3.3 EMERGENCY PROCEDURES CHECK LIST

SPEEDS

V_{MCA} .... 67 KIAS
V_{MCG} .... 60 KIAS

ENGINE INOPERATIVE PROCEDURES

ENGINE SECURING PROCEDURES
(Feathering Procedures)

Power Levers .... IDLE
Propeller .... FEATHER
Condition Lever .... STOP
Boost Pumps (Inop Eng) .... OFF
Generator Switch .... OFF
Prop Sync .... OFF
Electrical Loads .... REDUCE
Crossfeed .... AS REQUIRED
Autofeather .... OFF

ENGINE FAILURE DURING TAKEOFF
(Prior to V_1, ABORT)

Power Levers .... IDLE
Brakes .... APPLY

If Insufficient Runway Remains for a Safe Stop:

Condition Levers .... STOP
Fuel Shutoff Switches .... OFF
Battery Master Switches .... OFF
Generators .... OFF

ENGINE FAILURE DURING TAKEOFF
(After V_1 Continue)

Airspeed .... V_2 UNTIL CLEAR OF OBS.
Directional Control .... MAINTAIN: 5° BANK TOWARD GOOD ENGINE
Power (Opr Eng) .... MAXIMUM
Gear .... RETRACT
Prop (Inop Eng) .... FEATHER
Trim .... AS REQUIRED
Climb .... STRAIGHT AHEAD TO SAFE ALT.
Inop Engine .... COMPLETE ENG. SECURE PROCEDURES

ENGINE FAILURE DURING FLIGHT

Airspeed .... ABOVE V_{MC}
Direction Control .... MAINTAIN
Inop Engine .... IDENTIFY & VERIFY
Air Start .... ATTEMPT

If Air Start is Unsuccessful:
Engine Securing Procedures .... COMPLETE

SINGLE ENGINE APPROACH & LANDING

Engine Securing Procedure .... COMPLETE
Hydraulic Pressure .... CHECKED
Landing Gear .... DOWN & LATCHED, GREEN LIGHT
Airspeed .... V_{REF} + 10
Wing Flaps .... FULL DOWN WHEN RUNWAY IS ASSURED

NOTE

It may not be possible to taxi on one engine

SINGLE ENGINE GO-AROUND

Power Levers .... MAXIMUM
Directional Control .... MAINTAIN: 5° BANK TOWARD GOOD ENGINE
Wing Flaps .... UP
Airspeed .... V_2 + 6kts
Landing Gear .... UP AFTER POSITIVE RATE OF CLIMB
Trim .... AS DESIRED

FUEL SYSTEM MALFUNCTIONS

SINGLE BOOST PUMP FAILURE

Select Remaining Pump .... SELECTED (affected engine)

DUAL BOOST PUMP FAILURE
(on one engine)

Descend below 10,000 ft MSL IF PRACTICABLE
Above 10,000 ft MSL .... CROSSFEED OPEN

7.7 PROPELLERS

The airplane is equipped with composite, five bladed, constant-speed, full-feathering, single-acting, governor-regulated propellers. Each propeller utilizes oil pressure which opposes the force of springs and counterweights to obtain correct pitch for engine load. Oil pressure from the propeller governor drives the blades toward low pitch (increased RPM) while the springs and counterweights drive blades toward high pitch (decrease RPM). The source of oil pressure for propeller operation is furnished by the engine oil system, boosted in pressure by the governor gear pump, and supplied to the propeller hub through the engine propshaft flange.

To feather the propeller blades, the propeller control levers on the control pedestal must be placed in the feather position. Unfeathering the propeller is accomplished by positioning the propeller control lever to the minimum or higher RPM position. The unfeathering system uses engine oil pressure to force the propeller out of feather and into the low pitch condition.

