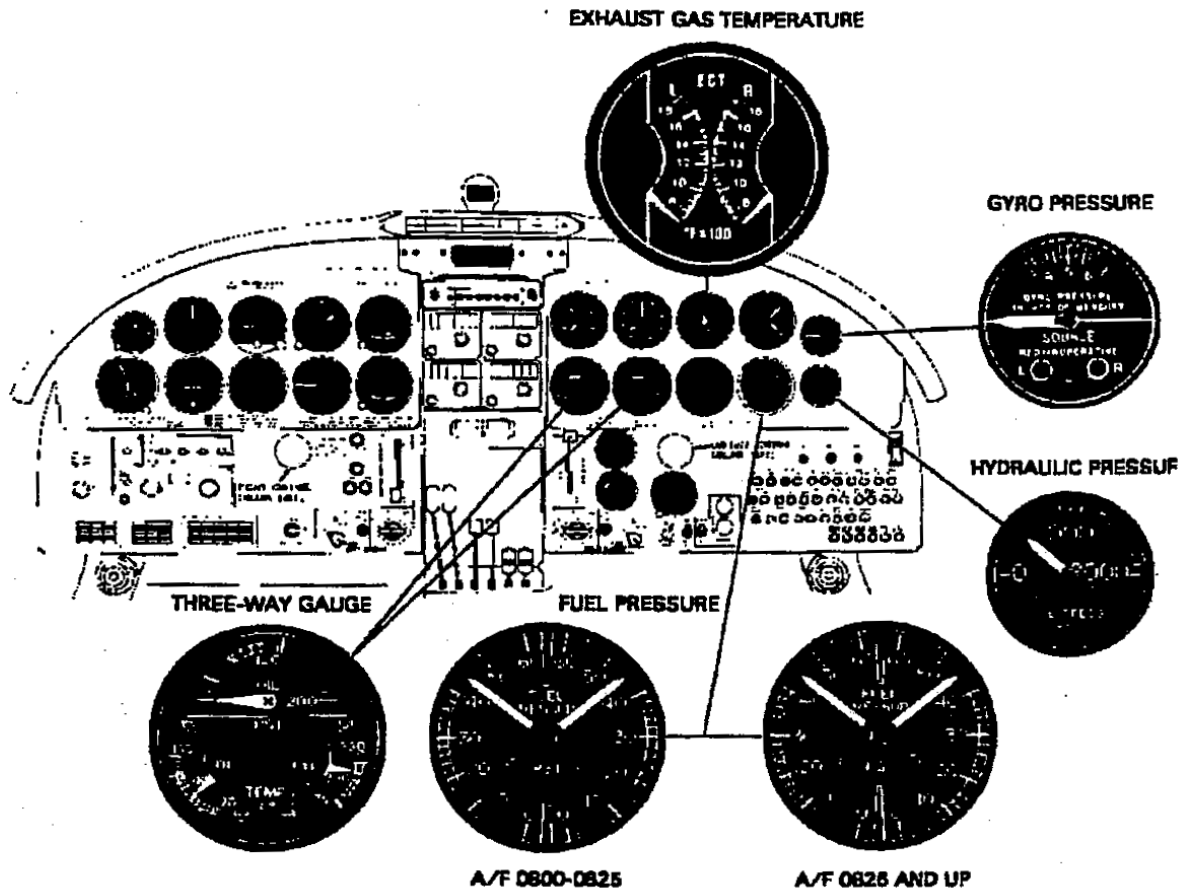


POWERPLANT INSTRUMENTS	RED LINE MINIMUM	GREEN ARC NORMAL	RED LINE MAXIMUM
OIL TEMPERATURE		24-118°C	118°C
OIL PRESSURE	25 PSI (IDLE)	60-80 PSI	100 PSI
CYLINDER HEAD TEMPERATURE			
A/F 0001-0714	100°C	100-246°C	246°C
A/F 0715 AND UP	100°C	100-260°C	260°C
HYDRAULIC PRESSURE	—	900-1100 PSI	1300 PSI
FUEL PRESSURE			
A/F 0001-0200	12 PSI (IDLE)	18-35 PSI	35 PSI
A/F 0201-0799	12 PSI (IDLE)	18-40 PSI	40 PSI
GYRO PRESSURE (PNEUMATIC GYRO ONLY)		4.8-5.2 IN. HG.	
EXHAUST GAS TEMPERATURE			1850°F

FIGURE 5-18: POWERPLANT INSTRUMENTS 601/601P



Aerostar
Owners
Association



POWERPLANT INSTRUMENTS	RED LINE MINIMUM	YELLOW ARC CAUTION	GREEN ARC NORMAL	RED LINE MAXIMUM
OIL TEMPERATURE			24-118°C	118°C
OIL PRESSURE	25 PSI (IDLING)		55-95 PSI	115 PSI
CHT	100°C		100-260°C	260°C
HYDRAULIC PRESSURE			800-1100 PSI	1300 PSI
FUEL PRESSURE	12 PSI (IDLING)		18-40 PSI	40 PSI
A/F 0826 AND UP	12 PSI (IDLING)	12-18 PSI	18-40 PSI	40 PSI
GYRO PRESSURE			4.8-5.2 IN. HG.	
FUEL QUANTITY (FUSELAGE TANK)		0-12 GAL		
EGT				1650°F

FIGURE 5-19: POWERPLANT INSTRUMENTS 600

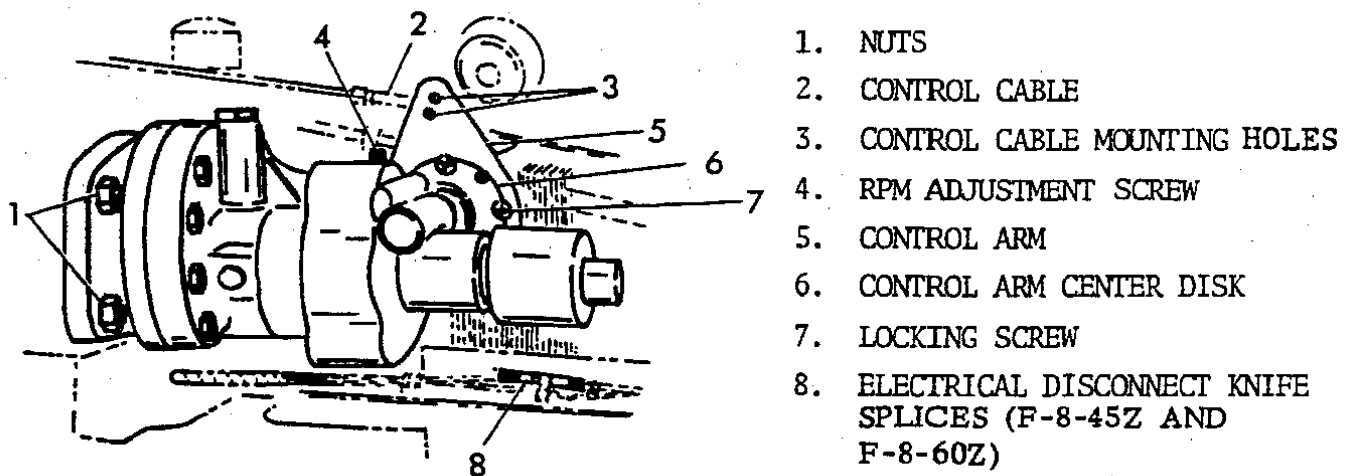
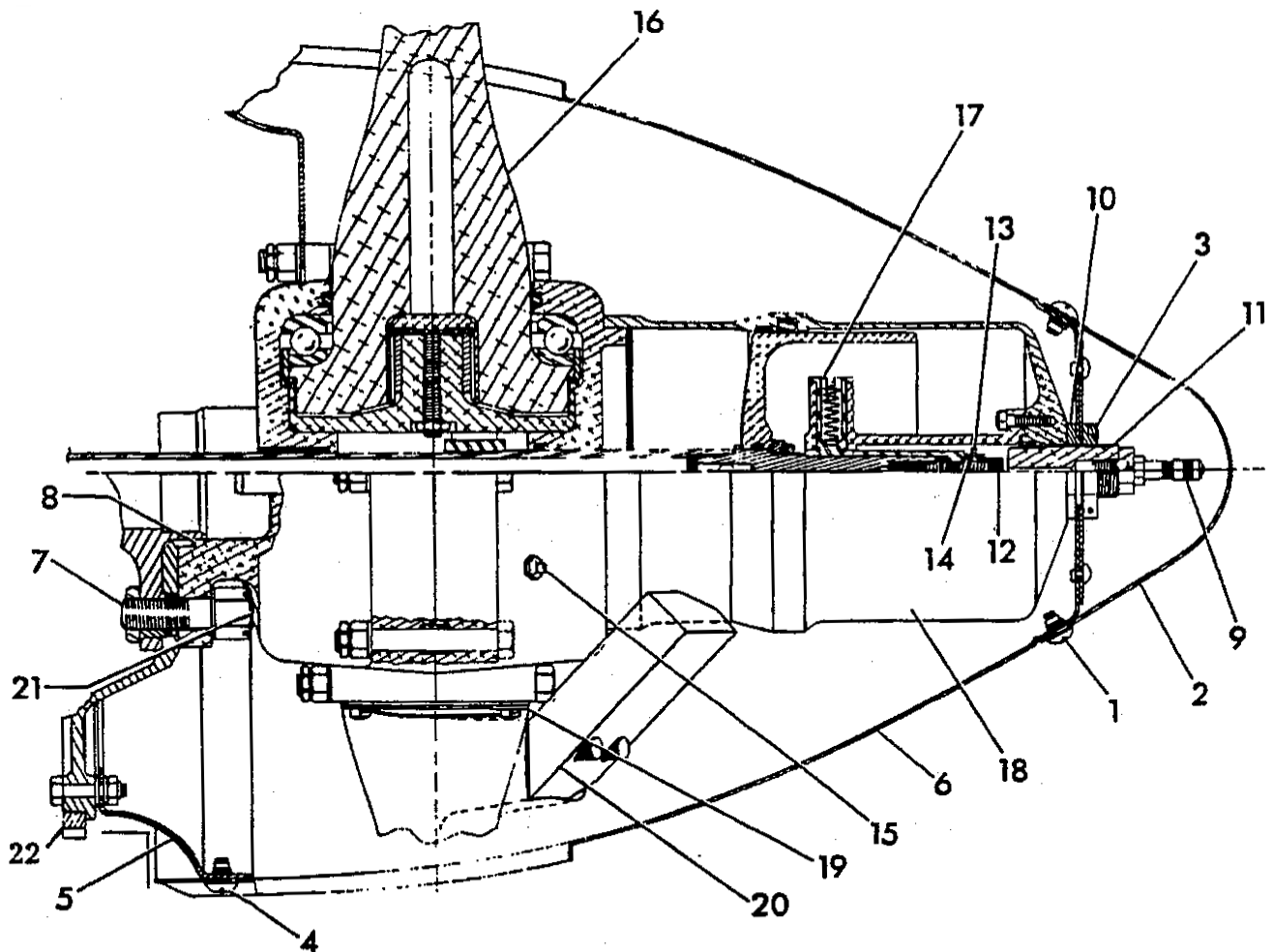
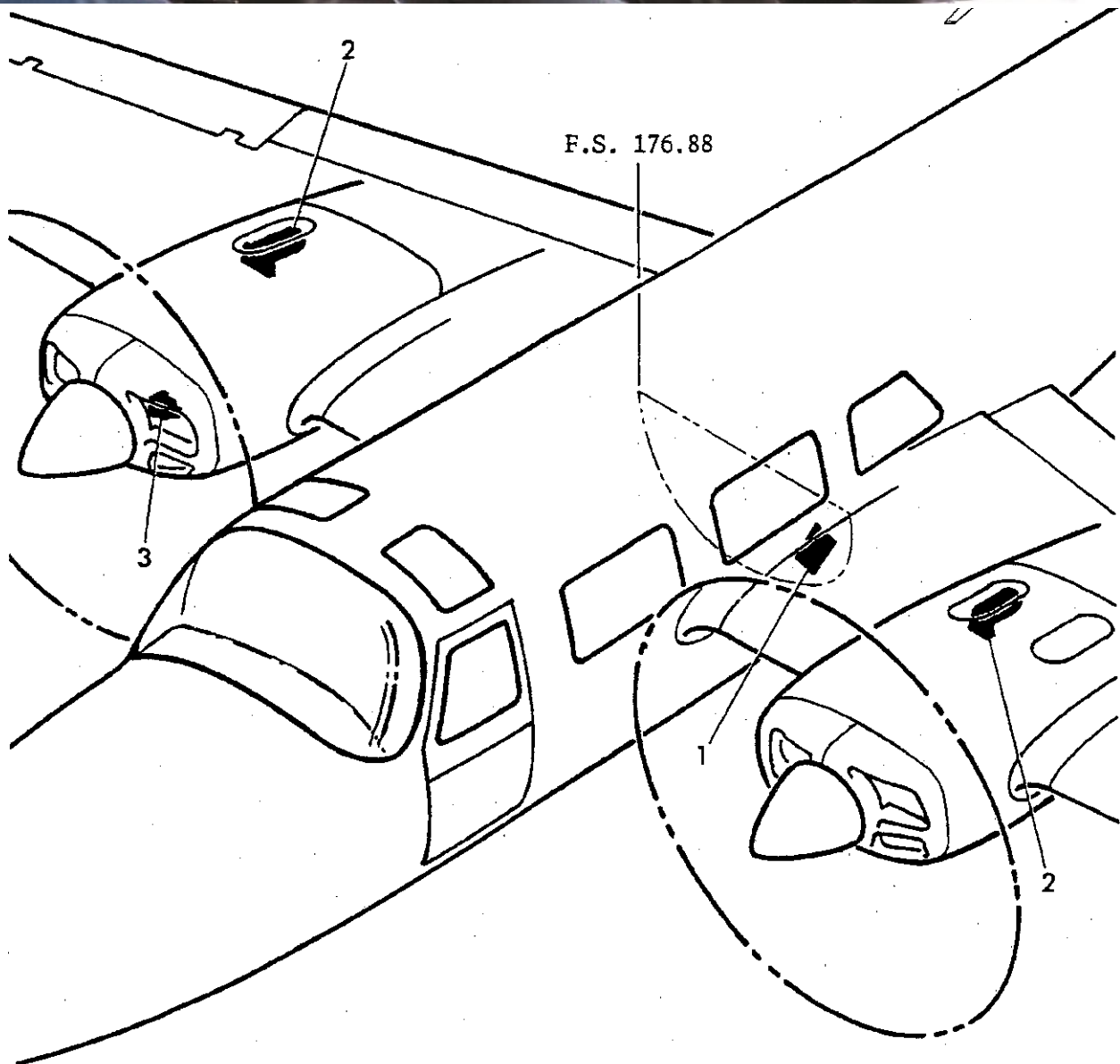


FIGURE 5-20: PROP GOVERNOR



- | | |
|----------------------------|----------------------------------|
| 1. DOME CAP MOUNTING SCREW | 13. FEATHER STOP WASHER |
| 2. DOME CAP | 14. WASHERS |
| 3. JAM NUT | 15. GREASE FITTING |
| 4. SPINNER MOUNTING SCREWS | 16. BLADE |
| 5. SPINNER ADAPTER | 17. AUTOMATIC HIGH PITCH STOP |
| 6. SPINNER | 18. CYLINDER |
| 7. MOUNTING BOLT | 19. BALANCE WEIGHTS |
| 8. PROPELLER HUB "O" RING | 20. COUNTERWEIGHTS |
| 9. SCHRADER VALVE | 21. SAFETY WIRE |
| 10. CHECK NUT | 22. LYCOMING ENGINE STARTER GEAR |
| 11. LOW PITCH STOP | |
| 12. SOCKET HEAD CAP SCREW | |

FIGURE 5-21: PROPELLER ASSY



1. SYNCHROPHASER COMPUTER
2. PULSE GENERATOR
3. RIGHT ENGINE GOVERNOR
AND SOLENOID (F-8-45Z,
F-8-60Z, F-8-63Z OR
F-8-63)

FIGURE 5-22: PROP SYNC

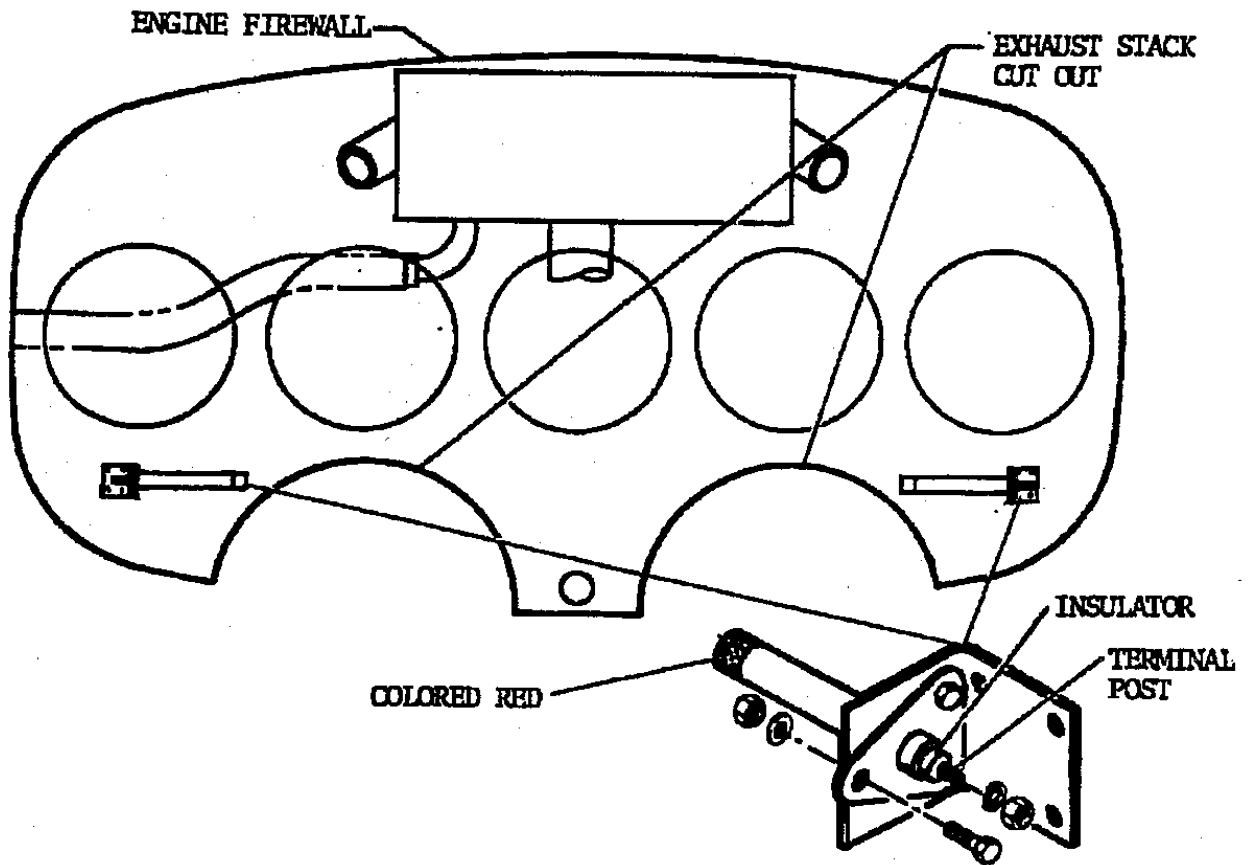


FIGURE 5-23: FIRE DETECTOR



CHAPTER 6 - QUIZ

1. The Aerostar 700P has two Avco Lycoming TIO-540 series rated at:
 - a. 250 horsepower.
 - b. 275 horsepower.
 - c. 290 horsepower.
 - d. 350 horsepower.

2. The Aerostar 600A, 601B, 601P and 602P have two Avco Lycoming 10-540 or TIO-540 series rated at:
 - a. 250 horsepower.
 - b. 275 horsepower.
 - c. 290 horsepower.
 - d. 350 horsepower.

3. The turbochargers are driven by:
 - a. direct drive from engine.
 - b. exhaust gas.
 - c. air.
 - d. None of the above.

4. Engine fuel system consists of:
 - a. a carburetor system.
 - b. a Bendix RSA-10EDI fuel injection system.
 - c. only a fuel pump with a flow divider.
 - d. None of the above.



5. The turbocharging is controlled by means of an automatic turbo control system consisting of a controller and an actuator.

TRUE

FALSE

6. The actuator and waste gate is spring loaded to move the waste gates to the closed position.

TRUE

FALSE

7. The Aerostar has two 3-bladed Hartzell props:

- a. that are full feathering.
- b. with accumulators for unfeathering.
- c. with optional 2-bladed props.
- d. None of the above.

8. The optional synchrophasor system on the Aerostar:

- a. has a 28-volt motor driven phasing unit.
- b. has a solenoid type control valve on the right engine propeller governor, slaving it to the left engine.
- c. has a computer mounted in the nose cone.
- d. None of the above.



6

6. ELECTRICAL

FOR TRAINING PURPOSES ONLY



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CHAPTER 6

ELECTRICAL

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CHAPTER 6

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OVERVIEW

The Aerostar is equipped with a 28V DC electrical system. Power to operate the various circuits and components is provided by two self-exciting 70-amp alternators; one on each engine. Maximum continuous output from each is limited to 55 amps, total dual alternator capacity is 110 amps.

To assist the alternator fields in bringing the alternators on line Machen has developed a field excitation kit. As alternators age the field winding units in the alternators may lose their ability to excite the field automatically. A wire is run from the starter relay to the fuse on the voltage regulator to assist in exciting the fields within the alternator bringing the alternator on line almost immediately. When the kit is installed, the alternator switches should be turned ON prior to engine start.

The voltage from each alternator is controlled by its voltage regulator and overvoltage relay. The voltage regulator senses the output of the alternator and automatically adjusts the alternator field current to increase or decrease the output voltage. Should one regulator become inoperative, the overvoltage relay will prevent any overvoltage condition of that alternator by interrupting the field current, shutting off the alternator. This alternator may be reactivated by turning it OFF (this resets the relay) and then back ON.

Each alternator system is separated from the battery and the other alternator system by isolation diodes. These diodes prevent reverse flow of current from a good alternator or the battery into an inoperative alternator. Additionally, some aftermarket alternator and electric components are available to improve the operation of the Aerostar electrical system.

National Air Parts, Inc. located in Deland, FL. offers 70 and 100 Amp alternators for the entire Aerostar line. Their alternators are capable of outputting 40 Amps at 800 RPM making them an ideal alternator improvement if the aircraft is equipped with an electric JB air conditioning system because of their high draw at low engine RPM. However, a caution has to be posted that regardless of the type of alternators installed the electrical load should be reduced to assist the batteries and alternators in supplying the necessary loads while on the ground. Running the Aerostar at over 900 RPM's on the ground invites a lot of brake wear.

NOTE

The 700 alternators are limited to 60 amps due to better engine baffling.



BATTERY INSTALLATION

The 700P and several modified models of the Aerostar have installed one 24-volt acid battery, located just aft of the rear baggage compartment, which provides power for engine starting and is a reserve source of power in the event of dual alternator failure. A DC external power receptacle, located just behind the access door on the underside of the tail, provides a means for connecting external power to the aircraft electrical system. (See Figure 6-3)

Two 12 volt, lead acid batteries, located just forward of the tail cone, are connected in series to provide 24 volts for engine starting and a reserve source of power in the event of dual alternator failure. (See Figure 6-4) A DC external power receptacle, located just behind the access door on the underside of the tail, provides a means for connecting external power to the aircraft electrical system. The battery switch must be in the ON position prior to connecting external power, then switched OFF after external power unit is turned on. Since this will provide a direct connection to the main aircraft bus, care should be taken to ensure that all electrical switches and radio equipment are turned off before attempting a GPU assisted start.

The exception to all switches off for the start is that of the battery switch which is on before connecting the external power unit. This will protect the individual systems from a poorly regulated external power source which can damage the airplane's electrical

equipment. Prior to turning on any electrical equipment, check to ensure the bus voltage does not exceed 30 volts. Turn battery switch ON prior to disconnecting external power source. It is recommended that a single battery installation be installed whenever possible for the aircraft. The actual procedure varies by model, so consult your POH for actual instructions.

VOLT-AMMETER

The volt-ammeter is located on the copilot's lower panel and reads either voltage or amperage. A three-position amperage selector switch, mounted adjacent to the volt-ammeter, is used to select the circuit to be read off the meter. Total OPERATING EQUIPMENT amperage load is displayed when the switch is in the BUS position.

The appropriate ALTERNATOR amperage load is displayed by moving the switch either left or right. If left and right alternator loads are added, the sum may be greater or less than displayed in BUS position. If greater, the battery is being charged; if less, battery is being discharged.

The left and right positions are also useful in determining load sharing, or paralleling. At lower load values (not to exceed 55 amps) one alternator may carry much more load than the other. This condition is acceptable if the lower load



value alternator has any load indication and will carry the load when the higher load value alternator is turned off. This test is valid only when both engines are operating above 1800 RPM to assure 28V output for each alternator. Alternators are considered to be in parallel when they share load equally between 10-15 amps.

Depressing the button on the volt-ammeter, regardless of amperage selector switch position, will cause the meter to display system voltage. The volt-ammeter circuit is fuse protected.

An alternator warning light will illuminate when the respective alternator fails or is turned off. Other system malfunctions will illuminate the light, such as:

- A. Engine RPM too low - alternator not on line.
- B. Failure of alternator output fuse and/or filter.
- C. Overvoltage relay open.
- D. Voltage regulator failure.

Many new electronic systems have been developed for today's aircraft that mimic larger glass cockpit instrumentations in modern turboprop and turbojet installations. These installations combine the function of the volt-ammeter, battery status, and paralleling functions that are viewed electrically in a concise and easy readable display. Integrated in these displays are engine and cylinder temperatures, oil pressure, oil temperature, engine prop

speed, and outside air temperature readings.

NOTE

Multiple failures may or may not illuminate the warning lights; however, these failures are readily determined by monitoring the volt-ammeter. If system load exceeds 70 amps per alternator, a circuit breaker should also pop, but the warning light will not illuminate.

Additionally, there will be no annunciation if there is a total failure of the electrical system.

Individual alternator switches are provided to turn their respective system ON or OFF and to check alternator circuit operation. Should an alternator fail, or an engine not be running, the respective alternator should be turned OFF. Since the alternators are self-exciting, battery exciting, battery power is not required for excitation.

CIRCUIT BREAKERS

An equipment circuit breaker panel is located on the lower right instrument panel. Each of the push-to-reset type circuit breakers will pop out when excessive current flows through the circuit it protects. After allowing the circuit breaker to cool for 1 - 3 minutes, it may



be reset by pushing it in until it clicks. Attempting to reset the circuit breaker before it has cooled sufficiently will not increase the reset time. Should a circuit breaker pop a second time, it should be left out until the cause has been corrected, as a short is indicated and damage may occur to the circuit and its components.

NOTE

The circuit breakers are not only push to reset, but also are of the pull to disable type, except for alternator and battery breakers.

The battery and each alternator is protected by panel mounted 70-amp circuit breakers. After 1 to 3 minutes cooling period, these panel mounted breakers may be reset.

FUSES

The volt-ammeter circuit is protected by six 1-amp fuses mounted on a plate directly below the circuit breaker panel. The avionics bus is protected by one 30-amp fuse mounted forward of the co-pilot panel inaccessible in flight. In the event of a failure of this fuse (as indicated by simultaneous failure of all radios), the auxiliary radio master switch may be used to obtain limited power for the radios. Some Aerostars have been modified through field DAR approval to replace the 30-amp fuse holder with a 30-

amp circuit breaker mounted externally on the lower right sub panel to allow the pilot to reset the avionics buss while in flight.

EXTERIOR LIGHTING

Appropriate switches and circuit breakers on the instrument panel control all exterior lighting. Combination strobe/navigation lights are located in the wing tips and on the tail cone. Dual taxi/landing lights are recessed in the bottom of the nose section. Simultaneous operation of both taxi/landing lights for extended periods while on the ground should be avoided, as this may cause overheating and possible deformation of the acrylic lens.

Led replacement lamps are available which greatly reduce power consumption and heat generated. Taxi and Landing lights may be left on indefinitely with led lamps installed.

WARNING

Strobe lights should not be operated when flying through cloud, fog, or haze, since the reflected light can produce spatial disorientation.



NOTE

Aircraft having electrical air-conditioning cannot use A/C during single engine operation, night flying, IFR, single alternator or on the ground unless RPM stays above 1300 RPM.

INTERIOR LIGHTING

The instrument panel is lighted by means of red and white lights located under the glare shield and side panels, and post lights. All red, all white, or any combination thereof, may be selected by means of rheostats located on the pilot's lower panel. Full counter-clockwise rotation of the knobs turns the lights off. The avionics equipment, post lights and some instruments are controlled by means of a rheostat, also located on the pilot's lower panel.

The magnetic compass is internally lighted, with the lighting controlled by the airplane battery switch. Cabin lighting is provided by individual passenger seat lights located in the headliner above each seat. Each light has a switch for individual control.

The master cabin light switch is located on the pilot's lower panel. A dual intensity map light is mounted overhead, between the pilot and copilot stations. The map light switch, adjacent to the map light, has a center OFF position, and BRIGHT or DIM

selection capability. The baggage compartment is illuminated when the baggage door is opened and the battery switch is ON.

ELECTRICAL DIAGRAMS

The attached electrical diagrams are for instructional purposes only and may not reflect actual circuits on your aircraft. Very early models may have undocumented circuit variations. Additionally, circuits may have been modified and documented or not documented. Consult the Aerostar Maintenance Manual for the most accurate diagrams.

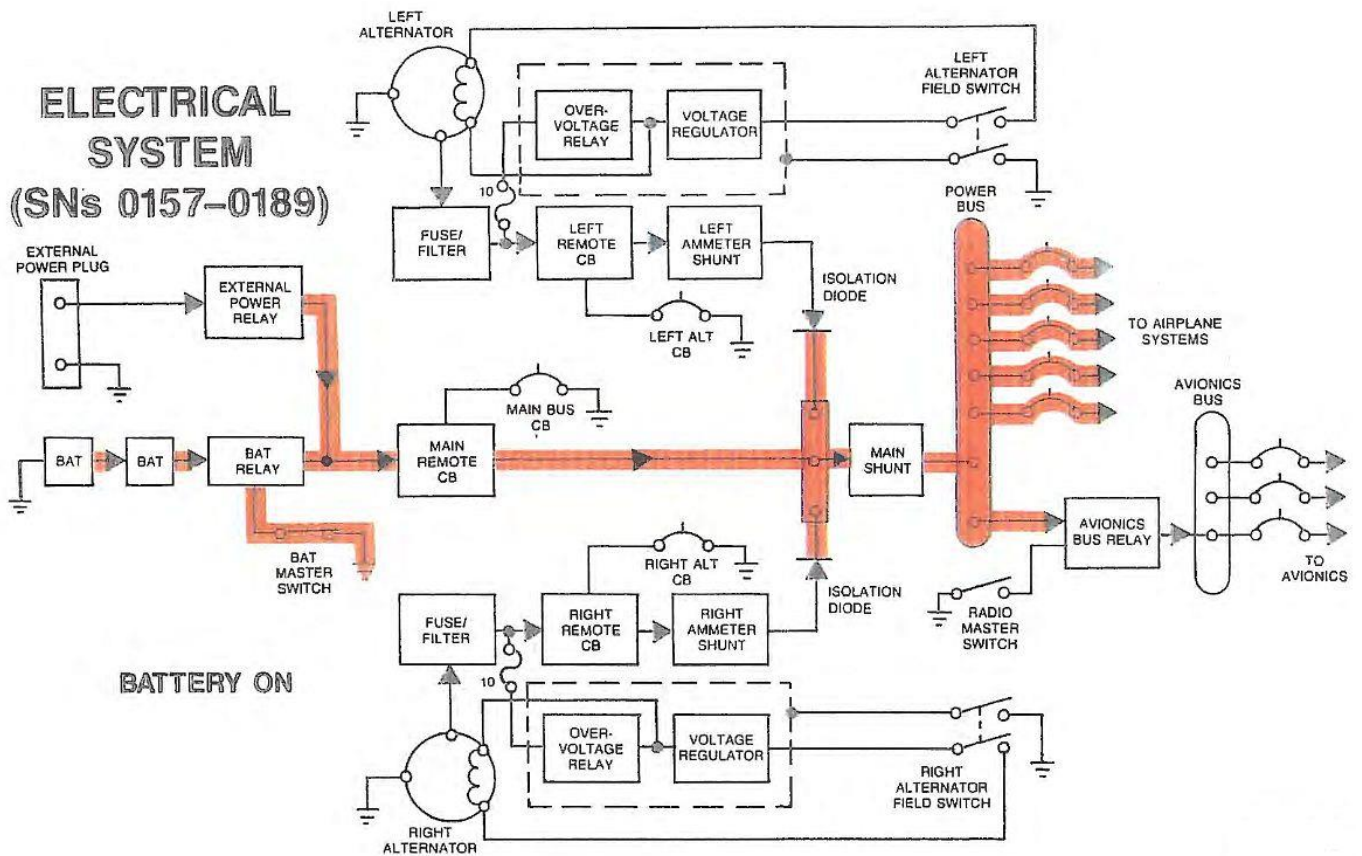


FIGURE 6-1: ELECTRICAL BATTERY (157-189)

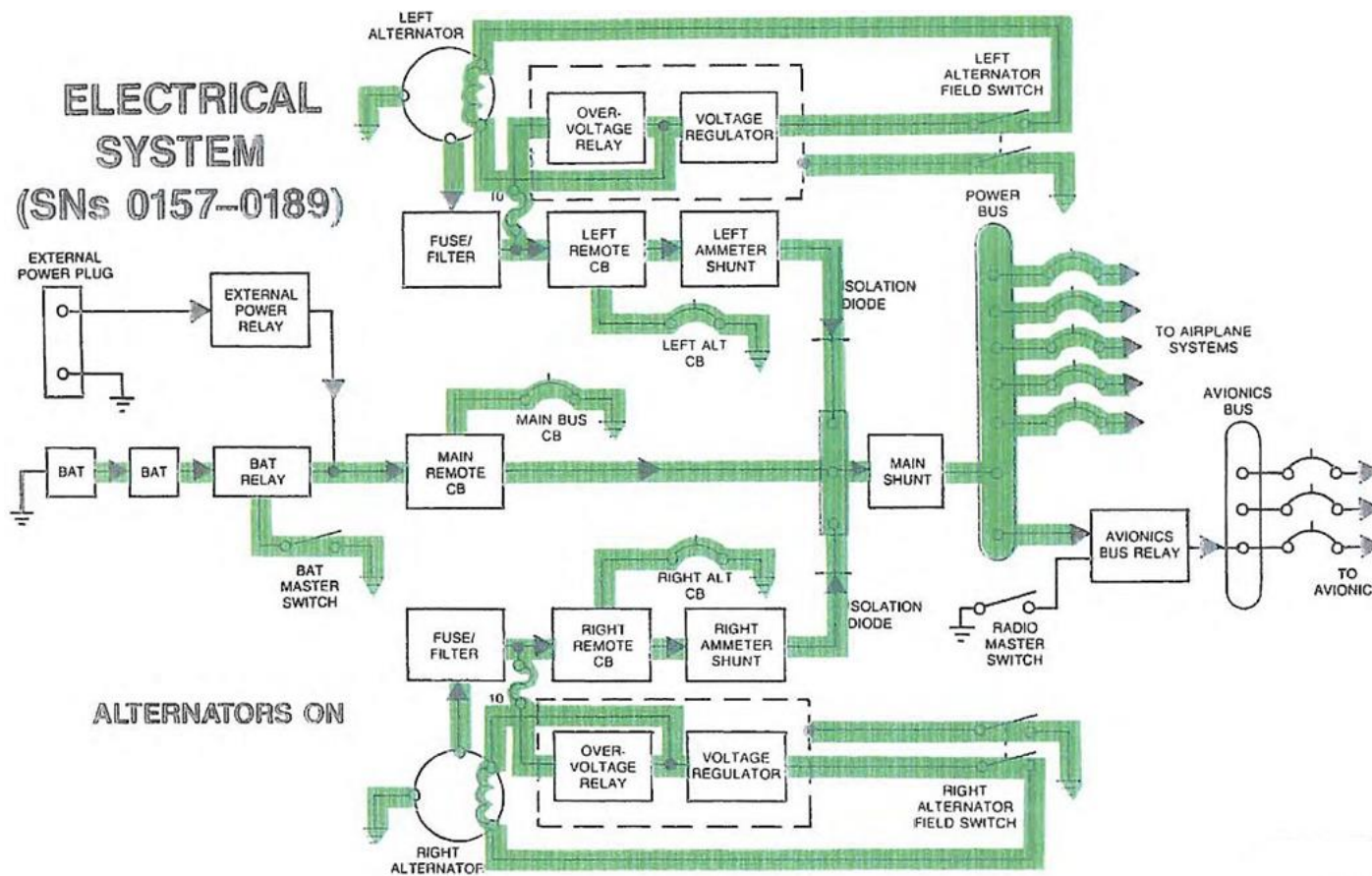


FIGURE 6-2: ELECTRICAL ALT ON (157-189)

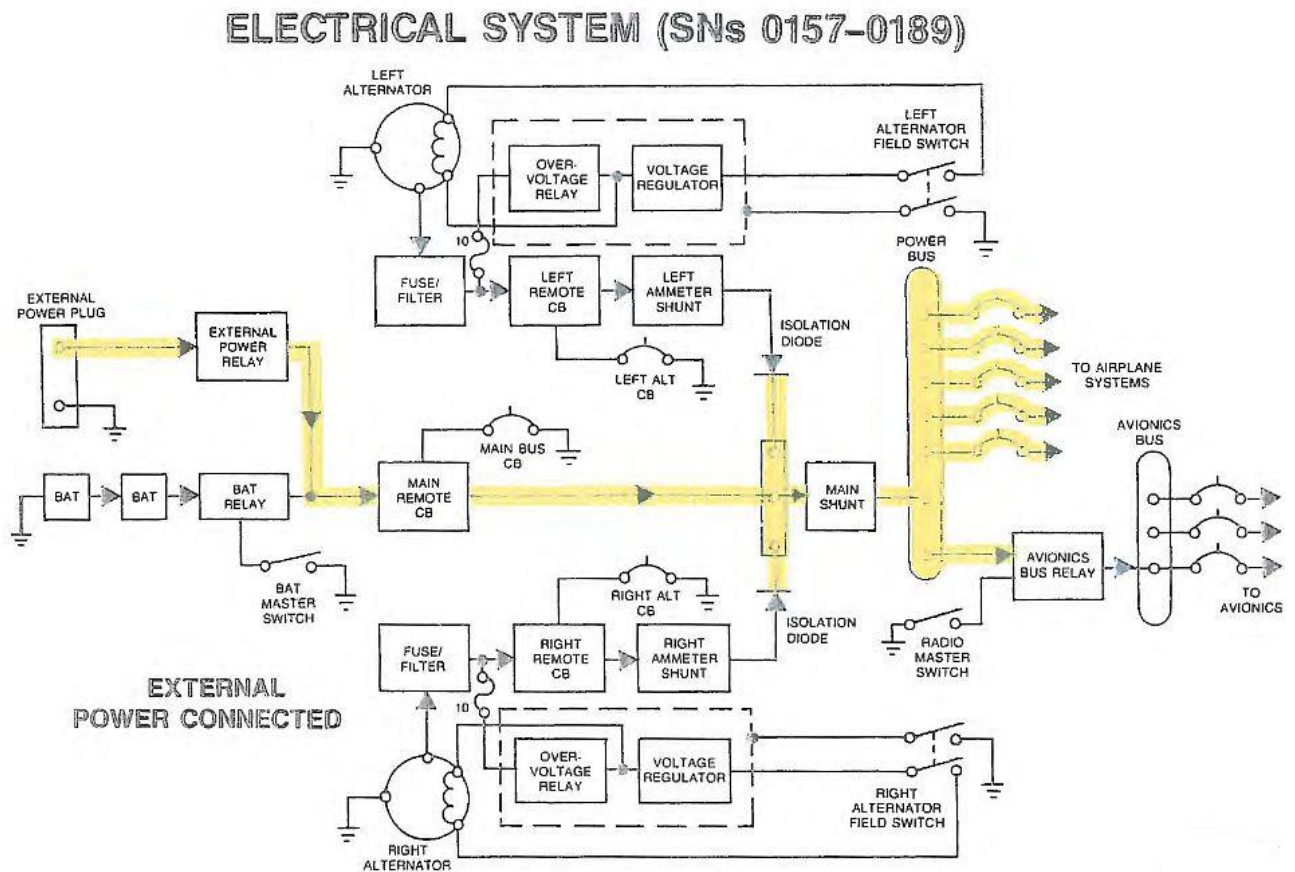


FIGURE 6-3: ELECTRICAL EXTERNAL (157-189)

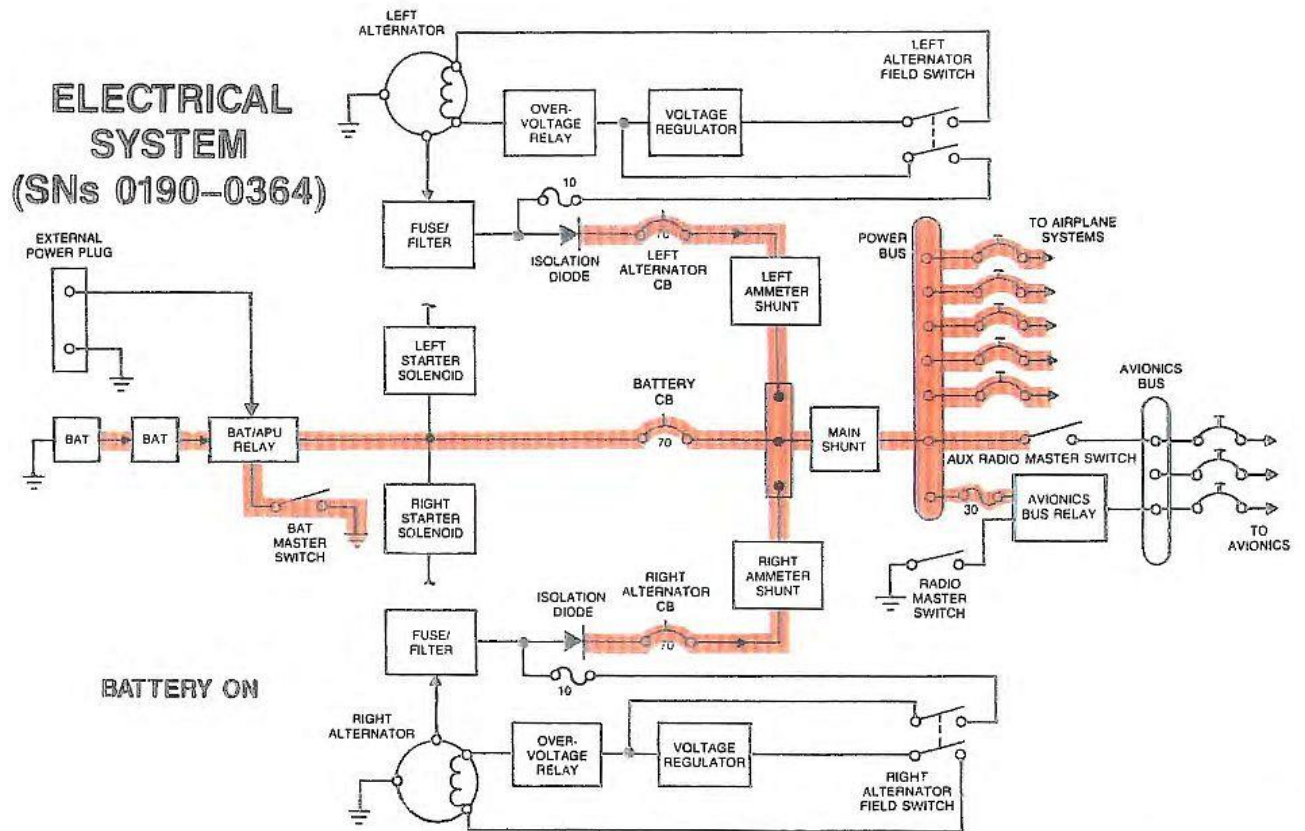


FIGURE 6-4: ELECTRICAL BATTERY (190-364)

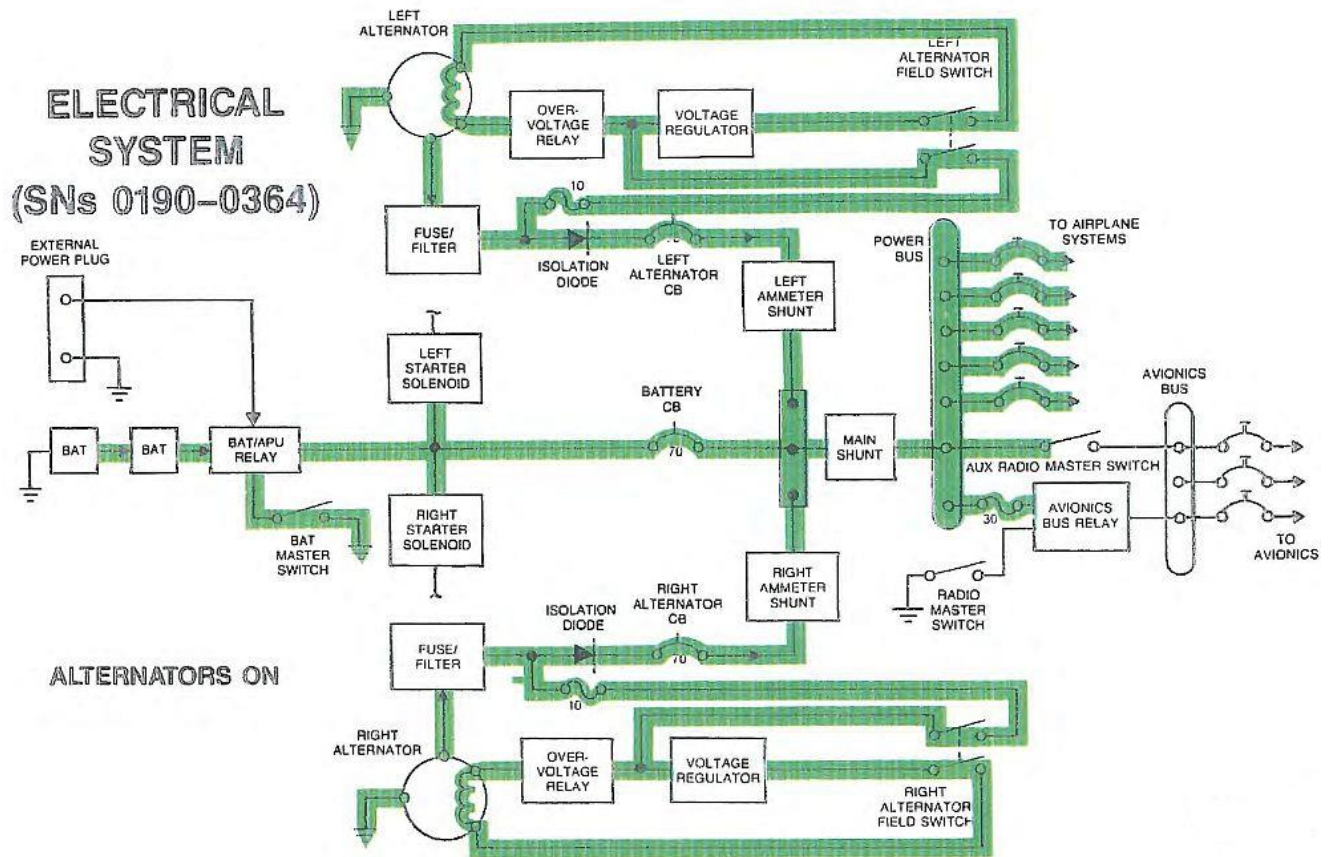


FIGURE 6-5: ELECTRICAL ALT ON (190-364)



ELECTRICAL SYSTEM (SNs 0190-0364)

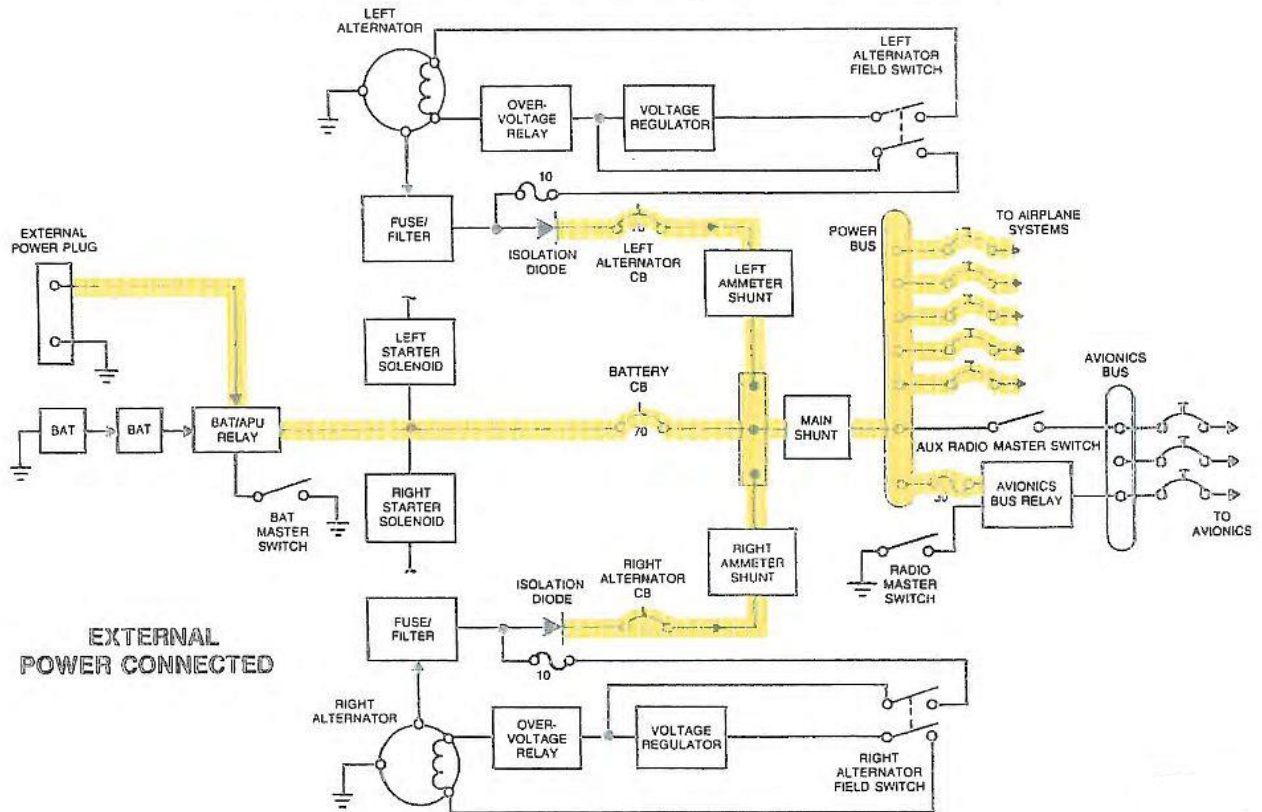


FIGURE 6-6: ELECTRICAL EXTERNAL (190-364)



ELECTRICAL SYSTEM (SNs 0365 AND SUBSEQUENT)

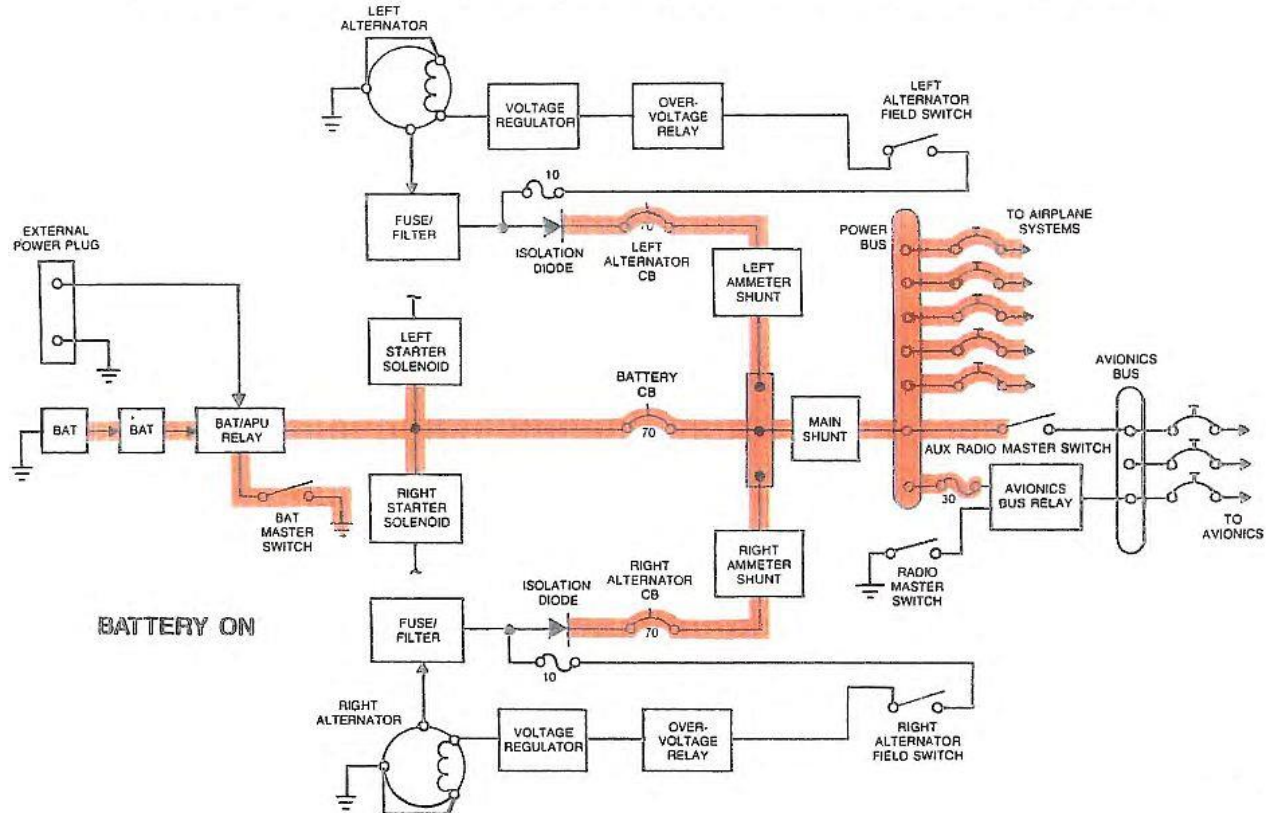


FIGURE 6-7: ELECTRICAL BATTERY (365 UP)



ELECTRICAL SYSTEM (SNs 0365 AND SUBSEQUENT)

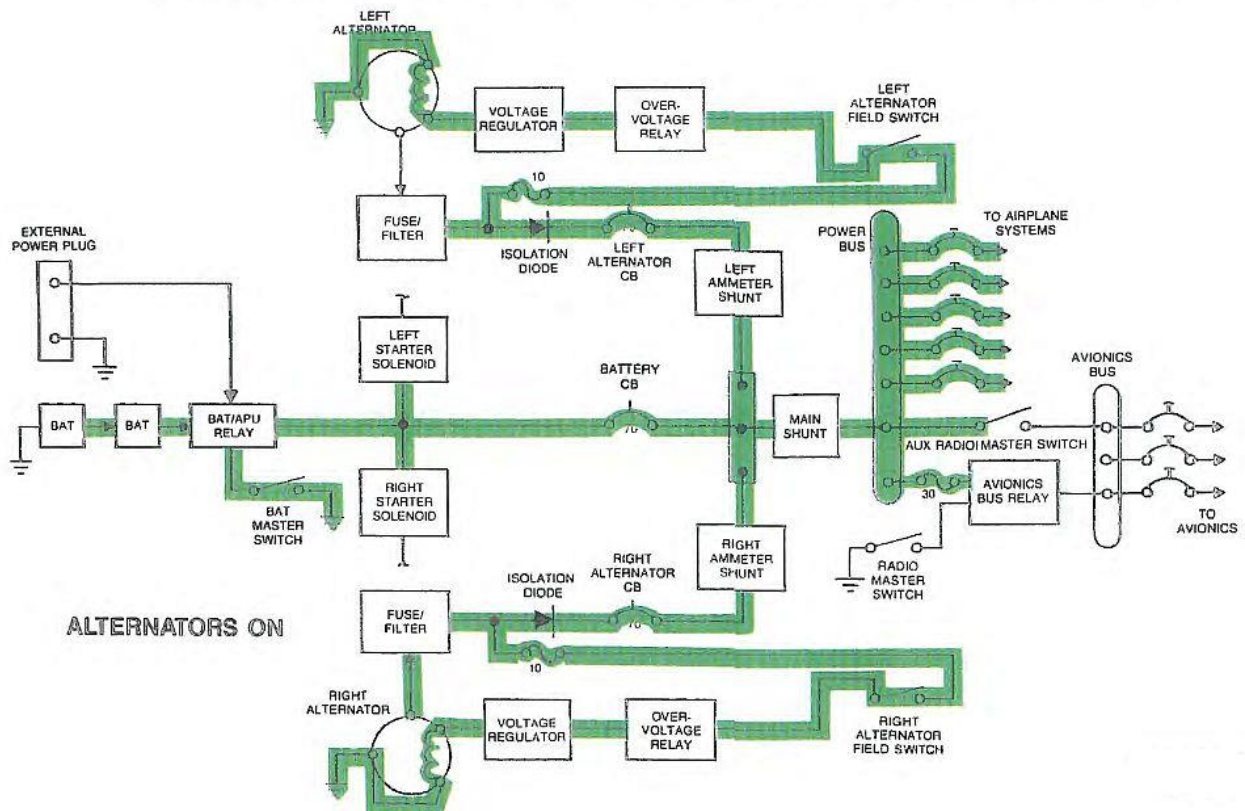


FIGURE 6-8: ELECTRICAL ALT ON (365 UP)



ELECTRICAL SYSTEM (SNs 0365 AND SUBSEQUENT)

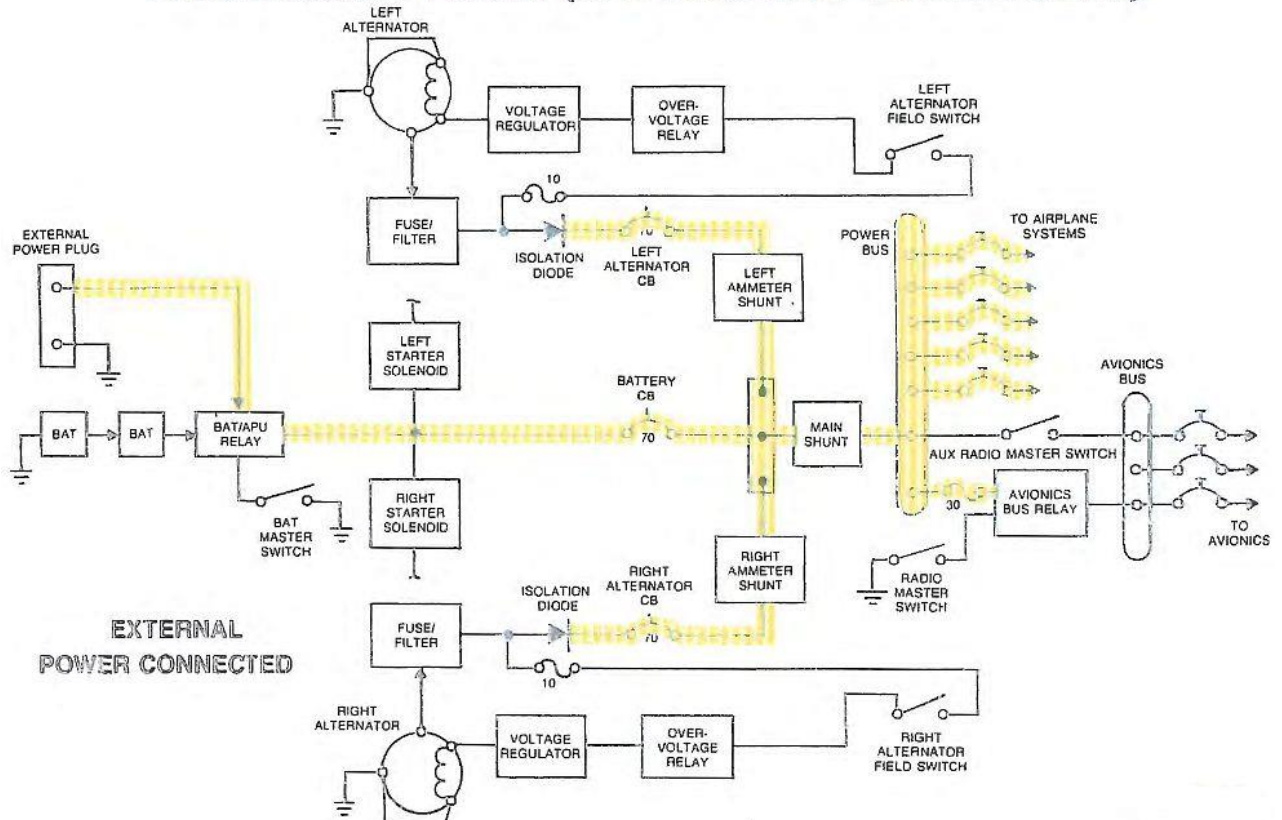


FIGURE 6-9: ELECTRICAL EXTERNAL (365 UP)



F TELEDYNE BATTERY INSTALLATION
(SINGLE 24 VOLT BATTERY) (OPTIONAL ON LATER 602P'S)
(ALSO AVAILABLE AS A RETROFIT KIT FOR 600, 601, 601P EARLIER 602P'S)

