

Tork Tech

Tork Tech Inc.

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*** PREMIUM FUEL MANDATORY ***

Make sure vehicle has 91+ octane gas in it prior to beginning installation.

ATTENTION!

Your Tork Tech kit is sensitive to corrosion! Take care of your engine coolant and IC fluid system by using 50/50 Anti-freeze with de-ionized (distilled) water

Tork Tech kits are designed for engines in good mechanical condition only. Installation on very high mileage or damaged engines is not recommended and may result in engine failure, for which we are not responsible.

Tork Tech is not responsible for the engine or consequential damages.



INSTALLATION INSTRUCTIONS

Terminator GT Kit

Thank you for choosing a Tork Tech kit for your Mustang or fast Ford. Please read this instruction manual all the way through before beginning work so you fully understand how each step is related to the entire installation.

Note – This kit is designed specifically to mate with the 2003/4 factory Eaton supercharger that came on the Cobra (Terminator) Mustangs. This was a 112 cubic inch displacement supercharger. A similar displacement unit from a F150 Lightning, GT500, GT Supercar, or other vehicle will not work as intended. A '03/04 Cobra specific positive displacement supercharger from K. Bell, Whipple, or some other manufacturer will also work and will likely be a near bolt on application like the Eaton unit is. Other non-Cobra specific units may also work but the customer will be responsible for any adapters to mate between their supercharger and the Tork Tech lower manifold. The alignment between the supercharger pulley and the provided Tork Tech secondary crank pulley must also be kept proper if another manufacturer's supercharger is used.

This Terminator GT kit does not provide every component that will be necessary for you to complete the installation of a 2003/04 Mustang Cobra Eaton supercharger on to a '99-04 Mustang GT or other 2V PI equipped fast Ford. It does provide all the necessary components to mount the blower on to a high flow lower manifold with integral intercooler that will mount to your cylinder heads and also everything necessary to be able to create a unique drive belt system for the supercharger.

How you plan to complete other aspects of the kit is up to you. You will need to complete the intake with a throttle body, intake kit and mass air meter/filter. The intercooler system also will need to be completed with a pump, heat exchanger, fluid reservoir and hoses/clamps. This setup will require an upgraded fuel system with larger fuel injectors and a high flow pump. It will require a revised engine coolant and thermostat setup. We

do include a revised thermostat housing and hose assembly with the kit. A revised computer tune will also be necessary. All of these aspects are left up to the customer as there are many options available to satisfy these requirements. Original Cobra components can be used or any number of aftermarket components can work successfully.

One general comment first before you get started: Tork Tech always welcomes your help in getting these instructions as accurate as possible. If you find anything lacking in this document please let us know and it will be updated to help future customers! Thank you for your help.

Disassembly Process



Disconnect negative ground cable from battery.

Before you begin working on your engine you may want to remove your hood for easier access. The hood will be coming off later since it does need to be altered if you do not have a raised aftermarket hood. There are two bolts per side on the hinge that are to be removed. A helper is definitely needed to remove the hood safely without damage.

Drain some engine coolant from the valve on the bottom of the radiator to allow for removal of the manifold and upper radiator hose later. **If your coolant is over 2 years old replace it with all new 50/50 coolant/distilled water mix upon reassembly.**

NOTE: There are many vacuum lines about the engine compartment. During the disassembly process it is recommended that you wrap each line

with masking tape when removed and mark on the tape its location or what it was attached to.



Remove mass air sensor to throttle body tube and take out the air box.



Remove all eight ignition coils.

Remove idle air valve, hose and silencer from vehicle.

Remove crankcase vent hose from vehicle.



Disconnect vehicle wiring harness connectors from ignition coils, throttle position sensor, idle air, EGR solenoid valve, EGR pressure transducer, temperature sensors, fuel pressure transducer, alternator, and fuel injector connections.



Disconnect throttle cable and cruise control cable and mounting bracket from intake manifold. The cables can now be easily detached from bracket with a pair of pliers.

