

# AFFORDABLE INNOVATIONS

## ACCESSIBLE SAFETY STC

**STC SA04075CH**

### Instructions for Continued Airworthiness

**Document Number: TJJ-MAN-01**

**Rev. 3**

**Date: 28 November, 2016**

**EAA STC, LLC  
3000 Poberezny Road  
Oshkosh, WI 54902**

Aircraft Make: \_\_\_\_\_

Aircraft Model: \_\_\_\_\_

Aircraft Serial Number: \_\_\_\_\_

**Record of Revision**

Rev.	Date	Description of Change
0	5/17/2016	Initial Release
1	7/18/2016	Added Dynon EFIS-D100 Superbright to STC Kit 102778-000 as interchangeable part for EFIS-D10A
2	8/2/2016	Clarified specifics of differences in EFIS-D100 SuperBright installation in Appendix A. Created task cards for additional installation and calibration information.
3	11/28/2016	Added pitot probe mount to STC kit, clarified Dynon display may be installed as a supplemental instrument and that other instruments must only be retained if required for operation

**List of Effective Pages**

NOTE: Changes to the current issue are indicated by a vertical line in the outer margins of the page.

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# Chapter 01: Introduction

**01-00-00**

## Introductory Information

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**IMPORTANT NOTE:** For the entirety of this manual the term “Dynon Display” may be considered interchangeable for “EFIS-D10A” or “EFIS-D100 SuperBright,” except where specifically noted. Changes to these instructions specific to the EFIS-D100 may be found in Appendix A of this document.

These Instructions for Continued Airworthiness (ICA) provide instructions necessary for authorized personnel to inspect and maintain the Dynon Display system installed by the AML-STC SA04075CH. This document should be printed and included with the aircraft Instructions for Continued Airworthiness and arranged for easy and practical use.

It should be noted that many of the Maintenance Tasks and Inspections included in this manual do not meet the definition of preventative maintenance and therefore require FAA certification to perform. Users of this manual should refer to 14 CFR Part 43 to ensure that they hold the require credentials to legally perform maintenance on a FAA certified aircraft.

### **Description of the Appliances and its Systems and Installations:**

The Dynon Avionics kit number 102778-000 is an Electronic Flight Information System (EFIS) that includes the following components:

#### *Main Dynon Display:*

- EITHER: 100321-000 Dynon EFIS-D10A
- OR: 100488-001 Dynon EFIS-D100 SuperBright\*

#### *Additional Components:*

- 100323-000 Dynon EDC-D10A
- 100096-000 Dynon EFIS-D10/D100 Series Internal Backup Battery
- 102827-000 Dynon GPS-251 GPS Receiver/Antenna Module for EFIS D10/D100 Series
- 100433-001 Dynon OAT Probe for EFIS D10/D100 Series
- 100141-000 Dynon AOA/Pitot Probe, Unheated
- 102813-000 Dynon Pitot Mount Bracket
- 102832-000 Dynon Simplified Wiring Harness for D10/D100 Series
- 102852-000 Dynon Limitations Placard
- 100422-000 Dynon D100 Series Mounting Tray
- 100024-000 Dynon D10 Series Flush Mount Bracket

Installation of the Dynon Display, the Dynon EFIS-D10/D100 Series Internal Backup Battery, and Dynon GPS-251 GPS Receiver/Antenna Module 102827-000 is mandatory under this approval. When installing the EFIS-D100 SuperBright, the installation of the Dynon D100 Series Mounting Tray is also mandatory. The balance of the kit part numbers represents optional equipment.

The Dynon EFIS-D10A fits in a standard 3 1/8” instrument hole (see Appendix A for EFIS-D100 SuperBright dimensions). The Dynon Display system-wide power requirement is 13 watts typical and 17 watts maximum, and can run on 10-30 volts. On a 12-volt system, this translates to about 1.5 amps of maximum current draw. On a 24-volt system, this translates to about 0.75 amps maximum current draw. Detailed wiring description is found in section 34-76-01. The Dynon Display must be installed as a replacement for and in the original location of a vacuum-driven Attitude Indicator. The Dynon Display

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provides displays of primary attitude, as well as supplementary Angle of Attack, Airspeed, Altitude, Heading, Turn Rate, Vertical Speed and Turn Coordination. Supplementary indications are not intended for primary flight use and a warning placard indicating this is required to be displayed in the cockpit. All supplementary displays (i.e., all indications except attitude) are optional and may be turned off by the operator, therefore not all screen shots will match a particular installation.

The display includes an internal battery to provide a nominal 45-minute operation in the event of power loss. Typical battery backup endurance at 25 degrees Celsius will exceed two hours when the battery is fully charged.

### **Updated Versions of this Manual**

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Updated versions of this manual can be obtained by contacting EAA STC at (920) 426-4800 or at [WWW.EAA.ORG](http://WWW.EAA.ORG).

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# Chapter 04: Airworthiness Limitations

**04-00-00**

**The Airworthiness Limitations Section is FAA approved and specifies maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.**

**The following limitations apply to installations approved by STC SA04075CH:**

1. Every 12 calendar months a certificated mechanic must ensure that the Dynon Display attitude indicator unit is installed in the proper location. If the Display replaces the primary attitude indicator, it should be located in the upper center of the instrument cluster (i.e., standard 6 pack arrangement) or the original location of the vacuum driven attitude indicator it replaced. If the Display is being installed as a supplement to the primary attitude indicator, it may be located elsewhere. It must also be verified that a certificated Airspeed Indicator, Altimeter, Heading Indicator and Turn Coordinator are installed in the standard 6 pack arrangement or their original production location, if required for operation. The Dynon Display installation may only be considered an Attitude Indicator and may not substitute for any other primary flight instrument.
2. Every 12 calendar months a certificated mechanic must ensure the 100096-000 Dynon EFIS-D10/D100 Series Internal Back Up Battery is installed and has been tested and found serviceable in accordance with task 05-24-04. Additionally, GPS connection must be verified in accordance with task 05-24-07
3. Every 12 calendar months a certificated mechanic must ensure that Limitations Placard, Dynon Part number 102852-000 must be installed on the instrument panel in the pilot's primary field of view and must be legible. See Chapter 34-80-00 for Limitations Placard installation instructions.
4. Every 24 calendar months the accuracy of the altitude and airspeed displayed on the Dynon Display must be checked in conjunction with the pitot static check required by 14 CFR 91.411 and documented in the aircraft log as required by 14 CFR 43.9. The airspeed displayed on the Dynon Display must agree with the installed Airspeed Indicator within -5 knots / +5 knots. The altitude displayed on the Dynon Display must agree with the installed Altimeter within -50 feet / +50 feet. Tests of the Airspeed and Altitude values may be achieved using the manufacturer's instructions or other acceptable data. (See Note in section 05-24-01 of this manual regarding pitot static system checks.)

for

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FAA Approved

Timothy Smyth

Manager, Chicago Aircraft Certification Office

Federal Aviation Administration

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# Chapter 05: Recommended Inspection Practices

**05-00-00**

Except for the airworthiness limitations specified in 04-00-01 of this manual the components constituting Dynon kit 102778-000 and have no specified maintenance or inspection periods. All maintenance is on-condition.

The components constituting Dynon kit 102778-000 have no field-serviceable components. If the component fails any of the required testing in sections 04 or 05 of this manual or malfunctions in any other manner, contact Dynon Avionics. No special equipment is required for servicing.

**NOTE: When performing a pitot / static test required by Section 4 of this manual, sudden changes in airspeed will cause changes in pitch on the attitude display. This is normal and expected. This does not cause any harm to the unit or indicate a malfunction of the equipment.**

### **TASK 05-24-01 Operational Check**

Turn the unit on by energizing the aircraft power to which it is connected. Ensure that the screen is bright and readable and that all instrument displays appear.

With the unit powered on, verify the following:

1. The attitude is stable and visually correct for the attitude of the aircraft. If the pitch is off but stable, this is acceptable as it may be corrected via Task 34-23-02.
2. The airspeed indicates zero
3. With the kollsman window set to the same value as the aircraft's altimeter, verify the altitudes match within -50 / +50 feet. NOTE: The altimeter bar of the Display does not appear until about 10 seconds after power on by design.
4. The turn coordinator ball matches the aircraft's ball within ½ ball diameter.
5. If the Unit fails any of the above tests refer to 34-100-00 of this manual.