1. AUXILIARY POWER UNIT RELAY
2. APU SOCKET
3. TELEDYNE BATTERY INSTALLATION

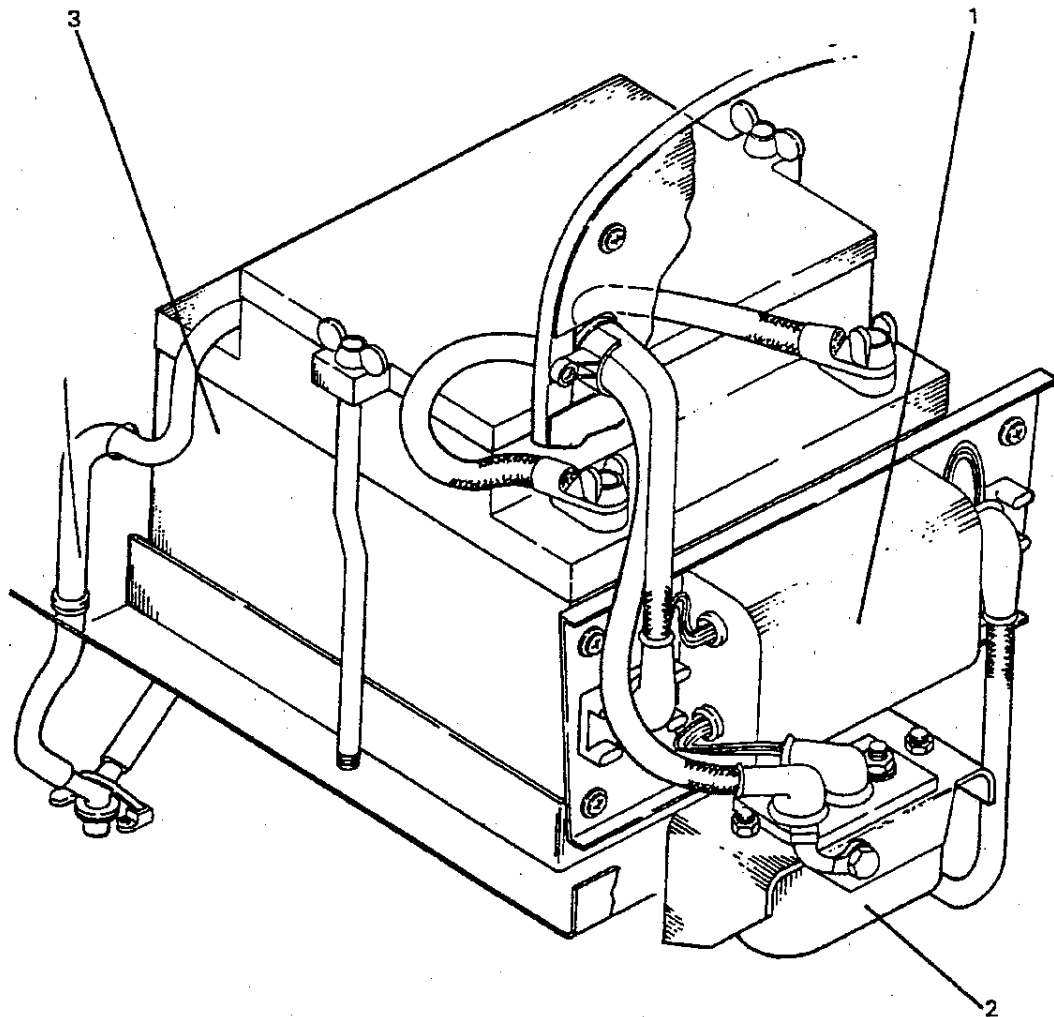
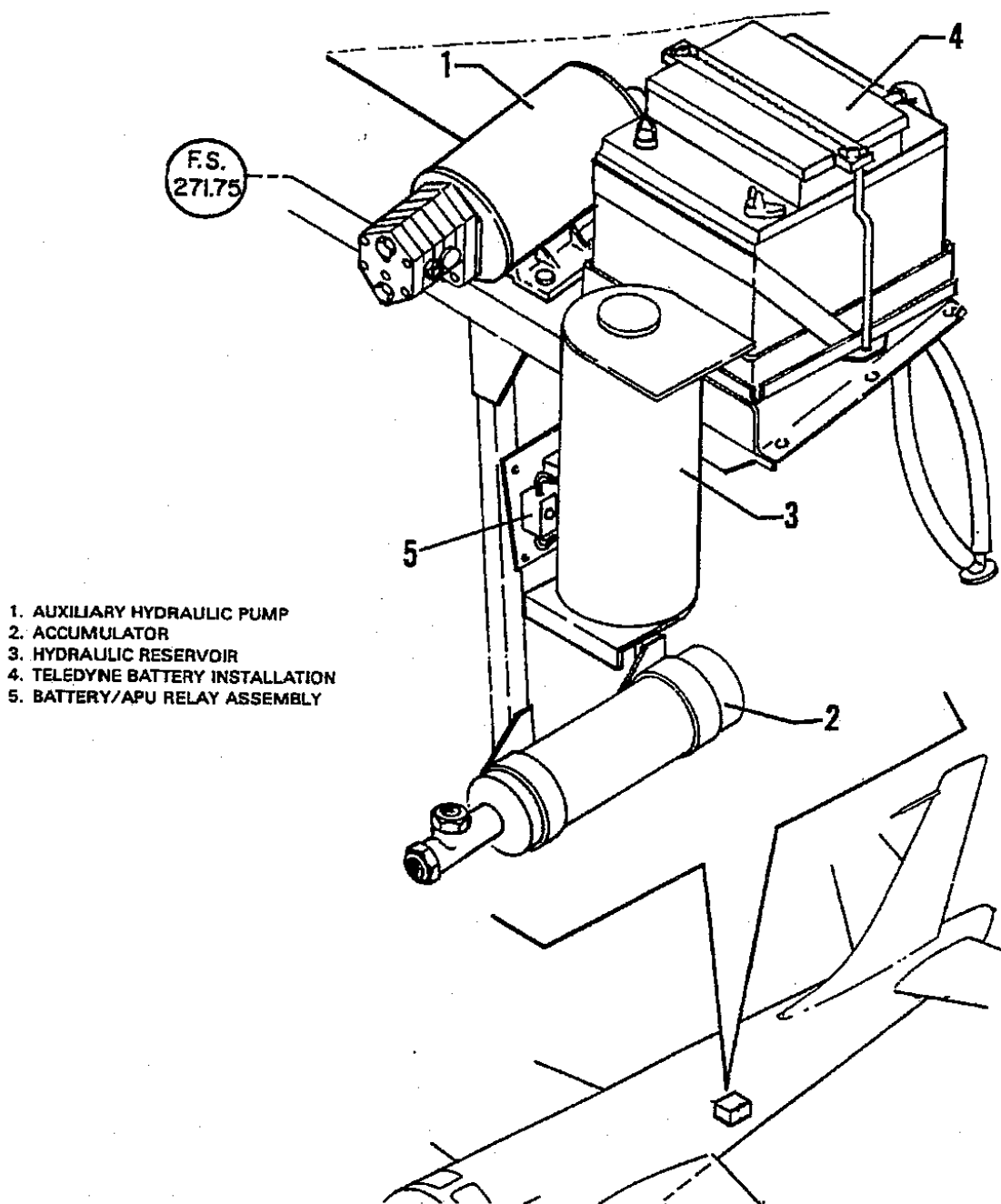


FIGURE 6-10: TAIL BATTERY INSTALLATION



- 1. AUXILIARY HYDRAULIC PUMP
- 2. ACCUMULATOR
- 3. HYDRAULIC RESERVOIR
- 4. TELEDYNE BATTERY INSTALLATION
- 5. BATTERY/APU RELAY ASSEMBLY

E TELEDYNE BATTERY
INSTALLATION (F.S. 275.00 700P ONLY)

FIGURE 6-11: MID BATTERY INSTALLATION

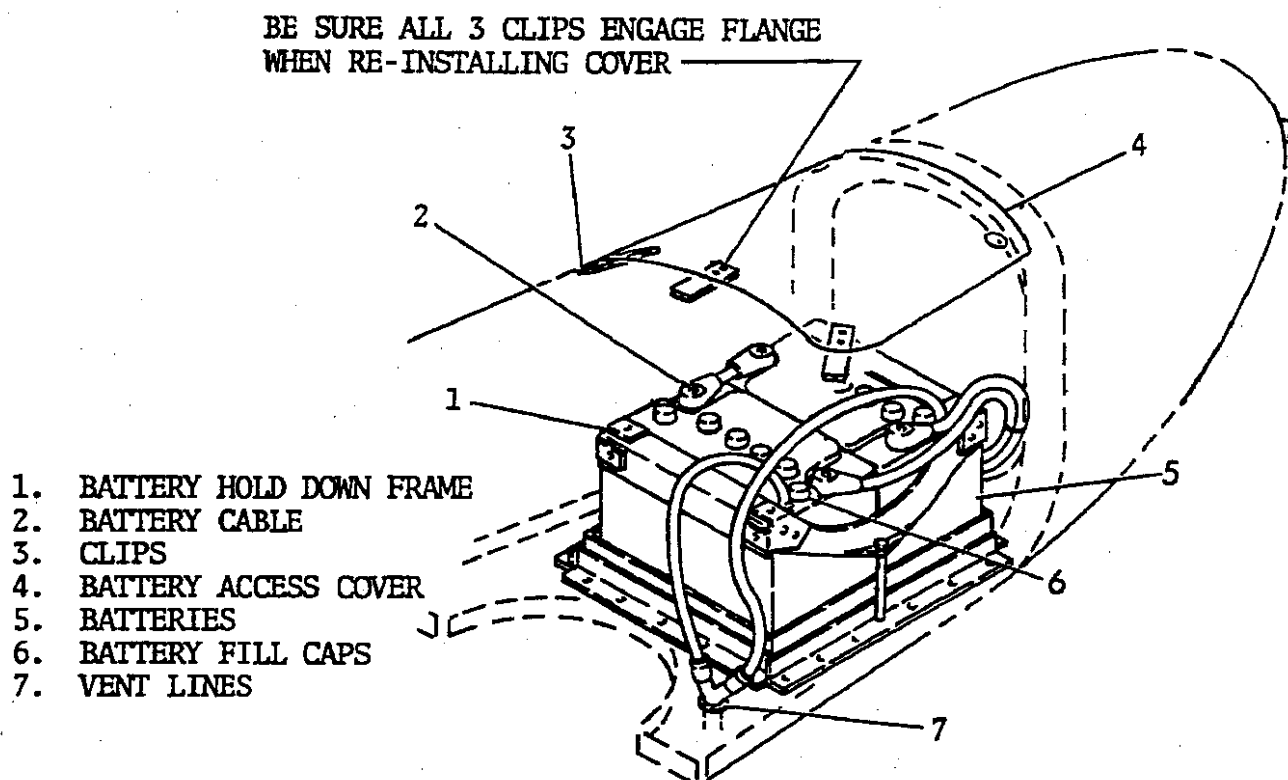


FIGURE 6-12: DUAL 12 VOLT BATTERY INSTALLATION

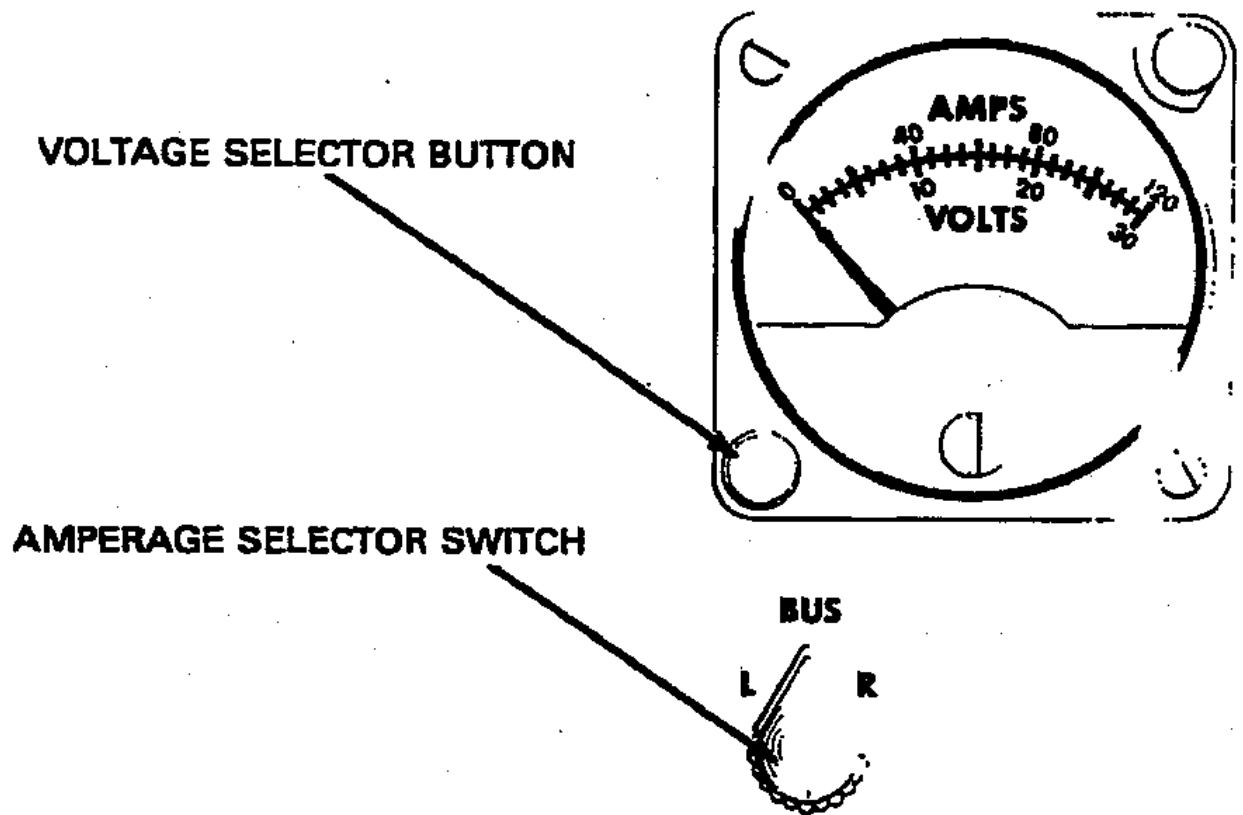


FIGURE 6-13: VOLT-AMMETER



CHAPTER 6 - QUIZ

1. If external power is used for starting:
 - a. battery switch must be in the ON position prior to connecting external power, then switched OFF after external power unit is turned on. After engines are started, turn battery master switch ON prior to disconnecting external power source.
 - b. alternators should be ON throughout starting operation.
 - c. battery and alternator switches should be OFF during the starting operation.
 - d. none of the above.

2. The aircraft may be operated:
 - a. with the air conditioner operating, provided that at least one alternator is operative.
 - b. IFR at night with the air conditioner operating.
 - c. with only one alternator operative if the total electrical load is reduced to 80 amps.
 - d. with one alternator inoperative should in-flight failure occur, provided the total electrical load is reduced to 55 amps.



3. The Aerostar has a 28-volt system and has installed:
- a. one 14-volt battery for engine starting and a reserve source of power.
 - b. two 12-volt batteries for engine starting and a reserve source of power.
 - c. one 24-volt battery for engine starting and a reserve source of power.
 - d. none of the above.
4. All of the avionics are protected by individual circuit breakers and in addition it has:
- a. a 30-amp circuit breaker between the power bus and the avionics bus.
 - b. a 15-amp in line fuse.
 - c. a 70-amp circuit breaker.
 - d. a 30-amp in line fuse.
5. The volt-ammeter will display:
- a. voltage or amperage.
 - b. only voltage.
 - c. only amperage.
 - d. only useful in determining alternator load sharing.



6. Should you have a total avionics failure during flight, you should:
- a.** turn your alternate battery switch on.
 - b.** continue your flight without the use of radios.
 - c.** turn all avionics OFF, lift guard on Aux Radio Master, turn switch to the ON position to obtain limited power for radios.
 - d.** remove and replace 30-amp fuse which is mounted forward of the co-pilot panel, inaccessible in flight.
7. The Aerostar has 28V DC electrical system. Power to operate the various circuits and components is:
- a.** two self-exciting 70-amp alternators: one on each engine. Maximum continuous output from each is limited to 55 amps.
 - b.** two self-exciting 70-amp alternators, gear driven.
 - c.** two self-exciting 95-amp alternators: one on each engine. Maximum continuous output from each is limited to 70 amps.
 - d.** two 65-amp alternators.
8. The alternator warning light will illuminate when:
- a.** the respective alternator fails or is turned OFF.
 - b.** engine RPM is too low.
 - c.** voltage regulator fails.
 - d.** all of the above.



9. The 700P battery installation incorporates:
- a.** one 14-volt battery for engine starting, and a reserve source of power.
 - b.** one 24-volt battery for engine starting, and a reserve source of power.
 - c.** one 28-volt battery for engine starting, and a reserve source of power.
 - d.** none of the above.



7

7. PITOT STATIC, PNEUMATIC & DEICE

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 7

PITOT STATIC, PNEUMATIC & DEICE

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FOR TRAINING PURPOSES ONLY



PITOT-STATIC PRESSURE SYSTEM

A pitot head on the 700P is located on the left side of the fuselage forward of the instrument panel location. A static opening is located on each side of the forward fuselage. Both pitot and static pressures are transmitted to the airspeed, altimeter, and rate of climb instruments, as required, through the pitot-static system lines. Low point drains are installed in the nose wheel well. The pitot head incorporates an electric heating element, which is activated by a pitot heat switch located in the left instrument panel switch grouping. Alternate static source is in radar dome.

A pitot-static head is installed on a boom extending from the leading edge of the vertical stabilizer on all 600 series. Both pitot and static pressures are taken at the head and transmitted to the airspeed, altimeter, and rate of climb instruments, as required, through the pitot-static system lines. Low point drains are installed in the right wheel well. Optional quick drains are installed just forward of the right wheel well. The pitot-static head incorporates an electric heating element, which is activated by a pitot head switch located in the left instrument panel switch grouping. Alternate static air is taken from the ports forward of entry door and low point drains are in left wheel well.

PNEUMATIC SYSTEM

The pneumatic system consists of two

engine-driven dry air pumps and solenoids operate spring-loaded pressure regulating valves, located in the inboard wing bays, a manifold with check valves, and an in-line filter. The system can operate fully with one pump inoperative.

Airborne manufacturing has issued an AD requiring engine startup and shutdown checks of the manifold check valves by starting one engine and observing the check ball on the pneumatic/vacuum gauge. If after startup, both check balls on the pneumatic/vacuum gauge are sucked inwards then the manifold check valve is considered inoperative. The same goes for the other engine check at shutdown.

INFLATABLE CABIN DOOR SEAL

The air supply is tapped downstream of the in-line filter and fed into a pilot operated door seal control valve and subsequently into the inflatable seals. The door seal control valve is comprised of a solenoid shutoff valve, a check valve (for airplanes equipped with optional surface de-ice, the check valve is replaced with a solenoid shutoff valve) and a pressure switch set at approximately 12 psig. When the seal inflation mode is selected by the pilot, the pneumatic system pressure regulating valve is energized by the pressure switch from the door seal control valve and air is pumped into the seals until the pressure regulating valve is de-energized allowing excess air to discharge overboard and system pressure to return to normal.



A micro-switch wired in series with the door seal control valve is mounted at the emergency exit handle. This is to prevent inflation of the door seal in the event the emergency exit handle is not in the fully closed position. The door seal switch located on the pilot's console will show DEFLATE regardless of modes selected until the emergency exit handle has been properly secured.

In addition to the OEM installed door seal kit, an optional after-market electrical door seal kit is available from Aerostar Aircraft Corporation (AAC) in their kit # 253. The kit allows the pilot to select air to the cabin and emergency exit door seals via an electric pump located on CG station 176. The system may be turned off in the event of the electric pump failure. The system also has the capacity to extend the life of the dry vacuum pumps installed on each of the engines.

GYRO PRESSURE SYSTEM

The air from the pneumatic system in-line filter is routed under the cabin floor to an in-line pressure regulator located behind the instrument panel then to the gyros and overboard. A pressure gauge mounted on the instrument panel shows the gyro system pressure in inches of mercury. The gauge also has L and R red indicators that come into view when the air supply from either the L or R engine-

driven pump fails or drops below approximately 2.5 psig.

WING AND EMPENNAGE DE-ICE SYSTEM

The wing and empennage deicing system consists of a fabric reinforced rubber sheet with built-in inflation tubes that are bonded to the leading edge of the surfaces to be protected. The deicers (commonly known as "boots") are pressurized by exhaust air from the engine-driven dry air pumps and are held deflated by suction from an ejector system.

Each inflation of the boots is physically controlled by the pilot. The duration of each inflation cycle is controlled by the system and should not exceed 6 seconds for a properly operating system. Excessive duration of inflation cycle may allow ice to form a bridge over the deicers rendering them ineffective. Inflation on each surface leading edge is simultaneous and symmetrical, keeping the disturbance of the air flow over all aerodynamic areas to a minimum.

Some do's and don'ts associated with the use of the boots should be observed for safety and economic reasons when icing conditions are present.

Do's:



1. Get off the autopilot. You need to feel the effects of the ice on the control surfaces.
2. Determine the extent of the ice buildup on the airframe. Speed and thickness of the forming ice is criteria for the pilot's decision to use the boots.
3. Consider course of actions when ice starts to build. Higher is better if there is a ceiling you can get above. Lower is good if temperature is warmer. Watch the surface temperature; you may be a Popsicle all the way to the ground.
4. Check all of your anti-ice and de-ice equipment on the ground before takeoff. Even if you are approved to operate into known icing conditions, any component that makes up those systems that is inoperative negates the legal use of the known icing capability.
5. Use the icing programs on the NOAA weather ADDS system. It provides highly accurate icing forecast and potential levels of build up during the pilot's flight planning.
6. Remember minimum flaps and gear with ice on the airframe. Increase airspeed by 15 to 20 KIAS for approaches and landing in the Aerostar with ice on the airframe. Weight and airfoil configuration has changed all Vref numbers on the aircraft. In effect, you are the test pilot for your aircraft.

Don'ts:

1. Even though your aircraft is approved for operations in known icing conditions that does not mean you should try penetrating icing conditions that are greater than light to moderate in buildup.
2. Don't keep silent about the conditions you are operating aircraft. Tell ATC what is happening in terms of ice accumulation and your plan of action to exit those conditions.
3. Do not accept a clearance that will put you into greater icing conditions and request to depart your current situation if the ice is building greater than your boots can rid the airframe of the ice.
4. Do not accept routing or altitudes in the terminal area that will put you into greater danger with icing.
5. Do not delay in ice filled clouds for holding or approach clearances. Coordinate with ATC your needs to "Slam Dunk" the approach if necessary.

NORMAL PROCEDURES

A. Observe that the red indicators on the gyro pressure gauge are out of view. This indicates proper operation of the respective engine-driven dry air pumps supplying vacuum or air pressure to the deicing surfaces. The system will operate with one dry air pump operating, but puts



greater pressure on the remaining pump. Altitude height also adds additional pressure when the de-ice boots are inflated at higher altitudes. Regardless of these limitations the use of the de-ice boots should be when airspeed and outside air temperature dictate.

B. Deicing system control switch: Select (momentary) INFL position.

C. Observe amber Wing Deice inflate light and full inflation period of no more than 6 seconds to verify proper operation.

D. Repeat Item (B) and (C) for each desired Wing Deice inflation cycle.

E. Manual Override: In the event the system fails to fully inflate or fully deflate the deicing surfaces (amber light remaining ON more than 6 seconds), the pilot can de-energize the system by actuating the Control Switch (momentary) to the MAN DEFL position.

NOTE

The system will also automatically de-energize after 12 to 16 seconds in the event it fails to fully inflate.

PROPELLER DEICE SYSTEM

The propeller deicing system consists of an electrically heated rubber boot bonded to the leading edge of each blade, a slip-ring assembly with a brush block assembly to transfer electrical power to the rotating boots, a timer, an ammeter, and a control switch. Power is drawn from the aircraft electrical system through a manual reset, 20-amp circuit breaker.

PROPELLER DEICER OPERATION

A. Deicer Control Switch - ON. The system may be used continuously in flight if needed.

B. Observe Deicer Ammeter to verify that needle rests within green arc (14 to 18 amps).

C. During single engine or single alternator operation, monitor aircraft electrical load when deicer system is in use.

ALL 600 SERIES

Cycle is inboard-outboard, starting on one engine for 30 seconds each phase, then to opposite engine for a total of approximately two minutes.



700P ONLY

Cycle is 90 seconds on each engine, one at a time, or a total of three minutes.

NOTE

An ammeter needle flicker will occur approximately each 30 seconds as the step switch of the timer operates to heat the propeller surfaces in sequence.

WINDSHIELD ALCOHOL DEICE SYSTEM

The windshield deice system consists of a reservoir, a pump, supply lines, and dispersal jets located at the pilot's windshield. The reservoir and pump are located in the forward section of the baggage compartment, left hand side. The reservoir contains approximately 3.0 gallons of isopropyl alcohol with a duration of approximately 1 hour.

After operation of the windshield deice system, all external surfaces exposed to isopropyl alcohol should be thoroughly cleansed with a mild soap and water solution.

PREFLIGHT CHECK

A. Check fluid level in windshield deice reservoir. Use only isopropyl

alcohol. Federal Specification TT-1-735-2.

B. Check that fluid outlets at windshield are clear of obstruction.

NOTE

Windshield alcohol deice system must not be operated without fluid in the reservoir. Turn system OFF when fluid flow stops. Installation of this option does not constitute approval for flight into known icing conditions.

ELECTRIC WINDSHIELD SYSTEM

The Electric Windshield Anti-Ice System is comprised of an electrically heated anti-ice panel installed in front of the pilot's windshield, a controller/sensor which maintains a pre-set temperature including automatic overheat protection, a pilot operated switch, and a blue indicator light. The panel may be removed in warm weather operation while the mounting bracketry, fairings and electrical connector remains without the aircraft. A cap for the electrical connector is provided and must be installed when the panel is removed.



NOTE

The electric panel is thermostatically controlled and electrical power will shut off when the panel sensor temperature reaches approximately 120°F. The advisory light illuminates only when electrical power is being supplied to the panel. Therefore, if the ambient temperature is high, it is possible that the panel is already at or above a temperature that would prevent the thermostat allowing electrical power to flow to the panel. In this condition, the panel will not become hotter and the advisory light will not illuminate until the panel sensor temperature drops to approximately 100°F.

NOTE

It may be necessary to lift the panel and clean between windshield and panel, especially to remove any moisture that may have accumulated. Check the condition and fit of the seal with the panel against the windshield. A proper seal fit prevents moisture from entering between the panel and windshield.

PREFLIGHT CHECK

Windshield Anti-Ice Switch----- ON,
note advisory light illuminates. Check
panel warm to touch.

Windshield Anti-ice - OFF, Advisory light out.

Windshield Panel/Windshield -
CHECKED,

Condition, Proper seal fit and security.



CHAPTER 7 - QUIZ

1. Normal gyro pressure is:
 - a. 4.0 - 6.0" Hg
 - b. 3.8 - 6.0" Hg
 - c. 5.7 - 12.5" Hg
 - d. 4.75 - 5.25" Hg
2. The pneumatic system:
 - a. provides a back-up for the engine-driven fuel pumps
 - b. provides pressure for the altimeter, airspeed indicator, and VSL
 - c. supplies bleed air for pressurization
 - d. supplies pressure for the gyros, door seal, and de-ice boots
3. The pneumatic system uses:
 - a. two engine-driven oil cooled pumps.
 - b. one engine-driven oil cooled pump.
 - c. two engine-driven dry air pumps.
 - d. None of the above.
4. During flight, if one pneumatic pump becomes inoperative:
 - a. the cabin pressurization will become inoperative
 - b. all systems will continue to operate normally, as a manifold with check valves is installed in the aircraft.
 - c. the system can operate fully with one pump inoperative.
 - d. b and c are correct



5. On the 600, 601 and 602P, the primary static pressure to the altimeter and rate of climb instruments is taken from:
- a. the boom extending from the leading edge of the vertical stabilizer.
 - b. a port located in the right wheel well.
 - c. two ports located on each side of the fuselage.
 - d. All of the above.
6. The pneumatic pump provides air pressure to which ice protection group?
- a. Heated windshield.
 - b. Heated propeller.
 - c. The wing deicing system.
 - d. Wing and empennage.
7. Aerostar with the windshield alcohol de-ice system has a reservoir which contains approximately 3.0 gallons of isopropyl alcohol, with a duration of:
- a. approximately 3 hours.
 - b. two hours.
 - c. four hours at FL 220.
 - d. approximately 1 hour.
8. The propeller de-icer on the Aerostar is electric and when the system is in operation, you should observe the de-icer ammeter to verify that the needle is:
- a. within the green arc 20 - 28 amps.
 - b. within the green arc 24 - 28 amps.
 - c. within the green arc 14 - 18 amps.
 - d. None of the above.



9. On the 700P, the primary static pressure to altimeter and rate of climb instruments is taken from:
- a. the boom extending from the leading right edge of the vertical stabilizer.
 - b. a port located in the right wheel well.
 - c. two ports located on each side of the fuselage.
 - d. None of the above.



FOR TRAINING PURPOSES ONLY



8

8. ENVIRONMENTAL SYSTEMS



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CHAPTER 8

ENVIRONMENTAL SYSTEMS

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CHAPTER 8

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OVERVIEW

While all airframes seem similar in design, there are several variations in cabin environmental systems. These variations are due to pressurization, model, year produced and options installed. Understanding the systems is the key to frustration-free operation and passenger comfort.

This chapter will cover the variety of air distribution systems first. Then it will cover heating and air-conditioning systems as they are similar for most aircraft.

AIR DISTRIBUTION

NON-PRESSURIZED 600/601

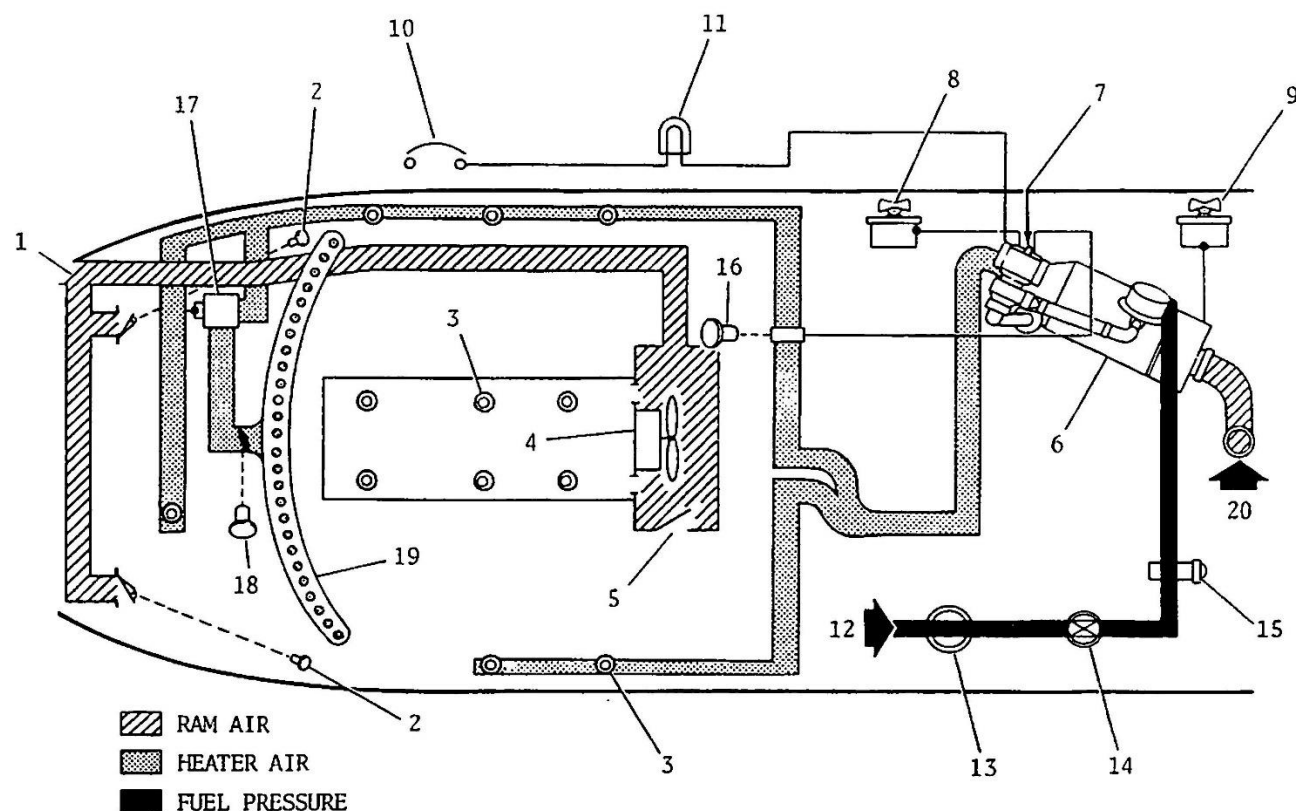
The airflow for the non-pressurized 600 and 601 consists of two independent systems. An NACA scoop inlet in the right nose section allows air into overhead ducts leading to overhead adjustable eyeball vents for each passenger location. Some models have a switchable cabin ventilation fan to assist in air flow on the ground. Some models have Pilot and co-pilot vents operated with a control knob for each.

Outside air also enters via a dorsal vent at the base of the tail. From there the ram air goes through the heater and then into floor ducting to adjustable floor eyeball vents. The air is split to left and right side. The left side feeds two floor vents for the mid and rear passengers. The right side feeds the two vents for the right mid and rear passengers plus the floor vents for the co-pilot and pilot. It also feeds the supply for the defrost blower.

On the ground, this system does not allow for unassisted airflow. If installed, the cabin ventilation fan can be turned on to assist airflow. For air to flow through the floor vents, the heater fan must be turned on and the Air knob pulled out.

CAUTION

While, on hot days, Aerostars may be seen taxiing with the upper clamshell door open, this is not a safe practice as a wind gust could cause damage to the door.



- | | |
|--------------------------------------|--------------------------------------|
| 1. AIR INLET | 11. HEATER FAIL LIGHT |
| 2. AIR VENT CONTROL KNOB | 12. AIRPLANE FUEL TANK FUEL SUPPLY |
| 3. CABIN DIRECTIONAL AIR VENT (TYP.) | 13. SUMP |
| 4. BLOWER MOTOR (OPTIONAL) | 14. FUEL REGULATOR AND SHUTOFF VALVE |
| 5. DOOR (OPTIONAL WITH BLOWER MOTOR) | 15. FUEL PUMP |
| 6. HEATER ASSEMBLY | 16. DUCT SWITCH CONTROL KNOB |
| 7. IGNITION ASSEMBLY | 17. DEFROST BLOWER MOTOR |
| 8. CABIN HEAT SWITCH | 18. DEFROST CONTROL KNOB |
| 9. CABIN FAN SWITCH | 19. DEFROST OUTLET MANIFOLD |
| 10. C/B MANUAL RESET | 20. VERTICAL STABILIZER INTAKE |

FIGURE 8-1: AIR DISTRIBUTION SCHEMATIC 600/601

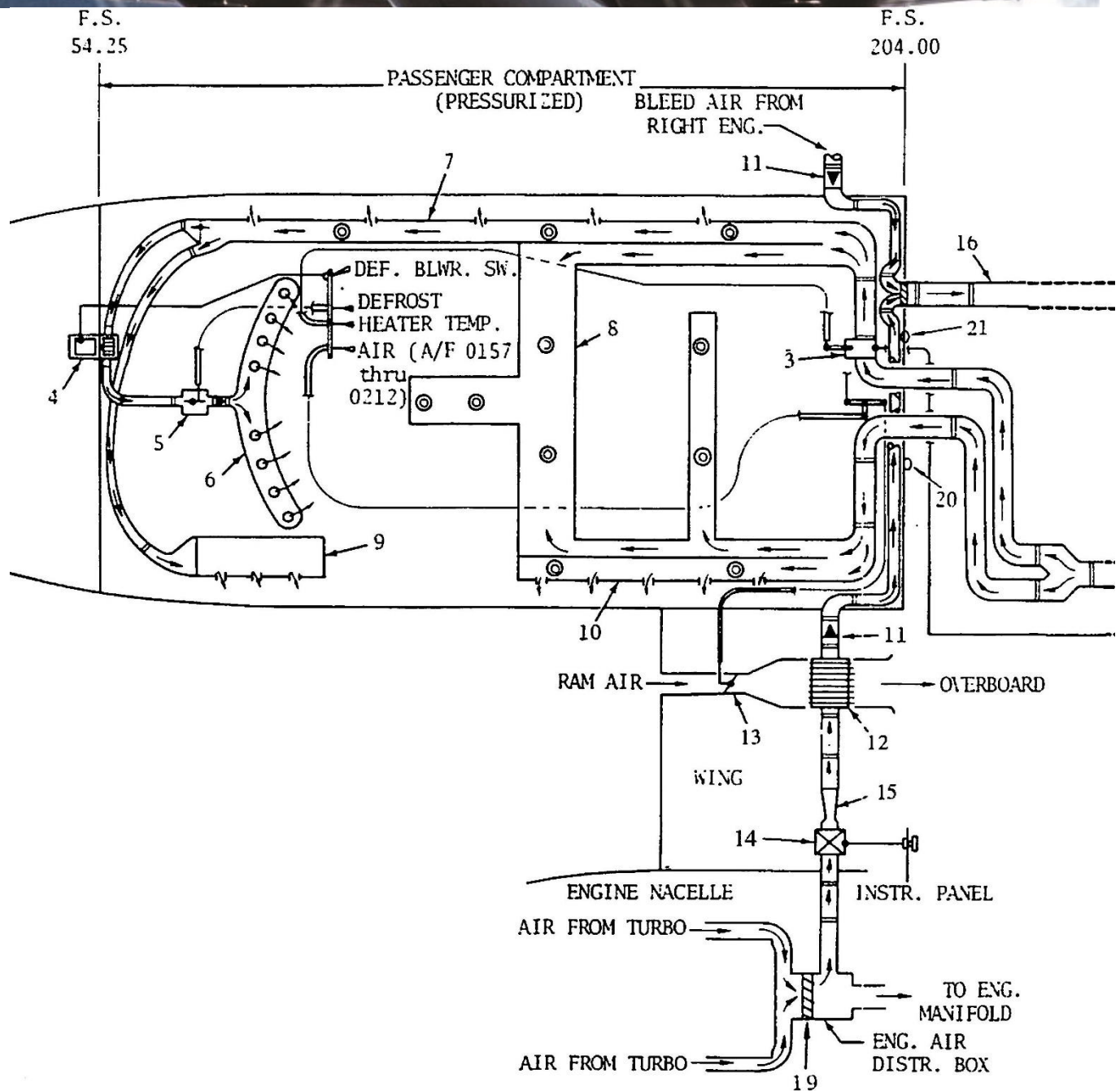
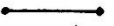


FIGURE 8-2: AIR DISTRIBUTION SCHEMATIC 601P



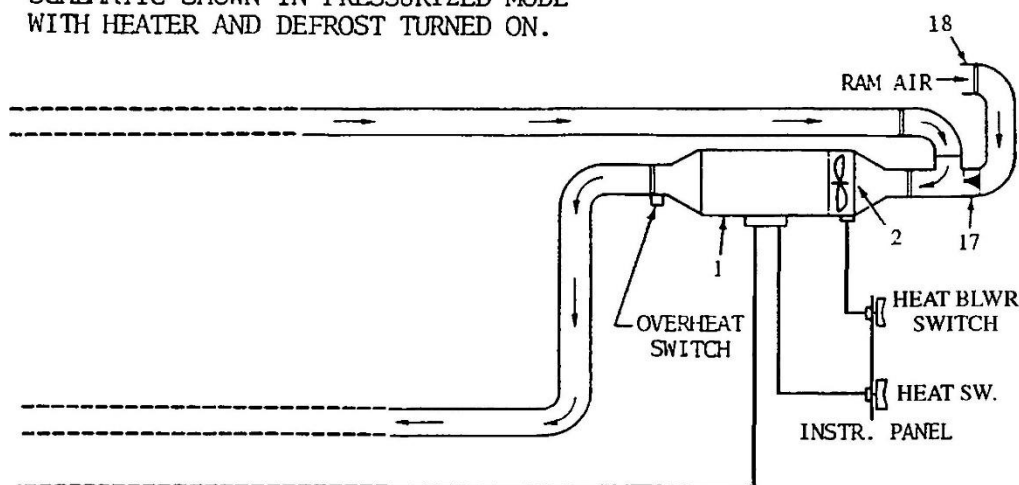
Aerostar
Owners
Association

LEGEND

- | | |
|---|---|
|  FLEXIBLE DUCT |  FIXED AIR VENTS |
|  CONTROL CABLE (PUSH-PULL) |  DIRECTIONAL AIR VENTS |
|  ELECTRICAL ACTUATION |  CHECK VALVE |
|  TOGGLE SWITCH | |
|  ROCKER SWITCH | |
|  PUSH ON - PUSH OFF SWITCH | |

NOTE:

SCHEMATIC SHOWN IN PRESSURIZED MODE
WITH HEATER AND DEFROST TURNED ON.



- | | |
|-------------------------------|-----------------------------|
| 1 HEATER | 12 HEAT EXCHANGER |
| 2 HEAT. BLWR | 13 BUTTERFLY VALVE ASSY |
| 3 HEATER TEMP CONTROL RELAY | (A/C 0157 thru 0212 only) |
| 4 DEFROST BLWR | 14 BLEED AIR VALVE |
| 5 DEFR. BUTTERFLY VALVE | 15 SONIC NOZZLE |
| 6 DEFROST DUCTS | 16 BLEED AIR DUCTING |
| 7 RIGHT HOT AIR DIST. DUCT | 17 CHECK VALVE (FLAPPER) |
| 8 VENT. AIR DIST. SYSTEM | 18 DORSAL AIR SCOOP |
| 9 PILOT HOT AIR DUCT | 19 AIR FILTER |
| 10 LEFT HOT AIR DIST. DUCT | 20 CABIN PRESSURE REGULATOR |
| 11 CHECK VALVE ASSY (FLAPPER) | VALVE |
| | 21 CABIN PRESSURE SAFETY |
| | VALVE |

FIGURE 8-3: AIR DISTRIBUTION SCHEMATIC 601P (cont.)

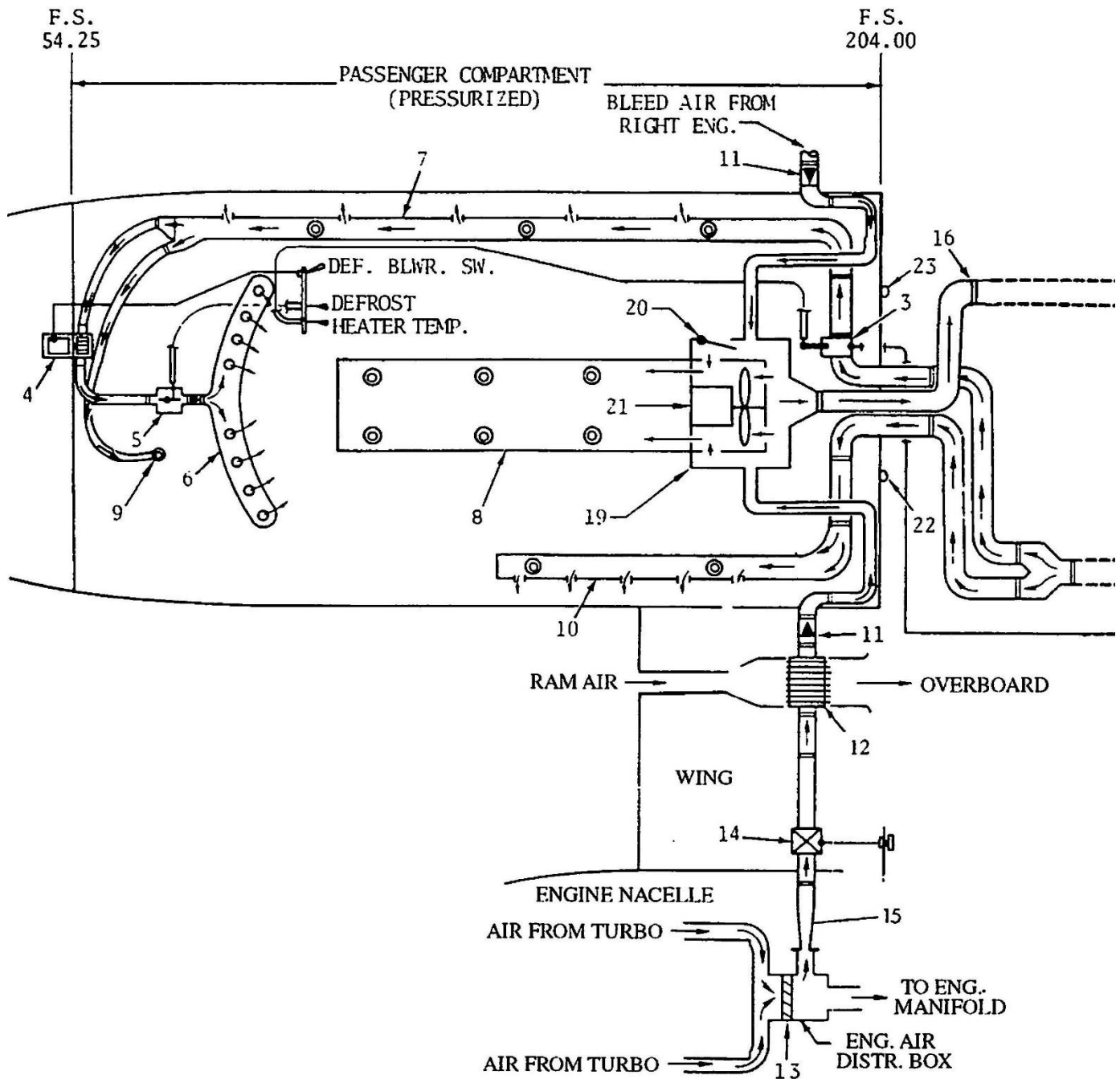


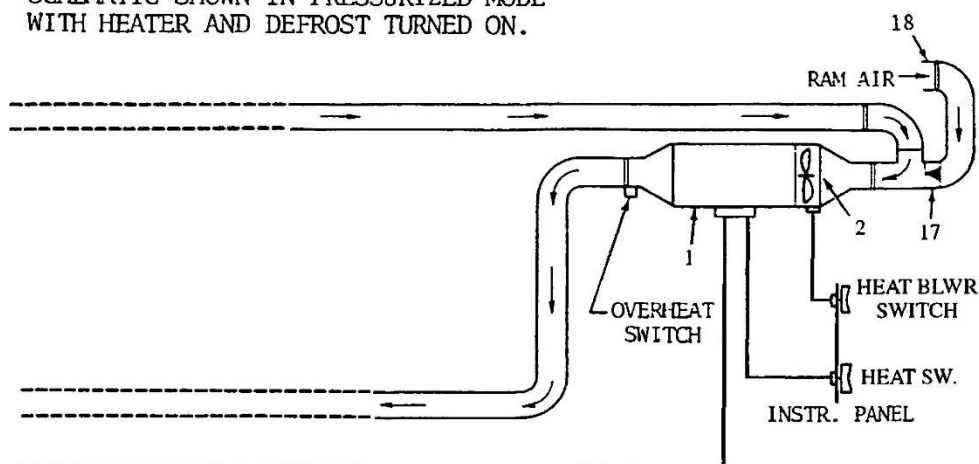
FIGURE 8-4: AIR DISTRIBUTION SCHEMATIC 602P/700P

LEGEND

- | | | | |
|---|---------------------------|---|-----------------------|
|  | FLEXIBLE DUCT |  | FIXED AIR VENTS |
|  | CONTROL CABLE (PUSH-PULL) |  | DIRECTIONAL AIR VENTS |
|  | ELECTRICAL ACTUATION |  | CHECK VALVE |
|  | TOGGLE SWITCH | | |
|  | ROCKER SWITCH | | |
|  | PUSH ON - PUSH OFF SWITCH | | |

NOTE:

SCHEMATIC SHOWN IN PRESSURIZED MODE
WITH HEATER AND DEFROST TURNED ON.



- | | |
|-------------------------------|-----------------------------|
| 1 HEATER | 12 HEAT EXCHANGER |
| 2 HEAT. BLWR | 13 BUTTERFLY VALVE ASSY |
| 3 HEATER TEMP CONTROL RELAY | (A/C 0157 thru 0212 only) |
| 4 DEFROST BLWR | 14 BLEED AIR VALVE |
| 5 DEFR. BUTTERFLY VALVE | 15 SONIC NOZZLE |
| 6 DEFROST DUCTS | 16 BLEED AIR DUCTING |
| 7 RIGHT HOT AIR DIST. DUCT | 17 CHECK VALVE (FLAPPER) |
| 8 VENT. AIR DIST. SYSTEM | 18 DORSAL AIR SCOOP |
| 9 PILOT HOT AIR DUCT | 19 AIR FILTER |
| 10 LEFT HOT AIR DIST. DUCT | 20 CABIN PRESSURE REGULATOR |
| 11 CHECK VALVE ASSY (FLAPPER) | VALVE |
| | 21 CABIN PRESSURE SAFETY |
| | VALVE |

FIGURE 8-5: AIR DISTRIBUTION SCHEMATIC 602P/700P (cont.)

PRESSURIZED 601P

Pressurized Aerostar 601P models and those which were originally 601P models and subsequently modified, receive air into the cabin via a dorsal vent at the base of the tail and engine bleed air when the Bleed Air valves are ON. No other outside air intake is available.

As in the 600 models, outside air enters a dorsal vent at the base of the tail. From there the ram air goes through the heater and then into floor ducting to adjustable floor eyeball vents. The air is split to left and right side. The left side feeds two floor vents for the mid and rear passengers. The right side feeds the two vents for the right mid and rear passengers plus the floor vents for the co-pilot and pilot. It also feeds the supply for the defrost blower.

Most models also have overhead adjustable eyeball vents which are feed off the heater duct system as well. Once the aircraft is pressurized, the dorsal vent air is no longer available due to a check valve which prevents pressurized air from going out the dorsal vent

On the ground, this system does not allow for unassisted airflow. For air to flow through the floor vents, the heater fan must be turned on and the Air knob pulled out.

Bleed air is air pressurized by the engine turbocharger. Pressurized models of the Aerostar can prevent the hot bleed air from coming into the cabin by pressing the bleed air dump valves located on the aircraft's center pedestal. See the photo below for Bleed Air shutoff switches.



FIGURE 8-6: BLEED AIR SWITCHES

To keep cool, other common-sense tactics can help. Keeping the plane in the shade, door open and not loading until ready to depart can make a big difference.



CAUTION

Care should be exercised when closing and opening the bleed air valves, especially in a 601P model. In flight, closing the bleed air valves (OFF) can cause manifold pressure to increase possibly causing an over-boost. MAP should be monitored and adjusted, if necessary. It will also cause the loss of pressurization. Sufficient time must be allowed for the valves to fully operate (up to 10 seconds). Short cycling can cause valve failure.

PRESSURIZED 602P & 700P

The air distribution for the 602P and 700P models is very similar to the 601P models, with the exception of a cabin ventilation fan which helps circulate cabin air. There is also a difference in the plenum chamber at the back of the cabin and how bleed air and cabin air are routed.

All pressurized models have a heat exchanger in the wing root to cool the bleed air. Some 601P models have a knob which controls a door in each wing root which blocks airflow to this heat exchanger thereby providing hotter bleed air to the cabin. In some cases, this door and/or control cable have become stuck or been disabled. It is worth knowing if you have this feature and its condition.

HEATING

Aerostar non-pressurized 600 and 601 models are heated with a 25,000 BTU gasoline powered Janitrol or a C&D Associates direct replacement heater for the Janitrol heater. The heater is located in the fuselage, aft of the baggage compartment, and obtains its fuel supply from the airplane's fuel system main or header tank.

During continuous operation, the heater fuel consumption is approximately 0.6 GPH. The heater air supply comes from the inlet at the base of the dorsal fin, and is directed to the blow motor of the heater. When the heater is not operational the air from the dorsal fin opening passes through the heater is directed to the floor outlets.

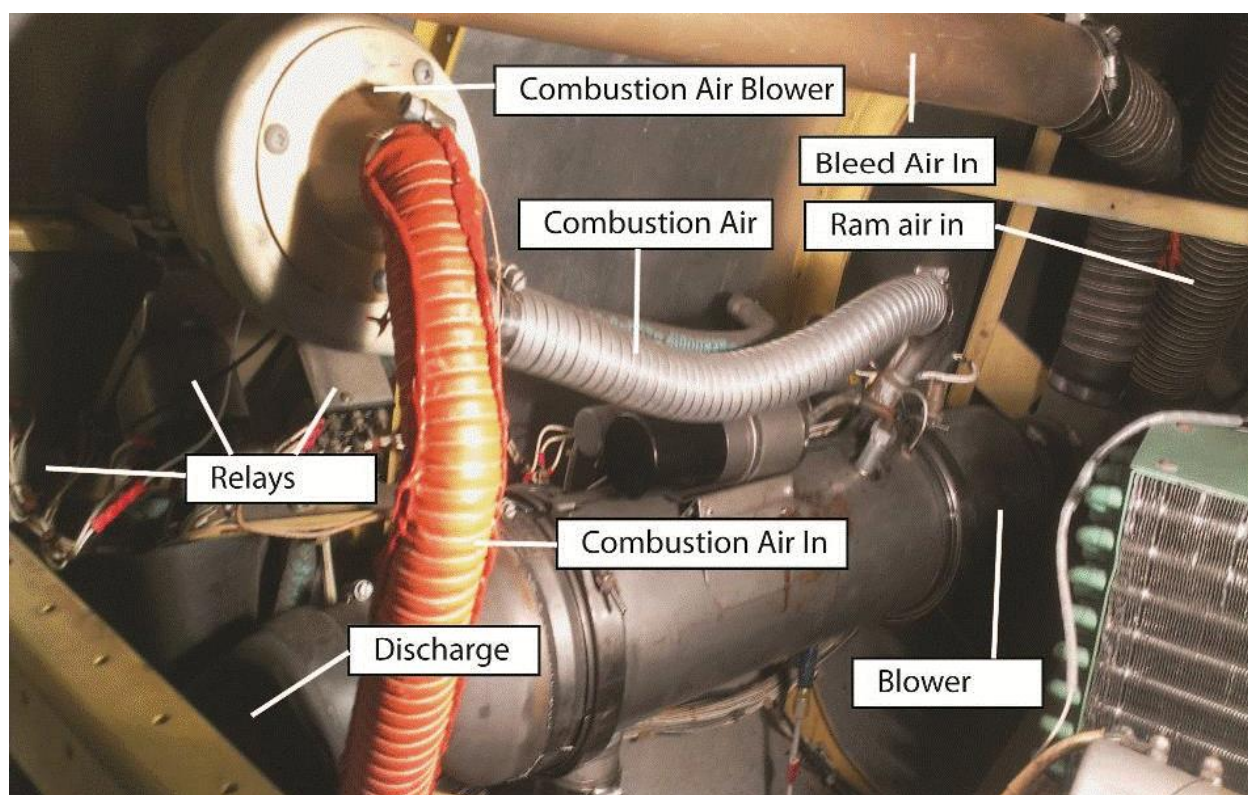


FIGURE 8-7: JANITROL HEATER (601P)

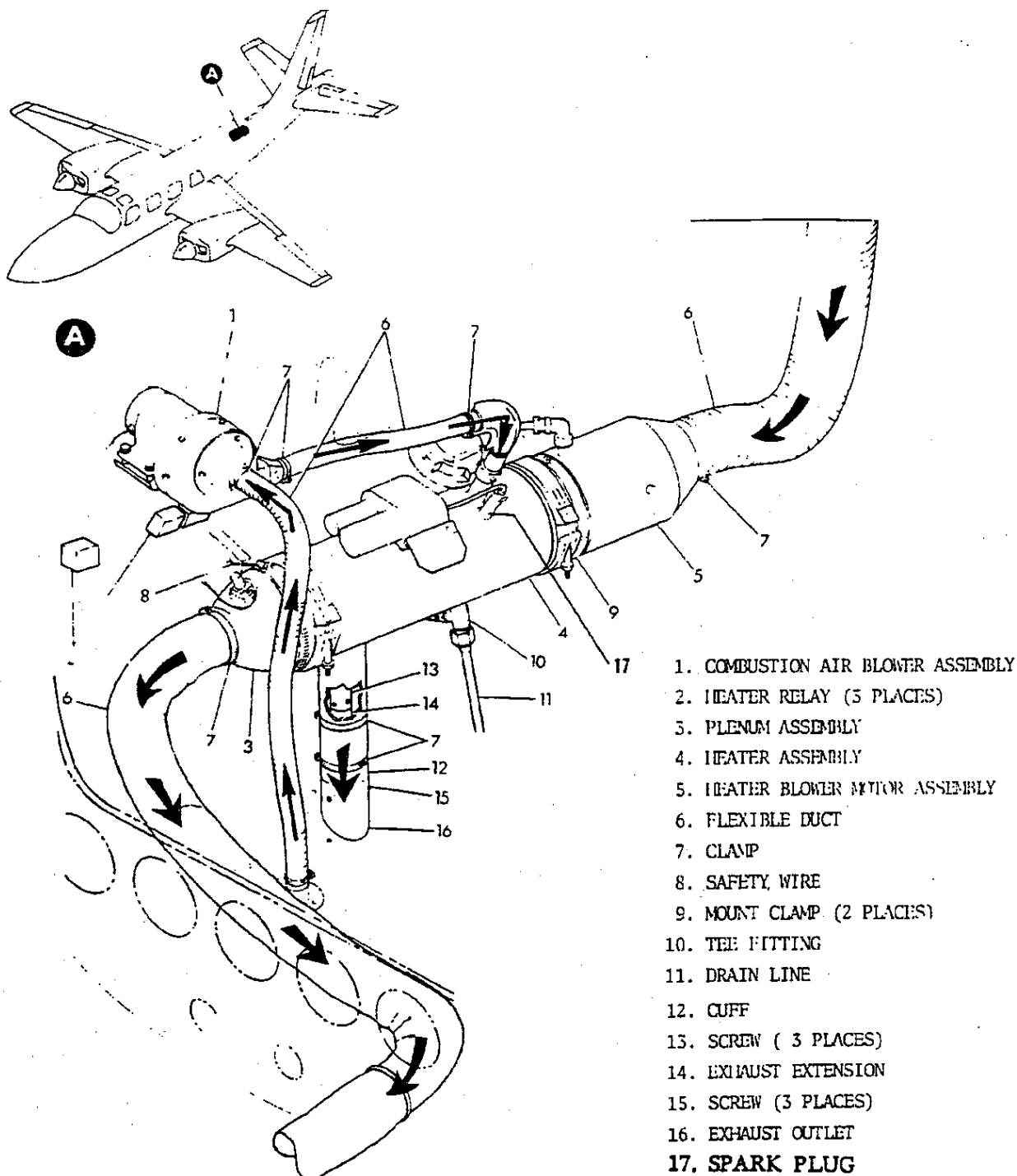


FIGURE 8-8: HEATER & BLOWER ASSY 600/601

The controls for the heater operation are located on the lower right-hand side of the Aerostar instrument panel. They include heater temperature control knob, defrost temperature knob, heater blower switch, and defrost blower switch. These controls directly force heated or ambient air through the

cabin of the aircraft. The photograph below shows the location of the heating and defrosting knobs on the instrument panel. Additionally, the heater fan and start switches are located with the rocker switches on the lower left instrument panel.



FIGURE 8-9: ENVIRONMENTAL CONTROLS



In turbocharged and pressurized models of the Aerostar a 35,000 BTU gasoline powered Janitrol or C&D heater is employed to heat the aircraft. In addition, pressurized aircraft can use the bleed air from the engine turbochargers to heat the cabin. On aircraft serial numbers 157 through 212 butterfly valve assemblies were used to increase the bleed air heat coming off of the engines by shutting off the outside air flowing to the stub wing heat exchangers. A lot of these assemblies have been removed from the aircraft on the above listed serial numbers.

Pressurized models not incorporating the butterfly doors or that have had them removed rely on bleed air heat coming from the engines through the heat exchangers cooling the bleed air to around 20°F above ambient temperatures.

HEATER PROTECTION DEVICES

Heater operations are controlled and protected by the duct switch located under the floor around station 176 in the rear of the aircraft. See photo below.



FIGURE 8-10: HEATER DUCT SWITCH

The duct switch is a thermal mechanical device that allows the heater to cycle between 150 to 250°F. During annual and normal inspection, the duct switch and the tubing surrounding its location are often damaged due to aging of the ducting material and the location under the floor preventing normal inspection. Failure of the mechanical duct switch or heater duct tubing will result in no or poor heater operations.

A cycling switch located on the forward housing of the Janitorial or C&D heater assemblies is normally set to 250°F maximum for heater operations protection. An amber heater fails light HTR FAIL will illuminate when the heater temperature exceeds the 250°F level. Restart operations of the heater can only be attempted after the heater has cooled below 150°F.



