

Ford Mustang GT - Garrett Tuner Turbo Kit

Bill of Materials & Precautions

Ford Mustang GT Twin Turbo

Part Number: 768674-0001

4.6I V8

Parts List			Required Other Items
Item	Description	Qty	
1	Exhaust Manifold R (765380-0004)	1	<ul style="list-style-type: none"> •Hi Volume Fuel Pump (we used Ford Racing P/N M-9407-GT05) •Hi Flow Fuel Injectors (We used Ford Racing 42lb/hr) •Ford Exhaust Pipe Studs (Ford P/N W707747S431) •Ford Exhaust Gasket (4 req'd) (Ford P/N 3L329448A) •Proper Heat Range Spark Plugs (We used Autolite HT) •Battery Relocation Kit (We used Summit SUM-G1231-K) •MAF Sensor (We used PMAS- 30T) •ECU Tuning Device (We used SCT Livewire) •Tial Blow-off Valve
2	Exhaust manifold L (765382-0004)	1	
3	Fluid line Kit (779931-0001)	1	
4	Gasket kit (716909-0046)	2	
5	Left Downpipe Upper (774802-0001)	1	
6	Left Downpipe Lower (777849-0001)	1	
7	Right Downpipe (765386-0001)	1	
8	Turbo Assy (739548-5001s)	2	
9	Fastener Kit (769959-0001)	1	
10	Installation Instructions (737639-0033)	1	
11			



Recommended Other Items

- Factory Service Manual
- Safety glasses
- Catch basins for engine coolant and engine oil
- Engine coolant (quantity per service manual)
- Anti-seize compound
- Oil filter
- Oil (quantity per service manual)

IMPORTANT INFORMATION - PLEASE READ CAREFULLY



We recommend that this turbo kit be installed by a qualified automotive technician. If you have any doubts as to your ability to install this turbo upgrade kit, consult with a local automotive repair company. Please be sure to carefully read all of the attached instructions prior to starting the installation process. If you have any questions about the enclosed parts or the instructions, call the distributor that you purchased the kit from for clarification.



Prior to the Garrett Turbo Kit installation, be sure that the vehicle is parked on a level surface and the engine is cool. Engine fluids and components can be extremely hot following normal vehicle operation. Avoid direct contact of engine fluids or components with your skin which may cause personal injury.

NOTE: It is recommended that the oil and oil filter are changed prior to running the Garrett turbocharger. This will provide clean oil to the new turbocharger. To ensure optimal performance, always follow oil and filter change intervals per the Factory Service Manual.

IMPORTANT INFORMATION - PLEASE READ CAREFULLY

Return Policy

Only unused and complete merchandise will be accepted for return subject to inspection and acceptance by Honeywell Turbo Technologies. No goods will be accepted without prior return authorization from Honeywell Turbo Technologies. No returns are accepted after thirty (30) days from original ship date from The Garrett Garage. All accepted returns are subject to a 20% restocking charge - NO EXCEPTIONS.

Damaged Shipments

The customer must file a claim with the shipping company if goods arrive in a damaged condition. The customer must also notify Honeywell Turbo Technologies with pertinent information.

Refused Shipments

Sending a shipment back to The Garrett Garage (or Honeywell) does not automatically give rise to a complete refund or credit. Honeywell Turbo Technologies may, at its sole discretion require different payment means for any shipment refused and then reshipped. It is the customer's responsibility to make all arrangements with Honeywell Turbo Technologies for disposition of refused shipments.

Shortage or Discrepancy Claim

Shortage or Discrepancy claims must be reported within forty-eight (48) hours of receipt of goods. Honeywell Turbo Technologies will either issue a credit or send a replacement(s) at no charge. Please contact garrett.iamcs@honeywell.com for instructions on how to address shortages or discrepancies.

Limited Warranty

Honeywell Turbo Technologies warrants to the original purchaser of its Turbocharger Products that such Turbocharger Products will, for a period of 1 year from date of shipment and subject to the Limitations on Warranty, be free from defects in materials and workmanship. For approved warranty claims Honeywell Turbo Technologies will, at its sole discretion, either credit the original purchaser in an amount equal to the original purchase price, or replace the applicable Turbocharger Product free of charge, within 60 days of Honeywell Turbo Technologies' approval. This is purchaser's sole and exclusive remedy and provides the complete financial responsibility of Honeywell Turbo Technologies for a warranty claim.

