J.P. INSTRUMENTS

FAA APPROVED INSTALLATION MANUAL FOR THE EGT-701 # 103

INSTALLING THE EGT-701 SCANNER®

Rev-C

THE OWNER OF THIS EDM-700/800 MUST KEEP THIS MANUAL

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LOS ANGELES
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INITIALS: ANM-40L

1) INSTALLING THE INDICATOR Installation Should Be Done In Accordance With Advisory Circular AC43.13-1A A steel template supplied with the installation kit is used as a guide for drilling two button holes in the instrument panel. Align and **Mount** the Template into the instrument panel hole. First drilling a 0.125 hole. Remove the template and check the instrument alignment, if OK redrill with a 0.147 drill. Buttons can be removed by pulling off. The EGT-701 mounts in a standard 2.25" instrument hole. The instrument **configures itself automatically** for 4 to 9 cylinders, 14/28 volt aircraft. The instrument is 7.5” deep less connectors and is 2.6 square behind the panel.

TO PREVENT DISPLAY DAMAGE IT IS ESSENTIAL THAT THE FOUR MOUNTING SCREWS NOT PENETRATE THE INSTRUMENT MORE THAN .12 INCHES.
DAMAGE OF THIS NATURE IS NOT COVERED UNDER WARRANTY.

2) EXHAUST GAS TEMPERATURE PROBE (EGT)

The Model M-111 Probe will fit any existing holes in the exhaust stack in any engine having the diameter of 1/8" to 1/4". 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 a **uniform** distance from the exhaust stack flange. A nominal distance of 2 to 4 inches from the exhaust flange is recommended. (See fig-2). 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. Be certain to locate all holes BEFORE drilling to ensure that nothing interferes with the probe, clamp, clamp screw or wire. Careful matching of probe position will provide best temperature readings. Insert the probe in the exhaust or previously drilled hole (see fig-3) 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. Probe warranty is void if mounted in a slip-joint of any kind.

3) TURBINE INLET TEMPERATURE PROBE (TIT)

The standard TIT probe P/N M-111-T with a special clamp is placed in the exhaust stack accumulator to a **maximum** depth of 1/2 inch and approximately four (4) inches from the Turbine inlet if possible, on the wastgate side of the turbine. TIT will appear as the seventh column “T “and the expression “1650 TIT” will be seen when the dot is in place over it. The EDM-700 input is also compatible with the aircraft’s factory TIT and may be piggy backed.

The EDM-700 TIT cable may be connected in parallel (piggyback) at the TIT probe (preferred), or at the ship's TIT gage.

Check the TIT readings between the EDM and the ships TIT gage in flight, then do the following calibration procedure. (This may be done in flight or on the ground.)

Press & hold 'STEP' and 'LF' keys simultaneously until you see
'PROGRAM' and 'RATE 4'. (Note: Bargraph disappears)

Now press & hold 'STEP' and 'LF' simultaneously again until you see
'ORIG. TIT' and 'ORIG. T-N'.

Tap 'LF' once to change to
'ORIG. T-Y'.

Tap 'STEP' once to display
'CAL TIT' and 'TIT+ 0'.

This is the correction added to (+), or subtracted from (-) the EDM reading for TIT (at high temperatures).

Hold in 'LF' to raise the correction, or tap 'LF' to lower it.

For example, if the EDM read 100 less than the ship's TIT,
Then hold in 'LF' until you see
'TIT+100'.

Adjust the correction slightly if a difference between the EDM
and the ship's gage still exists.

Now tap 'STEP' once to complete setup.

4) CYLINDER HEAD TEMPERATURE PROBE (CHT), BAYONET

The Bayonet probe 5050-T has the 3/8-24 boss as part of the probe and is screwed into the base of the cylinder (See fig-2). The bayonet probe has a screwdriver slot to facilitate tightening.

NOTE: Required original equipment that has a Red Line may not be replaced by the EGT-701 TIT or CHT installation. This includes but is not limited to all aircraft with adjustable cowl flaps and on aircraft with placards on the instrument panel showing a climb air speed, for cooling, different from the best rate of climb air speed.

If a previously installed TIT, CHT or EGT is listed on the aircraft equipment list as Optional Equipment or not listed at all, it may be replaced by the EGT/CHT SCANNER.

5) CYLINDER HEAD TEMPERATURE PROBE (CHT) SPARK PLUG GASKET

Most factory installed cylinder head temperature gauges utilize a **bayonet** or **screw-in** resistive type probe that occupies one of the bayonet sockets. This probe is not compatible with the thermocouple probes required for the EGT-701.

The spark plug gasket probe, P/N M-113, replaces the standard copper spark plug gasket on one spark plug. The plug chosen, upper or lower, should be the one that provides the best correlation with the other temperature probes. Due to the spark plug location, the gasket probe may read 25°F higher or lower than the factory probe. The probe is usually placed on the plug that receives the most direct cooling air. After many removals the probe may be annealed for re-use. Heat and quench in water. At additional cost an adapter probe (**bayonet** or **screw-in**) is available that permits the factory CHT probe and a JPI probe to fit the same bayonet location.

6) OIL TEMPERATURE PROBE

The Oil Temperature Probe P/N 400505-**C**-**L** is installed as a supplemental oil temperature indicator. The **-L** part number is for all Lycoming Direct Drive Engines and is installed in the **Right** (passenger side) front Oil galley by removing the present 1/8 NPT plug (see fig-4). The **-C** part number is for all Continental Direct Drive engines and is installed in the **Left** (pilot side) front Oil galley by removing the present plug (see fig-5). Oil temperature will be displayed as an independent temperature like "230 OIL" and will be displayed In the seventh column automatically if TIT is not available. The original oil temperature gauge and sensor must remain. Check for oil leaks and safety wire before first flight.

7) OUTSIDE AIR TEMPERATURE PROBE, OAT

Install the OAT probe, P/N 400510 in the airframe manufactures recommended location. If this is not possible, it is recommended that the OAT probe be placed 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 instructions of AC 43.12-2a "Acceptable Methods, Techniques and Practices". The outside aluminum tube is used to both hold the probe in place and shield it from radiated heat. OAT option is displayed as an independent digital temperature like "75 OAT". Be sure that when testing the OAT it is not in direct sun and the engine is running.

8) INDUCTION AIR TEMPERATURE PROBE (IAT) / CARB TEMP.

Induction Air temperature probe, IAT, is installed just after the inter-cooler (OUT) and the Compressor Discharge Temp (CDT) just before the inter-cooler (IN). The probe is an EGT probe and installed the same way as an EGT probe. A large clamp is supplied to fit around the airport leaving the inter-cooler or a 1/8 NPT 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”.

9) RADIAL ENGINES

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. Refer to the engine manufactures red line and set the EDM-700 appropriately. Front spark plugs will read 15 to 20 degrees cooler than

the rear plugs. Do not route the EGT/CHT harness in with the ignition harness. Do not extend the yellow thermocouple leads with copper wire.

10) FUEL FLOW OPTION

The EGT-701 receives signal from any installed Flowscan Transducer of the following Flowscan P/N's embossed on to the top of the transducer. The K-Factor is engraved on the side of the Transducer. Wire per drawing 700744, Route the JPI wires along the existing wiring bundle lacing every foot.

Flowscan Instruments, Seattle WA 98106

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

Install the function switch in the panel per drawing 700124.

11) WIRING (12 / 24 volt)

The EGT-701 automatically accommodates both 14 and 28 volt electrical systems. Connect the power lead (red) to a separate 5 amp circuit breaker (or 2 amp in-line fuse) connected to the avionics power buss. The avionics master switch will then be used to turn off the instrument during engine start-up. The EDM-700 has a 10-second warm-up. If the panel lacks an avionics master switch we recommend that one be installed or a circuit breaker switch be provided to turn off the EGT-701 during engine start-up. The Instrument should be **grounded at the engine**. No connection to the aircraft dimmer system is required because the instrument dims automatically with reductions in ambient light.

12) EGT and CHT Probe Wiring

The EGT-701 is supplied with special Teflon insulated Chromel Alumel factory assembled wiring harness configured for the correct number of cylinders. The wire harness is marked E-1= EGT-1, C-1= CHT-1, etc. TIT is marked "T", Oil I = "O" and OAT = "A". For retrofits of the EGT-100 SCANNER or bar graph instruments, where only the indicators are being exchanged, the old harness wires need to be pinned with AMP P/N 665049 and fitted into AMP D-SUB connector P/N 205207-1 with hood per drawing 300701 fig-6 or connected directly via an adapter connector.

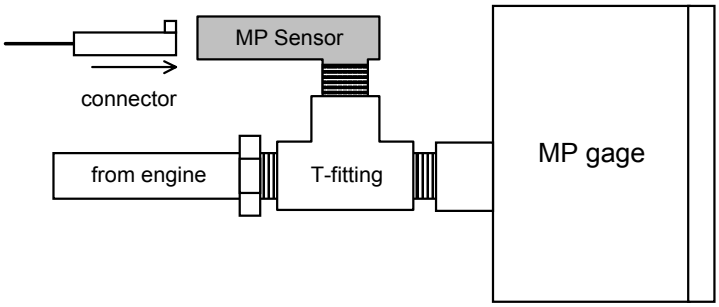
NOTE: Unlike most other EGT & CHT installations the probe wire length is not critical and should be trimmed to any length as required for a clean installation.

