3.5 REJECTED TAKEOFF

Power Lever.....IDLE
Braking.....AS REQUIRED
Reverse.....AS REQUIRED

If insufficient runway remains for a safe stop:

Condition Lever.....CUTOFF / FEATHER
Battery Switch.....OFF
Firewall Shutoff Valve.....LIFT COVER - PULL OFF

Maneuver as necessary to avoid obstacles.

After the aircraft has stopped - EVACUATE.

3.7 ENGINE FAILURE

Engine failure before rotation:

Power Lever.....IDLE
Braking.....AS REQUIRED

STOP STRAIGHT AHEAD.

If insufficient runway remains for a safe stop:

Condition Lever.....CUTOFF / FEATHER
Battery Switch.....OFF
Firewall Shutoff Valve.....LIFT COVER - PULL OFF

Maneuver as necessary to avoid obstacles.

After the aircraft has stopped - EVACUATE.

3.7 ENGINE FAILURE (Continued)

Engine Failure Immediately After Takeoff

Airspeed .....100 KIAS
Landing Gear.....DOWN
Power Lever.....IDLE
Condition Lever .....CUTOFF / FEATHER
When landing gear is down and time permits:
  Flaps.....DOWN 36°
  Airspeed.....85 KIAS
Battery Switch .....OFF
Firewall Shutoff Valve.....LIFT COVER - PULL OFF

After the aircraft has stopped - EVACUATE.

Engine Failure in Flight

Oxygen .....AS REQUIRED
Mic Select Switch .....MASK
Airspeed .....105 KIAS
Power Lever.....IDLE
Condition Lever .....CUTOFF / FEATHER
Propeller .....VERIFY FEATHERED

CAUTION

The battery switch must be ON to feather the propeller.

Remaining Fuel.....CHECK

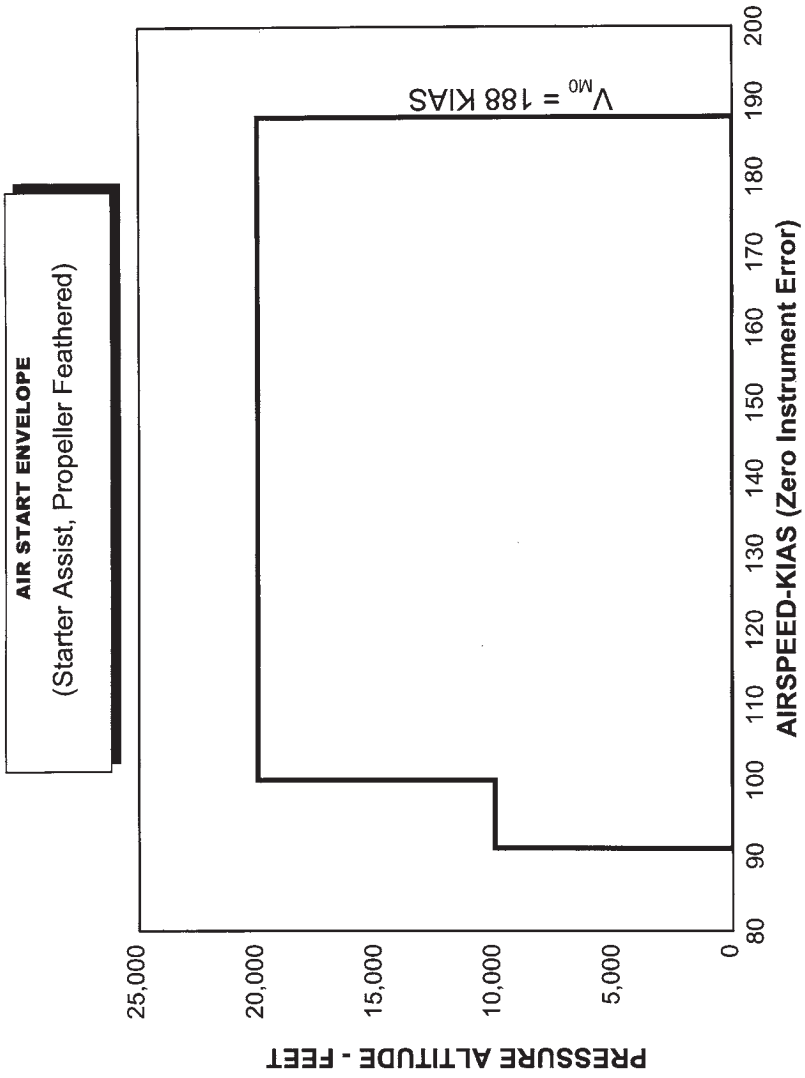
Air Start .....Refer to Air Start procedure in this section

If above the airstart envelope (Fig. 3-3), descend into the envelope and make an airstart per this section. Use oxygen as required. Perform a normal descent or emergency descent as appropriate.

