

FUEL QUANTITY INDICATING SYSTEMS - INSPECTION/CHECK**1. General**

- A. This section has the inspections and checks necessary to keep the fuel quantity indicating systems in a serviceable condition.

TASK 28-41-00-710**2. Fuel Reservoir Warning System Operational Check**

A. General

- (1) This task gives the procedures to do a check of the low fuel warning system for the reservoir. This check is done with the engines running.

B. Special Tools

- (1) None

C. Access

- (1) None

D. Do an Operational Check of the Fuel Reservoir Warning System (Non-Garmin equipped airplanes).

- (1) Start the engine. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.
 (2) Set both fuel selectors to OFF.
 (a) Make sure that the FUEL SELECT OFF (red) annunciator comes on and a fuel selector warning horn sounds.
NOTE: The horn can be shut off by pulling the START CONT circuit breaker.
 (3) Make sure that the RESERVOIR FUEL LOW (red) annunciator warning light comes on with approximately one-half or less fuel remaining in the reservoir tank.

NOTE: With the fuel reservoir full, there is sufficient fuel for approximately 3 minutes of maximum continuous power or approximately 9 minutes at idle power.

- (4) Set both fuel selectors to ON.

- (5) Shut down the engine. Refer to Pilot's Operating Handbook and Approved Flight Manual.

E. Do an Operational Check of the Fuel Reservoir Warning System (Garmin equipped airplanes).

- (1) Start the engine. Refer to Pilot's Operating Handbook and Approved Airplane Flight Manual.
 (2) Set both fuel selectors to OFF.
 (a) Make sure that the FUEL SELECT OFF (red) CAS message comes on and a fuel selector warning horn sounds.

NOTE: The horn can be shut off by pulling the START CONT circuit breaker.

- (3) Make sure that the RSVR FUEL LOW (red) CAS message comes on with approximately one-half or less fuel remaining in the reservoir tank.

NOTE: With the fuel reservoir full, there is sufficient fuel for approximately 3 minutes of maximum continuous power or approximately 9 minutes at idle power.

- (4) Set both fuel selectors to ON.

- (5) Shut down the engine. Refer to Pilot's Operating Handbook and Approved Flight Manual.

F. Restore Access

- (1) None

END OF TASK**TASK 28-41-00-720****3. Fuel Quantity and Low Fuel Warning Systems Functional Check**

A. General

- (1) This task gives the procedures to do a functional check of the fuel quantity and low fuel warning systems.

B. Special Tools

- (1) Ground Electrical Power Unit
 (2) Digital Ohm Meter

- (3) 1 watt, 230-Ohm resistor Dummy Load

C. Access

- (1) Remove access panels 511AB and 611AB from bottom of wings. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

D. Do a Functional Check of the Fuel Quantity and Low Fuel Warning Systems (Non-Garmin Equipped).

CAUTION: When you do the resistance tests of the fuel quantity wiring or the fuel probe transmitters, use a digital ohmmeter only. Some analog ohmmeters can introduce high current, which will make the fuel probe transmitters unserviceable.

NOTE: Always use a screwdriver with an insulated shank when calibrating the fuel system.

