BARFIELD

MIAMI, FL ATLANTA, GA

INSTRUCTION SUPPLEMENT

FOR

2548H FUEL QUANTITY TEST SET

P/N 101-00420

WITH

ADAPTER CABLE

P/N 101-00435

FOR

CESSNA

402C S/N 0001 & ON
404 S/N 0001 & ON
414A S/N 0001 & ON
421C S/N 0114 & ON

1. SYSTEM CAPACITANCE MEASUREMENT

1. Remove power from Aircraft Fuel Quantity System.
2. Defuel Aircraft as per Aircraft Maintenance Manual instructions.

   CAUTION: Observe all safety precautions.

3. Gain access to the Signal Conditioner.
4. Break electrical connection.
5. Connect the Adapter Harness A/C connector to mating Aircraft wiring plug.
6. Do not connect the Adapter Harness to the Signal Conditioner.
7. Connect the Adapter Harness HI-Z COAX and LO-Z TANK jacks to the Test Set HI-Z COAX and LO-Z TANK capacitance jacks using 2 each 101-01008 (BNC to BNC) cables.
8. Place BNC shorting cap on Test Set LO-Z COMP jack.
9. Connect the GND jack of the Test Set to a good aircraft ground using the 101-01007 cable.
10. Set the Test Set ON/OFF switch to ON.
11. Set the Test Set TEST FUNCTION switch to CAP BRIDGE.
12. Set the Adapter Harness IND. SELECT switch to A/C.
13. Depress the PRESS TO MEASURE pushbutton.
14. Vary the TANK CAP PF thumbwheels to find the best null (as close to 0 μA as possible) on the Test Set meter.

    NOTE: Refer to Test Set manual for details.

15. TANK capacitance shall measure 61.3 ± 1.5 pF (402C, 414A, 421C) or 47.1 ± 1.5 pF (404).
16. Release the pushbutton.
17. Set the Test Set ON/OFF switch to OFF.
18. Disconnect all connections.
19. Return aircraft to normal configuration.

2. SYSTEM INSULATION MEASUREMENT

1. Remove power from Aircraft Fuel Quantity System.
2. Defuel Aircraft as per Aircraft Maintenance Manual instructions.

   CAUTION: Observe all safety precautions.

3. Gain access to the Signal Conditioner.
4. Break electrical connection.
5. Connect the Adapter Harness A/C connector to mating Aircraft wiring plug.
6. Do not connect the Adapter Harness to the Signal Conditioner.
7. Set the Test Set ON/OFF switch to ON.
8. Set the INS TEST POINTS switch to GND/SH.
9. Set the RANGE switch to X1.
10. Set the TEST FUNCTION switch to the INSULATION position.
11. Adjust the METER ADJUST to achieve an infinity indication on the Test Set meter MEGOHM scale.
12. Set the Test Set ON/OFF switch to OFF.
13. Set the Adapter Harness IND. SELECT switch to A/C.
14. Connect the Adapter Harness HI-Z COAX and LO-Z TANK jacks to the Test Set HI-Z COAX and LO-Z TANK insulation jacks using 2 each 101-01008 (BNC to BNC) cables.
15. Connect the GND jack of the Test Set to a good aircraft ground using the 101-01007 cable.
16. Set the Test Set ON/OFF switch to ON.
17. Allow the Test Set time to stabilize.
18. Insulation shall not be less than value specified in Table 1.

TEST	TEST POINTS	INSULATION
1	GND / SH	1000 MEG Ω
2	GND / LO-Z	1000 MEG Ω
3	GND / HI-Z	1000 MEG Ω
4	SH / LO-Z	1000 MEG Ω
5	SH / HI-Z	1000 MEG Ω
6	LO-Z / HI-Z	1000 MEG Ω

TABLE 1

19. Set the Test Set INS TEST POINTS switch for remaining Tests per Table 1.
20. Insulation shall not be less than values specified in Table 1.
21. Set the Test Set ON/OFF switch to OFF.

