

# Introduction to V Rod turbocharger installation

- ◀ The following procedures should be followed in the order they are listed to avoid extra work. The installation should take 8-10 hours. The tools you will need are standard hand tools. Included in the kit are all necessary drills and taps needed for the installation. Footnotes are provided to help with additional problems you might encounter.
- ◀ Custom Performance has designed this turbocharger kit to provide usable, dependable horsepower for many trouble free miles. It was intended to make 8 lbs of boost on 91 or higher octane fuel. At this level the bike should make @ 160 horsepower. The MAP included on the CD and website is for this level of performance. If the customer chooses to increase the boost level, the fuel system will have to be remapped and other modifications may be needed to supply enough fuel for higher levels of performance. Also engine modifications may be needed to support higher levels of horsepower. Custom Performance does not recommend raising boost levels beyond the kit-preset levels unless you make the proper modifications. Expensive engine damage may result if these warning are not observed. With that said lets get started.
- ◀ There are color pictures of the various steps and extra pictures for reference. Look them over as they will help show what each step will look like. There is a fuel and ignition MAP for the Harley race tuner that will be loaded after the installation but before you start the bike. The map is for 8 lbs of boost, which is what we recommend. If you increase boost level above the kit settings, the bike will need to be remapped to insure the engine doesn't run dangerously lean, resulting in engine damage.

**NOTE: The base map included is a generic map to accommodate different riding conditions; for maximum power, we recommend having the bike dyno tuned to achieve maxim power potential. Additional maps can be found on our web site.**

# Harley V-Rod Turbocharger Installation

## 1. Throttle body

- Remove the air box cover, air filter and filter housing. Save the air temp sensor out of the air box; this will be relocated later. Using pliers unscrew the air filter hold down stud then remove the six Allen bolts with a 5mm Allen wrench replace the bolts with six studs in the bolt kit. Now bleed any residual fuel pressure by depressing the fuel shutoff valve (See Photo 1). Remove the fuel line quick disconnects (See Photo 2) by depressing the blue tabs and pulling of the line. Unplug the throttle position sensor and IAC motor wiring. Loosen the hose clamps on the intake boots, remove bolts holding injectors and gently pry up fuel unit and disconnect injector wiring. Now you are going to tap threads into the fuel pressure regulator vent hole. This is to install a vacuum fitting to sense boost pressure. Using a 10x32 tap provided (no drilling necessary) tap threads into vent hole (See Photo 3). Only allow the tap to go into the regulator about 7mm or damage may result. Thread in the supplied brass fitting into regulator with loctite on thread. Now reinstall throttle body and reconnect wiring and fuel lines.

**NOTE: Lube injector o-rings to slide injector into bore.**

## 2. Cooling system

- Place a clean container under the radiator and remove the drain plug that is in the front of the front cylinder (5mm allen) open radiator cap and drain into container. Next you are going to remove upper radiator hose and fill tube assembly. This tube has to be cut and repositioned, (See Photo 4). Note: Make the cut 1-inch from tee towards filler cap. After cutting reconnect tubes with the supplied (2in X 1in) hose and two clamps. Reinstall upper hose and fill tube on bike, tighten clamps and refill coolant. Remove bleed screw (5mm allen on top of radiator tube) and bleed air out of system. Don't forget to check for leaks after engine is started.

## 3. Intake plenum

- Included are 6 studs, use blue loctite and thread into the top of the throttle body. The plenum should have three vent hose fittings screwed into it and one vacuum line fitting. Slip on the vent hoses, the short hose (5 inch) in the front and the long hose (8 inch) in the rear. Now place the intake gaskets on the throttle body and mount the plenum, use the six nylock nuts and washers and tighten plenum snug (See Photo 5). Check for clearance of radiator fill tube and cap. In front of the plenum is a blow off valve; the valve discharge opening should face the right side of the bike. Using the 7/32 vacuum hose, connect the blow off valve to the throttle body vacuum port



