

***600/800 ETEC***  
**Turbo System Installation Manual**

V1.7

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# INTRODUCTION

Congratulations on your purchase of the Aerocharger Turbo system for the 600/800 Rev XP. You are now the owner of the most powerful, reliable, and technologically advanced turbocharger in the world. With your new intercooled turbocharger and fuel system installed, you will experience substantial performance gains. Not only will you get amazing performance but our unique system which combines VATN technology (Variable Area Turbine Nozzle) and our nearly frictionless, non-flooded ceramic ball bearing design will provide you with our famous zero turbo-lag.

This system is made and assembled by Aerocharger LLC. We manufacture turbo systems with a passion.

*The installation of this kit consists of two major components:*

1. Installation of the turbocharger system
2. Installing the fuel control electronics

**Note:** Before getting started, refer to the Packing List and identify all the components of your turbo system. This will also aid in the installation process.

## **WARNING!**

**Installation of the turbo system is not for the mechanically challenged! If you are uncomfortable performing any of the tasks outlined in this manual, please refer to trained professionals at your local performance shop. If you are performing the installation of this system, it is suggested that you read this ENTIRE manual prior to proceeding with the installation. It is also suggested that you review each section as you progress to ensure everything is installed correctly.**

## **WARNING!**

**Do NOT hit the rev limiter. It will lead to detonation and you will damage your engine.**

## **WARNING!**

**This system is designed for use on a STOCK 600/800 Rev-XP only!**

### **WARNING:**

If your Rev-XP has been modified, consult Aerocharger (913.541.0200) before proceeding. This Turbo system is intended for use on a **STOCK**, well-maintained 600/800 Rev-XP with a strong running, well-maintained engine. Installation of this kit on brand-new snowmobiles with very few miles/hours on them is **NOT** recommended. New engines require specific break-in procedures that do not include adding forced induction! If your snowmobile is brand new, consult your local dealership and owner's manual to determine proper break-in procedures **BEFORE** continuing with this installation. Failure to do so may result in significant internal engine damage. **AEROCHARGER WILL NOT BE HELD RESPONSIBLE FOR DAMAGE TO VEHICLES POWERTRAIN.** Aerocharger is not responsible for ECU tuning/programming on 600/800 Rev-XP's that were not stock before the installation of this turbo kit.

### **WARNING:**

For best performance and reliability always use minimum 91-octane non-ethanol fuels and listen for signs of detonation. **IF DETONATION SHOULD OCCUR OR IF YOU ARE UNSURE IF YOU ARE HEARING DETONATION, DECREASE THROTTLE APPLICATION IMMEDIATELY** and consult Aerocharger staff (913.541.0200). Detonation should **NOT** be an issue with this kit provided if it is installed correctly, though OEM factory shipped engine and parts inconsistencies are possible on any new vehicle.

### **Note:**

Aerocharger holds no responsibility for any powertrain damage that results from misuse of this turbo system!

### **Note:**

Read and understand ALL safety and technical precautions in this manual before proceeding. Failure to comply with the instructions in this manual could result in personal injury, property damage, voiding your warranty, and/or inconsistent/poor performance from the turbocharger system. Contact Aerocharger for any questions or concerns.

Do **NOT** let any debris (hard or soft) enter the existing air intakes or exhaust ports during installation of this turbo kit.

Do **NOT** use any silicone sealants under any circumstances. Doing so can result in F.O.D. (Foreign Object Damage) to the turbo. This will void your warranty.

## TOOLS NEEDED:

1. Metric socket and wrench set (7mm-17mm)
2. T27 torx wrench
3. Stubby Phillips head screwdriver
4. Long Phillips head screwdriver
5. 2.5" hole saw
6. 6"-8" 3/8" socket extension
7. Spring tool
8. Torque wrench
9. 4mm Allen wrench

## PREPARATION

### REMOVE BODY PANELS

1. Remove the left and right side panels.



2. Remove the nose panel.



3. Remove the gauge panel by unscrewing the 5 T27 torx screws, the two on each side and one in the front

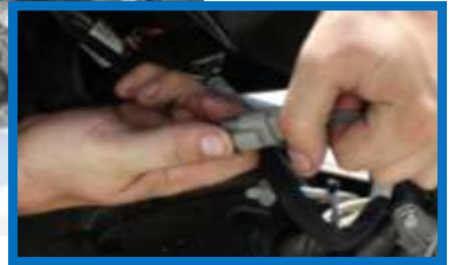


4. Disconnect the Gauge panel electronics.

*Press with your thumb as shown in the picture and pull the clip off.*



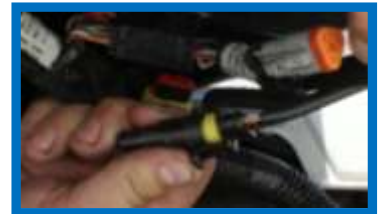
*Squeeze with your thumb and pull the clip off.*



*Pull out both of the headlight clips.*



*Press with your thumb as shown in the picture and pull the clip off.*



*Push up and out with your thumb as shown.*

5. Remove the headlights: there are two T27 torx screws under the windscreen holding them on. Do not discard hardware, as they will be reused later.



