



MEMORANDUM OF RECORD

Eric Alleyne
Air Safety Investigator
National Transportation Safety Board
Office of Aviation Safety - Eastern
Region

NTSB Case Number: ERA18LA227

Subject: Insight Avionics Installation
manuals

Insight Avionics installation manuals were located on there website at
www.insightavionics.com, all information is available for public viewing.

may be installed to allow connection of a 7-pin cable to a 6-pin Vibration Sensor, or 7-pin connectors may be removed from service and new 6-pin connectors installed, consult Insight for details.

Aircraft with 24 Volt (28 Volt) electrical systems require a 750 Ohm resistor installed in series with the vibration sensors power supply wire.

The sensor should be mounted to an engine case bolt on the top of the engine as close to the propeller as practical. The sensor should be oriented with the nameplate up and the aircraft symbol pointing forward. The sensor may be oriented otherwise if the preferred mounting is impractical, please consult Insight technical support.

If the Vibration Sensor's Connector assembly is located so as to be subject to rain or other fluids, the connector assembly should be protected with liquid-resistant wrap or tubing suitable for location in the engine compartment.

Installing The Outside Air Temperature Probe

The GEM is supplementary for Outside Air Temperature. OAT probe must be mounted in a location which is in free ambient air. Avoid locating the probe adjacent to exhaust pipes, in a confined area, or on the top of the fuselage. Any location where the probe is exposed to direct sunlight or radiant heat from the runway pavement, will cause increased temperature readings above ambient temperature.

Insight recommends mounting the probe in the engine induction air inlet near the engine induction air filter. Probes located there will read well as soon as the engine is started.

Refer to Drawing No. 1200-016 for the mounting dimensions and appropriate hole size to drill.

Mount the OAT probe in the prepared hole and secure the nylon nut being careful not to over-tighten.

If the OAT probe is installed on a pressurized aircraft where bulkhead penetration is necessary and/or potting of the OAT probe is required, be certain to apply "Proseal" or equivalent potting substance prior to tightening.

NOTE: Be careful not to get potting substance on the connector.

Installing the Fuel Flow Sensor (for Aircraft without an existing Flow Sensor)

The GEM is supplementary for fuel flow. Aircraft without existing Fuel Flow (FF) sensors should have one Insight-supplied sensor installed per engine except for engines equipped with pressure-carburetors, which require two sensors per engine. The GEM model G4-002 (twin) does not support pressure-carburetors.

Aircraft equipped with TAS-1000 Air Data Systems may share the FF sensor signals with the GEM. Refer to the following installation drawings and the TAS-1000 Installation Manual Doc No. 1000-402.

Insight manufactures a variety of FF sensors for injected and carbureted engines. See drawing 1000-303 (3 pages) for sensor details and part numbers.

For single-engine aircraft or twins with two GEM instruments, wire the Insight FF sensor in accordance with Insight Drawing #610C-315, Option "C".

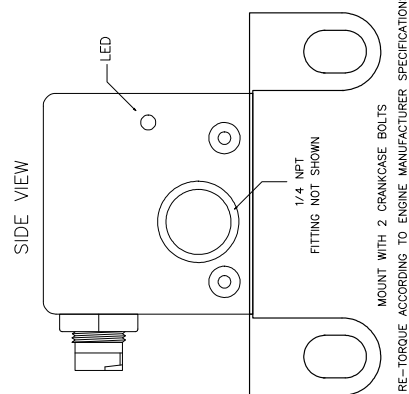
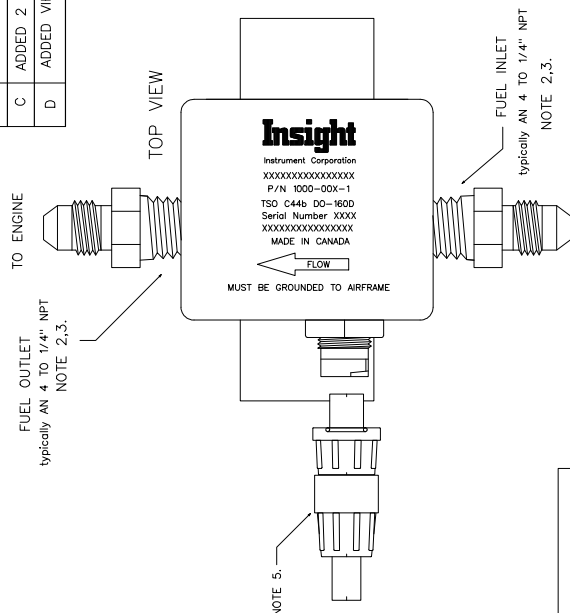
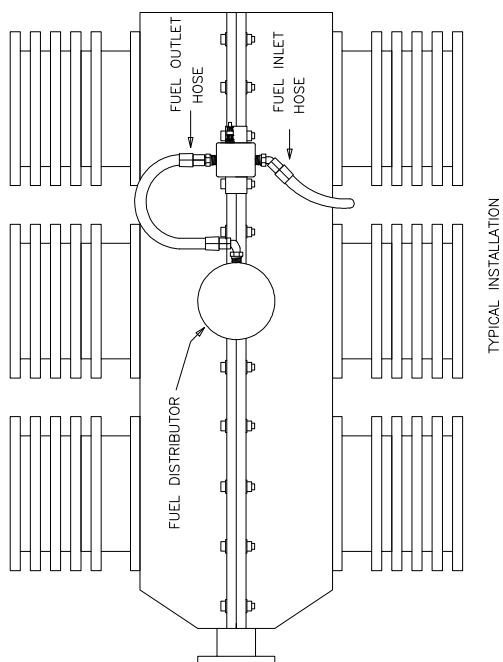
For G4-002 (Twin) installations use Drawing G4-315.