NOTE: A different throttle cable may be needed with this kit, depending upon what throttle body and inlet is used. Customer to provide as required.

Remove vacuum hoses attached to the upper plenum.



Remove PCV hose from vehicle. Save all vacuum lines and elbows for reassembly.



Relieve fuel system pressure and disconnect spring lock couplings. A special fuel line removal tool is required for this.

Remove accessory drive belt.



Disconnect wiring, loosen alternator bolts and remove Alternator. (Set aside)



Disconnect EGR tube retaining nut at EGR Valve and remove EGR valve from upper plenum. Set aside valve as it will be reused later. Save EGR valve to plenum gasket.



Assuming some of the engine coolant has already been drained from the radiator you can now remove several of the coolant hoses.



Remove EGR Solenoid and Transducer from mount.



Disconnect the heater hose that goes to the rear of the manifold on the passenger side. See the arrow pointing to this tube. Twist the stock hose out of the way as it will be reused later.



Disconnect the upper radiator hose from the thermostat housing and the radiator. The hose will be reused but trimmed to fit the new setup. If your radiator hoses are more than 5 years old we recommend replacing them with new ones.



Unplug all upper wiring harnesses and remove intake manifold assembly as a whole unit.



Remove the two T-stat housing bolts and remove housing for reuse later. This can also be done later once the manifold is off the car. Note that the original Tstat housing will later be used on the bottom of the new housing.



Remove Intake Manifold Gaskets and inspect for any wear or torn areas. *If there are any concerns at all we recommend you purchase new gaskets as these must be in like-new condition to insure a proper seal during reassembly.*



Remove all the intake manifold bolts.



Vacuum any debris from the intake manifold valley and around the intake ports. Cover the ports with rags to prevent debris from falling into the engine.



Disconnect water heater hose (rear on manifold to firewall) from firewall. (snap connector)



Use a knife to cut off the reinforcement wrap near the 90 degree fitting and also remove the line from the fitting as we will be reusing this fitting later. Once the fitting is separated from line you can clip it back into place on the firewall pointing towards the center of the car. A new hose will be attached to it shortly.



Remove the remainder of this coolant line (see arrow) that goes from the firewall to the front of the valley of the block. Also unclip the 90 degree fitting that feeds this coolant line into the heater core on the firewall.

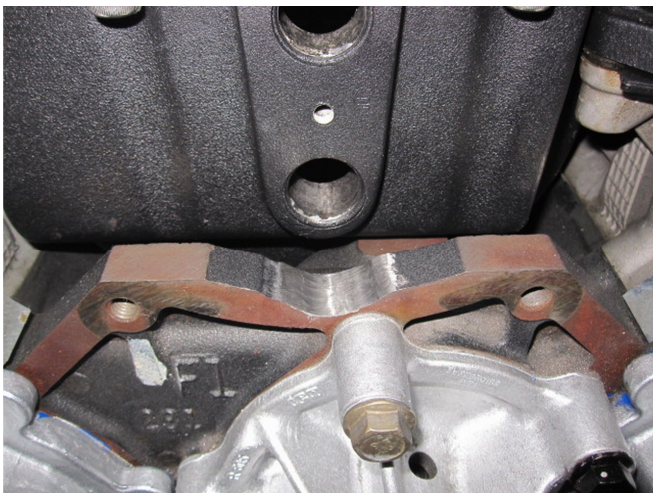
From the intake manifold assembly recently removed you need to take off the fuel rail assembly so it can be mounted to the new TTI manifold. Also take out the coolant temperature sensor that is screwed into the old manifold. It will be reused in the new manifold

Prior to installing the cross brace and the supercharger/manifold assembly you will need to create some clearance for the intercooler inlet/outlet tubes on the top front center part of your cylinder block. A die grinder makes quick work of this.