6. Remove the seat.



7. Remove the gas tank panel. First, unscrew the gas cap and remove the threaded plastic retainer. There are also two T27 torx screws toward the front that need to be removed.



8. Disconnect the electrical connections from the gas tank panel. There may be fewer connections depending on the sled model.



## REMOVE FRONT AIR PLENUM

1. Unscrew the T27 torx screws connected to the gas tank.



2. Use a 7 mm socket to remove the coolant tank from the front of the air plenum and disconnect hoses. Note: this is not required on sleds with a 600cc engines.



3. Pull off the Velcro strap on the bottom of the plenum.



4. Loosen the hose clamp on the top of the air box then remove the top section of the plenum.



## REMOVE GAS TANK

1. Unbolt the gas tank: there are two 13 mm nuts on either side of the seat. There are two 10mm bolts at the handle bars and 2 more 10mm bolts connecting support members.



Two 10mm bolts connect the frame members running along the gas tank to the handle bar neck.



There are two vertical members attached at the handle bar neck connected with two 10mm bolts.



Remove the four 10mm bolts and the frame members over the gas tank will be loose from the handlebar neck.



On either side of the gas tank, midway down, there are two 13mm nuts covered by panels that snap off. Pull outward on the panels to remove them.



Use a 13mm ratchet to remove the nuts on both sides of the gas tank.

2. Remove gas tank vent line.



3. Remove fuel lines and electrical connectors from the fuel pump assembly.



4. Slide the fuel tank away from the airbox.



## REMOVE STOCK MUFFLER

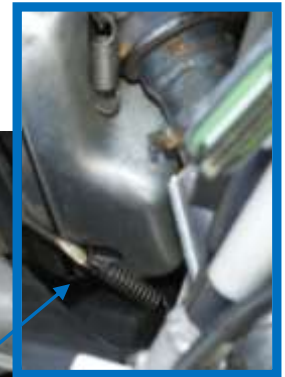
1. The Muffler is held on with 4 exhaust springs - one on both sides near the bottom and two connecting it to the exhaust pipe. There is also a temperature sensor on top of the muffler. Remove this using a 17mm wrench and use a spring puller to remove the springs. The muffler will easily come off.



*Two spring tabs connect the muffler to the exhaust pipe.*



*The clip toward the rear of the muffler.*



*The clip toward the front of the muffler.*

## REMOVE STOCK AIR BOX

1. Remove the intake air temperature sensor from the airbox tube using a flat head screwdriver to pry up the two retainers. Leave it connected to the wiring harness and move it aside.



2. Loosen the two hose clamps holding the airbox onto the throttle bodies using a long Phillips head screwdriver.

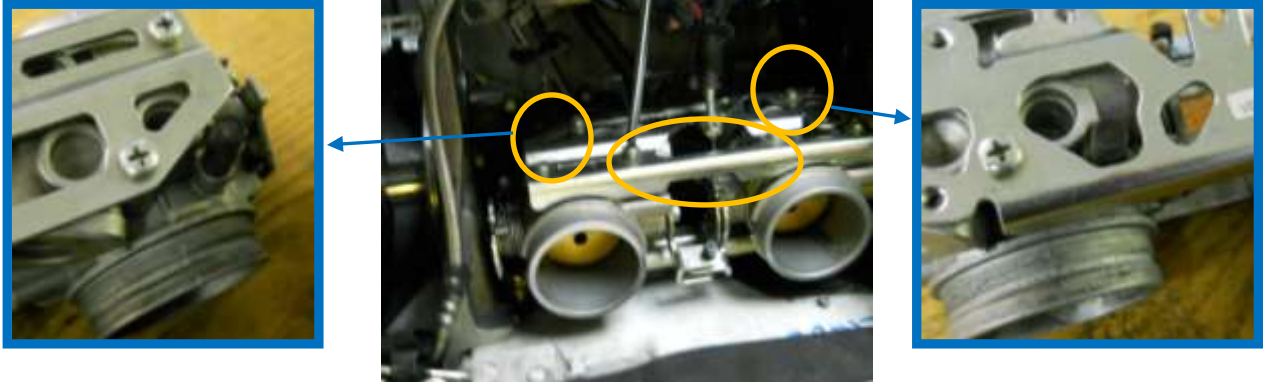


3. Remove the airbox.



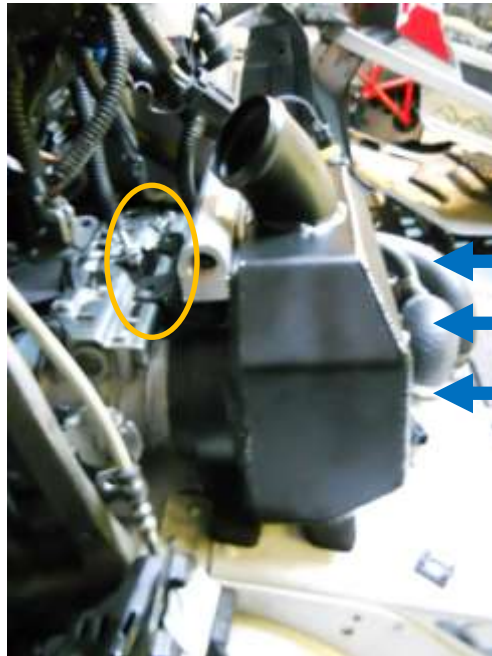
## INSTALL AIR BOX

1. Remove the throttle body screws and the vacuum plugs pictured. These will no longer be needed.\



2. Using the supplied silicone, lubricate the o-rings.
3. Press on the air box.

*The holes on the airbox support will line up with the screws you removed from the throttle bodies.*



*Press on the back of the airbox to press it onto the throttle bodies. This will take significant force. It may be helpful to use a heat gun and warm up the airbox and o-rings.*

Using the longer screws provided, attach the air box to the throttle body.

