

## FUEL FLOW TRANSDUCER TEST

Each succeeding step assumes the previous step(s) passed. Record the readings and/or results of these tests. FAX them back to us at 360-714-8253, along with your name, address and phone/fax numbers. We will get back to you as soon as possible.

1. Check that wires are correctly installed into DPU and have not broken or come loose. Inspect closely because a wire that has just broken may not be easy to detect. Give the wire a gentle pull to insure it is connected. Insure that wire is not touching adjacent wires or DPU case.

2. Repeat this inspection at the transducer end of the cable.

3. Measure continuity of each wire from transducer terminals to appropriate DPU terminal block screw. There should be very low resistance if the wire is intact. If resistance is greater than 0.7 ohms, then stop and correct connections.

Resistances = (WHT) \_\_\_\_\_, (RED) \_\_\_\_\_, (BLK) \_\_\_\_\_.

4. Measure resistance between the WHT and BLK wires. (s/b approx = 5100 ohms). Resistance = \_\_\_\_\_

5. Measure resistance between the WHT and RED wires. (s/b approx = 4700 ohms). Resistance = \_\_\_\_\_

6. With power applied to instrument system, perform the following DC voltage tests at the transducer:

a. BLK (meter com) to RED (meter +) (s/b = 5.00 VDC). = \_\_\_\_\_

b. BLK (meter com) to WHT (meter +) (s/b > 0.30 VDC). = \_\_\_\_\_

Leaving meter connected as 'b' pump a steady uninterrupted stream of fuel flow through the transducer into a container. This should produce an AC voltage at the BLK and WHT wires of greater than 1.0 VAC. = \_\_\_\_\_

If any test fails the transducer needs to be sent in for evaluation under the terms of the warranty.  
Your options are:

1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement.  
This is what we recommend.

2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

**Your warranty registration needs to be completed and on file with VMS. This is located in your manual.**

## OIL OR FUEL PRESSURE TROUBLESHOOTING GUIDE

Each succeeding step assumes the previous step(s) passed. Record the readings and/or results of these tests. FAX them back to us at 360-714-8253, along with your name, address and phone/fax numbers. We will get back to you as soon as possible.

1. Check that wires are correctly installed into DPU and have not broken or come loose. Inspect closely because a wire that has just broken may not be easy to detect. Give the wire a gentle pull to insure it is connected. Insure that wire is not touching adjacent wires or DPU case.

2. Repeat this inspection at the transducer end of the cable.

3. Measure continuity of each wire from transducer terminals to appropriate DPU terminal block screw. There should be very low resistance if the wire is intact. If resistance is greater than 0.7 ohms, then stop and correct connections.

Resistances = (WHT) \_\_\_\_\_, (GRN) \_\_\_\_\_, (RED) \_\_\_\_\_, (BLK) \_\_\_\_\_.

4. With power applied to instrument system, perform the following DC voltage tests at the transducer:

- a. BLK (meter com) to RED (meter +) = 5.00 VDC +/- 0.05 = \_\_\_\_\_
- b. BLK (meter com) to WHT (meter +) = 1.90 VDC +/- 0.20 = \_\_\_\_\_
- c. BLK (meter com) to GRN (meter +) = same as above = \_\_\_\_\_
- d. GRN (meter com) to WHT (meter +) = 0.00 VDC +/- 0.003 = \_\_\_\_\_

NOTE: The above assumes that the wires are CORRECTLY connected from the DPU to the pressure transducer. See manual to get correct connections under 'Fuel pressure Installation'.

With meter still connected as 'd' apply a known pressure to transducer. Calculate VDC for applied pressure using appropriate ratios as charted below.

OIL PRESSURE (100 psi max) = 0.0005 VDC / lb

INJC FUEL PRESSURE (50 psi max) = 0.001 VDC / lb.

CARB FUEL PRESSURE (15 psi max) = 0.0033 VDC / lb.

If any test fails the transducer needs to be sent in for evaluation under the terms of the warranty.

