
Servicing

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Servicing Record

	DATE	QTY	DATE	QTY
Engine Oil	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
Brake Fluid	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
Oxygen	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

Servicing Record (continued)

	DATE	QTY	DATE	QTY
Other	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

Other	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

Other	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

The following procedures are for reference purposes only. Always refer to the Aircraft Flight Manual, aircraft Maintenance Manual, and engine Maintenance Manual for current procedures, precautions, and approved servicing materials.

Fire Extinguisher Cylinder

During the exterior preflight inspection, check that the engine fire extinguisher cylinders are properly serviced. A cylinder is in each main gear wheel well aft of the main gear. An under-charged or fully discharged cylinder requires removal and servicing by an approved agency with a proper charge of 2.5 lbs of bromotrifluoromethane (CbrF₃) and pressurized with dry nitrogen to 450 PSI at 70°F (21.1°C). The bottle cannot be serviced in the aircraft. Refer to **Table 6-A** for cylinder pressures at corresponding temperatures.

Temperature		Indicated Pressure (PSI)
*F	*C	
-40	-40	190-240
-20	-29	220-275
0	-18	250-315
20	-7	290-365
40	4	340-420
60	16	390-480
80	27	455-550
100	38	525-635
120	49	605-730
140	60	700-840

Table 6-A; Pressure Versus Temperature

CAUTION: If the engine ingests fire extinguishing compound, it must be cleaned, removed, and disassembled for a thorough internal cleaning. If the engine fire extinguisher is discharged, the engine baffling will prevent entry of the compound into the engine; thus, only an external engine washing is required. Most incidences of fire extinguisher compound ingestion are the result of ground personnel using an external fire extinguisher during engine operation.

Fuel

Approved Fuels

Commercial JET A, A-1, B

Emergency Fuels 80 RED; 91/98, 100LL BLUE;
100 GREEN; 115/145 PURPLE

In some countries 100LL blue is designated 100L and colored green.

Military JP-4, 5, 8

JP-4 contains factory-blended anti-icing additive.

Emergency Fuels 80/87 RED; 100/130 GREEN;
115/145 PURPLE

Use the lowest octane emergency fuel available.

CAUTION: JP-4 fuel per MIL-T-5624 contains factory-blended anti-icing additive; no further treatment is necessary. Some fuel suppliers blend anti-icing additive in their storage tanks. To ensure proper concentration by volume of fuel on board, blend only enough additive for the unblended fuel.

Fuel Capacities

System	Lbs.*	U.S. Gals	Kg	Liters
Main	2586	386	1173	1461
Auxiliary	1058	158	480	598
Total	3645	544	1653	2059

Table 6-A; Usable Fuel Quantities

*6.7 lbs/gallon

Use of Jet B, JP-4, and Aviation Gasoline

When using Jet B, JP-4, or aviation gasoline, the fuel quantity indicators will not show correct fuel quantity. When using these fuels, an approximate fuel quantity can be determined by:

- multiplying indicated fuel quantity by 0.96 when using Jet B or JP-4
- multiplying indicated fuel quantity by 0.94 when using aviation gasoline.

Fuel Imbalance (Lateral)

Maximum Allowable Between Wing Systems . . . 1,000 LBS

Refueling/Defueling

Filling the Tanks

Aircraft/Refueling Unit GROUNDED

Ensure the aircraft is grounded, refueling unit is grounded, and that the refueling unit is grounded to the aircraft.

Main Tanks (Outboard) REFUEL

CAUTION: To prevent damage to the filler neck, do not let fueling nozzle rest against side of filler. To prevent damage to the fuel tank bladder, do not insert fueling nozzle more than three inches.

Auxiliary Tanks (Inboard) REFUEL

Do not put any fuel into the auxiliary tanks unless the main tanks are full.

Fuel Drain Points CHECK FOR CONTAMINATION

Allow a three-hour settle period if possible.

NOTE: Clean any spilled fuel/additive off of tires to prevent tire deterioration.

Fuel Draining

Draining the Main Fuel System

Filler Caps	REMOVE
Cover on Bottom of Nacelle	REMOVE
Adapter Plug Behind Cover	REMOVE
AN832-12 Union	SCREW INTO ADAPTER
Defuel	ACCOMPLISH

Defuel using one of three methods:

- gravity feed
- aircraft defueling unit
- mechanical pump.

Draining the Main Fuel System

(S/Ns Prior to BB-85 without SI 0725-295)

Filler Cap	REMOVE
Right Side Cowling	OPEN
Flexible Fuel Line at Oil-to-Fuel Heater	DISCONNECT
Standby Fuel Pump (if operative)	ON

If standby fuel pump is inoperative, connect another pump to flexible line or accomplish the following.