To be eligible for reimbursement, Customer must (a) submit all warranty claims to Honeywell Turbo Technologies within 30 days of the discovery of the alleged Turbocharger Product defect; and (b) complete and return a Returned Material Authorization Form. This form may be obtained from Honeywell Turbo Technologies at garrett.iamcs@honeywell.com.

When Honeywell Turbo Technologies requires the examination of a failed part, Honeywell Turbo Technologies will promptly notify Customer and will await receipt of the failed part before further processing the warranty claim. If Honeywell Turbo Technologies ultimately determines that the failed part is covered under the Limited Warranty, Honeywell Turbo Technologies will reimburse Customer for the actual cost of ground shipment for any part found to be defective.

IMPORTANT INFORMATION - PLEASE READ CAREFULLY**Limitations on Warranty**

The Limited Warranty does not apply to any parts: (a) not used in accordance with Honeywell Turbo Technologies' written instructions (b) for which no fault is found; (c) that have been modified in any manner not specifically approved by Honeywell Turbo Technologies; (d) for which an inspection indicates that reasonable and proper installation and/or preventative care and maintenance has not occurred; (e) that have been subject to damage attributable to or caused by misuse, abuse or vandalism; mishandling, improper shipping or other transit related damage; acts of god or insurrection; foreign object entry; any part not supplied by Honeywell Turbo Technologies; any repair, maintenance or service by anyone other than Honeywell Turbo Technologies; or any other acts that are beyond Honeywell Turbo Technologies' reasonable control; or (f) attributable to parts not supplied by Honeywell Turbo Technologies. Honeywell Turbo Technologies expressly disclaims any and all warranties relative to the foregoing circumstances.

Honeywell Turbo Technologies shall not be liable to Customer under any circumstances for any special, incidental or consequential damages, including without limitation, damage to or loss of property other than for Turbocharger Products; damages incurred in installation, repair or replacement; lost profits, revenue or opportunity; loss of use; losses resulting from or related to downtime of Turbocharger Products; the cost of replacement transportation, power, or compression; the cost of substitute products; or claims of third parties for such damages, howsoever caused, and whether based on warranty, contract, and/or tort (including negligence, strict liability or otherwise).

The Limited Warranty is the only warranty made by Honeywell Turbo Technologies for any of its turbochargers and related parts and/or services, and is in lieu of and excludes all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. Honeywell Turbo Technologies hereby disclaims all other warranties not expressly set forth. Some jurisdictions do not allow for the exclusion of implied warranties, so the above exclusions may not apply to you, however if implied warranties do apply they are limited to the original purchaser and for a period of one (1) year from the date of shipment.

Diagnosing Your Vehicle

Do not rely on diagnostic software without seeking the advice of an ASE certified mechanic. Diagnostic software should only be used as a general guideline to help you facilitate the repair of your car. If you experience or suspect any malfunction of vital safety equipment, such as your brakes, exhaust, motor, transmission, fuel delivery system, your car's structural integrity or any other potentially life threatening malfunction, cease driving your vehicle immediately and seek professional help. Always consult your owner's manual.

Vehicle Modification Notice

Any modifications to your car are AT YOUR OWN RISK. You should consult the owner's manual and service manual. You should also contact your car's manufacturer to determine what effects modifications may have on your safety, warranty, performance, etc. Please also contact your local authorities to determine whether your intended modifications will make your car illegal to drive on public roads. A vehicle modified by the use of competition parts may not meet the legal requirement for use on public roads. It is your responsibility to comply with federal, state, and local laws prior to driving your vehicle on public roads.

IMPORTANT INFORMATION - PLEASE READ CAREFULLY

ECU Reprogramming Notice

Turbocharger Kits require that the Vehicle's Engine Control Unit (ECU) be reprogrammed before operation. Failure to properly recalibrate the operating parameters can result in severe engine damage.

TUNER KIT

This kit is sold as a "tuner kit", meaning that some further fitment and fabrication is required to complete the installation. This is done to allow maximum flexibility for the installer to optimize the kit to meet the customer's requirements. Depending on how the kit is to be customized, some of the installation steps in this document may need to be completed in a different order, deleted, or new steps added to complete the installation. These instructions are intended only a guide to assist the mechanic's judgment.

OTHER PRECAUTIONS

Observe all safety precautions and warnings contained in the installation instructions. Wear eye and ear protection and appropriate protective clothing. When working under or around the vehicle support it securely with jack stands. Use only the proper tools. Exercise extreme caution when working with flammable, corrosive, and hazardous liquids and materials.