FIGURE 8-11: C & D HEATER

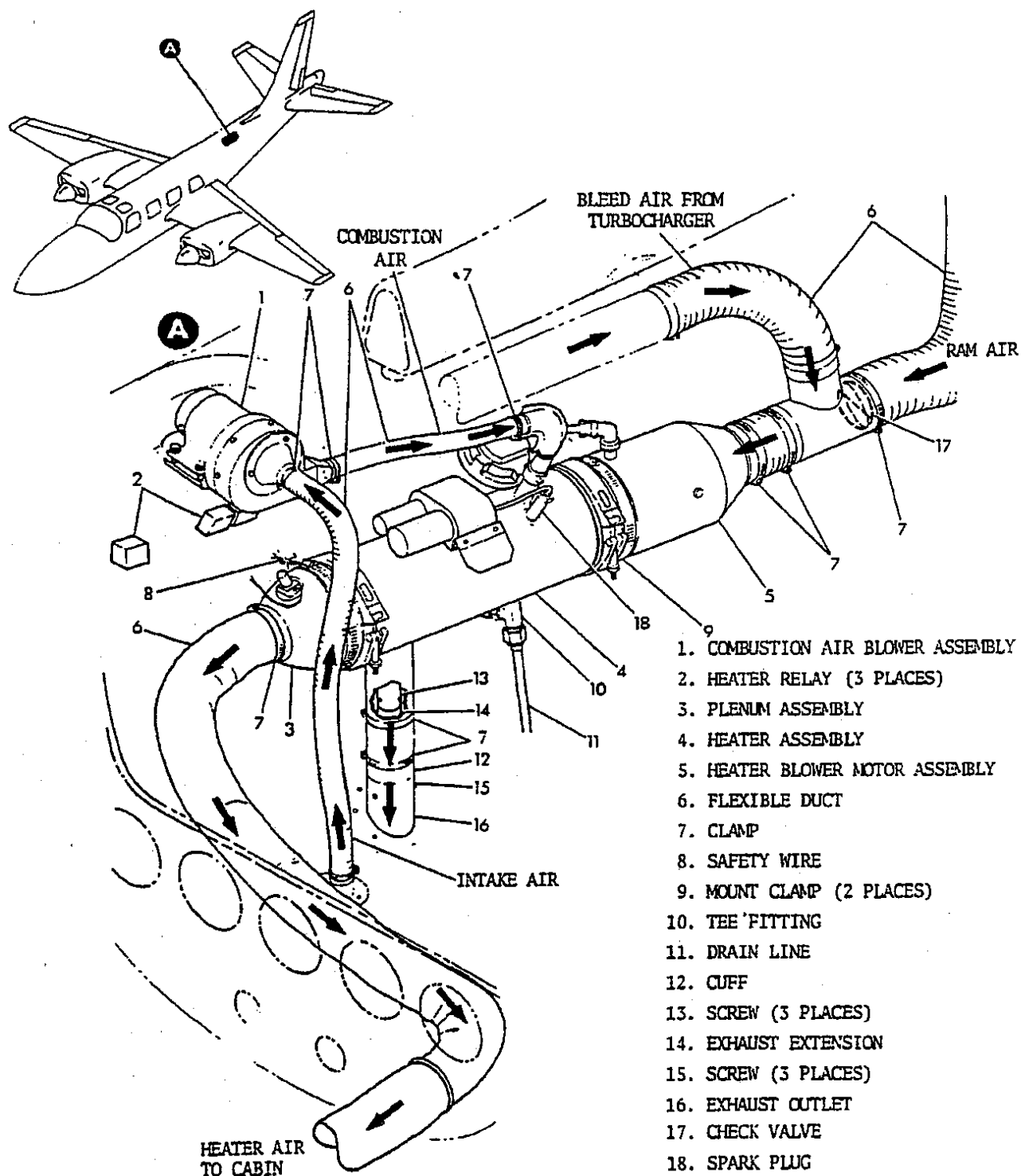


FIGURE 8-12: HEATER ASSEMBLY 601P/602P/700P

The main design of feature at the heart of the Janitrol heater operation is the whirling flame principle of combustion. Combustion air is ducted

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from an outside source through a combustion blower motor and enters a sealed combustion tube via the combustion inlet. It is introduced at an angle so as to set up a spinning or whirling motion inside the combustion chamber. Simultaneously, fuel from the header tank is delivered to the heater through a fuel pump and nozzle spray to create a combustible mixture of a fuel to air ratio (F/A) of .067.

This mixture is basically a “lean mixture” and if evidence of heavy soot is around the exhaust pipe of the heater system, the F/A should be examined or fuel pressure switch for maladjustment. The F/A mixture is ignited via a high voltage spark plug. Combustion gases travel the length of the combustion tube, double back over the outside of the combustion tube, bypass the vent airflow through a crossover to an outer heater transfer area, and then make one last trip down the length of the heater to exit at the exhaust. The heat transfer air passages are between the combustion tube assembly’s layered walls. This vent air enters at the combustion head end of the heater, exits downstream and is ducted to the aircraft cabin.

HEATER OPERATION

To safely operate the heater system in either the pressurized or non-

pressurized model Aerostar a convenient checklist is provided.

Heater Starting:

1. Open adjustable floor outlets, as many as possible but a minimum of two.
2. Heater Fan Switch – ON
3. Cabin Heat Switch – PRESS ON then release.
4. Heater TEMP knob - Pull at least half out preferably full out.
5. Floor Outlets- Adjust to desired flow
6. Pilot and Co-Pilot’s floor outlets are at the far end of the heater delivery system. Turn off other floor heater inlets on the right side to increase heat to pilot and co-pilot outlets.

100 hours of heater use or 24 months requires a pressure decay test. Though some of the pressure decay test criteria can be alleviated with improved heater cores, it is often thought in the maintenance world a good idea to conduct a pressure decay test each year before cold weather arrives. The pressure decay test ensures there are no excessive leaks between the combustion and ventilation sections of the heater. This test relates not only to safe operation of the heater but, more importantly to the safety of the cabin occupants.



DEFROST

CAUTION

Heater shut down operations should be accomplished in the air whenever possible.

If cold outside ambient temperatures are encountered and heater needs to function on the ground, allow a three-minute cool down period before turning off battery.

NOTE: Heater operation on the ground requires the battery switch to be ON. Failure to monitor battery condition while operating Heater or CABIN FAN Switch will cause excessive battery drain. It is recommended that pre-heat operations be conducted with a APU Ground unit.

Windshield defrost operation is controlled by the defrost knob and the defroster blower switch. Pulling the defrost knob opens a butterfly valve to allow bleed air or ram air to be directed to the defroster outlet along the bottom of the windshield. Defrost air temperature is controlled by cabin air temperature. The defroster blower switch activates the blower to provide maximum defrosting and additional heat capability.

Unfortunately, this leads to only a two-inch defrosting strip from the bottom of the windshield upwards. To increase the efficiency of the defrost blower, it is advised to turn on the windshield heat plate, if installed, and increase the cabin temperature control to highest setting.



Heater Shut Down:

1. Heater Fan Switch – OFF
2. Fan Switch may be turned back ON to allow residual heat into cabin and to facilitate cool down. The fan will cycle until the heater is sufficiently cool if left OFF.
3. Floor outlets – leave open.
4. Allow for adequate cooling before shutting off battery switch.

INFLIGHT HEATER RESTART

OPERATIONS AFTER HTR FAIL LIGHT ILLUMINATED:

1. Prior to restart of heater, ensure maximum number of heater floor inlets are open.
2. The heater TEMP knob should be, as a minimum, half extended.
3. HTR FAIL light should have extinguished.
4. Attempt to restart heater using normal restart procedures listed in the above start procedures.
5. If the HTR FAIL light illuminates again, immediately shut off the heater and do not attempt to restart again. Have heater serviced by an

authorized service center before further use. Continued use is a safety of flight issue.

6. After heater has restarted wait five minutes to adjust heater knob.

Note - Not all airframes have a heater fail light.

AUXILIARY CABIN HEAT SYSTEM

For pressurized aircraft Aerostar Aircraft Company has recently released Option # 276 that uses turbocharger bleed air heat to provide auxiliary heat. This option uses the turbocharger bleed air through special designed piping to assist in supplemental heating of the cabin. The aircraft bleed air heat is turned on and off through a lever mounted on the cockpit center pedestal. The more power the aircraft is making the greater the heat output in the cabin.

The advantages are no heater smell, no fuel burn, reduced electrical load, greater reliability and no exhaust stains.

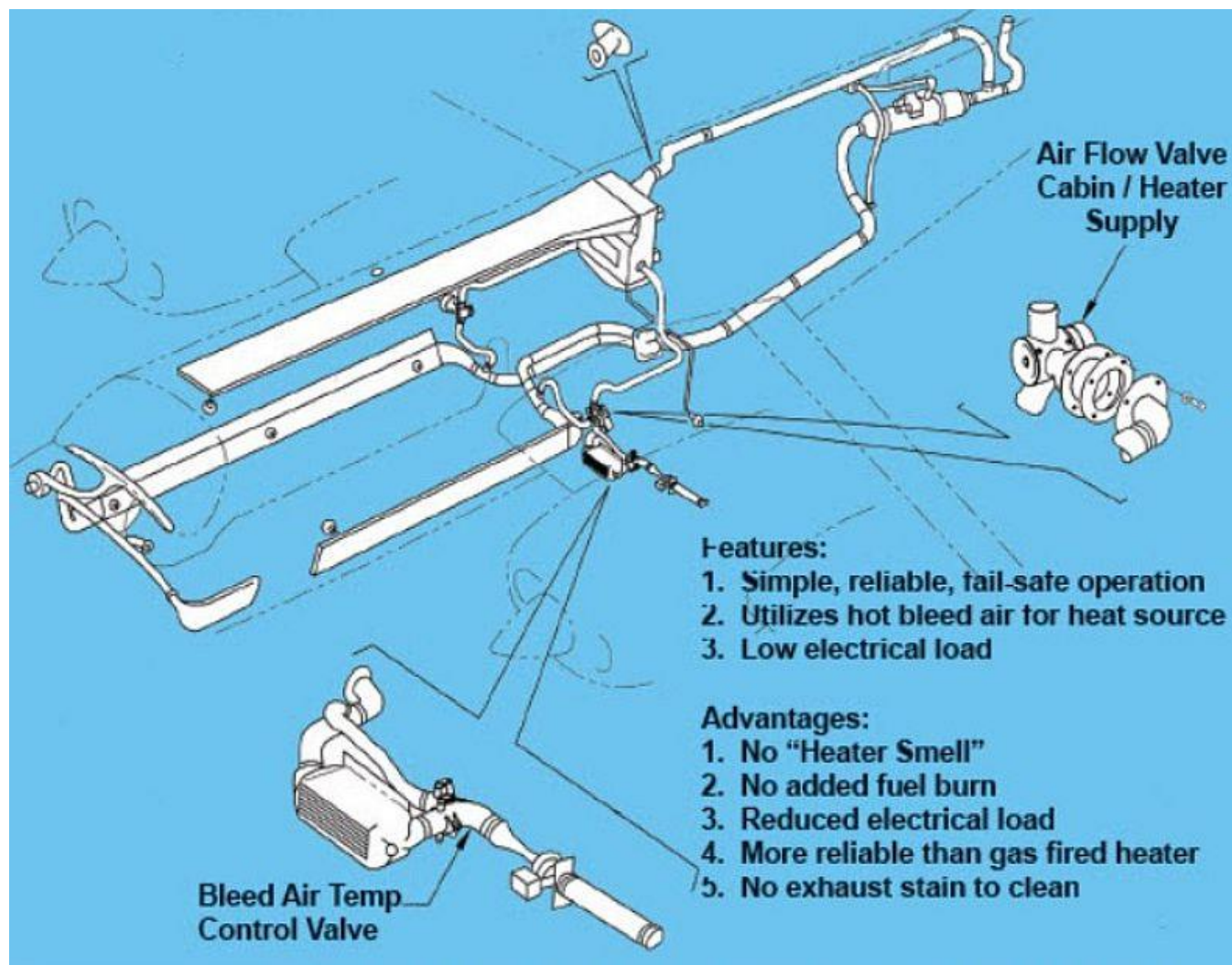


FIGURE 8-13: AUXILIARY CABIN HEAT SYSTEM

AIR CONDITIONING

There are two basic air conditioning systems approved for the Aerostar. The first is an electric system produced by JB Air/Keith of Addison, TX and the other is

an engine driven system supplied by the Aerostar Aircraft Company as kit number 254.

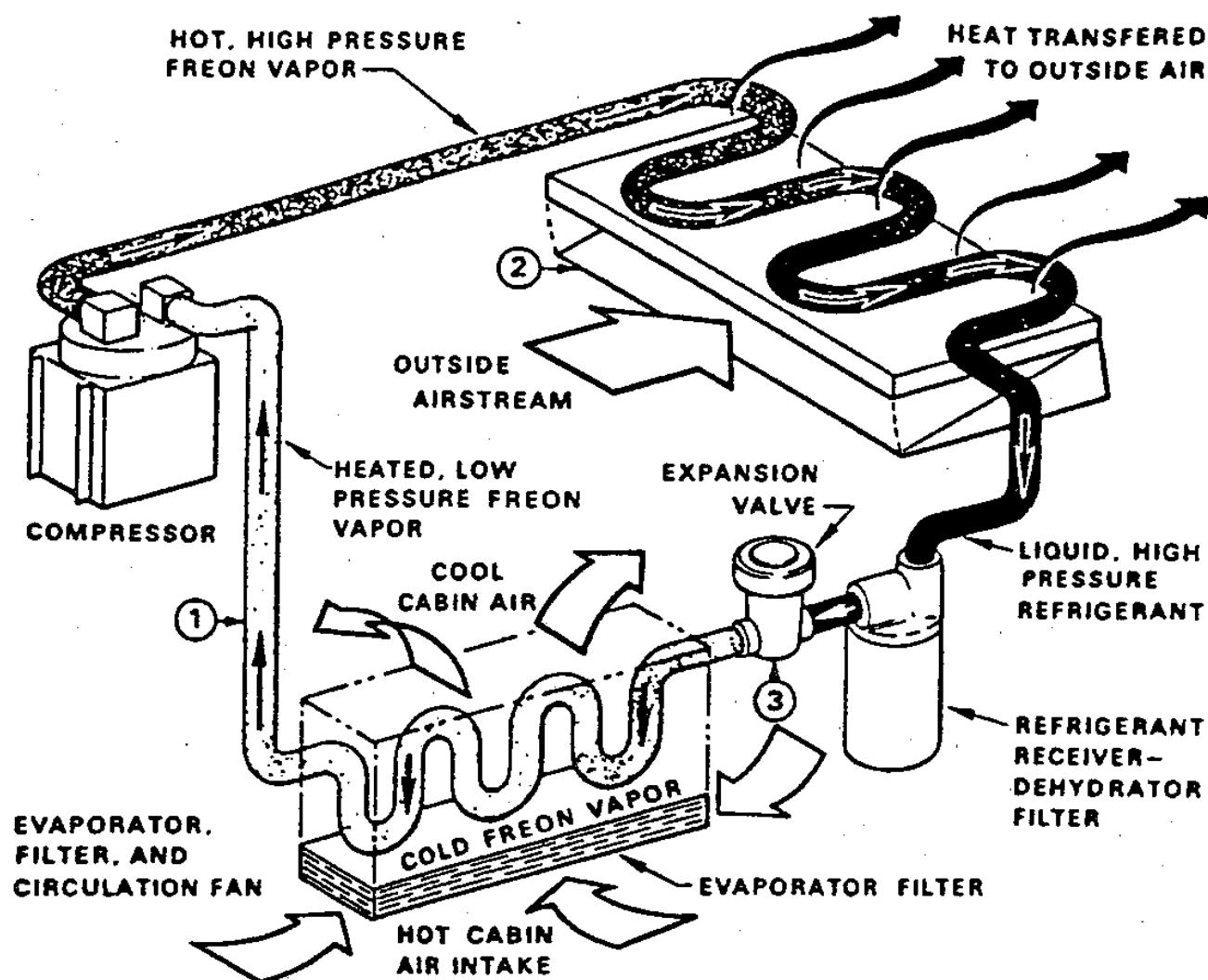


FIGURE 8-14: AIR CONDITIONING SYSTEM SCHEMATIC

JB AIR/KEITH ELECTRIC AIR CONDITIONING

The JB/Keith Air Conditioner installed in Aerostar aircraft consist of evaporator module mounted in the cabin above the hat shelf and the compressor/condenser mounted on a

pallet located aft of the baggage compartment on the port side of the aircraft. The JB/Keith Air Conditioner contains the five major components found in all automotive and aircraft air conditioning systems: compressor, condenser, receiver-dryer, expansion,

ELECTRICALLY DRIVEN COMPRESSOR INSTALLATION

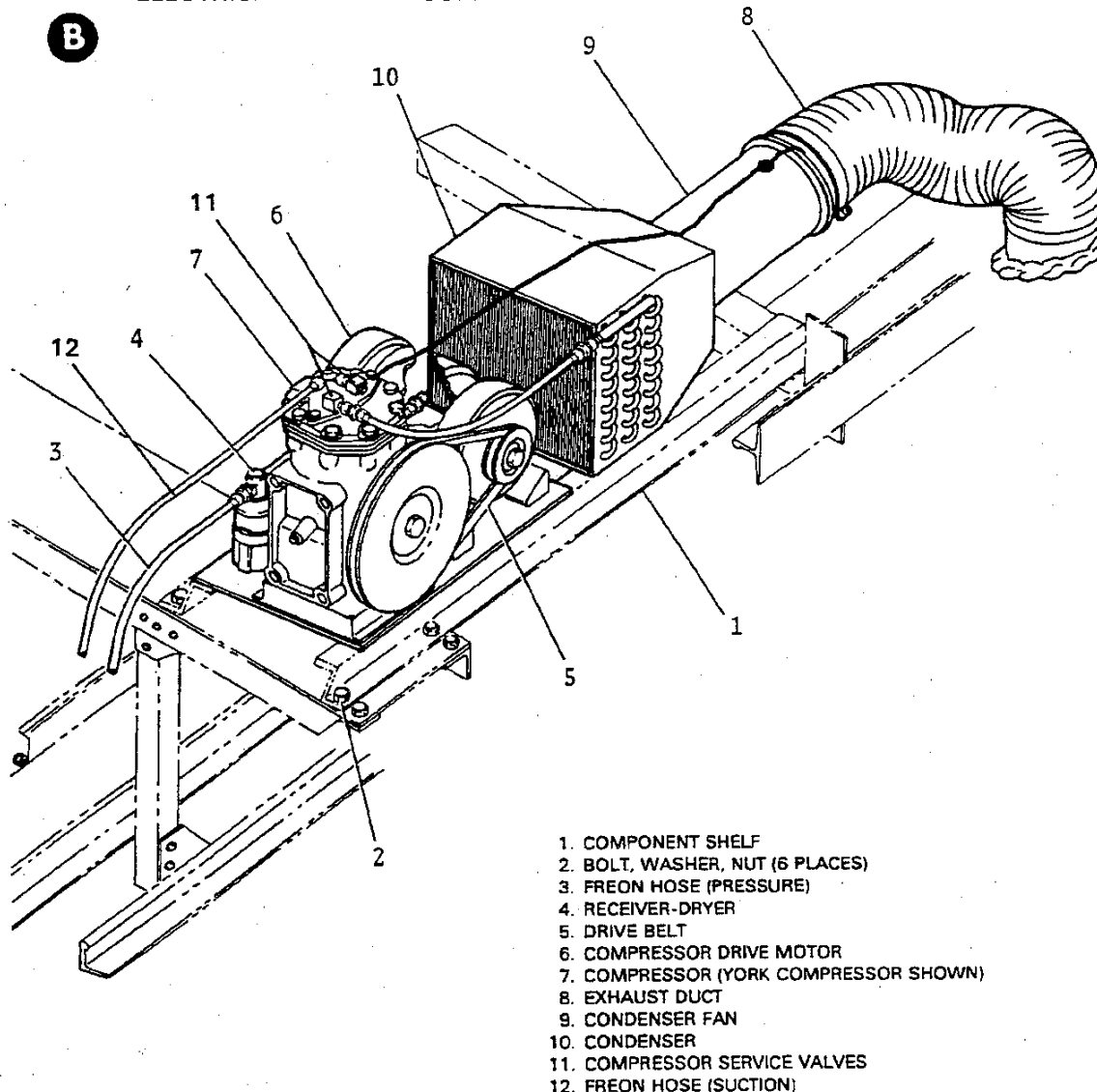
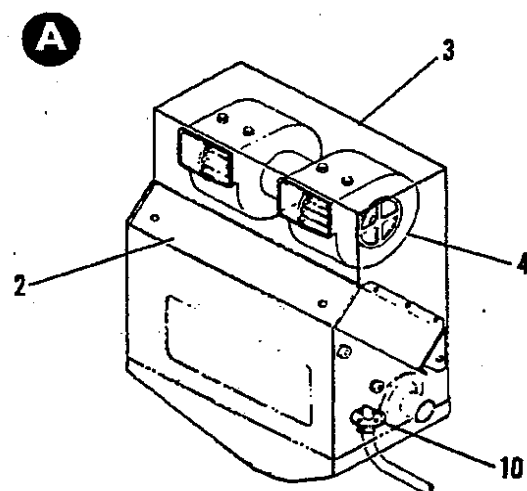
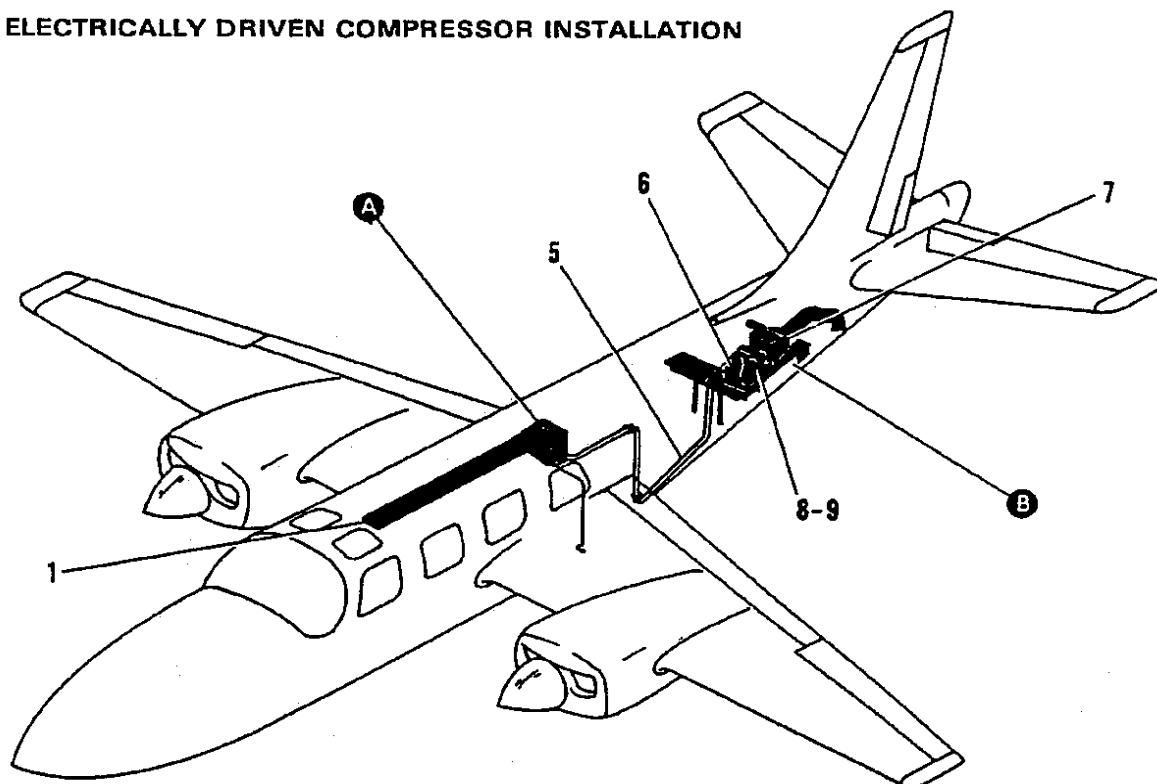


FIGURE 8-15: JB/KEITH ELECTRIC A/C SYSTEM

ELECTRICALLY DRIVEN COMPRESSOR INSTALLATION



1. OVERHEAD CABIN DUCT OUTLETS
2. EVAPORATOR ASSY.
3. PLENUM BOX
4. BLOWER FAN
5. FREON LINES
6. COMPRESSOR
7. CONDENSER AND FAN
8. DRIVE MOTOR
9. RECEIVER DRYER
10. EVAPORATOR DRAIN (SOLENOID OPERATED UP TO A/F 0456)

FIGURE 8-16: LAYOUT OF ELECTRIC A/C



valve, and evaporator. The controls for the JB/Keith Air Conditioner are located on the right side of the instrument lower panel or on the lower center console.



It is controlled by two switches one labeled AIR COND or A/C, OFF and FAN and another high (HI) or low (LO) fan speed control.

The evaporator module consists of an evaporator coil, a fan, and an automatic drain. In the air conditioning mode (AIR COND), the evaporator module fan is automatically activated. The evaporator has a water catch basin located beneath it with a pneumatic automatic drain attached leading to outside the pressure vessel of the aircraft by the port main landing gear door. Failure to keep this tube open from debris entering from the drain pan will cause the accumulated moisture and water to spill out above the station 176 location and leave a heavy musky odor in the aircraft when secure for an

extended period of time. It is recommended the catch basin be cleaned once a month during high humidity conditions to ensure the evaporator drain tube remains clear and free of debris.

The compressor/condenser pallet consists of a Freon compressor driven by an electric motor, a condenser coil, and a vane axial fan which draws cooling air through the coil. The compressor control circuit on later Aerostar models incorporates a load shedding feature which prevents operation of the compressor motor and condenser fan unless both alternators are operating or power is applied through the external power plug. Earlier models without this capability could exceed the output of both alternators at low engine idle and drain the battery during taxi. In the event of an alternator failure, while the air conditioner is in operation, the compressor motor and condenser fan automatically shut down to reduce electric load. This capability is dependent upon the age of the specific airframe and STC installation.

Operation of the JB/Keith Air Conditioning system requires only turning on or off the switch labeled AIR COND. A minimum three-minute wait to re-engage the air conditioning compressor is required to allow compressor head pressure to diminish.



The compressor/condenser electrical circuit is protected by a 70-amp circuit breaker located on aft cabin bulkhead trim panel near the aircraft center line. An 80-amp current limiter located on the accessory shelf panel forward of the circuit breaker panel, is installed to provide additional circuit protection. The evaporator fan is protected by a 10-amp circuit breaker marked FAN.

NOTE: A W&B issue may be incurred with the installation of the JB/Keith Air Conditioning System. Some single pilot operations may be adversely effected.

Operation of the electric air conditioning is not recommended during takeoff and landing. Its operation is prohibited during IFR operations. Operation on the ground required idling at 1300 rpm for standard alternators and 1000 rpm for National Airparts alternators.

ENGINE DRIVEN AIR CONDITIONING SYSTEM

The major change for the engine driven air conditioning system over the JB/Keith electric system is the compressor is mounted on the right engine of the Aerostar and supplies

compressed Freon to the condenser located around F.S. 298 in the aft portion of the Aerostar. The Freon is delivered under approximately 240 psi of pressure to the condenser.

The engine driven Vapor Cycle Cooling Product (VCCP) is recognized as an improvement over the electric driven unit in the Aerostar for the following reasons:

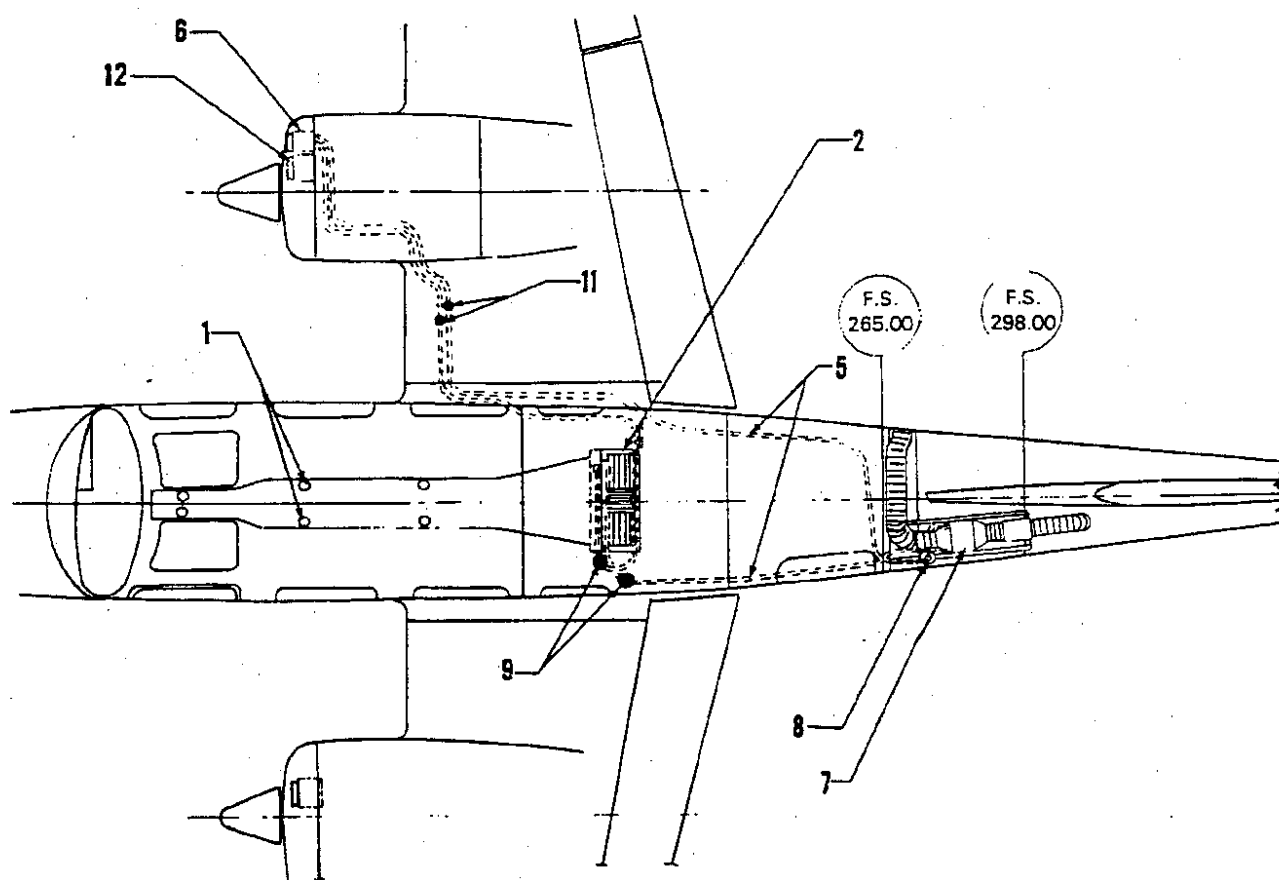
1) The engine driven Freon system can deliver cool air at reasonable engine RPM's of 900-1000, as opposed to the 1300 RPM's required for the electric system. The higher engine RPM's makes taxing the Aerostar very difficult and tend to wear brake pads out very quickly when required to use the electric air conditioning system on the ground.

2) The engine driven air conditioning system has no limitation when in IFR conditions in flight of disabling the air conditioner or having both alternators functioning to use the system.

3) There is usually a weight reduction between the electric and engine driven systems of the Aerostar favoring the engine driven system.

Operation of the engine driven air conditioning system uses the same controls and requires the same switching sequence to turn on/off of the air conditioning system as JB/Keith system.

ENGINE DRIVEN COMPRESSOR INSTALLATION

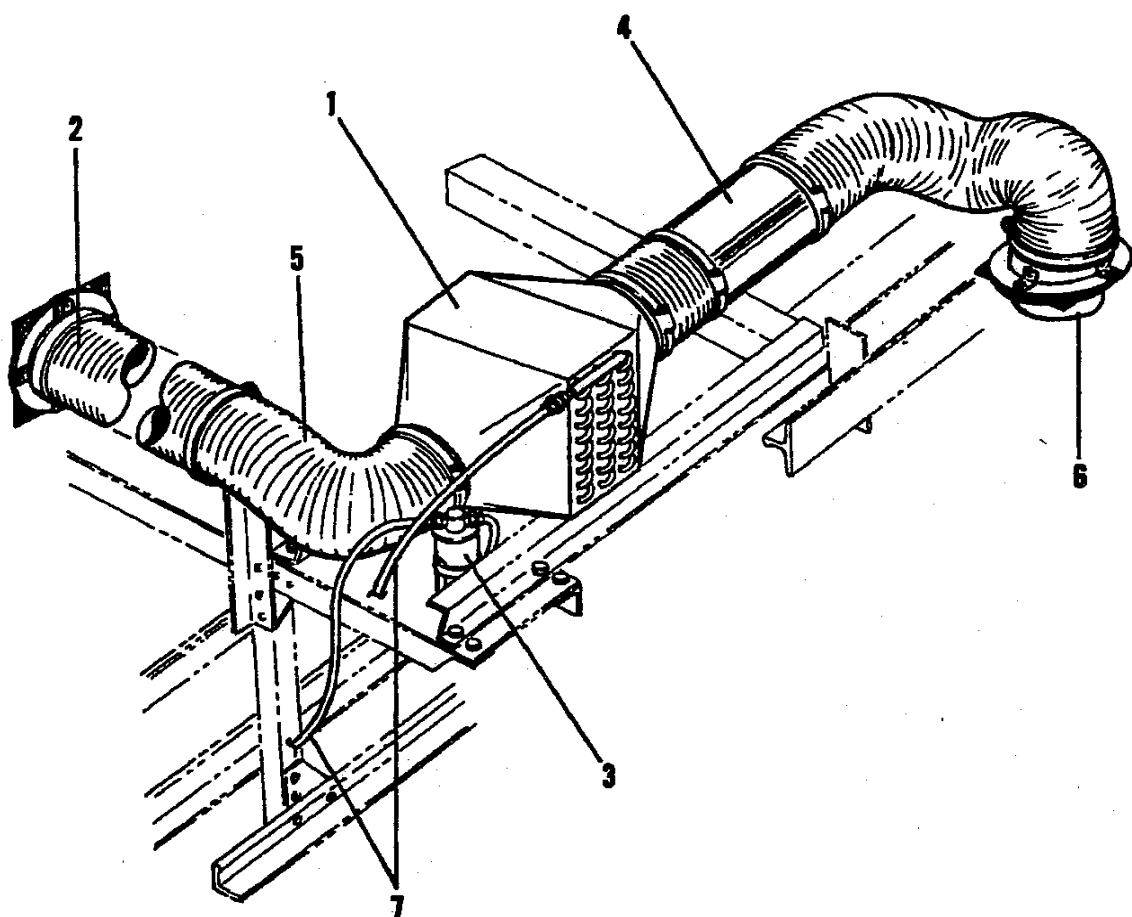


1. OVERLEAD CABIN DUCT OUTLETS
2. EVAPORATOR ASSEMBLY
3. PLENUM BOX*
4. BLOWER FAN*
5. FREON LINES
6. COMPRESSOR
7. CONDENSER AND FAN
8. RECEIVER-DEHYDRATOR
9. PRESSURE SWITCHES
10. EVAPORATOR DRAIN*
11. SERVICE VALVES
12. ALTERNATOR

*SEE DETAIL A OF ELECTRICALLY DRIVEN
COMPRESSOR INSTALLATION.

FIGURE 8-17: LAYOUT OF ENGINE DRIVEN A/C

ENGINE DRIVEN COMPRESSOR INSTALLATION SHELF



- 1. CONDENSER
- 2. AIR INLET
- 3. RECEIVER-DEHYDRATOR
- 4. BLOWER
- 5. AIR INLET DUCT
- 6. AIR EXHAUST
- 7. FREON LINES

FIGURE 8-18: ENGINE DRIVEN A/C CONDENSER



CHAPTER 8 - QUIZ

1. The PA-60-600A heating system has a:
 - a. 25,000 BTU gasoline powered Janitrol heater.
 - b. 35,000 BTU gasoline powered Janitrol heater.
 - c. 45,000 BTU gasoline powered Janitrol heater.
 - d. heat muff on engine exhaust to provide heat for cabin.

2. The PA-60-601B, 601P, and 602P heating system have a:
 - a. 25,000 BTU gasoline powered Janitrol heater.
 - b. 35,000 BTU gasoline powered Janitrol heater.
 - c. 45,000 BTU gasoline powered Janitrol heater.
 - d. heat muff on engine exhaust to provide heat for cabin.

3. The fuel consumption during continuous operation is:

a. 1.5 GPH	c. 1.0 GPH
b. 1.6 GPH	d. 0.6 GPH



4. When the Janitrol heater overheats:
 - a. the overheat switch turns off the heater.
 - b. the heater fail light will illuminate.
 - c. the heater has exceeded the maximum safe operating temperature.
 - d. All of the above.

5. When the "HEATER FAIL" illuminates:
 - a. the light will stay on until the temperature drops to a safe limit.
 - b. you will not be able to restart the heater.
 - c. you may restart if you reset the overheat switch mounted on the heater.
 - d. None of the above.

6. The air conditioning condenser is located:
 - a. behind the baggage compartment.
 - b. just behind the rear seat.
 - c. in the nose compartment.
 - d. None of the above.

7. The compressor/condenser or electric circuit is protected by:
 - a. 30-amp circuit breaker.
 - b. 40-amp circuit breaker.
 - c. 60-amp circuit breaker.
 - d. 70-amp circuit breaker.





9

9. PRESSURIZATION & OXYGEN SYSTEMS

FOR TRAINING PURPOSES ONLY





CHAPTER 9

PRESSURIZATION & OXYGEN SYSTEMS

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CHAPTER 9

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PRESSURIZATION

Pressurization of the Aerostar began with the 601P series and continued through the 602P and 702P models of the aircraft. Standard 5,000 Ft or Sea Level controllers are used. Aerostar Aircraft Corporation also provides a 5.5 psi differential controller through Options #262 and #264.

Pressurization of the airplane cabin is an accepted method of protecting occupants against the effects of hypoxia. Within the pressurized cockpit of the Aerostar occupants can be transported comfortably and safely for long periods of time since sea level cabin altitude can be maintained up to 12,400 feet with the 5.5 psi system or 9,100 feet with the 4.25 psi system. Thinking about it the other way, at 25,000 feet the cabin altitude can be kept at 7,900 feet with the 5.5 psi system or 11,000 feet with the 4.25 psi system where the use of oxygen is not required. Part of the flight crew's responsibilities is to be aware of accidental loss of cabin pressure at altitude and how to deal with such abnormal situations.

The NOAA standard atmospheric chart displayed below shows the effect of pressurization in both the Aerostar or for any pressurized aircraft by just applying simple math. Take sea level psi 14.7 and subtract the aircraft's pressure differential from the sea level psi, then look at the atmospheric table below and see where the new cabin psi is. That is the maximum altitude the aircraft can hold sea level pressure. See example below of how the system works.

14.7 Sea Level psi

- 4.25 Aerostar Delta "P"

10.45 Atmospheric psi

A check of the standard atmospheric table shows 10.45 psi atmospheric pressure equals just over 9,100 MSL. Thus, a sea level cabin with a 4.25 psi differential could be held up to an altitude of 9,100 MSL.

Variance from standard temperature and humidity can affect pressurization performance. Obviously, the aircraft and pressurization system must be performing optimally to achieve this result.



Altitude Above Sea Level		Absolute Barometer		Absolute Pressure		Atmospheric
<i>feet</i>	<i>meters</i>	<i>inches Hg</i>	<i>mm Hg</i>	<i>psia</i>	<i>kg/cm²</i>	<i>kPa</i>
0 ¹⁾	0	29.92	760.0	14.696	1.0333	101.33
500	153	29.38	746.3	14.43	1.015	99.49
1,000	305	28.86	733.0	14.16	0.996	97.63
1,500	458	28.33	719.6	13.91	0.978	95.91
2,000	610	27.82	706.6	13.66	0.960	94.19
2,500	763	27.32	693.9	13.41	0.943	92.46
3,000	915	26.82	681.2	13.17	0.926	90.81
3,500	1,068	26.33	668.8	12.93	0.909	89.15
4,000	1,220	25.84	656.3	12.69	0.892	87.49
4,500	1,373	25.37	644.4	12.46	0.876	85.91
5,000	1,526	24.90	632.5	12.23	0.86	84.33
6,000	1,831	23.99	609.3	11.78	0.828	81.22
7,000	2,136	23.10	586.7	11.34	0.797	78.19
8,000	2,441	22.23	564.6	10.91	0.767	75.22
9,000	2,746	21.39	543.3	10.5	0.738	72.40
10,000	3,050	20.58	522.7	10.1	0.71	69.64
15,000	4,577	16.89	429.0	8.29	0.583	57.16
20,000	6,102	13.76	349.5	6.76	0.475	46.61
25,000	7,628	11.12	282.4	5.46	0.384	37.65
30,000	9,153	8.903	226.1	4.37	0.307	30.13
35,000	10,679	7.06	179.3	3.47	0.244	23.93
40,000	12,204	5.558	141.2	2.73	0.192	18.82

FIGURE 9-1: PRESSURIZATION CHART

A succinct definition of aircraft pressurization is a sealed cabin capable of containing air under pressure, in the case of the Aerostar 4.25 psi or 5.5 psi differential. The pressurized air is supplied from the engine turbocharger via “bleed air” through a sonic nozzle (flow limiter) into the cabin and released in a controlled manner from a device called the outflow valve.

Terms used in aircraft pressurization that are common and essential to understanding how the aircraft functions while pressurized.

Aircraft Altitude - the actual height above sea level at which the airplane is flying

Ambient Pressure - the pressure in the area immediately surrounding the airplane

Cabin Altitude - used to express cabin pressure in terms of equivalent altitude above sea level

Differential Pressure - the difference in pressure between the pressure acting outside the aircraft versus the pressure contained inside of the aircraft. It is the difference between cabin and atmospheric pressure. The differential is commonly known as the aircraft’s Delta “P”.

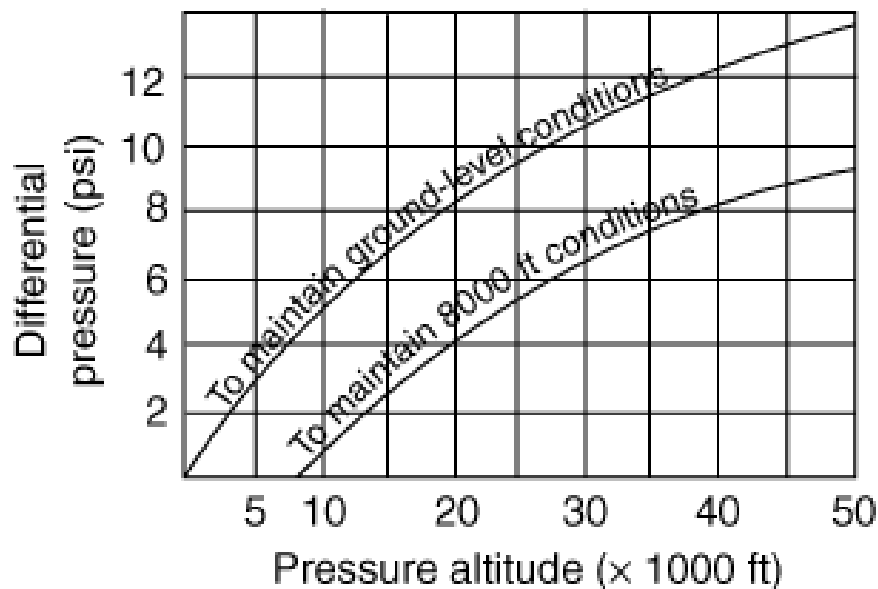


FIGURE 9-2: DIFFERENTIAL PRESSURE CHART



CABIN PRESSURIZATION SYSTEM

The cabin control system provides cabin pressurization regulation, pressure relief, vacuum relief, and the means for selecting the desired cabin altitude or differential. In addition, dumping of the cabin pressure is a function of the pressure control system. A cabin pressure regulator, an outflow valve, and a safety valve are used to accomplish these functions.

Another important component of the pressurization system is the cabin door and emergency exit seal system which is inflated by pneumatic pressure from engine driven pumps or an optional electric motor driving pump.

The cabin pressure regulator controls cabin pressure to a selected value and limits cabin pressure to a preset differential range, 4.25 psi in the standard Aerostar. When the airplane reaches the altitude at which the difference between the pressure inside and outside the cabin is equal to the highest differential pressure for which the fuselage structure is designed, a further increase in airplane altitude will result in a corresponding increase in the cabin altitude. Differential control is used to prevent the maximum differential pressure, for which the fuselage was designed, from being

exceeded. This differential pressure is determined by the structural strength of the cabin and often by the relationship of the cabin to the probable areas of rupture, such as window areas and doors. Aerostars equipped with the 4.25 psi controllers are tested to 8.5 psi differential and 5.5 psi equipped Aerostars are tested to 11 psi differential.

The cabin air pressure safety valve is a combination pressure relief, vacuum relief, and dump valve. The pressure relief valve prevents cabin pressure from exceeding the 4.25 or 5.5 psi differential pressure. The vacuum relief prevents ambient pressure from exceeding cabin pressure by allowing external air to enter the cabin through the pressurization relief valve of the outflow valve. An electric dump switch located on the center pedestal of the cockpit energizes a solenoid that opens the aircraft's safety valve, causing the cabin air to dump to the atmosphere. Bleed air switches also located on the cockpit pedestal, can block the turbocharger bleed air from entering the cabin (601P) or dump overboard (602P and 700P).

The Aerostar may not be landed while pressurized, so the nose landing gear squat switch energizes the safety valve, dumping cabin pressure.

CONTROLLER

The cabin pressurization controller consists of a cabin altitude controller and cabin rate controller. The standard controller, mostly found on early model 601P Aerostar, starts to control the cabin atmosphere at 5,000' MSL. On later 601P, 602P and 700P models a sea level controller is installed to start controlling pressurization at sea level. The 702P and a specially modified 601P and 602P have option to have installed a 5.5 psi controller.

The cabin pressurization controls maintain the desired differential pressure by increasing or decreasing the air flow out of the cabin through the pressure regulating or outflow valve mounted on the left aft cabin bulkhead, which exhausts through the aft fuselage. The cabin altitude control located on the pressurization console, allows cabin altitude selection up to the maximum differential. The rate controller allows the cabin to be controlled up to 1,000 FPM up or down with the rate controller normally set to around the 12 o'clock position or 500 FPM.

A safety valve installed on the right aft bulkhead of the fuselage is designed to back up the outflow valve from over pressuring by automatically opening



when the pressurization differential of the cabin exceeds the maximum allowable value depending on model. Both altitude and rate controller along with the outflow and safety valve are manufactured by Duke Aircraft Manufacturing. Thus, the term Duke Controllers is generally used to define the pressurization equipment installed in the Aerostar. Aerostar Aircraft Corporation can work on Duke Controllers for Aerostars.

A pressure switch located under the instrument panel provides the pilot with a visual warning light when the cabin approaches an altitude of 12,000' plus or minus 100' MSL. This light warns the pilot that the pressurized cabin is climbing above 12,000' MSL and appropriate action should be taken by the pilot to reduce the cabin altitude or go on supplemental oxygen.

BLEED AIR SYSTEM

The bleed air system provides the air required for ventilation and cabin pressurization. Compressor discharge air or bleed air from each engine turbocharger is routed from the manifold air box mounted on the engine compartment aft firewall, through a sonic nozzle or flow limiter, and then through a two position electrically operated diverter valve assembly “bleed air valve” mounted within the inboard wing leading edge. The air continues to pass through a heat exchanger that drops the “bleed air” temp from 350 °F to within 20 °F of ambient air. Passing through a one way flowing check valve, the “bleed air” enters the cabin.

The air entering the cabin is ducted to a common plenum located on the aft cabin bulkhead. From the plenum, air is distributed forward to the cabin overhead ventilation outlets and aft through the heater. Pressurized air passing through a leaking heater and/or heater ducting and hoses can be a common source of pressurization loss. Leaving the heater, air returns to the cabin and is distributed through the floor outlets. The heater ducts are comprised of ABS material and over the years tend to crack where the tubing passes through the floor around F.S. 176. Again, this limits the distribution of pressurized and heated air into the cabin. Inspection of this area during maintenance operations can eliminate these problems before they become a major problem.



Electrically operated, motor driven, two position diverter valves are located in each wing root and are controlled by the AIR ON/AIR OFF annunciator type switches located on the pressurization console. These valves are left open to cabin, AIR ON, position for all normal flight conditions, both pressurized and unpressurized. These valves are to be closed (601P) or overboard (602P and 700P), AIR OFF, (closed to cabin) for emergency conditions such as cabin air contamination, or to assist cabin cooling on ground or during low level flight.

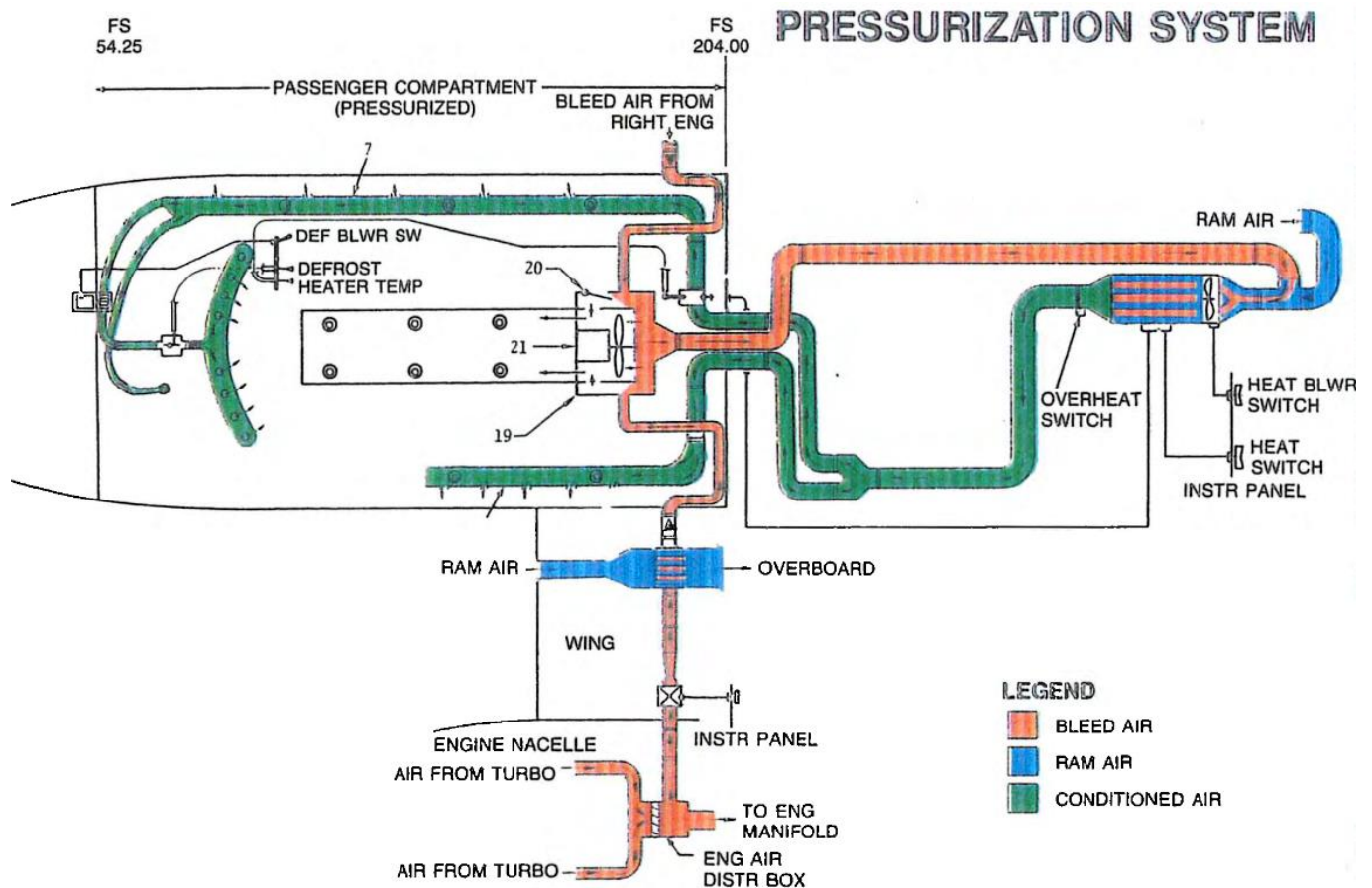


FIGURE 9-3: CABIN PRESSURE SCHEMATIC



PRESSURIZATION PROCEDURES

Normal Operations:

After Engine Start – NORMAL/DUMP switch shows green over red.

Left and right Bleed Air ON

Door Seal - Inflate

Pressurization rate controller – 12 o'clock position.

Pressurization altitude controller - Select an altitude 1,000 FT above the departure airfield.

After take-off cabin rate is equal to aircraft rate.

When above the set cabin altitude of departure field plus 1,000 feet, confirm the cabin rate indicator is at zero.

During climb, set controller to intermediate or final altitude. Carefully, move the outside ring of the altitude pressurization in a clock wise manner when increasing cabin. Set either the cabin altitude (top window) at lower flight levels or flight level (lower window). If you set the lower controller window to the flight level, you get the maximum differential available. For example, setting the lower window of the controller to 25 and flying at FL250 will yield the maximum cabin differential of 4.25 for a cabin altitude of about 11,000 feet.

It is not necessary to place the controller higher than the flying altitude since the safety valve has a slight safety margin of 4.35 psi compared to the maximum outflow setting of 4.25 psi.

Upon reaching the desired altitude, check cabin altitude and pressure differential to match the desired altitude and pressurization differential set.

When descending, turn the rate controller to full increase and turn the outside altitude controller knob counter clockwise to 1000 feet over the arrival field altitude.

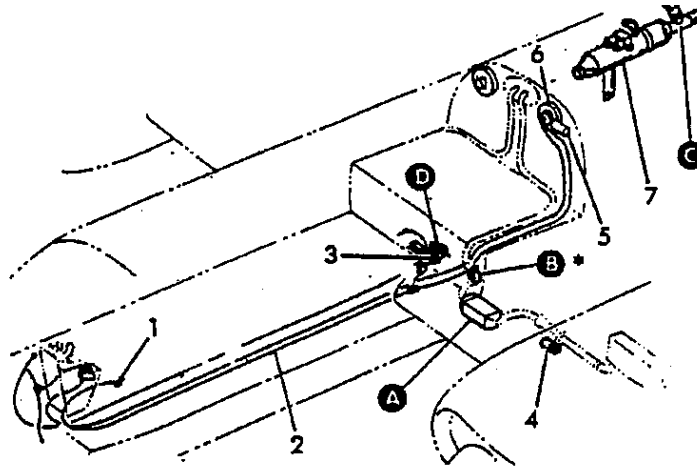
Prior to landing, ensure that the cabin differential needle is showing "0".

Some pilots set the controller to more than 1,000 over field elevation to minimize pressurization loss when retarding the throttles for descent speed reduction.

The small inner knob travels with the outer ring and is not moved independently during normal operation.

CAUTION

Do not remove the control knob and ring assembly from the controller for any reason such as cleaning or maintenance. It should only be removed by a repair facility as it is very difficult to properly install. .



- | | |
|---|---|
| 1. PRESSURIZATION STATIC PORT | 18. GASKET |
| 2. PRESSURIZATION STATIC LINE | 19. ELBOW WITH BLEED AIR CHECK VALVE ATTACHED |
| 3. PRESSURIZATION STATIC DRAIN | 20. CLAMP |
| 4. FLOW CONTROL ASSEMBLY | 21. FLEXIBLE DUCT |
| 5. FILTER | 22. T DUCT |
| 6. OUTFLOW VALVE | 23. CLAMP (5 OR 6 PLACES) |
| 7. HEATER ASSEMBLY | 24. SCREW |
| 8. CLAMP | 25. MANIFOLD ASSEMBLY |
| 9. FLEXIBLE DUCT | 26. CLAMP |
| 10. BOLT, WASHER, GROMMET (6 PLACES) | 27. IN-LINE FILTER |
| 11. HEAT EXCHANGER | 28. RAM AIR CHECK VALVE (FLAPPER VALVE) |
| 12. RAM AIR DOOR } 601P A/F | 29. BLEED AIR CHECK VALVE |
| 13. CONTROL CABLE } 0157 THRU 0212 | 30. RIVETS (4 PLACES) |
| 14. CLAMP | 31. RIVETS (2 PLACES) |
| 15. FLEXIBLE DUCT | 32. SONIC NOZZLE |
| 16. BOLT, WASHER, NUT (4 PLACES) | 33. DIVERTER VALVE |
| 17. ELBOW | |
| * SEAL WITH PR820 SEALANT TO ABSOLUTE LEVEL | |

FIGURE 9-4: PRESSURIZATION SYSTEM SCHEMATIC (cont.)