Filler Caps	REMOVE
Drain Plug at Nacelle Sump Strainer	REMOVE
Gravity Feed	ACCOMPLISH

Draining the Auxiliary Fuel System

The auxiliary fuel tank can be drained:

- by transferring fuel to the associated main tank with a stand-by fuel pump
- through the wing center section filler cap with an external pump and hose
- by removing the auxiliary tank sump drain plug and allowing fuel to drain into a suitable container.

NOTE: The fuel crossfeed will not transfer fuel between the left and right fuel systems.

Blending Anti-Icing Additive to Fuel

The following procedure must be used when blending anti-icing additive with fuel during refueling. Use only anti-icing additives that conform to specification MIL-I-27686.

Use a HI-FLO PRIST blender Model PHF-204.

- Additive Container REMOVE CAP CONTAINING TUBE AND CLIP ASSEMBLY
- Pistol Grip ATTACH
- Tube PRESS INTO BUTTON
- Tube End CLIP TO FUEL NOZZLE
- Trigger PULL FIRMLY/LOCK IN PLACE
- Refueling BEGIN

Additive Flow BEGIN

CAUTION: Ensure the additive is directed into the flowing fuel stream. Start additive flow after fuel flow starts; stop before fuel flow stops. Do not allow concentrated additive to contact coated interior of fuel cells or aircraft painted surfaces. Use not less than 20 fluid ounces of additive per 260 gallons of fuel or more than 20 fluid ounces per 104 gallons of fuel.

Fueling Rate 30 TO 60 GPM

A rate of less than 30 GPM may be used when topping off tanks.

Adding Biocide to Fuel

Biobor JF is a fuel biocide and not an anti-icing agent. Biobor JF can be used periodically at concentrations up to 135 parts-per-million (PPM) when the aircraft is operated in environments conducive to fungal or microbial growth or there is evidence of fuel contamination (i.e., dirty sump drains, clogged filters, unusual odor, or growth seen in fuel tanks).

As a single-dose shock treatment, Biobor JF can be used in concentrations up to 270 PPM to clean out and sterilize a contaminated fuel system. After all fungal or microbial growths are killed, Biobor JF can be used at a 135 PPM concentration to prevent new growth.

When used to sterilize the fuel system, the additive blended fuel should remain in contact with all fuel tank surfaces for at least 72 hours. If the airplane is flown, Biobor JF should be added during refueling to ensure a 72 hour biocide treatment.

Refer to aircraft Maintenance Manual and **Tables 6-B** and **6-C** for blending charts for 135 and 270 PPM Biobor JF concentrations.

CAUTION: Ensure that the additive is directed into the flowing fuel stream; start additive flow after fuel flow starts and stop before fuel flow stops. Do not allow concentrated additive to contact coated interior of fuel cells or airplane surfaces. Use not less than 20 fl oz of additive per 260 gallons of fuel or more than 20 fl oz of additive per 104 gallons of fuel.

Turbine Fuel		Biobor JF @ 270 PPM			Biobor JF @ 135 PPM		
LBS	GALS	LBS	GALS	FL OZ	LBS	GALS	FL OZ
670	100	0.18	0.02	2.63	0.09	0.01	1.32
1340	200	0.36	0.04	5.26	0.18	0.02	2.63
2010	300	0.54	0.06	7.89	0.27	0.03	3.95
2680	400	0.72	0.08	10.53	0.36	0.04	5.26
3350	500	0.90	0.10	13.16	0.45	0.05	6.58
6700	1000	1.81	0.21	24.46	0.90	0.10	13.16
13400	2000	3.62	0.41	52.92	1.81	0.21	24.46
16750	2500	4.52	0.52	66.08	2.26	0.26	33.04
33500	5000	9.04	10.3	132.16	4.52	0.52	66.08
67000	10000	18.09	2.07	264.47	9.05	1.03	132.31

Table 6-B; Biobor JF Blending Ratios

Fuel	Fuel Density at 15°C		Oz per 1000 gallons fuel	Gallons of fuel treated per quart
	G/ML	LBS/GAL		
JP-4	0.7601	6.343	25.37	1261
Kerosene	0.8045	6.714	26.86	1191

Table 6-C; Biobor JF Addition Levels for Various Fuels – Biobor JF Rates at 270 PPM

Ground Power Unit

The ground power unit (GPU) should be capable of providing a continuous load of 300A at 24 to 30V DC and 1,000A for 0.1 seconds during engine start. Use of an inadequate GPU will cause a voltage drop below the start relay's drop-out voltage. This may result in relay chatter and welded contacts. Similarly, a GPU that provides more than 350A continuous load will damage the external power relay and airplane power cables.