LEGAL INFORMATION

The Garrett turbo kits are for use off the public roadways. Federal law restricts the removal or modification of any part of a federally required emission control system on motor vehicles. Also, many states have enacted laws which prohibit tampering with or modifying emission or noise control systems. Vehicles which are not operated on public roadways may be exempt from certain regulations, however the buyer is strongly urged to check all applicable local and state laws and is ultimately responsible for compliance with the applicable laws and regulations.

Honeywell Turbo Technologies Contact Information

Please contact Honeywell Turbo Technologies at garrett.iamcs@honeywell.com for any questions regarding this Shipping>Returns/Cancellation Policy, for notifications to Honeywell Turbo Technologies, and for instructions on processing damaged shipments and authorized returns.

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Installation Instructions

1. Remove the battery and battery tray –

(Fig.1) Disconnect the negative lead first, then the Positive lead. Remove the battery heat shield. Remove the bolt and battery hold down clamp and remove battery. Remove 3 bolts and the battery tray. Relocate the battery to the trunk using a Battery Relocation Kit.

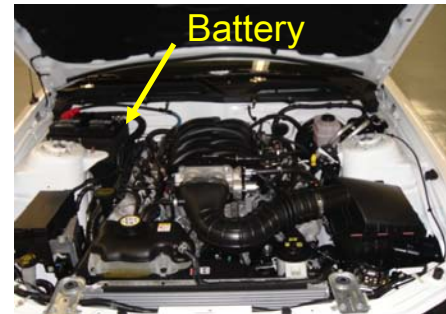


Fig.1

2. Drain oil and water – drain the engine oil and engine coolant.

3. Remove the Air Filter Assy – Disconnect the crankcase vent tube (Fig. 2) from the intake air duct. Loosen the 2 clamps and remove the intake air duct. Disconnect the mass air flow (MAF) sensor electrical connector (Fig. 3). Remove the air cleaner assembly bolt and gently pull the air filter assy from the vehicle. CAUTION: COVER THE THROTTLE BODY WITH A RAG TO KEEP FOREIGN OBJECTS OUT!

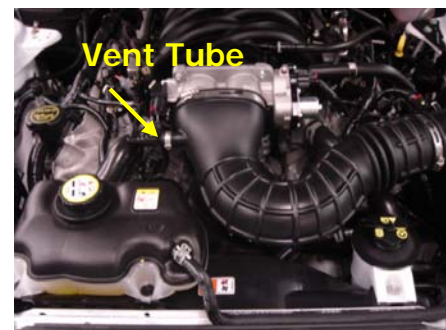


Fig.2

4. Remove the Exhaust Manifolds - PERFORM THE FOLLOWING WORK ON A COLD VEHICLE ONLY

- a. Raise and support vehicle. The use of a floor hoist is recommended. If you do not have access to one, use a hydraulic floor jack and jack stands to raise and support the vehicle.



Caution: Jack stands must be used on a level surface and be securely seated. Failure to do so may result in personal injury or vehicle damage.

- b. Disconnect the oxygen sensor and wiring retainer (1 per side).
- c. Disconnect Catalyst Monitor Sensors located on the catalytic converter (1 per side).

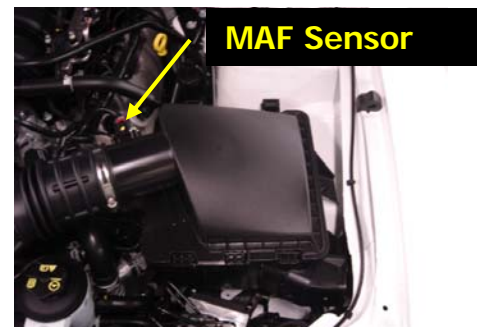


Fig.3

Installation Instructions

- d. Remove exhaust manifold to H-pipe nuts (2 per side).
- e. Loosen exhaust coupler clamps located between H-pipe and tailpipe.
- f. Remove lower exhaust manifold nuts and studs (4 per side accessible from underneath).
- g. Remove H-pipe.
- h. Remove steering column pinch bolt at rack and disconnect the steering coupling. **DO NOT ALLOW THE STEERING WHEEL TO ROTATE WHILE THE STEERING COLUMN INTERMEDIATE SHAFT IS DISCONNECTED OR DAMAGE TO THE CLOCKSPring CAN RESULT.**
- i. Remove dipstick and tube from the drivers side of the engine by removing one bolt on the cylinder head.
- j. Remove upper exhaust manifold nuts and studs (4 per side).
- k. Remove the exhaust manifolds from below.
- l. Remove the oxygen sensor from the drivers side exhaust manifold. Set it aside, it will be re-installed in step 7.c.4.
- m. Install Garrett manifolds with new exhaust gaskets. Install exhaust studs and nuts and torque to 34Nm (25 lb-ft) (8 per side). On the driver's side, it will be necessary to trim the upper front stud by 1/4" (6mm) to clear the manifold (Fig. 4).
- n. Install the dipstick and tube, and torque the bolt to 9Nm (80 lb-in).
- o. Install steering column on rack and tighten pinch bolt to 25Nm (18 lb-ft).
- p. Install the manifold support brackets as shown (Fig. 5a&b). Attach each bracket to the manifold with an included M8 x 12 6-point bolt at one end and with an existing fastener on the block at the other end. Torque the manifold bolt to 25Nm (18 lb-ft) and the existing fastener to 12Nm (100 lb-in)



