

1997-2004 Corvette C5 Instruction Manual



STS2006 1997-2000 Corvette C5 (LS1) STS2008 2001-2004 Corvette C5 (LS1/6)
STS2007T 1999-2000 Corvette C5 (LS1) STS2008T 2001-2004 Corvette C5 (LS1/6)

Turbo Systems

Congratulations on your purchase of a STS Turbo System!

We're confident you'll be happy with the ease of installation and the performance of the patented remote mounted STS Turbo System.

The installation is a straight-forward process, but it is **critical that you read through ALL of the instructions carefully**. If you do have any issues during the installation process, please contact your local STS dealer where you purchased the system. If they are not available, please call our customer service department at 1-866-464-6553. We appreciate your business and would like to hear from you regarding your experience with the STS Turbo System.

Holley Performance Products, Inc.

1801 Russellville Road, Bowling Green, KY 42101

Phone 866-464-6553 (Toll Free)

Monday through Friday, 8:00am to 5:30 pm and Saturday 8:00am to 2:00pm CST

We encourage you to read this manual completely for a couple reasons:

- Verify the parts list to make certain your kit is complete before starting the installation (See the kits parts page of this manual). If you discover shipping damage or shortage, please call us immediately
- Take a look at what is required for tools, time, and experience.
- Review our limited parts warranty

All STS Turbo Systems are protected by us patent # 7,134,282 and # 6,745,568. Any infringement of patent will be pursued to the fullest effect of the US patent law.

IMPORTANT: It is the responsibility of the owner of the turbo system to make any necessary upgrades to the vehicle's fuel system, engine and drive-train components, etc. to ensure optimal performance and reliability and to prevent damage to engine and drive-train components. **By installing this turbocharger system, the owner understands and acknowledges the severity of the vehicle damage that may occur by turbocharging an improperly modified and tuned vehicle and accepts ALL risk and responsibility.**

Our systems are designed for vehicles in good mechanical condition only. Installation on worn or damaged engines is NOT recommended and may result in engine failure, for which we cannot be held responsible. STS Turbo is NOT responsible for the engine or consequential damages. **By proceeding with this install, you accept full responsibility for any damage that may occur.**

It is also the responsibility of the owner to comply with all emissions laws in their state.

Before you drive your vehicle, we recommend:

- Your vehicle be in good running condition
- Change your fuel filter
- Tune-up with spark plugs gapped to .035".
- 91 or higher octane fuel in the tank
- Proper tuning and fuel system modifications
- Install a boost gauge and test boost levels @ 5-6 psi
- Test air/fuel ratios using a wideband O2 gauge (11.5:1 recommended)
- Use caution until you are familiar with the system

Please remember to follow all safety rules that apply when working, including:

- Wear eye protection.
- Do not work on a hot engine.
- Keep sparks and flames away from your work area - fuel is highly flammable.

AVOID THESE COMMON MISTAKES!!!

IMPORTANT: The installation of a turbocharger system on your vehicle is a major modification and should be taken very seriously. It is critical that each step in this installation manual be performed in order and exactly as the manual shows. This will help you avoid installation problems, as well as problems that arise after the installation is complete. There are many steps to the installation that may seem obvious but that require a step or procedure that may not seem like the obvious thing to do. Skipping steps and/or just installing the system by looking at the pictures in the manual typically will end up taking you more time and cause frustration. Please follow this manual exactly and contact STS Customer Support if you need assistance or have questions. Below is a list of the most common mistakes that our Customer Support department receives technical calls about – all of which could be avoided if the instruction manual was followed carefully:

Avoid these common installation mistakes and save yourself time and frustration:

- Read the instruction manual completely before starting the installation.
- Follow the instruction manual during the installation process.
- Inventory all components to make sure you have everything before starting the installation.
- Account for all components, parts, and tools necessary before starting the installation.
- If STS tuning was purchased, start the tuning process as per instructions BEFORE installing the turbocharger.
- Follow instructions EXACTLY when making electrical connections at the oil pump (oil pump is reversible!)
- DO NOT ATTEMPT TO BOOST THE VEHICLE WITHOUT PROPER TUNING!!!
- Follow tuning instructions and fill out tuning feedback forms completely.
- Follow instructions exactly to connect the wastegate properly.
- Make sure electrical system tests are performed and that oiling, PCV, and alarm systems are working properly.
- Align and carefully install all silicone connections then retighten after first few heat cycles to avoid intake leaks.
- Use extreme caution when cutting and welding on the exhaust system to avoid debris that will damage the turbo.
- Test air/fuel ratios using a wideband O2 gauge (11.5:1 recommended).
- Monitor the air fuel ratio and boost level with a wideband AFR gauge and a vacuum/boost gauge.
- Use caution when routing electrical harness and hoses to prevent damage from hot and/or sharp objects.
- Follow oil pump break-in and electrical system test procedures.

1997-04 C5 Corvette Turbo System Parts

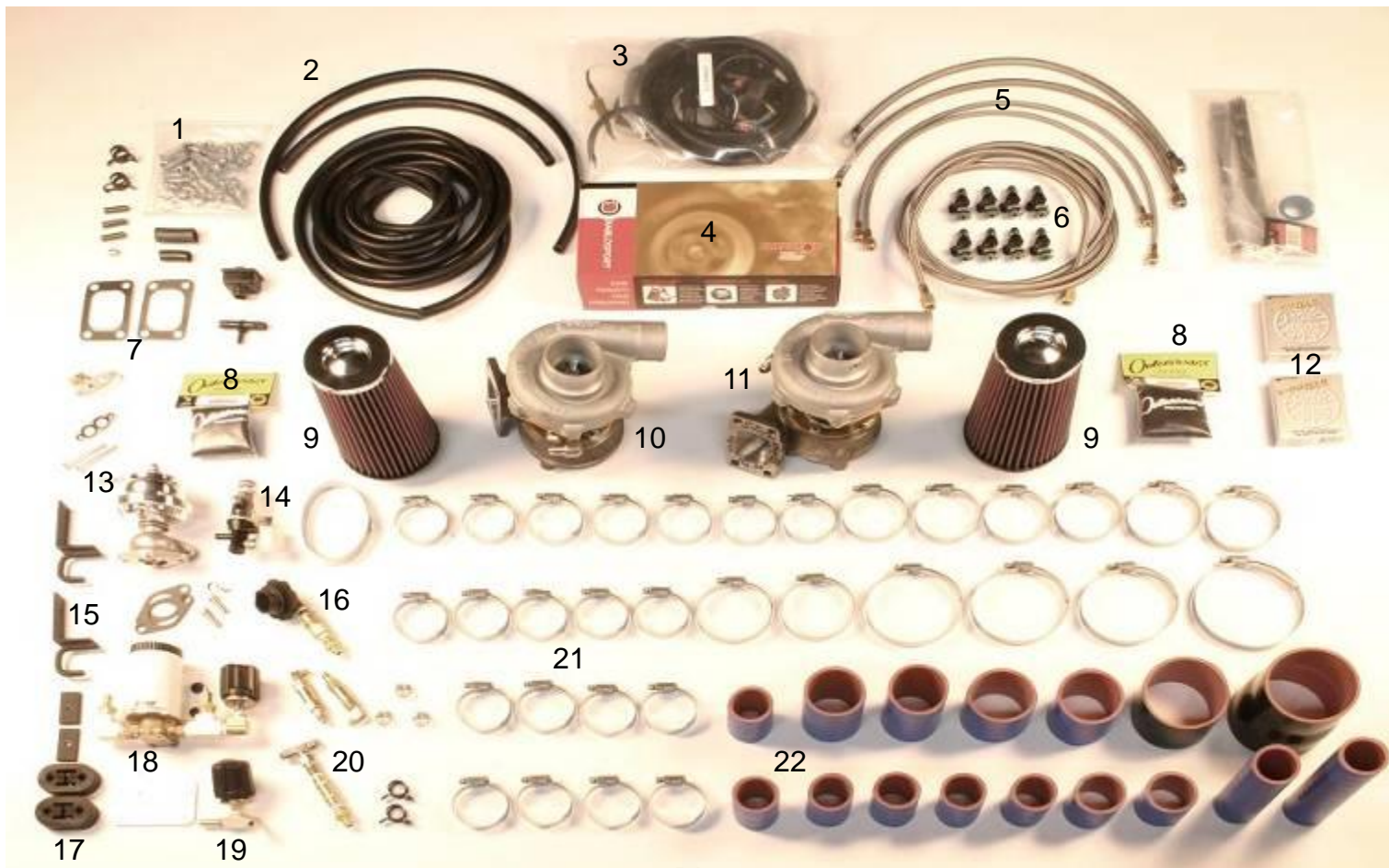


Diagram 1

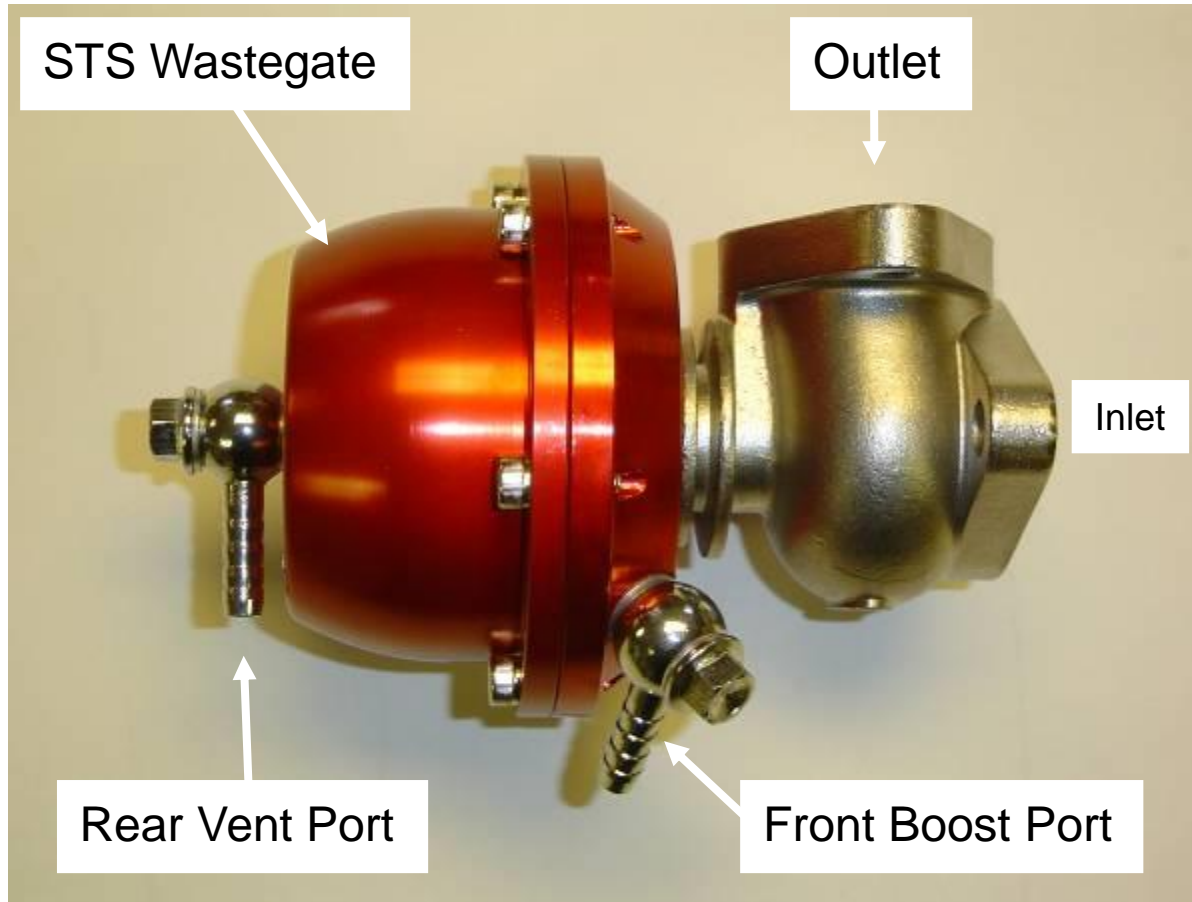
Picture Key:

- 1: Bolt Kit
- 2: Oil Return Hoses
- 3: Wiring Harness
- 4: Predator Tuner
- 5: Stainless Oil Hoses
- 6: Fuel Injectors
- 7: T3 Gaskets
- 8: Dry Charger Cover
- 9: STS Air Filter
- 10: LH Turbo
- 11: RH Turbo
- 12: Accek Spark Plugs
- 13: STS Wastegate
- 14: PCV Switch Valve
- 15: Exhaust Hangers
- 16: Oil Cap
- 17: Exhaust Insulators
- 18: Oil Pump
- 19: 1 PSI Switch
- 20: Oil Check Valves
- 21: Hose Clamps
- 22: Silicone Hoses

Unpack the turbo kit and account for all parts as per Diagram 1. Inspect parts for shipping damage and make sure there is no debris or packing material in any of the components that could potentially cause damage to the engine and/or turbochargers.

WASTEGATE INSTALLATION WARNING!

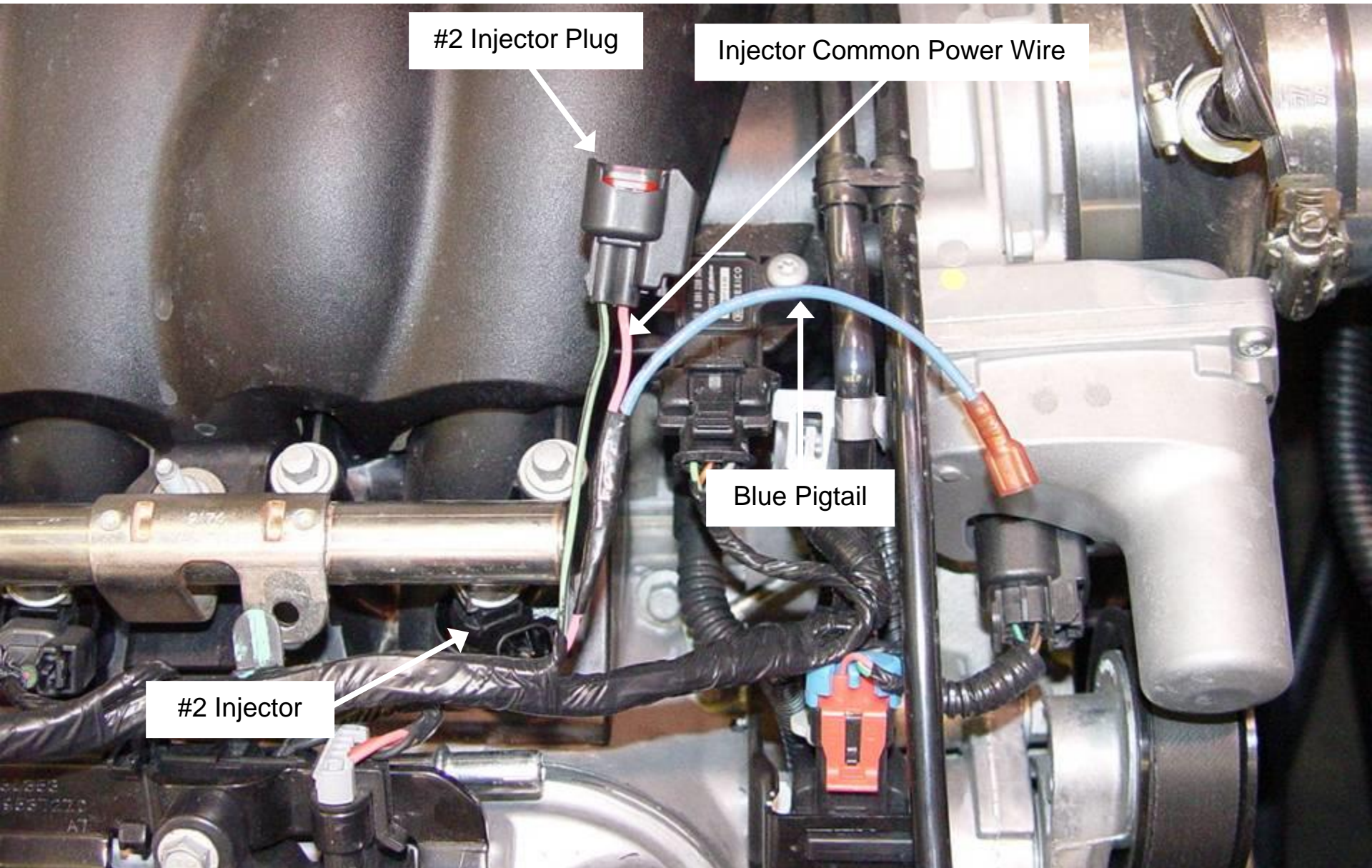
The wastegate **MUST** be connected as shown or **IMMEDIATE SEVERE** engine damage will result!



The boost reference hose from the intake manifold or compressor must be connected to the Front Boost Port fitting on the wastegate(s). The Rear Vent Port on the wastegate must be vented to atmosphere. Applying boost pressure to the Rear Vent Port of the wastegate and/or not applying boost pressure to the Front Boost Port will cause the wastegate to stay closed and the turbo to over-boost. This will cause **IMMEDIATE SEVERE** damage to the vehicle's engine!

It is the responsibility of the vehicle owner/operator to frequently inspect the wastegate and wastegate hoses to ensure that the wastegate hoses are connected properly, are in good condition, and that the wastegate is functioning properly. The easiest way to monitor boost levels is through a boost gauge. It is recommended that a vacuum/boost gauge be installed in **all** turbocharged vehicles.

1997-04 C5 Corvette Injector Wire

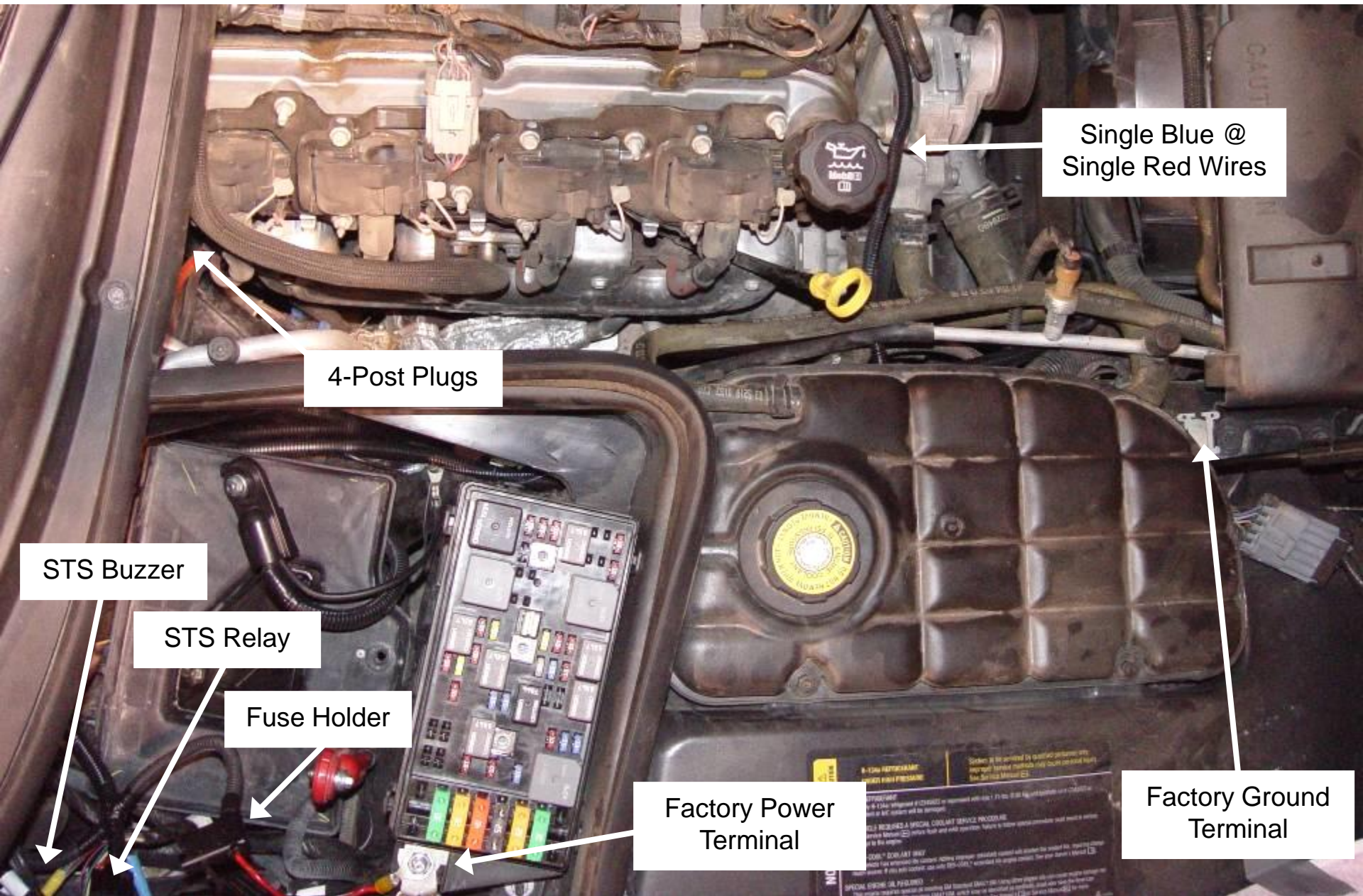


Unplug the #2 injector plug from the injector. The common power wire will be the same color wire on all of the injectors. Find this wire on the #2 injector then probe it with a test light. Turn on the ignition but **DO NOT** start the car. The test light should light up with the ignition on and remain on for approximately 2 seconds after the ignition is turned off.

Once the correct wire is located, install the provided t-tap onto the power wire. It is recommended to solder the provided pig tail onto the power wire for a more secure connection.

Disconnect both positive and negative leads from the battery.

1997-04 C5 Corvette Wiring Harness



Single Blue @
Single Red Wires

4-Post Plugs

STS Buzzer

STS Relay

Fuse Holder

Factory Power
Terminal

Factory Ground
Terminal

Secure the relays to the factory hood latch cable with nylon ties as shown above. Route the RED wires with the inline fuses over to the factory power terminal.