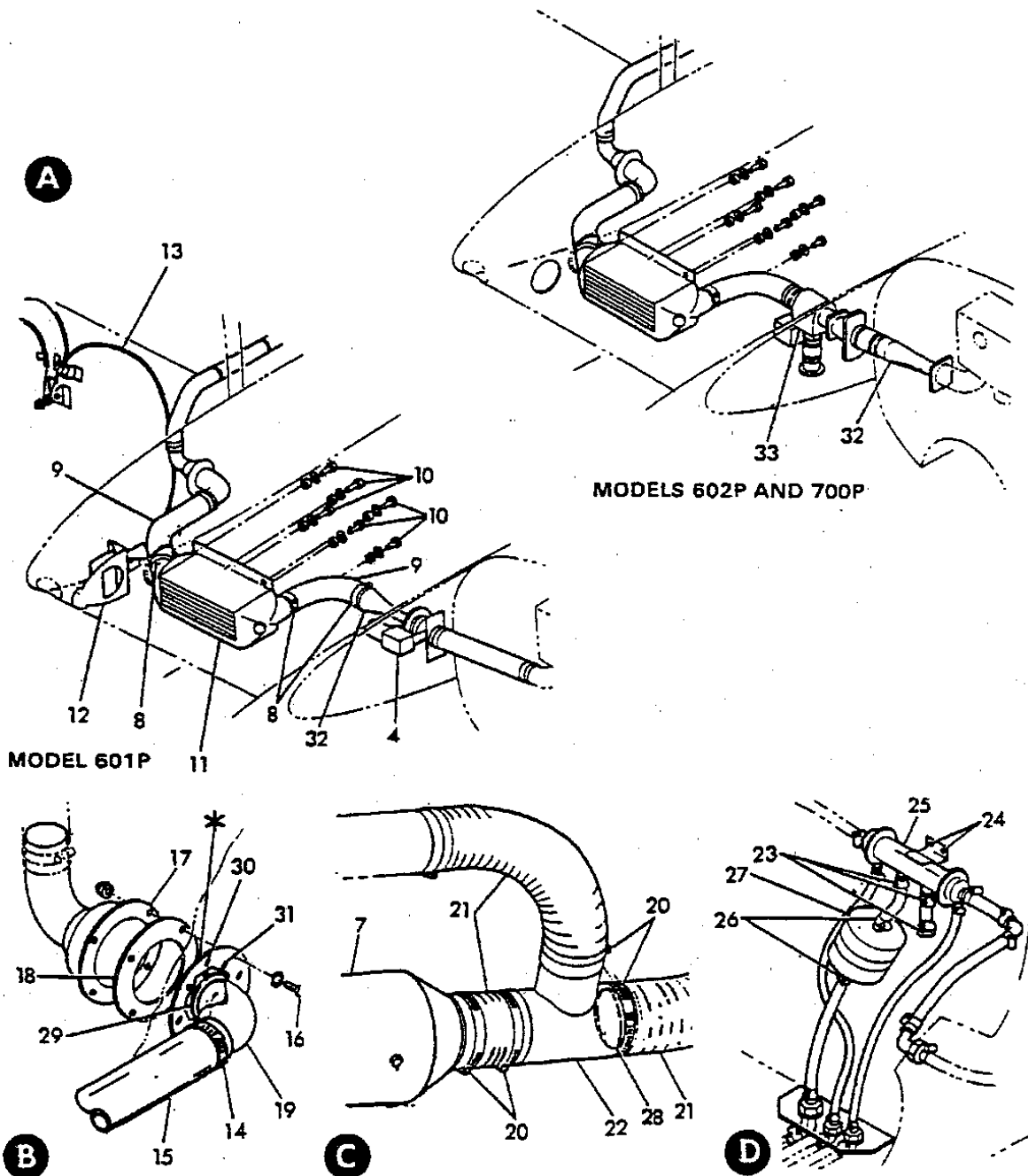
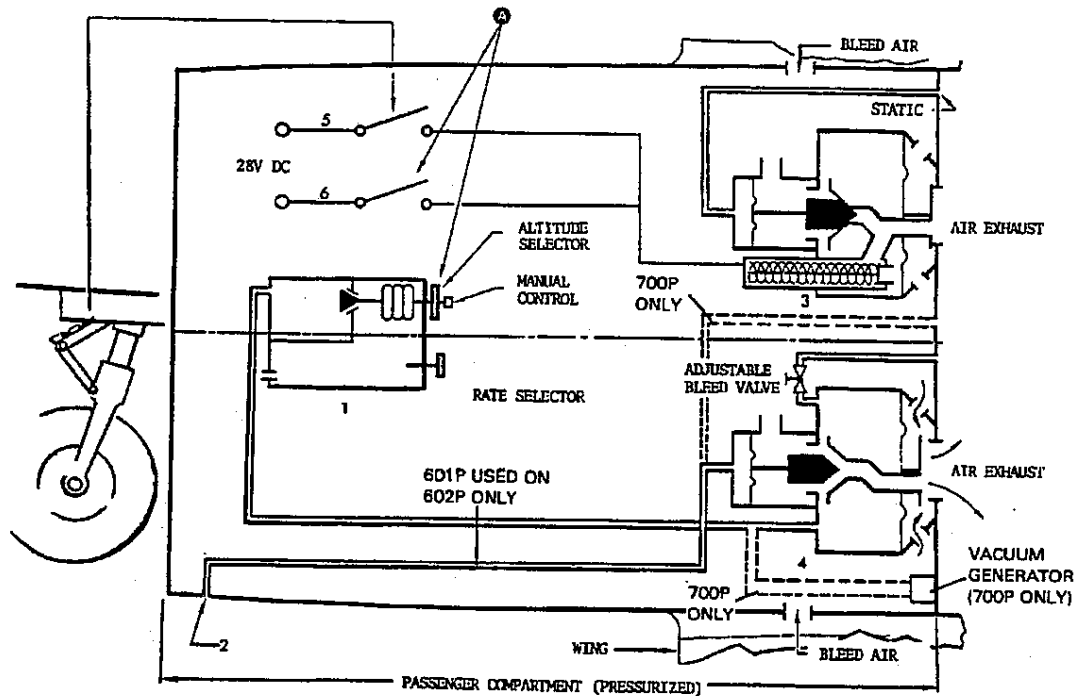


FIGURE 9-5: PRESSURIZATION SYSTEM COMPONENTS



1. CONTROLLER
2. STATIC PORT
3. SAFETY VALVE (P + 4.35 + .10, -.00)
4. PRESSURE REGULATOR VALVE (P + 4.15 + .10, -.00)
5. SQUAT SWITCH MOUNTED ON NLG.
6. PRESSURE DUMP SWITCH MOUNTED ON PILOT CONSOLE
7. CIGARETTE FILTER

NOTE
SCHEMATIC SHOWS PRESSURIZATION
SYSTEM IN DIFFERENTIAL MODE

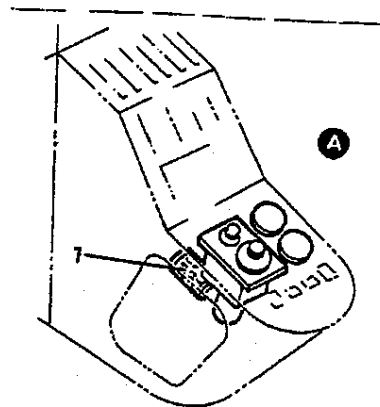


FIGURE 9-6: PRESSURIZATION SYSTEM CONTROLS

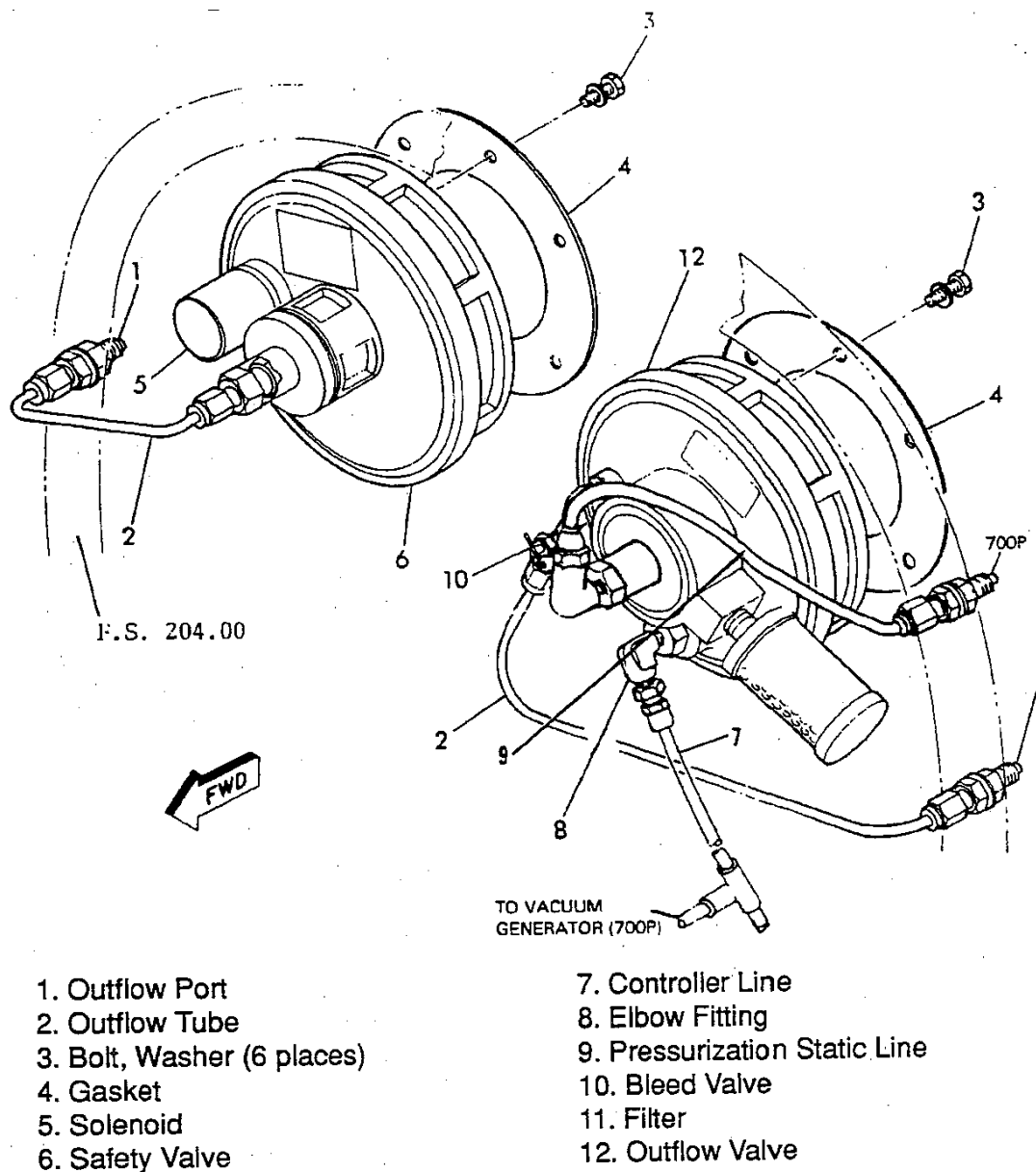


FIGURE 9-7: OUTFLOW AND SAFETY VALVES

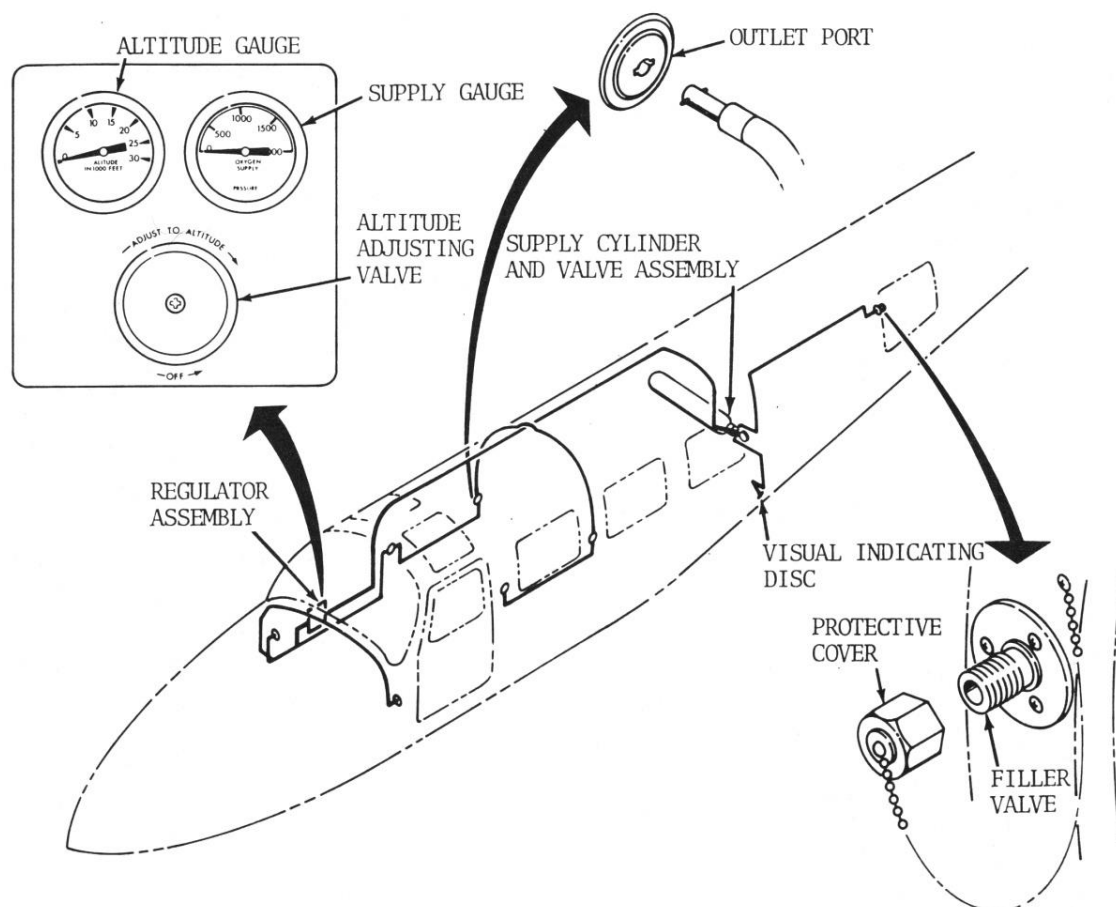


FIGURE 9-8: OXYGEN SYSTEM



PERSONS USING	MINIMUM DURATION IN HOURS AND MINUTES AT FOLLOWING ALTITUDES 				
	8,000 Ft	10,000 Ft	15,000 Ft	20,000 Ft	25,000 Ft
1	4:57	3:43	2:19	1:41	1:19
2	2:28	1:51	1:09	0:50	0:39
3	1:39	1:14	0:46	0:33	0:26
4	1:14	0:55	0:34	0:25	0:19
5	0:59	0:44	0:27	0:20	0:16
6	0:49	0:37	0:23	0:16	0:13

Note 1 – Cylinder capacity 11 cu. Ft. (325 liters at 70°F and 760 MM Hg) charged to 1800 psi

FIGURE 9-9: MINIMUM DURATION IN HOURS & MINUTES



FAILURE OF AUTOMATIC SELECTION AND RATE CONTROL

Should there be no automatic cabin pressurization changes following the procedures, you may manually change cabin altitude by carefully rotating the inner knob until the desired altitude is under the index at top of the knob. The knob should be rotated slowly, as the cabin altitude will change as rapidly as the knob selection is made. Familiarity with the pressurization system will aid in developing one's own techniques. The following are only a few tips for improved passenger comfort.

Plan the flight.

Try to plan the cabin climb rate around 500 to 600 FPM.

During the climb phase, it is better for the cabin to reach its cruise altitude before, rather than after the airplane.

PRESSURIZATION SAFETY FEATURES

Should the pressure regulating valve fail to maintain differential pressure, a safety valve will automatically open when cabin pressure reaches 4.35 +/- .10 psi. This valve may be electrically opened by the pilot by pressing the guarded NORMAL/DUMP switch on the pressurization console to the DUMP position. This will allow the cabin to depressurize rapidly, and should be used for this purpose only when an emergency occurs. A squat switch located on the nose gear electrically opens the safety valve when weight is on the nose gear to prevent the aircraft from remaining pressurized after landing.

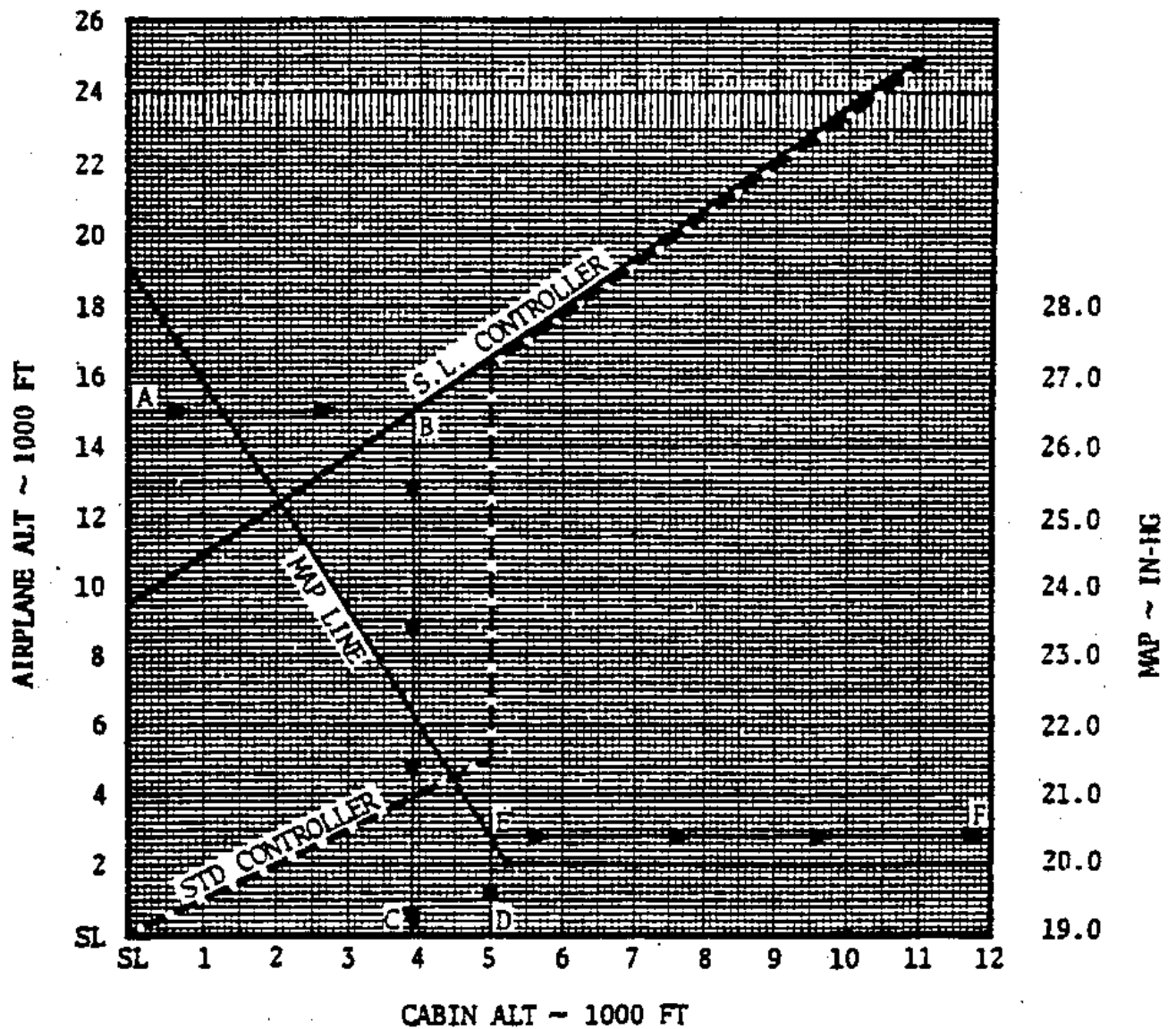


FIGURE 9-10: CABIN ALT VS AIRCRAFT ALT/MAP 601P



SAMPLE PROBLEM

To determine minimum cabin altitude that may be selected:

Read airplane altitude, 15,000 ft. (point A).

Read horizontally right to controller line (point B).

Read vertically down to base for minimum cabin altitude, 3900 ft. (point C) that could be selected (based on maximum differential pressure of 4.25 psi). Any higher cabin altitude may be selected, resulting in a lower displayed differential pressure, and a lower required minimum MAP.

To determine minimum MAP required for selected cabin altitude:

Select cabin altitude at or above minimum found in above procedures, 5000 ft. (point D). Minimum would be 3900 ft.

Read vertically up to MAP line (point E).

Read horizontally right to side for required minimum MAP, to maintain the selected cabin altitude 20.4 in-Hg (point F). If the minimum cabin altitude of 3900 ft. had been selected, the corresponding minimum MAP would be 22.4 in-Hg.

NOTE

All selected cabin altitudes above 5200 ft. can be obtained with a minimum of 20.0 in-Hg MAP and 2200 RPM, independent of airplane altitude

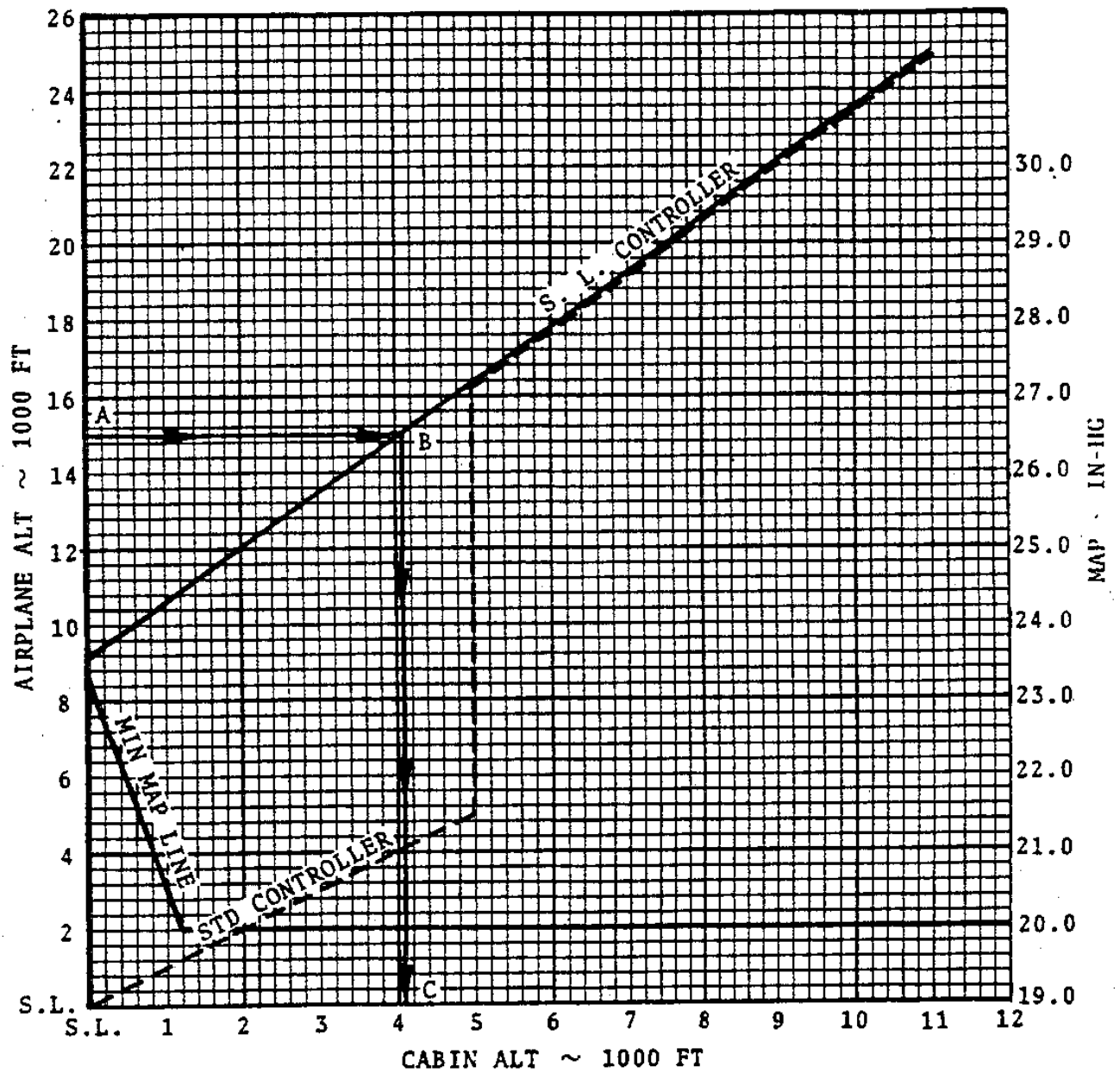


FIGURE 9-11: CABIN ALT VS AIRCRAFT ALT/MAP 602P



1. What is the minimum cabin altitude that can be maintained when the aircraft is at 16,000 feet? _____

A sea level cabin can be maintained up to _____ feet with approximately _____ inches MAP.

A 3,000 ft. cabin can be maintained with _____ inches MAP

With the aircraft at approximately 12,000 ft. a _____ ft. cabin can be maintained and will require approximately _____ inches MAP.

Using the previous 602p graph, please fill in the closest answer to each question. Assume standard temperatures and a sea level controller.

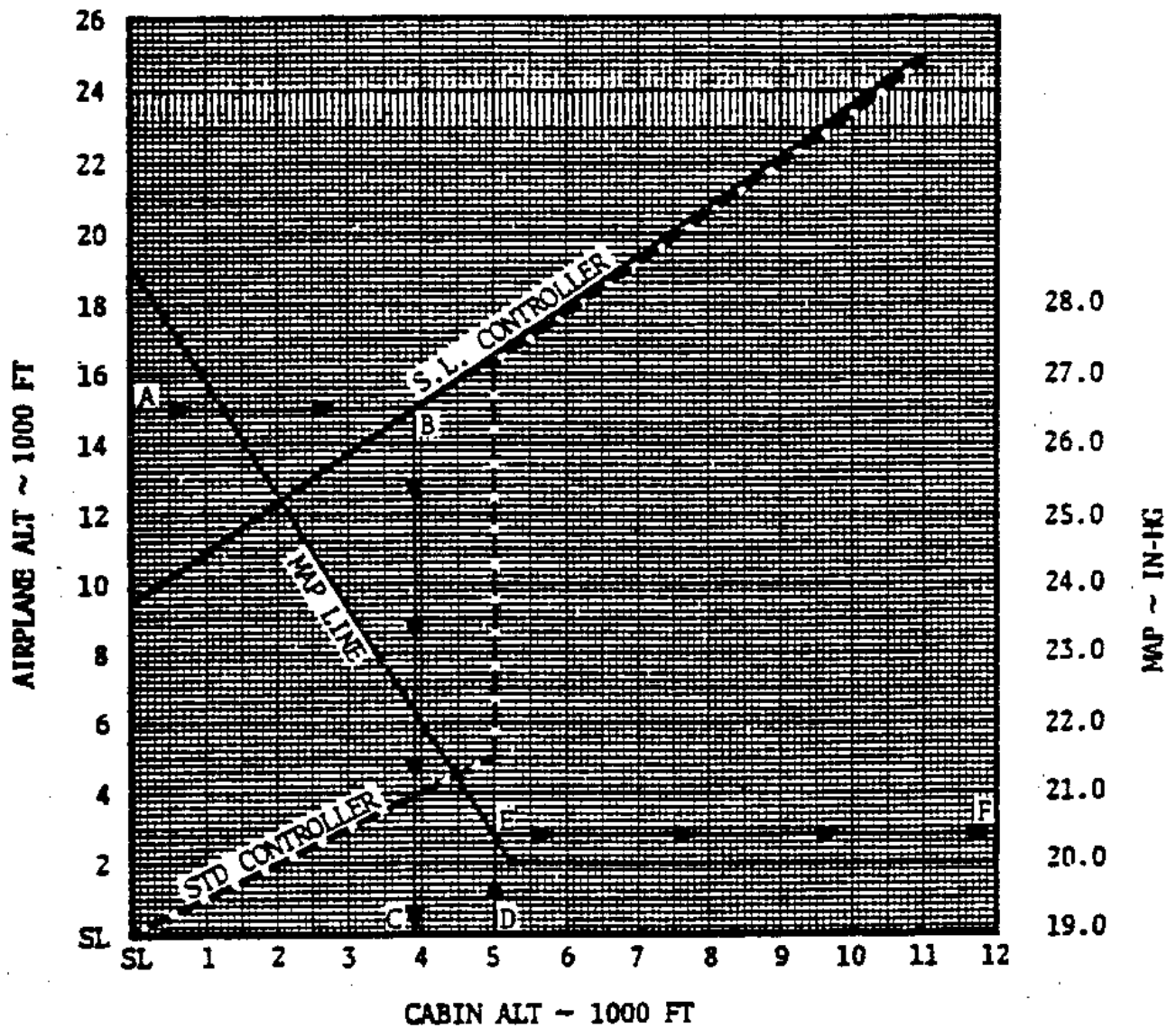


FIGURE 9-12: CABIN ALT VS AIRCRAFT ALT/MAP 601P



1. What is the minimum cabin altitude that can be maintained when the aircraft is at 16,000 feet? _____

A sea level cabin can be maintained up to _____ feet with approximately _____ inches MAP.

A 3,000 ft. cabin can be maintained with _____ inches MAP

With the aircraft at approximately 12,000 ft. a _____ ft. cabin can be maintained and will require approximately _____ inches MAP.

Using the previous 601p graph, please fill in the closest answer to each question. Assume standard temperatures and a sea level controller.



OXYGEN SYSTEM

The oxygen system on the Aerostar pressurized models will not normally be utilized, since cabin altitude should not exceed 11,075 feet, with the airplane service ceiling of 25,000 feet for the 4.25 psi controllers.

Most Aerostars have an oxygen storage cylinder with an 11 cubic ft. capacity. It should be kept fully serviced when flying in a pressurized condition above 12,000 feet airplane altitude to assure adequate oxygen for crew and passengers for emergency descent in the case of pressurization system failure and contamination.

WARNING

Smoking is not permitted when oxygen is in use. All oil, grease, soap, lipstick, lip balm or other fatty material which constitute a fire hazard, must be kept away from oxygen under pressure.

The oxygen system consists of the storage cylinder mentioned previously, with pressure relief valve, recharging filler valve, an altitude compensating regulator assembly, and six system outlet ports - one at each crew and passenger station. Any constant flow mask may be used with this

system with proper Scott SC bayonet type fittings for the oxygen outlets. The oxygen required warning light, located in the annunciator panel, will illuminate should the cabin altitude exceed 12,000 +/- 500 feet.

The oxygen system filler valve is mounted on the forward door frame of the baggage compartment. It is recommended that oxygen masks be carried for all passengers and pilot, and that all personnel be familiar with the oxygen masks' usage (see Emergency Descent procedure). See Oxygen Duration chart and Capacity vs. Oxygen Pressure to determine oxygen duration for a specific flight condition.

The storage cylinder in the aft fuselage supplies high pressure oxygen to the regulator assembly located on the right side of the cabin interior, just below the copilot's side window. The regulator assembly, consisting of supply gauge, altitude gauge, and altitude adjusting valve, supplies low pressure oxygen to the crew and passenger outlets.

Oxygen to the outlets is controlled by the altitude adjusting valve. This valve regulates oxygen pressure and flow rate available at the system outlets according to the airplane altitude. It also serves as the oxygen system shut-off valve when the system is not in use. The flow indicator depicts oxygen flow in terms of airplane altitude and the pressure gauge indicates the amount of oxygen pressure remaining in the cylinder.



The cabin outlets incorporate a spring-loaded check valve which stops the flow of oxygen from the outlet when the mask is disconnected. The oxygen storage cylinder pressure relief valve is incorporated into the oxygen dump outlet as a system protection factor. If cylinder pressure should exceed 2700 psi through thermal expansion or overcharging, a safety outlet disk in the cylinder valve assembly will rupture and blow the overpressure visual indicating disk mounted on the lower left fuselage skin aft of the wing trailing edge. Oxygen supply will flow overboard through the dump outlet.

Inspect masks frequently to keep in proper working order. Keep a mask accessible to each occupied seat. Disconnect masks when not in use.

Check supply gauge in cabin.

Convert to percent of capacity.

Read duration from Oxygen Duration Chart and multiply by percent of capacity.

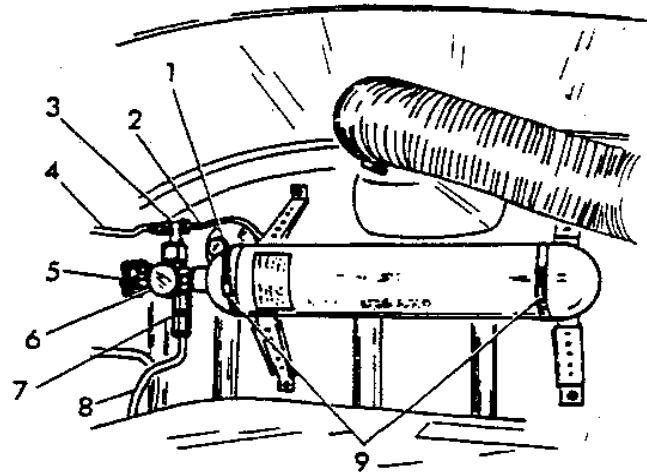
This will give oxygen duration with a partially charged system.

The standard Aerostar oxygen tank has an 11 cubic foot emergency bottle located in the aft baggage area at station 204 with a filler port located on the baggage door left jamb. Option #119 is for a larger 115 cubic foot tank in the same location.

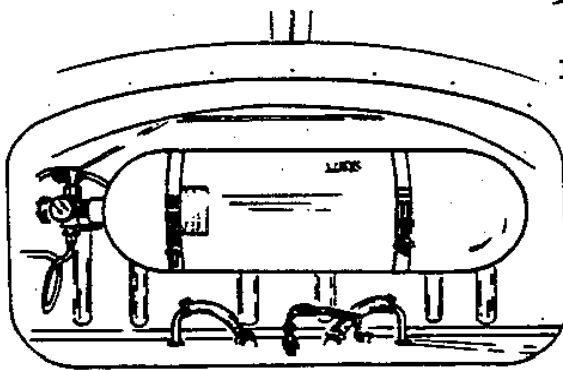
The oxygen controller located on the right-side co-pilot panel allows the pilot to set an altitude that the controller will maintain with the appropriate oxygen flow from the masks located throughout the cabin. The supply gauge on the oxygen controller tells the pilot what the oxygen level oxygen bottle has within.

Normal charge of the 11 cubic foot bottle is 1800 psi. Normal charge of the 115 cubic foot tank is 1,850 psi. Masks have a Scott SC bayonet plug used to attach to the oxygen outlet port. The pilot mask normally has a microphone located within the mask. Two pilots under normal breathing consumption at FL 200 would have 50 minutes of oxygen available to them with the standard system.

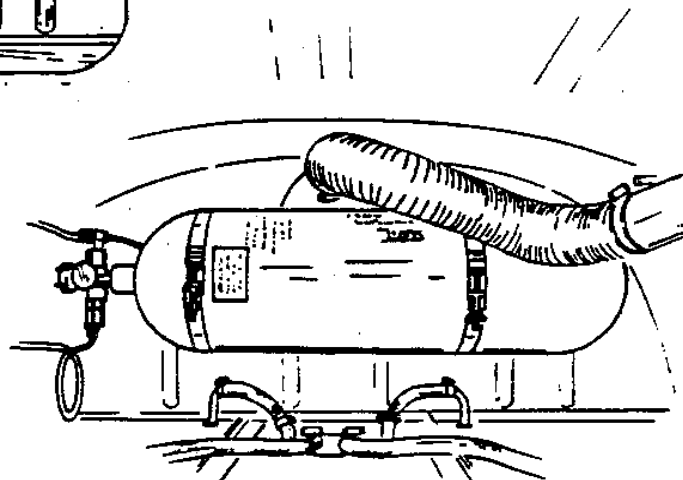
1. OUTFLOW VALVE
2. SYSTEM PRESSURE LINE
3. "T" FITTING
4. FILL LINE
5. SHUTOFF VALVE
6. GAGE
7. SAFETY OUTLET ASSEMBLY
8. DUMPLINE
9. CLAMPS



11 CU. FT. (601P, 602P AND 700P)



115 CU. FT. 601



115 CU. FT. 601P, 602P AND 700P

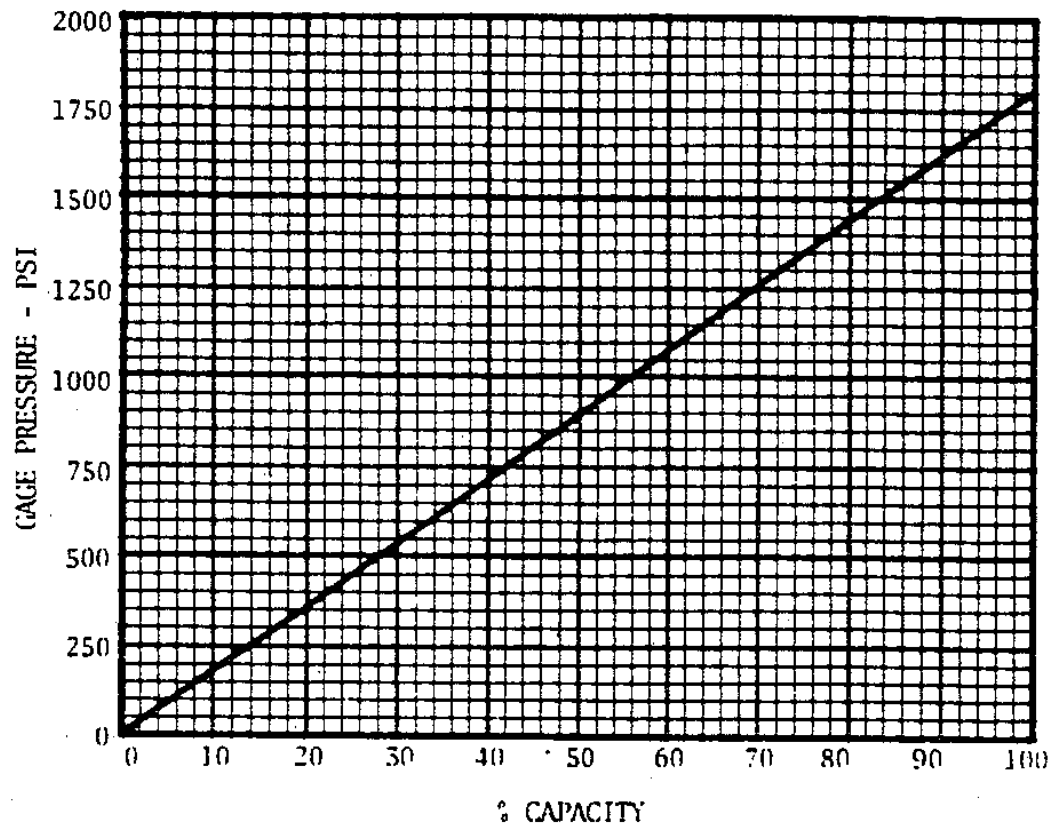
FIGURE 9-13: OXYGEN CYLINDER



Persons using	Minimum duration in hours and minutes at following altitudes *				
	8,000 ft	10,000 ft	15,000ft	20,000ft	25,000ft
1	4:57	3:43	2:19	1:41	1:19
2	2:28	1:51	1:09	0:50	0:39
3	1:39	1:14	0:46	0:33	0:26
4	1:14	0:55	0:34	0:25	0:19
5	0:59	0:44	0:27	0:20	0:16
6	0:49	0:37	0:23	0:16	0:13

* Cylinder capacity 11 cu ft (325 liters at 70 degrees F and 760 MM Hg) charged to 1800 PSIG

FIGURE 9-14: OXYGEN DURATION CHART



To use above chart:

- * Check supply gauge in cabin
- * Convert to percent of capacity
- * Read duration from oxygen duration chart (fig. 9.10) and multiply by percent of capacity.

This will give oxygen duratiuon with a partially charged system.

FIGURE 9-15: CAPACITY VS OXYGEN PRESSURE

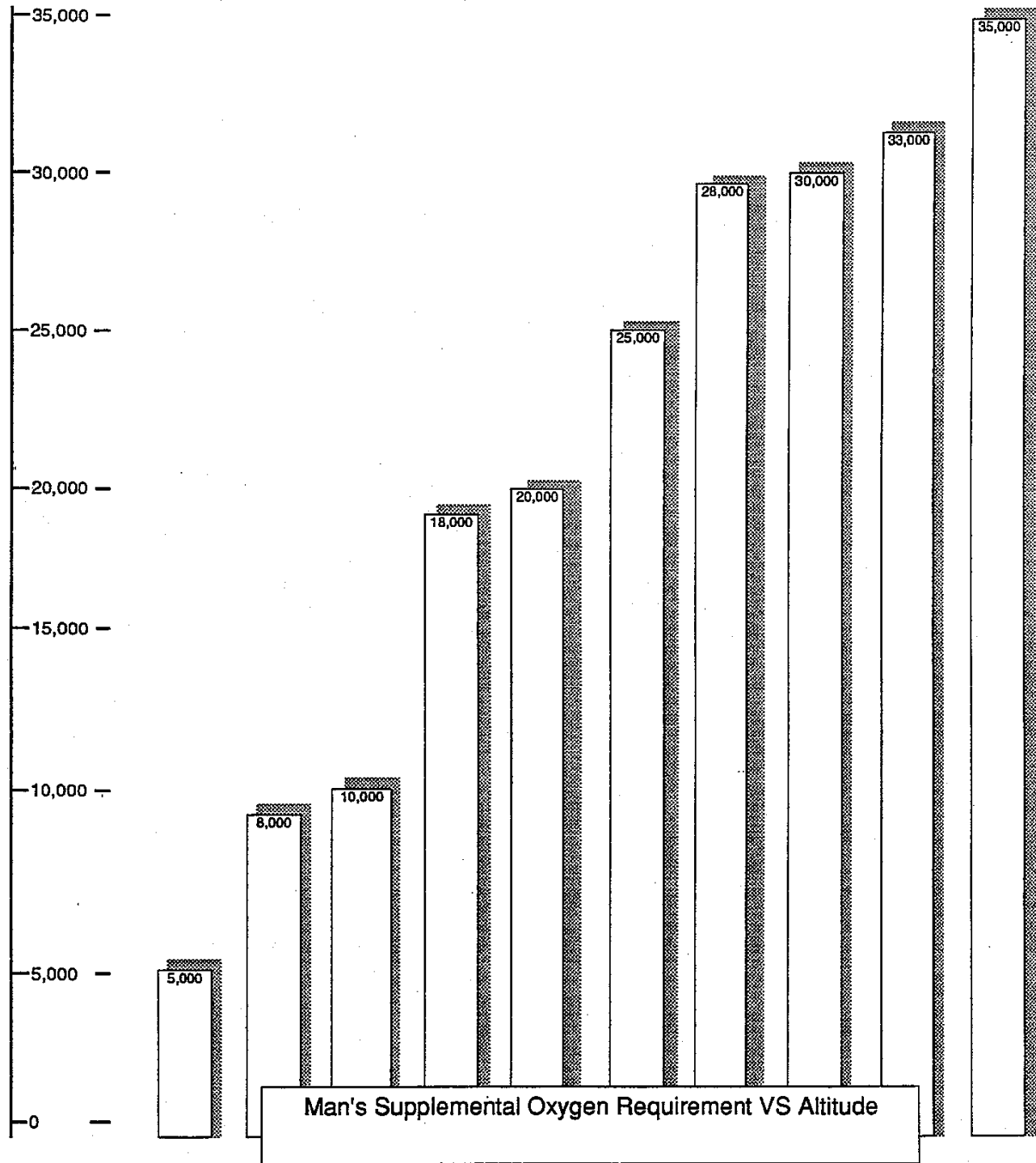


FIGURE 9-16: OXYGEN REQUIREMENT VS ALTITUDE



<u>FEET</u>	<u>REACTION</u>
35,000	Pressurized oxygen system required regardless of oxygen flow.
33,000	Pure oxygen barely adequate. 15 seconds of clear consciousness without supplemental oxygen.
30,000	Unconsciousness in two minutes without supplemental oxygen.
28,000	Immediate 100 percent loss of coordination without supplemental oxygen.
25,000	Hypoxia rate increases rapidly. Usually less than five minutes of consciousness without supplemental oxygen.
20,000	Unconsciousness can occur in as little as five to seven minutes at 20,000 feet without supplemental oxygen.
18,000	This is the half-way point in the earth's atmosphere, and the pressure is reduced to 7.34 psi and oxygen saturation in the body is only 75%. Without supplemental oxygen, hypoxia is almost immediately apparent and efficiency deteriorates quickly and drastically. Unconsciousness can occur if supplemental oxygen is not used.
10,000	Fatigue, drowsiness and sharp headaches can occur with increasing quickness if flights are made without supplemental oxygen at this and higher altitudes.
8,000	Over prolonged flights, there are measurable changes in blood pressure and respiration. Mild hypoxia can result. It is generally assumed that the normal, healthy individual is unlikely to need supplementary oxygen at and below this altitude.
5,000	No supplemental oxygen is required below 5,000 feet. Oxygen saturation at this altitude is 95%. Use of supplemental oxygen at and above 5,000 feet for night flying will benefit pilot, particularly towards end of flight. Smoking reduces visual acuity and service attitude of the individual



OPERATING TIPS

Pilots who fly above 10,000 feet should be aware of the need for special physiological training. Appropriate training is available at approximately twenty-three Air Force Bases throughout the United States for a small fee. The training is free at the NASA Center in Houston and at the FAA Aeronautical Center in Oklahoma.

Forms to be completed (Physiological Training Application and Agreement) for application for the training course may be obtained by writing to the following address:

Chief of Physiological Training, AAC-143
FAA Aeronautical Center
P.O. Box 25082
Oklahoma City, Oklahoma 73125

It is recommended that all pilots who plan to fly above 10,000 feet take this training before flying this high, and then take refresher training every two or three years.

In an effort to avoid accidents, pilots should obtain and study the safety regulated information made available in FAA publications such as regulations, advisory circulars, Aviation News, AIM, and safety aids.



CHAPTER 9 - QUIZ

1. In a standard 601P or 602P, should the differential pressure rise above 4.35 psi:
 - a. the cabin door should be unlatched.
 - b. the emergency exit will automatically open.
 - c. the safety valve will automatically release excess pressure.
 - d. a warning light will appear on the annunciator panel.

2. If loss of pressurization is experienced when the aircraft is above 21,000':
 - a. altitude should be maintained for approximately 3 to 5 minutes to allow equalization between cabin pressure and outside pressure.
 - b. an immediate descent should be initiated, and the use of oxygen begun immediately.
 - c. bleed air should be manually turned off immediately.
 - d. all cabin ventilation outlets should be fully opened.

3. The standard pressurization system with the sea level controller installed will:
 - a. permit pressurization on the ground as soon as the door seal is inflated.
 - b. make a sea level cabin possible up to 9,100', providing 19" MAP is maintained.
 - c. maintain a cabin altitude of approximately 3,500' if the aircraft is at 14,000' at normal cruise power settings.
 - d. sustain a sea level cabin if the aircraft is at 18,000' with a MAP setting of 20".



4. Cabin pressurization of 1,000' may be maintained at 10,000' with power settings of: (602P)
- a. 18" MAP/2,000 RPM.
 - b. 22" MAP/2,000 RPM.
 - c. 15" MAP/2,300 RPM.
 - d. None of the above.



FOR TRAINING PURPOSES ONLY



10

10. WEIGHT & BALANCE

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 10

WEIGHT & BALANCE

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CHAPTER 10

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GENERAL

In order to achieve the performance and flying characteristics which are designed into the airplane, it must be flown with the weight and center of gravity (C.G.) position within the approved operating range (envelope). Although the airplane offers a flexibility of loading, it cannot be flown with the maximum number of adult passengers, full fuel tanks and maximum baggage.

Additionally, single pilot operations with baggage compartment loading may shift the C.G. beyond the aft limit. With this loading flexibility comes responsibility. The pilot must ensure the airplane is loaded within the loading envelope prior to departure and that the airplane will remain within the loading envelope until landing.

The various Aerostar models have gross weights from 5,500 lbs to 6,315 lbs. Additionally, a Gross Weight Increase Option is available from the manufacturer which increases the maximum gross weight to 6,850 lbs.

Today there are many tools to assist the pilot making it very easy to check weight and balance. Spreadsheets, cell phone apps, iPad apps, etc. all are

readily available. However, the pilot must ensure the correct information is loaded for their use to be meaningful.

Loading outside the envelope carries consequences for any aircraft. An overloaded airplane will not take off, climb or cruise as well as a properly loaded one. The heavier the airplane is loaded, the less climb performance it will have.

Center of gravity is a determining factor in flight characteristics. If the C.G. is too far forward in any airplane, it may be difficult to rotate for takeoff or landing, or properly trim for approach to landing. If the C.G. is too far aft, the airplane may rotate prematurely on takeoff or tend to pitch up during climb. Longitudinal stability will be reduced. This can lead to inadvertent stalls and even spins; and spin recovery may become more difficult or even impossible as the center of gravity moves aft of the approved limit.

CAUTION

Some combinations of optional equipment, particularly with electric air conditioning, may require additional weight in the cabin when operating with light cabin load, such as pilot only, to prevent the C.G. from being aft of the approved limit.



A properly loaded airplane, however, will perform as intended. Before the airplane is delivered, it is weighed, and a basic empty weight and C.G. location is computed (basic empty weight consists of the standard empty weight of the airplane plus the optional equipment). Using the basic empty weight and C.G. location, the pilot can easily determine the weight and C.G. position for the loaded airplane by computing the total weight and moment and then determining whether they are within the approved envelope.

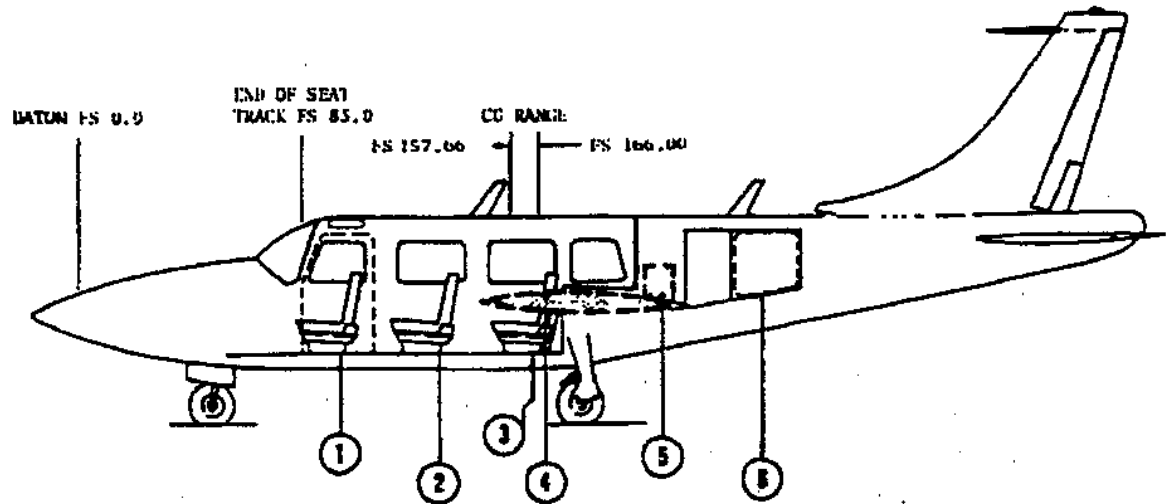
The basic empty weight and C.G. location are recorded in the Weight and Balance Data Form and the Weight and Balance Record. The current values should always be used. Whenever new equipment is added or any modification work is done, the mechanic responsible for the work is required to compute a new basic empty weight and C.G. position and to write these in the Aircraft Log Book and the Weight and Balance Record. The owner should make sure that it is done.

A weight and balance calculation is necessary in determining how much fuel or baggage can be loaded so as to keep

within allowable limits. Check calculations prior to adding fuel to insure against improper loading. Following this is the method for computing takeoff and landing weight and C.G. This is required by FAR 91.103 for proper preflight planning of the flight. Pilots must show the aircraft will be within the published W&B envelope of any particular aircraft.

Aircraft modified by Aerostar Aircraft Corporation often have W&B tables published that differ from the original aircraft manufacturer. These new W&B tables take precedent to older OEM published tables.

Aircraft operated on a FAA Part 135 certificate require the aircraft to be reweighed every three years or if a major airframe modification is performed on the aircraft. It is recommended that an aircraft be reweighed after ten years regardless of the equipment installed to ensure that the aircraft shows the proper empty weight and CG limitations for its current configuration. Like human beings as we age the aircraft tends to pick up weight with the addition of new equipment and debris left within the aircraft as it used on a routine basis.



	<u>NOMINAL</u>	<u>LOADING RANGE</u>
1 PILOT-COPILOT - ARM	96.0 in.	94.0 - 102.0 in.
2 FRONT PASSENGERS - ARM	132.0 in.	127.0 - 135.0 in.
3 REAR PASSENGERS - ARM	165.0 in.	161.0 - 165.0 in.
4 WING FUEL - ARM	170.0 in.	—
5 FUSELAGE FUEL - ARM	213.0 in.	—
6 BAGGAGE - ARM	250.0 in.	224.0 - 265.0 in.

FIGURE 10-1: LOADING STATIONS DIAGRAM



WEIGHT AND CENTER OF GRAVITY LIMITATIONS-600A

Maximum Ramp Weight	5525 lbs
Maximum Takeoff Gross Weight	5500 lbs
Maximum landing Gross Weight.....	5500 lbs
Fuel (165.5 gals usable)	993 lbs
Oil (6gals)	45 lbs
Baggage Compartment	240 lbs

CENTER OF GRAVITY

Forward	157.66	to 4600 lbs *
.....	159.58	@5500 lbs (Max Takeoff)*
.....	159.63	@5525 lbs (Max Ramp)*
Aft	167.88	@3400 lbs *
.....	167.88	@5500 lbs (Max Takeoff)*
.....	167.88	@5525 lbs (Max Ramp)*

* Straight line variation between points



WEIGHT AND CENTER OF GRAVITY LIMITATIONS-601B/601P

Maximum Ramp Weight.....	6025 lbs
Maximum Takeoff Gross Weight	6000 lbs
All weight in excess of 5900 lbs must be fuel in the wings	
Maximum landing Gross Weight	6000 lbs
Fuel (165.5 gals usable)	993 lbs
Oil (6gals).....	45 lbs
Baggage Compartment	240 lbs

CENTER OF GRAVITY

Forward	157.66	to 4600 lbs *
.....	160.67	@6000 lbs (Max Takeoff)*
.....	160.72	@6025 lbs (Max Ramp)*
Aft	167.88	@3600 lbs *
.....	167.88	@6000 lbs (Max Takeoff)*
.....	167.88	@6025 lbs (Max Ramp)*

* Straight line variation between points



WEIGHT AND CENTER OF GRAVITY LIMITATIONS-602P

Maximum Ramp Weight.....	6029 lbs
Maximum Takeoff Gross Weight.....	6000 lbs
All weight in excess of 5900 lbs must be fuel in the wings	
Maximum landing Gross Weight	6000 lbs
Fuel (165.5 gals usable).....	993 lbs
Oil (6gals).....	45 lbs
Baggage Compartment	240 lbs

CENTER OF GRAVITY

Forward	157.66	to 4600lbs *
.....	160.67	@6000 lbs (Max Takeoff)*
.....	160.73	@6000 lbs (Max Ramp)*
Aft	166.00	@3600 lbs *
.....	166.00	@6000 lbs (Max Takeoff)*
.....	166.00	@6029 lbs (Max Ramp)*

* Straight line variation between points



WEIGHT AND CENTER OF GRAVITY LIMITATIONS - 700P

Maximum Ramp Weight..... 6356 lbs

Maximum Takeoff Gross Weight..... 6315 lbs

All weight in excess of 6050 lbs must be fuel in the wings

Maximum Landing Gross Weight..... 6000 lbs

Fuel (165.5 gals usable) 993 lbs

Oil (6 gals) 45 lbs

Baggage Compartment..... 240 lbs

CENTER OF GRAVITY

Forward	 157	to 5400 lbs
	 161.7	@ 6315 lbs (Max. Takeoff)
Aft	 161.7	@ 6356 lbs (Max. Ramp)
	 167.88	@ 6315 lbs (Max. Takeoff)
	 167.88	@ 6356 lbs (Max. Ramp)

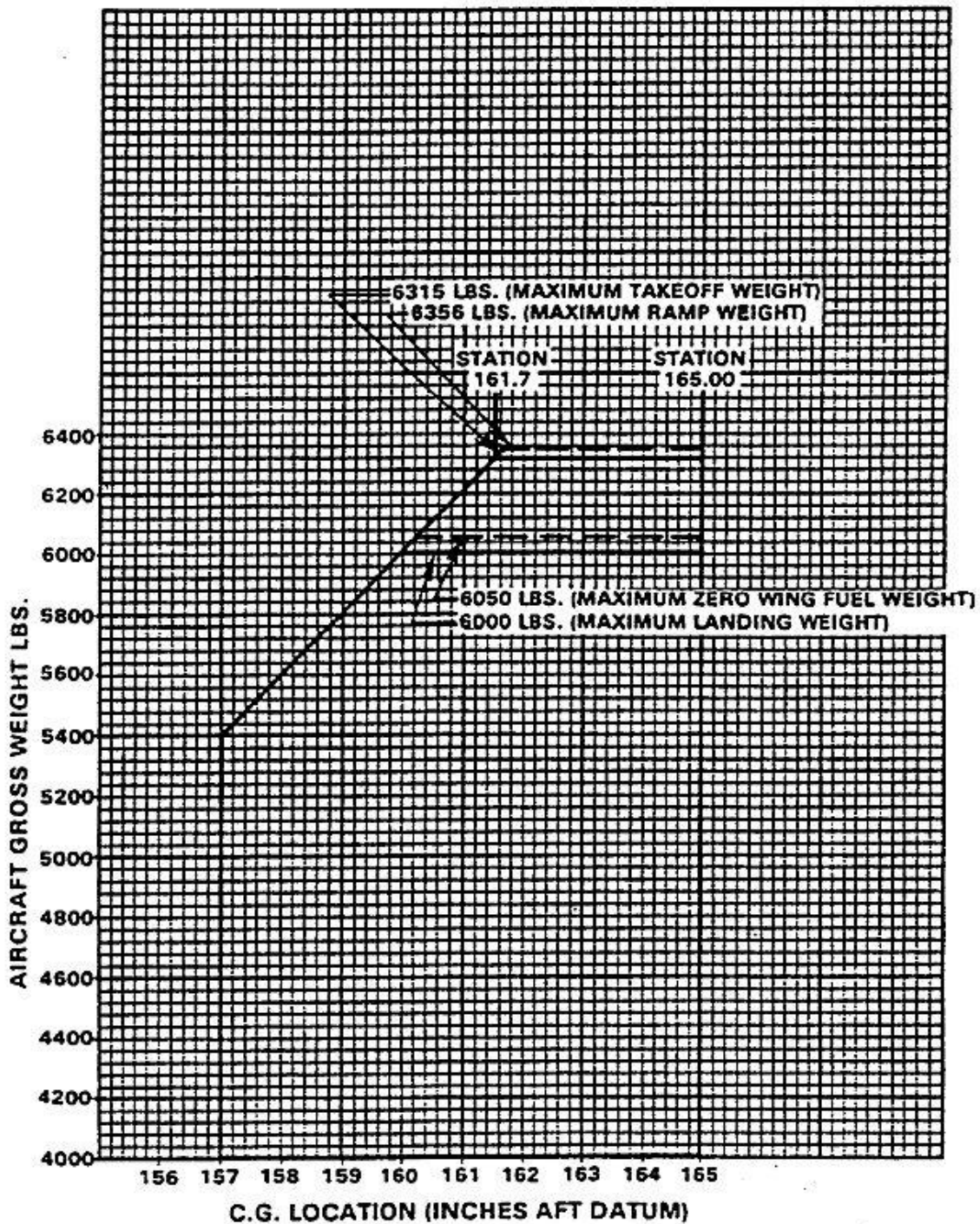


FIGURE 10-2: 700P LOADING CHART



OCCUPANTS

Weight (lbs)	Pilot-Copilot Arm 96 in	Each front passenger Arm 132 in. Moment 1000 lb. in.	Each rear passenger Arm 165 in.
90	8.64	11.88	14.85
100	9.60	13.20	16.50
110	10.56	14.52	18.15
120	11.52	15.84	19.80
130	12.48	17.16	21.45
140	13.44	18.48	23.10
150	14.40	19.80	24.75
160	15.36	21.12	26.40
170	16.32	22.44	28.05
180	17.28	23.76	29.70
190	18.24	25.08	31.35
200	19.20	26.40	33.00
210	20.16	27.72	34.65
220	21.12	29.04	36.30
230	22.08	30.36	37.95

WING FUEL (@ 6.0 lbs/gal)

GALLONS	WEIGHT (lbs)	MOMENT 1000 lb.-in.(lbs)	GALLONS	WEIGHT	MOMENT 1000lb-in.
5	30	5.10	70	420	71.40
10	60	10.20	75	450	76.50
15	90	15.30	80	480	81.60
20	120	20.40	85	510	86.70
25	150	25.50	90	540	91.80
30	180	30.60	95	570	96.90
35	210	35.70	100	600	102.00
40	240	40.80	105	630	107.00
45	270	45.90	110	660	112.20
50	300	51.00	115	690	117.30
55	330	56.10	120	720	122.40
60	360	61.20	125	750	127.50
65	390	66.30	130.	780	132.60

FIGURE 10-3: LOADING TABLE



FUSELAGE FUEL (@ 6.0 lbs/gal)

GALLONS	WEIGHT (lbs)	MOMENT 1000 lb.-in.(lbs)	GALLONS	WEIGHT	MOMENT 1000 lb.-in.
5	30	6.39	30	180	38.34
10	60	12.78	35	210	44.73
15	90	19.17	40	240	51.12
20	120	25.56	41.5	249	53.04
25	150.	31.95			

BAGGAGE (Arm 250.0 in.)

GALLONS (lbs)	MOMENT 1000 lb.-in	WEIGHT (lbs)	MOMENT 1000 lb.-in.
10	2.50	140	35.00
20	5.00	150	37.50
30	7.50	160	40.00
40	10.00	170	42.50
50	12.50	180	45.00
60	15.00	190	47.50
70	17.50	200	50.00
80	20.00	210	52.50
90	22.50	220	55.00
100	25.00	230	57.50
110	27.50	240	60.00
120	30.00		
130	32.50		

FIGURE 10-4: LOADING TABLE (cont.)



SAMPLE PROBLEM

Consider an airplane with a licensed empty weight of 4145 lbs, a moment of 678,930 lb.-in., 24 qts of oil, a pilot, a copilot, two front seat passengers, two rear seat passengers, full fuel in the fuselage tank (41.5 gals) and fuel in the wing tanks (97.2 gals). The datum for the moments is FS 0.00.

SOLUTION

Find the corresponding weights and moments for each loaded item from the appropriate Loading Table, and enter them on the computation guide below. After computation, enter Points I and II into the Center of Gravity Weight and Moment Envelope. You will notice Point II falls outside of the forward CG limit. Therefore, the loading must be rearranged.

ITEM	WEIGH	MOMENT
Aircraft licensed empty weight and moment (from aircraft W & B report)	4145	678.93
Pilot (arm 96.0 in.)	170	16.32
Copilot (arm 96.0 in.)	170	16.32
Front seat passengers (arm 132 in.)	340	44.88
Rear seat passengers (arm 165 in.)	340	56.10
Baggage (maximum 240 lbs)	- - - -	- - - -
Wing fuel (97.2 gals)	583	99.11
Fuselage fuel (41.5 gals)	249	53.04
Point I most rearward CG location (takeoff weight)	6000	965.34
Subtract fuel listed above		
Wing 97.2 gals.	-583	-98.26
Fuselage 41.5 gals	-249	-53.04
Add minimum fuel reserve (24.6 gals)	+146	+31.52
Point II most forward CG location (landing weight)	5311	844.92

Note: Takeoff weight must not exceed 6000 lbs gross weight.

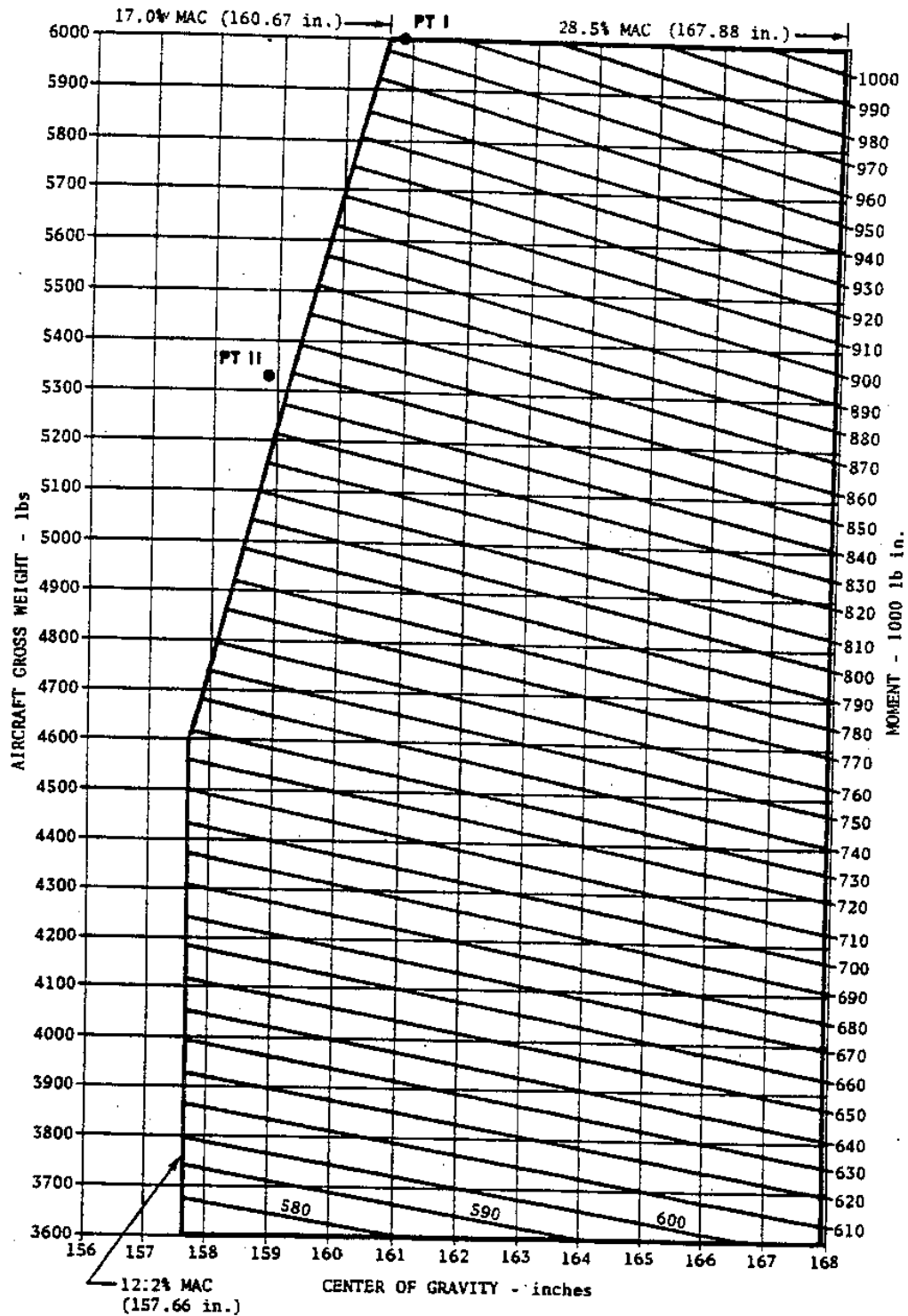


FIGURE 10-5: WEIGHT AND BALANCE ENVELOPE (601P)



Using the following tables and Center of Gravity Weight and Moment Envelope, fill in the moments and determine whether or not the aircraft will be within limitations for both takeoff and landing.

Takeoff C.G. and gross weight: _____ lbs and _____”.

Landing C.G. and gross weight: _____ lbs and _____”.

The aircraft is/is not within limits for takeoff. (Circle one)

The aircraft is/is not within limits for landing (Circle one)

ITEM	WEIGHT	MOMENT
Aircraft licensed empty weight and moment (from aircraft W & B report)	4160	681.37
Pilot (arm 96.0 in.)	170	
Copilot (arm 96.0 in.)	170	
Center seat passengers (arm 132 in.)	240	
Rear seat passengers (arm 165 in.)	350	
Baggage (maximum 240 lbs)	0	
Wing fuel (110 gals)	660	112.20
Fuselage fuel (41.5 gals)	-249	53.04
Point I most rearward GG location (takeoff weight)		
Subtract fuel listed above		
Wing 110 gals.	-660	-112.20
Fuselage 41.5 gals	-249	-53.04
Add minimum fuel reserve (25.0 gals)	+150	+30.66
Point II most forward GG location (landing weight)		

Note: Takeoff weight must not exceed 6000 lbs gross weight.