Fig.4

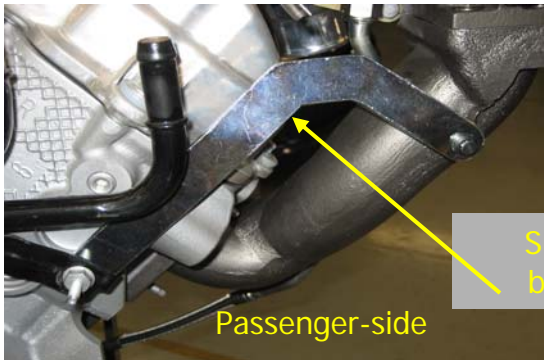


Fig.5a

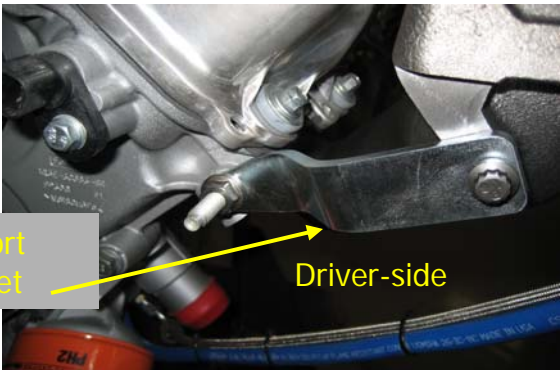


Fig.5b

Installation Instructions

5. Turbocharger Preparation –

- Test fit the turbos to the manifolds to determine the proper compressor and turbine orientation. Orientation can be adjusted by loosening the clamp bolts that hold the compressor and turbine housings to the center housing and rotating the housing to the desired location. The center housing oil drain must point down. Use the supplied adjustable actuator brackets and rod ends to position the actuator so that the actuator rod lines up with the wastegate crank and does not rub the lower actuator housing during operation (Fig 6).
- a. Prepare the turbos for installation – install the oil inlet fitting, the oil drain fitting, water inlet fitting, heat shield bracket and the down pipe prior to installing the turbocharger (Figure 7):
- 1) On both turbos install the -3 oil inlet fitting.
 - 2) On both turbos install the water inlet and outlet fittings with the supplied copper crush washer.
 3. On both turbos install the oil drain fitting using the two (2) 12-point bolts supplied (Fig. 8). Make sure the o-ring is in place. A spare o-ring is provided in the gasket kit.
 - 4) On both turbos install the heat shield bracket by removing the turbine housing bolt pictured. Install the bracket and torque the bolt to 200 lbf-in.
 - 5) On the passenger-side turbo install two (2) M8 studs in the turbine housing outlet flange as shown (Fig. 9a).
 - 6) On the driver-side turbo, install one (1) M8 stud in the turbine housing outlet flange as shown. (Fig. 9b) (next page)

