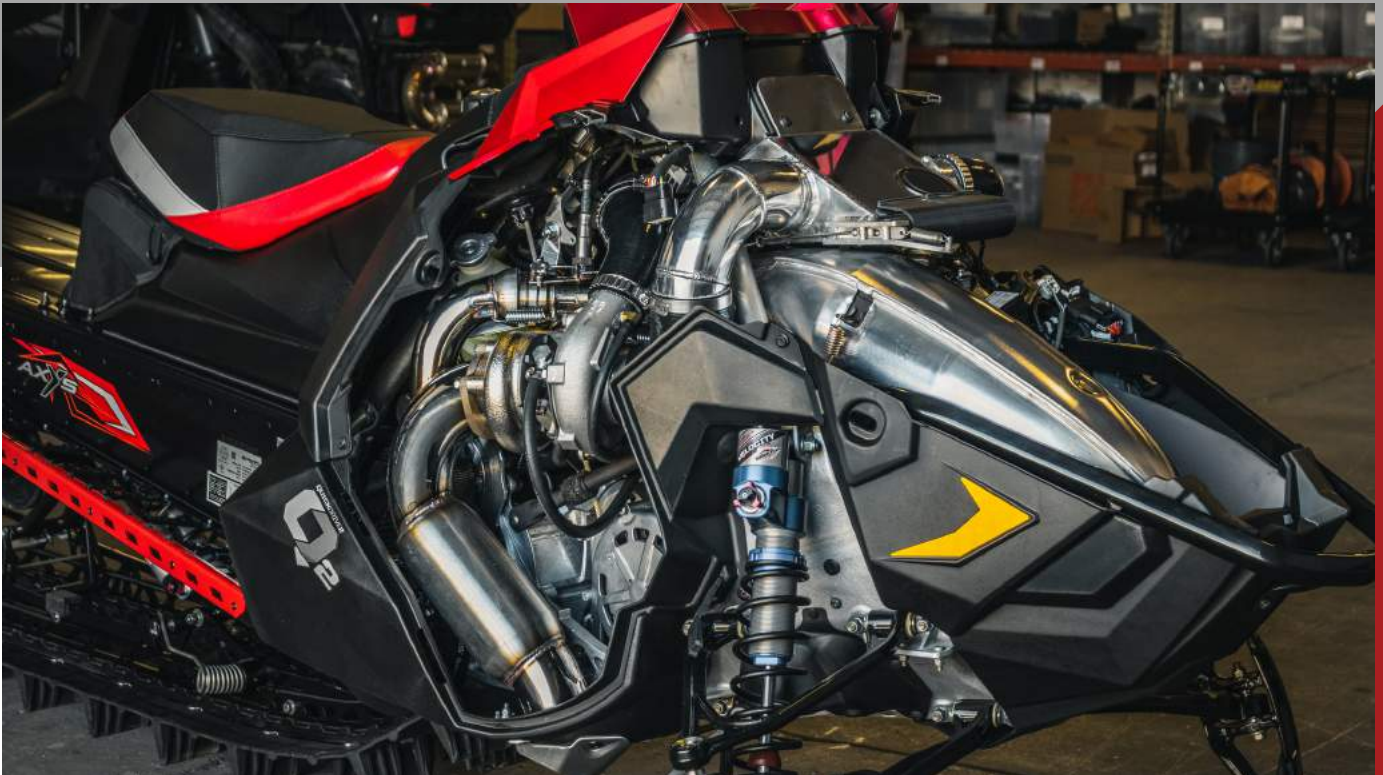




INSTALLATION GUIDE

POLARIS 850 PUMP FUEL VCS TURBO SYSTEM



INTRODUCTION

WELCOME TO YOUR NEW POLARIS 850 PUMP FUEL VCS TURBO SYSTEM.

The Polaris 850 Pump Fuel VCS Turbo System is the high-performance, zero-compromise bypass turbo solution you have been waiting for. Powered by the VCS (Velocity Control System), we are able to eliminate fuel and air limitations seen in traditional turbo systems. By mechanically maintaining and balancing manufacturer stock air, fuel, and exhaust velocities, we are able to maximize the bottom-end and mid-range response you would expect from a naturally aspirated engine while adding the top-end power of boost.

With its lightweight design, the Polaris 850 Pump Fuel Turbo System adds less than 12 pounds.

The installation of the turbo system is simple and doesn't require any modification of the chassis or re-flashing of the ECU.

Force Turbos' Polaris 850 Pump Fuel VCS is designed specifically for all Polaris 850 Patriot units, including the PRO-RMK 850 (2016-2020) and the RMK KHAOS 850.

DISCLAIMER:

While there are no internal engine modifications required, we still recommend that the installation technician have adequate experience in power sports mechanics. Proper installation is imperative for safe operation.

