Very important:

Prior to installation, blow out all oil lines and air tubes to make sure debris is not inside any of the lines or tubes

Stock Turbo Clocking and Preparation Instructions
For use with Twin Turbo Kit.

These two pictures show stock turbos. The turbo on the right is the stock clocking. The turbo on the left has been clocked according to the template.

The three sections of the stock turbo need to be disassembled (turbine housing-exhaust end, cartridge-middle section, and compressor housing-cold air end). These are disassembled by removing the v-band clamp, and the internal snap ring. **Be very careful removing and replacing the compressor and turbine housings. Pull the housings straight on and off, and do not damage the turbine or compressor fins.**

There is a roll pin in the housing which needs removed, this pin will not allow the turbo to be clocked until removed. Pull this pin out with pliers.

Clock (rotate) the three sections of the stock turbo so that they match the template included with these instructions.

On 2004.5 and newer trucks unscrew wastegate sensor, and zip-tie the sensor to the shock mount. Leave it plugged into the wiring harness. Screw the supplied plug into the hole.

Remove the wastegate rod, and wastegate actuator from the turbo. It may be necessary to force compressed air into the rubber tube to release the wastegate pressure. Don't lose the small external snap ring.

Left: You must trim the corner off of the compressor housing, where the wastegate actuator mounts. It will not clear the manifold if not trimmed off. Do this when the compressor is off the turbo, or tape off all oil and air ports so that metal pieces to not get into the turbo.

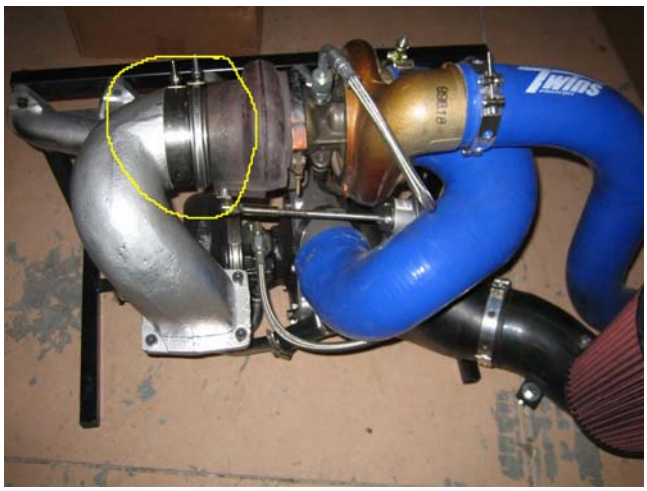
WASTEGATE (ABOVE): The new supplied wastegate actuator and bracket will be mounted as shown above. When the turbo is mounted on the manifold the mounting bolts will be used to hold this bracket in place.

(BELOW) The actuator pulls the wastegate shut. The correct starting adjustment should be as shown below. The actuator shaft should be approximately this position when the wastegate is completely shut. You will need to blow air into the actuator to release the pressure enough to get the hole on the linkage over the pin. (DO NOT USE OVER 50 psi when pressurizing the actuator, as too much pressure can damage the inner diaphram). The two jam nuts should be midway up the threaded shaft, and tightened together. This will allow the wastegate to be adjusted when it's installed. After the linkage hole is on the pin, re-use the stock c-clip (retaining ring) to put back on the slot on the pin to hold the linkage on.

You will need to remove the mounting studs from the turbo, and drill out the threads from the two threaded holes in the turbo. Use one of the following size drill bit size 'X' , 'Y' or 13/32, to drill the threads out.

Then mount the turbo onto the manifold as shown. **The manifold mounts upside down from what the stock manifold mounts.**

Once the turbo is mounted to the manifold, continue with the installation.



YOU MUST USE THE STOCK V-BAND CLAMP to attach the turbo to the hot pipe adapter. Use the provided v-band clamp to attach the bottom turbo to the exhaust. The stock v-band clamp is the only clamp that will work on the back of the turbo.

Installation Instructions for Twin Turbos.

Following these instructions is crucial to proper installation!

Prior to installation the engine oil and oil filter should be changed. **We strongly recommend head studs for boost pressure over 45 psi, and fire rings for boost pressure over 55 psi. Nearly every issue can be solved during installation by adjusting the clocking of the turbos and/or hot pipe slightly.**

1. Begin by removing air box, battery, battery box, and plastic inner wheel well cover (splash guard). These items must be removed before attempting to install twin turbos. Be careful when removing plastic wheel well cover, there are wires mounted on engine side. Battery and inner wheel cover will be put back in when finished.