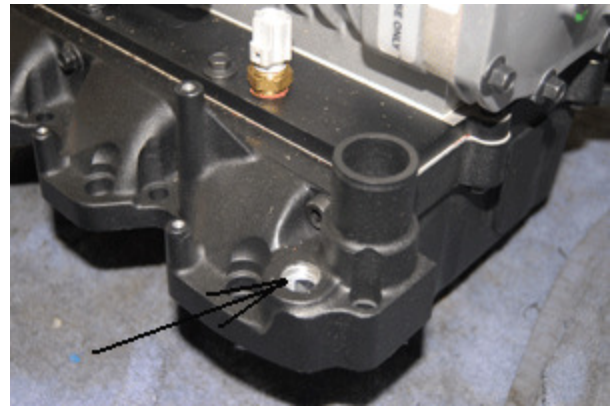




Notch the front center area of the block as shown with a die grinder for clearance of the Intercooler tubes that go in/out the front of the new lower manifold. The depth of cut should be at least 3/8" and the width of cut should be at least 3/4". Capture all chips with a shop vac so as to not cause any contamination issues.



For reference...Here is what this area will look like after the lower manifold is laid in place. Note the clearance needed directly in front of the lower IC tube hold.



Install the original coolant temp sensor into the new manifold before you install the fuel rail as it is very difficult to tighten after the rail is in place! Wrap threads with Teflon tape or equivalent to prevent coolant leaks!



Connection shown to block above, to heater core below. **NOTE: Make sure the front most clamps are positioned so that the screws are facing up or down as they may interfere with the placement of the new lower manifold if they are not installed out of the way.**



Use 5/8"heater hose (cut to approx. 25.25"long) connect it from the nipple in the front of the valley of the block back to the 90 degree fitting we prepared earlier on the firewall. Use a single hose clamp on

the firewall end and a double hose clamp on the engine block end. There MUST be sufficient slack in this line as the engine will move slightly on the motor mounts.

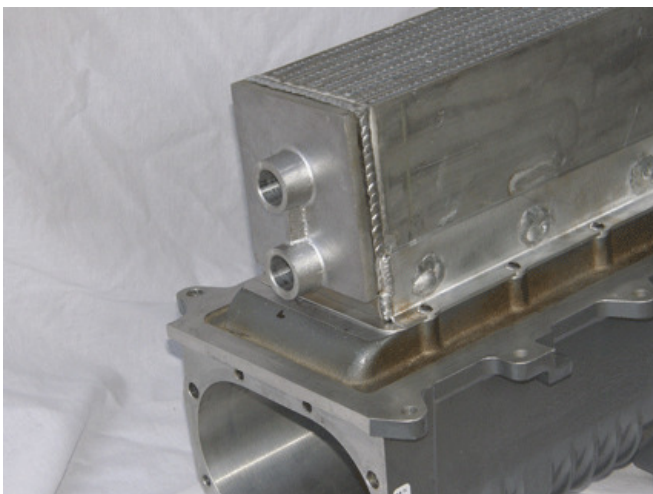
Now is a great time to install new spark plugs as we recommend using NGK TR6 plugs that are a bit colder than the stock plugs.

Manifold Assembly Process

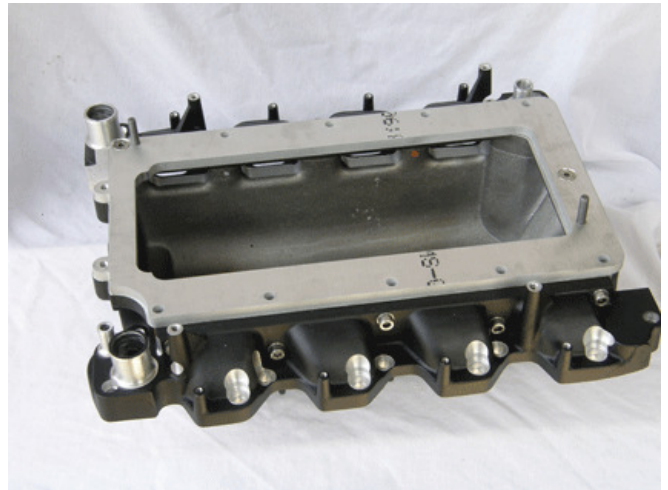


The supercharger case shown in all of these pictures obviously does not have the nose assembly attached or rotors installed.

