

On 3 Performance, LLC

86 – 93 Foxbody Single Turbo System

Installation Tip Guide

This guide is designed to help give you tips on the install and a rough guide that will answer most questions on doing the install. This is not a step by step instruction but we do try to cover everything that we can on the install to make sure you are not guessing on what you are doing. We highly recommend reading over the install tips several times before you do the install so you know that you are prepared and able to cover the whole install yourself. Also helps make a plan so you know what order and so you don't end up working backwards on any of the steps. This system is designed for racing or off road applications only

1. In order to get started installing your new single turbo kit, you are going to have to start by clearing some room for all the new components included with your kit. Generally we will get started off by pulling the stock exhaust off the car. Depending on if you are going to run a pipe connecting your new downpipe to your catback, you can pull the full exhaust system off. Normally start by unbolting the catback and move forward to the H-pipe then headers. Save a few of the stock header bolts as in later steps you will have to reuse a few of the stock bolts. ****On 3 Performance does have a new product, it's a Y-pipe kit that will go from your downpipe and allow you to hook up to your catback. Its \$159 and if you need that or any other information, let us know - On3performance@aol.com
2. Supplied in the kit is a new alternator relocation bracket to push the alternator towards the driverside more and allow to keep it away from the heat and contact as much as possible. At this time we will normally pull the alternator off to just get it out of the way and prepare for the turbo install. If your car still has the smog system installed, the crossover pipe will interfere with it later on the turbo install. Our car didn't have a smog system on it as you may see in photos but you will need to also remove the pump and other supporting lines at this time.
3. During the manufacturing process, debris can accumulate on the inside of the intercooler piping. Its ideal to ensure nothing is sucked into your engine to thoroughly rinse the inside of the piping and check for any burrs before installed. Also if you do this now, it will be dried out and ready to be installed when you get to that step
4. Before you begin on installing the new turbo headers, you will need to scrap the old exhaust gasket material from the heads. This will ensure proper sealing and on any turbo application, any exhaust leak is going to rob the car of max horsepower. After cleaning up the surface in this area now, you are ready to install the new headers.
5. You will notice on the turbo there are (6) ½" bolts that hold the compressor and turbine housing to the center section of the turbo. View the orientation and angles that the turbo will sit at so you can rotate each section to sit correctly. The center section where your oil feed and return hook up should sit as close to horizontal as possible. Its also ideal to bolt on your aluminum drain plate(large one of the 2 plates with supplied BOLTS. The (2) allen bolts will be used to bolt the feed plate to the turbo) to the bottom of the turbo and bolt the barb on and rubber drain hose. It gets confined in this area once everything gets in there and its just easier to attach it now because its next to impossible to get it in there once the turbo is on the car. It can just sit for this time until later steps when you are ready to punch the hole for the drain.
6. **EXTREMELY IMPORTANT: If you do not clock the turbo center section so the turbo drains straight down and the feed is 100% vertical, it WILL blow seals. You have to ensure this step to make sure your turbo will not have future complications. Once the damage is done, your basically**

going to require a brand new CHRA (\$175). Save yourself the money, read this step carefully and make sure you do this right

