APU (-40C14) - MAINTENANCE PRACTICES

EFFECTIVITY: AIRCRAFT WITH APU T-62T-40C14

1. General

   A. This section gives the ground safety precautions and operating limitations for the APU operation, during the maintenance procedures.

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2. APU Ground Safety Precautions

A. Be careful during the APU operation to prevent injury to persons and damage to material. Some of the general safety items are given below. Others will be added when applicable at the specific maintenance procedures.

WARNING:

- **DO NOT PERMIT THE EXHAUST GASES TO TOUCH YOUR EYES AND SKIN NOR BREATHE THEM TO PREVENT RESPIRATORY IRRITATION.**
- **DURING THE APU OPERATION, USE A DEVICE FOR EAR PROTECTION. A VERY HIGH NOISE CAN CAUSE DAMAGE TO THE EARS.**
- **DO NOT OPERATE THE APU NEAR FLAMMABLE MATERIALS OR FUEL VENT. EXPLOSIONS CAN OCCUR.**
- **THE APU IGNITION SYSTEM CAUSES HIGH ENERGY. THIS ENERGY MAKES THE SYSTEM A DANGEROUS SOURCE OF ELECTRICAL SHOCK. THERE IS THE DANGER OF DEATH UNLESS THE PRECAUTIONS ARE OBEYED. DO NOT DO MAINTENANCE TASKS ON THE APU IGNITION SYSTEM WHEN IT IS ON. TO DO THE IGNITION SYSTEM MAINTENANCE, ALWAYS REFER TO THE PROCEDURES IN THE MAINTENANCE SOURCE DATA OF SUNDSTRAND.**
- **ALL JET FUEL AND LUBRICATING OILS CAUSE INJURY TO THE SKIN. DO NOT PERMIT THIS FLUIDS TO TOUCH YOU.**
- **DO NOT TOUCH THE EXHAUST DUCT AND APU COMPONENTS UNTIL THEY ARE COOL. THE TEMPERATURE CAN STAY HOT FOR A LONG TIME AFTER THE APU STOPS.**
- **IF THE FIRE BOTTLE DISCHARGES, DO NOT BREATHE THE HALON GASES NOR GET HALON ON YOUR SKIN OR EYES, AND CLEAN THE AREA. MAKE SURE THAT THE AREA HAS A GOOD FLOW OF AIR. HALON GASES CAN CAUSE IRRITATION TO THE SKIN AND EYES.**

CAUTION:

- EMBRAER AND HAMILTON SUNDSTRAND DO NOT RECOMMEND APU OPERATION DURING THE AIRCRAFT DEICING/ANTI-ICING PROCEDURE. IF THE APU IS KEPT IN OPERATION DURING THE DEICING/ANTI-ICING PROCEDURE, DAMAGE CAN OCCUR TO IT. IF THE APU OPERATION IS ABSOLUTELY NECESSARY, MAKE SURE THAT THE APU BLEED VALVE IS CLOSED, PACKS ARE SET TO OFF, AND THE DEICING/ANTI-ICING FLUID WILL NOT BE APPLIED DIRECTLY TO OR NEAR THE APU AIR INLET.
- REMOVE ALL DEICING/ANTI-ICING FLUID BUILD-UP BEFORE THE ENGINE OR THE APU START. IF NOT, DAMAGE TO COMPONENTS CAN OCCUR.
- DO NOT RUN THE APU FOR A LONG TIME WITHOUT THE APU TAIL CONE OR WITH THE ACCESS PANEL OPEN. IF THE APU RUNS IN ONE OF THESE CONDITIONS, A HIGH-OIL-TEMPERATURE SHUTDOWN CAN OCCUR.

B. You must do the maintenance services on the APU only in ventilated areas which permit free movement of fire fighting equipment and persons.

C. You must keep the air inlet screens clean. Be careful not to permit objects such as caps, glasses, cloths, etc., to go into the engine.