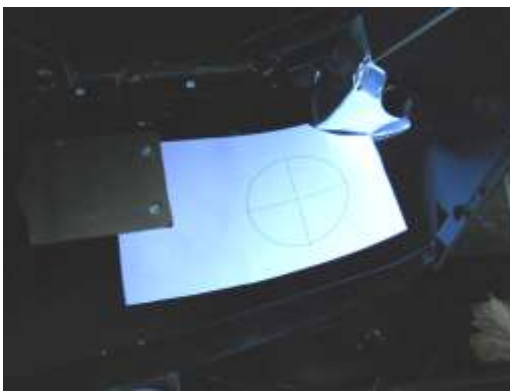


## AEROCHARGER INSTALLATION

1. Using the provided cover and rivets, cover the factory exhaust hole location.



2. Use the pattern included in the kit to mark the location of the new exhaust hole.



3. Use a 3" hole saw and cut the new exhaust hole.



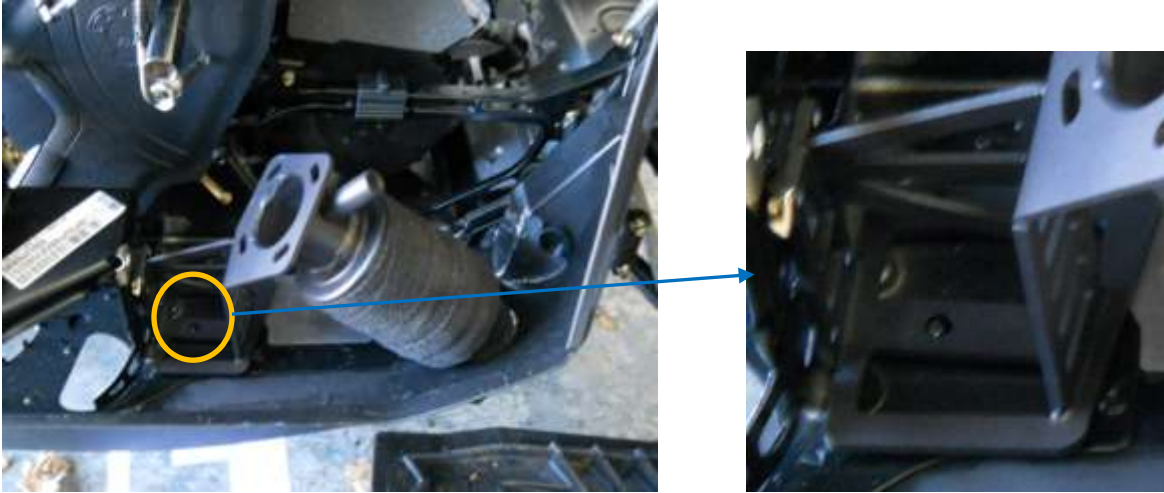
4. Install the white check valve between the RAVE valves and the factory RAVE solenoid, as pictured. Do not install the check valve on the new solenoid included with your system.



5. Install the “vacuum side” check valve onto the line going to the top of the factory RAVE solenoid. You will need to remove and cut about 1/2” of the spring off. You should also use a clamp or wire tie to hold the hose on.



6. Seat the cradle in its place. The holes in the base will correspond with the stock rivets.



7. Bolt the cradle to the frame using the stainless steel washers and four nuts and bolts supplied in the kit on the other side of the foot well.

8. Install the ceramic-coated heat shield and exhaust wrap onto the turbine housing of the Aerocharger.



9. Install the Aerocharger onto the exhaust cradle using the provided M8 bolts and lock-washers. Do not completely tighten the bolts, as it may be necessary to rotate the turbo for final fitment.



10. Remove your expansion pipe and check for any welding debris. We found mig wire on our pipe and were able to remove it using a sanding wheel. After inspection make sure to blow out any debris.



11. Bolt the turbine inlet pipe to the turbo, using the M10 flange bolts provided in the kit.



*Use the original graphite gasket on the exhaust pipe.  
If gasket is damaged, replace with a new gasket.*



*Put the inlet pipe on as shown in the picture.  
Remember to put the gasket included with the kit in-between the turbine inlet pipe and the Aerocharger.*

12. Tighten the bolts on the Turbo.



*Tighten the Turbine Outlet bolts using a 13mm open ended wrench.*



*Tighten the four turbine inlet bolts using a 15mm wrench.*

13. Using a spring tool, install two springs per side onto the connection between the turbine inlet pipe and the expansion pipe.