If engine air start is not successful, proceed with the power off landing procedure per Section 3.21.

3.7 Engine Failure (Continued)

Air Start Envelope



Air Start Envelope
Figure 3-3

3.7 Engine Failure (Continued)

Air Start - Starter Assist

Oxygen..... AS REQUIRED
Mic Select Switch..... MASK
Autopilot.....DISENGAGE
Condition Lever..... CUTOFF / FEATHER
Altitude & Airspeed.....WITHIN THE AIR START ENVELOPE
Power Lever.....IDLE
Generator..... OFF
Alternator..... OFF
Electrical Load.....REDUCE

WARNING

Turning off the avionics switch will result in a loss of power to the AHRS system. If power is removed for more than 2 minutes, initialization of the AHRS system will not be accomplished, resulting in loss of attitude/heading information.

ECS Switch..... OFF
Bleed Air Lever..... PULL OUT (closed)
EMERGENCY PRESSURE Circuit Breaker.....PULL
(Located on the pilot's aft circuit breaker panel, row B, position 8)
Fuel Pump ..... MANUAL
Ignition..... MANUAL

CAUTION

To obtain an AUTO air start, the MANUAL/STOP START switch must not be selected. If the switch is selected to MANUAL (switch light illuminated), the starter switch must be held ON to keep the starter engaged during the start.

Start Mode Switch.....AUTO

3.7 Engine Failure (Continued)
Air Start - Starter Assist (continued)

CAUTION

Activation of the Start switch will cause a transient DC voltage drop, which may cause the AHRS to lose its reference, forcing the system to realign, when the voltage is restored. During this period the aircraft attitude should be level flight.

Starter Switch.....ENGAGE (Verify Start Annunciator Illuminated)
Condition Lever (N_g min. 13%).....RUN
ITT and N_g .....MONITOR

After Engine Relight - Ng > 60%.

Generator.....ON
Alternator.....ON
Fuel Pump .....AUTO
Ignition.....AUTO
EMERGENCY PRESSURE Circuit Breaker.....RESET
(Located on the pilot's aft circuit breaker panel, row B, position 8)
Bleed Air Lever.....PUSH IN (open)
ECS Switch..... NORMAL
Electrical Equipment..... AS REQUIRED

3.9 ENGINE SYSTEM

3.9a High Oil Temperature

Indication: Aural warning with associated red oil temperature needle and red background box associated with digital readout.

Power Lever.....REDUCE POWER

If temperature remains high, continue flight at reduced power and *land as soon as possible.*

3.9 ENGINE SYSTEM (continued)

3.9b Oil Pressure

Indication: Aural warning with associated red oil pressure needle and red background box associated with digital readout. Red oil pressure annunciator.

low Oil Pressure, Below 85 PSI

Power.....REDUCE TO A MAX. OF 1100 FT - LB OF TORQUE

Land as soon as practical.

low Oil Pressure, Below 60 PSI

Power..... REDUCE TO MINIMUM TORQUE REQUIRED TO COMPLETE FLIGHT

Land as soon as possible.

If possible, always retain glide capability to the selected landing area in case of total engine failure.

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3.9 ENGINE SYSTEM (Continued)

3.9c Chip Detector Light

Indication: Amber " CHIP DETECTOR" annunciator illuminated.

After Engine Start

Return to parking area and shutdown engine.

In Flight

Oil Temperature .....MONITOR
Oil Pressure .....MONITOR

Land as soon as practical.

Inspect Engine Before Next Flight

3.9d Start Engage

Indication: Amber " START ENGAGE" annunciator remains illuminated after engine start.