Remove the factory nut from the factory power terminal on the fuse box. Install the RED inline-fused wire onto the remote battery terminal then reinstall the factory nut and install the fuse box lid. **Leave the fuses out at this time.**

Route the rest of the harness behind the battery tray then towards the front of the engine compartment on top of the frame rail.

Route the 2 – 4 post plugs along the firewall over to the driver's side of the engine. Drop the plugs behind the engine to the ground and leave hanging loose at this time.

Route the single blue wire and single red wire just in front of the passenger's side cylinder head as shown above and leave loose at this time.

Remove the nut from the factory ground terminal in front of the coolant overflow tank, on the top of the frame rail, and install the STS ground then reinstall the nut.

From inside the passenger's side of the vehicle, remove the kick panel below the glove box to allow access to the firewall. Pull back the rubber backed insulation to expose where the wiring harness goes through the firewall.

Cut a small slit in the factory rubber grommet located behind the battery tray. From the engine bay, remove the oil alarm buzzer from the harness then route the oil alarm buzzer section of the harness through the hole in the firewall into the passenger's compartment.

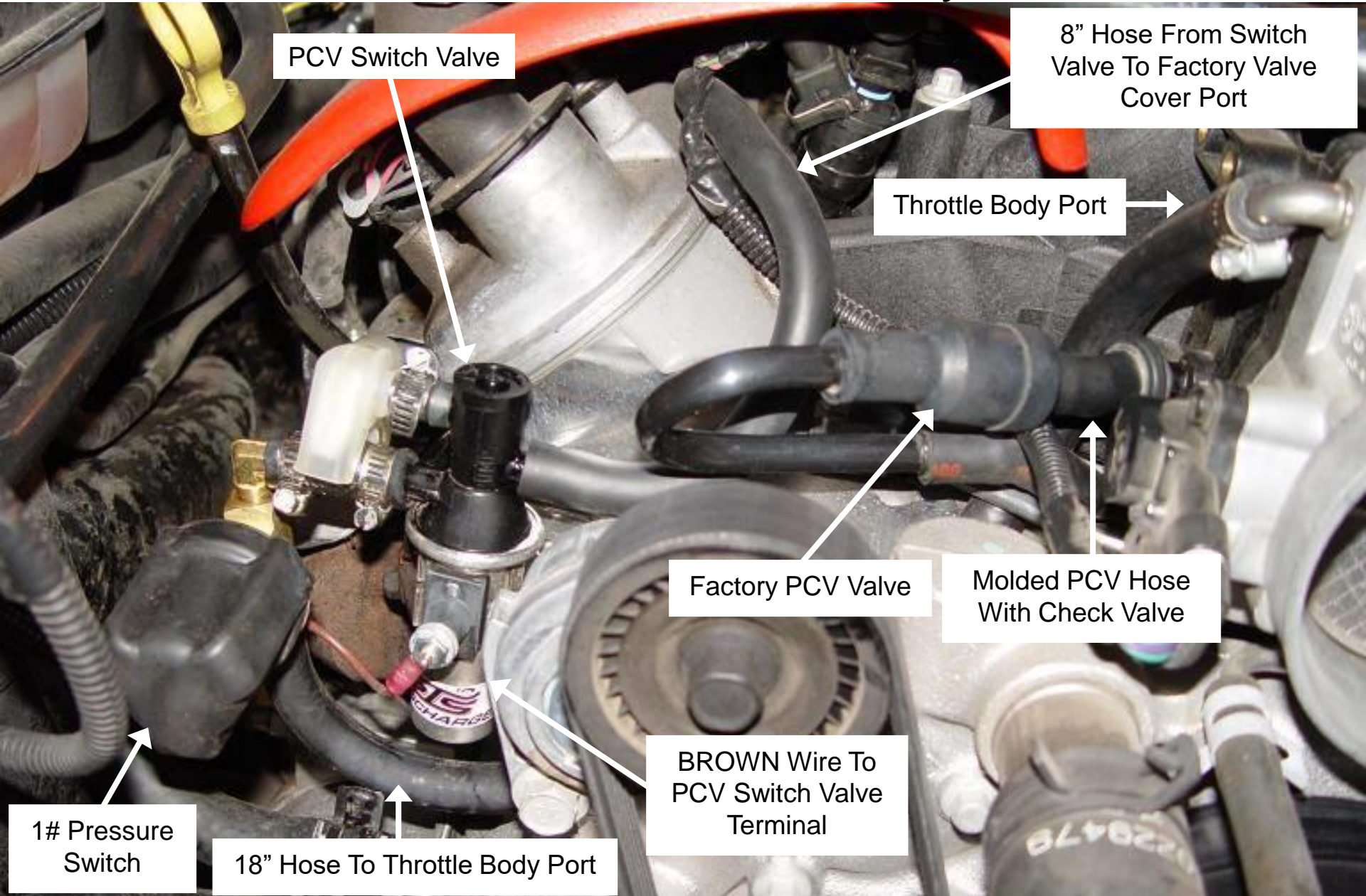
(Note: This is also a good place to route the vacuum/boost hose through for a boost gauge. This is a good time to install any gauges or accessories which require routing through the firewall.)

From inside the passenger's compartment, install the buzzer with the blue wire on the positive side and the white wire on the negative side. Secure the buzzers under the dash in a location that allows the buzzer to be unobstructed so the driver can hear the alarm, while making sure that it clears any sharp and/or moving objects.

Replace the insulation and reinstall the kick panel.

Reinstall the battery and reconnect the battery cables.

1997-04 C5 Corvette PCV System



Bolt the PCV switch valve to the front of the passenger's side cylinder head as shown in the above diagram using the 10mm x 20mm bolt and lock-washer supplied.

Locate the factory PCV Vent hose from the RH valve cover port to the throttle body port and remove this hose from the throttle body port only. Connect this factory hose from the valve cover to the single port on the side of the PCV Switch Valve.

Connect the 1.5 inch long 3/8" hose onto the 90 degree fitting on the pressure switch and secure with a hose clamp. Connect the 18 inch long 3/8" hose to the straight fitting on the pressure switch. Install the pressure switch assembly as shown with the short hose connected to the port on the PCV switch valve closest to the metal switch valve body (on dual port side) and the long hose connected to the port on the throttle body (that the factory PCV Vent hose was removed from). Secure the hoses with hose clamps.

Install the filter element on the top port of the PCV switch valve (furthest away from the metal body) on the 2 port side as shown and secure the filter with a hose clamp.

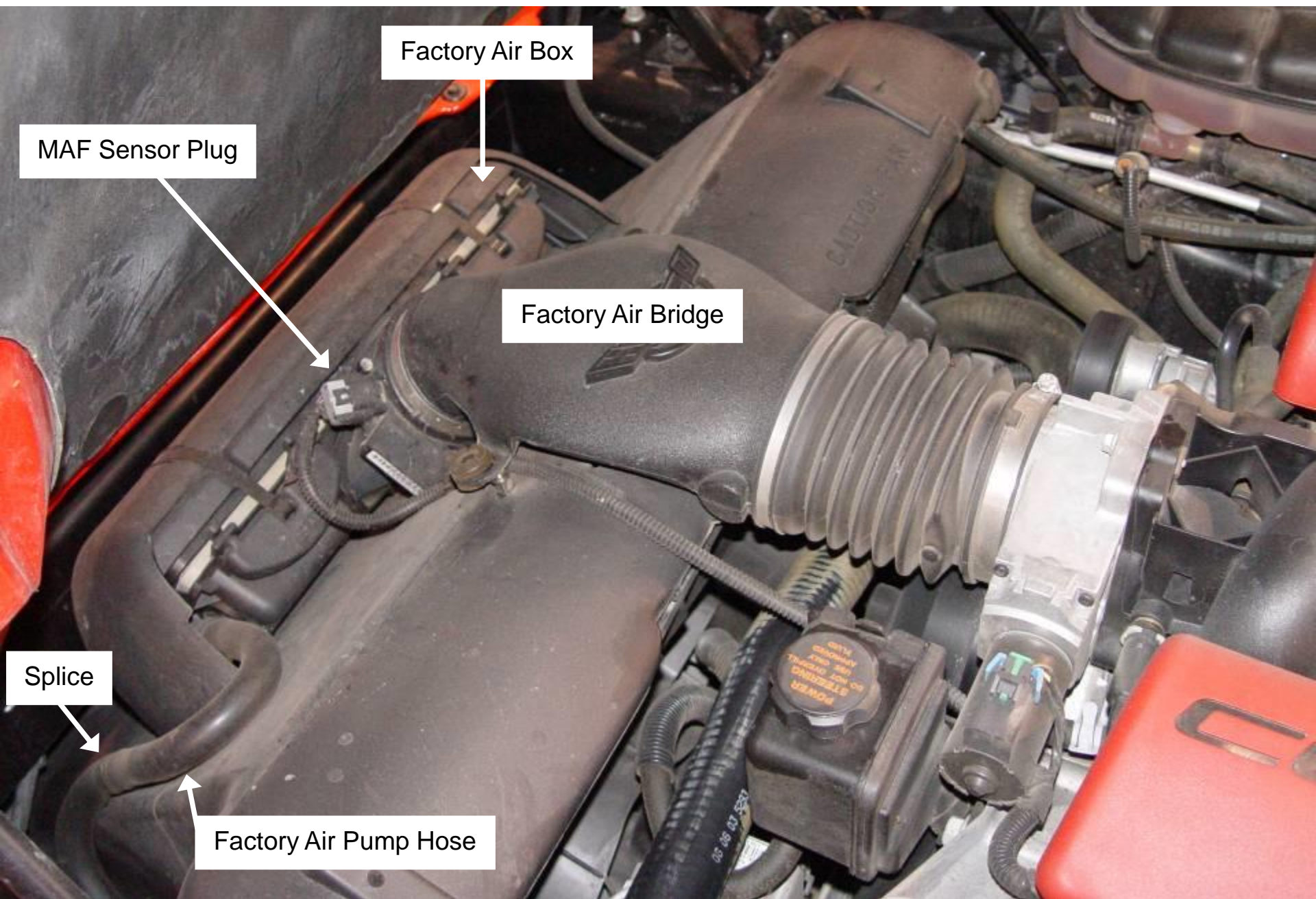
Route the RED wire from the STS harness one terminal on the 1 psi switch and connect. Connect the BROWN extension wire to the other terminal on the pressure switch. Connect the other end of the short BROWN extension wire to the terminal on the PCV Switch Valve. Secure the harness with the provided nylon ties away from any HOT, SHARP, and/or MOVING objects. Leave the protective rubber cap off at this time.

Route the BLUE wire to the previously installed T-tap or pigtail on the #2 injector power wire and install.

Remove the molded factory rubber PCV hose between the PCV valve and the intake manifold port and note the direction which the hose was installed from the factory. Clean the hose, PCV valve, and intake manifold port of any oil. Install the small brass check valve into the center of the hose so that the snap ring is facing away from the intake manifold. Reinstall the PCV hose onto the PCV valve and the intake manifold as shown.

(Note: This check valve must be installed carefully as to not damage the valve. This valve will prevent the flow of boost into the crank case but will allow the venting of crank case gasses to flow through the PCV valve into the intake manifold.)

1997-04 C5 Corvette Factory Air Box Removal



Factory Air Box

MAF Sensor Plug

Factory Air Bridge

Splice

Factory Air Pump Hose

Disconnect the electrical connector from the Mass Air Flow Sensor (MAF) and loosen the hose clamps at the throttle body and the air box.

Remove the MAF sensor and plastic intake ducting, leaving the MAF sensor connected to the plastic runner that goes over the radiator to the throttle body.

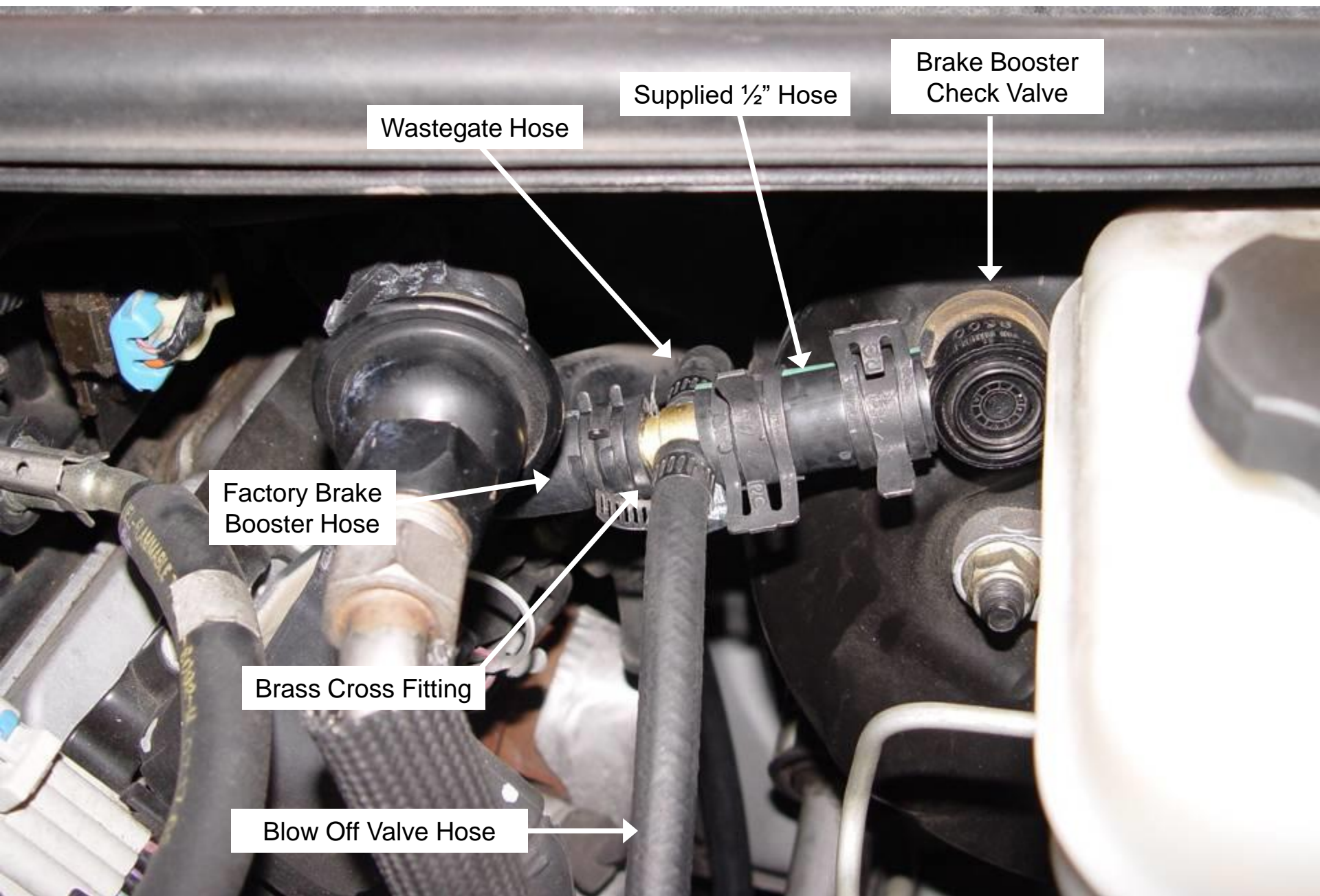
Remove the corrugated duct from the plastic runner.

Remove the air pump hose from the air box where the hose is spliced from the factory.

Remove the upper and lower pieces of the factory air box and the shroud from the front of the radiator.

Install the black breather filter into the open end of the AIR pump hose that was removed from the air box.

1997-04 C5 Corvette Wastegate & BOV Hoses



Wastegate Hose

Supplied 1/2" Hose

Brake Booster
Check Valve

Factory Brake
Booster Hose

Brass Cross Fitting

Blow Off Valve Hose

Remove the factory brake booster check valve from both the booster and the booster hose.

Install the supplied 1.5 inch long $\frac{1}{2}$ " hose onto the brake booster check valve. Install the supplied brass cross into the open end of this hose. Install the open $\frac{1}{2}$ " end of the brass cross into the factory brake booster hose.

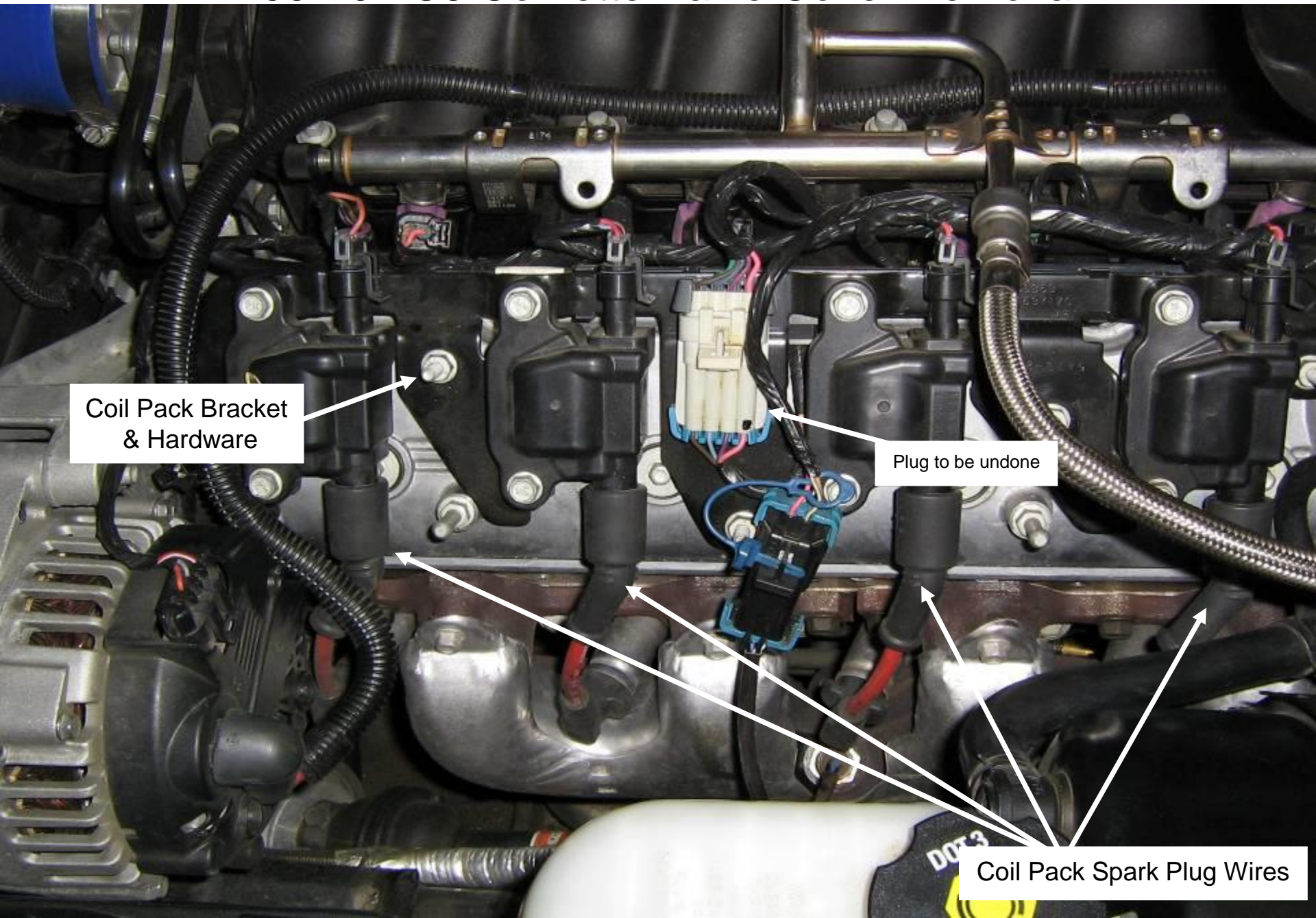
Cover one end of both the 140 inch long and 60 inch long $\frac{1}{4}$ " hoses to prevent debris from entering during the installation process.

Install the 140 inch long $\frac{1}{4}$ " wastegate hose onto the rearward facing port of the brass cross. Route the wastegate hose down along the firewall behind the engine along the driver's side of the rear of the engine. Make sure that all hoses are routed away from any HOT, SHARP, and/or MOVING objects which could damage the hoses.

Install the 60 inch long $\frac{1}{4}$ " BOV hose onto the forward facing port of the brass cross. Route this hose along the driver's frame rail and down near the AIR pump in the RF corner of the engine compartment. Secure hoses away from any HOT, SHARP, and/or MOVING objects to prevent damage to the hoses.

(IMPORTANT: Use caution when routing the wastegate hose. If this hose gets damaged, it can cause the turbo to boost uncontrollably and cause SEVERE and IMMEDIATE engine damage! Inspect this hose frequently and monitor boost levels at all times to prevent accidental over-boost conditions.)

