

A C T  
AIRCRAFT COMPONENT TECHNOLOGY  
ACT EZ FUEL GAUGE

General Description

The ACT EZ Fuel Gauge fulfills the need on Long EZ's and Vari EZ's for a retrofittable fuel gauge that is easily read, day or night. The ACT EZ Fuel Gauge does this and more.

For example, the ACT EZ Gauge:

- \* provides panel-mounted, 9/32" dia. low-fuel warning lights which...
  1. glow dimly when fuel is above reserve level, reassuring you that you are above reserve and that the system is working.
  2. glow at full intensity when fuel is at or below reserve.
- \* is illuminated for night-time readability. This readability is enhanced as the fuel level lowers.
- \* has functional redundancy. Low-fuel warning lights and gauge illumination are completely independent.
- \* employs all-solid-state components for dependability.
- \* consumes only 50 milliamps per gauge.
- \* is viscous-damped to reduce the effects of sloshing.
- \* is made of clear, shatter-resistant material.

Original or retrofit installation is simple. All work is on the cockpit side of the fuel tank. The ACT Gauge is glassed vertically and flush on the face of the existing sight-gauge layup in the passenger's cockpit. Fuel level in the ACT Gauge is exactly the same as the level in the tank.

IMPORTANT

This gauge is intended for use with aviation gasoline only. AUTOMOBILE GASOLINE WILL RUIN IT! If you plan to use any fuel other than aviation gasoline do NOT install these gauges. Return them postpaid in their original condition and we will refund your money.

WARRANTY

The ACT EZ Fuel Gauge is warranted for 90 days from date of delivery to be free of defects in materials and workmanship. If, within the 90-day warranty period, any defect is observed which is not the result of mishandling or incorrect installation the defective part(s) will be replaced free of charge when it (they) are returned postpaid.

LIABILITY

Because Aircraft Component Technology (ACT) has no control over the treatment the gauge(s) may receive after delivery nor any control over the installation or use of the gauge(s), ACT assumes no responsibility for the gauge's(s') installation and/or operation nor the consequences of any occurrence arising out of the installation and/or operation of the gauge(s).

By purchasing the gauge(s) you, the purchaser, agree to assume all responsibility for its (their) use and further agree not to hold ACT nor any person(s) connected with ACT liable for any incident resulting from the installation and/or use of the gauge(s). If you, the purchaser, find that you cannot agree to the above terms simply return the gauge(s) postpaid to ACT and your money will be refunded.

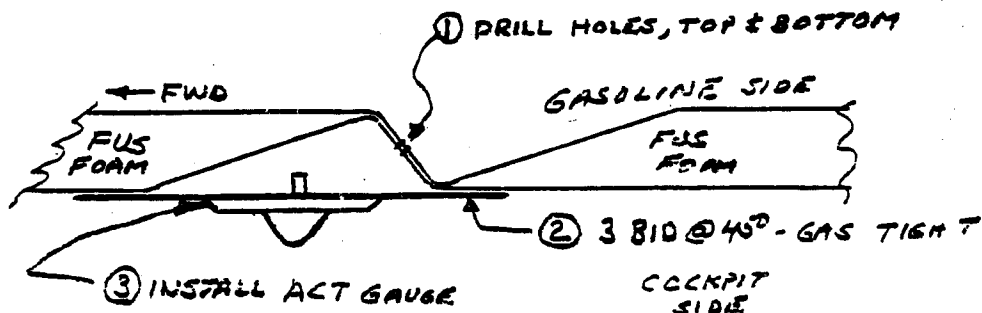
OPERATION

The ACT Gauge must be connected to a 12VDC circuit protected by not more than a 2 amp circuit-breaker or fuse. Power must be OFF while cranking the engine with a starter. (Same as avionics) Failure to provide such protection will damage gauge electronics and void the warranty.

INSTALLATION

Read and understand ALL instructions before proceeding with the installation. Instructions are for one gauge.