An auto feathering system provides for automatic feathering of a propeller in the event of loss of the engine power. The system is controlled by an arming switch with ARM, OFF and TEST positions. In the OFF position, the system is deactivated. In ARM, the propeller will automatically feather if engine torque drops below approximately 200 foot-pounds at power lever position of 90% N_g or greater. Auto feathering of one propeller disarms the system on the other propeller. L and R AUTO-FEATHER ARM annunciator lights will illuminate when the system is armed. TEST is a momentary position and provides for a check out of the system with power below 90%N_g. The system is primarily intended for use during takeoff, initial climb and landing.

Reversed propeller pitch is available for decreased landing ground roll stopping capability. To accomplish reverse pitch, the power levers are retarded beyond IDLE over the gate and into the BETA position. The R and L BETA annunciator lights will illuminate to advise the pilot that the propellers are capable of being reversed. Full reverse-pitch is accomplished by retarding the power levers to the MAX REVERSE position. Control of propeller speed is achieved through control of blade angle. An externally grooved feedback ring is provided with the propeller. Motion of the feedback ring is proportional to propeller blade angle, and is picked up by a carbon block running in the feedback ring. The relationship between the axial position of the feedback ring and the propeller blade angle is used to maintain control of blade angle from flight idle to full reverse.

PROPELLER DE-ICE SYSTEM

The propeller de-ice system consists of electrically heated boots on the propeller blades. Each boot has a heating element which receives its electrical power through a de-ice timer. The timer activates the heating elements in 90 second intervals. A complete cycle takes 3 minutes. A reading below the green arc (30 to 36 amps) on the propeller de-ice ammeter indicates that the blades of the propeller are not being de-iced uniformly.

7.37 ENGINE FIRE DETECTION AND EXTINGUISHER

Fire Detection Test Switches located on the overhead panel are used to check system indication operation. In the Test Fire position a resistance is connected in the circuit. This resistance simulates an engine fire, and energizes the visual and aural warnings. In the Test Short position a fault in the system is simulated and the Fault Light above the switch will illuminate.

FIRE WARNING LIGHTS

7.17 FUEL SYSTEM

The fuel system for the turbine powered DC-3TP has a total capacity of 1041 U.S. gallons for the standard aircraft. Fuel is carried in six tanks – a main tank in each nacelle, and four aux tanks mounted in both inboard wings. The right and left fuel systems are independent of each other and are connected only when the crossfeed system is activated or the wing interconnect is open. Fuel to the engines is supplied by the main tanks only.

Each main tank has two submerged boost pumps to supply fuel to the engine. One boost pump must be operating any time the engine is in operation so that fuel under pressure is being supplied to the engine-driven fuel pump. The engine-driven fuel pump supplies fuel to the engine nozzles.

Each main fuel tank has a fuel drain located under the nacelle, and each aux tank has a drain located under the inboard wings. On the fuel filter assemblies forward of each engine firewall, are main filter drains accessible at the bottom of each cowling.

Fuel flow is controlled by a separate fuel shutoff valve for each engine. These valves are controlled from the cockpit by two switches on the upper forward switch panel. The fuel shutoff switches function as firewall shutoffs and as OPEN-CLOSED valves for the fuel system.

Fuel can be transferred from either the FWD AUX or AFT AUX to the Main tank of the same side. With the fuel Transfer selector switch in AUTO, fuel will automatically be routed from the FWD AUX to the Main tank when the fuel quantity in the main tank decreases to ¾ full. Whenever the FWD AUX empties, its transfer pump will shut off and the AFT AUX transfer pump will now be energized when the main fuel decreases to ¾ full. This will continue until the FWD AUX is empty and its transfer pump shuts OFF. In the MAN position the pilot may select which AUX tank will transfer fuel to the mains by selecting position 1 for the FWD AUX and position 2 for the AFT AUX.

The fuel crossfeed is electrically operated by the crossfeed switch on the overhead switch panel in the cockpit. A green light will illuminate whenever the valve is in the open position. This switch should remain closed except during single engine operation when crossfeed to the operating engine is necessary, or anytime to balance main tank fuel.

