DC400/A Adapter Module

USER INSTRUCTION SUPPLEMENT
M/N DC400/A, P/N 101-00802

Doc. P/N: 61-101-00802.EF1
Revision I
January 7, 2015

MOD C, used with
DC400 OR DC400A
P/N's 101-00800 or 101-00850
Digital DC Fuel Quantity Test Sets
For
KING AIR MODELS
100, A100, B100, 200, B200 / GT / GTi, 300,
350/350i, C90, C90A / B / GT / GTi, E90, F90
and
BEECHCRAFT C99

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APPLICABILITY

This manual is one of a family of manuals, each developed to address an individual Adapter Module especially designed for the DC-400 / DC-400A Digital Fuel Quantity Test Sets. It contains complete instructions for the maintenance, inspection, testing, troubleshooting, and calibration of the Gull Airborne and Ragen Data Fuel Quantity Systems.

These aircraft include (at the time of this writing):

C90	S/N LJ-575, LJ-586 thru LJ-1062
C90A/B/GT/GTi	S/N LJ-1063 and after
C99	S/N U-50, U-165 and after
E90	S/N LW-17, LW-69 and after
F90	S/N LA-1 thru LA-225
F90-1	S/N LA-226 and after
A100/B100	S/N B-152, B-156 and after, BE-2 and after
200	All 200, 200C, 200CT and 200T
B200/GT/GTi	All
300	All 300 and 300C
350/350i	All

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REVISION RECORD

REV.	ECO #	REV. DATE	DESCRIPTION OF CHANGE
A	N/A	Mar/11/03	Initial release. This supplement replaces 56-101-00802 manual and covers MOD B (or earlier) releases of 101-00802.
B	260-00617	May/19/03	For Mod C or later releases of adapter module.
C	260-00677	Sep/15/06	Changes are reflected in the company logo, company contact information, unit figures and listed part 101-00814 to 101-00829. Previous instruction supplements did not show or mention the modified version to the original 101-00814 adapter cable.
D	260-00729	Jan/22/09	Updated Company Logo
E	260-00779	Apr/29/10	List of Approved Repair Facilities and Recertification Information were added (page *vii*)
F	260-00788	Sep/15/10	Updated aircraft models, table data and test set connector options. Added notes for accuracy of procedures.
G	260-00812	Apr/16/12	Revised 101-00831 references. Added section 5 System Wiring Integrity Test. Moved Probes Bench Test to Chapter 3.
H	260-00973	Jun /04/13	Corrected Step #s, Table and Figure references In Section 5.
I	260-01076	Jan/07/15	Updated Barfield logos.

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LIST OF APPROVED REPAIR FACILITIES

The manufacturer of this equipment does not recommend the user to attempt any maintenance or repair. In case of malfunction, contact the manufacturer, to obtain the list of approved repair facilities worldwide, ensuring that this equipment will be serviced using proper procedures and certified instruments. A Return Maintenance Authorization (RMA) number will be assigned during this call, to keep track of the shipment and the service.

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RECERTIFICATION

Barfield Adapter Module, P/N 101-00802, has a one-year recertification requirement. Qualified technicians in a shop equipped with the necessary tooling, facilities, and Barfield-approved procedures must perform the maintenance required by this unit.

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CONTACT INFORMATION

USERS ARE REQUESTED TO NOTIFY THE MANUFACTURER OF ANY DISCREPANCY, OMISSION OR ERROR FOUND IN THIS SUPPLEMENT.

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CHAPTER 1 DESCRIPTION

A. Capabilities

(1) Complete testing of fuel quantity system.
(2) Testing of individual fuel tanks.
(3) Testing of indicators.
(4) Dry and wet tank calibration.

B. Panel Controls

(1) See Instruction Manual 56-101-00850 for information on the DC400A Fuel Quantity Test Set. See Technical Manual 57-101-00800 for information on the DC400 Digital Fuel Quantity Test Set.
(2) Refer to Aircraft Maintenance Manual for description of the aircraft fuel quantity system.

C. Aircraft System Description

Refer to the Aircraft Maintenance Manual for specific procedures and maintenance practices.

D. Equipment Required (or equivalent)

(1) DC400A Digital Fuel Quantity Test Set, P/N 101-00850 or the DC400 Digital Fuel Quantity Test Set, P/N 101-00800.
(2) Barfield Instruction Manual 56-101-00850 (DC400A) or Barfield Technical Manual 57-101-00800 (DC400).
(3) Fuel Quantity Adapter Module, P/N 101-00802.
(4) Probe Adapter Cable, Barfield P/N 101-00814 (original adapter with rectangular connector) or P/N 101-00829 (latest adapter with circular connector).
(5) Discrete Level Interface (test leads, banana plug to alligator clip), Barfield P/N 101-01012.
(6) 15-pin adapter cable, Barfield P/N 101-00817 (original adapter for converting from circular to 15 pin D connectors) or P/N 101-00831 (latest adapter for converting from 15 pin D connectors to circular).

NOTE: The 101-00831 adapter is not included with the Test Set and is available as a separate purchase.

(7) A 28 VDC Power Supply (not included) for bench testing.
(8) Banana to Banana leads P/N 101-01010 (not included).

E. Precautions

(1) Refer to Aircraft Maintenance manual for proper fueling and defueling procedures. Observe all safety precautions.
(2) Refer to the Aircraft Maintenance manual for location of the system components and instructions for removal and replacement.
(3) Ensure fuel quantity circuit breakers are open and they remain open while aircraft and test set connections are broken or made.
(4) Ensure power remains OFF unless otherwise specified.

F. Preliminary

(1) To ensure the integrity of all system components, perform the Insulation, Capacitance tests first. Then, perform one of the Indicator tests (System or Bench) and, if necessary, the Probe Bench test. These tests will provide an effective means for troubleshooting the system.
(2) After performing an indicator test and before returning the aircraft to service, calibrate the aircraft fuel quantity system using the Preferred (or Alternate) Calibration Test.
(3) Failure to calibrate the system could result in an inaccurate fuel quantity indication.

G. Disclaimer

BARFIELD, INC., neither a vendor nor supplier of fuel quantity systems or an airframe manufacturer, has no control over calibration figures or procedures. A variant between actual values and those recommended may exist. However, the information presented is correct to the best of our knowledge at time of publication and is presented for reference only.

CHAPTER 2 OPERATION

1. INSULATION TEST

Note: Refer to PRECAUTIONS and PRELIMINARY sections (Chapter 1).

Note: This test may be performed with either wet or dry tanks.

A. Aircraft Preparation

(1) Disconnect the aircraft battery.

Caution: When lowering or raising pilot fuel panel, ensure aircraft battery is disconnected.

(2) Access the indicator.
(3) Open the circuit breakers.

Caution: When breaking or making indicator connections, ensure that the applicable circuit breaker(s) are open.

(4) Disconnect aircraft wiring plug at the indicator.

B. Test Set Preparation

(1) Set the ON/OFF switch to OFF.
(2) Rotate the TEST FUNCTION switch to IND AMP.
(3) Set the INSULATION/SYSTEM switch to INSULATION.
(4) Rotate the INS TEST POINTS switch to LO-Z/GND.

C. Connecting Test Set

(1) Connect the test set as shown in either Figure 1 or Figure 2. Figure 1 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.

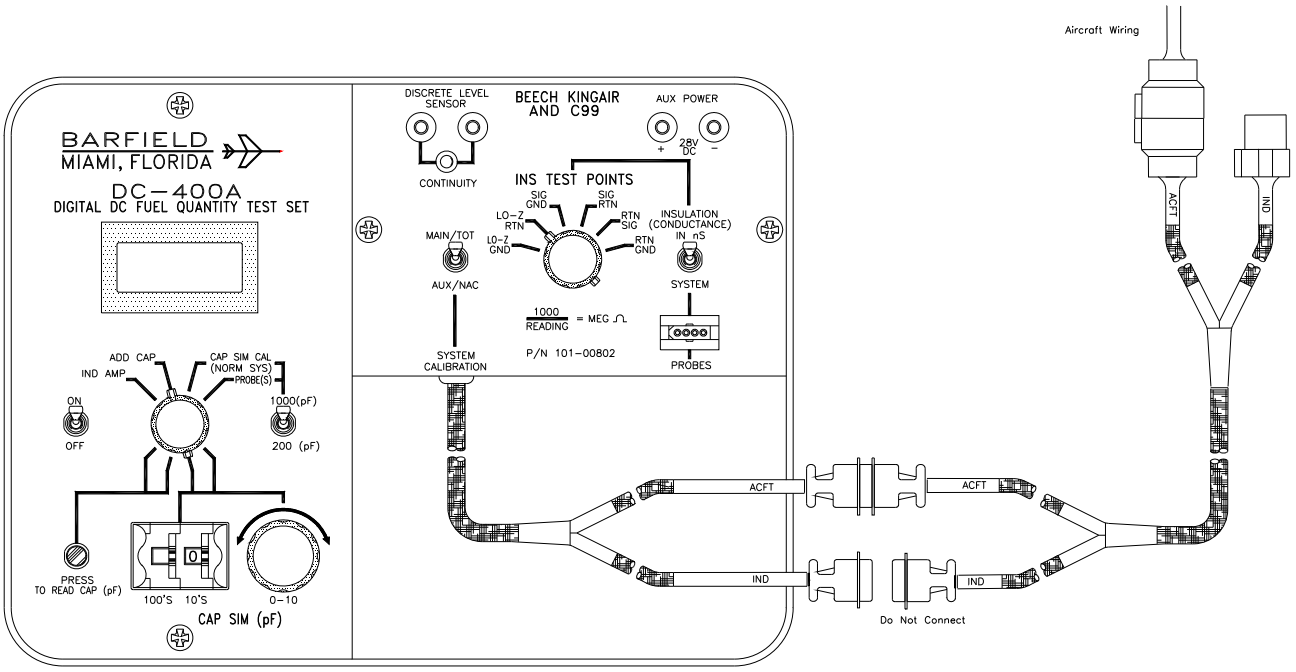

Figure 1 Insulation Test Connector Setup (With 101-00831 Adapter)

