

INTERTURBINE TEMPERATURE INDICATOR - ADJUSTMENT/TEST

1. General

- A. The interturbine temperature (ITT) indicator adjustment and test section has procedures to use a TT1000A or TT1200 tester with the interturbine temperature indicator. Refer to Figure 501, Figure 502, Figure 503, Figure 504, Figure 505 and Figure 506 for the test equipment connections.

2. Interturbine Temperature Indicator Adjustment and Test

Table 501. Calibration

TEST POINT °C	APPLIED VOLTAGE IN MILLIVOLTS	TOLERANCE TEMPERATURE °C
100	4.095	+20 to -20
300	12.207	+20 to -20
660	27.445	+7.5 to -7.5
805	33.480	+2.5 to -2.5
900	37.325	+5.0 to -5.0
1090	44.729	+2.5 to -2.5
1100	45.108	+5.0 to -5.0

- A. Test the Interconnect Interturbine Temperature (ITT) System (Refer to Figure 501).

NOTE: Let the junctions in the ice bath become stable for 5 minutes before any test.

- (1) Make sure that the ITT harness and the TT5 trim harness are disconnected from the system.

NOTE: A large terminal is designated for the alumel connector.

- (2) Adjust the applied millivolt source for each test point of the calibration data. Make sure that the temperature indication is in the range of the specified tolerance for each test point. Refer to Table 501.

- (a) If the ITT indication does not agree with the applied millivolt input, do the following:

- 1 Examine the connectors and wiring between the thermocouple harness connector and the ITT indicator. Make sure that the wiring is clean, there is proper contact, and there is correct alumel/chromel pin arrangement.
- 2 Examine the interconnect ITT indicator.

NOTE: Let the junctions in the ice bath become stable for 5 minutes before any test.

- a Adjust the applied millivolt source to 0.00 mV output and apply power to the unit. Let the unit become warm and stable for approximately one minute.
 - b Use the calibration data to make an analysis of the indicator operation when the applied millivolt source is adjusted for each test point. Refer to Table 501.
- (b) If the ITT indicator agrees with the millivolt input, but the indication during the engine operation is incorrect, refer to the Pratt & Whitney Maintenance Manual for ITT Thermocouple and Thermocouple Harness Inspection Procedure.

3. Interturbine Temperature Indicator Bench Test

- A. Bench Test the ITT Indicator with the TT1000A Tester (Refer to Figure 504).

CAUTION: Approximately 45 VDC no-load is present on the test leads during resistance measurements. Let the test leads reach ambient temperature before any test.

- (1) Remove the ITT indicator from the airplane. Refer to Chapter 77, Interturbine Temperature Indicator - Adjustment/Test.
- (2) Connect the test harness to the indicator.
- (3) Complete the TT1000A self test before you connect the test set to the indicator.
 - (a) With the test set leads disconnected, set the RESISTANCE RANGE switch to the BATT position.
 - (b) Set the FUNCTION switch to RESISTANCE MEASURE.
 - (c) Set the power switch to ON and make sure that the display shows 30 VDC to 50 VDC.

- (4) Set the FUNCTION SWITCH to INDICATOR TEST.
- (5) Set the RESISTANCE RANGE switch to 2M ohms (0 ohm resistance).
- (6) Connect the black clip (-) of TT1000A lead to the alumel wire connected to pin B on indicator.
- (7) Connect the red clip (+) of the TT1000A lead to the chromel wire connected to pin A on the indicator.
- (8) Turn the TEMP ADJ knob on TT1000A until the tester display matches the test points, and make sure that the indicator display is in the range of the specified tolerance for each test point. Refer to Table 501.
 - (a) If the indicator does not agree with the TT1000A input, make sure that the harness is clean, there is proper contact, and there is correct alumel/chromel pin arrangement.
 - 1 Do a test to make sure that the indicator does not agree with the TT1000A input.
 - (b) If the indicator agrees with the TT1000A, examine the airplane wiring between the engine thermocouple harness connector and the ITT indicator. Make sure that the wiring is clean, there is proper contact, and there is correct alumel/chromel pin arrangement.
 - 1 Examine the ITT thermocouple and the thermocouple harness. Refer to Pratt & Whitney Maintenance Manual procedure.
- (9) Disconnect the test harness from the ITT indicator.
- (10) Install the ITT indicator in the airplane. Refer to Chapter 77, Interturbine Temperature Indicator - Maintenance Practices.