Photo 1



Photo 2



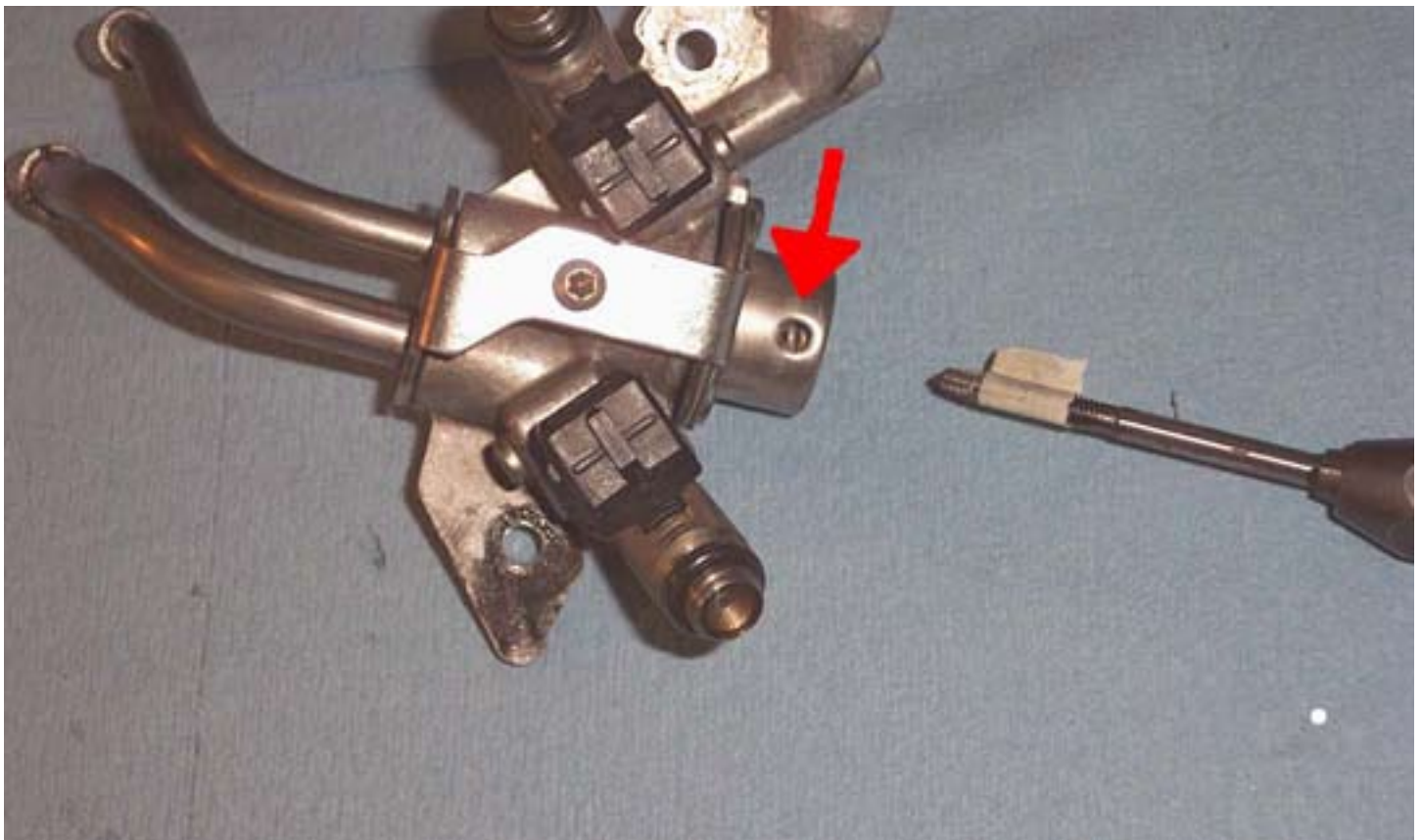


Photo 3

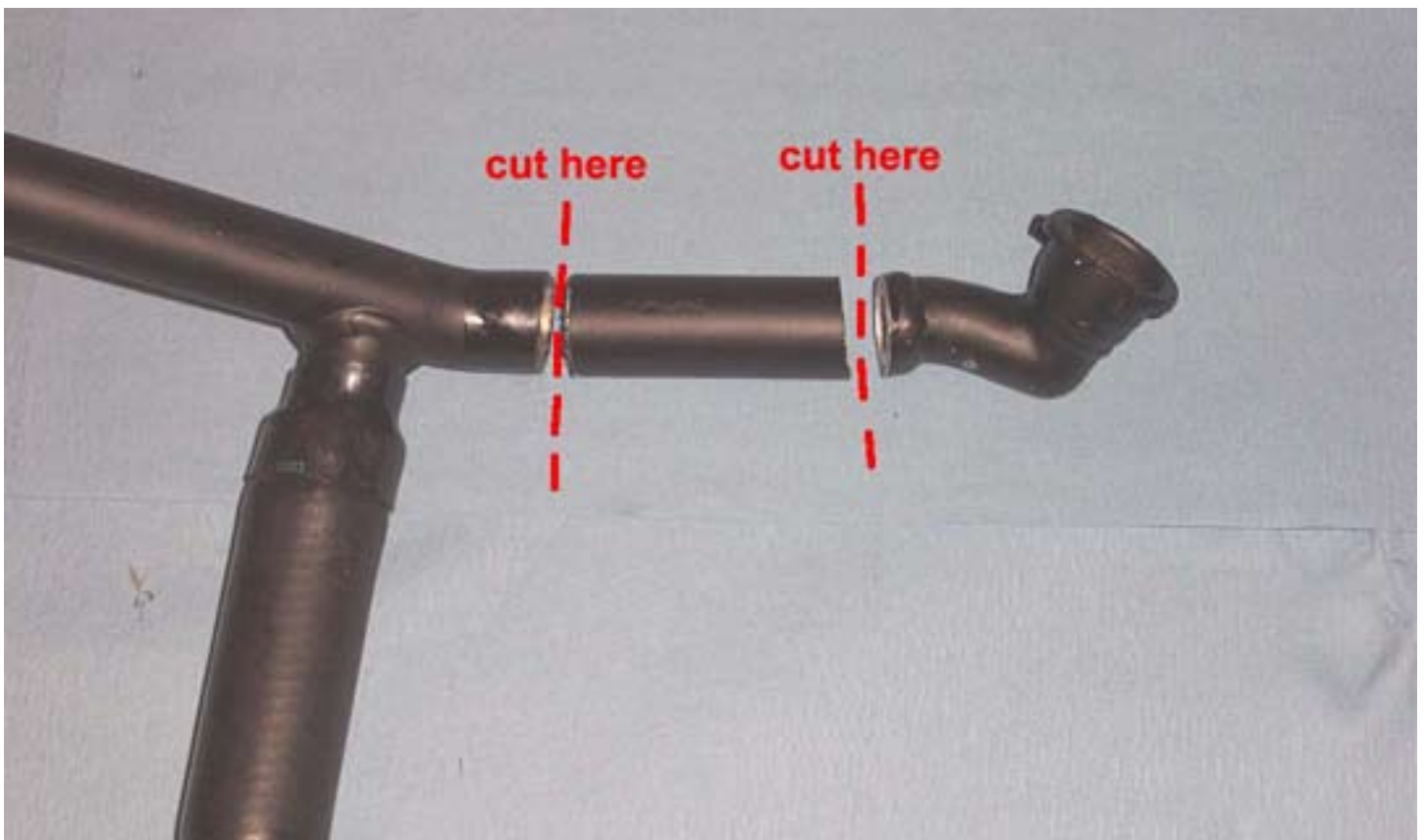


Photo 4



Photo 5

on the left rear side of the throttle body. (See vacuum diagram) The fuse box will hit the large silicone hose at the rear of the plenum; remove the cover of the fuse box and cut with a hacksaw the corner of the plastic box, it will now slide back into its mounting tabs.

#### 4. Oil feed fitting

- Next remove the oil filter and disconnect the oil line to the filter adaptor. Now unbolt the adaptor and remove from the bike. The adaptor will be drilled and tapped for the oil feed line to the turbo. Using the 5/16 drill supplied, drill through the center of the oil filter boss, (See Photo 6). Now, flip over the adaptor and tap the hole with the 1/8 x 27 NPT pipe tap from the outside of the adaptor. It is important that you tap the threads deep enough so that the pipefitting is tight, just before the hex touches the adaptor. Clean the adaptor of chips and install thread sealant on the fitting. Thread in the fitting and then reinstall adaptor on the engine. Now is a good time to remove entire stock exhaust system with brackets. Save the head flanges and clips for use on the new exhaust.

#### 5. Clutch Installation

- Drain oil from crankcase and remove primary cover and clutch pressure plate, remove all steel and friction plates. Install Barnett clutch pack and red clutch springs as per factory instructions
- Torque main clutch nut to 165 ft.lb. and torque 6mm bolts to 85in. lb. in a crisscross pattern. Make sure clutch pack is completely sandwiched together. (See Photo 7)

**NOTE: It is advised that you look up proper factory installation procedures there are items that differ from other Harley clutches. Like, early clutches were balanced units this requires matching the clutch basket with pressure plate.**

#### 6. Oil Drain

- Unbolt starter solenoid from left front frame down tube, move away from oil fill hole.
- Remove oil fill dipstick from the crankcase and install the 35mm filler adaptor for the turbo oil drain hose. Tighten adaptor by hand and align opening toward right side of bike. The dipstick will be retained but needs to be remarked. (See Photo 8) Measure 35mm or 1 3/8 inches down from the full mark and cut a groove in the stick this is now your full mark. Position the fitting slightly toward the engine to keep the drain hose away from the exhaust.

