



DISCLAIMER

Congratulations on your purchase of a Cartuning Performance Turbo kit! The Cartuning Team would like to thank you for making the decision to increase the performance of your vehicle the smart way.

We require that the installer fully read and understand these installation instructions before continuing with installation of the turbo kit. Read through it multiple times if necessary, print it for use during installation or keep a laptop nearby throughout. Be sure to have an understanding of what tools are necessary as well so you can be properly prepared. Although Cartuning Performance quotes a straightforward installation time of about 6 hours, we recommend that you set aside a full day for any unexpected issues which may arise (rusted factory bolts that could break, etc).

Cartuning Performance products are intended for off-road use only. We do not warrant the durability/longevity/effect of these products on any portion of the customer's vehicle. All liability and any possible issues arising are implied to be at the customer's expense as the products are required to be installed by a licensed mechanic or other qualified professional.

All Cartuning Performance products are warranted for a period of ninety (90) days from the date of purchase against defects in materials and workmanship. The warranty provides for a replacement product or refund only, and does not cover labor or any other costs. Purchaser and Installer assume all liability with regard to any and all damages in any way related to the purchase, installation and/or use of these products.

Thanks again,

The Cartuning Performance Team.



Cartuning Performance Turbo Kit Installation Guide

Preparation. Park vehicle with parking brake applied, rear wheel blocks in place, and make sure that the car has cooled sufficiently. Loosen wheel nuts ½ turn on the front passenger wheel. Place and leave the vehicle in neutral. Disconnect negative terminal of battery, and leave disconnected for entire installation of kit. It is recommended that you start with a cool car which has sat overnight giving you a full day to complete the installation if any problems should arise during disassembly and reassembly of the car.



Remove the strut tower cross-brace between the rad support and strut tower on the driver's side (3 bolts), along with any aftermarket strut tower brace which is installed as well. Remove the factory airbox and intake piping on the car so that all that is left is the PCM, and an open space to the throttle body. Now is a good time to replace the PCM with the new one supplied in the box, along with fixing the PCM down as shown in the picture. In order to swap the PCM, you will need to loosen the two 7mm fasteners in the connectors and remove the PCM, paying attention to the orange gaskets inside the connector. Getting the PCM "Case Learned" is an important step after installing the turbo kit. Any dealership can do this (as can many local mechanics).



MAF Removal. Relieve any pressure in the radiator (although you should be working on a cool car!) by carefully removing the radiator cap. Now remove all the vacuum hoses and electrical connectors (MAF, TPS, IAC) from the throttle body. Remove the three 10mm nuts, and one 8mm bolt on support bracket holding the throttle body to the intake manifold. Slide the throttle body off of the engine, and rest on the raintray. Your engine compartment should now look like the picture on the right.



Thermostat. Now you can change your thermostat by removing the two 10mm bolts on thermostat housing. Clean off any gasket material that might be there, swap the rubber ring from old thermostat to new one, and install in reverse order. If your vehicle originally came with a surface mating gasket (paper) be sure to have one to replace it.

Crossover and O₂ Removal. You can now remove the exhaust crossover. Be careful when removing these fasteners because they are known to break in the manifold. You will first need to remove the shield (shield not re-installed for turbo kit) at the rear connection by removing two 13mm nuts and then the four 13mm bolts and setting them



aside (no longer needed for vehicle). Remove the round donut gasket from stock crossover and install on new "Y" pipe crossover, paying attention to the orientation of the flange which you place on the crossover before the donut. Unplug the O₂ sensor from the rear manifold, and remove it. Install the provided O₂ sensor plug in its place and tighten securely. If you are planning on installing ported manifolds, or porting your own, NOW is the time to do so. Your manifolds should be fully installed for the next step.

Spark plugs and Dipstick. Change the spark plugs, being sure to use anti-seize. Check to make sure that your spark plug wires are in good condition. Although the replacement spark plugs have been gapped, recheck them to be at 0.040 (follow standard guidelines for changing sparkplugs). Do not re-install the rear three sparkplug wires until the fuel injectors have been changed. It's now time to move the transmission dipstick by firmly persuading it as shown to sit in the new location just to the left of the brake booster (see photos).



Fuel Injectors. Unplug fuel injector connectors, along with all vacuum lines and electrical connectors in the way of removing the fuel rail. Remove the four 10mm fuel rail retaining nuts. Remove the fuel rail from the manifold without disconnecting fuel lines. Place a rag under the injectors as removing them will cause fuel to spill. Remove the injector retaining clips and pull all the fuel injectors out of rail, making sure that no "O" rings are left in the rail. Lubricate the two "O" rings on each new injector and install them onto the rail, re-inserting retaining clips. Re-install the fuel rail and the 10mm nuts. Re-connect the fuel injector electrical connectors, along with all other electrical connectors and vacuum lines. You can now route and install the three rear spark plug wires.