The Temperature probes must be wired with the correct polarity. Each wire is marked with the cylinder number. The EGT and CHT probes connect to the temperature indicator with yellow jacket Teflon Chromel Alumel wire supplied. Strip the wires according to drawing 5057 and terminate with the crimp-on ring terminals provided. Verify the quality of each crimp with a sharp pull on the wire. The terminal should be almost impossible to pull off when crimped correctly. With in a few inches of the instrument terminal strip a connector may be installed.

NOTE: The ring terminals may be crimped with a " service type " tool, however AMP part number 48518 tool is recommended. Be sure to test each crimp by pulling on the wire to assure it will not come out.
The most common installation problems are poor quality terminations.

13) Manifold Pressure (MP) Sensor

Install a T-fitting (not supplied) in the aircraft's MP gage line in the cockpit near the MP gage. Install the JPI MAP sensor P/N 604010 on the T-fitting. Connect the JPI MP sensor to the wiring harness using the 4-pin connector supplied. The MAP sensor uses a 1/8 NPT fitting. Note: this is eligible for installation on all 4 & 6 cylinder engines only. There are no alarm limits.



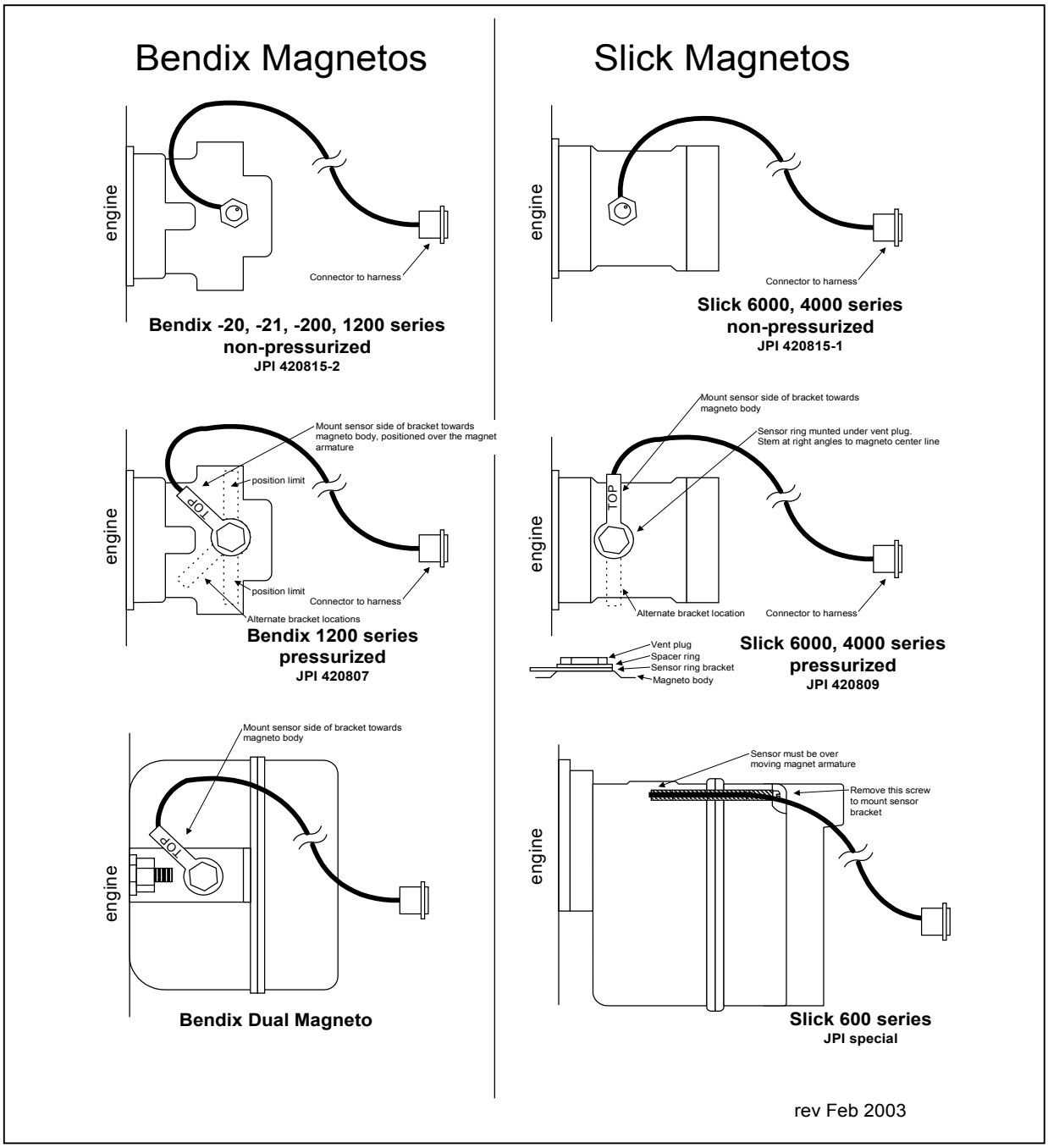
Manifold Pressure Calibration

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	1300	0.9539	3200	0.8896	5100	0.8289
-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		

14) RPM Sensor installation

There are four 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 series use JPI P/N 420809. For the Bendix -1200 series use P/N 420807. Dual magnetos use JPI PN 420815. For the Bendix -20 series use JPI P/N 420806. Mount the sensor as shown in the appropriate diagram below. Note: this is eligible for installation on all 4 & 6 cylinder engines only. There are no alarm limits.



15)

ROUTING THE WIRING HARNESS

Route the wires from the probes and sensors through the firewall using fireproof rubber grommets and flame retarding silicone. Use an existing hole if possible. Following the existing wiring harness and connect to the indicator marking each lead with the cylinder number. All wires must be routed **away from high temperature** areas (exhaust stacks, turbochargers, etc.). Secure Probe leads to a convenient location on the engine approximately 8 to 12 inches from the probe, 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 airframe or engine since abrasion will destroy this high temperature wire.

Connect the JPI RPM sensor to the wiring harness using the 3-pin connector supplied.
Secure thermocouple wires along the route to the indicator. Secure wire using original clamps, tie wrap if possible.

CAUTION: Be sure the wiring does not obstruct the controls under the panel.

- The probe wires must not be tied in with ignition, alternator or twin engine cabin heater ignition wires because of potential interference with temperature readings.
- Temperature probe wiring harness is made of Chromel-Alumel alloy wire (yellow) that **must not be substituted or extended with normal copper wire**. The power and ground wire are normal copper. 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 chaffing with flight control cables or other moving parts.

16) DESCRIPTION/OPERATING INSTRUCTIONS

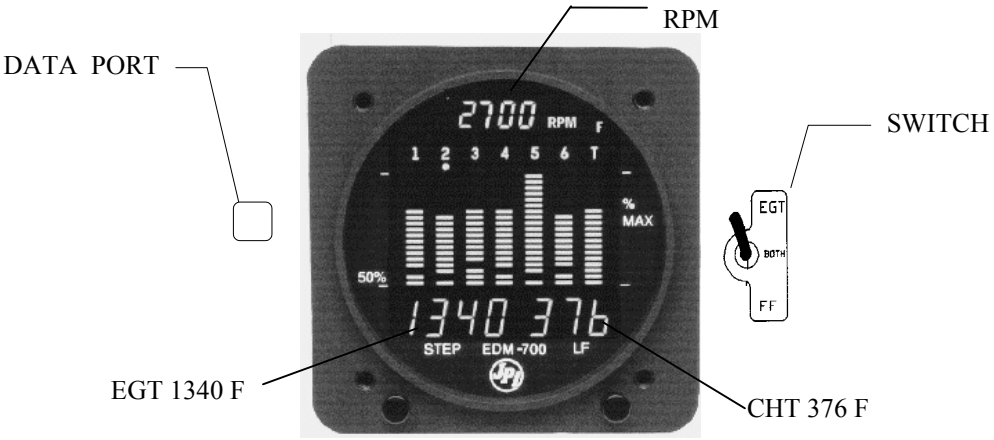
General

The EGT-701 temperature indicator displays temperature digitally and in analog format. The EGT as displayed is based on probes located near the exhaust outlet for each cylinder and the TIT probe, if installed, is adjacent to the turbo charger. These probes are not necessarily collocated with the primary probes therefore; EGT-701 may not indicate the same as the aircraft primary instruments. The analog display is an electronic bar graph (vertical columns, one per cylinder) of EGT & TIT temperatures presented as a percentage of 1650°F. Below the vertical columns the specific value for EGT and CHT are displayed digitally. The dot over the column indicates which cylinder's digital information is presently displayed. The missing bars at the base of the columns indicates the hottest and coldest Cylinder Head temperature trend. During Lean Find mode the leanest cylinder is displayed along with the fuel flow (optional) at that time. Depressing the LF and STEP button simultaneously brings up the adjustable scan rate function, OAT in °C or °F. Depress the LF button will change the value of the rate or Oat in °C or °F. Exit by Depressing STEP.

