

# Full-Race

M o t o r s p o r t s

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## Turbo Kit Installation Instructions

**\*NOTE:** this kit is not intended for novices or anyone who does not have any previous turbocharging experience. Turbochargers are very powerful devices with high risk involved. Improper installation can lead to serious engine damage. Possibilities of failure exist from oil leaks, detonation, over-revving the turbo or many other possible points of failure.

**\*\*NOTE:** the kit should only be installed on a properly running engine. If you are installing the kit at the same time as a new Engine Management System, new larger injectors, new fuel pump, etc there could be issues that will prevent a perfect installation. Only install the kit on a car that idles like stock, drives like stock and has stock oil pressure. If you are installing the kit on a brand new motor, be sure to get the car running perfectly first!

**\*\*\*NOTE:** Turbochargers are very dangerous and **MUST** be handled with care. Do not place hand near turbocharger inlet as high vacuum can pull your hand towards the compressor wheel and **WILL** cut your fingers off.

**DO NOT** start work on the car until you are 100% sure about the capabilities of the installer and have the appropriate tools. The installation will typically take 2-3 days.

### Tools Needed:

10mm wrench and socket

12mm wrench and socket

13mm wrench and socket

14mm wrench and socket

9/16" wrench and socket

1/2" wrench and socket

socket wrench

large 1"+ adjustable wrench

Electric Angle Grinder, Pneumatic Cut-Off wheel or equivalent (electric angle grinder recommended)

Flat head screwdriver

Teflon Tape

Electric Drill

1/2" Drill Bits

Hacksaw

### **\*\*optional but recommended tools**

22mm socket

24mm socket

o2 sensor socket

hammer

sharp chisel

- 1) Disassemble stock intake and exhaust system. Remove intake, air box, stock exhaust manifold, catalytic converter, o<sub>2</sub> sensor, air conditioning, air conditioning condenser, and all air-conditioning lines. Be sure to save all nuts from the exhaust manifold.
- 2) Completely drain all oil from oil pan
- 3) Remove front bumper cover and unbolt bumper support. At this point the engine bay should be completely empty and awaiting turbo installation
- 4) Slightly loosen bolts on turbocharger housings. Only loosen the bolts that hold the compressor and turbine housing to the center section. Do not loosen the small bolts on the center section itself. Once these bolts are slightly loose, you can rotate the compressor and turbine housings. Compressor housing bolts are 1/2", turbine housing bolts are 13mm.
- 5) Using the supplied 9/16" bolts, washers and nuts, bolt the turbine housing to the manifold. The Gasket is not necessary, however some prefer to use one. If you do use a gasket, it is recommended that you spray it with copper-gasket spray. Make bolts extremely tight, ensuring that there is a seal between the turbo and manifold.
- 6) Place turbocharger and manifold on the head, with both housings free to rotate. Rotate the center section until the oil inlet (smaller hole) is facing up (completely vertical is ideal).
- 7) Remove oil sender from back of block with adjustable wrench or 22mm socket. The sender is the silver plug (about the size of a quarter) next to the oil filter. One wire is coming off of the plug. Replace this hole with the supplied brass Tee. Thread the male portion over with Teflon tape, and then thread the sender into the back of the tee. On the side, thread in the 1/8" to -3 AN male fittings for the oil feed line. Attach feed line to this fitting
- 8) Screw feed fittings into the turbo and attach the oil feed line from block to turbo, making sure there is a smooth passage for the line. Be sure the stainless line will not hit the timing belt or alternator belt.
- 9) Attach the oil outlet flange to the bottom of the turbo using the supplied gasket and bolts. To this flange, thread in the 1/2" NPT to -10 AN fitting and begin construction of the oil return line. If you have never before cut stainless line, it must be wrapped with tape and cut at high speeds using an abrasive wheel. An electric or pneumatic abrasive cut-off disk would work suitably. If you have an extremely sharp chisel, heavy sledge and a hard metal surface, you can shear through the line, making an extremely clean cut. Putting the AN fittings together is not an easy task, and must be done correctly to prevent any oil leaking. Once the line is cut to length, slide the AN fittings over the line and tighten the locking portion into place. It is recommended to use aluminum AN wrenches in order to not damage the aluminum clamping and anodized surfaces. However, a steel adjustable 1"+ wrench will suffice
- 10) Once the oil return line is in place, be sure there are no kinks in the line, and mark on the oil pan where you want to have the oil return dump to. The supplied steel weld bung must be TIG welded to the oil pan. Any local TIG welder/fabricator should have no difficulty whatsoever doing this. Be sure that the oil return is as high up on the pan as physically possible. Higher is certainly better in this case. Before welding be sure to grind all black paint off of the pan to reveal the silver steel underneath, and clean of all oil, contaminants, etc. Denatured alcohol is a good chemical to clean with. A clean surface is required for a leak free weld.
- 11) Now that the oil return and feed lines are in place, lightly tighten the nuts on the turbine housing. This will not allow the center section to rotate anymore.

