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BRP MP62/S1 Supercharger Kit 1999 - 2003 Mazda Miata - w/power steering

Congratulations!

Congratulations on your purchase of the BR Performance (BRP) MP62 Supercharger Kit. This supercharger kit was designed FOR the Miata, BY true Miata aficionados. We don't just build and sell kits for the Miata. We love them and drive them HARD every day. That said, we put a lot of time and effort into the design of our MP62 supercharger kit.

"So how long is this going to take to install anyway?" Well, that really depends upon you. We suggest reading through the instructions a couple of times to familiarize yourself with the components, your car, and how they all fit together. If this is your first time installing a modification of this degree, then we suggest you give yourself at least a full day, to a day and a half for the install. An experienced mechanic should be able to install this kit in approx. 8-10 hours.

Get ready to unleash a wave of power that will change your Miata experience forever!

Tools:

No special tools or equipment will be needed to install your BRP MP62 kit.

Common mechanics tools will be needed. Following is a list of tools that may be necessary depending upon how your Miata is currently equipped.

- ◇ Wrenches: 17mm, 14mm, 13mm, 12mm, 10mm. A torque wrench will help ensure against stripping threads.
- ◇ Sockets: 3/4", 1/4", 5/16", 17mm, 14mm, 13mm, 12mm, 10mm, 8mm, and assorted extensions may come in handy as well.
- ◇ Screwdrivers: Phillips and Flat Head.
- ◇ Pliers: Slip Joint and Needle Nose.
- ◇ Allen Wrenches (Hex Key): 8mm, 6mm
- ◇ Wiring Tools: Wire stripper/cutter, Crimper (although we suggest the use of a soldering iron & solder for electrical connections when possible).
- ◇ Other: Thread locking compound. Utility knife. Electrical tape. Extra zip-ties to help tidy up the wires and hoses. Throttle body cleaner if you think you'd like to clean your throttle body while it's removed.



Compatibility :

There are no known compatibility issues with the following equipment:

- ◇ Shock Tower Bars: OEM, Jackson Racing Strut Brace (No ABS!)(Moss #904-650)
- ◇ Headers: OEM, Jackson Racing (Moss # 903-125), Racing Beat 4-2-1 (old model style).
- ◇ Cars equipped with ABS, and all Canadian cars, will require a Washer Bottle Relocation Kit. (Moss #902-490)



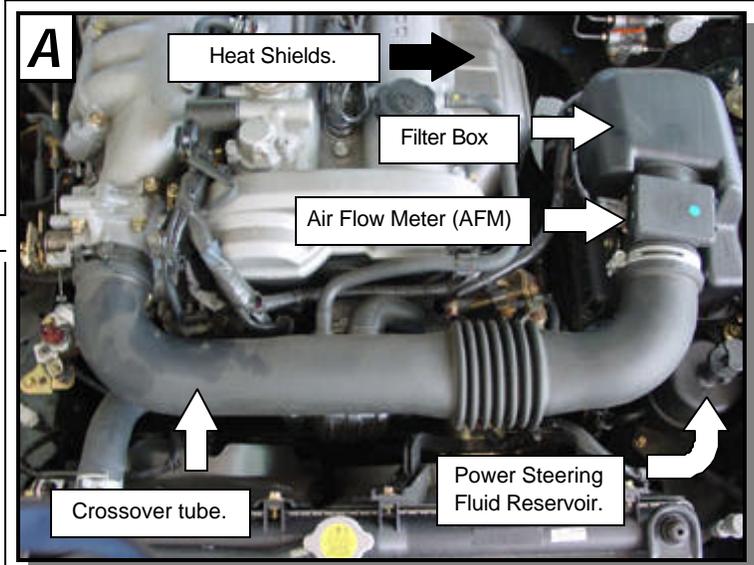
Prior to Installation:

- ◇ You should use a *minimum* of 91 octane, major brand, fuel for at least two tank fulls prior to installations (use of high octane fuel required after supercharger is installed).
- ◇ If you have not done so within the last 3,000 miles, you should change your oil and oil filter. We highly recommend the use of synthetic oil with any form of forced induction.
- ◇ Be sure that your car's cooling system is adequate (flush and new coolant).
- ◇ We suggest a slightly cooler range spark plug such as the NGK BKR6E gapped at approx. .033-.035.
- ◇ Before beginning work, disconnect the negative terminal from your battery.
- ◇ While not necessary, the installation job is much easier on your back if you're able to place the car on four jack stands (never use a floor jack to hold a car up).

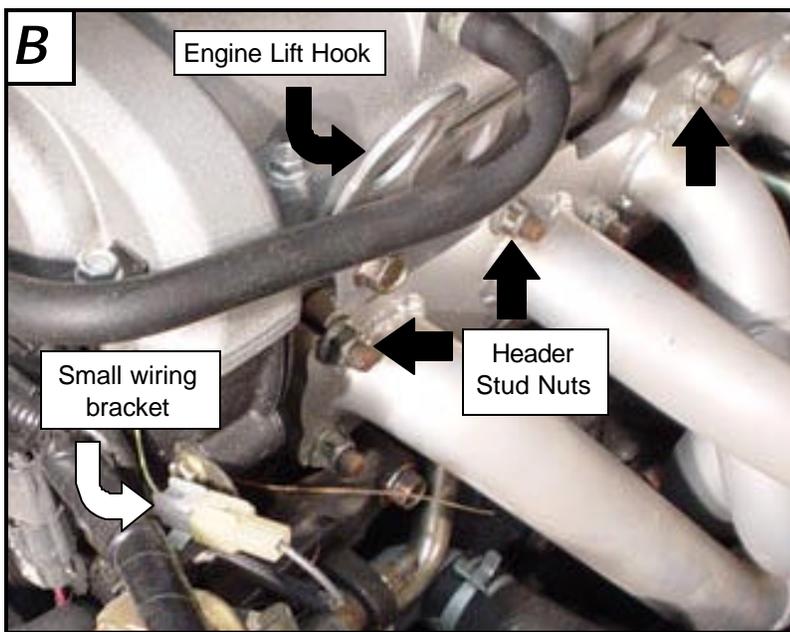
Removing Stock Equipment:



- ◆ Image "A"
- [1] Begin by removing your shock tower bar (if your car is so equipped). You can re-install this after the supercharger installation is completed.
- [2] Remove the factory crossover tube, filter box and air flow meter (AFM). You will need to unplug the connector at the AFM as well as remove the air temp sensor from the filter box.
- [3] Remove the exhaust header's heat shields.
- [4] If so equipped, just to the right of the power steering fluid reservoir, is a panel with relays mounted onto it. Remove the relays from the panel and then remove the panel itself.
- ◆ Image "B"



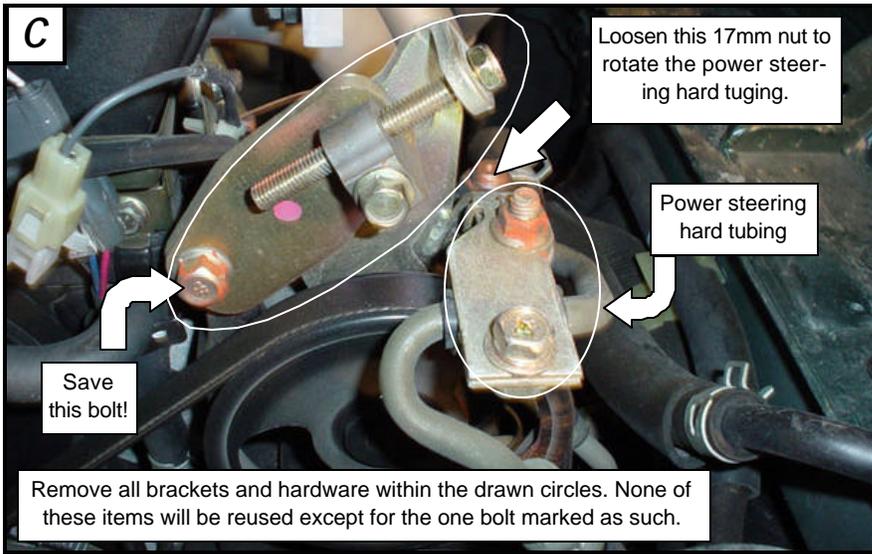
- [5] Remove the engine's front lift hook from the front of the cylinder head.
- [6] Remove the small wiring bracket securing the two small wiring harnesses to the cylinder head. Be sure to replace the bolt.
- [7] Remove the 1st, 2nd, and 3rd (counting from the front) nuts from the top header studs .



Tip!



You may want to consider organizing and keeping all of the components and hardware that you take off of your Miata. You may decide to return the car to stock for re-sale, or perhaps buy another Miata and want to put your BRP Supercharger on that car instead. Use zip-lock baggies to label bolts, nuts and brackets. Store them with the OEM components, along with the instructions in a box. After you've done the install once, you'll be pleasantly surprised how easy it is to take off and re-install should you want or need to!

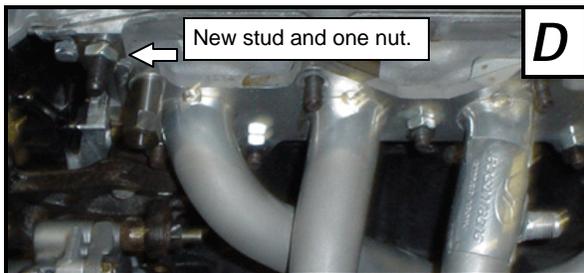


Tip!



To gain access to the bolts under the power steering pulley, do one of these two tricks:
 1). With the car in 2nd gear and the emergency brake off, gently "rock" the car forward or backward to turn the pulley.
 2). With the car on jacks and the transmission in neutral, use a 21mm wrench or socket to turn the crank pulley.

- ◆ Image "C"
- [7] Loosen the 17mm nut on top of the Power Steering (PS) pump which secures the hard tubing.
- [8] Remove the belt tensioning hardware. Refer to image above as the one bolt on the left will be reused.
- [9] Remove the two 14mm bolts behind the PS pulley that secures the large belt tensioning bracket to the PS pump. They are approximately in the 12 o'clock and 7 o'clock positions. Note, you will be reusing those two bolts to secure the new Idler Pulley Assembly to the pump.
- [10] There also is a 14mm pinch bolt behind the PS pulley that is approximately in the 10 o'clock position. You will need to hold the nut on the other end of the bolt in order to loosen it.