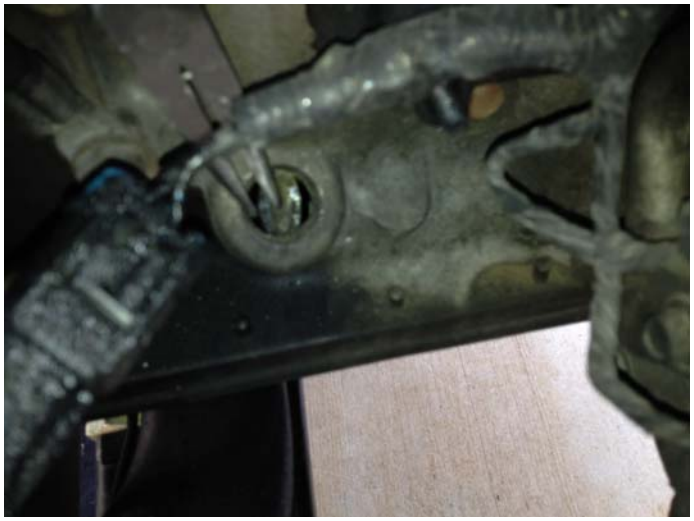
Next remove old turbo, old exhaust manifold, and old oil supply lines. **Now On 2003-07 trucks leave the oil drain tube in the truck, you will later be attaching this oil drain line to the lower turbo. refer to the "Oil Drain Lines" section of the instructions.**

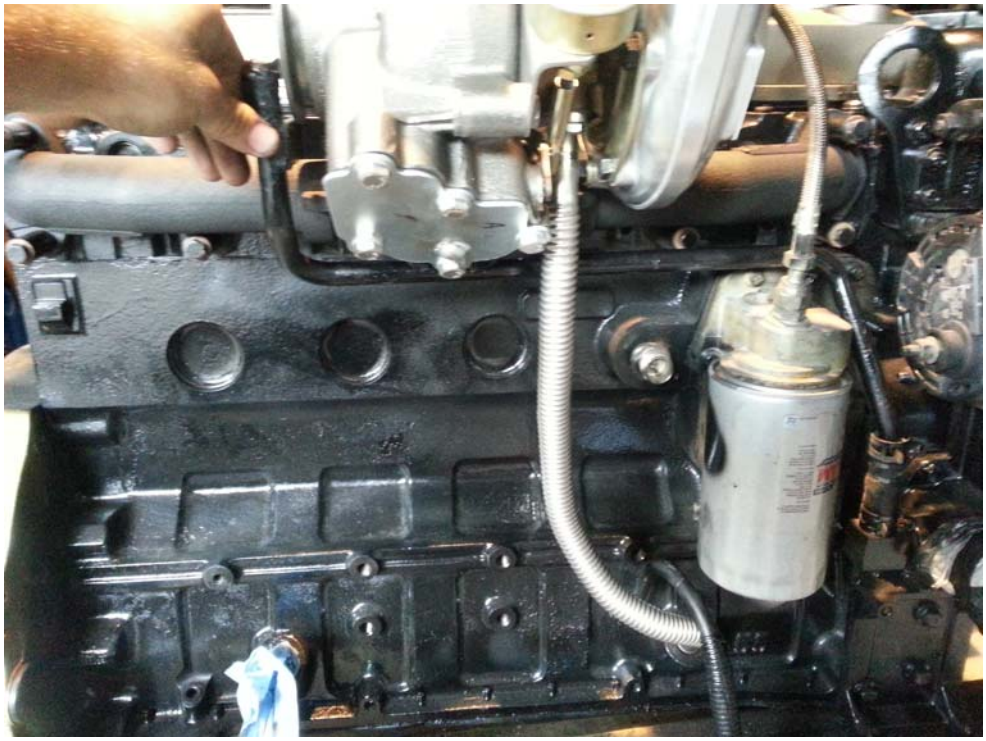
Oil Drain Lines

2003-2007 trucks.

You will use the stock oil drain to attach to the lower turbo's oil drain. Locate the front freeze plug (same height as the back oil drain port). Take a punch or screwdriver and lightly tap on one edge of the freeze plug to get it to rotate or twist inside the hole. Then take a pair of needle nose pliers and remove the freeze plug (BE VERY CAREFUL NOT TO PUSH THE PLUG INTO THE OIL PAN, OR YOU WILL HAVE TO DROP THE OIL PAN TO RETRIEVE IT). Insert the provided long drain tube into this front drain port. Make sure it is pushed completely into the hole, both o-rings should be inside the hole.