If the EGT-701 buttons are not depressed for 10 minutes the system will start scanning automatically. Depressing the STEP button will stop the automatic scan and index through all the functions available. During constant power cruise, if the LF button is depressed for five seconds the Bargraph will level at mid scale. The leveled bars represent the peaks of each column. Each bar represents 10 °F and now acts as an EGT & TIT trend monitor, quickly showing an increase or decrease in temperature. Depress again to return to normal; nothing else is affected. With the fuel flow option there is a three position toggle switch. The positions are: 1) **EGT**, digital and Bargraph display of temperatures, 2) **FF**, digital display of GPH, REM and USED Fuel. Temperature Bargraph remains. 3) **Both**, cycles through everything installed. The data port output, sends RS232 serial data every 6-sec.

Options of Fuel Flow, TIT, OAT, IAT (induction air temp.), OIL, BAT (voltage) and are only displayed digitally with headlines after the number, as "230 OIL" or “14 GPH”. A large value (50 +) of "CLD" indicates shock cooling usually associated with rapid descents at low power. Optional functions not installed will not display.

RPM is displayed constantly in the top display. Manifold pressure is display in the scan sequence. There are no alarm limits on RPM or MAP.



P/N EGT-701

17) INDICATOR INSTALLATION & RECORD

Locate a 2.25 diameter hole in the instrument panel, where you would like to mount the indicator per drawing 700124. Mount the indicator in the panel, using the four 6-32 X.15" screws. The screws must not penetrate the bezel more than .120".

The indicator is FAA TSO approved, as a temperature indicator under TSO-C43b

Record the installation of the P/N EGT-701 per **STC# SA 2586NM.** Make entry in the aircraft logbook. FAA form 337 may be required.

18) ENGINE OPERATION

Airplane flight manual limitations based on primary instrument indication take precedence over those of the EGT-701

CAUTION
Comply with manufacturer's Airplane/Rotor craft
Flight Manual leaning procedure.
Do not exceed applicable engine
or aircraft limitations.

After establishing desired cruise power depress the LF button to activate the Lean Find Mode. As the mixture is leaned, the column display on the EGT-701 for one cylinder will begin blinking; indicating the exhaust gas temperature for that cylinder has peaked. Continue with the leaning procedure as recommended by the aircraft manufacturer while monitoring the primary engine instruments and the EGT-701 display. Once the leaning procedure has been completed, depress the Step button briefly to exit the Lean Find Mode and enter the Monitor Mode.

ENGINE OPERATION: **Operate and lean the engine in accordance with the manufacturers' recommendations** for different power settings.

19) EGT-701 SPECIFICATIONS and LIMITATIONS

OUTPUT FUNCTIONS (ALL OPTIONS):	FACTORY LIMITS
EGT (Exhaust Gas Temp.,K ,Max. limit 2500°F)	1650 °F
CHT (Cylinder Head Temp., J/K Max. limit 600°F)	450 °F
TIT (Turbine Inlet Temperature, K, Max. limit 2500°F)	1650 °F
OIL (Oil temperature, K, Max. limit 600°F)	(Hi/Lo) 230/90°F
OAT (Outside Air Temp., K, Limit -40 to 300°F)	
IAT (Induction Air Temp., K, Max. Limit 600°F.)	
CLD (Rate of change of CHT)	-60°/minute
DIF (Maximum EGT differential)	500 °F
LFM (Lean Find Mode, detects first EGT peak)	
BAT (Voltage, 0 to 40 volts.) Not FAA Approved under TSO-C43b	15.5/11.0 or 31.0/22.0 Hi/Lo
RPM Tested under TSO-C43b (Does not comply with TSO-C49a)	
MAP Tested under TSO-C43b (Does not comply with TSO-C45)	

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.

An alarm causes the digital function to flash when the particular limit is exceeded. Factory set alarm limits for CHT (450°F) and OIL (230°F) are lower than the actual aircraft limits. The values may be adjusted to suit individual preference by pressing the reset button. Other factory set alarm limits are: "BAT" Voltage 15.5/11.0 or 31.0/22.0 Hi/Lo as appropriate; "DIF" (differential Hi/Lo EGT) 500°F; "TIT" 1650°F Hi; "OIL" Lo 90°F; "CLD" (Rate of change of cylinder head temperature in degrees per minute) -60 degrees/minute. The pilot should be aware of the setting of each alarm for his particular aircraft. **An alarm is "Canceled" by holding the step button in for 5 seconds** and seeing the word **"OFF".** Then, only that particular alarm is canceled. Canceled alarms will not appear again until the power has been removed and reapplied to the EGT-701. The entire display dims automatically depending on the ambient lighting.

20) Component Parts List for EGT PN-128, TIT PN-120, IAT PN-130 Probe in polybag

1 Thermocouple 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
1Fiberglass tube 1/2" X 4"

21) Component Parts list for CHT probe PN 126

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

22) Components Parts list for OIL probe PN 124

1 P/N 400505 -C or -L, OIL probe
2 Ring Terminals
2 Screws and Nuts 6-32 X 1/4"
1 Fiberglass tube 1/2" X 4"

23) Components Parts list for OAT probe PN 122

1 P/N 400509, OAT probe
2 Ring Terminals
2 Screws and Nuts 6-32 X1/4"
1 Fiberglass tube 1/2" X 4"

24) Components Parts list for Manifold pressure sensor probe P/N 604010

1 P/N 604010, Manifold pressure sensor with 1/8 NAP termination.

25) Components Parts list for RPM sensor P/N depends on Magneto make and model.

1) Bendix magneto series 20,21……..…P/N 420806
2) Bendix magneto series 1200,…….……...P/N 420807
3) Bendix magneto Plug Std and Dual ……...P/N 420815-1
4) Slick magneto series 4000 or 6000 P/N 420809 or Plug PN 420815-2

26) Component Parts list for Single Engine, EGT and CHT

P.N. EGT-**701**	**-4C**	**-6C**	**-7C**	**-8C**	**-9C**
Temperature Indicator	1	1	1	1	1
EGT probe KIT PN 128	4	6	7	8	9
CHT probe KIT PN 126	3	5	6	7	
CHT Gasket probe KIT PN 126	1	1	1	1	9
Oil probe with option O KIT 124	1	1	1	1	1
TIT probe with option T KIT 120	1	1	1	1	
OAT probe with option A KIT 122	1	1	1	1	1
IAT probe with option I KIT 130	1	1	1	1	1
MAP P/N 604010	1	1			
RPM one of P/N 420806, 7, 9, 15-1,-2	1	1			

27) Weight and Balance Data

TSO C43b, Temperature Indicator EGT-701	14.5 oz ./ 0.9 lbs
EGT probe MM-111	2.0 oz. each / 0.125 lbs
CHT probe 5050	1.5 oz. each / 0.094 lbs
Wire P.N. WK.-24 Harness 8 ft.	14.0 oz. each / 0.88 lbs
RPM and MAP	1.5 oz each / .094 lbs

28) CHANGING THE PROGRAMMED LIMITS

Pressing the reset button in the back of the instrument when the power is on changes the programmed limits. The reset button is located in a small hole marked RS.

The STEP button indexes alarms. The LF button changes the limits by holding in to advance and tapping to back up the value.

The following messages and JPI set limits will appear:

"FAC LIM" *(Bold headings will display for 2 seconds only)*

"FAC ? N" (N=NO Y=YES) **Yes.... Reinstalls the generic alarms and it will also reset the automatic configuration sequence.** It is necessary to say yes if an option was placed in the wrong connector location. or the instrument is not displaying certain options.

"VER 002" (Software Version)

"ENG F" (All Engine temperatures in ^{o}F or ^{o}C)
yes-no

If ^{o}C is chosen, then ALL alarm limits must be manually reset to ^{o}C values.

"BATTERY"
"15.5H BAT" (High Voltage Limit - or 31.0vdc)
"11.0L BAT" (Low Voltage Limit - or 22.0vdc)

"EGT DIF"
"500 DIF" (Difference between highest and lowest EGT)

"CHT HI"
"450H CHT" (Cylinder Head Temperature limit)

"COOL CHT"
"- 60 CLD" (Cool Rate Limit, calculated in degrees per minute for cooling only)

"TIT HI"
"1650 TIT" (Turbine Inlet Temperature Limit)

"OIL TMP"
"230H OIL" (High Oil Temperature Limit)
" 90l OIL" (Low Oil Temperature Limit)

"END Y"

Note: There are no limits associated with RPM and MAP

29) TROUBLE SHOOTING

1. **A missing column in the display on start up** indicates that the 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 bad 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 Ohm meter** 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 10 ohms.