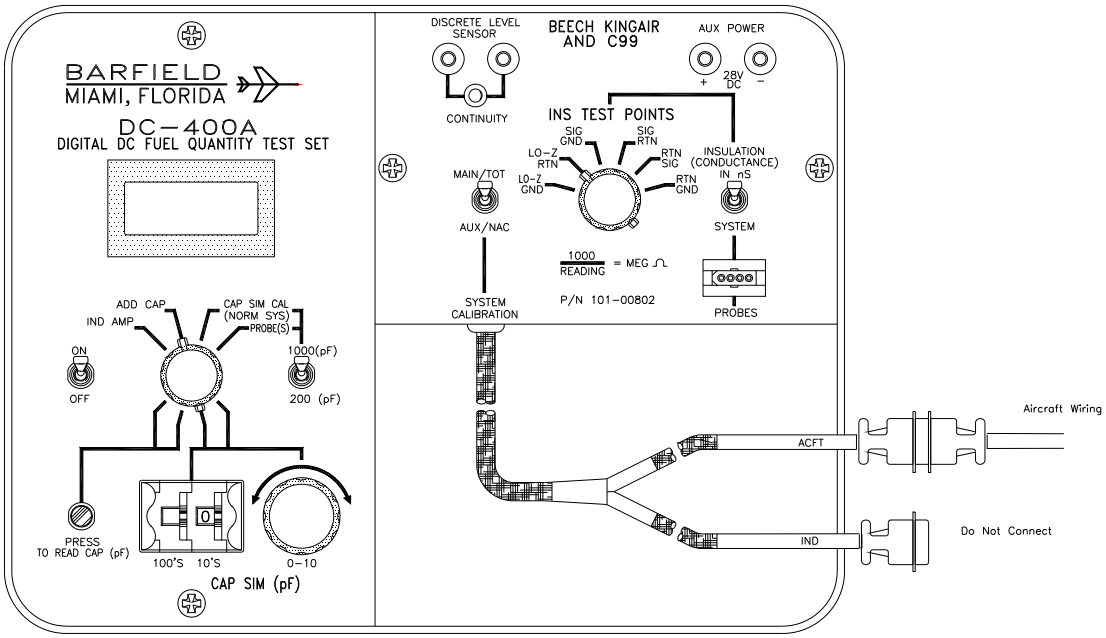

Figure 2 Insulation Test Connector Setup

(2) Connect test set ACFT connector to the aircraft wiring plug removed from the indicator.

(3) Do not connect the test set IND connector.

D. Test

(1) Set the test set ON/OFF switch to ON.

(2) Allow time for the test set display to stabilize.

Note: On those occasions when display stabilization cannot be achieved, take the reading after being performing this Test for 30 seconds. If this value is in the acceptable range, then consider that the Aircraft system has passed this test.

(3) Verify that the test set reading is less than 50 nS.

Note: The display reading is in nS (nano Siemens). To get an equivalent MΩ (megaohms) measurement, divide 1000 by the test set display reading.

Table 1 Conductance to Megaohm Conversion

Test Set Display Reading	Equivalent MΩ
1.	Less than 1
1000	1.
500	2.
200	5.
100	10.
050	20.
020	50.
010	100.
005	200.
002	500.
001	1,000.
000	Greater than 1,000

Example: 1000/50 = 20 MΩ

(4) Rotate the INS TEST POINTS switch through each remaining position.

(5) Allow test set to stabilize.

(6) Verify test set reading is less than 50 nS at every position except SIG/RTN.

(7) With switch rotated to SIG/RTN, verify a test set reading of “1”.

(8) Connect the aircraft battery.

(9) Close circuit breakers.

(10) Set the aircraft fuel panel select switch to AUX/NAC and hold it, if applicable.

Note: The battery switch must be in the ON position for all airplanes except the model C90/C90A/B/GT/GTi. The fuel quantity select relay or switch shorts the signal lead to return lead of "MAIN/TOTAL" or "AUX/NAC" that is not selected. Also, due to continuity through diodes inside the probe, a short on "RTN/GND" shows as a short on "SIG/GND".

(11) Rotate INS TEST POINTS switch through remaining positions.

(12) Allow the test set to stabilize.

(13) Verify the test set reading is less than 50 nS at each position except SIG/RTN.

(14) With switch rotated to SIG/RTN, verify a test set reading of "1".

(15) Return fuel panel select switch to MAIN/TOT.

Note: If a test does not comply with specification, repeat test to verify readings. If wrong reading remains, isolate fault by referring to aircraft wiring drawings and disconnecting probes and/or the aircraft wiring at connecting junctions.

(16) Set test set ON/OFF switch to OFF.

Note: If testing the opposite side, repeat procedure.

E. Disconnecting/Reconfiguring

(1) If the battery switch was turned on in step 10, it needs to be turned off here. Disconnect the aircraft battery.

(2) Open the circuit breakers.

(3) Disconnect the test set ACFT connector from the aircraft wiring plug.

(4) Reconnect the aircraft wiring plug to the indicator.

(5) Return the aircraft to its original configuration.

2. CAPACITANCE TEST

Note: Refer to PRECAUTIONS and PRELIMINARY sections (Chapter 1).

A. Aircraft Preparation

(1) Disconnect aircraft battery.

Caution: When lowering or raising pilot fuel panel, ensure aircraft battery is disconnected.

(2) Access the indicator.
(3) Open the circuit breakers.
(4) Disconnect the aircraft wiring plug located at the indicator.

B. Test Set Preparation

(1) Set the test set ON/OFF switch to OFF.
(2) Rotate the TEST FUNCTION switch to PROBE(S).
(3) Set the INSULATION/SYSTEM switch to SYSTEM.
(4) Set the MAIN/TOT-AUX/NAC switch to MAIN/TOT.
(5) Set the 200 (pF) / 1000 (pF) switch to 200 (pF) for empty capacitance and 1000 (pF) for full capacitance.

C. Connecting Test Set

(1) Connect the test set as shown in either Figure 3 or Figure 4. Figure 3 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.

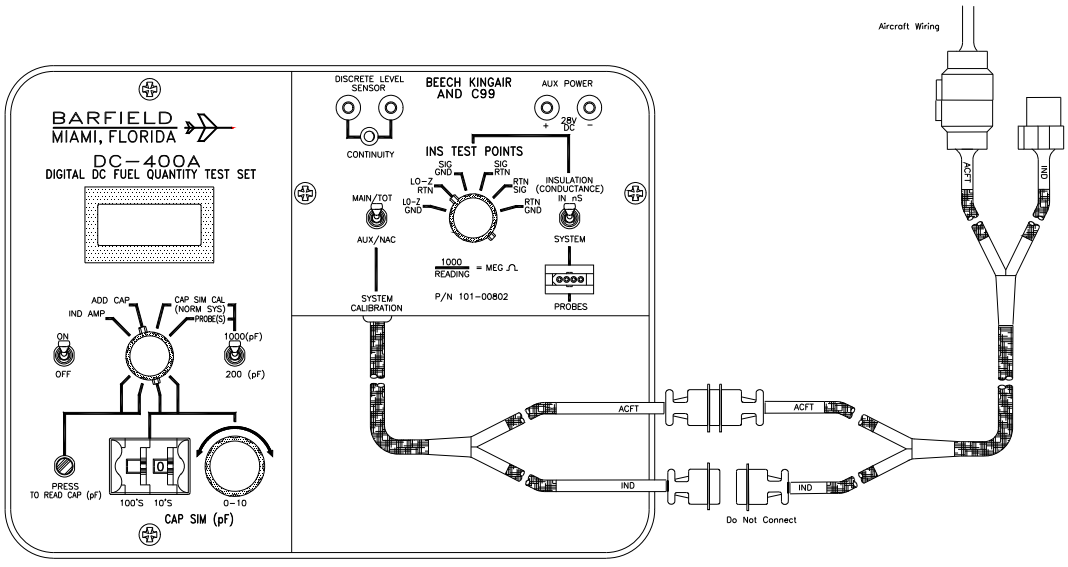

Figure 3 Capacitance Test Connector Setup (With 101-00831 Adapter)

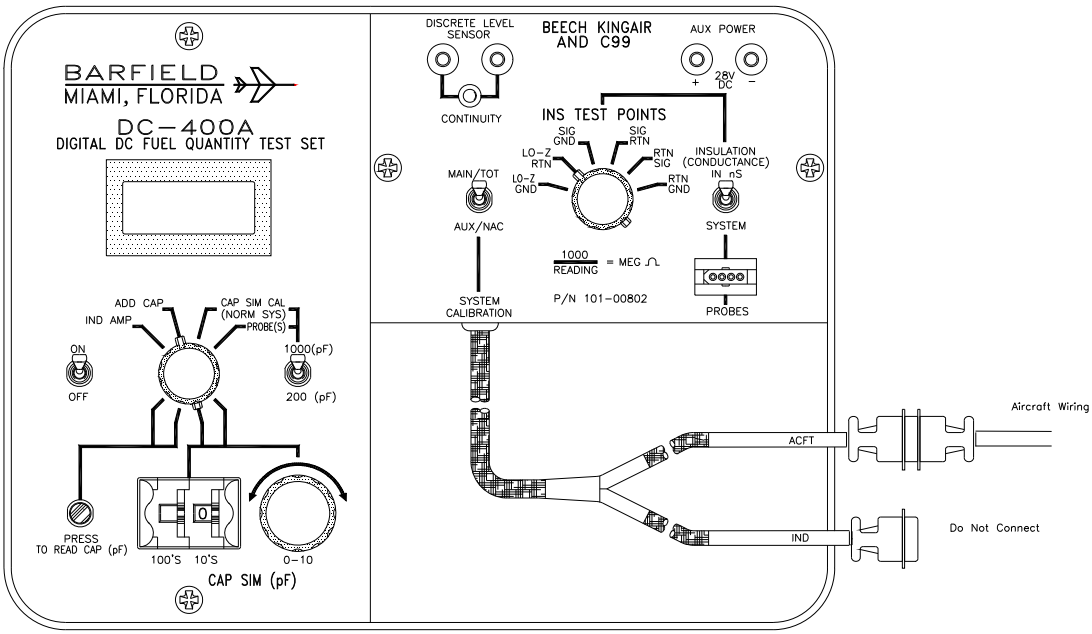

Figure 4 Capacitance Test Connector Setup

(2) Connect the test set ACFT connector to the aircraft wiring plug removed from indicator.

