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The Owner of the EDM-960 must keep this manual

J.P. INSTRUMENTS
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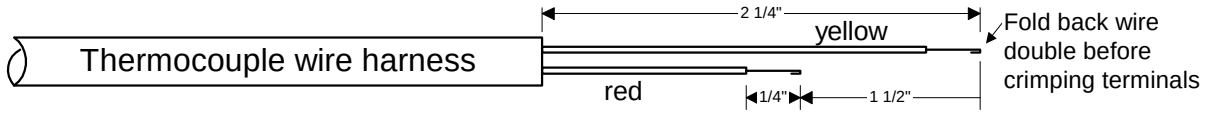
1. Read This First

- The following notes apply to a new installation. **Read this section before proceeding**.
- The JPI warranty found in the back of the pilots guide clearly states that JPI will replace defective parts under warranty, **but does NOT cover labor to remove or install any parts**.
- The most common cause of probe problems is poor terminal crimps. Crimp ring terminals with AMP tool or equivalent. **Fold back the wire double before crimping terminals.**



- This installation will require some parts unique to your aircraft that are not supplied with the kit, (including but not limited to tie-wraps, hoses and fittings). Acquire all the necessary parts prior to beginning the installation.
- Do not use aluminum fittings or Teflon tape or pipe sealant with the FXT-201 or FXT-231 fuel flow transducer.
- Write down the K-factor engraved on the side of the fuel flow transducer here _____. Once the transducer is installed and covered with the fire sleeve, you will not be able to access this K factor.
- Determine the locations of all holes before drilling to ensure that nothing interferes with the probe, clamp, clamp screw or wire.
- Provide service loops at the instrument so that it can be moved for maintenance or troubleshooting.
- Thermocouple wire length is not critical. Trim to required length, allowing for service loops at the engine so that probes can be swapped with probes on adjacent cylinders for troubleshooting purposes.
- Dress all wires away from high temperature components such as exhaust stacks.
- Never splice thermocouple wire using copper wire. Use only K-type thermocouple wire. Solder using zinc chloride flux such as Nokorode brand – rosin flux alone won't work.
- Observe correct polarity on all probe wires. Connect like colors together (red to red, yellow to yellow).
- **The DAU EDM-950 must be grounded at the engine**, not at the avionics ground.
- Record the installation of the EDM-960 on a FAA form 337. Make an entry in the aircraft logbook.

2. Instrument Marking

The TSO label on the instrument is marked as to the instrument's configuration and DO-160 and DO-178 testing.

The EDM-960 system consists of one EDM-930 Display P/N 790000-C-120, two EDM-950's P/N 790000-B-(xxx), two RADs P/N-790749, and all related wiring and connectors.

Model Number / Part Number	Description
EDM-930 PN 790000-C- [120]	Display only with TFT (liquid crystal) Type
EDM-950 PN 790000-B- [XXX]	DAU (Data Acquisition Unit
PN 790749	RAD (Remote Alarm Display)

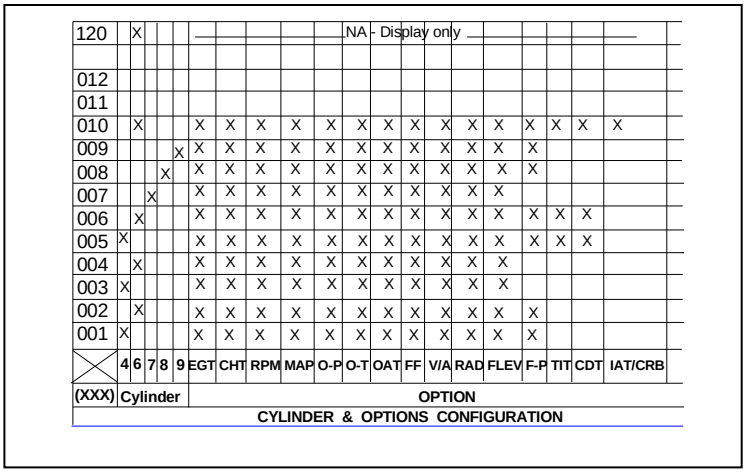
PRIMARY INSTRUMENTS

EGT	FUEL FLOW	Remote Display
CHT	FUEL PRESS	TIT
OIL TEMP	RPM	CDT
OIL PRESS	MAP	FUEL Quantity Main and Aux

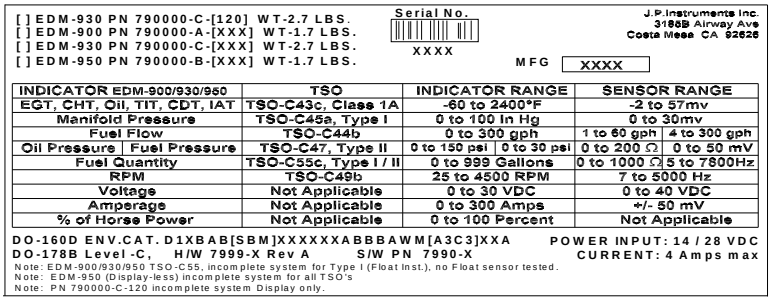
NON-PRIMARY INSTRUMENTS

OAT, AMP, VOLTS, CARB, IAT
Shock Cooling Lean Find
Differential EGT
Percent of HP

2.1 TSO Label EDM-950 Configuration per Report 9501



2.2 TSO Label for the EDM-930/950



[ ] EDM-930 PN 790000-C-[120] WT-2.7 LBS.
[ ] EDM-900 PN 790000-A-[XXX] WT-1.7 LBS.
[ ] EDM-930 PN 790000-C-[XXX] WT-2.7 LBS.
[ ] EDM-950 PN 790000-B-[XXX] WT-1.7 LBS.

Serial No. XXXX

J.P.Instruments Inc.
3185B Airway Ave
Costa Mesa CA 92626

MFG XXXX

INDICATOR EDM-900/930/950	TSO	INDICATOR RANGE	SENSOR RANGE
EGT, CHT, Oil, TIT, CDT, IAT	TSO-C43c, Class 1A	-60 to 2400°F	-2 to 57mv
Manifold Pressure	TSO-C45a, Type I	0 to 100 In Hg	0 to 30mv
Fuel Flow	TSO-C44b	0 to 300 gph	1 to 60 gph | 4 to 300 gph
Oil Pressure | Fuel Pressure	TSO-C47, Type II	0 to 150 psi | 0 to 30 psi	0 to 200 Ω | 0 to 50 mV
Fuel Quantity	TSO-C55c, Type I / II	0 to 999 Gallons	0 to 1000 Ω | 5 to 7800Hz
RPM	TSO-C49b	25 to 4500 RPM	7 to 5000 Hz
Voltage	Not Applicable	0 to 30 VDC	0 to 40 VDC
Amperage	Not Applicable	0 to 300 Amps	+/- 50 mV
% of Horse Power	Not Applicable	0 to 100 Percent	Not Applicable

DO-160D ENV.CAT. D1XBAB[SBM]XXXXXXABBBAWM[A3C3]XXA
DO-178B Level-C, H/W 7999-X Rev A S/W PN 7990-X

POWER INPUT: 14 / 28 VDC
CURRENT: 4 Amps max

Note: EDM-900/930/950 TSO-C55, incomplete system for Type I (Float Inst.), no Float sensor tested.
Note: EDM-950 (Display-less) incomplete system for all TSO's
Note: PN 790000-C-120 incomplete system Display only.

3. Operation

The EDM-960 is a combined electronic indicating system which simultaneously displays to the pilot powerplant and aircraft systems operating parameters. It includes the following indicating systems; replacing all previous primary digital and/or analog instruments:

1. Engine revolutions per minute (RPM)
2. Engine Manifold Pressure (MAP)
3. Engine Cylinder Head Temperature (CHT)
4. Engine Exhaust Gas Temperature (EGT)
5. Engine Oil Temperature (OIL-T)
6. Engine Oil Pressure (OIL-P)
7. Fuel Pressure (F-P
8. Fuel Flow (GPH)
9. Fuel Quantity (Left Wing and Right Wing tanks)
10. Main bus voltage
11. Alternator/Generator Output (Loadmeter) -Amps.
12. Outside Air Temperature (OAT)
13. Turbocharger, Compressor Discharge Temperature (Primary on some turbocharged engines)(CDT).
14. Turbine Inlet Temperature (TIT)
15. Induction Air Temperature or Carburetor inlet temperature (IAT)

Refer to Pilots Guide Rev NC or higher or AFM for detailed operating instructions.

3.1 Remote Alarm Display Operation

The RAD is composed of two (one per engine) red 0.2” high by 8 character displays. The RAD displays flashing alert messages when any of the parameters reaches its preset trigger point, otherwise the RAD is dark. The RAD also serves as an alert back-up if the main LCD display screen becomes inoperative. Some alarm examples are; CHT over-temp: ‘**HIGH-CHT**’, oil over-temp: ‘**OIL-TEMP**’, RPM over-speed: ‘**HIGH-RPM**’. The RAD will extinguish when no primary alarms exist or when the pilot acknowledges the alarm by tapping the STEP button on the EDM-960. On initial startup or whenever power is turned on, the words ‘**EDM-960 PRIMARY’** are displayed, followed by the make and model of the aircraft for which the primary limits are set.

Alarm hierarchy
When a measurement limit is reached, the pilot can momentarily tap the STEP button on the EDM-960 instrument to extinguish the particular flashing alarm acronyms. If another measurement has also reached its limit, that label will then begin to flash. The pilot should continue to monitor the affected parameters (just as he would using a conventional analog display that had reached a limit). The bar graph functions of CHT, EGT, and TIT remain displayed for easy reference should one of these limits be reached.

Dimming

Automatic dimming is provided to dim both the panel display and the remote alarm display, RAD. Dimming can also be accomplished manually to change the Automatic setting. Tapping the far right button below the display decreases brightness. Continuously holding this button increases brightness mode display.

Each EDM-950 has four mounting holes to mount to the avionics equipment rack or to the cold side of the firewall. The data ports are then connected to the display unit via a harness terminating at the EDM-930 display with a 25 pin D-Sub connector.

Remote Alarm Display
PN 790749

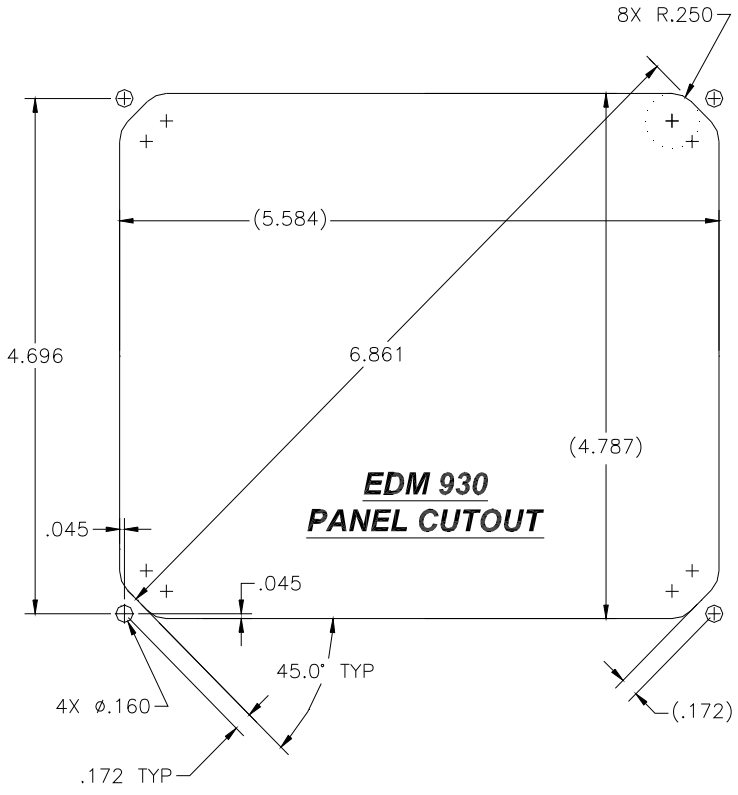
EDM-950 DAU

DAU EDM-950 P/N 790000-B

4. Locating and Installing the Indicator and Remote Alarm Display, RAD

A) The diagram below should be used as a guide for cutting and drilling the mounting and buttonholes in the instrument panel. The dimensions shown are for the final cutouts. Allow extra clearance for any panel finish such as powder coat. The plastic button caps are removable by grasping and pulling each off. The EDM-930 mounts in a 6x4.5 cutout. Mount the indicator using the figure below as a guide. If the panel has too many holes for a clean installation, it is recommended that an .10" aluminum overlay panel be constructed and installed over the original instrument panel and the EDM be installed into this overlay panel.

B) The Remote Alarm Display PN-790749 mounts in a 5/8 inch hole in the panel immediately above the Attitude Gyro / D.G. / HSI +/- 0.5 inches from their centerline directly in front of the pilot.



EDM-930/960 PANEL CUTOUT

Figure 2: EDM-960 Mounting Area

EDM-960 Display Installation

Choose the Proper Installation Location

The display is best located within the natural scan and easy reach of the pilot. The recommended
mounting location is defined as the distance from the vertical centerline of the Primary Flight Instruments to the outer edge of the further most gage displayed on the EDM-930.

HORIZONTAL ORIENTATION:
The EDM-960 display may be mounted from the vertical centerline of the Primary Flight Instrument "T" to a maximum of 21" to the further most gage of the EDM-930 display and to the left of the centerline as much as needed. See fig 2

VERTICAL ORIENTATION:
The EDM-960 to be mounted within +/- 10" from the horizontal centerline of the Primary Flight Instrument "T". The installer should insure that the EDM-960 display is not obstructed by either the glare shield or the control wheel.

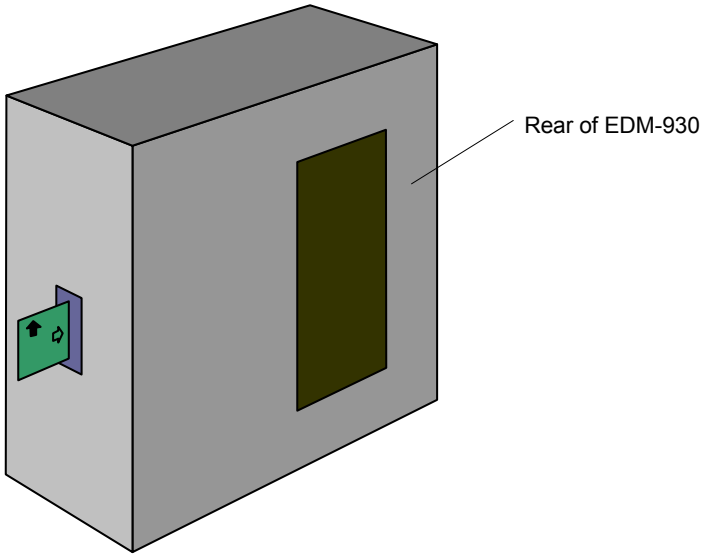
The installing A&P and IA should decide that where the installation is to occur does not conflict with the viewing angle requirements listed above.

Note: Any appliances that are installed under the original Type Certificate (TC) that require relocation should be relocated in accordance with the guidance provided in AC.23.1311-1B, Section 15.4 (presented below). Special care should be exercised to insure that proper pilot visibility of displays and pilot access to controls in not interfered with, with respect to relocated instruments and non-relocated instruments.

5. EDM-960 Key Card Installation

The EDM Key Card activates the primary engine instrument limits for you engine monitor. This key card contains the primary engine POH markings data. After installation do not remove the Key Card from the instrument. The key card is programmed with the serial number of your EDM and the make, model and year of your aircraft. Every time you power up the EDM, the Remote Auxiliary Display (RAD) will show your aircraft make and model in the right engine RAD. The Left RAD will display “EDM-960”

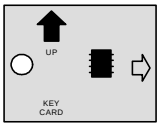
Each system is configured to a specific aircraft type. Therefore for example, a Cessna 310R would have a different series Part number [XXX] than a Cessna 310Q.



Installation

With the EDM removed from the aircraft, position it on a flat surface with the rear of the instrument facing you as shown below. You do not have to remove any cables if you have sufficient service loop available. Follow the appropriate instructions below.

Open the small access door on the side of the EDM-930 Display using the appropriate tool.



Hold the Key Card so that the UP arrow is facing up and in insertion arrow is facing to the right.