1997-04 C5 Corvette Valve Cover Removal



Coil Pack Bracket
& Hardware

Plug to be undone

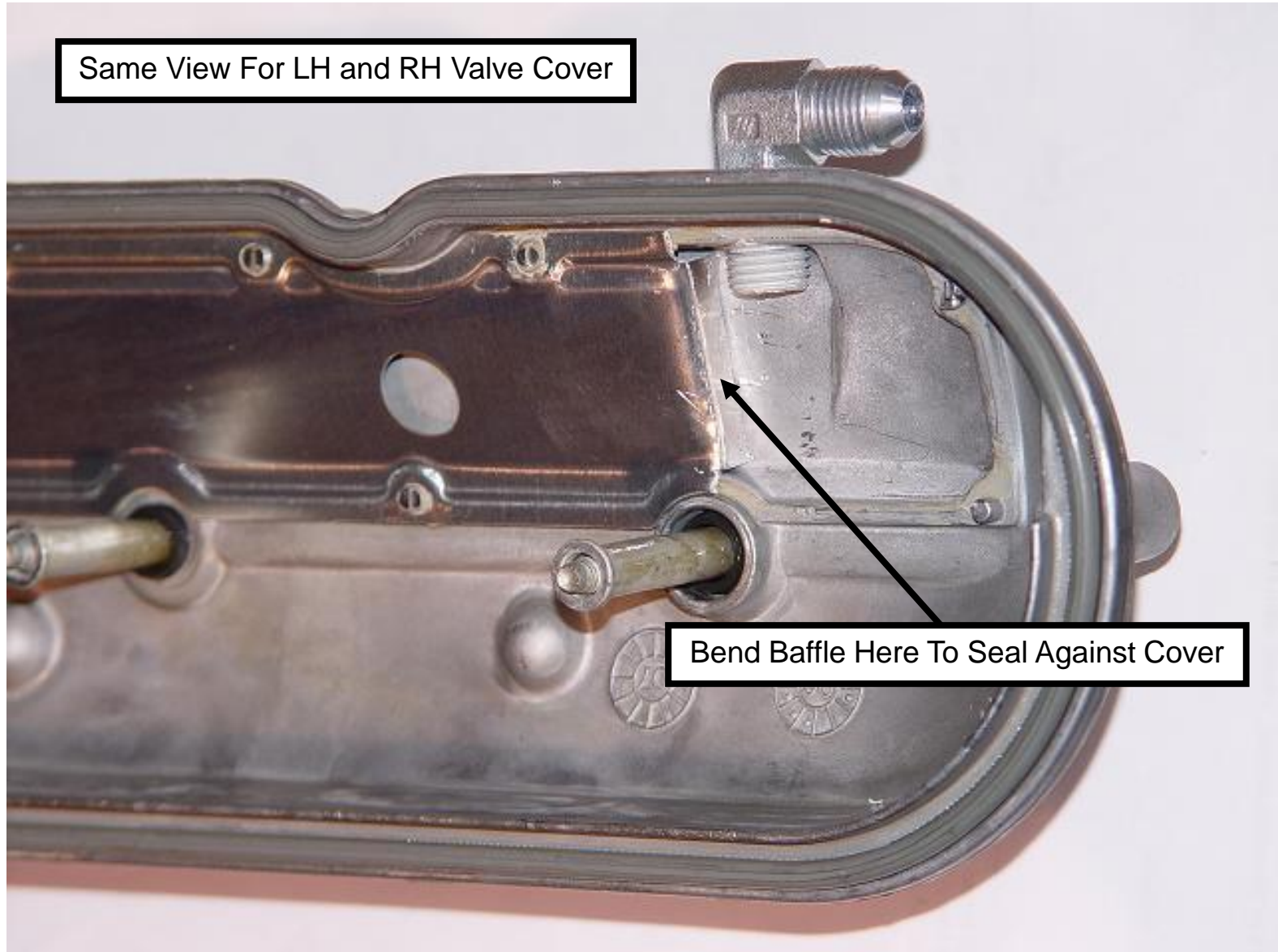
Coil Pack Spark Plug Wires

Remove the four spark plug wires from the coil packs on the driver's side valve cover as shown. Then, unplug the main coil pack plug routed over the coil pack bracket. Next, remove the 5 - 10mm studs from the coil pack mounting bracket. Remove coil pack mounting bracket with coil packs still attached and set aside.

Once coil packs and all wiring is out of the way, remove the 4 valve cover bolts and pull valve cover off. Repeat removal process for passenger's side. Once valve covers have been removed, cover the valve train with paper towels to prevent debris from entering the motor.

1997-04 C5 Corvette Valve Cover Modifications

Same View For LH and RH Valve Cover



Bend Baffle Here To Seal Against Cover

Diagram 9.5B

Turn the valve covers over and cut the baffle back just enough to expose the location of the new oil return fitting to be installed. Cut slots in the baffle and bend the end of the baffle down as shown so that it seals against the valve cover to isolate the returning oil from the PCV venting. This will prevent oil from getting on top of the baffle and allow oil to flow freely back into the engine.

Clean off any of the sealant used to seal the baffle to the valve cover.

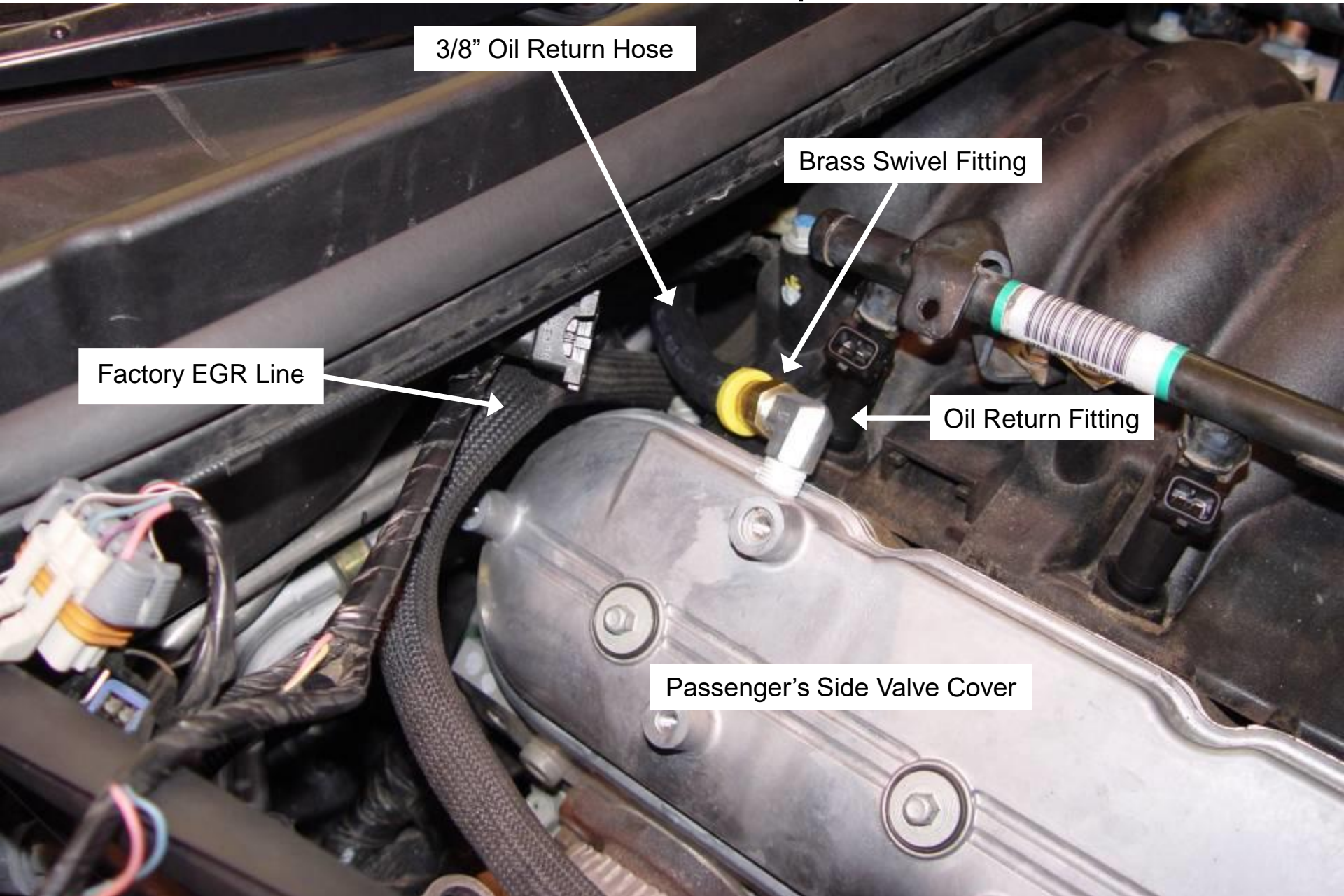
Mark and drill a 7/16" hole in the top rear of each valve cover at the location shown. Carefully tap the valve cover using the 1/4" NPT tap provided.

Use an appropriate cleaner such as "Brake Parts Cleaner" to flush out any debris in the valve cover, including the baffled part of the valve cover. Thoroughly de-bur and clean the new hole and valve cover of all metal shavings. Then, use compressed air to blow out the valve cover and baffle entirely.

(WARNING: ANY METAL SHAVINGS LEFT IN VALVE COVER CAN CAUSE SEVERE ENGINE DAMAGE!)

Wrap the threads on the 90 degree #6 AN fitting with the thread tape and install into each valve cover with the fitting pointing toward the rear of the engine. Clean the gasket surfaces, remove any protective cover put over the valve train, and inspect to make sure no foreign debris entered the engine. Reinstall both of the valve covers and torque hardware to factory specs.

1997-04 C5 Corvette Twin Pump Oil Return Hoses



3/8" Oil Return Hose

Brass Swivel Fitting

Factory EGR Line

Oil Return Fitting

Passenger's Side Valve Cover

Cover one end of both of the 150 inch long 3/8" hoses with tape to prevent debris from entering during installation.

Install a brass barb/swivel fitting into the open end of each of these hoses. These are pushlock fitting which do not require clamps.

Route the taped end of these hoses behind the engine with one on the passenger's side and one on the driver's side. Leave hoses hanging loose at this time.

Secure the swivel fittings onto the previously installed AN fittings on the valve covers.

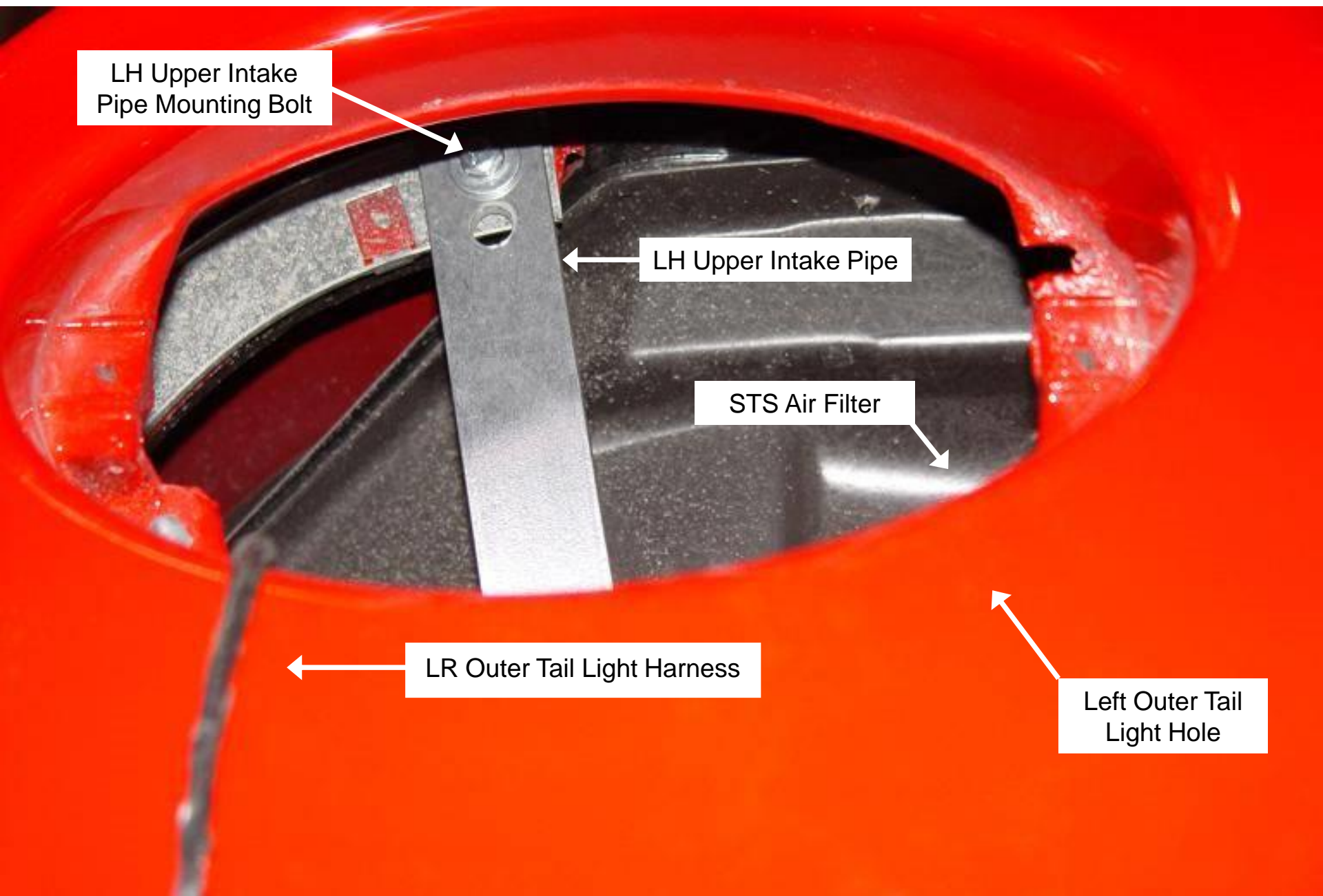
It may be necessary to slightly bend the EGR line so that it is not touching the oil return hoses.

Secure hoses away from any HOT, SHARP, and/or MOVING objects to prevent damage to the hoses.

Remove the factory spark plugs and install the supplied Accel spark plugs 0524-4 (pack of 4) gapped to .032" - .035" and apply anti-seize to the threads, and then install the new plugs and torque to factory recommended specifications.

Reinstall the coil pack and spark plug wires.

1997-04 C5 Corvette LH Upper Intake



LH Upper Intake
Pipe Mounting Bolt

LH Upper Intake Pipe

STS Air Filter

LR Outer Tail Light Harness

Left Outer Tail
Light Hole

Remove the 2 screws retaining the left outer tail light and remove the tail light assembly. Remove the factory body bolt shown above. Install the LH upper intake pipe into the tail light cavity and secure to the body using the 6mm x 25mm bolt, lock-washer, and flat-washer supplied as well as using 2 additional flat-washers for spacers between the pipe bracket and the body mount as shown.

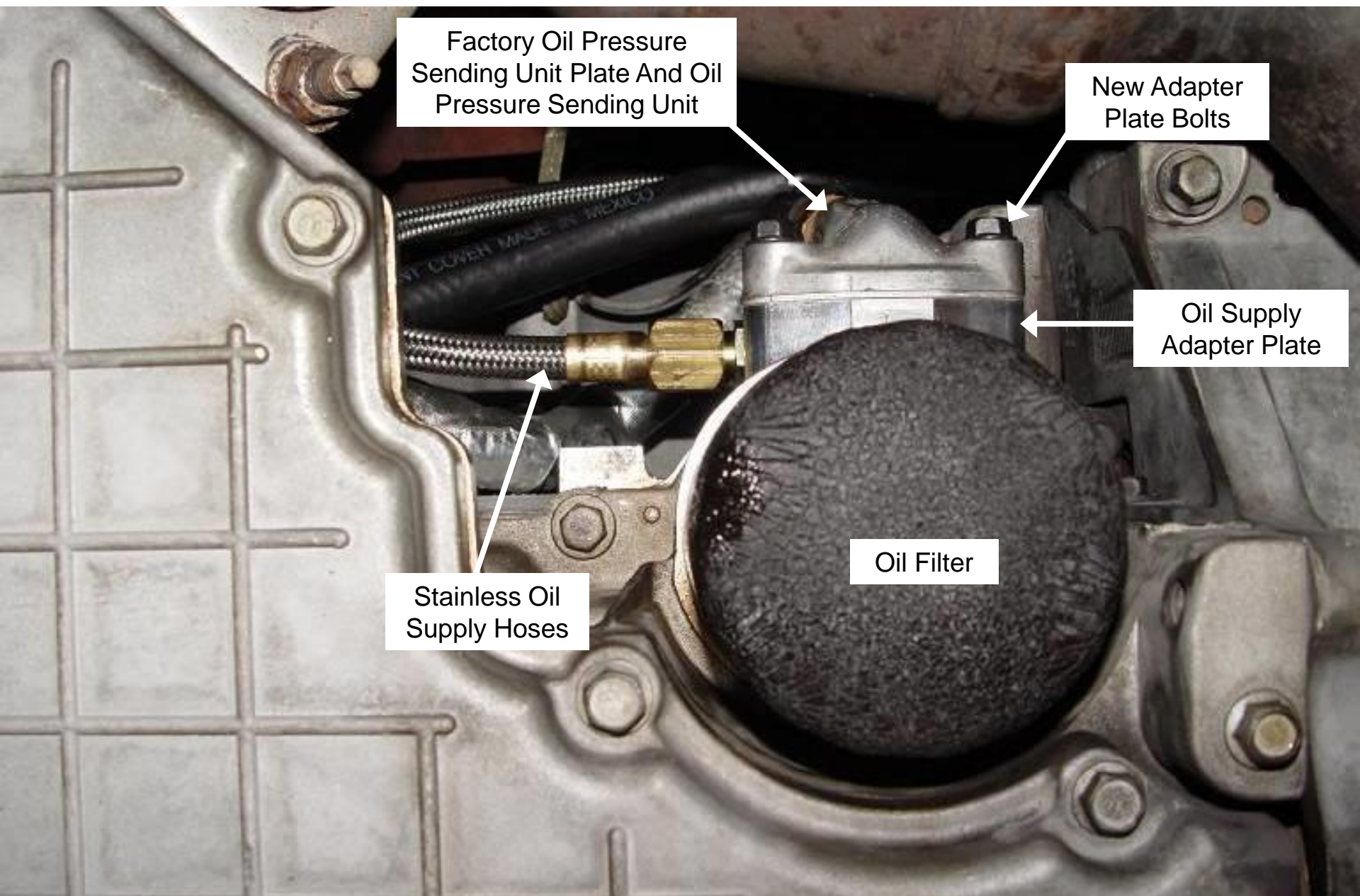
Install the STS air filter into the tail light cavity and install onto the inlet end of the upper intake pipe and secure with the clamp provided. Reinstall the tail light assembly. Repeat above process for right hand upper intake.

(Note: A Dry-Charger filter cover is supplied with the kit and should be used for wet or dusty driving conditions. The Dry-Charger should not be used for performance driving and/or dyno testing. The surface area of the filter cover is very small compared to the surface area of the air filter which requires more frequent cleaning of the filter cover. A restricted air filter or filter cover will cause a vacuum on the intake side of the compressor housing which can draw oil into the intake air charge. Check filters and filter covers regularly. Regular filter and filter cover maintenance and cleaning will prevent this oil control problem.)

Taking all necessary precautions recommended by the vehicle manufacturer and the equipment manufacturer, raise the vehicle on a suitable vehicle hoist to allow access to the under-side of the vehicle.

(IMPORTANT: Before lifting the vehicle, read through the instruction manual and review the illustrations as to the work that will need to be performed while on the vehicle hoist. It will be necessary to place the hoist arms in specific locations to allow access to specific areas of the vehicle to facilitate the installation and to prevent having to readjust the location of the hoist lift points during the installation. Always use appropriate lifting equipment, jack stands, or vehicle support equipment as well as proper lift points and take necessary precautions to prevent accidental damage to the vehicle and/or personal injury!)

1997-04 C5 Corvette Oil Supply at Engine



Factory Oil Pressure
Sending Unit Plate And Oil
Pressure Sending Unit

New Adapter
Plate Bolts

Oil Supply
Adapter Plate

Oil Filter

Stainless Oil
Supply Hoses

Remove the 2 factory bolts securing the oil pressure sending unit plate to the engine right above the oil filter.

Remove the sending unit plate and factory gasket. Clean plate, engine, and gasket surfaces.

Install the 6mm x 45mm bolts provided through the sending unit plate, the factory gasket, the oil supply adapter plate, and the new gasket provided in that order.

(Note: The oil outlet fitting should be located on top of the plate. The fitting should point toward the front of the vehicle. These factory gaskets are reusable if not damaged.)

Install the assembly onto the engine as shown in the above diagram and tighten the bolts to secure in place.

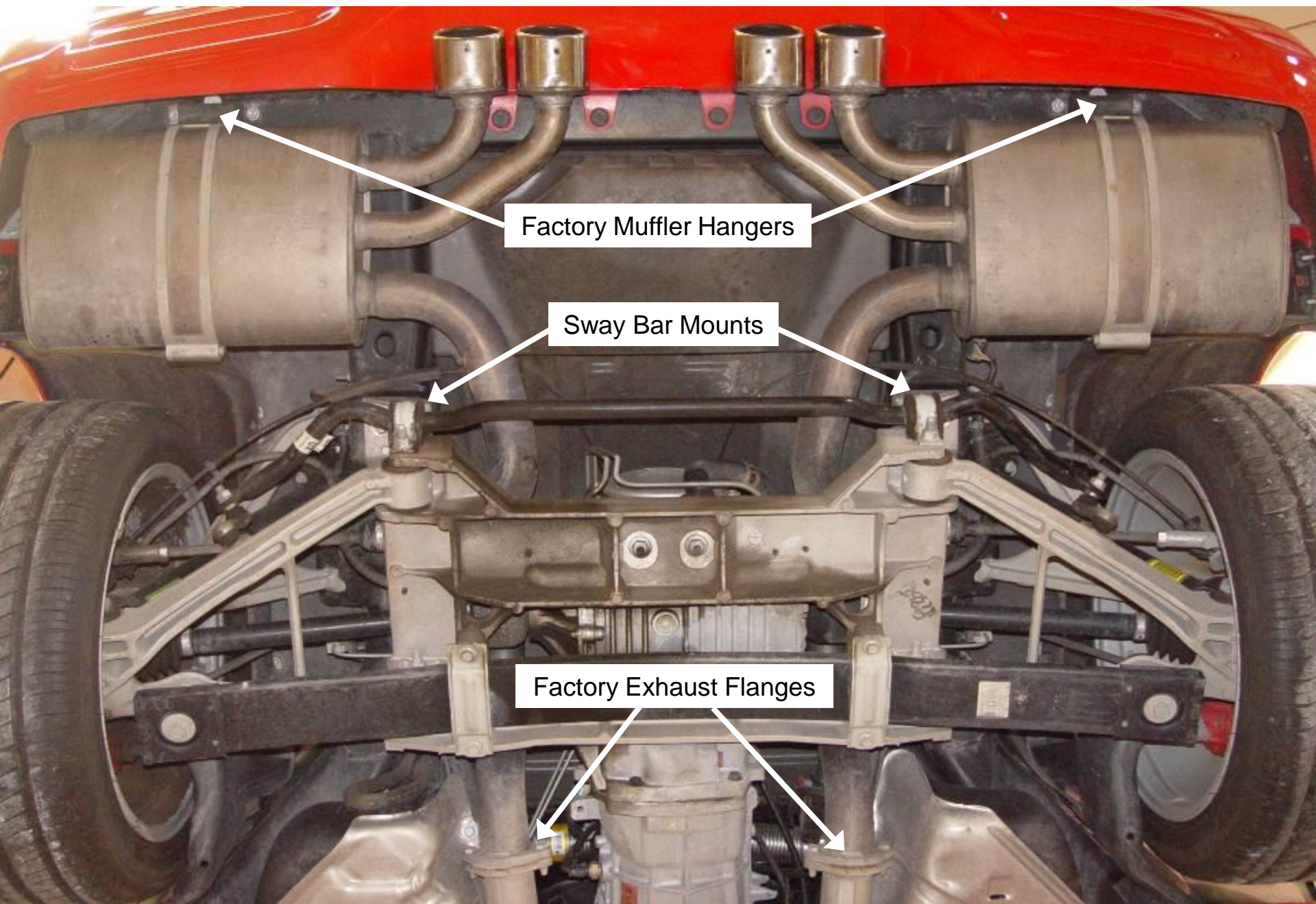
Securely connect the 120" #6 stainless oil supply hose to the fitting. Cover the open ends of the oil supply hose and the wastegate hose with tape to prevent debris from entering the hoses.