The ACT Gauge is located on the face of the existing sight-gauge area. (See suggestion below for adapting to VARI EZ's.) The gauge is mounted vertically with its optical bosses near the bottom. (Don't install it upside down!) Lateral location (allow a total width of  $3\frac{1}{2}$ "") on the existing sight-gauge area is a matter of choice, but be sure the mating surfaces are flat. Vertical location is IMPORTANT. The bottom edge of the white base of the gauge MUST be located at the same level (water line) as the bottom surface of the inside of the gas tank. For example, on a LONG EZ built per print the bottom of the gauge base will be 9.15" below the top of the longeron.



Suggestion for VARI EZ adaptation.

Protect the clear portion of the gauge with grey tape (or equiv.) all over down to within  $1/8$ " of the white base. Sand dull the existing sight-gauge area on your bird full height to a width of 4", extending 2" left and right of the gauge center-line. Sand dull the white base of the gauge ALL OVER, FRONT AND BACK. Sand up  $1/8$ " high onto the clear plastic gauge to the edge of the grey protective tape full length, each edge. (DO NOT SAND THE OPTICAL BOSSES.) Take your time. This requires patience. It's like a mini canopy. The BID tapes which secure the gauge will lap up onto this  $1/8$ " area. See the drawing. Be especially sure to sand dull about a 1" dia. area around the orifice tubes on the back side of the gauge base. Gasoline sealing occurs here. Do not damage the orifice tubes nor attempt to sand them dull. Temporarily seal the ends of the orifice tubes to prevent dirt from entering the gauge.

If you are retrofitting. EMPTY THE FUEL TANK. Locate the centers of the two holes which you will later drill through the existing sight-gauge area and which match the orifice tubes on the ACT EZ gauge. These holes will be on the vertical center-line of the gauge. The bottom hole is  $9/16$ " above the base of the gauge. The top hole is  $5-5/8$ " center-to-center above the bottom hole. When you have marked the location of the two holes check carefully against the ACT EZ gauge to be certain the orifice tubes will match the holes when you drill them. Before you drill the holes resand thoroughly at least a 1" dia. area on the existing sight-gauge area around each of the two hole locations. (Fuel sealing occurs here, also.) Using a vacuum cleaner to clear chips, drill the two holes, #10. Mix up a small amount of SAFE-T-POXY and wet the back of the gauge around the two orifice tubes then wet the face of the existing sight gauge. Be generous here.. you are re-sealing your original layup. Make wet FLOX with the remaining epoxy then apply a fillet or "doughnut" of FLOX around the base of each orifice tube being careful not to plug the orifices. Use enough FLOX to squeeze out into at least a 1" dia. circle (by about  $1/32$ " thick) when the gauge is pressed in place. Mix a small amount of BONDO. Now press the gauge lightly in place to squeeze the FLOX onto the face of the existing sight-gauge being careful to KEEP THE ORIFICES CLEAR as you insert them into the #10 holes. Do not apply so much pressure that you squeeze the FLOX out too thin. There should be about a  $1/32$ " standoff. Use some temporary  $1/32$ " thick shims to achieve this standoff. Keep the pressure uni-directional. Do not back off. Hold the gauge in place while you apply several small blobs of BONDO near the center, top and bottom. Hold until the BONDO sets firmly. Remove shims. When FLOX is fully cured, refill the tank (if you are retrofitting) and check for leaks BEFORE applying BID tapes as described below. Since you can see the fuel in the corners of the gauge, this will also provide you an opportunity to mark on the grey tape any calibration levels you may wish to transfer permanently later. If you are not retrofitting, check the gauge installation for leaks at the same time you check your tanks for leaks as described in the RAF plans. INSTALL BID TAPES ONLY AFTER SATISFACTORY LEAK CHECKS.

BID TAPE INSTALLATION: Protective grey tape still in place? OK. Be sure all surfaces are sanded dull where BID tapes will go. Prepare two 2-ply X 45° BID tapes 2" wide X 8" long. Put Saran wrap down first. then a 2" wide strip of peel ply then wet out the two plies of BID tape onto the peel ply. Trim both edges of the BID/peel ply tape cleanly to a width of  $1-7/16$ ".