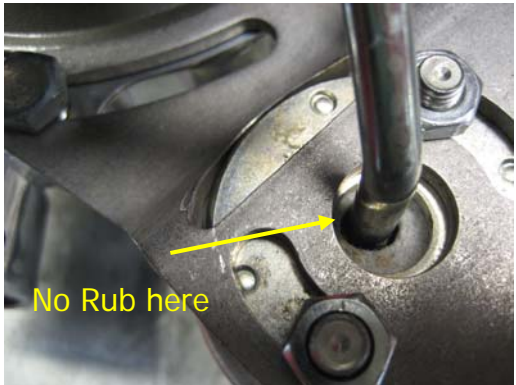


Fig.6

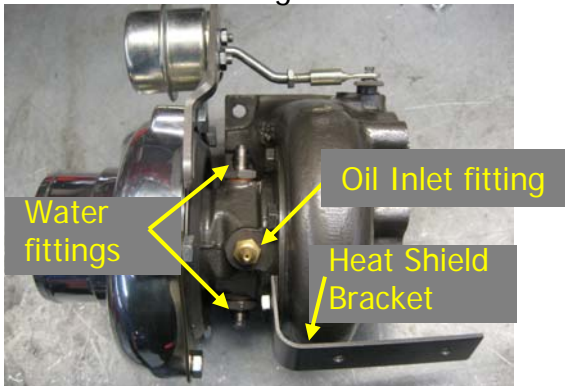


Fig.7

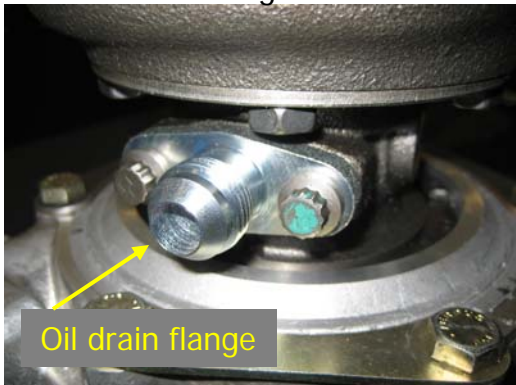


Fig.8

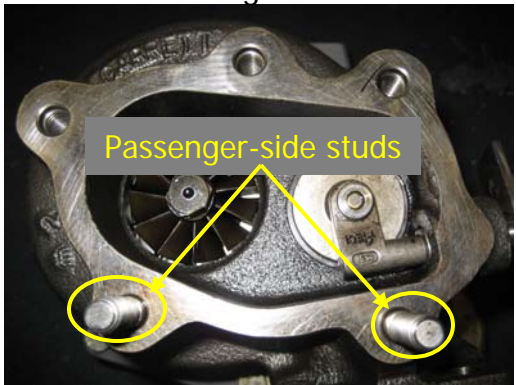


Fig.9a

Installation Instructions

6. Install and route the oil and water lines –

a. Oil Supply:

1. Disconnect the engine oil pressure sensor electrical connector located on the oil filter adapter.
2. Remove the oil pressure sensor and clean any sealant from the threads.
3. Take the supplied multi-port oil feed fitting and, using a light coating of thread sealant paste on the threads, thread it into the pressure sensor port and torque to 20Nm (15lb-ft). Mark the two most accessible holes with a marker. You may need to turn the fitting slightly one way or the other to get two holes to be optimally positioned.
4. Now remove the fitting and install the four supplied plugs into the holes without the marks. Re-install the multi port oil feed fitting and tighten to the same position as in the previous step.
5. Install the two supplied -3 fittings into the two marked holes, and torque to 20Nm (15lb-ft). (Fig 10)
6. Apply new thread sealant paste to the threads and install the oil pressure sensor into the multi-port hole and, holding the multi-port fitting to prevent it from moving, torque the oil pressure sensor to 20Nm (15lb-ft) (sensor connector may need to be modified to fit) .

- b. Coolant Supply: Remove the plug on the block (driver’s side rear). Trapped coolant in the block will drain out. Apply thread sealant to the adapter and install as shown. Tighten to 25Nm (20lb-ft). Now fit the Tee swivel fitting and position the fitting as shown (Fig. 11) and torque to 25Nm (20 lb-ft).