B. Bench Test the ITT Indicator with the TT1200 Tester (Refer to Figure 505).

CAUTION: Approximately 45 VDC no-load is present on the test leads during resistance measurements. Let the test leads reach ambient temperature before any test.

- (1) Remove the ITT indicator from the airplane. Refer to Chapter 77, Interturbine Temperature Indicator - Maintenance Practices.
- (2) Connect the test harness to the indicator.
- (3) Complete the TT1200 self test before you connect the test set to the indicator.
 - (a) Set the FUNCTION switch to RES MEAS.
 - (b) Set the RANGE switch to 2M ohms and touch the test lead clips together.
 - (c) Push the PTM button. If BAT is shown, replace the batteries.
- (4) Set the FUNCTION switch to IND TEST.
- (5) Set the RANGE switch to 2M ohms position (0 ohm system resistance).
- (6) Put the 1%/1° switch to either the 1° or .1° position.
- (7) Set the °C/MV switch to °C or MV.
- (8) Connect the black clip (-) of the TT1200 lead to the alumel wire connected to pin B on the indicator.
- (9) Connect the red clip (+) of the TT1200 lead to the chromel wire connected to pin A on the indicator.
- (10) Turn the TEMP ADJ knob on the TT1200 tester until the display matches the test points. If necessary, turn the FINE knob to get the exact adjustment, and make sure that the indicator display is in the range of the specified tolerance for each test point. Refer to Table 501.
 - (a) If the indicator does not agree with the TT1200 input, make sure that the harness is clean, there is proper contact, and there is correct alumel/chromel pin arrangement.
 - 1 Do a test to make sure that the indicator does not agree with the TT1200 input.
 - (b) If the indicator matches the TT1200, examine the airplane wiring between the engine thermocouple harness connector and the ITT indicator. Make sure that the wiring is clean, there is proper contact, and there is correct alumel/chromel pin arrangement.
 - 1 Examine the ITT thermocouple and the thermocouple harness. Refer to Pratt & Whitney Maintenance Manual procedure.
- (11) Disconnect the test harness from the ITT indicator.
- (12) Install the ITT indicator in the airplane. Refer to Chapter 77, Interturbine Temperature Indicator - Maintenance Practices.

4. Interturbine Temperature Indicator Airplane Check

A. Check the ITT Indicator with the TT1000A Tester.

CAUTION: Approximately 45 VDC no-load is present on the test leads during resistance measurements. Let the test leads reach ambient temperature before any test.

- (1) Complete the TT1000A self test before you connect the test set to the indicator.
 - (a) With the test set leads disconnected, set the RESISTANCE RANGE switch to the BATT position.
- (2) Set the FUNCTION switch to INDICATOR TEST.
- (3) Set the power switch to ON. The display should show 30 VDC to 50 VDC.
- (4) Set the FUNCTION switch to RESISTANCE MEASURE.
- (5) Set the RESISTANCE RANGE switch to 2M ohms position (0 ohm system resistance).
- (6) Disconnect the airplane ITT gage thermocouple wires from the engine ITT harness and the TT5 trim harness.

NOTE: The terminals are marked on the engine side of the connection for the alumel/chromel identification.

- (7) Connect the black clip (-) of the TT1000A lead to the alumel wire connected to pin "B" on the indicator.
- (8) Connect the red clip (+) of the TT1000A lead to the chromel wire connected to pin "A" on the indicator.
- (9) Apply airplane power to the ITT indicator.
- (10) Push the TT1000A tester power button to ON.
- (11) Turn the TEMP ADJ knob on TT1000A until the tester display matches the test points, and make sure that the ITT indicator display is in the range of the specified tolerance for each test point. Refer to Table 501.
 - (a) If the indicator does not agree with the TT1000A input, make sure that the airplane harness is clean, there is proper contact, and there is correct alumel/chromel pin arrangement.
 - 1 Do a test to make sure that the indicator does not agree with the TT1000A input.
 - (b) If the TT1000A and the indicator agree, examine the ITT thermocouple and the thermocouple harness. Refer to Pratt & Whitney Maintenance Manual procedure.

B. Check the ITT Indicator with the TT1200 Tester.

CAUTION: Approximately 45 VDC no-load is present on the test leads during resistance measurements. Let the test leads reach ambient temperature before any test.