Stock Downpipe Removal. Place hydraulic jack at front cradle crossmember and raise vehicle being sure that the rear wheels are blocked from rolling. Support properly with jackstands on cradle. Unplug the rear O₂ sensor (plugged in tin tray next to catalytic converter). Now loosen and remove the two 14mm bolts at the back of stock downpipe along with the two 13mm nuts holding the stock downpipe to the rear manifold. At this point you should be able to remove the rubber hangers, and slide the downpipe towards the rear of the car allowing it to drop out, and remove it entirely. Remove the O₂ sensor from the stock downpipe. Discard both gaskets (metal and composite, one at the rear manifold, one at the connection between downpipe and rear exhaust system) as new ones are provided. Inspect the surfaces at the rear manifold and the rear exhaust system, cleaning the surface any of old gasket material as necessary with sandpaper.



Engine Position. In the engine compartment, remove the 15mm bolts holding the top engine mounts at engine, allowing movement of the drivetrain. Tilt engine towards front of vehicle, and install 7" 2x4 spacer (or other suitable hard material) to keep engine pulled back.



Block Off Plate / Wastegate. Install new thin metal gasket at the rear manifold outlet (from underneath car) and install block off plate (with loosely installed wastegate) over rear manifold studs. Hand tighten passenger side nut ONLY, leaving drivers side nut NOT installed.



“Y” Pipe / Crossover. Install the new “Y” pipe crossover using the four M8 black Allen head bolts provided. The front two bolts are M8 x 55mm (longer) with large round washer. The rear two bolts are M8 x 50mm (shorter) with small round washer. Note that all four Allen bolts should only be loosely installed at this point to still allow for full movement of the crossover. The cupped end seats on the front manifold. Use anti-seize on all bolts.





Top Downpipe / Turbo. Next you'll be installing the top downpipe. This is the shorter of the two pipes provided. With the motor still pulled back, lift the brake booster vacuum line and fuel lines while snaking the downpipe into position as shown. You can now remove the 7" spacer which was holding the engine back. Place the turbo into



position as shown paying attention to how the oil return line drops next to the trans oil cooler lines. Leave the oil return hanging below the vehicle for now.



Using the two turbo gaskets (rectangular and circular), install all turbo bolts (3/8 x 8) to the crossover and downpipe using washers, nuts, and lock washers as shown. All major nuts, bolts and washers are pre-placed in components to help you determine what goes where. Tighten bolts on turbo outlet tightly, while leaving remaining bolts on rectangular flange hand tight. **BE SURE**



to use anti-seize here as these connections get very hot and will seize over time. Tighten well enough to ensure no exhaust leaks without reaming on bolts. You can now install the primary O₂ sensor in the bung provided in the upper

downpipe about 12" down from the turbo. The connector is long enough to reach, so just plug it in.



Lower Downpipe. Install the lower downpipe by first sliding the bracket (PHOTO) up and onto the rear manifold stud (driver side), very loosely install the second 13mm nut now. The lower downpipe should have full movement to swing at this point. You will notice that where the top and bottom downpipe join there are nuts pre-welded on opposing sides. This is to make installation

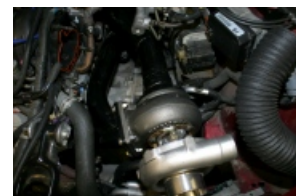
easier. You will now need to make this connection. First install and loosely fasten 3/8" x 1.5" bolt with large round washer from under vehicle ensuring to leave enough space between flanges to allow installation of gasket. In engine compartment, slide in the new



2.5" universal gasket (one side slotted to slide in). Now with the gasket properly lined up, start the other 3/8" x 1.5" bolt with large round washer. Working one side, then the other to insure a properly aligned connection, tighten a few turns at a time until the connection is complete and snug, but not tight. Don't forget to also use some anti-seize here, another hot area connection.



Tightening Things Up. The next step requires the vehicle to be lowered back down to the ground, onto the tires. Now it's time to tighten the bolts at the crossover using some extensions and universal joints with your ratchet. Pull up on the turbo so you are pulling it up and toward the intake manifold. While pulling up, tighten the front crossover bolts. First the top one, then the bottom, getting them nice and snug enough to hold the turbo up on their own. Note that these bolts should be installed evenly, working one bolt, then the other, into the manifolds. What we are trying to do is bring the top downpipe as close to the valve cover as possible pulling it away from the brake booster. The end result should be a pipe which is evenly spaced between the brake booster and rear valve cover, biased closer to the valve cover. You should also see about 1/4" between the top downpipe and the bottom of the master cylinder. Note that this procedure can be tricky, and requires additional attention and time towards orientation. You can now tighten up the rear crossover connection snugly, then go back to the fronts for a strong tightening, and back to the rear connection for the same torque. With the crossover tightened into place, you can now finish tightening all the turbo bolts tightly. Tighten the top-to-bottom downpipe 2.5" flange union bolt (3/8" x 1.5") from engine compartment. Note this is in a tight space and will require extensions and universal joints.