INCLUDED PARTS

1. Airbox Hold Down Bracket (21461)
2. Airbox Hold Down Bracket Bolts (18765)
3. VCS Injector Intake Assembly (A-18184)
4. Air Line Assembly (A-18086)
5. Fuel Line Assembly (A-18190)
6. Coolant Line Assembly (A-21757)
7. Oil supply line assembly (IA-18194)
8. VCS Airbox assembly (IA-18186)
9. Airbox Bolts (21520)
10. Coil Bracket Assembly (A-21760)
11. Coolant Bottle Bracket (21741)
12. Coolant Bottle Heat Shield (21495)
13. Turbo Assembly, Stage 3 (A-21760)
14. VCS Cold Air Intake System (IA-21758)
15. VCS Cable System (AI-21477)
16. Charge Tube Assembly (21759)
17. VCS Boost Equalizer Pipe (A-21750)
18. VCS Exhaust Springs (21498)
19. Dummy Load Sensor Bypass (no part number)
20. Line Plug (21781)
21. Operational Instructions *Not pictured
22. Installation Instructions *Not pictured
23. Turbo System Pre Run Check Off Sheet *Not pictured



TOOLS & SUPPLIES NEEDED

- Polaris belt removal tool
- T40 Torex
- Flat head screw driver
- Phillips head screw driver
- 2) 10 MM open end wrenches
- 15 MM open end wrench or socket
- 3/8 open end wrench
- 1/2 open end wrench
- 9/16 open end wrench
- 10 MM socket
- 1/2 socket
- Ratchet
- Long ratchet extension
- 1/4" nut driver
- 5/16 nut driver
- Hose cutter
- Side snips
- Drill
- 3/16 Drill bit
- 1/2 Drill bit
- 3/32 Allen wrench
- 1/8 Allen wrench
- 3/16 Allen wrench
- Torch
- Rivet gun
- Razor knife
- Needle nose pliers
- Pliers
- Exhaust spring puller
- Sharpie marker
- Rags
- Coolant catch can
- Syringe filled with 2 stroke oil
- Magnet
- Grease
- 2 stroke oil

STOCK SLED



DISASSEMBLY

REMOVE THE FOLLOWING PARTS:

- Side panels
- Hood
- Console
- Air ducting to airbox
- Oil tank
- Clutch cover
- Belt
- Secondary clutch
- Airbox
- Coils from spark plugs and off airbox
- Muffler and exhaust probe
- Seat
- Fuel tank
- Spark plugs
- Coolant line that runs from engine head to throttle bodies on the left side of motor



DISASSEMBLED SLED



ASSEMBLY



1. Install airbox hold down brackets using new supplied bolts



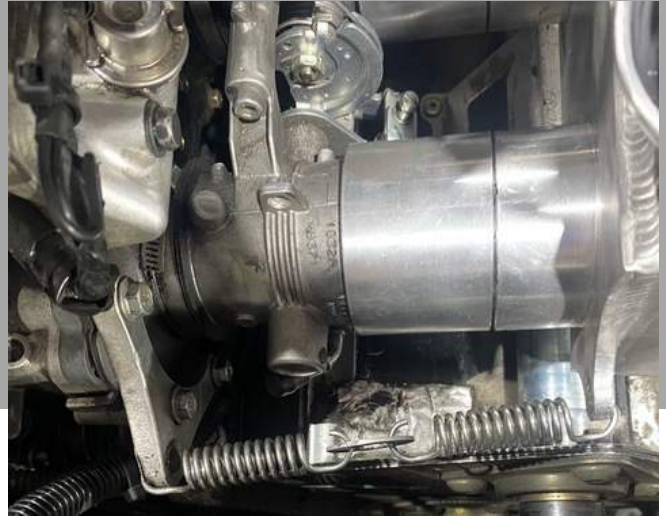
2. Take aluminum intake spacers and add high temp silicone to the o-rings to help seal the o-rings to the throttle body



3. Slide the spacer onto the throttle body ensuring it's all the way on



4. Put some high temp silicone on the airbox o-rings to help seal the o-rings to the throttle body spacers. Take your airbox and line it up with the spacers. It's important that both sides go on at the same time so as to not roll or rip the rubber o-rings



5. Install the airbox hold down springs by grabbing the springs and aluminum washers provided in the kit and placing one spring on the mounting bracket located on the Reed cage. Put the second spring on the other side of the washer and, using a spring puller, pull the spring and put it on the spring tab on the airbox