- (1) Complete the TT1000A self test before you connect the test set to the indicator.
- (2) Set the FUNCTION switch to RES MEAS.
- (3) Set the RANGE switch to 2M ohms and touch the test lead clips together.
- (4) Push the PTM button. If BAT is shown, replace the batteries.
- (5) Set the FUNCTION switch to IND TEST.
- (6) Set the RANGE switch to 2M ohms (0 ohm system resistance).
- (7) Set the 1%.1° switch to 1° or .1°.
- (8) Set the °C/MV switch to °C or MV.
- (9) Disconnect the airplane ITT gage thermocouple wires from the engine ITT harness and the TT5 trim harness.

NOTE: The terminals are marked on the engine side of the connection for the alumel/chromel identification.

- (10) Connect the black clip (-) of the TT1200 lead to the alumel wire connected to pin "B" on the indicator.
- (11) Connect the red clip (+) of the TT1200 lead to the chromel wire connected to pin "A" on indicator.
- (12) Apply airplane power to the ITT indicator.
- (13) Push the TT1200 tester button to ON.
- (14) Turn the TEMP ADJ knob on the TT1200 tester until the display matches the test points. If necessary, turn the FINE knob to get the exact adjustment, and make sure that the ITT indicator display is in the range of the specified tolerance for each test point. Refer to Table 501.
 - (a) If the indicator does not agree with the TT1200 input, make sure that the harness is clean, there is proper

contact, and there is correct alumel/chromel pin arrangement.

- 1 Do a test to make sure that the indicator does not agree with the TT1200 input.
- (b) If the TT1200 and the indicator agree, examine the ITT thermocouple and the thermocouple harness. Refer to Pratt & Whitney Maintenance Manual procedure.

5. Insulation Check.

- A. Check the Insulation with the TT1000A Tester (Refer to Figure 506).

CAUTION: Approximately 45 VDC no-load is present on the test leads during resistance measurements. Let the test leads reach ambient temperature before any test.

- (1) Disconnect the airplane ITT harness from the engine ITT and the TT5 trim harness.
- (2) Disconnect the connector from the ITT indicator.
- (3) Connect the black clip (-) of the TT1000A to airframe ground.
- (4) Connect the red clip (+) of the TT1000A to the alumel wire connected to pin B of the ITT connector.
- (5) Set the RESISTANCE RANGE switch to 2M ohms.
- (6) Set the FUNCTION switch to RESISTANCE MEASURE.
- (7) Set the power switch to ON.
- (8) Push the PUSH TO MEASURE button (black) and make sure that the indication is greater than 1 MEG ohm.
- (9) Set the power switch to OFF.
- (10) Connect the red clip (+) of the TT1000A to the chromel wire connected to pin A of the ITT connector.
- (11) Set the RESISTANCE RANGE switch to 2M ohms.
- (12) Set the FUNCTION switch to RESISTANCE MEASURE.
- (13) Set the power switch to ON.
- (14) Push the PUSH TO MEASURE button (black) and make sure that the indication is greater than 1 MEG ohm.
- (15) Set the power switch to OFF.
- (16) Connect the airplane ITT harness to the engine ITT and the TT5 harness.
- (17) Install the connector on the ITT indicator.

- B. Check the Insulation with the TT1200 Tester.

CAUTION: Approximately 45 VDC no-load is present on the test leads during resistance measurements. Let the test leads reach ambient temperature before any test.

- (1) Disconnect the airplane ITT harness from the engine ITT and the TT5 trim harness.
- (2) Disconnect the connector from the ITT indicator.
- (3) Connect the black clip (-) of the TT1200 to airframe ground.
- (4) Connect the red clip (+) of the TT1200 to the alumel wire connected to pin B of the ITT connector.
- (5) Set the FUNCTION switch to INS MEAS.
- (6) Set the RANGE switch to 2M ohms.

NOTE: The position of the 1%.1° and °C/MV switches are irrelevant.

- (7) Set the power switch to ON.
- (8) Push the PTM button (black) and make sure that the indication is greater than 1 MEG ohm.
- (9) Set the power switch to OFF.
- (10) Connect the red clip of the TT1200 to the chromel wire connected to pin A of the ITT connector.
- (11) Set the FUNCTION switch to INS MEAS.
- (12) Set the RANGE switch to 2M ohms.

NOTE: The position of the 1%.1° and °C/MV switches are irrelevant.

