

TESTING AND FAULT ISOLATION

TASK 36-20-01-700-801-A01  
Testing and Fault Isolation

A. Equipment required

(1) Test requirements

(a) The test must be performed at atmospheric pressure and ambient temperature. The hydrometrical level shall be less than 90% RH.

(b) Instrumentation

TABLE 1/TABLE 36-20-01-992-001-A01  
 PRECISION TOOLS

SYMBOL	MEASUREMENT	RANGE	PRECISION	SUPPLIER
-	3 wires ohmmeter	0-700 Ohm	0.1%	Local Purchaser
-	Megaohmmeter	0-10000 Megohm	5%	Local Purchaser
-	Temperature probe	0-120°C	±0.05°C	Local Purchaser
-	Barometer		1 mmHG	Local Purchaser

TABLE 2/TABLE 36-20-01-992-002-A01  
 OTHER TOOLS

SYMBOL	DESCRIPTION	SUPPLIER
-	3 wires cable equipped with connector as per MIL C5015 10-SL3-SN	Local Purchaser
-	Thematically controlled bath	Local Purchaser
-	Hypsometer	Local Purchaser
-	Dewar vase	Local Purchaser
-	Hot air gun	Local Purchaser
-	Tool 15031	Auxitrol
-	Thermal Recorder	SEFRAM
-	Hermetically cap T14953	Auxitrol

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B. Preliminary checks

(1) Check the condition of the sensor. Refer to chapter INSPECTION/CHECK.

C. Testing

Subtask 36-20-01-750-001-A01

(1) Insulation test

- (a) Install the megaohmmeter between the pins A, B and C (connected together) and the probe body.
- (b) Apply a voltage of 100 VDC during 1 minute.
- (c) Check the resistance value is greater than 100 megaohm.
- (d) If not replace the sensor.

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(2) Calibration of the sensor.

(a) Calibration at temperature of 0°C

- 1 Measure the resistance of the sensing element using the ohmmeter.
- 2 Perform this measurement at temperature of 0°C (32°F) with the sensor body fully immersed into the calibrated environment (Dewar Vase).
- 3 Maintain the sensor in the calibrated environment until the ohmmeter reading stabilises.
- 4 Note the exact fluid temperature in the calibrated environment. Note the measured resistance.
- 5 Record the value and check that the corrected resistance is between the following minimum and maximum tolerance:  
  
99.7 Ohm < R < 100.4 Ohm
- 6 If not replace the sensor.

(b) Calibration at temperature of 100°C (212°F)

1 Measure the resistance of the sensing element using the ohmmeter.

2 Perform this measurement at temperature of 100°C (212°F) with the sensor body fully immersed into the calibrated environment (Hypsometer).

3 Maintain the sensor in the calibrated environment until the ohmmeter reading stabilises.

4 Note the exact fluid temperature in the calibrated environment. Note the measured resistance.

5 Note the atmospheric pressure. If atmospheric pressure is greater than 14.70 psi add absolute value given in table 3. In the other case subtract absolute value.

6 Record the value and check that the corrected resistance is between the following minimum and maximum tolerance:

$$138.1 \text{ Ohm} < R < 138.9 \text{ Ohm}$$

7 If not replace the sensor.

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ATMOSPHERIC PRESSURE		CORRECTION
in Kpa	in PSI	in Ohm
97.28	14.11	-2.135
97.42	14.13	-2.060
97.56	14.15	-1.990
97.70	14.17	-1.915
97.84	14.19	-1.845
97.97	14.21	-1.770
98.11	14.23	-1.700
98.25	14.25	-1.630
98.39	14.27	-1.555
98.52	14.29	-1.485
98.66	14.31	-1.415
98.80	14.33	-1.340
98.94	14.35	-1.270
99.08	14.37	-1.200
99.21	14.39	-1.130
99.35	14.41	-1.055
99.45	14.43	-0.985
99.56	14.44	-0.915
99.70	14.46	-0.845
99.83	14.48	-0.775
99.97	14.50	-0.705

ATMOSPHERIC PRESSURE		CORRECTION
in KPa	in PSI	in Ohm
100.11	14.52	-0.630
100.25	14.54	-0.560
100.39	14.56	-0.490
100.53	14.58	-0.420
100.66	14.60	-0.350
100.80	14.62	-0.280
100.94	14.64	-0.210
101.08	14.66	-0.140
101.21	14.68	-0.070
101.35	14.70	0.000
101.49	14.72	0.070
101.56	14.73	0.140
101.70	14.75	0.210
101.84	14.77	0.280
101.97	14.79	0.350
102.11	14.81	0.420
102.25	14.83	0.490
102.39	14.85	0.555
102.53	14.87	0.625
102.66	14.89	0.695

RESISTANCE CORRECTION FOLLOWING ATMOSPHERIC PRESSURE  
 Table 3/Table 36-20-01-992-003-A01

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(2) Hermeticity test.