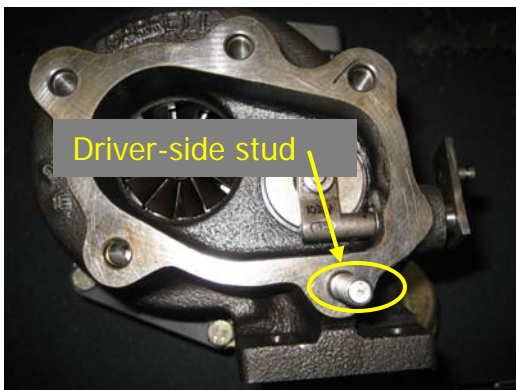


Fig.9b

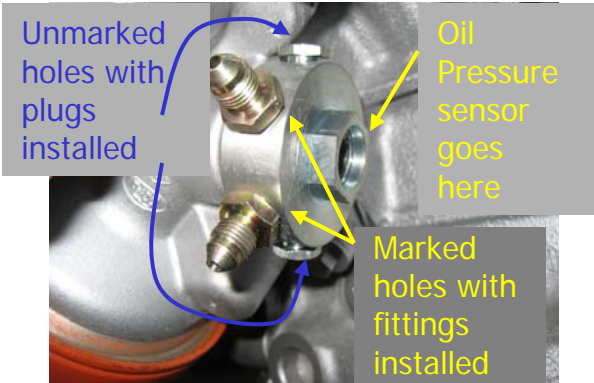


Fig.10

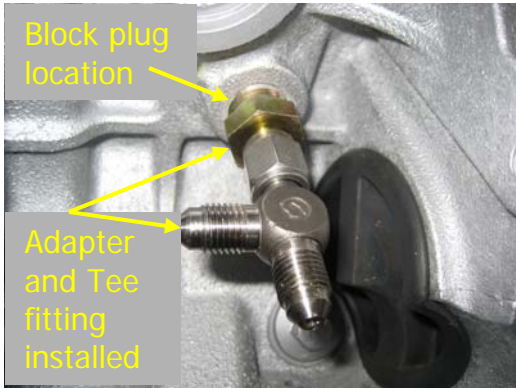


Fig.11

Installation Instructions

- c. Coolant Return: Remove the plug on the intake manifold water passage (Fig. 12) and install the supplied banjo fitting, crush washers, and bolt. Position as shown (Fig. 13) and torque to 67Nm (50lb-ft).
- d. Oil Drain: This step will require removal of the oil pan and will be covered later in step 10.b.

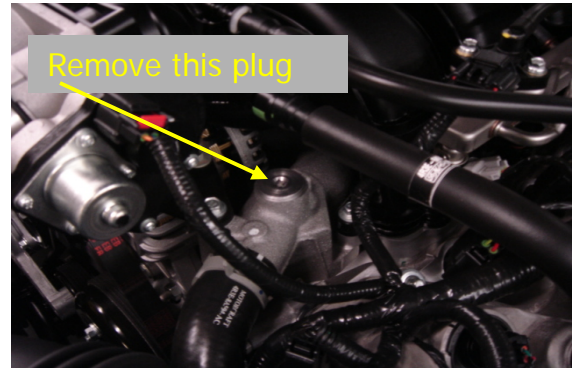


Fig.12

- e. Oil Feed Hose Routing

1. Passenger-side turbo: Take the longest supplied steel braided hose and attach to the multi-port oil feed fitting as shown (Fig. 14). Route along lower block and shown (Fig 15 & 16).



Fig.13

2. Drivers-side turbo: Using the shorter supplied steel braided hose, route as shown (Fig. 15).

*Use supplied clamps and be sure to carefully route the lines. The braided stainless line is very abrasive and will quickly wear through anything it is allowed to rub against.

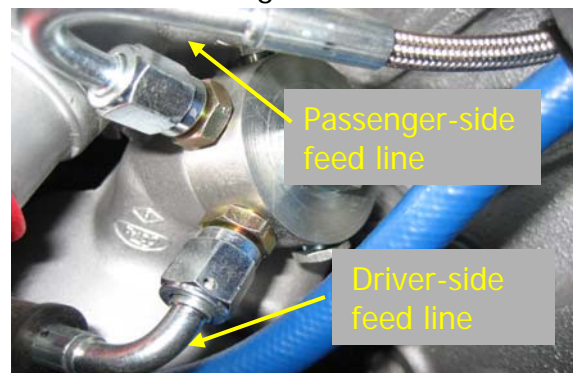


Fig.14

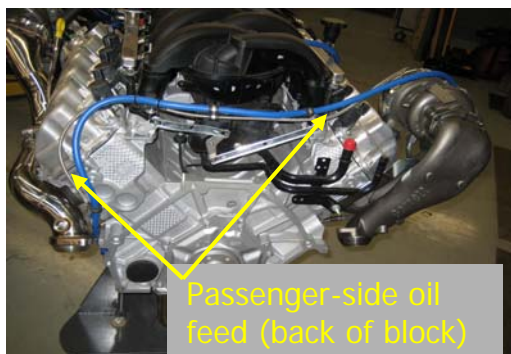


Fig.16

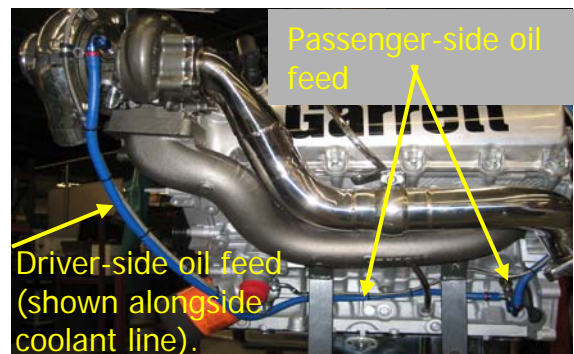


Fig.15

Installation Instructions

7. Mounting the Turbochargers –

- a. For both turbos: Install four (4) M8 studs on the turbine inlet flange of each manifold . Place the turbine inlet metal gasket on the exhaust manifold studs. Install the turbocharger and drop it onto the studs. Start all four (4) nuts before tightening any of them. Tighten all nuts to 25Nm (18 lb-ft). (it may be helpful to temporarily remove the compressor housing to access difficult to reach fasteners. Be careful to prevent damage to the exposed compressor wheel blades)