22. Disconnect all connections.
23. Return aircraft to normal configuration.

3. SIGNAL CONDITIONER / INDICATOR TEST

1. Remove power from Aircraft Fuel Quantity System.
2. Gain access to the Signal Conditioner.
3. Break electrical connection.
4. Connect the Adapter Harness AUX connector to mating Aircraft wiring plug.
5. Connect the Adapter Harness SIG. COND. connector to the Aircraft Signal Conditioner.
6. Set the Test Set ON/OFF switch to ON.
7. Set the Test Set TEST FUNCTION switch to CAP BRIDGE position.
8. Set COMP SIM pF 100'S and 10'S thumbwheels to BLANK and 6 respectively (402C, 414A, 421C) or BLANK and 4 respectively 404).
9. Set the TANK CAP pF thumbwheels to 61.3 pF (402C, 414A, 421C) or 47.1 pF (404).
10. Depress and hold the COMP CAL pushbutton while varying the 0-10 adjust knob to achieve the best null (as close to 0 μA as possible) on the Test Set meter.

    NOTE: Refer to Test Set manual for details.

11. Release the pushbutton.
12. Set Test Set TEST FUNCTION switch to CAP SIM 2.
13. Set the Test Set ON/OFF switch to OFF.
14. Place BNC shorting cap on Test Set LO-Z TANK jack.
15. Set the Adapter Harness IND. SELECT switch to A/C.
16. Connect the Adapter Harness HI-Z COAX and LO-Z TANK jacks to the Test Set HI-Z COAX and LO-Z COMP capacitance jacks using 2 each 101-01008 (BNC to BNC) cables.
17. Connect the Adapter Harness TEST A/C IND. jacks to the Test Set IND jacks using Banana to Banana leads - observe polarity.
18. Do NOT connect the GND jack of the Test Set to the aircraft.
19. Return power to aircraft Fuel System.
20. Adjust the Signal Conditioner E adjustment for Indicator reading of exactly 0 lbs.

    NOTE: Tap the Indicator lightly when taking readings.

21. Remove power from aircraft Fuel System.
22. Set the Test Set ON/OFF switch to ON.
23. Set the Test Set TEST FUNCTION switch to CAP BRIDGE position.
24. Set COMP SIM pF 100'S and 10'S thumbwheels to 1 and 1 respectively (402C, 414A, 421C) or BLANK and 9 respectively 404).
25. Set the TANK CAP pF thumbwheels to 117.2 pF (402C, 414A,

421C) or 93.6 pF (404).

26. Depress and hold the COMP CAL pushbutton while varying the 0-10 adjust knob to achieve the best null (as close to 0 µA as possible) on the Test Set meter.

    NOTE: Refer to Test Set manual for details.

27. Release the pushbutton.
28. Set Test Set TEST FUNCTION switch to CAP SIM 2.
29. Set the Test Set ON/OFF switch to OFF.
30. Return power to aircraft Fuel System.
31. Adjust the Signal Conditioner F adjustment for Indicator reading of exactly 620 lbs (402C, 414A, 421C) or 1100 lbs (404).

    NOTE: Tap the Indicator lightly when taking readings.

32. Repeat EMPTY and FULL adjustments until no further improvement can be made.
33. With Indicator at 0 lbs set the Adapter Harness IND. SELECT switch to T/S.
34. Test Set shall indicate 34 ± 20 µA.
35. With Indicator at 620 lbs (402C, 414A, 421C) or 1100 lbs (404) set the Adapter Harness IND. SELECT switch to T/S.
36. Test Set shall indicate 774 ± 20 µA (402C, 414A, 421C) or 754 ± 20 µA (404).
37. This procedure can be repeated for the increments detailed in Table 2A, or Table 2B for a linearity test.