### **TASK 05-24-02 Cleaning**

The front bezel, keypad, and display can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical-cleaning agents. Care should be taken to avoid scratching the surface of the display.

### **TASK 05-24-03 Display Backlight Inspection**

Over time, the backlight lamp may dim and the display may not perform as well in direct sunlight conditions. The user must determine by observation when the display brightness is not suitable for its intended use. Contact Dynon when the backlight lamp requires corrective action.

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**TASK 05-24-04 Battery Inspection / Capacity Test**

The backup battery must be tested once every 12 calendar months to ensure it is operational and meets the nominal 45 minute expected backup operation period. Perform the following test:

1. With the Dynon Display drawing power from an external source, allow it to charge its internal battery above 16.0 volts. Observe the voltmeter under the EFIS > INFO > LEFT > VMETER selection option in the menu system. The battery may charge to as high as 16.8 volts, but it is only necessary to charge it to 16.0 volts for this test.
2. Remove all sources of external power from the Dynon Display. When power is lost, a red bar will appear with a 30 second count down timer. Press STAY ON so that it remains operating off its internal battery.
3. Ensure that the screen is at its full brightness level. To do this, enter the menu system by pressing any button beneath an EFIS page (except the far left or far right hotkeys) and press MORE > DIM and increase the brightness until it will not increase anymore.
4. Let the unit remain on for 1 hours.
5. If, after 1 hour, the Dynon Display has not turned off and does not display the INTERNAL BATTERY LOW warning, the battery passes the capacity test. If the battery does not pass the capacity test, contact Dynon Avionics or an authorized dealer to purchase a new battery and replace per instructions in Task 34-23-05.
6. Switch the Dynon Display back to aircraft power and charge battery until voltage is at least 15.7V before returning to service.

**TASK 05-24-05 Inspection of the Angle of Attack Indicator**

If the optionally installed, the Dynon Angle of Attack system is installed, it is checked in the following manner:

1. The AoA probe should be visually inspected for damage and wear. The AoA pneumatic tubing should be checked for integrity, damage, chafing, or excessive wear. The installation should be inspected for cracks in the fuselage, and loose or damaged fasteners.
2. With the aircraft at a safe altitude and the area fully cleared perform clean configuration power off stall per the Aircraft Flight Manual instructions. This stall can be gradually approached and should not be abrupt. Discontinue the maneuver when either the certified stall warning occurs or the Dynon AoA system warns of an impending stall.
3. The Dynon Angle of Attack system must have indicated a stall warning prior to the installed aircraft certified warning. If the Dynon Display systems warning was not conservative to the aircraft certified warning, refer to Task 34-23-06 for calibration instructions.

**05-24-05**

## **TASK 05-24-06 Inspection of the Outside Air Temperature Probe**

If the optional Dynon Outside Air Temperature (OAT) system is installed, it is checked in the following manner:

1. The OAT probe should be visually inspected for damage and wear. The OAT wiring should be checked for integrity, damage, chafing, or excessive wear. The installation should be inspected for cracks in the fuselage, and lose or damaged fasteners.
2. Obtain the Correct Outside Air Temperature from a reliable source.
3. Enter the EFIS > INFO > RIGHT menu and select OAT so that the OAT block is displayed next to the altitude tape.
4. Warm or cool the OAT probe by placing your hand around it and verify that the displayed value changes.
5. Verify that the OAT displayed is within 2 degrees C of the step 2 outside air temperature.
6. If unit displays a value outside of the requirements of step 5, refer to Task 34-23-07.

## **Task 05-24-07 Inspection of the GPS-251**

The GPS-251 is to be checked in the following manner.

1. The GPS-251 should be visually inspected for damage and wear. The GPS-251 wiring should be checked for integrity, damage, chafing, or excessive wear. The installation should be inspected for cracks, and lose or damaged fasteners.
2. Verify connection by pressing and holding the rightmost button for two seconds until a black screen appears. Press the DOWN button to select HSI, then GOTO. Verify that the left side of the screen says "waiting for GPS fix" or shows TRK and SPD. If no data is displayed, the GPS is not communicating properly.

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## **Chapter 34-00-00: Dynon Avionics kit number 102778-000**

- **Removal**
- **Installation**
- **Calibration**

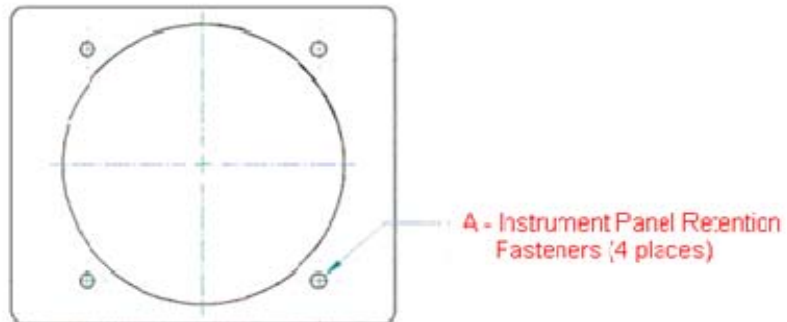
**34-00-00**

**TASK 34-23-01 Removal / Installation 100321-000 Dynon EFIS-D10A**

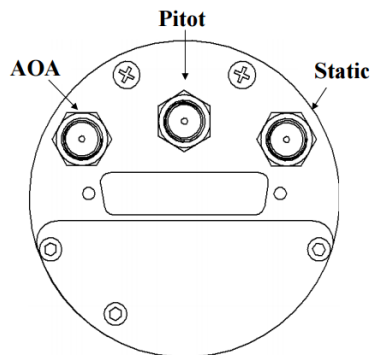
See Appendix A for changes to these instructions specific to the EFIS-D100

**Removal:**

- Shut down aircraft power and disconnect the aircraft battery.
- Remove the 4 Instrument Panel Retention Fasteners (denoted as A below) and carefully slide the unit out.



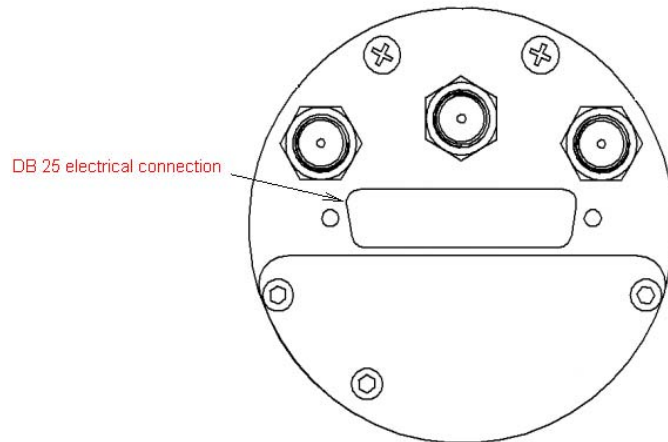
- Carefully disconnect and cap the 1/8 NPT fittings for the Pitot, Static and if installed, AoA lines as shown in the figure below.



- Carefully disconnect and the DB25 electrical connector from the back of the unit. This is accomplished by removing the two retention screws and carefully sliding out the connector. See illustration below:

**34-23-01**

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- The unit now should be safely stored until needed for reinstallation.

**Installation:**

3. Reverse the above removal process tightening the installation fasteners to approximately 12 inch-pounds.
4. Calibrate the Unit per Task 34-23-02.
5. Perform and document the Pitot Static System checks leak check per the appropriate aircraft maintenance manual requirements.

**TASK 34-23-02 Calibration of the 100321-000 Dynon Display**

1. If your unit is being reinstalled into the aircraft it was removed from, and no corrective action has been performed on the unit, no further calibration is necessary. Operation check the unit per Task 05-24-01.
2. If the unit was not previously installed in the aircraft, perform the following steps.

**NOTE:** It is your responsibility to fly your plane safely while performing any configuration or calibration in flight. The best scenario would include a second person to perform any necessary steps on the unit.