# Vacuum Line Diagram for V-Rod

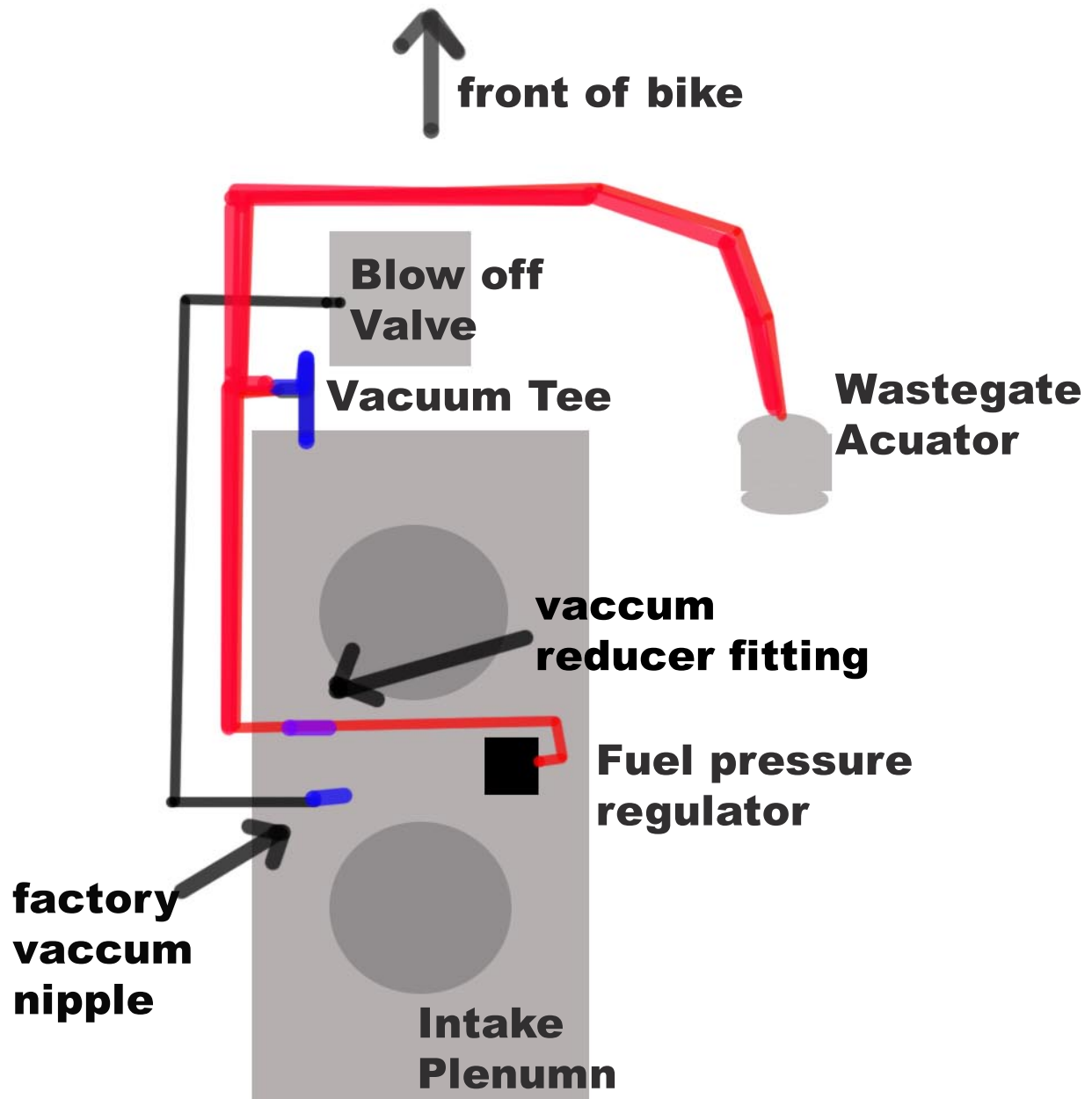






Photo 6a



Photo 6b





Photo 6c

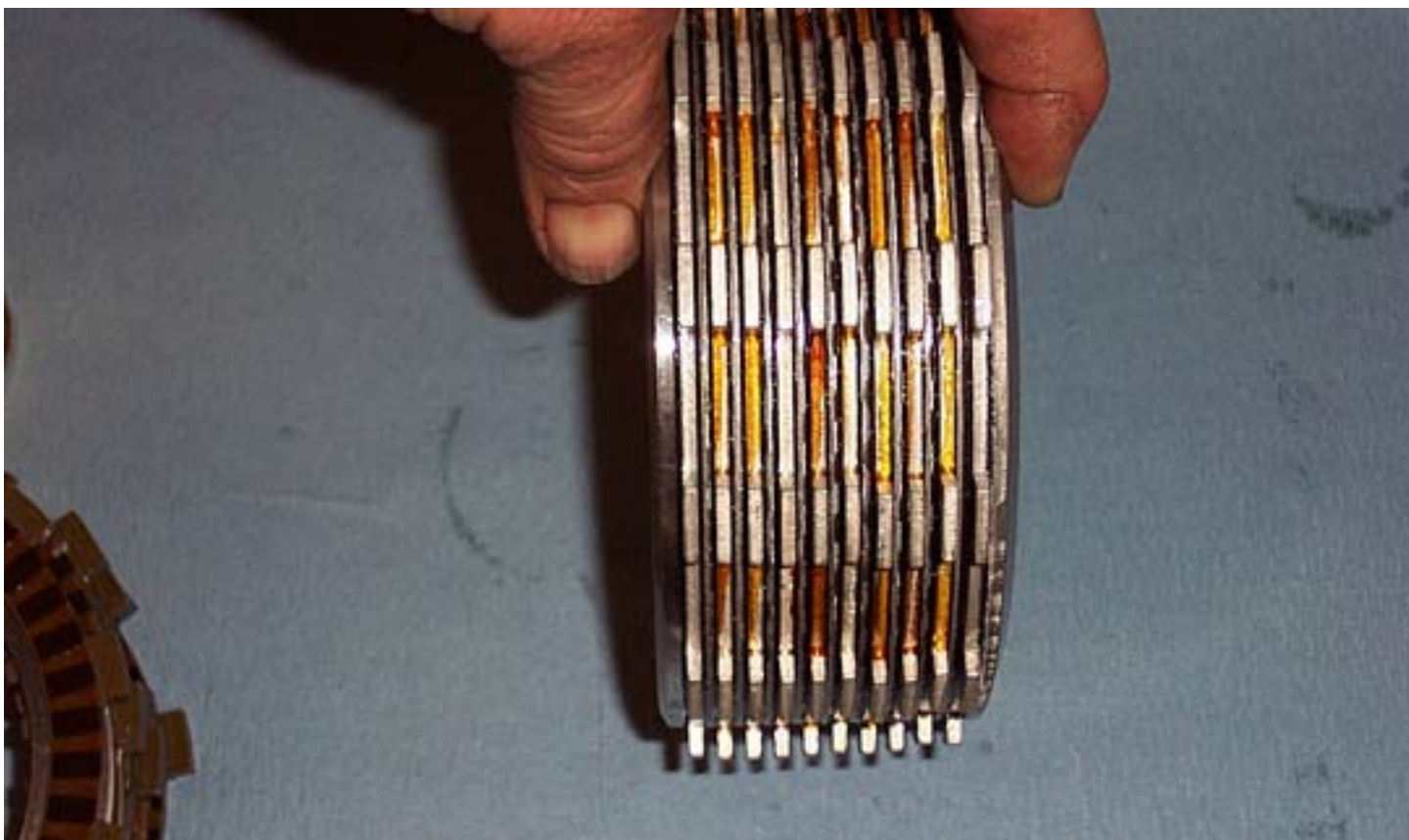


Photo 7

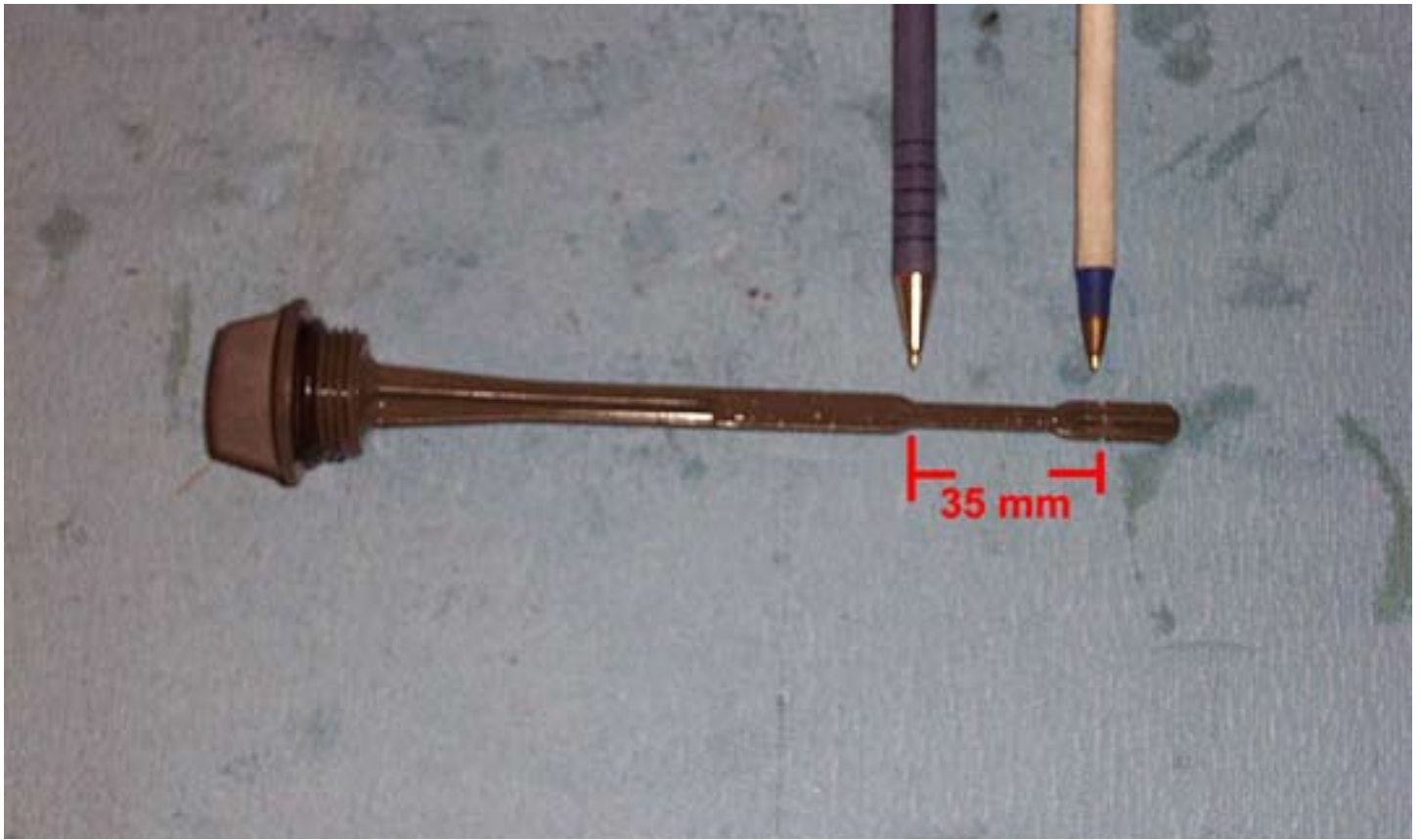


Photo 8

## 7. Exhaust manifold and Turbo

- Next you are going to install the exhaust manifold pipe. First install exhaust gaskets in both head ports, you may use the old gaskets if in good shape, then install front pipe by itself. Don't tighten bolts just start them.
- Now slide clamp and rear section into front pipe and place rear of pipe into head, leave bolts loose enough to reposition pipe for final fitting. Now mount the turbo with oil drain hose (8 inches long) fitted to the turbo drain fitting and clamped. Apply a thin film of high temp silicone to the mounting flange on the exhaust manifold pipe. Make sure not to over do it with the silicone, just a thin film. Mount the turbo to the exhaust head pipe at the same time align the oil drain hose up with the fitting on the oil fill adaptor. (See Photo 9) Tighten the oil drain fitting to the adaptor and be sure to locate the hose away from the exhaust pipe. If necessary use a zip tie and tie the hose to the starter. Next mount the support plate from the starter bolts to the header flange. New starter bolts are supplied that are longer than the stock bolts. Once this is in place you can tighten all the mounting bolts and flange nuts. Route the oil feed line behind the turbo and attach to oil feed fitting and the turbo oil inlet fitting. Tighten all oil feed and return lines at this point.

## 8. Intake Pipe

- The silicone elbow tube will need to be cut to proper length; use razor blade and trim to fit. Now slide over rear of intake plenum with clamps, mount intake pipe to elbow and tighten clamps. Using gasket on turbo flange, adjust the position so the intake pipe clears the rocker cover and the frame tube. Tighten bolts. (See Photo 10) You may need to clock or rotate the compressor housing to line up intake tube, this can be done by lightly tapping with a rubber mallet until the turbo compressor housing aligns to the intake tube and the tube clears the frame and engine.
- Route the vacuum harness from the wastgate diaphragm to the fitting on the front of the plenum to the fuel pressure regulator vacuum port. (See vacuum diagram)
- In the kit, there is an extension harness for the intake air temp sensor wiring. Plug this extension harness into the connector on the bikes wiring harness and route it to where the air filter will go. Plug in the air temp sensor into the extension harness and insert the sensor into the back of the new air filter.
- Route the crankcase vent tube from the top of the intake plenum to where the air filter will be. Insert the end of the vent tube into the back of the air filter next to the air temp sensor. (See Photo 11) The vent hose will have a plastic inline fitting on the end that plugs into the filter.