5. All readings jumping around? Make sure the Instrument is **grounded at the engine** for single engine installations. If an adapter probe is being used make sure it is screwed in tightly. Remove original probe and see if problem is removed, if so a bad ground exists between the engine and probe.

6. **Having problems with 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.

7. **Display jumps when transmitting** on the radio. Review fig-6, a kit is available to stop transmission noise it connects on pin 11 connector P-1.

8. **EGT, large span**. Normally aspirated (carburetor) engines at normal cruise display a "DIFF" of 125 to 175 ^{o}F spread between cyls. 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.
9. If the temperature is changing more than 500 F in one second it should not be trusted and a lose wire crimp or probe should be suspected.

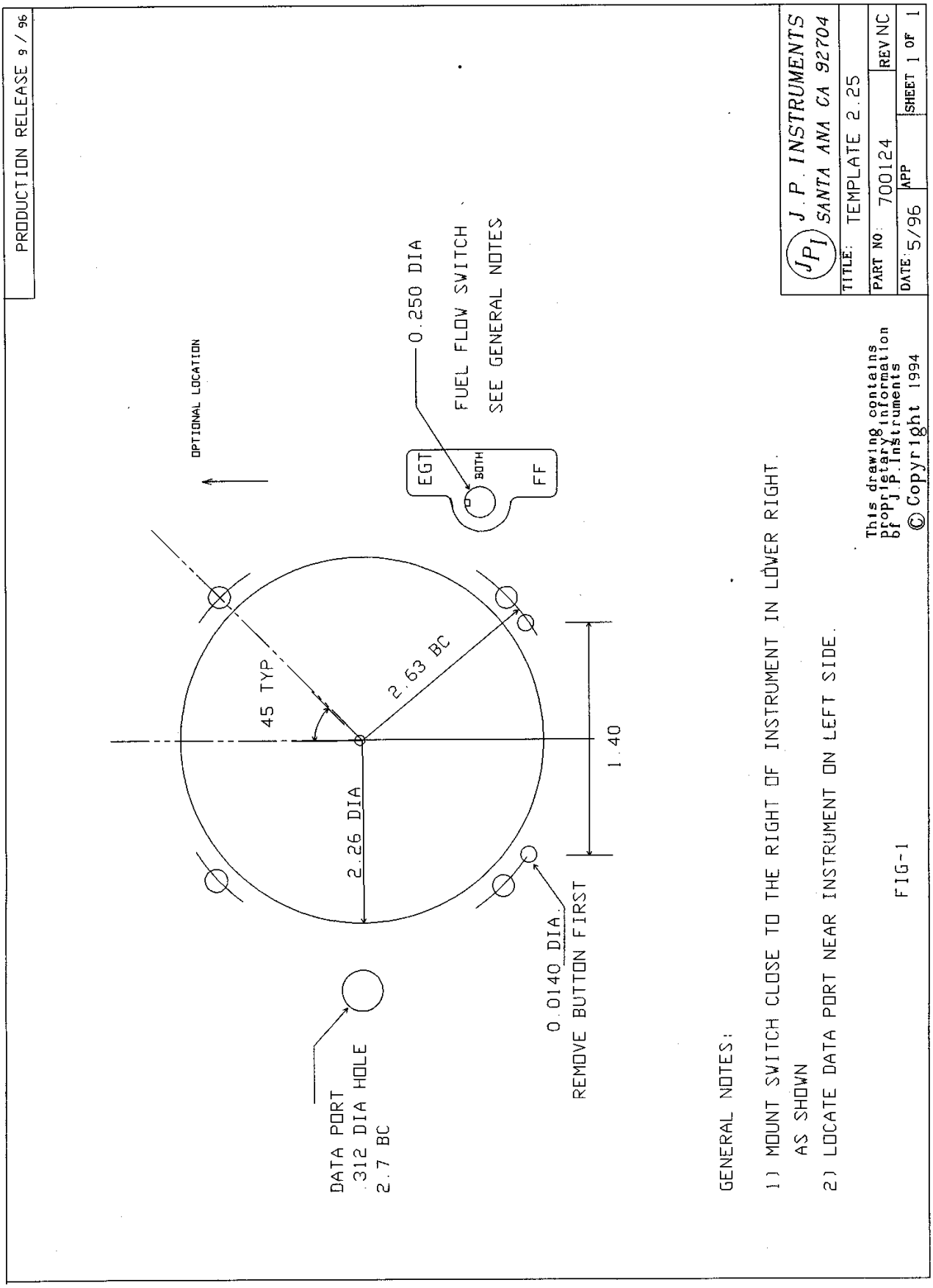
10. **All EGT or CHT readings seem to High or Low or Unsteady**. Use a DVM (digital voltmeter) to measure the difference between SCANNER ground and the engine block ground. If the difference is greater than 0.5 volts with the alternator charging. Then remove the EGT-701 ground (Black wire) from the instrument panel and connect it directly to the ENGINE BLOCK for GROUND.

11. **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 alarms.

12. **Gem conversion, CHT's read high** (100 degrees) EDM-700 not calibrated for Gem installation "J" calibration, return to factory.

START UP ERROR LIST and PROBE LOCATION
Display indicates "**OPEN PRB**" then the following message:

EGT 1	CHT 1	OIL
EGT 2	CHT 2	
EGT 3	CHT 3	IND.
EGT 4	CHT 4	OAT
EGT 5	CHT 5	TIT
EGT 6	CHT 6	
EGT 7	CHT 7	
EGT 8	CHT 8	
EGT 9	CHT 9	


PRODUCTION RELEASE 9 / 96
OPTIONAL LOCATION
0.250 DIA
FUEL FLOW SWITCH
SEE GENERAL NOTES
EGT
BOTH
FF
45 TYP
2.63 BC
2.26 DIA
1.40
DATA PORT
.312 DIA HOLE
2.7 BC
0.0140 DIA
REMOVE BUTTON FIRST
GENERAL NOTES:
1) MOUNT SWITCH CLOSE TO THE RIGHT OF INSTRUMENT IN LOWER RIGHT
AS SHOWN
2) LOCATE DATA PORT NEAR INSTRUMENT ON LEFT SIDE.
FIG-1
J.P. INSTRUMENTS
SANTA ANA CA 92704
TITLE: TEMPLATE 2.25
PART NO: 700124
REV NC
DATE 5/96
APP
SHEET 1 OF 1
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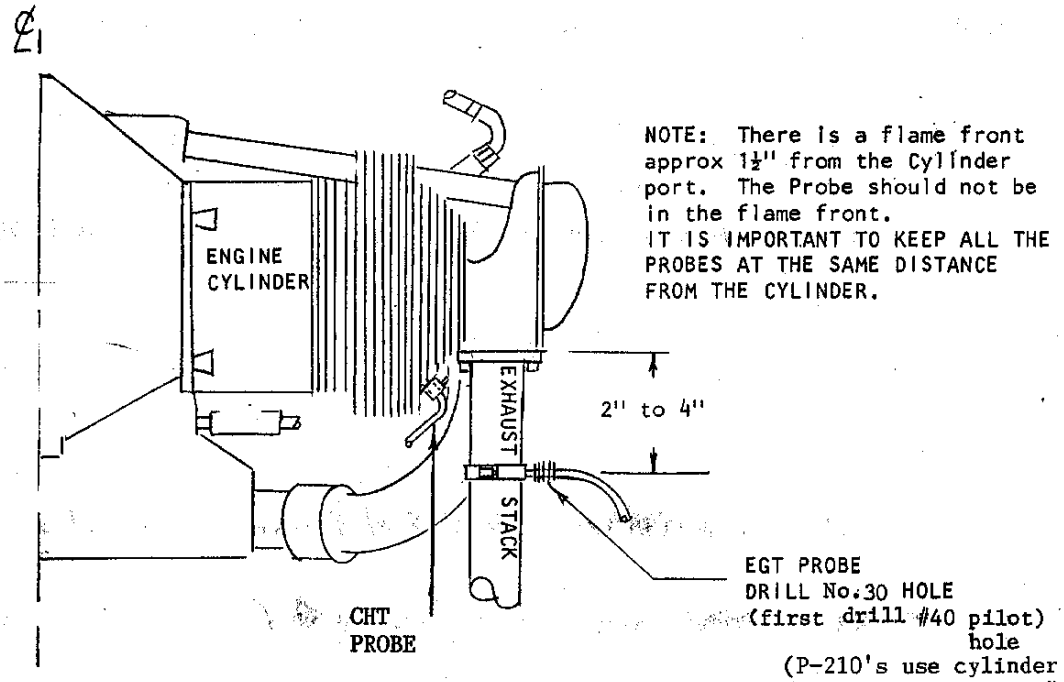
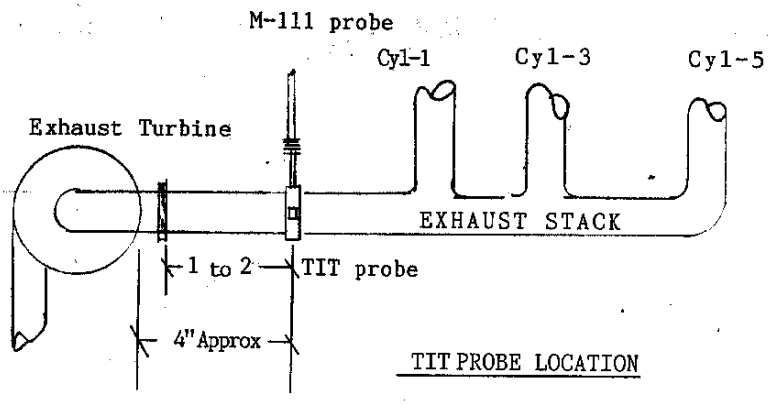


EGT - CHT PROBE LOCATION



TIT PROBE LOCATION

FIG-2

PROBE INSTALLATION INSTRUCTIONS

The K/MM-111 Probe will fit an 1/8 (.125) to 1/4 inch dia. hole in the exhaust stack that is approximately 3 to 4 inches from the cylinder exhaust port. Installation is extremely simple and requires no special tools or welding.