Attach the TTI intercooler core to the bottom of the supercharger case with the “shield plate” sandwiched in between.



Intercooler shown attached to the supercharger case with the inlet / outlet ports properly facing forward.

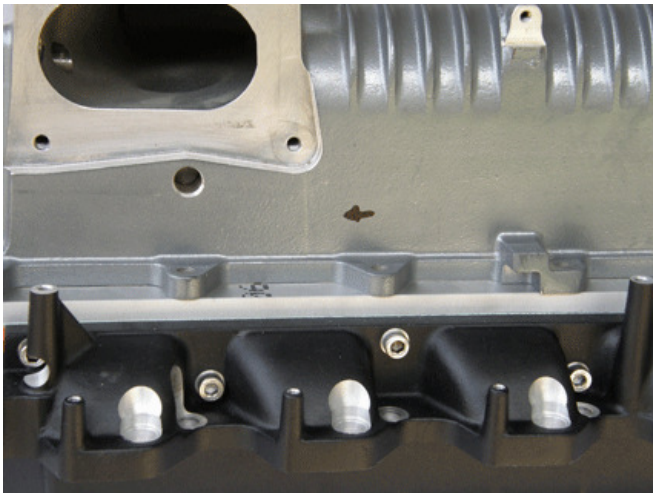


This picture shows the lower manifold with the adapter plate attached. Note the two flat head screws securing the plate to the manifold and the two studs sticking up.

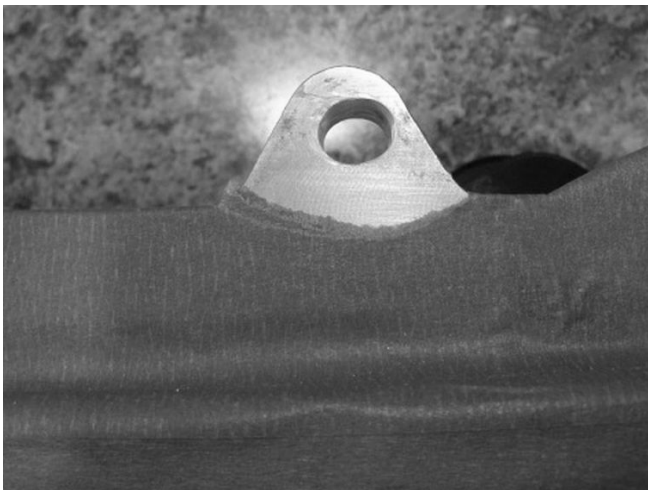


On the drivers side of the case, these arrows indicate that the drilled through mounting holes will need to be slotted approximately .150” in the direction indicated to allow the hole to align with the tapped hole in the Tork Tech manifold. Slot the hole using a round file or small deburring bit or sanding roll in a Dremel type tool or air grinder.

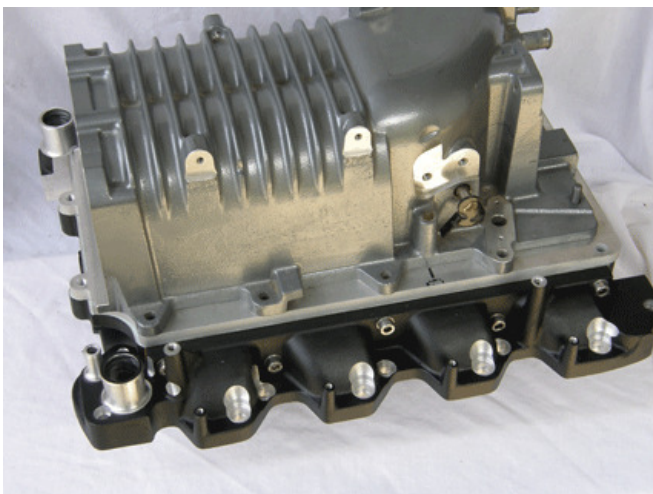
NOTE: Care should be taken to seal off the supercharger openings to prevent any aluminum chips or debris from getting into any of the openings. Seal off all openings with masking tape or rags and use a shop vac to clean up all material removed from the holes.



On the passenger side, this one mounting through hole also needs to be slotted in the direction shown.



For reference, here is hole shown after the required amount slotting.



Align the two orienting studs with the mating holes on the supercharger case. At this point the case can be attached to the lower manifold with the supplied hardware. Torque to approx. 25 ft-lb.

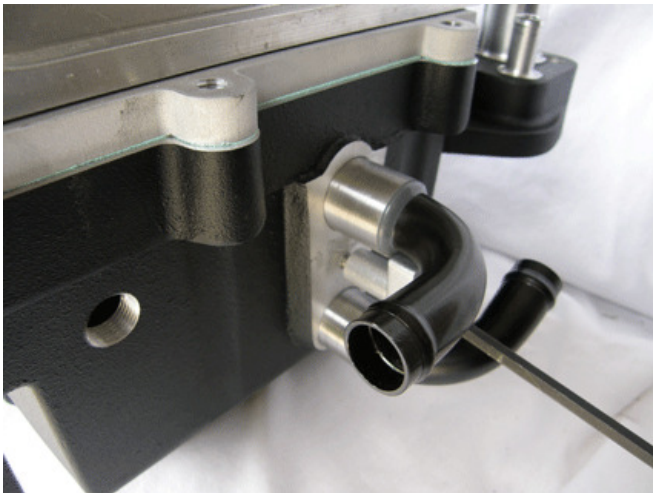


On the front of the Tork Tech lower manifold there are two o-ringed coolant fittings that need to be inserted into the intercooler core once the supercharger is attached to the manifold. *It is important that ONLY water with a few drops of liquid soap is used to lube the o-rings before they are inserted into the manifold. DO NOT USE OIL as oil may cause the o-rings to detonate.*





The upper outlet tube is to be directed to the passenger side and the lower inlet tube to the drivers side. The tube clamp is shown and ready to be inserted into the threaded hole between the IC coolant tubes.



Use an Allen wrench to attach the tube clamp as shown.

Use a screw in type (Motorcraft DY-1159) Air Charge Temperature (ACT) sensor and thread it into the tapped hole that is now located up on the passenger side by the #2 cylinder. Use some thread sealant on the sensor.



Picture shown is not a Cobra SC. The SC shown is for reference only.

Run a 1/8" vacuum line from the very bottom rear of the TTI manifold to a small vacuum fitting on the Cobra inlet plenum. A "T" fitting may be necessary to achieve this vacuum line. We recommend you use a small zip tie to firmly secure the vacuum lines at each end. This is to vent engine oil that will accumulate in the plenum from the PCV system. NOTICE the notch in the passenger side of the lower manifold. This notch is important in the next step and during the installation of the manifold/supercharger assembly.

Cross Brace Assembly



We recommend installing the cross brace assembly before the manifold/supercharger is put in place because the nose of the supercharger will be in your way. The first step to installing the cross brace is to take out the two upper front cover bolts. The image above shows two studs in place of these bolts but we now provide long bolts to attach the cross brace at these points.



Remove the power steering reservoir and its mounting bracket.



A new tension arm that is included in our kit will likely be attached to the cross brace assembly but take out the 3 bolts and remove it before attaching the cross brace to the two studs.



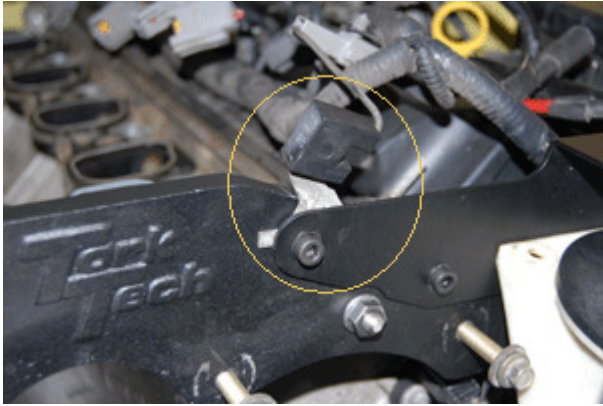
Install the cross brace using the two long bolts and thread them into the upper front cover tapped holes and fasten to approx. 25 ft-lb. We recommend installing a NEW accessory belt and the belt needs to be positioned now for proper routing and installations shortly. There is a third attaching point for the cross brace in the middle. Attach the long center Allen head bolt into the recessed hole and the stiffening sleeve that goes back to the block, but first place your new belt into position so the bolt/sleeve is in the middle of the belt. The Allen bolt and sleeve is individually removable so that the accessory belt can be changed without having to remove the cross brace assembly.



Refasten the 3 bolts that hold the new tension arm to the cross brace.



There are two noise suppression capacitors (one on each side of the engine) and these need to be attached to the front cross brace. There are several good places to attach these but we put the passenger side one into the left most hole on the cross brace along with a miscellaneous bracket. NOTE that this is temporary as the IC fluid reservoir will soon bolt in this position also.



The drivers' side suppressor can be attached to one of the bolts that hold the new power steering reservoir bracket.



There is a studded bolt that goes into the front cover down by the power steering pump that must be modified to allow the engine accessory belt to move freely due to its new routing. It is shown in

the picture above. Remove the bolt and cut the stud off flush and reinstall. There is also a battery cable bracket that should be unbolted and removed also and it is shown to the right of the modified bolt.



Attach the alternator to the cross brace with the pulley facing towards the engine. Use a bit of Loctite on these bolts to prevent loosening.

You can now install your new accessory belt.



Attach the power steering fluid reservoir to the new bracket.

Prior to installing the supercharger/manifold assembly the coolant line that was just installed MUST be pushed to the passenger side of the valley. There is a notch in the rear of the lower manifold and this is there for clearance because the coolant line must be run directly behind this notch. If the coolant line is not contained within this notch you will have restricted coolant flow to the heater core resulting in little or no heat to the cars interior on cold days.

Attaching the Manifold Assembly

Important: Prior to installing the supercharger/manifold assembly the coolant line that is installed in the valley of the block **MUST** be pushed to the passenger side of the valley. There is a notch in the rear of the lower manifold and this is there for clearance because the coolant line must be run directly behind this notch. If the coolant line is not contained within this notch you will have restricted coolant flow to the heater core resulting in little or no heat to the cars interior on cold days.

It is highly recommended to use two people when installing the supercharger/manifold assembly. This is rather heavy and you do not want to drag the bottom of the manifold on the gaskets.



Rub a bit of engine oil or assembly lube around on the o-ring surfaces of the gaskets to reduce friction prior to placing the blower assembly on the engine.



The assembly is to be installed with the rear tilted downwards at first so it clears the EGR plumbing and any vacuum lines and wiring harnesses and

then straightened up so it can be finally placed flush on to the lower manifold gaskets. Again, **DO NOT** drag the assembly on the gaskets or a coolant leak may develop if the seals are damaged. Once in place, verify that the coolant line going to the block valley has remained in the notch of the lower manifold during installation.



Attach the new manifold to the engine with the provided Allen head bolts. At the front and rear of the manifold on both sides there are longer bolts required than in the center. Several of these bolts can be difficult to reach and use of swivel sockets and ball end Allen wrenches is recommended. Torque to 19 ft-lbs + 90 degrees.