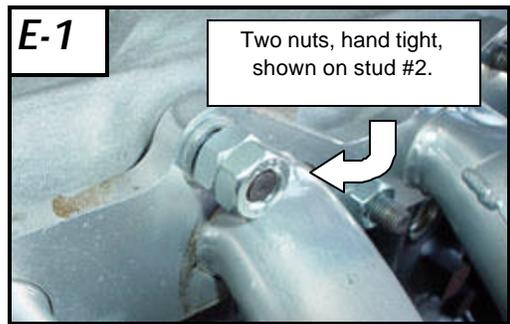


Head Bracket Install:

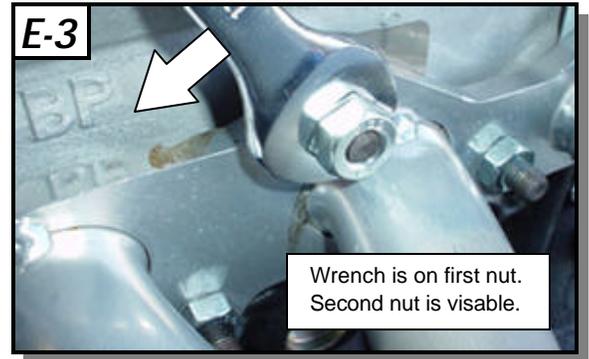
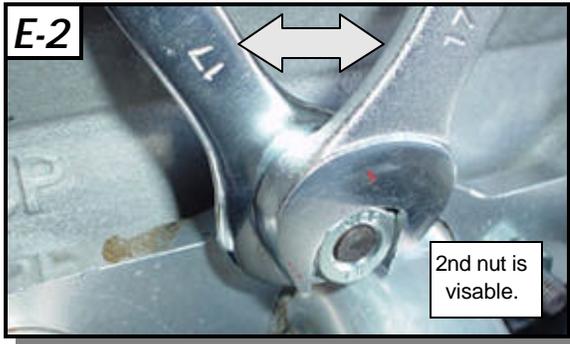


- [1] Locate the Head Bracket Assembly (HBA) component. This assembly is pre-assembled by BRP. Pay attention to bolt sizes and orientation during the installation steps.
- [2] Remove the short threaded stud (and two

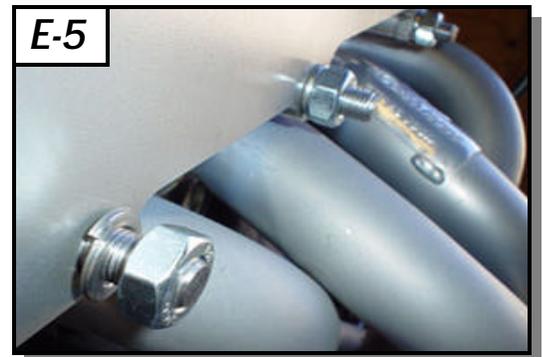
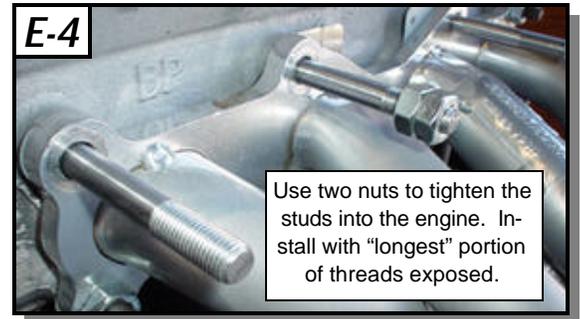
- nuts) from the HBA.
- ◆ Image "D"
- [3] Use thread locking compound and thread the short end of the new stud into the cylinder head where the front engine eye hook was previously mounted (removed earlier).
- [4] Thread one of the nuts hand tight onto the threaded stud as far as it will go.
- [5] Next we will begin securing the Head Bracket Assembly to the cylinder head.
- [6] The three header studs need to be removed and replaced with the three longer studs provided in your kit.



- ◆ Images "E-series"
- [7] Use two of the provided nuts and hand thread them onto the stud just far enough to clear the end of the stud. (E-1)



- [8] Use two 17mm wrenches to put tension on the two nuts. Do this by turning the first nut counter-clockwise and the second nut clockwise. (E-2) This will tighten the nuts up to one another.
- [9] Next, use the 17mm wrench on the first nut to turn the stud counter-clockwise, thereby removing the stud from the engine. (E-3) Once the stud is out, use the other 17mm wrench to loosen the two nuts. Repeat the process for the other two studs that need to be removed.
- [10] Note the amount of thread on each end of the stud is different. Start the replacement studs into the engine with the shorter section of thread being inserted into the engine.
- [11] Tighten the new studs by performing the same procedure that was used to remove the original studs.
- [12] You will use the second (outer) nut to tighten though. Torque to 29-33 ft./lbs.. Remove the nuts when finished installing the three new studs.
- [13] Mount the HBA onto the three new header studs and the stud in the engine eye lift position. Use a lock washer and nut on each stud to se-



- cure the HBA. Torque to 29-33 ft./lbs.. (E-5)
- [14] Depending upon the thickness of your header flange, you **may** need to back off the nut on the engine eye lift stud. Back it off until it just touches the plate. Install and tighten the lock washer and other nut onto the stud on the other side of the head bracket assembly plate.

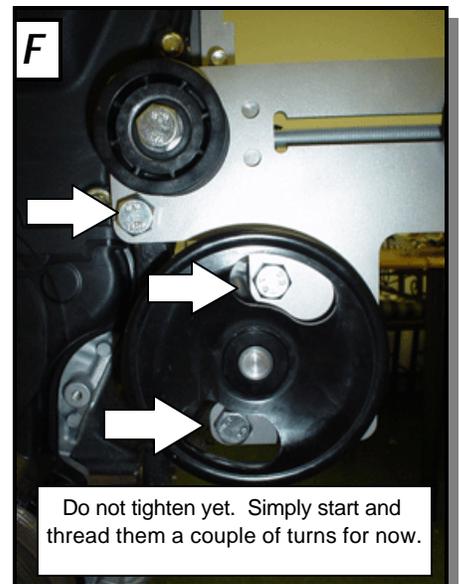
Tip!