7. Bolting on the turbo after the header is already installed can be really hard and its ideal to bolt the turbo on the header before you install it. With your kit, you will have (4) 3/8" bolts with prevailing locking nuts and bolts, gold in color to secure the turbo down. In the package with your turbo, you will find a metal gasket for this mounting surface to be used. We DO NOT include gaskets for the headers as we have had very good luck just running a bead of high temp copper RTV instead of gaskets. If you wanted to run a gasket it would be up to you but we have always just used copper RTV. To keep underhood temps to a minimum, you may also consider a turbo blanket
8. Now is also a good idea to gap the spark plugs before the headers go on as it starts to limit your room to access them as easy. On our car, we replaced the plugs with a standard resistor plug and had the best luck with it. We run a gap of around .028" in order to try and prevent any spark blowout. Running a stock ignition on the car we built the system around, we didn't have any blowout on the dyno.
9. You now should have everything out of the way and ready for the header/turbo (passenger side) setup to be bolted on the car. Install the o2 sensor in the header at this time as well because once the header goes on, it will make it very tough to access it (Don't forget to plug it in!). We supply you new header bolts but due to the way the primaries off the flange route, you will end up having to run a few of the stock header bolts. They will not thread in far but its better to have something there than nothing. Also they can be tricky to get in there and will want to try and get the short header bolts threaded slightly before tightening all the other bolts down. This may sound confusing but once you have the header on the car, it will become very clear to you. You may consider to test fit the header alone before the turbo is bolted to it so you know the way the bolts will work. REMEMBER, either run the RTV for the gasket or buy the gasket of your preference before bolting on
10. Now you can go to the driver side and install that header using the same method. Depending on the way your clutch cable, power steering, etc lines are routed, you will need to strap them with zip ties or fasten them far enough away so they are not effected by the heat. The same package that contained the headers will have 2 pipes w/ 1 flex joint in the one. This is your crossover section and you can now use the 3" v band clamp and loosely fasten the crossover pipe with the flex joint in it to the driver side header. To attach the other crossover pipe, we normally start and attach it at the passenger side turbo header first at the v band. The clamp used at this is a 2 1/2" v band clamp and you may have to grind back a little material in order to get enough room to get the nut started. The little cap will pull off and you can then grind the material a little then replace the cap. Now you can use the (2) 12mm bolts and flange nuts to fasten the shorter crossover pipe to the flex joint side. Once everything is bolted together loosely, you can now go back and tighten the rest of the hardware down.
11. The dump tube is the short 1 3/4" pipe packed in the box with the downpipe and cold side tubing. Remember to install fire ring (small stainless ring in the wastegate box, see photos) flange between the wastegate and the downpipe from the header. It will actually slide into the wastegate to push against the valve to seat it. Do not forget to install this, it will make an exhaust leak and hurt spool up. This is a very tightly fit piece, spray a little white lithium or any other lubricate to it for an easier fit. You will notice that top port of the wastegate will remain open, nothing will plug that or need any hose ran from it. There is another tapped area on the lower section and that is where you will attach your banjo fitting and run it to a vacuum source. Step 16 will cover the vacuum source and routing.
12. **WASTEGATE SPRING & MANUAL BOOST CONTROLLER DETAILS:**

We supply you the wastegate loaded with a ~6-7psi rating. Depending on the airflow of the engine, back pressure, and several other variables, this spring rating can vary. In most situations though on a fairly stock 302ci setup, you are going to make right around

that number. If you want to make more boost, add the manual boost controller we supply. These are very sensitive. We highly recommend getting the car on the dyno and adjusting it from there. There is an arrow pointing the direction of the airflow. The air is flowing toward the wastegate. So the inlet will be the vacuum line you from from the engine. The outlet is the direction the arrow is pointing and that goes so you run the line from there to the bottom port of the wastegate. There is also 2 side ports that are not used and just get plugged up with the supplied hardware. In order to get started adjusting boost, blow through the fitting in the direction the arrow is pointing. Once you get to the point where you can feel little resistance, instantly stop and that is a good point to lock the cap and do a partial test pull to see where boost is sitting. Go in extremely small increments, 1/10 of a turn or so till you know what its doing. Another thing that's ideal is to make reference points. The cap is marked with (+) and (-), its going to do the opposite so if you start going in the (-) direction, its going to start adding boost which you will notice when setting it up for the base pull. (+) direction is going to start decreasing boost. **IF YOU ARE TURNING THE KNOB AND NOT GETTING ANY ADJUSTMENT, READ ON:** Inside the cap there is a nut locked into place with a threaded rod. If the knob is turned too much in a certain direction it can basically over-tighten and wont adjust. You can fix this by removing the cap section from the base. Take the rod/nut assembly out of the cap and loosen it up so it will adjust freely. Be sure to assemble back together with the washers on each side of the rubber bladder and tighten back up.