Insert the Key Card in the guide rails until you feel it snap into place. Secure the access door.

Power up the EDM and confirm that your aircraft make and model is initially shown in the RAD upon power up. Install the EDM back into the aircraft. Your installation of the Key Card is complete.

If your EDM should ever have to be replaced with a unit with a different serial number, the factory will reprogram your Key Card to match the new serial number. You should always retain your fuel quantity calibration records, as these may need to be manually re-entered in a different or serviced unit.

5.1 Twin Engine asymmetrical thrust Aircraft EDM-960

Figure 1

RAD: Left/Right engine

Cockpit Display unit

Back of Display unit

Twin Engine symmetrical thrust Aircraft EDM-960

FRONT

REAR

R A D

Routing the Wiring Harnesses

Five connectors are protruding from each of the two EDM-950 DAU's, one for each engine. Connect the five wiring harnesses to the rear of the 950 DAU mounted on the cold side of the firewall and run the cables through the firewall into the engine compartment. Allow sufficient service loop to facilitate removal of the connectors for servicing. These wiring harnesses are labeled as follows:

EDM-950 DAU	Harness PN	
P1	790200	Oil temperature, Induction temperature, Carburetor temperature, Outside air temperature, Turbine inlet temperature, Turbine inlet temperature 2, Engine ground.
P2	700700 700702	CHT, EGT 6 cylinder 10 feet CHT, EGT 4 cylinder 10 feet
P3	790420	RPM, MAP, Oil pressure
P4	700708	Fuel flow transducers FX-201, GPS
P5	790719	Fuel pressure (VDO), amperes, Voltage, and fuel level.
RAD's	790749	Category 5 jack and cable for EDM-960 External remote display
P6	790802	Part of fuel qty sensor interface. Connects with J6 and P5
P7	790811	FQ, interface to Fuel tank.
P8	790807	Power for DAU, GPS , Aux Light to display
P9/P10	174203	Connector Lft/Rt Data (field installed to P11)
P11	790808	Power DAU, Data for DAU
P12	790810	Optional—Aux Light interface cable to J12 on P8

Route the wires from the connectors through the firewall using fireproof rubber grommets and flame retarding silicone. Use an existing hole if possible. All wires must be routed away from high temperature areas (exhaust stacks, turbochargers, etc.). Secure probe and sensor leads to a convenient location on the engine approximately 8 to 12 inches from the probe or sensor, being sure there is sufficient slack to absorb engine torque. It is essential in routing the probe wire that this wire not be allowed to touch metal parts of the air-frame or engine since abrasion will destroy this high temperature wire. Secure wires along the route to the indicator. Secure wire using original clamps, tape or tie wrap if possible.

EDM-960 Display Wiring Harness

EDM-930 Display	Harness PN	Description
LEFT/FRONT RAD	790749	Category 5 jack and cable for RAD Right engine
RIGHT/REAR RAD	790749	Category 5 jack and cable for RAD Left engine
J8	790747	26 pin D-Sub - GPS RS232, GND, Aux Tank Intfc.
LEFT/FRONT ENGINE (P9)	790808	Canon Plug (Installer wired) - Power, RS232 MFD data
RIGHT/REAR ENGINE (P10)	790808	Canon Plug (Installer wired) - Power, RS232 MFD data

CAUTION: Be sure any wiring does not obstruct the control movement under the instrument panel.

The probe wires must not be tied in with ignition, alternator or engine cabin heater ignition wires because of potential interference with readings.

The temperature probe wiring harness is made of Chromel-Alumel alloy wires that must not be substituted or extended with copper wire. The power and ground wire are normal copper. Temperature probe leads may be spliced with additional Chromel-Alumel wire using copper butt splices.

When the installation is complete all wires should be secured using ties and carefully checked for interference, rubbing or chafing with flight control cables or other moving parts.

6. Power Connection

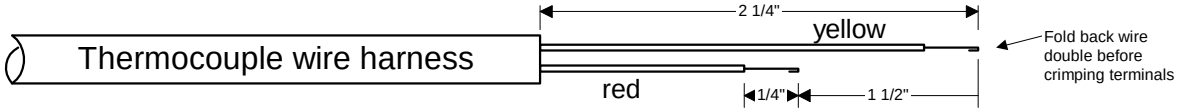
The EDM-960 automatically accommodates either a 14 or a 28-volt electrical system. Master Bus power must be individually provided, via three 5 amp circuit breakers, to the two DAU units and the EDM-960 head. See Section 33 ‘

Interconnection between Display, DAU's and GPS' for wiring details.
IMPORTANT: Insure the DAU ground wires are connected to the engine block. Any wiring extensions or additions beyond JPI supplied wiring must be MIL-W-32759/16 or equivalent. The EDM-960 has a 8-second warm-up. No connection to the aircraft dimmer system is required because the instrument dims automatically with reductions in ambient light. The instrument is designed to reset at less than 10vdc bus power, therefore the instrument may reset on engine start (typical for 14vdc systems). This is normal due to the starter loading down the battery output to below 10vdc.

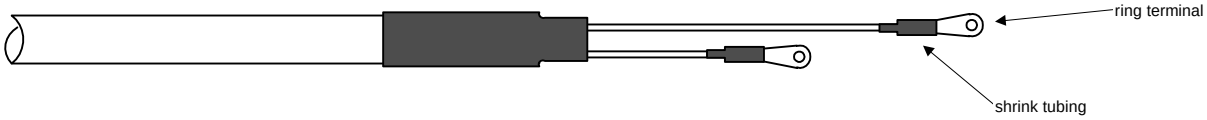
7. Probe Wiring

When cutting the pair of leads to the proper length to connect to the probes, leave enough slack in the wiring so that probe may be interchanged to an adjacent cylinder if necessary for trouble-shooting and servicing. Thermocouple wire length is not critical and should be trimmed to any length as required for a clean installation.

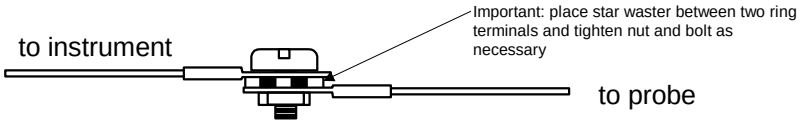
The Temperature probe must be wired with the correct polarity. The temperature probe connects to its temperature indicator with yellow jacket Teflon Chromel-Alumel wire supplied. Strip the wires as shown below—observing color-coding.



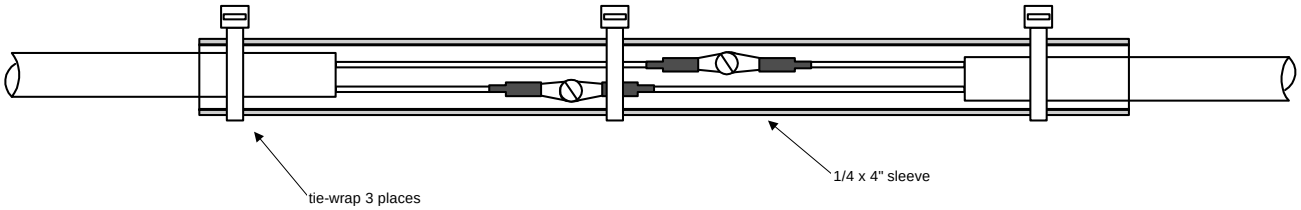
Terminate each wire with a crimp-on ring terminal, provided. The ring terminals may be crimped with a "service-type" tool, however AMP part number 48518 crimp tool is recommended. Verify the quality of each crimp with a sharp tug on the wire. The terminal should be impossible to pull off when crimped correctly.



Place a ¼ x 4-inch sleeve over each pair of wires in the wiring. Connect the wire ring lug to the probe ring lug using the supplied number 4 screws and nuts, placing the star washer *between* the ring lugs, not against the nut.



Slide the sleeve over the joint and secure with three tie-wraps.



The most common installation problems are related to poor quality terminations.

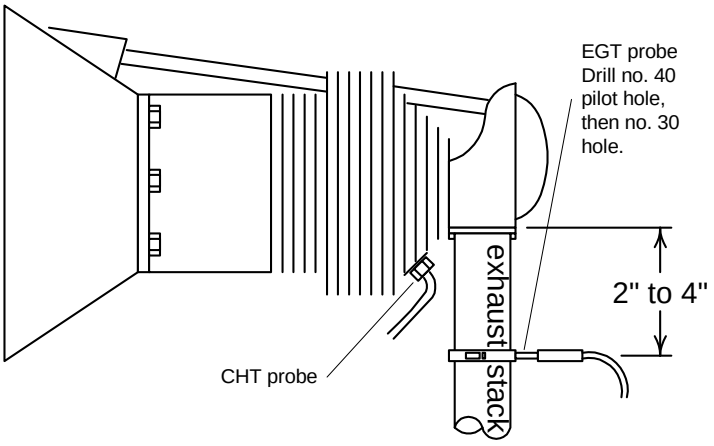
8. Wiring Markings

The EDM-960is supplied with special Teflon insulated Chromel Alumel factory assembled wiring harness configured for the correct number of cylinders. The wire harness is marked E1= EGT-1, C1= CHT-1, etc.

NOTE: **Unlike most other EGT & CHT installations the probe wire length is not critical and should be trimmed to any length as required for a clean installation. Do not extend the thermocouple wire with copper wire.**

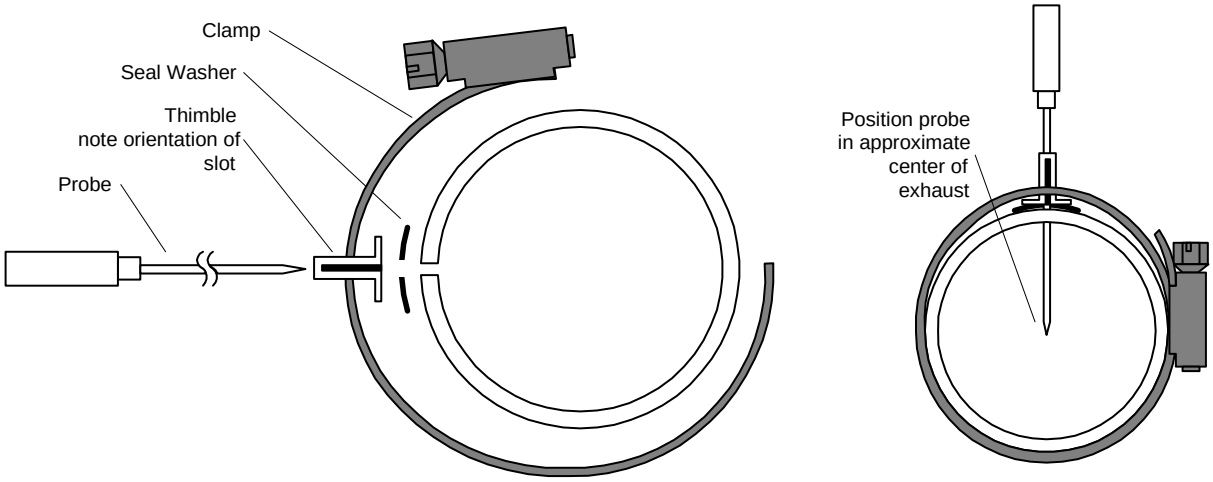
9. Exhaust Gas Temperature Probe (EGT) Installation

Use the J2 connector harness 700700 or 700702 labeled E1 through E4 or E6. Remove the existing EGT gage and Probe. Replace with JPI probe M-111 in all exhaust stacks.



The Model M-111 Probe will fit any engines where the existing holes in the exhaust stack are 1/8" to 1/4" in diameter. If no hole exists, it will require the drilling of a 1/8" diameter hole and ream to fit. It is important that each probe be mounted the same distance from its exhaust stack flange. A nominal distance of 2 to 4 inches from the exhaust flange is recommended. If the recommended distance is impractical because of obstructions, slip joints or bends in the exhaust system then position the probes a uniform distance from the flange as space permits. Do not mount probes in slip joints. Be certain to locate all holes BEFORE drilling to ensure that nothing interferes with the probe, clamp, screw or wire. Careful matching of probe position will provide best temperature readings.

Insert the probe in the exhaust or previously drilled hole so that the tip of the probe is in the center of the exhaust stream. Tighten the stainless steel clamp to a torque of 45 in/Lbs. Cut off the excess strap close to the screw.



RADIAL ENGINE EGT

Radial engine exhaust, require a larger EGT clamp (supplied) to fit the 2.5 inch exhaust pipe. The EGT probe is installed in the same fashion as a Lycoming or Continental engine and should be placed between the exhaust pipe flange and the accumulator at a distance of 2 to 3 inches form the engine exhaust flange. Cylinder head temperatures are measured with a spark plug gasket type probe placed under the front sparkplugs . Front spark plugs will read 15 to 20 degrees cooler than the rear plugs. Refer to the engine manufactures recommended location. Do not route the EGT/CHT harness in with the ignition harness. Do not extend the yellow thermocouple leads with copper wire.

10. Turbine Inlet Temperature (TIT) Probe Installation (optional)

Use the J1 connector harness 700200 and insert the yellow wire into the connector pin 16 and the red wire into pin 17. The standard TIT probe PN M111-T with a #48 clamp is placed in the exhaust stack accumulator to a maximum depth of 1/2 inch and approximately 4 inches from the turbine inlet if possible, on the waste-gate side of the turbine.

10.1 Using the Factory original TIT Probe

The factory installed TIT probe (K-calibration) is compatible with the JPI EDM-960 System. Connect the JPI wire marked TIT. Replacement probes should be purchased per part number from the aircraft manufacturer.

The EDM-960 permits you to remove the factory installed TIT indicator and leave the TIT probe installed. Connect the JPI wire marked TIT directly to the probe noting color polarity. The TIT probe should now have only the JPI leads attached to it. No calibration of the EDM-960 is necessary.

11. Cylinder Head Temperature (CHT) Probe Installation

Use the J2 connector harness 700700 or 700702 labeled C1 through C4 or C6. The JPI probe is a bayonet probe P/N 5050-T that has a captive 3/8-24 boss that is screwed into the head of each cylinder.

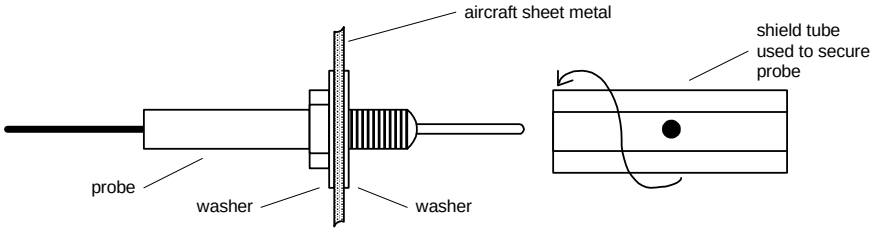
For Indicator replacement, replace your existing CHT probe and adapter, a bayonet or screw in type with one supplied by JPI. Install the probe on the same cylinder from which you removed the original equipment probe. Your current CHT probe is installed in the hottest cylinder as determined by the airframe manufacturer. Alternate method To keep the existing CHT gage functional install a JPI PN 5050-A adapter probe.

RADIAL ENGINE (CHT) SPARK PLUG GASKET

The spark plug gasket probe, P/N M-113, replaces the standard copper spark plug gasket on one spark plug. <u>The probe is usually placed on the Rear plugs.</u> After many removals the probe may be annealed for re-use. Heat to 1100 ^{o}F and quench in water.

12. Outside Air Temperature (OAT) Probe Installation

Connect the OAT probe to the LEFT ENGINE DAU J1 connector harness 700200 labeled OAT. All wiring must be type K thermocouple wire. Do not splice ordinary copper wire in any temperature probe circuits.



Install the OAT probe, PN 400510 in the airframe manufacturer's recommended location. If this information is not available, place the OAT probe in clean airflow such as in a cabin air scoop or below the underside of the wing away from engine heat or exhaust. In this case it is recommended that the installation be done similar to the antenna installation. The outside aluminum shield tube is used to both hold the probe in place and shield it from radiated heat from the sun it can be replaced with a 5/16 nut. The OAT option is typically displayed as digital gauge and has no associated alarms.