The rear mounting block on the head bracket assembly comes pre-assembled loose on purpose. You do not need/want to remove either block during your installation. We will tighten the rear mounting block later in the installation.



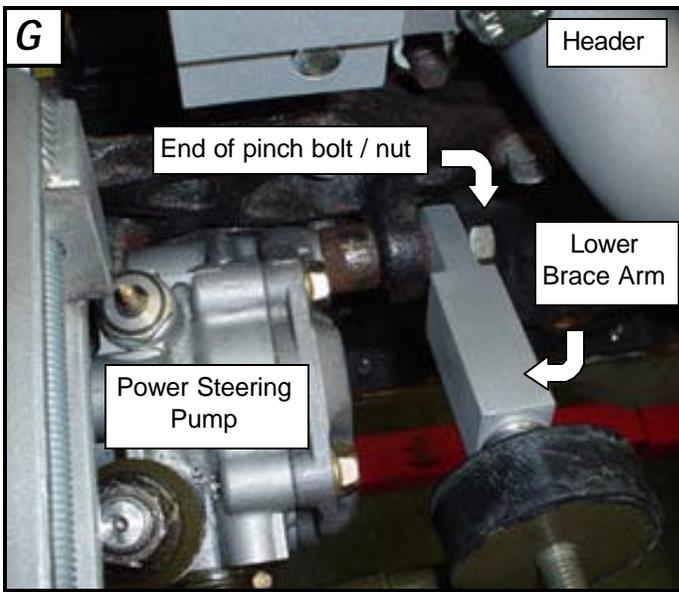
Idler Pulley Plate Installation:

- ◆ Image "F"
- [1] Place the new Idler Pulley Assembly (IPA) into position behind the PS pump pulley.
 - [2] Secure with the three OEM 14mm bolts that were removed earlier during the removal of the OEM belt tensioning hardware. Only start these bolts and thread a couple of turns. We will tighten them later in the installation.
 - [3] Position the PS hard tubing and re-tighten the 17mm nut that secures it to the PS pump.



◆ Image "G"

- [4] Follow the pinch bolt back through it's mounting flanges and remove the nut on the other end.
- [5] Locate the Lower Brace Arm assembly. We've set and tightened the lower brace approximately to the appropriate length needed to extend from the pinch bolt up the the side brace that is mounted on the supercharger. However, due to different sized header flanges, the brace's length may need to be adjusted to fit your car's equipment. You will not be able to determine if the length of your brace is correct until after the supercharger is installed later in the installation steps. For now, just leave it the length it came.
- [6] Mount the lower brace onto the pinch bolt. Use one of the two lock washers (comes pre-assembled onto the side brace of the supercharger unit) and the original nut. Only hand tighten the nut at this point as adjustment may be needed once the supercharger is mounted.

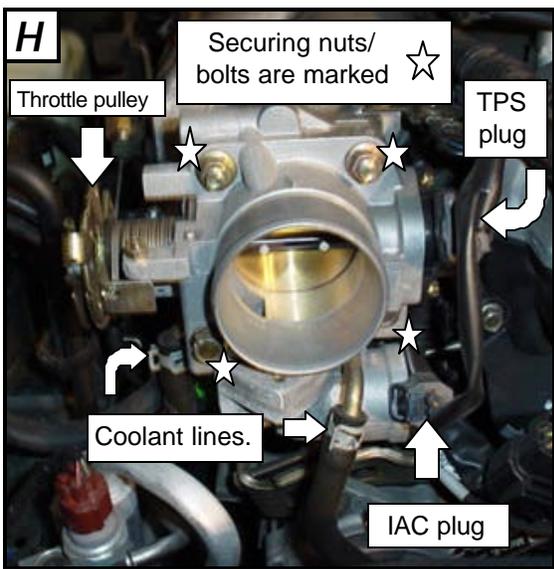


Throttle Body (TB):

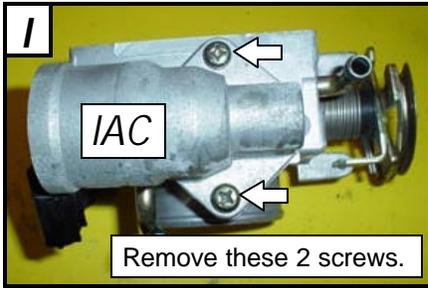


◆ Image "H"

- [1] Disconnect the two coolant lines from the factory TB.
- [2] Use the provided hose mender and 1/4" hose clamps to connect them together.
- [3] Unplug the Throttle Position Sensor (TPS) and Idle Air Control (IAC) connections.
- [4] Remove the throttle cable from the pulley on the side of the TB.
- [5] Remove the throttle cable from the mounting bracket on the side of the intake manifold.



- [6] Remove the mounting bracket. You can store this bracket & it's bolts.
 - [7] Remove the throttle body by removing the two nuts and two bolts (the nuts will be reused). Depending upon model year, behind and below the TB is a brace secured with 4 bolts that will need to be removed too (re-secure the ground wire that is also attached with one of those bolts).
 - [8] Carefully remove the gasket behind the TB and keep it with the TB.
- ◆ Image "I"
- [9] Remove the IAC from the throttle body.
 - [10] Carefully remove the original gasket and keep it, and the original screws, with the IAC.
 - [11] Install the provided gasket and blanking plate



Tip!

The heads of the original mounting screws for the IAC are soft and easily stripped, even using quality screwdrivers. We've found that it's often best to use a small set of vice grips to loosen these screws. Also, consider cleaning the TB and the IAC with throttle body cleaner while you have them removed.



to the factory throttle body.