Route the hoses and wiring harness along the factory fuel and brake lines down the driver's side of the driveshaft tunnel keeping it away from any hot, sharp, and/or moving parts and secure the hoses with nylon ties.

(IMPORTANT: Cover the open ends of the hoses with tape to prevent debris from entering hose during the installation process.)

Continue routing the hoses along the factory brake lines up and over the rear differential to the back side of the rear differential, securing the hoses along the way with the nylon ties provided.

1997-04 C5 Corvette Factory Exhaust Removal



Factory Muffler Hangers

Sway Bar Mounts

Factory Exhaust Flanges

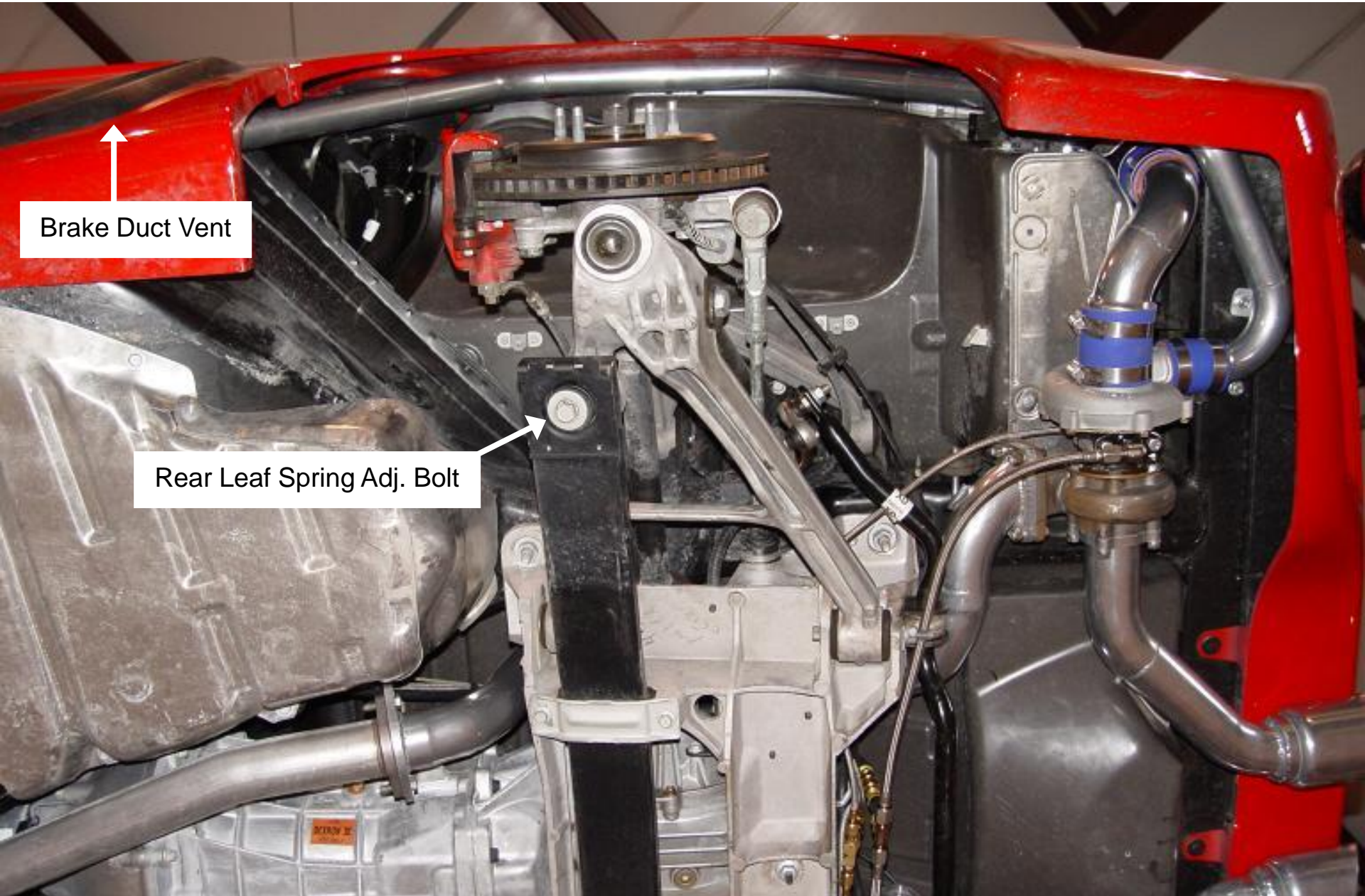
Remove the (x2) nuts and the (x2) bolts from the 2 sway bar mounts. Allow the sway bar to hang from the end links.

Remove the (x4) bolts from the factory exhaust flanges.

Remove the (x4) nuts from the factory muffler hangers, and then remove the rear exhaust and muffler assembly.

(NOTE: Be careful not to damage the exhaust gaskets. If the gaskets are damaged, you MUST replace them. Any leaks in the exhaust before the turbos will dramatically effect the spool up of the turbos.)

1997-04 C5 Corvette Rear Suspension



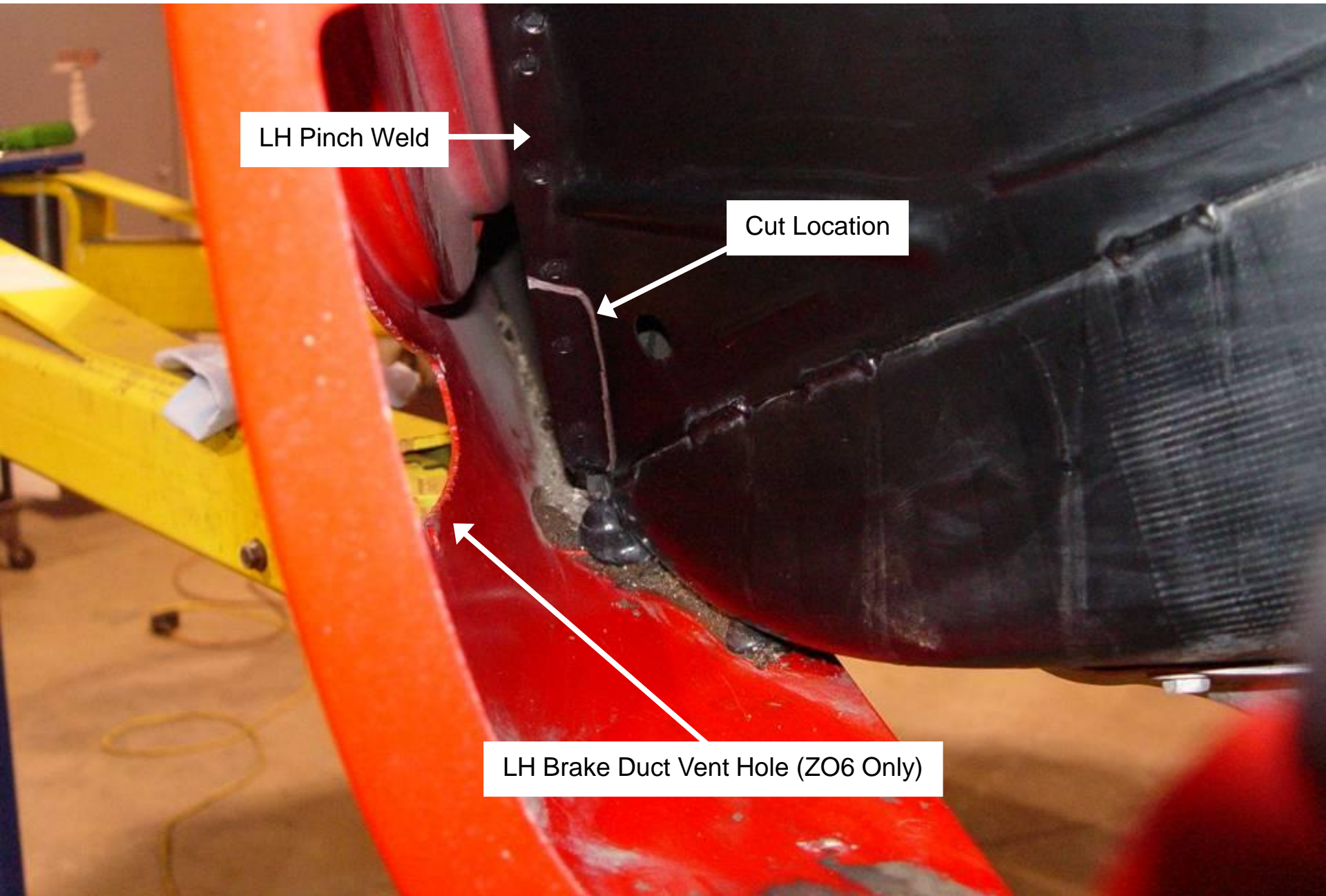
Brake Duct Vent

Rear Leaf Spring Adj. Bolt

Remove the front and rear wheels and the front and rear plastic inner fender well liners. For Z06 models, remove the plastic brake cooling ducts and the cooling duct vents from the rocker panels.

Support the outer ends of the rear leaf spring with suitable jack stands and slightly raise the spring to remove the tension from the rear leaf spring. Remove the snap ring from each of the leaf spring adjusting bolts on the lower control arms. Measure the distance from the top of the nut to the top of the bolt, record that distance, then remove the nut, bolt and bushings from each side. Remove the jack stands.

1997-04 C5 Corvette Pinch Weld Modification



LH Pinch Weld

Cut Location

LH Brake Duct Vent Hole (ZO6 Only)

Using suitable jack stands, raise the lower control arms enough to allow each Pipe #3 to pass under the brake rotor and into the rocker panel.

Using a sawzall or another suitable cutting device, cut the section of pinch weld laid out in the above drawing. Test fit Pipe #3. It is easiest to install if the pipe is slightly twisted as it is pushed into the rocker panel. Do not force the pipe. It may be necessary to cut slightly past the pinch weld and into the inner structure. The welded seam on Pipe #3 needs to be centered in the front brake duct vent mounting hole or further forward. Once adequate clearance has been achieved, apply some paint on the exposed metal to prevent corrosion and blow out Pipe #3 with compressed air.

Complete this process for both right and left sides.

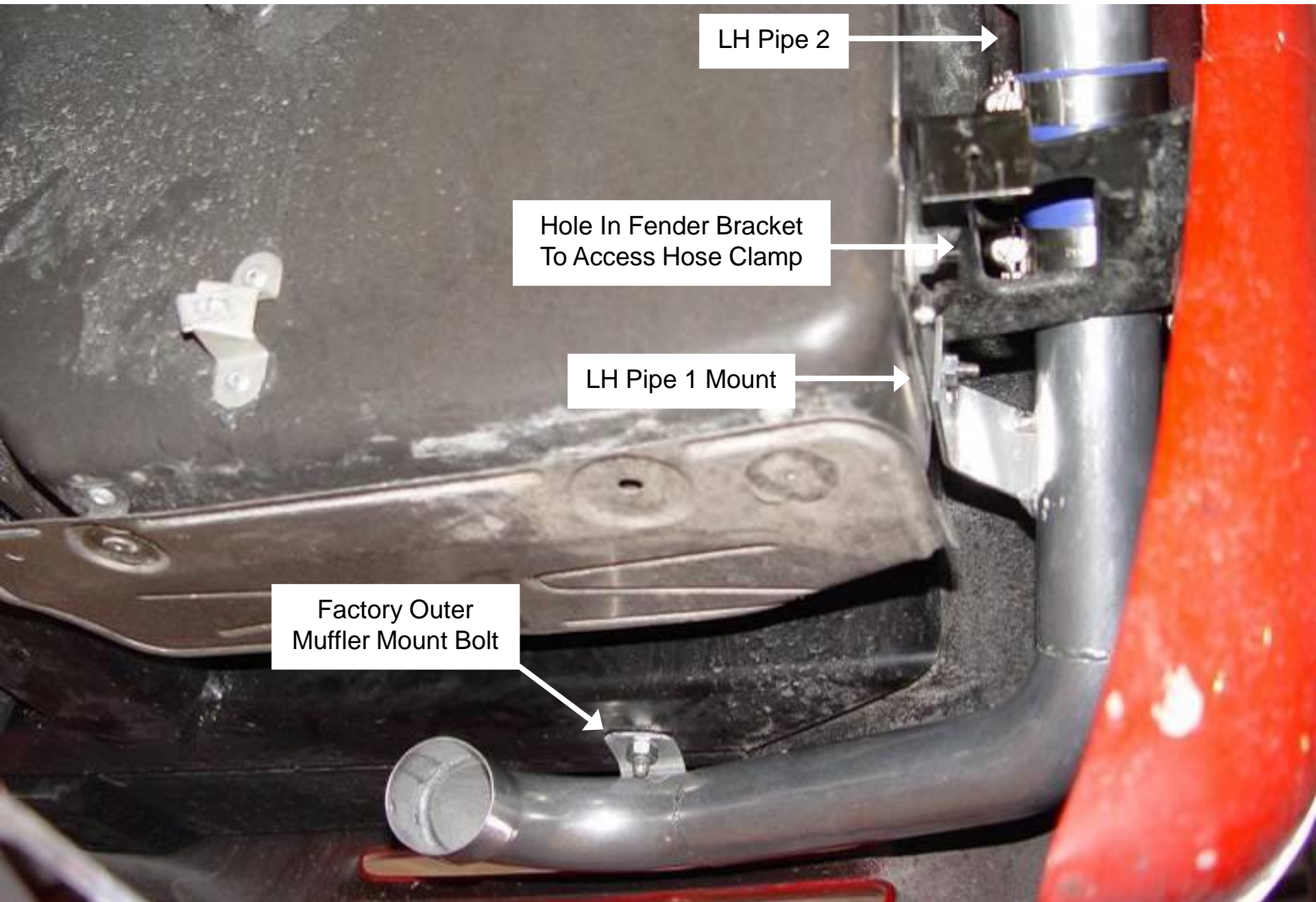
(Note: Make sure that the cavity inside the rocker panel is free of obstructions. It may be necessary to remove excess insulating foam and/or excess glue to ease installation of Pipe #3. It may be helpful to remove the plastic rear splash panels from the front wheel wells as shown in the above diagram to allow better access to the rocker panel cavity and the front of Pipe #3 as it can get stuck and need guidance from the front during installation.)

Insert a clean rag into the long end (outlet) of each Pipe #3 to prevent any debris from entering the pipe during final installation.

Install a 1.75" x 3" silicone hose and 2 clamps onto both ends of each Pipe #2. Install the long end of each Pipe #2 into the inlet end of Pipe #3 so that the top of Pipe #2 is flush and parallel with the top of the wheel well and secure in place with the clamps.

(Note: If you have difficulty installing Pipe #1, it may be easier to install Pipe #2 after installing Pipe #1. The silicone hoses can be slid all the way onto the ends of Pipe #2, then the hoses can be slid down onto Pipe #1 and Pipe #3 and secured with the hose clamps after Pipe #2 has been installed.)

1997-04 C5 Corvette Pipes 1-2 Mounting



LH Pipe 2

Hole In Fender Bracket
To Access Hose Clamp

LH Pipe 1 Mount

Factory Outer
Muffler Mount Bolt

Remove the factory nut from the 6mm stud shown in the above diagram which mounts the fender bracket and install each Pipe #1 into Pipe #2 as shown. Position the mounting brackets on each Pipe #1 over the stud in the fender bracket and install the factory nuts, but don't tighten yet. Align each Pipe #1 bracket over the outer muffler mount bolt. Reinstall the factory exhaust mounting nuts to secure Pipe #1 into position, and then fully tighten the factory nuts on the inner muffler mounting bolts and the fender brackets. Pipe #2 can be adjusted to prevent rattling by increasing the gap at the silicone hoses. Align the hose clamps so that they can be accessed for easy maintenance tightening and tighten the hose clamps.

(Note: It may be necessary to adjust the position of Pipe #3 slightly forward or back to facilitate proper alignment of Pipe #1 to Pipe #2. It may be necessary to bend the rear of the body support bracket to allow clearance for Pipe #1 to line up properly with the mounting studs. Be careful not to push the studs into the body as the stud support bracket inside the body will get bent and make it difficult to pull the stud all the way back out.)

Reinstall the brake duct vents, brake ducts, and the inner fender shields on both sides.

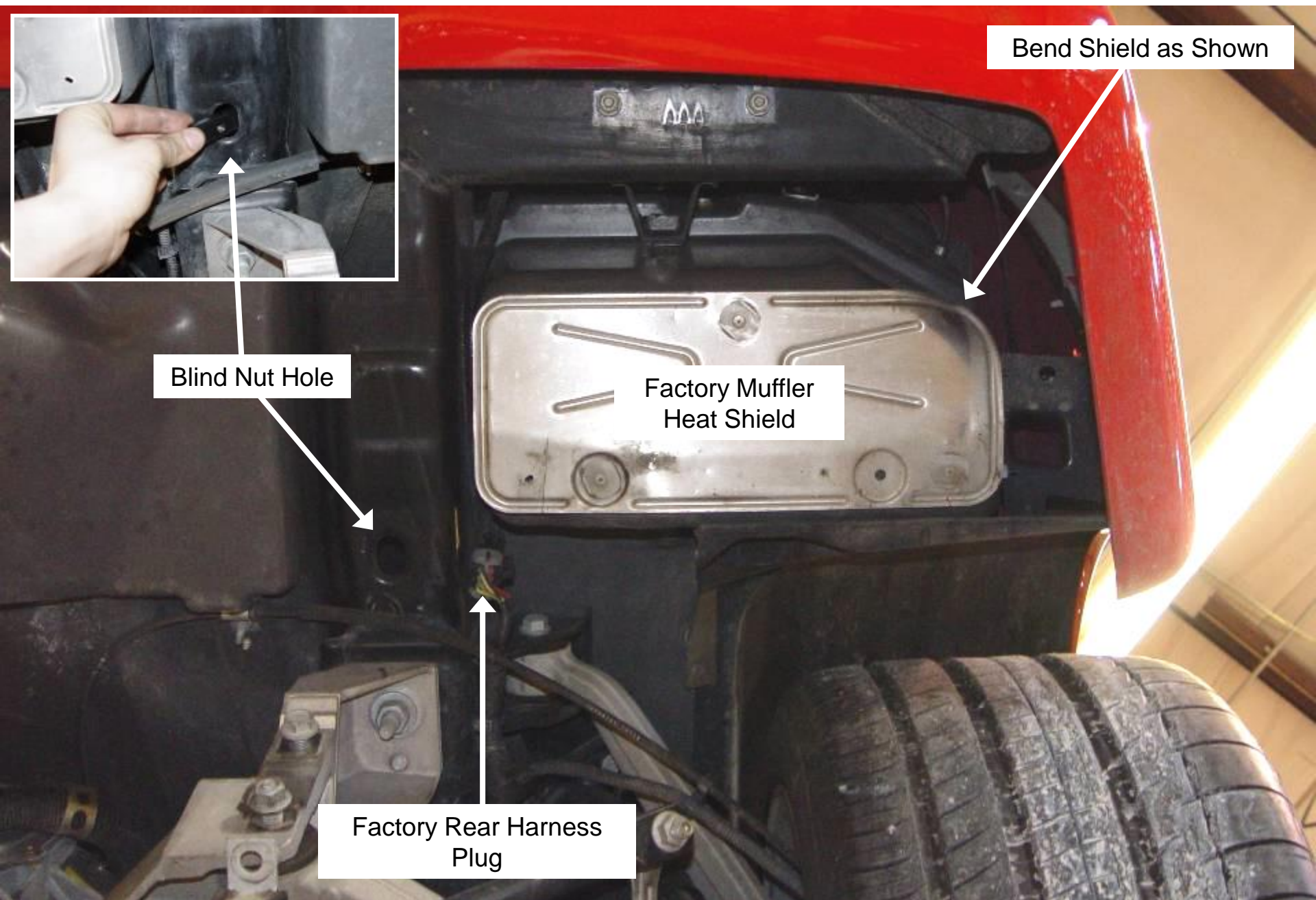
(Note: Installation of the rear inner fender shields as well as the rear splash shields on the front wheels can be done after the installation is complete and after the final tightening of the brackets and hose clamps has been done. The hose clamps should also be retightened after 50 miles of driving. Keep this in mind when installing the factory shields as they may need to be removed again to check the clamps.)

(Note: It may be necessary to grind the front stud on the brake duct vent slightly to allow adequate clearance from Pipe #3 and to prevent the front of the vent from being pushed outward. It will be very difficult to install the factory nut back on the front stud. The vent can be held in place by the other 3 mounting studs. It will be necessary to cut a small oval hole in the top of the inner fender shield to clear Pipe #2. This hole should be approximately 1.5" x 7" and located at the top-center of the fender well.)

Support and slightly raise the outer ends of the leaf springs and reassemble the leaf spring adjusting bolts and bushings in the reverse order of which they were removed. Tighten the adjusting nut until the distance from the top of the nut to the top of the bolt are equal to the measurements taken before disassembly. Reinstall the snap rings into the groove in the ends of the bolts and remove the supports.