Your options are:

1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement. This is what we recommend

2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

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## AMPS SYSTEM TROUBLE SHOOTING GUIDE

Each succeeding step assumes the previous step(s) passed. Record the readings and/or results of these tests. FAX them back to us at 360-714-8253, along with your name, address and phone/fax numbers. We will get back to you as soon as possible.

1. Check that wires are correctly installed into DPU and have not broken or come loose. Inspect closely because a wire that has just broken may not be easy to detect. Give the wire a gentle pull to insure it is connected. Insure that wire is not touching adjacent wires or DPU case.

2. Repeat this inspection at the pressure transducer end of the cable.

3. Measure continuity of each wire from transducer terminals to appropriate DPU terminal block screw. There should be very low resistance if the wire is intact. If resistance is greater than 0.7 ohms, then stop and correct connections.

Resistances = (WHT) \_\_\_\_\_, (GRN) \_\_\_\_\_, (RED) \_\_\_\_\_, (BLK) \_\_\_\_\_.

4. Engine off, instruments on.

5. Measure at DPU with digital voltmeter. Readings should be steady.

a. RED J3-15 (Meter +) to BLK J3-16 (Meter com) (s/b = 10.0 VDC) = \_\_\_\_\_

b. GRN J3-13 (Meter +) BLK J3-16 (Meter com) (s/b = 10.0 VDC) = \_\_\_\_\_

c. WHT J3-14 (Meter +) BLK J3-16 (Meter com) (s/b = 5.0 VDC) = \_\_\_\_\_

6. Leave meter connected as in step '5 c.' A test can be done to see if amp sensor responds to current flow through it. Turn on a heavy load, such as the landing light and see below:

a. If your installation monitors 'BATTERY CHG / DISCHG' then the voltage between 'WHT & BLK' should **decrease** by approximately 0.036 volts per amp of current drawn from battery. Note: Engine is OFF during this test.

b. If your installation monitors 'ALTERNATOR OUTPUT LOAD' then the voltage between 'WHT & BLK' should **increase** by approximately 0.036 volts per amp of alternator current drawn by the load. Note: Engine must be running fast enough for alternator to produce current flow.

If any test fails the transducer needs to be sent in for evaluation under the terms of the warranty.

Your options are:

1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement. This is what we recommend

2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

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## OIL TEMPERATURE AND AIR TEMPERATURE TROUBLE SHOOTING GUIDE

Each succeeding step assumes the previous step(s) passed. Record the readings and/or results of these tests. FAX them back to us at 360-714-8253, along with your name, address and phone/fax numbers. We will get back to you as soon as possible.

1. Check that wires are correctly installed into DPU and have not broken or come loose. Inspect closely because a wire that has just broken may not be easy to detect. Give the wire a gentle pull to insure it is connected. Insure that wire is not touching adjacent wires or DPU case.
2. Repeat this inspection at the transducer end of the cable.
3. Measure continuity of each wire from transducer terminals to appropriate DPU terminal block screw. There should be very low resistance if the wire is intact. If resistance is greater than 0.7 ohms, then stop and correct connections.  
Resistances = (RED) \_\_\_\_\_, (BLK) \_\_\_\_\_.
4. Engine OFF, instruments ON, with approximate temperature at 70 deg F.
5. Measure at DPU with digital voltmeter on best range for measurement. Readings should be steady.

### OIL TEMP TESTS

- a. J4-1 (Meter +), J4-7 (Meter com) (s/b = 4.70 VDC) = \_\_\_\_\_
- b. J4-2 (Meter +), J4-7 (Meter com) (s/b = 98.9 mVDC) = \_\_\_\_\_

NOTE: A Oil Temp indicator reading of 26 means the probe is not delivering a signal to the DPU. The most common cause is an open connection, or a short in the cable causing the signal to be grounded.

### OAT TEMP TESTS

- a. J4-3 (Meter +), J4-7 (Meter com) (s/b = 4.70 VDC) = \_\_\_\_\_
- b. J4-4 (Meter +), J4-7 (Meter com) (s/b = 98.9 mVDC) = \_\_\_\_\_

NOTE: An OAT indicator reading of -50 means the probe is not delivering a signal to the DPU. The most common cause is an open connection, or a short in the cable causing the signal to be grounded.