13. Compressor Discharge Temp Probe Installation (optional)

Use the J1 connector harness 700200 and insert the yellow wire into the connector pin 3 and the red wire into pin 4. All wiring must be type K thermocouple wire. The Induction Air Temperature probe, (IAT), is installed just after the inter-cooler and the Compressor Discharge Temperature (CDT) just before the inter-cooler. The probe is the same as an EGT probe and installed similarly to an EGT probe. A large clamp is supplied to fit around the air duct leaving the inter-cooler. Alternately a 1/8 NPT fitting is available. IAT

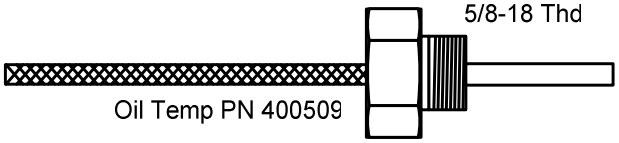
option is displayed as an independent digital temperature like "125 IAT". On non-turbo engines the IAT in reality is the Carburetor temperature and displayed as “34 CRB.”

14. Carburetor Probe Installation (optional)

Use the J1 connector harness 700200 and insert the yellow wire into the connector pin 5 and the red wire into pin 6. All wiring must be type K thermocouple wire. Do not splice ordinary copper wire in any temperature probe circuits. Locate the access hole (1/4-24 thread) in the carburetor near the butterfly valve. Remove the screw plug now in that hole and screw the CRB probe into the carburetor throat. No drilling or machining of the carburetor is necessary.

15. Oil Temperature Probe Installation

The sensor port is a standard 5/8-18 thread for both the Continental and Lycoming engines. Probe PN 400509 is a complete assembly using type K thermocouple wire (red/yellow). Connect the wire marked oil temperature observing polarity. Wire length has no effect on the readings. Oil temperature will be displayed as an independent temperature digital and bar-graph. Check with engine manufactures proper location for oil temperature. Check for oil leaks before first flight.

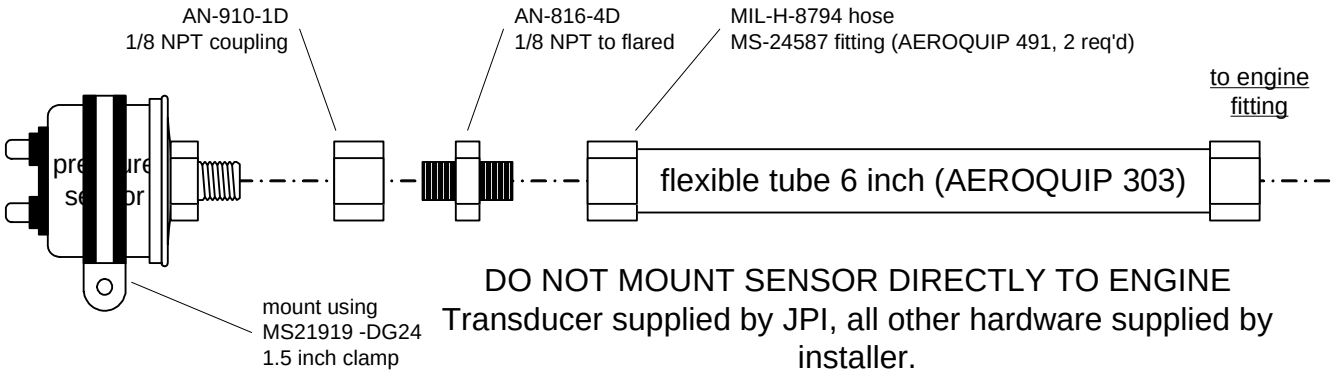


16. Oil Pressure Sensor Installation

Use the J3 connector harness 790420 labeled OIL-P for a VDO pressure sensor (shown in diagram below). Use J4 for a VDO pressure sensor (not shown).

Oil pressure sensor mount using an aluminum clamp MS21919. Mount to firewall.

Mount the pressure sensor to the pressure line using a flexible hose and fittings (not supplied) as depicted in the drawing below. Use aluminum clamp to mount the pressure sensor to firewall. Do not mount the sensor directly to



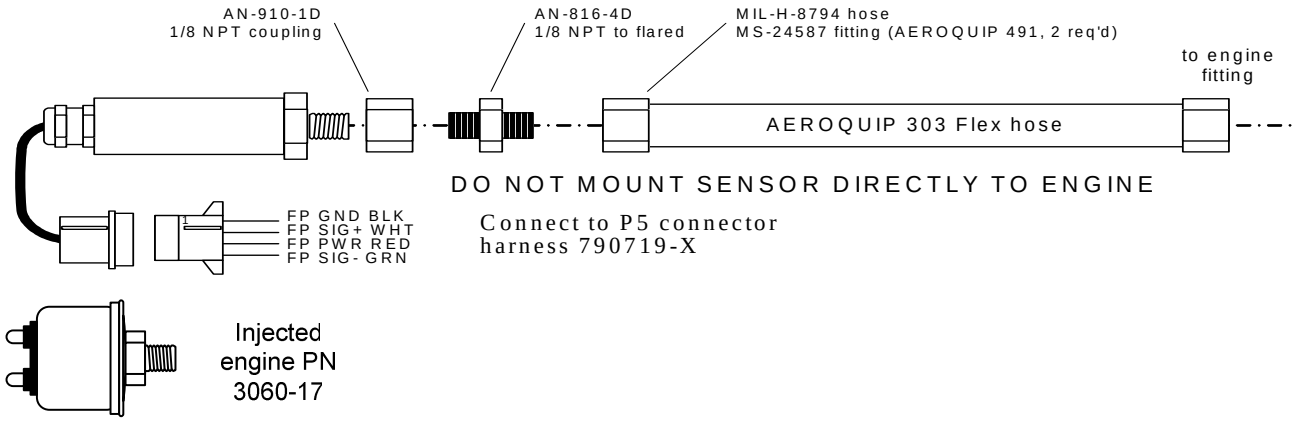
the engine. Connect the other end of the hose to the engine manufacturer's recommended location for engine oil pressure.

17. Fuel Pressure Sensor Installation

Use the J5 connector harness 790719.

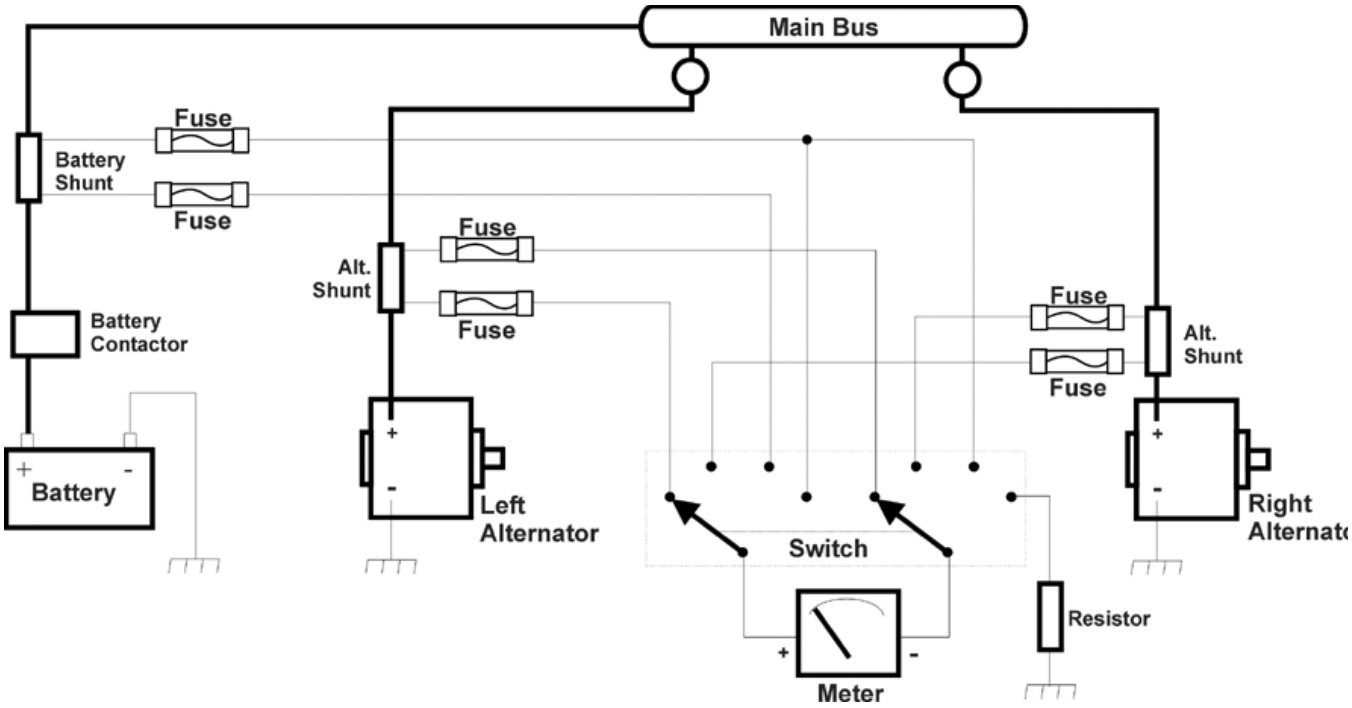
Mount the pressure sensor to the pressure line using a flexible hose and fittings (not supplied) as depicted in the drawing below. Use Aluminum Clamps MS21919WDG25, or WDG14 to mount the pressure sensor to engine mount structure or firewall. Do not mount the sensor's directly to the engine. Connect the other end of the hose to the existing pressure line. Later, you will connect the pressure sensor to the four pressure sensor wires through the supplied 4-pin connector. Part No. 790719() required for Carburetor engines OR Transducer PN 3060-17 for injected engines. PN 3060-17 is a resistive and requires two wires with no polarity.

For Sensym fuel pressure sensor (shown below), crimp the four pins of the female Molex connector to the harness, matching the wire colors. Secure to firewall with Aluminum Clamp MS21919 WDG14. For injected engines use clamp MS21919WDG 25.



18. Ammeter Shunt Installation

Use the J5 connector harness 790719-X labeled AMP+ and AMP-. Connect the harness leads using ring terminals to the smaller terminal screws on the side of the shunt. The information will be displayed as Amp-1 and Amp-2 on the display.



Typical charging circuit for a Cessna 310 (reference only)

18.1 Volt Meter reading is derived from the bus location that the EDM Display is wired to. A second voltage input is also available.

18.2 Load Meter Configuration. The shunt must be installed in the main bus where it will be the load meter configuration showing alternator load (positive only). Be sure that the negative side of the shunt is connected to the main bus in the load meter configuration. There are no alarms for the load meter configuration.

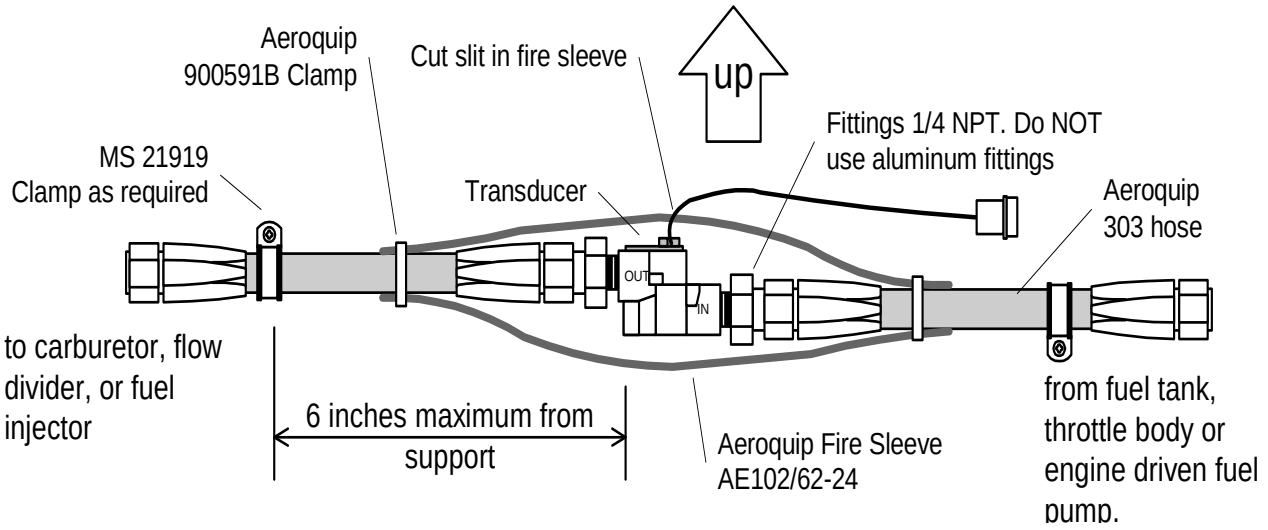
19. General Fuel Flow Transducer Installation

Use the J4 connector harness 700709 labeled FFSIG (white), FFPWR (red), and FFGND (black). If no previous fuel flow transducer is installed, install transducer per Report 503, Rev B, 03/14/97, FUEL FLOW TRANSDUCER INSTALLATION . The EDM-960 receives signal from any installed FloScan Transducer with the following FloScan P/N's embossed on to the top of the transducer. The K-Factor is marked on the side of the Transducer and on an attached white ticket. Wire per drawing 790744, Route the JPI wires along the

existing wiring bundle lacing every foot. The EDM is approved to work with the following Shadin equivalent PN.

FloScan PN	Shadin equivalent PN
201-A	
201-B	680501/680600
231	680503

Before connecting any hoses to the transducer, thoroughly clean them and insure they are free of any loose material. Never pass air pressure through the transducer or use Teflon tape/pipe cement; damage will occur. Use only steel fittings never use aluminum fittings on transducer. Aluminum will gaul. Remove the transducer cap plugs only when ready to install the hoses. Note the direction of fuel flow marked on the transducer. Fuel must flow in this direction. Reverse flow installations will read ½ the required flow. Mount the transducer with the three wires pointing up. The K-factor is printed on the side of the transducer and on a tag. Write down the K-factor here for future reference _____.



The EDM-960 fuel flow transducer receives signal from any installed 201 transducer with part numbers imprinted on to the top of the transducer. For specific engine installations see Report 503

20. Fuel Level Interface Installation (Optional)

The EDM-960 has the capability to interface to 4 tanks in the aircraft's fuel level system. This is done by connecting the DAU directly to the senders or in some cases to the aircraft's fuel sender signal conditioner (for example the Pennycap system typically found in Cessna Twins). The DAU has the capability to process signals from three types of sender signals: Resistive output, Voltage output or Frequency output. JPI provides the appropriate interface hardware (the P5 harness and any associated signal conditioners) based on information you provided when your order was placed. Once installation is completed, you will perform a fuel level calibration. The EDM-960 stores this calibration internally. NOTE: The fuel quantity function will not be available until this calibration has been performed successfully.

21. Setting Fuel Calibration Points

The EDM interfaces to various fuel level sensor types to facilitate direct reading of the fuel level in the aircraft fuel tanks. The EDM has a fuel calibration table that is stored in non-volatile memory and contains calibration values used to translate sensor readings into displayable fuel quantity values. The calibration information is collected and recorded on paper for later entry into the EDM. NOTE: Fuel quantity gauges will not be functional until the fuel calibration information has been entered into the EDM.

You will use the EDM instrument itself as the measuring device to collect calibration data. Refer to Installation Manual Report 908 for expanded information on fuel level system implementation.

WARNING:

- **Never add or remove fuel from the aircraft when the master switch is turned on.**
- **Fuel quantity gauge performance is affected by many factors, such as the integrity of the sensor performance, the accuracy of the calibration data you collected and entered and most importantly your validation that the EDM fuel quantity gauge is accurate and repeatable after installation and calibration. You should not use the fuel quantity gauge system for any flight related operations until this validation criterion has been met.**

The following describes the procedures necessary for collection and entry of the fuel level calibration table. Note: Any changes to fuel table data will be temporary until you execute the 'SAVE' function. This function is only available after the last cell of the last table is entered.

To begin the fuel table entry/edit process, you must have properly installed and tested the interface to the fuel sensors.

With power off, hold in Button 3 (buttons are considered 1 to 4 from left to right). Keep holding it while turning on power to enter the fuel table editor. Wait until question 1 appears, then release Button 3:

The menu buttons are referred to below as in 'XXXXXX' which means to tap the button below the 'XXXXXX' label.

The questions follow:

1) 'Do you agree with the disclaimer?'

At the top of this screen you will see "VOLTAGE MODE" if the EDM is set to voltage mode (or "FREQUENCY MODE" if set to frequency (capacitive) mode.

- **a) 'YES': You agree to disclaimer. Question 2 appears.**
- **b) 'RESTART': You disagree. This instrument will start normal operation and exit this mode.**

2) 'Do you have table data?'

- **a) 'YES': You are ready to enter your readings. Tap button and Question 3 will appear.**
- **b) 'NO': You need to collect readings. Jump to Meter Mode (you will create a paper record of the calibration points by recording the current tank volume and its associated reading). Here are some recommended calibration points:**
  - **i) 2 Points: Empty and Full.**
  - **ii) 3 Points: Empty, Half Full, and Full.**
  - **iii) 4 Points: Empty, One Third Full, Two Thirds Full, and Full.**
  - **iv) 5 Points: Empty, One Quarter Full, One Half Full, Three Quarters Full, and Full.**
- **c) 'BACK': Go back to Question 1.**
  Note: the meter mode can also be directly accessed on power up by holding Button 4 instead of Button 3. Also, the meter mode will show values only for tanks that are defined by your EDM. The calibration parameters have no units as this is the way they will be entered into the Fuel Table. They will be interpreted correctly by the EDM.

3) 'Do you want to restore user table?'

Note: If there is no factory key card plugged into the EDM, you will not see Question 3 or 4, but will instead see Question 5. You will however see a 1 second message 'No factory data plugged in.'.

- **a) 'USER': Maintains the existing Fuel Table. Message "Restoring user table." appears for 1 second. Then Question 5 appears.**
- **b) 'FACTRY': This is to restore factory tank data. Question 4 appears. NOTE: this is mandatory when changing the fuel tank configuration or after installing a new key. Typically there is no calibration data on the key so you will need to re-enter it from your paper records or create new calibration data. You will also normally enter the number of points in each table in Question 6 below.**
- **c) 'BACK': Go back to Question 2.**

4) 'Are you sure? – Current data will be written over'

- **a) 'USER': Maintains the existing Fuel Table. Message "Restoring user table." appears for 1 second. Then Question 5 appears.**

b) 'FACTRY': This time both FACTRY buttons must be held to restore available factory tank data if you are sure. Message "Restoring factory table." appears for 1 second. Then Question 5 appears.

c) 'BACK': Go back to Question 3.

5) 'Do you want to edit the table?'

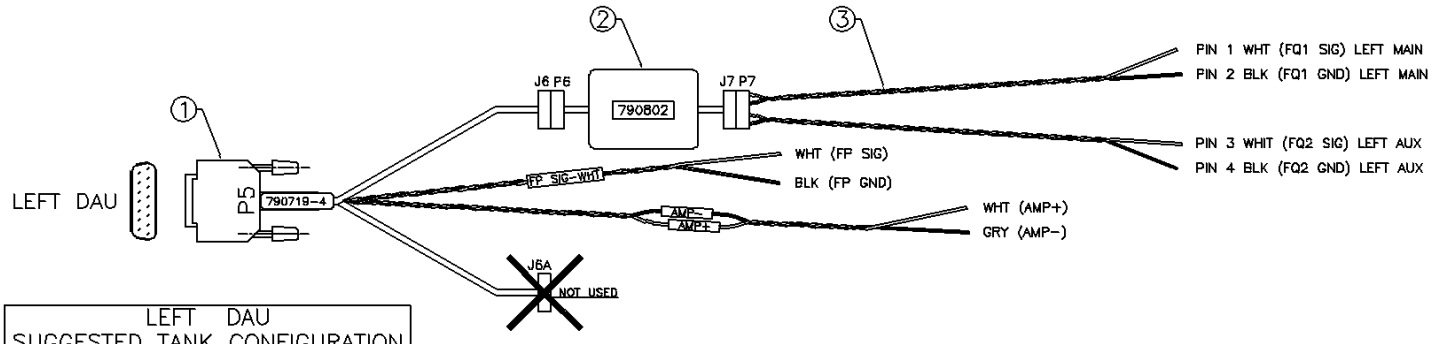
a) 'TABLE': Starts the Fuel Table Editor Mode with the User or Factory data that is selected in Questions 4 and/or 5. The number of table points, or entries, will be unchanged.

'POINTS': Allows the number of tank points (or entries) to be changed to a number from 2 to 5. Only the min and max data will not get written over. The data will be evenly spread between min and max for each tank as a starting point for entering data, so hopefully it will be quicker to enter the actual data, because it should be somewhat close to what you will

21.1 Resistive Output Type Sender System

NOTE: JPI strongly recommends replacing the existing fuel quantity sensors with new units. Locate the wires that run between the existing ships fuel gauges and the senders and disconnect them at the senders. For tanks that have more than one sender, the wiring between the senders must be retained. Make sure the senders do not have voltage on them before connecting to the EDM. Connect the EDM to the senders using the wire pairs coming from the signal conditioner (PN 790802) P7 as shown below. Note that one pair is for MAIN and the other is for AUX. Connect the 'SIG' wire to the senders signal terminal (typically the center stud) and the 'GND' wire to the closest ground terminal near or on that sender.

Example harness arrangement for an aircraft with MAIN and AUX tank resistive fuel level senders and the JPI 2 wire fuel pressure sender (left wing only shown).

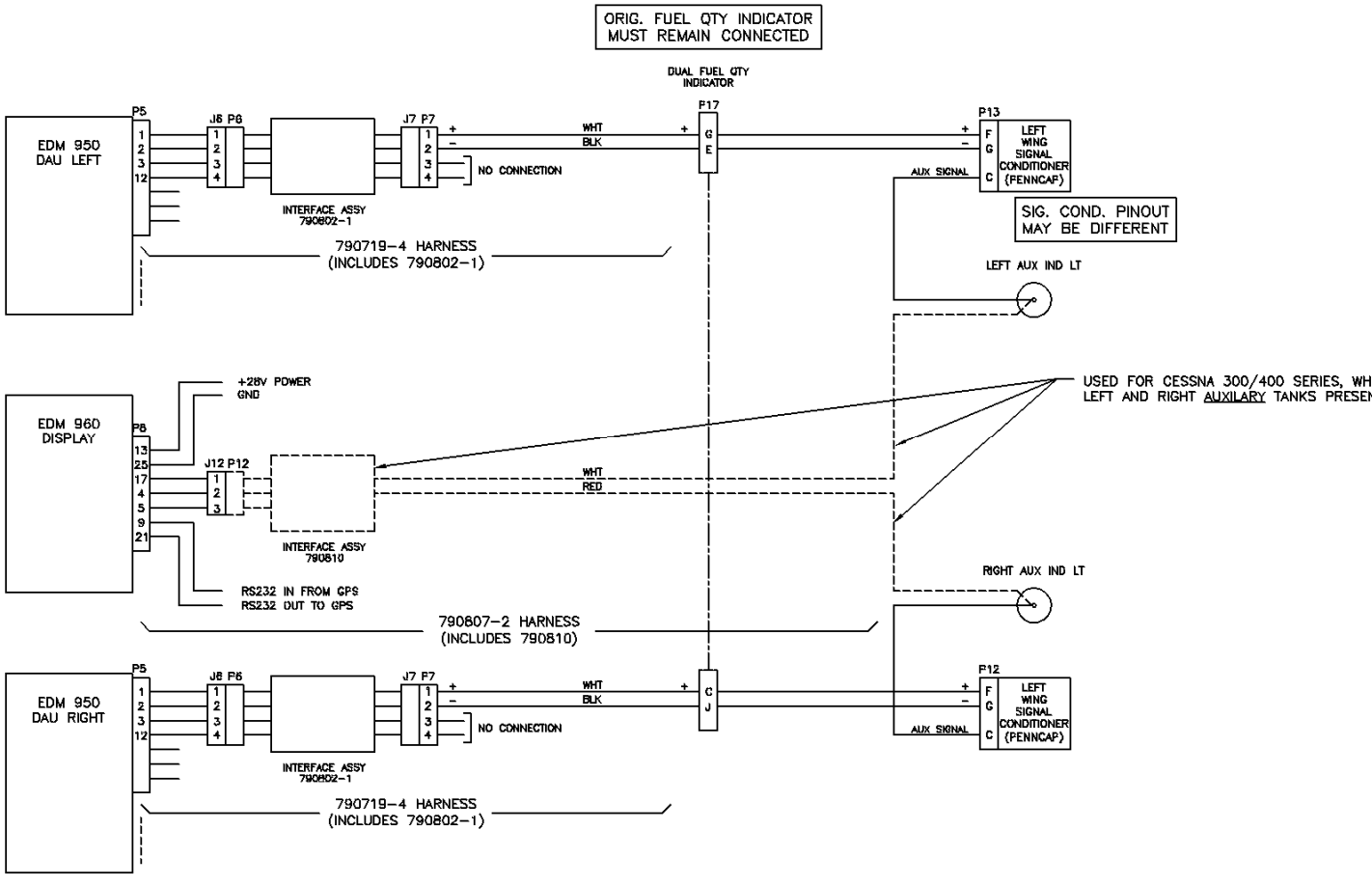


LEFT DAU SUGGESTED TANK CONFIGURATION	
INPUT SIGNAL	TANK POSITION
FQ1	LEFT MAIN
FQ2	LEFT AUX

21.2 Voltage Output Type Sender System

Voltage output type systems usually have a convertor box. This is typical with the 'Pennycap' brand capacitive sender system. The Pennycap convertor box measures sender capacitance and converts it to a DC voltage output signal for the aircrafts fuel level gauge. In some cases the Pennycap convertor box alternately monitors two tanks per wing controlled by cockpit selector switch positions. This is typical for Cessna twins having 4 selectable tanks. The EDM can interface to this system with the addition of the dashed interface hardware (PN 790810) shown below. NOTE: This drawing is accurate for most models of the Pennycap system, however it is the installers responsibility to verify proper connections to the Pennycap output signal. Note: The original ships gauge and all gauge selector switches and related annunciator lights must remain in the aircraft. The gauge could be mounted behind the panel if desired.

Example harness arrangement for an aircraft with MAIN and AUX tank Pennycap shared gauge system (shown for both wings).



21.3 Fuel Tank Calibration

In order for the EDM-960 to display fuel quantity, it must be calibrated to correlate the senders signal to the corresponding fuel level at several points for each monitored tank. This is known as creating the 'fuel tables'. The EDM-960 is used to directly read the fuel senders during fuel table data collection (no other equipment is needed). These readings are written down then later entered into the EDM-960, which stores them in its nonvolatile memory. NOTE: The fuel quantity gauges will not function until the fuel tables have been successfully created. The following describes the process of calibrating the fuel quantity measurement system.

21.3.1 Determining Calibration Points

The EDM-960 can monitor up to four tanks, with each tank having a maximum of 5 calibration points. Note that EMPTY and FULL are mandatory calibration points. Three intermediate points may optionally be recorded and entered. These are typically ¼, ½, ¾ quantity, but you can choose your own quantity values.

IMPORTANT: The 'EMPTY' calibration point must be set up by draining the tank completely dry, and then adding back the unusable fuel amount. Be sure the aircraft is in the attitude required for proper fuel level indications. This information is typically found in the Aircraft Maintenance Manual. This page can be copied and the charts below used for recording the values, as they closely resemble the EDM screens later used to enter your recorded data into. We recommend filling in the 'GAL' (quantity) fields prior to beginning aircraft calibration. Remember that these values must equal the actual tank quantity when the reading is taken.

	Left Main Tank				Right Main Tank			
E	**0**	**GAL**		**Volts**	**0**	**GAL**		**Volts**
2		**GAL**		**Volts**		**GAL**		**Volts**
3		**GAL**		**Volts**		**GAL**		**Volts**
4		**GAL**		**Volts**		**GAL**		**Volts**
F		**GAL**		**Volts**		**GAL**		**Volts**

	Left Aux Tank				Right Aux Tank			
E	**0**	**GAL**		**Volts**	**0**	**GAL**		**Volts**
2		**GAL**		**Volts**		**GAL**		**Volts**
3		**GAL**		**Volts**		**GAL**		**Volts**
4		**GAL**		**Volts**		**GAL**		**Volts**
F		**GAL**		**Volts**		**GAL**		**Volts**

21.3.2 Capturing the sender reading at each calibration point:

a) Power down the aircraft and empty the fuel tank so that it is completely dry.

b) Add the tanks 'UNUSABLE' amount back into the tank in preparation to read the mandatory 'EMPTY' calibration point (NOTE: EMPTY and FULL are mandatory calibration points).

c) Hold EDM-960 button 4 (rightmost) in during power-up until 'Fuel Level Readings' screen appears and readings stabilize.

d) Record the respective tanks sender reading and tank quantity, then power down the aircraft.

e) Add fuel to reach the next desired quantity calibration point.

f) Repeat steps 'c' through 'e' until the tank profiles for all tanks have been recorded.

IMPORTANT: The sender reading should change in one direction as you add fuel to the tank. This can either be a decreasing or increasing change depending on the aircraft design - but not both. If this direction reverses during the calibration process then you should stop and determine the cause (typically a bad sender).

21.3.3 Entering the sender reading and tank quantity calibration data points into the EDM-960:

a) Hold button 3 in during power-up until the 'Fuel Table Data' screen appears.

b) Transfer the calibration point data from your paper fuel table chart to the highlighted cell (see the on-screen instructions). NOTE: do not use the 'Capture Sensor' function.

c) Change to the next cell and repeat from step 'b'.

NOTE: The first Fuel Table Data entry screen shows the two MAIN tanks. When you step past the last cell, then a second page may appear for AUX tanks. After you step past the last entry for the last fuel tank, the EDM will ask if you want to 'Save Fuel Tank Data'. Tap 'SAVE' to store the data to memory or 'LF' to cancel and continue editing. If you 'SAVE', the instrument will automatically restart. Failure to use the 'SAVE' function will result in losing the calibration data you entered.

IMPORTANT: The owner of the aircraft is responsible for assuring the correct contents of the fuel tables and subsequently the correct operation of the fuel level system after calibration.

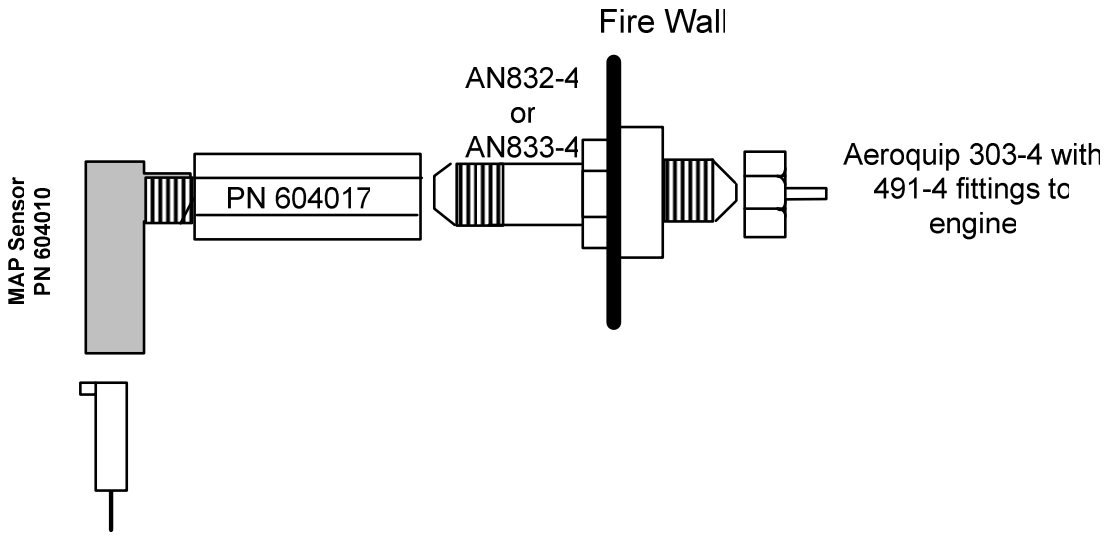
22. GPS Interface

The GPS is wired to the EDM-960 head. See 'Section 33

Interconnection between Display, DAU's and GPS' for wiring reference. Refer to the Manufactures GPS manual for the required pin connections on the GPS.

23. Manifold Pressure (MAP) Sensor

Screw a AN816-4D (flared to pipe thread) into the Aeroquip 303 hose to and from the bulkhead fitting an 832-4 as shown below if not already installed from the aircraft factory MAP gage.



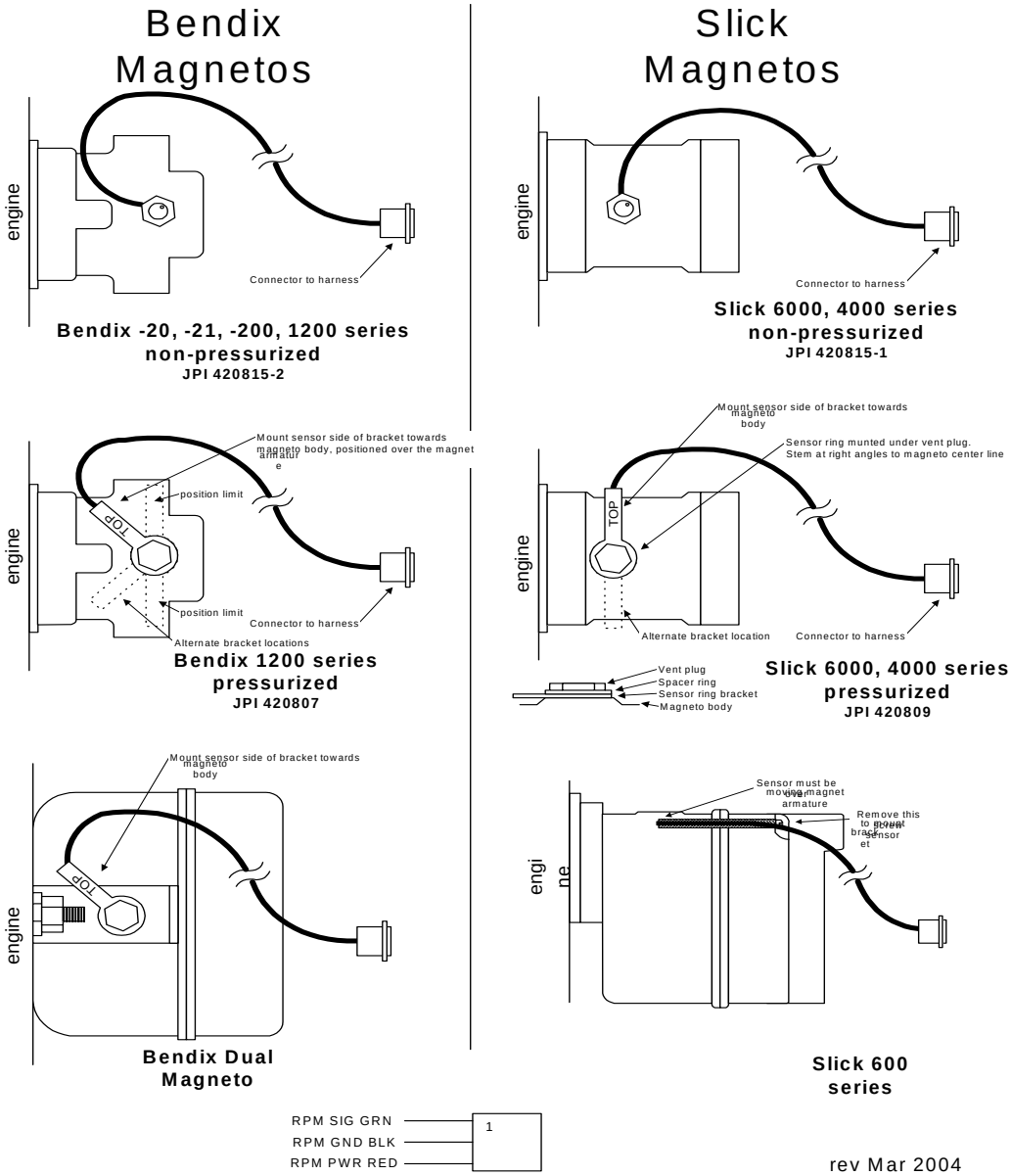
23.1 Manifold Pressure Calibration

The manifold pressure must be calibrated to the ambient air pressure. Enter the current ambient barometric pressure. The engine must *not* be running. This setting is *not* the same as the altimeter setting that you receive from ATIS or Unicom. It will vary with field elevation. Use the chart below to calculate the MP FACTOR. Multiply this MP FACTOR by the altimeter setting that you receive from ATIS or Unicom. For example if the field elevation is 1700 ft and the altimeter setting is 30.1, the MP FACTOR is 0.9400 from the table. Multiply 30.1 x 0.9400 to get the ambient MP of 28.29.

Field Elev.	MP FACTOR						
-500	1.0182	1400	0.9504	3300	0.8863	5200	0.8258
-400	1.0145	1500	0.9469	3400	0.8830	5300	0.8227
-300	1.0109	1600	0.9435	3500	0.8798	5400	0.8196
-200	1.0073	1700	0.9400	3600	0.8765	5500	0.8165
-100	1.0036	1800	0.9366	3700	0.8733	5600	0.8135
0	1.0000	1900	0.9332	3800	0.8700	5700	0.8104
100	0.9964	2000	0.9298	3900	0.8668	5800	0.8074
200	0.9928	2100	0.9264	4000	0.8636	5900	0.8043
300	0.9892	2200	0.9230	4100	0.8604	6000	0.8013
400	0.9856	2300	0.9196	4200	0.8572	6100	0.7983
500	0.9821	2400	0.9162	4300	0.8540	6200	0.7953
600	0.9785	2500	0.9129	4400	0.8508	6300	0.7923
700	0.9750	2600	0.9095	4500	0.8477	6400	0.7893
800	0.9714	2700	0.9062	4600	0.8445	6500	0.7863
900	0.9679	2800	0.9028	4700	0.8414	6600	0.7833
1000	0.9644	2900	0.8995	4800	0.8382	6700	0.7804
1100	0.9609	3000	0.8962	4900	0.8351		
1200	0.9574	3100	0.8929	5000	0.8320		
1300	0.9539	3200	0.8896	5100	0.8289		

24. RPM Sensor installation

Use the J3 connector harness 790420 and connect the 3 leads using the supplied 3-pin connector and pins. There are three types of magnetos commonly in use. You must have the correct RPM sensor for the magneto installed in the aircraft. The following part numbers apply: Slick -4000, -6000 use JPI P/N 420815-1. For the Bendix -1200 use P/N 420815-2. Dual magnetos use JPI PN 420810. Mount the sensor as shown in the appropriate diagram below.



rev Mar 2004

25. EDM-960 system Specifications and Limitations

The following parameters must be customized for the aircraft into which the EDM-960 system is installed.

Factory set limits or default values for EDM-960

1.	TIT 1650 F	TSO-C43
2.	CHT 450 F	TSO-C43
3.	Oil Temp Low 90 F	TSO-C43
4.	Oil Temp HI 230F	TSO-C43
5.	Oil Press low 15 psi	TSO-47
6.	Oil Press Hi 100 psi	TSO-47
7.	Vacuum 0- 15”hg	TSO-47
8.	RPM 2700 Limit and range	TSO-C49
9.	RPM set to cyl 6	TSO-C49
10.	Map 32 In hg HI	TSO-C45
11.	Map setting 29.90 In Hg	TSO-C45
12.	Fuel Pressure Hi 35 psi Injected	TSO-47
13.	Fuel Pressure Lo 15 psi Injected	TSO-47
14.	Fuel Pressure Hi 8 psi Carb	TSO-47
15.	Fuel Pressure Lo .5 psi Carb	TSO-47
16.	Fuel Flow 24 GPH	TSO-C44
17.	K-factor 29.99	
18.	Carburetor filter smoothing 1	
19.	Ammeter configuration (load or charge-discharge). Load	NON TSO
20.	HC-120 (% of HP)	NON TSO
21.	Fuel Level Resistive/Capacitive	TSO-55
22.	Low fuel 10 Gal	
23.	Low time 45 Min	
24.	Main tank 75 gallons	
25.	Aux tank 0	
26.	GPS set at GARMIN	
27.	Diff 500 degrees	TSO-C43
28.	CLD 60 degrees per minute	TSO-C43
29.	Amps limit 100 amps	NON TSO
30.	Record time, 6 sec intervals	NON TSO
31.	Hobbs on at 1000 RPM	NON TSO

During start-up the EDM may reset (typical on 14 vdc systems). This is normal due to extremely low battery voltage due to starter amperage draw. The conditions and test required for TSO approval of this article are minimum performance standards. It is the responsibility of those desiring to install this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO

standards. The article may be installed only if installation of the article is approved by the Administrator. The functions of Volts, Amps, and Horse Power were tested to DO-160D and DO-178B, but not TSO'd since no TSO exist for these functions. Deviation granted for TSO-C49b to include digital display and sensor. All TSO required probes, transmitters and sensors also tested to DO-160D.

26. EMI Radio Test:

Even through the EDM-960 has been tested to DO-160E Section 20 (EMI) the installation itself could creates radio interference on specific frequencies. The following test is to insure that this does not exist

EMI/RFI TESTS: perform tests, in accordance to the table below, to insure wire routing and connectivity has not compromised the signal integrity of the NAV/COM receivers. Power up the aircraft bus (or buses) in accordance with normal engine prestart procedures (see Aircraft Pilot Operating Handbook). Verify that the EDM-960 is operating normally. Set the frequency and audio panel to listen to that radio. Loud buzzing/humming is considered 'unusual noise' in the context of these tests also the OBS needle should not move. Should any EMI noise be found that is attributed to the EDM-960 system, it must be corrected by shielding and/or rerouting wiring to eliminate the noise. If unusual noise is heard, remove power from the EDM-960 system to check if it is the source of this noise. If the EDM-960 system is not the source of 'unusual noise' then mark the table with a 'PASS'.

Frequency	NAV/COM 1 (PASS/FAIL)	NAV/COM 2 (PASS/FAIL)	Comments
108.00			
112.00			
115.00			
117.00			
120.00			
121.00			
122.00			
123.00			
124.00			
125.00			
126.00			
127.00			
128.00			
129.00			
130.00			
132.00			

27. Component P arts

	Twin engine				
	-4 Cyl	-6 Cyl	-7 Cyl	-8 Cyl	-9 Cyl
Display EDM-930 P/N 790000-C-120	1	1	1	1	1
DAU EDM-950 P/N 790000-B-(xxx)	2	2	2	2	2
EGT probe KIT PN 128000	8	12	14	16	18
TIT probe with option KIT 120000	2	2	2	2	2
CHT probe KIT PN 126000	8	12	14	16	18
OAT probe with option KIT 122000	1	1	1	1	1
IAT probe with option KIT 130000	2	2	2	2	2
Carb temp probe if required	2	2	2	2	2
Oil probe with option KIT 124000	2	2	2	2	2
Oil pressure sender	2	2	2	2	2
Fuel pressure sender	2	2	2	2	2
Ammeter shunt	2	2	2	2	2
Fuel Flow transducer	2	2	2	2	2
Fuel Level sender option	2	2	2	2	2
MAP P/N 604010	2	2	2	2	2
RPM one of P/N 420815-1,-2	2	2	2	2	2
RAD P/N-790749	2	2	2	2	2

27.1 Component Parts List for EGT (PN 128000), TIT (PN 120) Probe

1 Thermocouple type K probe PN M-111
1 Stainless Steel Clamp Thimble
1 Stainless Steel Exhaust Seal Washer
1 Stainless Steel Screw Type Clamp
2 Ring Terminals
2 Screws and nuts 6-32 X 1/4
1 Fiberglass tube 1/2" X 4"

27.2 Component Parts list for CHT (PN 126000) probe

1 Bayonet Probe Thermocouple type K Spring loaded PN 5050-T
1 Or Gasket thermocouple probe type K PN MM-113
2 Ring Terminals
2 Screws and Nuts 6-32 X 1/4"
1 Fiberglass tube 1/2" X 4"

27.3 Component Parts list for OAT (PN 122000) probe

1 P/N 400510, OAT probe

2 Ring Terminals
2 Screws and Nuts 6-32 X1/4"
Fiberglass tube 1/2" X 4"

27.4 Component Parts list for IAT/CARB (PN 121000) probe

1 P/N 400128, IAT/CARB probe
2 Ring Terminals
2 Screws and Nuts 6-32 X1/4"
1 Fiberglass tube 1/2" X 4"

27.5 Component Parts list for OIL probe

1 P/N 400509 OIL probe
2 Ring Terminals
2 Screws and Nuts 6-32 X 1/4"
1 Fiberglass tube 1/2" X 4"

27.6 Component Parts list for VDO Oil Pressure sensor

1 P/N 3060-18, Oil pressure sender two wire
2 Ring Terminals

27.7 Component Parts list for Sensym Oil Pressure sensor

1 P/N 790775-1, Oil pressure sender four wire
1 4-pin male connector housing
4 male crimp pins
1 4-pin female connector housing
4 female crimp pins

27.8 Component Parts list for Sensym Fuel Pressure Sensor

1 P/N 790775 Fuel pressure sensor
1 4-pin male connector housing
4 male crimp pins
1 4-pin female connector housing
4 female crimp pins

27.9 Component Parts list for ampere shunt

1 P/N 159920 100 amp shunt
2 Ring Terminals

27.10 Component Parts list for Fuel Flow Transducer

1 fuel flow transducer, 201 or 231 PN 700900-1,-2
8 inches of 1.5”dia fire sleeve
1 3-pin connector housing
3 female pins
2 AN816-4-4 fittings

27.11 Component Parts MAP sensor

1 P/N 604010, MAP sender

27.12 Components Parts list for RPM sensor P/N depends on Magneto make and model

Bendix magneto -20,1200 P/N 420815-2
Slick magneto 4000 or 6000 P/N 420815-1

28. Weight and Balance Data

DAU PN 790000-B EDM-950	**1.8 Lbs**
Indicator PN 790000-C-120, EDM-930 incl. 2 RADs	**2.0 Lbs**
EGT / TIT / CDT / IAT / OAT probe	**2.0 oz. each / 0.125 lbs**
CHT / Oil Temperature probe	**1.5 oz. each / 0.094 lbs**
4/6 Cylinder Harness 8 ft.	**14.0 oz. each / 0.88 lbs**
RPM and MAP	**1.5 oz each / .094 lbs**
Fuel Pressure Sender	**3.9 oz each /**
Oil Pressure Sender	**4.4 oz each /**
Harness each	**1.0 Lbs**

29. Pilot Programmable Mode

29.1.1.1 Pilot Programming

Refer to the Pilots Guide for specific Pilot Programming details. Basically to start the Pilot Program procedure, simultaneously hold the STEP and LF buttons for five seconds. You will see the word PROGRAM for two seconds and then the example sequence shown in the chart below.

Tap the STEP button to advance to the next item in the list. Hold the STEP button to step back to the previous item. Tap the LF button to select alternate values of that item. Simultaneously hold both STEP and LF to exit.

STEP *advances next item*	**LF** *sequences through these values*	*Comments*
PROGRAM		***Stays on for two seconds.***
FUEL N	**FILL ? N**	**Tap LF to change fuel status. Exits program mode when done.**

RATE 4	0 … 9	Index rate (pause time in seconds) in the Automatic Mode. 0 disables the Automatic Mode.
OAT F	OAT F ⇔ OAT C	To calibrate the OAT ±10°, hold both the STEP and LF buttons simultaneously for five seconds, which will proceed to the next step. Otherwise the next step will be skipped.
OAT+0	OAT-I0 … OAT+I0	This step will be normally be skipped. Adjust the indicated temperature up or down by up to 10°. For example, OAT+3 adjust the OAT 3° higher.
EGT I?N	EGT I?N ⇔ EGT I?Y	Y—Yes—sets the digital display to one-degree resolution; N—No—sets 10°. (10° resolution is easier to interpr et the EGT's.)
HPC I25	70 HP HPC= I25	%HP display will change when HP constant is adjusted. Hold STEP and LF for 5 seconds until you see ADJUST to set the HP calibration. Tap STEP to continue to the next step. See page 26→ To adjust the MAP, hold both the STEP and LF buttons simultaneously for five seconds, which will proceed to the next step. Otherwise the next step will be skipped.
MAP 29.9	MAP 20 → 32	Adjust the MAP. See page 37→
KP 29.90		Adjust the instrument's K-factor to match the fuel flow transducer K-factor. See page 37→
TR IP? N	TR IP? N ⇔ TR IP? Y	N—No—Upon informing the EDM that you refueled the aircraft, reset total fuel used to 0. Y—Yes—accumulate total fuel used rather than reset to 0 at each refueling. See page 37→
HOBS VAL	2424 ENG⇔ 25 EDM⇔ 3567 FRM	Displays the engine hours and airframe hours.
END? Y	END? Y	STEP exits the pilot programming mode. LF reenters pilot programming mode.