Note, the ACT shown above is now located on the upper passenger side.

NOTE: The above picture shows the reason for the clearance required on the cylinder block that we mentioned back on Page #7. **The IC fluid tubes will interfere slightly without this modification.**

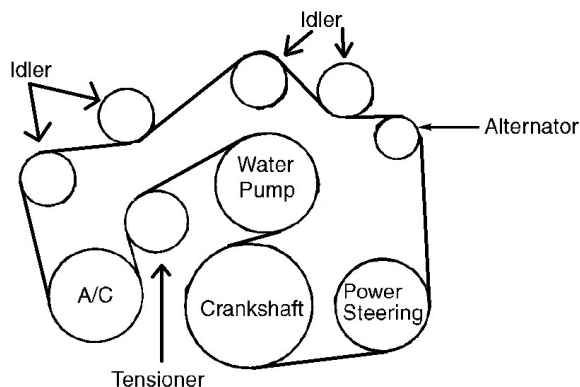
Secondary Crank Pulley Installation

A Romeo Engine Plant style harmonic pulley dampener **MUST** be used with this kit. If you have a Windsor engine you will need to buy a new Romeo pulley from your Ford dealership. To guarantee the perpendicularity of your new crank pulley to the crank centerline it is recommended you remove your old balancer and mill a flat mounting surface into the balancer. Mill just enough material from the balancer to create a flat pad for the new TTI crank pulley to mount to.



Using a balancer installation tool, install the new harmonic balancer and attach the new crank pulley to the front of it. Use Loctite on the bolts to prevent loosening. NEVER use a hammer to install a balancer. Torque balancer to 60 ft-lbs, loosen and retorque to 36 ft-lbs + 90 degrees.

At this point, the Cobra supercharger is mounted to the engine and the necessary components are in place to be able to drive the supercharger.



Here is the new accessory belt routing.

NOTE: The remainder of the installation is at the discretion of the customer. Remember that there is no “one best way” to complete these other tasks. Many alternatives are available to you so use those solutions which best suites your budget and skill level. Here are some suggestions for you.

First of all we suggest you look at and be familiar with the MP112 / TVS kit Installation Instructions as much of the work shown in detail there will address the issues you face to complete your kit. The work needed to complete your fuel system, intercooler fluid hose routing, IC fluid pump wiring, IC Fluid hose routing, heat exchanger mounting, and much much more is covered in these other instructions in detail. **These other instructions will likely help you a lot so don't forget to review them too!**

- Fuel system upgrades will be needed based upon power expectations. The 39# Cobra injectors are adequate at 400 RWHP or less and are easily found in good used condition and are very inexpensive. The SVT Focus or GT Supercar fuel pumps are relatively inexpensive and are adequate at these same power levels.
- Engine coolant / radiator lines will need to be completed. The stock lines can typically be reused but will need to be trimmed for best fit.
- The intercooler fluid system will need to be addressed and heat exchanger mounted. The stock Cobra heat exchanger is more than adequate at the 400 RWHP power level and many good used examples can be purchased inexpensively. A Cobra/Lightning Bosch IC fluid pump is recommended. A Cobra IC Fluid reservoir is a good choice or Tork Tech can provide its own tank as an option.
- Computer tune as necessary for safe air/fuel ratios. Tork Tech can provide you with a good safe “starter” type tune if desired.

- The intake path from the air filter to the throttle body needs to be completed also. We recommend a 90mm Lightning MAFS with a conical filter and a 90mm MAFS adapter. Several sources sell these three items together as a kit. Tork Tech can provide our intake tube to you separately as it fits nicely and is inexpensive. (See it below for reference) You can use other intake tubes as well as long as they have a oval throttle body opening. The stock Cobra Tbody is recommended or an aftermarket Cobra performance unit.



Shown above is the optional TTI intake tube between the MAFS and Tbody for reference.