Assembly is accomplished by inserting the stainless steel thimble thru the hole in the clamp, inserting the probe in the thimble and applying the sealing washer between the thimble and the exhaust stack in such a position that the radius of the washer follows the curvature of the stack.

Insert the probe in the exhaust stack so that the tip of the probe is in the approximate center of the exhaust stack. Try not to go over center. Make certain that the slot in the thimble is positioned **LONGITUDINALLY** with the length of the exhaust stack or the probe will not lock firmly. Tighten the clamp firmly, which will lock the probe thimble assembly and probe in position.

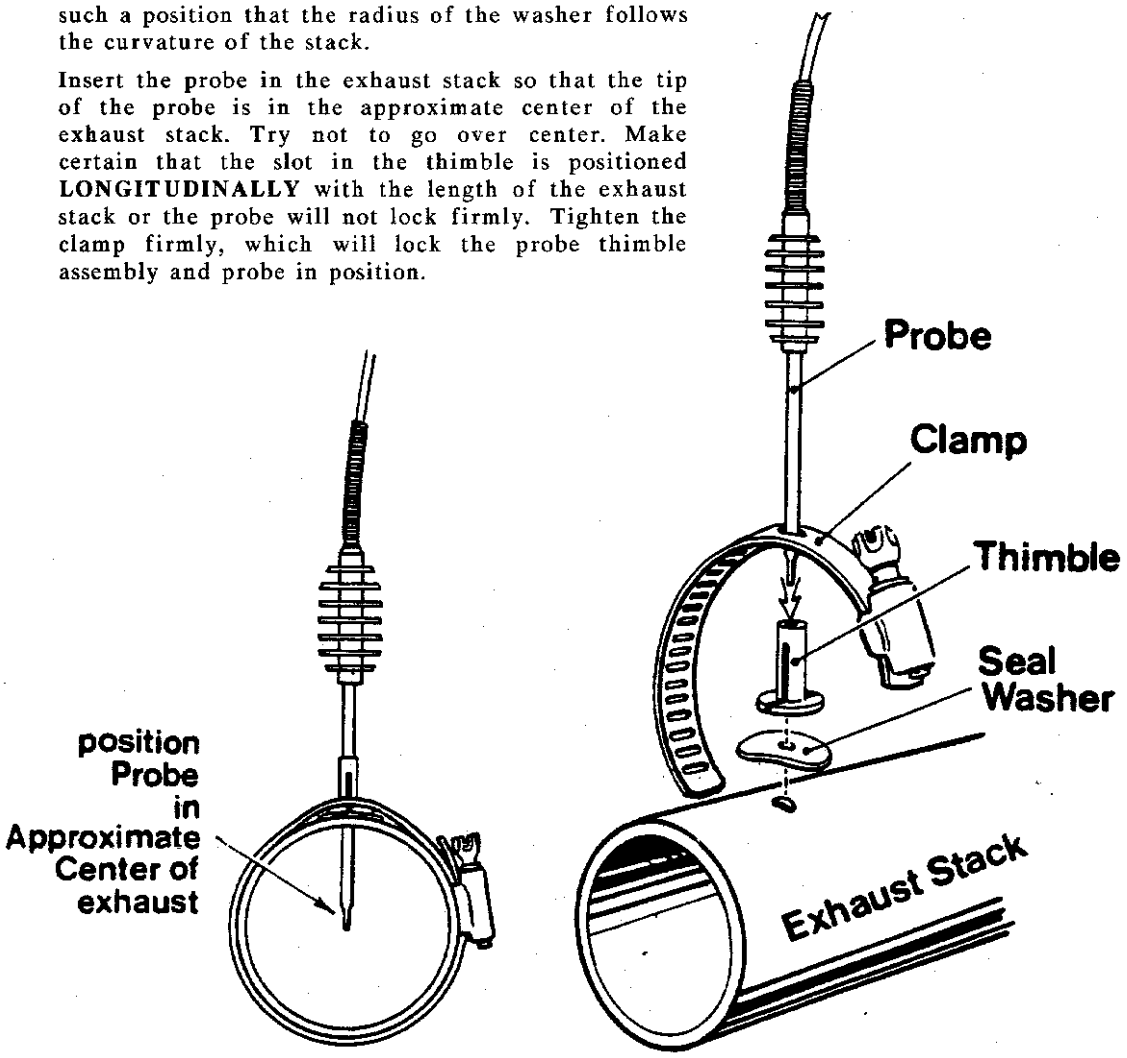
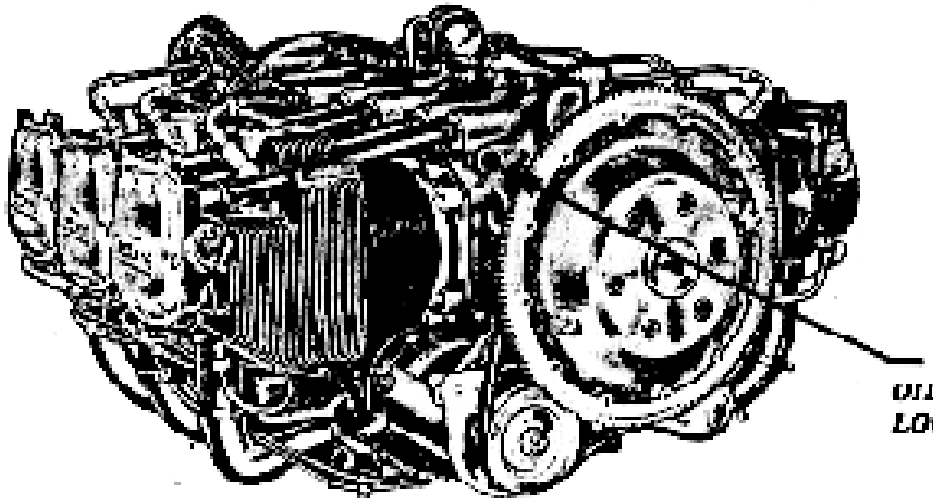
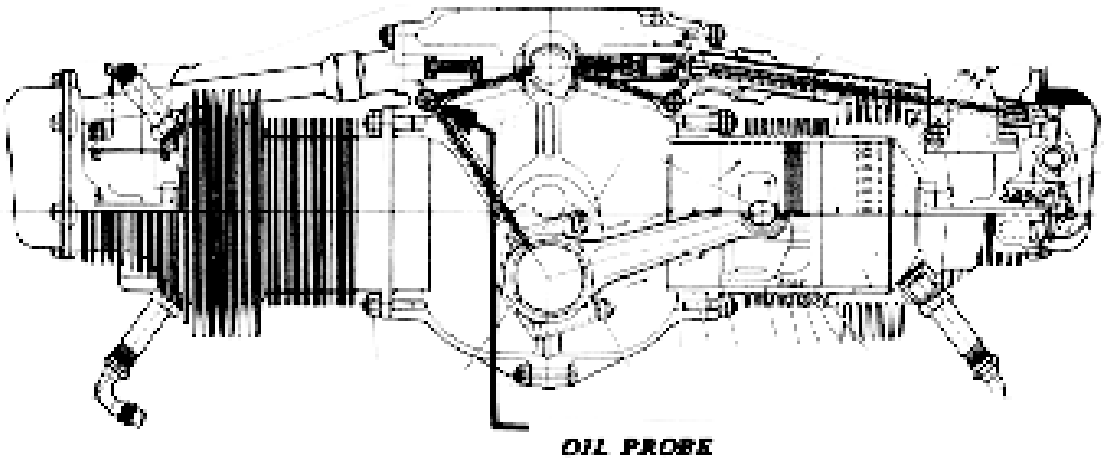