3. Turn your unit on by energizing the aircraft power to which it is connected. Ensure that the screen is bright and readable and that all instrument displays appear.

**4. Configure Display Units**

The Dynon Display has the ability to display various measurements in different units. Enter the units configuration via EFIS > SETUP > UNITS.

- a) Under IAS, set the units to the same units as the primary airspeed indicator.
- b) Under ALT, set the units to the same units as the primary altimeter
- c) Under TEMP select the units to be used for the OAT display (if installed)

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## 5. Configure Airspeed Color Thresholds:

To configure the airspeed bar color thresholds for your unit enter the EFIS > SETUP > IASCLR menu. This displays the Airspeed Color Threshold menu. In this menu, enter the values for five airspeed constants (V<sub>so</sub>, V<sub>s1</sub>, V<sub>fe</sub>, V<sub>no</sub>, and V<sub>ne</sub>), each of which has its own button. Enter these values in units of knots, mph, or km/h depending on what airspeed units you are currently using (you may change the displayed airspeed units via EFIS > SETUP > UNITS > IAS). Perform the following steps for each airspeed constant:

- a) Press SEL to select the digit you wish to increment or decrement.
- b) Press DEC- or INC+ to decrement or increment the selected digit.
- c) Press BACK to return to the previous menu.

**NOTE:** Upon completion, you will not be able to see some of the colors until the aircraft has achieved airspeeds in the range of each threshold. This is a normal indication.

## 6. Setting Zero Pitch (In flight):

- a) For the purposes of this setting, level is defined as the attitude at which the aircraft's longitudinal axis is parallel to the ground. For most aircraft, the attitude the aircraft assumes at normal cruise speeds will be acceptable. Additionally, this feature should not be used to "zero out" pitch when the aircraft is at an attitude other than level. Do not think of this adjustment as you would the parallax adjustment on a normal attitude indicator. Instead, think of it as a calibration step which is not changed often.
- b) With your aircraft flying straight and level, enter the EFIS > SETUP > PITCH menu. Press INC or DEC until the horizon line intersects the center of the crosshairs. It is important that this be done while the aircraft is level to ensure proper pitch and roll display throughout all maneuvers.

## **TASK 34-23-03 Removal / Installation of the 100433-001 OAT Probe**

### Removal:

1. Shut down aircraft power.
2. Unscrew nylon nut threaded onto OAT inside aircraft.
3. Carefully disconnect intermediate connector in-line between OAT Probe and DB9 connector at the EDC-D10A Remote Compass.
4. Remove nylon nut and washer from cable assembly, retaining them for reinstallation.
5. Remove OAT probe and wiring from aircraft.
6. Seal the hole in the skin of the aircraft using appropriate material and practices.
7. The unit now should be safely stored until needed for reinstallation.

### Installation:

1. Reverse the above removal process tightening the installation fasteners to approximately 36 inch-pounds.
2. Calibrate the Unit per Task 34-23-07.

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**TASK 34-23-04 Removal / Installation of the 100141-000 Angle Of Attack Pitot Probe**

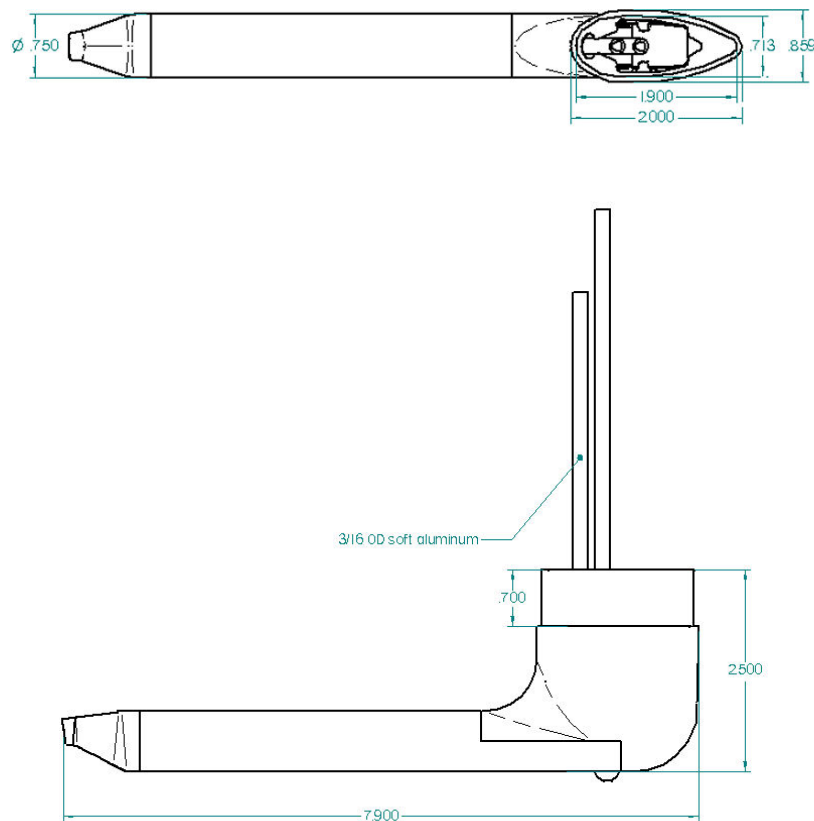
**NOTE:** The Angle Of Attack Pitot Probe is isolated from the aircraft Pitot Static system and is not interconnected. The Dynon Display uses the input from the AoA probe only for determining Aircraft Angle of Attack.

**Removal:**

1. Carefully disconnect plumbing lines. **NOTE:** Because the pitot and AOA plumbing tubes have not been annealed, they work-harden rapidly when manipulated. Make gentle bends, and only bend any given section once.
2. Unscrew screws from mounting bracket.
3. Carefully remove AOA/Pitot Probe from aircraft, pulling plumbing lines through the mount.
4. Seal the hole in the skin of the aircraft using appropriate material and practices.
5. The unit now should be safely stored until needed for reinstallation.

**Installation:**

1. Reverse the above removal process.
2. Calibrate the Unit per Task 34-23-06.

**Dimensions:****34-23-04**

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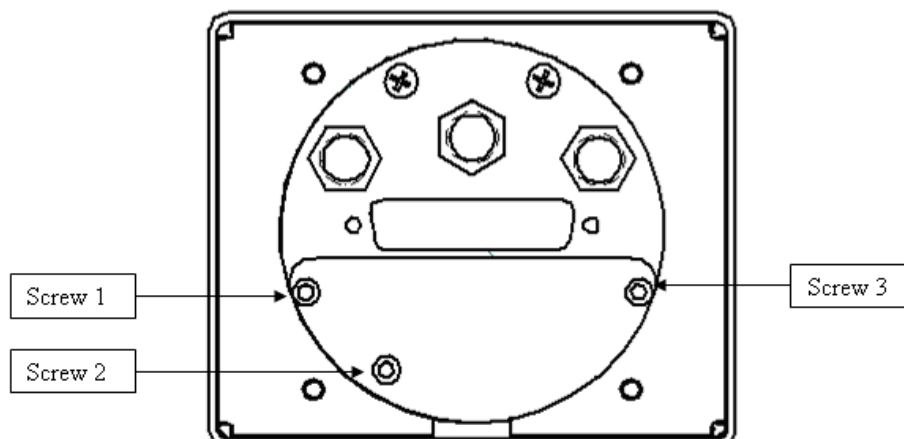
**TASK 34-23-05 Battery Replacement**

**See Appendix A for changes to these instructions specific to the EFIS-D100**

If the battery is found to need replacement, it can be replaced in the field. Purchase a replacement battery from Dynon or an authorized dealer, and follow the following instructions:

1. Remove the three 7/64" hex screws from the battery door on the back of the Dynon EFIS-D10A below the pneumatic fittings. Do not remove the Phillips or D-sub screws. In order to access the back of the EFIS-D10A, it may need to be removed from the panel as described in section 14.1, however if access permits, it may remain in the panel. Not removing the pitot, static, and AoA pneumatic lines will allow the unit to return to service without a leak check.
2. Disconnect the existing battery from the EFIS-D10A by unplugging the battery connector and gently pulling out old battery. It is safe to *gently* pull on the battery wire to remove the battery.
3. Insert the battery with the "bumpy" side up, toward the foam.
4. Connect the battery connector to the battery. The connector is keyed; make sure it is positioned correctly.
5. Verify battery is operational by pressing button #1 under the screen. The unit should boot up and show the PFD screen. Press and hold button #1 until the unit powers off.
6. Position the connector so it is centered on the end of the pack. Verify battery pack is properly centered, not under screw 2.
7. Re-insert screw 2 first and tighten to approximately 12 in-lbs.