On the Ground:

Manual/Stop Switch .....PUSH
Condition Lever .....CUTOFF/FEATHER
Battery Switch .....OFF

In Flight:

Manual/Stop Switch .....PUSH
Generator .....VERIFY ON

If generator is not on, *land as soon as possible.*

3.9e Fire Detect Fail

Indication: Amber " FIRE DETECT FAIL" annunciator illuminated.

Fire Detect Circuit Breaker .....CHECK IN
(Located on the pilot's forward circuit breaker panel, row C, position 8.)

Inspect and Repair Prior to Next Flight.

3.9 ENGINE SYSTEM (Continued)

3.9f Feather

Indication: Amber " FEATHER" annunciator illuminated.

On Ground After Engine Start:
Shut down and investigate cause.

In Flight:
Land as soon as practical and investigate cause.

3.9g Beta

Indication: Amber " Beta" annunciator illuminated in flight.

Power Lever .....VERIFY FLIGHT IDLE POSITION OR FORWARD OF FLIGHT IDLE.

3.11 FUEL CONTROL UNIT FAILURE / POWER LEVER CONTROL LOSS (Manual Override Operation)

Indication: Power lever movement does not change Ng.

Power Lever .....FLIGHT IDLE

MOR Lever.....PULL UPWARDS AND MOVE FORWARD SLOWLY TO ACHIEVE REQUIRED ENGINE POWER

Land as soon as possible.

Perform landing without reverse.

After landing
(If power cannot satisfactorily
be controlled with MOR Lever)
Condition Lever .....CUTOFF / FEATHER

3.11 FUEL CONTROL UNIT FAILURE / POWER LEVER CONTROL LOSS (Manual Override Operation) (Continued)

CAUTION

Exercise extra care when using the MOR to avoid exceeding engine limitations. Engine response may be more rapid than when using the power lever. Avoid rapid movement.

If power control using MOR is excessive:

Reduce airspeed to below 168 KIAS by increasing pitch attitude.

Landing Gear.....EXTEND BELOW 168 KIAS
Flaps 10° .....BELOW 168 KIAS

Land as soon as possible.

When landing is assured:

Condition Lever .....CUTOFF / FEATHER

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3.13 PROPELLER OVERSPEED

Indication: If Np remains between 2000 and 2080 RPM:

Power Lever .....REDUCE POWER
Airspeed.....REDUCE

Continue flight at reduced speed, using minimum power necessary and land as soon as practical.

Indication: If Np exceeds 2080 RPM steady state:

Power Lever .....REDUCE AS NECESSARY
Airspeed .....REDUCE TO LOWEST PRACTICAL

Land as soon as possible.

If possible maintain altitude as necessary in order to retain glide capability to the selected airport in case of total engine failure.

Should heavy vibration or uncontrolled prop speed runaway occur, be prepared to shut down the engine.

Condition Lever .....CUTOFF / FEATHER

Conduct a Normal Descent, Section 4.5n, or Emergency Descent, Section 3.17, as appropriate and Power Off Landing, Section 3.21.

3.14 ENGINE FIRE

On Ground (During engine start or taxi)

Indication: Engine Fire Warning Annunciator.

Power Lever.....IDLE
Condition Lever.....CUTOFF / FEATHER
Brakes.....AS REQUIRED
Firewall Shutoff Valve.....LIFT COVER - PULL OFF
Bleed Air Lever.....PULL OUT (closed)
ECS Switch.....OFF
Fuel Pump Switch.....OFF
Ignition Switch.....OFF
Radio.....EMERGENCY CALL
Battery Switch.....OFF
Aircraft.....EVACUATE
Fire.....EXTINGUISH

In Flight

Indications: Engine Fire Warning Annunciator or Visual Verification

Engine Power.....REDUCE TO MINIMUM ACCEPTABLE ACCORDING TO FLIGHT SITUATION
Oxygen.....AS REQUIRED (all aircraft occupants)
Mic Select Switch.....MASK

Confirm that fire exists then:

Condition Lever.....CUTOFF / FEATHER
Firewall Shutoff Valve.....LIFT COVER - PULL OFF
ECS Switch.....OFF
Bleed Air Lever.....PULL OUT (closed)

Conduct a Normal Descent, Section 4.5n, or Emergency Descent, Section 3.17, as appropriate and Power Off Landing, Section 3.21.