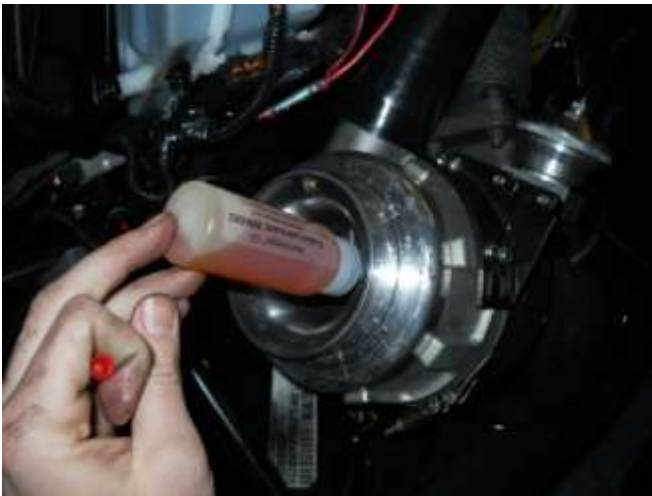
14. Using a 16mm wrench, reinstall the temperature sensor into the bung on the muffler. The sensor needs to be oriented as pictured to prevent damage to the sensor.



15. Remove the brass pipe plug shown.



16. Add two bottle of Aerocharger Oil.



17. Put LocTite 262(Red) on the plug and then torque to 35 in-lbs.



# INTERCOOLER INSTALLATION

## 800 COOLANT TANK RELOCATION

**This step is only required on the 800cc E-Tec engines. If you are installing on a 600cc engine, the coolant tank is already in the correct location.**

1. Drain the coolant fluid from the reservoir.



2. Remove the clamp and then cut the large diameter coolant tube at the frame member.



3. Re-attach the coolant bottle to the hose with the included hose clamp.



4. Re-mount the tank on the chassis using the front cross-member.



## INTERCOOLER INSTALLATION

For non-intercooled installation see page 48

1. Place the intercooler in position on the front of the sled.



*The circled areas are the mounting point for the intercooler. They match up to the frame of the snowmobile.*

2. Install the charge tubes.



*Charge tube 1 goes from the turbo to the intercooler, install it as shown, and make sure it doesn't rub anywhere.*



*Charge tube 2 goes from the intercooler to the airbox. Install it as shown above.*

3. Use the included hose clamps to secure the intercooler to the frame. The hose clamps use a 7mm socket or flat head screwdriver.



*Completely unscrew the hose clamp.*



*Wrap the hose clamp around the intercooler and chassis and reconnect it to itself.*



*Tighten the clamp around the intercooler bracket to secure the intercooler to the chassis.*



4. Tighten all of the charge tube hose clamps.

5. Connect the signal lines to their labeled locations.



*The signal lines that are labeled “to manifold”, get attached to the hose barbs on the throttle bodies.*



*The line labeled “to Aero-Commander” gets routed to the handlebars and will be connected to the Aerocommander later when it is installed.*

## FUEL LINE INSTALLATION

1. Install the fuel line.



*The short legs of the line get installed between the gas tank fuel line and the ECU.*



*The long leg of the fuel line gets screwed onto the fuel rail.*

## AERO-COMMANDER INSTALLATION

1. With the Aero-Commander near the handlebars, feed the wires down the steering shaft into the engine bay. Then connect the connectors to their appropriate locations.



*This is the default mounting position for the Aero-Commander.*



*Run the electrical harness through the handlebars and into the sled.*



*Unplug the ignition coil plug, this is directly across from the fuel rail and is pictured above. The Aero-Commander harness gets connected inline at this plug.*



*Connect the long leg of the harness to the solenoid valve mounted on the Intercooler.*



*Connect the fuel injectors to their matching plugs. There are two of these plugs with about 6" of wire between them; these are for the fuel injectors - it does not matter which injector they get plugged into.*

2. Attach the signal line labeled "to Aero-Commander" on the solenoid to the Aero-Commander.
3. Zip Tie the vacuum pump onto the frame above the expansion pipe.



4. Plug in the supplied vacuum pump in-between the solenoid and the Aerocommander wiring harness.



5. Cut the 1/8" line applying vacuum to the R.A.V.E. valves before the T fitting going to the individual valves. Install the T and hose preinstalled on the vacuum pump at this location.



6. Powering the Aero-Commander will be covered in the next section.

## GAUGE INSTALLATION

1. Using a 13mm wrench remove the front two bolts on the handlebar mount and install the preassembled gauge pod using the original bolts. Torque the bolts to **18 ft-lbs**.



2. Run the signal line labeled "to gauge pod" to the boost gauge and attach it by pushing it over the barb.



3. Connect the Air/Fuel gauge line to the oxygen sensor on the exhaust and run the end to the gauge pod location.



4. Connect the sensor harness to the Air/Fuel gauge.



5. Solder together the red power leads from the Aero-Commander and the Air/Fuel ratio gauge.



6. Cut the red wire from the empty fuse holder located on the oil tank.



7. Strip the end of the wire and solder the tip.
8. Using the provided butt connector, insert the wires and crimp the connector.



9. Using a heat gun, heat the connector to provide a secure, water resistant connection.
10. Crimp the eyelet connector to the end of the Aero-Commander and Wideband ground wires.