13. You will notice that your current oil filter will need removed and require a remote oil filter. The kit is available though us for \$70 if you did not add to your invoice at the time of purchase. You can find this on our new site
14. Since most of the hot side parts are now installed on the car, its ideal to go back over the whole system of what you have installed now and make sure you do not have anything contacting the surface of these parts. Any sort of contact on these critical engine wires, tubes, or lines that carry vital engine fluids could cause catastrophic engine failure if they were to burn or leak.
15. Next you will have to get started plumbing up your cold side tubing. We normally start out at the turbo, you will attach the supplied 2 1/2" – 3" coupler. The first pipe is the "L" shaped 3" bead rolled pipe that will run straight at the ground and then 90 to run along the length of the firewall to the driver-side of the vehicle. Then you will need to find the "U" shaped pipe with the blow off valve flange welded to it. This will take it from the first pipe around the core support, then into the intercooler. During all of this process we will normally not clamp the tubing tightly because you will have to move around some of the tubing to get everything adjusted correctly. Once you have the tubing ran to this point, it will give you an idea on where to mount your intercooler. We normally use something to support the intercooler at this point and try to continue plumbing up your intercooler pipes. This leaves you just the last two pipes, the outlet of the intercooler is the long 90 degree pipe and your last 3" pipe will take you up to the throttle body. Also you may have to shave a little material from the bolts in the lower fog light bracket on GT cars to make sure you are not contacting the intercooler pipe. Once all pipes are on in later steps and before you tighten all pipes down, test fit the bumper to make sure your intercooler situated correctly and that you wont have any clearance issues with the top, bottom, etc of your bumper. This way you assure yourself not to work backwards
16. In order to get the vacuum source to the blowoff valve and wastegate, we will tee off of one of the hoses coming from the vacuum tee on the firewall by the brake booster. Then run either 1/8-1/4 vacuum hose down to the wastegate and blow off valve, once again tee it off and run a line to each port. We will normally put a zip tie around each connection the rubber vacuum hose makes in order to make sure you don't blow one off. Some people may also say this should only see a boost source, **we do not warranty the turbo if you drill and tap the compressor housing but this is what some people do in order to run**

the vacuum line directly to the turbo itself. We will normally just tee into a vacuum source and it gets the job done.

17. The next pipe section is where you will have to mount your mass air setup. If you go with our flange and MAF, you will just need to drill through the pipe and either epoxy or weld the flange to the pipe (this will be relocating your MAF to your inner fender). Remember to put the flange in the straightest section of the pipe that you can, normally 6" after the last bend and 6" before the next. Your tuner will thank you for this because it will give your MAF a more clear signal and prevent turbulence in the tubing. You may also have to cut and extend the MAF wires just simply using a few butt connectors. . **NOTE: We have noticed in a few installs as well it allows for more adjustment by pulling the one bumper support brace in the passenger side inner fender. Sometimes it doesn't clear the intercooler pipe that well and effects the pipe from there to the throttle body making you think it might not fit correctly. Ditch the bracket and should give you the adjustment needed.**
18. Before installing the last section to your throttle body, you will want to install your downpipe to the turbo. Supplied 3" v band clamp will attach it and fasten to the outlet of the exhaust housing. It can't hurt to run a small bead of copper RTV once again around the v band surface that contacts the turbo to help ensure proper sealant and prevent any leaks. At the lower section of the downpipe by the transmission, it gets really tight. Generally you will not have to massage the pipe but depending on what heads, motor mounts, etc, we have slightly dented the pipe to assure any vibration against the body or the tranny. We leave the 3" v band ring welded to the end of the downpipe to make it easy for your local shop to either continue your exhaust to the rear or however you plan to run it. As mentioned above we do have a new Y-pipe kit that will go from your downpipe back to your existing catback. It's a \$159 kit and a very nice addition for a street car or if you are trying to keep it a sleeper. On our car, since it was for track use, we just ran an open downpipe. Note, this is illegal to run open exhaust in any of the 50 USA states and not having proper emissions such as a catalytic converter will also be subject to penalty of the law. **THIS KIT IS SOLD AN AN OFF-ROAD USE ONLY KIT** as it does not have or retain the emissions system. **NOTE: Your intercooler pipe will run along the top of the downpipe thus can serious heatsoak the charge pipe and raise your intake air temperatures. We do recommend a turbo blanket to prevent any of this occurring and keeping it to a minimum. Cooler intake air = more power !**
19. Once the downpipe is all squared away, you can now go back to the last intercooler pipe up top and attach at the throttle body. We have installed this kit quite a few times and we know, the 90 degree silicone coupler that you attach to your throttle body is a trick. Depending on what size throttle body, it will be easier on some than others. It's nice to have 2 pairs of hands to get this done and we supply you a t bolt clamp that is 3.25"(86-94mm) in the package that you will use to attach the coupler at the throttle body. Now you have all your intercooler pipes on, go back over all your t bolt clamps and retighten down and get everything snug. Once again test fit the bumper to make sure no additional adjustments are needed. In addition, we sometimes will make a few flat brackets just cutting a flat plate of steel and bolt to the lower holes of the intercooler. Then you can use the bolts already in the lower lip area of the core support area to bolt the steel bracket to.
20. Now you are ready to move on to the fluid lines. Locate the oil sending unit coming off the driverside of the engine block. You will need to remove the sending unit and disconnect the wire from the top of it. We supply you a 3 way brass block which is threaded on the one end. The one threaded end will now screw into the area where the sending unit was attached. Use one of the (2) reducer fittings and thread it into the middle port of the brass block. Now the sending unit can be attached to the end port of the brass block. You will also need to cut the wire going to the sending unit and extend it with a butt connector and a section of wire. Now you can thread the last brass fitting into the center hole of the 3 way block and attach the oil feed line to it. The 90 degree fitting on the oil feed line will attach up at the turbo.
21. Up at the turbo now, you can use the (2) allen bolts and bolt the smaller aluminum plate to the oil feed on the turbo (top of the turbo). You have one 90 degree brass fitting that will now thread into the feed plate and allow you to attach your oil feed line.