(3) Do not connect the test set IND connector.

Note: The battery must be connected and the battery switch must be in the ON position for this test in all airplanes except the model C90, C90A/B/GT/GTi.

D. Test

Note: If the CONTINUITY light is illuminated it means that the DC400 Oscillator Circuit is overloaded. The most probably cause is a short circuit on the LO-Z wire.

(1) Set the test set ON/OFF switch to ON.

(2) Set the aircraft fuel panel select switch to MAIN or TOTAL.

(3) Push and hold the test set PRESS TO READ CAP (pF) pushbutton.

(4) Verify that the tanks' value is within tolerances as specified in Table 2 (Tank Capacitance Empty) or Table 3 (Tank Capacitance Full).

Note: The following values are valid as of this publication's release date and provided as reference. Refer to the Aircraft Maintenance manual for actual test values.

Table 2 Tank Capacitance Empty

C90, C90A/B/GT/GTi, and C99						
Aircraft Type	**Total**			**Nacelle Only**		
	Min.	**Nom.**	**Max.**	**Min.**	**Nom.**	**Max.**
C90, C90A/B/GT/GTi	151.5	164.8	177.0	57.3	63.3	69.3
C99	147.5	160.4	173.0	53.3	58.7	64.0

E90, A100, B100 Aircraft with 100-380006-15 and -17 Integral Tank Units						
Aircraft Type	**Main**			**Aux. Only**		
	Min.	**Nom.**	**Max.**	**Min.**	**Nom.**	**Max.**
E90	166.2	184.1	201.9	29.1	32.0	35.2
A100/B100	162.2	179.7	197.1	29.1	32.0	35.2
200	161.0	182.7	204.04	53.5	59.4	65.3

Aircraft with 100-380006-93, -121, -179 and -95, -123, -181 Tank Units						
Aircraft Type	**Main**			**Aux. Only**		
	Min.	**Nom.**	**Max.**	**Min.**	**Nom.**	**Max.**
E90	159.1	175.8	192.5	29.1	32.2	35.2
F90, A100/B100	155.1	171.4	187.7	29.1	32.2	35.2
200, 300, 350/350i	154.0	170.2	186.3	53.5	59.4	65.3

Table 3 Tank Capacitance Full

C90, C90A/B/GT/GTi and C90						
Aircraft Type	Total			Nacelle Only		
	Min.	Nom.	Max.	Min.	Nom.	Max.
C90, C90A/B/GT/GTi	224.6	249.5	274.5	79.3	88.1	96.9
C99	219.4	243.7	268.0	74.1	82.3	90.5

E90, A100, B100 Aircraft with 100-380006-15 and -17 Integral Tank Units						
Aircraft Type	Main			Aux. Only		
	Min.	Nom.	Max.	Min.	Nom.	Max.
E90	241.4	268.2	295.0	46.2	51.3	56.4
A100, B100	236.2	262.4	288.6	46.2	51.3	56.4
200	233.9	259.9	285.9	87.5	97.2	106.9

Aircraft with 100-380006-93, -121, -179 and -95, -123, -181 Tank Units						
Aircraft Type	Main			Aux. Only		
	Min.	Nom.	Max.	Min.	Nom.	Max.
E90	236.0	262.2	288.4	46.2	51.3	56.4
F90, A100, B100	230.7	256.4	282.0	46.2	51.3	56.4
200, 300, 350/350i	228.5	253.9	279.2	87.5	97.2	106.9

(5) Release pushbutton.

(6) Set the aircraft fuel panel select switch to AUX / NAC and hold if applicable.

(7) Push and hold the PRESS TO READ CAP (pF) pushbutton.

(8) Verify the tanks' value is within tolerances as specified in Table 2 (Empty) and Table 3 (Full).

Note: Verify that capacitance is within specifications. If a test in not within specification, isolate the fault by referencing the aircraft wiring schematics and disconnecting the probes and/or the aircraft wiring at connecting junctions.

(9) Set the test set ON/OFF switch to OFF.

Note: If testing the opposite side, repeat procedure.

E. Disconnecting/Reconfiguring

(1) If the battery switch was turned on in the previous section it can now be turned OFF. Be sure to disconnect the battery before closing the fuel panel.

(2) Disconnect the test set ACFT connector from the aircraft wiring plug.

(3) Reconnect the aircraft wiring plug to the indicator.

(4) Reconnect the aircraft battery.

(5) Close the circuit breakers.

(6) Return the aircraft to its original configuration.

3. INDICATOR TEST

Note: Refer to PRECAUTIONS and PRELIMINARY sections (Chapter 1).

Note: The Indicator Bench Test (Chapter 3, Section 1) may be performed in place of the Indicator Test.

Note: Failure to calibrate the system after performing the indicator test will result in an inaccurate fuel quantity reading.

A. Aircraft Preparation

(1) Disconnect the aircraft battery.

Caution: When lowering or raising the pilot fuel panel, ensure aircraft battery is disconnected.

(2) Access the indicator.

(3) Open the appropriate circuit breakers.

(4) Disconnect the aircraft wiring plug located at the indicator.

B. Test Set Preparation

(1) Set the ON/OFF switch to OFF.

(2) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

(3) Set the INSULATION/SYSTEM switch to SYSTEM.

(4) Set the MAIN/TOT-AUX/NAC switch to MAIN/TOT.

(5) Set the 200 (pF)/1000 (pF) switch to 200 (pF).

C. Connecting Test Set

(1) Connect the test set as shown in either Figure 5 or Figure 6. Figure 5 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.

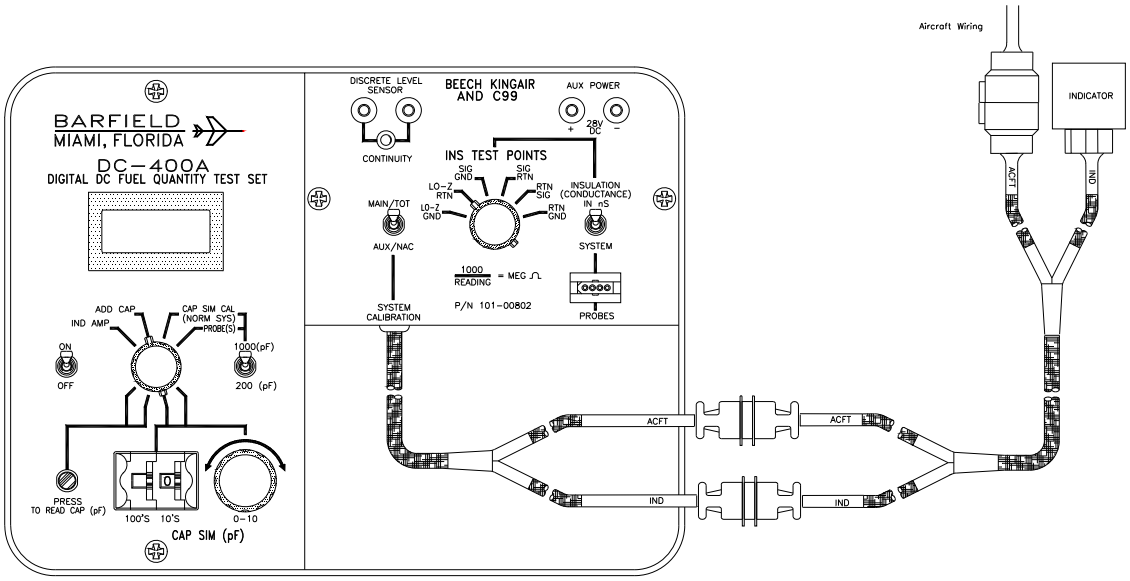

Figure 5 Indicator Test Set Connection (With 101-00831 Adapter)

