Section 27
Altitude Compensation Induction System (ACIS)

Procedures covered in this section:
Install stepper motor controller; install man/baro sensors and hoses; install ACIS oil cooler and hoses; install ACIS air filter, housing and flex hose; tension drive belt.

Cards used in this section:
None

Prints used in this section:
E35-2001

Templates used in this section:
E32-1

Tools required for this section:

Air grinder	Files	Pliers	Wire strippers
Air or electric drill	Hacksaw	Scissors	
Cleco	Hex wrench 8mm	Screwdrivers	
Cleco pliers	Pop rivet gun	Wire cutter	

Drill bits of the following sizes: 3/32", 1/8", 9/64", Uni-bit or step drill
Ratchet with sockets of the following sizes: 5/16", 1/2"
Wrenches of the following sizes: 5/16", 1/2", 11/16", 13/16", 7/8"

Notes:
1. ALTITUDE COMPENSATION INDUCTION SYSTEM (ACIS): This section contains installation procedures for the optional ACIS supercharger components. All of the necessary internal engine modifications have been done by RotorWay. The supercharger and most of the related intake components are installed on the engine at the factory. Procedures for installing the ACIS engine into the helicopter are the same as the standard engine installation described in Section 12.

   An exploded view drawing and complete parts list of the Altitude Compensation Induction System can be found in Section 5 of the Engine Manual.

Diagram #1

Using Template E32-1, mount the man/baro sensors along the lower edge of the passenger side seat back panel and the ignition packs near the top of the panel as shown. Mount the stepper motor controller in the area shown, using 6-32 screws, fiberlock nuts and washers.

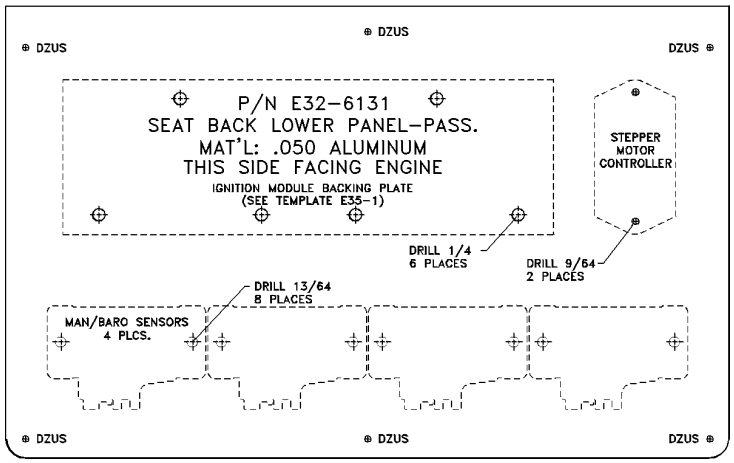


Diagram #2

Install a blue rubber hose from each of the baro sensors to the fittings on the flapper assembly. Secure with plastic hose clamps. Route the hose from the manifold pressure sensor to the fitting on the plenum.

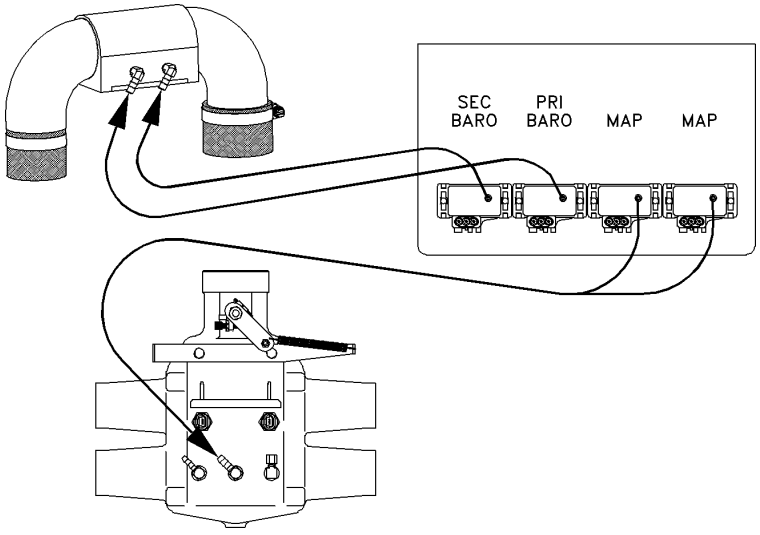
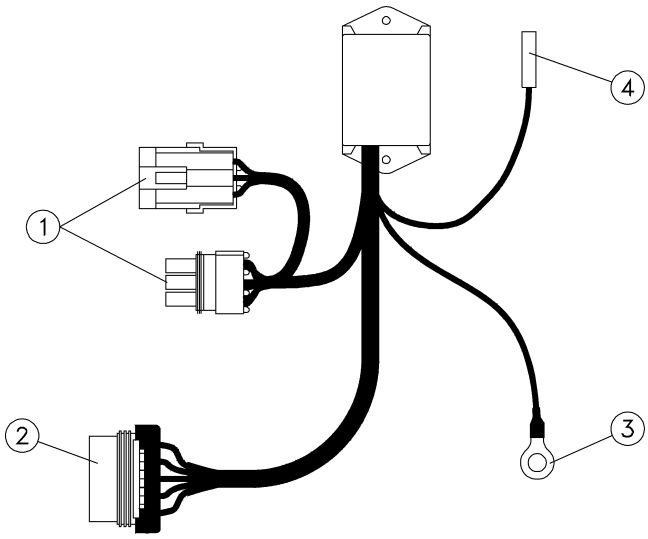