[12] Locate the dummy throttle body (DTB) from your kit.

[13] Secure the IAC to the DTB using the original factory gasket and mounting screws. Notice that the IAC orientation is different than when mounted to the factory throttle body- it will point towards the firewall.



◆ Image "J"

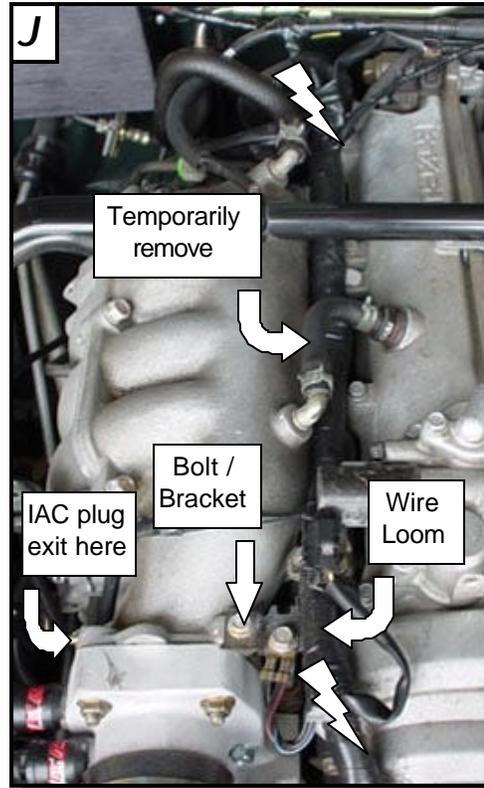
[14] Locate the large wiring loom that runs between the intake manifold and the cam cover.

[15] Temporarily remove the bolt that secures a mounting bracket for the loom at the front of the intake manifold. Cut/remove the zip tie from this bracket too.

[16] Temporarily remove the hose between the intake manifold & the cam cover.

[17] Starting at the front of the loom, CAREFULLY and LIGHTLY use a utility knife (or razor blade) to cut through along the top of the outside of the black wiring loom. Extend the cut freeing wires all the way to the back. Image is marked at both ends with a lightning bolt. Cut that distance on the loom.

[18] Carefully work free the wires for the IAC. Wrap them



with electrical tape and route them under the front "neck" of the intake manifold so that the connector will reach the IAC plug-in once the DTB is re-installed.

[19] Next carefully work free the wires for the TPS. You will need to free these wires from the loom nearly all the way to the back of the loom. You **may** need to actually cut 1-2 wires to free them. **If** you need to do this, be sure to solder these wires back together and wrap them individually with electrical tape, then wrap all the wires of the TPS harness with electrical tape. The TPS will be extending across the back of the cam cover to the supercharger once it's installed.

[20] Leave the main wiring loom unwrapped until after the installation of the timing control unit.

[21] Position the provided DTB gasket over the two studs on the intake manifold.

[22] Using the original nuts and the two new bolts provided, mount the dummy throttle body onto the intake manifold.

[23] Plug the relocated IAC connector into the IAC.

[24] Locate the factory throttle body (with blanking plate) and the original gasket.

◆ Image "K"

[27] Depending upon the headers you have installed, moving the coolant barbs on the throttle body may be necessary for mounting

Tip!

The wiring loom may seem like a scary part of the install. Don't be intimidated by it. **Take your time** and you'll find it's really not that difficult.

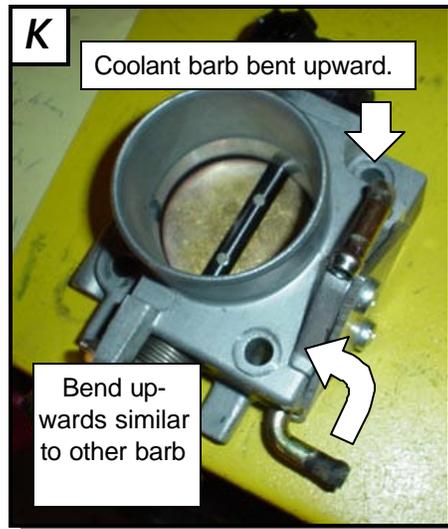


clearance of the supercharger. As a matter of habit, we turn them out of the way on all installations. However, it may not be necessary on your Miata. If you're careful, you can return the barbs back to their original position later if needed. If you choose not to rotate them now, just remember to check for clearance when installing the blower.

[28] Image "K" shows one of the barbs already bent up and out of the way. Working on a table, use a small screwdriver inserted into the barbs to bend them up.

[29] Mount the original factory gasket onto the studs on the back of the supercharger (verify orientation).

[30] Mount the throttle body onto the same studs and secure with the provided



Preparing & Mounting the Supercharger Unit!

• Throttle Cable

[1] Using a towel to protect the cam cover, lay the supercharger onto the engine.
 [2] Free the throttle cable from the brackets along the firewall and allow for a nice looping of the throttle cable. The routing should take the cable over near the fender, around the shock tower mount, towards the headlight, back towards the engine and then back towards the firewall.

◆ Image "L"

[3] Remove the throttle cable mounting bracket from the side brace of the supercharger so that it is easier to mount the throttle cable into the slot.

[4] Install the throttle cable into the pulley on the side of the throttle body (not shown in Image "L"). Ensure that the cable is in the "groove" of the pulley and firmly attached.

[5] Secure the throttle cable into the mounting bracket (it's a very snug fit, but it will fit).