The long oil drain tube will go from the top turbo to the front oil drain. The stock oil drain tube will go to the lower turbo oil drain.





Top Turbo Oil Drain will go in as shown here

ELECTRONIC WASTEGATE SOLENOID:

On 2004.5-2007 year of truck the stock turbo waste gate is electronically controlled. You have two options. The first, and easiest option is to simply unscrew the entire sensor from the stock turbo, and wire tie it onto the shock mount. This works very good. The second option is to purchase a boost-fooler and plug it into the sensor wire.

2. It will be helpful if you slightly loosen the bolts (or v-band clamps) on both turbos which will allow you to "clock" the turbos (don't remove the bolts or clamp or loosen too much as this can damage the turbo(s)). Loosen just enough to be able to rotate the housings. In this installation, if items don't fit properly, it's usually just a matter of "clocking" or turning slightly one of the turbos, or "clocking" the hot pipe, to get the proper relationship with each other.

As you install this kit, makes sure that all air conditioning tubes, heater lines, electrical cords, wastegate tubes etc. are not in contact with any portion of the Twin Turbo Kit (especially with the cast iron (hot) sides of the turbos, as they will melt or wear into these items.

Prep Large Turbo:

3. Attach large turbo to hot pipe (elbow), and to the support bracket as shown in the picture. Remember to place the gasket in between the turbo and hot pipe. A washer should be used on the support bracket bolts going into the turbo. (Note: It's a good idea to wrap this hot pipe with included header wrap.)

Leave the two bolts going through the bracket just barely loose, so they can be adjusted, once the top is on. All of the bolts going through the support bracket should be a little loose to allow the lower turbo to be adjusted to align the hot pipe with the top turbo. If necessary the bracket can be slightly flexed during the installation if the bolts are a little loose, then tightened when everything is aligned.

4. Install oil supply line (steel braided tube without elbows) and oil drain tube to large turbo as shown. The spring over the oil drain line allows it to be bent without kinking. Tighten fittings and clamps snug, but do not over tighten.

5. Place this large turbo, elbow and support bracket assembly in the truck. Simply and carefully set this whole assembly on the truck frame. Do not attach the exhaust yet. **Be very careful not to damage the steel braided oil supply line or the oil drains.** (Picture below shows HT3B turbo, for S400 turbo air outlet will go up.)

Note, the small turbo and manifold are not yet in the truck.

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6. Install the small turbo and manifold assembly by holding it in place while putting the bolts into the head. Don't forget the 6 manifold gaskets. **Attach the <u>center</u> manifold gaskets and bolts first (cylinders 3 & 4).** Don't bump or pound on the ends of the 3-piece manifold, as they are press fit together, and can misalign if hit too hard. Once the center manifold bolts are in place, install the remaining stock bolts. Leave out the two top rear bolts (cylinders 5 & 6), to be used to hold the support bracket.

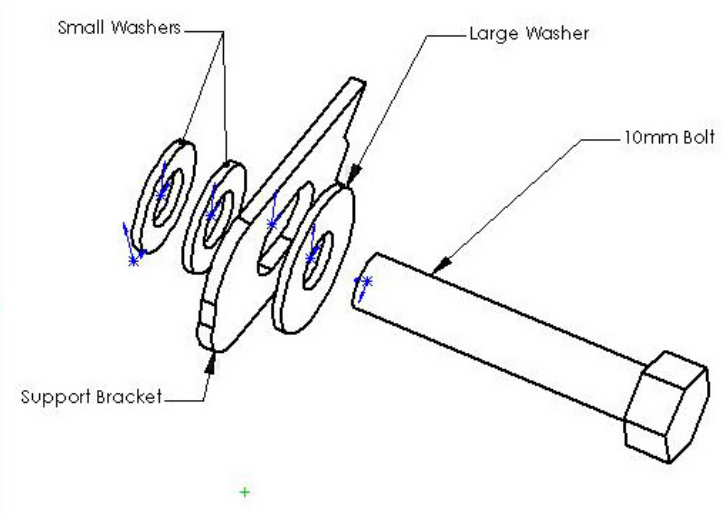
Note: The two provided 10mm bolts go in the lower two center holes.