CAUTION

If pressurized, this procedure will result in an immediate loss of pressurization and cabin altitude will rise at an uncontrolled rate.

4.5n DESCENT (4.33)

CAUTION

Isolated reports of no engine response to power lever movement have occurred during low engine power (Ng idle speed below 63%) and high engine accessory load operations in hot environments. The possibility of encountering this condition (referred to as "engine roll back") may be minimized by turning air conditioning and bleed air off before final landing approach. During ground and flight operations, if an engine roll back is detected, immediately perform the FUEL CONTROL UNIT FAILURE OR POWER LEVER CONTROL LOSS (Manual Override Operation) procedure in Section 3. Pilots should review this procedure in advance and be prepared to execute if required.

7.5 ENGINE AND PROPELLER

Engine

The Meridian is powered by a Pratt & Whitney PT6A-42A turbo-propeller engine, with a flat rated power of 500 shp and maximum propeller speed of 2000 RPM. This engine is a reverse flow, free turbine arrangement. Accessories include a starter/generator and a belt driven alternator and air conditioning compressor.

Engine intake air is provided through dual, symmetric air inlets located on the forward portion of the cowling at the four and eight o'clock positions. The inlets are of fixed geometry such that no moving ice vanes or doors are utilized. The inlets are designed such that the dynamics of icing conditions do not allow the inlet to ice closed. Both inlets supply air to an inertial separator, which in turn supplies a common engine inlet plenum and intake screen.

The inertial separator functions by preventing foreign objects from making an abrupt turn into the plenum and instead exit through the bypass outlet. As air enters through the intake screen, it is ducted into a three-stage axial and single-stage centrifugal compressor driven by a single-stage reaction turbine. A dual turbine, counter-rotating with the first, drives the propeller through a two-stage reduction gear box. Exhaust is provided through dual exhaust stacks located on either side of the engine just behind the propeller.

A single annular combustion chamber, containing 14 removable fuel nozzles and two igniter plugs, comprises the combustion system. Seven of the fuel nozzles are used for starting; the remaining nozzles activate as the engine accelerates. A hydropneumatic fuel control schedules fuel flow to maintain engine power.

The ignition system consists of one exciter box, two ignition leads and two spark igniters. Both igniters are engaged simultaneously. DC power is delivered to the exciter box from the essential bus through an ignition mode selector switch in the overhead switch panel and a torque pressure switch. When in the automatic ignition mode, the ignition system will activate when the torque is less than or equal to approximately 275 ft. lbs., and deactivate when the torque is greater than or equal to approximately 375 ft. lbs. Continuous ignition, at any torque setting, is provided in the manual ignition mode.

7.5 ENGINE AND PROPELLER (continued)

Engine (continued)

The engine incorporates an integral oil lubrication system with an oil tank of approximately 12 quarts (11.35 liters) total capacity including propeller, integral engine oil system, and oil cooler. The oil tank is an integral part of the compressor inlet case in front of the accessory gearbox and contains a filler neck with calibrated dipstick. The filler neck incorporates a ball check valve to ensure oil does not migrate out of the filler neck in the event the dipstick is not properly secured. In addition, an oil level sight glass is provided to indicate the oil level in the gearbox without having to remove the dipstick. Adequate oil level for engine operation is indicated by an oil level within the green area of the sight glass.

Engine instruments are displayed on the two EDU's (engine display unit). The primary display, pilot side, EDU displays torque, ITT (interstage turbine temperature), propeller (Np) RPM, gas generator (Ng) RPM, and fuel flow (during engine start). The secondary display, copilot side, EDU displays vacuum level, fuel flow, oil temperature, oil pressure, outside air temperature, estimated time enroute, fuel at destination, and fuel quantity.

Fire detection is provided by a heat sensitive fire cable, which passes a current at approximately 540° F (282.2° C). This current alerts the fire detection computer, which then actuates the ENGINE FIRE warning light on the annunciator panel. When switched to test mode, an electrical current is passed to the fire detection computer, which should sense the current and illuminate the ENGINE FIRE warning light in the annunciator panel.

7.5 ENGINE AND PROPELLER (continued)

Propeller

The propeller is a Hartzell model number HC-E4N-3Q/E8501K-3.5, 82.5 inch diameter, four blade, metal, constant speed unit with reversing and full feathering capabilities. Each propeller blade incorporates an electric deice boot.