The left hand and right hand AUX Tank Interconnect valves can be opened in the event of a transfer pump failure. This allows the operating transfer pump to draw fuel from the tank with the failed pump. Normal operation is with the valve closed.

The Wing Interconnect valve can be opened to connect the left hand and right hand AFT AUX tanks. This will allow pumps from the opposite side to draw fuel in the event that both pumps on one side fail. Normal operation is with the valve closed.

Fuel quantity can be monitored through six gauges, one for each tank, located on the upper forward switch panel in the cockpit. This system transmits to the gauges the amount of fuel in pounds remaining in the respective tanks. A low fuel light for each main tank, located on the annunciator panel will illuminate whenever the quantity goes below approximately 300 pounds.

The total fuel quantity on board in pounds, fuel flow per engine, fuel remaining on landing, range, efficiency and fuel required to destination are displayed on the analog fuel flow gauges, fuel page on the Garmin430/530/650/750, and/or other panel display.

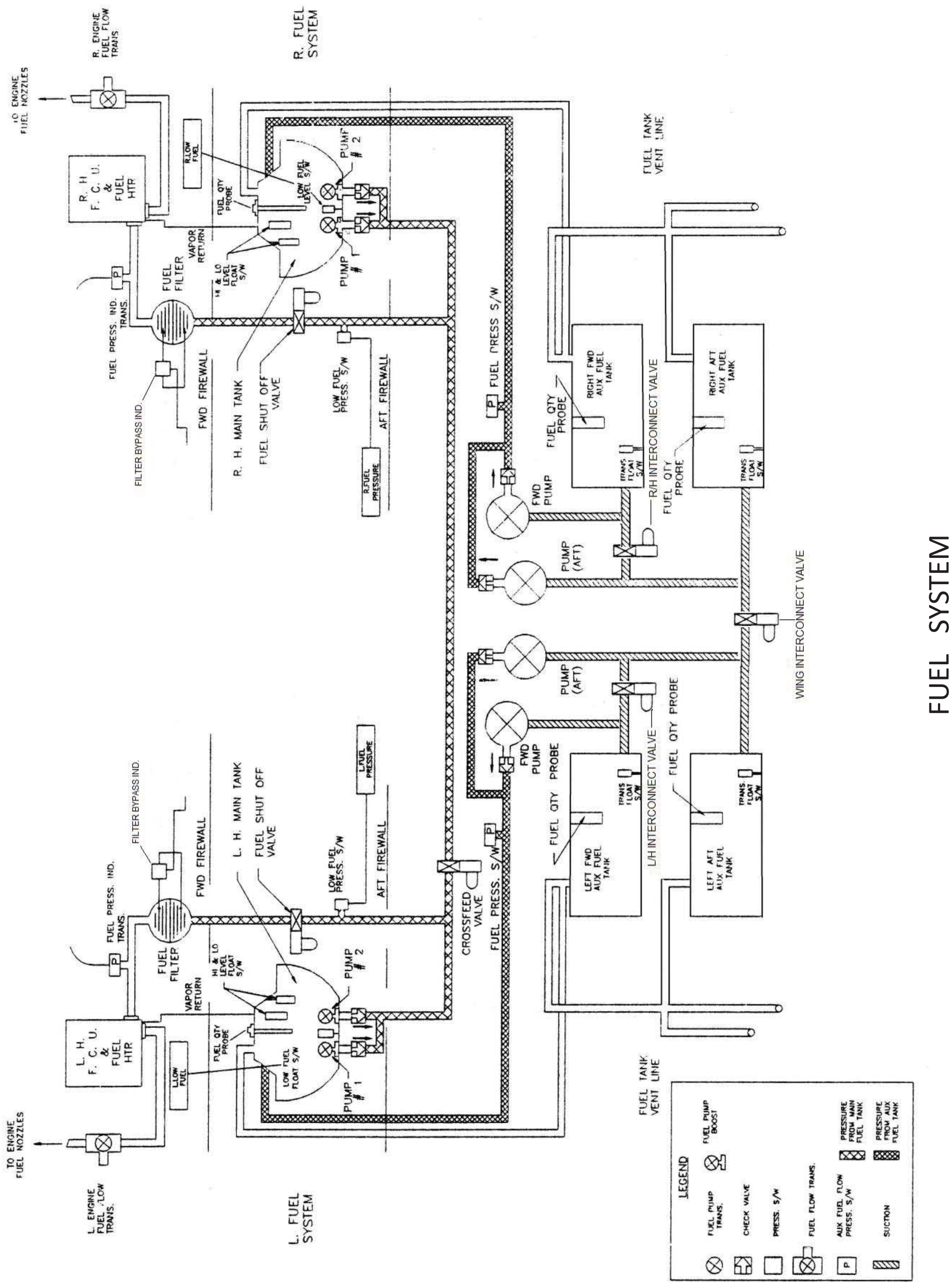
FUEL SYSTEM
R. FUEL SYSTEM
L. FUEL SYSTEM
TO ENGINE FUEL NOZZLES
R. ENGINE FUEL FLOW TRANS
L. ENGINE FUEL FLOW TRANS.
R. H. F. C. U. & FUEL HTR
L. H. F. C. U. & FUEL HTR
FUEL PRESS. IND. TRANS.
FUEL FILTER
FILTER BYPASS IND.
FWD FIREWALL
AFT FIREWALL
R. H. MAIN TANK
L. H. MAIN TANK
FUEL SHUT OFF VALVE
LOW FUEL PRESS. S/W
VAPOR RETURN
HI & LO LEVEL FLOAT S/W
FUEL QTY PROBE
LOW FUEL LEVEL S/W
PUMP # 1
PUMP # 2
FUEL PRESS. S/W
CROSSFEED VALVE
FWD PUMP
PUMP (AFT)
R/H INTERCONNECT VALVE
L/H INTERCONNECT VALVE