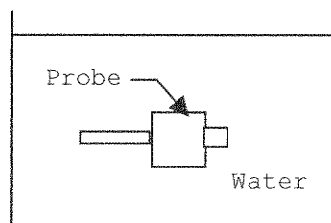
(a) The test consists in immersing the probe in demineralized water to make sure that the sensing element is fully sealed.

(b) The procedure is as follow:

1 Plug the connector probe with the hermetically cap T14953.

2 Take a clean receptacle capable of containing the full probe and fill it with hot demineralized water. The water temperature should be approximately 176°F (80°C).

3 Immerse the complete probe for 20 minutes as per figure 3.



Hermeticity Test Installation  
FIGURE 3/GRAPHIC 36-20-01-991-003-A01

4 Remove the probe from the water and remove any water droplets using a hot air gun.

NOTA: Hot temperature may damage connector. Use the hot air gun with a maximum temperature of 392°F (200°C).

WARNING: USING HOT AIR GUN MAY CAUSE BURNS.  
AVOID CONTACT WITH SKIN OR EYES.

5 Measure the insulation resistance as paragraph C (1) and with the same criteria.

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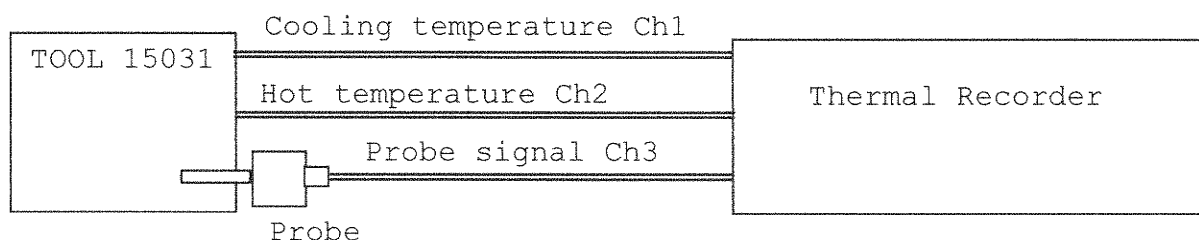
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(2) Climatic test.

(a) The test consists in cycling the probe in hot air at 842°F (450°C) to make sure the sensing element is conform.

(b) The procedure is as follow:

1 Install the probe on Tool 15031 as per figure 4.



Climatic Test

FIGURE 4/GRAPHIC 36-20-01-991-004-A01

2 Thermal recorder parameters

Channel 1: Type thk cmp  
Caliber: 500.0°C  
Center: 0.000°C  
Function: without  
From -250°C  
To: 250°C  
Filter: 1 Hz

Channel 2: Type thk cmp  
Caliber: 500.0°C  
Center: 250.0°C  
Function: without  
From: 0.000°C  
To: 500°C  
Filter: 1Hz

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Channel 3: Type tension  
Caliber: 200.0 mV  
Center: 200.0 mV  
Function: without  
From: 100.0 mV  
To: 300.0 mV  
Filter: 1Hz

Drawing: Mode: f(t)  
Speed: 5 mm/mn  
External channel: without  
Format: 1x250 mm  
Reticle: 5mm large  
Note: without

- 3 Reset and switch on Tool 15031.
- 4 Examine carefully the records of the output signals of the temperature Ch 1 and temperature Ch 2.
  - a Check the output signals are regular.
  - b If not, begin again the test.
- 5 Examine carefully the records of the output signal of the probe.
  - a Check the output signal of the probe is regular and with no discontinuity.
  - b If not replace the probe.
- 6 Calibrate the sensor as per paragraph (2).  
Record the values.
- 7 Check the difference between the two records at 0°C is less than 0.12 Ohm and less than 0.30 ohm at 100°C.
- 8 If not replace the probe.