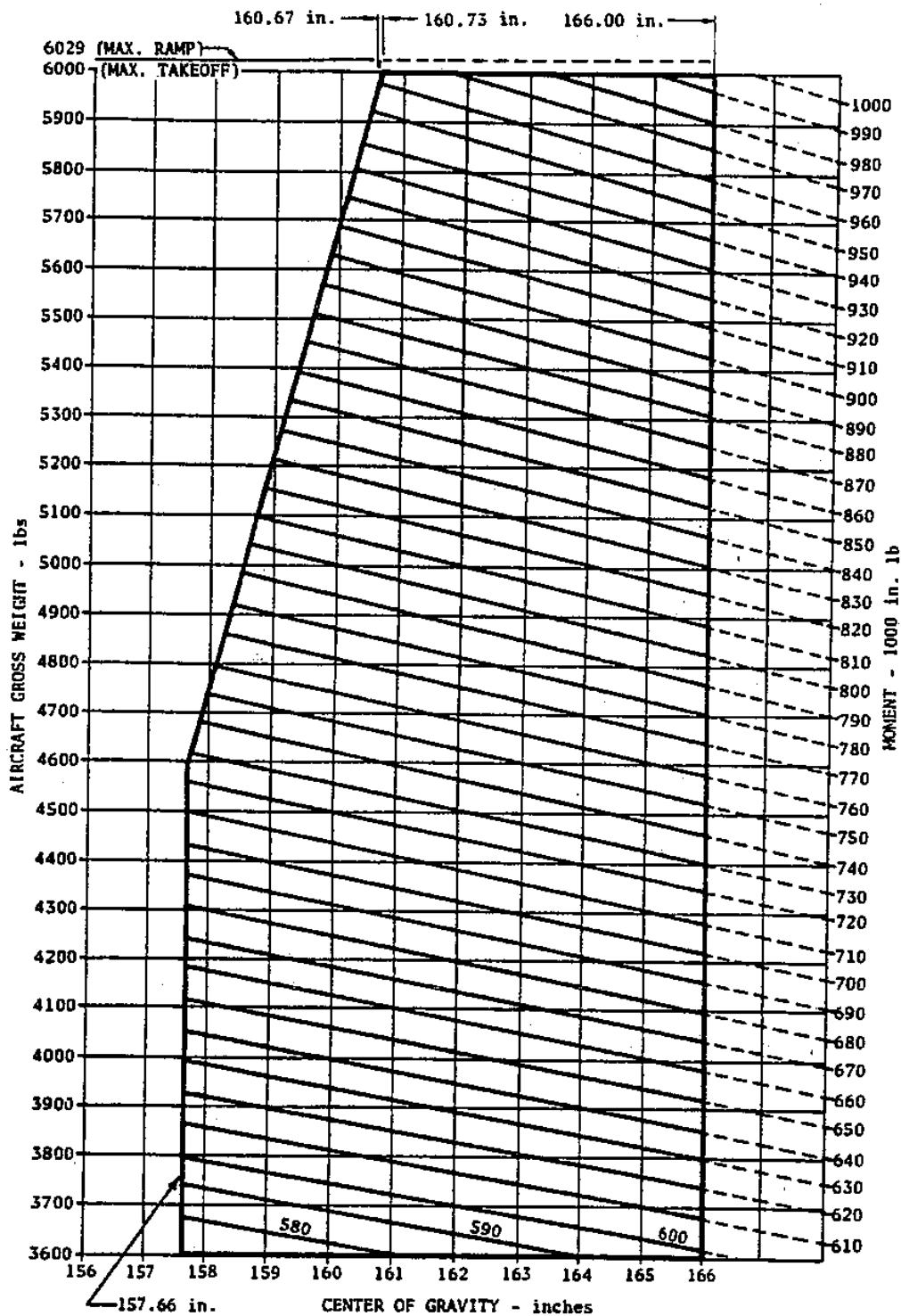


FIGURE 10-6: WEIGHT AND BALANCE ENVELOPE (602P)



CHAPTER 10 - QUIZ

1. Maximum Landing and Takeoff Weight is limited to _____ for the 600, and _____ for the 601, 601P, and 602P.
 - a. 5500 and 6000 lbs.
 - b. 5500 and 5700 lbs.
 - c. 6000 and 6200 lbs.
 - d. 5700 and 6000 lbs.

2. All weight in the 601B, 601P, and 602P in excess of _____ lbs. must be fuel in the wings.
 - a . 5500
 - b . 5900
 - c . 4000
 - d . 4400

3. If the aircraft is within gross weight and C.G. and loaded properly:
 - a. as fuel is burned, a rapid rearward movement of the C.G. may occur prior to landing.
 - b. a flight of at least 15 minutes is required to lower the full gross takeoff weight to a legal landing gross weight.
 - c. in planning the landing C.G., care must be taken to use the average weight of 170 lbs. per passenger rather than actual weights.
 - d. C.G. will not move appreciably during burn off, or out of the C.G. envelope.

4. Maximum allowable weight in the baggage compartment is:
 - a. 200 lbs"
 - b. 240 lbs.
 - c. 390 lbs.
 - d. 350 lbs.





11

11. EMERGENCY PROCEDURES



FOR TRAINING PURPOSES ONLY



CHAPTER 11

EMERGENCY PROCEDURES

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ENGINE INOPERATIVE PROCEDURES

DETECTING DEAD ENGINE

Loss of thrust.

Nose of aircraft will yaw in direction of dead engine (with coordinated controls).

ENGINE SECURING PROCEDURE (feathering procedure)

ThrottleCLOSE
Prop Control.....FEATHER (1000 RPM min.)
Mixture idle cut-off
Boost pump.....OFF
Fuel selectorOFF
Magneto switchOFF
Cowl flap closed on inoperative engine, as
required on operative engine (700P & Superstar I)
AlternatorOFF
Bleed airpress to OFF
Aux. hydraulicARMED
Prop sync (if installed.....MANUAL
Electrical loadreduced

Trim..... as required (3° to 5° bank
toward operative engine -ball 1/2 to 1 out)

Crossfeed (level coordinated
flight only)as required



ENGINE FAILURE DURING TAKEOFF (Before lift-off)

If sufficient runway remains for a safe stop:

Throttles CLOSE immediately

Brakesas required

If insufficient runway remains for a safe stop:

Throttles CLOSE immediately

Brakes maximum (while runway remains)

Mixtures idle cut-off

Fuel selectorsOFF

Magneto switchesOFF

BatteryOFF

Directional control..... maintain, maneuver to
avoid obstacles

Crew and passengers evacuate



ENGINE FAILURE DURING TAKEOFF (After lift-off)

If sufficient landing area remains for a safe stop:

Throttles..... CLOSE
Gearcheck DOWN
Flaps full DOWN
Airspeed establish 95 KIAS
Brakes.....as required after touchdown

WARNING

Negative climb performance may result from engine failure, occurring after lift-off and before the landing gear and flaps have been retracted, the failed engine propeller feathered and the VYSE speed obtained. One engine inoperative climb performance is also affected by aircraft weight, density altitude and other ambient conditions. Refer to One Engine Inoperative Climb Chart, for clean configuration climb performance.

If insufficient landing area remains for a safe stop, and the decision is made to abort the takeoff:

Throttles CLOSE immediately
Gear DOWN (terrain permitting)
Flaps full DOWN
Airspeed 95 KIAS
Mixtures idle cut-off
Fuel selectors OFF
Magnetos switches OFF
Battery OFF



Land avoiding obstacles.

Crew and passengers.....evacuate

If insufficient landing area remains for a safe stop, and the decision is made to continue the takeoff:

Lateral/directional controlmaintain

Airspeed accelerate to 101 KIAS

Mixture controls full RICH

Prop controls full FORWARD

Throttlesmax. power

Aux. hydraulic ON

Gear UP

Flaps.....(in steps) UP

Inoperative engine determine

Prop control (inoperative engine).....FEATHER

AirspeedVYSE after all obstacles
have been cleared

Trim as required

Climb..... straight ahead (avoiding obstacles and attain sufficient altitude to
execute One Engine Inoperative Landing Procedure)

Inoperative engine..... secure (Refer to Engine Securing Procedure)

Land as soon as practical at nearest suitable airport.



CROSSFEED (X-FEED) WITH INOPERATIVE ENGINE

CAUTION

Fuel system limitations outlined in Chapter 1 must be adhered to for crossfeed_ operation. When either X-FEED selector is in the X-FEED position, the selected engine is obtaining its total fuel supply from the opposite wing fuel tank. Frequently monitor selected wing fuel tank quantity.

Level coordinated flightmaintain

Fuel selector (operative engine) X-FEED

Fuel quantity (selected wing tank)monitor frequently

After utilizing required fuel from inoperative engine wing fuel tank and prior to initiating descent, continue as follows:

Fuel Selector (operative engine)..... ON



ONE ENGINE INOPERATIVE LANDING

Inoperative engine secure..... (Refer to Engine Securing Procedure)

Altimeterset

Seat belts/harnesses.....secure

Boost pump (operative engine) ON

Mixture (operative engine) full RICH

Fuel selector (operative engine) ON

X-FEED annunciator light out

Prop control (operative engine)..... full FORWARD

Flaps..... 20° DOWN, do not extend more than 20° flaps

Airspeedmaintain VYSE minimum

Throttle (operative engine) as required

When landing is assured:

Gear DOWN

Gear down lights3 green ON

Airspeed (approach)

Flaps UP 111 KIAS

Flaps 20° DOWN..... 104 KIAS

Throttle (operative engine) retard slowly and flare
for landing

Directional control maintain as power is reduced (airplane will
yaw into operative engine)

Braking as required



ONE ENGINE INOPERATIVE GO-AROUND

WARNING

Under certain combinations of aircraft weight, configuration, ambient conditions, and airspeed, a go-around attempt may result in negative climb performance.

Avoid if possible, but if necessary:

Airspeedmaintain climb speed
Best angleVXSE
Best rateVYSE
Mixture (operating engine)..... full RICH
Prop control (operating engine) full FORWARD
Throttle (operating engine)max. power
Auxiliary hydraulic..... ARMED
Gear UP
Flaps(in steps) UP
Trim..... as required
Cowl flap (operating engine) (700P only) as required



ENGINE FIRE ON GROUND

(Engine start, taxi and takeoff with sufficient distance remaining to stop)

Fire warning annunciator light and horn will activate (if installed).

If airborne after takeoff and sufficient distance remains to land and stop the airplane, execute "Engine Failure During Takeoff (After lift-off)" procedures and continue as follows:

Throttles..... CLOSE

Brakes as required

Mixtures..... idle cut-off

Fuel selectors..... OFF

Boost pumps OFF

Magneto switches OFF

Hydraulic shutoff valve (right engine
fire only) CLOSE

Bleed air (both)..... press to OFF

Cabin door seallift guard, press to DEFLATE

Alternators..... OFF

Radiocall for assistance

Battery OFF

Crew and passengersevacuate

External fire extinguishers.....use as required



ENGINE FIRE IN FLIGHT

Fire warning annunciator light and horn will activate (if installed).

Engine with firesecure (Refer to Engine Securing Procedure)

Cowl flap... open

Hydraulic shutoff valve (right engine fire only) CLOSE

If fire persists:

Airspeedincrease in attempt to blow out fire

Radionotify ground personnel at airport of intended landing

Land at nearest suitable airport following "One Engine Inoperative Landing" procedures.

After landing, continue as follows:

Operating engine:

Mixtureidle cut-off

Fuel selector OFF

Boost pump OFF

Magneto switch OFF

Alternator OFF

Cabin door seallift guard, press to DEFLATE

Battery OFF

Crew and passengersevacuate

External fire extinguishersuse as required



ENGINE ROUGHNESS/DECREASING MANIFOLD PRESSURE

Conduct each step as an individual action item for affected engine until cause can be determined.

ENGINE ROUGHNESS

- Boost pump ON
- Engine instruments check
- Fuel selector (with X-FEED selected) ON
- Mixture control adjust as required (within permissible limits)
- Magnetos check (not above 65% BHP)

DECREASING MANIFOLD PRESSURE

- Prop control (cruise flight) select higher RPM
- Bleed air/Alternate air press OFF/pull OPEN (except 700P)

CAUTION

Should it become necessary to turn OFF both bleed air switches, the cabin will depressurize at an uncontrolled rate.

Increase or decrease altitude to depart from induction icing conditions.



ENGINE OVERHEAT

Boost pump ON
Mixture..... enrich
Powerreduce
Cowl flap (700P only)open
Airspeed increase (if altitude permits)

LOSS OF OIL PRESSURE

Enginesecure (Refer to Engine Securing Procedures)

PROPELLER/GOVERNOR MALFUNCTIONS

RPM OVERSPEED

Throttle decrease MAP
Airspeedreduce as feasible until RPM
is at or below red line

If prop speed cannot be kept below red line:

Prop control.....Feather

CAUTION

If propeller will not feather, do not shut down engine.

Engine secure (Refer to Engine Securing Procedure) if prop will feather



ELECTRICAL SYSTEM MALFUNCTIONS

ELECTRICAL FIRE

CAUTION

If pressurized, the following procedures will result in an immediate loss of pressurization and the cabin altitude will rise at an uncontrolled rate until approximately equal to the airplane's altitude. All electrically powered systems, including annunciator lights, will be inoperative while battery and alternators are off.

If an electrical fire occurs at an altitude where supplemental oxygen is required, conduct "Emergency Descent" procedure. Use supplemental oxygen only if flames and heat are not present.

Flashlight (at night) locate
Battery.....OFF
Alternators (both)OFF
Circuit breakerscheck and pull
All electrical switchesOFF
Bleed air (both)press to OFF
Dump valve lift guard, press to DUMP
Battery..... ON
Alternators..... ON
Circuit breaker and switch for each unit (one at a time) ON



NOTE

Bleed air and dump valve switches will be electrically deactivated, but depressing switches will position them such that they will activate to above positions when electrical power is restored.

Circuit breaker and switch for failed unitOFF

Prior to re-pressurizing cabin, allow cabin to purge of smoke and fumes. Select and obtain a cabin altitude on cabin altitude control equal to or higher than flight altitude.

Dump valvelift guard, press to NORMAL

Bleed air (both)press to ON

SINGLE ALTERNATOR FAILURE

Failed alternatordetermine

NOTE

The appropriate alternator warning light should illuminate, however, certain multiple failures may not annunciate. These failures may be determined by monitoring the voltammeter.

Failed alternatorOFF

Electrical load reduce below 55 amps

Circuit breaker (failed alternator) IN

If circuit breaker was IN, or resets satisfactorily:

Failed alternator ON

Volt-ammeter check



Electrical load increase as required

If circuit breaker will not reset, or if alternator will not re-excite:

Failed alternatorOFF

Electrical load maintain at minimum required
(below 55 amps (60 amps for 700P))

DUAL ALTERNATOR FAILURE (Battery power remains)

NOTE

The alternator warning lights should illuminate, however, certain multiple failures may not annunciate. These failures may be determined by monitoring the volt-ammeter.

Alternators (both).....OFF

Electrical loadreduce

Alternator circuit breakers (both) IN

If alternator circuit breakers were IN, or if either resets satisfactorily, continue as follows for alternators) with circuit breaker(s) IN:

Alternators (one at a time) ON

Volt-ammeter check

If one or both alternators re-excite:

Electrical load increase as appropriate

If neither circuit breaker resets or if neither alternator re-excites, continue as follows:

Electrical load minimum (only battery power remains)

Land as soon as practical.



COMPLETE ELECTRICAL FAILURE

NOTE

There will be no warning light annunciations with a complete electrical failure and, if pressurized, the cabin will depressurize.

Flashlight (at night) locate

Electrical load reduce by turning OFF all high amperage electrical equipment, including radio master

Alternators (both)OFF

Battery (BATT) circuit breakerreset

If battery circuit breaker fails to reset:

Alternator circuit breakers reset one only

Alternator with circuit breaker IN ON

After one alternator is re-excited, leave other alternator OFF and continue as follows:

Electrical loadincrease only as required

Land as soon as practical.

If battery circuit breaker resets:

Battery check ON

Nonessential avionics.....OFF

Radio master ON as required

Alternator circuit breakers reset one only



RADIO MASTER SWITCH/RELAY FAILURE

- Avionics (controlled by radio master)all OFF
- Auxiliary radio master (AUX RADIO) Lift guard, ON
- Avionics (controlled by radio master) ON only as required

CAUTION

The auxiliary radio master switch has a maximum rating of 15 amps. Amperage above this value could also fail this switch.

LOSS OF ELECTRICAL POWER TO SYNCHROPHASER (If installed)

- Prop control.....manually set

CAUTION

The auxiliary radio master switch has a maximum rating of 15 amps. Amperage above this value could also fail this switch.



HYDRAULIC SYSTEM MALFUNCTIONS

EMERGENCY GEAR EXTENSION (Loss of hydraulic system pressure)

Airspeedestablish below 130 KIAS

Gear handle DOWN

Gear down lights:.....3 green ON

NOTE

Flap extension is not possible without hydraulic system pressure. If flaps are desired, they must be extended with remaining hydraulic system pressure prior to extending landing gear. Place flap handle in NEUTRAL position after flap extension. Nose wheel steering will be inoperative.

WARNING

Unless flap handle is returned to NEUTRAL, flaps will retract when landing gear is emergency extended.



EMERGENCY GEAR EXTENSION (With hydraulic system pressure)

NOTE

The following procedures will cause the hydraulic pump drive shaft to shear.

- Aux. hydraulicOFF
 - Airspeed..... establish below 130 KIAS
 - Gear handleselect DOWN position
 - Hydraulic shutoff valveCLOSE
 - Flap handle.cycle DOWN, UP, DOWN, etc.
depleting hydraulic pressure
 - Gear down lights 3 green ON
- Make flaps UP landing.
- Airspeed (approach).....111 KIAS
 - Taxi avoid as feasible

CAUTION

No hydraulic downlock will exist for landing gear.

NOTE

The nose wheel steering will be inoperative.



ASYMMETRICAL FLAP CONDITION

The indication of an asymmetrical flap condition is a rolling tendency towards the least extended flap.

Flaps extended (Regardless of flap setting):

Flap handleselect NEUTRAL, if rolling tendency increases, select UP

Flaps in transit (Extending or retracting):

Flap handleselect NEUTRAL, if rolling tendency reverses, select UP For either of the above conditions, continue as follows:

Lateral control maintain with opposite aileron

Airspeed decrease as required to reduce asymmetric force

Flap handleselect NEUTRAL after regaining lateral control

Airspeedestablish up to 130 KIAS if lateral control allows

Land as soon as practical, using normal procedures, except maintain an approach speed commensurate with least extended flap setting.



HYDRAULIC PRESSURE LOSS (Above 500 psi)

A partial loss of hydraulic system pressure is probably caused by a failure of the right engine driven hydraulic pump or loss of accumulator charge.

- Flap handle.....select NEUTRAL
- Aux. hydraulic.....ARM
- Hydraulic Pressuremonitor

If hydraulic pressure does not stabilize at or above 500 psi, continue with procedures given for "Hydraulic Pressure Loss (Below 500 psi)".

If hydraulic pressure stabilizes at or above 500 psi, continue as follows:

Land as soon as practical at nearest suitable airport, following normal "Before Landing" procedures, except as follows:

- Flaps.....as desired, return handle to NEUTRAL

WARNING

Unless flap handle is returned to NEUTRAL, flaps will retract when landing gear is emergency extended.

NOTE

Reduction of hydraulic pressure below approximately 450 psi, by actuating flaps prematurely, may result in landing gear beginning to free-fall extend

- Gear.....DOWN

CAUTION

Less than normal hydraulic downlock will exist for landing gear



HYDRAULIC PRESSURE LOSS (Below 500 psi)

Continuously decreasing or totally depleted hydraulic system pressure indication is probably caused by a system failure rather than a failure of the right engine driven hydraulic pump.

Flap handle immediately select NEUTRAL

Aux. hydraulic..... ARM, if pressure does not stabilize at 900 to 1050 psi, turn

NOTE

If the failure is the right engine driven hydraulic pump, the aux. hydraulic pump will increase and stabilize pressure at 900 to 1050 psi

aux. hydraulic OFF

If hydraulic pressure stabilized at 900 to 1050 psi by means of the auxiliary hydraulic pump, continue with Hydraulic Pressure Loss (Above 500 psi)".

If auxiliary hydraulic pump activation did not stabilize hydraulic pressure at 900 to 1050 psi, continue as follows:

Airspeed..... establish at or below 153 KIAS

CAUTION

As the hydraulic pressure decreases below approximately 450 psi, the landing gear will start to free-fall extend.

Land as soon as practical at nearest suitable airport, following normal "Before Landing" procedures, except as follows:

Flapsas desired/available – return handle to NEUTRAL



NOTE

Flaps may or may not extend, depending on extent and nature of hydraulic pressure loss. If flap extension occurs, the landing gear will not remain retracted.

WARNING

Unless flap handle is returned to NEUTRAL, flaps will retract when landing gear is emergency extended.

Gear handle DOWN

Airspeed (approach)

Flaps UP111 KIAS

Flaps 20° DOWN104 KIAS

Flaps FULL DOWN95 KIAS

Taxiuse differential power/brakes
as nose wheel steering will
be inoperative

CAUTION

No hydraulic downlock will exist for landing gear.



FUEL SYSTEM MALFUNCTIONS

FUEL PUMP FAILURE IN FLIGHT (Engine driven) Affected engine:

Boost pumpON

Mixturefull RICH

NOTE

If fuel starvation occurs before boost pump is turned ON, the engine will stop running. Engine will restart within a few seconds after boost pump is turned ON. Retard throttle to idle position until fuel pressure is restored to normal, before advancing power.

After engine regains normal power:

Mixturereset as required

NOTE

If both engine driven fuel pump and boost pump fail, the engine will be inoperative. Perform "Engine Securing Procedure (Feathering Procedure)" and conduct "One Engine Inoperative Landing" procedure at nearest suitable airport.



LOW FUEL WARNING LIGHT ILLUMINATED (12 gallons or less in fuselage tank)

WARNING

Do not use X-FEED for descent and landing.

CAUTION

When the low fuel warning light first illuminates continuously, there is a maximum of 12 gallons usable fuel remaining in the fuselage tank. THERE MUST BE FUEL IN THE FUSELAGE TANK TO ENSURE AN UNINTERRUPTED ENGINE FUEL SUPPLY.

If an immediate landing is feasible or fuel does not remain in both wing tanks, proceed as follows:

- Boost pumps (both) ON
- Fuel selectors (both) ON
- Execute a landing at nearest suitable area with fuel remaining.

If an immediate landing is not feasible and fuel remains in both wing tanks, proceed as follows:

- Level coordinated flight.....maintain
- Boost pumps (both) ON
- Power.....reduce to maximum range
- Wing fuel quantities (both)..... determine
- Fuel selectors (both)X-FEED

At first indication of fuel pressure drop and/or prior to initiating descent, continue as follows:

- Fuel selectors (both)ON



Execute a landing at nearest suitable landing area with fuel remaining.

PRESSURIZATION SYSTEM MALFUNCTION

DIFFERENTIAL PRESSURE ABOVE 4.45 psi OR STRUCTURAL FAILURE OCCURS OR APPEARS IMMINENT.

Dump valvelift guard, press to DUMP
Descent..... initiate

NOTE

If cabin does not completely depressurize, lift guard on cabin door seal switch and press to DEFLATE.

Land as soon as possible if actual or imminent structural failure is suspected.

CABIN AIR CONTAMINATION

CAUTION

If pressurized, the following procedures will result in an immediate loss of pressurization and the cabin altitude will rise at an uncontrolled rate until equal to airplane's altitude.

Bleed air (both)press to OFF
Dump valvelift guard, press to DUMP
Descent..... initiate to altitude not requiring supplemental oxygen



Continue flight unpressurized unless the offending engine is determined, in which case, continue as follows:

- Cabin altitude control..... select and obtain a cabin altitude equal to or higher than flight altitude
- Dump valve.....lift guard, press to NORMAL
- Bleed air (good engine)press to ON
- Cabin altitude control..... select desired cabin altitude
- Cabin rate control select desired rate



TURBULENT AIR OPERATION

Airspeed.....reduce to V_a or less

Fly attitude (autopilot altitude hold OFF) and avoid abrupt maneuvers.

Seat belts/harness on/secure

LOSS OF ELEVATOR CONTROL IN FLIGHT

Perform normal "Before Landing" procedures, except as follows:

Pitch changes..... use elevator trim (short inputs) and engine power

Landing gear DOWN

Landing approach establish a long straight-in approach with approx. 500 FPM rate of descent

Flaps..... 20° DOWN maximum, at least 500 ft. above runway

Approach speed..... maintain 110 KIAS minimum

Landing.....touch down slightly longer than normal, maintaining rate of descent at or below 500 FPM, do not flare with trim

ThrottlesCLOSED at touchdown



RUNAWAY TRIM

ELEVATOR TRIM RUNAWAY

This procedure addresses standard (non-autopilot) airplane configuration.

For airplane with elevator trim disconnect switch:

Elevator trim switch to opposite position
Elevator trim disconnect switchOFF
Elevator trim circuit breaker disengage, do not reset
Power..... change if necessary

RUDDER TRIM RUNAWAY

Rudder trim switch press in opposite
direction of runaway
Rudder trim circuit breaker disengage, do not reset
Power.....change if necessary



SPIN RECOVERY

Intentional spins are not permitted in this category airplane. Spin flight tests have not been conducted, however, should a spin inadvertently occur, the following procedures are recommended.

ThrottlesCLOSE immediately

Elevator..... forward briskly with
ailerons NEUTRAL

Rudder..... full deflection opposite to
direction of rotation until rotation stops

Elevator control (after
rotation stops)apply smooth constant back
pressure to recover from
resultant dive

CAUTION

Do not exceed positive G limits.

Power.....advance as required after
dive recovery



EMERGENCY DESCENT

CAUTION

If pressurized, the following procedures will result in an immediate loss of pressurization and the cabin altitude will rise at an uncontrolled rate until approximately equal to the airplane's altitude.

EMERGENCY DESCENT DURING NON-TURBULENT CONDITIONS

Fuel selectors (both)..... ON
Throttles full CLOSED
Prop controlsfull FORWARD
Airspeed215 KIAS
ATC.....advise

After reaching desired safe altitude, continue as follows:

Throttlesadvance slowly to 15 in. MAP
Prop controlsselect 2000 RPM
Cabin altitude control..... select and obtain a cabin
altitude equal to or higher
than flight altitude
Engine temperatures/pressuresNORMAL
Prop controlsset as desired
Throttles.....set as desired
Mixturesset as desired



GEAR UP LANDING

Radioinform ground personnel
Fuel.....burn Goff (if time allows)
Passengers.....brief
Cabin baggagestow
Normal landing checklist..... complete
Gear..... UP

NOTES

Pull landing gear warning horn circuit breaker to silence gear horn, if desired.

Crossfeed annunciator circuitry will be disabled with landing gear retracted; verify both fuel selectors are in the ON position.

Bleed air (both)..... press to OFF
Cabin door seal..... lift guard, press to DEFLATE
Electrical load reduce to minimum
Alternators (both)..... OFF

Make a normal approach with FULL DOWN flaps.

Boost pumps (on short final) OFF

When over runway and landing is assured:

Prop controls (simultaneously and rapidly) FEATHER

Mixtures..... idle cut-off



Touch down at minimum safe airspeed and level attitude.

- Fuel selectors..... OFF
- Hydraulic shutoff valve..... OFF
- Battery..... OFF
- Crew and passengers..... evacuate

BRAKE SYSTEM FAILURE

(One-wheel braking)

- Braking (landing roll out)..... minimum and intermittent
- Directional control (landing roll out) maintain with rudder on failed brake side
- Directional control (taxi)..... maintain with rudder and nose wheel steering

EMERGENCY EXIT

- Exit (adjacent to right rear passenger station) locate
- Exit handle cover remove
- Handle pull down
- Emergency exit push out



UNSAFE DOOR INDICATION

Door seal do not deflate

Cabin immediately depressurize

Airspeed reduce to VYSE

Land as practical.

OPEN DOOR

(Upper cabin only)

Airspeed REDUCE to VYSE

Land as soon as practical.

WARNING

Do not attempt to manually hold door closed in flight due to the possibility of injury caused by air loads or propeller in the event the door opens.



COMBUSTION HEATER OVERHEAT

(Heater failure illuminated)

Unit will automatically shut off.

One restart may be attempted.

LOSS OF ALTITUDE DURING STALLS

The loss of altitude during a power-off stall with the gear and flaps up or down may be as much as 650 feet.

The loss of altitude during a power-on stall may be as much as 500 feet.

The loss of altitude during one engine inoperative stalls may be as much as 400 feet. The pitch angle may be as much as 25° below level.

Above 20,000 feet, the loss of altitude in power-on stalls may be as much as 900 feet.



12

12. PERFORMANCE & FLIGHT PROFILE

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 12

PERFORMANCE & FLIGHT PROFILE

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CHAPTER 12

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FOR TRAINING PURPOSES ONLY



PERFORMANCE & FLIGHT PROFILE

As in Chapter 10 Weight and Balance of this manual, FAA Part 91.103 requires all aircraft to compute takeoff and landing distance for all flights to include the calculation for Density Altitude and its effect on the performance of the aircraft. Included in this chapter are a variety of OEM charts that show performance of different model of stock Aerostar aircraft. Aircraft modified by aftermarket suppliers will have recomputed performance charts when applicable. In the absence of recomputed data, owner/operators will refer back to the original OEM performance charts knowing that upgraded aircraft will equal or exceed published data in the applicable aircraft POH.

Many considerations have to be factored into the use of any OEM or aftermarket performance chart to include age of the airframe, hours on the engine and propellers, and the ability of the pilot flying the aircraft. It behooves all pilots to use the published performance chart conservatively in all of their calculations.

Remember when calculating takeoff performance in a twin engine aircraft, often it is not what the aircraft will do on both engine operating, but what the aircraft is capable of on a single engine operation. Terrain, aircraft weight, and aircraft configuration all have impact on the takeoff situation the pilot finds him/her operating

especially during the takeoff portion of the flight. The old saying is that a twin engine aircraft loses fifty per cent of its engines but eighty per cent of its performance during single engine operations.

Pilots using this manual should conduct a few sample performance calculations from the charts contained herein. It is required that pilots use their actual performance charts for their respective aircraft in order to get an accurate capability for their aircraft for the conditions they are operating for that specific flight.

Many of the aircraft options and AD's listed in this chapter have been deleted, superseded, or modified by the OEM or aftermarket producers of STC's for the aircraft. It is important that all data used in the performance or operation of your aircraft is current and applicable to your aircraft.



1

PERFORMANCE CHARTS

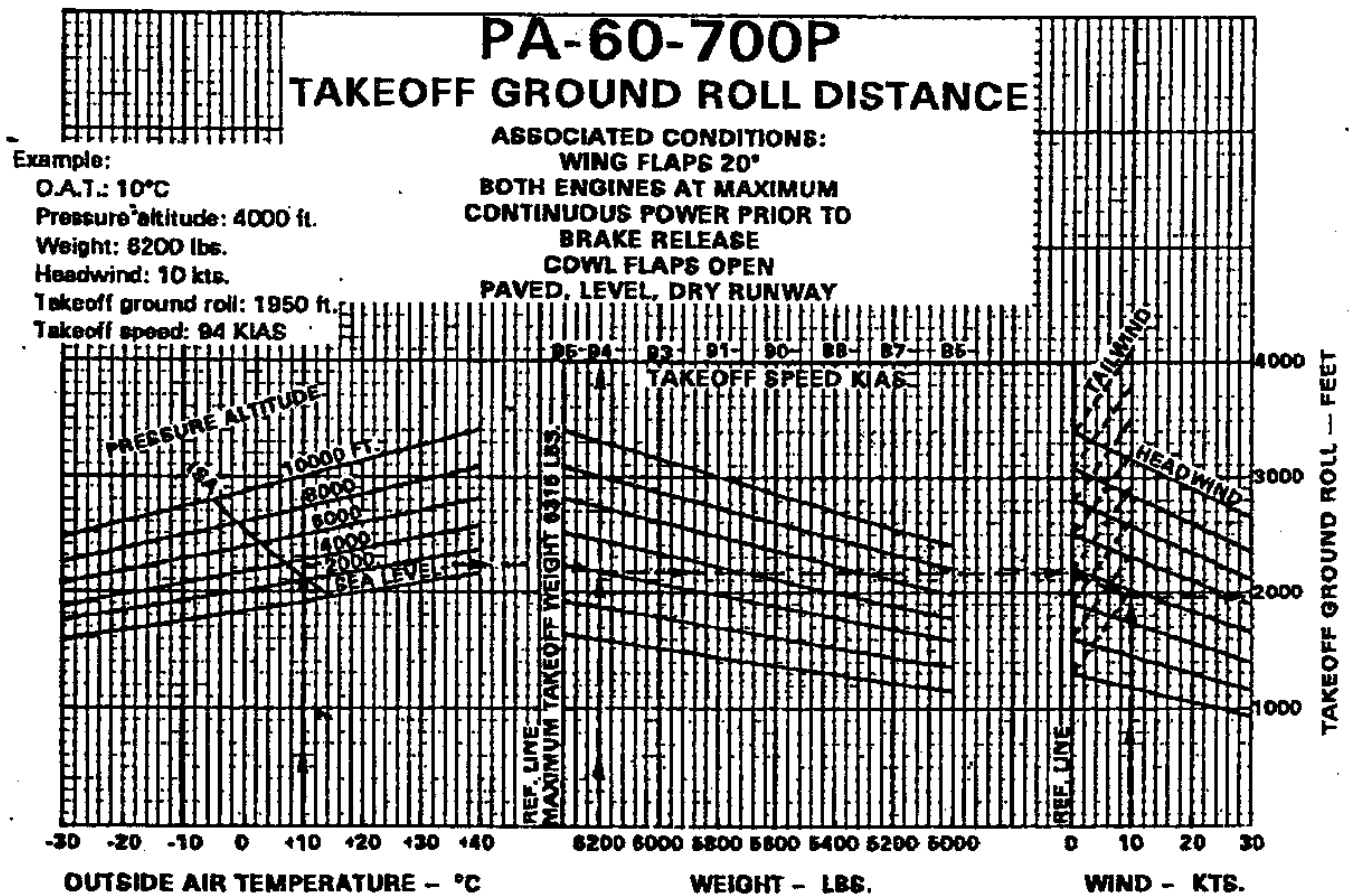


FIGURE 12-1: 700P T/O GROUND ROLL



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Example:

OAT: 20°C

Pressure Altitude: 2000 ft.

Weight: 5500 lbs.

Headwind: 10 knots

Ground Run: 1900 ft.

Total Distance: 2200 ft.

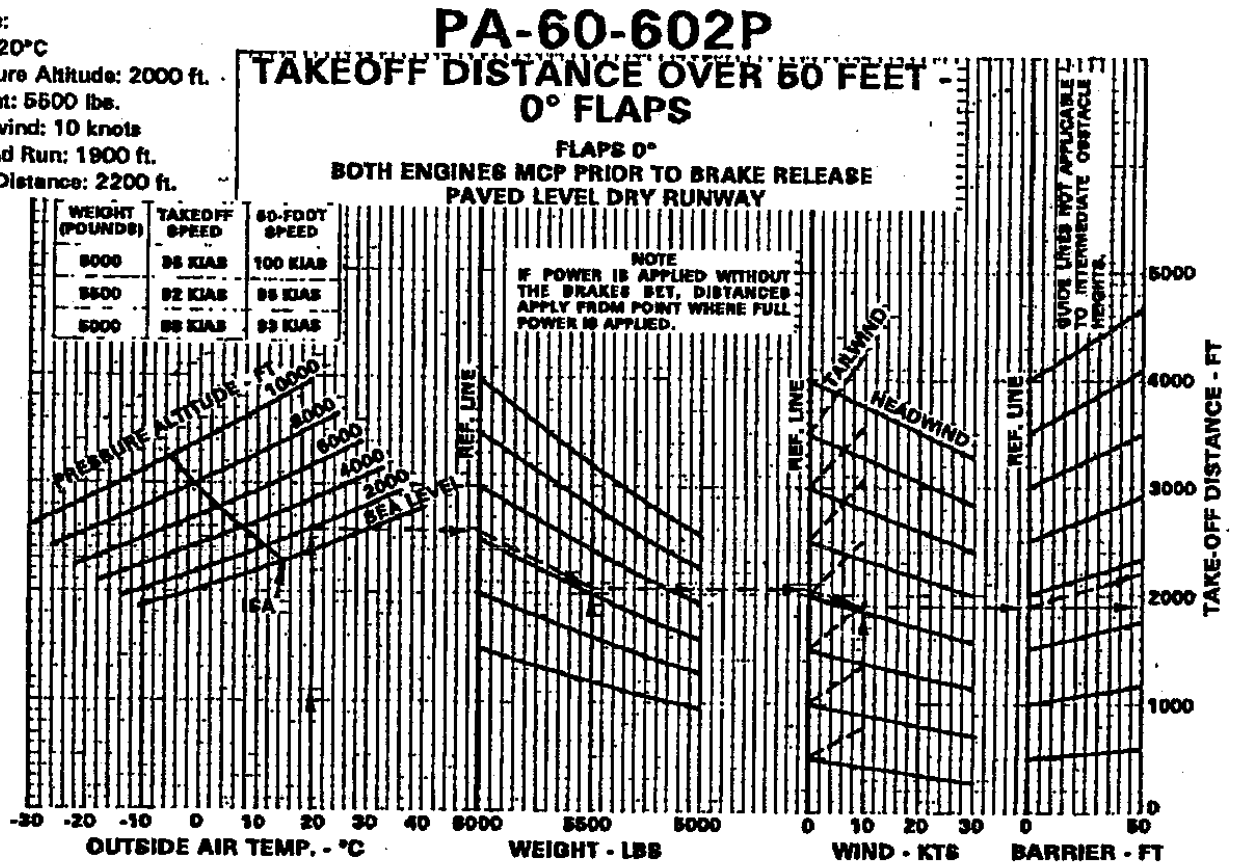


FIGURE 12-2: 602P T/O DISTANCE OVER 50'



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Association

Example:

OAT: 20°C

Pressure Altitude: 2000 ft.

Weight: 5500 lbs.

Headwind: 10 knots

Ground Run: 1830 ft.

Total Distance: 2080 ft.

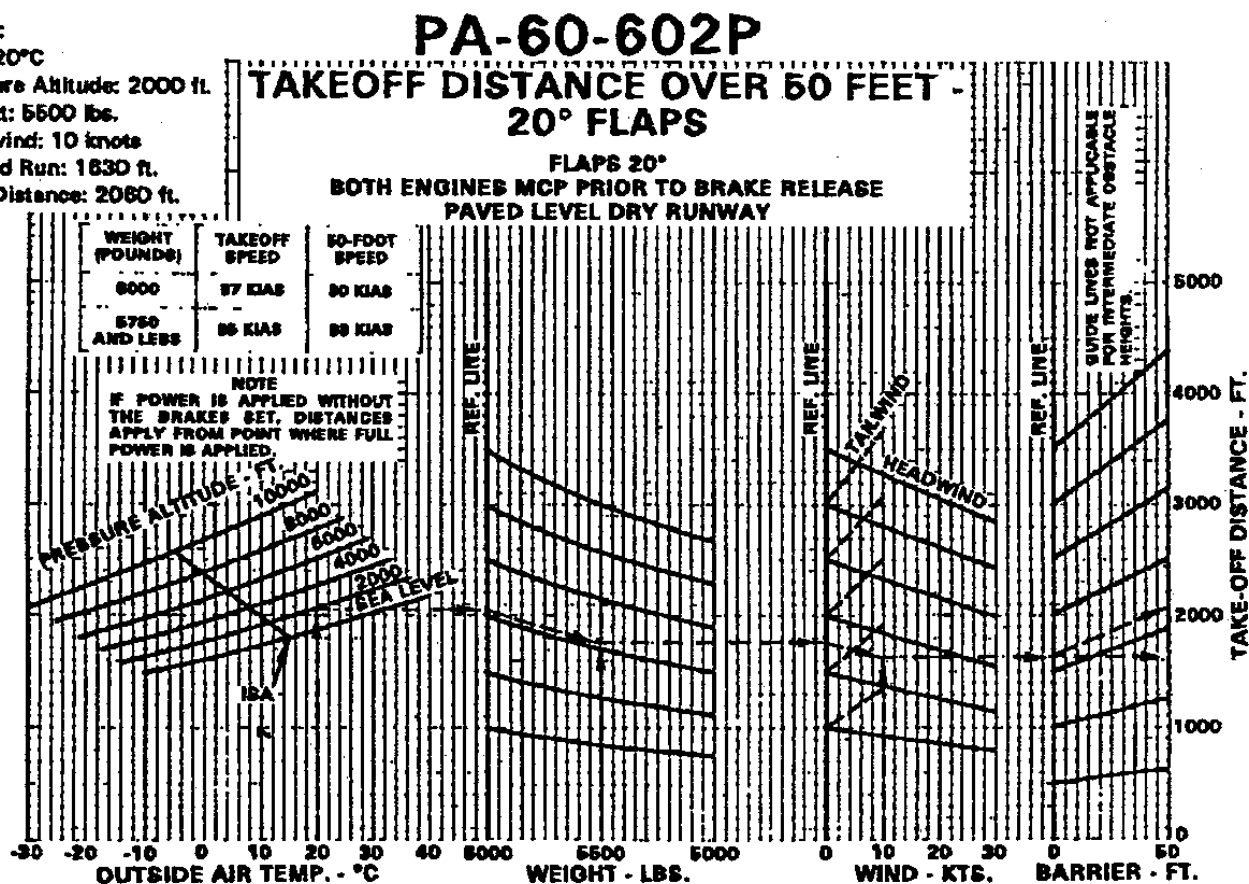


FIGURE 12-3: 602P T/O DISTANCE OVER 50' 20° FLAPS



TAKEOFF GROUND ROLL

FLAPS UP

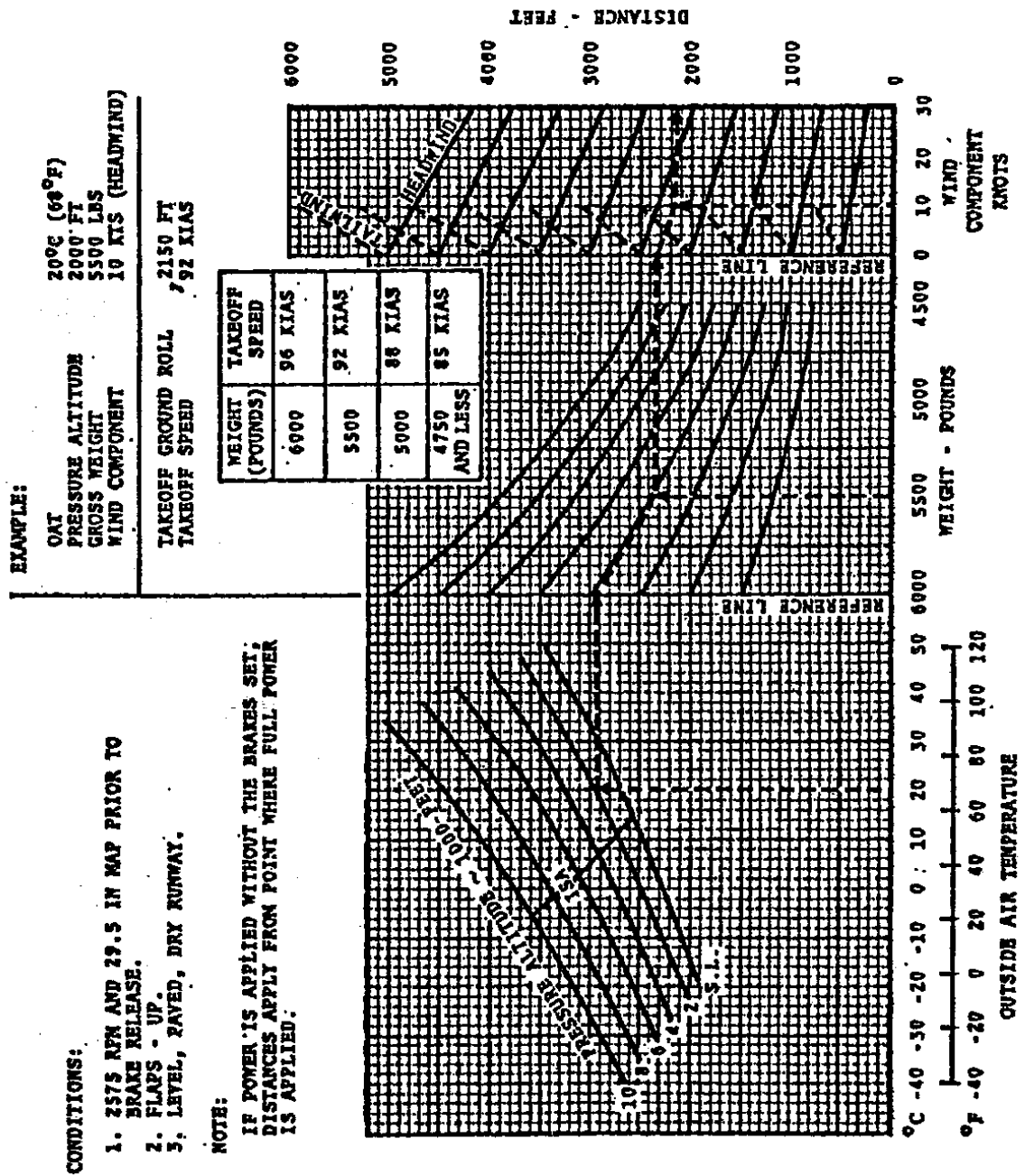


FIGURE 12-4: 601P T/O GROUND ROLL FLAPS UP



TAKEOFF GROUND ROLL

FLAPS 20°

CONDITIONS:

1. 2575 RPM AND 29.5 IN MAP PRIOR TO BRAKE RELEASE.
2. FLAPS - 20°.
3. LEVEL, PAVED, DRY RUNWAY.

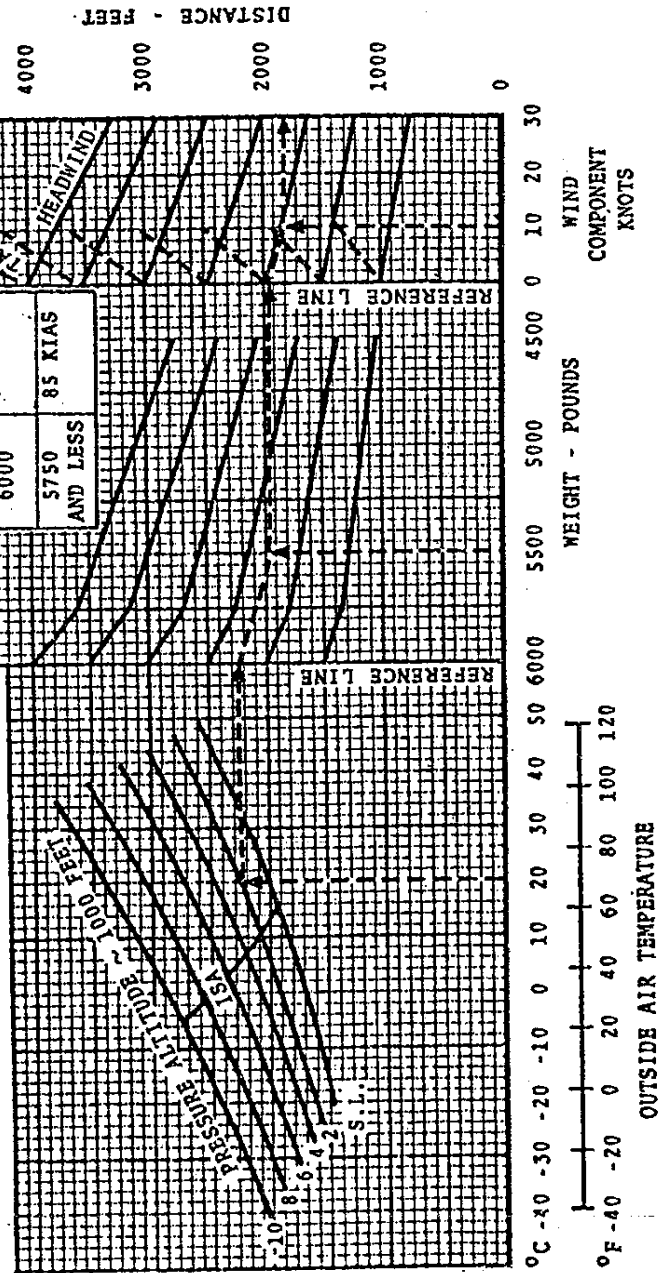
NOTE:

IF POWER IS APPLIED WITHOUT THE BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.

EXAMPLE:
OAT 20°C (68°F)
PRESSURE ALTITUDE 2000 FT
GROSS WEIGHT 5500 LBS
WIND COMPONENT 10 KTS (HEADWIND)

TAKEOFF GROUND ROLL 1800 FT
TAKEOFF SPEED 85 KIAS

WEIGHT (POUNDS)	TAKEOFF SPEED
6000	87 KIAS
5750 AND LESS	85 KIAS





TAKEOFF GROUND ROLL

FLAPS UP

CONDITIONS:

1. 2575 RPM AND FULL THROTTLE PRIOR TO BRAKE RELEASE.
2. FLAPS - UP.
3. LEVEL, PAVED, DRY RUNWAY.

NOTE:

IF POWER IS APPLIED WITHOUT THE BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.

EXAMPLE:

OAT 20°C (68°F)
PRESSURE ALTITUDE 2000 FT.
GROSS WEIGHT 5000 LBS
WIND COMPONENT 10 KTS (HEADWIND)

TAKEOFF GROUND ROLL 1700 FT
TAKEOFF SPEED 88 KIAS

WEIGHT (POUNDS)	TAKEOFF SPEED
5500	92 KIAS
5000	88 KIAS
4700 AND LBS	85 KIAS

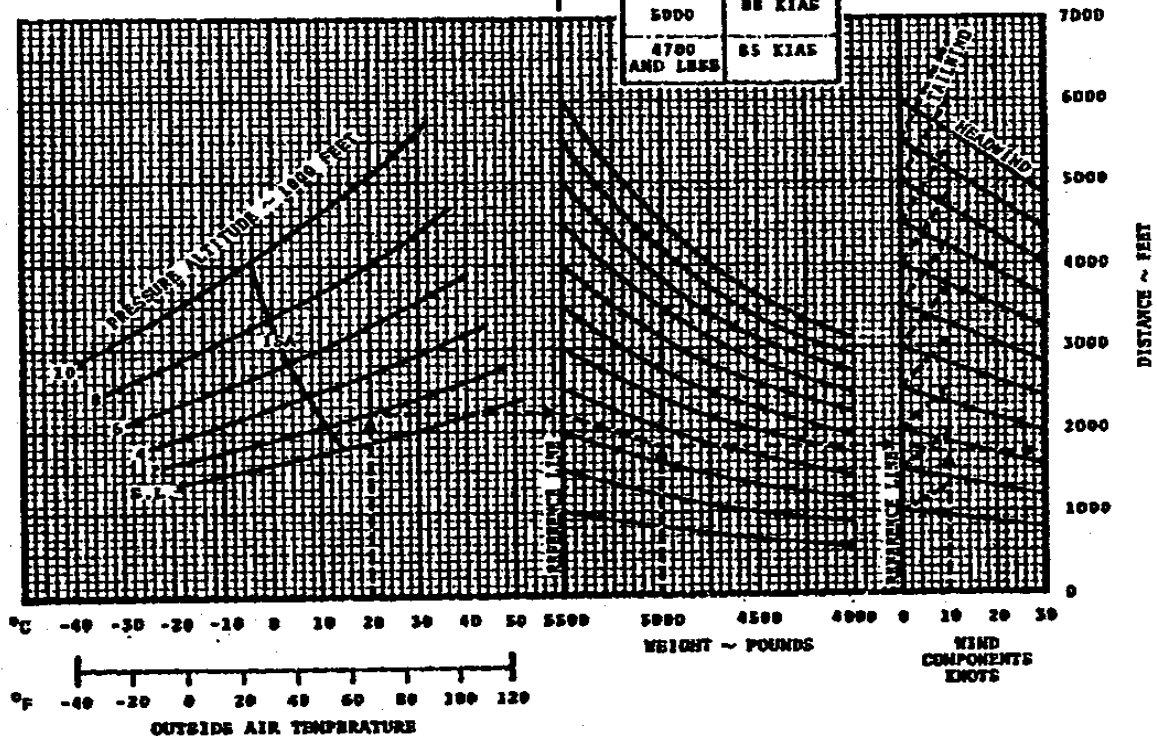


FIGURE 12-6: 600 T/O GROUND ROLL FLAPS UP



TAKEOFF GROUND ROLL

FLAPS 20°

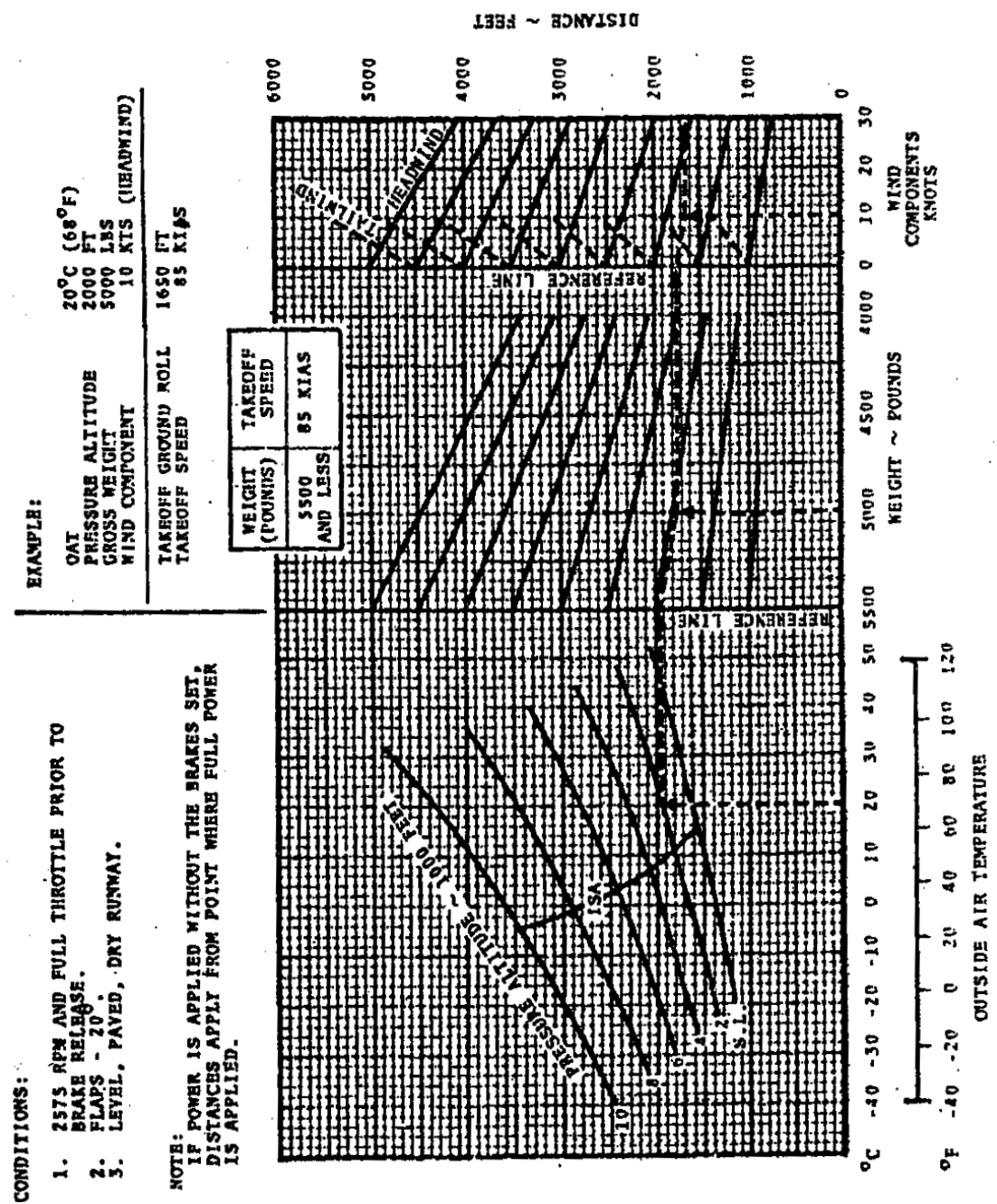


FIGURE 12-7: 600 T/O GROUND ROLL 20° FLAPS



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Association

Example:

O.A.T.: 20°C

Pressure altitude: 2000 ft.

Weight: 5900

Head wind: 10 kts.

Engine failure speed: 82 KIAS

Accelerate/stop distance: 3760 ft.

PA-60-700P

ACCELERATE/STOP DISTANCE

WING FLAPS 20°. PAVED LEVEL DRY RUNWAY
BOTH ENGINES M.C.P. PRIOR TO BRAKE RELEASE

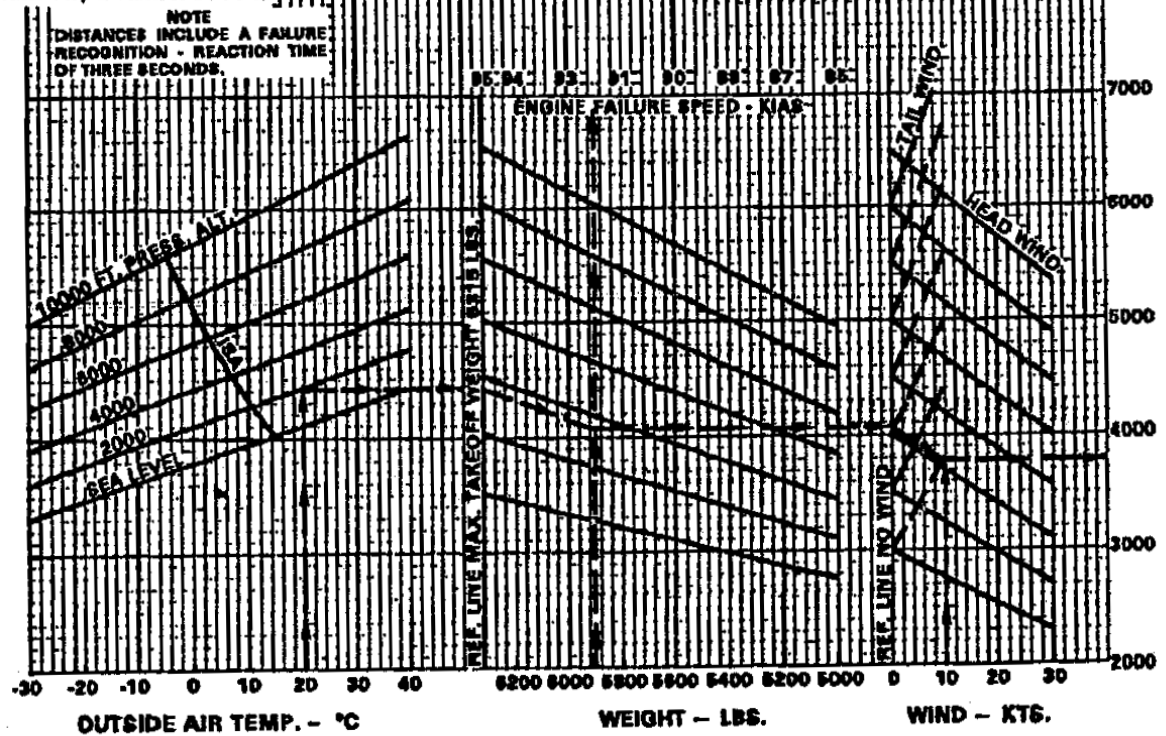


FIGURE 12-8: 700P ACCELERATE/STOP DISTANCE



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PA-60-602P

ACCELERATE/STOP DISTANCE - 0° FLAPS

Example:

OAT: 20°C

Pressure Altitude: 2000 ft.

Weight: 5500 lbs.

Headwind: 10 knots

Acc/Stop Distance: 3780 ft.

FLAPS 0°
BOTH ENGINES MCP PRIOR TO BRAKE RELEASE
PAVED LEVEL DRY RUNWAY

NOTE
DISTANCES INCLUDE A FAILURE
RECOGNITION/REACTION TIME
OF THREE SECONDS.

NOTE
IF POWER IS APPLIED WITHOUT
THE BRAKES SET, DISTANCES
APPLY FROM POINT WHERE FULL
POWER IS APPLIED.

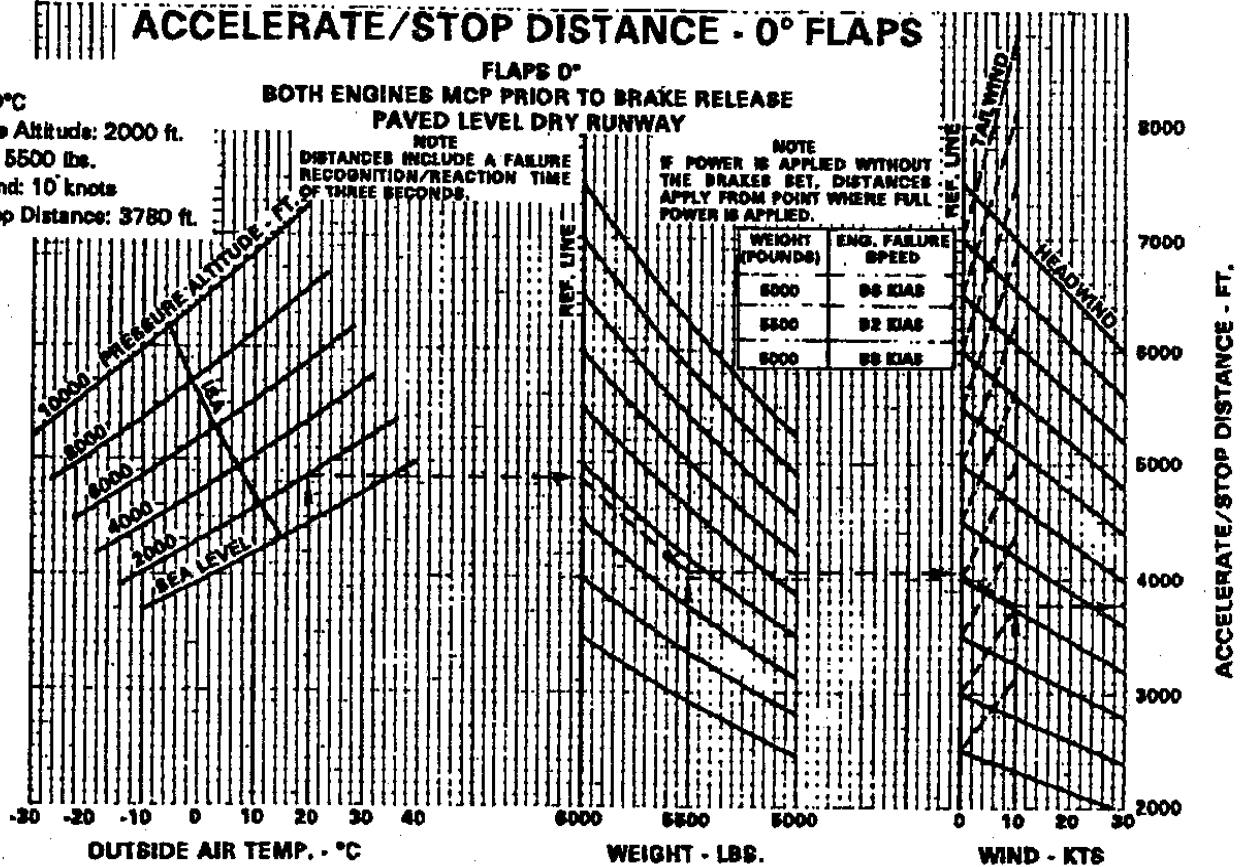


FIGURE 12-9: 602P ACCELERATE/STOP FLAPS UP



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Example:

OAT: 20°C

Pressure Altitude: 2000 ft.