In all installations the Insight FF sensor(s) case must be connected to airframe ground.

The installer must determine the correct type and location for the FF Sensor, and supply the plumbing and fittings to hook up the FF Sensor to the fuel lines.

For all fuel flow sensor installations refer to FAA AC 43.13-1B, Chapter 8 Section 2, 8-30, 8-31, 8-37, 8-38.

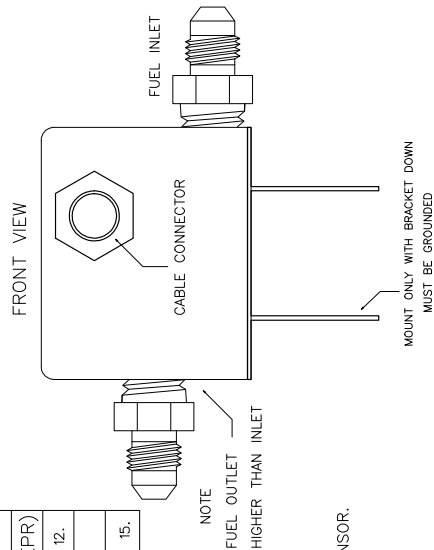
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	Added housing and bracket.	June 22/00	JWT
B	CHANGED TITLE	June 15/01	R.R.
C	ADDED 2 ADDITIONAL MOUNTING OPTIONS	MAY 26/03	R.R.
D	ADDED VIBRATION AND K-FACTOR OPTIONS	DEC 10/10	JY



PART NUMBERS		
	INJECTOR	CARBURETOR
FLOW SENSOR	1000-004-1(-Knnnn)(-EPR)	1000-004-4(-Knnnn)(-EPR)
TRUE FLOW SENSOR	1000-006-1X SEE NOTE 12.	1000-006-4X SEE NOTE 12.
FLOW/VIBRATION SENSOR	1000-004A-1	1000-004A-4
VIBRATION SENSOR	1000-004V(-Xn) SEE NOTE 15.	1000-004V(-Xn) SEE NOTE 15.

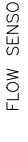
NOTES:

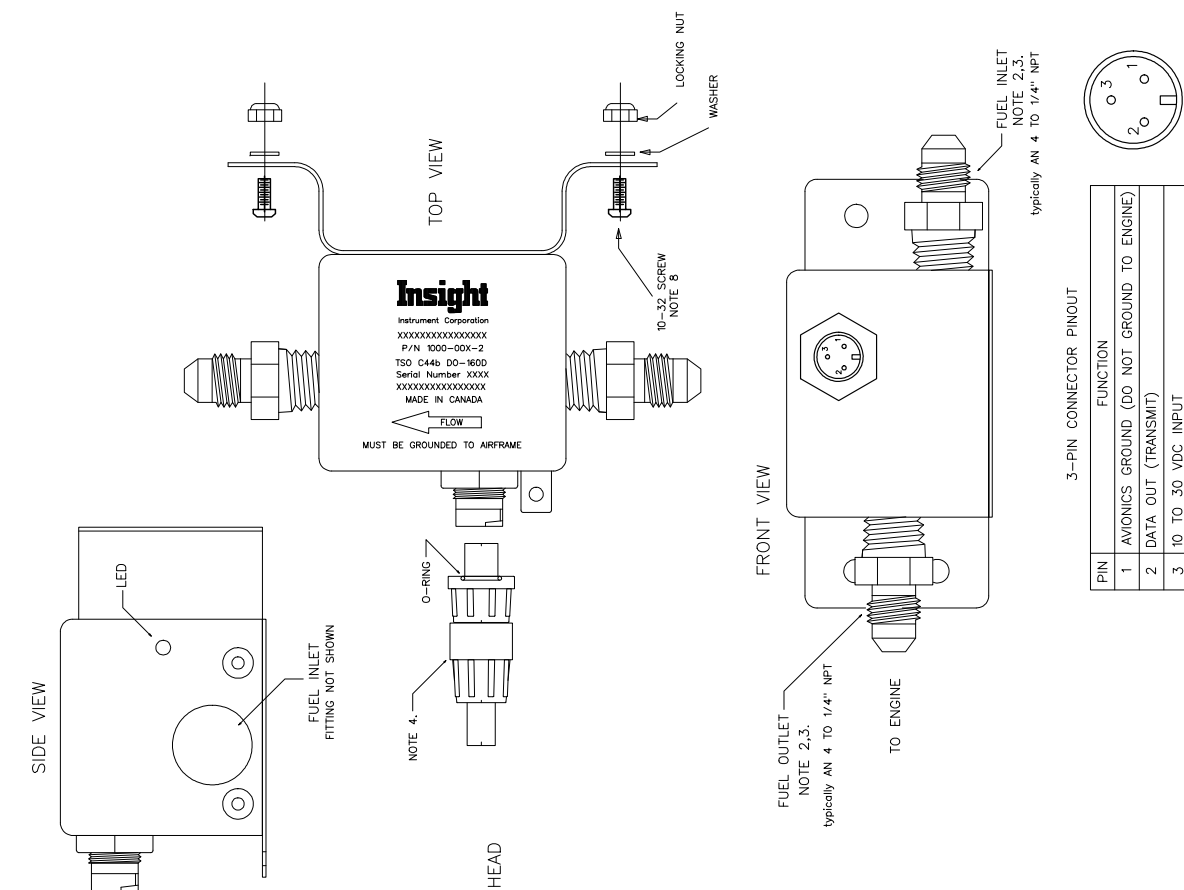
1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use ONLY approved fuel line assemblies.
4. Use approved thread sealant. Torque pipe threads to a max of 15 ft. lbs. (180 in. lbs.)
5. INSIGHT supplied electrical harness; 1/3 TURN, 3-pin OR clip-on 7-pin for FLOW/VIBRATION SENSOR.
6. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
7. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP.
8. Mount transducer with nomenclature facing up.
9. Confirm all wiring PRIOR to powering up.
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY GPS MANUFACTURE AND MODEL WHEN ORDERING TRUE FLOW SENSOR, BENDIX KING B-FORMAT, APOLLO
13. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY -Kmmnn.
14. FLOW SENSOR DATA SIGNAL 5V UNLESS -EPR, EXTERNAL PULL-UP RESISTOR REQUIRED, SEE WIRING DIAGRAM.
15. Install vibration sensor, one per engine, consult insight for alternate application.