[6] Mount the bracket back onto the side brace. Use the lock washer and nut and tighten the bracket such that the cable runs straight out of the grooves

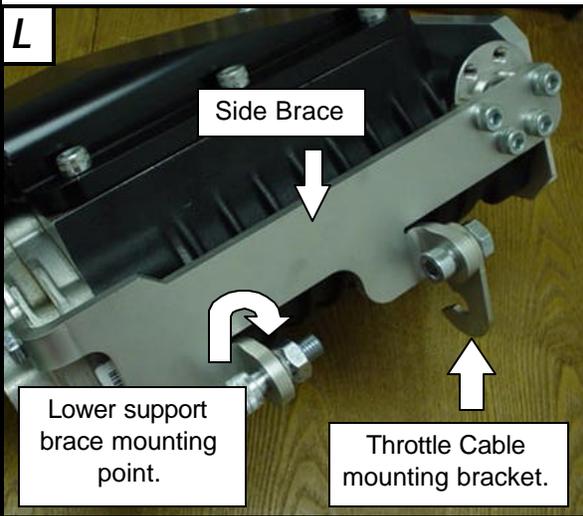
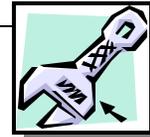
of the pulley. This means the bracket itself will be "under" the supercharger (see small insert photo for bracket orientation without the cable mounted).

[7] Adjust the 12mm nuts so that there is a little bit of slack in the cable between the pulley. Make sure that the slack is present when the accelerator pedal is released, and that full throttle can occur when the pedal is depressed.

• Mounting SC to the Head Bracket Plate

◆ Image "M"

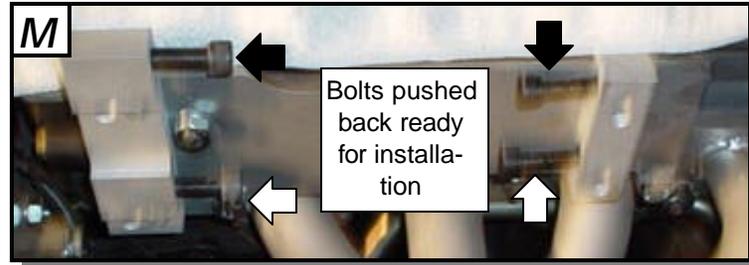
[1] Remove and keep handy the four nuts and lock washers that are pre-assembled onto the front and rear mounting blocks of the Head Bracket Assembly (HBA).



[2] Push the mounting bolts back out of the blocks just enough to allow mounting of the supercharger unit.

◆ Image "N"

[3] Position the supercharger for mounting by first aligning the top holes of the super-

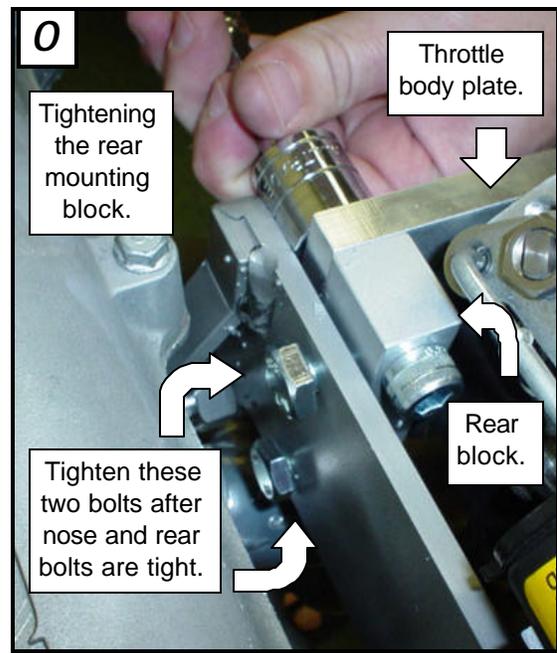
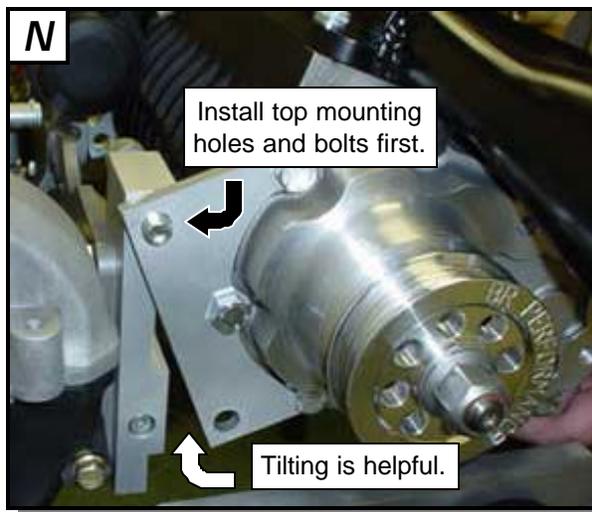


charger's nose and rear mounting brackets to the top holes of the Head Bracket Assemblies mounting blocks. This is done best by tilting the supercharger up while aligning the holes.

[4] Once the top holes are aligned, push the top bolts through the block and mounting brackets.

[5] Lower the supercharger and align the lower holes of the mounting blocks & brackets.

[6] Push the lower bolts in. Replace and hand tighten the lock washers and nuts onto the bolts.



◆ Image "O"

[7] Starting with the rear, tighten 17mm nuts. You may need to use an allen wrench on the bolts.

[8] After the rear mount/throttle body plate is secured to the

rear block of the head bracket assembly, then you can tighten the nuts on the front block / bracket.

[9] Finally, after the supercharger has been mounted to the head bracket blocks, tighten the two 17mm bolts which extend through the head bracket plate and secure the rear mounting block.

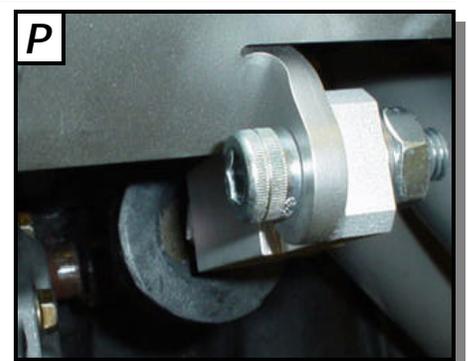
[10] Plug in the TPS connector on the throttle body. Secure the wiring along the firewall.

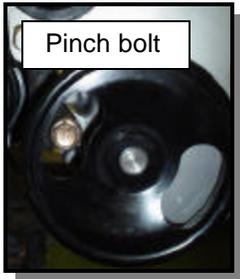
◆ Image "P"

[11] Position and check the length for the lower brace. (Recall that it's only secured hand tight on the power steering pinch bolt.) Extend the lower support up to the side arm of the supercharger to check its length. As mentioned ear-

lier, we've set it to the approximate length, but some adjustment *may* be necessary. Important: The HBA install should be completed and the brace should be in either "neutral" (no load or pulling force) or "light compression" (light load). It should not be in tension (pulling force or bending). Once adjusted, use the bolt, lock washer, and nut to secure it to the tab. The bolt should easily slide into the holes.

[12] Keep in mind a nice circular path, route and secure the throttle cable. Use one of the rubber sleeves on the cable (originally used to mount cable along firewall) and position it between the lower brace and the cable. Use a zip-tie to secure. This will secure and guard the cable's covering.

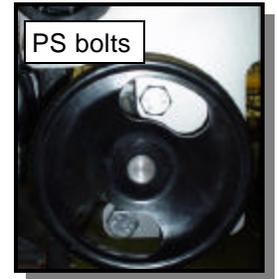
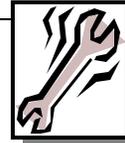




Pinch bolt

Belt and Idler Pulley:

- [1] With the lower brace now attached to the side arm brace, it's time to tighten the Idler Pulley Assembly.
- [2] Tighten the 14mm pinch bolt. You will need to have a wrench on the pinch bolt's nut.
- [3] Tighten the two 14mm bolts securing the power steering pump.
- ◆ Image "Q"
- [4] If not already loose, loosen the 17mm bolt on the adjustable idler



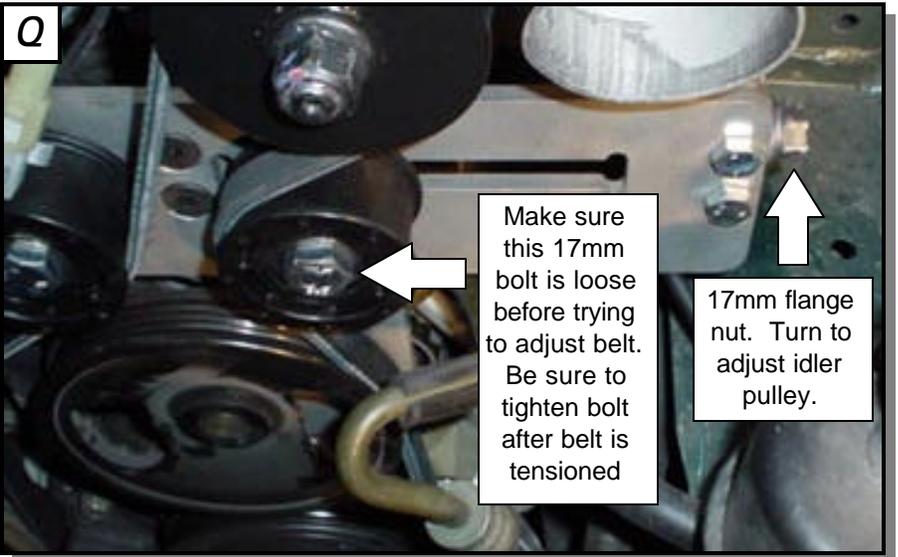
PS bolts

pulley. Adjust the pulley to allow belt installation by turning the flange nut on the side of the idler pulley assembly.

- [5] Begin routing the belt around the crank pulley and A/C pulley (if so equipped). The belt will pass over the right side of the power steering pulley, between the idler pulleys and then onto the supercharger's pulley.
- [6] Ensure the belt is properly positioned on all pulleys.
- [7] Tighten the belt by turning the flange nut.
- [8] Check belt tension by making sure the longest run of the belt can't be deflected more than about 3/8" with approximately 25 pounds of thumb pressure applied.

Tip!

Using a ratchet and socket is the easiest way to move the adjustable idler pulley. Even once the supercharger is completely installed, when/if belt adjustment is needed it will be faster to remove the filter and use a socket to turn the flange nut vs. using a wrench.



Q

Make sure this 17mm bolt is loose before trying to adjust belt. Be sure to tighten bolt after belt is tensioned

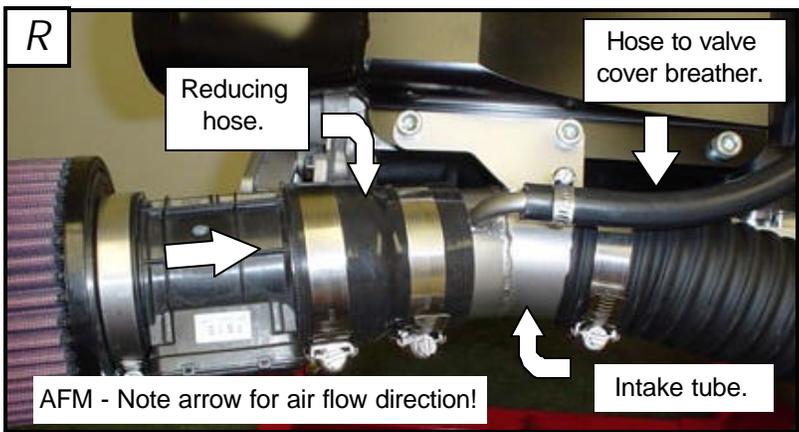
17mm flange nut. Turn to adjust idler pulley.