29.1.2 Programming the Horsepower Constant

You must adjust the HP Constant once for your aircraft. You must perform this adjustment in the air while the aircraft is in flight between 5,000 and 8,000 feet MSL.

1. **Enter the pilot program mode by simultaneously holding the STEP and LF buttons for five seconds.**
2. **Tap STEP repeatedly until you see—for example— HPC = I25. Then hold both the STEP and LF buttons display until you see ADJUST, followed by HPC= I25. The adjustment range for the HP Constant is 45 to 180.**
3. **Set the MP and RPM per your POH to 70 percent power. Let conditions stabilize.**
4. **Change the HP reading on the EDM-960 to 70 percent by adjusting the HP constant in the lower display by holding or tapping the LF button. Percent HP should be close to 100 percent during takeoff at sea level.**
5. **Tap the STEP button to proceed to the next step.**

29.1.3 Programming the MAP

Sets the manifold pressure calibration (an sets the Carbureted fuel pressure zero points).
You may need to correct the MAP based on the altimeter setting at a sea level airport.

1. **Enter the pilot program mode by simultaneously holding the Step and LF buttons for five seconds.**
2. **Tap Step/OK repeatedly until you see—for example— HPConstant=125. Then hold both the first two buttons Step/OK and Change buttons display until you see Adjust, followed by HP Constant=125.**
3. **Again, Hold both the two buttons, Step/OK and Change buttons display until you see ADJUST, followed by MAP+0. The adjustment range for the MAP is ±3.0 in Hg. As you adjust the MAP up or down you will see a change in the MAP gage under RPM. When you see the correct setting stop.**
4. **Tap the Step/OK button to proceed to the next step or hold both buttons again to exit setup.**

Do this one time and only if the MAP on your manifold pressure gauge doesn't match the MAP shown on the EDM-960
You must do this on the ground with the engine turned off.

A. **Absolute calibration: the table below shows the MAP for a given field elevation (down the left side of the table) and altimeter setting (along top row of the table). Find the entry in the table most closely matching your field elevation and current altimeter setting. Interpolate if necessary.**

Alt setting-> field elev.	29.0	29.2	29.4	29.6	29.8	29.9	30.0	30.2	30.4	30.6	30.8	31.0
0	29.0	29.2	29.4	29.6	29.8	29.9	30.0	30.2	30.4	30.6	30.8	31.0
1000	28.0	28.2	28.4	28.5	28.7	28.8	28.9	29.1	29.3	29.5	29.7	29.9

2000	**27.0**	**27.1**	**27.3**	**27.5**	**27.7**	**27.8**	**27.9**	**28.1**	**28.3**	**28.5**	**28.6**	**28.8**
3000	**26.0**	**26.2**	**26.3**	**26.5**	**26.7**	**26.8**	**26.9**	**27.1**	**27.2**	**27.4**	**27.6**	**27.8**
4000	**25.0**	**25.2**	**25.4**	**25.6**	**25.7**	**25.8**	**25.9**	**26.1**	**26.3**	**26.4**	**26.6**	**26.8**
5000	**24.1**	**24.3**	**24.5**	**24.6**	**24.8**	**24.9**	**25.0**	**25.1**	**25.3**	**25.5**	**25.6**	**25.8**
6000	**23.2**	**23.4**	**23.6**	**23.7**	**23.9**	**24.0**	**24.0**	**24.2**	**24.4**	**24.5**	**24.7**	**24.8**
7000	**22.4**	**22.5**	**22.7**	**22.8**	**23.0**	**23.1**	**23.1**	**23.3**	**23.5**	**23.6**	**23.8**	**23.9**

Unless your airfield is close to sea level, do not set MAP to the local altimeter setting since that setting is the pressure corrected to sea level, and is not the same as your field elevation pressure.

Tap or hold the LF button to change the MAP value.
Tap the STEP button to proceed to the next item.

29.1.4 K factor

The K factor is shown on the fuel flow transducer as a four-digit number, which is the number of pulses generated per gallon of fuel flow. Before installing the transducer, write down the K factor here _____. To enter the number, move the decimal point three places to the left. For example if the K factor on the fuel flow transducer is 29,123, enter 29.12 in the K factor parameter.

If the K factor is increased, the indicated fuel flow will decrease, and vice-versa. When the K factor is changed during a trip, calculations of fuel used, fuel remaining and time to empty are not retroactively recalculated.

29.1.4.1.1 Fine Tuning the K factor

The K factor shown on the fuel flow transducer does not take into account your aircraft's particular installation. Fuel hose diameters and lengths, elbows, fittings and routing can cause the true K factor to be different from that shown on the fuel flow transducer.

You must use the following procedure to fine tune the K factor.

1. **Make at least three flights of about two to three hours each. Note the actual fuel used (as determined by topping the tanks) and the EDM-960 calculation of the fuel used for each flight USD.**

Flight	*Fuel USED shown by EDM (total tank - REM)*	*Actual fuel used by topping tanks*
1		
2		
3		
Total	❶	❷

2. Total ❶ the EDM-960 calculated fuel used and ❷ the actual fuel used.

3. Record the current K factor here ❸_____ and in the table below.

4. Calculate the New K factor as follows:

New K factor = (❶EDM fuel used) x (❸Current K factor)
(❷actual fuel used)

New K factor = (❶) x (❸)
(❷)

Every time you fine tune the K factor, change it by only half of the amount calculated above, and record the measurements here:

Date	*❶EDM fuel used*	*❷actual fuel used*	*❸Current K factor*	*New K factor = ❶x❸/❷*	*Pilot's initials*

29.1.4.2 Programming the K factor

This procedure is different than for setting other parameters.

1. If you haven't already done so, start the Pilot Program procedure, by simultaneously hold the STEP and LF buttons for five seconds. You will see the word PROGRAM, followed by FUEL N.

2. Tap STEP button to advance to the FFLW? N screen.

3. Tap LF to enter the fuel flow submenu.

4. Tap STEP repeatedly until you see KF = 29.90 (for example)

5. Hold both the STEP and LF buttons simultaneously for five seconds. The first digit flashes (shown here as a larger digit only for illustration purposes): 29.90

6. Tap or hold the LF button to change flashing digit: I 9.90

7. Tap STEP button for next digit (hold STEP for previous digit): I 9.90

8. Tap or hold the LF button to change flashing digit: I 8.90

9. Tap STEP button for next digit (hold STEP for previous digit): I8.90

10. Repeat items 9 and 10 for the remaining two digits.

11. Hold STEP and LF buttons simultaneously for five seconds to exit the K factor parameter setup.

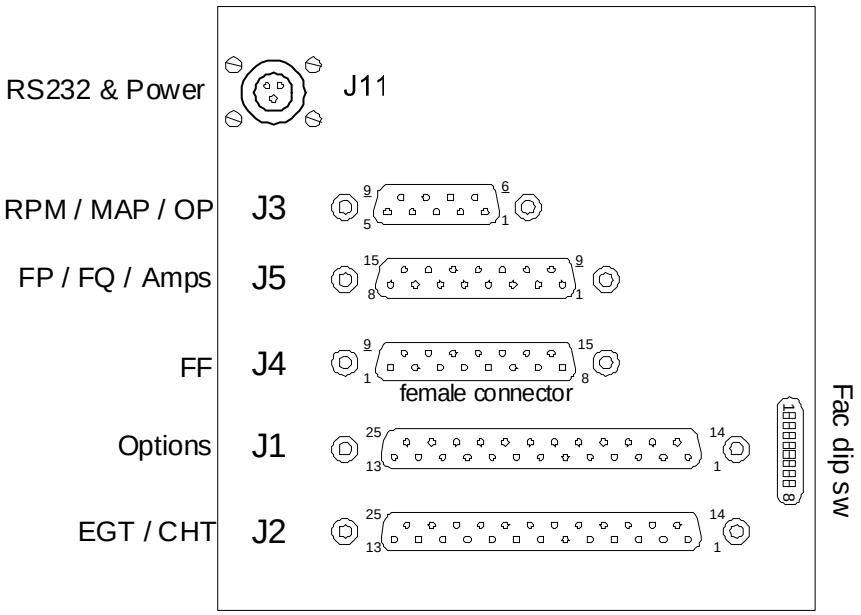
12. Tap STEP repeatedly until you see END ? Y, then Tap STEP once more to exit the factory setup mode.

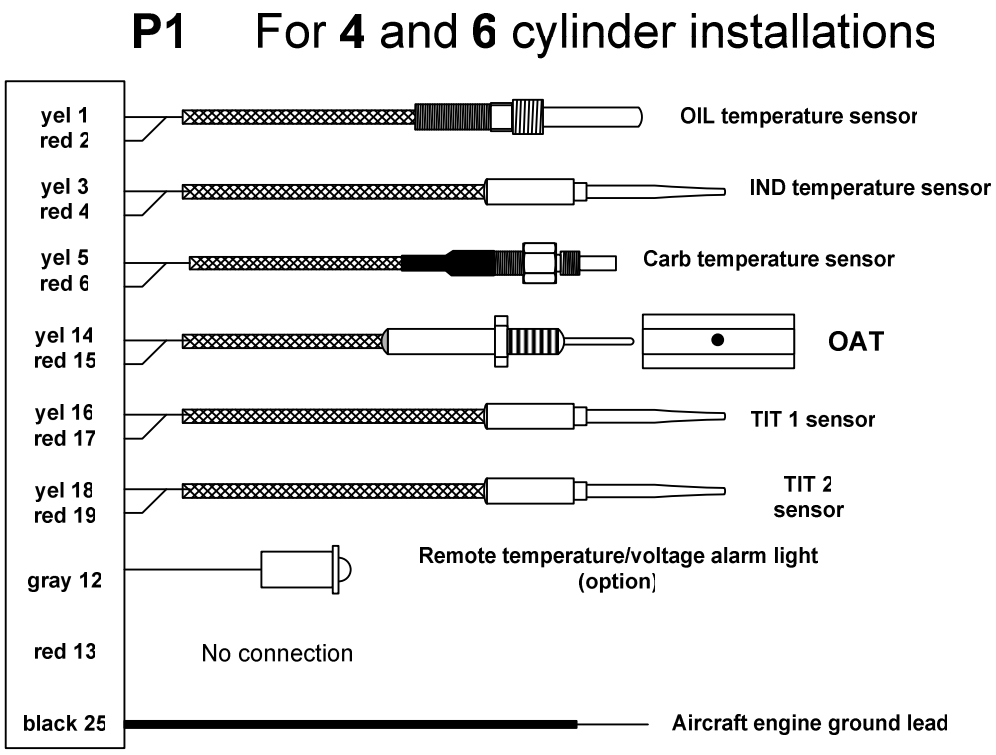
30. Trouble Shooting

1. **A missing column in the display upon start up indicates the continuity check diagnostic routine has found an open line or probe with no connection. An error message will indicate which cylinder to look at.**
2. **A missing column in the display during flight indicates a reading that is jumping around or incorrect. The probe is removed from the line up to prevent false alarms.**
3. **A negative reading (-) in front of the number indicates reverse polarity on the red/yellow wire to probe.**
4. **Using an ohmmeter or continuity checker measure across the probe output leads. A good probe should be around 2- ohms and at the connector to the probe around 20 ohms.**
5. **Erroneous or erratic readings on one cylinder reading. Swap the suspected probe with a probe from a good cylinder. If the problem goes to the good cylinder the probe should be replaced. If the problem remains the same, it is in the Thermocouple hook-up wiring from the probe to the instrument or it can be in the ring terminals crimped to the wire. Remember to double back on the wire going into the ring terminal.**
6. **EGT, large span. Normally aspirated (carburetor) engines at normal cruise display a "DIFF" of 125 to 175 ^{o}F spread between cylinders. Injected engines at normal cruise display a "DIFF" 50 to 90 ^{o}F spread between cylinders. All cylinders are measured by a common circuitry. It is almost impossible not to have identical calibration on all channels.**
7. **If the temperature reading is changing more than 500℉ in one second it should be questioned and a loose wire crimp or probe should be suspected. A malfunctioning probe will automatically be removed from the scan.**
8. **All EGT or CHT readings seem to high or low or unsteady. Use a DVM (digital voltmeter) to measure the difference between 950 ground and the engine block ground. If the difference is greater than 0.5 volts with the alternator charging. Then remove the EDM-960ground (Black wire) from the instrument panel and connect it directly to the ENGINE BLOCK for GROUND.**
9. **OAT readings off by 25 degrees, but oil and CHT readings OK, look for *copper wire spliced* in line to OAT probe. OAT reading can be fine tuned +/- 5 degrees, see reset procedure. Engine heat could also be the cause.**
10. **The instrument configures itself automatically for 14 or 28 volt electrical systems.**

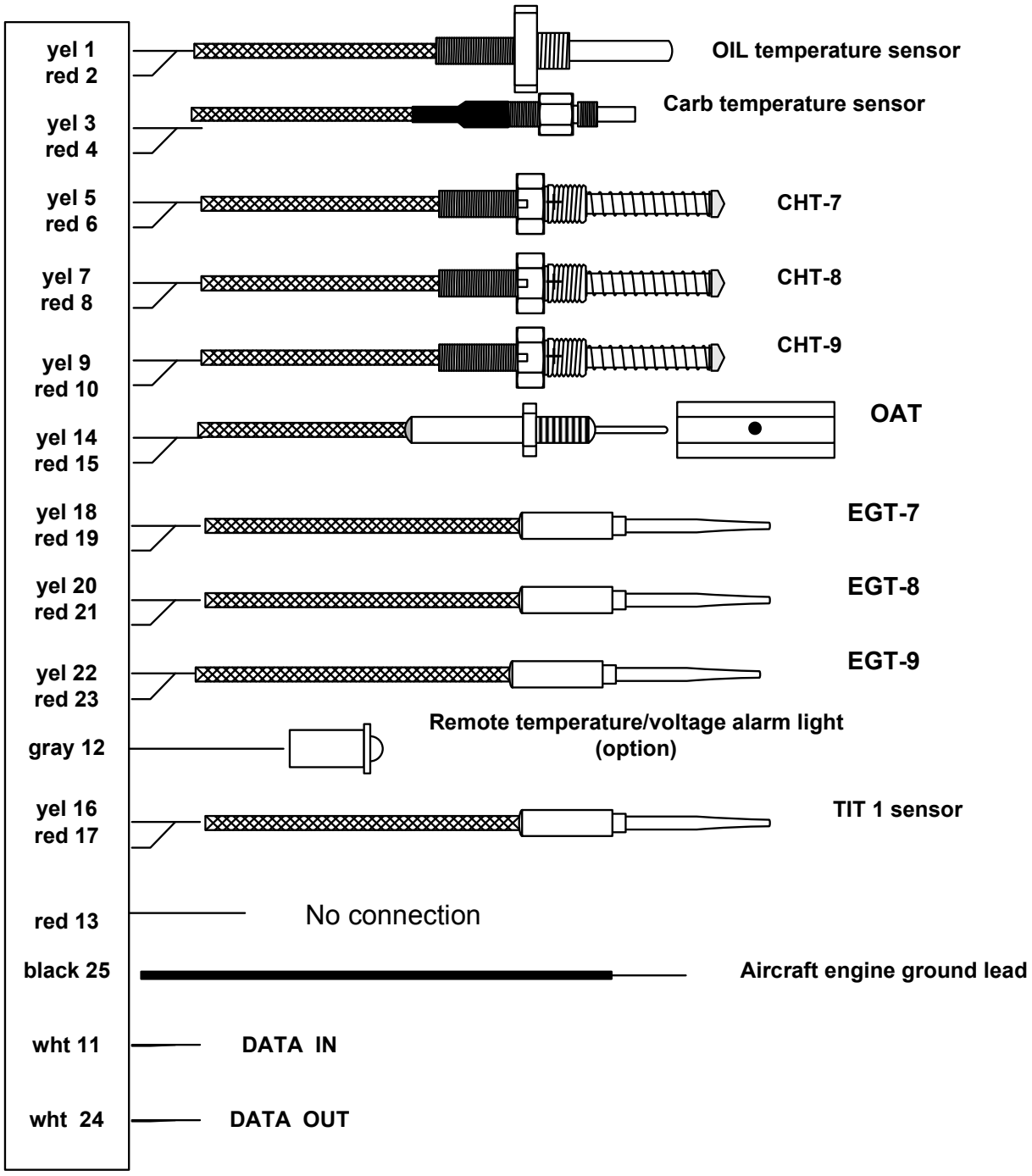
31. Connector Pin Assignments EDM-950, J1 through J5