Install a 2" x 3" silicone hose and 2 hose clamps **ALL THE WAY** onto the inlet end of each Pipe #1. After the turbochargers have been installed, this hose will then be slid back onto the compressor outlet.

1997-04 C5 Corvette Heat Shield Modification and Blind Nuts

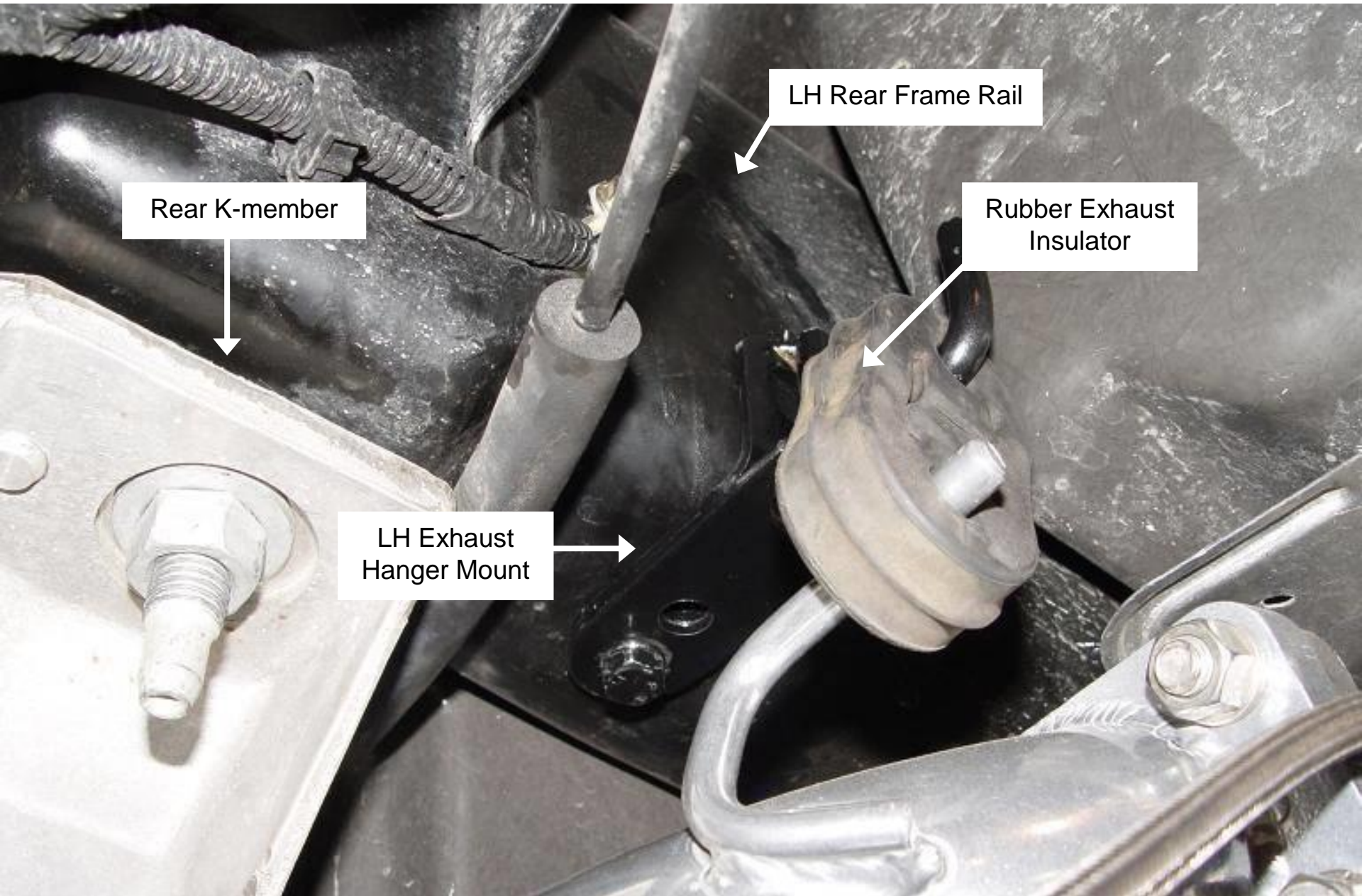


Bend both the right and left heat shields as shown above.

Carefully pull the rear harness plug out of the frame rail on the passenger's side as shown above.

Insert 1 blind nut into both the right and left hand frame rails as shown above.

1997-04 C5 Corvette Exhaust Hangers



Rear K-member

LH Rear Frame Rail

Rubber Exhaust Insulator

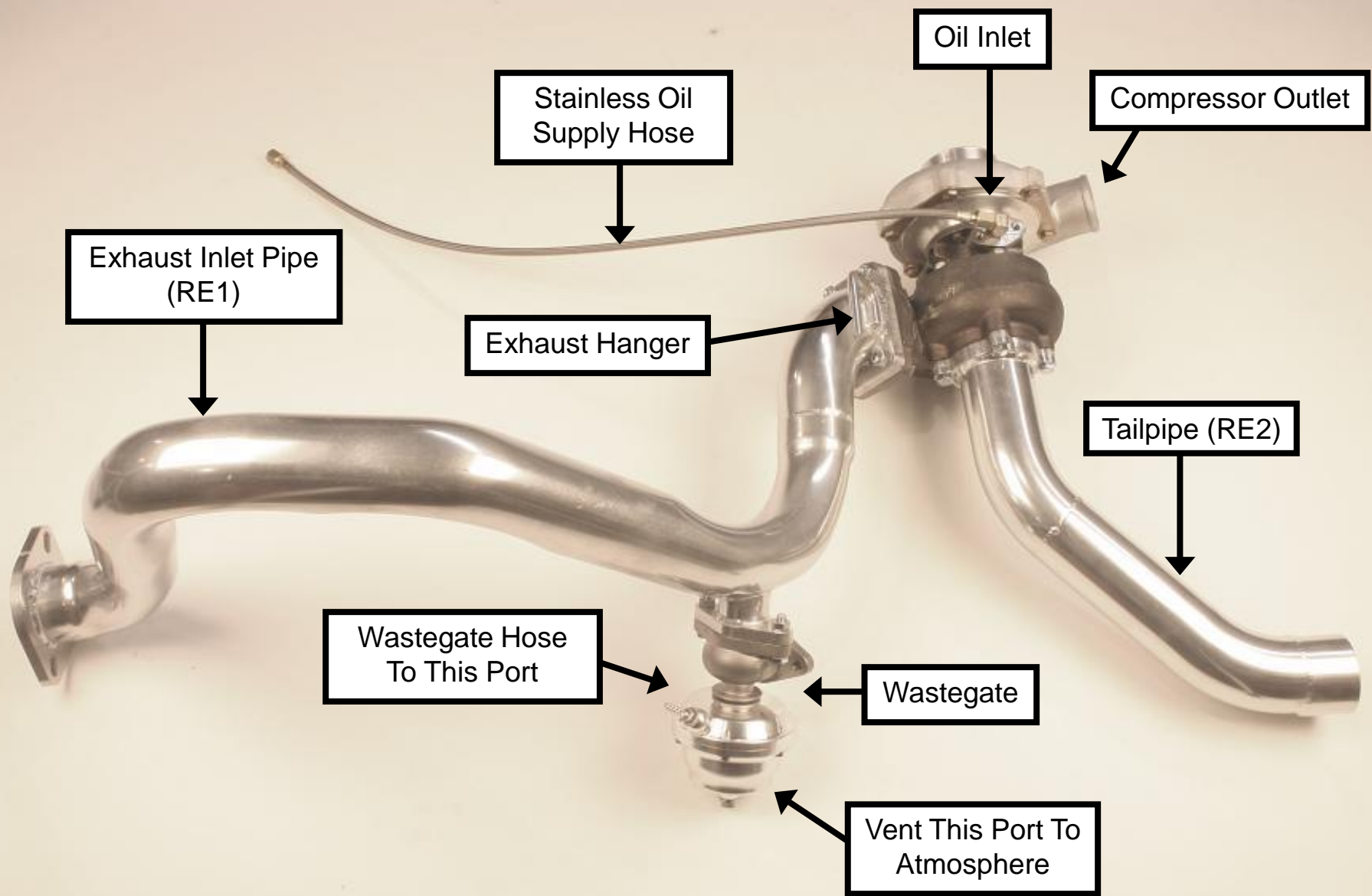
LH Exhaust Hanger Mount

Install the new exhaust hanger mount to the frame as shown by threading the 8mm x 35mm bolt, flat washer, and lock-washer provided through the mount and into the blind nut.

Tighten the mount securely to the frame and install the new rubber exhaust insulator onto the mount as shown.

Repeat this process for the RH side exhaust hanger mount.

1997-04 C5 Corvette RH Turbo and Exhaust



Assemble the RH turbocharger, T3 flange gasket, wastegate, RH exhaust inlet pipe, and RH tailpipe as shown in Diagram #18.

Tighten all bolts evenly to facilitate lining up flanges evenly. Don't do final tightening until the turbo assemblies are in place on the vehicle.

(Important: Make sure that the wastegate valve seat ring is properly positioned into the wastegate and the gasket is in place before installing the wastegate to the flange. Make sure that there is 1 sealing ring on each side of the banjo hose fittings on the wastegate ports.)

The 6 turbine housing bolts can be loosened to allow the center section of the turbocharger to be rotated. Rotate the center section so that the oil outlet flange of the turbo faces straight down once the turbo assembly has been installed on the vehicle. Once aligned properly, tighten the turbine housing bolts to 12 ft lbs.

Loosen the 6 compressor housing bolts and rotate the compressor housing so that the outlet of the compressor lines up with Pipe #1 once the turbo assembly has been installed on the vehicle. Once aligned properly, tighten the compressor bolts to 10 ft lbs.

Install the RH tailpipe onto the outlet of the turbine housing with the (x4) 8mm x 20mm bolts and lock washers. Complete the final tightening of the tailpipe once the assembly has been installed on the vehicle, so that the tailpipe can be adjusted if needed to properly line up the tailpipe with the body.

Install the 26" #4 stainless steel oil supply hose onto the fitting at the top of the turbocharger as shown.

1997-04 C5 Corvette LH Turbo and Exhaust

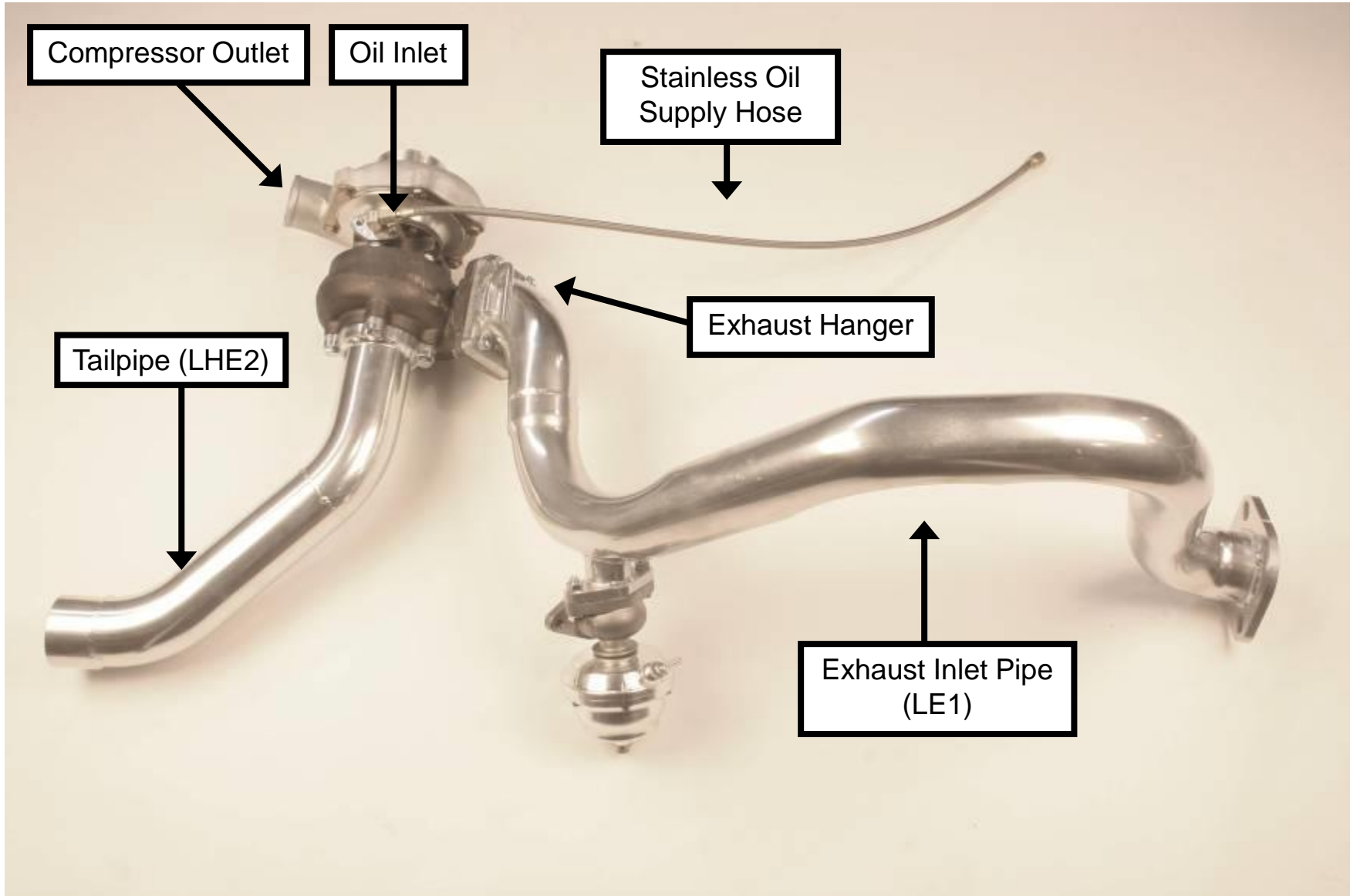


Diagram 19

Assemble the LH turbocharger, T3 flange gasket, LH exhaust inlet pipe, and LH tailpipe as shown in Diagram #19.

Tighten all bolts evenly to facilitate lining up flanges evenly. Don't complete final tightening until the turbo assemblies are in place on the vehicle.

The 6 turbine housing bolts can be loosened to allow the center section of the turbocharger to be rotated. Rotate the center section so that the oil outlet flange of the turbo faces straight down once the turbo assembly has been installed on the vehicle. Once aligned properly, tighten the turbine housing bolts to 12 ft lbs.

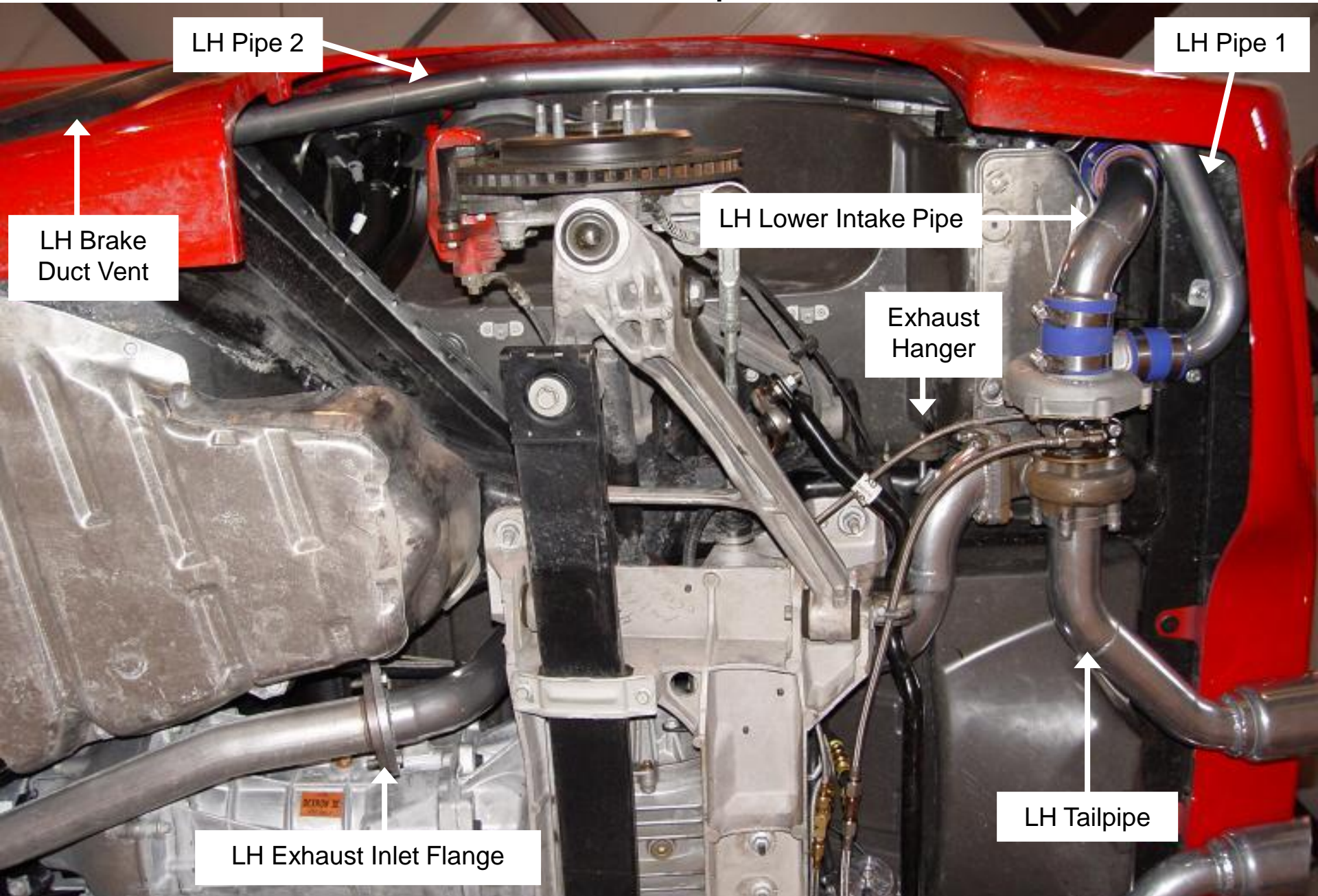
Loosen the 6 compressor housing bolts and rotate the compressor housing so that the outlet of the compressor lines up with Pipe #1 once the turbo assembly has been installed on the vehicle. Once aligned properly, tighten the compressor bolts to 10 ft lbs.

Install the LH tailpipe onto the outlet of the turbine housing with the (x4) 8mm x 20mm bolts and lock washers. Complete the final tightening of the tailpipe once the assembly has been installed on the vehicle, so that the tailpipe can be adjusted if needed to properly line up the tailpipe with the body.

Install the 26" #4 stainless steel oil supply hose onto the fitting at the top of the turbocharger as shown.

(Note: Once the turbo assemblies have been installed on the vehicle, it may be necessary to adjust the clocking of the center section and/or the compressor housing to line them up properly and to allow for maximum clearance from the body. The stainless supply hoses should be installed to the turbo inlet brass before installing the assembly onto the vehicle.)

1997-04 C5 Corvette Pipe 1, 2, and Turbo



Install the LH Turbo assembly as shown in the above diagram by inserting the flanged turbo inlet pipe end up and over the rear differential. Insert the exhaust hanger into the rubber insulator mount to hold the rear of the turbo in place. Install the factory exhaust gasket and connect the exhaust inlet pipe to the factory mid-pipe and secure with the factory bolts.

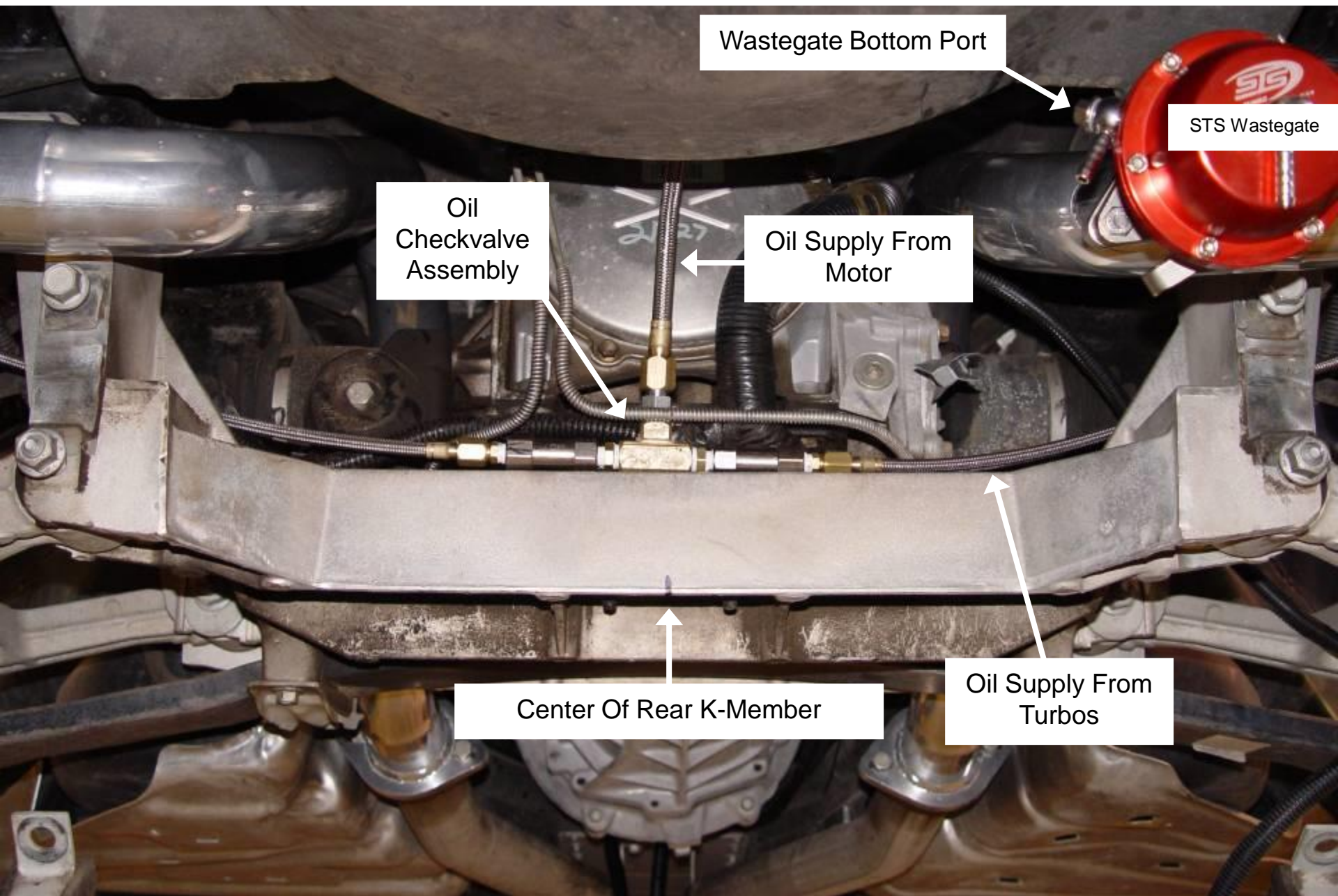
Repeat this process for the RH side.

(Note: It may be necessary to adjust the flange (mid-pipe flange, turbine housing flange, and/or tailpipe flange) alignment and/or bend the exhaust hangers to get the turbos to hang properly so that the tailpipes are centered and have equal clearance from the body. It may also be necessary to re-clock the turbo center section and compressor housing so that the oil outlet flange is facing straight down and the compressor outlet lines up correctly with Pipe 1. Some adjustments may need to be made after driving the vehicle to eliminate any rubbing or rattling.)

Route the wastegate hose to the top of the rear differential **(SEE WASTEGATE WARNING AT BEGINNING OF THIS MANUAL)**. Cut to length and install the supplied ¼" brass T. Install a 16 inch long ¼" hose onto either end of the brass T. Route either hose to the **BOTTOM** port of each wastegate and install onto barb. Secure all hoses with nylon ties to prevent damage from hot exhaust, sharp, and/or moving objects.

(IMPORTANT: Use caution when routing the wastegate hose. If this hose gets damaged, it can cause the turbo to boost uncontrollably and cause SEVERE and IMMEDIATE engine damage!)

1997-04 C5 Corvette Oil Checkvalve Assembly



Wastegate Bottom Port

STS Wastegate

Oil
Checkvalve
Assembly

Oil Supply From
Motor

Center Of Rear K-Member

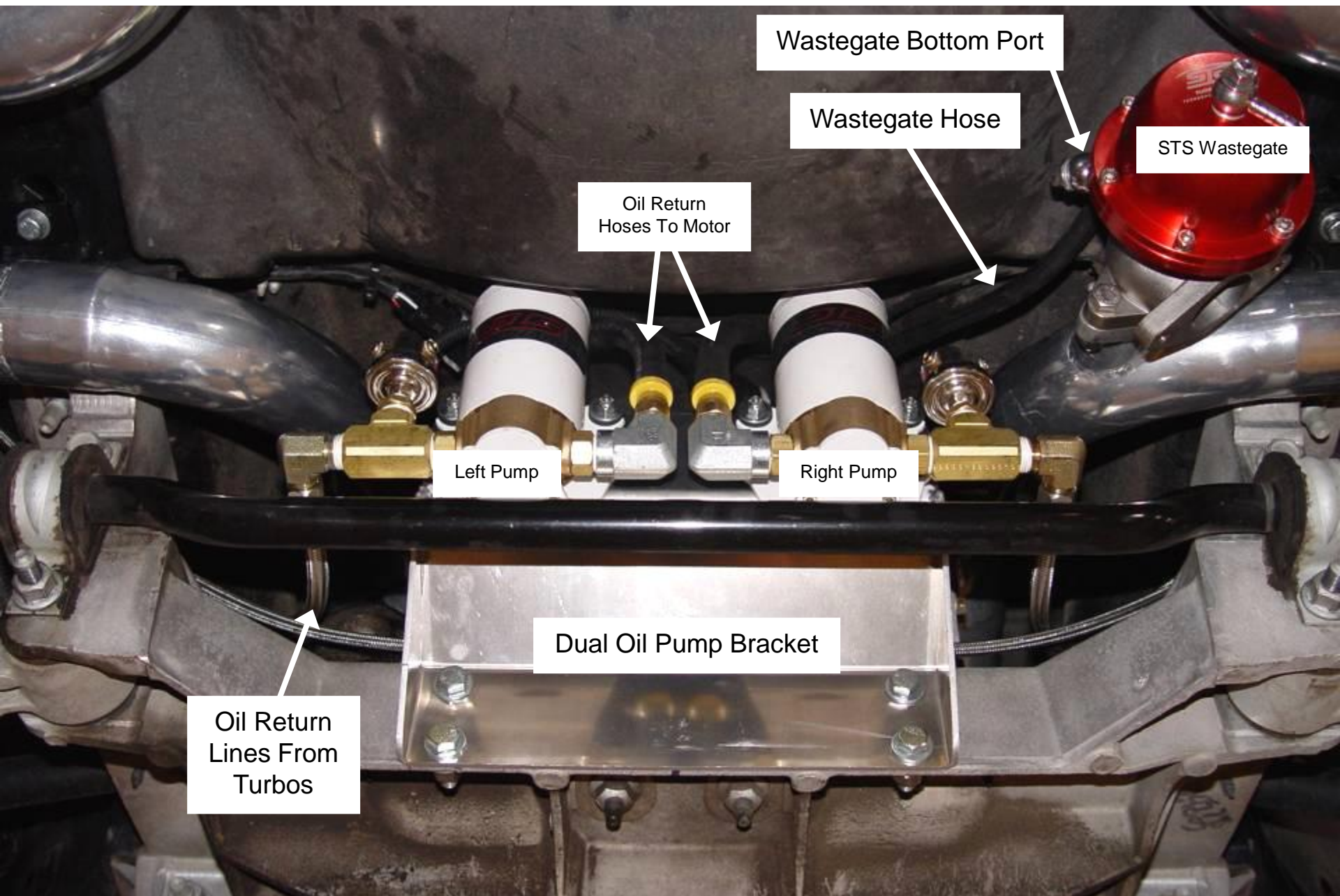
Oil Supply From
Turbos

Remove the tape from the oil supply line coming from the motor. Install the oil checkvalve assembly onto the end of this oil supply line.

Route the 2 oil supply lines from the turbos to either side of the oil checkvalve assembly and install as shown above.

Locate the center of the rear K-member and mark this location with a permanent marker.

1997-04 C5 Corvette Dual Pump Assembly



Wastegate Bottom Port

Wastegate Hose

STS Wastegate

Oil Return
Hoses To Motor

Left Pump

Right Pump

Dual Oil Pump Bracket

Oil Return
Lines From
Turbos

Locate the center of the dual pump oil bracket and mark it's location.

Line up this mark with the mark previously made on the rear K-member. Also line up the bottom of the oil pump bracket with the bottom of the K-member. Once the bracket is positioned as shown above, use a suitable clamp to hold it in place.

Mark the 4 holes through the oil pup bracket on the rear K-member.

Remove the oil pump bracket and drill (x4) 7/16" holes in the previously marked locations.

Plug the wiring harness plugs onto the oil pumps with the plug marked "passenger" going to the right pump and the plug marked "driver" going to the left side pump.

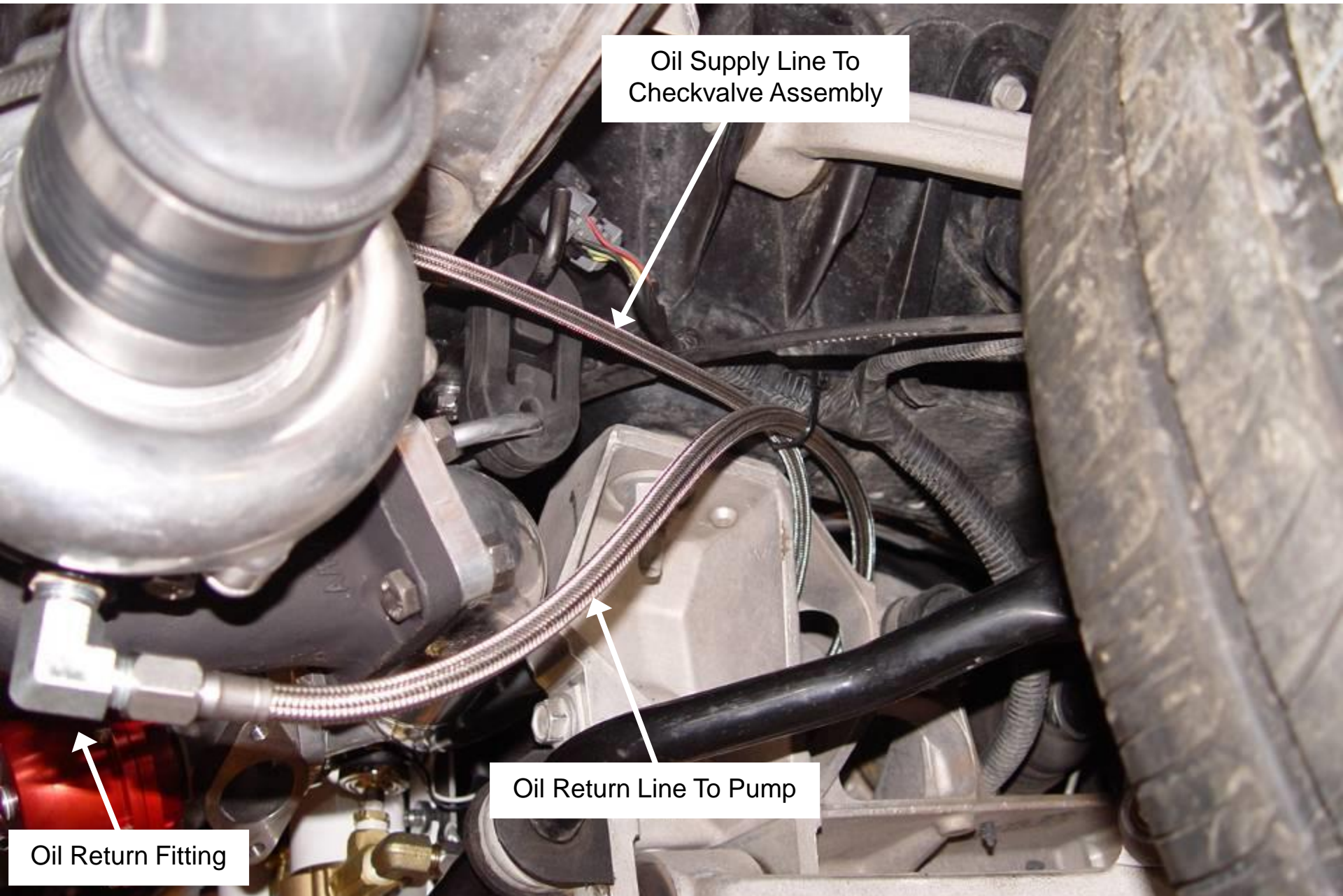
Re-clamp the pump bracket onto the K-member and install the supplied 3/8" bolts, nuts, flat washers, and lock washers as shown.

Route the oil return hoses from the engine to the oil pump outlets.

Install the brass barb/swivel fittings onto the oil pump outlets and cut the oil return hoses to length.

Install the brass barb/swivel fittings into the oil return hoses, and then install fittings onto the pump outlets as shown above.

1997-04 C5 Corvette Oil Return Lines



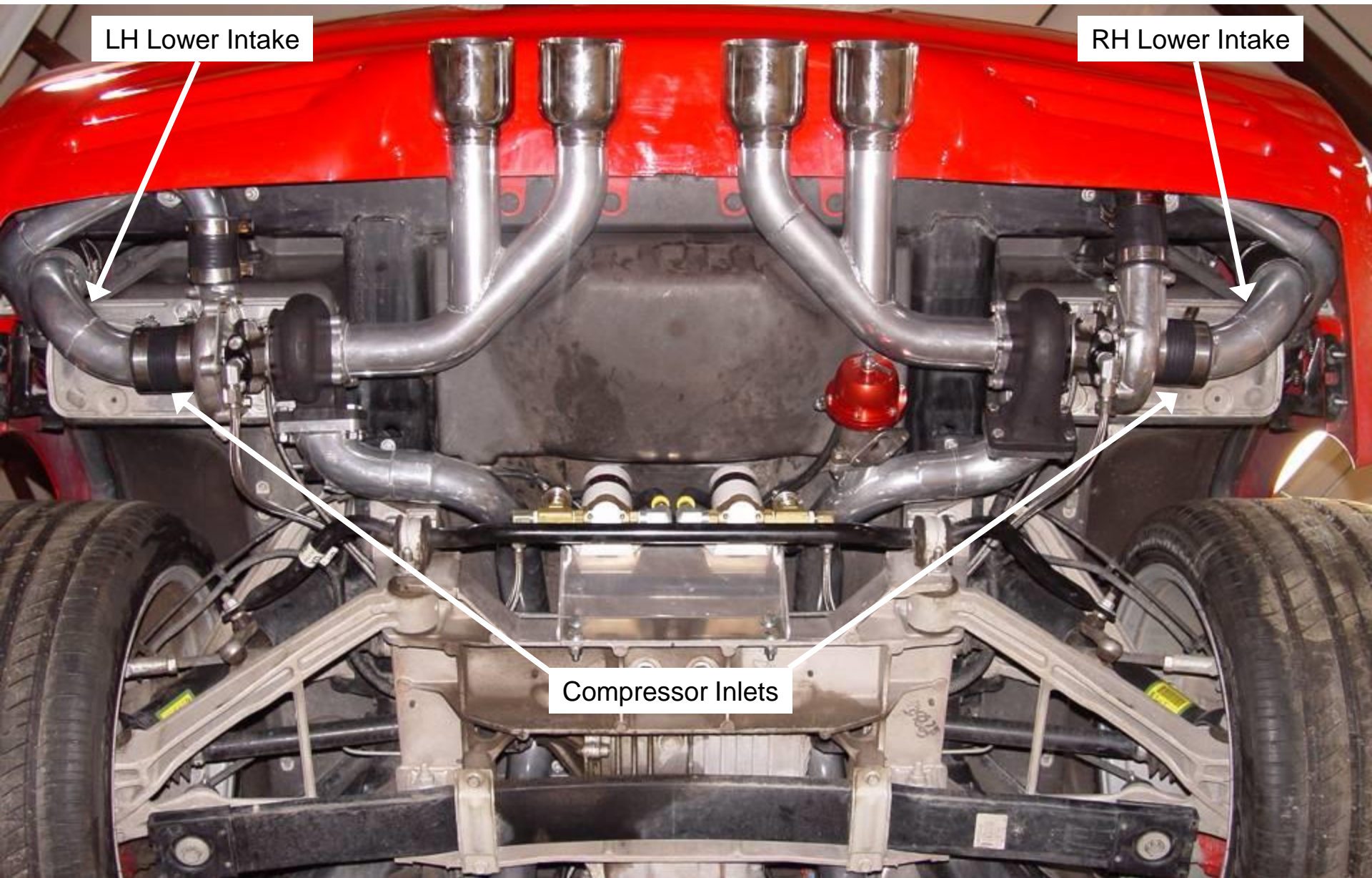
Install one 32 inch long #6 stainless line onto each turbo oil outlet.

Route both the oil return lines and oil supply lines, keeping them away from any hot, sharp and/or moving parts, through the K-member as shown above and secure to the factory wire harness with nylon ties.

Install the other end of the #6 stainless lines onto the inlet (same side as pressure switch) of each oil pump and secure.

(NOTE: Make sure that all wastegate, oil supply, and oil return hoses are secured with nylon ties provided and are kept away from any hot, sharp, or moving objects. Damage to any of these hoses can cause immediate and severe damage to the vehicle!!!)

1997-04 C5 Corvette Underneath Overview



Reinstall the rear sway bar.

Loosen the 6 turbine housing bolts and rotate the center section of the turbocharger so that the oil outlet flange faces straight down (the AN fitting should face forward) as shown in Diagram #21. Tighten the turbine housing bolts to 12 ft lbs.

Loosen the 6 compressor housing bolts and rotate the compressor housing so that the outlet lines up with Pipe #1. Tighten the compressor housing bolts to 10 ft lbs and slide the 2" x 3" silicone hose on Pipe #1 forward onto each compressor outlet and secure the clamps.

Install a 2.5" x 3" silicone hose and clamps onto the outlet ends of the upper intake pipes and secure the clamps.

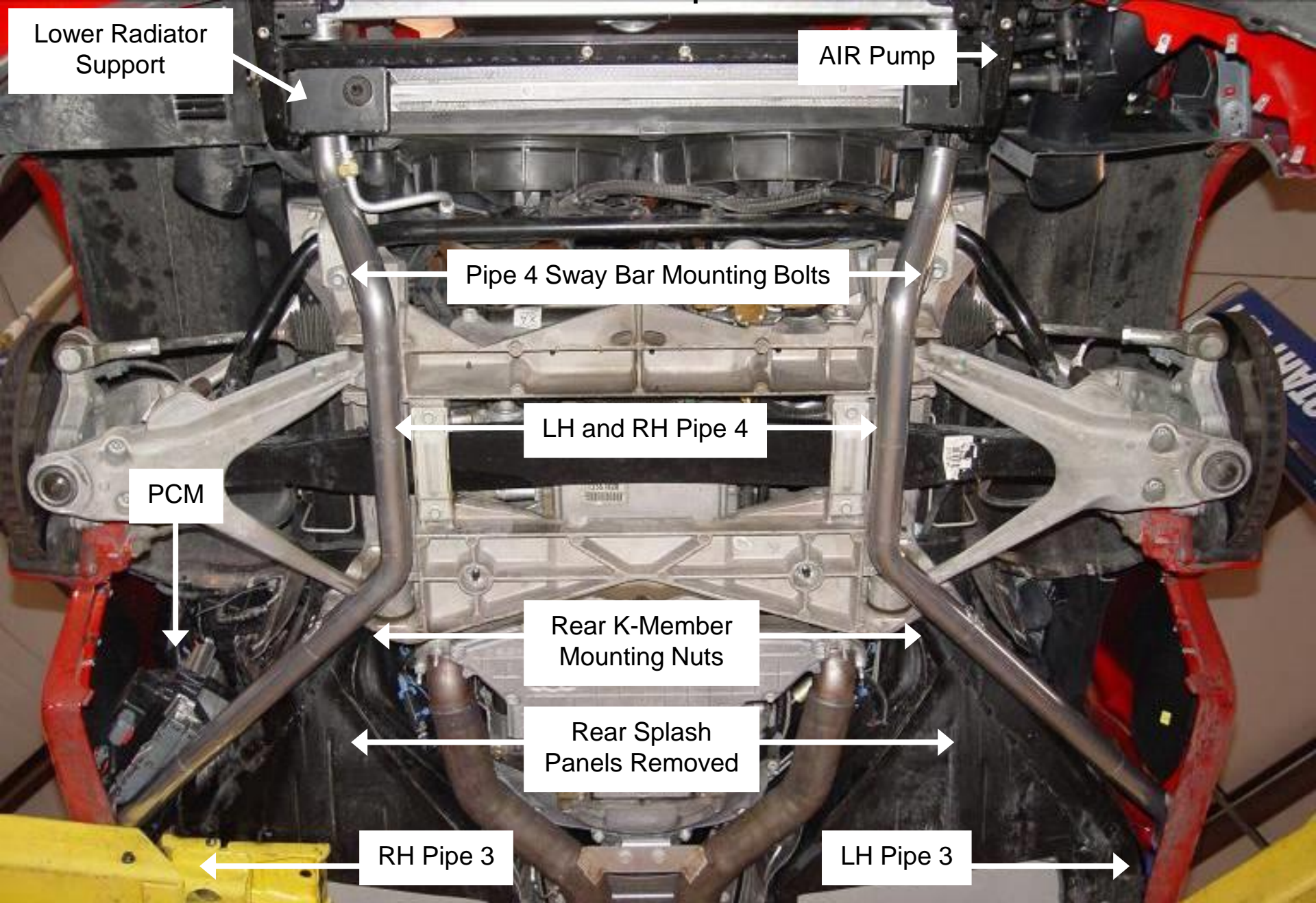
Install a 2.75" x 3" silicone hose and clamps all the way onto the outlet ends of the lower intake pipes. Then, insert the small end of each lower intake pipe into the upper intake pipe. Align the lower intake pipes with the compressor inlets and slide the silicone hose over the compressor inlet. Position the intake pipes and clamps to provide adequate clearance from other components and secure all the hose clamps.

Install the 21" #6 stainless oil return hose onto the outlet fitting of the LH turbocharger and the 27" #6 stainless oil return hose onto the outlet fitting of the RH turbocharger. Connect the other end of the stainless oil return hoses to the #6 fittings on the oil return hose T which runs to the oil pump. Tighten the fittings on the ends of these hoses so that they will keep the hoses from hanging down. The hoses should fit nicely between the rear sway bar and the lower sway bar frame bushing mounting studs as shown.

Once the system has been installed and all pipes are lined up correctly, securely tighten all the hose clamps and tighten all the mounting hardware and bolts. Double check all the hose routing and make sure that hoses are secure and away from any hot, sharp, and/or moving objects.

(Note: When the turbocharger and all the tubing have been installed correctly, the installation should be identical to the picture in Diagram #21.)

1997-04 C5 Corvette Pipe 4 and Front View



Lower Radiator Support

AIR Pump

Pipe 4 Sway Bar Mounting Bolts

LH and RH Pipe 4

PCM

Rear K-Member Mounting Nuts

Rear Splash Panels Removed

RH Pipe 3

LH Pipe 3

Remove the front wheels. Remove the rear splash panels and the LF splash panel from the front wheel wells. Remove the center section and the LH section of the front air dam. Remove the 2 aluminum air dam support brackets from the lower radiator support bracket. Remove the front radiator shroud and the outside air temperature sensor from the shroud.