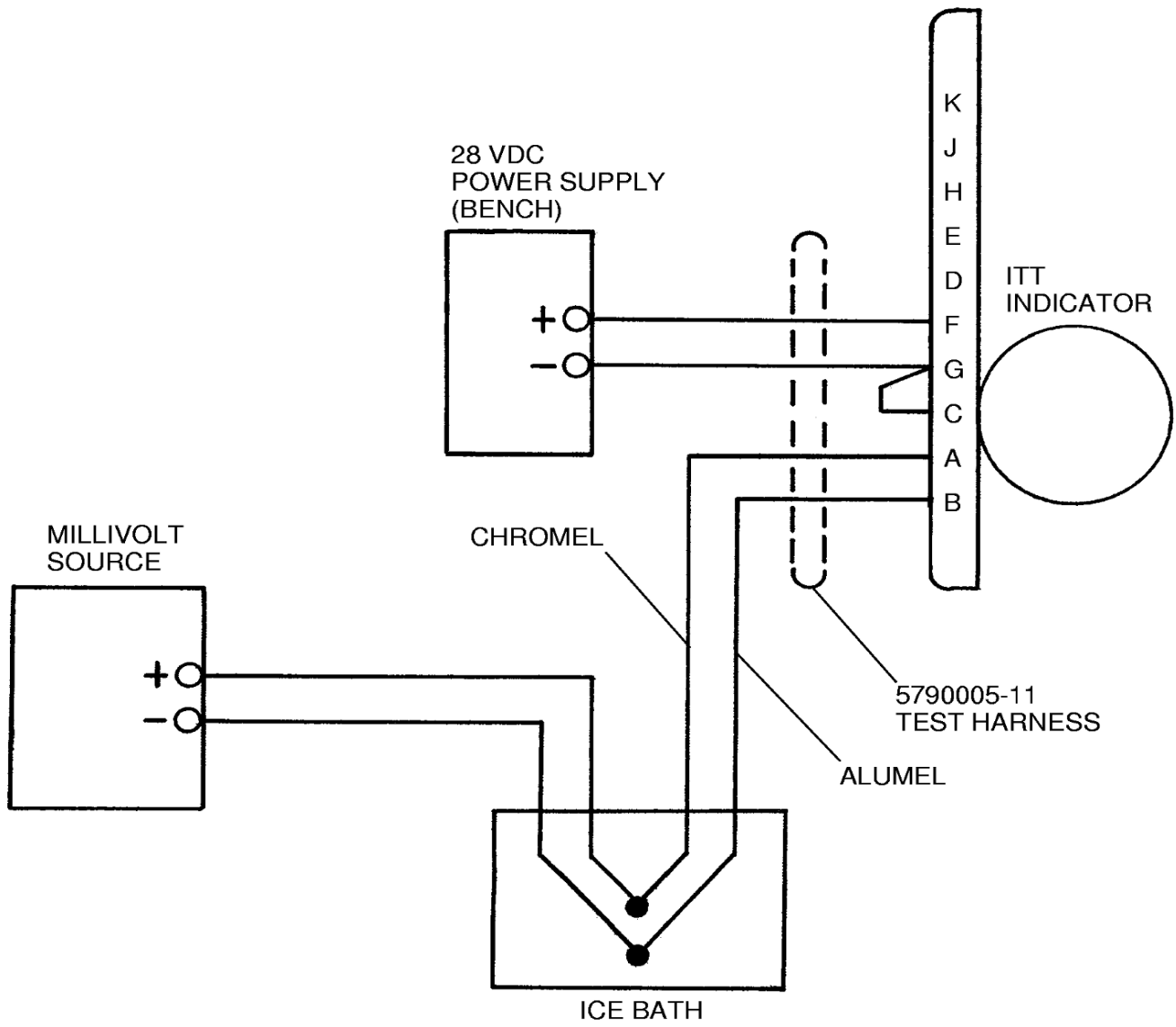
- (13) Set the power switch to ON.
- (14) Push the PTM button (black) and make sure that the indication is greater than 1 MEG ohm.
- (15) Set the power switch to OFF.

(16) Connect the airplane ITT harness to the engine ITT and the TT5 harness.

(17) Install the connector on the ITT indicator.

