GLOBAL Aircraft Leak Detection Elements Troubleshooting

Leak Detection Elements (LDE) Insulation Resistance Verification

To troubleshoot LDE insulation integrity, measure the insulation resistance between the center conductor and its outer sheath.

There are two ways to measure the insulation between the LDE inner conductor and outer sheath. The method to be used will be determined by the type of test equipment used.

1. LCR meter method - measure the insulation resistance using an approved LCR Meter (ref: Illustrated Tools and Equipment Manual). The LCR meter must be adjusted to a test frequency of 1 Kilo Hertz and 1 Vac (ref: user manual). The LDE measurement is performed using the "R" function of the LCR meter. "R" is the symbol for resistance in Ohms.
2. TEGAM meter method - measure the conductance using a TEGAM meter (ref: Illustrated Tools and Equipment Manual). With the TEGAM meter, the test frequency and voltage is preset. Therefore no specific adjustment is required. The LDE measurement is performed using the "G" function. If the reading is fluctuating, use the average value as a measurement result. "G" is the symbol for conductance in Siemens.

CAUTION: It is not permitted to use a Megger (Mega-ohmmeter) to verify LDE (loops). Permanent damage can occur to the loops.

To perform insulation check of the LDE, connect the test meter between center conductor and outer sheath as shown in Fig 1.

The insulation check can be performed from a connector. If we use MT94 (in Fig 2) as an example, we can connect the meter at P442 and measure between pin 6 and 11. This is possible because pin 11 is connected to MT94 outer sheath via the shield and pin 6 is connected to pin A of MT94. Refer to the applicable Troubleshooting instruction sheet for the expected values.

Siemens & Ohms

The relationship between Siemens & Ohms when measuring conductance is as follows:

Resistance (ohms) = **1 / conductance (siemens)** (Siemens)

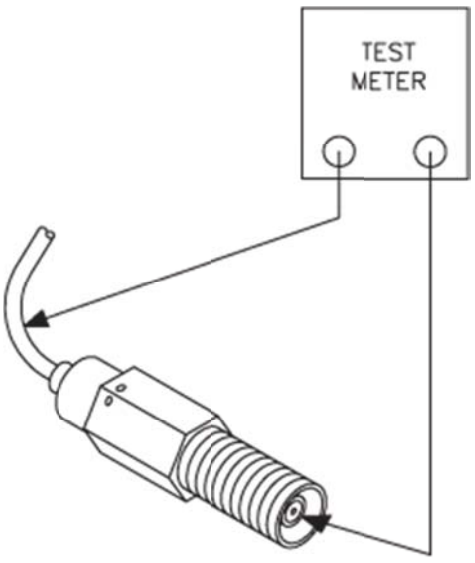

Fig 1. Insulation Check Setup

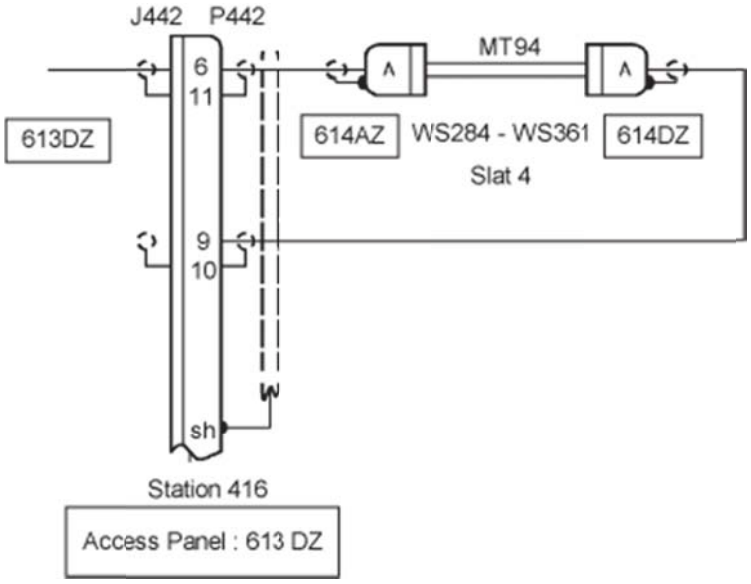

Fig 2. Sample Loop Schematics

LDE Linear Resistance Check

To perform a linear resistance check of a leak detection element, use any approved meter in resistance 'R' mode (ohms). Connect the test meter to measure the linear resistance as shown in Fig 3.

To measure the linear resistance of MT94 (in Fig 2) as an example, connect the test meter to P442 between pin 6 and 9.

Refer to the applicable Troubleshooting instruction sheet for the expected values.

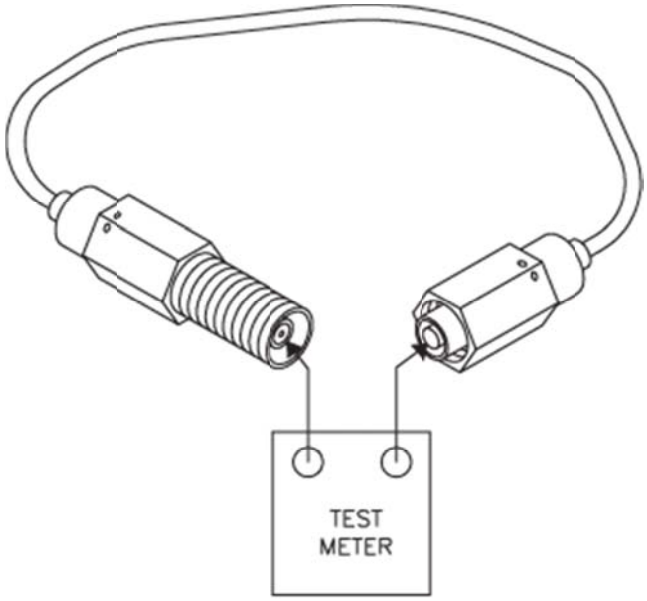

Fig 3. Resistance Test Setup

Troubleshooting Tips:

If a failure condition is present only with Bleed Air or Wing Anti-Ice applied, then the affected system can be operated on the ground without restriction for troubleshooting purposes. This is possible on the Wing Anti-Ice system in the Global aircraft, because the wing temperature is auto regulated by the system and is therefore protects the structure from any possible overheat condition. When a failure condition is temperature related, operate the system on the ground and try to duplicate the condition(s).