- (1) Make sure that the airplane is in a level condition. Refer to Chapter 8, Leveling - Maintenance Practices.
- (2) Make sure that the airplane is correctly grounded. Refer to Chapter 12, Fuel - Servicing.
- (3) Connect external electrical power to the airplane.
- (4) Disengage the AUX FUEL PUMP circuit breaker.
- (5) Set the external power switch to BUS.
- (6) Set the battery switch to ON.
- (7) De-fuel the airplane. Refer to Chapter 12, Fuel - Servicing.
 - (a) Make sure that the amber LEFT FUEL LOW and RIGHT FUEL LOW annunciator panel lights come on when approximately 25 +/-5 gallons (170 +/- 33.5 lbs.) of fuel remains in the related main fuel tank.
- (8) When all fuel is drained (except unusable) from the wing tanks, position both fuel selector valves to OFF.
- (9) Fully drain the reservoir tank until it is empty.
- (10) Make sure that each fuel quantity gage needle is fully in the empty red zone.
 - (a) If necessary, carefully adjust the null trimpot on each fuel quantity gage so that the needle is fully in the empty red zone.
- (11) Set the external power switch to OFF.
- (12) Set the battery switch to OFF.
- (13) Find and disconnect the electrical wire from the center post of the inboard fuel transmitter on one wing.
- (14) Install a 1 watt, 230-ohm resistor, dummy load between this wire and airplane ground.
- (15) Set the external power switch to BUS.
- (16) Set the battery switch to ON.
- (17) Carefully adjust the gain trimpot on the fuel gage to put the needle to the center of the 1100 pound mark for the wing being checked.
- (18) Set the external power switch to OFF.
- (19) Set the battery switch to OFF.
- (20) Remove dummy load and connect electrical wire to center post of inboard fuel level transmitter.
- (21) Do the steps again for the opposite wing.
 - (a) If necessary, adjust the null and the gain trimpots again until the left and the right fuel gage low end setting reads zero and the high end setting reads 1100 pounds.
- (22) Set the external power switch to BUS.
- (23) Set the battery switch to ON.
- (24) Make sure that the LEFT FUEL LOW, RIGHT FUEL LOW, and RESERVOIR LOW annunciator panel lights are on.
 - (a) If any of the lights are not on, do a continuity check of the circuit and replace the bulbs if necessary.
- (25) Fill each wing fuel bay with 20 gallons of measured fuel, then continue to add fuel, if necessary until each bay contains 30 gallons of fuel.
 - (a) Make sure that the LEFT and the RIGHT annunciator lights go off between the 20 and 30 gallon levels.
 - 1 If one or both lights do not go off, replace the applicable low fuel level switches. Refer to Fuel Quantity Indicating Systems - Maintenance Practices.

- (26) Set both fuel selector valves ON until the RESERVOIR LOW light turns off, then position both fuel selector valves OFF.
 - (27) Slowly drain the fuel from the reservoir until the Reservoir Low light turns ON.
 - (28) Drain the remaining fuel from the reservoir and measure the quantity.
 - (a) Make sure that the measurement is from 1.95 to 2.15 gallons.
 - (b) If quantity of measured fuel is more than 2.25 gallons, or is less than 1.75 gallons, remove and replace the reservoir fuel low level switch. Refer to Fuel Quantity Indicating Systems - Maintenance Practices.
 - (29) Fill both tanks to the full capacity. Refer to Chapter 12, Fuel - Servicing.
 - (30) Make sure that the indication on both fuel gages is FULL.
 - (31) Set the external power switch to OFF.
 - (32) Set the battery switch to OFF.
 - (33) Engage the AUX FUEL PUMP circuit breaker.
 - (34) Remove the external electrical power unit from the airplane.
 - (35) Remove the grounding wire from the airplane.
- E. Do a Functional Check of the Fuel Quantity and Low Fuel Warning Systems (Garmin equipped airplanes with CAN bus type fuel level sensors).

NOTE: All G1000 aircraft must have software version 0767.00 or later. The software version is shown on the upper right corner of the MFD on the first page shown after the MFD is powered on in normal operation.

NOTE: If the fuel quantity indicator on the Garmin G1000 system has a red X on it during normal operation, examine the fuel quantity sensors and wiring and refer to the Garmin G1000 Line Maintenance Manual for more Garmin system troubleshooting. If the values given on the PFD are not the same as the values given in the calibration procedure, refer to the Garmin G1000 Line Maintenance Manual for troubleshooting.