Figure 501 : Sheet 1 : ITT Indicator Functional Test

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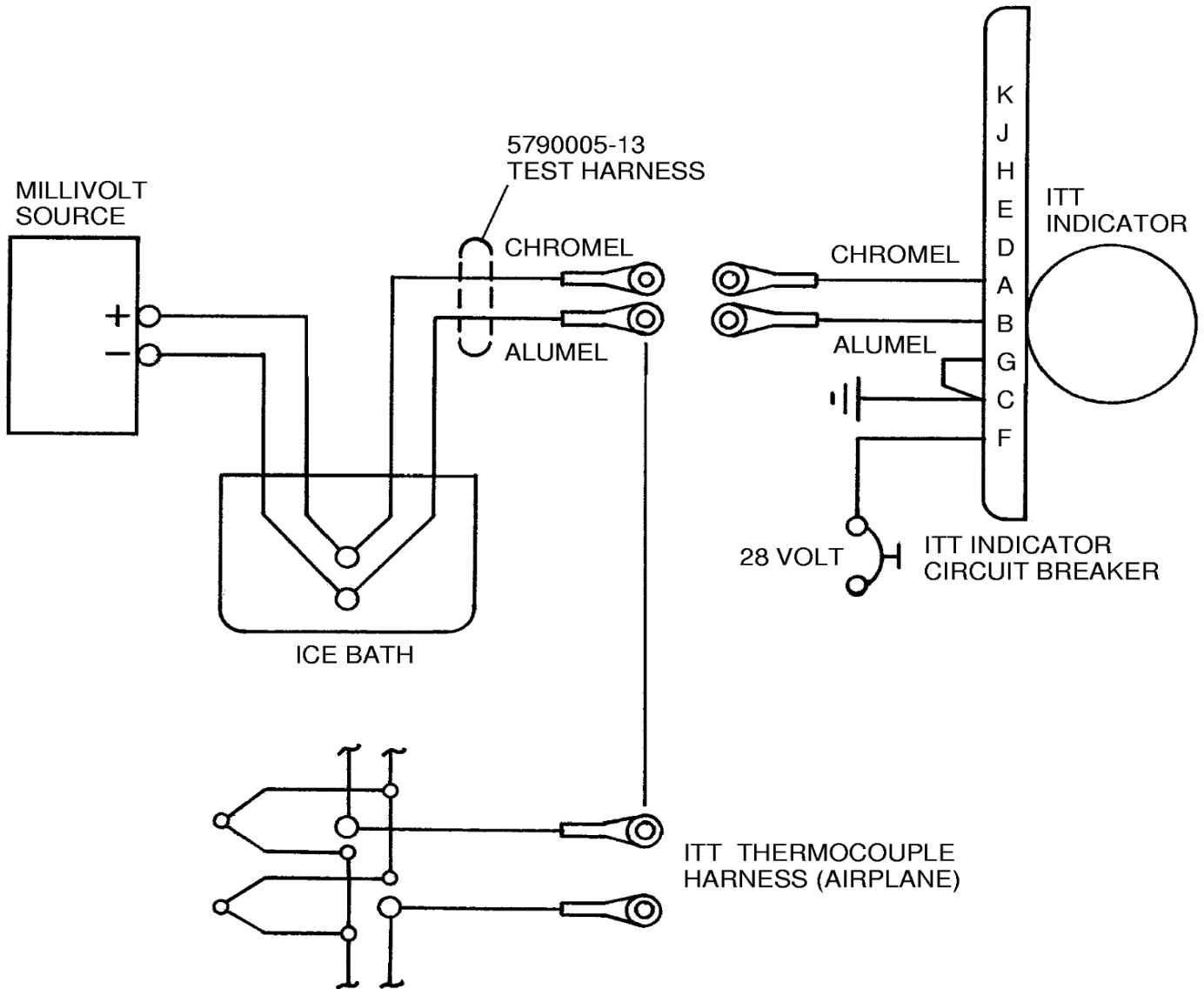


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Figure 502 : Sheet 1 : ITT System Functional Test