CAUTION: The output setting must not exceed 1,000A on external power sources with a higher current-carrying capability. Any current in excess of 1,000A may overtorque the starter-generator driveshaft or produce heat sufficient to shorten starter-generator life.

When using an external power source:

- use only a negatively grounded unit. If polarity unknown, check with a voltmeter before connecting to the airplane
- before connecting the GPU, turn off all radio equipment and generator switches but leave the battery on to absorb transient voltage spikes
- if battery voltage indicates less than 20V, the battery must be removed and serviced before using external power
- the generators must be OFF and the battery switch ON when starting engines with external power
- if the GPU does not have a standard AN plug, check plug polarity. The positive lead must connect to the external power receptacle's center post, negative lead to the front post, and positive voltage of 24 to 28V DC to the external power receptacle's polarizing pin.

CAUTION: Voltage is required to energize the avionics master power relays to remove power from the avionics equipment. Therefore, never apply external power to the airplane without first applying battery power. If the battery is removed from the airplane or the battery switch is in the OFF position, connect an external battery parallel to the GPU before energizing the GPU.

CAUTION: The battery may be damaged if exposed to voltages higher than 30V for extended periods of time.

Connecting GPU

Avionics MASTER PWR Switch OFF
GEN Switches OFF
Battery Switch ON
Volt/Loadmeter (Battery Voltage) 20V MINIMUM
Ground Power Voltage . SET 28.25 ± 0.25V (King Air 200) or
28.0 to 28.4V (King Air B200)
Ground Power Unit OFF/CONNECT TO AIRCRAFT
Ground Power Unit ON
Volt/Loadmeter MONITOR
Monitor to ensure voltage reading remains greater than
battery voltage (28.25 ± 0.25 volts).

Disconnecting GPU

Right Propeller	FEATHER
Ground Power Unit	OFF/DISCONNECT
External Power Access Door	SECURE
GEN Switches	RESET/ON
Right Propeller Control	FULL FORWARD

Oil – Engine

NOTE: If the engine is cold-soaked, oil level is full when the dipstick reads one quart low. Overfilling may cause an oil discharge through the breather.

Approved Engine Oils

The following oils comply with Pratt & Whitney Canada (P&WC) specification PWA521, Type II oil (5 centistoke). These oils are fully approved for use in P&WC commercially operated PT6A-41 and -42 engines. Refer to the latest revision of P&WC SB 3001 for a current list of approved oils.

- Aeroshell Turbine Oil 500
- Aeroshell Turbine Oil 560
- Castrol 205
- Exxon Turbo Oil 2380
- Mobil Jet Oil 254
- Mobil Jet Oil II
- Royal Turbine Oil 560
- Roy Turbine Oil 500
- Turbonycoil 525-2A.

NOTE: When switching to another approved brand, drain and flush complete oil system and refill in accordance with engine Maintenance Manual instructions.

CAUTION: When changing from an existing lubricant formulation to a “third generation” lubricant formulation, P&WC strongly recommends that such a change should only be made when an engine is new or freshly overhauled.

CAUTION: Do not mix different brands of oil when adding or changing oil. Different brands of oil may be incompatible because of the difference in their chemical structures. Should oils of different brands become intermixed in the engine, drain and flush the entire engine oil system and refill with an approved lubricant.

Engine Oil Capacity

Total 14.2 QTS/13.4 LTRS
Refill 12.7 QTS/12.0 LTRS
Undrainable 1.5 QTS/1.4 LTRS
Operating Range Full to 4 QTS Low

Oil Consumption

Maximum 1 QT/10 HRS
0.95 LTRS/10 HRS

Oil Servicing

Check the oil level after the oil has been changed or the engine has remained stationary for more than 12 hours.

Engine RUN AT IDLE FOR 2 MINUTES
Engine SHUT DOWN

Oil Access Door OPEN

The oil access door is on the upper aft cowling.

Dipstick REMOVE

The dipstick is behind an access door on the aft engine cowl and is marked for the last five quarts. Minimum oil quantity operating range is four quarts low. Replenish oil through the dipstick opening; do not fill past the full mark.

Oil Quantity CHECK

Oil ADD TO ONE QUART MARK ON DIPSTICK

Add only oil of the same brand as that already in the engine. Normal oil level is to the one quart mark on the dipstick. Overfilling the engine may cause oil discharge through the breather until satisfactory oil level is reached.