Remove the screws securing the lower rear corners of the front fenders to allow the lower edge of the front fender to be pulled out to access the outlet ends of each Pipe #3. Remove the rags from the outlet ends of each Pipe #3 and clean out any debris that may have entered the pipes. Install a 1.75" x 3" silicone hose and 2 hose clamps onto the outlet end of each Pipe 3# and secure the clamps.

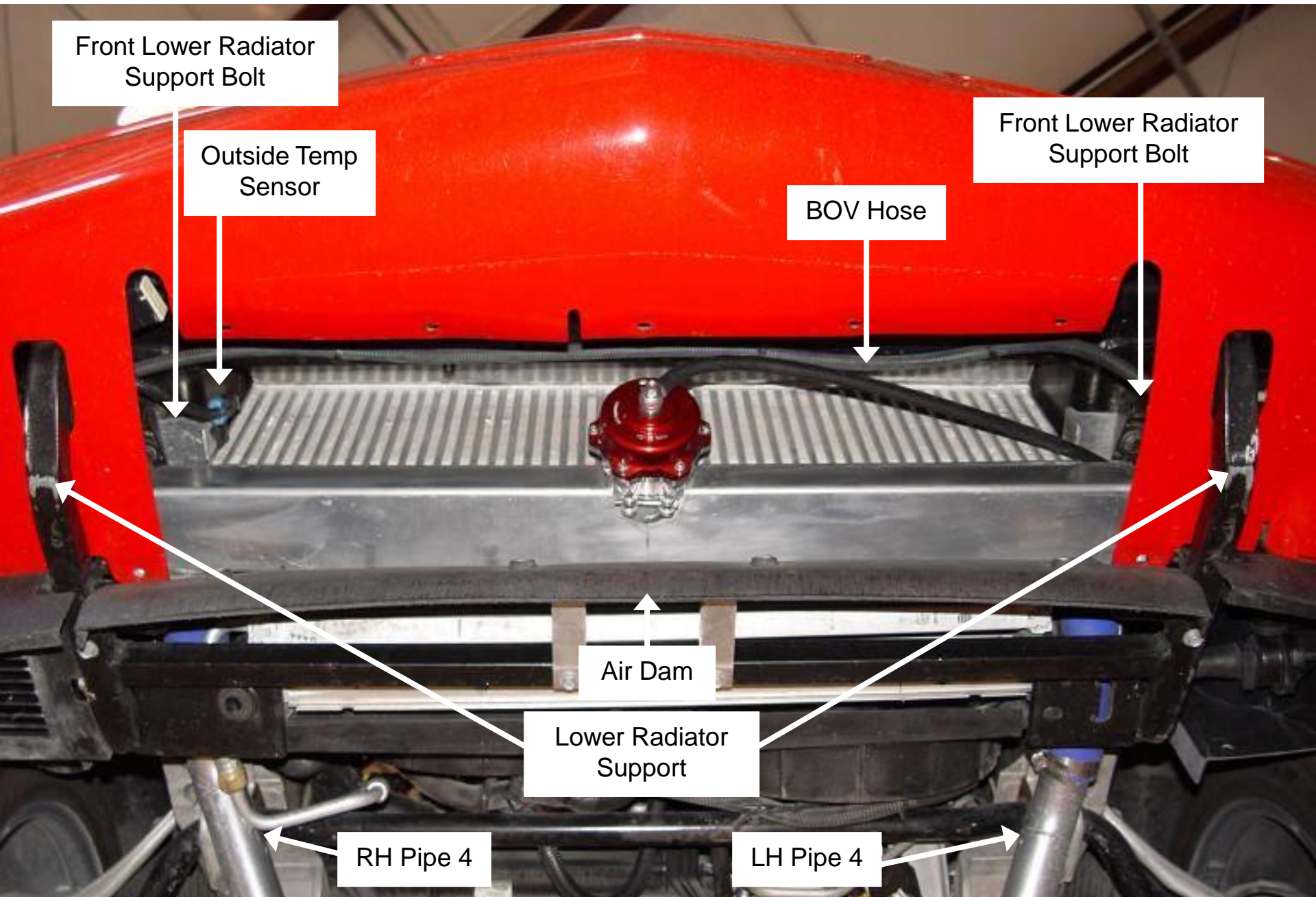
(Note: The hose clamps can be tightened from below on the passenger's side where they can be accessed between the frame and the loosened fender. On the driver's side, it is recommended that the hose clamps be tightened from above through the splash panel access to prevent hose clamp bolts from rubbing on the bottom side of the fender.)

Remove the large nuts (21mm wrench) from the LR corner of the front K-member and remove the rear bolt (13mm wrench) from the LF sway bar frame bracket. Install the LH Pipe #4 into the outlet end of LH Pipe #3. Install Pipe #4 over the K-member stud and loosely install the factory nut. Secure the front bracket to the sway bar mount using the factory bolt and two 5/16" flat washers as spacers between the pipe bracket and the sway bar frame bracket. Align Pipe #4 for maximum clearance and tighten the nut, bolt, and hose clamps. Repeat this process to install RH Pipe #4.

Install a 7.5" x 1.75" silicone hose and 2 clamps onto the outlet end of LH Pipe #4. Install a 6.5" x 1.75" silicone hose and 2 clamps onto the outlet end of RH Pipe #4. Do not secure the hoses with the clamps, as they will have to be adjusted when the intercooler is installed. When complete, the installation should look identical to the diagram above. Reinstall the rear splash shields and secure the front fenders with the factory screws.

(Note: It will be necessary to cut a slot in the splash shield to clear Pipe #4. It will be necessary to relocate the air injection hose on the driver's side radiator support to clear the silicone hose on the outlet of Pipe #4.)

1997-04 C5 Corvette Intercooler



Front Lower Radiator
Support Bolt

Outside Temp
Sensor

Front Lower Radiator
Support Bolt

BOV Hose

Air Dam

Lower Radiator
Support

RH Pipe 4

LH Pipe 4

Remove the three bolts securing the AIR pump to the LF side of the lower radiator support. Remove the 4 bolts securing the lower radiator support to the bottom side of the frame rails and pull the bracket down slightly.

Install the intercooler as shown in the above diagram by inserting the intercooler brackets one side at a time (passenger's side first) between the lower radiator support bracket and the bottom of the frame rails. Once in place, reinstall the 2 rear lower radiator support frame bolts about ½ way.

Line up the silicone hoses onto the intercooler from each Pipe #4. Line up the intercooler brackets between the bottom of the frame and the lower radiator support brackets and install the front support bracket bolts. Position the intercooler toward the front of the vehicle and tighten all 4 radiator support bracket bolts. Bend the aluminum intercooler deflector forward (if necessary) so the gap to the front frame rail is at a minimum. Tighten the hose clamps on the silicone hoses between each Pipe #4 and the intercooler.

Install the factory outside air temperature sensor clip into the ¼" hole in the RF intercooler bracket and plug in the electrical connector. Reinstall the center air dam aluminum support brackets to the lower radiator support and install the center air dam. Bend any factory hoses or lines away from the pipes to allow adequate clearance.

Install the BOV O-ring onto the BOV flange on the lower intercooler tank. Carefully install the BOV while keeping the O-ring in place and secure the BOV to the flange with the V-band clamp. Install the barbed banjo fitting with the supplied bolt and 1 aluminum sealing ring on each side of the banjo fitting. Cut the 64 inch long ¼" hose (from the brake booster hose) to length and install onto the BOV fitting. Secure hose away from any hot, sharp, and/or moving objects with the nylon ties provided to prevent damage to the hose.

(Note: High altitude BOV springs are available for elevations over 4000 feet.)

(IMPORTANT: Use caution when routing the BOV hose. If this hose gets damaged, since it is connected to the wastegate hose, it can cause the turbo to boost uncontrollably and cause SEVERE and IMMEDIATE engine damage! Inspect these hoses frequently and monitor boost levels at all times to prevent accidental over-boost conditions.)

INTERCOOLER INSTALLATION WARNING!

The installation of an intercooler is a great addition to any turbocharger system and can dramatically increase the efficiency, power, and reliability of your turbocharger system by lowering intake temperatures and creating a denser intake charge. There is, however, a slight possibility that under some very specific conditions, water may accumulate in the bottom of the intercooler. Because of the cooling and condensing effect of the intercooler on the air inside the cooler during some driving conditions as well as after the engine has been shut off, accumulation of liquid inside the intercooler can occur. Due to the airflow characteristics of an intercooler, the airflow through the bottom of the core may not be enough to keep this liquid cleared out and could allow it to build to a substantial level. If this occurs, this liquid could be pulled up into the engine during a high airflow demand. A large amount of liquid can cause a hydra-lock condition which will cause IMMEDIATE SEVERE damage to the engine as the engine will not be able to compress the liquid during the compression stroke which will cause a mechanical failure of the engine components. Conditions that could cause this problem would be extreme wet driving conditions, submerging the air intake system in water, high humidity, and/or extreme temperatures.

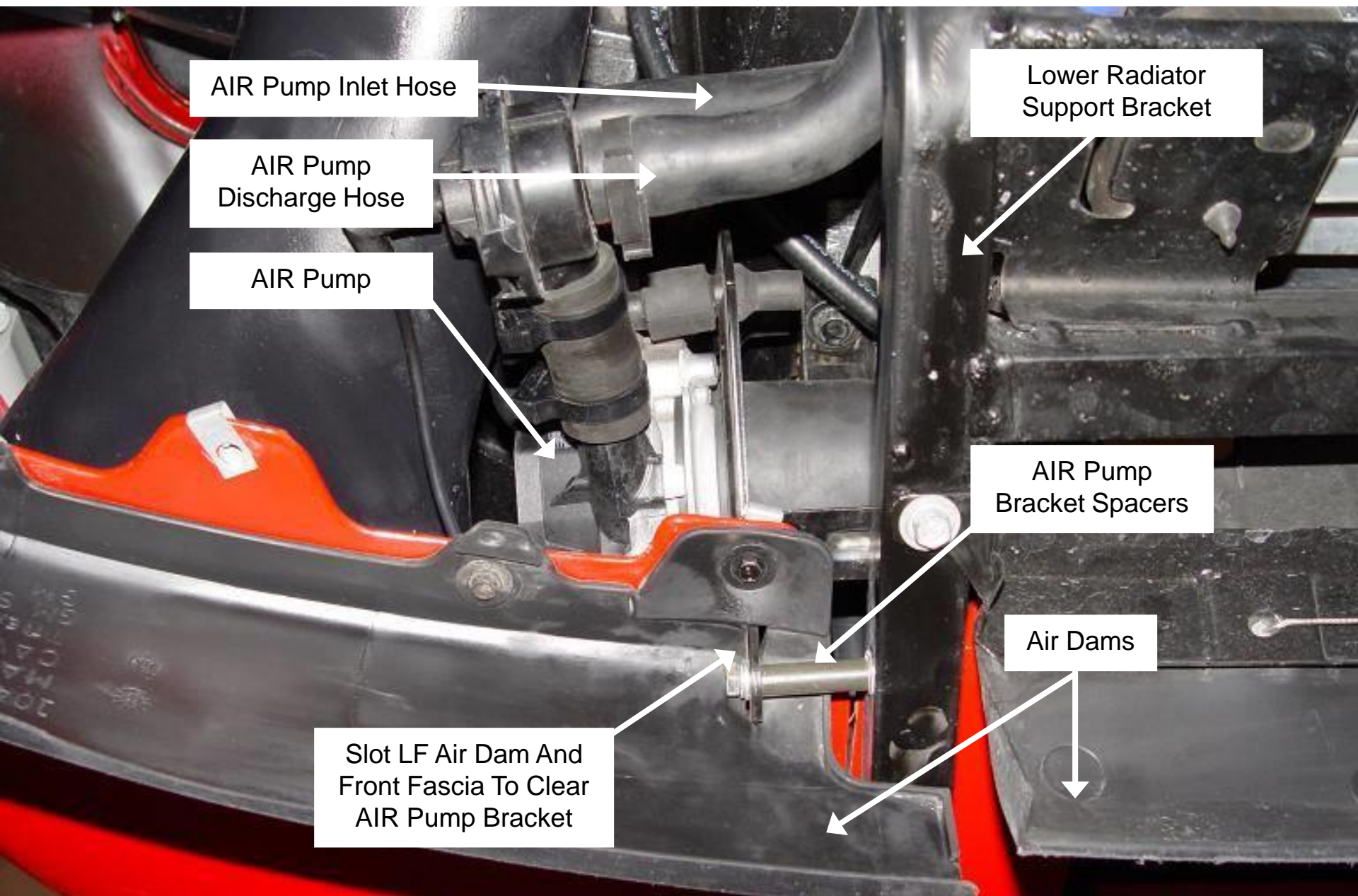
The possibility of this rare condition can be greatly reduced and/or prevented. It is highly recommended that you perform one of the following methods:

- 1- Regularly inspect the intake system and intercooler for signs of water accumulation and clean out any water and/or oil (fluid) that is found inside the intake system.*
- 2- Drill a 1/8" hole in the bottom of the intercooler tank and install a small sheet metal screw that can be removed on a regular basis to inspect for liquid accumulation inside the intercooler and allow that fluid to be drained from the cooler. **(Note: The cooler will only drain when you physically remove this screw. If left unchecked, it could accumulate enough liquid inside the cooler to cause engine damage.)***
- 3- Drill a small 1/16" hole in the bottom of the intercooler which will allow the boost pressure within the intercooler to automatically purge any liquid from the system through the hole. **(Note: This small hole will not allow enough airflow to pass through it to affect performance but should allow any fluid in the system to automatically drain. There is a risk that the hole could become plugged so it is recommended that the hole be checked to make sure it remains clear periodically.)***

(Note: There is a remote possibility that this condition could occur in the intake tubing of the turbocharger system without an intercooler. The above precautions could be taken by drilling a small hole in the lowest point of the turbocharger intake tubing as described in step 2 or 3.)

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1997-04 C5 Corvette AIR Pump Relocation



AIR Pump Inlet Hose

AIR Pump Discharge Hose

AIR Pump

Lower Radiator Support Bracket

AIR Pump Bracket Spacers

Air Dams

Slot LF Air Dam And Front Fascia To Clear AIR Pump Bracket

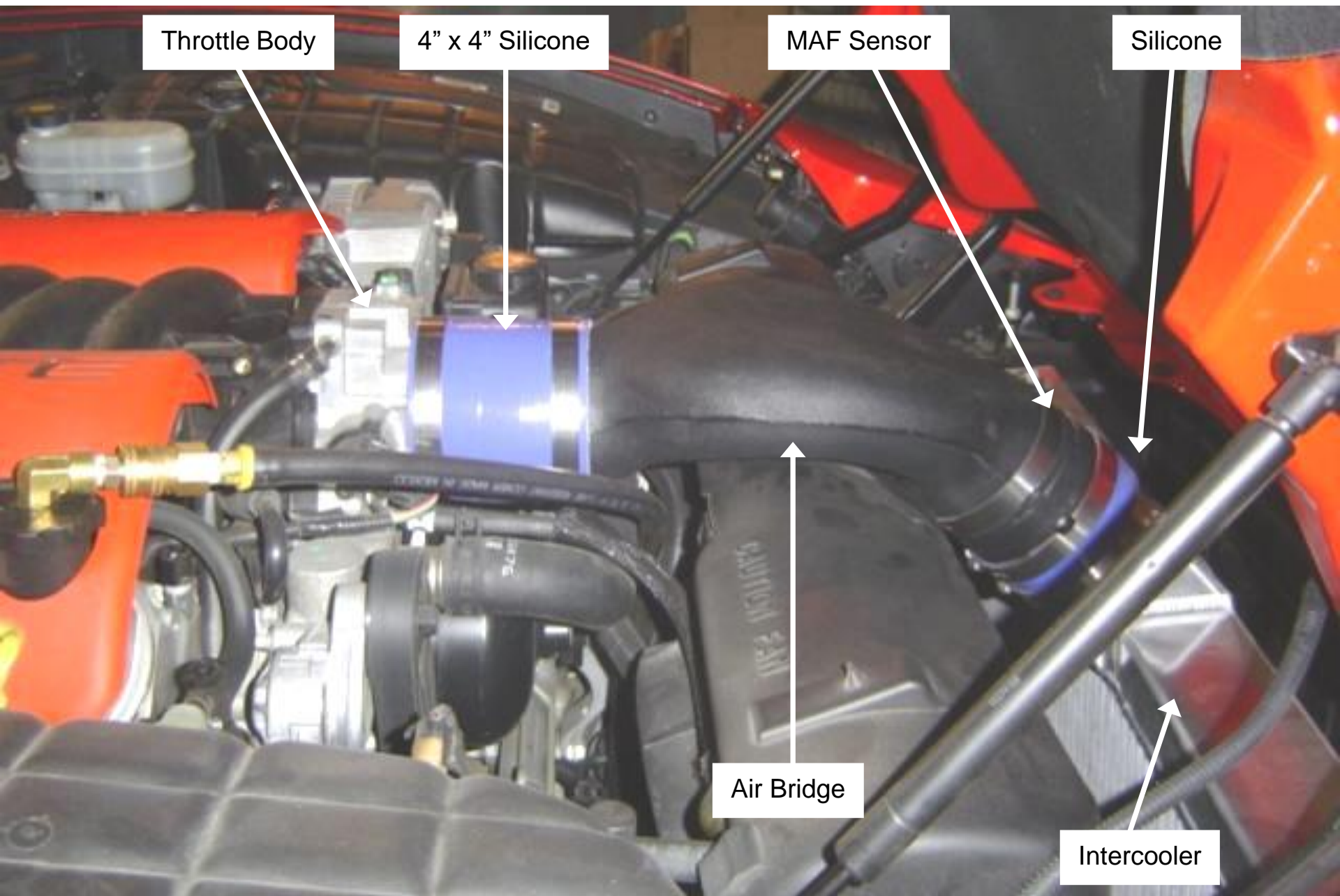
Reinstall the AIR pump to the radiator support bracket with the three 6mm x 50mm bolts, lock-washers, and the 1.25" long spacers provided as shown in the above diagram.

Install the 2 upper mounting bolts and spacers first, as the lower bolt will require trimming of the front fascia and LF air dam plastic to clear the relocated AIR pump bracket. Cut a slot in the plastic fascia and LF air dam. Install the lower bolt and spacer. Reinstall the LF air dam and LF splash panel.

Check the routing of the AIR Pump inlet hose (with the previously installed BLACK breather filter) and secure the hose with a nylon tie.

Lower the vehicle to access under the hood.

1997-04 C5 Corvette Air Bridge



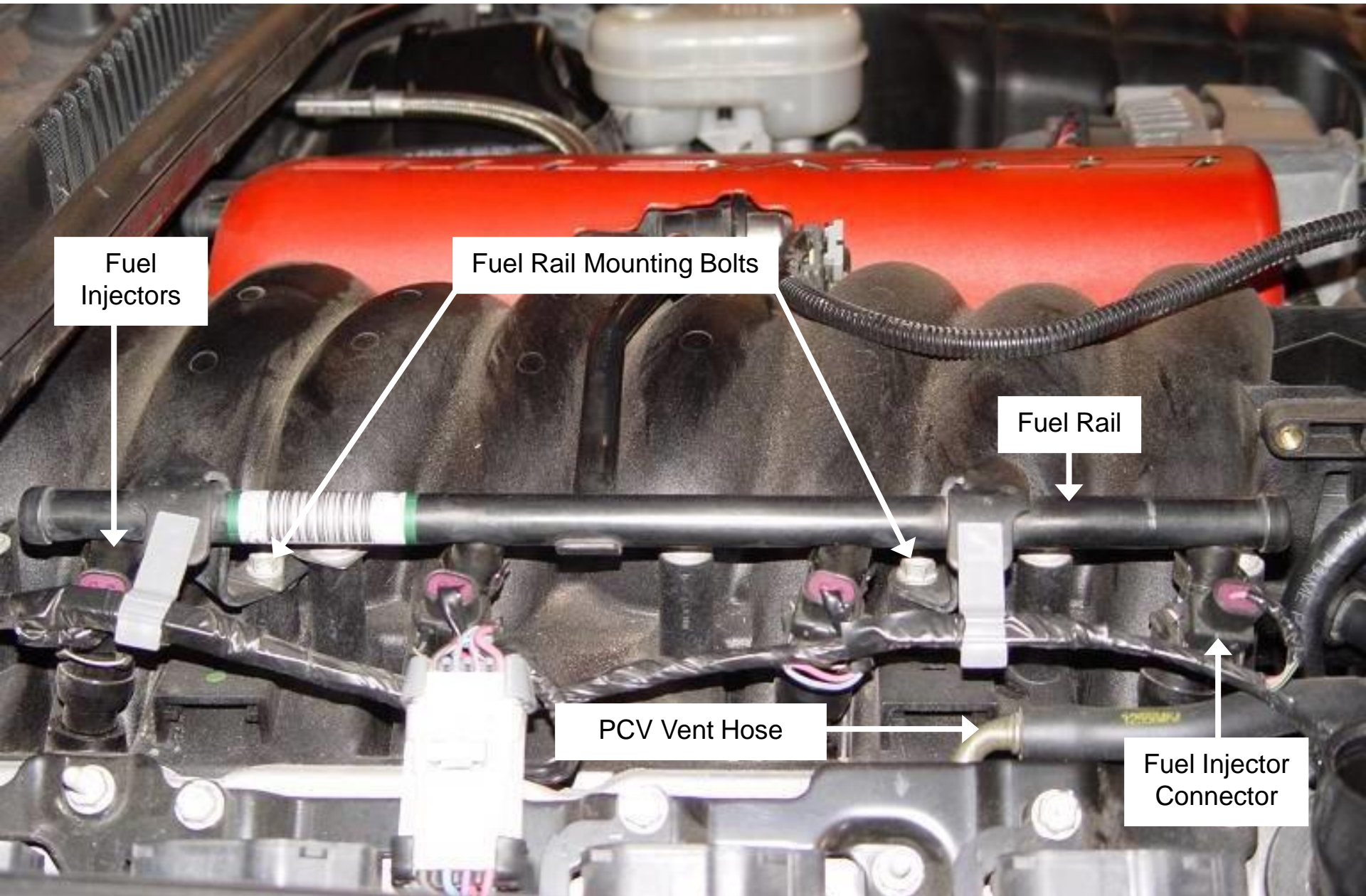
Install the MAF outlet into the inlet side of the new air bridge and secure with clamp. Install the silicone hose and 2 clamps onto the inlet end of the MAF sensor and secure with a hose clamp. The flow indicator arrow on the side of the MAF sensor should point toward the throttle body.