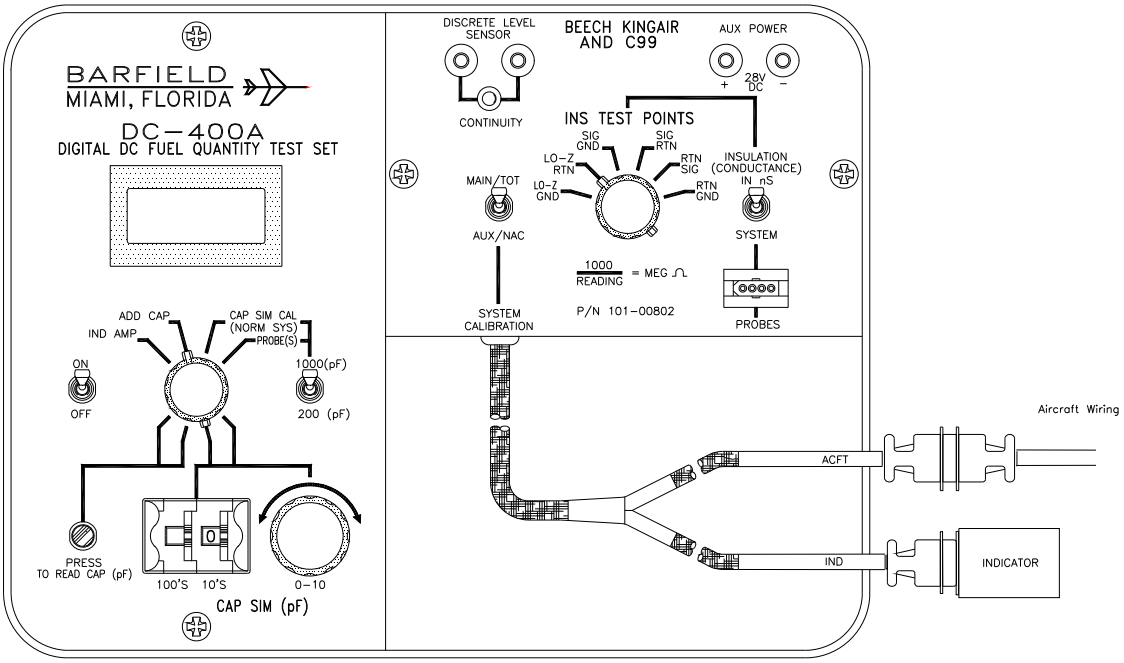

Figure 6 Indicator Test Set Connection

D. Test

(1) Set the test set ON/OFF switch to ON.
(2) Set the CAP SIM (pF) 100's to 1. Set 10's thumbwheels to 8.
(3) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain a test set reading of 189.0 pF.
(4) Rotate the TEST FUNCTION switch to IND AMP.
(5) Connect the aircraft battery.
(6) Close the circuit breakers.
(7) Turn the aircraft battery ON/OFF switch ON.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(8) Verify that the indicator reads zero lbs.
(9) If reading is not zero, adjust EMP 1/E 1.
(10) If the indicator will not give a zero reading, replace the indicator.
(11) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(12) Set the 200 (pF)/1000 (pF) switch to 1000 (pF).
(13) Set CAP SIM (pF) 100's thumbwheel to 2. Set the 10's thumbwheel to 7.
(14) Push and hold the PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain a test set reading of 273 pF.
(15) Release the pushbutton.
(16) Rotate the TEST FUNCTION switch to IND AMP.
(17) Verify the indicator reads 1200 lbs.
(18) If the indicator does not show 1200 lbs, adjust FULL.
(19) If the indicator still does not read 1200 lb, replace indicator.
(20) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(21) Set the 200 (pF)/1000 (pF) switch to 200 (pF).
(22) Set the CAP SIM (pF) 100's thumbwheel to "-". Set the 10's thumbwheel as follows:

If testing E90, F90, A100 or B100 series aircraft, set 10's to "3".

If testing C90, C90A / B / GT / GTi, C99, 200, 300 or 350/350i series, set 10's to "6".

(23) Push and hold the PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knobs and verify as follows:

If testing E90, F90, A100 or B100 aircrafts, test set display shows 31.0 pF.

If testing C90, C90A/B/GT/GTi, C99, 200, 300 or 350/350i series, test set display shows 60.0 pF.

(24) Release pushbutton.

(25) Set the MAIN/TOT-AUX/NAC switch to AUX/NAC.

(26) Rotate TEST FUNCTION switch to IND AMP.

(27) Verify the indicator reads 0 lbs.

(28) If reading is not 0 lbs., adjust the indicator using the EMP 2 / E 2.

(29) If the indicator still does not read 0, replace the indicator.

(30) Repeat steps (2) thru (29) until an accurate gage adjustment is obtained.

(31) Set the MAIN/TOT – AUX/NAC switch to MAIN/TOT.

(32) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

(33) Set the 200 (pF)/1000 (pF) switch to 1000 (pF).

(34) Set the CAP SIM (pF) 100's thumbwheel to 2. Set the 10's thumbwheel to 1.

(35) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain a test set reading of 210 pF.

(36) Rotate the TEST FUNCTION switch to IND AMP.

(37) Verify the indicator reads 300 ± 35 lbs.

(38) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

(39) Set the CAP SIM (pF) 100's thumbwheel to "2". Set the 10's thumbwheel to "3."

(40) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain a test display of 231 pF.

(41) Rotate the TEST FUNCTION switch to IND AMP.

(42) Verify the indicator reads 600 ± 35 lbs.

(43) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

(44) Set the CAP SIM (pF) 100's thumbwheels to "2". Set the 10's thumbwheel to "5".

(45) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain a test set display of 252 pF.

(46) Rotate the TEST FUNCTION switch to IND AMP.
(47) Verify the indicator reads 900 ± 35 lbs.
(48) Set the test set ON/OFF to OFF.

Note: Failure to calibrate the system after performing the indicator test will result in an inaccurate fuel quantity reading.

E. Disconnecting/Reconfiguring

(1) Open the circuit breakers, place the battery switch in the OFF position and disconnect the battery before closing the fuel panel.
(2) Disconnect the test set ACFT connector from aircraft wiring plug or adapter cable.
(3) Disconnect the test set IND connector from the indicator or adapter cable.
(4) Connect the aircraft wiring plug to the indicator.
(5) Return the aircraft to its original configuration.

4. PREFERRED CALIBRATION TEST (WITH DRY TANKS)

Note: Refer to PRECAUTIONS and PRELIMINARY sections (Chapter 1).

Note: When draining facilities are not readily available, the Alternate Calibration Test (Chapter 3, Section 2) may be used as a temporary measure.

The preferred calibration is done with dry tanks. This method is the most accurate for calibration since the indicator zero reading is set to the actual empty tank condition. A capacitance value, applied to system by the test set, is substituted for an equivalent quantity of fuel in the tanks. The indicator is adjusted to read the substituted fuel quantity.

A. Aircraft Preparation

Caution: Refer to the Aircraft Maintenance Manual for proper defueling and fueling procedures. Observe all safety precautions.

(1) Ensure aircraft is defueled. Drain sumps.
(2) Disconnect the aircraft battery.
(3) Maintain the circuit breakers open.
(4) Access the indicator.
(5) Disconnect the aircraft wiring plug from the indicator.

B. Test Set Preparation

(1) Ensure the test set ON/OFF switch is OFF.

(2) Rotate theTEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(3) Set the INSULATION/SYSTEM switch to SYSTEM.
(4) Set the MAIN/TOT-AUX/NAC switch to MAIN/TOT.
(5) Set the 200 (pF)/1000 (pF) switch to 200 (pF).
(6) Set the CAP SIM (pF) 100's thumbwheels to "-". Set the 10's to "9".

C. Connecting Test Set

Connect the test set as shown in either Figure 5 or Figure 6. Figure 5 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.

D. Test

(1) Set test set ON/OFF switch to ON.
(2) Press and hold PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain a test set reading according to the following table.

Table 4 Add For Full

Aircraft	Add For Full Simulator (pF)	
C90, C90A/B/ GT/GTi, C99	91.6	
	100-380006-15/-17 Tank Units (Transmitters)	100-380006-93,-121,-179 and -95,-123, or -181 Tank Units (Transmitters)
A100, B100, E90	95.3	95.0
200	93.4	93.1
300, 350/350i	- - -	93.1
F90	N/A	95.0

NOTE: The 100-380006-93,-95 and subsequent tank units (transmitters) are used beginning with airplane serial numbers BB-221; B235; BE25; LW215 and any earlier airplane in compliance with Service Instruction 0648 Rev. 2.

(3) Release the pushbutton.
(4) Connect the aircraft battery.
(5) Close the circuit breakers and set battery switch ON.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(6) Verify the indicator reads slightly below zero (approximately one needle width).

(7) If pointer position is not acceptable, use the EMP 1 / E 1 adjustment to obtain the correct pointer position.

(8) Rotate the TEST FUNCTION switch to ADD CAP.

(9) Verify the indicator reads 1300 lbs.

(10) If the indicator does not read 1300 lbs, use the F / FULL adjustment to obtain correct reading.

(11) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

Note: FULL adjustments may affect the EMPTY setting. EMPTY adjustments may affect the FULL setting. It may be necessary to switch between CAP SIM CAL (NORM SYS) and ADD CAP a few times and adjust each accordingly in order to achieve complete accuracy.

(12) Set the aircraft fuel panel select switch to AUX / NAC and hold, if applicable.

(13) Verify the indicator shows as follows:

The indicator should read zero pounds on all models except the C90, C90A / B / GT / GTi*, and the C99. On these airplanes the indicator should indicate slightly below zero as in step 6.*

(14) If pointer position is not acceptable, use the EMP 2 / E 2 adjustment to obtain a desirable pointer position.

(15) Set the test set ON / OFF switch to OFF.

E. Disconnecting or reconfiguring

(1) Open the circuit breakers.

Caution: When lowering or raising pilot fuel panel, ensure aircraft battery switch is OFF and this battery is disconnected.

(2) Disconnect the test set ACFT connector from aircraft wiring plug or the adapter cable.

(3) Disconnect the test set IND connector from the indicator or adapter cable.

(4) Disconnect the adapter cable from the aircraft wiring and indicator.

(5) Connect the aircraft plug to indicator.

(6) Return the aircraft to original configuration.