402C, 414A, 421C		
LBS	CAPACITANCE	CURRENT
0	61.3	34
100	70.5	153
200	79.6	273
300	88.8	392
400	97.9	511
500	107.1	636
600	116.3	
620	117.2	774

TABLE 2A

404		
LBS	CAPACITANCE	CURRENT
0	47.1	34
200	56.8	165
400	65.0	296
550	71.5	394
700	77.2	492
900	85.4	623
1100	93.6	754

TABLE 2B

38. Remove power from aircraft Fuel System.
39. Set the Test Set ON/OFF switch to OFF.
40. Disconnect all connections.
41. Return aircraft to normal configuration.

4. PREFERRED CALIBRATION PROCEDURE

1. Remove power from Aircraft Fuel Quantity System.
2. Defuel Aircraft as per Aircraft Maintenance Manual instructions.

   CAUTION: Observe all safety precautions.

3. Gain access to the Signal Conditioner.
4. Break electrical connection.
5. Connect the Adapter Harness AUX connector to mating Aircraft wiring plug.
6. Connect the Adapter Harness SIG. COND. connector to the Aircraft Signal Conditioner.
7. Set the Test Set ON/OFF switch to ON.
8. Set the Test Set TEST FUNCTION switch to CAP BRIDGE position.
9. Set COMP SIM pF 100'S and 10'S thumbwheels to BLANK and 6 respectively (402C, 414A, 421C) or BLANK and 4 respectively 404).
10. Set the TANK CAP pF thumbwheels to 62.2 pF (402C, 414A, 421C) or 48.2 pF (404).
11. Depress and hold the COMP CAL pushbutton while varying the 0-10 adjust knob to achieve the best null (as close to 0 μA as possible) on the Test Set meter.

    NOTE: Refer to Test Set manual for details.

12. Release the pushbutton.
13. Set Test Set TEST FUNCTION switch to CAP SIM 2.
14. Set the Test Set ON/OFF switch to OFF.
15. Place BNC shorting cap on Test Set LO-Z TANK jack.
16. Set the Adapter Harness IND. SELECT switch to A/C.
17. Connect the Adapter Harness HI-Z COAX and LO-Z TANK jacks to the Test Set HI-Z COAX and LO-Z COMP capacitance jacks using 2 each 101-01008 (BNC to BNC) cables.
18. Do NOT connect the GND jack of the Test Set to the aircraft.
19. Return power to aircraft Fuel System.
20. Adjust the Signal Conditioner E adjustment for Indicator reading of exactly 0 lbs.

    NOTE: Tap the Indicator lightly when taking readings.

21. Remove power from aircraft Fuel System.
22. Disconnect the Adapter Harness AUX connector and replace with the Adapter Harness A/C connector.
23. Set the Test Set ON/OFF switch to ON.
24. Set the Test Set TEST FUNCTION switch to CAP BRIDGE position.
25. Set COMP SIM pF 100'S and 10'S thumbwheels BLANK and 5 espectively (402C, 414A, 421C) or BLANK and 4 respectively 404).

26. Set the TANK CAP pF thumbwheels to 55.9 pF for 100 grade fuel) 57.1 pF (for 100 octane low lead fuel) {402C, 414A, 421C} or to 44.0 pF for 100 grade fuel) 46.2 pF (for 100 octane low lead fuel {404}.
27. Depress and hold the COMP CAL pushbutton while varying the 0-10 adjust knob to achieve the best null (as close to 0 µA as possible) on the Test Set meter.

    NOTE: Refer to Test Set manual for details.

28. Release the pushbutton.
29. Set Test Set TEST FUNCTION switch to CAP SIM 2.
30. Set the Test Set ON/OFF switch to OFF.
31. Return power to aircraft Fuel System.
32. Adjust the Signal Conditioner F adjustment for Indicator reading of exactly 620 lbs (402C, 414A, 421C) or 1100 lbs (404).

    NOTE: Tap the Indicator lightly when taking readings.

33. Repeat EMPTY and FULL adjustments until no further improvement can be made.
34. Remove power from aircraft Fuel System.
35. Set the Test Set ON/OFF switch to OFF.
36. Disconnect all connections.
37. Return aircraft to normal configuration.