22. Now you are ready to finish up on the oiling system by tapping into your oil pan for the drain. In the photo section you will find a photograph showing the location and where to mark your pan to punch. If you have access to an air hammer, this makes punching a hole into the pan 10x easier we have found. You will need to punch the oil pan out and tap the hole to 3/8" npt. In most situations, we will run a small bead of RTV around the fitting once it is threaded into the pan just to ensure no leaks. Do not drill the hole, it needs the edge rolled that a punch will make. That will give surface area for the tap to bite and cut threads. Drilling will just throw shavings into the pan and not give anything for the tap to thread
23. You can now get the power steering line out from the kit and slip the hose on to each end of the new cooler line. You normally can use the stock clamps but on our car we bought new worm clamps and used them to clamp the hose to the line more tightly. On our application, we positioned the line between the intercooler and the radiator. Then finished up by just putting a zip tie around the cooler line to the core support. That way you don't have any rattles from the line as the line would move when hitting any bumps.
24. Using the supplied alternator bracket and hardware kit, you can now bolt on the alternator and hook up the wiring harness. Normally it is also a good time to once again go over everything to make sure wires, hoses, cables are all wrapped and/or pulled away from any moving or hot parts. Since you are relocating and removed the smog pump, it is going to require a shorter belt. We normally will use a piece of string and run it in the way that the serpentine belt is going to route and mark the string where they meet. Measure that length and you will have to just call around, Napa, Auto Zone, Advance Auto, Summit, Jeg's, etc. Tell them the length and normally you can just pick one up locally. It all depends on what pulleys you are running, stock, underdrive, etc so there are a lot of different varieties of lengths that are possible. Most of the time you can just pick one up at the local auto parts but one application we had with underdrive pulleys that we had to order a Goodyear Gaterback from Summit. You can look up all the sizes on Summit's website if you are one of the lucky ones like us and had to order one instead of being able to pick one up at the auto parts store. If you have all accessories including a/c and stock pulleys, your belt length will be 71.5"
25. One of the last tips to keep your radiator hose away from the turbo is to cut around 1 – 1 1/2" from the section that goes into the radiator. This will pull the hose forward more and allow the hose to not run directly past the turbo. This is not necessary but it is a step that we have always taken when doing the install on cars.
26. Depending on what you go with for fuel delivery, we normally just recommend dropping the tank and running the ON 3 Performance 340lph / 320lph E-85 intake pump and our fuel injector kit (60# Deka's) combo price \$445. Before you get any sort of tuning done on the car, you will want to make sure you install a pump. Our car with the stock pump would instantly drop pressure at 3,000rpm on the dyno and lean out right as the turbo would spool. These are the small things that you don't want to skip over as they are critical to the performance of your car and the reliability of the setup.
27. After completing your install, it all depends on what MAF, injectors, pump, etc that you go with, a tune is basically essential. We have a custom dyno tested tune file that is available through us so the car is as close as we can get if. They are essentially just for start up and baselining your tune from. It will be a safe setup to get the car to the dyno if you are driving it there. The custom burned On3 chip with a base tune start at \$225
28. Remember to drain your oil and put fresh in after tapping the oil pump. Prime everything up and once you do start up the car, check everything for leaks. It can't hurt either to double check and triple check everything after the car is running, 5, 10, 15 minutes. Make sure coolant level is correct, the system is burped and ready to go.