12) Make sure the compressor housing can still rotate and begin to line up the intercooler inlet with the compressor housing. Keep the intercooler as low as possible, and using the supplied 2.5" hump hose, attach the compressor outlet to the intercooler inlet. The intercooler is very large so you must cut off portions of the metal bumper support to make space for the core. Using the angle grinder with an abrasive cutting wheel remove approximately 2 inches from the bumper to allow the intercooler to safely sit in place. Some cars may need up to 3 inches removed. Once you have the intercooler where you would like it, drill holes through the supplied tabs and into the bumper. Then, using the supplied bolts, bolt the intercooler to the bumper support. This will make sure that it does not move whatsoever. Once the intercooler core is exactly where you want it, tighten the compressor housing bolts as much as possible to prevent any movement.

13) Remove the manifold and turbo from the block. Once it is out of the car, firmly tighten all bolts on both housings. Make sure they do not move. It is recommended to apply never-seize compound to the turbine bolts, to prevent seizing in the future

14) Now it is time to put the turbo manifold and turbo on the engine. It is necessary to use a 2-layer exhaust manifold gasket (GSR or LS are 2 layer, ITR is 1 layer). It is recommended that you spray the gasket with Permatex Brand Copper-Spray-A-Gasket. This ensures a leak free seal

15) Place the turbocharger and manifold (which are now bolted together) on the cylinder head. Be sure the gasket is properly placed on the head, and slide the manifold onto the studs. If you have a 96+ B series head it may not come with studs. Studs must be used at the top of the flange over cyls 1 and 4, bolts will not fit through the head flange.

**In order to bolt the manifold to the head, you MUST make sure that you tighten down the upper right and upper left nuts (over cyls 1 & 4) before even starting any of the others. Fully tighten down these two nuts first.**

16) Install the rest of the nuts and bolts on to the head. Be sure that the nuts and bolts on cyls 1 and 4 are fully tightened using a 12mm combination wrench before tightening down the others. Now, the engine bay should look bare with just a turbo and manifold firmly attached to the cylinder head.

17) Attach the intercooler to the compressor housing using the hump-hose and clamps.

18) Attach all oil lines to the turbocharger. Be sure oil feed line can not come in contact with timing belt.

19) Install the o2 sensor in the downpipe. Attach the downpipe using the supplied 8mmx1.25mm bolts.

20a) **WHEN A TIAL 40MM WASTEGATE IS USED:** Insert tial 40mm studs into the wastegate flange. Thread in the small threaded section into the flange, leaving the big section for the nuts to bolt on to. Slide wastegate over studs and proceed to tighten down all 4 nuts. Make sure the valve seat is in the wastegate and that it is properly inside the wastegate, not sitting crooked. Some 92-95 civics may require slight trimming of the radiator to clear the wastegate, although this is very rare, and usually the result of a front end collision.

20b) **WHEN A TIAL 44MM WASTEGATE IS USED:** Place v-band clamp over both the wastegate and the manifold wastegate flange. Close wastegate on both flanges evenly and tighten v-band clamp bolt.

21) Take the supplied large vacuum Tee, and place it inside of the brake booster vacuum line between the check valve and intake manifold. **\*\*\*\*DO NOT place the tee between the check valve and brake booster as you will lose braking power!!!!\*\***

- 22) Attach a vacuum line from the brake booster vacuum Tee installed in 21 and run the line to the lower port on the wastegate, NOT the top of the gate. Be sure that the line does not come in contact with timing belt.
- 23) Install Tial Blow off valve on intercooler end tank using supplied BOV V-band clamp.
- 24) Install small vacuum Tee immediately before the wastegate vacuum line. Run additional vacuum line from Tee to the BOV
- 25) Install upper charge pipe from TB attachment point. Slide coupling over TB and clamp coupling to the TB. Next, insert the charge pipe into the coupling without clamping down. Clamp coupling to opposite end. Next, insert following charge pipe to upper charge pipe. If you have a Civic or non-ABS Integra, there are only two pipes. If you have an ABS equipped car the ABS system requires 3 piece intercooler piping. The Pipe from the intercooler outlet is purposely left long to accommodate a variety of fitments, intercooler mounting points and bumper cover/body kit preferences. It must be cut approximately 1-3 inches depending on how you have mounted the intercooler and bumper support.
- 26) At this point the turbo kit should be fully installed. Tighten ALL clamps on all silicon couplers, hump hoses and the Throttle body. Next go check all oil lines to ensure they are tight. Inspect oil pan fittings, turbo fittings and block Tee. Check turbocharger housing bolts to ensure tightness. Check downpipe bolts. Check manifold bolts. Check Cylinder head bolts. Check oil pan bolts
- 27) Add oil to motor. Be sure to clean any dirt, oil and grime off of the manifold and downpipe. If there is grease on them, it will stain the stainless steel surface once the car is started.
- 28) Making 100% sure that everything has been installed 100% correctly, start car. It should idle like stock, the engine should rev like stock, and the oil light should not be illuminated. Expect ~20 psi oil pressure at idle and everything above 3000 rpm should have 75 psi oil pressure. If there are \*any\* oil leaks, TURN ENGINE OFF IMMEDIATELY, and fix the oil leak. Proceed to restart engine and fix the leak. If there is an erratic idle, fix the vacuum leak emanating from brake booster vacuum line.
- 29) Attempt to install front bumper cover. Some cutting will be necessary, so look through vents to see where it is hitting the intercooler. Trim the bumper cover until it fits perfectly, and reinstall.
- 30) The turbo kit is now 100% installed. You are ready to install the fuel management system, fuel pump and fuel injectors, and tune the engine.