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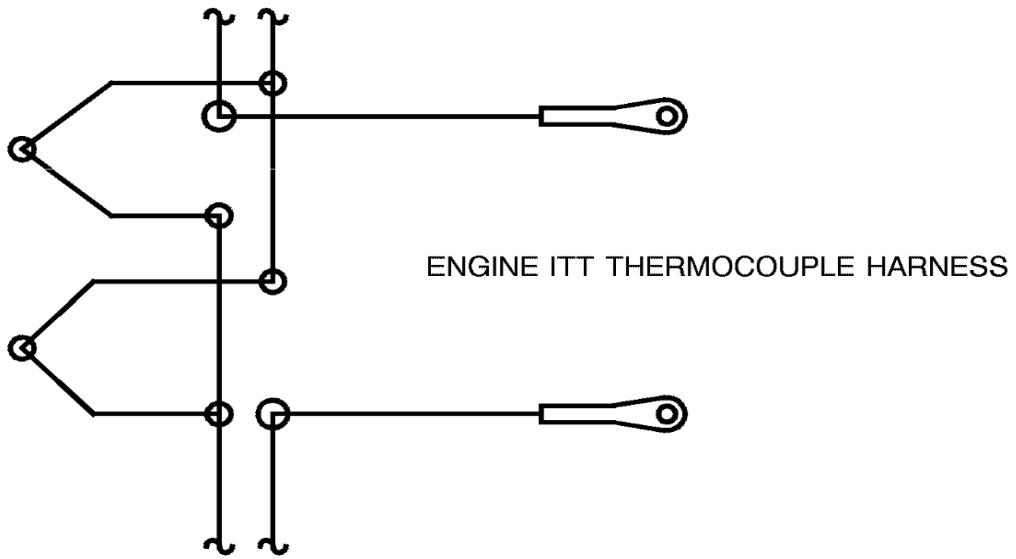
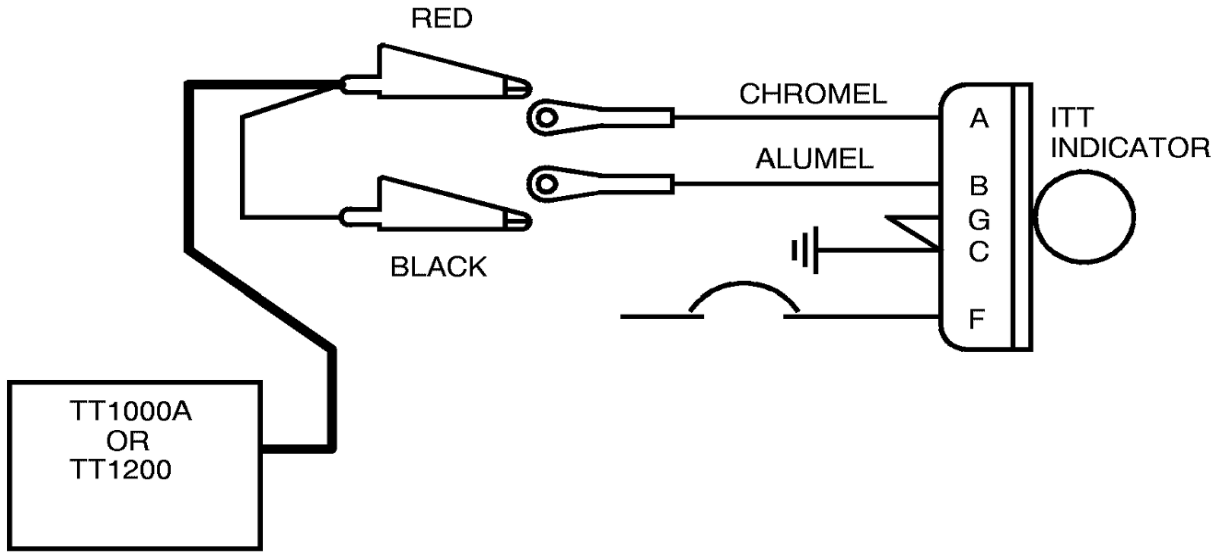
NOTE: ALL WIRING NOT DESIGNATED AS TEST HARNESS IS EXISTING AIRCRAFT WIRING



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Figure 503 : Sheet 1 : Bench Test Connections