Screws 1 and 3 are screwed into the extrusion and are easy to over-torque. Press on the back plate as you insert screws 1 and 3 and tighten to approximately 6 in-lbs.

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**TASK 34-23-06 Calibration of the Angle of Attack System**

**NOTE:** The Angle Of Attack system is isolated from the aircraft Pitot Static system and are not interconnected. The Dynon Display uses the input from the AoA probe only for determining Aircraft Angle of Attack.

If the optional AoA system is installed, it should be calibrated in the following manner:

**On ground configuration (if audio connected)**

1. Enter the EFIS > SETUP > AOAALM menu and press any of the buttons beneath the AUDIO label to select the point on the AOA bar at which you wish the alarm to sound:

AUDIO: ALWAYS OFF  
AUDIO: ON IN RED  
AUDIO: START YLW TOP  
AUDIO: START YLW MID (recommended)  
AUDIO: START YLW BTM

The latter three alarms (the ones that begin with START) are progressive, meaning the audio alert gets more intense as your angle of attack increases. You may set these progressive alarms to start at the top, middle, or bottom of the yellow section of the AOA bar. Setting AUDIO to ON IN RED configures an intense alarm to occur only when the AOA indicator is in the red.

2. While in the EFIS > SETUP > AOAALM menu, press MINSPD to configure the minimum airspeed at which an AOA alarm can occur. Anytime airspeed is below the MINSPD value, AOA alarms will not occur; anytime it is above the MINSPD value, alarms can occur. Set this speed to 10 knots below  $V_{S0}$ .

**Calibration (In Flight)**

1. Once you are flying straight and level at a safe altitude for stalls, enter the EFIS > SETUP > AOACAL menu.
2. While the AOACAL menu is displayed, oscillate the aircraft between  $\pm 5^\circ$  pitch 4 times at fast cruise airspeed. During this maneuver the Dynon Display records the lowest angle of attack that you usually see during flight. You do not need to push any additional buttons before starting this maneuver.
3. Configure the aircraft with no flaps, and minimal engine power. Push the STALL button before performing the stall. When you push the STALL button, a 45-second timer starts. Notice the "T" next to the time that is counting down. During the 45 seconds that the timer is counting down, you are expected to have completed the stall maneuver. If any stall maneuver is not completed before the timer expires, the calibration will be invalid, and should be reset. To do this, push the CANCEL button. This exits the AOACAL menu; re-enter it to begin the calibration again.
4. Slow the aircraft until the aircraft's existing stall warning system begins to stall. At this point, recover the aircraft. Do not let the stall develop beyond the initial signal from the aircraft's system. **After completing the stall, make sure you let the 45 second timer count down to 0 before you push the FINISH button.**

When the listed stall maneuver have been completed according to the above procedure, push FINISH. At this point, the AOA indicator has been calibrated. If it is not visible, turn the display on in the EFIS > SETUP > CLUTTR > AOABAR menu. This calibration should result in the aircraft stall warning occurring just above the red/yellow boundary. If this is not the case, please repeat the AOA user calibration. If the user calibration continues to be unsuccessful, please contact Dynon Avionics technical support.

**AoA System Drainage Provisions****34-23-06**

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Dynon’s AoA pitot design deliberately has a pin-sized leak hole in each of the two tubes to permit draining any moisture which might accumulate inside. These holes are located in the middle of the tube at the bottom. Plugging these holes does *not* guarantee a pneumatic seal (although one is sometimes present). The leak that may exist does not affect the performance of the probe and are present to allow drainage of the system.

**TASK 34-23-07 Calibration of the Dynon Outside Air Temperature (OAT) System**

If the optional OAT system is installed, it should be calibrated in the following manner:

1. Obtain an accurate outside Air Temperature in the vicinity of the OAT probe. This can be achieved with a standard thermometer.
2. Enter the menu system and press the following sequence of buttons: MORE > SETUP > MORE > OAT. This will display the OAT adjustment menu.
3. Press INC or DEC to increase or decrease the currently displayed OAT value. Adjust the displayed OAT until it agrees with your independent temperature reference from step 1.

**OAT/TAS/DA Display**

You must set up the Dynon Display to recognize the OAT. To set this up, enter the menu system by pressing any button beneath an EFIS page, and press MORE > SETUP > MORE > OAT. Push the INSTALLED button (either button 1 or 2) to toggle between N, 1 and 2. OAT type 1 is not supported in STC’d installations.

Installed Type	Sensor
N	No OAT installed, dial in OAT value in OATSET menu
2	Dynon P/N 100433-001– marked with a black band near the sensor

**TASK 34-23-08 Removal/Installation of the EDC-D10A**

**Removal**

1. Remove the hardware determined by installer.
2. The unit should now be safely stored until needed for reinstallation

**Installation**

The bracket used to hold the EDC- D10A must hold the EDC-D10A at the same pitch, roll, and yaw as the EFIS-D10A with respect to the airframe. We recommend that you use an electronic level, if available, to make sure the EDC-D10A is aligned with the EFIS-D10A to better than 1 degree.

All mounting hardware needs to be made from non-ferrous material such as aluminum, plastic, or brass. Many stainless steel screws are magnetic. If the item is attracted to a magnet, it should not be used in the installation. The EDC-D10A needs to be mounted in a location as free from magnetic interference as possible. This means keeping the EDC- D10A away from any ferrous nuts, bolts, and screws, aircraft tubing, as well as from wires or devices carrying any appreciable current such as strobe light wiring, autopilot servos, or other electronics.

**TASK 34-23-09 Calibration of the EDC-D10A****Compass Heading Calibration Preparation:**

- a) To calibrate your Dynon Display heading, you must input your location's current magnetic inclination angle and intensity. Before doing this, you must obtain these two values for the geographic location where you will be performing the calibration. Note that this procedure only needs to be done once, prior to magnetic calibration. Moving the aircraft to another location does not require repeating this procedure.
- b) Obtaining Magnetic Inclination and Intensity.
  - i) Browse to web page: [www.dynonavionics.com/docs/maginfo.html](http://www.dynonavionics.com/docs/maginfo.html). (Looking up this information can be done before going to the aircraft.)
  - ii) The Dynon Avionics "Magnetic Inclination and Intensity" web page is updated as needed; it contains a link to a NOAA web pages and instructions for easily finding your local magnetic inclination and intensity by inputting your ZIP code (in the US) or your latitude and longitude and inputting the resulting data into your Dynon EFIS.
  - iii) Follow the instructions listed on the web page, especially clicking the "Compute Magnetic Field Values" button at the bottom of the linked page – the values required by your Dynon EFIS will be displayed only after clicking that button. If you are near the equator or in the southern hemisphere, note that the inclination may be negative number.
  - iv) Enter the inclination setup menu by pressing any button beneath an EFIS page (except the far left or far right hotkeys), then MORE > SETUP > MORE > MORE > MAGINC
  - v) Press INC or DEC to increment or decrement the displayed inclination angle. Press and hold to change values more rapidly.
  - vi) When the display shows the magnetic inclination angle for your location, press BACK to leave the menu.
  - vii) Enter the magnetic intensity setup menu by pressing any button beneath an EFIS page (except the far left or far right hotkeys), then MORE > SETUP > MORE > MORE > MAGINT). Press SEL to change the digit being incremented or decremented. Press INC or DEC to increment or decrement the selected digit. Press and hold to change values more rapidly.
  - viii) When the display shows the magnetic intensity for your location, press BACK to leave the menu.