FIG-3

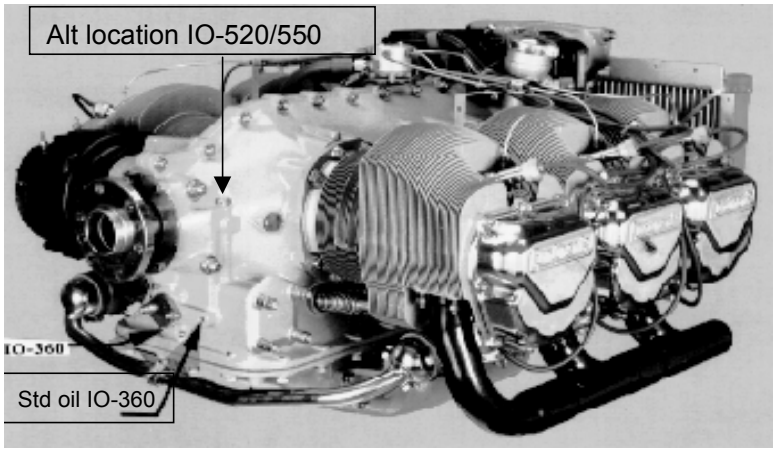
OIL PROBE INSTALLATION FOR A LYCOMING ENGINE



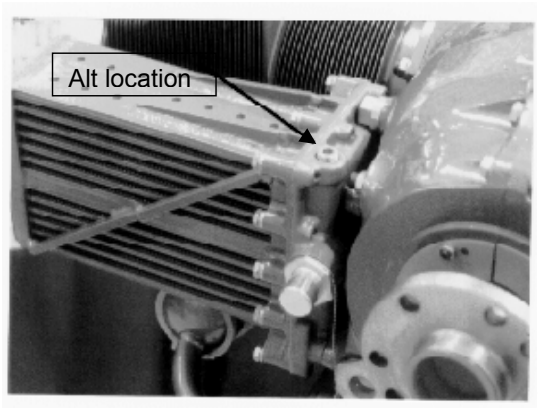
The oil probe, P/N 400585-1, is installed by removing the 1/8 inch pipe plug located on the front, passenger side of the engine (see diagrams this page) and inserting the JPI probe supplied with the kit. The probe leads are routed back to the cockpit



Continental Engines Oil probe location



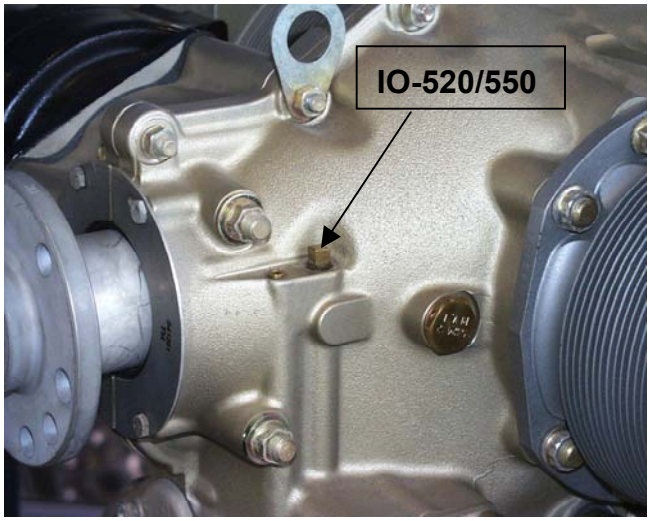
IO-360



O-470

Requires ¼ NPT to 1/8 NPT reducer Oil reports after thermostat opens

Alternate Oil Location



IO-520/550

The oil probe P/N 400505-C is installed by removing the 3/8 or 1/8 pipe plug located on the front of the engine inline with the push rods. This oil galley feeds the valve lifters. Insert the JPI 1/8 NPT probe supplied with the kit. Check for leaks after installation. Due to cowling restrictions the alternate oil location may be chosen. The probe leads are routed back to the cockpit along with the EGT wires.

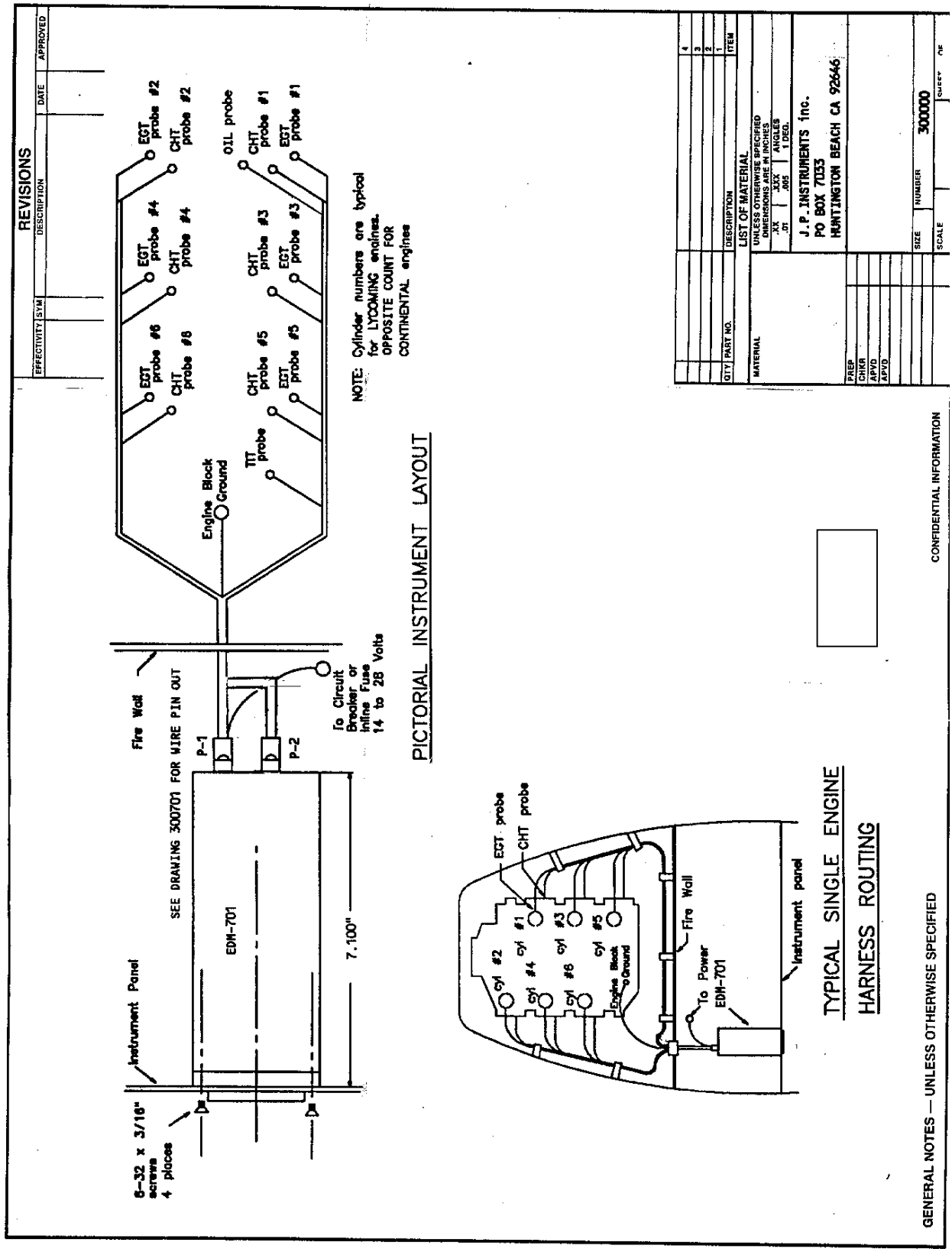
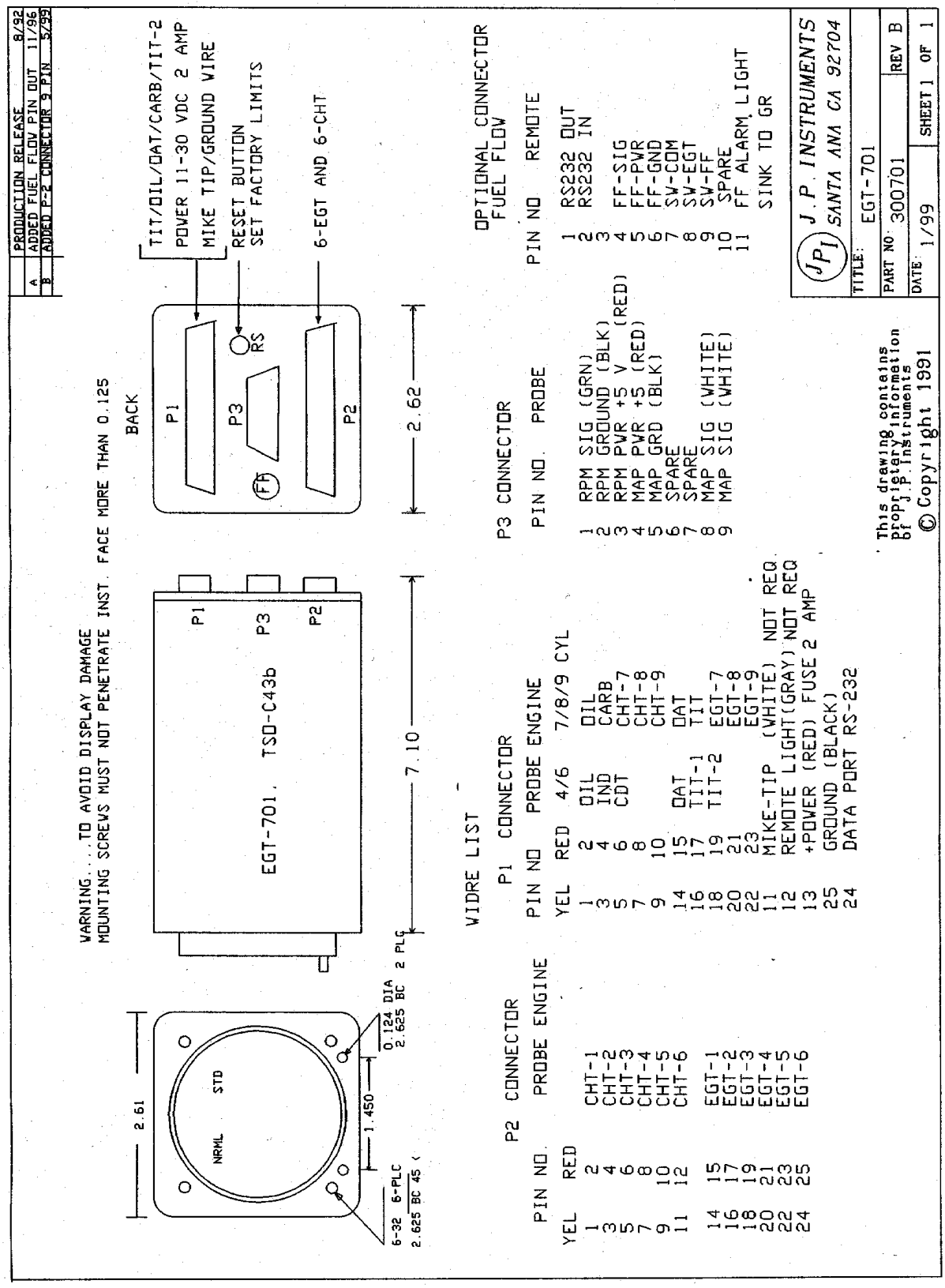

