



Turbine Power Technologies, Inc.

WHEN AND HOW TO USE THE ISOLATING VALVE (ISOL/ EMERGENCY CIRCUIT) IN FLIGHT

In-flight, if there is a simultaneous reduction in torque and an increase in ITT, the likely cause is mechanical. The ISOL function will be ineffective, and it is recommended to initiate a prompt landing.

If a decrease in torque, N1, and/or ITT occurs, and applying additional power does not yield any improvement, there may be a potential issue with the FCU (Fuel Control Unit). Reduce power to idle (throttle) and ensure the condition lever is positioned within the indent range, approximately +/- 1/3 forward. Engage the ISOL valve and use the condition lever as the throttle.

To exit ISOL mode, ensure the throttle is in the idle position. Move the condition lever to the indent position, approximately +/- 1/3 forward, and switch the ISOL valve to the off position. The throttle can then be advanced to the required power setting.

1340 Flight Line Blvd.
Deland, Florida 32724
United States
386-216-8180



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STARTING LIMITATIONS

- Minimum ambient air temperature for starting engines without their preheating is -20°C
- Maximum inter-turbine temperature during starting from an external power source 700°C
- Maximum inter-turbine temperature during starting from aircraft batteries 700°C
- Maximum altitude for engine restarting in flight 12,000 ft
- Maximum 5 number of engine starting (turning) attempts from an external power source following at 3 minute intervals
- The next attempt can be made in one hour.
- Voltage of external power source during starting (no load) 20 to 31 Volts.
- Allowable voltage drops of aircraft power supply during the initial phase of starting (not over 4 seconds) minimum 18 V
- Maximum 5 number of starts attempts from aircraft batteries (3 minute intervals)

FUEL SYSTEM

- Maximum flight altitude in case of all fuel pumps failure 16,000 ft at or below 90% N1

OIL SYSTEM

The engine can be lubricated exclusively with the following oils:

- Aeroshell Turbine Oil 500
- Aeroshell Turbine Oil 555
- Aeroshell Turbine Oil 560
- Mobil Jet Oil 11
- BP Turbo Oil 2380
- Eastman 2380 Turbine Oil

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MISCELLANEOUS OIL SPECIFICATIONS

- Minimum oil quantity in engine 5.5 L
- Maximum oil quantity in engine 7 L
- Minimum oil temperature during starting: -20 °C
- Maximum oil temperature for engine acceleration and normal engine operation: +85 °C
- Minimum oil temperature for engine acceleration and normal engine operation: +20 °C
- Maximum oil consumption 0.1 L/ h
- Minimum permissible oil pressure: N1/Ng 60% (20PSI) N1/Ng 80-101.5% (26 PSI)
- Maximum permissible oil pressure (43 PSI)

Note: For oil temperatures range -20 °C to +85 °C oil pressure can be higher by 43 PSI. Increase of oil pressure to a maximum of 50 PSI is permitted for a short time during starting at temperatures below 0 °C. Short-term oil pressure drop to zero 10 seconds.

OTHER ENGINE LIMITATIONS IMPOSED BY THE POWER PLANT

Bleed Air for Aircraft Systems: It is prohibited to open air bleed ducts while the engine is operating at maximum take-off power or emergency power. When air bleed is activated, the gas temperature (ITT) will increase by approximately +30 °C. Consequently, it is essential to adjust the engine operating parameters after opening the bleed air to ensure that the maximum Inter Turbine Temperature (ITT) is not surpassed.

Use of Reverse Thrust: Reverse thrust is permissible only after landing and post-touchdown. It is strictly forbidden to engage beta or reverse thrust while the aircraft is in flight.

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ELECTRIC SYSTEM

- Electric power sources: Normal voltage in DC system: 26 to 29.0 V
- Maximum load of generator in flight: 200 A
- Maximum load of generator on ground (30 min maximum): 100 A

BLEED FUEL CONTROL UNITS (FCUs)

The FCU features four bleed ports: two at the bottom (left and right), one at the rear, and another on the top.

Throughout the entire bleed process, it is crucial for the electrical fuel pump to operate continuously. It should not be switched off while the bleed pipe is being changed.

1. Remove all four bleed caps.
2. Condition lever to shut off position, throttle to idle.
3. Turn electrical fuel pump on.
4. Fit fuel bleed pipe to bottom port till no air can be observed, continue bleeding from the bottom ports up to the last one located all the way on top.
5. Fit bleed caps and start Turbine.

After replacing the FCU or fuel filter, it is necessary to repeat the procedure once the turbine has been run. A quick check can be conducted by turning off the electrical fuel pump while idling on the ground. If the Compressor RPM (N1) experiences a drop of more than 3%, it indicates the need to bleed the FCU again.

Technicians without the appropriate bleed fitting with a pipe can use a small Allen wrench (Hex Key) or .041 locking wire cautiously to activate the Schrader valves located beneath the bleed caps. After replacing the FCU, it is essential to verify that all throttle and condition lever settings are accurate before attempting to start the engine.

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