- (1) Make sure that the airplane is in a level condition. Refer to Chapter 8, Leveling - Maintenance Practices.
- (2) Make sure that the airplane is correctly grounded. Refer to Chapter 12, Fuel - Servicing.
- (3) Connect external electrical power to the airplane.
- (4) Disengage the AUX FUEL PUMP circuit breaker.
- (5) Set the external power switch to BUS.
- (6) Set the battery switch to ON.
- (7) Set the AVIONICS 1 and AVIONICS 2 switches to ON.
- (8) Defuel the airplane. Refer to Chapter 12, Fuel - Servicing.
 - (a) Make sure that the amber L-R FUEL LEVEL LOW CAS message comes on when approximately 25 +/-5 gallons (170 +/- 33.5 lbs.) of fuel remains in the related main fuel tank.
- (9) When the fuel is fully drained from the wing tanks (except unusable), set both fuel selector valves to OFF.
- (10) Fully drain the reservoir tank.
- (11) Make sure that the Fuel Quantity Indications (MFD - Engine and System displays) are zero (analog pointers and digital indications).
 - (a) If there is not a zero indication, do a Fuel Quantity System Calibration (Airplanes with CAN bus type fuel level sensors). Refer to Fuel Quantity (CAN BUS)- Adjustment/Test.
- (12) Add or remove the fuel quantities shown in the "Fuel Qty" column of Table 601, for both the left (L) and the right (R) wing fuel tanks and make sure that you have the correct values.

NOTE: The value listed in the "fuel qty" column is the amount of fuel to add (positive values) or remove (negative values), such that it increases or decreases the existing fuel level in the tank by that amount; each row must be completed and verified separately before you go to the next row.

Table 601. Fuel Data Verification

Tank (L/R)	Fuel Qty (gal)	EIS Parameter	CAS Annunciation (color)	Display Value
L	+20	L Fuel Qty Scale/Pointer (Analog) (Amber/Amber Background)	L-R FUEL LOW - Amber	< 200 lbs
		QTY L LBS (Digital) (Amber Background)		134* (Theoretical)
L	+8#	L Fuel Qty Scale/Pointer (Analog)	R FUEL LOW - Amber	< 200 lbs
		QTY L LBS (Digital)		175*
R	+20	R Fuel Qty Scale/Pointer (Analog) (Amber/Amber Background)	R FUEL LOW - Amber	< 200 lbs
		QTY R LBS (Digital) (Amber Background)		134* (Theoretical)
R	+10	R Fuel Qty Scale/Pointer (Analog)	None	Approx. 200 lbs
		QTY R LBS (Digital)		200*
L	-4**	L Fuel Qty Scale/Pointer (Analog) (Amber/Amber Background)	L FUEL LOW - Amber	< 200 lbs
		QTY L LBS (Digital) (Amber Background)		150*
L	##	L-R Fuel Qty Scale/Pointer (Analog)	None	Approx. 200 lbs
		QTY L LBS (Digital) QTY R LBS (Digital)		200*
L/R	+50	L-R Fuel Qty Scale/Pointer (Analog)	None	400-600 lbs
		QTY L LBS (Digital) QTY R LBS (Digital)		536* (Theoretical)
L/R	+50	L-R Fuel Qty Scale/Pointer (Analog)	None	800-1000 lbs
		QTY L LBS (Digital) QTY R LBS (Digital)		871* (Theoretical)
L	F	L Fuel Qty Scale/Pointer (Analog)	None	Full
		QTY L LBS (Digital)		1100
R	F	R Fuel Qty Scale/Pointer (Analog)	None	Full
		QTY R LBS (Digital)		1100

- * Tolerance +/- 75 lbs.
- ** Remove fuel by draining into reservoir tank (approx. 4 gallons) as follows: Set the Left Fuel Selector to ON; Make sure that the "RSVR FUEL LOW" red CAS annunciation goes off; set the Left Fuel Selector to OFF.
- # You can add 2 more gallons (10 gal total) if the "R FUEL LOW" amber CAS annunciation does not show. Digital display value must show 200*, if 10 gallons is added.
- ## Add (14 - X) gallons, where X is the number of gallons added in the second step (row 2 of table).

- (13) Set the AVIONICS 1 and AVIONICS 2 switches to OFF.
- (14) Set the external power switch to OFF.
- (15) Set the battery switch to OFF.
- (16) Engage the AUX FUEL PUMP circuit breaker.
- (17) Remove the external electrical power from the airplane.
- (18) Remove the grounding wire from the airplane.

F. Restore Access

- (1) Install lower wing access panels 511AB and 611AB. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

END OF TASK