8. Mounting the Downpipes -

- a. For the passenger-side turbo:
 1. Fit an exhaust flange gasket over the studs on the turbine housing. Take the cast downpipe and pass it down along the firewall and fit the slots in the flange over the studs mounted in the turbine housing. Install M8 nuts on the studs and M8 bolts in the remaining three (3) holes. Tighten all fasteners to 25Nm (18 lb-ft).
 2. From below, install the exhaust pipe studs into the downpipe exhaust flange Tighten studs to 45Nm (33 lb-ft).
- c. For the driver-side turbo:
 1. Fit an exhaust flange gasket over the stud on the turbine housing. The driver-side downpipe is a 2-piece fabricated tube (upper downpipe and lower downpipe) held together with a spherical clamp. Before getting started, install the exhaust pipe studs into the lower downpipe exhaust flange and tighten studs to 45Nm (33 lb-ft).

Installation Instructions

- d. Move and/or relocate any tubing or components on the driver-side of the engine bay to gain clear access for the downpipe installation.
- e. With a twisting motion feed the lower downpipe towards the bottom of the engine bay towards the exhaust pipe.
- f. Install the O2 sensor that was removed in step 4-m. Tighten to 48Nm (35 lb-ft).
- g. Install the H-pipe and slide clamps into place, but do not tighten yet.
- h. Fit the lower downpipe exhaust flange studs into the exhaust pipe and start the nuts on the threads, but do not tighten. This will help to align the lower down pipe properly. Slide the spherical joint clamp over the spherical flange, leaving the clamp loose.
- i. Install the upper downpipe onto the single stud on the turbine housing outlet flange, making sure that the gasket is in place. Thread on a nut and use bolts in the other 4 holes and tighten to 25Nm (18 lb-ft).
- j. Lift the lower downpipe to engage the spherical joint with the upper downpipe and slide the spherical clamp into place. Tighten the clamp with the head of the bolt facing the driver-side fender for best wrench access. Tighten to 25Nm (18 lb-ft).
- k. Now install and tighten both the driver-side and passenger-side downpipe to exhaust nuts to 40 Nm (30 lb-ft).
- l. Position the h-pipe clamps and tighten to 48Nm (35 lb-ft).

Installation Instructions

9. Install the water lines –

The water lines consist of two push-on fittings and a length of hose. Trim the hose to fit.

P/N SP1173-045 Driver-side inlet

P/N SP1173-047 Driver-side outlet

P/N SP1173-044 Passenger-side inlet

P/N SP1173-046 Passenger-side outlet

Suggested routing as per the photos: Use supplied tube clamps to hold the hoses in place.

Install turbocharger heat shields onto the brackets after fitting all fluid lines. Torque the supplied bolts to 6.8Nm (60lb-in)