Position the air bridge/MAF sensor assembly onto the throttle body and the intercooler outlet flange and secure the assembly in place with the hose clamps. Route the MAF sensor harness to the MAF sensor and secure the harness to prevent damage from hot, sharp, and/or moving objects. Connect the MAF sensor harness connector onto the MAF sensor.

(Note: If the MAF air bridge assembly doesn't line up properly, the intercooler can be moved forward or back by loosening the lower radiator support brackets and the hose clamps on each Pipe #4. Slide the intercooler into the proper position then tighten the radiator support brackets and the hose clamps.)

(Note: Route and secure the MAF sensor harness to prevent damage from HOT, SHARP, and/or MOVING objects.)

1997-04 C5 Corvette Fuel Injectors



WARNING: Any fire or smoking is absolutely prohibited during this process. Use extreme caution as fuel hoses and lines are pressurized and will leak when disconnected. Take all necessary precautions when servicing pressurized fuel lines and open fuel containers!

Depressurize the fuel system by loosening the fitting at the fuel filter and draining the fuel into a suitable container. Once system pressure has been relieved, tighten the fittings.

(Note: This is a good time to replace the fuel filter with a new one.)

Remove the oil cap and plastic valve cover covers. Make sure that the intake manifold is clean around the fuel injectors so that no debris can fall into the intake manifold. Any debris that gets into the intake manifold could cause immediate SEVERE engine damage!

Referring to the above diagram, disconnect the 8 fuel injector harness electrical connectors from the fuel injectors. Remove the 4 fuel rail mounting bolts. Remove the fuel rails and 8 injectors from the intake manifold, taking care that no debris falls into the holes in the intake manifold. Remove the metal fuel injector retaining clips from each of the injectors. Using a small container to catch the fuel, remove each fuel injector one by one and drain the fuel into the container. Make sure that the O-ring seals come out of the manifold and the rail with the injectors.

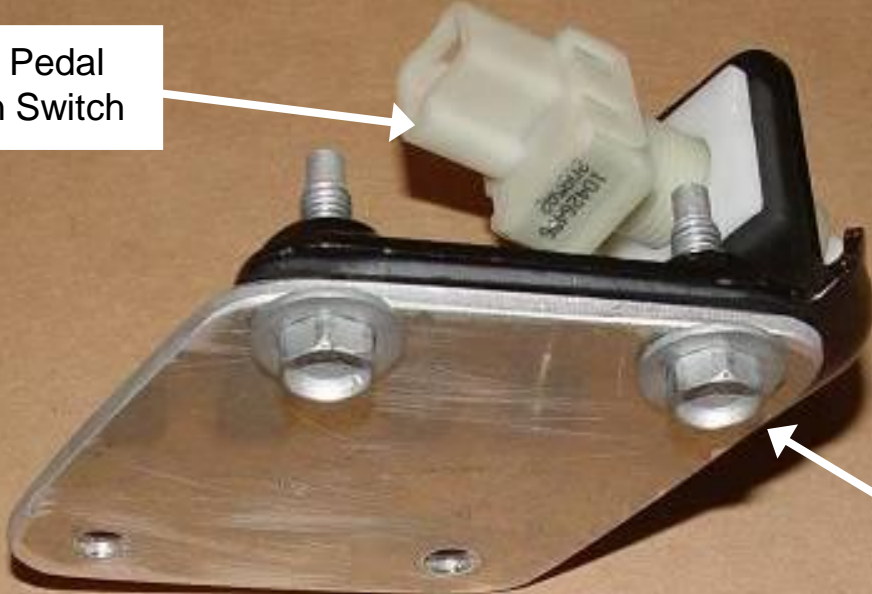
Install the metal retaining clips onto the new fuel injectors at the same location which they came off of the factory injectors. Lubricate the seals on the new injectors with silicone grease and insert the injectors into the fuel rails. Reinstall the fuel rails onto the intake manifold making sure not to damage the injector seals as the injectors fit into the manifold ports. Reinstall the fuel rail bolts and reconnect the injector electrical harness connectors.

Cycle the key to the RUN position several times to build up fuel pressure in the rails and check and repair any fuel leaks in the system. Reinstall the plastic valve cover covers and oil cap.

Replace the spark plugs with the Accel 0524-4 spark plugs provided. Set the plug gap to .035" for standard boost. Use a small amount of anti-seize on the spark plug threads.

1997-04 C5 Clutch Pedal Bracket (MT ONLY)

Clutch Pedal
Position Switch



Factory Bolts



If the 2 step Neutral Rev Limit tuning option is going to be used, it will be necessary to relocate the clutch pedal position switch to make it less sensitive or the Limiter will tend to engage between shifts. This bracket will relocate the switch upwards on the clutch pedal and cause the switch to 'open' when the clutch pedal is approximately ½ way pushed in. At this point, the PCM will set the Neutral Rev Limit to 3800 RPM. With the clutch pushed in and the gas pedal held at Wide Open, the RPM will hold at 3800 and the turbochargers will build boost in Neutral. This is quite effective for being able to launch the car on full boost. Caution must be used as prolonged use of the 2 step can be harmful for engine components and can also cause a check engine light and/or a failsafe mode.

(IMPORTANT: This feature is for Manual Trans Cars only. Use CAUTION when using the 2 step Rev Limit function, as prolonged use may cause damage to the engine, check engine light, and/or a failsafe PCM condition!!! This feature can be turned ON or turned OFF at the customer's request. Contact STS Turbo Tech Support.)

MT CARS ONLY: Remove the plastic panel above the clutch and brake pedals. Remove the light assembly from the panel to allow the panel to be removed from the vehicle. Locate the clutch pedal position switch on the clutch pedal arm. Unplug the electrical connector from the end of the switch. Remove the 2 factory bolts from the support bracket. Remove the switch and bracket as an assembly.

Install the relocation bracket onto the switch bracket as shown in the above diagram. Reinstall the switch assembly onto the car so that the switch is located closer to the clutch pedal pivot point (further up). Use the 6mm x 25mm bolts, washers, and nuts to secure the relocation bracket to the support bracket using the factory holes.

Adjust the switch by rotating the switch to thread it in toward the clutch pedal. Adjust the switch in until the switch button is depressed completely, but not so far as to push the pedal forward with the switch housing. Reconnect the electrical connector. Install the light and reinstall the plastic panel.

(Note: The pedal position switch is adjustable. Screwing the switch in/out in the bracket allows you to adjust the free-play of the switch against the clutch pedal. The switch should be screwed all the way in until the switch button is completely depressed within the threaded switch housing. Do NOT thread the switch in so far as to push the pedal toward the floor.)

1997-04 C5 Corvette Tuning



OBD2 Diagnostic Port

Diablosport i3
ST-3000

DIABLOSPORT TUNER

Before starting the tuning process, open your DiabloSport i3 and read through all of the DiabloSport instructions. Once you understand the operation of the i3, proceed with the tuning process.

Connect your DiabloSport i3 to your PC using the supplied USB cable. Once connected, the i3 will boot up and create a new "i3" folder on your PC. Open the "Updater" folder and the appropriate "Windows" or "MAC" folder and click on the "Updater.exe" file or the "IgnitionInstaller.cmd" file. This will run the updater program and load the latest updates onto your i3. When finished, press the "CONTINUE" button on the i3 to reboot the i3. When the i3 has rebooted, disconnect the i3 from your PC.

Once updated, connect your i3 to your vehicle's OBD2 port which is typically located under the driver's side of the dash. Turn your ignition to the "RUN" position with the engine "OFF". Do NOT start the engine. Follow the on-screen prompts as per the DiabloSport instructions and select "YES" to agree to the Diablosport Terms and Conditions. Select "TUNE VEHICLE" and follow the on-screen prompts. Select "ADVANCED TUNE" and then "INSTALL STANDARD TUNE". Select the "STS Turbo Base Tune" and follow the on-screen prompts and select "YES" to install the STS Turbo Base Tune. Follow the on-screen prompts and the device will read, store, and export your factory tune. Once the factory backup process is complete, select "APPLY TUNE" to install the STS Turbo Base Tune. Once complete, turn the ignition "OFF" and follow the on-screen prompts to reboot the i3. Leave the ignition in the "OFF" position during the reboot process and do not start the vehicle until the reboot is complete.

CAUTION: Do not do anything that would disrupt the voltage of the vehicle during the tune writing process or severe damage may occur to the PCM. Do NOT attempt to start the vehicle with the STS Turbo Base Tune installed until the STS fuel injectors have been installed.

(IMPORTANT: DO NOT INSTALL THE DIABLOSPORT TUNING FOR NON TURBOCHARGED VEHICLES as these are tunes for a STOCK naturally aspirated vehicle and not a TURBOCHARGED vehicle. In this case, IMMEDIATE and SEVERE engine damage and DRIVABILILTY PROBLEMS may result! Contact STS Customer Support at 866-464-6553 for further information regarding tuning.)

(WARNING: Tuning is critical on turbocharged vehicles and needs to be done carefully. DO NOT BOOST the vehicle until tuning parameters are correct. If the WOT fuelling and/or spark timing parameters are not correct or vehicle is getting detonation, SEVERE ENGINE DAMAGE CAN RESULT!!! PREMIUM FUEL IS REQUIRED!!!)

Electrical System Tests

Install the 15 amp fuse(s) into the fuse holders located next to the relay(s). Connect the BLUE wire in the STS harness (not the blue soldered pigtail) to the 12V remote battery terminal. When the BLUE wire is powered, the oil pump(s) should turn on and you can start the electrical system tests. If the pumps do not turn on, make sure that the 15 amp fuse(s) are installed, the relay(s) are completely inserted into their sockets, and the oil pump plug(s) are completely inserted in to the wiring harness plug(s).

Once the oil pump(s) are running, remove the temporarily installed oil return lines from the valve covers or oil fill cap and make sure the air is being blown out of the oil return outlet(s) as opposed to being sucked in. If the air is being sucked in at the oil return outlet, then refer to oil pump installation section of the manual. If the pumps are blowing air out of the oil return outlet(s), then reinstall the oil return lines onto the valve covers or oil fill cap and secure.

With the oil pump(s) still running, conduct the following electrical tests. (**NOTE:** The oil pump(s) will be doing their initial dry break in during this time, but **DO NOT** let the pump(s) run dry for more than 5 minutes.)

1. PCV System Electrical Tests:

Use a jumper wire to connect either side of the 1PSI pressure switch. You should be able to hear the PCV switch valve switching. If the PCV switch valve is not switching, complete the following tests:

- a. Make sure the 18 gauge RED wire is secured to one side of the 1PSI pressure switch. Also, make sure that the 18 gauge RED wire has 12 volts of power when the blue wire is powered and the oil pump(s) are running.
- b. Make sure the 18 gauge BROWN wire is secured to the other side of the 1PSI switch. Also, make sure that the other end of the 18 gauge BROWN wire is secured to the terminal on the switch valve and that it has not been over tightened. (**NOTE:** Make sure that the terminal on the switch valve has not been over tightened as it will damage the internals of the switch valve!)
- c. Make sure that the switch valve is mounted to a grounded metal surface (or has a auxiliary ground strap hooked to the switch valve mounting tabs). (**NOTE:** The auxiliary ground strap is only necessary when mounting the switch valve to a NON-grounded object, refer to the switch valve installation portion of the manual.)
- d. Make sure that the terminal on the switch valve is secure, but not over tightened and that it has power when the 1PSI switch is jumped.

2. Oiling System Electrical Tests:

Use a jumper wire to connect the 2 terminals of the 3PSI switch(s) located on the inlet side of the oil pump(s). When you connect the terminals of the 3PSI switch, you should hear the oil alarm buzzer go off inside the passenger's compartment. If you do not hear the oil alarm buzzer, then complete the following tests:

- a. Make sure that the oil alarm buzzer is plugged into the BLUE and WHITE wires previously routed into the passenger's compartment. (**NOTE:** The oil alarm buzzer has a specific polarity. The BLUE wire in the passenger's compartment should be connected to the POSITIVE (+) side and the WHITE wire should be connected to the NEGATIVE (-) side.)

Starting & Driving the Vehicle

Once all of the electrical system tests are complete, install the BLUE wire onto the soldered pigtail on the vehicle. If you have installed larger injectors, you will need to upload the tuning before starting the vehicle. Refer to the tuning installation manual supplied with your kit.

With the tuning installed on the vehicle, remove the stainless oil supply line(s) from the oil inlet of the turbo and insert it into a suitable container. Start the vehicle and let it **IDLE ONLY** until the oil lines are flushed out well (usually about ½ quart) then shut off the engine. Clean the fittings and reinstall the oil line onto the oil inlet of the turbo fitting.

Check the oil level in the engine and fill to the manufacturer's specifications. Start the car and let it **IDLE ONLY** for 5 minutes. If the oil alarm buzzer sounds or you see any oil coming out of the tailpipes, shut the vehicle off **immediately** and refer to the electrical system test page.

While running, check under the vehicle as well as in the engine compartment for any oil/fuel leaks. If there are any leaks, shut the vehicle down and address the leak before running the vehicle.

After the car has run for 5 minutes, shut it off, check the oil level again, and fill if necessary. The STS oiling system will take ½ - 1 quart of oil.

First Drive:

Test drive vehicle as per the tuning instructions which you received with your STS tune. If you are not using the STS tune, make sure that the tuning is correct **BEFORE** boosting the vehicle! Make sure that the turbocharger is working properly and producing the proper amount of boost. The standard kit should produce about 5PSI of boost. The air fuel ratio at WOT and/or under boost should be at least 11.5:1 or richer (.920v+ on OBDII O2 sensors). There should be **NO** consistent knock retard under boost and absolutely **NO** audible detonation. Boosted timing should be in the 14 degree range. If you experience lean air fuel ratios and/or knock retard or audible detonation during boost, **DO NOT DRIVE THE VEHICLE** as **SEVERE ENGINE DAMAGE WILL OCCUR!!!** Contact your local STS Power Dealer and/or STS Customer Support immediately!

After the test drive, recheck **ALL** connections, clamps and brackets for proper tightness and routing.

(IMPORTANT: Inspect the wiring harness routing near the engine and exhaust system for any evidence of the loom melting due to high heat. If the loom is getting too hot, reroute the harness and secure harness to protect it from excessive heat.)

Vehicle performance should increase over the next few days of driving as the turbocharger breaks in, allowing quicker spool-up, and as the computer relearns and adjusts to boost conditions. The "Check Engine" light may come on during the next few weeks of driving, as the computer will see sensor values that are out of the "normal range" of what it is used to seeing. The light should go off and reset each time you drive the vehicle. It is recommended that you check and keep track of any trouble codes that are set in the computer to make sure that no damage is done to your vehicle. Report any trouble codes to your tuner.

If you experience any problems, refer to the Trouble Shooting Guide. If you can't solve the problem that is related to the turbocharger system, please contact your local STS Power Dealer or contact STS Technical Support at 866-464-6553

TROUBLESHOOTING GUIDE

Oil pump alarm sounds

Check to see if oil pump is working while the vehicle is running.

If pump is working, check to see that the oil pump is spinning in the correct direction.

If pump is not working, check inline fuse in main harness and electrical harness connections.

Check relays to make sure they are plugged in properly.

Oil pump is noisy

Oil pump will be slightly noisy upon startup and when cold, but should get quieter as system warms and as pump breaks in.

Check to make sure that the pump mounting hardware is not too tight, causing the pump to transmit noise through its mounting surface.

Check to see if oil pump or housing are rubbing on frame and that rubber insulators are in good shape.

Turbo won't boost, produces low boost, or has excessive spool time

Check intake tubing for any leaks at tubes or hose connections.

Check exhaust system for any leaks.

Check wastegate to see that valve isn't stuck open.

Spool up time will decrease as the turbocharger breaks in and should improve over first few days of driving.

Check condition of air filter or pre-charger filter cover.

Detonation

Check for lean condition. O2 readings should be above .900 volts at WOT.

Check Octane rating of fuel and **use premium fuel only**.

Check boost level to see that it isn't running too much boost.

Check wastegate and hose connections.

Squeaking or rattling noise

Check to see that all mounts and tubing are secure.

Check to see that tubing and hose clamps are not rubbing on any moving parts.

TROUBLESHOOTING GUIDE

Check engine light

Check all sensor electrical connections.

Pull codes with diagnostic scanner and follow diagnostic flow charts.

If MAF code appears, check and clean MAF sensor of any oil residue or contaminants.

Trouble code may reset on it's own with time as computer relearns and recognizes higher sensor readings as normal values.

Clear out code and let computer relearn new values and see if code reoccurs.

Gas smell and fuel tank pressurization

Check to see that fuel tank Evap solenoid is working properly.

Excessive engine blow by or smoking

Check condition of gaskets and seals and look for oil leaks.

Check condition of PCV valve. A bad valve will let boost into crank case (also refer to the electrical system tests).

Check to see that the PCV switch valve hoses are routed correctly and that the valve is switching properly.

Check the 1 PSI pressure switch to see that it is powering the BROWN wire at 1 PSI.

Check cylinder compression to verify engine is in good condition.

Check oil pump operation and for any flow restrictions.

Burning smell

Check to see that all wiring harnesses and hoses are routed properly and away from hot exhaust.

Check to see that external resistor in main wiring harness is routed away from harness and other low-heat parts.

Check to see that there are no shorts in electrical wiring harness.

Check oil pump operation and for any flow restrictions.

STS Turbo Systems – Safety Warning - Please Read!

IMPORTANT

Oil System Warning Buzzer

Your STS™ Turbo System is equipped with a safety system that will alert you in the event that your oil pump fails. This system is a buzzer that will be heard inside your vehicle. If you hear the Oil Alarm sound, immediately shut the engine off and safely pull over to the side of the road and contact STS Tech Support. Serious engine damage can occur if the pump stops while your engine is running. With the pump stopped, oil will flow out of the turbo and will not return to the engine.

Premium Fuel

STS Turbo recommends that you only use Premium Fuel, 91 Octane or better, on vehicles equipped with the STS™ Turbo System. Premium fuel reduces ping and early detonation which can cause significant damage to your vehicle.

Engine Pinging or Detonation

If you hear pinging in your engine, back off the throttle immediately. Pinging is the sound of Detonation and can cause significant damage to the engine. If you hear pinging, do NOT drive the vehicle during this condition and call your local STS dealer immediately.

Heavy Towing

The STS Turbo System, like other turbo and supercharger systems, under certain heavy towing situations can create more power than a stock engine can handle. STS Turbo Systems does not recommend using this system for heavy towing purposes.

Vehicle modifications

STS Turbo Systems were designed to fit stock vehicles. If you have modified your vehicle, modifications to the turbo system or your vehicle may be necessary to ensure the proper fit and safe use of the STS Turbo System. Inform your dealer of any aftermarket changes to your vehicle.

The STS™ turbo system is designed to provide enhanced power and engine performance. It could cause severe damage to your vehicle if it is not properly installed or if your vehicle is not properly tuned and maintained for the system. Under some circumstances, improper installation or use of the STS™ turbo system could result in serious personal injury or even death.

STS Turbo Systems can not accept responsibility for the proper maintenance or the proper operation of your vehicle. Please take all necessary precautions to use the STS™ Turbo System strictly in accordance with all instructions and warnings

STS TURBO LIMITED ONE-YEAR WARRANTY

STS Turbo products are covered by a **Limited One-Year Warranty** that covers certain defects in workmanship and materials.

Who is covered? This warranty covers the original purchaser of STS Turbo products in the United States and Canada.

What is covered and for how long? Holley Performance Products Inc. ("Holley") warrants that STS Turbo products will be free from defects in material and workmanship for the life of the product on the original car on which it was installed. Blemishes, marring of appearance, discoloration, internal rust, or surface rust due to weather, road hazards, lack of maintenance, or extremes of heat or cold are not to be considered defects under this Limited One-Year Warranty. Holley warrants moving parts such as valves and actuators for one year. All claimed warranty products must have a return goods authorization (RGA) number and be returned to the place of purchase. The returned product must be accompanied with a copy of the original purchase receipt and the original purchaser's contact information.

What will Holley do? If there is a defect in material or workmanship, Holley will choose either to repair the defective part or replace it with a comparable, new part, without charge for the repair or the replacement product. Purchaser's remedies under this Limited One-Year Warranty are strictly limited to the repair or replacement of the defective product. You must pay the cost of shipping the product back to Holley and for any labor or other costs, including any additional parts, associated with removing the allegedly defective part and with the installation of the repaired or replacement part.

What is NOT covered? This warranty does not cover STS Turbo products that have been installed on any commercial or racing vehicle or that have been damaged due to misuse, abuse, neglect, or accident, such as having been modified or altered; improperly installed, adjusted or repaired; welded; exposed to corrosion, corrosive materials, other contaminants; or used in applications other than those recommended by STS Turbo on our website (www.holley.com).

How do I start the warranty claim process? To initiate the warranty process, the consumer must return the alleged defective product to the place of purchase with a dated receipt and completed applicable warranty claim tag. Warranty claims will be rejected if the date of purchase cannot be established by the consumer. Do not send products directly to Holley Performance Products. Holley Performance Products assumes no responsibility for products sent directly to Holley Performance Products.

What other conditions and exclusions apply? This warranty does not provide compensation for loss of time, loss of use of vehicle, labor cost, cost of additional parts, shipping, inconvenience or other consequential or incidental damage. Some states do not allow the exclusion or limitation of incidental or consequential damages, so these limitations or exclusions may not apply to you.

Holley's maximum liability under this Limited One-Year Warranty shall not exceed the original cost of the product to the consumer. This Limited Warranty gives you specific legal rights and you may also have other rights which vary under state or provincial laws.

This Limited Warranty is exclusive and in lieu of all others, whether oral or written and whether express or implied. Any implied warranties, including implied warranties of merchantability and fitness for a specific purpose are hereby disclaimed. Some states do not allow the exclusion or limitation of implied warranties, so these exclusions or limitations may not apply to you.

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Date: 11-27-18