5. SYSTEM WIRING INTEGRITY TEST

Note: Refer to PRECAUTIONS and PRELIMINARY sections (Chapter 1).

Note: Insure that the Insulation, Capacitance, Indicator test and Preferred Calibration have all been accomplished with satisfactory results and that the tanks are still dry prior to attempting this test.

This test is used to determine whether there exists an inline (series) resistance problem in the aircraft wiring. It will be accomplished by a comparison of the aircraft empty probes capacitance versus a simulated capacitance from the Test Set to drive the cockpit indicator to the same point. No adjustment of the Indicator should be made during this test or based on the outcome of this test. If repairs are made to the harness following this test, then the Preferred Calibration must be repeated and subsequently this integrity test.

A. Aircraft Preparation

(1) Disconnect aircraft battery.

Caution: When lowering or raising the fuel panel, ensure aircraft battery is disconnected.

(2) Access the indicator.
(3) Open the circuit breakers.
(4) Disconnect the aircraft wiring plug located at the indicator.

B. Test Set Preparation

(1) Set the test set ON/OFF switch to OFF.
(2) Rotate the TEST FUNCTION switch to PROBE(S).
(3) Set the INSULATION/SYSTEM switch to SYSTEM.
(4) Set the MAIN/TOT-AUX/NAC switch to MAIN/TOT.
(5) Set the 200 (pF)/1000 (pF) switch to 200 (pF).

C. Connecting Test Set

(1) Connect the test set as shown in either Figure 3 or 4. Figure 3 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.
(2) Connect the test set ACFT connector to the aircraft wiring plug removed from indicator.
(3) Do not connect the test set IND connector.

D. Test

(1) Set the test set ON/OFF switch to ON.
(2) Set the aircraft fuel panel select switch to MAIN or TOTAL.
(3) Push and hold the test set PRESS TO READ CAP (pF) pushbutton.
(4) Record the capacitance value measured.
(5) Release the pushbutton.
(6) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(7) Set the CAP SIM (pF) 100's and the 10's thumbwheels to the closest approximation of the recorded value of step 4.
(8) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain the recorded value of step 4.
(9) Set the test set ON/OFF switch to OFF.
(10) Connect the test set to the Indicator as shown in either Figure 5 or 6. Figure 5 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.
(11) Connect the aircraft battery if not already connected.
(12) Close the circuit breakers.
(13) Turn the aircraft battery ON/OFF switch ON.
(14) Set the test set ON/OFF switch to ON.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(15) Verify the indicator reads slightly below zero (approximately one needle width).
(16) Rotate the TEST FUNCTION switch to IND AMP.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(17) Verify the indicator reads the same as in step 15 within one needle width.

Note: Failure to obtain the correct indication may indicate the possibility of in-line resistance in the aircraft wiring between the Indicator and the probes. If this condition is found to exist, disconnect and clean the wing break connector and the wet wing connector with contact cleaner and gently blow dry. The model 90 and 99 series have no wet wing. If the condition persists disconnect and clean the fuel panel connector behind the LH

sidewall below the fuel panel in the same manner. Do not spray contact cleaner on the individual Matrix type connectors. If cleaning the afore mentioned connectors does not yield satisfactory results, it may become necessary to de-pin and inspect each Matrix type connector. Replace any matrix type blocks that are suspect. When cleaning the connectors be sure to include the test sets connectors.

(18) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

(19) Set the CAP SIM (pF) 100's and the 10's thumbwheels to the closest approximation of the required value as per Table 4.

(20) Press and hold PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain a test set reading according to Table.4.

(21) Release the pushbutton.

(22) Rotate the TEST FUNCTION switch to ADD CAP.

(23) Verify the indicator reads 1300 lbs.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(24) Record the exact indicator reading.

(25) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

(26) Set the CAP SIM (pF) 100's and the 10's thumbwheels to the closest approximation of the sum of aircraft capacitance from step 4 and value used from Table 4.

(27) Press and hold PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain the summed value.

(28) Release the pushbutton.

(29) Rotate the TEST FUNCTION switch to IND AMP.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(30) Verify the indicator reads the same as in step 24 ± 40 lbs.

Note: Failure to obtain the correct indication may indicate the possibility of in-line resistance in the aircraft wiring between the Indicator and the probes. If this condition is found to exist, disconnect and clean the wing break connector and the wet wing

connector with contact cleaner and gently blow dry. The model 90 and 99 series have no wet wing. If the condition persists disconnect and clean the fuel panel connector behind the LH sidewall below the fuel panel in the same manner. Do not spray contact cleaner on the individual Matrix type connectors. If cleaning the afore mentioned connectors does not yield satisfactory results, it may become necessary to de-pin and inspect each Matrix type connector. Replace any matrix type blocks that are suspect. When cleaning the connectors be sure to include the test sets connectors.

(31) Set the test set ON/OFF switch to OFF.
(32) Turn the aircraft battery ON/OFF switch OFF.
(33) Open the circuit breakers.
(34) Disconnect the aircraft battery if previously connected.
(35) Connect the test set as shown in either Figure 3 or 4 as applicable.

Note: The battery must be connected, the battery switch set to ON position and the circuit breakers closed for this test in all airplanes except the model C90, C90A/B/GT/GTi.

(36) Rotate the TEST FUNCTION switch to PROBE(S).
(37) Set the test set ON/OFF switch to ON.
(38) Set the aircraft fuel panel select switch to AUX/NAC and hold if applicable.
(39) Push and hold the test set PRESS TO READ CAP (pF) pushbutton.
(40) Record the capacitance value measured.
(41) Release the pushbutton.
(42) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(43) Set the CAP SIM (pF) 100's and the 10's thumbwheels to the closest approximation of the recorded value of step 40.
(44) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain the recorded value of step 40.
(45) Set the test set ON/OFF switch to OFF.
(46) Turn the aircraft battery ON/OFF switch to OFF if applicable.
(47) Disconnect the aircraft battery if previously connected.
(48) Connect the test set to the Indicator as shown in either Figure 5 or 6 as applicable.

(49) Reconnect the aircraft battery.
(50) Close the circuit breakers.

(51) Turn the aircraft battery ON/OFF switch ON.

(52) Set the test set ON/OFF switch to ON.

(53) Set the aircraft fuel panel select switch to AUX/NAC and hold, if applicable.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(54) Verify the indicator shows as follows:
The indicator should read zero pounds on all models except the C90, C90A / B / GT / GTi*, and the C99. On these airplanes the indicator should indicate slightly below zero.*

(55) Rotate the TEST FUNCTION switch to IND AMP.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(56) Verify the indicator reads the same as in step 55 within one needle width.

Note: Failure to obtain the correct indication may indicate the possibility of in-line resistance in the aircraft wiring between the Indicator and the probes. If this condition is found to exist, disconnect and clean the wing break connector and the wet wing connector with contact cleaner and gently blow dry. The model 90 and 99 series have no wet wing. If the condition persists disconnect and clean the fuel panel connector behind the LH sidewall below the fuel panel in the same manner. Do not spray contact cleaner on the individual Matrix type connectors. If cleaning the afore mentioned connectors does not yield satisfactory results, it may become necessary to de-pin and inspect each Matrix type connector. Replace any matrix type blocks that are suspect. When cleaning the connectors be sure to include the test sets connectors.

(57) Set the test set ON/OFF switch to OFF.

E. Disconnecting or reconfiguring

(1) Open the circuit breakers.

Caution: When lowering or raising the fuel panel, ensure aircraft battery switch is OFF and this battery is disconnected.

(2) Disconnect the test set ACFT connector from aircraft wiring plug or the adapter cable.
(3) Disconnect the test set IND connector from the indicator or adapter cable.
(4) Disconnect the adapter cable from the aircraft wiring and indicator.
(5) Connect the aircraft plug to indicator.
(6) Return the aircraft to original configuration.

CHAPTER 3 ALTERNATE TESTS

1. PROBES BENCH TEST

Note: See PRECAUTIONS and PRELIMINARY sections (Chapter 1).

A. Test Set Preparation

(1) Set the test set ON/OFF switch to OFF.
(2) Rotate the TEST FUNCTION switch to PROBE(S).
(3) Set the INSULATION/SYSTEM switch to SYSTEM.
(4) Set the MAIN/TOT-AUX/NAC switch to MAIN/TOT.
(5) Set the 200 (pF)/1000 (pF) switch to 200 (pF).

B. Connecting Test Set

(1) Refer to Figure 7 and connect the test set to the probe as shown.
(2) Connect the probe adapter, P/N 101-00829 or P/N 101-00814, to the test set PROBES receptacle as shown in the figure.
(3) Determine the part number and physical makeup of the probe-under-test.
(4) Connect the color-coded wires (sockets) from the probe adapter to the matching color of the probe lead wires (pins).
(5) Connect the socket pin ground lead of the probe adapter (small black lead) to the ground clip pigtail of the probe adapter. Attach the ground clip to the grounding area on the probe.