6. Remove hose and wire bracket from motor on the right hand side of the motor. This bracket will not be reused



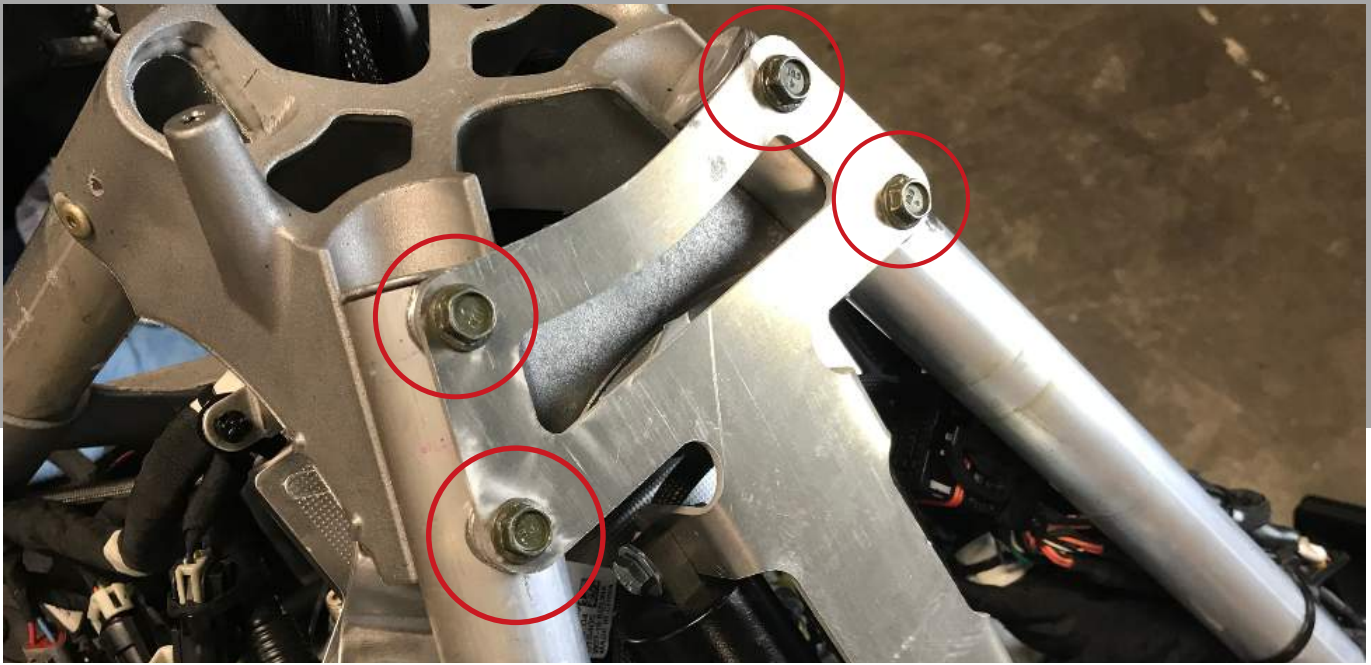
7. Install new long coolant line onto head. Route new coolant line to right hand side of the sled. This new line will hook up to the outer banjo fitting turbo later on in the install to supply coolant. Securely attach the coolant line out of the way of any moving parts



8. Remove bolts and contour spaces holding the PBR (power boost regulator) to the snowmobile over structure



9. Install coils onto Force Turbos coils bracket with supplied bolts and nuts. (See photo for orientation. Make sure pto coil will be on the right side of the engine and mag coil will be on the left side of the engine



10. Install coil bracket with coils attached back onto snowmobile over structure. Place contour spacers under the coil bracket and face the correct way. Bolts will be threading back through the PBR. Tighten everything back together. Make sure no wires or spark plug wires are pinched. Plug coils back in to wiring harness blue to blue and white to white

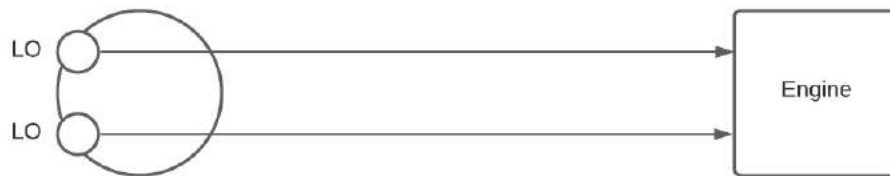


13. Lay snowmobile on its side or lift front end of snowmobile to get to the bottom bulkhead access panel. Drill out 16 rivets holding access panel in place (2 rivets are not pictured). Heat edges of the access panel up with a torch to loosen the glue holding the access panel in place. Once glue is softened, remove access panel by prying it off