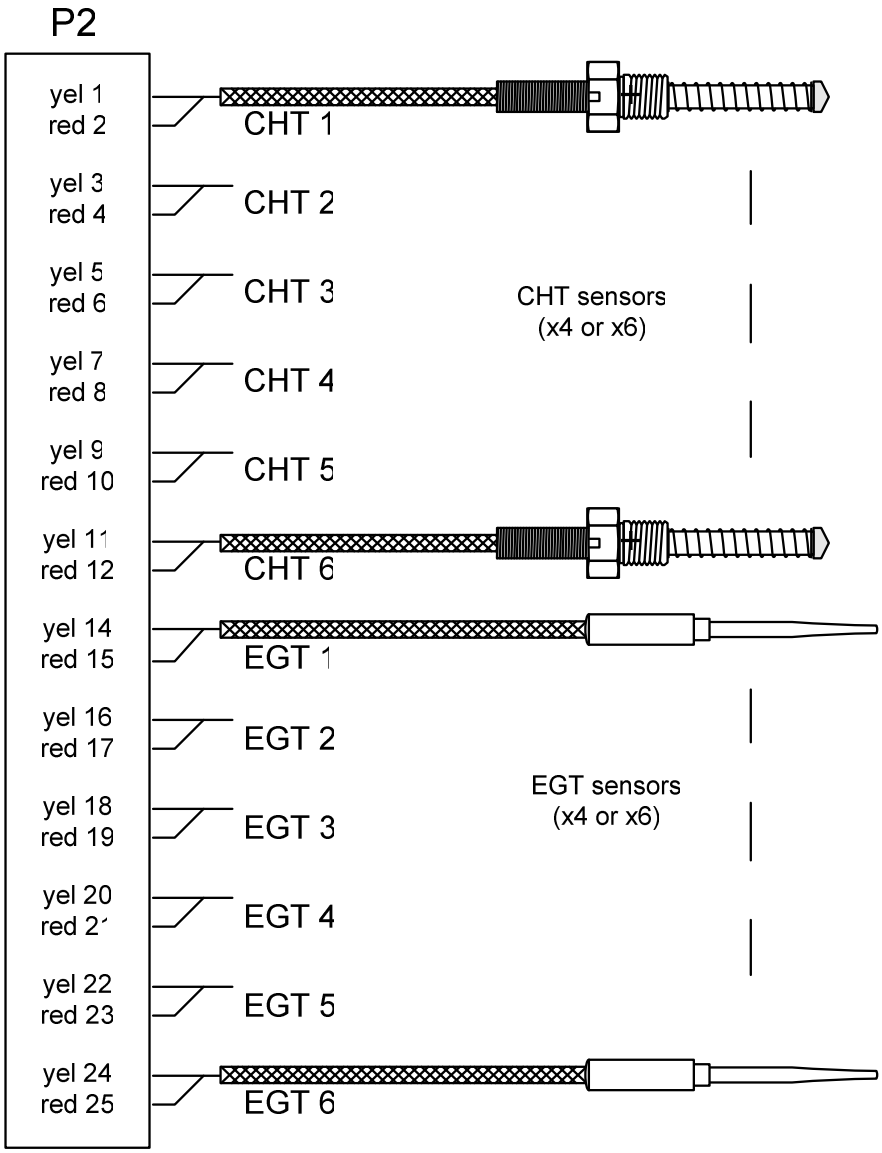
Top View of EDM-950 [DAU] Showing Connector Locations

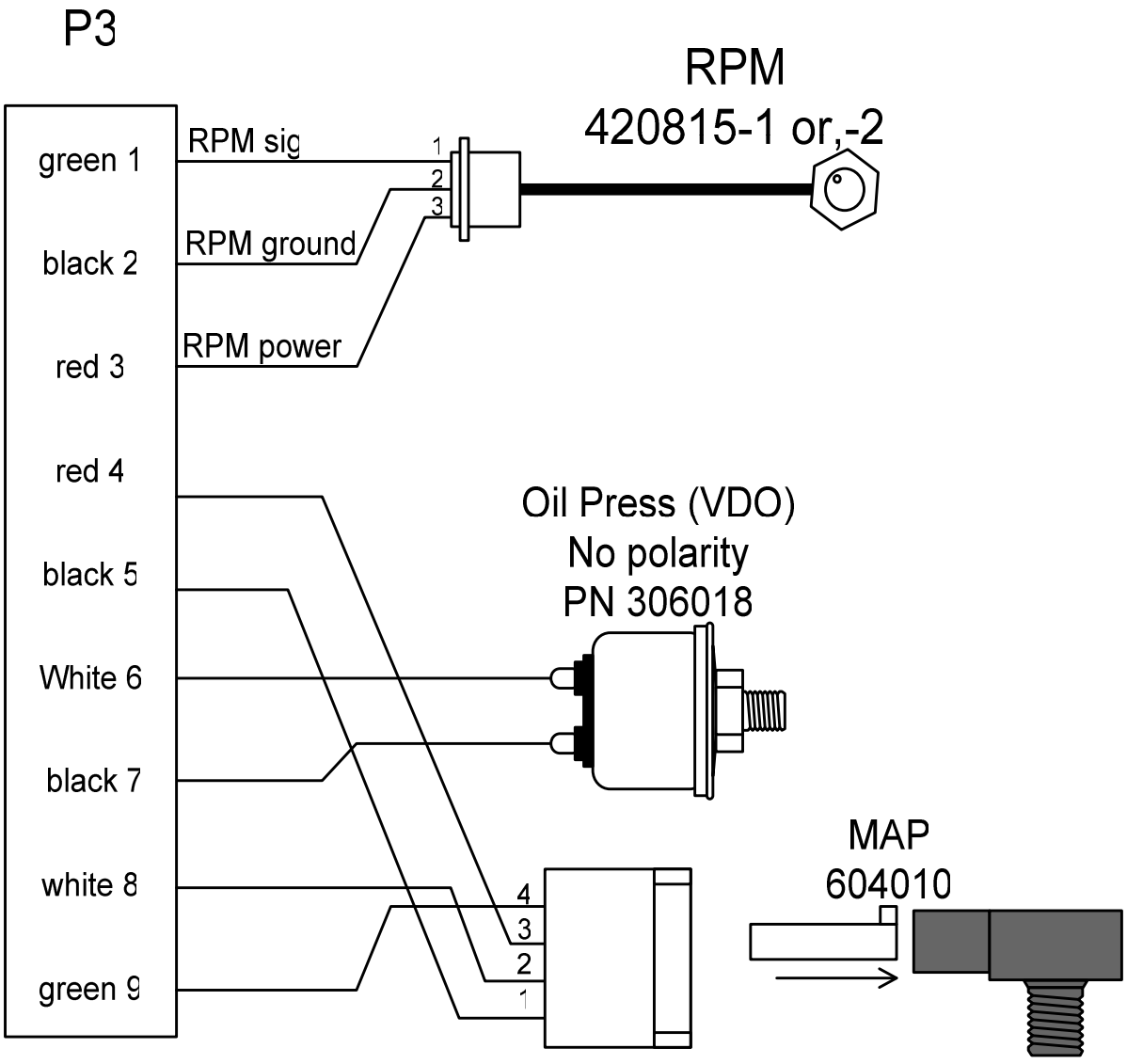


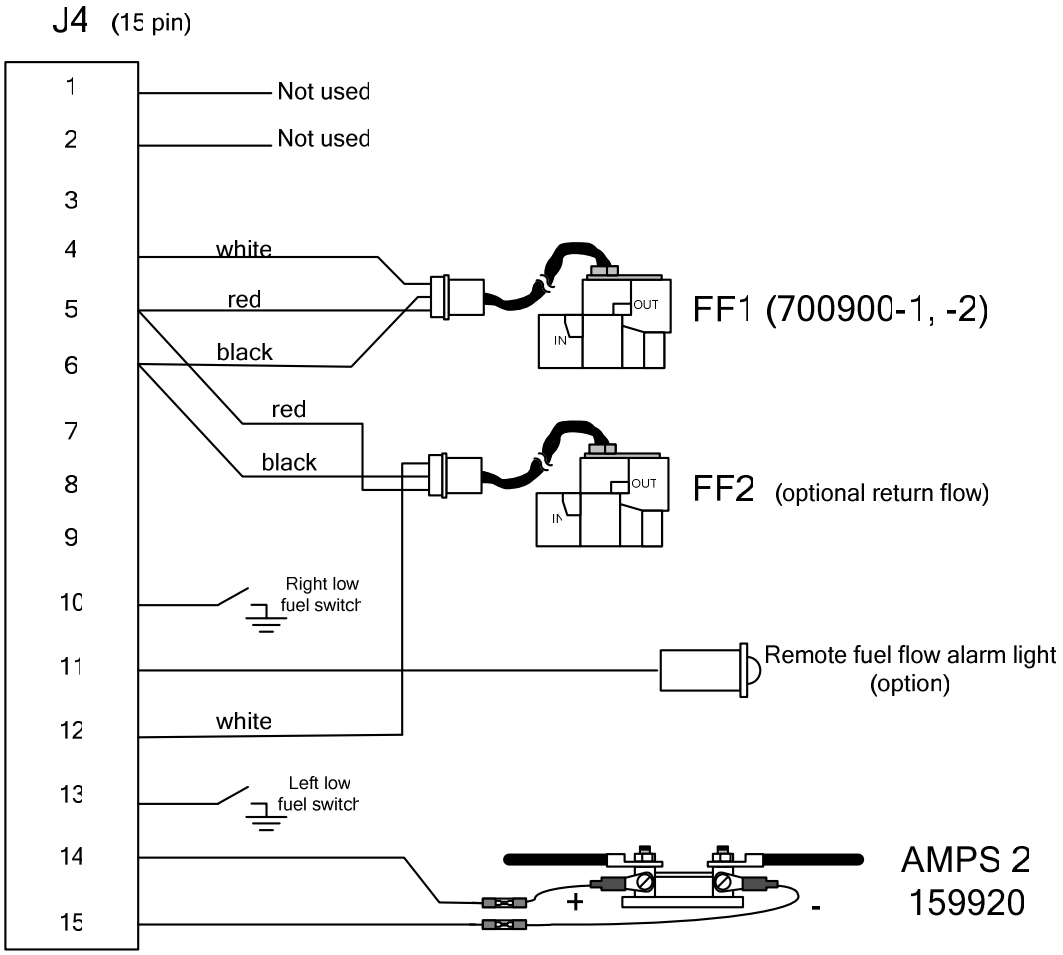


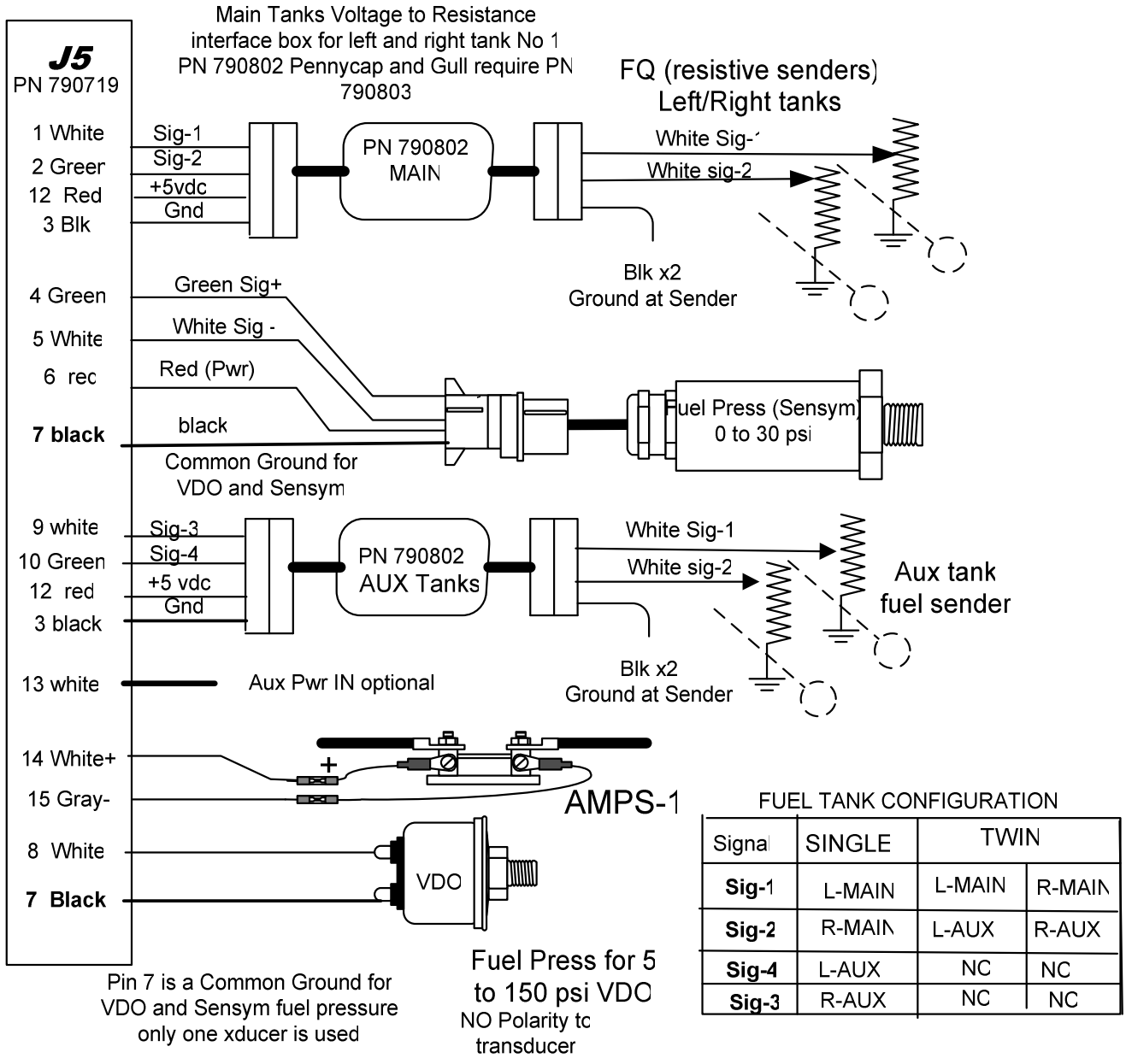
J1 FOR **7, 8,** and **9** cylinder installations




P2
yel 1
red 2
CHT 1
yel 3
red 4
CHT 2
yel 5
red 6
CHT 3
yel 7
red 8
CHT 4
yel 9
red 10
CHT 5
yel 11
red 12
CHT 6
yel 14
red 15
EGT 1
yel 16
red 17
EGT 2
yel 18
red 19
EGT 3
yel 20
red 2
EGT 4
yel 22
red 23
EGT 5
yel 24
red 25
EGT 6
CHT sensors
(x4 or x6)
EGT sensors
(x4 or x6)


P3
RPM
420815-1 or,-2
green 1
black 2
red 3
red 4
black 5
White 6
black 7
white 8
green 9
RPM sig
RPM ground
RPM power
1
2
3
Oil Press (VDO)
No polarity
PN 306018
4
3
2
1
MAP
604010