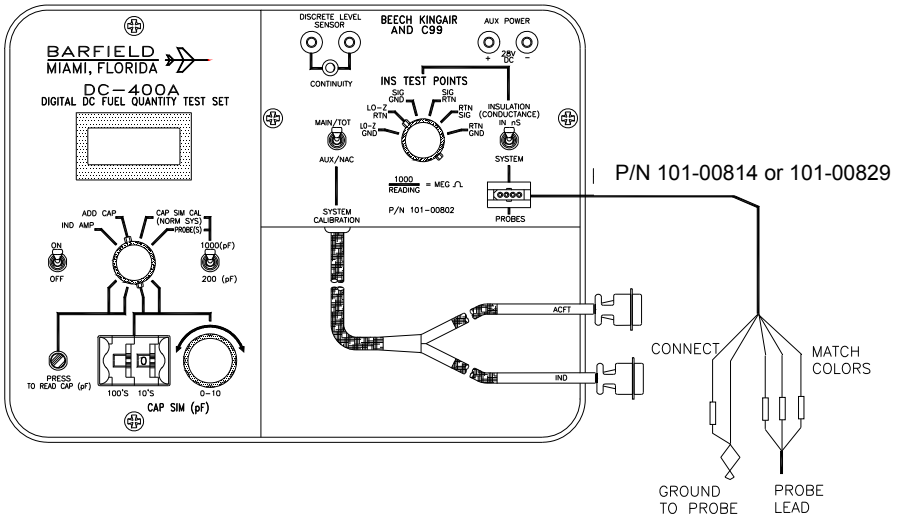

Figure 7 Bench Probe Interface

C. Test

(1) Set the test set switch to ON.

(2) Press the PRESS TO READ CAP (pF) pushbutton to display probe capacitance.

(3) Verify probe capacitance is within the tolerance referenced in Table 5 through Table 8.

(4) If value is not within tolerance, reject probe.

Note: The following values are valid as of this publication's release date and provide as reference. Refer to the Aircraft Maintenance manual for actual test values.

Table 5 Probe Capacitance Empty (in pF)

Aircraft (C90, C90A/B/GT/GTi, C99)				
Tank Unit	**Beech Probe P/N**	**Min.**	**Nom.**	**Max.**
Leading Edge Inboard	100-380006-11, -69, -105, -139, -143, -175	25.5	27.5	29.5
Leading Edge Outboard	100-380006-13, -67, -103, -187	23.0	24.6	26.5
Inboard Aft	100-380006-37, -71, -107, -141, -145, -173	15.0	17.7	19.0
Center Section	100-380006-7, -73, -109, -183	30.0	32.0	34.0
Nacelle (C90/ C90A/B/GT/GTi)	100-380006-49, -79, -97, -125, -185	58.0	63.0	68.0
Nacelle (C99)	100-380006-77, -113, -171	54.0	58.6	64.0

Table 6 Probe Capacitance Empty (in pF)

Aircraft (A100, B100, E90, F90)				
Tank Unit	**Beech Probe P/N**	**Min.**	**Nom.**	**Max.**
Leading Edge Inboard	100-380006-11, -69, -105, -139, -143, -175	25.5	27.5	29.5
Leading Edge Outboard	100-380006-13, -67, -103, -187	23.0	24.6	26.5
Inboard Aft	100-380006-37, -71, -107, -141, -145, -173	15.0	17.7	19.0
Integral Inboard	100-380006-93, -121, -179	20.2	22.2	24.2
Integral Outboard	100-380006-95, -123, -181	18.1	20.0	21.9
Auxiliary	100-380006-7, -73, -109, -183	30.0	32.0	34.0
Nacelle (for E90)	100-380006-43, -75, -111, -189	58.0	63.0	68.0
Nacelle (for A100, B100, F90)	100-380006-41, -77, -113, -171	54.0	58.6	64.0

Table 7 Probe Capacitance Empty (in pF)

Aircraft (200, 300, 350/350i Series)				
Tank Unit	**Beech Probe P/N**	**Min.**	**Nom.**	**Max.**
Leading Edge Inboard	100-380006-11, -69, -105, -139, -143, -175	25.5	27.5	29.5
Leading Edge Outboard	100-380006-55, -81, -115, -177	21.2	23.4	25.6
Inboard Aft	100-380006-37, -71, -107, -141, -145, -173	15.0	17.7	19.0
Integral Inboard	100-380006-93, -121, -179	20.2	22.2	24.2
Integral Outboard	100-380006-95, -123, -181	18.1	20.0	21.9
Nacelle	100-380006-41, -77, -101, -113, -147, -171	54.0	58.6	64.0
Auxiliary Outboard	100-380006-35, -85, -119, -169, -197	27.3	30.3	33.3
Auxiliary Inboard	100-380006-33, -57, -83, -117, -149, -151, -167	26.2	29.1	32.0

Note: The probes and harnesses in the following table (Table 8) were installed in aircraft with S/N LW17, LW69 through LW214, B152, B156 through B234, BE1 through BE24 and BB2 through BB220. The –59 harness has diodes mounted in it and can be tested without any probes attached. The –15 and –17 probe cannot be tested without the –59 harness attached. Refer to Beech Service Bulletin, 0648-355, for replacement P/N's of the 100-380006-15, 17, & 59 cables and probes.

Table 8 Probe Capacitance Empty (in pF)

Aircraft	**Tank Unit**	**Beech Probe P/N**	**Min.**	**Nom.**	**Max.**
A100, B100, 200, 300/350i, E90	**Aircraft with 100-380006-59 Harness**				
	Bulkhead Cable Assembly	**100-380006-59**	**16.8**	**21.8**	**26.8**
	Cable Assembly and Integral Tank Units	**100-380006-15, -17, -59**	**41.5**	**46.5**	**51.5**
	Aircraft with 100-380006-99, -127 Harness				
	Cable Assembly and Integral Tank Units Combined	**100-380006-93, -95, -121, -123, -179, -181**	**37.8**	**42.1**	**46.3**

Table 9 Probe Capacitance Full (in pF)

Aircraft (C90, C90A/B/GT/GTi, C99)				
Tank Unit	**Beech Probe P/N**	**Min.**	**Nom.**	**Max.**
Leading Edge Inboard	100-380006-11, -69, -105, -139, -143, -175	40.3	44.8	49.3
Leading Edge Outboard	100-380006-13, -67, -103, -187	34.3	38.1	41.9
Inboard Aft	100-380006-37, -71, -107, -141, -145, -173	24.5	27.2	29.9
Center Section	100-380006-7, -73, -109, -183	46.2	51.3	56.4
Nacelle (C90/ C90A/B/GT/GTi)	100-380006-49, -79, -97, -125, -185	79.3	88.1	96.9
Nacelle (C99)	100-380006-77, -113, -171	74.1	82.3	90.5

Table 10 Probe Capacitance Full (in pF)

Aircraft (A100, B100, E90, F90)				
Tank Unit	**Beech Probe P/N**	**Min.**	**Nom.**	**Max.**
Leading Edge Inboard	100-380006-11, -69, -105, -139, -143, -175	40.3	44.8	49.3
Leading Edge Outboard	100-380006-13, -67, -103, -187	34.3	38.1	41.9
Inboard Aft	100-380006-37, -71, -107, -141, -145, -173	24.5	27.2	29.9
Integral Inboard	100-380006-93, -121, -179	31.1	34.6	38.1
Integral Outboard	100-380006-95, -123, -181	26.5	29.4	32.3
Auxiliary	100-380006-7, -73, -109, -183	46.2	51.3	56.4
Nacelle (for E90)	100-380006-43, -75, -111, -189	79.3	88.1	96.9
Nacelle (for A100, B100, F90)	100-380006-41, -77, -113, -171	74.1	82.3	90.5

Table 11 Probe Capacitance Full (in pF)

Aircraft (200, 300, 350/350i Series)				
Tank Unit	**Beech Probe P/N**	**Min.**	**Nom.**	**Max.**
Leading Edge Inboard	100-380006-11, -69, -105, -139, -143, -175	40.3	44.8	49.3
Leading Edge Outboard	100-380006-55, -81, -115, -177	32.1	35.7	39.3
Inboard Aft	100-380006-37, -71, -107, -141, -145, -173	24.5	27.2	29.9
Integral Inboard	100-380006-93, -121, -179	31.1	34.6	38.1
Integral Outboard	100-380006-95, -123, -181	26.5	29.4	32.3
Nacelle	100-380006-41, -77, -113, -171	74.1	82.3	90.5
Auxiliary Outboard	100-380006-35, -85, -119, -169, -197	44.9	49.9	54.9
Auxiliary Inboard	100-380006-33, -57, -83, -117, -149, -151, -167	42.6	47.3	52.0

Note: The probes and harnesses in the following table (Table 12) were installed in aircraft starting with S/N LW17, LW69 through LW214, B152, B156 through B234, BE1 through BE24 and BB2 through BB220. The -59 harness has diodes mounted in it and can be tested without any probes attached. The -15 and -17 probe cannot be tested without the -59 harness attached. Refer to Beech Service Bulletin, 0648-355, for replacement P/N's of the 100-380006-15, -17, & -59 cables and probes.

Table 12 Probe Capacitance Full (in pF)

Aircraft	Tank Unit	Beech Probe P/N	Min.	Nom.	Max.
A100, B100, 200, 300/350i, E90	**Aircraft with 100-380006-59 Harness**				
	Bulkhead Cable Assembly	100-380006-59	16.8	21.8	26.8
	Cable Assembly and Integral Tank Units	100-380006-15, -17, -59	61.8	68.7	75.6
	Aircraft with 100-380006-99, -127 Harness				
	Cable Assembly and Integral Tank Units Combined	100-380006-93, -95, -121, -123, -179, -181	57.6	64.0	70.4

(5) Set the test set ON/OFF switch to OFF.
(6) Rotate the TEST FUNCTION switch to IND AMP.
(7) Set the INSULATION/SYSTEM switch to INSULATION.
(8) Disconnect the pin socket ground lead of the probe adapter (small black lead) from the ground clip pigtail.
(9) Rotate the INS TEST POINT switch to LO-Z GND.
(10) Set the ON/OFF switch to ON.
(11) Allow time for test set display to stabilize.

Note: On those occasions when display stabilization cannot be achieved, take the reading after performing this test for 30 seconds. If this value is in the acceptable range, then consider that the Aircraft system has passed this test.