**Remote Compass Calibration and Configuration:**

**NOTE:** This step needs only to be performed if the optional 100433-001 EDC-D10A Remote Compass Module is installed. If not installed, skip this step.

- c) The procedure for in-plane calibration of the EDC-D10A involves pointing the aircraft in four directions and taking data at each direction using the Dynon Display. The Dynon Display will then perform some calculations to ensure an accurate calibration.
- d) During magnetic calibration, do not turn the power off on the Dynon Display. This will cause any recorded compass calibration data to be lost; the calibration will need to be restarted.

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- i) Magnetic inclination angle and intensity properly entered into the Dynon Display per the section above.
- ii) An accurate method of aligning the aircraft with magnetic North, East, South, and West, such as an airport's compass rose.
- iii) Turn on the Dynon Display and allow it to warm up for at least 15 minutes before performing the calibration.
- iv) Align the aircraft pointing magnetic North as closely as possible.
- v) On the Dynon Display, enter the menu system by pressing any button beneath an EFIS page (except the far left or far right hotkeys) and press MORE > SETUP > MORE > MORE > MAGCAL. You should see a menu that reads NORTH, EAST, SOUTH, and WEST. If you do not, then the EDC-D10A is not properly communicating with your Dynon Display.
- vi) Press the NORTH button; you will see the message, COLLECTING DATA FOR NORTH along with a 15 second timer. Let the time run out before proceeding.
- vii) Align the aircraft pointing magnetic East as closely as possible.
- viii) Press the EAST button; you will see the message, COLLECTING DATA FOR EAST along with a 15 second timer. Let the time run out before proceeding.
- ix) Align the aircraft pointing magnetic South as closely as possible.
- x) Press the SOUTH button; you will see the message, COLLECTING DATA FOR SOUTH along with a 15 second timer. Let the time run out before proceeding.
- xi) Align the aircraft pointing magnetic West as closely as possible.
- xii) Press the WEST button; you will see the message, COLLECTING DATA FOR WEST along with a 15 second timer. Let the time run out before proceeding.
- xiii) Press the END button. This will cause the Dynon Display to pause as it calculates. This pause should last between 1-20 seconds. However, if the collected data is poor, this can take as long as 5 minutes. A message will be displayed onscreen: CALCULATING MAGNETIC CALIBRATION VALUES.
- xiv) Wait for the message CALIBRATION COMPLETE before attempting to use the Dynon Display or remove power. Press BACK to leave the menu.
- xv) This completes the EDC-D10A calibration process. The process can be repeated as often as desired. The overall accuracy of the compass depends on the installation location (away from any ferrous materials or current carrying wires or devices), the installation alignment (aligned with the Dynon Display in pitch, roll, and yaw), and the calibration procedure (accurately aligning the aircraft with North, East, West, and South and having the correct magnetic inclination angle loaded into the Dynon Display). If the compass performance is unacceptable, we suggest that you investigate each of these factors and try to optimize your installation for each factor. If the heading shown onscreen is off by a small, but constant amount, you can change a heading offset in the Dynon Display which will correct this. Orient your plane in a known direction, preferably on a compass rose at the airport. Navigate to the Heading Adjustment menu by pressing MORE > SETUP > MORE > MORE > MAGADJ. Increment or decrement the value of the heading offset until the Dynon Display heading corresponds to the direction in which your plane is pointed.

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**TASK 34-23-10 Installation/Removal of the GPS-251****Removal**

1. Remove the hardware determined by installer.
2. The unit should now be safely stored until needed for reinstallation

**Installation**

The GPS-251 is designed to be installed with #8 fasteners that have 100 degree countersunk heads. The use of nut plates is recommended for convenience, but other hardware can be used if space allows. Specific hardware selection is determined by the installer. Note that no mounting hardware is included with the GPS-251.

We recommend the use of weather sealant around the fastener heads to keep moisture from entering the aircraft through the mounting holes. For extra protection, you may use weather sealant around the outside of the Receiver/Antenna where it meets the skin of the aircraft.

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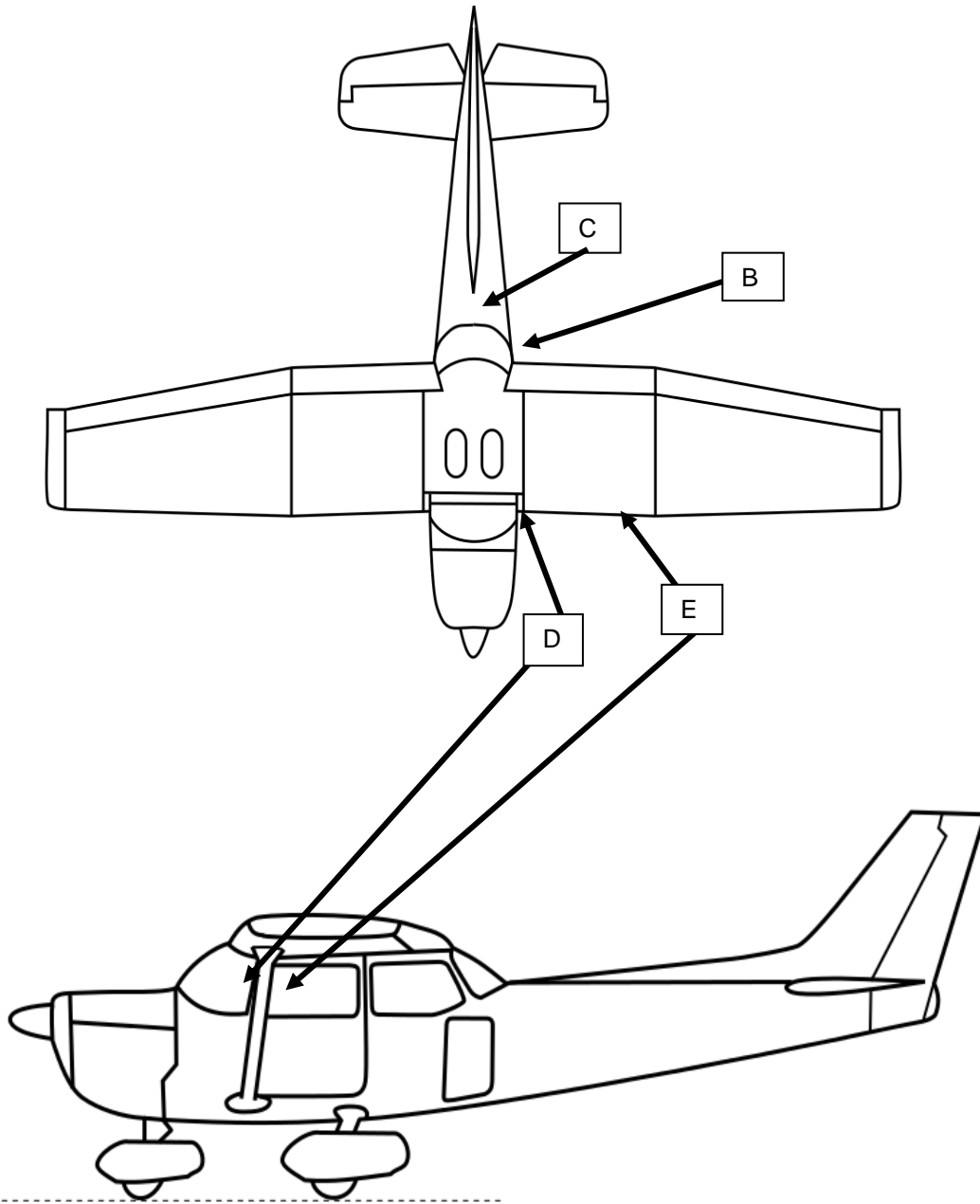
# **Chapter 34-75-00: Dynon Avionics kit number 102778-000 Equipment Location**