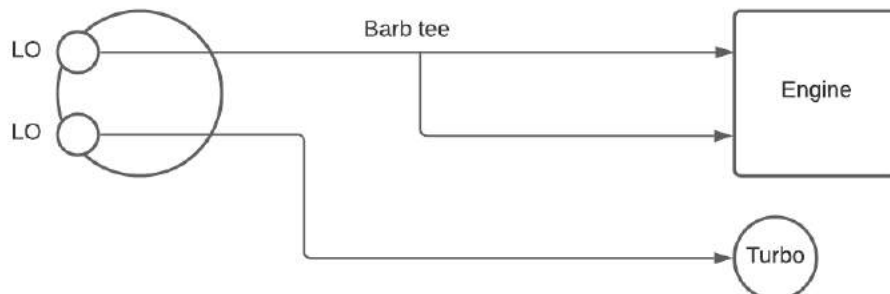


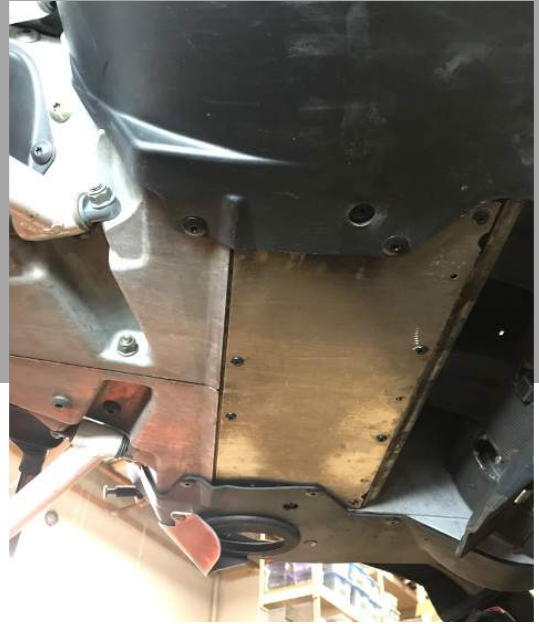
14. Locate the two low pressure lines. Notice that the two low pressure lines supply each side of the engine. Remove line from one of the low pressure ports. Connect turbo oil supply line to low pressure port where hose was removed. Route turbo oil supply line up to the head of the engine, ready to connect to turbo later on. Now, locate the second low pressure line (approximately 3 inches away from oil pump). Cut line and install brass tee. Connect low pressure oil engine feed lines to brass tee. See diagram below for routing details. Note: to prime the oil lines, use a large 1000cc syringe and suck the oil into the line through the pump. Place the syringe into the brass fitting on the oil line and pull the syringe back until oil comes out of the line and into the syringe