Weight: 5500 lbs.

Headwind: 10 knots

Acc/Stop Distance: 3150 ft.

PA-60-602P

ACCELERATE/STOP DISTANCE 20° FLAPS

FLAPS 20°

BOTH ENGINES MCP PRIOR TO BRAKE RELEASE
PAVED LEVEL DRY RUNWAY

NOTE
IF POWER IS APPLIED WITHOUT
THE BRAKES SET, DISTANCES
APPLY FROM POINT WHERE FULL
POWER IS APPLIED.

NOTE
DISTANCES INCLUDE A FAILURE
RECOGNITION/REACTION TIME
OF THREE SECONDS.

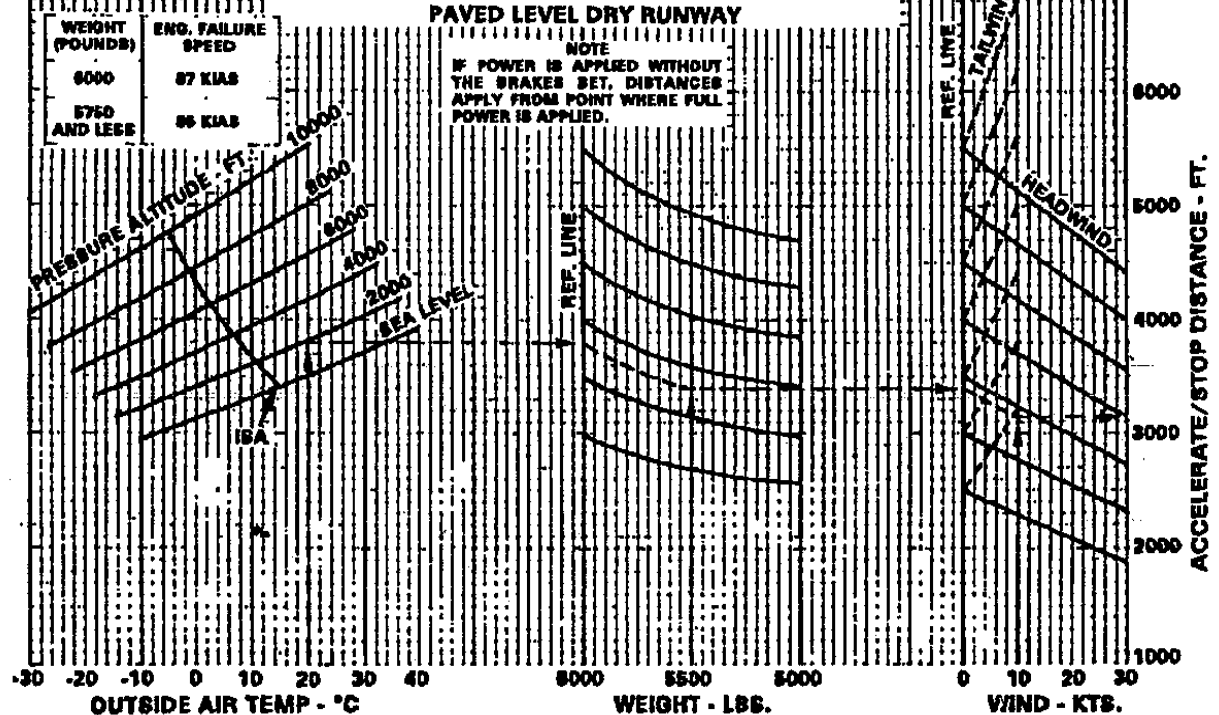


FIGURE 12-10: 602P ACCELERATE/STOP 20° FLAPS



ACCELERATE - STOP DISTANCE

FLAPS UP

EXAMPLE:

OAT 20°C (68°F)
 PRESSURE ALTITUDE 2000 FT
 GROSS WEIGHT 5500 LBS
 WIND COMPONENT 10 KTS (HEADWIND)

ACCELERATE - STOP DISTANCE 4000 FT
 ENGINE FAILURE SPEED 92 KIAS

WEIGHT (POUNDS)	ENG. FAILURE SPEED
6000	96 KIAS
5500	92 KIAS
5000	88 KIAS
4750 AND LESS	85 KIAS

CONDITIONS:

1. 2575 RPM AND 29.5 IN MAP PRIOR TO BRAKE RELEASE.
2. FLAPS - UP.
3. LEVEL, PAVED DRY RUNWAY.
4. ENGINE FAILURE AT ENGINE FAILURE SPEED.
5. IDLE POWER AND MAXIMUM EFFECTIVE BRAKING AFTER ENGINE FAILURE.

NOTE:

IF POWER IS APPLIED WITHOUT THE BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.

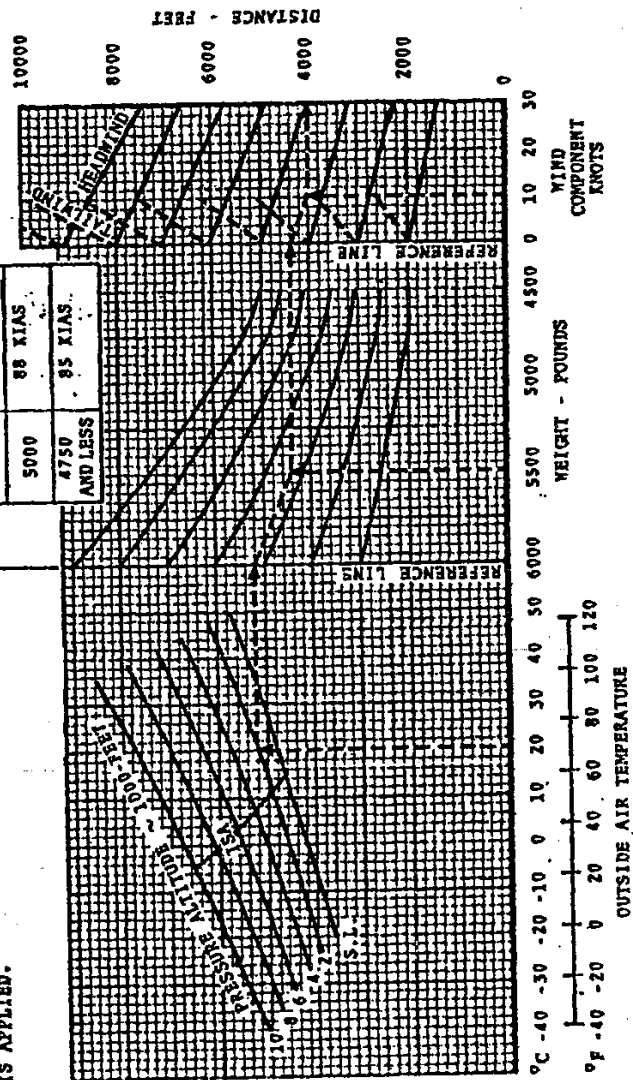


FIGURE 12-11: 601P ACCELERATE/STOP FLAPS UP



ACCELERATE - STOP DISTANCE

FLAPS 20°

CONDITIONS:

1. 2575 RPM AND 29.5 IN MAP PRIOR TO BRAKE RELEASE.
2. FLAPS - 20°.
3. LEVEL, PAVED, DRY RUNWAY.
4. ENGINE FAILURE AT ENGINE FAILURE SPEED.
5. IDLE POWER AND MAXIMUM EFFECTIVE BRAKING AFTER ENGINE FAILURE.

NOTE:

IF POWER IS APPLIED WITHOUT THE BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.

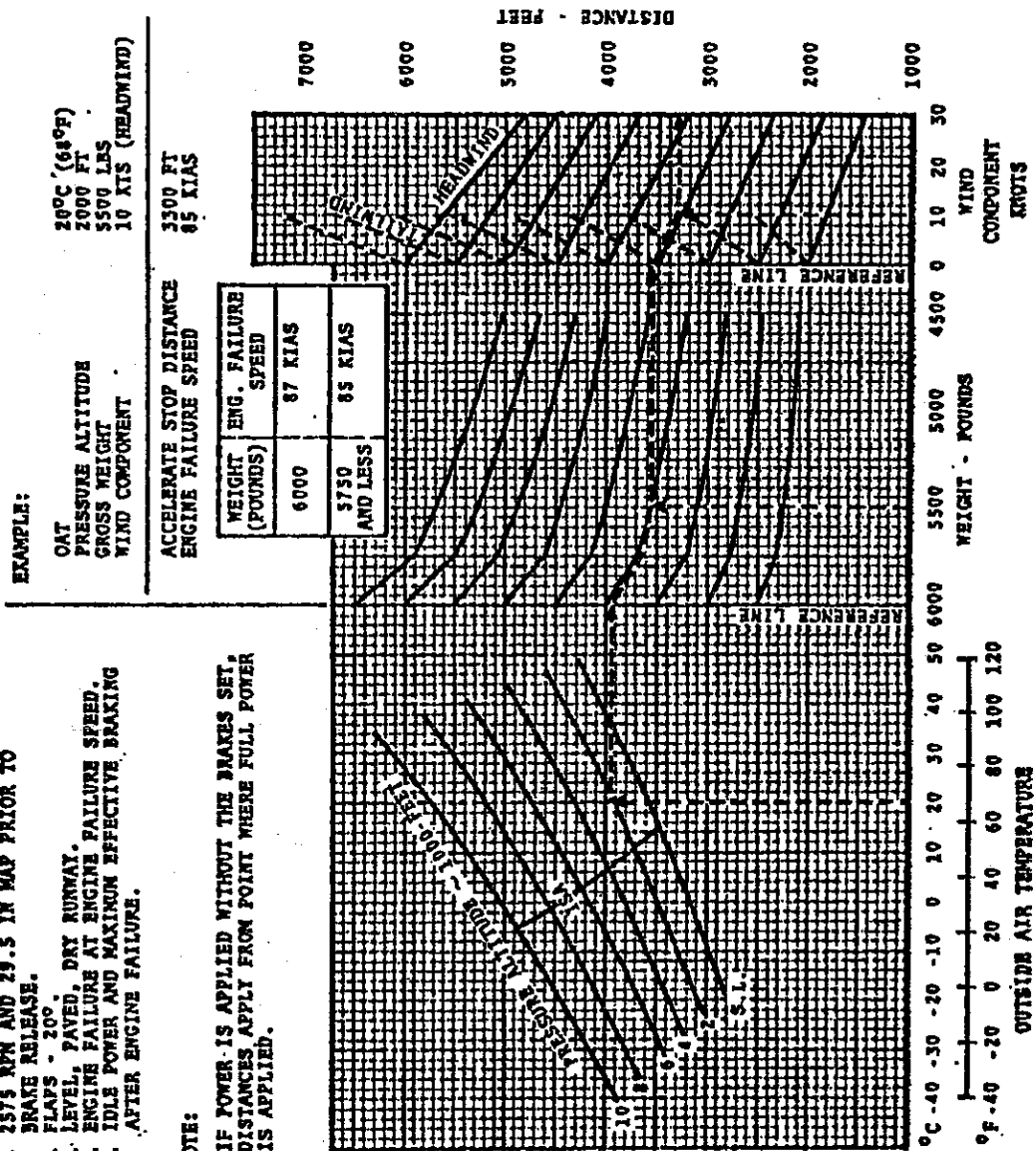


FIGURE 12-12: 601P ACCELERATE/STOP 20° FLAPS



ACCELERATE - STOP DISTANCE

FLAPS UP

CONDITIONS:

1. 2575 RPM AND FULL THROTTLE PRIOR TO BRAKE RELEASE.
2. FLAPS UP
3. LEVEL, PAVED, DRY RUNWAY.
4. ENGINE FAILURE AT ENGINE FAILURE SPEED.
5. IDLE POWER AND MAXIMUM EFFECTIVE BRAKING AFTER ENGINE FAILURE.

NOTE:

IF POWER IS APPLIED WITHOUT THE BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.

EXAMPLE:

OAT 20°C (68°F)
 PRESSURE ALTITUDE 5000 LWS
 GROSS WEIGHT 5000 LBS
 WIND COMPONENT 10 KTS (HEADWIND)

ACCELERATE - STOP DISTANCE 5300 FT
 ENGINE FAILURE SPEED 88 KTS

WEIGHT (POUNDS)	ENG. FAILURE SPEED
5500	92 KIAS
5000	88 KIAS
4500 AND LESS	85 KIAS

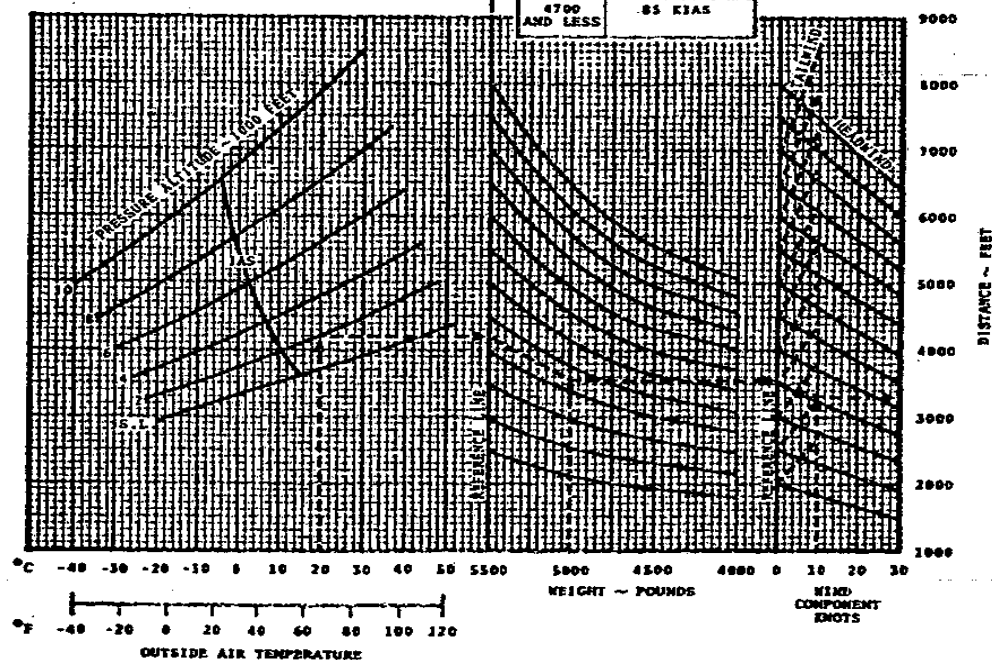


FIGURE 12-13: 600 ACCELERATE/STOP FLAPS UP



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ACCELERATE - STOP DISTANCE

FLAPS 20°

CONDITIONS:

1. 2575 RPM AND FULL THROTTLE PRIOR TO BRAKE RELEASE.
2. FLAPS - 20°.
3. LEVEL, PAVED, DRY RUNWAY
4. ENGINE FAILURE AT ENGINE FAILURE SPEED.
5. IDLE POWER AND MAXIMUM EFFECTIVE BRAKING AFTER ENGINE FAILURE.

NOTE:

IF POWER IS APPLIED WITHOUT THE BRAKES SET, DISTANCES APPLY FROM POINT WHERE FULL POWER IS APPLIED.

EXAMPLE:

OAT	20°C (68°F)
PRESSURE ALTITUDE	2000 FT
GROSS WEIGHT	5000 LBS
WIND COMPONENT	10 KTS (HEADWIND)

ACCELERATE STOP DISTANCE	3200 FT
ENGINE FAILURE SPEED	85 KIAS

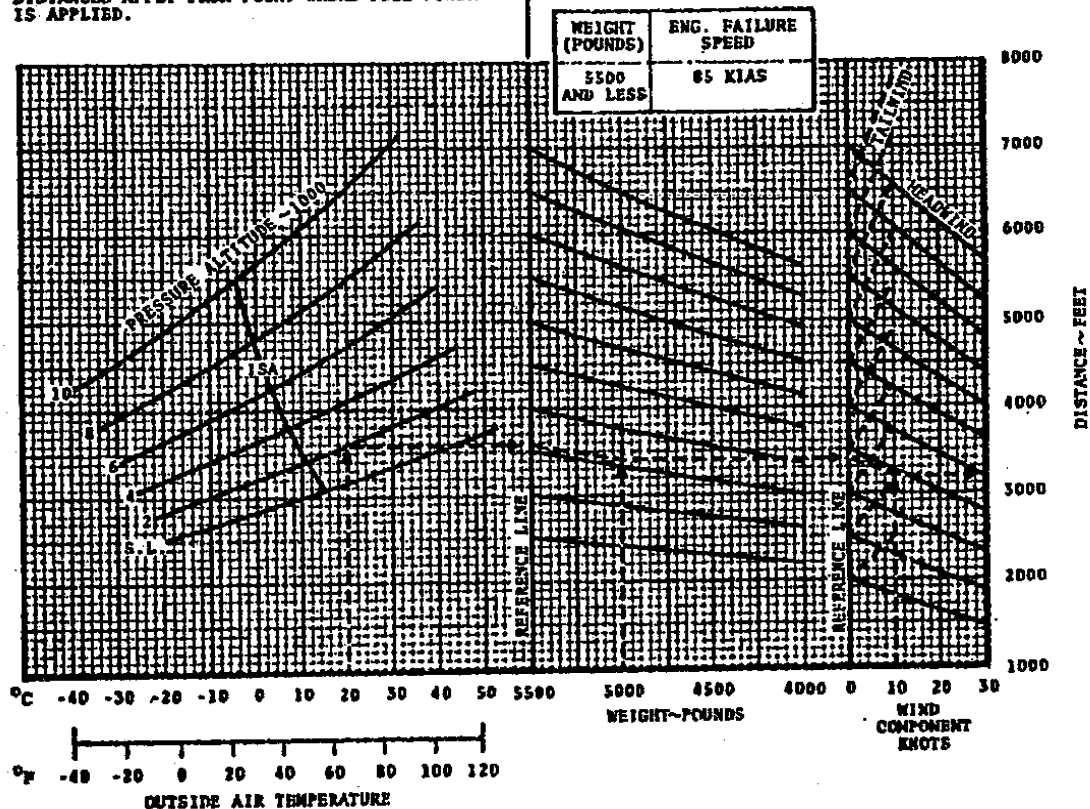


FIGURE 12-14: 600 ACCELERATE/STOP 20° FLAPS



PA-60-700P

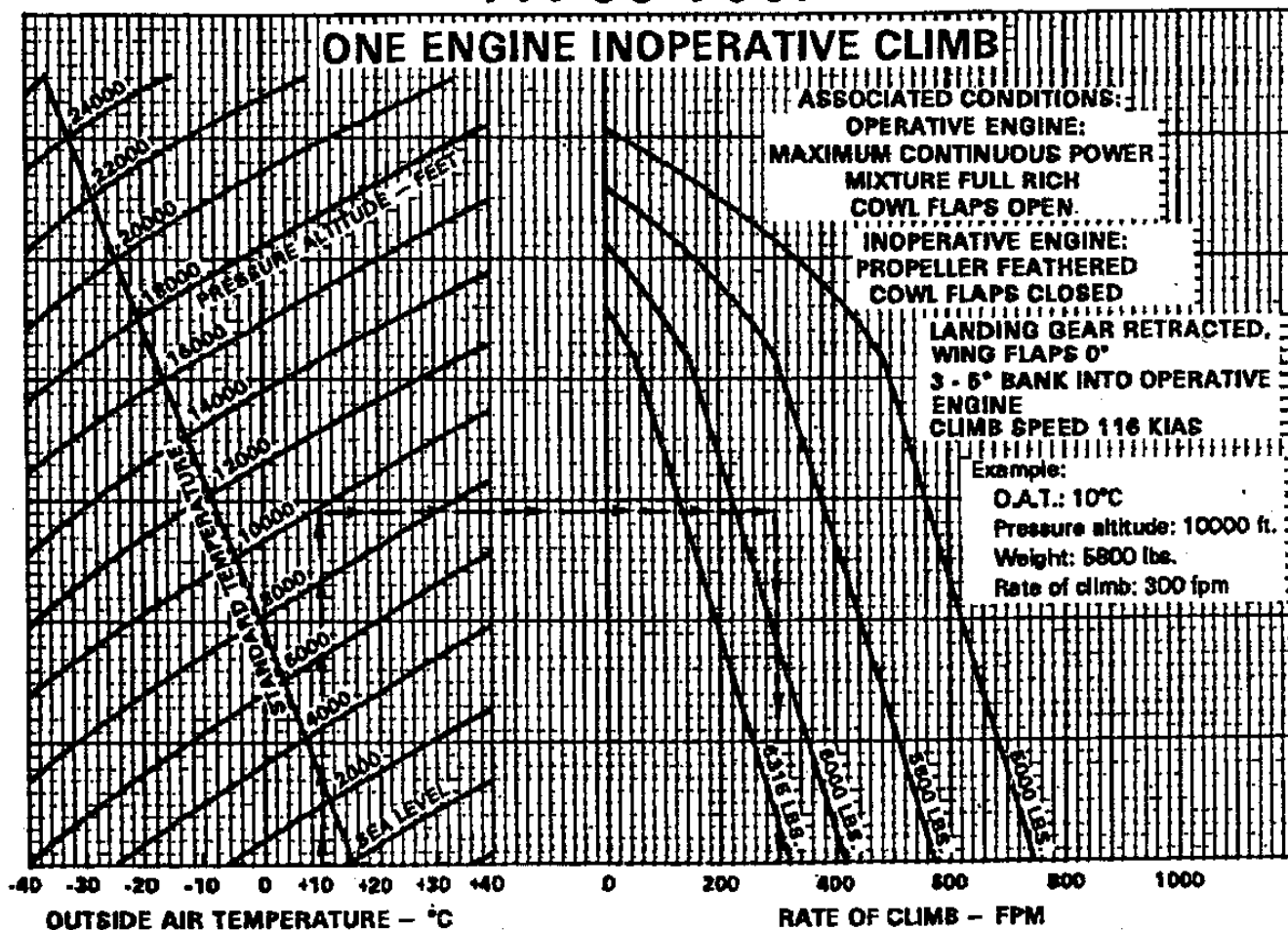


FIGURE 12-15: 700P ONE ENGINE INOP CLIMB



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PA-60-602P

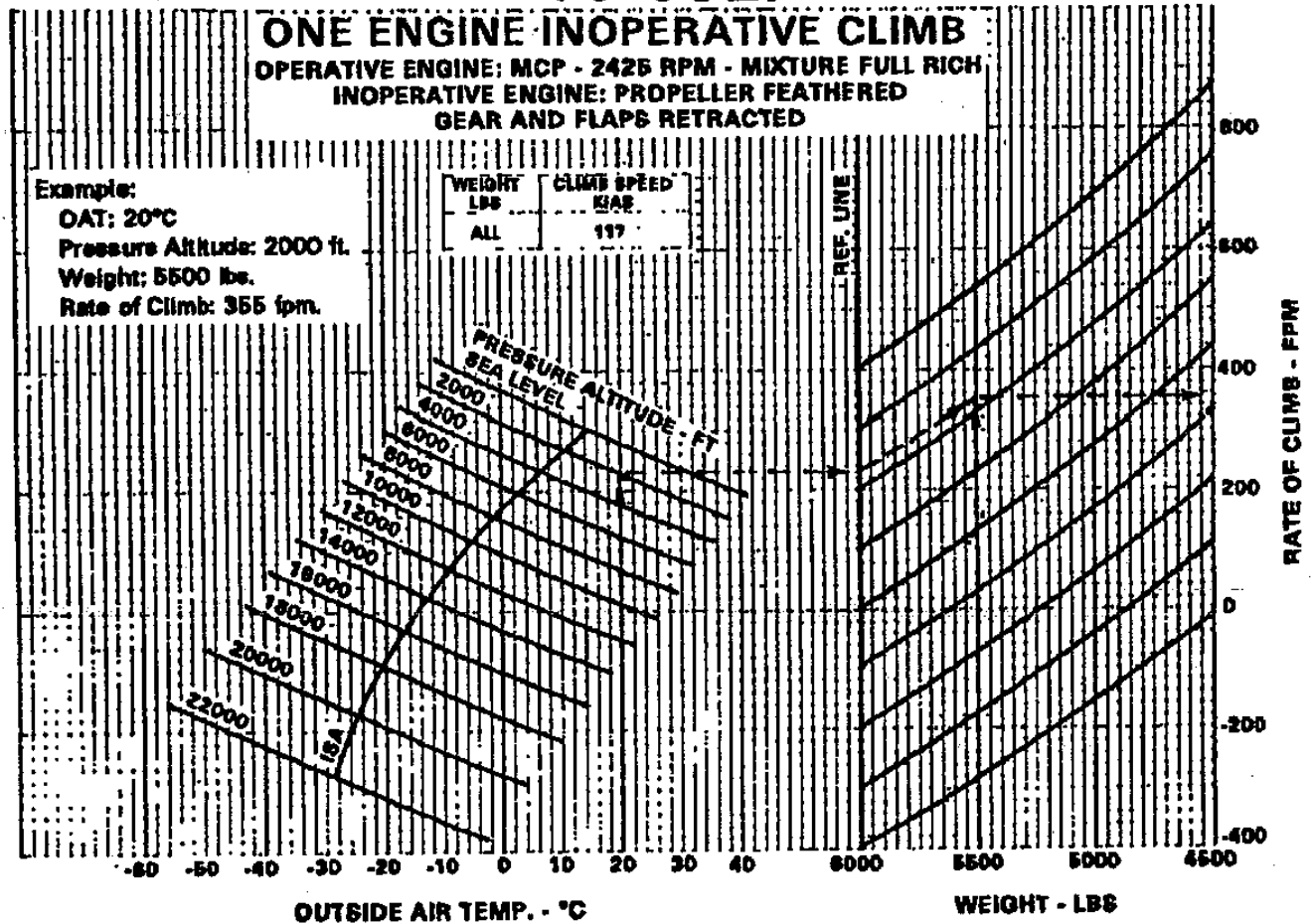


FIGURE 12-16: 602P ONE ENGINE INOP CLIMB



SINGLE ENGINE - MAXIMUM CONTINUOUS POWER

CONDITIONS:

1. 2575 RPM AND 29.5 IN MAP (OPERATING ENGINE).
2. FUEL MIXTURE - FULL RICH.
3. FLAPS - UP.
4. LANDING GEAR - UP.
5. INOPERATIVE ENGINE PROPELLER-FEATHERED.

NOTE:

1. PERFORMANCE PRESENTED REFLECTS A NOMINAL FUEL FLOW OF 26.0 GPH. DECREASE THE CHART RATE OF CLIMB BY 8 FT/MIN FOR EACH 1 GPH OF FUEL FLOW ABOVE 26.0 GPH.
2. WHEN LANDING GEAR IS EXTENDED, DECREASE CHART RATE OF CLIMB BY 500 FT/MIN, AND REDUCE CLIMB SPEED BY 13 KTS.

EXAMPLE:

OAT	20°C (68°F)
PRESSURE ALTITUDE	2000 FT
GROSS WEIGHT	5500 LBS
RATE OF CLIMB	260 FT/MIN
CLIMB SPEED	109 KIAS

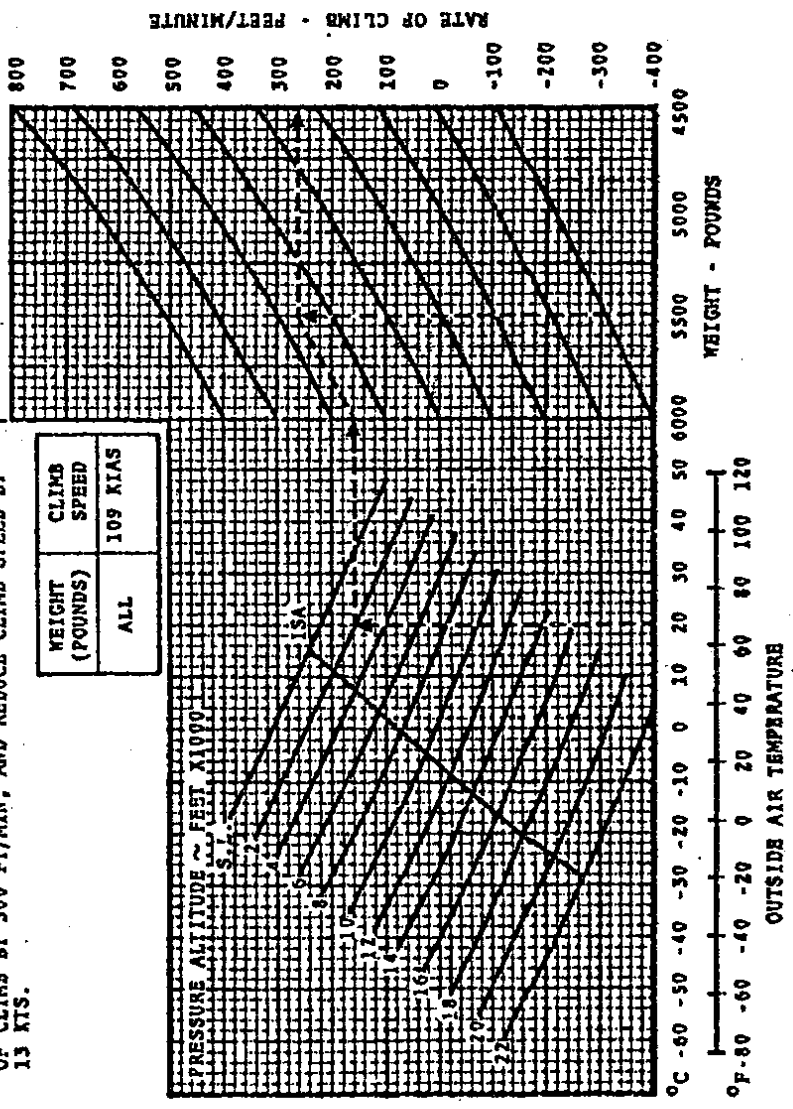


FIGURE 12-17: 601P ONE ENGINE INOP CLIMB



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RATE-OF-CLIMB, SINGLE ENGINE - MAXIMUM CONTINUOUS POWER

CONDITIONS:

1. 2575 RPM AND FULL THROTTLE (OPERATING ENGINE).
2. FUEL MIXTURE - FULL RICH ABOVE 75% POWER.
3. FLAPS - UP.
4. LANDING GEAR - UP.
5. INOPERATIVE ENGINE PROPELLER-FEATHERED

NOTE:

1. REDUCE CLIMB SPEED 1.0 KNOT FOR EVERY 1000 FEET ABOVE SEA LEVEL.
2. WHEN LANDING GEAR IS EXTENDED, DECREASE CHART RATE OF CLIMB BY 500 FT/MIN, AND REDUCE CLIMB SPEED BY 13 KTS.
3. A SIGNIFICANT INCREASE IN RATE OF CLIMB WILL BE OBTAINED, IF THE ENGINE IS LEANED TO BEST POWER. HOWEVER, WHEN LEANING ABOVE 75% POWER, DO NOT EXCEED 252°C MAXIMUM CYLINDER HEAD TEMPERATURE LIMIT

EXAMPLE:

OAT	20°C (68°F)
PRESSURE ALTITUDE	2000 FT
GROSS WEIGHT	5000 LBS
RATE OF CLIMB	400 FT/MIN
CLIMB SPEED	197 KIAS

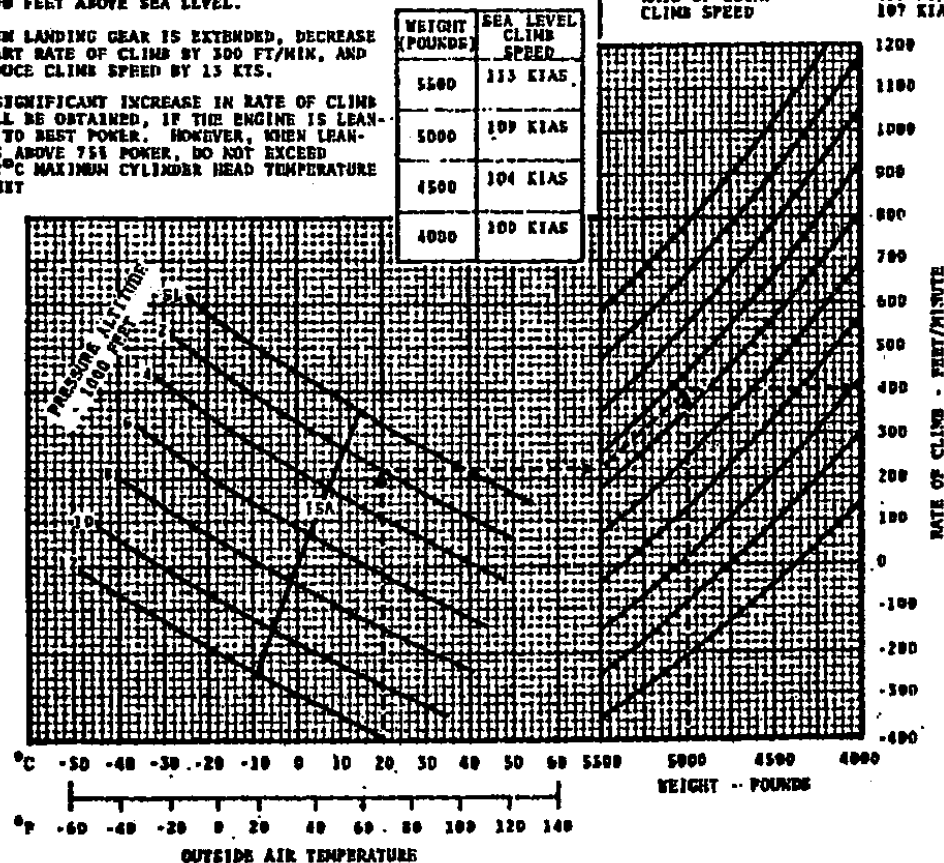


FIGURE 12-18: 600 ONE ENGINE INOP CLIMB



PA-60-700P

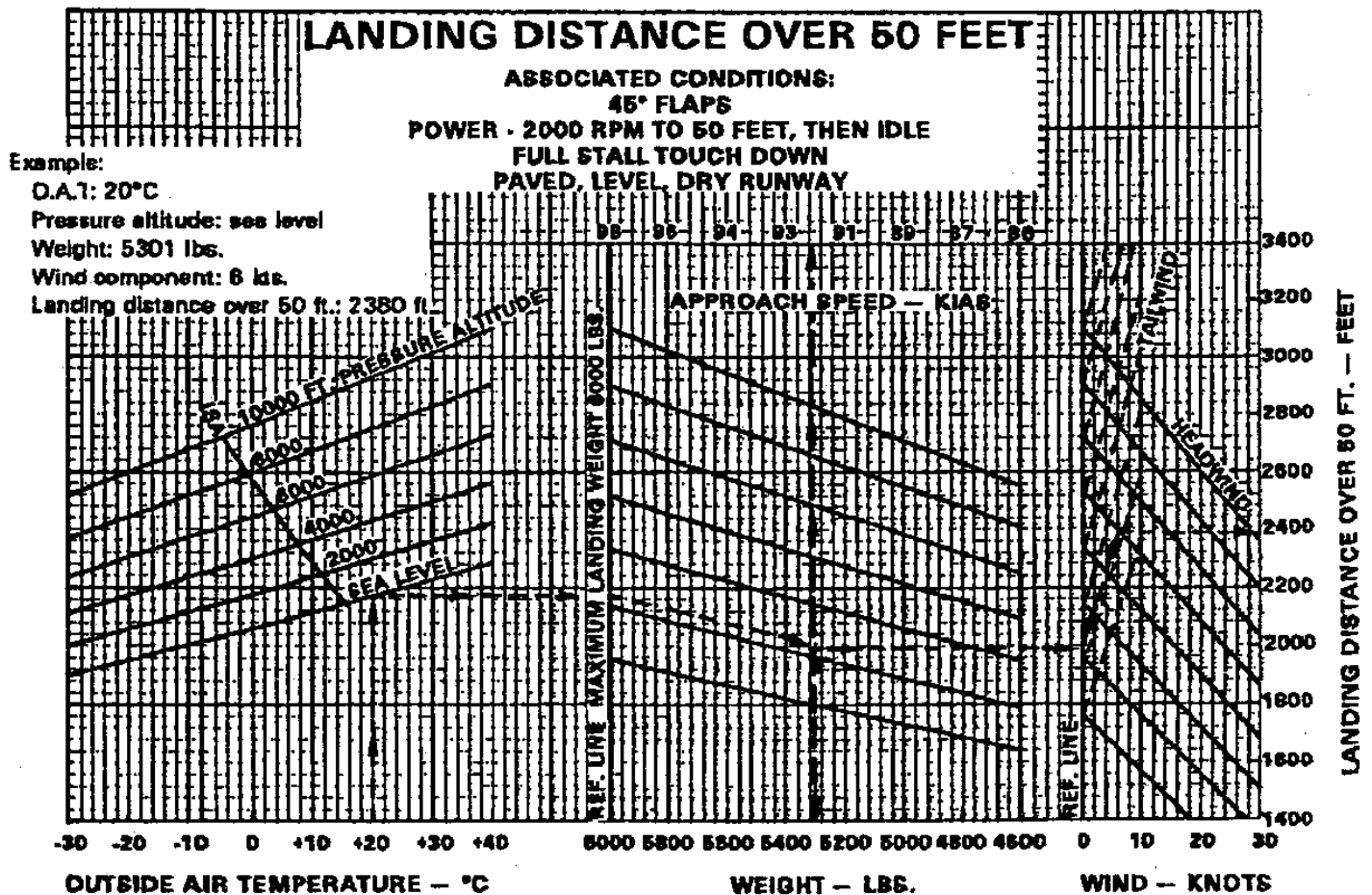


FIGURE 12-19: 700P LANDING DISTANCE OVER 50'



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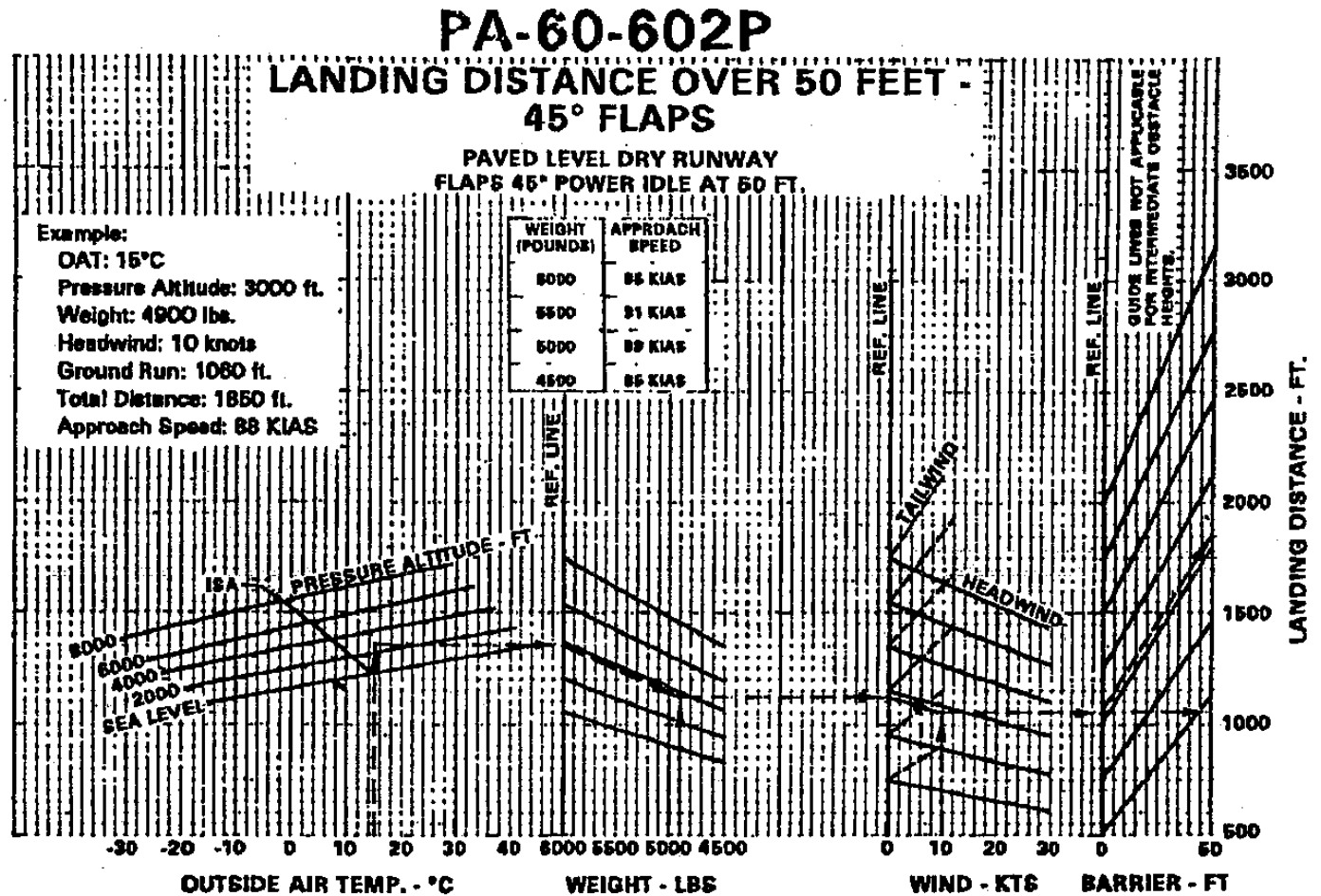


FIGURE 12-20: 602P LANDING DISTANCE OVER 50'



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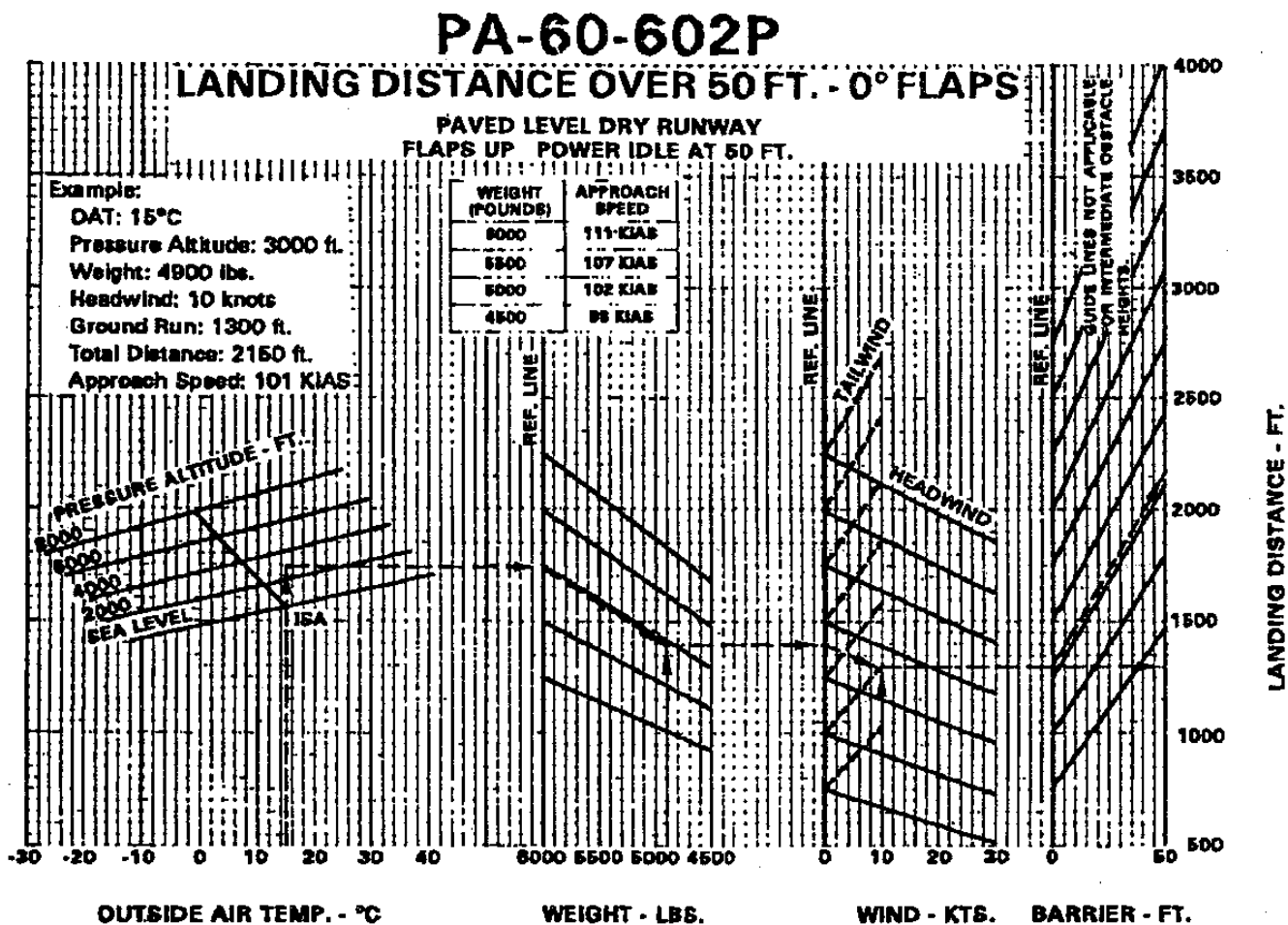


FIGURE 12-21: 602P LANDING DIST OVER 50' NO FLAPS



LANDING GROUND ROLL

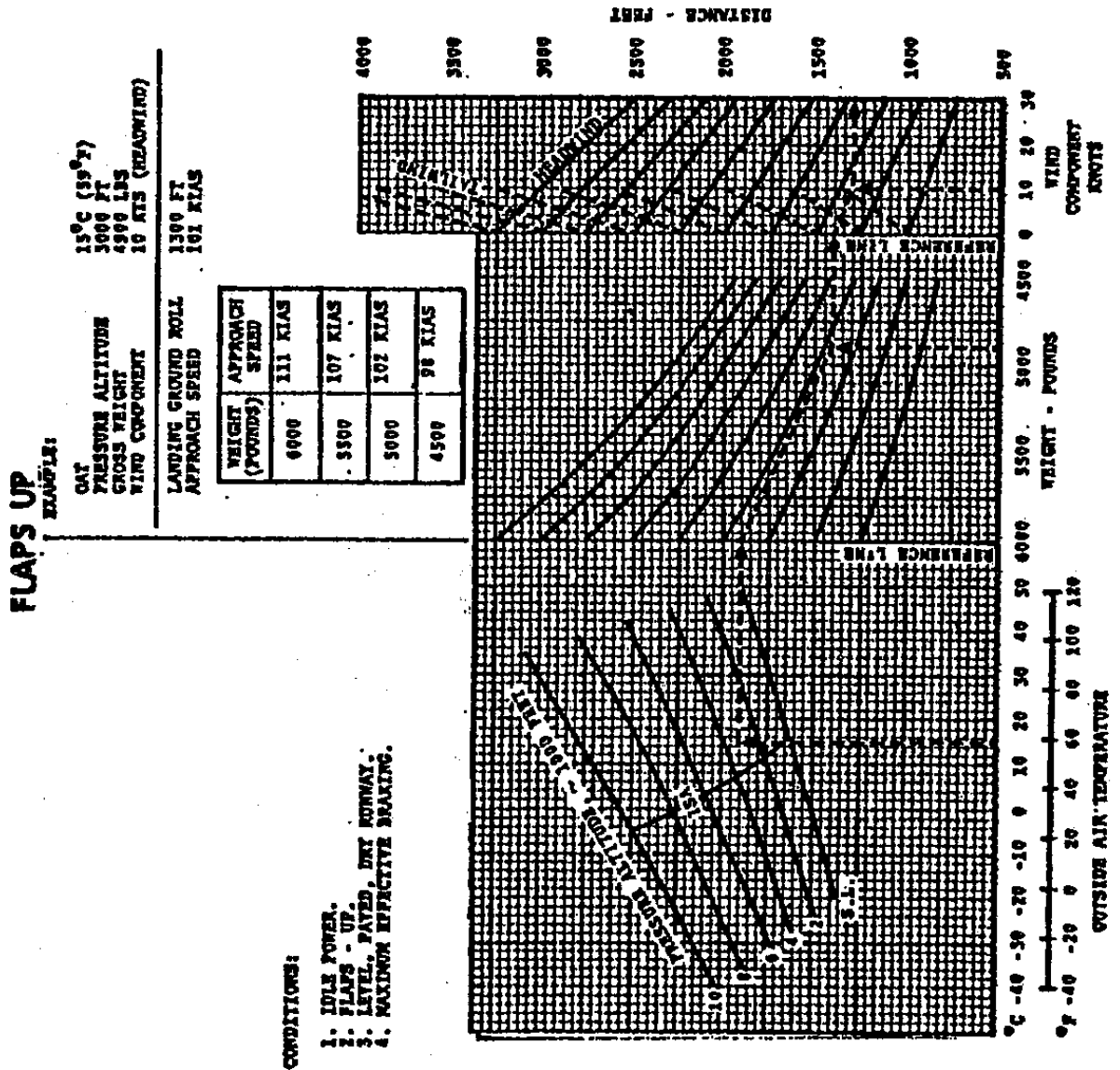


FIGURE 12-22: 601P LANDING GROUND ROLL FLAPS UP



LANDING GROUND ROLL

FLAPS 45°

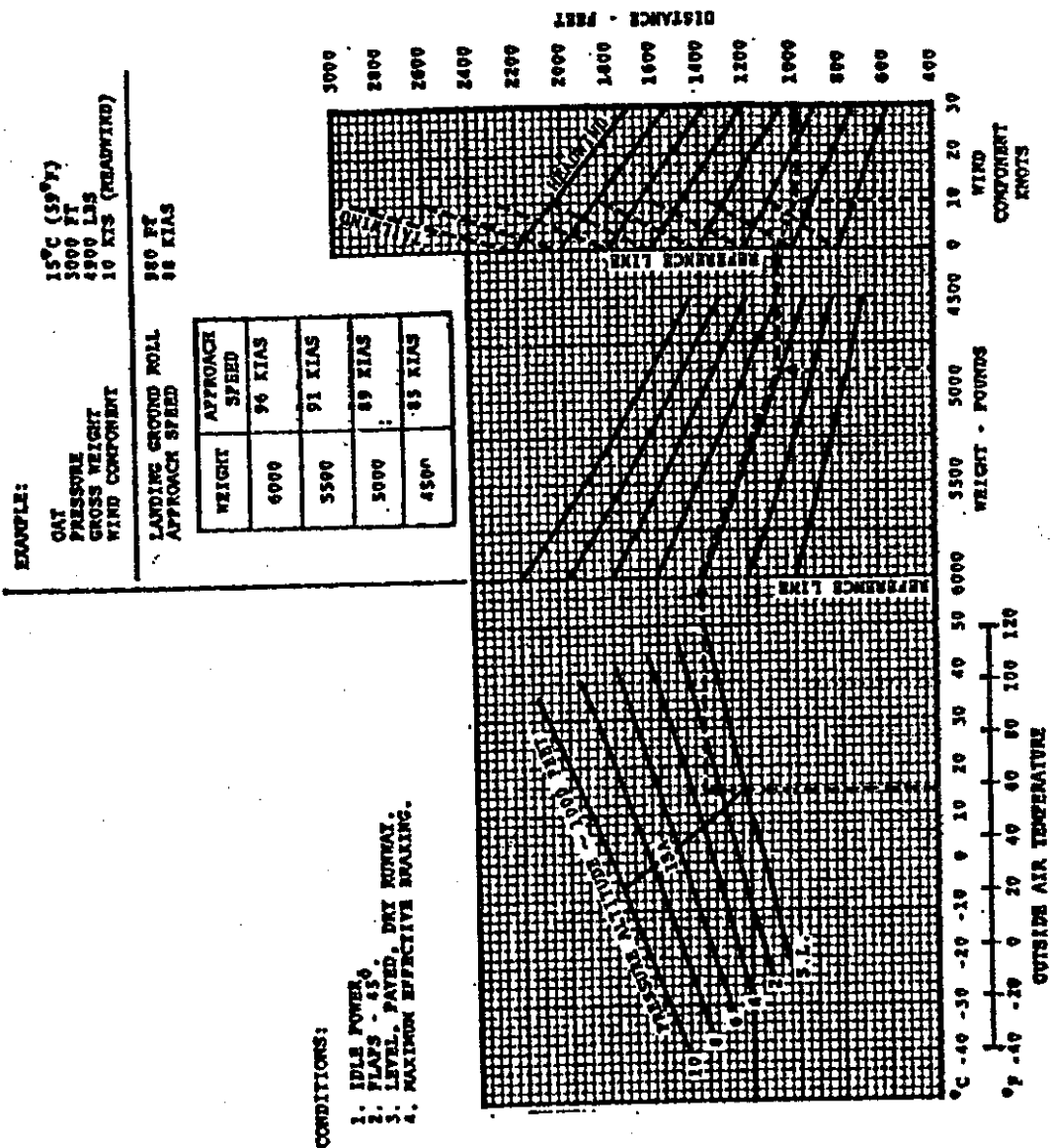


FIGURE 12-23: 601P LANDING GROUND ROLL 45° FLAPS

LANDING GROUND ROLL

FLAPS UP

EXAMPLE:

OAT 15°C (59°F)
 PRESSURE ALTITUDE 3000 FT.
 GROSS WEIGHT 4400 LBS
 WIND COMPONENT 10 KTS (HEADWIND)

LANDING GROUND ROLL 1140 FT
 APPROACH SPEED 98 KIAS

WEIGHT (POUNDS)	APPROACH SPEED
5500	107 KIAS
5000	102 KIAS
4500	98 KIAS
4000	94 KIAS

CONDITIONS:

1. IDLE POWER.
2. FLAPS - UP.
3. LEVEL, PAVED, DRY RUNWAY.
4. MAXIMUM EFFECTIVE BRAKING.

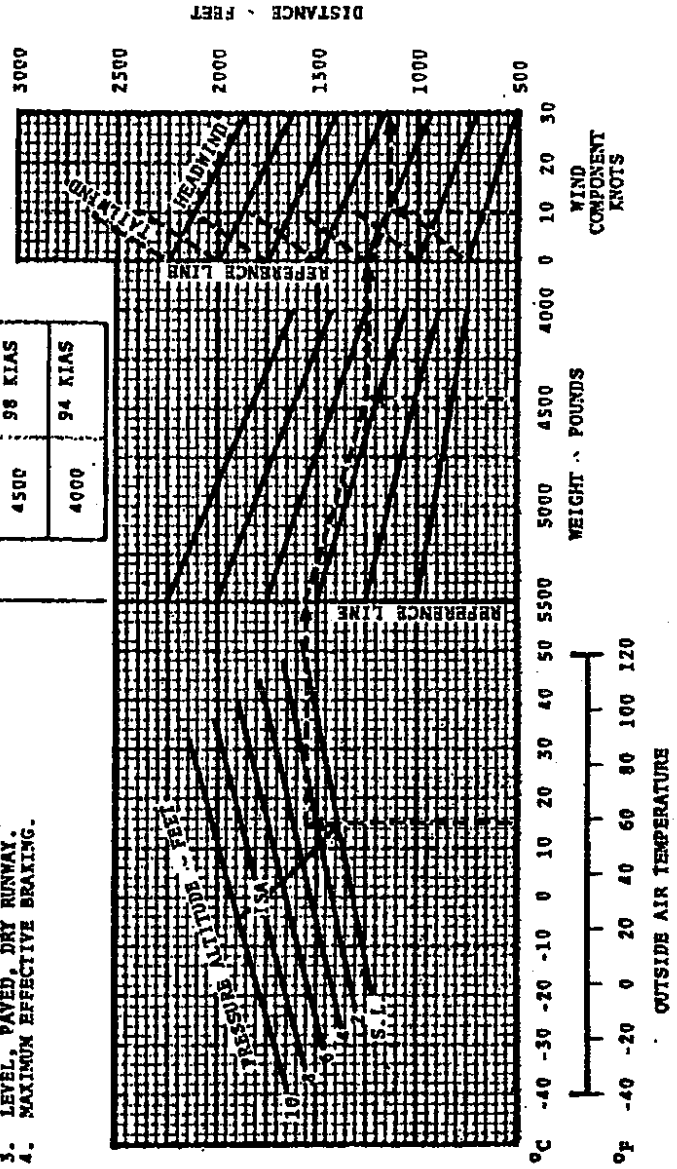


FIGURE 12-24: 600 LANDING GROUND ROLL FLAPS UP



LANDING GROUND ROLL

FLAPS 45°

EXAMPLE:

OAT 15°C (59°F)
 PRESSURE ALTITUDE 5000 FT
 GROSS WEIGHT 4440 LBS
 WIND COMPONENT 10 KTS (HEADWIND)

LANDING GROUND ROLL 920 FT
 APPROACH SPEED 85 KIAS

CONDITIONS:

1. LANDING GEAR DOWN.
2. FLAPS - 45°
3. IDLE POWER FROM 50-FOOT OBSTACLE.
4. LEVEL, PAVED, DRY RUNWAY.
5. MAXIMUM EFFECTIVE BRAKING.

WEIGHT (POUNDS)	APPROACH SPEED
5500	90 KIAS
5000	87 KIAS
4880 and less	85 KIAS

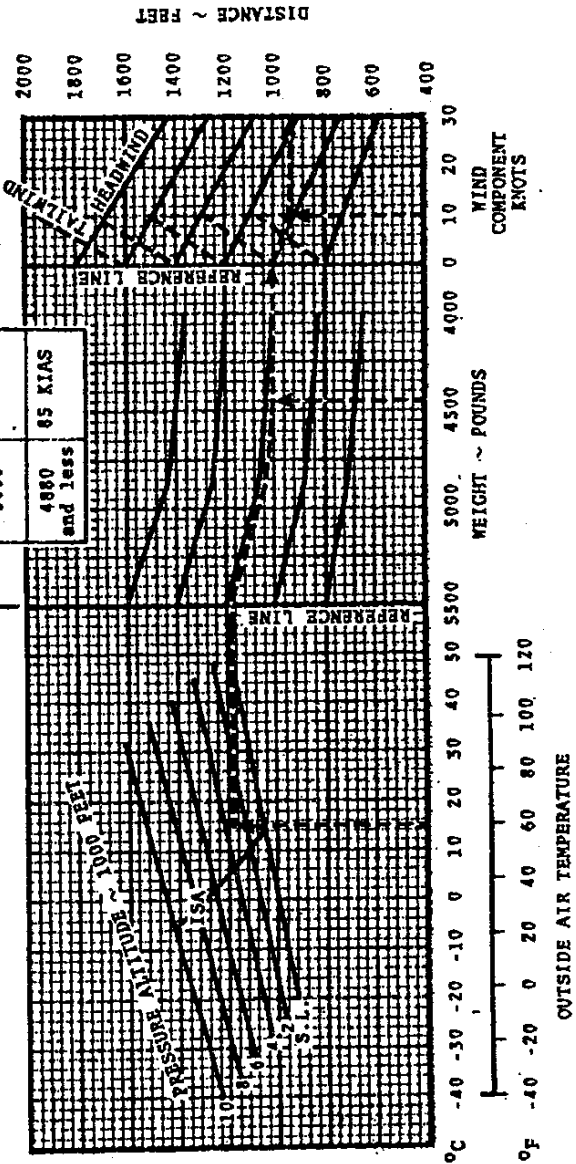


FIGURE 12-25: 600 LANDING GROUND ROLL 45° FLAPS



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POWER SETTING AND CRUISE PERFORMANCE TABLE SEA LEVEL

RPM	MAP IN. HG.	%	COLD DAY -5° C (23° F)					STANDARD DAY 15° C (59° F)					HOT DAY 35° C (95° F)				
			BEST PWR		ECONOMY		%	BEST PWR		ECONOMY		%	BEST PWR		ECONOMY		%
		BEST PWR	KTAS	OPH PER ENG	KTAS	OPH PER ENG		KTAS	OPH PER ENG	KTAS	OPH PER ENG		KTAS	OPH PER ENG	KTAS	OPH PER ENG	
2300	28.6	--	--	--	--	--	75.0	196	18.6	191	15.5	70.8	194	17.7	189	14.7	
	28.0	--	--	--	--	--	73.1	194	18.2	189	15.1	69.0	192	17.3	186	14.3	
	26.0	70.5	187	17.6	182	14.6	66.2	185	16.6	179	13.8	62.4	182	15.8	177	13.0	
	25.6	69.2	185	17.3	180	14.4	65.0	183	16.4	178	13.5	61.2	180	15.5	175	12.8	
	24.0	63.3	177	16.0	172	13.2	59.3	174	15.1	169	12.4	55.8	171	14.3	166	11.7	
	22.6	58.8	171	15.0	166	12.3	55.0	168	14.1	163	11.6	51.7	165	13.3	159	10.9	
2200	29.8	--	--	--	--	--	75.0	196	18.3	191	15.2	70.9	194	17.4	189	14.4	
	28.0	73.7	190	18.0	186	15.0	69.3	189	17.1	184	14.1	65.4	186	16.2	181	13.4	
	26.6	69.2	185	17.0	180	14.1	65.0	183	16.1	178	13.3	61.3	180	15.3	175	12.6	
	26.0	67.2	183	16.6	178	13.7	63.1	180	15.7	175	13.0	59.5	178	14.9	172	12.3	
	24.0	60.7	173	15.2	169	12.5	56.9	171	14.3	166	11.8	53.5	168	13.6	163	11.1	
	23.4	58.7	170	14.7	166	12.1	55.0	168	13.9	163	11.4	51.7	165	13.2	159	10.8	
2100	31.4	--	--	--	--	--	75.0	196	18.0	191	15.0	70.9	194	17.2	189	14.2	
	30.0	75.0	192	18.1	186	15.0	70.7	191	17.3	186	14.2	66.8	188	16.3	183	13.4	
	28.0	69.1	185	16.8	180	13.9	65.0	183	15.9	178	13.1	61.4	180	15.1	175	12.4	
	26.0	62.8	176	15.4	172	12.7	59.0	174	14.6	169	12.0	55.6	171	13.8	166	11.4	
	24.6	58.6	170	14.5	166	11.9	55.0	168	13.7	163	11.2	51.8	165	13.0	159	10.6	
2000	33.1	--	--	--	--	--	75.0	196	17.8	191	14.7	71.0	194	16.9	189	14.0	
	32.0	--	--	--	--	--	72.1	192	17.1	188	14.2	68.2	190	16.3	185	13.5	
	30.0	70.3	186	16.8	182	13.8	66.2	185	15.9	180	13.1	62.6	182	15.1	177	12.4	
	29.6	69.0	185	16.5	180	13.6	65.0	183	15.6	178	12.9	61.4	181	14.9	176	12.2	
	28.0	67.8	183	16.2	179	13.4	63.8	181	15.4	176	12.7	60.3	179	14.6	174	12.0	
	26.0	58.5	170	14.3	166	11.7	55.0	168	13.5	163	11.1	51.9	165	12.9	160	10.5	

- NOTES: 1. 6000 pounds gross weight. TAS will increase approximately 3 kts for each 500 pounds of weight reduction.
 2. Use full rich mixture above 75% power.
 3. Do not lean beyond peak or 1650°F RGT.
 4. Some manifold pressure values shown are limiting, refer to Maximum Manifold Pressure vs. Altitude Chart, Figure S-51.
 5. Best power leaning: Lean to peak or 1650°F RGT and enrichen 100°F. Use fuel flows shown as a reference.
 6. Economy leaning: Lean to peak or 1650°F RGT. Use fuel flows shown as a reference.