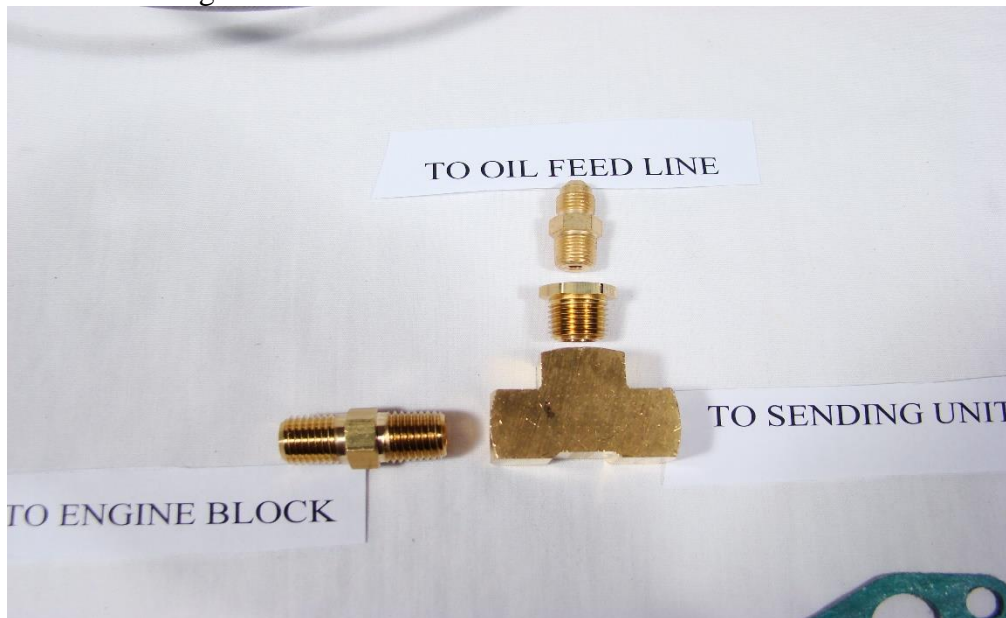
Disclaimer: This packet is for educational purposes only and On 3 Performance, LLC will not be held responsible for any damage to the vehicle or persons due to improperly installing the product, personal injury or death. Products are inspected and strict quality control is enforced before kits are shipped out and in perfect working order. The kits are to be installed by professional mechanics and all warranties are voided unless this is followed. Purchaser of the kit assumes all responsibility and will be liable for the car and anyone involved in the use of this kit. Our warranty covers the hot side of the kit for 1 year and we cover our turbo for 1 month from the purchase.

1986 – 1993 Single Turbo Install Photo Sheet - On 3 Performance

Oil Feed at the turbo



Oil feed coming out of the block



Below is the drain fitting screwed into the drain plate. The other fitting is what will be tapped and threaded into your oil pan



Alternator relocation configuration





This photo is to illustrate to you the rough idea of the way the hot side will fit together