**34-75-00**

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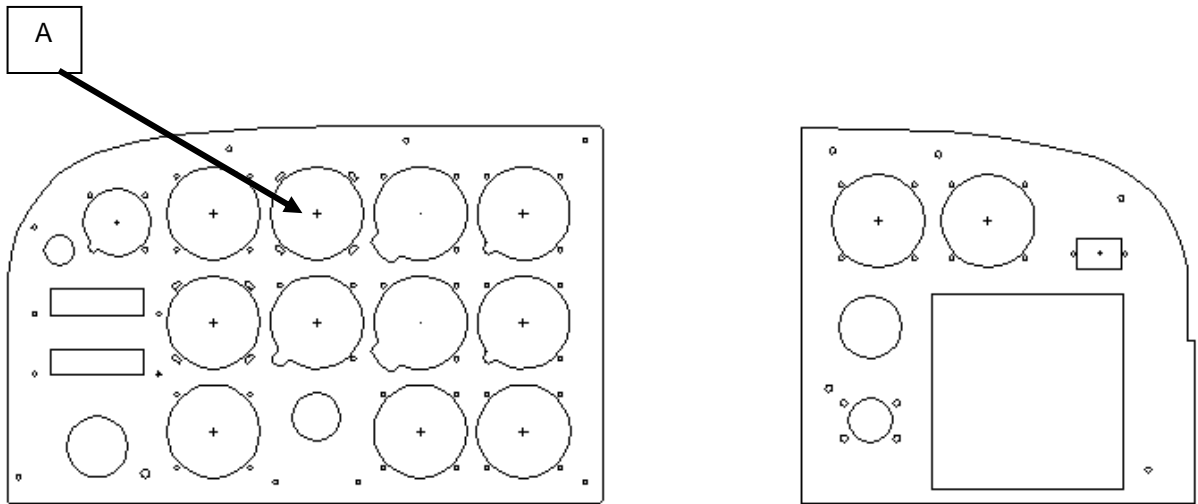
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The above locations are general guidance. Actual equipment locations may vary per aircraft.

# 34-75-01

**LRU Definitions**

- A. Dynon Display PFD (backup battery is located inside Display)
- B. EDC-D10A
- C. GPS Antenna/Receiver Puck
- D. OAT Probe
- E. AoA Probe

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# Chapter 34-76-00: Dynon Avionics kit number 102778-000 Diagrams

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STC SA04075CH

Instructions for Continued Airworthiness

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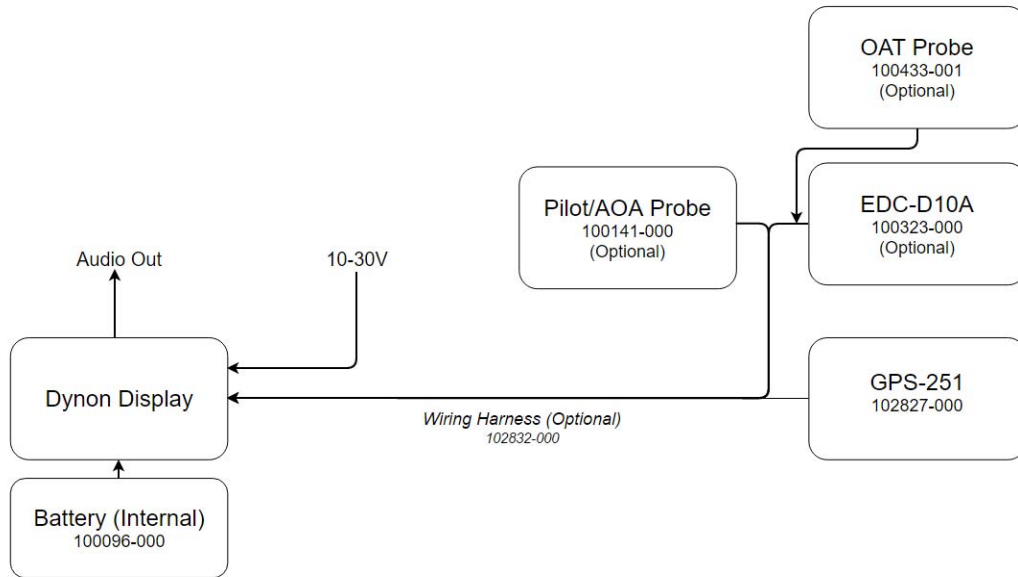


Figure 1 Block Diagram

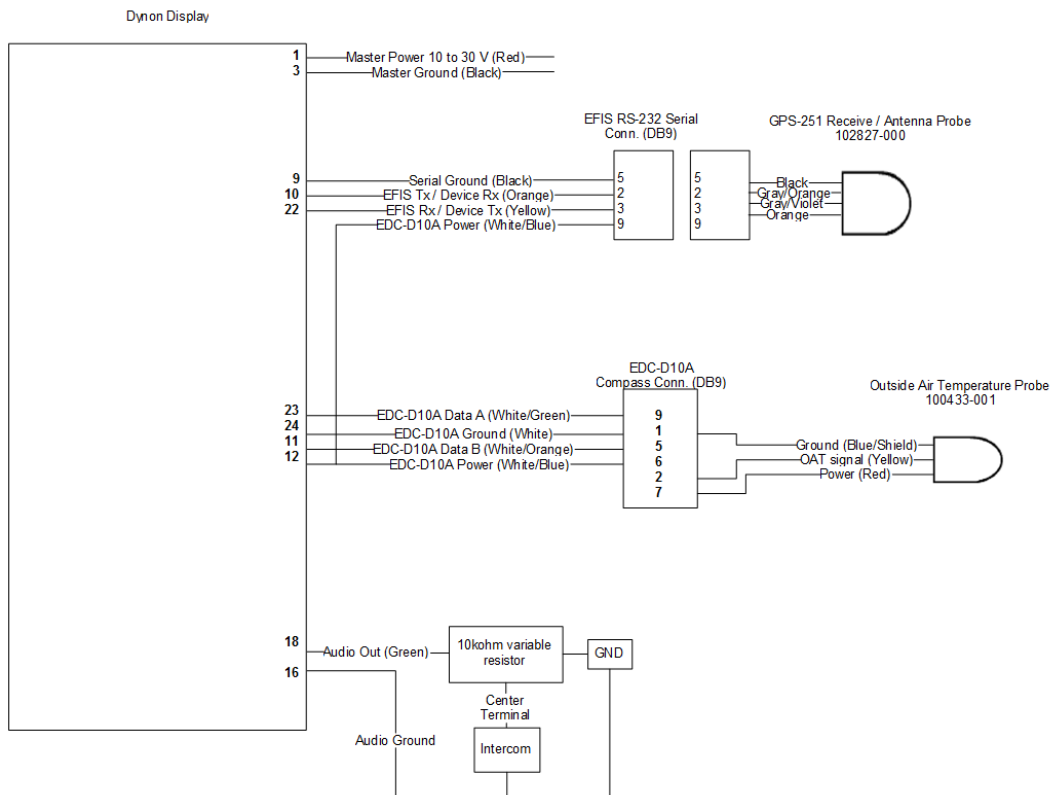


Figure 2 Wiring Diagram

**34-76-01**

# Chapter 34-80-00: Placarding

**34-80-00**

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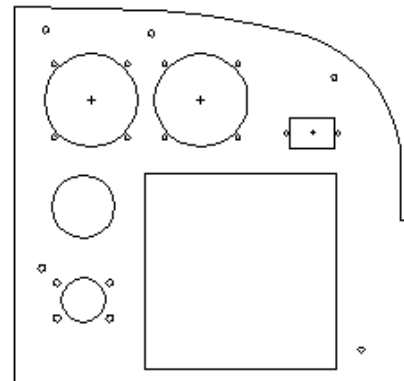
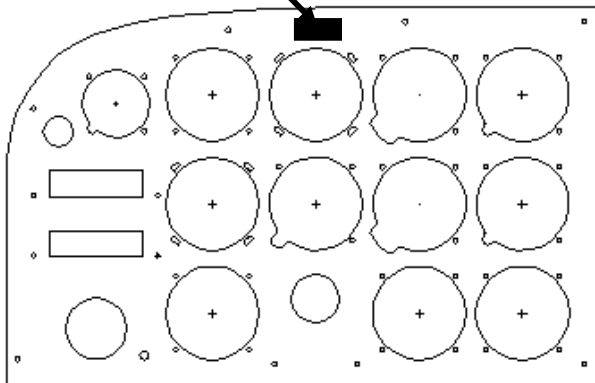
**TASK 34-80-01: Installation of Limitations Placard**

A placard describing the limitations of the Dynon Display must be displayed in prominent view of the pilot to comply with the STC. The placard should be installed in the following manner:

1. Remove the provided limitations placard, Dynon Part number 102852-000 (pictured) from the Dynon Display kit 102778-000. Placard may have white or clear background with black text, or black background with white text.
2. Affix the limitations placard to the instrument panel in the approximate location shown below. Though the exact position may vary depending on the aircraft in which the Dynon Display is installed, the placard must be in the pilot's primary field of view.

**NON-ATTITUDE INDICATIONS  
DISPLAYED ON DYNON EFIS  
NOT FOR FLIGHT REFERENCE**

Approximate location of  
Limitations Placard



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# **Chapter 34-100-00: Dynon Avionics kit number 102778-000 Troubleshooting**

**34-100-00**

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**Introduction**

This section gives the installer or mechanic information pertaining to maintenance of the Dynon Display. Additionally, it provides the steps necessary to ensure continued airworthiness for the unit.

**NOTE:** With the exception of replacing the internal emergency battery, the Dynon Display contains no user-serviceable parts. Refer all servicing to Dynon Avionics.

Other than for regulatory periodic checks and an annual internal battery capacity test (if optional internal emergency battery is installed), maintenance of the Dynon Display is “on-condition” only. With the exception of the battery, periodic maintenance of the Dynon Display is not required.

**Altimeter Check**

The following test can be performed on an as-needed basis. If the altimeter is found to be out of specification, the following single-point adjustment can be performed by navigating the menus to SETUP > ALTADJ. In the Altimeter Adjustment menu, you can change the displayed altitude by up to 500 feet up or down. After making this adjustment, ensure that the altimeter on the Dynon Display meets the tolerances allowed between 0 and 30,000 feet. If this adjustment does not bring the altimeter on the Dynon Display to within specification at all attitudes, please contact Dynon Avionics to return for corrective action.

**Internal Battery Check**

Perform Task 05-24-04

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**Displayed Alert Messages**

The following table describes the alert messages that the Dynon Display can display.

<b>Alert Message</b>	<b>Description</b>	<b>End condition</b>
INTERNAL ERROR SERVICE UNIT	This error can occur for a few reasons, including an aborted upload. It signifies that the Dynon Display has detected internal problems in its firmware or calibration tables.	When this error appears, it may be possible to recover your unit in the field. The best way of ensuring this is to call Dynon Avionics immediately. However, there is a good possibility that the unit will have to be returned for corrective action.
ATTITUDE RECOVERING...	This alert is displayed anytime the unit is rotated at a rate faster than 150 degrees/second or the unit is powered on with airspeed applied. Rotating the unit faster than this threshold will saturate the gyros, leading to potentially erroneous display. The blue/brown horizon indication will turn grey and black to indicate that the artificial horizon is not currently a trusted source. Note that this alert only appears when airspeed is non-zero; using the Dynon Display on the bench will not trigger this alert.	The grey/black horizon indication and onscreen message will remain until the unit has resumed normal operation. In the case of rotation rate greater than 150 degrees/second, the unit enters a fast recovery mode and usually recovers within 5 seconds of coordinated flight.
TEMPERATURE UNSTABLE	When the unit is turned on after having been off for a long period, its internal temperature will rise above ambient at a fast rate. This fast change in temperature can sometimes reduce the reliability of the output of the sensors. Therefore, this alert is displayed and the horizon indication is changed from blue/brown to grey/black.	The screen remains normal color, but the message is displayed until the temperature within the unit has stabilized. This temperature instability should last no longer than 2 minutes. For this reason, it is a good idea to turn the unit on before you run through any of the preflight procedures, so that it will be ready by the time you are ready to fly.
TEMPERATURE OUT OF SPEC	The temperature inside the unit is outside of -30°C to 50°C.	The screen remains normal color, but the message is displayed until the temperature within the unit is within the specified range. This is most common in unventilated panels during hot periods. If you continue to see this alert, provide more airflow to the space around the Dynon Display.

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Alert Message	Description	End condition
INTERNAL BATTERY LOW	You will see this alert only when operating the unit solely off the internal backup battery. When its voltage has dropped below a certain threshold, you will see this alert. Additionally, the voltmeter will be displayed onscreen. When you see this alert, it is advisable that you turn the unit off by pressing the POWER button in Main Menu 1.	The alert will disappear when you press any button; however, it is advised that you do not ignore this alert, as it appears when the unit's internal battery has very little life left. This alert will also go away upon the application of either the external backup battery or Master Power. At that point, the battery will begin charging off the external power.
REMOTE COMPASS NOT DETECTED	The Dynon Display is unable to communicate with the EDC-D10A. If you have an OAT connected to your EDC-D10A, you will lose this reading, as well.	Ensure that you a) have an EDC-D10A installed and b) have verified that the wiring to the EDC-D10A is correct.
OAT SENSOR NOT DETECTED	This alert appears when the EFIS has an OAT connected and then loses that connection for some reason. Either the EDC-D10A has become disconnected, or the OAT sensor itself has become disconnected from the EDC-D10A.	Double-check your wiring between the Dynon Display and the EDC-D10A as well as that of the OAT sensor.

**Troubleshooting Guide**

The following table provides a list of potential issues that the Dynon Display may experience. The symptom is given on the left side while the probable solution is listed at the right.

Problem	Solution
After performing a magnetic calibration the Dynon Display's heading is wrong by a constant amount.	Orient your plane in a known direction, preferably on a compass rose at the airport. Navigate to the Heading Adjustment menu by pressing SETUP > MORE > MORE > MAGADJ. Increment or decrement the value of the heading until the Dynon Display heading corresponds to the direction in which your plane is pointed.
When the barometer on the unit is set correctly, the displayed altitude is wrong by a constant amount at all altitudes.	Set the barometer to the correct value for your current location. Note the difference between the displayed altitude and the actual altitude for your location. Navigate to the Altitude Adjustment menu by pressing SETUP > MORE > ALTADJ. Increment or decrement the value of the altitude until the Dynon Display altitude corresponds to that of the current location of your plane. If you need to adjust by more than 200 ft, or find that you need to adjust frequently (after setting your baro), please call Dynon Technical Support for assistance.

Problem	Solution
Airspeed is inaccurate by between 1 and 10 knots (or equivalent, in other units) at takeoff speed.	You may recalibrate your Dynon Display's zero pressure value. With your plane in as windless an environment as possible (e.g., a hangar), on the Dynon Display, enter the EFIS main menu, press MORE > SETUP > MORE > MORE > MORE > SPDCAL. When you are confident that there is no pressure on the pitot and static ports, press either button corresponding to SET ZERO PRESSURE. Press YES to confirm you have zero pressure on the pitot and static ports. You will see a message indicating that the unit is calibrating. This should only take a few seconds. On your next flight, verify that the airspeed is what you expect. To reset the airspeed calibration to factory defaults, enter the SPDCAL menu, and press RESET DFLTS.
Dynon Display displays continuous or blinking blue screen	Ensure that your power supply is capable of supplying at least 2 amps and that it is at least 10 volts. If, after verifying that you have met these two conditions the unit does not operate normally, it is necessary to contact Dynon Avionics.
Dynon Display screen stays black when power is applied	Verify Master Power is connected. Verify Master Power is above 10 volts.
Dynon Display indicates over temperature condition	Provide additional cooling to instrument
Dynon Display indicates incorrect heading	(Re)calibrate the magnetic heading using the procedure described above.
Internal battery life is too short	Verify internal battery is charged to above 16 volts using Dynon Display voltmeter. Re-run capacity test. Replace battery if insufficient capacity.
Clock setting is lost	If present, verify internal battery is charged. If no internal battery, verify Keep Alive power is supplied to unit at all times.
Cannot make connection with PC	Verify wiring is correct. Verify no other programs using the COM port are running on the PC. Verify latest version of The Dynon Product Support Program is being used.
Unit will not boot off battery power	This can be normal behavior for the FlightDEK-D180. When booted off master power, the FlightDEK-D180 will have no problem continuing to run off battery power. However, at startup, it draws more current than the battery can provide.

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OAT value fluctuates wildly	If the OAT probe is improperly wired, the Dynon Display will not receive a valid signal from it. Verify that the three wires coming from the OAT probe are wired exactly as described in the Wiring Instructions section above.
OAT value is consistently high/low	You need to adjust the displayed OAT value to correct for sensor inaccuracies. Follow the instructions in the Calibration and Adjustment section above.
OAT display area states OAT NOT FOUND	Ensure that you have selected the number corresponding to your OAT in the OAT INSTALLED menu as described above. It can sometimes take as long as 5 seconds for the Dynon Display to lock onto the OAT reading. Ensure that all wiring is correct and that there are no shorted or open connections.

# Chapter 34-101-00: STC SA Commercial Parts List

## STC# SA04075CH

## Commercial Parts List

Affected Aircraft Type – Listed on AML SA03275CH

April 1, 2016 Revision NR

Article Number	Article Nomenclature	Manufacturer Name	Electrical Power	Specification Sheet
102778-000	EFIS-D10A EAA Sales Kit	Dynon	Yes	No

Revision History

Revision Number	Article Number	Revision Date	Revision Level	Comments;
1	EFIS-D10A EAA Sales Kit	Dynon	NR	Original issue

**FAA APPROVED**  
  
 MAR 24 2016  
 CHICAGO AIRCRAFT  
 CERTIFICATION OFFICE  
 CENTRAL REGION

EAA Document Number JAE-CPL-01  
 Revision 1  
 March 25, 2016

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# **Appendix A: Changes to These Instructions for Dynon EFIS-D100 SuperBright**

## **APPENDIX A**

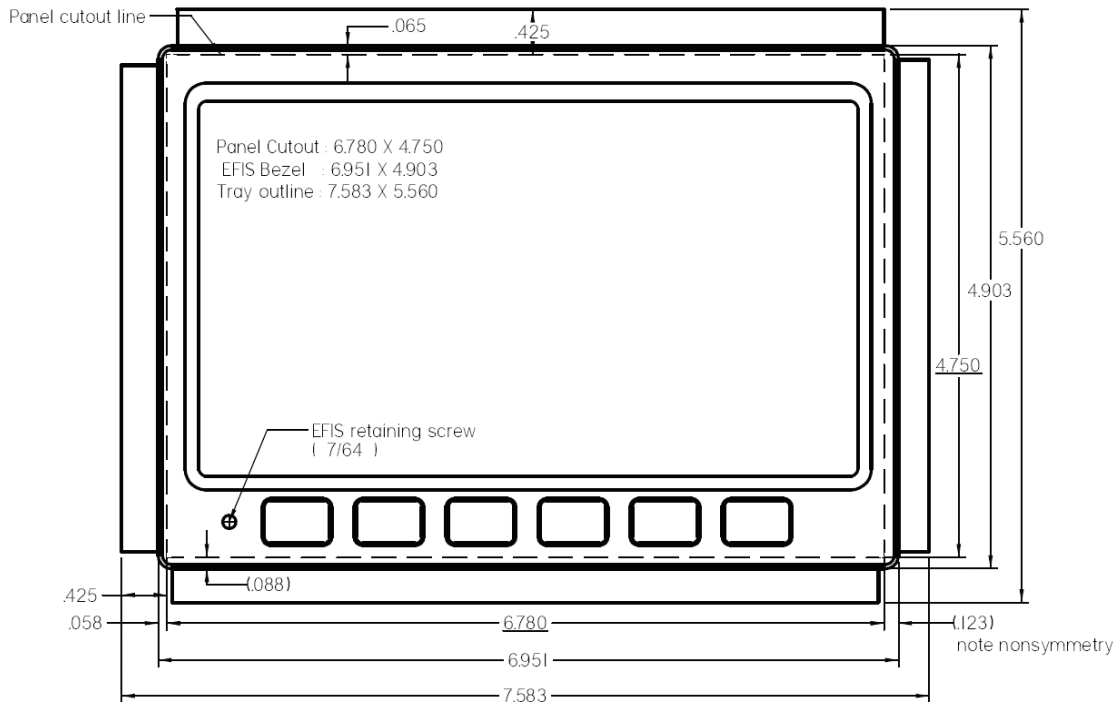
## Task 01-00-01: Dynon EFIS-D100 Dimensions

The Dynon EFIS-D100 is 6.95" wide x 4.90" tall x 4.51" deep.

## Task 34-23-01: Dynon EFIS-D100 Removal and Installation

### Removal:

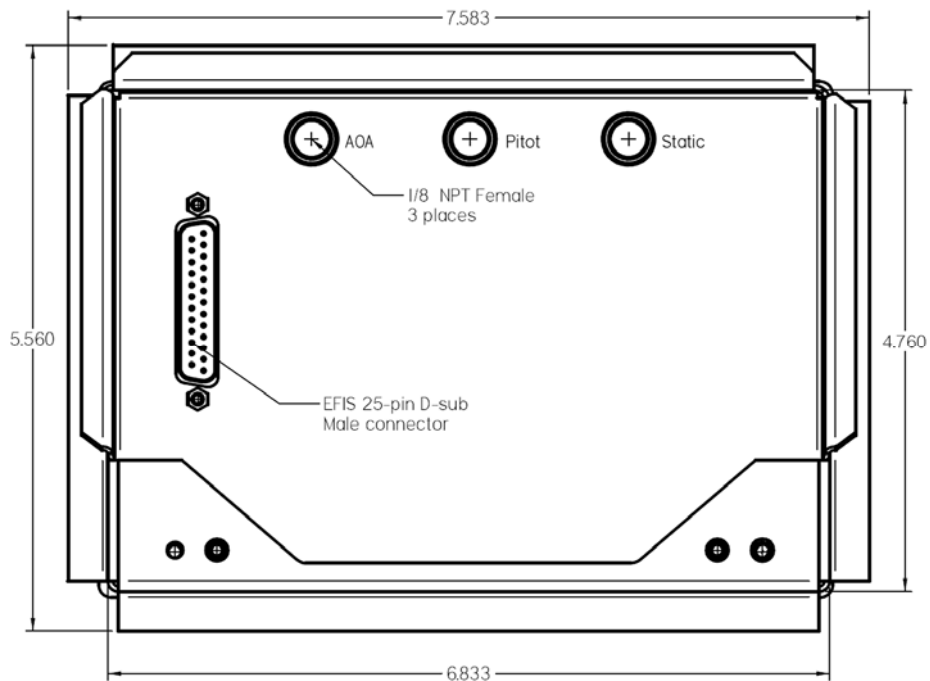
1. Shut down aircraft power and disconnect the aircraft battery.
2. Use the included 7/64" Allen wrench to remove the mounting screw (at the bottom left of the front bezel) into mounting rack. Carefully slide the unit out.



3. Carefully disconnect and cap the 1/8 NPT fittings for the Pitot, Static and if installed, AoA lines as shown in the figure below.

## APPENDIX A





4. Carefully disconnect the DB25 electrical connector from the back of the unit. This is accomplished by removing the two retention screws and carefully sliding out the connector.
5. The unit now should be safely stored until needed for reinstallation.

#### Installation:

1. Reverse the above removal process tightening the installation fasteners to approximately 12 inch-pounds.
2. Calibrate the Unit per Task 34-23-02.
3. Perform and document the Pitot Static System checks leak check per the appropriate aircraft maintenance manual requirements.

### Task 34-23-05: EFIS-D100 Battery Replacement

1. Remove the two screws (either #1 Phillips or 7/64" hex, depending on when your unit was manufactured) from the small, rectangular battery door on the side of the EFIS-D100. Remove the battery door. Do not remove any other screws from the case of the unit.
2. Insert the new battery with the bumpy side up.
3. Connect the battery connector to the battery. The connector is keyed; make sure it is positioned correctly.
4. Position the connector so it is centered on the end of the pack. Verify that the battery pack will not interfere with insertion of either of the door screws.
5. Reinsert screws and tighten to 12 in-lbs.

## APPENDIX A