The propeller governor pressurizes and regulates the flow of the propeller gearbox oil to a piston in the propeller dome. The piston is linked by a sliding rod and fork arrangement to the propeller blades. Governor oil pressure against the piston works to decrease propeller blade pitch. Centrifugal twisting moments on the propeller blades work to decrease propeller blade pitch and increase rpm. Governing of the interaction of these and other forces to maintain a constant rpm is provided by the propeller governor.

The propeller governor maintains a constant propeller speed and is not pilot controlled, but rather fixed at a maximum propeller speed of 2000 RPM. Propeller feather is selected by moving the condition lever to the cutoff position. Beta and reverse blade angles are controlled by power lever movement. Movement of the power lever into the beta and reverse range of operation is only possible on the ground via a squat switch controlled solenoid. An additional overspeed governor is also provided to protect against propeller and power turbine overspeed.

Propeller feathering is controlled electrically by switches in the throttle quadrant and a torque sensing switch. The battery switch must be ON to feather the propeller.

7.7 ENGINE CONTROLS

The engine is controlled by power, condition, and manual override (MOR) levers, located on the control quadrant of the lower central instrument panel. The power lever is used to actuate the engine fuel control unit as well as propeller beta and reverse settings. The power lever is connected through linkage to the fuel control unit at the rear of the engine, and controls engine power through the full range from maximum takeoff power back to idle and further aft to the beta detent and the reverse detent. When the power lever is at the idle stop, the gas generator (Ng) is at idle and the propeller (Np) is at minimum pitch. A lifting action is required to raise the power lever over the idle detent to the beta and reverse detents. When the power lever is selected to the beta position, the gas generator is at idle and the propeller blade pitch is controlled by the power lever from idle thrust back through a zero or a no thrust condition. The beta position may be used after landing during ground roll and to control taxi speed. Further lifting and aft movement of the power lever to the reverse detent increases engine power and provides negative thrust (reverse).

WARNING

To prevent damage to the control linkage, do not move the power lever aft of the idle stop when the engine is not operating.

WARNING

Positioning the power lever aft of the flight idle stop in flight is prohibited. Such positioning may cause loss of airplane control or may result in an engine overspeed condition and consequent loss of engine power.

The landing gear warning horn is activated by an idle power setting or flap extension beyond 10 degrees combined with the landing gear not in a down and locked position. The horn will continue to sound until the gear is down and locked, the power setting is increased, or the flaps are retracted to less than 10 degrees. This is a safety feature to warn the pilot of an inadvertent gear-up landing.

The condition lever controls the run and cut-off function of the fuel control unit as well as propeller feather. The full forward position sets the run fuel flow, and full aft position cuts off fuel flow and feathers the propeller.

7.7 ENGINE CONTROLS (continued)

The manual override (MOR) lever is located in the center console to the left of the power lever. The MOR is used to directly control fuel flow to the engine if a pneumatic malfunction occurs in the engine fuel control unit. When the engine is operating, a failure of any pneumatic signal input to the fuel control unit will result in the fuel flow decreasing to minimum idle (approximately 48% Ng at sea level and increasing with altitude). Power may be regained by using the manual override (MOR) lever. The normal position for the MOR is the OFF position. The normal position is used for all normal engine operation when the fuel control unit is operating normally and engine power is selected by the power lever. Rapid movement of the MOR lever could cause compressor surges and excessive ITT overtemperature.

To operate the MOR, lift up on the lever and slowly move it forward toward the MAX position. Monitor gas generator speed (Ng) and ITT.

The friction adjustment lever, located in the middle of the control quadrant, may be adjusted to increase or decrease the friction holding the power lever.

7.8 MEGGITT AVIONICS NEXT GENERATION INTEGRATED COCKPIT (MAGIC)

This section describes the components and operation of the Meggitt Avionics Next Generation Integrated Cockpit (MAGIC).

Refer to **Section 7.8a, Meggitt Powerplant and Mechanical System Instrumentation,** for the components and operation of the powerplant and mechanical system instrumentation.

Refer to **Section 7.8b, Meggitt EFIS Display**, for the components and operation of the Electronic Attitude Director Indicator (EADI) and the Electronic Horizontal Situation Indicator (EHSI).