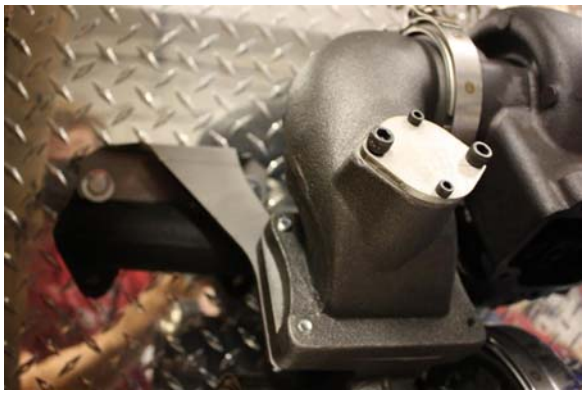
7. Attach the long oil drain tube to the upper turbo. If you have the full flexible drain tube, simply attach the two bolts into the turbo, (shown below). This drain will go to the front drain.

8. Find the 4.4 inch v-band clamp that connects the small turbo to the hot pipe (elbow). Remove the nut off the v-band clamp or simply unhook the bolt so the clamp is open, and set the open clamp on the rear of the small turbo's flange where it will mount. On the stocker kits you should already have an adapter and clamp that is pre-attached to the hot pipe.

Attach large turbo assembly:

9. Take the large turbo assembly, and attach the support bracket to the two upper bolt holes on the manifold/head (cylinders 5 & 6) as shown below. It is very important that the washers are placed in the configuration that they came in. The support bracket must be spaced from the manifold by two washers, and have another washer on the other side, for proper fit. The configuration is as follows: Bolt, Small Washer, Large Washer, Support Bracket, two small washers, manifold, gasket, head. (See Picture).



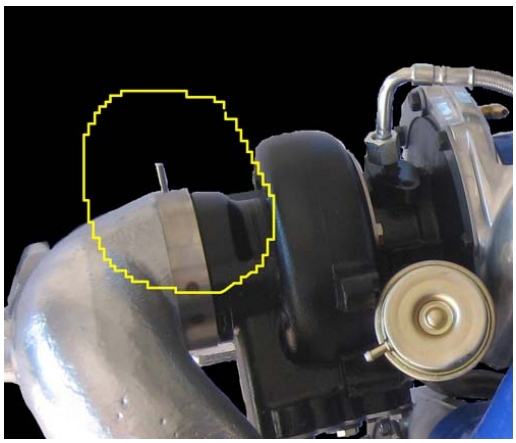


Tighten the bolts most of the way, but do not completely tighten theses two bolts…yet.

10. The cast iron hot pipe (elbow) should be in nearly the exact place it should be. (If it's not aligned how it should you may have to loosen the support bracket bolts, either the bottom or top bolts or both.) Attach the cast iron elbow to the turbine housing of the small turbo, using the v-band clamp to hold in place. Tighten the v-band clamp.

Tighten all support bracket bolts.

Before tightening the v-band clamp, the clamp opening must be on the side, NOT THE TOP. It may leak if clamp opening is on the top.



Helpful Hints to complete this part of the installation:

If necessary, loosen the large turbo's v-band clamps, and the small turbos bolts to allow the housings to be clocked/rotated. This will give several places of adjustment if necessary. Having these points of adjustment should allow the proper alignment of all segments. Make sure to tighten all four adjustment points when completed. **Do not allow the cast iron elbow, bolts, or any other part of the twin turbos to touch air conditioning lines, they will wear a hole in the soft aluminum air conditioning lines.**

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11. At this point make sure both of the oil drain tubes are each attached to the turbos they go to (rear drain to lower turbo, front drain to upper turbo.

Note: Every set of air conditioning, and transmission dipstick tubes are slightly different. While there should be plenty of clearance, if by chance they do touch the Twin Turbo Kit, they may require some slight bending to get them to fit properly. The transmission dipstick tube can touch the cast iron elbow, but the air conditioning lines CAN NOT touch any part of the Twin Turbo Kit, as they will have holes worn in them.

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12. Attach the steel braided line from the small turbo to the stock oil feed from the truck, located on the oil filter mount.

Next, remove one of the oil plugs from the top of the oil filter mount, and screw in the provided fitting (should be at the end of the steel braided oil line from the large turbo), then couple the oil line to that fitting.