WING INTERCONNECT VALVE
RIGHT FWD AUX FUEL TANK
RIGHT AFT AUX FUEL TANK
LEFT FWD AUX FUEL TANK
LEFT AFT AUX FUEL TANK
TRANS FLOAT S/W
FUEL TANK VENT LINE
LEGEND
FUEL PUMP TRANS.
CHECK VALVE
PRESS. S/W
FUEL FLOW TRANS.
AUX FUEL FLOW PRESS. S/W
SUCTION
FUEL PUMP BOOST
PRESSURE FROM MAIN FUEL TANK
PRESSURE FROM AUX FUEL TANK

Figure 7-4

Two fuel pressure gauges, which indicate in pounds per square inch show the pressure at which fuel is being supplied to each engine fuel pump, are located on the forward instrument panel.

Most fuel stocked by suppliers does not contain anti-icing additive blended at the refinery. Therefore, the additive should be blended while refueling. If you are refueling with a fuel which has the additive blended at the refiner, disregard the steps for blending anti-icing additive. Anti-icing additive must be blended with the fuel to prevent filter icing and possible engine flameout.

WARNING

Fuel additive may be harmful if inhaled or swallowed. Use adequate ventilation. Avoid contact with skin and eyes. If sprayed into eyes, flush with large amounts of water and then contact a physician immediately.

CAUTION

Assure that additive is directed into the fuel stream and that additive flow is started after fuel flow starts and is stopped before fuel flow stops. Do not allow concentrated additive to contact interior of fuel tank or aircraft painted surface. Use not less than 20 fl. oz. of additive per 260 gallons of fuel or more than 20 fl. oz. per 104 gallons of fuel.

Attach “Hi-Flo Prist” Blender (Model PHF-204, manufactured by Houston Chemical Corp, Pittsburgh, PA.) to refuel nozzle, making sure blender discharges into fuel stream.