FIGURE 12-26: 602P POWER SETTING & CRUISE PERFORMANCE



NOTES:

1. 6000-POUNDS GROSS WEIGHT (INCREASE SPEEDS BY 1.0 KIAS FOR EACH 600-POUNDS BELOW 6,000 POUNDS).
2. WHEN OPERATING AT POWER SETTINGS WITHIN THE BOXES, DO NOT LEAN BELOW FUEL FLOWS SHOWN. WHEN OPERATING OUTSIDE THE BOXES LEAN TO PEAK EGT AND ENRICHEN 100°F, THEN INCREASE INDICATED FUEL FLOW 1 GALLON USING FUEL FLOWS SHOWN ONLY AS A GUIDE.
3. WHEN OPERATING ABOVE 75% POWER, 2400 RPM, OR MAXIMUM MAP SHOWN FOR A SELECTED RPM, USE FUEL RICH MIXTURE.
4. PERCENT POWERS ARE PERCENT OF SEA LEVEL RATED POWER AND ARE APPROXIMATE.

SLAT 111										
RPM	MAP (In. Hg)	COLD DAY -5°C (23°F)			STANDARD DAY 15°C (60°F)			HOT DAY 35°C (95°F)		
		% POWER	KIAS	GPH PER ENG.	% POWER	KIAS	GPH PER ENG.	% POWER	KIAS	GPH PER ENG.
2400	26.0				75.0	200	18.6	70.5	199	17.7
	25.0				71.6	196	18.0	67.3	196	17.2
	24.0	72.8	193	18.2	68.2	193	17.4	64.1	192	16.6
	23.0	68.2	188	17.4	65.0	189	16.8	60.9	188	16.1
	22.0	65.6	186	16.9	61.4	186	16.1	57.6	183	15.6
	21.0	62.0	181	16.2	58.0	180	15.6	54.4	176	15.0
	20.0	58.4	177	15.6	55.0	176	15.1	51.1	173	14.5
	27.0				76.0	200	18.3	70.4	199	17.5
2300	26.0				71.7	196	17.7	67.5	196	16.9
	25.0	73.0	193	18.0	68.5	193	17.1	64.4	192	16.3
	24.0	69.6	190	17.3	65.0	189	16.4	61.4	188	15.8
	23.0	66.2	186	16.7	62.0	185	15.9	58.3	184	15.3
	22.0	62.8	182	16.0	58.8	181	15.3	55.2	180	14.7
	21.0	59.3	178	15.4	55.5	177	14.8	52.1	176	14.2
	20.8	58.7	177	15.3	55.0	176	14.7	51.7	174	14.1
	20.0	56.0	174	14.9	52.3	172	14.3	49.0	169	13.7
2200	26.0				75.0	200	18.0	70.5	199	18.2
	27.0				71.4	196	17.4	67.3	196	16.6
	26.0	72.9	193	17.7	68.5	193	16.8	64.5	192	16.1
	25.0	68.7	190	17.1	65.4	189	16.2	61.6	189	15.6
	24.8	68.1	189	16.9	65.0	188	16.2	61.2	188	15.4
	24.0	66.6	187	16.4	62.3	186	15.6	58.7	185	15.0
	23.0	63.2	183	15.8	59.3	182	15.1	55.7	180	14.5
	22.0	60.0	179	15.3	56.2	178	14.6	52.8	176	14.0
	21.5	58.4	177	15.0	55.0	176	14.4	51.4	174	13.8
	21.0	56.8	176	14.7	53.1	173	14.1	49.9	171	13.5
	20.0	53.5	170	14.2	50.1	168	13.6	47.0	166	13.1

FIGURE 12-27: 601P CRUISE PERFORMANCE, BEST POWER



POWER SETTING TABLE

		Holding Power (45%)			Long Range Cruise Power (55%)			Economy Cruise Power (65%)			High Speed Cruise (81%)		
		Approximate Fuel Flow 12.3 GPH Per Engine			Approximate Fuel Flow 15.1 GPH Per Engine			Approximate Fuel Flow 17.9 GPH Per Engine			Approximate Fuel Flow 25.6 GPH Per Engine		
		Mixture leaned to peak IGT not to exceed 1650°F IGT Maximum recommended cylinder head temperature 435°F.									Mixture leaned to 25.6 GPH per engine not to exceed 1650°F IGT Max. rec. cyl. head 475°F.		
Press.	OAT	RPM			RPM			RPM			RPM		
Alt.	FL	Man.	Press.	In. Hg.	Man.	Press.	In. Hg.	Man.	Press.	In. Hg.	Man.	Press.	In. Hg.
SL	15	25.6	-	-	29.2	28.1	26.2	32.8	31.6	30.5	-	37.4	36.4
5000	5	24.8	-	-	28.6	27.6	26.0	32.4	31.4	30.3	-	37.2	36.2
10000	-5	24.2	-	-	28.0	26.9	26.0	32.2	30.8	29.8	-	36.8	36.0
15000	-15	23.8	-	-	27.8	26.8	26.0	32.0	30.8	29.8	-	37.0	36.0
18000	-21	23.7	-	-	27.8	26.7	26.0	32.0	30.9	29.8	-	37.2	36.4
20000	-25	23.4	-	-	27.8	26.9	26.0	32.2	30.9	29.7	-	37.5	36.4
23000	-31	23.4	-	-	27.9	26.6	25.9	32.4	31.0	29.7	-	-	36.5
25000	-34	23.5	-	-	28.1	26.9	26.0	-	31.3	29.9	-	-	36.9

NOTES:

1. To maintain constant power, correct the manifold pressure approximately .2 In. Hg. for each 5°C variation from standard temperature. Add manifold for temperatures above standard and subtract manifold pressure for temperatures below standard.
2. Adjust cowl flaps and/or fuel flow as required to maintain cylinder head and oil temperatures within recommended limits.

FIGURE 12-28: 700P POWER SETTING TABLE



CRUISE PERFORMANCE, BEST POWER

SEA LEVEL

NOTES:

1. 5500 POUNDS GROSS WEIGHT (INCREASE SPEEDS BY 2.0 KTAS FOR EACH 500-POUNDS BELOW 5500 POUNDS).
2. LEAN TO PEAK EGT AND ENRICHEN 100°F USING FUEL FLOWS SHOWN ONLY AS A GUIDE. FOR AIRPLANES NOT EQUIPPED WITH EGT GAGE DO NOT LEAN BELOW FUEL FLOWS SHOWN.
3. WHEN OPERATING ABOVE 75 PERCENT POWER, USE FULL RICH MIXTURE.
4. PERCENT POWERS ARE PERCENT OF SEA LEVEL RATED POWER AND ARE APPROXIMATE.

SEA LEVEL										
RPM	MAP (in.Hg)	COLD DAY -5°C (23°F)			STANDARD DAY 15°C (59°F)			HOT DAY 35°C (95°F)		
		POWER	KTAS	GPH PER ENG.	POWER	KTAS	GPH PER ENG.	POWER	KTAS	GPH PER ENG.
2400	25.6				75.0	203	17.5	70.5	202	16.7
	25.0				72.5	200	17.0	68.2	199	16.3
	24.0	73.8	197	17.3	69.1	196	16.4	64.9	195	15.6
	23.0	69.3	193	16.5	65.0	192	15.7	60.8	190	15.0
	22.0	65.3	188	15.7	61.1	187	15.0	57.3	185	14.3
	21.0	60.7	183	15.0	56.7	181	14.2	53.1	179	13.7
	20.5	58.9	180	14.7	55.0	178	14.0	51.6	177	13.4
	20.0	56.4	177	14.3	52.6	175	13.6	49.2	173	13.1
	19.0	52.4	171	13.6	48.9	169	13.1	45.7	167	12.5
	18.0	48.2	165	12.9	45.0	163	12.4	41.9	161	12.0
2300	26.5				75.0	203	17.2	70.5	202	16.4
	26.0				73.2	201	16.9	68.9	200	16.1
	25.0	73.8	197	17.0	69.1	196	16.1	65.0	195	15.4
	24.0	70.3	194	16.3	65.8	193	15.6	61.8	191	14.9
	23.7	69.6	193	16.2	65.0	192	15.4	61.2	190	14.8
	23.0	66.3	189	15.6	62.1	188	14.9	58.3	186	14.3
	22.0	62.4	184	14.9	58.4	183	14.3	54.8	182	13.7
	21.0	58.5	179	14.3	55.0	178	13.7	51.3	176	13.1
	20.0	54.3	174	13.5	50.7	172	13.0	47.5	170	12.5
	19.0	50.3	169	12.9	46.9	166	12.4	43.9	164	12.0
2200	18.4	48.5	166	12.7	45.0	163	12.1	42.3	162	11.7
	18.0	46.9	163	12.4	43.7	161	11.9	40.9	159	11.5
	27.3				75.0	203	17.0	70.7	202	16.2
	27.0				73.9	202	16.8	69.6	201	16.0
	26.0	74.9	198	17.0	70.2	198	16.1	66.1	196	15.4
	25.0	71.0	194	16.3	66.5	193	15.5	62.6	192	14.7
	24.5	69.5	193	16.0	65.0	192	15.1	61.3	190	14.5
	24.0	67.5	190	15.6	63.3	189	14.8	59.5	188	14.1
	23.0	63.4	185	14.8	59.4	184	14.1	55.8	183	13.5
	22.0	59.9	181	14.2	56.1	180	13.5	52.7	178	12.9
	21.7	58.8	179	14.0	55.0	178	13.4	51.6	177	12.8
	21.0	56.0	176	13.5	52.3	175	12.9	49.1	173	12.3
	20.0	52.3	171	12.9	48.9	169	12.3	45.9	168	11.8
	19.0	48.8	166	12.3	45.0	163	11.7	42.7	162	11.4
	18.0	44.9	160	11.7	41.9	158	11.2	39.2	156	10.9

FIGURE 12-29: 600 CRUISE PERFORMANCE, BEST POWER



CHAPTER 12 – QUIZ

1. Leaning procedures on all PA-60 model aircraft are:
 - a. the same on all aircraft.
 - b. peak EGT or 2650° and enrich 200°.
 - c. different between the 602P and 602P.
 - d. None of the above.

2. For a flight at 20,000' in the 602P using 28" MAP and 2400 RPM, the leaning procedures for best power would be:
 - a. peak EGT or 1650° and enrich 200°.
 - b. peak EGT or 1650°.
 - c. lean until engine becomes rough running.
 - d. None of the above.

3. For a flight at 20,000' in the 602P using 30" MAP and 2000 RPM, the leaning procedures would be:
 - a. peak EGT or 2650° and enrich 200°.
 - b. peak EGT.
 - c. lean until engine becomes rough running.
 - d. None of the above.



4. The takeoff ground roll for the 601P would be _____ft. under the following conditions:
- | | |
|---------------------------|---------|
| 0° flaps | a. 2000 |
| 20°C | b. 2650 |
| 1500 pressure altitude | c. 3200 |
| 6000 lbs. aircraft weight | d. 3750 |
| 10 KT headwind | |
5. The accelerated stop for the 602P would be _____ft. under the following conditions:
- | | |
|---------------------------|---------|
| 0° flaps | a. 3750 |
| 30°C | b. 5200 |
| 1000 pressure altitude | c. 4600 |
| 6000 lbs. aircraft weight | d. 2000 |
| 5 KT headwind | |



13

13. AVIONICS & AUTOPILOTS

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 13

AVIONICS & AUTOPILOTS

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FOR TRAINING PURPOSES ONLY



DISPLAYS

Not long ago, a modern cockpit in a general aviation airplane was a Flight Director, HSI, and MFD. The last ten years has seen this portion of the industry change dramatically. The two normally installed products for Aerostars which qualify as glass navigational devices are the Garmin G500 and G600 and the Aspen Pro and Evolution series. The basic components are a Primary Flight Display (PFD) and a Multi-Function Display (MFD). Options such as Synthetic Vision, Altitude Preselect, and Electronic Charts provide an amazing degree of customization and functionality.

These displays combined with other equipment, also known as Electronic Instrument Flight Systems (EFIS) were previously found only in much larger airline and business jets. They have revolutionized the 12,500 pounds and under General Aviation industry. The major advantage of the glass cockpit over legacy or "Steam Gauges" is that all the information is displayed on the PFD/MFD with much less interpretation and scan technique. The idea of looking around an ill organized cockpit for data such as DME, Wind Vectors, Slip Data, Turn Rates, Altitudes, Headings, etc. is regressive.

Additionally, when combined with advanced navigation equipment, situational awareness is improved tremendously. Add, satellite or ADS-B weather and pilots have everything they need for a safe flight. They can display synthetic vision,

navigational data, weather data, traffic, terrain, external sources such as infra-red, and control many autopilots.

The number of options and variations can be overwhelming whether evaluating an existing panel or investigating a possible upgrade. The first thing to remember is the FAA publishes an approved model list STC for each type of airframe. Also, there is a list of avionic accessories the PFD/MFD is approved to operate. Any deviation from this approved list requires individual approval by a FSDO avionics inspector. Normally a FAA Designated Electronic Designee is going to be required in this approval process along with the individual FAA approved avionics facility. All of this can be quite expensive, because the aircraft owner is taking upon himself the responsibility of complying with all applicable FAA rules, regulations, and STC requirements.

It behooves the aircraft owner to obtain the services of a qualified and experienced avionics shop when considering a major avionics installation job. Shops with electronic CAD/CAM, laser panel cutting, and the latest diagnostic equipment should be sought out for the installation. Many owners and even CFI's are not aware that, during the approval testing of the new installed avionics equipment, inadvertent non-compliance with the applicable FAR's or STC's may place the testing pilot in jeopardy with the local FAA FSDO. Under these circumstances the NASA reporting system or the plea of ignorance may still



incur the offending pilot or instructor a FAA violation and its corresponding penalties. This warning is not meant to deter owners from upgrading their equipment, but to use diligence during the process.

That said, the Aerostar is truly an exceptional platform for advanced avionics. Combining advanced systems

with outstanding performance creates a remarkable transportation machine.

While this chapter deals with updating instrument panels, it is worth mentioning that new equipment does not necessarily add utility. And, eventually, the new becomes old.



Dual Garmin G600s, GTN750/650 and EDM960

Why are the Garmin G500 and G600 listed as two configurations? Garmin certified the G500 for Class I and II aircraft, piston singles and multi-engine aircraft

below 6,000 lbs GW. The G600 was approved for Class III multi-engine aircraft and singles weighing 6,000 to 12,500 lbs GW. The Aerostar was initially STC'd for

only the G600, but eventually was added to the G500. The G500 or G600 has great resolution and capabilities. While it does interface with competitor's equipment, it is at its best in an all Garmin installation.

and Aspen PFD's is getting rid of the pneumatic attitude indicator. They both use an electronic heading reference systems (AHRS) which is significantly more reliable than mechanical pump, gyro systems.

One of the advantages of both Garmin



Aerostar Aspen Evolution 1000

The Aspen Avionics Evolution 1000 PFD. It is available for Class II & III aircraft available in the Evolution series from the 1000 to the 2500. Aspen Avionics has an outstanding history of working with the manufacturers of other equipment.





ADS-B

The cornerstone of the FAA's NexGen update of the National Airspace System (NAS) is Automatic Dependent Surveillance–Broadcast known as ADS-B. There is ADS-B in (receiving) out (broadcasting). ADS-B out will be mandatory for all aircraft flying in the NAS Class A through E airspace starting on January 1, 2020. The carrot offered to install an ADS-B system is that with ADS-B in, you can receive traffic and weather for no additional cost from ground based stations.

There is a myriad of products to meet the FAA mandate. These boxes are known as ADS-B compliant equipment for certified aircraft. Many solutions are transponder replacements such as Garmin's GTX-33es or GTX-335. Bendix King has the KT74. L-3 has the NGT-9000 Lynx. A new player is the Stratus ESG 1090ES. Some of these have reception and display capabilities and some do not. Careful evaluation is necessary.



Lynx NGT-9000

Also requiring careful consideration is the ability to display weather and traffic on

your MFD. For Garmin, there is the GDL-88 and for Aspen Avionics the ATX 100/200G. Both of these units are remote boxes which allow for the aircraft owner to receive weather and traffic into their aircraft to be displayed on a variety of compatible displays with the G-500/600 and Evolution 1000 as primary candidates. Each pilot or owner needs to contact his or her avionics shop to determine the options that best fit their individual needs.



Aspen ATX 100/200G

As time grows closer to the January 1, 2020 compliance date, manufacturers will be pushed to deliverer in adequate numbers the equipment to make aircraft ADS-B compliant. This is not to say that better and cheaper equipment will not be available in the future, but considering the large number of aircraft that need upgrading to comply with ADS-B, the adverse of this rule may take effect and the GA industry will see a rapid rise in price to the end users to comply with ADS-B by January 1, 2020.

NAVIGATION



The Garmin GNS530/430 series has been the dominant player in the navigation receiver market for many years. Its run has truly been remarkable. It is likely that many owners will continue to use them for many years. Garmin is likely to provide maintenance support for a long time. However, new features and updates will not be added. It may not be worth upgrading by itself, but as part of a major panel redo, it should be considered.

There are several paths for replacing the GNS or older nav equipment. Avidyne has the IFD540 and IFD440 which are drop in replacements for the GNS530 and 430. This saves considerably on the installation costs.

Garmin is likely to continue to dominate the market especially for those going the G500/G600 route. The GTN 750 and 650 are very capable, have touchscreens and, obviously, interface well. It does not reuse any of the GNS installation however. The size is different so the panel will need to be modified or arranged differently. This can make for an expensive upgrade.

In the past, many upgrades included a MFD such as the Avidyne EX600 for displaying onboard radar, traffic, Stormscope, terrain, and nav data. The

GTN750 can do that as well freeing the panel space. Keep in mind that many of these options require an unlock card specific to the receiver and they can be expensive.

Also, the GTN series can control remote transponder and intercom boxes for a cleaner panel. It does come at a higher price and locks you into that manufacturer's equipment.

Whatever system you choose, the databases must be kept current. A prudent pilot will have a good plan for doing so and be organized. Good labeling and a SD Card wallet can help. Garmin has bundles which can reduce the cost of updates. Additionally, there is the choice of FAA (free) verses Jeppesen Charts (not free).

GRAPHIC ENGINE MONITORS

A graphic engine monitor can be one of the most important and cost-effective instruments in the panel. The information provided can save repair costs and even save the engine. No pilot should even think about LOP operations without one.

Another great feature of most engine monitors, is the ability to record and download data. The data can be uploaded onto the Savvy Aviator website or into a



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program like EGView. Then it can be analyzed to determine any anomalies or problems with the engine or operator.

There are several options for single instrument monitors. JP Instruments makes several with the EDM760 being installed in many Aerostars. The upgraded display of the EDM790 uses the same sensors but requires more panel space.



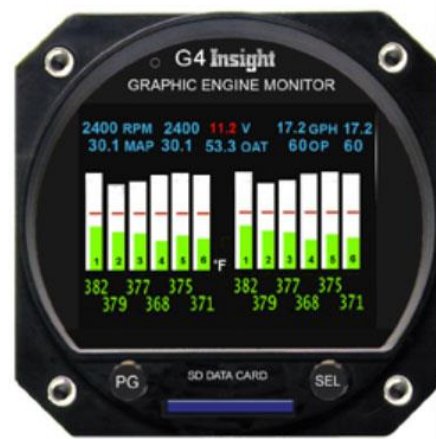
JP Instruments EDM790

Insight Avionics made the GEM1200 which was one of the first engine monitors for general aviation. Today the G4 Twin is their Aerostar offering.

Electronics International offers several instruments STC'd for the Aerostar,

There are also systems which can replace all the engine instruments cleaning up the panel and providing a modern appearance. They are certified as a primary flight instruments which

means you can remove the old steam gauges. JP Instruments has the EDM960 Twin which is considered to be the strongest contender in the market. Flightline Systems offers the AuRACLE CRM2120.



Insight G4 Twin

When considering an upgrade to the instrument panel and the elimination of primary flight instruments, one must first consider what instruments are required. Some aircraft have a Minimum Equipment List (MEL). Those pieces cannot just be eliminated. They can only be removed if the equipment you are considering is approved as Primary for that use. If it is not, you must leave the original gauges.

For example, the G4 Twin is approved for Primary for CHT, EGT and



TIT. If you install it, you may remove the original gauges. It is not always easy to find this information. Again, a knowledgeable installer can prove invaluable.

WEATHER

The amount of weather data available in the cockpit today is nothing short of amazing. A call to Flight Watch can get you a great deal of information, but a picture is worth a thousand words. There are also a great number of options to sort through.

NEXRAD is an essential weather service for weather flying. It is available from SiriusXM Aviation Weather or ADS-B receivers properly equipped. SiriusXM requires a paid subscription, but some pilots prefer the quality and amount of data you can receive such as lightning and echo tops. It also has the benefit of immediate reception whereas ADS-B is not available in some locations and at some altitudes.

With the proper equipment, both provide METARS, Winds Aloft, PIREPS, TFRs, and more. The caveat is the right equipment. Careful planning must be used to avoid surprises. Many of the same features can be obtained with portable devices, but not onto certified in-panel equipment. Portable options

will be covered in another section.

For Garmin, the GDL-69 is used to download SiriusXM weather to in-panel certified equipment. The GDL-69A downloads SiriusXM audio as well. As mentioned before, the GDL-88 is the certified ADS-B receiver.

NEXRAD, keeping in mind its time delay limitations, provides good information for strategic moves such how far to do an end run on that line of thunderstorm. On-board radar provides good tactical information such as 20° left or 20° right. On-board radar requires user knowledge and operation garner useful information. Garmin has their digital radar the GWX-70. There are handful of other supported analog radars installed such as the Bendix King RDR-2000 which can be displayed and controlled by the Garmin GTS receivers, with a fee of course.

Stormscope is still valuable if installed. It provides lightning strike data. You might not install a new one, but it can provide valuable data. The WX500 is now owned by L3 and is most commonly installed.



AUTOPILOTS

The Aerostar was designed and manufactured well before digital autopilots existed. Analog autopilots did and still do a fine job when working properly. Today, their repair and maintenance can be problematic as fewer shops can work on them and parts can be hard to find. It can be frustrating for an owner to put money into 30 or 40-year-old technology.

There is also the problem of interoperability of older and newer equipment. It is up to the owner and ultimately pilot to ensure the aircraft is modified in a way which maintains its functionality and certification. Working with a reputable and certified shop will go a long way towards that end.

This section will provide an overview of the certified options. The Aerostar performs better with attitude based autopilots and most of the higher end and certified autopilots are rate based. Replacing an autopilot is a major undertaking. Installation times and costs tend to increase greatly as the work is being performed. Much of the airplane is opened up and major issues can be found. It should not be undertaken lightly.

It is important to note the Aerostar

uses electric only trim. Therefore, a certified pitch trim adapter is necessary to properly interface with the autopilot.

In all cases careful consideration should be given to ensure all the necessary equipment and connections are installed. Also, features may not work as intended or at all. Again, a knowledgeable installer can be invaluable. Additionally, a discussion with Aerostar Aircraft Corporation should be undertaken in the planning stages to avoid unnecessary mistakes and confusion.

Finally, new options may be available which were not at the time of this publication or unknown to the writer. Things change fast in the world of autopilots and avionics.

Bendix FS810



The Bendix FS810 was originally installed in a large number of Aerostars. It is an attitude based autopilot with



several components which are quite heavy and bulky. When working properly, it does a fine job of flying the airplane. There are still quite a few 810's in use today. The FS810 is very limited in its ability to interface with modern equipment. The FS810 does not have vertical speed or altitude preselect. There is no manufacturer support but several shops still work on them.

Century III/IV



The Century III and IV autopilots are analog attitude base and perform well when working properly. The Century IV has a long history as a proven and reliable autopilot. The manufacturer is still in business and supports all models. They do not have altitude preselect or vertical speed control, just pitch hold and altitude hold. While certain models interface with glass panels, there have been problems. Care should be exercised to make sure all the costs, equipment and features are understood.

Century 41



The Century 4100 autopilot is digital attitude base and perform well when working properly. The Century IV has a long history as a proven and reliable autopilot. The manufacturer is still in business and supports all models. It does not have altitude preselect or vertical speed control, just pitch hold and altitude hold. It interfaces with glass panels but care should be exercised to make sure all the costs, equipment and features are understood.



S-TEC 55X



The S-TEC 55x is made by S-TEC now Genesys Aerosystems. It is an analog, rate based autopilot with vertical speed and altitude preselect. The reviews are mixed with the Aerostar and some installations have had problems with the servos, but others have not. There is still manufacturer support. The S-TEC has interface capabilities with PDF displays such as the G500 and Aspen. In most cases, with the right equipment, it will provide full functionality.

King KFC-225



The King KFC-225 is a digital, attitude based autopilot. It flies the Aerostar exceptionally well. While it has been around for a while, it is still available for installation from Aerostar Aircraft who owns the STC. There have been some reliability issues reported, but installation could play a part in those reports. The servos are the same robust servos on the KFC-200. It has vertical speed and altitude preselect. It has a robust power on self-test and good audio alerting including voice alerts.

King KFC-200



The analog King KFC-200 was installed in many of the later Aerostar models. It is an attitude based autopilot with vertical speed and altitude preselect. The system is robust including the servos and a good performer. With proper equipment and installation, it can interface well with modern glass panels. Care should be taken, however as early, unmodified versions, may require costly upgrades to do so.

As it is a digital autopilot, it interfaces well with modern PFDs such as the Garmin G500 and the Aspen Evolution. One item to note is the control of altitude preselect and vertical speed will remain with the KFC-225 and not the PFD. This can be frustrating if not anticipated. Also, there is a quirk which requires pilot interaction just before the FAF on GPS LPV approaches in order to automatically capture the glide slope. This is only for GPS LPV approaches.



ELECTRONIC FLIGHT BAG

For charts and flight planning, it is hard to beat a tablet with an Internet connection. The information provided concerning this subject changes constantly. A good pilot will stay informed and find solutions which work for him or her.

The most common Electronic Flight Bag (EFB) is the Apple iPad. For software Foreflight is the most common solution. Garmin Pilot is a close second with more features being added each day. Plus, Pilot can be run on Android devices.

Garmin has several dedicated solutions in the form of tablets.

With an EFB and a database subscription the days of dealing with paper charts is over. You still need a backup and many pilots print those. But, if you have in-panel charts with a G500 or GTN750, your iPad can be your backup.

ADS-B weather and traffic can be downloaded while in the air using the Stratus receiver or the GDL-39. Garmin has a new portable receiver the GDL-52 which can receive both ADS-B and SiriusXM. Most portable solutions also download AHRS and GPS data to the tablet.

Garmin allows communication between certified panel equipment and portable devices via their Flightstream products. Flight plans can be uploaded and traffic and weather data can be downloaded. Interestingly, SiriusXM traffic and weather cannot be downloaded to Foreflight. This means that only Garmin Pilot can display ADS-B traffic from a Garmin GDL-88.

One of the other great uses for the iPad or other tablet is to keep handy all the equipment manuals, operator manuals, flight manuals, FARs, AIMs, service manuals, parts lists, etc. You can even scan your aircraft logs and keep them handy while keeping the originals in a safe place. The weight savings can be considerable, not to mention much greater convenience. Bear in mind, the files need to actually be downloaded to the device, not just linked.

The FAA has produced Advisory Circular AC No. 120-76C to help clarify the acceptable use of EFB's. You can read it and decide if it helps. It seems to indicate that, for an aircraft like the Aerostar, they are perfectly acceptable as a paper replacement. But you must determine that it does not interfere and will be reliable. Plus, you should have a backup and it should not be free to fly around in turbulence. Every pilot should read this for yourself and determine its



applicability.

An EFB can have weight & balance applications, pilot logbook applications, weather, tracking, cloud height, the list is practically unlimited.

OTHER CONSIDERATIONS

Traffic alerting is an important tool, especially in busy airspace. ADS-B has made it easy and affordable. ADS-B provides Traffic Information System or TIS data. Of course, standalone TAS and TCAS systems such as the Avidyne TAS 620 still have a place and can be displayed on most MFDs.

Terrain and obstacle information has become built into every new system. Even Garmin 430s provide alerting for obstacles. New EFIS systems take terrain awareness to a new level with synthetic vision.

If upgrading a panel, you may want to consider adding a certified USB charging port. This can provide convenience as well as safety in the event of a low battery situation.

With backup attitude displays, angle of attack indicators, etc. there is almost no limit to the number of ways you can spend money on your panel. Manufacturers have become very good

at separating pilots to from their AMU's. For the uninformed an AMU is short for Aviation Monetary Unit equal to \$1,000. Each pilot and owner will have to determine their desire to replace perfectly good equipment to have a great panel. On the other hand, it is hard to place a value on situational awareness, weather awareness and safety.



14

14. APPENDIX

FOR TRAINING PURPOSES ONLY



FOR TRAINING PURPOSES ONLY



CHAPTER 14

APPENDIX

PRODUCTION DETAILS.....	14-1
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FOR TRAINING PURPOSES ONLY



PRODUCTION DETAILS

AEROSTAR (TED SMITH) PRODUCTION DETAILS			
Year Built	Construction Number Range	Type	Comment
1966	36-1	360	
1968-1978	60-0001 to 60-0500-162*	600/600A	
1968-1978	61-0001 to 61-0497-128*	601/601A/601B	
1974-1978	61P-0157-001 to 61P-0501-206	601P	
1978	62-001	602	
(* c/n -131-00 and -133-00 were fuselages only)			

AEROSTAR (PIPER) PRODUCTION DETAILS			
Model Year	Construction Number Range	Type	Comment (Built)
1978	60-0503-163 to 60-0560-182	600A	Santa Maria
1978	61-0510-129 to 61-0537-132	601B	Santa Maria
1978	61P-0502-207 to 61P-0559-241	601P	Santa Maria
1979	60-0563-7961183 to 60-0713-7961221	600A	Santa Maria
1979	61-0573-7962133 to 61-0698-7962143	601B	Santa Maria
1979	61P-0561-242 to 61P-0562-243	601P	Santa Maria
1979	61P-0564-7963244 to 61P-0714-7963345	601P	Santa Maria
1980	60-0715-8061222 to 60-0824-8061236	600A	Santa Maria
1980	61-0717-8062144 to 61-0838-8062152	601B	Santa Maria
1980	61P-0716-8063346 to 61P-0825-8063433*	601P	Santa Maria
1981	60-0833-8161237 to 60-0933-8161262	600A	Santa Maria
1981	61-0844-8162153 to 61-0880-8162157	601B	Santa Maria
1981	61P-0826-8163434 to 61P-0860-8163455	601P	Santa Maria
Prototype	62P-0750-8165001	Sequoia	Santa Maria
1981	62P-0861-8165002 to 62P-0932-8165055*	602P	Santa Maria
1982	60-8265001 to 60-8265048*	60-602P	Vero Beach
1983	60-8365001 to 60-8365021	60-602P	Vero Beach
Prototype	60-8223001	60-700P	Vero Beach
1984	60-8423001 to 60-8423025	60-700P	Vero Beach
A total of 15 aircraft in the batches marked * were not delivered, instead they were updated to the next year's model and given new construction numbers. (See appendix g)			
Total manufactured by Piper 512			

Total Aerostars manufactured 1010



CHANGES BY SERIAL NUMBER

SN 130 and up	Double window installation standard.
SN 144 and up	Tach generator moved to aft nacelle.
SN 150 and up	New fuel quantity gauge system. Control monitor on station 176 panel.
SN 157	1st "P" model @ 5700 lb. gross weight. Pneumatic gyros standard.
SN 173 and up	Replaced Goodyear brakes with Cleveland.
SN 190 and up	Pneumatic gyros installed as standard 600/601.
SN 213 and up	First long wing 601P-6000 lb. gross weight. Change to wide deck engines, "A" after serial number.
SN 266 and up	First fuel flow transducer system.
SN 329 and up	First A/C fuel pump on 600's (10540 K1,15).
SN 342 and up	First long wing, hydraulic gate-6000 lb. gross weight 601-B.
SN 344 and up	New piston type accumulator, Hydrodine.
SN 356 and up	1977 model year change. Landing gear down lock system. Lamar voltage regulators. Split nose cowls. EGT system. Flap speed increases. Annunciator panel for "P" models. Auto reset on heater (light on instrument panel).
SN Up to 454	Hartzell tach synchrophaser. Right hand strobe sensor for tach on right. Left hand pulse generator. Large computer. A/N tach. Old style generator.
SN 455-493	Aerosonic synchrophaser (combination Aerosonic tach and Hartzell synchrophaser). Small tach generators. Small computers (prop synchrophaser solid state).
SN 494 and up	New synchrophaser system. A/N tach. Large A/N generators (Hartzell System). Small computer.
SN 456 and up	1978 model year change. First cigarette lighter - optional. Down deflectors on exhaust pipes. New cabin blower system. 601 new waste gates.
SN 457 and up	New turbos and gates 601P.
SN 500 and up	New type low fuel probe system - separate probe 12 gal.



SN 561 and up	1979 model year change. New Piper SN. First standard Piper paint scheme.
SN 605 and up	Aux hydraulic CB/Relay replacement.
SN 611 and up	New Wiebel nose landing gear.
SN 630 and up	New glare shield.
SN 645 and up	3rd tach generator cover (access to fuel line probe and plug).
SN 675 and up	New factory gauges installed.



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AEROSTAR AIRCRAFT OPTIONS

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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. Man. Suppl. FT-052	Notes	Status																																								
E.O.'s ATTACHED <table><tr><td>DWG CHG</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td></tr><tr><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td><td>ADV</td></tr><tr><td>SALVAGE</td><td>REWORK</td><td>REWORK</td><td>REWORK</td><td>REWORK</td><td>REWORK</td><td>REWORK</td><td>REWORK</td><td>REWORK</td><td>REWORK</td></tr><tr><td>MEMO</td><td>764-465</td><td>040100</td><td>040100</td><td>040100</td><td>040100</td><td>040100</td><td>040100</td><td>040100</td><td>040100</td></tr></table>										DWG CHG	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	SALVAGE	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK	MEMO	764-465	040100	040100	040100	040100	040100	040100	040100	040100
DWG CHG	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV																																								
ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV	ADV																																								
SALVAGE	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK	REWORK																																								
MEMO	764-465	040100	040100	040100	040100	040100	040100	040100	040100																																								
1	Bendix Nav/Com Autopilot			N	600 601	TC 8-18-69	NO	Discontinued - See Option #55	Inactive																																								
2	Mitchell Century III Autopilot			N	600 601 601P	TC 7-31-76	YES		Inactive																																								
3	System Instl - Surface Deicing			N	600 601 601P	TC 6-04-70	YES		Inactive																																								
4	System Instl., Prop De-Icing			Y	600 601 601P 602P	TC 10-10-69	YES	Recommended Instl. Opt. #58, #59	Active																																								
5	Wing De-ice Light	764-153	89411	Y	600 601 601P 602P	TC 10-24-70	NO	Required for Option #79	Active																																								
6	Collins Nav/King Comm, Bendix M4C Autopilot Instl		040107	N	600 601	TC 2-02-70	NO	Discontinued - See Option #55	Inactive																																								
7	Avionics Installation		040040	N	600 601	TC 2-02-70	NO	Discontinued - See Option #62	Inactive																																								
8	70 Amp Alternator		040051	N	600 601	TC 10-09-69	YES	Discontinued - See Options #58 & #59	Inactive																																								
9	PC-14 Inverter		040020	N	600 601	TC 7-13-70	NO		Inactive																																								

E.O.'s ATTACHED			
DWG CHG	ADV	ADV	ADV
ADV	ADV	ADV	ADV
SALVAGE	REWORK	REWORK	REWORK
MEMO	764-465	040100	040100

NOTES: (1) The Option is only approved for installation on noted aircraft models.
 (2) TC = FAA Approved under Type Certificate A17WE
 STC = Approved under Supplementary Certificate, either Aerostar Aircraft Corporation or other company
 ----- = Drawings not completed, option still under development

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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. Man. Suppl. Proc.	Notes	Status
10	Bendix Electronic Tach		040103	N	600 601	TC 3-05-70	NO		Inactive
11	Ground Blower Unit		040090	N	600 601	TC 7-18-70	NO		Inactive
12	Bendix M4C Autopilot		040019	N	600 601	TC 7-13-70	NO	Discontinued - See Option #55	Inactive
13	Bendix CNS Nav-Corn		040030	N	600 601	-----	YES	Cancelled, not released	Inactive
14	Seating Instl (With Armrest)		040108	N	600	TC 7-31-70	NO		Inactive
15	Fuel Quantity System		040129	N	600 601 601P	-----	NO	Replaced by new Fuel Gage	Inactive
16	Low Fuel Warning	764-440	040114	Y	600 601 601P	TC 4-24-75	NO	A/C 0001 - 0289	Active
17	Heated Windshield Panel		040134	N	600 601 601P	-----	NO		Inactive
18	Air-Conditioning System, Electric		040166	Y	600 601 601P 602P	STC	YES	Airborne Systems STC SAE 2207WE	Active
19	King KWX40 Weather Radar		040135	N	600 601 601P	-----	NO		Inactive
20	Encoding Altimeter		040136	Y	600 601 601P 602P	TC 9-13-74	NO		Active
21	Instl - Refreshment Console		040109	N	600 601	TC 11-14-69	NO	Canceled	Inactive
22	Instl - Armrest - Frazier Seats		040117	N	600 601 601P	TC 1-09-70	NO	not req'd for A/C 0130 & up	Inactive



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Fit. Tst. Suppl Proc.	Notes	Status
23	Auxiliary Hydraulic System	764-154	040185	Y	600 601 601P 602P	STC TC	YES	X	Active
24	Curtain Installation		040099	Y	600 601 601P	TC 7-18-73	NO	STD A/C 0130 & up	Active
25	Strobe Light - Instl		040037	N	600 601	TC 6-03-70	NO	Discontinued	Inactive
26	Bendix Slaved RMI System		040118	N	600 601	-----	NO	Canceled, not released	Inactive
27	Bendix HSD-830 Horizontal Situation Display System		040119	N	600 601	-----	NO	Canceled, not released	Inactive
28	Collins PN-101 Pictorial Nav Sys		040120	N	600 601	-----	NO	Canceled, not released	Inactive
29	Essential Bus. System		040018	N	600 601	TC 7-20-70	NO	Canceled	Inactive
30	Furnishing - Internal & External		040121	N	600 601	TC 7-31-70	NO	Canceled	Inactive
31	Bendix SG-842 Slave Gyro System		040029	N	600 601	-----	NO	Canceled, not released	Inactive
32	Fuselage Protective Strip		040031	N	600 601	TC 7-13-70	NO		Inactive
33	Narco MK-24/12 Nav/Com Bendix M4C Autopilot		040122	N	600 601	-----	NO	Canceled, not released	Inactive
34	Control Wheel Accessories	764-486	040123	Y	600 601 601P 602P	TC 7-13-70	NO	For Autopilot Instl.	Active
35	Optional Engine Instl. Model 600		040032	Y	600	TC 3-31-70	NO		Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. FT-052 Man. Fit. Tst. Suppl. Proc.	Notes	Status
36	Turbocharger Overboost Protection		040023	Y	601	TC 3-31-70	YES	A/C 61-001 thru -0136	Active
37	Valve Instl NLG Steering Closed Circuit		040027	N	600 601	TC 7-22-70	NO	Canceled	Inactive
38	Deflection Plate Instl		040035	N	600 601	TC 3-16-70	NO		Inactive
39	System Instl - Fuel Pressure Relief	764-155	106068	N	600 601 601P	TC 2-14-73	NO		Inactive
40	Oxygen Mask		040034	Y	600 601 601P 602P 700P	TC 6-04-70	NO		Active
41	Alternate Static System	AAA00526	040036	Y	600 601 601P 602P	TC 7-17-70	NO	X STD 601P/602P	Active
42	Emergency Exit Door		040038	N	600 601 601P	-----	NO	Canceled, not released	Inactive
43	Modified Brake System		040039	Y	600 601	TC 7-28-70	NO		Inactive
44	Larger Elel/Rudder - Extended Chord		040084	N	601P	-----	NO	Canceled	Inactive
45	Control Linkage - Wastegate		040085	N	601	TC 6-05-70	NO	STD on A/C 0130 & up	Inactive
46	Main Landing Gear Control		040086	N	600 601	TC 5-04-70	NO		Inactive
47	100 Amp Alternator		040087	N	600 601	-----	NO	not released	Inactive
48	MLG- Up Stop		040088	N	600 601	-----	NO	not released	Inactive



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. FT-052 Man. Fit. Tst. Suppl Proc.	Notes	Status
49	Ground Support - Equip Storage		040089	N	600 601	-----	NO	not released	Inactive
50	Filter Instl - Alternator		040091	N	600 601	TC 7-13-70	NO		Inactive
51	Breather Instl - Anti-Ice, Model 600		040022	N	600	TC 7-13-70	NO	STD on A/C 0130 & up	Inactive
52	Wing Ice Light Instl - Dual		040092	N	600 601	TC 8-11-70	NO	See Option #5	Inactive
53	Instrument Instl - Dual Flight		040093	N	600 601	TC 9-15-70	NO		Inactive
54	Heating System Modification		040096	N	600 601	TC 2-23-73	NO	STD on A/C 0130 & up	Inactive
55	Bendix FCS-810 Nav/Autopilot System		040097	N	600 601 601P	TC 7-31-73	YES	Bendix STC SA444SO-3 configurations	Inactive
56	Sun Visor Installation	764-446	040098	Y	600 601 601P 602P	TC 8-08-73	NO	STD on 600/601, 0199 & UP STD on 601P, 0213 & UP STD on 602P	Active
57	Super Soundproofing Installation		040110	Y	600 601 601P 602P	TC 9-20-73	NO		Active
58	70 Amp Alternator Installation	764-447	108036	Y	600 601 601P	STC	Yes	SA2367WE for A/C w Std Elec. Sys. up to A/C 0143	Active
59	70 Amp Alternator Installation SB 600-24		107037	Y	600 601 601P	STC	YES	SA2336WE for A/C w SB600-24 sys. up to A/C 0143	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Flt. Tst. Suppl. Proc.	Status
60	King Silver Crown Avionics System		040113	Y	600 601 601P	TC 7-74	NO X	Active
61	Pneumatic System Installation	764-487	040125	Y	600 601	TC 6-29-73	NO	Pneumatic Pump System for Gyros A/C prior to 0174 Active
62	Flight Time Recorder		040111	Y	600 601 601P 602P 700P	TC 11-25-74	NO	STD on 600/601-0199 & up STD on 601P - 0213 & up Active
63	Double Window Installation		040112	N	600 601 601P	TC 6-12-73	NO	Active
64	Synchrophaser		040124	Y	600 601 601P	TC 4-02-74	YES X	replaced by Option #150 Inactive
65	Optional Color Scheme		040126	N	600 601 601P	TC 7-17-74	NO	Inactive
66	Tachometer Generator Instl.		040127	Y	600 601 601P 602P	TC 10-12-73	NO	STD 0144 & up Active
67	Engine Fire Detect Instl.	764-155V 764-405	040128	Y	600 601 601P 602P 700P	TC 9-17-73	YES	Active
68	Emergency Locator Transmitter (ELT)		650066	Y	600 601	TC 2-23-73	NO	STD A/C 0130 & up; AFM Supplement req'd A/C prior to 0130 Inactive
69	Strobe Light Wing Tip, Strobe/Pos. Installation		040133	Y	600 601 601P 602P 700P	TC 6-18-74	YES	STD A/C 0191 & up; AFM Supplement only req'd for -501 & -507 config. Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. FT-052 Man. Fit. Tst. Suppl Proc.	Notes	Status		
70	Double Window Installation (.06)	764-452	040104	N	600 601 601P 602P 700P	TC 6-12-73	NO	STD A/C 0130 & UP	Active		
71	Opt. Pneumatic Gyro Instl.	040106		Y	600 601 601P	TC 9-25-73	YES	STD Gyros - no Autopilot A/C prior to 0130	Active		
72	Synchronous Tachometer	040130		Y	600 601 601P	TC 10-30-73	NO	For use with Mech. Tach. Gen.	Inactive		
73	Map Reading Light	040137		Y	600 601 601P 602P 700P	TC 7-17-74	NO	STD on 600/601 -0199 & up STD on 601P - 0213 & up STD on 602P/700P	Active		
74	Cleveland Wheel & Brake Instl	040138		N	-----	TC 1-24-74	NO	For 62-0001 only	Inactive		
75	Emergency Power Supply	590021		N	600 601	Log Book Entry	NO		Inactive		
76	Mitchell Century I Autopilot (Wing Leveler)	040131		Y	600 601	STC	YES	not released	Inactive		
77	Pressurization System - Sea Level Controller	764-454	040139	Y	601P 602P 700P	TC 5-31-74	YES	X	Active		
78	Cleveland Wheel & Brake Retrofit	764-160V	040140	N	600 601	TC 9-10-74	NO	A/C prior to 0170	Active		
79	Surface De-Ice System Instl.	MULTIPLE	040141	Y	600 601 601P 602P 700P	TC 2-25-75	YES		Active		
80	Bendix Radar Installation		040142	Y	600 601 601P 602P	TC 12-15-76	NO	X	Active		



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. Man. Suppl	FT-052 Flt. Tst. Proc.	Notes	Status
81	Bendix M4D Autopilot		040143	N	600 601	-----	NO		not released	Inactive
82	King KI226 Radio Magnetic/Ind.		040144	Y	600 601 601P	TC 8-25-75	NO	X	replaced by Option #208	Inactive
83	King KN74 Area Navigation System		040145	N	600 601 601P		YES		Inactive, FAA Letter dated 10-27-77	Inactive
84	Trim Tab Actuator & Transmitters Instl		040146	N	600 601 601P	TC 8-15-74	NO		Engineering approval req'd for use	Inactive
85	Dual Flight Instruments		040147	Y	600 601 601P 602P 700P	TC 12-15-76	NO	X	Various config. req'd in: Austria, Belgium, Denmark, Finland, France, Germany, Netherlands, Portugal, Sweden, Switzerland, United Kingdom	Active
86	Automatic Cycling - Surface Deice		040148	Y	600 601 601P	TC 2-25-75	NO		Requires instl of Option #79	Inactive
87	Flight Entertainment Unit		040149	N	600 601 601P	TC 6-19-76	NO		STD on 600/601 -0199 & up STD on 601P -0213 & up	Inactive
88	Furnishing Installation - Executive Interior		040150	Y	600 601 601P 602P 700P	TC 7-31-75	NO			Active
89	Mitchell Autopilot - Century IIIA		040159	N	600 601 601P	STC	YES		Mitchell STC SA3029 SW-D	Inactive
90	Mitchell Autopilot - Century IV		040165	Y	600 601 601P 602P	STC	YES	X	Mitchell STC SA3030 SW-D	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. FT-052 Man. Flt. Tst. Suppl Proc.	Notes	Status
91	Headrest Installation		040156	N	600 601 601P 602P	TC 10-12-76	NO		Active
92	Armrest Installation - Pilot and Copilot		040155	N	600 601 601P 602P	TC 10-12-76	NO		Active
93	Gross Weight Increase		040152	Y	601 601P	TC 3-26-75	*	Use 601P Flight Manual A/C 0213 & up	Active
94	Mitchell Century IA Autopilot		040131	N	600 601 601P	-----	NO	Canceled, not released	Inactive
95	H.F. Transceiver Instl		040151	N	600 601 601P	TC 7-29-75	NO		Inactive
96	Restraint System - 3 Point	764-161	040153	Y	600 601 601P 602P 700P	TC 2-24-75	NO	STD A/C 0256 & up	Active
97	Dual ADF Installation		040154	Y	600 601 601P 602P	TC 5-07-76	NO	X	Active
98	Airspeed Indicator - Knots		040157	Y	600 601 601P	TC 7-29	YES	A/C prior to 0561	Active
99	NSD 360 Slaved Directional Gyro System		040158	N	600 601 601P	-----	NO	Canceled, not released	Inactive
100	Oxygen System		040160	Y	600	TC 5-5-76	YES		Active
101	Hand Held Fire Extinguisher	764-456	040161	Y	600 601 601P 602P 700P	TC 5-25-76	NO	Req'd in Belgium, Denmark, France, Canada, Finland, Germany, Netherlands, Portugal, Sweden, Switzerland, United Kingdom	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Fit. Tst. Suppl Proc.	Notes	Status	
102	Radar Altimeter		040163	Y	600 601 601P 602P	TC 5-7-76	NO	X	Active	
103	Propeller Speed Limitation		040164	N	600 601 601P	TC 8-29-75	YES	X	Germany & Switzerland ONLY	Active
104	Angle of Attack Indicator			N		-----				Inactive
105	Remote Altitude Digitizer Instl		040167	Y	600 601 601P 602P 700P	TC 9-21-75	*		AFM Supp. 601 only	Active
106	Automatic Wastegate Controller	764-162	040168	Y	601	TC 12-18-75	YES		A/C prior to 0342	Active
107	Isopropyl Alcohol Windshield De-Ice		040169	N	-----	-----			Canceled, not released	Inactive
108	Transducer Fuel Flow System	764-458	040170	Y	600 601 601P 602P 700P	TC 11-21-75	NO		STD A/C 0849 & up	Active
109	Alternator - Annunciator		040171	N	600 601 601P 602P	TC 12-15-76	NO		A/C prior to 0306; STD A/C 0306 & up	Active
110	KWX-150		040172	N	600 601 601P	Log Entry Book	NO			Inactive
111	RDR-150 Radar		040173	N	600 601 601P	-----	NO		Canceled, not released	Inactive
112	Collins Avionics Instl		040174	Y	600 601 601P 602P	TC 10-12-76	NO	X		Active
113	Electrical Digital Clock		040175	Y	600 601 601P 602P 700P	TC 6-2-76	NO			Active
114	Lycoming Scavenge Pump Instl		040176	Y	601 601P	TC 5-25-76	NO			Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Suppl.	Flt. Tst. Proc.	Notes	Status
115	Smoking Restriction		040180	N	600 601 601P	TC 3-08-76	NO			Active
116	Baggage Light & Cover Instl		040181	N	600 601 601P 602P 700P	TC 6-02-76	NO		Req'd in Australia	Active
117	Extended Seat Track Instl		040183	N	600 601 601P	TC 6-21-76	NO			Inactive
118	United Kingdom AFM Supplement		-----	N	600 601 601P	TC 9-24-76	YES		United Kingdom ONLY	Active
119	Increased Oxygen Capacity		040184	Y	601P 602P 700P	TC 6-21-76	YES		Req'd in United Kingdom	Active
121	Windshield De-Ice System Instl	764-163V	040186	Y	600 601 601P 602P 700P	TC 11-23-76	YES	X		Active
122	Oxygen Req Light Switch (10,000 FT)		040187	Y	600 601 601P 602P 700P	TC 5-26-76	NO	X	Req'd in United Kingdom	Active
123	King KFC-200 Autopilot Instl		040191	Y	600 601 601P 602P	STC	YES	X	King STC SA1184CE	Active
124	Engine Isolator Mount		040194	Y	600 601 601P	TC 8-09-76	NO			Inactive
125	Transducer Fuel Press. System		040193	Y	600 601 601P	TC 12-09-76	NO		not released	Inactive
126	Electric Windshield De-Ice	068-001 764-489	040192	Y	600 601 601P 602P 700P	TC 4-19-80	YES			Active
127	Heater Blower Inst. - High Cap.		040195	Y	601 601P	TC 9-30-76	NO			Inactive
128	Instl - Lamar Voltage Regulators	764-462	040196	Y	600 601 601P	TC 10-18-76	NO		A/C prior to 0365	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Flt. Tst. Suppl Proc.	Notes	Status
129	Dual Exhaust Gas Temp Indicator		040197	Y	600	TC 9-14-76	NO		Active
130	King Avionics		040198	N	600 601 601P	TC 12-15-76	NO		Inactive
131	Flap Extension Airspeed Increase	764-464	040199	Y	600 601 601P	TC 12-20-76	NO	AFM Revision A/C prior to 0356	Active
132	Turbocharger Overboost Valve Instl		040203	N	601 601P	Log Book Entry	NO		Inactive
133	Annunciator Panel Instl		040204	Y	600 601 601P	TC 4-14-77	NO	replaced by Option 148	Inactive
134	Reinforced Baggage Floor		040205	Y	601P 602P 700P	TC 12-29-76	NO		Active
135	Starter Warning		040206	N	600 601 601P 602P 700P	TC 3-31-77	YES	Req'd in Belgium, Netherlands, United Kingdom	Active
136	Adapter - Oxygen Filler		040207	N	600 601 601P	TC 11-29-76	NO	600 equipped with Opt. 100	Active
137	Furnishing Instl. - Interior		700006	Y	600 601 601P 602P 700P	TC 7-17-74	NO		Active
138	Thermacon Heat Screen		040208	N	600 601 601P	-----		not released	Inactive
139	Split Nose Cowl	764-165	040209	N	600 601 601P	TC 4-08-77	NO	A/C prior to 0356 STD A/C 0356 & up	Active
140	Exhaust Deflector Instl		040210	N	600 601 601P	TC 4-27-77	NO	A/C prior to 0456	Active



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141	Copilot's Microphone Instl		040211	Y	600 601 601P 602P	TC 3-11-77	NO		Active
142	Nose Cap Instl	764-166V	040212	N	600 601 601P 602P	TC 4-08-77	NO		Active
143	Hi Gain Pressurization System		040213	N	601P			not released	Inactive
144-1	Static Wick Discharger	764-167	040214	Y	600 601 601P	TC 7-21-77	NO		Active
144-501	Static Wick Discharger	764-168	040214	Y	600 601 601P 602P 700P	TC 7-21-77	NO		Active
145	Pitot-Static System Drain	764-169V	040215	Y	600 601 601P 602P	TC 7-21-77	YES		Active
146	Crossfeed Annunciator		040216	Y	600 601 601P 602P 700P	TC 12-08-77	*	STD A/C 0456 & up; * AFM Supp. req'd A/C prior to 0456	Active
147-1	Landing Gear Lever & Warning Horn	764-492	040217	Y	600 601	TC 7-21-77	NO	A/C Prior to 0356	Active
147-501	Landing Gear Lever & Warning Horn	764-369	040217	Y	601P	TC 7-21-77	NO	A/C Prior to 0356	Active
148	Annunciator Panel Instl	764-493	040218	Y	600 601 601P 602P 700P	TC 2-24-78	YES		Active
149	NLG Jury Brace Instl	764-170	040226	Y	600 601 601P	TC 6-18-80	NO	A/C prior to 0611	Active
150	Instl - Synchrophaser	764-476	040225	Y	600 601 601P 602P 700P	TC 3-29-78	YES	X	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. FT-052 Man. Filt. Tst. Suppl Proc.	Notes	Status
151	Cabin Cooling Fan		040227	Y	600 601 601P 602P 700P	TC 9-12-77	NO		Active
152	Air-conditioning System Instl		040228	N	600 601 601P	TC 9-20-77		Canceled; Use Option #18	Inactive
153	Cigar Lighter Inst.		040229	Y	600 601 601P 602P	TC 9-12-77	NO		Active
155	Higher Crit. Alt. Turbos Instl		040231	Y	601P	TC 11-21-77	YES	A/C prior to 0456	Active
156	Low Fuel Warning	764-171	040232	Y	600 601 601P 602P 700P	TC 12-02-77	NO	A/C prior to 0290 STD A/C 0290 & up	Active
157	Low Fuel Warning - Modification		040115	N	600 601 601P	TC 12-02-77	NO	A/C prior to 0474	Active
158	Color Scheme Exterior		040223	N	600 601 601P	TC 3-02-79	NO		Inactive
159	Color Scheme Exterior		040234	N	600 601 601P	TC 3-02-79	NO		Inactive
160	Compass Instl - Southern Hemisphere		040238	Y	600 601 601P 602P 700P	TC 5-22-80	NO	Not Installed here	Active
161	H.F. Radio Instl		040239	Y	600 601 601P 602P	TC 5-25-79	NO		Active
162	Relocation - DME Indicator		040240	N	600 601 601P	TC 10-20-78	NO		Active
163	Audio/Marker Panel		040241	Y	600 601 601P 602P	TC 1-10-79	NO	X	Active
164	Auxiliary Hydraulic Relay Circuit Breaker Kit	764-198	040242	Y	600 601 601P	TC 9-25-79	NO	A/C prior to 0702	Active

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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. FT-052		Notes	Status
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165	Fuel Quantity Indicator	040243		N	600 601 601P	-----			not released	Inactive
166	Shaded Letters - Registration	040249		N	600 601 601P 602P	TC 11-13-79	NO			Active
168	Luminescent OAT Gage	764-466	040252	Y	600 601 601P 602P	TC 6-08-79	NO			Active
169	White Only - Exterior Paint Scheme	040247		N	600 601 601P 602P	TC 4-23-79	NO			Active
170	Collins ANS-351 Area Nav System	040253		Y	600 601 601P 602P	TC 10-25-79	YES	X		Active
171	Digital King Avionics Instl (KNS-80)	040254		N	600 601 601P	TC 10-24-79	YES	X	replaced by Option #195	Inactive
172	Glideslope Antenna Instl	040255		Y	600 601 601P 602P	TC 9-07-79	NO		Req'd in Belgium, France	Active
173	Aeronetics RMI	040256		Y	600 601 601P 602P	TC 9-07-79	NO	X		Active
174	Inst. - 3-Tank Fuel Quantity Indicator Retrofit	764-189	040258	Y	600 601 601P	TC 7-24-79	NO		A/C prior to 0630	Active
175	NLG Steering Cylinder Instl - Ozone Cylinder Replacement	764-497	040292	Y	600 601 601P	TC 6-18-80	NO		A/C 019 thru 0610	Active
190	Remote Transponder Ident. Instl	040275		Y	600 601 601P 602P 700P	TC 7-17-80	NO			Active
192	Fuel Valve Annunciator	040277		N	600 601 601P	-----	NO		Canceled; Replaced by Option #202	Inactive
193	Instl. - Lightning Diverter Strips	040260		Y	600 601 601P 602P 700P	TC 3-11-80	NO		Req'd in Netherlands	Active

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Option #	Title	Kit No.	Drawing No.	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Flt. Tst. Suppl Proc.	Status
194	King Avionics Instl (KS-1-PAS)		040279	Y 600 601 601P 602P	TC 10-01-80	NO X	Active
195	King KNS-80		040293	Y 600 601 601P 602P	TC 9-30-80	YES X	Active
196	Aircraft Configuration - Flight Into Known Icing		040278	Y 600 601 601P 602P 700P	TC 6-17-80	YES	Active
197	Passenger Restraint System, 3 Point Lap Belt w Shoulder Harness	764-413	040285	Y 600 601 601P 602P	TC 9-17-80	NO	Active
198	Tachometer - Retrofit		040280	Y 600 601 601P	TC 7-17-80	NO A/C 0455 thru 0494	Active
199	NLG Instl - Ozone NLG Replacement		040288	Y 600 601 601P	TC 6-18-80	NO A/C prior to 0611	Active
200	Ground Clearance System		040282	Y 600 601 601P 602P 700P	TC 6-18-80	NO	Active
201	RCA Radar System Instl		040283	Y 600 601 601P 602P	TC 2-27-81	NO X	Active
202	Fuel Valve Warning Lights	764-498	040284	Y 600 601 601P	TC 5-12-80	NO Netherlands ONLY	Active
203	King Digital Package KS-2 PAS		040286	Y 600 601 601P 602P 700P	TC 9-29-80	NO X	Active
204	Dual KR-87 ADF		040287	Y 600 601 601P 602P 700P	TC 9-03-80	NO X	Active
205	KNS-81 RNAV		040289	Y 600 601 601P 602P 700P	TC 8-18-80	YES X	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Flt. Tst. Suppl Proc.	Notes	Status
206	Collins HF-200 Radio		404290	Y	600 601 601P 602P	TC 3-20-81	NO		Active
207	King KI-229 RMI		040291	Y	600 601 601P 602P 700P	TC 1-30-81	NO	X	Active
208	King KI-226 RMI		040294	Y	600 601 601P 602P	TC 9-13-80	NO	X	Active
209	Seat Adjustable		040295	Y	600 601 601P 602P	TC 11-12-80	NO		Active
210	Radome Installation	764-412 764-468	040296	Y	600 601 601P 602P	TC 9-17-80	NO		Active
211	Century 41 Autopilot		040299	Y	600 601 601P 602P	STC 1-30-81	YES	X Mitchell STC SA3343SW-D Mitchell STC SA3372SW-D	Active
212	Lockable Fuel Cap Installation	764-469	040300	N	600 602P 700P	TC 5-26-81	NO		Active
213	Manifold Fuel Nozzle Vent Retrofit Kit	764-470	040301	Y	600 601 601P	TC 1-12-81	NO		Active
214	Cabin Door Holder	764-471	040302	Y	600 601	TC 1-14-81	NO		Active
215	KRA-10A Radar Altimeter Instl		040304	Y	600/601/601P/6 02P/700P	TC 6-25-81	NO	X	Active
216	Bendix RDR-160 Radar		040304	Y	600/601/601P/6 02P	TC 4-08-81	NO	X	Active
217	Co-Pilot's Control Wheel Accessories for Century 41		040306	N	600/601/601P/6 02P	-----	YES	X Under development	Inactive