11. Use a heat gun and shrink the connector.

12. Ground the Aero-Commander by removing a bolt from the chain-case and inserting the eyelet onto the bolt then retighten.



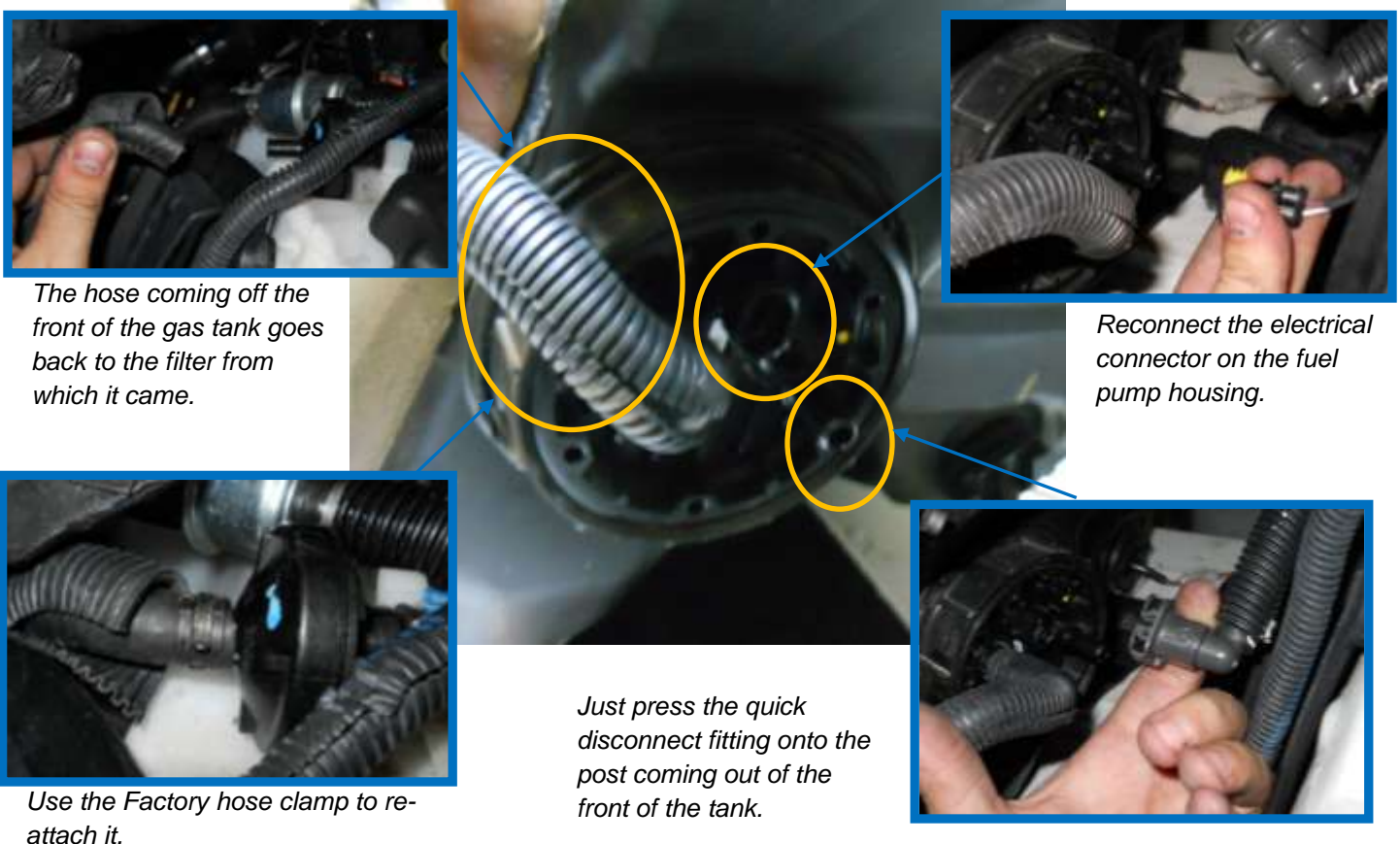
# PUTTING THE SNOWMOBILE BACK TOGETHER

## RECONNECT THE GAS TANK

1. Reconnect the electrical and fuel lines at the front of the tank.



*Place the gas tank on the snowmobile as shown.*



*The hose coming off the front of the gas tank goes back to the filter from which it came.*

*Reconnect the electrical connector on the fuel pump housing.*

*Use the Factory hose clamp to re-attach it.*

*Just press the quick disconnect fitting onto the post coming out of the front of the tank.*

*The fittings all go back on the same way they were taken off.*

2. Reconnect all other connections.



*Re-connect the breather line at the top of the tank.*



*Re-connect the plug coming off the bottom of the tank.*



*Use a zip-tie to reattach the wire at the bottom of the tank.*

3. Bolt the gas tank back on.



*Slide the tank forward on the sled to get the chassis supports and the gas tank over the studs on either side.*



*Line up the bolt holes at the neck and replace the bolts the same way they came off. Torque the bolts to **124 in-lbs.***