3-PIN CONNECTOR PINOUT	
PIN	FUNCTION
1	AVIONICS GROUND
2	DATA OUT (TRANSMIT)
3	10 TO 30 VDC INPUT

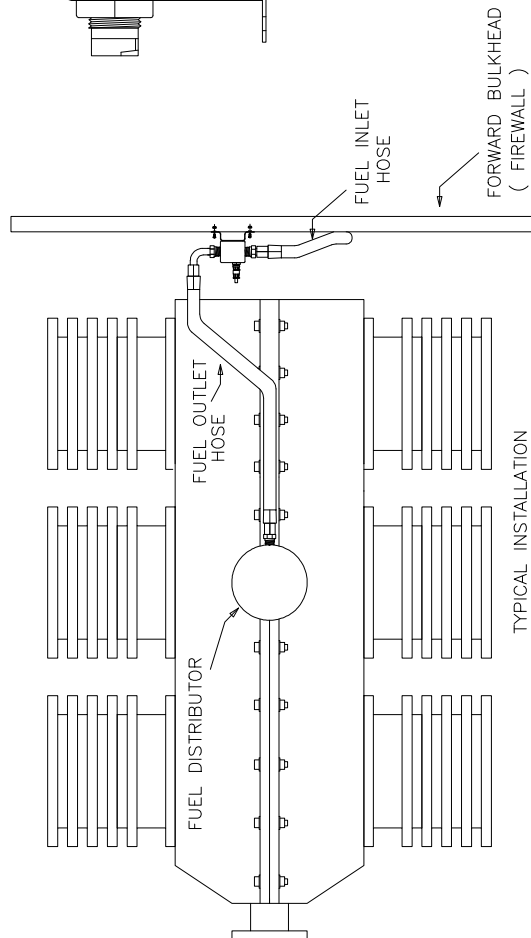
7-PIN CONNECTOR PINOUT	PIN	FUNCTION
	1	10 TO 30 VDC INPUT
	2	DATA OUT (TRANSMIT)
	3	AVIONICS GROUND
	4	RESERVED
	5	C2 CLOCK
	6	C2 DATA
	7	DATA IN (RECEIVE)

	This drawing is the property of Insight Instrument Corporation. It contains confidential and proprietary information. Reproduction or unauthorized use is strictly prohibited. © Copyright 1999	
	FLOW SENSOR AND TRUE FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 1)	
Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6		DRAWING NO. 1000-303 FILE NAME: 1000-303 SIZE: 11" x 17" (A)
none		DATE: June 1/99 SCALE: 1 OF 3



PIN	FUNCTION
1	AVIONICS GROUND (DO NOT GROUND TO ENGINE)
2	DATA OUT (TRANSMIT)
3	10 TO 30 VDC INPUT

	FLOW SENSOR AND TRUE FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 2)			
	Insight Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6			
This drawing is the property of Insight Instrument Corporation. All rights are reserved. Reproduction or unauthorized use is strictly prohibited. © Copyright 1999	SIZE	PANEL NAME:	DRAWING NO.	DATE
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	SCALE	none	DATE	June 1/99
			SHEET	OF 3