### CAT TEMP TESTS

- a. J4-5 (Meter +), J4-7 (Meter com) (s/b = 4.70 VDC) = \_\_\_\_\_
- b. J4-6 (Meter +), J4-7 (Meter com) (s/b = 98.9 mVDC) = \_\_\_\_\_

NOTE: A CAT indicator reading of -50 means the probe is not delivering a signal to the DPU. The most common cause is an open connection, or a short in the cable causing the signal to be grounded.

Note: Readings will vary slightly for temperature different from 70 deg F.

If any test fails the transducer needs to be sent in for evaluation under the terms of the warranty.  
Your options are:

- 1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement. This is what we recommend
- 2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

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## EXHAUST GAS TEMP / CYLINDER HEAD TEMP TROUBLESHOOTING

EGT / CHT probes are thermocouple devices and typically are exposed to very hostile environments. The typical probe failure is the 'hot junction' (junction inside the tip of the probe) creating an open circuit. This cannot be field repaired and the probe needs to be replaced. EGT probes are more susceptible to this than CHT probes due to the smaller tip and more hostile temperature environment.

The EPI800 and VM1000 systems check for an open probe when the system is first turned on. A probe that does not pass the checks is displayed as 'Er' in the corresponding cylinder switch position(s) on the EPI800 system and as a blank bargraph(s) on the VM1000 system.

If a probe becomes intermittent or fails inflight, the reading may appear as a random fluctuation in temperature which can climb very high or dip very low. If this occurs, you can re-cycle power and the system will attempt to recheck the probes. Note that probe problems often begin as intermittents and can be elusive ! If the problem is constant, you have the best chance of identifying the errant probe(s), otherwise it may take some trial and error troubleshooting.

The following steps will help you troubleshoot the suspected probe(s):

1. With the engine off, turn power ON to the engine instruments. After a short period of time, the system will be running.
2. Scan all CHT and EGT positions for 'Er' (EPI800) or blank graph (VM1000). If all positions are 'Er' there is most likely a DPU fault and the troubleshooting process can be stopped and the factory contacted. If not, the probe circuit(s) may be open. Perform the following test sequence for each suspected probe:
  - a. Shut off power.
  - b. With digital meter, measure resistance between suspect probe(s) leads, while still connected, at proper DPU terminals. Resistance should be less than 10 ohms. \_\_\_\_\_
  - c. If yes, then record the resistance and contact the factory. \_\_\_\_\_
  - d. If not, then **CHECK ALL CONNECTION POINTS** for a clean secure connection. Because of the type of metals used in thermocouples, the leads can corrode and/or rust and must be scraped clean. Accomplish this and re-try from #1.
  - e. If the above step does not result in a solution, then the probe can be considered bad and no further troubleshooting is needed. Replace the probe.
  - f. Measure for resistance to aircraft ground bus from each probe lead. This resistance check should be made on the 2 meg ohm scale of the meter. This value should be greater than 1 meg ohm. If not then the probe should be replaced.

If any test fails the transducer needs to be sent in for evaluation under the terms of the warranty .  
Your options are:

- 1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement. This is what we recommend
- 2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

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## MANIFOLD PRESSURE TROUBLE SHOOTING GUIDE

Each succeeding step assumes the previous step(s) passed. Record the readings and/or results of these tests. FAX them back to us at 360-714-8253, along with your name, address and phone/fax numbers. We will get back to you as soon as possible.

1. Check that wires are correctly installed into DPU and have not broken or come loose. Inspect closely because a wire that has just broken may not be easy to detect. Give the wire a gentle pull to insure it is connected. Insure that wire is not touching adjacent wires or DPU case.

2. Repeat this inspection at the transducer end of the cable.

3. Measure continuity of each wire from transducer terminals to appropriate DPU terminal block screw. There should be very low resistance if the wire is intact. If resistance is greater than 0.7 ohms, then stop and correct connections.

Resistances = (WHT) \_\_\_\_\_, (GRN) \_\_\_\_\_, (RED) \_\_\_\_\_, (BLK) \_\_\_\_\_.