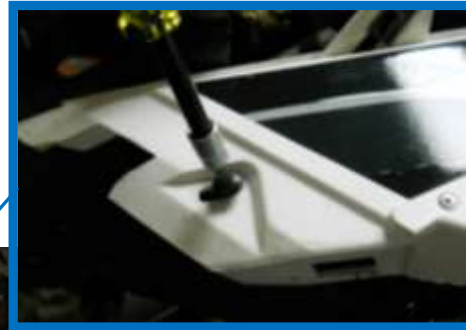
*Remember to use the aluminum washer inserts that hold the plastic gas tank onto the frame stud. Torque the bolts to **25 ft-lbs.***



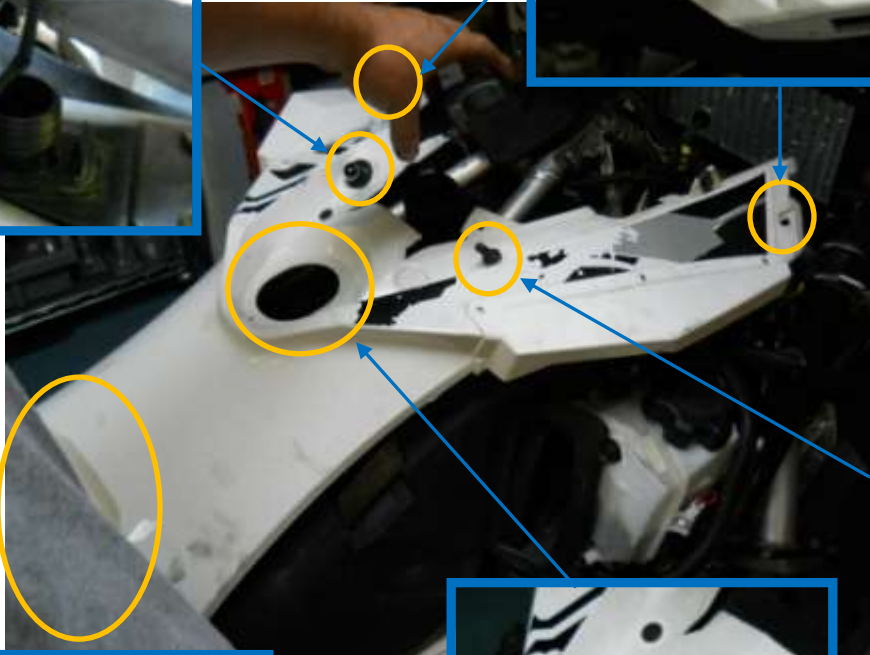
## REPLACE PANELS

1. Replace the gas tank cover panel.

*Screw in the two T-27 torx screw at the front to connect it to the front panel.*



*Re-connect the kill switch plug.*



*Re-connect the switch on the right.*



*Screw the gas cap nut back on top hat down.*



*Make sure the tabs toward the back are underneath the frame.*

**This step is for the 800cc version only. It is not necessary for the 600cc.**

2. Detach vent panels from plenum.



*There are two snap tabs on the top of the vent.*



*There is another snap tab at the bottom the vent.*



3. Attach the vent panel.



*Place the vent under the gas tank panel just like it would sit if the plenum were still there. Then screw in the T27 torx screw that connects it to the gas tank. It may seem secured, but when the other panels are on it will be held securely in place, double-sided tape can also be used on the top of the vent to help hold it in place.*

4. Attach the air temperature sensor that was removed from the factory airbox to the frame near the clutch side vent.

4. Attach the panels to the Intercooler flashing using the headlight hardware.



## VENTING THE SIDE PANELS

1. Using the clutch vent pattern, mark the rivet hole locations.



2. Using a 3/16" drill bit, drill out the holes.

3. Using the provided rivets and washers install the clutch vent.



4. Using the compressor inlet template, mark the location of the vent.



5. Cut out the marked section or drill holes within the area for the vent.



6. Using the vent, drill out the first hole and rivet the panel on. Continue this process until panel is completely attached.



## NON INTERCOOLED INSTALLATION

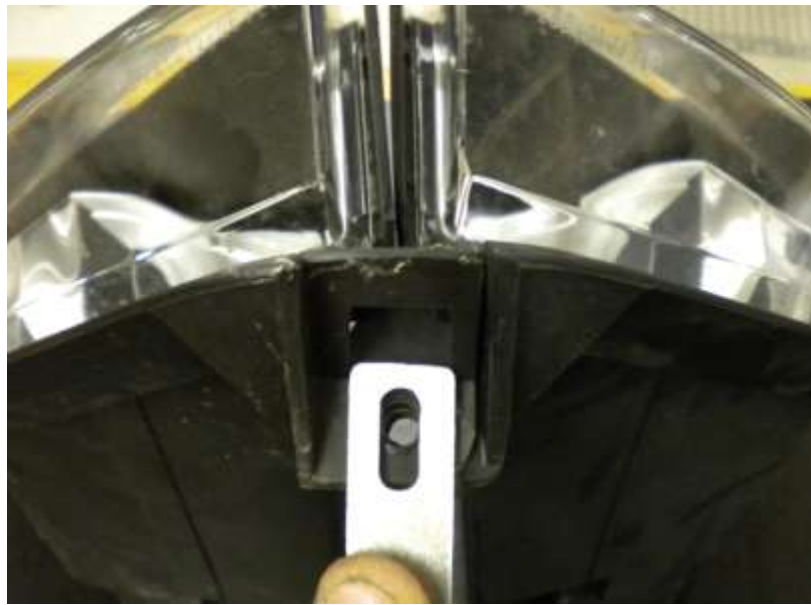
If installing a non-intercooled system disregard the above instructions regarding the installation of charge tubes or the intercooler and follow the instructions below.

1. The non-intercooled version of the system replaces the intercooler and charge tube with the silicone tube pictured below.



2. The blow off valve side of the charge tube gets connected to the top of the air box. The other end gets connected to the compressor outlet on the Aerocharger.
3. The tube is routed behind the headlights so there is no reason to remove them.

4. Included with the non-intercooled system is a headlight support bracket. This bracket bolts on to the chassis bar that the intercooler would bolt onto and support the headlights in place of the stock air box. Use an extra stock clip nut and bolt to attach the support to the headlight.



Appendix

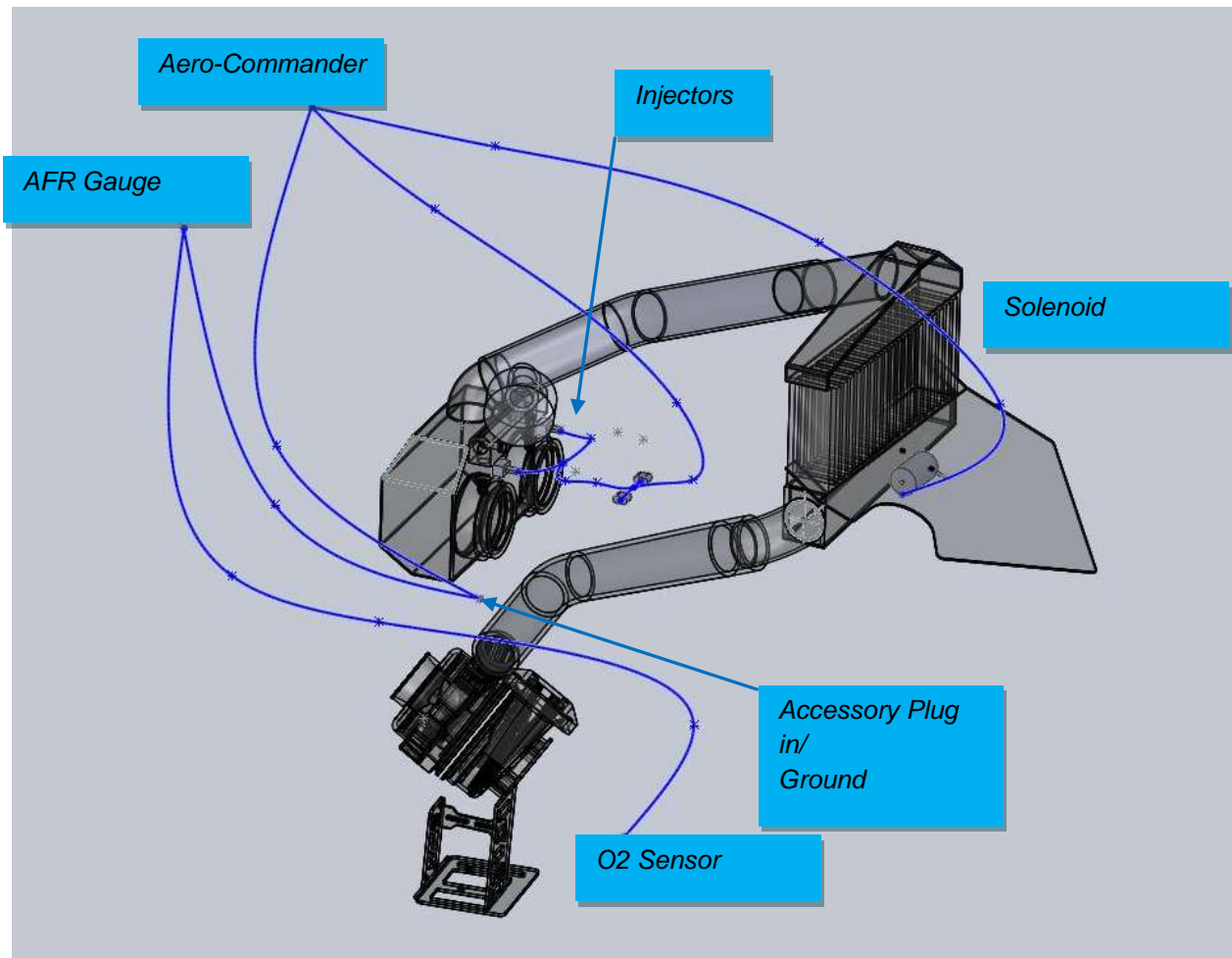


Figure 1 – This is an overview of the electrical system included with the kit.

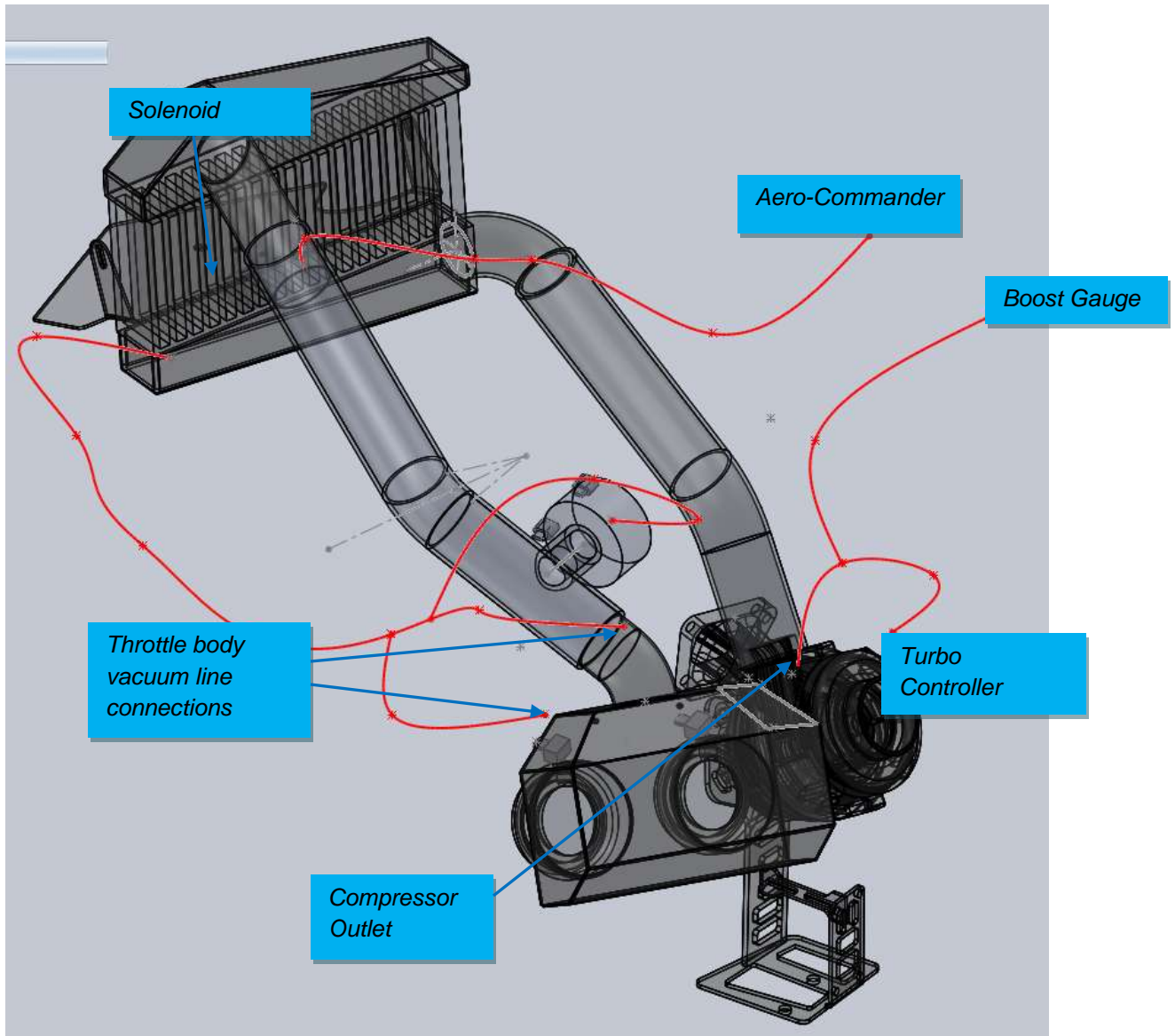


Figure 2 – This is an overview of the pneumatic control system included with the kit.

## **FUEL**

As stated earlier we recommend at least 91 octane non-ethanol fuel. This fuel is good up to 5psi above 6000ft. Above 5 psi we strongly recommend mixing race gas to allow for safe boosting of your engine. At 7psi we recommend a 50/50 mix of 91 and 110 octane fuel, this roughly comes out to 100 octane.

We also recommend running a 60:1 fuel/oil mixture using Ski-doo XP-S 2-stroke full synthetic oil. This is the same oil used for the normal engine oiling. This will help lubricate the pistons and bearings.

## **CLUTCHING**

The system includes pin weights to install in the Primary CVT. This is a starting point for clutching that works for most customers. If you are unfamiliar with adjusting the clutching on your snowmobile then have a local dealer or performance shop install the weights for you.

## **REEDS**

We recommend replacing the stock reeds on your E-Tec, while the stock reeds provide the best throttle response, the durability is poor. For the combination of performance and reliability We recommend replacing the outer reed pedals with Aerocharger Ski-Doo Outer Reed Petals. For absolute durability replace both the inner and outer reeds, using Aerocharger Ski-Doo Inner Reed Petals. On both reeds there is a slight curve to the pedal. The curve provides a preload and needs to be installed with the concave side facing the reed blocks. Failure to do so will result in poor throttle response.



Ski-Doo ETEC Aerocharger Turbo System  
By Aerocharger, LLC  
(913.541.0200)  
[www.AEROCHARGER.com](http://www.AEROCHARGER.com)