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13. ~~FOR 2ND GEN TRUCKS ONLY: The following picture shows how the oil drain on all 2nd Gen 1994-2001 trucks should be routed, then the lower end of the oil drain simply attaches to the block insert (included with the kit) in the front passenger side of the block.~~

14. Using the stock v-band clamp, attach the coupler on the back of the large turbo to the exhaust.

15. Air intake: Install the 5” or (5.5” on race covers) silicone coupler onto the front of the large turbo and tighten the clamp. Then insert the plastic inlet tube to the front of the large turbo, and tighten the clamp. **On 2nd Gen Trucks the 4 inch, steel 90 degree elbow goes directly from the silicone boot on the front of the turbo, to the air filter. The air filter will sit where the old air box was located.**

16. Install large rubber hose with steel ends, as shown. The ear shown below should align with the ear on the side of the battery box. If it does not, the two rubber boots should be clocked/twisted differently or the cast iron elbow may need to be clocked differently.

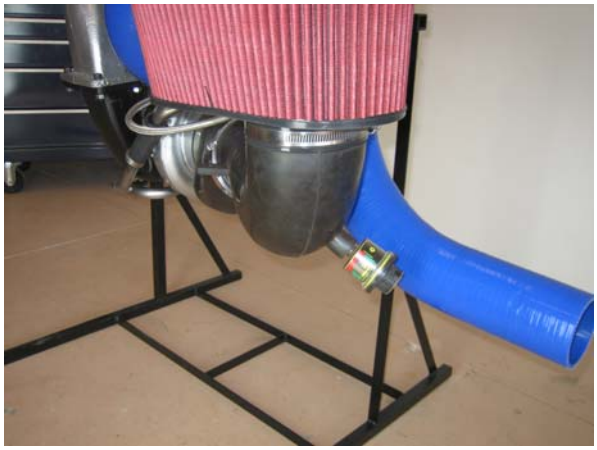
The ear on the tube and the battery box must be aligned to properly fit, so it can be bolted on, to properly support the air filter. The two jam nuts can allow the intake to hang a little lower if needed to clear hood.

The Ear on this tube should mount onto the BOTTOM of ear on the side of the battery box.

16.

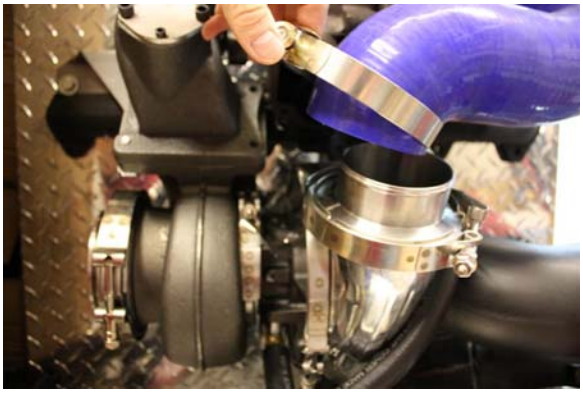
17. Install **both** stock sensors into the rubber tube, install the air filter.

Note: The filter will stick up slightly over the side of the truck. This is normal. It should however clear the hood of the truck. If it does not you will need to clock/rotate the tubes to get the filter in the right place. Make sure the hood does not crush the filter.



18. **Attach the metal fitting which is in the end of the silicone tube first to the large turbo air outlet.**

    Tighten the v-band clamp.



19. **Slide the Silicone Charge which connects the large turbo charge air outlet to the small turbo air inlet. Put on the t-bolt clamps and tighten.**
20. **Put on the polished aluminum charge pipe (goes from small turbo to intercooler), attach required couplers and clamps. Tighten securely. (Helpful Hint: use a small amount of soapy water to help the tube slide into the couplers. DO NOT USE OIL TO DO THIS as oil will not dry and tube may slip out under pressure Click the rolled edge of the aluminum hose beyond the steel ring on the steel coupler, then slide the silicone coupler onto the turbo.).**

VERY IMPORTANT! Be sure that when truck is started that oil pressure rises to the correct pressure,

We highly recommend oiling the filter with K&N filter oil, especially if being used in dusty environments. Also the K&N filter cleaning and oiling kit can be used to wash the air filter when it gets dirty.

On 2004.5-2007 trucks, remove the rubber cover to on the front, passenger side of the radiator. This needs to be left off, because if it is on it restricts cool air from entering the filter, and makes a substantial difference in EGT's and overall performance.

Completed Picture

Twins-Stock Turbo Clocking Template