Photo 9



Photo 10



Photo 11

## **9. Exhaust pipe**

- Spread a thin film of silicone on the turbo exhaust flange, install the stud closest to the head on the turbo exhaust flange and mount the exhaust pipe, start the bolts, install bolt that holds the ex pipe and the head pipe together tighten flange bolts and then mounting bolt. NOTE: There is one 8mm stud in the kit.

## **10. Final checklist**

- Replaced oil filter and fill crankcase with oil to recommend level (to your new mark on dipstick at 4qts). You may start bike now and let it idle to check for leaks. If everything is ok and no leaks found after idling for a few seconds remove the dipstick and look for signs of oil running out of the oil return line into the adaptor this lets us know the turbo has oil going to, it and returning from it.
- Now it is time to recalibrate the fuel system. We recommend using Harley Davidson Race Tuner Fuel and ignition controller. In the turbo kit you have EFI calibration maps on a CD for the race tuner. One for 8 lb boost setting on 91-octane fuel. We at Custom Performance have spent many hours on the dyno, many passes down the drag strip and many road miles perfecting the Map we use for our turbo kits. However our maps are conservative to insure no damage occurs, we recommend you have the bike dyno tuned to ensure max performance.
- We have a few recommendations for your turbo V ROD
- First is oil, we recommend synthetic oil. Many fine brands are available choose a good oil and stick with it. Oil and filter changes should be every 2500 miles.
- Second is cool down time, after running your bike always let it idle for while before shutting it off. This lets the turbo coast down and cool off the bearing surface. This ensures a long life for your turbo.
- Third ENJOY this will be for the majority of people the fastest bike you have ever ridden, ride safe, give yourself plenty of room for stopping the bike accelerates fast and can exceed the speed limit before you know it. Be careful, ride safe and have fun.

**NOTE: If you plan to drag race your bike, we recommend using 100 Octane fuel**



# **Attention: 2006 Street Rod**

## **Ignition switch relocation bracket**

- Remove ignition switch
- Install supplied bracket. Note: see pictures.

# Trouble Shooting

The following is a trouble-shooting guide, for our turbo kits. These are issues we have run across after installing the kits.

## 1. Idle speed higher than normal:

- Check for vacuum leaks and for proper vacuum hose routing.
- Check that throttle body is fully seated and injector o-rings in manifold are not damaged.

## 2. White or blue smoke:

- Oil smoke out of the exhaust may be caused by oil backing up in the turbo and being drawn into the inlet and burned in the engine. This is caused by a restriction in the oil drain hose or fitting on the return or drain side of the turbo. Check for kinks in the hose or dipstick that may obstruct drain port.
- If the bike leans out or overheats for whatever reason or over boosts more than 12psi, it is possible to damage the motor by causing the piston to scuff the cylinder and damage the rings or ring lands. This is why we recommend Turbo Pistons, when we increasing boost levels over what we recommend. (8-10 lbs)

## 3. Low power output:

- Check running fuel pressure it should be at 60psi, and not fall off when the bike is accelerated.
- Check woodruff key on charging system rotor for shearing, this causes rotor to shift and affects ignition timing and injector timing.

## 4. Engine running hot or overheating:

- Make sure your cooling system is full and you have bleed out the air from the system by removing the 5mm screw on top of the radiator tube while filling radiator.
- Check radiator cap to ensure it will hold 16psi. Make sure radiator fans are coming on. NOTE: If your bike did not run hot before installing the turbo kit, it should not run hot now. That means you did something during the install. (Think about it)

## 5. Check engine light on, has code for IAC motor:

- Check for vacuum leaks or vacuum hose routing.

## 6. Loading race tuner maps:

- Check to see that you are loading the right map file type 2005 and older should use a MT5 file extension, 2006 and newer should use MT6 file extension. Look on the box of the race tuner for the part number, if it ends with 01C it will take MT5; if it ends with 01D it takes a MT6 file map.

The preceding list should cover any problems you encounter, however we are available to assist you with any further questions that you may have, contact us at [www.TurboYourHarley.com](http://www.TurboYourHarley.com), or call us at 623-879-8488.