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Flt. Tst. Suppl. Proc.	Notes	Status
218	King Avionics Installation		040307	Y	600/601/601P/602P/700P	TC 4-27-81	NO	X	Active
220	Synchrophaser Installation		040312	N	700P	TC 5-5-82	NO	X	Active
221	Heated Stall Warning Instl		040310	N	700P	TC 11-23-82	NO	X	Active
223	Fixed Ballast Box Instl	764-950V	040314	N	600 601 601P 602P	TC 03-24-82	NO		Active
224	Oxygen System Instl		040315	N	602P 700P	TC 09-02-82			Active
225	Air Conditioning Instl		040316	N	602P 700P	TC 10-12-82	NO		Active
226	True Airspeed Indicator Instl		040317	N	700P	TC 6-01-82	NO	X Obsolete; Std. on 700P	Inactive
227	Prop Deicer Instl		040318	N	700P	TC 05-31-83	NO		Active
228	Fuel Flow w/Totalizer Instl		040319	N	700P	TC 09-28-82	NO	X	Active
229	Altitude Selector Instl		040320	N	602P 700P	TC 7-20-83	NO	X	Active
230	Flitefone IV Installation		040321	N	602P 700P		NO		
231	24 Volt Battery Installation		040322	N	602P		NO		
233	Aft Ballast Box Details & Instl		040324	N	700P	TC 02-16-83	NO		Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Flt. Tst. Suppl. Proc.	Notes	Status
234	KFC 150 AFCS (Autopilot)		040325	N	700P	STC	Yes	King STC SA1777CE-D	Active
235	Bendix RDS-82 Color Radar Texas Instruments Loran C (T-91 & TI-9100)		040326	N	700P		NO		
236	King KWX-56 Color Radar King KRG-356 Radar Graphics 3M Storm Scope		040327	N	700P		NO		
237	King KGR 356 Radar Graphics Instl.		040328	N	700P	-----	NO	Requires OPT236 KWX56 Radar and OPT205 KNS81	
238	TI91 Loran C Instl.		040329	N	700P	-----	NO	Not Available with OPT237 or OPT215 or OPT85 or OPT102	
239	Aux Fuel Tank System		Nayak 35000	N	700P	TC	Yes		Active
240	Control Wheel Mic. Switch Instl		040331	N	700P	TC 02-13-84	NO		Active
241	Inconel Front Exhaust	032-001	89407	N	601 601P 602P 700P	TC 02-27-92	NO		Active
242	Bolted Flange Tailpipes	032-002	89384	N	601 601P 602P 700P	STC	NO	Machen STC SA4976NM	Active
243	Adjustable Turbocharger Brackets	030-001	89376	N	601 601P 602P 700P	TC 02-27-92	NO		Active
244	Aux Fuel Tank System	062-001	89392	N	600 601 601P 602P	STC	YES	Machen STC SA1608NM	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. Man. Suppl	FT-052 Flt. Tst. Proc.	Notes	Status
245-1	Cleveland Slotted Discs and Heavy Duty Wheels	063-001	89386	N	600 601 601P 602P 700P	STC	NO		Machen STC SA4790NM	Active
245-501	Cleveland Slotted Discs and Heavy Duty Brake Linings	063-003	89396	N	600 601 601P 602P 700P	STC	NO		Machen STC SA4790NM	Active
246-1	Cleveland 6 Piston Brakes and Heavy Duty Wheel	063-002	89387	N	600 601 601P 602P 700P	STC	NO		Machen STC SA4724NM	Active
246-501	Cleveland 6 Piston Brakes	063-004	89397	N	600 601 601P 602P 700P	STC	NO		Machen STC SA4724NM for aircraft already Equipped w/ 2 ea. 30-93 or 30-93D brakes & 40-124 or 40-128 wheels	Active
247-1	Intercooling System	030-002	89388	N	601 601P	STC	YES		Machen STC SA3589NM & SA3590NM	Active
247-501	Intercooling System	030-002	89388	N	602P	STC	YES		Machen STC SA3589NM & SA3590NM	Active
248	Overboost Protection	030-003	89389	N	601 601P 602P	TC 10-21-92	NO		For aircraft modified per Option 247	Active
249	Low Noise Propellers		89390	N	600 601 601P	STC	YES		Machen STC SA4307NM	Active
250	Low Speed Flight Control Enhancement System	060-001	89391	N	600 601 601P 602P	STC	NO		Machen STC SA2143NM	Active
251	Firewall Hose Kit	066-001	89385	N	600 601 601P 602P 700P	TC	NO			Active
252	Crankcase Breather Oil Recovery System	030-005	89393	N	601 601P 602P 700P	STC	NO		Machen STC SA4777NM	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Flt. FT-052 Man. Flt. Tst. Suppl Proc.	Notes	Status
253	Pneumatic Door Seal Pressure System	067-001	89394	N	600 601 601P 602P 700P	STC	YES	Machen STC SA4718NM	Active
254	Air Conditioning System Engine Driven	021-004	89383	N	600 601 601P 602P	STC	YES	Machen STC SA1664NM	Active
255-1	TIO-540-U2A Engine Installation	030-007	89402	N	600 601	STC	YES	Machen STC SA1658NM	Active
255-501	TIO-540-U2A Engine Installation	030-008	89403	N	601P	STC	YES	Machen STC SA1658NM	Active
255-503	TIO-540-U2A Engine Installation	030-009	89404	N	602P	STC	YES	Machen STC SA1658NM	Active
258	Engine Icing Protection		89405	N	601P	TC	YES		Active
259	Inboard De-ice Boot		89406	N	600 601 601P 602P 700P	TC	YES	For aircraft already equipped with surface de-ice except inboard de-ice	Active
260	Wing Fuel Vent/Expansion Line	062-002	89401	N	600 601 601P 602P 700P	TC	YES		Active
261	Wastegate Actuator Oil Filter	030-010	89410	N	600 601 601P 602P 700P	TC	NO		Active
262	5.5 PSID Pressurization System	262	040333	Y	601P 602P 700P	TC	YES		Active
263	Alternator Exciter System	263	040321	Y	600 601 601P 602P	TC	YES	A/F 0365 and up, and A/F 0001 thru 0364 with Option 128, and 0344 thru 0364 with Factory Installed J.B. Air Conditioning	Active



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Option #	Title	Kit No.	Drawing No.	EL	Aircraft Model (1)	Approved Per (2)	Fit. FT-052 Man. Fit. Tst. Suppl. Proc.	Notes	Status
264	30,000 Feet Service Ceiling	264	040334	Y	601P 602P 700P	TC 11/2/95	YES	Requires Option 262 and Oxygen system. Models 601P and 602P require Macen, Inc. STC's SA1658NM and SE1657NM.	Active
265	Aft Fixed Ballast		040335	N	600 601 601P 602P 700P	TC	NO		Active
266	Aerostar Ski Rack	266	040337	N	600 601 601P 602P 700P	TC	NO		Active
268	KFC 225 AFCS Installation	268	040338	Y	600 601 601P 602P 700P	TC	YES		Active
269	Improved Overhead Duct	269	040339	Y	600 601 601P 602P 700P	TC	NO		Active
270	Battery Relocation	270	040336	Y	600 601 601P 602P	TC	NO		Active
271	Alternator Idler Pulley and Arm Installation	271	040441	N	600 601 601P 602P 700P	TC	NO		Active
272	J. P. Instruments - EDM 760 Installation	272	040442	Y	600 601 601P 602P 700P	TC	YES		Active
273	Air Inlet Instl' - Heater Combustion Blower	273	040443	N	600 601 601P 602P 700P	TC	NO		Active
274	Modified Seats for Increased Headroom Capacity	274	040444	Y	600 601 601P 602P 700P	TC	NO		Active
275	Aerostar Winglets	AAA00551	040446	N	600 601 601P 602P 700P	STC	NO	Aerostar STC SA02242SE	Active



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276	Aux Cabin Heat	AAA00556 AAA00558	27002 670166	N	601P/602P/700 P	TC	NO		Active
277	Aerostar Wing Extension	AAA00560	94201	N	600	STC	YES		Active



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AEROSTAR AIRCRAFT PRICELIST (as of October 20, 2016)



Installed Pricing Information
as of October, 2016

INSTALLED PRICES AT AEROSTAR AIRCRAFT		CUSTOMER NET COST FOR 601P	CUSTOMER NET COST FOR 602P
Option #126	Electric Windshield Anti-Ice	\$ 9,500	\$ 9,500
	Labor	\$ 1,200	\$ 1,200
	Total Installed Price	\$ 10,700	\$ 10,700
Option #144-501	Static Discharger Wicks 2 Piece Replaceable	\$ 2,082	\$ 2,082
	Labor	\$ 560	\$ 560
	Total Installed Price	\$ 2,642	\$ 2,642
Option #241	Inconel Front Exhaust System	\$ 10,432	\$ 10,432
	Labor	\$ 560	\$ 560
	Total Installed Price	\$ 10,992	\$ 10,992
Option #242	Inconel Exhaust Tail Pipes and Wastegate Clamps	\$ 10,500	\$ 10,500
	Labor	\$ 280	\$ 280
	Total Installed Price	\$ 10,780	\$ 10,780
Option #244	Auxiliary Fuel Tank System	\$ 15,270	\$ 15,270
	Labor	\$ 3,360	\$ 3,360
	Total Installed Price	\$ 18,630	\$ 18,630
Option #246-1	700-6 Wheel Brake System	\$ 8,580	\$ 8,580
	Labor	\$ 560	\$ 560
	Total Installed Price	\$ 9,140	\$ 9,140
Option #247	Turbo Induction Air Intercooling System	\$ 19,250	\$ 19,250
	Labor	\$ 2,100	\$ 2,100
	Total Installed Price	\$ 21,350	\$ 21,350
Option #248	Overboost Protection	\$ 3,693	\$ 3,693
	Labor	\$ 420	\$ 420
	Total Installed Price	\$ 4,113	\$ 4,113
Option #249	Low Noise Signature Prop. Blades (0SOH) (exchange)	\$ 12,300	\$ 12,300
	Prop labor 0/SOH hubs/install blades R & R	\$ 7,000	\$ 7,000
	Total Installed Price	\$ 19,300	\$ 19,300
	<i>If new hubs required add:</i>	\$ 7,390	\$ 7,390
Option #250	Low Speed Flight Control Enhancement System	\$ 3,500	\$ 3,500
	Labor	\$ 2,520	\$ 2,520
	Total Installed Price	\$ 6,020	\$ 6,020
Option #251	Fireproof Specification Engine Hoses	\$ 2,515	\$ 2,515
	Labor	\$ 560	\$ 560
	Total Installed Price	\$ 3,075	\$ 3,075

AEROSTAR PRICE LIST

Prices and availability subject to change without notice

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Installed Pricing Information as of October, 2016

INSTALLED PRICES AT AEROSTAR AIRCRAFT Continued . . .		CUSTOMER NET COST FOR 601P	CUSTOMER NET COST FOR 602P
Option #252	Crankcase Breather Oil Recovery System	\$ 2,500	\$ 2,500
	Labor	\$ 560	\$ 560
	Total Installed Price	\$ 3,060	\$ 3,060
Option #253	Auxiliary Electric Seal Pump	\$ 2,920	\$ 2,920
	Labor	\$ 760	\$ 760
	Total Installed Price	\$ 3,680	\$ 3,680
Option #254	Engine Driven AC Compressor Kit (R134A)	\$ 7,494	\$ 7,494
	Labor	\$ 2,800	\$ 2,800
	Total Installed Price	\$ 10,294	\$ 10,294
Modification	Engine Ice Protection & Inboard Wing Deice Kit	\$ 16,520	\$ 16,520
	Labor	\$ 1,680	\$ 1,680
	Total Installed Price	\$ 18,200	\$ 18,200
	<i>If not done in conjunction with an engine change upgrade, add:</i>	\$ 1,680	\$ 1,680
Option #262 & 264	5.5 PSID Cabin Pressurization Upgrade and *Increase in Maximum Operating Altitude	\$ 29,500	\$ 29,500
	Labor	\$ 3,500	\$ 3,500
	Total Installed Price	\$ 33,000	\$ 33,000
*Only available for all Superstar 680's, 700's, Super 700 Aerostars and 700P's equipped with cabin pressurization option #262			
Option #268	KFC 225 Autopilot		
	Total Installed Price	\$ 55,000	\$ 55,000
Option #270	Battery Relocation Kit* w/o Battery	\$ 2,535	\$ 2,535
	Labor	\$ 1,750	\$ 1,750
	Total Installed Price	\$ 4,285	\$ 4,285
*Aerostar Models 600, 601, 601P, and 602P (Unless equipped with Option 231 or Machen Air Conditioning A or B).			
Option #275	Blended Winglets	\$ 17,500	\$ 17,500
	Labor	\$ 2,400	\$ 2,400
	Total Installed Price	\$ 19,900	\$ 19,900
Option #276	Aux Cabin Heat System	\$ 6,500	\$ 6,500
	Labor	\$ 3,800	\$ 3,800
	Total Installed Price	\$ 10,300	\$ 10,300
Option #277	600 Aerostar Wing Extensions	\$ 17,500	
	Labor	\$ 6,800	
	Total Installed Price	\$ 24,300	

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Prices and availability subject to change without notice

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**Aerostar
Owners
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Installed Pricing Information
as of October, 2016

SERVICE BULLETIN KITS		CUSTOMER NET COST FOR 601P	CUSTOMER NET COST FOR 602P
Bulletin #	Description		
746C	Heavy Duty Landing Gear Torque Links	\$ 3,950	\$ 3,950
	Labor	\$ 280	\$ 280
	Total Installed Price	\$ 4,230	\$ 4,230
920A	Engine Fire Detection Kit	\$ 858	\$ 858
	Labor	\$ 1,120	\$ 1,120
	Total Installed Price	\$ 1,978	\$ 1,978
600-119	8 ea. Inconel 4 Segment Turbo Clamps w/Gaskets	\$ 2,496	\$ 2,496
	Labor	\$ 420	\$ 420
	Total Installed Price	\$ 2,916	\$ 2,916
600-120	6 ea. High Temperature Engine Control Cables	\$ 4,800	\$ 4,800
	Labor at annual	\$ 1,680	\$ 1,680
	Total Installed Price	\$ 6,480	\$ 6,480
600-126	Fuel Vent/Expansion Line Kit	\$ 1,540	\$ 1,540
	Labor	\$ 560	\$ 560
	Total Installed Price	\$ 2,100	\$ 2,100
600-127	Wastegate Actuator In-Line Oil Filter	\$ 2,160	\$ 2,160
	Labor	\$ 420	\$ 420
	Total Installed Price	\$ 2,580	\$ 2,580
600-128	Nose Gear Drag Brace Upgrade	\$ 4,900	\$ 4,900
	Labor	\$ 420	\$ 420
	Total Installed Price	\$ 5,320	\$ 5,320
600-129A	Turbocharger Oil Supply Relief/Shut-Off		
	Valve Replacement	\$ 452	\$ 452
	Labor	\$ 420	\$ 420
	Total Installed Price	\$ 872	\$ 872
600-130	Horizontal Stabilizer Attach Fittings		
	Labor to Inspect	\$ 105	\$ 105
600-131A	2 ea. Overhauled Turbocharger Scavenge Pumps	\$ 3,850	\$ 3,850
	Labor	\$ 560	\$ 560
	Total Installed Price	\$ 4,410	\$ 4,410
600-132	Wing Spar Inspection	\$ 105	\$ 105
600-133R1	Improved Aileron Bellcrank Attachment	\$ 460	\$ 460
	Labor	\$ 840	\$ 840
	Total Installed Price	\$ 1,300	\$ 1,300
600-134A	Main Landing Gear Lower Side Brace	\$ 4,150	\$ 4,150
	Labor	\$ 420	\$ 420
	Total Installed Price	\$ 4,570	\$ 4,570

AEROSTAR PRICE LIST

Prices and availability subject to change without notice

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Installed Pricing Information as of October, 2016

INSTALLED PRICES AT AEROSTAR AIRCRAFT Continued . . .	CUSTOMER NET COST FOR 601P	CUSTOMER NET COST FOR 602P
601P/602P to Machen Superstar 650 *		
Installation Kit (exchange)	\$ 54,900	\$ 45,900
Labor to Install	\$ 21,000	\$ 7,875
New Cylinder Assemblies	\$ 31,500	
Total Installed Price	\$ 107,400	\$ 53,775
601P/602P to Machen Superstar 680 *		
Installation Kit (exchange)	\$ 74,150	\$ 65,150
Labor to Install	\$ 23,100	\$ 9,975
New Cylinder Assemblies	\$ 31,500	
Total Installed Price	\$ 128,750	\$ 75,125
601P/602P to Machen Superstar 700 *		
Installation Kit (exchange)	\$ 86,380	\$ 77,450
Labor to Install	\$ 23,800	\$ 10,675
Prop Labor 0/SOH hubs/install blades	\$ 7,000	\$ 7,000
New Cylinder Assemblies	\$ 31,500	
Total Installed Price	\$ 148,680	\$ 95,125
If new hubs required add:	\$ 7,390	\$ 7,390
Machen Superstar 700 to 702P *		
6850 Gross Weight Option Installed	\$ 28,500	\$ 28,500
Opt. #262 & 264 5.5 Cabin Pressurization Upgrade and		
* Increase in Max. Operating Alt. to FL 280 Installed	\$ 33,000	\$ 33,000
Opt. #268 KFC 225 Autopilot Installed	\$ 55,000	\$ 55,000
Total Installed Price	\$ 116,500	\$ 116,500
Factory Intercooled 601P/602P to Machen Superstar 680 *		
Installation Kit (exchange)	\$ 54,900	\$ 45,900
Labor to Install	\$ 21,000	\$ 7,875
New Cylinder Assemblies	\$ 31,500	
Total Installed Price	\$ 107,400	\$ 53,775
Factory Intercooled 601P/602P to Machen Superstar 700 *		
Installation Kit (exchange)	\$ 64,830	\$ 55,830
Labor to Install	\$ 21,700	\$ 8,575
New Cylinder Assemblies	\$ 31,500	
Prop Labor 0/SOH hubs/install blades	\$ 7,000	\$ 7,000
Total Installed Price	\$ 125,030	\$ 71,405
If new hubs required add:	\$ 7,390	\$ 7,390
Machen Superstar 650 to Superstar 680 *		
Installation Kit w/Intercoolers (exchange)	\$ 19,250	\$ 19,250
Labor to Install	\$ 2,100	\$ 2,100
Total Installed Price	\$ 21,350	\$ 21,350
Machen Superstar 650 to Super 700 *		
Installation Kit w/Intercoolers and Propeller Blades (exchange)	\$ 31,550	\$ 31,550
Intercooler Labor	\$ 2,100	\$ 2,100
Prop. Labor 0/SOH hubs/install blades/R&R	\$ 7,000	\$ 7,000
Total Installed Price	\$ 40,650	\$ 40,650
If new hubs required add:	\$ 7,390	\$ 7,390

*All Machen conversions and Super 700 Aerostar installations require installation of the following factory options: 250 and 251.

AEROSTAR PRICE LIST

Prices and availability subject to change without notice

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Aerostar Owners Association



Installed Pricing Information as of October, 2016

INSTALLED PRICES AT AEROSTAR AIRCRAFT Continued . . .	CUSTOMER NET COST FOR 601P	CUSTOMER NET COST FOR 602P
Machen Superstar 680 to Superstar 700 *		
Installation Kit w/Propeller Blades (exchange)	\$ 12,300	\$ 12,300
Prop. Labor 0/SOH hubs/install blades/R&R	\$ 7,000	\$ 7,000
Total Installed Price	\$ 19,300	\$ 19,300
If new hubs required add:	\$ 7,390	\$ 7,390
601P/602P to Super 700 Aerostar *		
Factory New TIO-540-U2A Engines (exchange)	\$ 175,000	\$ 175,000
Engine HP Increase Kits (exchange)	\$ 49,220	\$ 42,000
Labor to upgrade airframe with Power		
Increase Kit and engine installation labor	\$ 18,375	\$ 16,625
Opt. #247 Turbo Induction Air Intercooling System	\$ 19,250	\$ 19,250
Labor to Install Opt. #247	\$ 2,100	\$ 2,100
Opt. #248 Overboost Protection	\$ 3,500	\$ 3,500
Labor to Install Opt. #248	\$ 420	\$ 420
Opt. #249 OSMOH 700 Prop Blades (exchange)	\$ 12,300	\$ 12,300
Prop Labor 0/SOH Hubs and Install Opt. #249 Blades	\$ 7,000	\$ 7,000
New engine hoses, isolator mounts, cross shaft bearings, rod ends	\$ 10,450	\$ 10,450
Total Installed Price	\$ 297,615	\$ 288,645
If new hubs required add:	\$ 7,390	\$ 7,390
If new Scavenge Pumps required add:	\$ 3,850	\$ 3,850
If new Pneumatic Pumps required add:	\$ 3,210	\$ 3,210
If OH Hydraulic Pump required add:	\$ 1,740	\$ 1,740
If OH Wastegate Actuators required add:	\$ 1,160	\$ 1,160
If OH Prop Governors required add:	\$ 1,580	\$ 1,580
If OH Wastegates required add:	\$ 6,752	\$ 6,752
Super 700 Aerostar to 702P		
6850 Gross Weight Option Installed	\$ 28,500	\$ 28,500
Opt. #262 & #264 5.5 Cabin Pressurization Upgrade and		
* Increase in Max. Operating Alt. to FL 280 Installed	\$ 33,000	\$ 33,000
Opt. #268 KFC 225 Autopilot Installed	\$ 55,000	\$ 55,000
Total Installed Price	\$ 116,500	\$ 116,500
Factory Intercooled 601P/602P to Super 700 Aerostar * with Factory New Engines		
Factory New TIO-540-U2A Engines (exchange)	\$ 175,000	\$ 175,000
Engine HP Increase Kits (exchange)	\$ 49,220	\$ 42,000
Labor to upgrade airframe with Power		
Increase Kit and engine installation labor	\$ 18,375	\$ 16,625
Opt. #248 Overboost Protection	\$ 3,500	\$ 3,500
Labor to Install Opt. #248	\$ 420	\$ 420
Opt. #249 OSMOH 700 Prop Blades(exchange)	\$ 12,300	\$ 12,300
Prop Labor, 0/SOH Hubs and install Opt. #249 Blades	\$ 7,000	\$ 7,000
New engine hoses, isolator mounts, cross shaft bearings, rod ends	\$ 10,450	\$ 10,450
Total Installed Price	\$ 276,265	\$ 267,295

*All Machen conversions and Super 700 Aerostar installations require installation of the following factory options: 250 and 251.

AEROSTAR PRICE LIST

Prices and availability subject to change without notice

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Installed Pricing Information as of October, 2016

INSTALLED PRICES AT AEROSTAR AIRCRAFT Continued . . .	CUSTOMER NET COST FOR 601P	CUSTOMER NET COST FOR 602P
Machen Superstar 700 to Super 700 Aerostar * with factory New Engines		
Factory New TIO-540-U2A Engines (<i>exchange</i>)	\$ 175,000	\$175,000
Labor to build up and install engines	\$ 11,200	\$ 11,200
Opt. #248 Overboost Protection	\$ 3,500	\$ 3,500
Labor to Install Opt. #248	\$ 420	\$ 420
New engine hoses, isolator mounts, cross shaft bearings, rod ends	\$ 10,450	\$ 10,450
Total Installed Price	\$ 200,500	\$200,500
<i>If new turbos required add:</i>	\$ 15,000	\$ 15,000
<i>If new Scavenge Pumps required add:</i>	\$ 3,850	\$ 3,850
<i>If Prop OH required add:</i>	\$ 7,350	\$ 7,350
<i>If new Pneumatic Pumps required add:</i>	\$ 3,210	\$ 3,210
<i>If OH Hydraulic Pump required add:</i>	\$ 1,740	\$ 1,740
<i>If OH Wastegate Actuators required add:</i>	\$ 1,160	\$ 1,160
<i>If OH Prop Governors required add:</i>	\$ 1,580	\$ 1,580
<i>If OH Wastegates required add:</i>	\$ 6,752	\$ 6,752

*All Machen conversions and Super 700 Aerostar installations require installation of the following factory options: 250 and 251.

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Prices and availability subject to change without notice

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OTHER OPTIONS

PowerPac Spoilers	www.powerpacspoilers.com
Deluxe Aerostar Window Shade Kit	www.plastech.com
Pilot & Co-Pilot Side Window Bezel Kit	www.plastech.com
EZ Glide Seat Anchors	jpwhitcomb@aol.com
National Airparts Alternators	www.nationalairparts.com/
Skytech Starters	skytec.aero/
GAMI Fuel Injectors	www.gami.com/gamijectors
Door struts and cables	www.theflightshop.com/



AIRWORTHINESS DIRECTIVES

Description	Mfg		Comment
Recurring -			
AD1976-07-12 Bendix Mag	Bendix		Ground check by pilot
AD1979-01-05 Fuel Cap Insp	AAC	Opt 156-1	Low Fuel light, O-rings replaced, tabs tensioned
AD1979-08-05 Engine Nacelle Fire	AAC	SB600-80	Not recurr if SB600-80 Kit Installed (Drain Tubes)
AD1980-02-09 R1	AAC		Superseded by 1992-11-08
AD1988-21-05 Exhaust System Comp	AAC		
AD1989-25-05	AAC		Superseded by 1990-01-02
AD1990-01-02 Fire Prevention	AAC	Kit 765-158	a) Kit 765-158 installed, b) STC#SA4976NM
AD1993-13-08 C Torque Links	AAC	Kit 765-155	SB746C Kit 765-155 rev G installed
AD1995-23-11 Horiz Stabilizer Flanges	AAC		See SB 600-130 Visual Inspection
AD1998-18-12 Engine Driven Fuel Pump			Superseded by 2003-14-03
AD1998-24-29 Wing Spar Cracks	AAC		See SB600-132 Visual Inspection
AD2002-26-01 Lyc Fuel Line	Lycoming		Superseded by AD2007-14-07
AD2003-14-03 Engine Driven Fuel Pump			Lycoming SB529B & AAC SB600-118
AD2003-22-01 Aux Transfer Pump	AAC		Only if you have Aux Fuel Tank
AD2004-21-05 Janitrol Heater Combust	Janaero		Pressure decay testing
AD2004-25-16 Janitrol Fuel Valve	Janaero		
AD2005-18-20 Goodrich De-Icing "FASTprop"	B.F. Goodrich		Replace boots that fail daily visual check



AD2006-12-07 ECI cylinder assemblies	ECI		
AD2008-14-07 Lyc Fuel Line	Lycoming		Superseded by AD2011-26-04
AD2011-26-04 Fuel Injection Line	Lycoming		Superseded by AD2015-19-07
AD2015-02-07 Prop Governor Set Screw	Lycoming		
AD2015-19-07 Fuel Injector Lines	Lycoming		Lycoming SB342G
Non-Recurring			
AD1970-23-04 Wing Flap Tracks	AAC		
AD1970-23-05 Fuel Pressure Indicators	AAC		
AD1970-25-09 Microphone Jack	AAC		
AD1971-02-05 Cabin Door Lock Pins	AAC		
AD1971-05-06 Main Landing Gear	AAC		
AD1971-10-02 Overvoltage Relay Ground	AAC		
AD1971-17-07 Wing Flap Attach Rib	AAC		
AD1974-25-02 Alt Load Placard	AAC		
AD1977-26-04 R	AAC		Superseded by 1979-01-05
AD1978-18-05 Wing Fuel Tank Indicator	AAC		
AD1979-18-10 Cabin Door Latching Mech	AAC		
AD1980-12-08 R1	AAC		Superseded by 1980-19-14
AD1980-12-14 Engine Fire	AAC		SB600-83
AD1980-17-04 Fuel Flow Transducers	AAC		Aerosonic transducers
AD1980-18-03 Fuel Pressure System	AAC		Yellow markings added



AD1980-19-14 Horiz/Vert Stabilizer	AAC	SB600-88A Kit	
AD1983-14-07 R3 Loss of Control - Stall	AAC	SB-73 Kit	per STC SA2143MN
AD1987-07-09 Exhaust Components	AAC		
AD1987-21-01 Fuel Filler Openings	AAC		Restrictors on all 3 fuel ports
AD1988-25-02 Engine Fluid Hoses	AAC	764-951 Kit	
AD1989-03-04 Cabin Door	AAC		Insp, install placards, install door ajar kit
AD1991-23-16 Manifold Pressure Operations	AAC		for 700P aircraft
AD1992-11-08	AAC		Superseded by 1993-13-08
AD1992-13-01	AAC		Superseded by 1994-15-13
AD1994-15-13 Nose Landing Gear	AAC		for Weibel MFG for NLG
AD1998-04-23 Limitations - Icing	AAC		add to flight manual
AD2001-08-10 MLG Lower Brace Assbly	AAC	SB600-134A	
AD2001-10-09 Honeywell KC 225 Auto Flight Control	Honeywell		KFC225 AutoPilot mods 1-2 only
AD2002-24-07 Scavenge Pump Failure	AAC		New Rajay pump p/n 3001110-002
AD2005-01-19 Mode S Transponders	Garmin		Upgrade software on some Garmin transponders
AD2017-16-11 Connecting Rod Bushings	Lycoming		Lycoming SB632B

Note – As of September 27, 2017. Check with FAA and manufacturers for most current list.



SERVICE BULLETINS

Item	Description	By	Comment
SB 600-1	Janitrol Heater Fitting Modification	SUPERSEDED BY SL600-1R1	60-0002 thru 60-0018
SB 600-2	Hydraulic System Modification	OBSOLETE	60-0002 thru 60-0015
SB 600-3	Nose Gear Retract Linkage Modification		60-0002 thru 60-0018 61-0003 thru 61-0009
SB 600-1R1	Janitrol Heater Fitting Modification		60-0002 thru 60-0018 61-0001 thru 61-0013
SB 600-4	Modification of Right and Left-Wing Center Flap Tracks		60-0002 thru 60-0018 61-0002 thru 61-0007
SB 600-5	Replacement of Cabin Floor Access Door		60-0002 thru 60-0019 61-0002 thru 61-0015
SB 600-6	Installation of Modified Nose Wheel Strut Collar Assembly	OBSOLETE	60-0018, 60-0019, 61-0002, 61-0003, 61-0010 thru 61-0013, 61-0015
SB 600-7	Magneto Switch Modification		60-0002 thru 60-0004, 60-0006 thru 60-0023, 61-0002 thru 61-0015
SB 600-8	Modification of Magneto "P" Leads and ADF Loop Antenna Cable Connector		All 600 and 601 Aerostars with ADF Operation Limitations Placard
SB 600-9	Modified Induction Airbox Installation		61-0001 thru 61-0034
SB 600-10	Brake Master Cylinder Modification		60-0002 thru 60-0026, 61-0002 thru 61-0016, 61-0019 thru 61-0023
SB 600-11	Addition of Aft Oil Cooler Spacers		60-0001 thru 60-0026
SB 600-13	Replacement of Landing Gear Control Valve		60-0001 thru 60-0029, 61-0001 thru 61-0028
SB 600-14	Installation of Elevator Trim Tab Control Split Switch		60-0001 thru 60-0028
SB 600-12	Replacing and Safetying Turbocharger Rotary Actuator Bolts		61-0002 thru 61-0034
SB 600-15	Wing Rivet Inspection and Repair		60-0002 thru 60-0026, 61-0002 thru 61-0024



SB 600-16	Main Landing Gear Lug Retaining Pin Installation		60-0002 thru 60-0031, 60-0033 thru 60-0037, 61-0002 thru 61-0033, 61-0035, 61-0036
SB 600-17	Oxygen System Modification		61-0002 thru 61-0059
SB 600-18	Installation of Wire Bundle Cover in Right Main Landing Gear Wheel Well		60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-19	Replacing Nose Gear Bushing Block Screws		60-0002 thru 60-0056, 61-0002 thru 61-0070
SB 600-20	Replacing Oxygen System Overpressure Discharge Lines		61-0002 thru 61-0175
SB 600-22	Flap Operating Limitations and Flap Track Inspection	SUPERSEDED BY SB600-22A	All Aerostar Models 600 and 601
SB 600-22A	Flap Operating Limitations and Flap Track Inspection	REFERENCE AD 70-23-04	60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-28	Rework of the Fuel Pressure Gage Vent Line	REFERENCE AD 70-23-05	60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-26	Relocation of Mike Jack, Earphone Jack, and Cabin Air Vent Controls	REFERENCE AD 70-25-09	61-0001 thru 61-0070, Model 600: All Aircraft equipped with the Aerostar Model 601 oxygen system.
SB 600-23	Modification of Wing to Flap Attaching Structure	REFERENCE AD 71-17-07	60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-24	Rework of the Alternator, Starter and Main Power Distribution Circuitry	REFERENCE AD 71-10-02	60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-21	Replacement of the Main Landing Gear Sidebrace Assemblies	REFERENCE AD 71-05-06	60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-25	Inspection and Rework of Nose Landing Gear Trunnion Support Structure		60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-27	Modification of the Nose Landing Gear Steering System		60-0001 thru 60-0056, 61-0001 thru 61-0070



SB 600-30	Inspection and Replacement of the Turbocharger Support Brackets and Wastegate Warning Light Switch		61-0001 thru 61-0070
SB 600-31	Corrosion Detection and Corrective Action	SUPERSEDED BY SB902	60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-32	Inspection for Cracks in the Flap Track		All Model 600/601 Series Aircraft
SB 600-29	Inspection and Modification of Throttle and Mixture Control Attachment at Engine Mounts		60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-36	Additional Insulation for Battery Mounting Clips, Inspection of Breaker Wiring and Starting Vibrator Cover Rework		60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-34	Nose Landing Gear Steering Cylinder Retaining Bolt	REVISED	60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-34R1	Nose Landing Gear Steering Cylinder Retaining Bolt		60-0001 thru 60-0017, 61-0003 thru 61-0009
SB 600-35	Modification of Main Cabin Door Latch Installation		60-0001 thru 60-0056, 61-0001 thru 61-0070
SB 600-37	Engine 3-Way Gage		60-0001 thru 60-0056, 60-XXXX-057 thru 60-XXXX-065, 61-0001 thru 61-0070, 61-XXXX-071 thru 61-XXXX-080
SB 600-38	Main Landing Gear Piston Assy. Inspection		60-0001-XXX thru 60-0056-XXX, 60-XXXX-057 thru 60-XXX-064, 61-0001-XXX thru 61-0070-XXX, 61-XXXX-071 thru 61-XXXX-075
SB 600-33	Turbocharger Clamps		61-0001 thru 61-0070
SB 600-39	Engine Oil Line Inspection		61-0001-XXX thru 61-0070-XXX, 61-XXXX-071 thru 61-XXXX-081
SB 600-40	Insulation Diode Overheat - 70 Amp Alternator		60-XXXX-064 thru 60-XXXX-073, 61-XXXX-076 thru 61-XXXX-083, 61P-XXXX-001 Only



SB 600-41	Improved Hinge for Alternate Air Door in Air Induction Filter Housing		60-0001-XXX thru 60-0056-XXX, 60-XXXX-057 thru 60-XXXX-077
SB 600-42	Aileron Bellcrank Bolt Inspection		60-0001-XXX thru 60-0056-XXX, 60-XXXX-057 thru 60-XXXX-070, 61-0001-XXX thru 61-0070-XXX, 61-XXXX-071 thru 61-XXXX-084
SB 600-44	Cabin/Fuselage Drain Ports		61P-XXXX-001 thru 61P-XXXX-010
SB 600-43	Engine Exhaust System Balance Tube Inspection and Support Installation		61-0001-XXX thru 61-0070-XXX, 61-XXXX-071 thru 61-XXXX-085, 61P-XXXX-001 thru 61P-XXXX-006
SB 600-45	Inboard Flap Track Support	REVISED	60-0001-XXX thru 60-0056-XXX, 60-XXXX-057 thru 60-XXXX-087, 61-0001-XXX thru 61-0070-XXX, 61-XXXX-071 thru 61-XXXX-090, 61P-XXXX-001 thru 61P-XXXX-014
SB 600-45R1	Inboard Flap Track Support		60-0001-XXX thru 60-0056-XXX, 60-XXXX-057 thru 60-XXXX-087, 61-0001-XXX thru 61-0070-XXX, 61-XXXX-071 thru 61-XXXX-090, 61P-XXXX-001 thru 61P-XXXX-014
SB 600-46	Remote Circuit Breaker Relays		ITEM 1 & 2: 60-0001-XXX thru 60-0056-XXX, 61-0001-XXX thru 61-0070-XXX, 60-XXXX-057 thru 60-XXXX-085, 61-XXXX-071 thru 61-XXXX-087, 62-0001-13, 61P-XXXX-001 thru 61P-XXXX-062 ITEM 1 ONLY: 60-XXXX-086 thru 60-XXX-0107, 61-XXXX-088 thru 61-XXX-0106, 61P-XXXX-013 thru 61P-XXXX-062



SB 600- Pilot Seat-Back Rest Attach Bolt
48

60-0130-057 thru 60-0285-108,
61-0132-071 thru 61-0281-107,
61P-0157-001 thru 61P-0284-066,
Also the following individual aircraft:
60-0047-108 61-0059-112
60-0048-109 61-0063-117
60-0050-111 61-0064-119
60-0051-115 61-0065-121
60-0053-120 61-0066-122
60-0054-123 61-0068-126
61-0069-127 61-0070-129

SB 600- Replacement of Cleveland Main
47 Wheel Assembly
Bolts and Nuts

60-XXXX-075 thru 60-XXX-0110,
60-XXXX-085 thru 60-XXX-0107,
61P-XXXX-001 thru 61P-XXXX-071

SB 600- Chafing of Oil Cooler Hose
49

61P-XXXX-022 thru 61P-XXX-077,
61P-XXX-001 thru 61P-XXX-022
with gross Weight Increase
Modification, Option #93

SB 600- Inspection of 920025-729 Oxygen Line Installation
50

61-XXXX-071 thru 61-XXXX-103, and
62-0001-013,
61P-XXX-001 thru 61P-XXX-058,
Model 600 equipped with oxygen
system installed prior to release date
of this Service Bulletin.

SB 600- Fuel Selector Switch Knob
52

The following Serial Numbers
manufactured prior to 1973:
60-0001-XXX thru 60-0056-XXX,
61-0001-XXX thru 61-0070-XXX
The following Serial Numbers
manufactured in 1973 and subsequent:
60-XXXX-057 thru 60-XXXX-129,
61-XXXX-071 thru 61-XXXX-0113, and
62-XXXX-013,
61P-XXXX-001 thru 61P-XXX-11

SB 600- Center Fuel Tank, Fuel Probe Gasket
53

60-0284-107 thru 60-0310-115,
61-0307-109,
61P-0283-065 thru 61P-0315-085
With the following exceptions:
61P-0288-068; 61P-0291-070
61P-0300-076; 61P-0313-083;
61P-0314-084



SB 600-56 Aileron Outboard Hinge Bolt Inspection

PART I

A/C Manufactured prior to 1973:
60-0001-003 thru 60-0056-128,
61-0001-004 thru 61-0070-129

A/C Manufactured since 1973:
60-0130-057 thru 60-0329-121,
61-0132-071 thru 61-0327-110,
62-0001-013,
61P-0157-001 thru 61P-0330-094

PART II

All models 600, 601, and 601P
Aerostars

SB 600-54 Alternator Field Circuit Protection

PART I

Applicable to the following A/C:

a) A/C manufactured prior to 1973:
60-0001-003 thru 60-0056-128,
61-0001-004 thru 61-070-0129

b) A/C manufactured since 1973:
60-0130-057 thru 60-0189-085,
61-0132-071 thru 61-0186-087, and
62-0001-013,
61P-0157-001 thru 61P-0183-012

NOTE: Aircraft equipped with OEKO
20218

voltage regulators (which already
incorporate
circuit protection) are not affected by
this

Service Bulletin.

PART II

Applicable to the following A/C:
60-0190-086 thru 60-0355-127,
61-0191-088 thru 61-0352-114,
61P-0192-013 thru 61P-0354-10

SB 600-55 Emergency Exit Door Rigging

All 601P S/N's

61P-0157-001 thru 61P-0330-094



SB 600-51	Pilot and Copilot Seat Rework		60-0130-057 thru 60-0329-121, 61-0132-071 thru 61-0327-110, 61P-0157-001 thru 61P-0330-094, and the following individual A/C: 60-0047-108 61-0059-112 60-0048-109 61-0063-117 60-0050-111 61-0064-119 60-0051-115 61-0065-121 60-0053-120 61-0066-122 60-0054-123 61-0068-126 61-0069-127 61-0070-129
SB 600-57	Propeller Dome Charging Pressure Decal		All Aerostar Models, Airframe Sequence Number 0311 thru 0348 ONLY, and all A/C which have incorporated Hartzell Service Letter No. 91A (equipped with Hartzell HC-C3YR-2UF/FC 8468-8R Propellers).
SB 600-58	Isolation Diode 70 Amp. Alternator Installation	SUPERSEDED BY SB600-58R1	Applies only to Aerostars equipped with 70 Amp. Alternators: 1. Airframe Sequence No. 0001 thru 0189, if modified per STC SA2336WE or STC SA2367WE 2. Airframe Sequence No. 0190 thru 0385.
SB 600-59	NLG Drag Brace Trunnion and Actuator Bracket Fastener Replacement	REVISED	All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence No. 0355.
SB 600-60	Starting System Wiring Revision		PART I All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence No. 0189. PART II All Aerostar Models 600, 601, and 601P, with Airframe Sequence No. 0190 thru 0385 NOTE: Aircraft with Starting Wiring System Modified per SB600-24 are not affected by this Service Bulletin.
SB 600-61	Main Cabin Door - Rod Fitting Inspection		All Aerostar Models 600 and 601 up to and including Airframe Sequence No. 0375.
SB 600-62	Fuel Injector Attach Hardware Inspection		All Aerostar Models up to and including Airframe Sequence No. 0385



SB 600-63	Century IV Autopilot NSD-360 Compass System		All Aerostar Models from Airframe Sequence No. 0240 up to and including 0368 equipped with Edo-Aire Mitchell Century IV Autopilot. All other Aerostars field retrofitted with the Century IV Autopilot are also affected regardless of Airframe Sequence Number.
SB 600-64	Bendix FCS810 Flight Director 'V' Bar Power Source		All Aerostar Models Equipped with Bendix FCS810 Autopilot up to and including Airframe Sequence Number 0407.
SB 600-65	Inspection of Pilot's Brake Lines		All Aerostar Models from Airframe Sequence No. 0356 thru 0407.
SB 600-67	Aerosonic Encoding Altimeters		All Aerostar Models equipped with factory installed Aerosonic Encoding Altimeters, up to and including Airframe Sequence Number 0256, and all aircraft field retrofitted with Aerosonic Encoding Altimeters.
SB 600-66	Seat Inspection/Rework		All Aerostar models up to and including airframe Sequence Number 0435.
SB 600-68	Cleveland Brake Disc Assembly Inspection		All Aerostar Models from Airframe Sequence No. 0171 up to and including 0455 and earlier Aerostars if equipped with Cleveland Wheels and Brakes per Option No. 78.
SB 600-69	Seat Retainer Revision		All Aerostar Models prior to Airframe Sequence No. 0266.
SB 600-70	Flight Manual Revisions and X-Feed Placard	REFERENCE AD 77-26-04	All Aerostar Models up to and including Airframe Sequence Number 0474.



SB 600-71	Low Fuel Warning	REFERENCE AD 77-26-04	All Aerostar Models up to and including Airframe Sequence Number 0474. PART I affects A.S. No. 0001-0255 which are not equipped with a Low Fuel Warning Light per SL600-40 (TSA Opt. No. 16-1) PART II affects A.S. No. 0256-0474 which are equipped with a Low Fuel Warning Light adjusted to 17 +/-1 gallons of fuel remaining in fuselage tank.
SB 600-59R1	NLG Drag Brace Trunnion and Actuator Bracket Fastener Replacement		All Aerostar Models up to and including Airframe Sequence Number 0385 as noted in instructions. AIRCRAFT IN COMPLIANCE WITH PREVIOUS RELEASE OF THIS SERVICE BULLETIN DATED JANUARY 19, 1977, ARE NOT AFFECTED BY THIS REVISION.
SB 600-72	Wing Tank Fuel Sumps		All Aerostar Models up to and including Airframe Sequence Number 0485.
SB 600-80	Addition of Drain/ Ventilation Tubes to Engine Nacelle Firewall		All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence No. 0659.
SB 600-73	Outboard Aileron Hinge Bolt Installation		All Piper Aerostar Models up to and including Airframe Sequence Number 0499.
SB 600-58R1	Isolation Diode 70 Amp. Alternator Installation		Aerostars equipped with 70 Amp. Alternators: 1. Airframe Sequence Number 0001 thru 0189, if modified per STC SA2336WE or STC SA2367WE. 2. Airframe Sequence Number 0190 thru 0448.



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SB 600-74	Main Cabin Door Placards	SUPERSEDED BY SB908	All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence Number 0545. PART I All unpressurized airplanes equipped with small "D" ring handle which rotates counter-clockwise to lock Model 600: 60-0001-003 thru 60-0056-128; 60-0130-057 thru 60-0304-113; except 60-0278-106. Model 601: 61-0001-004 thru 61-0070-129, except 61-0023-052, 61-0034-067, and 61-0060-113; 61-0132-071 thru 61-0301-108; 62-0001-013 PART II All pressurized airplanes. Model 601P: 61P-0157-001 thru 61P-0545-233; 61-0023-052, 61-0034-067 and 61-0060-113. PART III All pressurized airplanes equipped with large "D" ring handle which rotates clockwise to lock. Model 600: 60-0278-106; 60-0309-114 thru 60-0543-174 Model 601: 61-0307-109 thru 61-0537-133; 62-0001-013
SB 600-75	Main Landing Gear Scissors Assy. Inspection and Rework	SUPERSEDED BY SB746C	All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence Number 0554.
SB 600-76	Fuel Quantity Indicator Selector Switch Installation		All Aerostar Model 600, 601, and 601P with Airframe Sequence Numbers 0150 through 0520.
SB 600-77	Fuel Filler Cap Security		All Aerostar Models 600, 601, and 601P.
SB 600-78	Fuel Line Between Fuel Pump and Fuel Injector	REFERENCE AD 78-23-08	All Aerostar Models 600 up to and including Airframe Sequence Number 0322. All Aerostar Models 601 and 601P up to and including Airframe Sequence Number 0507.



SB 630	Collins VIR-350 and VIR-351 Navigation Receiver Modification	SUPERSEDED BY SB630A	
SB 600- 75R1	Main Landing Gear Torque Link Inspection	SUPERSEDED BY SB746C	All Aerostar Models 600, 601, and 601P up to and including Airframe Seq. Number 0554, IF equipped with 0.13 inch radius torque links (P/N 400076-501).
SB 600- 79	Airplane Flight Manual Revisions/ Supplement and Fuel System Placards		All Aerostar Models 600, 601, and 601P which do not have the placards specified in this Service Bulletin and/or have not received Flight Manual Revisions or Flight Manual Supplement dated December 5, 1978.
SB 600- 82	Nose Landing Gear Support Structure Inspection/ Modification	SUPERSEDED BY SB600-82A	Aerostar Models 600A, 601B, and 601P Airframe Sequence No. 0611 through 0714.
SB 600- 81	Three-Tank Fuel Quality Indicator	REFERENCE AD 79- 01-05	All Aerostar Models 600, 601, 601P Airframe Sequence No. 0001 through 0674.
SB 600- 82A	Nose Landing Gear Support Structure Inspection/ Modification		Aerostar Models 600A, 601B, and 601P Airframe Sequence No. 0611 through 0714.
SB 600- 83	Nacelle Fairing Modification		All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence No. 0799.
SB 630A	Collins VIR-350 and VIR-351 Navigation Receiver Modification		
SB 677	Publications for Aircraft Operations		
SB 600- 88	Horizontal and Vertical Stabilizer Attach Fitting Inspection and Attachment Hardware Replacement	SUPERSEDED BY SB600-88A	All Aerostar Models 600, 601 and 601P up to and including Airframe Sequence No. 0807.
SB 600- 84	Engine Three-Way Gauge Inspection/Modification		Aerostar Models 600, 601, and 601P. Airframe Sequence Numbers 0600 through 0732, Inclusive.
SB 600- 85	Engine Wiring Harness Installation		All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence No. 0714.

SB 600-86	Bendix Starter Vibrator Cover Replacement		All Aerostar Models 600, 601, and 601P up to and including Airframe Sequence No. 0824.
SB 600-88A	Horizontal and Vertical Stabilizer Attach Fitting Inspection and Attachment Hardware Replacement		All Aerostar Models 600, 601 and 601P up to and including Airframe Sequence No. 0807.
SB 720	Required Changes to Engine Operation, Maintenance and Inspection Procedures. Modification to Manifold Fuel Nozzle Vent.		
SB 600-87	King Autopilot (KFC-200) Wiring Rework and Modification		Aerostar Models 600, 601, and 601P with both King KFC-200 Autopilot and Dual Control Wheel accessories installed. Airframe Sequence Numbers 0339 through 0761, inclusive.
SB 743	Flap Position Transmitter Arm Security		
SB 750	Propeller Control Cable Installation		
SB 755	Ignition Harness Routing Modification		
SB 756	Air Induction System Modification		
SB 761	Turbocharger System oil Supply Hose Replacement		
SB 757	Alternate Air Door Replacement		
SB 770	Airworthiness Directive 83-14-07	REFERENCE AD 83-14-07	
SB 798	'Turbo' Marking Removal		
SB 797A	Fuel Port Restrictor Installation	SUPERSEDED BY SB797B	All Aerostar 600, 601, 601P, 602P and 700P Models
SB 815	Turbocharger Oil Supply Hose Security		
SB 818	Engine Exhaust System Inspection		
SB 805	*TRW Hartzel Propeller Products Service Bulletin No. 142B ("O" Ring Deterioration)	SUPERSEDED BY SB805A	
SB 805A	*TRW Hartzel Propeller Products Service Bulletin No. 142B ("O" Ring Deterioration)		
SB 832	Oil Separator Assembly Replacement		
SB 746A	Main Landing Gear Torque Link Replacement	SUPERSEDED BY SB746C	



SB 855	Use of Automobile Gasoline in Piper Aircraft		
SB 797B	Fuel Port Restrictor Installation		All Aerostar 600, 601, 601P, 602P and 700P Models
SB 880	Elevator Down Spring Attach Point Modification	SUPERSEDED BY SB880A	PA-60-600 Aerostar 600 60-0001-003 thru 60-0933-8161263 PA-60-601 Aerostar 601 61-0001-004 thru 61-0880-8162157 PA-60-601P Aerostar 601P 61P-0157-001 thru 61P-0860-8163455 PA-60-602P Aerostar 602P 62P-0750-8165001 thru 60-8365021 PA-60-700P Aerostar 700P 60-8423001 thru 60-8423025
SB 884	Lock Wiring of V-Band Couplings		
SB 880A	Elevator Down Spring Attach Point Modification		PA-60-600 Aerostar 600 60-0001-003 thru 60-0933-8161263 PA-60-601 Aerostar 601 61-0001-004 thru 61-0880-8162157 PA-60-601P Aerostar 601P 61P-0157-001 thru 61P-0860-8163455 PA-60-602P Aerostar 602P 62P-0750-8165001 thru 60-8365021 PA-60-700P Aerostar 700P 60-8423001 thru 60-8423025
SB 902	Corrosion Detection and Corrective Action		PA-60-600 Aerostar 600 60-0001 thru 60-0056 PA-60-601 Aerostar 601 61-0001 thru 61-0070, 62-0001-013
SB 903	Structure Corrosion Inspection		PA-60-600 Aerostar 600 60-0130-057 thru 60-0941-8161263 PA-60-601 Aerostar 601 61-0132-071 thru 61-0880-8162157



SB 908 Aerostar Cabin Door Inspection and Refinement

INSTRUCTION I
 60-0001-003 thru 60-0933-8161262
 61-0001-004 thru 61-0880-8162157
 and 62-0001-013
 61P-0157-001 thru 61P-0860-8163455
 62P-0750-8165001 thru 62P-0932-
 8165055, and 60-8265001 thru 60-
 8365021
 INSTRUCTION II
 60-0001-003 thru 60-0056-128
 60-0130-057 thru 60-0543-174
 61-0001-004 thru 61-0531-133 and
 62-0001-013
 61P-0157-001 thru 61P-0545-233
 61-0023-052, 61-0034-067 and 61-
 0060-113
 INSTRUCTION III
 60-0001-003 thru 60-0933-8161262
 61-0001-004 thru 61-0880-8162157
 and 62-0001-0130
 61P-0157-001 thru 61P-0860-8163455
 62P-0750-8165001 thru 62P-0932-
 8165055, and
 60-8265001 thru 60-8365021
 60-8423001 thru 60-8423018
 INSTRUCTION IV
 60-0001-003 THRU 60-0933-8161262
 61-0001-004 THRU 61-0880-8162157

SB 918 Induction Airbox and Upper Deck Reference Hose

61-0001-004 thru 61-0880-8162157
 and 62-0001-013
 61P-0157-001 thru 61P-0860-8163455
 62P-0750-8165001 thru 62P-0932-
 8165055
 and 60-8265001 thru 60-8365021
 60-8423001 thru 60-8423025

SB 920 Engine Tailpipe Inspection and REVISED
 Addition of Fire Detection System

60-0001-003 thru 60-0933-8161262 61-
 0001-004 thru 61-0880-8162157 and
 62-0001-013



SB 926	Hartzell Service Bulletin No. 165, Inspection for Cracks in Certain Three Blade "Y" Shank Aluminum Propeller Hubs		61-0001-004 thru 61-0880-8162157 and 62-0001-013 61P-0157-001 thru 61P-0860-8163455 62P-0750-8165001 thru 62P-0932-8165055 and 60-8265001 thru 60-8365021 60-8423001 thru 60-8423025
SB 942	Forward Wing Spar Lower Cap Inspection Procedure		60-0001-003 thru 60-0933-8161262 61-0001-004 thru 61-0880-8162157 and 62-0001-013 61P-0157-001 thru 61P-0860-8163455 62P-0750-8165001 thru 62P-0932-8165055 and 60-8265001 thru 60-8365021 60-8423001 thru 60-8423025
SB 898	Loss of Power in High Altitude Icing Conditions. Addition of Alternate Air Cable Locking Clips and Conversion of the Engine Fuel Injector Servo to add an Automatic Mixture Control.	SUPERSEDED BY SB898A	Aerostar 700P 60-8423001 through 60-8423025
SB 898A	Loss of Power in High Altitude Icing Conditions. Addition of Alternate Air Cable Locking Clips and Conversion of the Engine Fuel Injector Servo to add an Automatic Mixture Control.		Aerostar 700P 60-8423001 through 60-8423025
SB 950	Turbocharger Clamp Life Limit	SUPERSEDED BY SB600-119	61-0001-004 thru 61-0880-8162157 and 62-0001-013 61P-0157-001 thru 61P-0860-8163455 62P-0750-8165001 thru 62P-0932-8165055 and 60-8265001 thru 60-8365021 60-8423001 thru 60-8423025
SB 600-118	Installation of New Restricted Fuel Pump Vent Fittings in Engine Driven Fuel Pumps	REFERENCE AD 91-08-07	All Aerostar Models 601, 601P, 602P, and 700P.

SB 746B	Main landing Gear Torque Link Replacement	SUPERSEDED BY SB746C	All Aerostar Models
SB 600-119	Turbocharger Clamp Life Limit and Replacement		All turbocharged Aerostar Models 601, 601P, 602P and 700P
SB 600-120	Replacement of Throttle, Prop, and Mixture Control Cables		All Aerostars up to and including Airframe Sequence Number 0933.
SB 600-121	Nose Gear Drag Brace Spring and Piston Replacement		Aerostar 600's with Option #199 60-0001-003 thru 60-0608-7961195 Aerostar 600 60-0614-7961196 thru 60-0933-8164262 Aerostar 601's with Option #199 61-0001-004 thru 61-0605-7962136 Aerostar 601 61-0611-7962137 thru 61-0880-8162157 Aerostar 601P's with Option #199 61P-0157-001 thru 61P-0610-7963274 Aerostar 601P 61P-0612-7963275 thru 61P-0859-8163455 Aerostar 602P 62P-0750-8165001 thru 60-8365021 Aerostar 700P 60-8423001 thru 60-8423025
SB 600-128	Nose Gear Lower Drag Brace Link Assembly Replacement	REFERENCE AD 92-13-01	Aerostar 600's with Option #199 60-0001-003 thru 60-0608-7961195 Aerostar 600 60-0614-7961196 thru 60-0933-8164262 Aerostar 601's with Option #199 61-0001-004 thru 61-0605-7962136 Aerostar 601 61-0611-7962137 thru 61-0880-8162157 Aerostar 601P's with Option #199 61P-0157-001 thru 61P-0610-7963274 Aerostar 601P 61P-0612-7963275 thru 61P-0859-8163455 Aerostar 602P 62P-0750-8165001 thru 60-8365021 Aerostar 700P 60-8423001 thru 60-8423025



SB 920A	Engine Tailpipe Inspection and Addition of Fire Detection System		61P-0157-001 thru 61P-0860-8163455 62P-0750-8165001 thru 62P-0932-8165055 and 60-8265001 thru 60-8365021 60-8423001 thru 60-8423025
SB 600-122	Inspection and Limits for Wear in 600050 Series Control System Pushrods		All Aerostar Models
SB 600-123	Inspection of Front Exhaust Manifold Assemblies		All Turbocharged Aerostar Models 601, 601P, 602P, and 700P
SB 746C	Main Landing Gear Torque Link Replacement	REFERENCE AD 93-13-08	All Aerostar Models
SB 600-124	Replacement of Existing Fuel and Oil Hoses Behind the Firewalls With Fire Resistant Hoses		All Aerostar Models except those already equipped with fireproof type fuel and oil pressure sense hoses and fireproof type main fuel hoses installed in accordance with the following STC's: SA980NW, SA1658NM, or SA2612NM.
SB 600-125	Addition of Fuel Spillage Placards		All Aerostar Models
SB 600-126	Alteration of Existing Wing Fuel Tank Vent System		All Aerostar Models produced before 1992
SB 600-127	Installation of Wastegate Actuator Oil Filters		Aerostar 601's with Option #196 61-0001-004 thru 61-0334-111 Aerostar 601 61-0342-112 thru 61-0880-8162157 Aerostar 601P 61P-0157-001 thru 61P-0860-8163455 Aerostar 602P 62P-0750-8165001 thru 60-8365021 Aerostar 700P 60-8423001 thru 60-8423025
SB 600-129	Replacement of Turbocharger Oil Supply Relief/Shut Off Valve Part Number 532A-2MP-21 or 520A-2MP-21, Piper Code Number 491-917, and outlet fitting.	SUPERSEDED BY SB600-129A	All Aerostar Models 601, 601P, 602P, and 700P
SB 600-129A	Replacement of Turbocharger Oil Supply Relief Valves and Outlet Fittings		All Aerostar Models 601, 601P, 602P, and 700P
SB 600-130	Inspection of Fuselage Horizontal Stabilizer Attach Fittings	REFERENCE AD1995-23-11	All Aerostar Models with Airframe Numbers 0001 thru 0849
SB 600-131	Inspection of Turbocharger Oil Scavenge Pump	SUPERSEDED BY SB600-131A	

SB 600-132	Inspection of 55% Upper Spar Cap	REFERENCE AD1998-24-29	
SB 600-131A	Replacement of Turbocharger Oil Scavenge Pumps		All Turbocharged Aerostar Models; 601, 601P, 602P, 700P
SB 600-133	Improved Attachment of Wing Aileron Bellcrank Bracket	SUPERSEDED BY SB600-133R1	
SB 600-133R1	Improved Attachment of Wing Aileron Bellcrank Bracket		All Aerostar Models
SB 600-134	Main Landing Gear Lower Side Brace	SUPERSEDED BY SB600-134A	
SB 600-135	Possible Corrosion - Wing Fuel Pipe Assembly		All
SB 600-134A	Main Landing Gear Lower Side Brace		All Aerostar PA-60 Models of All Serial Numbers Thru Airframe 1026 (Aircraft Manufactured Prior to 1985)
SB 600-136	Wing Attach Fittings		All Aerostar PA-60 Models of All Serial Numbers Thru Airframe 1026 (Aircraft Manufactured Prior to 1985)
SB 600-137	Nose Landing Gear Support Structure Inspection		All Aerostar PA-60 Models of All Serial Numbers Thru Airframe 1026 (Aircraft Manufactured Prior to 1985)
SB 632	Lycoming - Identification of Connecting Rods with Non-Conforming Small End Bushings	SUPERSEDED BY SB632B	
SB 632B	Lycoming - Identification of Connecting Rods with Non-Conforming Small End Bushings		Certain engines bought or overhauled from 2015-2017. Also covers overhaul kits and rod assemblies

Note- This list is as of September 27, 2017. A complete list of Service Bullitens and Service Letters is available from Aerostar Aircraft Corporation.



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