

UNDER PRESSURE



Pumping up a 2004 GTO with a little help from Magnuson

Story and Photos: Chris White

What do you do when your 2004 GTO just doesn't have quite enough power for your liking? Well there are a myriad of solutions available including nitrous, heads and cam combos or other power adders; but what if you want to keep the stock gas mileage and a have a factory appearing engine bay? Well there is pretty much only one solution; a Magna Charger supercharger. Utilizing OEM quality components and design the Magna Charger supercharger kit for the 2004 GTO is the only way to fly if you want your under hood to shine in both appearance and factory quality. Magnuson makes supercharger kits for many GM vehicles including the C5 Corvette and full size trucks, all yielding impressive gains with an OEM engineered appearance to boot. Magna Charger Superchargers utilize Magnuson superchargers, renowned for their robustness and ability to meet stringent OEM engineering requirements. These supercharg-

ers are commonly found on top of the GM 3800 Series II-III engines, the Ford Lightning, Harley Davidson edition trucks as well as the previous generation Mustang Cobra.

The GTO Magna Charger kit is a phenomenal piece that includes a Magnuson MP112 supercharger fitted atop an intercooler heat exchanger that's sunk into the custom cast aluminum intake manifold. It's this phenomenal engineering that makes installing a Magna Charger supercharger just slightly harder than an intake manifold swap. The kit includes everything you need to install it except tools and someone to help you set the supercharger; this includes the supercharger, heat exchanger, intercooler coolant reservoir, and a Superchips micro tuner for the PCM as well as tons of miscellaneous installation hardware. So buckle up and follow along as we add some serious torque to an otherwise stock 2004 GTO!

It looks like quite a bit, but the Magna Charger kit is actually a breeze to install. Read on to find out the all the tricks of the trade to make getting it on your GTO easier!



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1 Our patient ready for some mild surgery, a 2004 six speed GTO with about 1300 miles on the clock.



2 First we'll start off with the easy cosmetic stuff, remove all the hood pad retainers using two screwdrivers or a crows foot type tool. Next remove the front radiator cover which is attached using push pins.



3 Next remove the battery from the vehicle.



4 Remove the factory intake system, including the airbox, not the MAF connector hidden towards the bottom of the tube that needs to be disconnected as well. You might want to find a place to put all your stock parts now as quite a few more will be coming off.



5 Remove the throttle cable, IAT and TPS connectors from the throttle body. Now would also be a great time to remove the PCV hose that connects the throttle body to the passenger side valve cover.



6 Using a 15mm wrench remove the factory accessory belt, leave the lower air conditioning belt in place.



7 Remove the injector wiring harness from each individual injector. Next remove the injector harness retainers from the fuel rail and finally remove the ignition harness connector from the valve cover. Note the connector retainer must be removed as pictured first.



8 Using a small flat blade screwdriver (or other pick type tool) gently depress the Schrader valve on the fuel rail to relieve any excess fuel pressure (wear safety glasses!). If the car has been sitting for awhile it's likely that most of the rail pressure may have bled down by now



9 Using a fuel rail removal tool (Dealership J-Tool Shown, you should be able to get a consumer version from any auto parts retailer) remove the fuel line connector from the fuel rail. The line may still contain some gasoline so you may want to keep a few rags under it while you remove it.

10



Remove the MAP sensor connector, brake booster hose and accessory vacuum line from the intake manifold. At this point you're almost ready to remove the manifold!

11



Using either high pressure air or a vacuum, remove all the dirt and other debris from the perimeter of the intake manifold. We don't want anything falling into the cylinders during the removal of the manifold!

12



Remove the ten intake manifold to cylinder head bolts and gently remove the intake. Be careful to check for any wires or vacuum lines you may have missed as the intake is made of composite and could crack under undue stress.

13



Using masking tape, carefully tape up all the intake ports on the cylinder heads. This will keep unwanted parts and particles out of your cylinder heads.

14



Now is a good time to break out the high pressure air again and blow off the valley cover plate.

15



After clearing any remaining debris, remove the knock sensor covers and the knock sensor connectors.

16



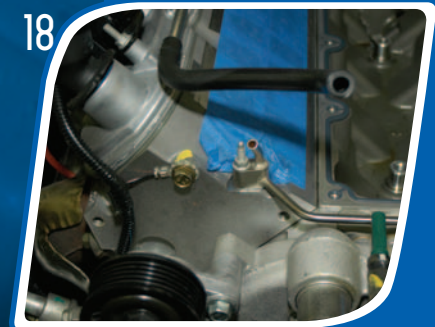
Next remove the knock sensors from the valley plate, it's a good rule of thumb (even though in this case it probably doesn't matter too terribly much) to put them back in their respective holes during reassembly.

17



Remove the 13mm perimeter bolts for the valley plate and remove the plate, it will not be re-used here.

18



Remove the factory coolant transfer tube that runs from each side of the cylinder head to the throttle body (shown here) and replace it with the Magnuson included piece with the stock bolts, torque to 106 in/lbs.