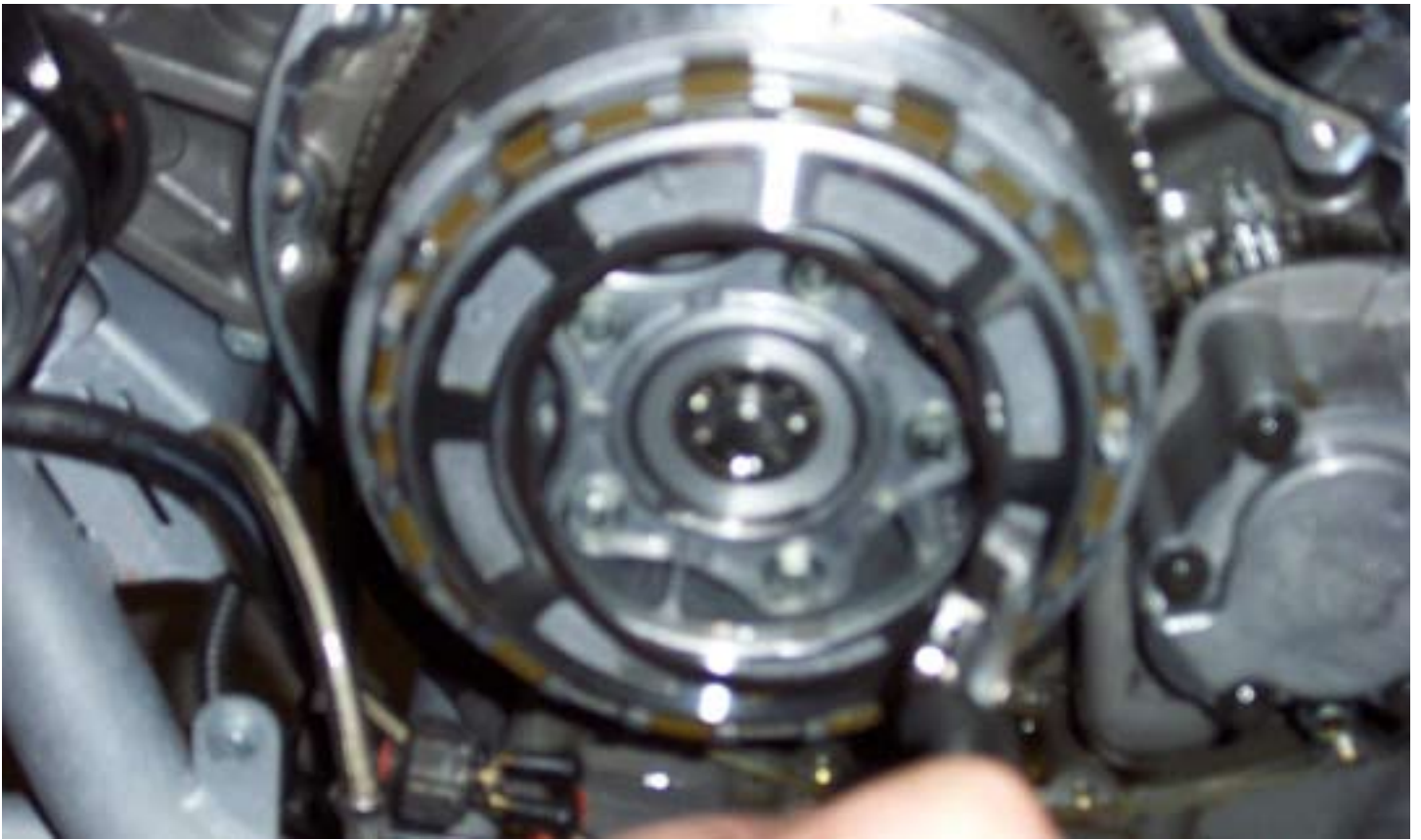


Air Filter



Clutch 1





Clutch 2



Clutch 3



Dip Stick



Drain Adapter



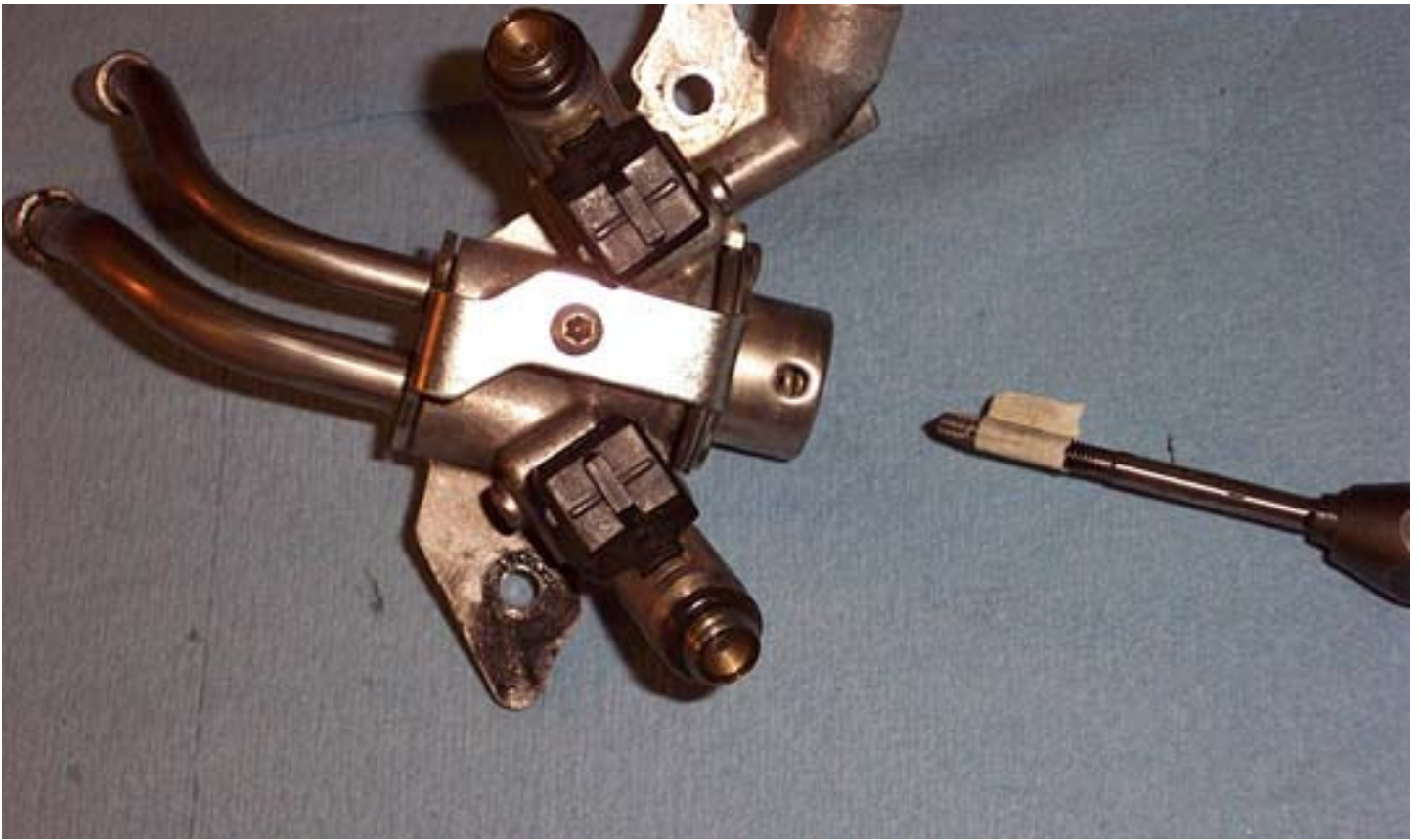


Flange



Pressure Regulator



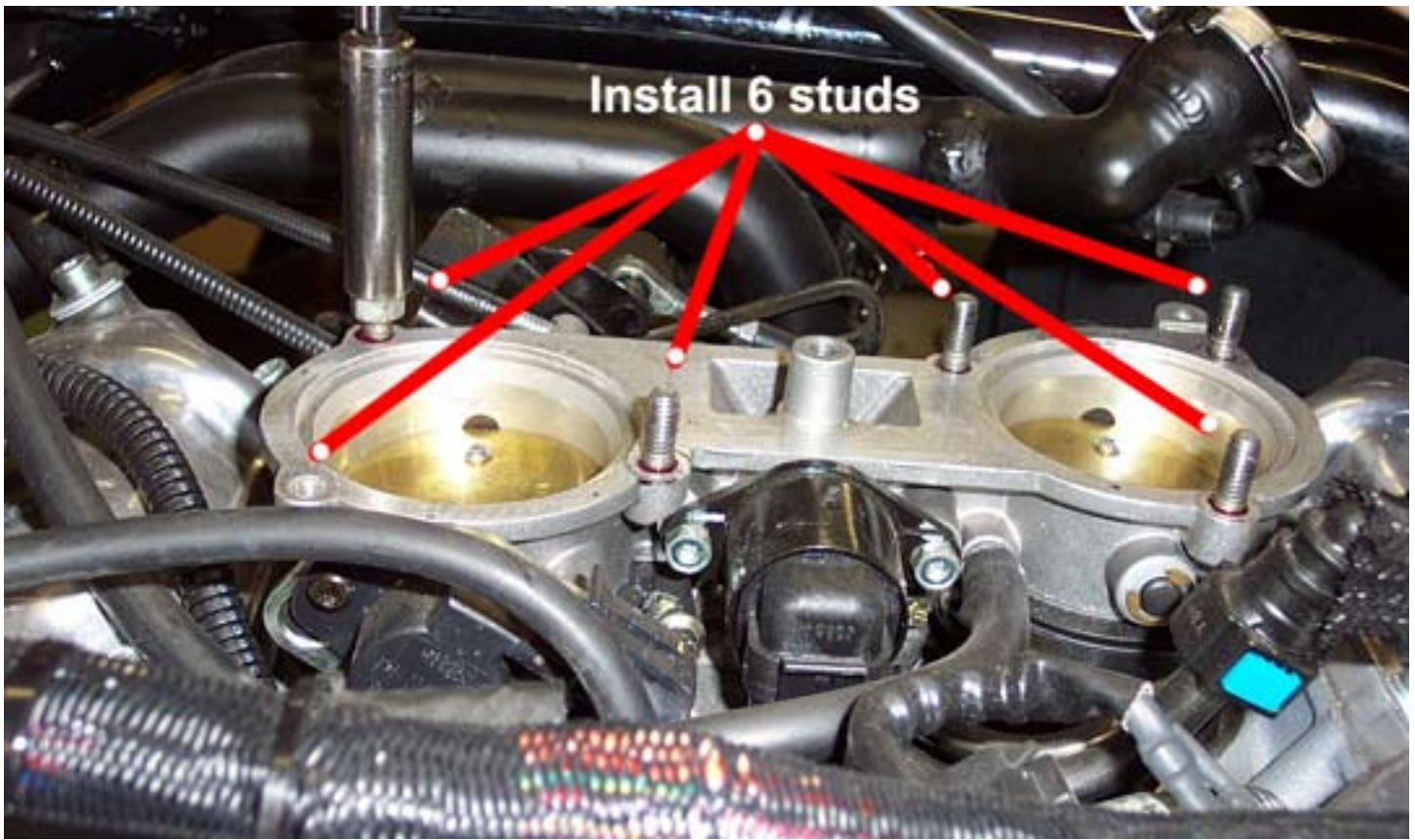


Tap Regulator



Throttle Body a





Throttle Body b



Throttle Body c





Throttle Body d



Turbo





Ignition Relocation Bracket 1



Ignition Relocation Bracket 2





Ignition Switch Relocation Bracket



Plenum