(12) Verify the test set display shows less than 50 nS. (Refer to Table 1).
(13) Rotate the INS TEST POINT switch to each remaining position except SIG / RTN and verify each time that the test set display shows less than 50 nS.

(14) With the INS TEST POINT switch at SIG/RTN position, verify the test set display shows a value between 1500 and an “over range” of 1.

Note: Ensure conductance is within specifications. If test results are outside limits, repeat test.

(15) Set ON/OFF switch to OFF.
(16) Disconnect Probe adapter from Probe.
(17) Disconnect Probe adapter from T/S.

D. Discrete Level Sensor Test for C90 and C90A/B/GT/GTi

(1) Connect the test set to the probe as shown in Figure 8.

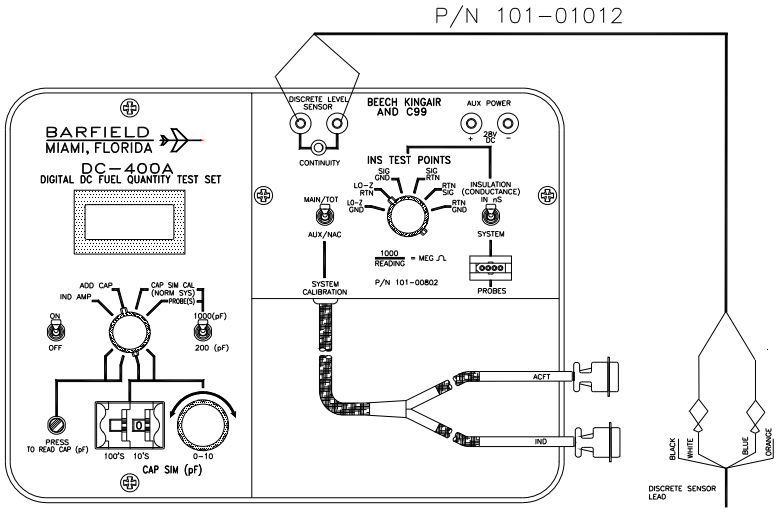

Figure 8 Probe Discrete Level Interface

(2) Ensure the test leads, P/N 101-01012 banana plugs are connected to the DISCRETE LEVEL SENSOR jacks.
(3) Connect the clip ends of test leads to probe DISCRETE LEVEL SENSORS leads as specified in the following table.

Table 13 Discrete Level Sensor Continuity for C90 and C90A/B/GT/GTi

	Position	
Connections	**Upright**	**Inverted**
Black and Blue	Lamp OFF	Lamp ON
Black and Orange	Lamp OFF	Lamp ON
Black and White	Lamp ON	Lamp OFF

(4) With clip ends connected to black and blue leads of sensor, hold sensor vertically
(5) Set the test set ON/OFF switch to ON.

(6) Invert probe at each connection and verify continuity results as referenced in Table 13.
(7) Set the test set switch to OFF.

E. Disconnecting and Reconfiguring

(1) Disconnect the test leads from the DISCRETE LEVEL SENSOR.
(2) Disconnect the test leads from the test set.

2. INDICATOR BENCH TEST

Note: See PRECAUTIONS and PRELIMINARY sections (Chapter 1).

Note: Failure to calibrate the system after performing the indicator bench test will result in an inaccurate fuel quantity reading.

A. Test Set Preparation

(1) Set the ON/OFF switch to OFF.
(2) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(3) Set the INSULATION/SYSTEM switch to SYSTEM.
(4) Set the MAIN/TOT-AUX/NAC switch to MAIN/TOT.
(5) Set the 200 (pF)/1000 (pF) switch to 200 (pF).

B. Connecting Test Set

(1) Connect the test set as shown in either Figure 9 or Figure 10. Figure 9 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.
(2) Connect the 28 VDC power supply to the test set AUX POWER jacks using Banana to Banana leads P/N 101-01010. Observe polarity.

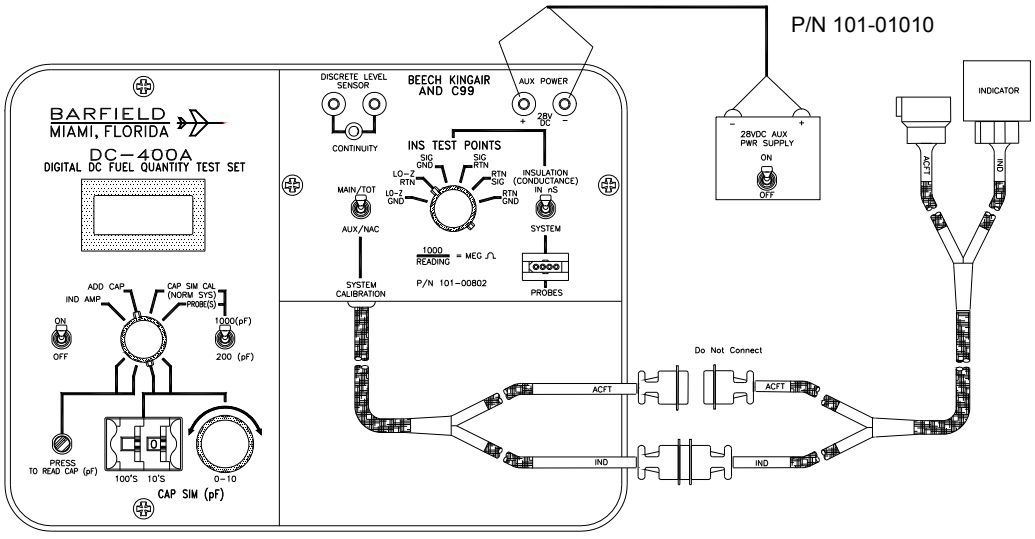

Figure 9 Indicator Bench Test Connection (With 101-00831 Adapter)

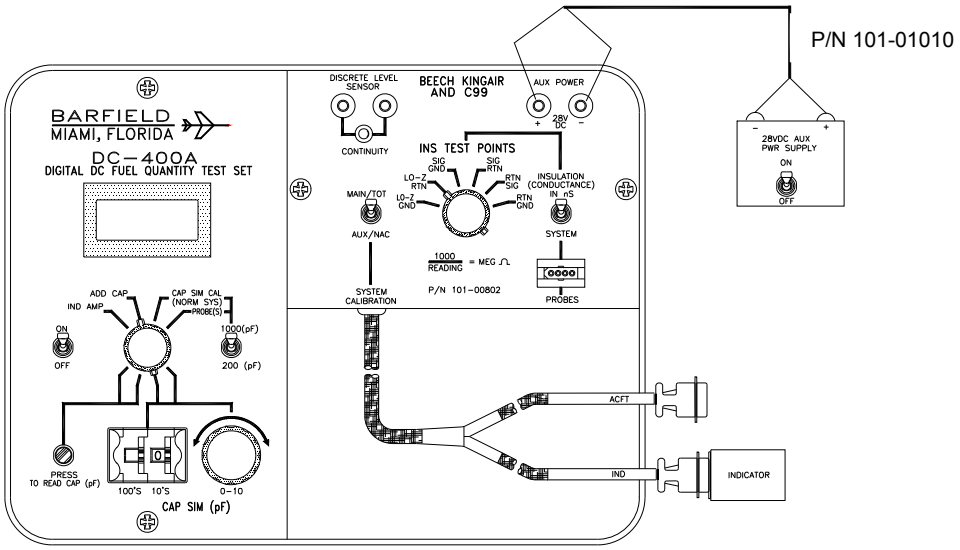

Figure 10 Indicator Bench Test Connection

C. Test

(1) Set the test set ON/OFF switch to ON.

(2) Set the CAP SIM (pF) 100's to 1. Set the 10's thumbwheels to 8.

(3) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain a test set reading of 189.0 pF.

(4) Release the pushbutton.

(5) Rotate the TEST FUNCTION switch to IND AMP.

(6) Set the 28 VDC power supply ON/OFF switch to ON.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(7) Verify the indicator reads zero lbs.

(8) If reading is not zero, adjust EMP 1/E 1.

(9) If the indicator will not give a zero reading, replace the indicator.

(10) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).

(11) Set the 200 (pF)/1000 (pF) switch to 1000 (pF).

(12) Set the CAP SIM (pF) 100's thumbwheel to 2. Set the 10's thumbwheel to 7.

(13) Push and hold the PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain a test set reading of 273 pF.

(14) Release the pushbutton.

(15) Rotate the TEST FUNCTION switch to IND AMP.
(16) Verify the indicator reads 1200 lbs.
(17) If the indicator does not show 1200 lbs, adjust F / FULL.
(18) If the indicator still does not read 1200 lbs, replace the indicator.
(19) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(20) Set the 200 (pF)/1000 (pF) switch to 200 (pF).
(21) Set the CAP SIM (pF) 100's thumbwheel to "-". Set the 10's thumbwheel as follows:

If testing E90, F90, A100 or B100 series aircraft, set 10's to "3".

If testing C90, C90A / B / GT / GTi, C99, 200, 300 or 350/350i series, set 10's to "6".

(22) Push the PRESS TO READ CAP (pF) pushbutton and hold while adjusting the CAP SIM (pF) control knob to obtain a test set display reading as follows:

If testing E90, F90, A100 or B100 series aircraft, verify the display shows 31.0 pF.

If testing C90, C90A / B / GT / GTi, C99, 200, 300 or 350/350i series, verify the display shows 60.0 pF.