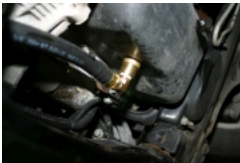


Wastegate. Use the two 5/16" x 1" black Allen head bolts with small black lockwashers to fasten the top downpipe to the wastegate tight. Be sure to place the wastegate outlet gasket between this connection first. You can

tighten the two pre-installed Allen bolts holding the wastegate to the block off plate using a 1/2" wrench and right-angle Allen key. Tighten these bolts tight.

Final Connections. Raise vehicle as per previous instructions paying attention to all safety measures. From underneath the vehicle, tighten the 3/8" x 1.5" bolt fastening the 2.5" universal flange union (top to bottom downpipe). Using a 13mm deep socket on a universal joint, tighten the two nuts holding the block off plate to rear manifold. The rear exhaust connection is now ready to be made. With a clean surface, install one of the 14mm factor bolts loosely. Slide in the second 2.5" universal slotted gasket and start the second 14mm bolt. You can now start tightening the two bolts a bit at a time making sure to have a good square connection with no leaks. Tighten this connection very tight. Connect the rear O₂ sensor, and mount the rubber hangers.

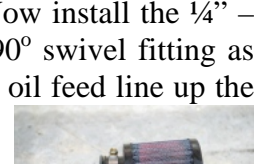
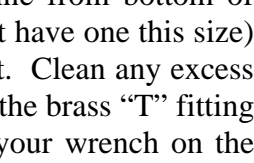
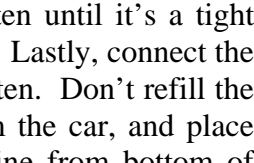




Oil Feed and Return. First drain oil, and change oil filter. Be sure to replace oil drain plug before continuing. For the oil return line, the necessary connections to the turbo are pre-done for you. All that is left is for you to make the connection to the oil pan. The kit has been designed so that you don't have to remove the oil pan, making the installation a lot easier and less time consuming. You now have to remove

the low oil level sender by unplugging it, and unscrewing it from the oil pan. You can now install the brass oil return fitting provided (tightly) using a vise-grip, and then install the

brass 90° elbow into the return fitting and tighten until it's a tight connection, and oriented as shown in the picture. Lastly, connect the oil return line (AN-10) to the 90° elbow and tighten. Don't refill the oil yet. Remove the passenger side wheel from the car, and place aside. Remove power steering pressure feed line from bottom of pump, and move to the side. Using wrench (or vise-grips if you don't have one this size) remove factory oil pressure sender. Allow oil to drain from oil outlet. Clean any excess oil off of female threads on engine. Now install the factory sender to the brass "T" fitting as shown. Install the "T" fitting into the motor and tighten using your wrench on the sender to ensure a tight fit to the engine in the orientation shown. Now install the 1/4" – AN fitting into "T" fitting. Lastly you will install and tighten the 90° swivel fitting as shown. Attach the feed line to the 90° fitting and tighten. Route the oil feed line up the firewall keeping it away from anything moving (belt) or anything hot (exhaust manifolds). Tie-wrap the feed line to make sure it doesn't move. Route the oil feed line (as shown in picture) on engine and connect to turbo. Re-install the power steering pressure line to power steering pump. Re-install the wheel and lower the car. Once lowered, be sure to tighten wheel nuts to factory specification. Fill the engine with fresh oil and install K&N valve cover breather on filler neck as shown. The filler cap is no longer needed.

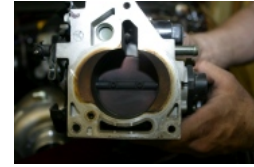


Transmission Oil Dipstick "Re-shaping".

Place a rag on the new top downpipe between the downpipe and trans dipstick. Pull the tube back towards the front of the car, placing it against the downpipe and bending it to the contours of the pipe. See photos.



Re-installing the Throttle Body. Before re-installing the throttle body, it has to be modified. Shown in the picture is the pcv passage which has to be tapped and plugged. To do so, use the supplied 5/16" – 18 tap and the closed end of a 7mm wrench to carefully tap down about 1/2". Be careful to watch that you are tapping perpendicular to the face of the throttle body. Use some pressurized air to clean out the area and, with some silicone or loc-tite, install the 5/16" Allen plug provided with the tap. Be sure that the plug is at least flush with the TB face, or recessed. At this point, you can re-install the throttle body in the reverse order of removal. Simply slide it on to the three studs, and tighten the three 10mm nuts.