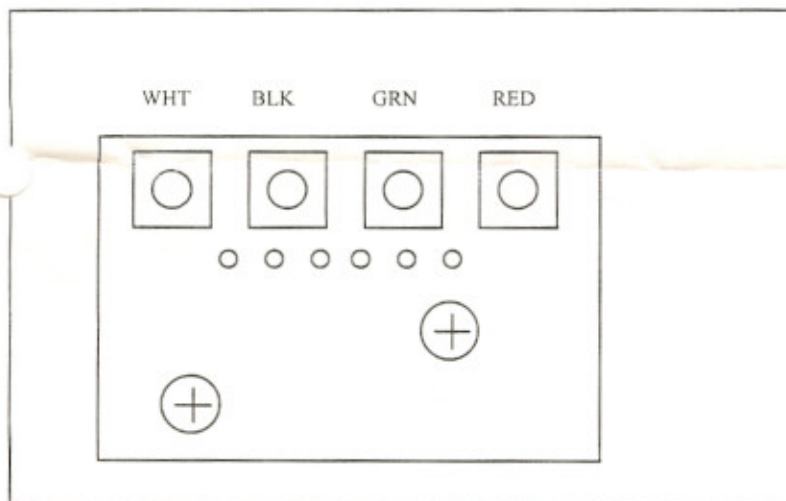
4. Engine off, instruments on.

5. Measure at DPU with digital voltmeter. Readings should be steady.

- a. WHT J3-9 (Meter +) BLK J3-12 (Meter com) (s/b = 2.50VDC) = \_\_\_\_\_
- b. GRN J3-10 (Meter +) BLK J3-12 (Meter com) (s/b = 2.45VDC) = \_\_\_\_\_
- c. RED J3-11 (Meter +) BLK J3-12 (Meter com) (s/b = 5.00VDC) = \_\_\_\_\_
- d. WHT J3-9 (Meter +) GRN J3-10 (Meter com) (s/b = 0.036VDC) = \_\_\_\_\_

Note: Steps a., b., c., may vary slightly if your altitude differs from sea-level.

Back View of transducer showing wire color connections for reference:



be sent in for evaluation under the terms of the warranty .

Your options are:

1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement. This is what we recommend.

2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

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## RPM TRANSDUCER TEST

Each succeeding step assumes the previous step(s) passed. Record the readings and/or results of these tests. FAX them back to us at 360-714-8253, along with your name, address and phone/fax numbers. We will get back to you as soon as possible.

1. Check that wires are correctly installed into DPU and have not broken or come loose. Inspect closely because a wire that has just broken may not be easy to detect. Give the wire a gentle pull to insure it is connected. Insure that wire is not touching adjacent wires or DPU case.

2. Repeat this inspection at the transducer end of the cable.

3. Measure continuity of each wire from transducer terminals to appropriate DPU terminal block screw. There should be very low resistance if the wire is intact. If resistance is greater than 0.7 ohms, then stop and correct connections.

Resistances = (WHT) \_\_\_\_\_, (RED) \_\_\_\_\_, (BLK) \_\_\_\_\_.

4. Measure resistance between the WHT and BLK wires. (s/b approx = 5100 to 6000 ohms) . Resistance = \_\_\_\_\_

5. Measure resistance between the WHT and RED wires. (s/b approx = 4500 to 5200 ohms). Resistance = \_\_\_\_\_

6. With power applied to instrument system, perform the following voltage tests at the DPU locations:

a. J4 -10 BLK (meter com) to J4-11 RED (meter +) (s/b = 5.00 VDC) . = \_\_\_\_\_

7. With engine running:

a. J4 -10 BLK (meter com) to J4-12 WHT (meter +) (s/b = 2.2 to 2.7 VDC) . = \_\_\_\_\_

b. J4 -10 BLK (meter com) to J4-12 WHT (meter +) (s/b = 2.5 to 3.3 VAC) . = \_\_\_\_\_

If any test fails the transducer needs to be sent in for evaluation under the terms of the warranty .

Your options are:

1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement.

This is what we recommend.