REVISIONS
EFFECTIVITY
SYM
DESCRIPTION
DATE
APPROVED
EGT probe #2
CHT probe #2
EGT probe #4
CHT probe #4
EGT probe #6
CHT probe #6
OIL probe
CHT probe #1
EGT probe #1
CHT probe #3
EGT probe #3
CHT probe #5
EGT probe #5
TIT probe
Engine Block Ground
NOTE: Cylinder numbers are typical for LYCOMING engines. OPPOSITE COUNT FOR CONTINENTAL engines
PICTORIAL INSTRUMENT LAYOUT
Fire Wall
SEE DRAWING 300701 FOR WIRE PIN OUT
P-1
P-2
To Circuit Breaker or Inline Fuse 14 to 28 Volts
Instrument Panel
EDM-701
7.100"
6-32 x 3/16" screws 4 places
EGT probe
CHT probe
cyl #2
cyl #1
cyl #4
cyl #3
cyl #6
cyl #5
Engine Block Ground
Fire Wall
To Power EDM-701
Instrument panel
TYPICAL SINGLE ENGINE
HARNESS ROUTING
ITEM
DESCRIPTION
QTY
PART NO.
MATERIAL
LIST OF MATERIAL
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
.XX .01
.XXX .005
ANGLES 1 DEG.
J.P. INSTRUMENTS inc.
PO BOX 7033
HUNTINGTON BEACH CA 92646
PREP
CHKR
APVD
APVD
SIZE
NUMBER
300000
SCALE
SHEET
CONFIDENTIAL INFORMATION
GENERAL NOTES — UNLESS OTHERWISE SPECIFIED

FIG - 6


PRODUCTION RELEASE 8/92
A ADDED FUEL FLOW PIN OUT 11/96
B ADDED P-2 CONNECTOR 9 PIN 5/99
WARNING....TO AVOID DISPLAY DAMAGE
MOUNTING SCREWS MUST NOT PENETRATE INST. FACE MORE THAN 0.125
BACK
TIT/OIL/OAT/CARB/TIT-2
POWER 11-30 VDC 2 AMP
MIKE TIP/GROUND WIRE
RESET BUTTON
SET FACTORY LIMITS
6-EGT AND 6-CHT
P1
P2
P3
RS
FF
EGT-701, TSD-C43b
2.61
1.450
7.10
2.62
NRML
STD
0.124 DIA
2.625 BC
2 PLC
6-32 6-PLC
2.625 BC 45°
WIDRE LIST
P2 CONNECTOR
PIN NO. PROBE ENGINE
YEL RED
1 2 CHT-1
3 4 CHT-2
5 6 CHT-3
7 8 CHT-4
9 10 CHT-5
11 12 CHT-6
14 15 EGT-1
16 17 EGT-2
18 19 EGT-3
20 21 EGT-4
22 23 EGT-5
24 25 EGT-6
P1 CONNECTOR
PIN NO PROBE ENGINE
YEL RED 4/6 7/8/9 CYL
1 2 OIL OIL
3 4 IND CARB
5 6 CDT CHT-7
7 8 CHT-8
9 10 CHT-9
14 15 OAT OAT
16 17 TIT-1 TIT
18 19 TIT-2 EGT-7
20 21 EGT-8
22 23 EGT-9
11 MIKE-TIP (WHITE) NOT REQ.
12 REMOTE LIGHT(GRAY) NOT REQ
13 +POWER (RED) FUSE 2 AMP
25 GROUND (BLACK)
24 DATA PORT RS-232
P3 CONNECTOR
PIN NO. PROBE
1 RPM SIG (GRN)
2 RPM GROUND (BLK)
3 RPM PWR +5 V (RED)
4 MAP PWR +5 (RED)
5 MAP GRD (BLK)
6 SPARE
7 SPARE
8 MAP SIG (WHITE)
9 MAP SIG (WHITE)
OPTIONAL CONNECTOR
FUEL FLOW
PIN NO REMOTE
1 RS232 OUT
2 RS232 IN
3
4 FF-SIG
5 FF-PWR
6 FF-GND
7 SW-COM
8 SW-EGT
9 SW-FF
10 SPARE
11 FF ALARM LIGHT
SINK TO GR
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J.P. INSTRUMENTS
SANTA ANA CA 92704
TITLE: EGT-701
PART NO 300701
REV B
DATE 1/99
SHEET 1 OF 1