This photo does the same besides showing the way the coldside parts fit together

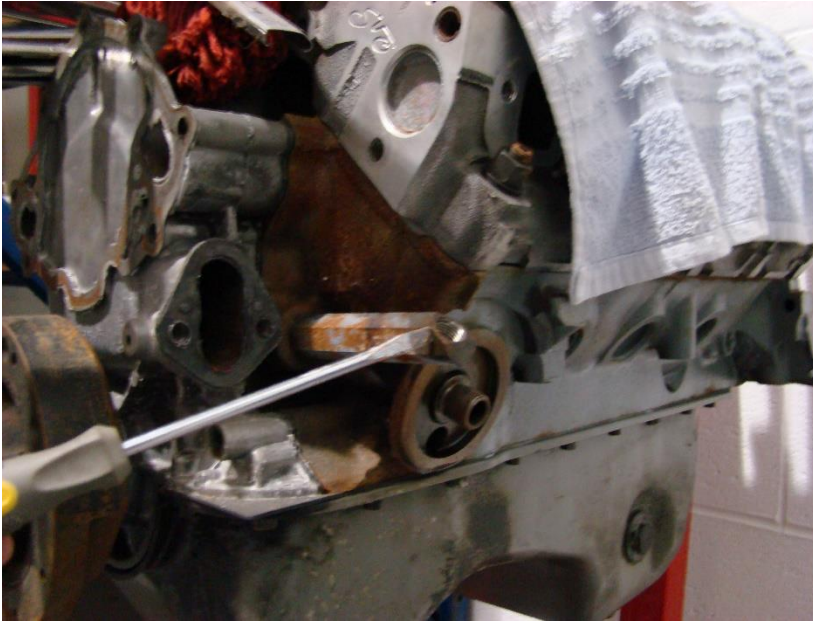


This shows the way the fire ring is

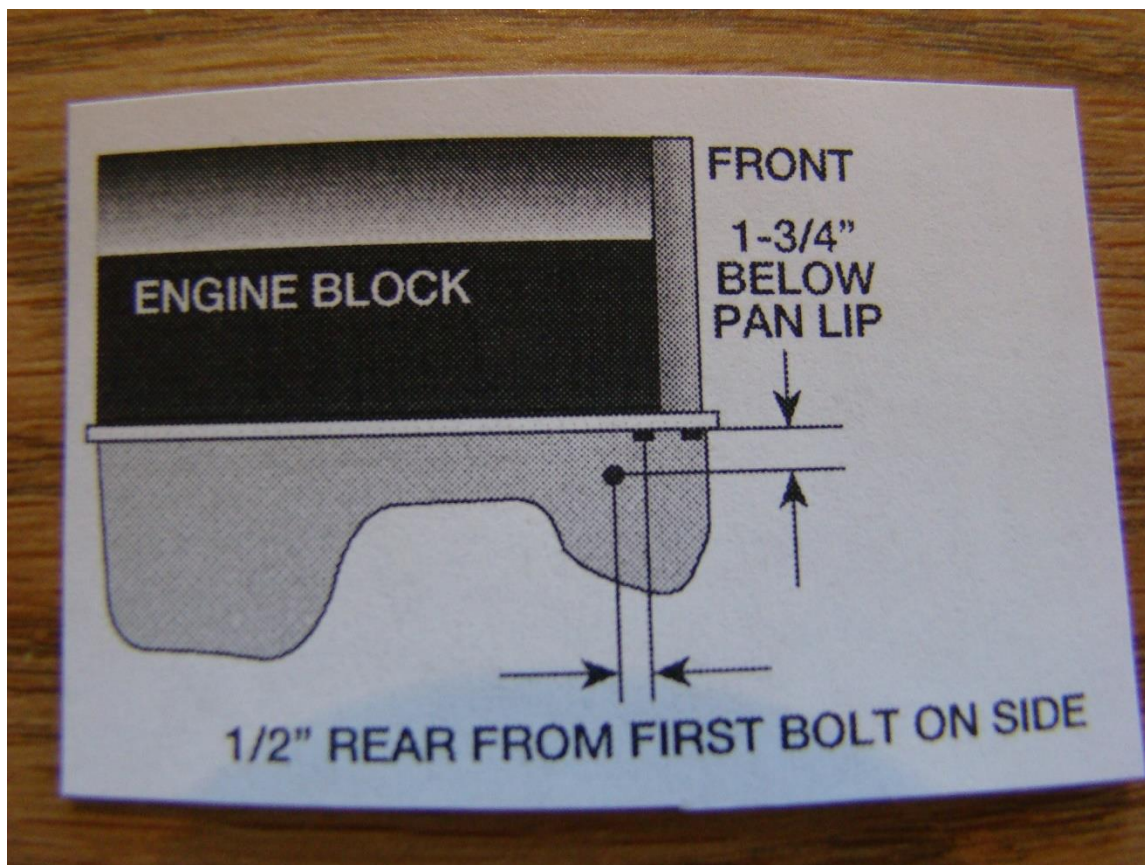
This is the fire ring and will show you how it gets installed into the wastegate before attaching to the hotside:



This barb sticking out is where the oil sending unit normally is located. You will remove the sending unit and tap into this source for the oil feed:



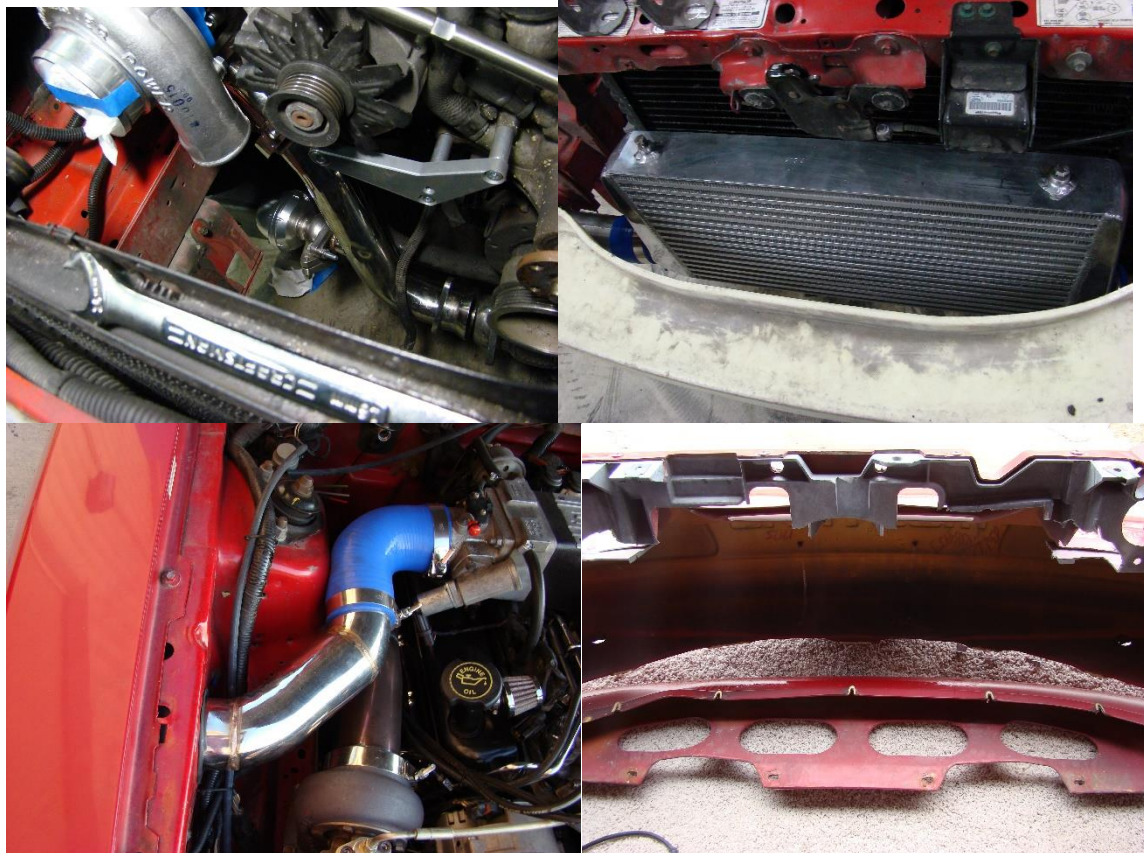
This shows the area where the oil pan will need punched and tapped:



When installing the crossover pipe to the turbo header, sometimes you need to pull the cap off the vband and grind back a little material. Then install the cap back on, this will provide enough threads as needed to get tension on the clamp



Random shots of the final install product





A very clean install keeping a/c:

