

ENGINE TECHNOLOGIES INC.  
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INSTALLATION INSTRUCTIONS  
FOR OXYGEN SYSTEM ON  
HAWKER BEECHCRAFT  
S35, V35, V35A, V35B, 35-C33A, E33A, 36, A36, F33A, G33,  
95-55, 95-A55, 95-B55, 95-B55A, 95-B55B, 95-C55, D55,  
95-C55A, D55A, E55, E55A, 58, AND 58A AIRCRAFT

**INSTALLATION INSTRUCTIONS**

**AFT MOUNTED OXYGEN SYSTEM INSTALLATION – BEECHCRAFT 33, 35, 36, 55, AND 58**

This report gives instructions for installation of the 77 cubic foot or 115 cubic foot Kevlar bottle aft of the baggage compartment using the Mountain High components.

COMPONENTS ARE, 77 CU FT OR 115 CU FT KEVLAR BOTTLE. PRESSURE TRANSDUCER, AND ELECTRICALLY OPERATED ON/OFF SOLENOID MOUNTED TO RCV/RCR VALVE. FILL PORT WITH MECHANICAL GAGE. THREE DUAL USER PORTS MOUNTED IN HEADLINER AFT OR FOUR SINGLE USER PORTS MOUNTED IN SIDEWALLS. ELECTRICALLY OPERATED ON/OFF SWITCH AND PRESSURE GAGE ON INSTRUMENT PANEL. SEE FLIGHT MANUAL SUPPLEMENT FOR OPERATION AND CONTINUED AIRWORTHINESS.

**CAUTION: KEEP HANDS, TOOLS, CLOTHING, AND OXYGEN EQUIPMENT CLEAN AND FREE FROM GREASE AND OIL. KEEP FIRE AND SPARKS AWAY FROM OXYGEN.**

Note: All locations of station and water line are approximate and some latitude should be given for exact locations. Referenced drawings ending in –L are for installation of O<sub>2</sub> bottle on left hand side of fuselage and drawings ending in –R are for installation of O<sub>2</sub> bottle on right hand side of fuselage.

1. Check area behind aft cabin bulkhead (sta. 190.00) and verify that oxygen bottle may be installed as shown on sheet 3 of drawing ETI-B-5006-1-L or ETI-B-5006-1-R or 35-4950008 without interfering with critical aircraft systems.
2. The bottle installation can be completed on the left side or the right side of the aircraft, depending on the available free space. The bottle mounting brackets for the most part will fit either side, except the forward end pieces. The forward end pieces will be part number labeled R for right and L for left. Instructions for both will be the same taking into account which side you are installing it on.
3. The bottle mount silicone base ETI-B-5006P3-J is also side specific. The base part number that ends with an R is for the right side. Most late model A36 aircraft will allow for the system to be installed on the left side.
4. On some older models of aircraft which have an incorporated “hat shelf” at the aft wall structure, there will be a need for extra long support brackets to cover the distance between the formers.
5. Aft end bracket ETI-B-5006P3-G3 will be installed the same way either for the upper or for the lower support. For upper support bracket, attach it to forward side of former at station 207, .250 inch above gusset at water line 105. Slide bracket outboard just short of contacting stringer. Refer to Drawing ETI-B-5006-1-L or ETI-B-5006-1-R or 35-

4950008. Mark, drill and install 2 each bolts, washers, and nuts. Repeat this step for the aft end lower bracket installed at water line 95.

6. To install the upper forward bracket ETI-B-5006P3-G1-L (or -R), attach it to the aft side of former at station 190, water line 105 (or station 179 if there is no former at station 190). Slide the bracket outboard until the cutout contour is just short of contacting the stringer. (If there is an existing rivet head or tail that will interfere with the bracket making good contact with the former, remove the rivet. The attaching hardware will replace the removed rivet.) Install shim ETI-B-5006P3-G4 to take up gap between bracket and former on the outboard edge. Use RTV to hold shim in place until attached between bracket and former. Install bolt, washers, and nut through outboard center of bracket and former. Install 2 bolts, washers, and nuts to inboard area of bracket and panel structure. Repeat this step for the lower forward bracket installed at water line 95.
7. Both aft and forward brackets must be aligned so that the inboard flat surface is straight up and down.
8. Place support ETI-B-5006P3-C or ETI-B-5006P3-C2 between the upper brackets. There is a narrow edge and wide edge. The narrow edge goes up. Keep in mind that the idea is to have the lower edge of the support parallel with the outboard stringer and level with the height of the bottom of the stringer so as to allow for the proper installation of the lower gusset plates ETI-B-5006P3-F and ETI-B-5006P3-E. Mark, drill, and rivet into place using 5 each CR3213-4-2 rivets for the upper and lower forward ends. Mark, drill, and rivet into place using 4 each CR3213-4-2 rivets for the upper and lower aft ends.
9. Install lower gusset plate ETI-B-5006P3-F to the aft end of each support. The plate is angle cut to allow for the clearance to existing structure. Place plate into position, mark and trim edge as necessary to remove excess material. Mark, drill and rivet into place using 9 each CR3213-4-2 rivets, 5 in the support and 4 in the aircraft stringer.
10. Install lower gusset plate ETI-B-5006P3-E to the forward end of each support. Place plate into position, mark and trim as necessary to remove excess material. Mark, drill and rivet into place using 12 each CR3213-4-2 rivets, 6 in the support and 6 in the aircraft stringer.
11. Place bottle mount pad ETI-B-5006P3-J left hand or -R for right hand, with slot down and outboard. The slot is there for the stringer at butt line 9L or 9R to fit into.
12. Inspect Kevlar bottle for defects. Check test date marked on bottle label. Make sure the low profile manifold is installed and tight. To place bottle onto bottle pad, point bottle aft and up and slip through opening to clear structure and place onto bottle mount pad. If everything worked out correctly the bottle should stand straight up directly inboard of previously installed support brackets.
13. Check to make sure there is enough clearance around the bottle and surrounding items. Check the control cables are not too close to bottle. Check the upper portion for clearance to aircraft structure.
14. Install bottle mount clamp with feet to the upper and lower part of the bottle. Tighten clamp just enough to secure the clamp and feet in alignment with the upper and lower support brackets. Using the mount spacers ETI-B-5006P3-D (for 115 cu. ft. bottle) or ETI-B-5006-D2 (for 77 cu. ft. bottle) as feet spacing gage. Mark support brackets where corresponding holes will be drilled. Mark area of bottle where clamps wrap around bottle.
15. Remove bottle and clamp assemblies. Drill .025 inch diameter holes where supports were marked. Using red silicone tape ETI-B-5006P6-E apply it to the bottle where it was

previously marked for the clamp area. This is chafe protector for the bottle where the clamp is wrapped around it.

16. Install clamp assembly with feet 00CMK-0012-02 or 00CMK-0008-02, spacers ETI-B-5006P3-D or ETI-B-5006P3-D2, as appropriate, using bolts AN4-6A, washers NAS1149F0463P, and nuts MS21044N4. Refer to drawing ETI-B-5006-1-L or ETI-B-5006-1-R or 35-4950008.
17. Install vertical support ETI-B-5006P3-A to connect the upper and lower horizontal supports together just forward of the bottle mount clamps. Mark, drill, and install with rivets CR3213-4-2.
18. With clamps open and chafe tape on bottle, install bottle. Place bottle on the pad, and tighten clamps around bottle. Have bottle label facing as close to forward as possible keeping in mind that you will have to later install the high pressure lines to the upper fittings. At this point the bottle installation is complete.
19. Installation of the RCV/RCR valve is a much less complicated matter. On A36 late model aircraft the RCV/RCR valve can be located in the avionics rack. Cut a  $\frac{3}{4}$  inch diameter hole in a convenient location of the avionics rack which will allow the valve to be installed and the high pressure tubing, low pressure tubing, and electrical wiring will not be interfered with. Put the threaded end of the valve through the hole and install nut AN924-8D and tighten.
20. On aircraft with no avionics rack installed, the standard vertical support ETI-B-5006P3-A will need to be modified with a  $\frac{3}{4}$  inch hole to accept the RCV/RCR valve and nut.
21. For 36/55/58 model aircraft with raised baggage floor, remove access door on baggage compartment floor just aft of rear door or baggage door. Set ETI-B-5006-10 filler box assembly in opening on baggage compartment floor as shown on drawing ETI-B-5006-11. Install fasteners later. For 33, 35, 55 aircraft with hat shelf in baggage compartment install 58-4950022 filler box assembly in hat shelf as shown on sheet 5 of drawing 35-4950008. Fabricate a doubler or reinforcement for the hat shelf, if required, to help support the filler box assembly.
22. With the Kevlar bottle, RCV/RCR valve, and filler port installed, now they have to be connected together. For aircraft with the filler port installed on the right side and the bottle mounted on the left side, the high pressure tubing will need to be ran from the back of the filler port, through an existing hole in former at station 179 and continue over to the left side. Drill a  $\frac{5}{16}$  inch hole in former at station 190, install grommet MS35489-4, run tubing through grommet, and connect to one fitting on bottle low profile adapter.
23. High pressure tubing should have an expansion loop installed prior to connecting to fitting. Just wrap a 3 inch loop in tubing then slide B-nut on, slide on cone ferule approximately  $\frac{1}{8}$  inch, slide on ferule cap, then install assembly into fitting and tighten nut finger tight plus  $\frac{1}{4}$  turn. Perform this same procedure for all high pressure connections.
24. Now run length of high pressure tubing from other fitting on bottle to the high pressure port on RCV/RCR valve, which should be in the threaded end of the valve. Use procedures in paragraph 23 for the connections. Secure tubing as needed. This takes care of all the high pressure requirements.
25. The low pressure user oxygen comes out of the RCV/RCR valve from the low pressure regulator. This regulator will have special hose connector. Insert the right diameter

polymer hose into the fitting until the locking mechanism holds the hose in place. This hose can be removed by depressing the collar and pulling hose out.

26. If user ports are installed in the headliner they will be installed as shown in Drawing ETI-B-5006-1-L or ETI-B-5006-1-R. Use a Rotabroach or similar tool to cut a pair of 7/16 inch holes in the headliner from the top down. Install the user fitting with washer through the hole from the bottom up and screw into the user block. For installation of user ports in armrests and under instrument panel see Drawing 35-4950008 (skip steps 27, 28, 29 and 30 if installing user ports in armrests and under instrument panel).
27. The user ports for the front seats and 3<sup>rd</sup> and 4<sup>th</sup> seats will be installed on the headliner. Two dual user ports are installed into position by finding the center across the air duct attach screws at the front of the headliner. These screws are used to clamp the duct on the headliner to the duct mounted to the top of the forward cabin. Install the user ports running forward and aft approximately at station 97 and butt line 7R and 7L. Keeping in mind that the outcome is for the dual user ports to be aft of the front seats and slightly inboard so as to clear all of seats head rests. Cut two 7/16 inch holes corresponding to the holes in the user block. Install the user fitting with washer, through the hole from the bottom up and screw into the user block.
28. Install low pressure tubing into a fitting at the aft of the user port on the right side and route under the air duct and install loose end into the fitting at the aft end of the left fitting. Install provided plug into the forward end of the right user port. The headliner itself is ready to be installed.
29. Now install the low pressure tubing into the low pressure fitting at the RCV/RCR valve. Drill a 7/16 inch hole in former 190 at a convenient location, install grommet and pass tubing through hole. Have tubing end in the general location of where the aft user ports will be. Cut tubing, leaving enough extra so as to make it easy to install to the user port once the headliner is in place. Have other loose end in same location that will be installed to the forward end of the user port when headliner is installed. This length of tubing will run forward through each former, drill 7/16 hole and use grommet as necessary. At the main structural former it will not be necessary to drill holes through the channel. Find the channel doubler in the center. Route tubing so it will lie in the corner of where the doubler and channel meet. Install tubing protector ETI-B-5006P3-Z to protect the tubing from being smashed by the headliner and secure with tape. End tubing at a location that will be forward of the front left side user port.
30. Protect all tubing from being smashed or kinked. When headliner is in place and ready to be installed, install the low pressure tubing to the aft user port and to the forward user port. Install headliner.
31. The electrically operated pressure gage can be mounted at the discretion of the installer. The standard gage is a 1.25" diameter gage, but a larger 2.25 gage is available. Just cut the proper size holes in the desired location and install. Using connector ETI-B-5006P6-B to gage, wire according to Drawing ETI-B-5006-1-L or ETI-B-5006-1-R or 35-4950008.
32. Install on/off switch in a location close to gage and wire accordingly.
33. Install connector ETI-B-5006P6-C to RCV/RCR valve and wire accordingly. Route the multi stand single bundle from RCV/RCR valve, along existing wiring that runs along the left side wall panel. Have forward end connected to the gage connector. Complete the wiring installation per Drawing ETI-B-5006-1-L or ETI-B-5006-1-R or 35-4950008.

34. Install placards: "Oxygen – No Smoking When In Use" next to each oxygen manifold or port, "Oxygen Recharge – Max Pressure 1850 PSI" next to filler port, ETI-B5006P-L1 label over switch.
35. After checking all fittings for security, charge system with 1000 psi of aviators breathing oxygen. Allow to set for a while to ensure no leaks. Turn on battery power and visually check that the electric gage reads the same pressure as the mechanical gage. Move switch from off to on, and visually check that the red indicator button on the RCV/RCR valve extends after a few seconds. At this point there should be low pressure oxygen available at each user port. Using the provided connector and flow meter, test each user port for availability of oxygen enough to float the ball for 18k feet.
36. After verifying that everything is operationally correct, continue to charge the system to 1850 psi. Install all required placards. Installation complete.