

SUPERCHARGER SYSTEM INSTALLATION MANUAL



'96 BMW 318 and '97+ Euro Models

GENERAL COMMENTS:

Installation of a supercharger kit from Downing/Atlanta is reasonably easy. In scope, you are simply removing the intake manifold and replacing it with a different unit. In practice, BMW makes this job fairly straightforward. We suggest you walk through our steps even if you are an experienced technician. Doing the work in a specific order will greatly speed up the process.

We recommend that you label all wire connectors and hoses when you take them off. You don't have to know the function of each item, simply label the wire or hose with an "A" and the receiver with a "A" as well.

When you take off a nut or bolt, whenever possible, reinstall the fastener back on the part it came from. This is particularly important on any electrical type connections such as starter or alternator leads. When the directions call for loctite, use it sparingly. One drop of loc-tite per bolt is sufficient. Place the loc-tite on the end of the threaded part of the bolt. When the directions call for the use of teflon tape, make sure it wraps around the item at least twice, but no more than three times.

When you install the supplied gaskets, use a very thin coat of gasket sealant such as a Blue RTV.

When we refer to the "Driver's side" of the car always assume a Left Hand Drive (USA, Germany, etc.) car unless otherwise noted.

Please treat the supercharger as a sealed unit. Do not open, loosen or tamper with any of the bolts. Do not change the lubricant.

There are several photos in the manual, they may not be from the same year as your vehicle. The point behind the photos is to provide a visual idea of what we are trying to accomplish in each step.



TOOLS REQUIRED

WRENCHES

9mm Combination Wrench 10mm Combination Wrench 11mm Combination Wrench 12mm Combination Wrench 13mm Combination Wrench 14mm Combination Wrench 15mm Combination Wrench 16mm Combination Wrench

RATCHET & SOCKETS

10mm Deep-well Socket 11mm Deep-well Socket 13mm Deep-well Socket Ratchet (Matching drive of sockets)

HAND TOOLS

5mm Hex Key 6mm Hex Key T-30 Torx bit Small Flat-blade Screwdriver Large Flat-blade Screwdriver Side Cuts (Pliers with cutting edges)

SHOP TOOLS

~30 Qt. Drain Pan Funnel

ENGINE PREPARATION:



FIGURE 2: 1996 318 Engine Bay 1) AFM 2) Bellows 3)Throttlebody 4) Upper Intake Manifold

1) PREPARATION: Later in the manual you will be asked to relieve the fuel pressure in the fuel rail. If you do not want to allow fuel to escape the system you can disconnect the fuse to the fuel pump and run the car's fuel system dry. This is not how we do it but others feel this is a good solution. The next thing to do is disconnect your battery. Note your radio security code (See owner's manual) then disconnect your negative terminal (Earth) lead.

2) RADIATOR SHROUD REMOVAL: The radiator shroud incorporates an intake air cross over tube. Remove the four bolts from the intake tube cover (10mm wrench) and remove it. Remove the insulated intake snorkel hose from the air box by pulling up sharply on the plastic end. Do not pull on the hose itself or it might rip free from its plastic end. Swing the intake hose aside out of the way. If your car has a belt driven cooling fan, remove the two clips at the top of the radiator shroud and lift the shroud out of the engine bay. Store for later reinstallation.

3) DRAIN ENGINE COOLANT: Locate the petcock on the lower back edge of the radiator (Driver's side). Use a large flat bladed screwdriver to back out the petcock. Coolant will flow out toward the driver's side fender (A short piece of hose can be

used to help direct the coolant into a container or the plastic underbody cover can be removed). You only need to drain about 1/2 of the total coolant for the supercharger installation (About 1-1/2 gallons). If you use a clean container, you can reuse your coolant (If it hasn't been changed in over two years, go ahead and replace it now). Unscrew the radiator cap and expansion tank bleed screw to speed drainage.

4) REMOVE UPPER RADIATOR HOSE: Loosen both hose clamps. If the hose feels stuck, gently rotate it to loosen it from the spouts. Be careful with the plastic spouts, as they are somewhat fragile.

5) REMOVE AIR FILTER Box LID: Loosen the hose clamps on the rubber bellows leading from the airflow meter to the throttle body. Carefully unscrew the wiring harness connector from the airflow meter. Unclamp the top of the air filter box (4 clamps) and remove the top. Some models have a dedicated intake air temperature sensor mounted to the air box cover front. Unplug the connector to this sensor to free up the cover for removal. You can leave the airflow meter in place on the air box cover. It will be used in this position in the final installation. Remove the black plastic "L" shaped resonance chamber from the lid and store away.

6) REMOVE THE BELLOWS ELBOW FROM THE THROTTLE BODY: Pay attention to the air line feeding off of the rear of the elbow. Disconnect this line from the elbow but leave the line connected at its other end. On the underside of the elbow is a small clamp for the airflow meter wiring harness. Unclip the wiring harness from it and move the elbow to the bench for later use.

7) REMOVE THROTTLE BODY: Remove the TP (Throttle Potentiometer) connector using the spring wire clamp on the connector (Push down on the wire bridge to release the connector). Remove the small vacuum signal line that runs between the stock fuel regulator and the throttlebody. This may be difficult and the use of pliers or, as a last resort, a knife may be necessary (This hose will not be re-used). Take care not to damage the stock fuel regulator, it is fragile. Pull the evaporative canister line loose from the throttle body. Remove the electrical connector to the IRV (Idle Regulator Valve) (Next to throttle potentiometer on same side of throttle body). Remove the four 10mm nuts holding the throttle body to the manifold. Moving the throttle lever may assist the access to the rear bolts. Remove any remaining hoses from the throttlebody. Lay the throttle body aside for later use.

8) REMOVE UPPER INTAKE MANIFOLD: Remove the front bracket that connects the manifold to the cylinder head. Remove the brake booster vacuum line from the intake manifold using a flat bladed screwdriver to spread the permanent hose clamp. After the clamp is loose, attempt to remove the hose by pulling it from the manifold. Some stubborn hoses will need to be cut off directly above the manifold nipple. This hose will be re-used, but there is extra length in the hose. Take care not to damage the check valve on the brake booster where the hose connects.

There is an 11mm head bolt threaded horizontally into the back edge of the manifold that clamps a bracket bolted to the bottom half of the manifold. Use an open end or box end wrench to loosen it so the manifold can be lifted up out of the slot in the bracket. Now remove the two nuts and one bolt (Running vertically) that hold the upper manifold to the lower manifold. Lift off the upper manifold, wiggling it to help it along. Remove the upper manifold from the engine bay and store it away.

9) FUEL RAIL: (If you didn't disconnect your battery DO SO NOW!). Remove the two hoses from the rail. If the heads of the hose clamps are hard to reach, loosen them slightly and then rotate them to a more convenient position. Using a rag to absorb any escaping fuel, relieve pressure from the fuel rail using the Schrader valve on top of the fuel rail (If you didn't run the car dry earlier). Remove the inlet fuel hose using a 12mm open-end wrench. Remove



the return fuel line by loosening the

FIGURE 3: Fuel Rail 1) Supply Line 2) Return Line

clamp and pulling the hose off. Remove the two 10mm-headed bolts holding the fuel rail to the manifold (These bolts will be reused). The rail will now be held in place by the injector O-rings, so it will take some gentle wiggling and lifting. Once loose, lay the injector rail (With the 4 injectors attached) over the cam cover out of the way. Unclip the wiring harness from each injector so the fuel rail/injector assembly can be removed from the car. On earlier cars the harness is long

enough to allow the assembly to be relocated without disconnecting it (And the clips are harder to use).

10) REMOVE THE PRV (PRESSURE REGULATING VALVE): Unscrew the **PRV** from its mounting plate (Save bolts). The remaining heater hoses can be taken off of the **PRV** mounting plate and left on the engine until later. See *Figure 4*.

11) JUNCTION BOX REMOVAL: The electrical



FIGURE 4: PRV and Manifold Heater plate

junction box lies on top of the exposed manifold and is held by two nuts (10mm wrench). Remove these nuts. The plastic housing has a top that is held on by various clips. Unclip the top and remove it from the harness box (You can stand in the fan shroud area to get better access to the manifold). Once the top is off, you can see the various connectors that need to be manipulated so the box can be

removed. Disassemble all of the connectors from the harness inside the box. The lower two harnesses that enter the box will require that the plastic box be cut apart with a pair of wire cutters or the tool of your choice. Be extremely careful not to cut any wires or damage their insulation. We have provided high quality electri-



cal tape to reconstruct the **FIGURE 5**: Cutting the junction box away protection the box provided. BMW provides a barrel connector for the lower manifold harness. It speeds the box-ectomy.

12) MORE MANIFOLD PREPARATION: Take out the two bolts (13mm heads) that hold the under-side support bracket to the underside of the manifold. Remove the nut holding the dipstick bracket to the manifold. Then remove the five nuts (11mm tool) holding the manifold to the cylinder head. Remove the evaporative canister's electrical connector (Some cars).

13) DISA WORK: You will notice that the **DISA** valve is attached to the manifold. Remove any remaining connections to the valve (Vacuum and/or electrical) so the manifold can be removed freely. Label the connectors.

14) OIL PRESSURE SENDER: At the base of the oil filter housing, the oil pressure sender's connector will have to be released to free up the wiring harness.

15) FUEL LINES: Remove the rubber hose ends from the steel fuel lines where they attached to the fuel rail. Now wrap the ends with electrical tape to keep from damaging the intake gasket once the manifold is removed.

16) DISLODGE MANIFOLD: Gently remove the manifold from the studs feed-



ing the loose wires and FIGURE 6: Removing the Lower Manifold

connectors through the holes of the manifold. Wires will still be running through the manifold so just tilt it up against the head for the moment. See Figure 6.

17) STARTER WIRES: Unfortunately, on some models, BMW ran the starter wires through the manifold, so you have to disconnect them to remove the manifold. There are two small wires and the main cable. LABEL THEM! Disconnect the wires then remove the manifold.

18) LOWER SUPPORT BRACKET: Do not remove the aluminum "Y" shaped lower support bracket from the motor mount arm. In a later step you will attach another bracket to it to support the supercharger.

19) WIRE INSULATING: Wrap all exposed wires well with electrical tape, overlapping it generously and covering up to the connector neck on each segment. You will have to create branches of wires to allow for the various routing of the harness. Make sure no bare wires are left exposed.

20) RE-WIRING: With the engine bare, reinstall the various electrical connectors while the access is good. This includes the starter wires, the alternator wires, and various sensors. Using the Zip ties provided, make sure to route the wires such that they have no tension on them and do not interfere with other components in the engine bay. Some wires will be left loose for later attachment including:

- * Air flow meter connector
- * Throttle potentiometer
- * Intake Air Temperature Sender
- * IRV valve
- * DISA connector

21) COOLANT SYSTEM TREATMENT: Remove the stock coolant hoses from the plastic coolant junction and the plastic rear barb. Install the 5/8" id by 18" heater hose on the nipples to form a loop. Reuse stock hose clamps.



FUEL LINE: Disconnect the lower car. The new hose is circled. rubber fuel line from the metal

22) REMOVE THE METAL RETURN FIGURE 6B: View from the driver's side of the

return line running under the starter next to the engine block. Remove the clampsecuring nut and slip the metal line out of the engine compartment. Store it away. Remove the plastic mesh sheath that covers the stock 16" rubber line and install it over the 36" long 5/16" fuel hose provided in your kit. Install this new line onto the steel fuel return line at the frame rail. Push the new line into the routing clamp



FIGURE 7: Belt run

beside the fuel supply line. Drape the line up along the engine coming out near the oil filter. Make sure that the hose will not chafe or bind when the engine rocks from side to side under acceleration and deceleration. The stock metal supply line does not change. You are only interrupting the RETURN line.

23) THROTTLE CABLE REPLACEMENT: Your original throttle cable is too short to reuse on the relocated throttle body, therefore it must be replaced. We have provided a BMW cable from another model car to accomplish the relocation. To remove the original cable...

* Remove the interior panel above the driver's feet. There is typically only one Phillips head screw to remove below the headlight switch to the left of the steering wheel. Once the screw is removed, the panel is held by various clips. Gently



FIGURE 8: Idler Pulley Bracket

pull the panel forward to remove it from the dash. Once partially removed, unclip the electrical component (Buzzer) from the back of the panel to completely remove it.

* Follow the throttle pedal assembly up to where the cable grommet clips into the firewall. Unhook the cable end from the pedal. Notice there are two ears (One on top, one on bottom) on the grommet that need to be depressed while the cable is pulled out into the engine bay. Look at the supplied cable to become familiar with the type of connection you are dealing with. A good tool is hard to find, but we have had success with spring ring pliers, needle nose pliers, kitchen tongs, and so forth - basically any form of clamp with a large throat will suffice. A partner gently pulling on the cable from the engine bay is the best help. Once the old cable is removed,

simply insert the new cable in the firewall (Make sure that the barrel of the throughfirewall clip is oriented up.) and install the hook end in the pedal receptacle. Check for free operation, re-install interior panels and proceed...

Belt Work

24) REMOVE AC BELT: Note



the tension on the air condi-FIGURE 9: Bypass Actuator tioning compressor belt prior

to removal to facilitate reinstallation later. Remove the air conditioning belt from the crank pulley/compressor run by loosening the eccentric idler bolt using a 13mm tool.

PULLEY INSTALLATION 25) Using a 16mm socket or wrench, apply counter-clockwise torque to the dynamic tensioner idler's center bolt. The bolt may have a plastic cover that needs to be removed first. Applying torque to this bolt will relax the tension on the main belt and it can be slipped off. Remove and store the stock serpentine belt. Remove the static idler located near the oil filter hous-



ing (16mm tool). Some cars do not have this idler. We have supplied an additional idler with these kits to be used instead of reusing the stock idler. Remove the three timing case bolts nearest the oil filter (*Figure 8*). Locate the 2.5" diameter plastic idler and the idler bracket from your kit. Hold the bracket so that the center hole sits high with respect to the horizontal centerline of the bracket. Mount the idler to what is now the front of the bracket using the hardware provided (Bag #1). Make sure to feed the bolt from the backside of the bracket. The Nylon lock nut should be exposed in the center of the pulley. Torque the nut to 30 ft-lbs. Carry the bracket/idler assembly to the engine and install it using the three timing case cover holes and the alternator bracket hole as in *Figure 8*. A small spacer (0.125" thick) goes between the idler bracket and the alternator bracket where the 10x20mm bolt goes through. Secure with the provided hardware (Bag #2). Loctite the 6mm bolts and torque them to 7.5 ft.lbs. Install your replacement idler into the right hand boss on the alternator (*Figure 8*).

26) MANIFOLD: Locate your new supercharger manifold and inspect it for cleanliness inside of the casting. Make sure no machining debris is left inside. Take the manifold to a clean work area for assembly.

27) BYPASS VALVE: Locate the bypass valve from the supercharger box and install it onto the manifold using the gasket and hardware provided (Bag #3). See *Figure* **9** to determine the correct position for the bypass. Locate the 1.5" diameter rubber sleeve (1.75" long) from the hose bag along with the two hose clamps. Slip the sleeve over the bypass spout and slide both clamps into place. Tighten the clamps.

28) SUPERCHARGER MOUNTING: Using the gasket from the hose bag and hardware provided in Bag # 4, install the supercharger to the manifold and secure with the bolts provided. Use loc-tite on the threads of the bolts. Make sure the gasket lays flat as you tighten the bolts into the supercharger. Torque them evenly to about 13 ft-lbs.

29) Bypass ELBOW: Locate the cast aluminum elbow that connects the supercharger and bypass to the throttle body. Using the gasket provided, secure the elbow to the supercharger nesting the elbow bypass spout into the rubber sleeve previously installed on the bypass. Using the four bolts provided (Bag #14) secure the elbow to the super-charger. Note orientation of gasket.

30) ELBOW HOSE BARBS: Install the brass hose barb(s) into their respective locations in the elbow using the Teflon tape provided (The 90 deg. barb goes on top). Wrap the tape around the threaded end of the barbs (wrap clockwise as viewed from the threaded end). Tighten the barbs very securely. Now tighten the hose clamps on the bypass sleeve.



FIGURE 10: Lower Support Bracket (Shown from driver's side)

31) LOWER SUPPORT BRACKET: Return to the engine bay momentarily. Locate your lower support bracket and hardware from Hardware Bag #6. Attach the bracket to the OE manifold support per *Figure 10*. **NOTE:** The attaching bolts on the OE bracket must first be loosened to create clearance for the kit bracket.

32) DIPSTICK: Swing the dipstick and dipstick tube assembly rearward toward the firewall as far as it will go.

33) FUEL LINE ROUTING/PREP: Locate the 5/16" I.D. high pressure fuel hose that is 21" long from the hose bag. With the electrical tape provided, temporarily tape one end of this hose to the hard fuel line where it will attach to the fuel injector rail.

Drape the other end so it lies between the oil filter housing and the cylinder head, next to the 36" line installed in step 22.

34) INSTALL SUPERCHARGER ASSEMBLY: Make sure your intake manifold gasket is in good shape and clear of debris. Bring the supercharger/manifold assembly over to the engine. Carefully slide the assembly onto the cylinder head studs. Make



sure that the lower strap bracket isn't FIGURE 11: AFPR in position interfering with the parts properly mating. The strap bracket should end up on the right side (As viewed from the front of the car) of the boss on the bottom of the supercharger. From this point on be careful not to drop bolts or nuts under the manifold. Anything that falls below the manifold will probably require the manifold to be removed for recovery.

35) FUEL LINE ROUTING: Feed both the new rubber fuel return line, and the stock metal fuel supply line through the opening between manifold runners #3 and #4. (These lines should be taped together from step 32). Intake runners #3 and #4 are the two runners at the back of the engine.

36) BOLT DOWN THE MANIFOLD: Install the five nuts (Reuse the stock nuts) that hold the supercharger manifold to the cylinder head. Tighten these nuts down gradually torquing to 7.5 ft-lbs. before moving to the next step.

37) LOWER SUPPORT BRACKET: Move the lower support bracket into place against the left side of the lower supercharger boss. Using the nut and bolt provided in Bag #6, secure the top of the bracket to the supercharger boss. Feed the bolt in from behind



the boss to facilitate installation. Tighten the upper FIGURE 12: Fuel Schematic

bolt. Tighten the OE bracket bolts.

38) DIPSTICK REMOUNTING: Attach the dipstick tube to the boss on the back of the bypass elbow, gently bend it into position if necessary. Use the small screw and washer in Bag #8.

39) MANIFOLD TO HEAD BRACKET: We provide you a new manifold to head bracket that uses the same mounting holes as the original BMW bracket that you removed earlier. Attach the front bracket between the cylinder head and the manifold using the hardware provided in Bag #9. Use flat washers and loc-tite (Provided) on each bolt (One drop of loc-tite per bolt is sufficient). Start all four bolts then tighten in an even pattern to about 16 ft-lbs. Get the **DISA** valve from your earlier disassembly and connect it to its electrical connector in the engine harness. Using the zip ties provided, secure the valve to the dipstick tube so that the valve does not interfere with any engine components and so that the valve flapper still is free to operate. This is to keep your ECU happy (and your "Check Engine" light off).

40) AFPR WORK: Locate your AFPR (Auxiliary Fuel Pressure Regulator) (Pictured in *Figure 11*). From Hardware Bag #10, install the two hose barbs to

the underside using Teflon tape on the threads as before. Slip a small hose clamp over the previously installed 36" return fuel line then connect it to the CEN-TER barb of the fuel regulator. Slip another small hose clamp over the high pressure fuel line (The 21" piece) then connect it to the OFFSET hose barb on the regulator. Tighten both hose clamps. By doing this, you are simply rerouting the original fuel return line to pass through the AFPR that we supply.



FIGURE 13: PRV on adapter

41) MOUNTING THE AFPR: Mount the **AFPR** to the cylinder head using the bracket and hardware provided in Bag #10. Do not reuse the stock bolt from the timing case cover, use the longer bolt provided. (See *Figure 11* for location).

42) VACUUM HOSES: Get the 10" long 3/16" I.D. vacuum hose from the hose bag. Slip it onto one of the two nipples on the manifold plenum. Attach the other end of this hose to the nipple on the **AFPR**. Connect the other new short hose to the stock pressure regulator and the remaining manifold nipple.

43) FUEL RAIL REINSTALLATION: Attach the fuel lines to the fuel rail. (See fuel schematic, *Figure 12*) Be very careful not to tear the delicate O-rings on the injector tips. LUBRICATE the O-Rings first! Guide each injector into its respective hole. Wiggle the fuel rail while pressing down carefully to send each injector

"home". New O-rings are provided in the hose bag in case yours are in poor condition. Reuse the stock bolts to attach the fuel rail to the new manifold.

44) INJECTOR HOOKUP: Reattach the electrical connectors to each injector, making sure the connector clips engage. If you

have any questions regarding the complete fuel system routing, please refer to Figure 16.

45) THROTTLE BODY HOOKUP: Locate your throttle body and connect the TP (Throttle Potentiometer) connector and the IRV (Idle Regulator Valve) (If it applies to that model) connector to the appropriate receptacle. Using a T-30 Torx bit wrench, remove the IRV. Use FIGURE 14: Fan Shroud Cutting Lines



the hardware in (bag #22) to relocate the **IRV**. Screw the four hosebarbs into their respective locations, using the teflon tape provided. Attach the **IRV** adapter (with the hosebarbs coming out the side) to the throttle body. Use the supplied gasket if yours is torn. Attach the other **IRV** adapter (with the hosebarbs pointed straight up) to the IRV. Use the other supplied gasket here. Use the two 5/16" x 12" hoses, and the hose clamps provided, to connect the relocated **IRV** to the throttle body. You can secure the relocated **IRV** with the supplied zip-ties. Connect the Evaporative Canister vacuum line to the large diameter vacuum nipple on the throttle body. Get the 15" long 3/16" I.D. vacuum hose from the hose bag. Attach this to the bypass actuator nipple and to the small vacuum nipple on the throttle body, routing the hose underneath the bypass elbow.

46) THROTTLE BODY BOLT-UP: Bolt the throttle body to the aluminum bypass elbow with the hardware provided (Bag #11). Make sure the throttle and cruise control cable are not tangled up in the harnesses or dipstick. If your car had a metal Throttle Body gasket, be sure not to omit it.

47) BRAKE BOOSTER LINE: Attach the brake booster vacuum line to the large vertical nipple on the aluminum elbow. Use a hose clamp (Provided).

48) PRV REMOUNT: Locate the PRV and unbolt it from the stock heater plate. Attach the new aluminum adapter to its underside reusing the original bolts. Obtain the small molded elbow hose from the hose bag and install the labeled end to the **PRV** hose barb. See *Figure 13*. Remove the rubber retainer sleeve from the valve cover end of the stock **PRV** hose and place it over the free end of the new elbow hose. Attach this sleeved end to the cam cover vent nipple. Connect the 1/2" x 12" straight hose to the hose barb on the bypass elbow and the adapter barb.

49) DRIVE BELTS: Locate the new multi-V drive belt and route it around the engine accessories per the corresponding diagram in Step #25. As before, use a 16mm tool to relieve the tensioner idler's tension and loop the belt over the tensioner pulley last. Release the tensioner and confirm that the belt is nested in each pulley correctly.

50) AC BELT INSTALL: Reinstall the air conditioning belt using the 10mm Allen wrench provided (the belt runs on TOP of the tensioner pulley). The Allen wrench fits into a receiver in the "well" of the tensioner pulley. With the wrench, put counterclockwise torque (about 6.5 ft-lbs.) on the tensioner to achieve the correct belt tension. Clamp the tensioner with the pinch bolt (13mm head).

51) FAN AND SHROUD: Reinstall the fan onto the viscous clutch using loc-tite on the stock bolts. Reinstall the fan shroud reusing the stock fasteners. Make sure all plastic tabs are seated correctly.

52) FAN SHROUD COVER MODIFICATION: Locate the radiator/fan shroud cover and trim the plastic flanges per *Figure 14* to make room for the new radiator hose run. For clarification, you can temporarily mount the shroud cover to the radiator and hold the new hose in place. The area to be trimmed will be apparent. Use a set of wire cutters or equivalent to trim the plastic. **Make absolutely sure no burrs or rough edges are left in the area where the hose rubs, to prevent chafing.

53) INTAKE WORK: Locate the long flat bracket (SAP Bracket) with three bends that came with your kit, and the small bracket with one bend and a curved piece of metal (AFM support bracket). Remove the power steering reservoir that is located behind the radiator on the driver's side. It will be held on with two nuts. Get the two rubber isolators from the stock air box (They look like little rubber cylinders with threaded ends sticking out). Using the hardware from Bag #21 bolt the rubber isolators in their stock locations (On the tabs on the inner fender skirt) and bolt the Cruise Control module on the outer side of the air box tabs. Place the long flat bracket on the rear power steering reservoir stud and the rear most of the two rubber isolator studs. Reinstall the power steering reservoir on top of the flat bracket with the stock nuts. Bolt the AFM support bracket to the flat bracket at the three holes on the flat section. Please inspect the rubber intake bellows for cracks which may cause air leaks. If cracks are found the bellows should be replaced. Attach the stock rubber intake bellows to the throttle body upside down. Locate the cast aluminum air flow meter elbow. Insert the O-ring provided into the machined groove on the inside of the elbow, lubricating the O-ring first with WD-40 or equivalent. Push the small end of the aluminum elbow into the round end of the bellows and secure it with the stock hose clamp. Orient the aluminum elbow so that its open end faces the front of the car. Push the AFM into the open end of the aluminum elbow (O-ring end), making sure that the arrow on the AFM points into the aluminum elbow (If you put the AFM in backward it will cause the car to run poorly). Rest the AFM on the curved, cradle part of the AFM support bracket. Slip the #44 hose clamp over the end of the AFM and tighten it so that the AFM is held to the bracket. Attach the air filter to the AFM with the supplied hose clamp. Insert the air temperature sensor into the end of the air filter.

54) AIR INJECTION LINE: Locate the 3/4" I.D. rubber hose (25.5" long) and connect it to the nipple on the rubber intake elbow. Route the hose toward the firewall, up beside the aluminum supercharger elbow and over to the air injection nipple (The four-into-one plastic nipple that feeds air to each fuel injector). Use the short section of 1/2" I.D. hose (Provided) on the air injection nipple to provide a seal to the 3/4" I.D. hose. Use a clamp to secure the assembly.

55) INSTALL THE NEW RADIATOR HOSE: Twist the hose so that the maximum clearance is provided to the supercharger pulley and tighten the hose clamps (Reuse the BMW radiator hose clamps). In some installations, to insure adequate clearance between the hose and the supercharger pulley, it may be necessary to carefully trim approximately one half inch from the water pump end of the hose. Keep in mind that, under pressure, the hose will "grow."

56) COOLANT: Before you do anything make sure that you have closed the drain petcock on the bottom of the radiator. Fill the engine/radiator with 50/50, coolant/water mixture or reuse your saved coolant. You will want to be careful when refilling the coolant system. Pour coolant into the tank next to the radiator. Stop when the tank is full. Start the car with the fill cap off. As the car runs it will draw coolant out of the side tank and into the system. Using a flat-blade screw-driver open the small bleed screw next to the radiator fill cap. This is the vent and will help allow air to be purged. When the side tank starts to get low add more coolant. Continue to fill the car until you have added all the required coolant. During the process of filling the coolant system squeeze the new radiator hose and release it frequently to help "burp" the system. When you are finished make sure that you close the vent screw and the fill cap. ****Very Important: If the coolant system is not properly purged of air, the engine will run hot.****

57) START UP: Start the engine and check for air or fuel leaks. Repair any faults that are found. The engine may stutter for a few seconds while the fuel rail fills with fuel. Visually check the belt run to make sure the belts are nested properly. If your car's idle fluctuates radically (Called Hunting) you have an air leak. In order to find the air leak you will need to spray "Carb." cleaner at all the intersections between items. Depending on the brand of "Carb.' cleaner the engine will either speed up or try to die. Rectify the air leak and test again until the problem is gone.

58) FINISH: If everything looks okay, you're done!

We hope that you enjoy your transformed BMW. If you have any questions or comments, do not hesitate to contact us. We also enjoy seeing the finished product, so pictures of your car are always appreciated.

Thank you for your business!

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Parts Glossary



B0-0012, Auxiliary Fuel Pressure Regulator - Mounts at the front of the engine.



B0-0007, Lower S/C Support Bracket - Attaches to OE manifold support brack-et.



B0-0009, Idler Bracket - This bracket supports the new idler pulley.



B1-0009, Bypass Elbow - Mounts between the supercharger and the throttlebody.



B0-0011, Radiator Hose - Replaces your stock radiator hose, in order to create clearance for the belt.



B0-0019, PRV Hose - This hose connects the cam cover vent to the PRV Valve.

Parts Glossary



B2-0019, AFM Support Bracket -Supports B2-0013. It is not shown in its mounting position.



B2-0004, ISC TB Mounted - In conjunction with B2-0005 allows for the relocation of the ISC.



B0-0010, AFPR Mounting Bracket -Mounts the AFPR to the front of the engine.



B2-0013, MAF Support Bracket - Bolts to B2-0019 and supports the MAF sensor.



B2-0005, ISC Remote - In conjunction with B2-0004 allows for the relocation of the ISC.



B0-0008, Manifold to Head Bracket -Helps support the intake manifold.

Parts Glossary



B2-0001, Intake Manifold - Mounts supercharger to cylinder head.



B0-0013, Throttle Cable - This longer cable replaces your stock cable.



B0-0015, Small Intake Elbow -Connects the bellows with the AFM.



B2-0008, PRV Adapter - Bolts to the PRV.

CARB Certification

The CARB certification sticker you received in your kit should be mounted in a visible area under your hood. This sticker is mandatory for all California residents, and recommended for everyone. The following locations are recommended for placement of your CARB certification sticker:

BMW 318 ('92-'99 3 series):

Place your CARB certification on the passenger side strut tower. There should be a BMW CARB sticker on the drivers side strut tower. Look at the BMW CARB sticker to get an idea of how the Downing/Atlanta CARB sticker should be placed. Look at the following picture for better reference: BMW 318



BMW

CARB

Sticker

Downing/Atlanta Inc. CARB Sticker

BMW Z3:

Place your CARB certification on the underside of your hood. There should be a BMW CARB sticker on the underside of your hood on the passenger's side. The Downing/Atlanta CARB sticker should be placed in the same location, on the driver's side of the car. Look at the following picture for better reference: **BMW Z3**