3. Operating Limits

A. Table 201 below gives the operating limitations of the APU.

Table 201 - AUXILIARY POWER UNIT (APU) STARTING AND NORMAL OPERATING LIMITS

ITEM	OPERATION MODE	NECESSARY LIMIT
Compressor Intake Air Temperature (Ambient Temperature)	(Any Operation Mode)	-54°C (-65°F) (Min) at sea level 50°C (122°F) (Max) at sea level[1]
Maximum Exhaust Gas Temperature (EGT)	Ground Start	Shutdown if: Shutdown if EGT > 873 ± 11°C (1604 ± 20°F).
	100% Engine Speed Ground Run	Shutdown if: EGT > 732°C (1350°F) for 3 seconds; EGT > 774°C (1425°F) for 0.5 seconds or; EGT > 690°C (1275°F) continuous
Fuel Pressure and Temperature	Any Operation Mode	10 to 55 psig (69 to 379 kPag) and 60 psig (414 kPag) Maximum. — Fuel type: • Jet A: -40 to 57°C (-40 to 135°F) • Jet A-1: -42 to 57°C (-45 to 135°F) • Jet B: -54 to 57°C (-65 to 135°F) • JP-4: -54 to 57°C (-65 to 135°F) • JP-5: -40 to 57°C (-40 to 135°F) • JP-8: -40 to 57°C (-40 to 135°F) • Russian GOST 10227: Minimum fuel temperatures that correspond to 12 centistokes maximum. - Grades TS-1 and RT - Additives I and I-M permitted as long as concentration is less than 0.3% by volume

[1] APU compressor inlet air temperature in flight is equivalent to the Total Air Temperature (TAT)

Table 201 - AUXILIARY POWER UNIT (APU) STARTING AND NORMAL OPERATING LIMITS (Continued)

ITEM	OPERATION MODE	NECESSARY LIMIT
Fuel Pressure and Temperature (Cont.)	Any Operation Mode (Cont.)	• Russian GOST 12308: Minimum fuel temperatures that correspond to 12 centistokes maximum. - Grades T-8V and T-6 - Additives I and I-M permitted as long as concentration is less than 0.3% by volume • Chinese GB438-77 Grade RP-1: Minimum fuel temperatures that correspond to 12 centistokes maximum. • Chinese GB1788-79 Grade RP-2: Minimum fuel temperatures that correspond to 12 centistokes maximum. • Chinese SY1008-80 Grade RP-3: Minimum fuel temperatures that correspond to 12 centistokes maximum. • Chinese GB6537-94 Grade PRC #3: Minimum fuel temperatures that correspond to 12 centistokes maximum.
Oil Temperature	Ground Mode - Shutdown Flight Mode - APU Fault	135°C ± 2.8°C (275°F ± 5°F) Maximum
Oil Pressure	Minimum Operation Oil Pressure Ground Mode - Shutdown Flight Mode - APU Fault	25 ± 5 psig (172 ± 35 kPag) Minimum
	Normal Operation	60 to 70 psig (414 to 483 kPag) Minimum
	Maximum Oil Pressure At 100% RPM with Oil Sump Temperature between 38 to 135ºC (100 to 275ºF)	Above 75 ±5 psig (518 ±35 kPag)
Usable Oil Quantity	Add	1.89 liters (4.0 US pints)
	Full	2.41 liters (5.1 US pints)
Oil Consumption	Any Operation Mode	0.045 kg/h (0.1lb/h)
Starting (Tailwind present)	On the Ground	14 kt (Max) Maximum
Starter/generator Duty Cycles	APU Start Mode Starting Cycles Until you have 95% RPM plus 7 seconds	3 (three) consecutive starting attempts, one after the other, with a 1 (one) minute cooling period between them. After that, wait 30 (thirty) minutes before a new series of 3 starting attempts.
Acceleration Time	Normal Modes	45 seconds (Max)

Table 201 - AUXILIARY POWER UNIT (APU) STARTING AND NORMAL OPERATING LIMITS (Continued)

ITEM	OPERATION MODE	NECESSARY LIMIT
Engine Speed	Continuous operation ECS, MES, Shaft load and idle	100%
	Overspeed Shutdown	104% - Primary 106% - Backup
	Underspeed shutdown	Less than 96% after stable condition