Fig 7

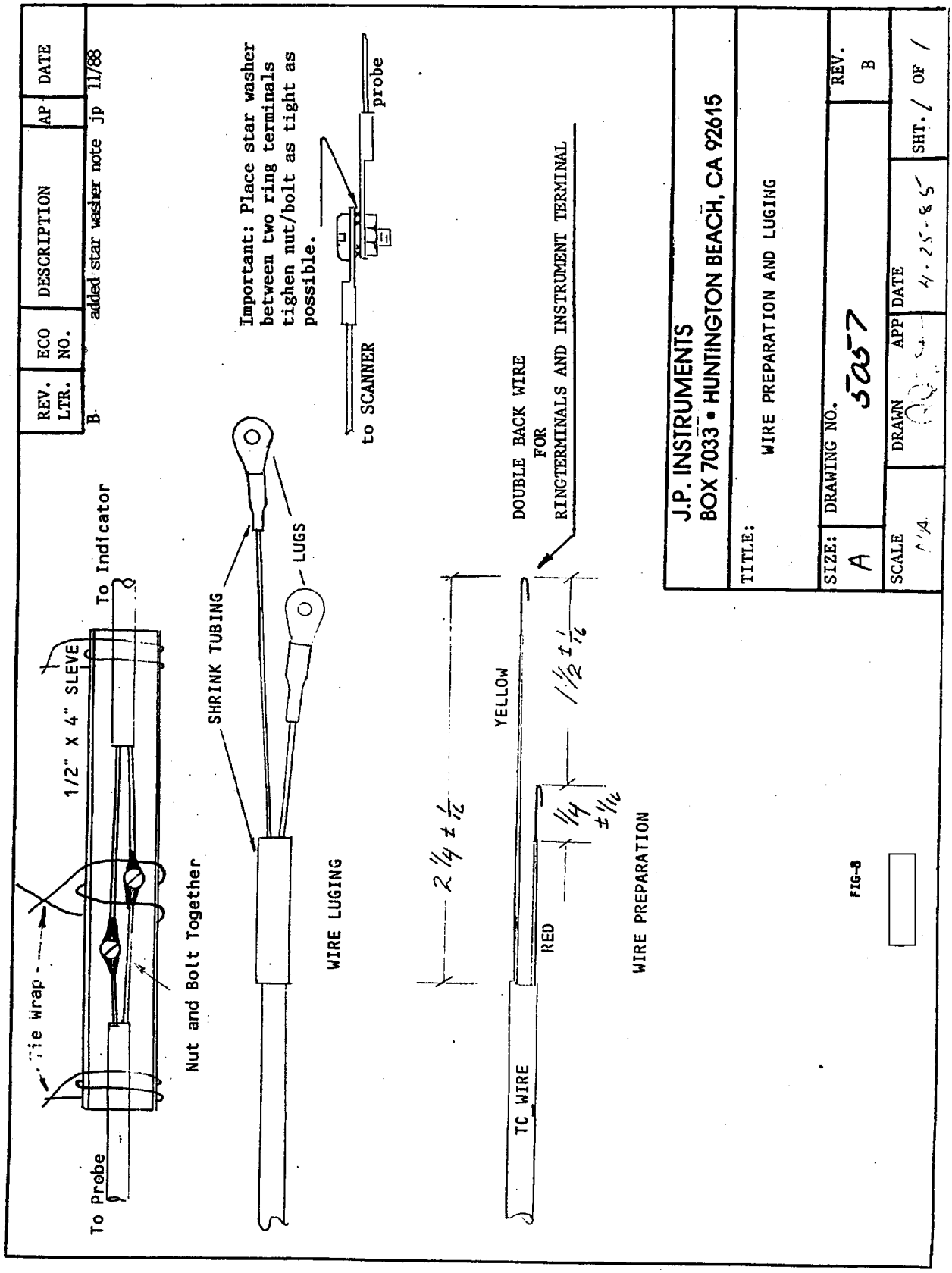
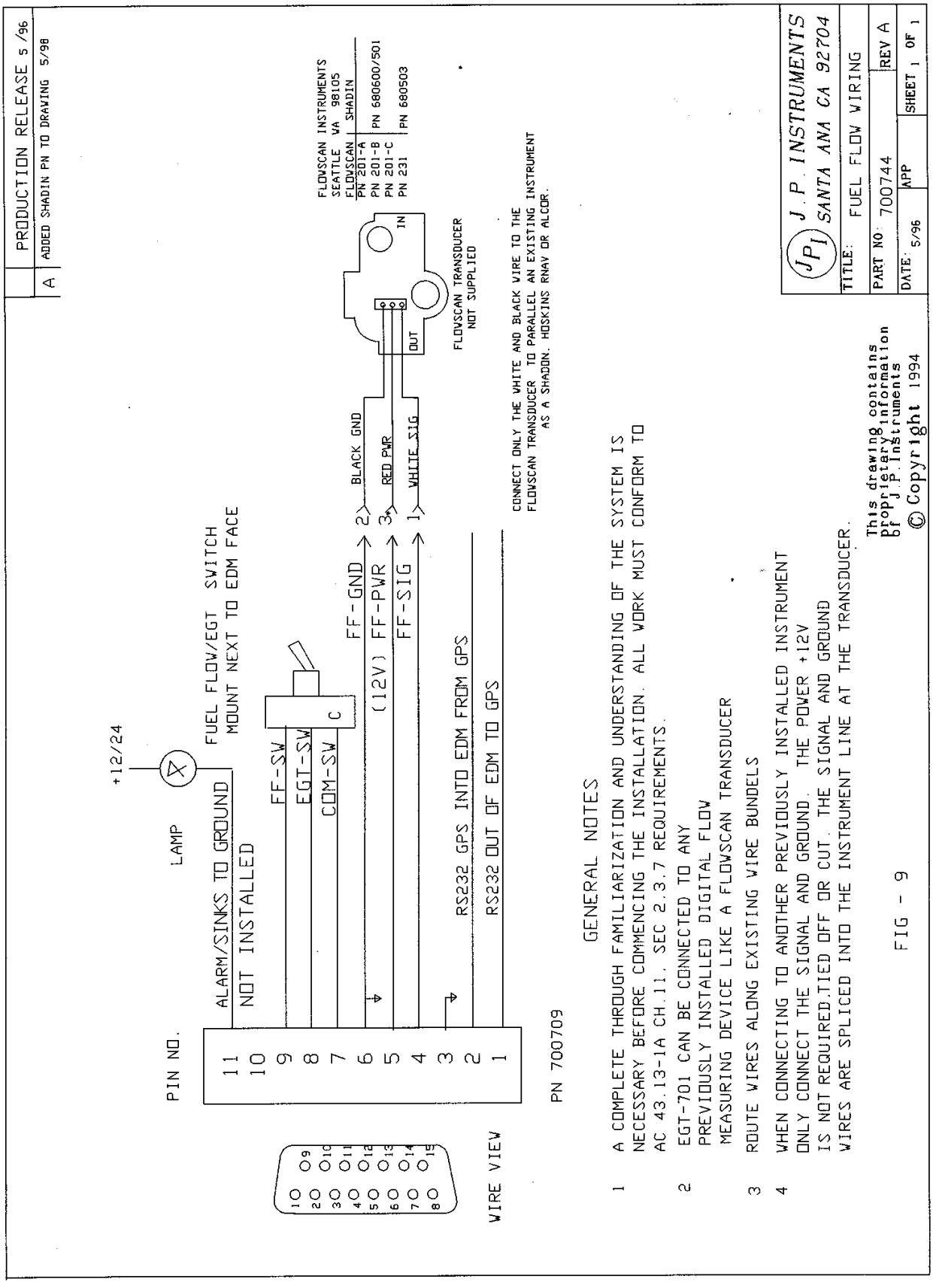

REV. LTR.
ECO NO.
DESCRIPTION
AP
DATE
B
added star washer note jp 11/88
Important: Place star washer between two ring terminals tighen nut/bolt as possible.
probe
to SCANNER
To Indicator
1/2" X 4" SLEVE
Tie Wrap
Nut and Bolt Together
To Probe
SHRINK TUBING
LUGS
WIRE LUGING
DOUBLE BACK WIRE FOR RINGTERMINALS AND INSTRUMENT TERMINAL
YELLOW
RED
TC WIRE
2 1/4 ± 1/2
1 1/2 ± 1/2
1/4 ± 1/16
WIRE PREPARATION
FIG-8
J.P. INSTRUMENTS
BOX 7033 • HUNTINGTON BEACH, CA 92615
TITLE: WIRE PREPARATION AND LUGING
SIZE: A
DRAWING NO. 5857
REV. B
SCALE 1/4
DRAWN
APP
DATE 4-25-85
SHT. 1 OF 1

Fig – 8


PRODUCTION RELEASE 5/96
A ADDED SHADIN PN TO DRAWING 5/98
+12/24
LAMP
FUEL FLOW/EGT SWITCH
MOUNT NEXT TO EDM FACE
ALARM/SINKS TO GROUND
NOT INSTALLED
FF-SW
EGT-SW
COM-SW
C
FF-GND
(12V) FF-PWR
FF-SIG
RS232 GPS INTO EDM FROM GPS
RS232 OUT OF EDM TO GPS
PIN NO.
11
10
9
8
7
6
5
4
3
2
1
WIRE VIEW
PN 700709
BLACK GND
RED PWR
WHITE SIG
2
3
1
IN
OUT
FLOWSCAN TRANSDUCER
NOT SUPPLIED
CONNECT ONLY THE WHITE AND BLACK WIRE TO THE
FLOWSCAN TRANSDUCER TO PARALLEL AN EXISTING INSTRUMENT
AS A SHADDN, HOSKINS RNAV OR ALCOR.
FLOWSCAN INSTRUMENTS
SEATTLE WA 98105
FLOWSCAN SHADIN
PN 201-A PN 680600/501
PN 201-B
PN 201-C PN 680503
PN 231
GENERAL NOTES
1 A COMPLETE THROUGH FAMILIARIZATION AND UNDERSTANDING OF THE SYSTEM IS NECESSARY BEFORE COMMENCING THE INSTALLATION. ALL WORK MUST CONFORM TO AC 43.13-1A CH.11, SEC 2.3.7 REQUIREMENTS.
2 EGT-701 CAN BE CONNECTED TO ANY PREVIOUSLY INSTALLED DIGITAL FLOW MEASURING DEVICE LIKE A FLOWSCAN TRANSDUCER
3 ROUTE WIRES ALONG EXISTING WIRE BUNDELS
4 WHEN CONNECTING TO ANOTHER PREVIOUSLY INSTALLED INSTRUMENT ONLY CONNECT THE SIGNAL AND GROUND. THE POWER +12V IS NOT REQUIRED.TIED OFF OR CUT. THE SIGNAL AND GROUND WIRES ARE SPLICED INTO THE INSTRUMENT LINE AT THE TRANSDUCER.
FIG - 9
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J.P. INSTRUMENTS
SANTA ANA CA 92704
TITLE: FUEL FLOW WIRING
PART NO: 700744
REV A
DATE: 5/96
APP
SHEET 1 OF 1

Fig - 9

Instructions for Continued Airworthiness (ICA)

There are no field adjustments and or calibration requirements for the EDM-700 series 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