Apply a light film of epoxy to the gauge base and existing sight-gauge sanded areas. Apply FLOX along vertical edges of the gauge ABOVE optics bosses as a fillet. Apply the BID tapes as shown in the drawing after FLOX-filling the inside corners at the base of the optics bosses. Some builders like to cover all wires and the light boss at the bottom of the gauge completely with the BID tapes. The choice is yours. If you want to install the tapes per the drawing procede as follows: Be sure to slit the tapes as shown to thread the wires through from the outside to the inside of each tape. The wires duck under the tapes, sneak downward along the edges of the white base and pop out the bottom. Refer to the drawing. During the layup it will be necessary to cut a relieving slit in the BID tapes at the base of the optics bosses so the tape can rise over the bosses on the gauge but remain flat outside the gauge. Be careful not to cut the wires! After setup remove BONDO and peel ply and finish per your interior. NEVER use solvents on your gauge. Clean it like your canopy.

#### WIRING

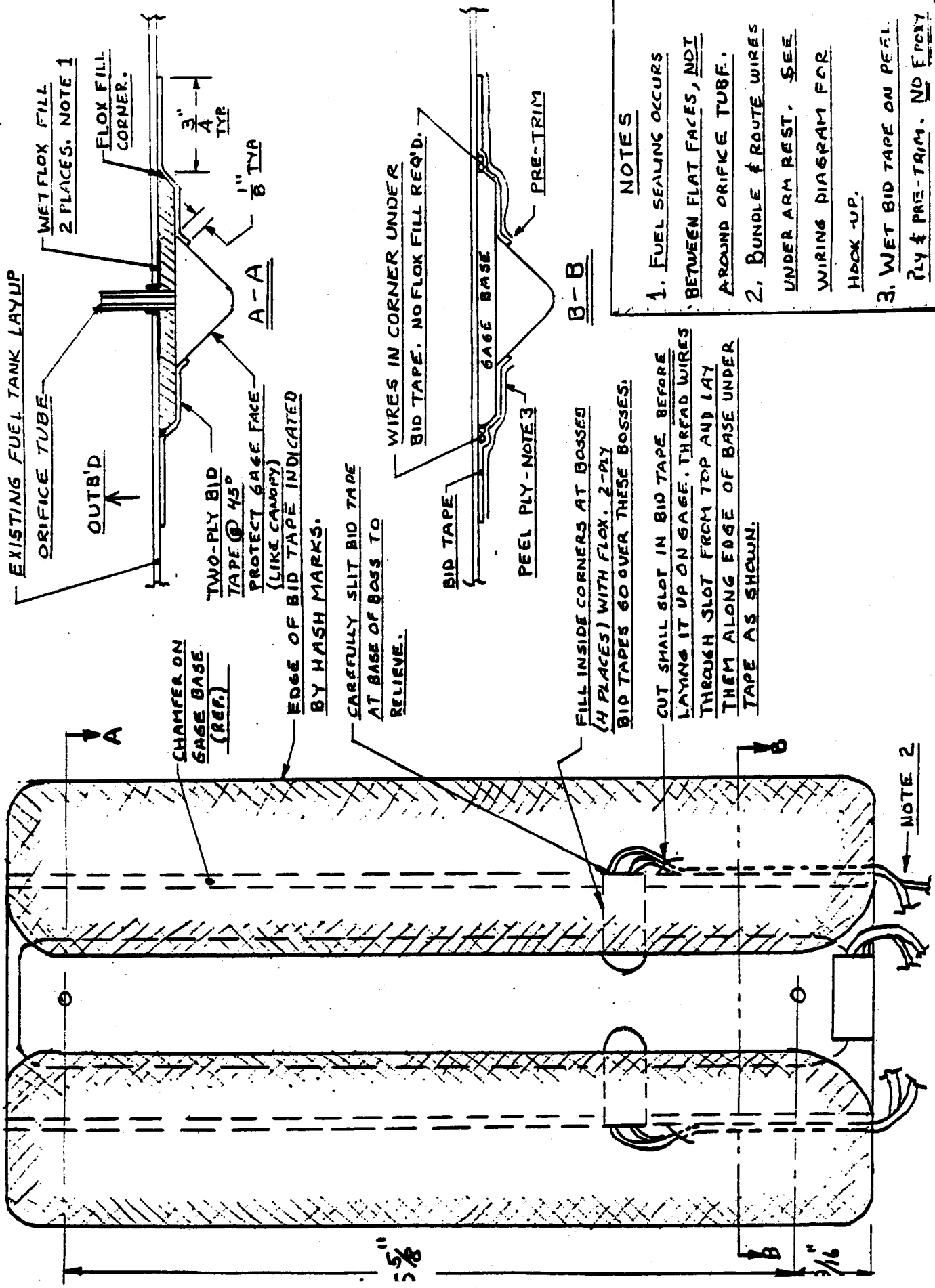
A wiring diagram is supplied. It illustrates the wiring associated with one gauge only. The second gauge is wired the same and can be connected to the same breaker or a separate breaker if redundancy is desired. The electronics package can be installed at any convenient location, however, if you install it near the gauge three wires will go forward to the panel, but if you install it in the panel area, four wires will go forward. The choice is yours. Use #22 or heavier.