2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

**Your warranty registration needs to be completed and on file with VMS. This is located in your manual.**

## **FUEL LEVEL PROBE TRANSDUCER TEST**

Each succeeding step assumes the previous step(s) passed. Record the readings and/or results of these tests. FAX them back to us at 360-714-8253, along with your name, address and phone/fax numbers. We will get back to you as soon as possible.

1. Check that wires are correctly installed into EC100 or IO PCB and have not broken or come loose. Inspect closely because a wire that has just broken may not be easy to detect. Give the wire a gentle pull to insure it is connected. Insure that wire is not touching adjacent wires or case.

2. Repeat this inspection at the transducer end of the cable.

3. Using a high quality digital volt ohmmeter, measure continuity of each wire from transducer terminals to appropriate terminal block screw. There should be very low resistance if the wire is intact. If resistance is greater than 0.7 ohms, then stop and correct connections.

Resistances = (WHT) \_\_\_\_\_, (RED) \_\_\_\_\_, (BLK) \_\_\_\_\_.

4. With power applied to instrument system, perform the following DC voltage tests at the transducer wires:

- a. BLK (meter com) to RED (meter +) (s/b = 5.00 VDC) . = \_\_\_\_\_
- b. BLK (meter com) to WHT (meter +) (s/b > 1.9 VAC). = \_\_\_\_\_
- c. BLK (meter com) to WHT (meter +) (s/b 1.9 to 2.4 VDC). = \_\_\_\_\_

5. With probe disconnected from EC100 or IO PCB, measure resistance between probe wires as follows:

- a. BLK (meter com) and WHT (meter +) wires. (s/b approx 14500 ohms) . Resistance = \_\_\_\_\_
- b. BLK (meter com) and RED (meter +) wires. (s/b approx 9100 ohms) . Resistance = \_\_\_\_\_
- c. WHT (meter com) and RED (meter +) wires. (s/b approx 5500 ohms) . Resistance = \_\_\_\_\_

If any test fails the transducer needs to be sent in for evaluation under the terms of the warranty .

Your options are:

1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement. This is what we recommend.

2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

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## INDICATOR TROUBLESHOOTING

### DISPLAY BACKLIGHTING INOPERATIVE:

The backlighting power for the indicators originates in the DPU. A small inverter generates 0 to 80 volts AC depending on the amount of DC voltage applied to DPU J4 pin 16. Follow these steps to isolate the cause of the backlighting problem:

NOTE: All succeeding steps presume prior steps have passed.

#### If illumination is out on all indicators:

1. Verify dimmer power applied, DPU J4 pin 16 has the correct DC voltage (full brightness would be close to full battery voltage, measured with a voltmeter, from your dimmer system).
2. Listen to the DPU. A faint whine can be heard inside the DPU if the inverter is running. This test must be conducted in complete quiet and you must be within approximately 12 inches from DPU to hear it.
3. Shut off dimmer power and unplug the display cable from the DPU. Re apply dimmer power, and listen again for the whining tone. If it is not present, then the problem is in the DPU.
4. Shut off dimmer power and unplug ALL indicators from the display cable, Reconnect display cable to the DPU.
5. With dimmer control applying full power to DPU J4 pin 16, CAREFULLY connect ONE indicator to display cable on the connector closest to DPU (this eliminates breaks that may be in cable further away). If the indicator lights up, then the first connector position AND indicator lighting circuitry are functional. Test the remaining indicators on this display connector.

#### If only some indicators are illuminated :

6. Shut off power. Remove the indicators that do not work.
7. Take a known working indicator and test each of the different connector positions on the display cable. Be sure to turn on full dimmer power after plugging into each position. If certain positions test bad, then a new cable will have to be fabricated. If certain indicators test bad, contact us for assistance.

If any test fails, the component(s) need to be sent in for evaluation under the terms of the warranty .

Your options are:

- 1) Send the part to VMS and we will repair or replace it under the terms and conditions of the warranty agreement. This is what we recommend
- 2) If option #1 is not chosen, the customer may request a transducer be sent out. He then has 30 days to return his old transducer for evaluation. When the transducer comes in and if VMS determines it to be serviceable the customer will then have to purchase the transducer sent out under this option and he will receive his original back for a spare.

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