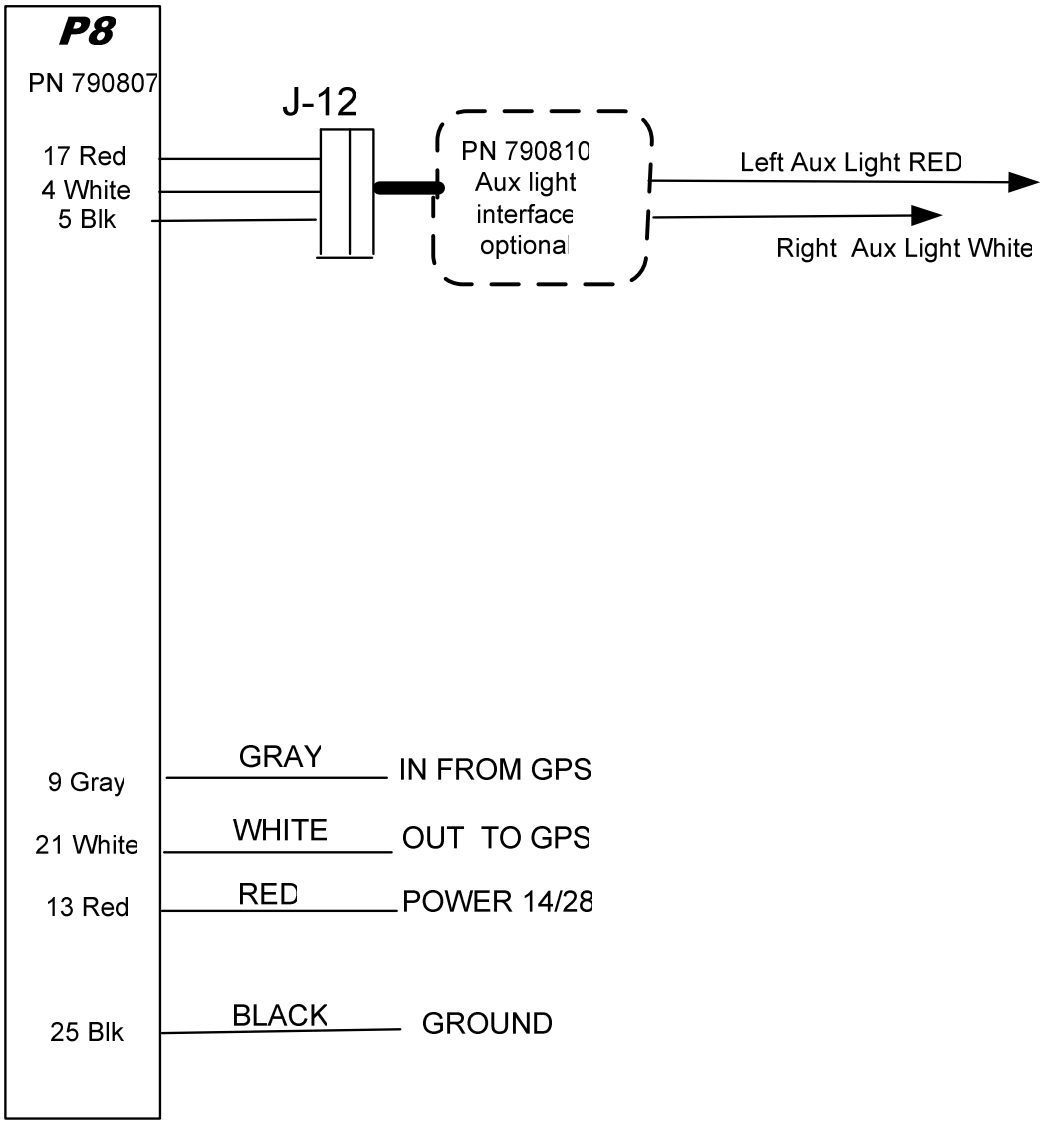

J4 (15 pin)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Not used
Not used
white
red
black
red
black
white
OUT
IN
FF1 (700900-1, -2)
OUT
IN
FF2 (optional return flow)
Right low fuel switch
Remote fuel flow alarm light (option)
Left low fuel switch
+
-
AMPS 2
159920



FUEL TANK CONFIGURATION

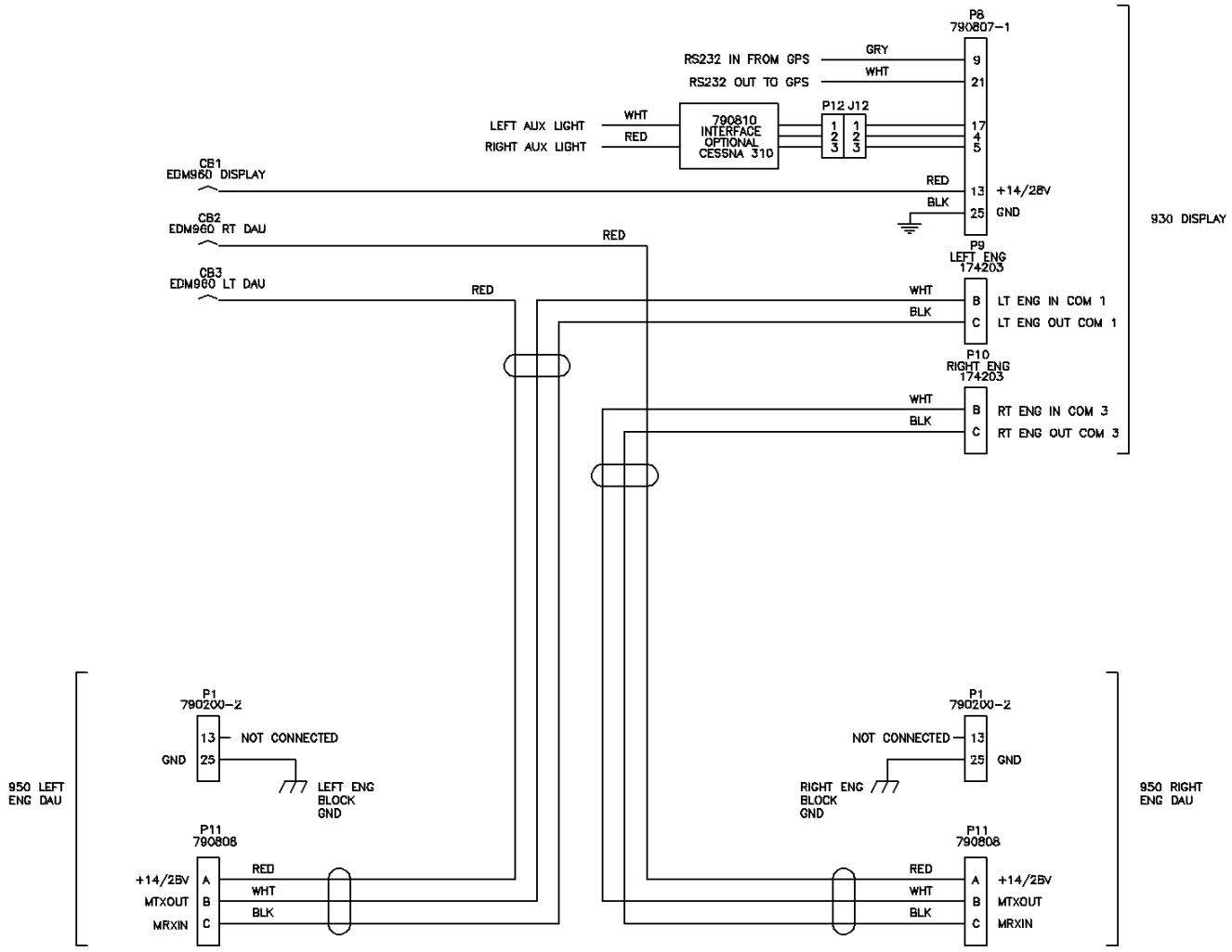
Signal	SINGLE	TWIN	
Sig-1	L-MAIN	L-MAIN	R-MAIN
Sig-2	R-MAIN	L-AUX	R-AUX
Sig-4	L-AUX	NC	NC
Sig-3	R-AUX	NC	NC

32. Display Harness P8



33. Interconnection between Display, DAU's and GPS

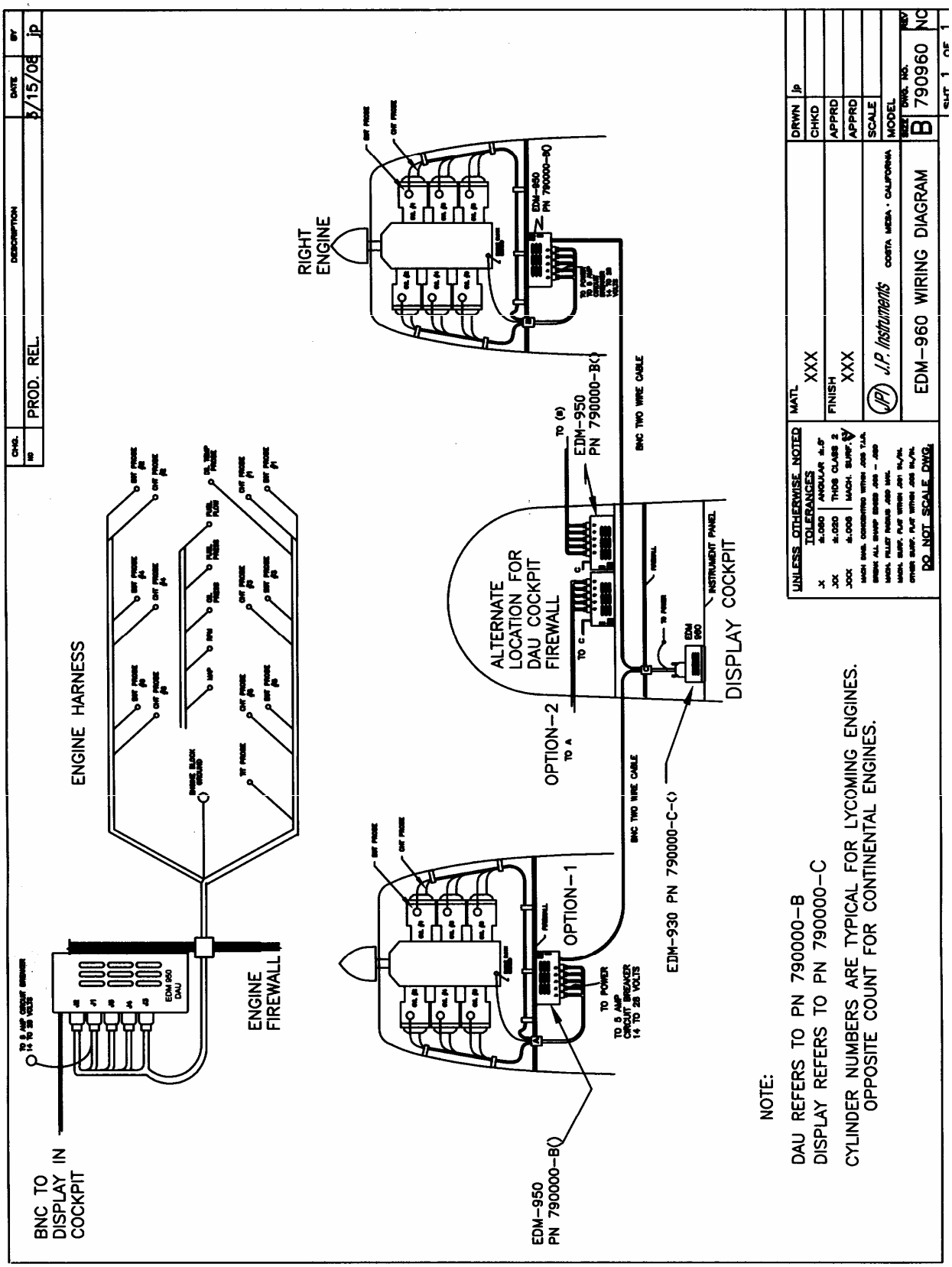
The DAU's must be interfaced to the panel mounted Display. For certain aircraft the Display must be interfaced to the aircraft's fuel gauge system switches and signal conditioners (typical on Cessna

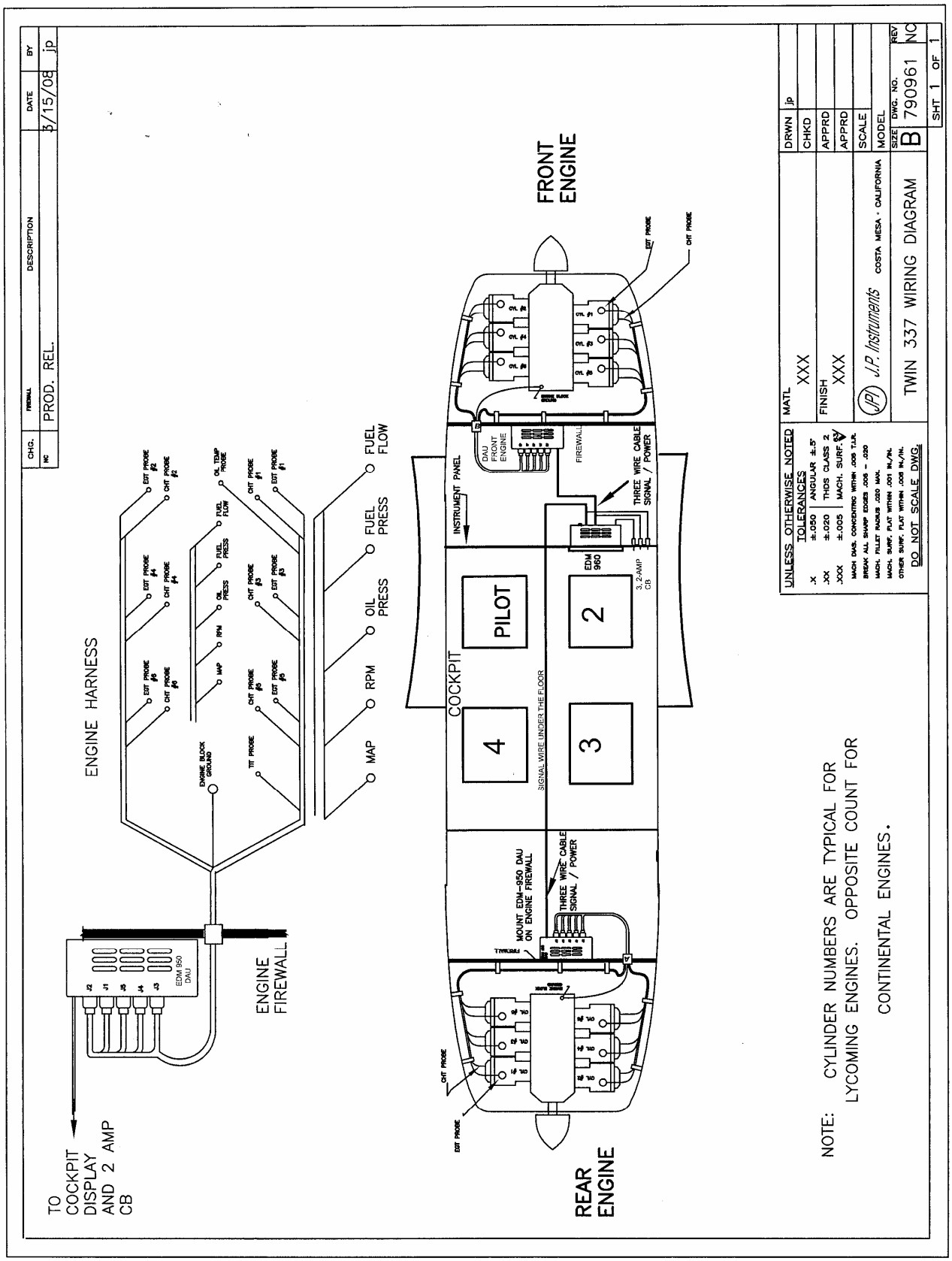


Note: P11 is the pre-wired Canon plug on the harness. P9 and P10 are installer wired.

Twins).

Overall Installation Wiring Diagram





NOTE: CYLINDER NUMBERS ARE TYPICAL FOR LYCOMING ENGINES. OPPOSITE COUNT FOR CONTINENTAL ENGINES.

34. Instructions for Continued Airworthiness (ICA)

There are no field adjustments and or calibration requirements for the EDM-960/950/930 instrument after initial installation. ICA is not required. Maintenance of nonfunctioning or malfunctioning components is limited to removal and replacement of JPI factory supplied new or repaired components as described in the troubleshooting section of the installation instructions.