#### LOW-FUEL WARNING LIGHTS

Both fuel-warning lights are RED in keeping with the convention of RED as a warning color. In order to distinguish between left-tank and right-tank lights we suggest that you separate them left and right as far apart as practical for your particular panel. If you locate them too close together you might have to resort to the Braille method at night to determine which tank is low!

To mount a light, drill "K" or 9/32" in panel. This diameter must be accurate, so try drilling on a scrap first to be certain the light fits snugly. The light supplied has been snapped into its black plastic mounting collar. Press the light assembly into the hole in your panel from the pilot's side. When hooking up a light, note that a ~~60000~~ resistor (supplied) MUST be wired in series with the light. (See the wiring diagram.) Failure to add this resistor will VOID THE WARRANTY. We suggest that, if at all possible, you "aim" each light as directly as you can toward your eyes to take advantage of its focus. Since this might require drilling a non-perpendicular hole it might be necessary to recess the light(s) slightly for neatness.

# FUEL GAGE INSTALLATION DETAILS



- NOTES**
1. FUEL SEALING OCCURS BETWEEN FLAT FACES, NOT AROUND ORIFICE TUBF.
  2. BUNDLE & ROUTE WIRES UNDER ARM REST. SEE WIRING DIAGRAM FOR HOOK-UP.
  3. WET BID TAPE ON PEEL PLY & PRE-TRIM. NO EPOXY ON CLEAR PORTION OF GAGE.

- NOTES**
1. FILL INSIDE CORNERS AT BOSSES (4 PLACES) WITH FLOX. 2-PLY BID TAPES GO OVER THESE BOSSES.
  2. CUT SMALL SLOT IN BID TAPE BEFORE LAYING IT UP ON GAGE. THREAD WIRES THROUGH SLOT FROM TOP AND LAY THEM ALONG EDGE OF BASE UNDER TAPE AS SHOWN.

# FUEL GAGE WIRING DIAGRAM

## WIRING PROCEDURE

1. CONVENTION: RED IS +12VDC, WHITE IS -12V.
  2. GAGE-TO-ELECTRONICS: BLUE TO BLUE, YELLOW TO YELLOW.
  3. INDICATOR LIGHT: LONG LEAD TO RED(+12V)  
SHORT LEAD TO BLACK
  4. WIRE SIZE: USE WIRE NO SMALLER THAN #22
  5. PROTECTION: POWER TO GAGE MUST BE OFF WHEN CRANKING ENGINE WITH STARTER. (SAME AS AVIONICS)
- WARRANTY VOID IF THIS CONDITION IS NOT MET.