BEFORE

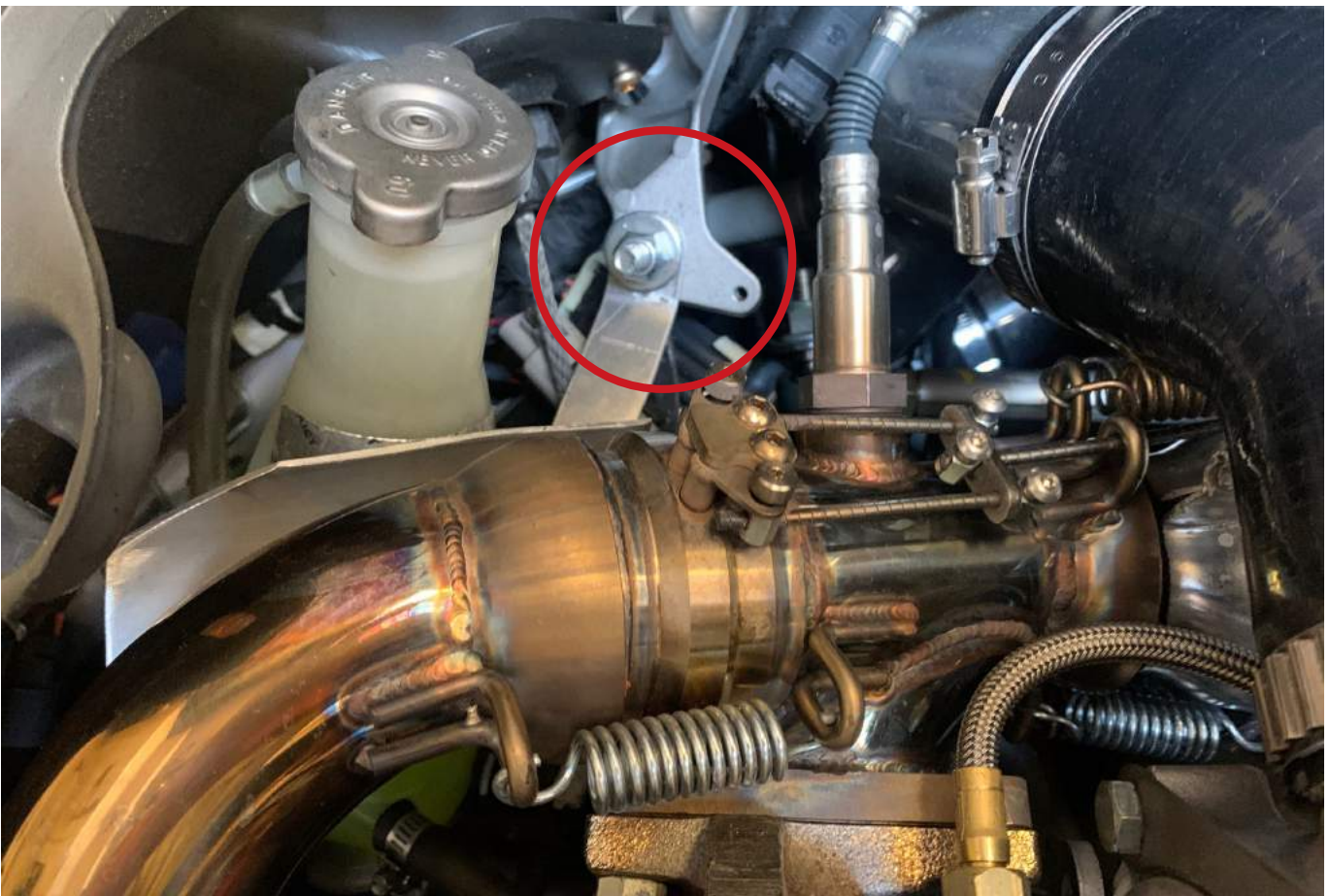


AFTER





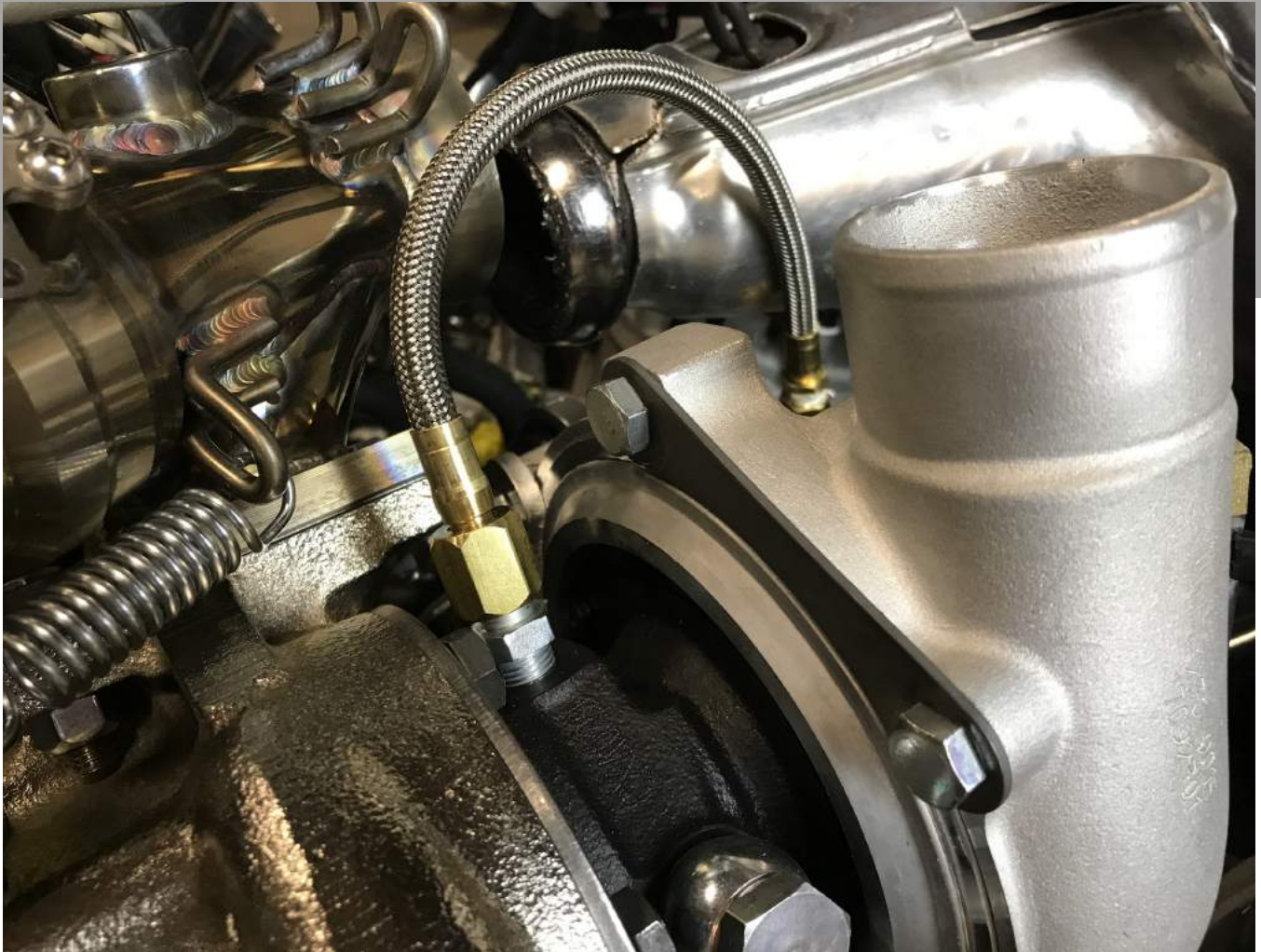
15. Reinstall oil line wear covers on oil line. Reinstall access panel and rivet back into place



16. Remove pull rope wheel and fittings. Bolt heat shield up to wheel bolt



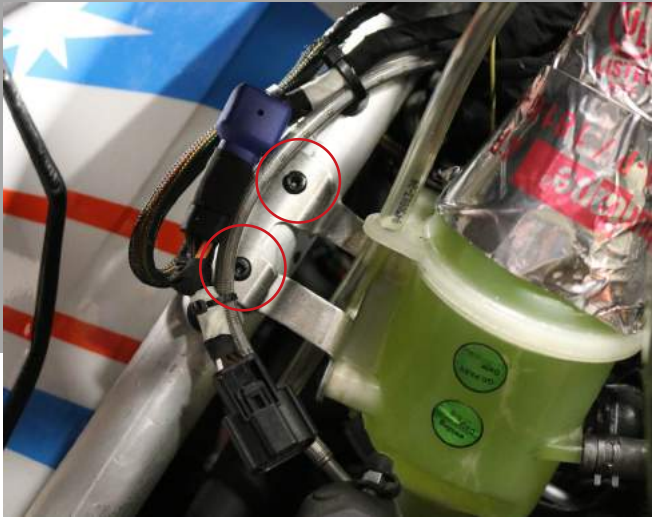
17. Set turbo assembly into fender well. Hold turbo up to pipe. Mark base plate holes ready for drilling. Remove. Turbo assembly drill 2 ** holes in belly pan (Note: make sure turbo down pipe has enough room to not hit brake disc)