Fig.17



Fig.18

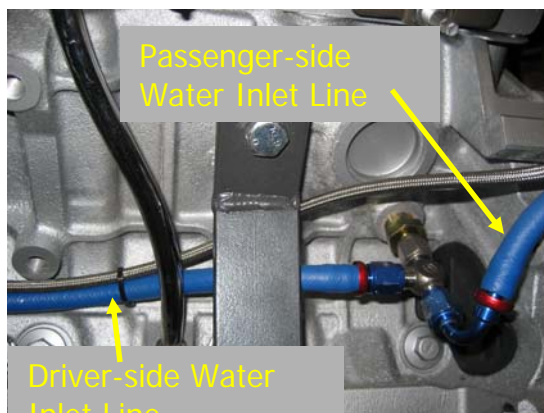


Fig.19



Fig.20

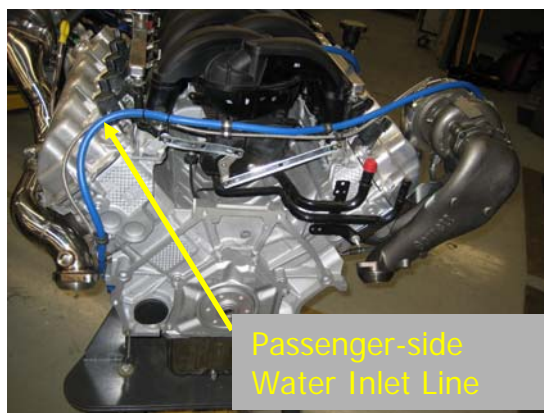


Fig.21

Installation Instructions

10. Install the oil drain fittings on the oil pan –

- a. Attach the oil drain lines to the turbochargers, routing the oil drain along the block so that the end of the line is adjacent to the oil pan. Install the oil drain pan mount fittings to the oil drain line. While ensuring that the oil line is routed to keep it away from the hot exhaust manifold and not kinked, hold the drain fitting to the oil pan and mark the drain and bolt hole locations on each side of the oil pan.
- b. The next step requires removal of the oil pan. Since this is an involved procedure it is recommended that a detailed shop manual and professional mechanic be consulted to ensure that the job is completed correctly.
- c. After the pan is removed, verify that the markings are accurate and then drill a 13mm or 1/2 in hole for the oil drain hole and two 7mm or 9/32 in holes for the bolts. Ensure that the sheet metal around the holes is as flat as possible for the best seal.
- d. Install the oil drain fittings on each side of the oil pan. Coat the gaskets with a thin coat of sealant to prevent leakage. Install the stat-o-seals onto the M6 bolts and apply threadlock to the end of the thread. Sandwich the gasket between the fitting and the outside surface of the pan, and starting from inside the pan, pass the bolts through the pan and gasket and thread into the fitting and tighten to 12Nm (105 lb-in).
- e. Re-install the oil pan on the engine.
- f. Connect the oil drain line to the fittings and tighten securely.

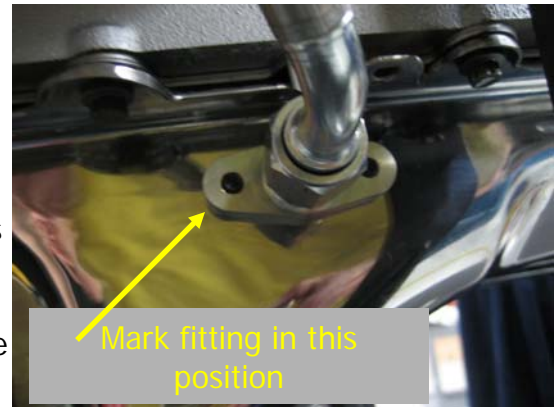


Fig.22

Installation Instructions (cont'd)

11. Compressor Discharge Plumbing –

This part is left to the installer to customize the compressor discharge and intercooler installation, but a few tips are in order:

- a. Ports for the wastegate actuators should be located before the throttle body to keep the actuators from seeing manifold vacuum. The actuators are not designed for vacuum.
- b. A blow-off valve is recommended to prevent the compressor from operating in surge during sudden throttle closing. If using a draw-through MAF, it will need to be a recirculating style valve that returns the flow the compressor inlet after the MAF sensor. If using a blow-through MAF, a non-recirculating style valve can be used and must be placed before the MAF.
- c. For our test car, we used 2 inch compressor discharge pipes that join into a 3" pipe ahead of the intercooler, and a 3 inch pipe from the intercooler to the throttle body.
- d. Minimum recommended intercooler core size is 10.5 x 24 x 3.
- e. Minimum recommended air filter area is 2.2 ft² per turbo. (We used KN RF1039)

12. Refill the engine fluids.

13. Check for fuel leaks - Turn the ignition key on to energize the fuel pump. Check for fuel leaks around the fuel injectors.

14. Prime the oiling system. Disconnect the oil drain lines from the oil pan fittings and place a suitable drain container in place below the lines. Remove the electrical connectors from all eight fuel injectors to prevent the engine from starting. Crank the engine with the starter and watch for oil to drain from each line. Do not crank the engine for more than 15 seconds at a time and allow a one minute pause before cranking again.

15. Engine Control Unit (ECU) Tuning – The ECU will need a recalibration by a qualified tuner prior to initial startup. Failure to do so can result in serious engine damage.

16. After initial recalibration and with engine running, check for engine coolant and oil leaks. Once a leak free system has been confirmed, you are ready to complete the calibration.

NOTE: After handling the exhaust components, it is not uncommon for the components to smoke as the engine heats up. Once the initial oil film is burned off, there should be no more smoke.

The logo for Garrett, featuring the word "Garrett" in a bold, red, sans-serif font with a registered trademark symbol.