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19 Remove the factory serpentine belt tensioner and replace it with the Magnuson provided unit, note the location of the spacers between the mount point and the tensioner it self, torque to 37 ft/lbs.



20 Using the original gasket, set the new Magna Charger valley cover in place and run the included 5mm allen bolts down snug by hand.



21 Torque the valley cover bolts to 18 ft/lbs in a criss-cross pattern.



22 Install the knock sensors in their respective locations and torque them to 15 ft/lbs



23 Using some of that now famous blue masking tape, tape down the knock sensor wires in the channel cut into the valley cover. Next apply a small dab of RTV every two inches or so, securing the wires into the channel



24 Install the included o-rings into the recessed holes in the valley cover, this particular hole goes into the valley cover but NOT into the supercharger so don't worry if you don't see a hole in the intake manifold mating to it.



25 While the RTV is curing on the valley cover turn your attention to the stock intake manifold. First we have to bend the throttle body vacuum lines to clear the intercooler assembly; this procedure is discussed at length in the included instruction manual. Now simply remove the throttle body and MAP sensor from the intake manifold. The MAP sensor is located at the rear of the manifold and simply unclips and pops out.



26 Now install the stock throttle body (with supplied gasket) and the MAP and IAT sensors back into the supercharger assembly. Make sure you use the included "lubriplate" to lubricate the MAP and IAT sensors before installing them into the manifold.



27 Next install the included intake manifold gaskets into the manifold. Note the retaining tab as they will only seat one way.

28



Remove the factory plug on the driver's side PCV port; this will be used with the Magna Charger assembly.

29



Mix up some mild detergent soap and water in a cup and gently wipe the cylinder heads down with it; leaving a mild film to help seat the manifold.

30



Finally set the intake manifold on the heads and using the supplied manifold to head bolts line up the assembly. This is a two person job so make sure you have someone to help you when you get to this part of the operation.

31



Torque the intake manifold bolts in sequence (shown) in one pass to 44 in/lbs then in a final pass to 89 in/lbs

32



Now install all the injector harnesses, ignition harnesses and fuel line.

33



Connect all the coolant tubes and vacuum lines to the supercharger per Magna Chargers instructions. You also have change out the vacuum brake booster hose and check valve as well.

34



Install the new serpentine belt included with the Magna Charger kit (this kit comes with everything doesn't it?).

35



Now we get to tackle the intercooler heat exchanger plumbing, first begin by installing the rubber insulators on the heat exchanger as instructed.

36



Next remove the lower fascia cover and windshield washer fluid reservoir. Using some masking tape to mark off the location measure and the holes to mount the intercooler pump according to the instructions.

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With the pump mounted, using the included wiring harness and fuse tap, tap the "Automatic Transmission" fuse in the under hood fuse block (pictured) to power the relay. Use the positive terminal on the fuse block to power the pump and the adjacent ground to ground.



Set the heat exchanger into it's new home in front of the radiator (it clips to the radiator and bolts in just above the power steering cooler) Route the coolant hoses as instructed; note the location of the drivers side hose as shown.



Using some sort of adhesion promoter (in our case body prep solvent) clean the underside of the intercooler overflow tank, and the top of the battery. Apply the included Velcro to the top of the battery and the bottom of the intercooler overflow tank, attach the lower intercooler hose before affixing the tank to the battery.



Fill the intercooler system with 50/50 blend of water and coolant, it may take a few minutes to pump out all the air pockets so leave the cap off. Now is a good time to install the included K&N filter in the stock airbox.



Magna Charger recommends simply removing the screen from the stock MAF for more flow, however in the interest of keeping all the stock parts "stock" we decided to use a ported MAF end set from TByrne Motorsports. These beautiful pieces no longer have the center divider to obstruct flow and should be good for a few more ponies on the dyno as well.



Simply install the MAF and new intake tubing to the supercharger and your almost home free!. Power up the included Superchips tuner and install the included calibration, the whole process only takes a few moments and you simply follow the on-screen prompts. After flashing fire the GTO up and check for any coolant leaks and proper operation and clearances of all the parts you replaced; now it's time for a test drive!

On the street the new found torque was quite a surprise, the ability to generate tire smoke with ease was readily apparent. The engine felt as though it had grown a few extra liters in the low to mid RPM range, high RPM pull was also improved. Satisfied that everything was operating as intended we headed over to our next stop, Advanced Chassis Dyno in Sterling Heights. When we arrived shop owner Andy Dafski quickly got the blown Goat strapped down to the chassis dyno. On the dyno the car put down a healthy 382 horsepower after tweaking the throttle stop so that the throttle body would open 90 degrees, it's a well known fact that LS1 throttle bodies only open about 85% or so and this netted us approximately 10 RWHP (up from 372). As you can see the Magna Charger adds what it's known for in the supercharger world: a ton of area "under the curve" and massive amounts of tire smoking torque at low RPM's, typical for a roots style blower.