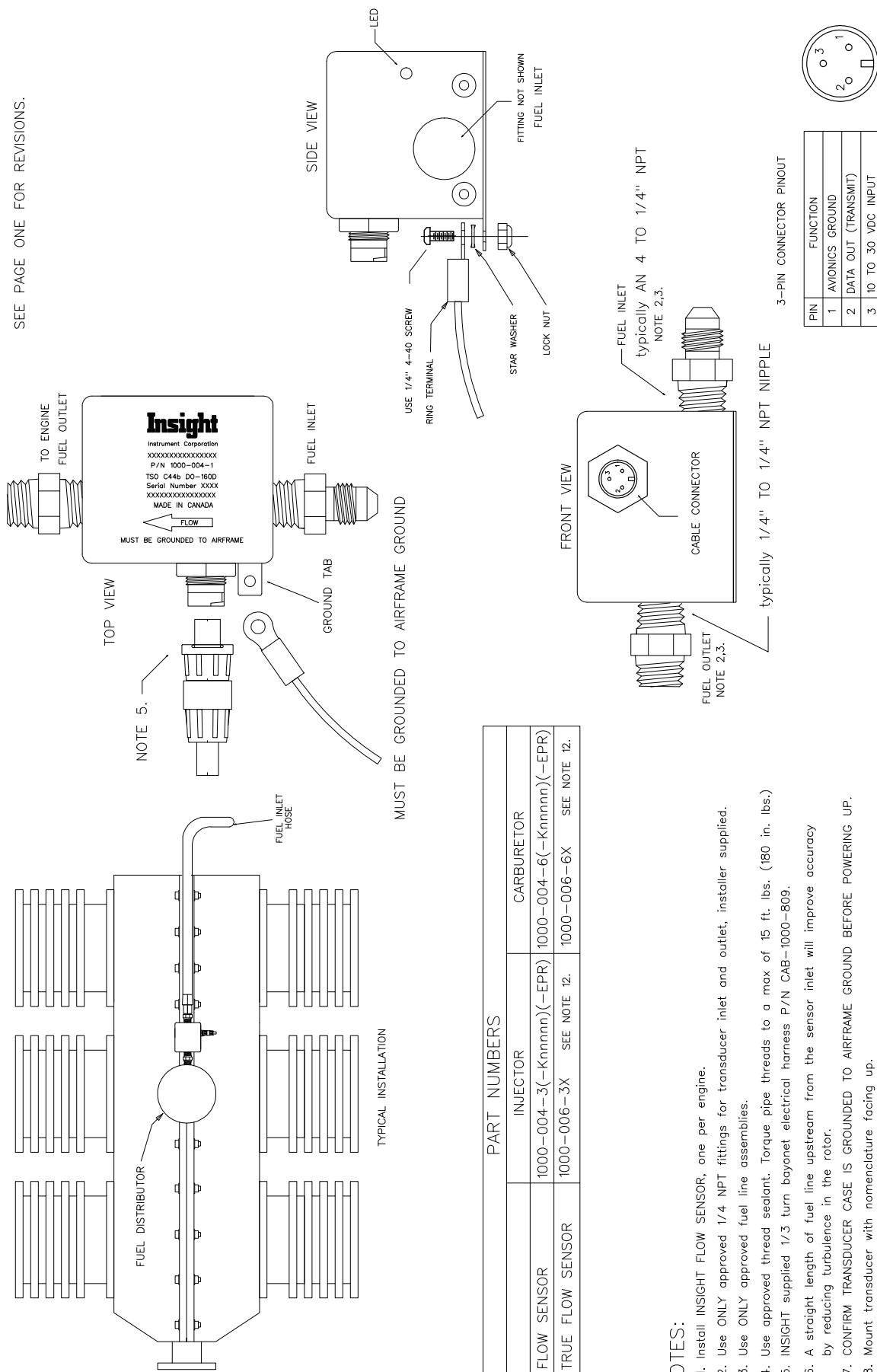


PART NUMBERS		
	INJECTOR	CARBURETOR
FLOW SENSOR	1000-004-2(-Knnnnn)(-EPR)	1000-004-5(-Knnnnn)(-EPR)
TRUE FLOW SENSOR	1000-006-2X SEE NOTE 12.	1000-006-5X SEE NOTE 12.

NOTES:

1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
Use appropriate fittings to match airplane fuel lines.
3. Use approved thread sealant. Torque pipe threads to a max of 15 ft. lbs. (180 in. lbs.)
4. INSIGHT supplied 1/3 turn bayonet mount power and signal harness P/N CAB-1000-809
5. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
6. Mount on firewall or airframe with nomenclature facing up.
7. Installer may drill additional holes in bracket if necessary.
8. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP
9. Confirm all wiring PRIOR to powering up
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
1. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
2. SPECIFY GPS MODEL WHEN ORDERING TRUE FLOW SENSOR, B = BENDIX KING, Z = APOLLO AND GARMIN.
3. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY -Knnnnn.
4. FLOW SENSOR DATA SIGNAL 5V UNLESS -EPR, EXTERNAL PULL-UP RESISTOR REQUIRED, SEE WIRING DIAGRAM.

SEE PAGE ONE FOR REVISIONS.



NOTES:

1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use ONLY approved fuel line assemblies.
4. Use approved thread sealant. Torque pipe threads to a max of 15 ft. lbs. (180 in. lbs.)
5. INSIGHT supplied 1/3 turn bayonet electrical harness P/N CAB-1000-809.
6. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
7. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP.
8. Mount transducer with nomenclature facing up.
9. Confirm all wiring PRIOR to powering up.
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY GPS MANUFACTURE AND MODEL WHEN ORDERING TRUE FLOW SENSOR, BENDIX KING B-FORMAT, APOLLON.
13. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY -Kmmn.
14. FLOW SENSOR DATA SIGNAL 5V UNLESS -EPR, EXTERNAL PULL-UP RESISTOR REQUIRED, SEE WIRING DIAGRAM.
15. Transducer self supporting on fuel fittings.

PIN	FUNCTION
1	AVIONICS GROUND
2	DATA OUT (TRANSMIT)
3	10 TO 30 VDC INPUT

Insight	This drawing is the property of Insight Instrument Corporation and contains confidential information. It is to be used only for the project and purpose for which it was created and is not to be reproduced or used for any other activity without the written permission of Insight Instrument Corporation. © Copyright 1999	
	SIZE: <u>11x17</u> FILE NAME: <u>INSIGHT.DWG</u>	DRAWN BY: <u>WJ</u>
FLOW SENSOR AND TRUE FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 3)	INSIGHT Instrument Corporation Box 122, Fort Erie, Ontario L2A 5M6	DATE: <u>June 1999</u> SHEET: <u>3</u> OF <u>3</u>
SCALE: <u>1:1</u>	PROJECT: <u>1000-303</u>	DRAWN: <u>June 1999</u>