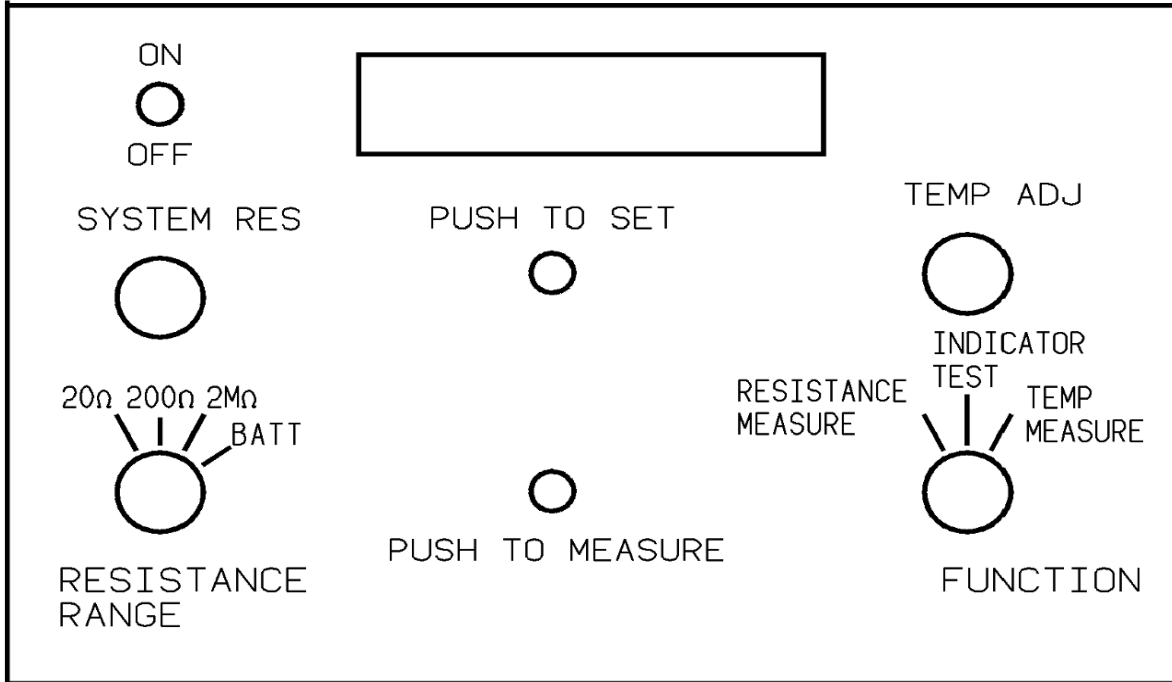
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Figure 504 : Sheet 1 : TT1000A Barfield Test Set