EGR Issue:

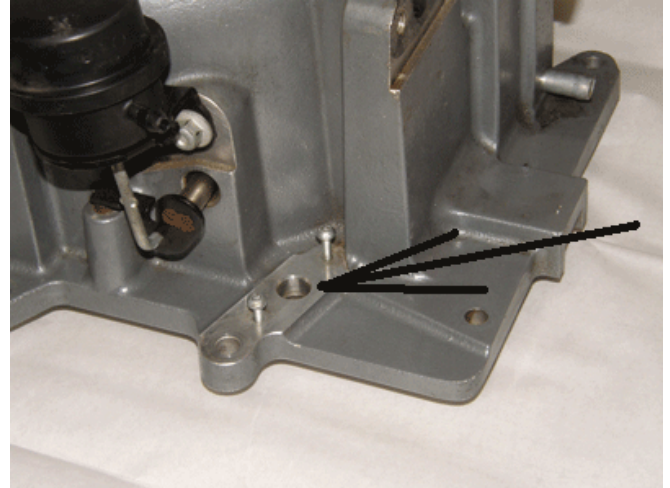
The EGR tube on the GT model will not mate with the Cobra plenum. We recommend you block off the port on the case and you remove the EGR tube and cap off the fitting. You will then need to turn off the EGR function during the computer tune.

If you wish to keep the EGR functional you will need to purchase a '03/04 Cobra EGR tube for use with this kit.

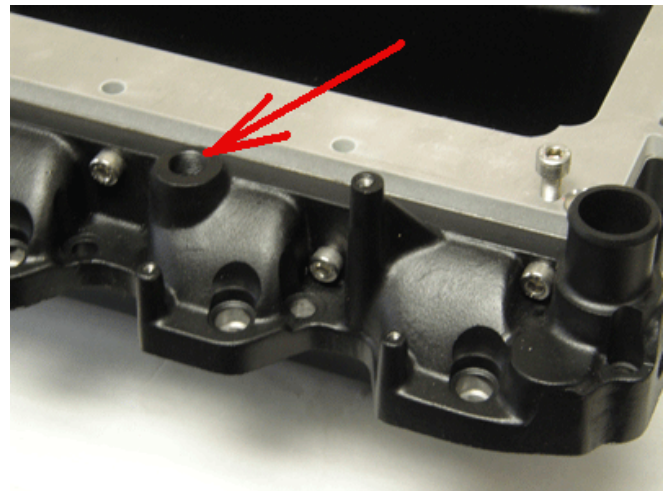
Cobra Air Charge Temp Sensor Issue:

The stock Cobra supercharger case has the ACT sensor located at the rear of the supercharger. Tork Tech provides a new location for their ACT (which is purchased separately by the

customer...Motorcraft DY-1159) so the stock hole needs to be plugged. We suggest you tap the hole with a 3/8" NPT thread and insert a 3/8" pipe plug with some thread sealant. Reuse the two existing mounting bolts and screw those into the adjacent drilled/tapped holes with some thread sealant if they are a through hole.



The old Cobra ACT location is shown above for reference. This must be blocked off.



The new ACT sensor is to be threaded into the tapped hole shown above and the wiring harness will need to be extended to mate with this new location. The '99-01 cars originally came with the ACT located in the intake path while the '02+ cars had the ACT located within the MAFS. See our MP112 / TVS kit instruction for more details on the new ACT.

Supercharger Belt Issue:

The customer provides their own supercharger pulley with this kit so we do not provide a belt as there are many aftermarket sizes available. To get a proper

belt for your setup we suggest you have someone helping you rock the SC belt tensioner arm to approximately half its travel and then another person can run a string about the belt travel path. With this estimated length you can go to a local auto parts store and ask for 3 or so 8-rib belts around this length...some shorter, some longer. Use the one that best fits your setup having the tensioner arm in the middle of its travel. We will be glad to post what has worked for others in a chart here if you know what size upper pulley you have and what belt worked well for you. Please send us your info.