Diagram #3

Connect wiring to the stepper motor controller as follows:

1. Plug the 3-pin connector into the primary baro sensor. Plug the primary baro connector on the FADEC harness into the corresponding plug on the controller.
2. Connect the 5-pin plug on the controller to the corresponding plug on the stepper motor.
3. Connect the 5/16 ring terminal to the engine mount bolt grounding location on the airframe.
4. Connect the 1-pin plug into the corresponding plug on the airframe wiring harness.



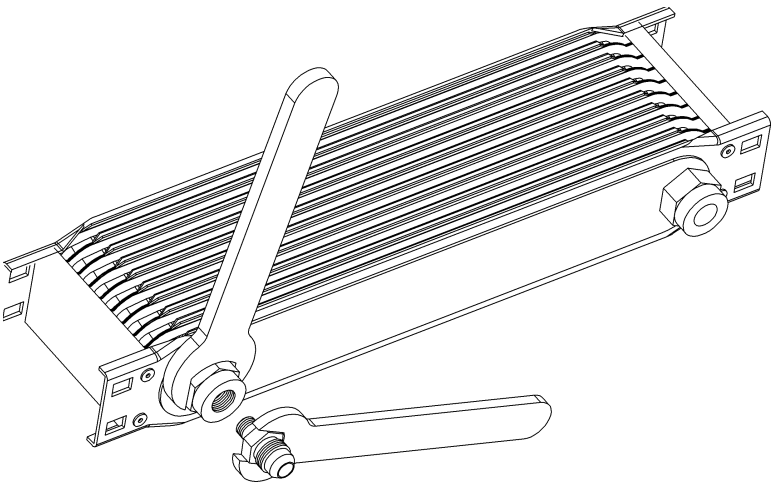


Diagram #4

Hose fittings supplied with the oil cooler may vary. If the openings of the cooler have female threads, male adapters must be installed. The fittings that are permanently attached to the cooler must be held with a wrench when installing the adapters and hoses to prevent damage to the cooler.
If the adapters use O-rings, oil the O-rings before installing. Tighten the adapter until the face behind the O-ring just touches the mating face on the cooler. Do not over tighten.
If the adapters have NPT (tapered) threads, use Teflon tape on the threads. (Do not use teflon tape on the AN –6 threaded side of the fittings where the hoses attach, or on any threads that utilize O-rings.)

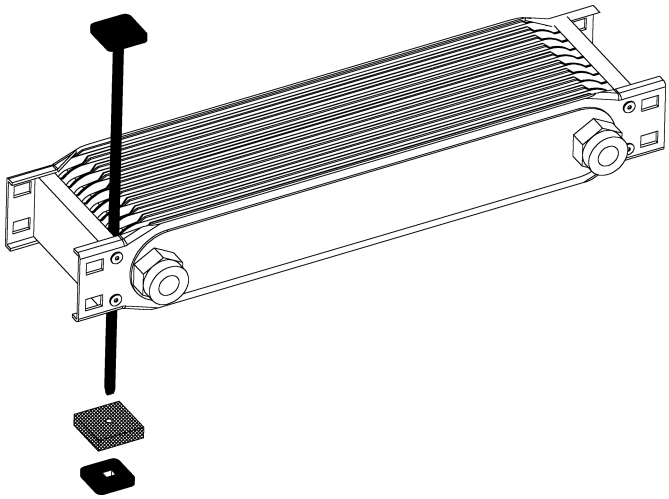


Diagram #5

Four black plastic ties are used to secure the oil cooler to the top of the radiator. Insert the ties through the oil cooler, then place the foam pads on the ties. The locking tabs are to be installed after the cooler is mounted to the radiator.

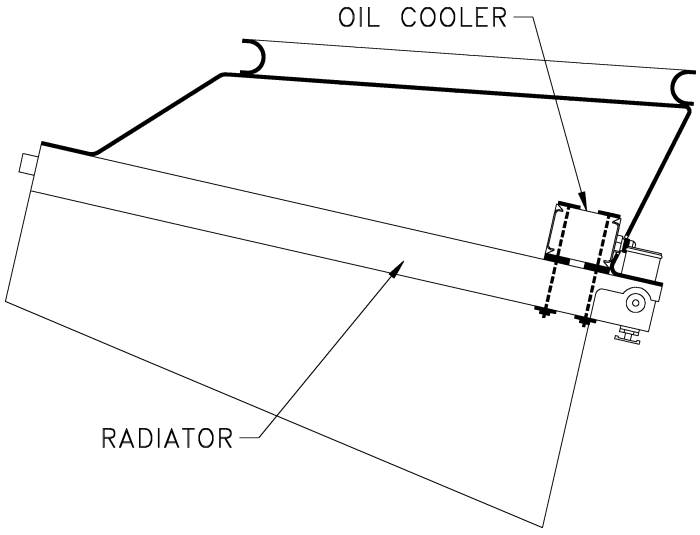


Diagram #6

Install the oil cooler on top of the radiator, inside the fan shroud, centered between the water hoses. Make sure the foam pads are in place between the cooler and the radiator. Cut holes in the front of the fan shroud for the fittings. Secure the ties with the locking tabs and cut off the excess length.

Diagram #7

Connect the hose assembly from the oil filter "out" to the forward threads of the tee on the lower cover of the engine. Use a –8 to –6 reducer on the rear part of the tee. Route the oil hose assembly from there to the oil cooler inlet, which is the fitting towards the pilot's side of the oil cooler.

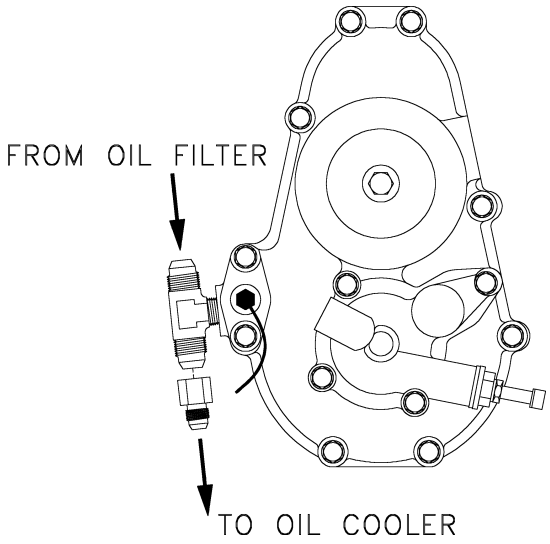


Diagram #8

Oil cooler hose routing. As described in the previous diagram, route the hose assembly from the tee on the lower cover to the pilot's side inlet on the oil cooler. Route the hose assembly from the outlet on the passenger side of the oil cooler to the supercharger oil inlet.

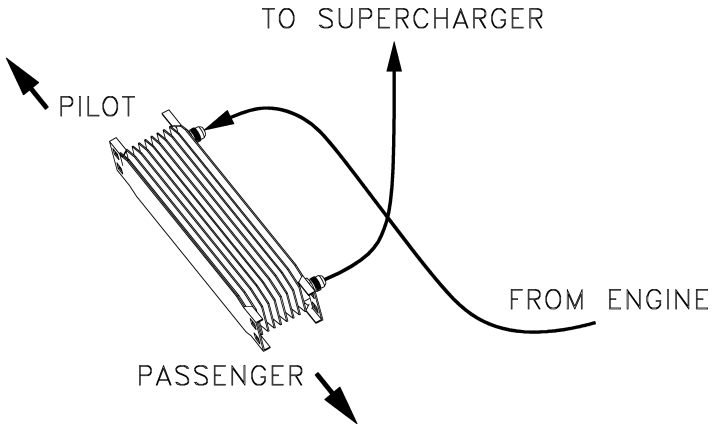
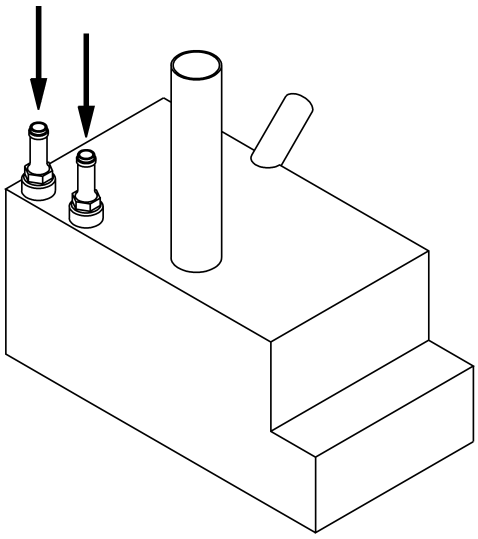


Diagram #9

Route the oil drain hoses from the supercharger to the oil sump/heat exchanger.



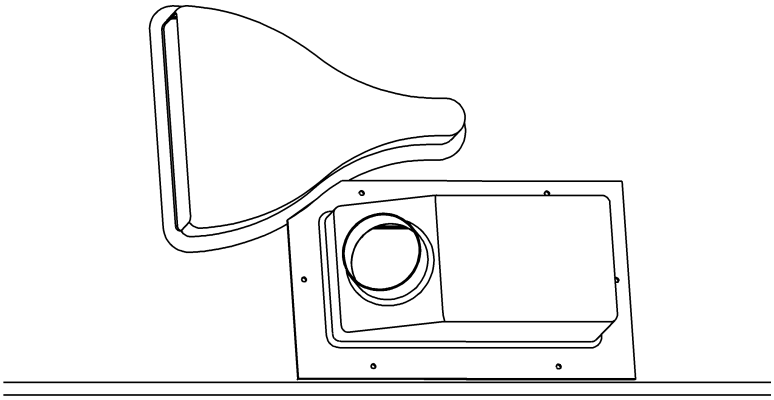


Diagram #10

Locate the ACIS air filter housing and retainer on the inside of the bottom tub, passenger side, between the rear air scoop and the strip of reinforcement material which runs fore/aft. Trim as necessary for best fit. When located, drill six 1/8" holes, using clecos to hold alignment. Cut a rectangular opening for air intake (the same size as the inside of the retainer) in the tub.

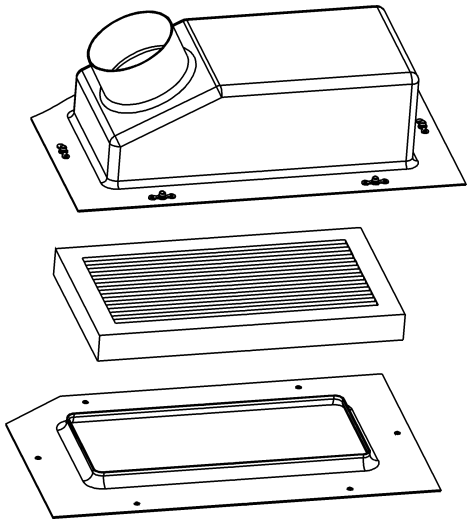


Diagram #11

Install nut plates on the filter housing, enlarging the cleco holes to accept 8-32 screws. Insert the air filter in the housing, then secure it with the fiberglass retainer. The filter should be completely enclosed by the housing and retainer to prevent dirt from getting past the filter.

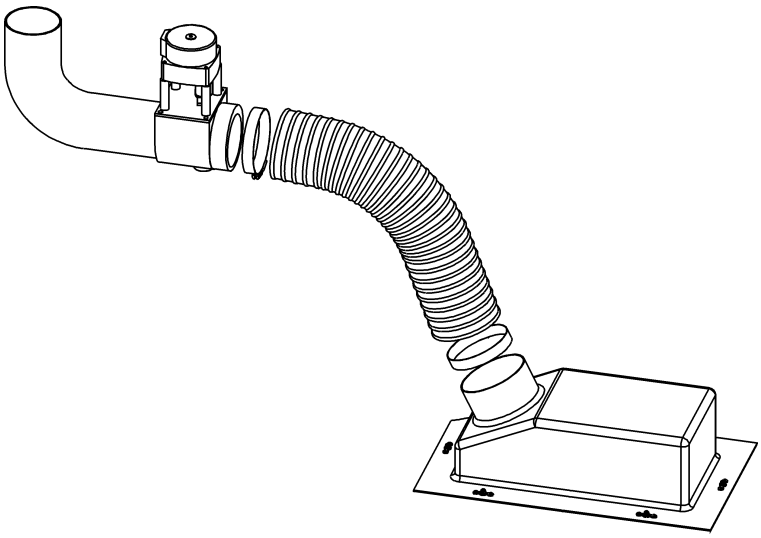


Diagram #12

Mount the air filter assembly in the tub. Install the screws from the bottom, through the tub, retainer, and housing. Route the 3” flex hose from the housing to the stepper motor assembly and secure it with hose clamps.

Diagram #13

To tension the belt, adjust left idler (A) to lightly make contact with the belt. Adjust the right idler with sleeve (B) so that belt deflects 1/8 inch at 10 pounds pressure, using the belt tension tool.