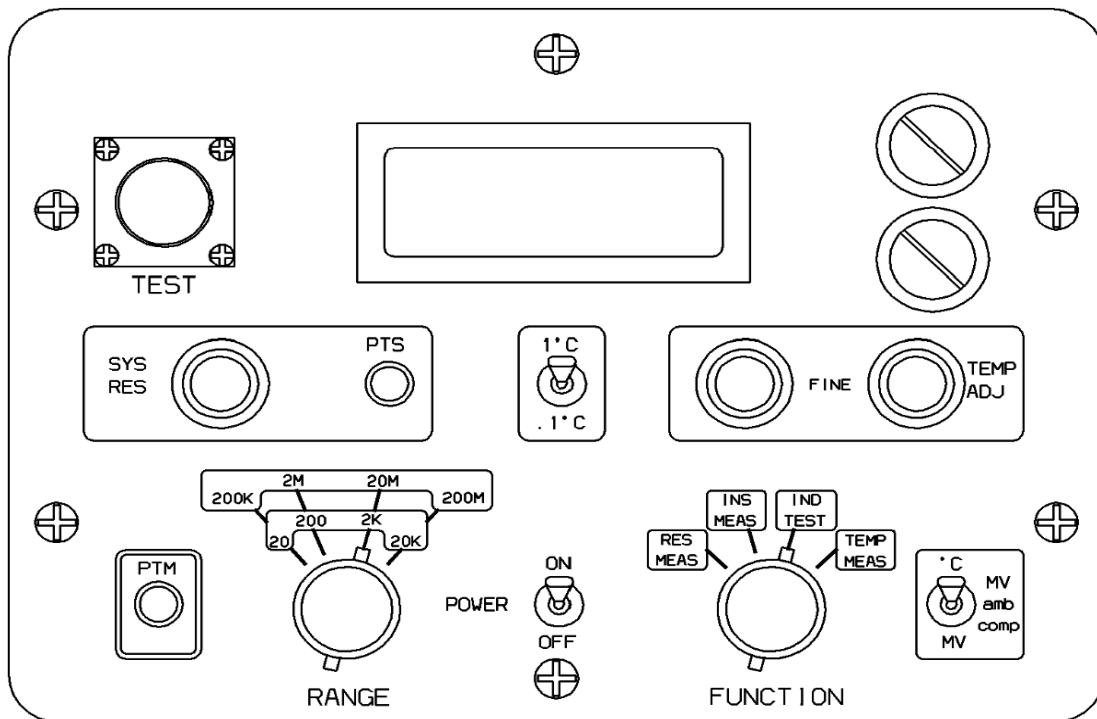
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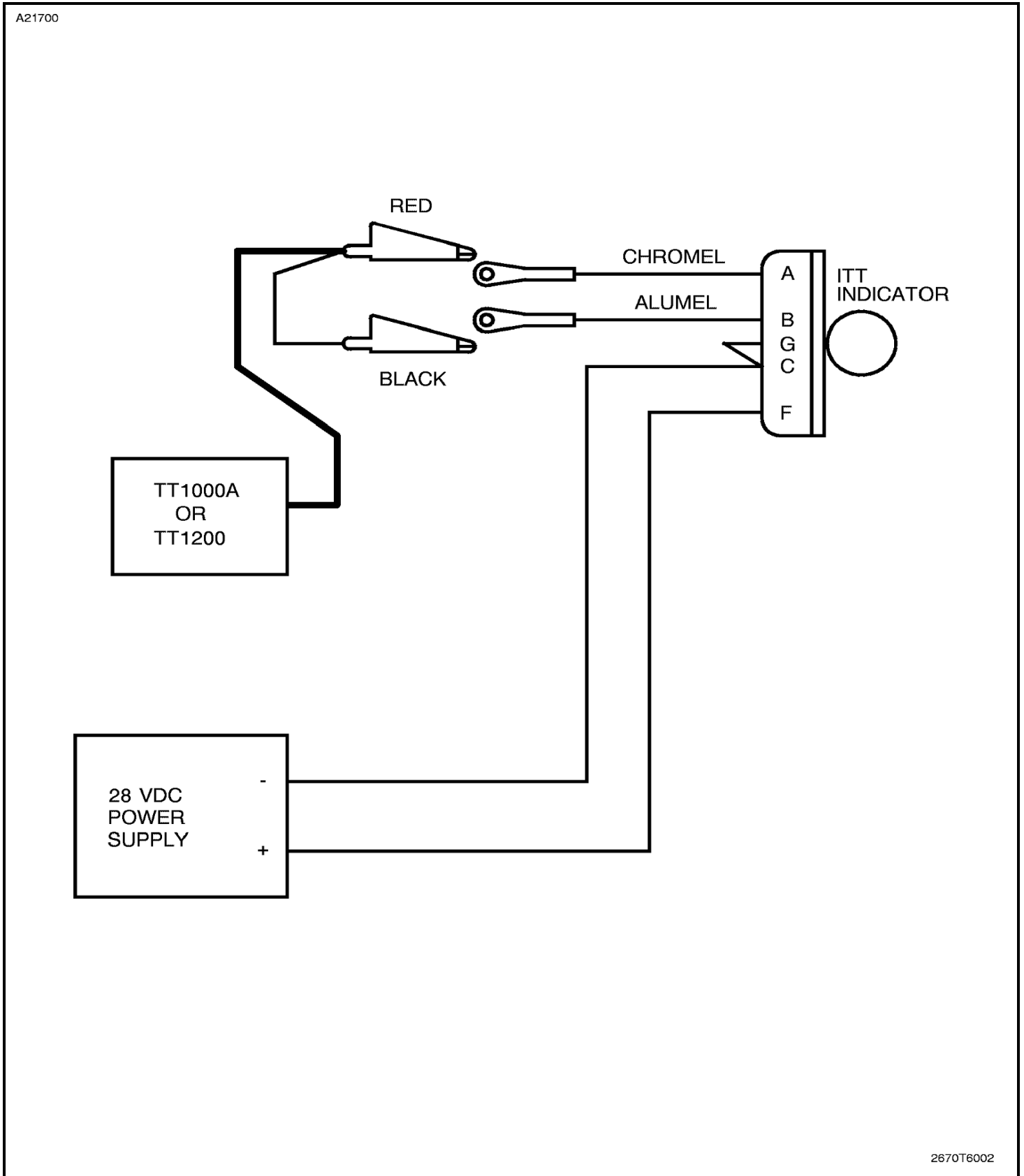
Figure 505 : Sheet 1 : TT1200 Barfield Test Set

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Figure 506 : Sheet 1 : ITT Functional Test with TT1000A or TT1200 Barfield Test Set



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