Air Filter. (*This step will require cutting.*) The air filter comes pre-assembled to the flex-hose intake. Remove inner fenderwell screws (three inner and two lower) to give access to inner fender area. Remove the bottom 10mm bolt inside the fender that holds fender bracket. Remove the speed clip which the bolt screws into. Now cut the top portion of the fender-brace from engine compartment as shown in photo. Now place filter and intake pipe into fender from the bottom of the car (bottom of fender) and fish intake pipe through new opening and onto turbo inlet using 3" band clamp provided. Tie-wrap the intake tube inside fender to keep filter from moving. Re-assemble inner fenderwell.

Intake Pipe. Just about the last step here is the install the intake pipe. The blow off valve has been pre-installed on it, and just requires the vacuum connection. Using the four T-Bolt clamps, install the pipe as shown in the photo. Make sure the clamps are tight as boost can blow them off!



Vacuum Lines. Remove the vacuum line for the HVAC system (this line is plugged into manifold right next to the large brake booster line) from the intake manifold. Install vacuum line system as shown in picture. The lines are labeled, and have four connections. These are: engine manifold, HVAC system, wastegate and blow off valve.



Inspection and Final Steps. Reconnect the battery and place the vehicle back in park. Remove the wheel blocks and start the car. While vehicle is warming up, perform a thorough check for any oil, vacuum, coolant or exhaust leaks. It is very normal for some smoke to burn off of the manifolds and other parts of the drivetrain as it burns off hand oils, fluids, etc. Also note that if you have ceramic coated pipes, they will smoke and smell slightly for the first few hours of operation. This is a good time to shut the car off, and verify your coolant and oil levels to be sure they are normal. Also run the car to verify trans oil levels. Under **NO CIRCUMSTANCES** should a newly-turbocharged vehicle be driven hard right away. To ensure that everything is operating properly, drive the car while slowly depressing the accelerator, making sure that the drivability of the vehicle is normal. A boost gauge is highly recommended to monitor boost levels. If the wastegate vacuum line were to pop off, boost levels will exceed the safe operating levels and can most certainly cause engine damage. Cartuning Performance has shipped the wastegate set to 9-10psi, which allows the vehicle to make generous hp using 91 or greater octane (minimum required) with no engine ping or drivability issues. Use the highest octane available in your area at all times. For turbo applications, Cartuning Performance recommends using Synthetic oil as oil operating temperatures are much higher with a force-fed engine. Don't forget about the "Case Learn" you have to perform on the PCM by either a dealer, local mechanic or other qualified person. Cartuning Performance does not recommend increasing boost pressures unless your vehicle has the modifications to support higher boost levels (such as an upgraded transmission, valvetrain work or intercooler).

Your suggestions and opinions will help us make a better kit for you, the end user. Please forward all comments and suggestions to kevin@cartuning.ca, along with any installation questions you may have before or during your installation. If for any reason you are not able to obtain information in a timely fashion, you can call our Technical Support line at 1-416-863-TUNE (8863) from 9am to 6pm Eastern time.



Thanks again for supporting Cartuning Performance,

The Cartuning Team.

Earlier Model “W”-Bodies

Of course, not all vehicles are built equal! Through multiple installations, the Cartuning Team has found that certain vehicles require some special attention outside of the standard installation instructions. Because a turbo system generates so much under hood heat, we ask that the installer use common sense and look for any wire loom, heater hoses, aftermarket accessories that could be too close to piping or newly installed hot object as we don't want them to melt, causing malfunctions or worse.

An example of this is the 1997, 1998, and some 1999 model year W body vehicles. The ABS module wiring loom, and heater core hoses at the firewall are *slightly* different from those on the later model vehicles. The ABS module requires that you cut a wire loom loop,

and move the loom out of the way of the top downpipe. The two photo's to the right show how the wire was in the way, and then easily fixed with a relocation and wire-tie.



Another issue an early-year “W” body will experience involves the heater core hoses. Because the earlier year W body vehicles did not have a bracket to hold the heater core hoses tight to the firewall, they will interfere with the wastegate. Again, a couple tie-wraps as shown will hold them out of the way and away from heat, etc.... or you can buy the bracket from GM as well.

Finally, be aware before performing an installation that pre-1999 vehicles require a coolant bottle reservoir change to the 99+ style to allow room for the turbo to sit properly without fitment issues.

Use these suggestions, and please remember to use common sense when performing any installation on your daily driver, as a few extra minutes now can save big headaches later.

The Cartuning Performance Team.