18. Set turbo assembly back into fender well. Connect coolant line from coolant bottle to engine side of the turbo

Put small amount of 2 stroke oil into turbo center section using syringe. Locate turbo oil supply line. Route oil supply line away from hot exhaust. Connect to top of turbo. Tighten down zip tie away from pull rope

Match turbo up to pipe. Place bolts through belly pan and tighten down turbo assembly



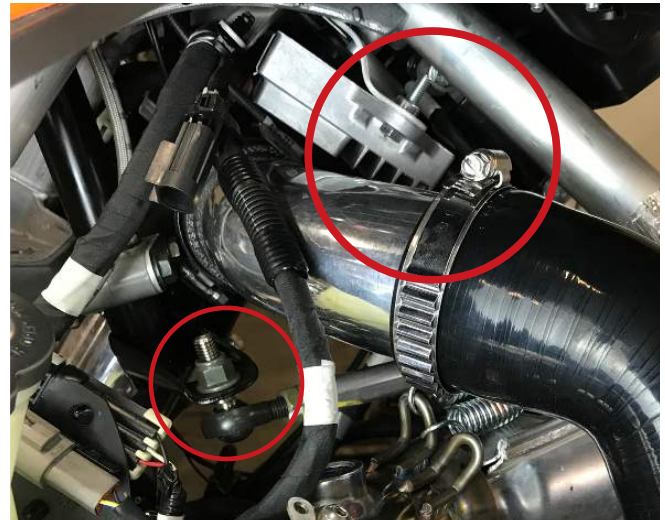
19. Drill out rivet in stock coolant bottle bracket. Reinstall newly supplied coolant bottle bracket with supplied rivets



20. Install the 3" silicone 90 onto the double inlet airbox. Point 90 to the right hand side of the vehicle. Make sure that the constant tension clamp will not run on the PBR voltage regulator when install is finished



21. Install 3 bar map sensor into the charge tube. Connect snowmobile map sensor wiring to the new 3 bar map sensor



21. Install charge tube onto the turbo and into the 3" silicone airbox 90. Adjust for clearance and tighten down clamps. Always check your clearances on the silicone couplers and aluminum pipes by turning your handle bars and skis



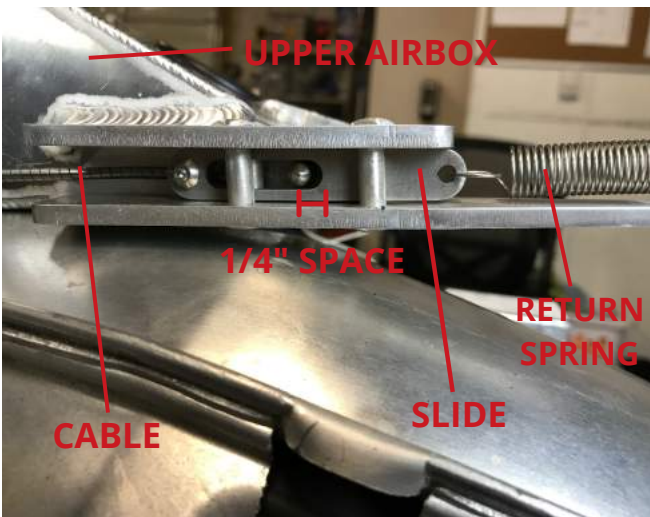
22. Install 3" silicone 90 on the turbo inlet as pictured



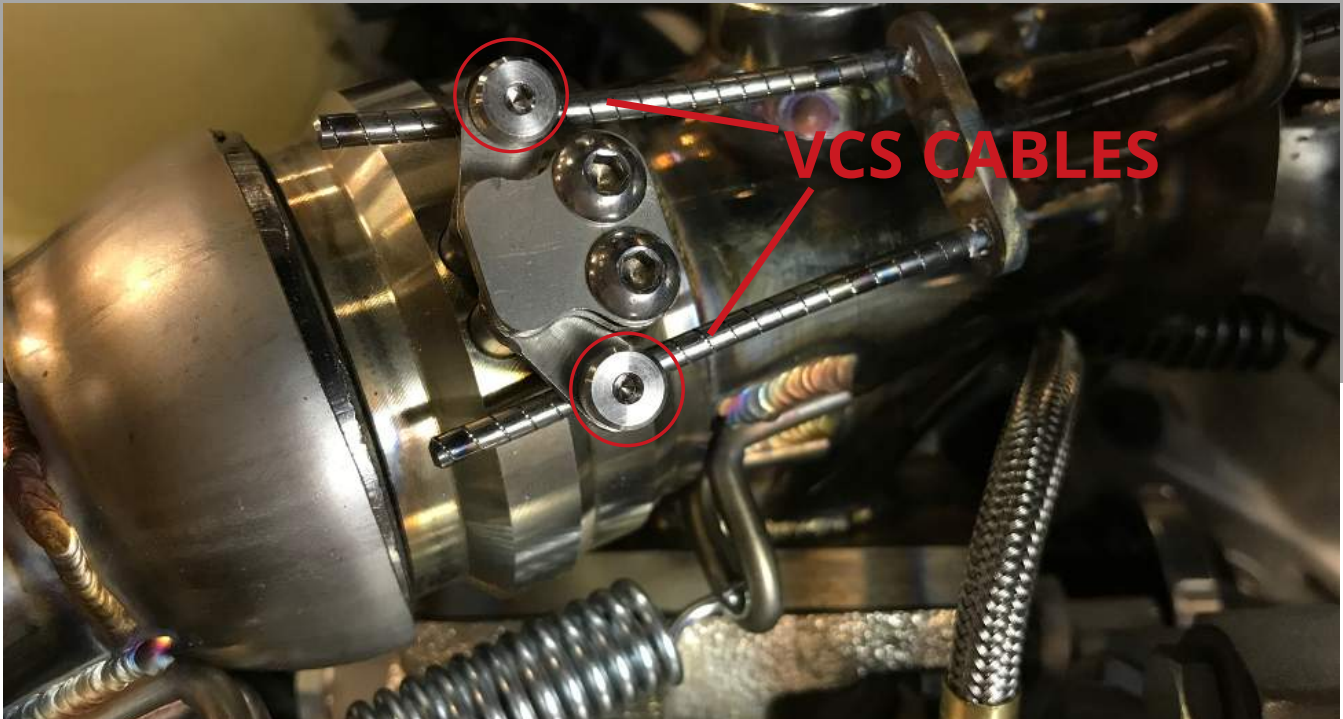
23. Install Force Turbos upper airbox assembly onto vehicles plastic upper airbox. Set hood on and make sure you have clearance (some adjustment may need to take place). Mark holes to drill in plastic upper airbox. Remove Force Turbos upper airbox and drill holes



24. Install upper airbox into the holes using the factory push pins



25. As you're placing your intake plenum on the stock intake, make sure to slide the VCS cable through the eyelet under the intake tube
26. Once in place, grab the aluminum slide piece with the small Allen screw and lock nut on it
33. Slide the cable into the provided hole and put the slide into the trigger slot
27. Once it's in place, make sure the cable is pulled tight and gap the trigger to slide at about 1/4"
35. Tighten the Allen head screw, locking the cable in place
28. Install the provided spring into the hole on the slide and to the post at the point of the trigger assembly
29. Grab the top of the bypass valves by the turbo and pull on them to ensure the trigger assembly is opening and closing easily and smoothly
30. It doesn't hurt to add WD-40 or some other form of oil-based lubricant to the slide assembly when it's new for break in



31. Make sure the VCS spindles are closed when installing the VCS cables onto the shoulder bolts as pictured



32. Install the air bypass tube from the Force Turbos upper airbox to the double inlet airbox. Tighten down the clamps



33. Double spring all spring tabs from the pipe to the turbo inlet pipe with the provided springs



35. Install clutching as needed

36. Reinstall fuel tank, seat, console, oil tank (make sure no air gets into the oil supply line), tighten down all bolts and double check all work

37. Follow Torque Link instructions at the end of this document to install tune. Do not run the sled until the tune is successfully installed

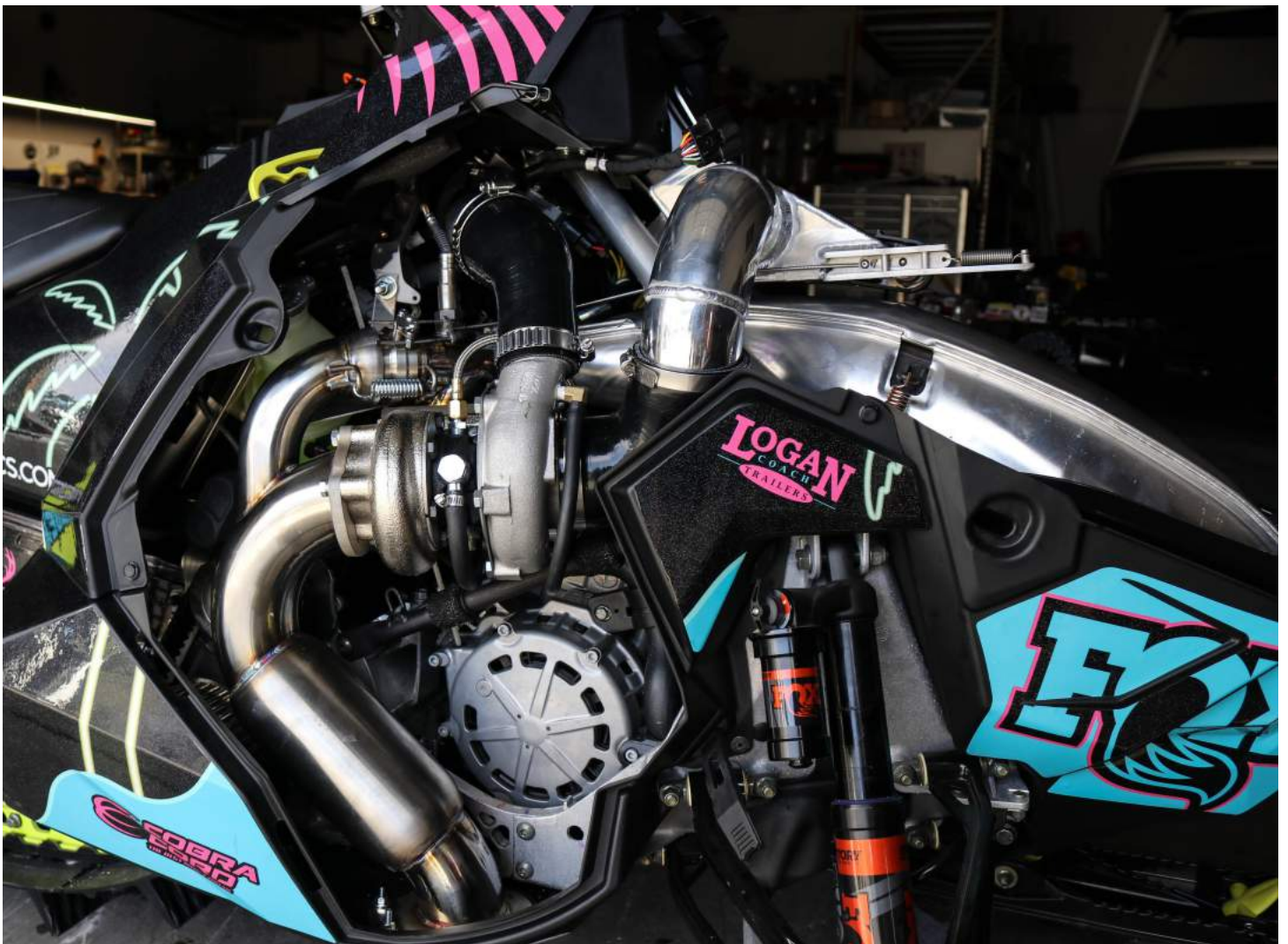


34. Install 220 ohm resistor into the muffler sensor plug. Zip-tie the sensor wire up

38. See Force Turbos operational guide for final machine set up and running practices

**THANK YOU FOR PURCHASING A FORCE TURBOS PRODUCT.
VISIT OUR WEBSITE AT FORCETURBOS.COM FOR OTHER
GREAT PRODUCTS.**

ASSEMBLED SLED





Torque Link how to instructions:

Torque Link Computer flashing application set up

- Use a Windows 8 or newer laptop with **Good** internet connection.
- Go to <https://www.flash.torquelink.com>
- Download the app
- If warning appears, click "Keep"
- Click on the download "torquelink.exe"
- Window warning will likely appear click "more info" then click "run anyway"
- Once installation completes go to desktop and run click on your new "Torque Link" app will be colors black and yellow.
- **** IMPORTANT STEP**** Firewall will likely advise warning, you must click "Allow Access"
- Click on "Log In"
- Click "Sign Up"
- Sign in using email used during purchase and create a password containing (uppercase, lowercase, number and symbol) and at least 8 digits long. Once done it will say verification email sent.
- Open your email and verify account.
- When done properly it will say account verified
- Usually within one business day licenses associated with your account will be added. If you are in a hurry call place of purchase and ask them to expedite it.
- Log out of email and close internet browser.
- Once license is added you can open Torque Link app from desktop.
- Login with user and password you created.
- Connect TL box to Vehicle, USB to Computer and Power Cord to wall. Order does not matter.
- From here follow on screen prompts.

Customer Account with Torque Link. (This has to be done before a tune can be dropped in the Torque link Account.)

- Open Torque Link application on a Windows 8 or newer laptop with **Good** internet connection.
- Hit login in key

- Sign up
- Type in new Account email address
- Type in new account password. Password must be 8 characters long and contain 3 of the following 4 Types of characters
 - Lower case letters
 - Upper case Letters
 - Numbers
 - Special Characters (ie: !@#\$%^&*)
- Confirm Torque link Account creation through email that was sent from Torque link confirming creation of the new account.
- Log into Torque link account through newly set up Torque Link account to make sure that account has been created.

Flashing Torque Link tune into a vehicle.

- Laptop must have **Good** internet connection.
- Always turn off key, remove DSS Tethers
- Connect Torque link flash tool to power and vehicle using the correct Diagnostic flash cable.
- Open torque link Application on computer.
- Connect computer (Green light will show on the Torquelink flash tool telling you connection is good)
- Select ECU Model
- Connect to ECU
- Select tune
- Flash tune
- Disconnect Torque link Flash tool.
- Start vehicle to make sure that tune went in to vehicle correctly.
- Test Vehicle.

FREQUENTLY ASKED QUESTIONS

- No connection to sled – Verify you are using windows 8 or newer computer with current updates (as of this time Apple in windows mode is glitchy).
- No connection to sled – verify firewall is not stopping connection temporarily turn off firewall or create exemption for Torque Link
- No connection to sled – Verify you have a good internet connection. If poor connection get closer to router.
- Program is glitchy – verify your computer is in good working order and not bogged down by multiple programs using all available memory. (Any new windows 8/10 laptop will run the program we have tried the cheapest acer and it will work great)
- Program stalls (Snowmobile only) – Verify ignition switch is off, kill switch is off and tether is unplugged. Fuel pump can try to power if ignition is left on and stall flash

*******Never cross pollinate a base tune file. Always use the correct ECU Base File*******