Intake:

◆ Image "R"



- [1] Your particular Miata's brake line setup will dictate the routing of the intake flex hose from the throttle body to the intake tube. Determine the routing that works best for your application. Slide one of the 3-1/2" hose clamp over the flex hose before placing hose onto the dummy throttle body. Position and tighten the hose clamp.
- [2] Mount the intake tube onto the supercharger's outlet manifold using the two existing bolts. Torque to 20 ft./lbs.
- [3] Using a 3-1/2" clamp, mount the other end of the flex hose onto the intake tube. Position & tighten hose clamp.
- [4] Using the two clamps provided, install the 3/4" bypass hose to the 3/4" nipple on the intake tube.
- [5] Run the bypass hose around and between the power steering fluid reservoir and headlight.



R

Reducing hose.

Hose to valve cover breather.

AFM - Note arrow for air flow direction!

Intake tube.

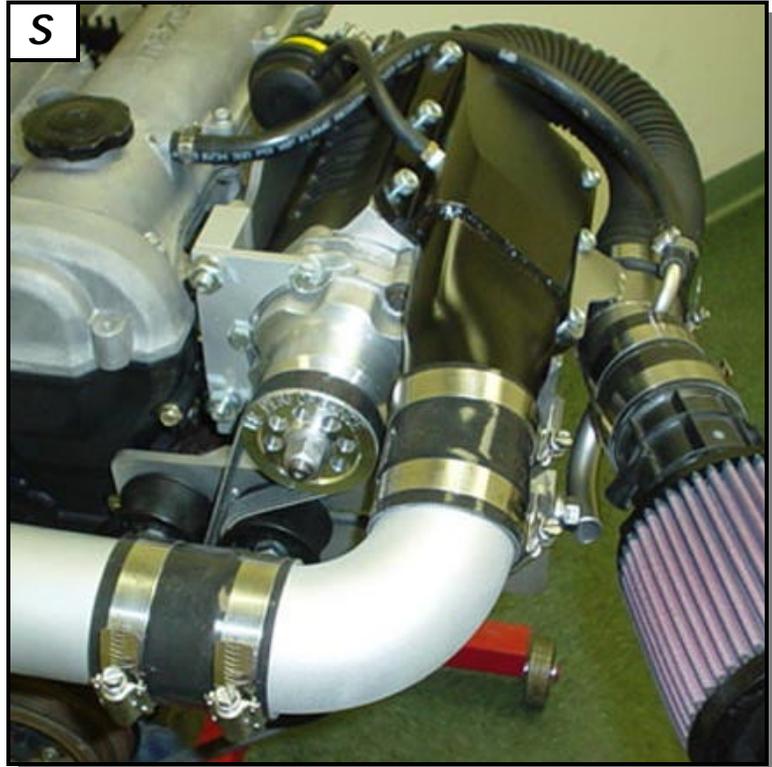
- [6] Route the bypass hose along the top of the cooling fan shrouds behind the radiator. Secure it with zip-ties. Check for kinks, and if needed, cut the hose so that it can be clamped onto the 3/4" nipple located on the dummy throttle body.
- [7] Secure the Air Flow Meter (AFM) to the intake using the clamps and reducing silicone hose. Be sure to note the proper orientation **marked with an arrow** on the side of the AFM to show air flow direction! Plug in the AFM connector and secure

the wiring for clearance from the belts and pulleys.

- [8] Clamp the short piece of 3/8" hose to the valve cover breather and to the 3/8" nipple on the intake tube.
- [9] Secure the K&N filter to the AFM with the clamp provided.

[10] Locate the Air Temp sensor that was removed from the factory air box. Route it under the air filter and simply secure it as close as possible to the air filter with a zip-tie. There should be a large wiring loom in the general area that you can secure it to.

[11] Next find the relays that were removed from the panel next to the power steering reservoir. We recommend using electrical tape to wrap around the bottom of the relays and their rubber boots. Wrapping them will protect them by helping to prevent water from getting up into the boots. These relays can also be simply zip-tied to a suitable location such as the wiring loom mentioned above.



Crossover & Final Touches:



- ◆ Image "S"

- [1] Using the silicone connectors provided, install the crossover tube and elbows.
- *Perform installation of Timing Control Unit and the PowerCard. Then finish the following steps.*
- [2] Use electrical tape to wrap the main wiring loom between the intake manifold and the cam cover.
- [3] Replace the nut and bracket at the front of the intake manifold. Use a zip-tie to secure the wiring loom to this bracket.
- [4] Replace the hose that was temporarily removed in step #16 of the Throttle Body portion of these instructions.
- [5] Re-install the shock tower bar (if so equipped).
- [6] Verify all wiring connections and check hose clamps/connections.
- [7] Verify belt tension and that the adjusting idler pulley's bolt is tight.
- [8] Verify clearances of wiring, hoses, etc. around the belt and pulleys. Use zip-ties to secure any potential issues.
- [9] Re-connect the negative terminal on the battery.