CAUTION: Remove any spilled oil immediately to prevent tire deterioration.

Dipstick REPLACE/VERIFY SECURE

Access Door CLOSE AND SECURE

Oxygen

Approved Oxygen

Use only MIL-O-27210 aviator's breathing oxygen.

WARNING: Do not use medical or industrial oxygen. These types of oxygen may contain moisture which could freeze the system valves and lines.

Oxygen Cylinder Servicing

Observe the following precautions during oxygen servicing.

WARNING: Avoid making sparks and keep all burning cigarettes or fire away from the vicinity of the airplane. Make sure that the oxygen shutoff valve in the flight compartment is in the closed position. Inspect the filler connection for cleanliness before attaching it to the filler valve. Make sure that your hands, tools, and clothing are clean, particularly of grease or oil, for these contaminants may ignite upon contact with pure oxygen under pressure. As a further precaution against fire, open and close all oxygen valves slowly. Observe all precautions when servicing the oxygen system.

- always ground the system to be serviced and the servicing equipment before connecting the filler adapter
- close the oxygen cylinder manual shutoff valve
- ensure that airplane electrical power is off. Do not operate electrical switches or connect/disconnect ground power unit (GPU) during oxygen servicing

- do not service the oxygen system if fueling or other flammable fluid servicing is in progress
- do not service the system too fast. Rapid charging can create a dangerous overheat condition. Fill the system slowly by adjusting the charging rate with the oxygen servicing cart pressure regulator valve.

Fill the oxygen cylinder slowly to prevent overheating. Fill the following cylinder sizes to corresponding maximum pressures (at 70°F/21.1°C).

22 Cubic-Foot Cylinder	1,800 PSI
49 Cubic-Foot Cylinder	1,850 PSI
64 Cubic-Foot Cylinder	1,850 PSI
76 Cubic-Foot Cylinder	1,850 PSI

For each 1°F increase in temperature, increase maximum pressure 3.5 PSI. For each 1°F decrease in temperature, decrease maximum pressure 3.5 PSI. If oxygen pressure drops below 50 PSI, a system purge is required.

Landing Gear and Brakes

Brake System

The brake system reservoir is on the upper left forward side of the avionics compartment. Service the reservoir with MIL-H-5606 hydraulic fluid.

Reservoir Cap REMOVE

Fluid Level CHECK

With the reservoir fully serviced, fluid level should read full on the dipstick.

Fluid REPLENISH IF NECESSARY

Reservoir Cap REPLACE

Remove and replace the reservoir cap by hand. Using tools may damage the cap and reservoir resulting in a fluid leak.

Tires

CAUTION: Tires that have picked up a fuel, hydraulic fluid, or oil film should be washed down as soon as possible with a detergent solution to prevent deterioration of the rubber.

Inflation

Check tire inflation daily when they are cool. Wait at least 2 hours (3 hours in hot weather) after a flight before checking tire pressure.

Nose Gear 55 TO 60 PSI

Standard Main Gear 96 ±2 PSI

High Flotation Main Gear 62 ±2 PSI

Strut Extension

The following minimum/maximum strut extensions apply to an empty aircraft with full fuel and oil tanks.

Nose Gear 3.00 TO 3.50 INCHES

Standard Main Gear 3.93 TO 4.19 INCHES

High Flotation Main Gear (**S/Ns BB-74 to 105 except BB-76**) 4.70 TO 4.95 INCHES

High Flotation Main Gear (**all other S/Ns**) 5.56 TO 5.93 INCHES

Deicing/Anti-Icing

Approved Airplane Deicing/Anti-Icing Fluids

- SAE AMS 1424 Type I
- ISO 11075 Type I
- SAE AMS 1428 Type II
- ISO 11078 Type II
- SAE AMS 1428 Type IV.

Only the following Type IV fluids are approved:

- Clariant Safewing MP IV 1957
- Clariant Safewing MP IV 2001
- UCAR ULTRA+ (Approved for use down to -15°C)
- Octagon Max Flight Type IV

Deicing and Anti-Icing Fluid Application

Airplane deicing fluids may be used diluted or undiluted according to manufacturer's recommendations for deicing. For anti-icing purposes, the fluids should always be used undiluted. Deicing fluids may be applied either heated or unheated.

NOTE: Type II and Type IV deicing fluids should only be applied at low pressure by trained personnel with proper equipment.

If a sprayer is not available, deicing fluid may be brushed or painted onto the airplane's surface.