(23) Release the pushbutton.
(24) Set the MAIN/TOT-AUX/NAC switch to AUX/NAC.
(25) Rotate the TEST FUNCTION switch to IND AMP.
(26) Verify that the indicator reads 0 lbs.
(27) If the reading is not 0 lbs., adjust the indicator using the EMP 2/E 2.
(28) If the indicator still does not read 0, replace the indicator.
(29) Repeat steps (2) thru (28) until an accurate gage adjustment is obtained.
(30) Set the MAIN/TOT – AUX/NAC switch to MAIN/TOT.
(31) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(32) Set the 200 (pF)/1000 (pF) switch to 1000 (pF).
(33) Set the CAP SIM (pF) 100's thumbwheel to 2. Set the 10's thumbwheel to 1.

(34) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain a test set reading of 210 pF.
(35) Release pushbutton.
(36) Rotate the TEST FUNCTION switch to IND AMP.
(37) Verify the indicator reads 300 ± 35 lbs.
(38) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(39) Set the CAP SIM (pF) 100's thumbwheel to "2". Set the 10's thumbwheel to "3."
(40) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain a test display of 231 pF.
(41) Release the pushbutton.
(42) Rotate the TEST FUNCTION switch to IND AMP.
(43) Verify the indicator reads 600 ± 35 lbs.
(44) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(45) Set the CAP SIM (pF) 100's thumbwheels to "2". Set 10's thumbwheel to "5".
(46) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain a test set display of 252 pF.
(47) Release the pushbutton.
(48) Rotate the TEST FUNCTION switch to IND AMP.
(49) Verify the indicator reads 900 ± 35 lbs.
(50) Set the 28 VDC power supply to OFF.
(51) Set the test set ON/OFF to OFF.

Note: Failure to calibrate the system after performing the indicator test will result in an inaccurate fuel quantity reading.

D. Disconnecting/Reconfiguring

(1) Disconnect 28 VDC power supply
(2) Disconnect the test set IND connector from the indicator or adapter cable.

3. ALTERNATE CALIBRATION (WET TANKS)

Note: The Alternate Calibration should only be used as a temporary measure when draining facilities are not available. *Recalibrate the aircraft using the Preferred Calibration method at the first opportunity.*

The Alternate Calibration applies the nominal empty tank capacitance value to the system by test set for the indicator zero reading. A second capacitance value, (equal to the combined value of nominal empty tank plus the equivalent quantity of fuel in the tanks), is applied to the system. The indicator is then adjusted to show the substituted fuel quantity.

Note: Accuracies, close to the Preferred Calibration, may be obtained if the measured dry capacitance for specific serial number aircraft is known and used instead of EMPTY values referenced in Table 2 (Tank Capacitance Empty). The ADD FOR FULL values listed in Table 4 should be added to the known values to obtain the CAP SIM value for FULL.

A. Aircraft Preparation

Note: See PRECAUTIONS and PRELIMINARY sections (Chapter 1).

(1) Ensure the aircraft battery is disconnected.

Caution: When lowering or raising the pilot fuel panel, ensure that the aircraft battery is disconnected. Observe all safety precautions.

(2) Access the indicator.
(3) Ensure the circuit breakers are open.
(4) Ensure the aircraft wiring plug at Indicator is disconnected.

B. Test Set Preparation

(1) Ensure the test set switch is OFF.
(2) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(3) Set the INSULATION/SYSTEM switch to SYSTEM.
(4) Set the MAIN/TOT-AUX/NAC switch to MAIN/TOT.
(5) Set the 200 (pF)/1000 (pF) switch to 200 (pF).

C. Connecting the Test Set

Connect the test set as shown in either Figure 11 or Figure 12. Figure 11 depicts using Adapter Cable 101-00831 for conversion to systems with circular style connectors.

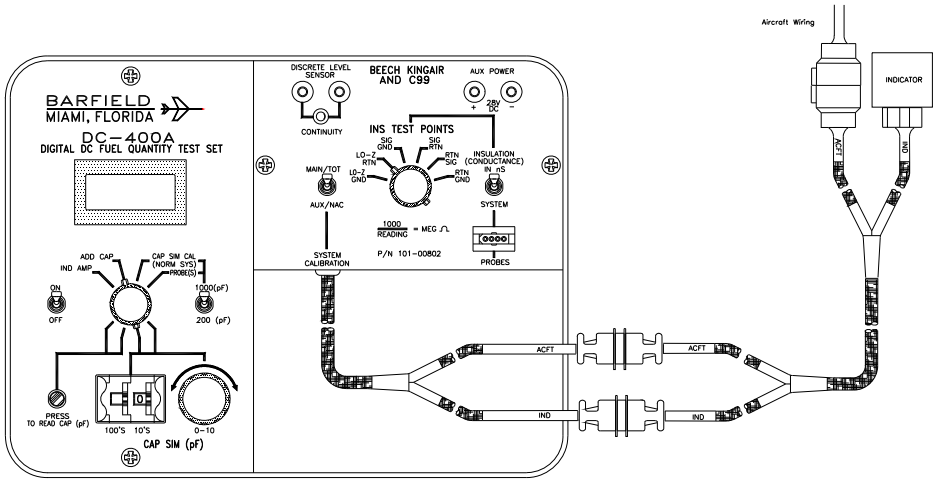

Figure 11 Alternate Calibration Test Set Setup (With 101-00831 Adapter)

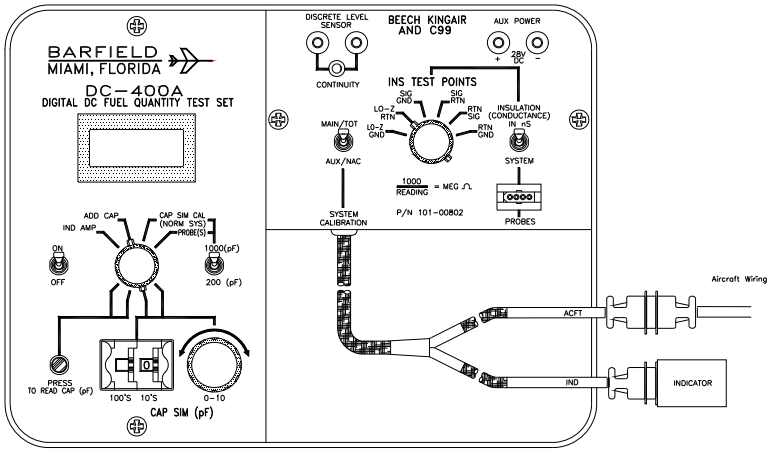

Figure 12 Alternate Calibration Test Set Setup

D. Test

(1) Set the test set ON/OFF switch to ON.
(2) Set the CAP SIM (pF) 100's and the 10's thumbwheels to the digits necessary to adjust the test set display to a MAIN/TOTAL EMPTY nominal value listed in Table 2 for the aircraft-under-test.
(3) Press and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain a test set reading MAIN / TOTAL Nom (nominal) value reading for the aircraft referenced in Table 2.
(4) Close the circuit breakers.
(5) Connect the aircraft battery and turn the battery switch to ON.
(6) Rotate the TEST FUNCTION switch to IND AMP.

Caution: Do not tap bezel of instrument to vibrate. To remove friction, gently tap adjacent panel or rear housing of indicator before taking readings.

(7) Verify the aircraft indicator shows a reading slightly below zero (approximately one needle width).
(8) If pointer position is not acceptable, adjust EMP 1/E 1 adjustment for the pointer position.
(9) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(10) Set the 200 (pF)/1000 (pF) switch to 1000 (pF).
(11) Set the CAP SIM (pF) 100's and the 10's thumbwheels to the digits required to adjust the test set display to a MAIN / TOTAL FULL nominal value for the aircraft listed in Table 3.
(12) Push and hold the PRESS TO READ CAP (pF) pushbutton while adjusting the CAP SIM (pF) control knob to obtain the test set MAIN/TOTAL nominal value for the aircraft listed in Table 3.
(13) Release the pushbutton.
(14) Rotate the TEST FUNCTION switch to IND AMP.
(15) Verify the indicator reads 1300 lbs.
(16) If the indicator does not read 1300 lbs, adjust F / FULL to obtain the value.
(17) Rotate the TEST FUNCTION switch to CAP SIM CAL (NORM SYS).
(18) Set the 200 (pF)/1000 (pF) switch to 200 (pF).
(19) Set the MAIN/TOT – AUX/NAC. switch to AUX/NAC.

(20) Set the CAP SIM (pF) 100's and the 10's to the digits required to adjust the test set display to an AUX/NAC. EMPTY nominal value referenced in Table 2 for the airplane under test.
(21) Press and hold PRESS TO READ CAP (pF) pushbutton while adjusting CAP SIM (pF) control knob to obtain the test set AUX/NAC. EMPTY nominal value reading for the aircraft listed in Table 2.
(22) Release the pushbutton.
(23) Rotate the TEST FUNCTION switch to IND AMP.
(24) Verify the indicator shows zero lbs for all King Air models EXCEPT C90, C90A/B/GT/GTi or C99.
(25) Verify the indicator shows slightly below zero (approximately one needle width) for C90, C90A/B/GT/GTi and C99 models.
(26) If pointer position is not acceptable, use the EMP 2 / E 2 adjustment to obtain a correct reading.
(27) Repeat steps (2) through (26) until an accurate calibration is obtained.
(28) Set the test set and Aircraft battery switch both to OFF.

E. Disconnecting or Reconfiguring

(1) Open the circuit breakers.

Caution: When lowering or raising pilot fuel panel, ensure aircraft battery switch is OFF and this battery is disconnected.

(2) Disconnect the test set ACFT connector from the aircraft wiring plug or adapter cable;
(3) Disconnect the test set IND connector from the indicator or adapter cable.
(4) If applicable, disconnect the adapter cable from the aircraft wiring.
(5) Connect the aircraft wiring plug to the indicator.
(6) Return the aircraft to its original configuration.