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# Miata MP62 Supercharger System Installation Instructions

## FOR 1994-97 Miata CARB E.O. D-453-8

999-845 w/ power steering, AC  
999-846 w/ power steering, w/o AC  
999-847 w/o power steering, w/AC

### READ THESE INSTRUCTIONS THOROUGHLY!

Follow the instructions STEP-BY-STEP, and your installation will be trouble free. If in doubt, CALL 1-888-888-4079. We suggest that as you proceed through the installation, you should read a few steps ahead in the instructions so you are certain to catch all notes and warnings.

### ATTENTION SUPERCHARGER INSTALLER!

Before proceeding with the installation, it is important to know that to validate the 2 year, 100K warranty on your new supercharger, you must completely fill out the Moss Motors warranty card that comes in every kit, including the serial number which is on a small white 'bar code' label on the body of the supercharger. Write down all of the numbers which appear on that label in the appropriate space on the warranty card. Be certain to do this now because once your supercharger is installed, it may be difficult to see the serial number.

**SPECIAL NOTE:** Moss Motors Supercharger Systems are designed to be installed by individuals with good mechanical skills and with the proper tools. Use your discretion-- if you are not a competent mechanic, do not attempt this installation.

**WARNING:** 91-octane gasoline (or higher) is required when running a supercharger. During this installation process, you will reuse some parts or hardware and not reinstall others. It is recommended that you make space for those that you will reuse, and a separate space for those that you will not reinstall. In addition, you should save the parts that will not get reused in case you ever have reason to convert the engine back to stock.

**NOTE:** If your car has Cruise Control you will need kit #999-827.

### TOOLS REQUIRED:

8mm, 10mm, 12mm, 14mm (deep), 16mm, 17mm, and 7/16" sockets, (2) 12mm, a 14mm, 15mm, 17mm, 22mm (or adjustable wrench), a 1/2", and 7/8" combination wrenches, multi-purpose pliers, needle nose pliers, wire cutters, wire crimpers/strippers, (2) needle nose locking pliers (Vise Grips), hose cutter, small and medium flat blade screwdrivers, #2 and #3 phillips screwdrivers, dead-blow hammer, torque wrench, thread sealing tape (i.e. Teflon tape), heat gun or lighter, #29 drill bit, electric drill, ruler or straight-edge, paper clip, utility knife, and a timing light.

**NOTE:** Cannot be installed with any strut tower brace.

### INSTALLATION:

1. Use a pair of needle nose pliers to release the clamp securing the PCV hose to the valve cover, connected near the oil filler cap. Disconnect the hose. Illustration 1



2. Using a 10mm socket, remove the two bolts securing the metal tube to the front of the valve cover. Illustration 2

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**Illustration 2**

3. Use a pair of needle nose pliers to release the clamp securing the large hose to the idle air control motor, under the passenger side of the cross tube. Disconnect the hose.

Illustration 3



**Illustration 3**

4. Then, using an 8mm socket or a phillips screwdriver, loosen the clamps securing both ends of the cross tube. If you have cruise control, you will also have to remove the vacuum line from the intake manifold nipple and from the points where it attaches to the cross tube. Remove the cruise control vacuum line from the cruise actuator as well and save it for use in a later step. Then remove the cross tube. Illustration 4



**Illustration 4**

5. Disconnect the electrical connector at the mass airflow sensor (MAF). Release the clips securing it's harness to the air box. Using a 10mm socket remove the two bolts securing the MAF to the air box. Remove the MAF from the air box and remove the rubber donut seal (which seals it to the air box) from the sensor. Set the MAF aside in a safe place for later use. Illustration 5



**Illustration 5**



6. Using a 12mm socket, remove the three (3) bolts securing the air box to the car. Using a 10mm socket, remove the bolts that secure the intake snorkel to the inner fender. Remove the air box and snorkel as an

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assembly and set it aside. Use a 10mm socket to remove the three bolts securing both of the air box brackets. Set the brackets aside. Illustration 6



Illustration 6

7. Back on the other side of the engine compartment, disconnect the electrical connectors at the throttle position sensor and at the idle air control motor. Using two 12mm combination wrenches, loosen the nuts securing the throttle cable to its bracket on the side of the intake manifold. Once the nuts have been loosened, push the sleeve out of the center of the rubber grommet. Then slide the grommet and cable out of the bracket. Disconnect the cable from the throttle bell crank. Use a 10mm socket to remove the throttle cable bracket from the intake manifold. Unclip the cable from the firewall mounting brackets and pull it over to the driver's (left) side of the car. Illustration 7



Illustration 7



Illustration 7 con't



8. Use two pairs of needle nose locking pliers to pinch off the two small coolant hoses leading to and from the idle air control motor. Using a pair of needle nose pliers, release the clamps on the two small hoses. Disconnect the hoses. Next, using a 12mm socket, remove the two bolts and two nuts securing the throttle body to the intake manifold. Slide the throttle body off of the studs. Use caution when removing the throttle body not to damage the original throttle body gasket. Illustration 8

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Illustration 8



9. Take the throttle body to a worktable and use a #3 phillips-head screwdriver to remove the four (4) screws securing the idle air control motor to the throttle body. If the screws are really tight, pliers can be used from the side to loosen the them. Gently separate the idle air control motor from the throttle body, taking care not to damage the o-ring gasket. The o-ring gasket will want to stay with the throttle body. Carefully use a small flat blade screwdriver to pick it out of its channels. Illustration 9



Illustration 9



10. Locate the dummy throttle body from the kit. Install the o-ring gasket from the previous step into the channels in the bottom of the dummy throttle body. Make sure that each section of the o-ring fits all the way down into the groove. Then attach the idle air control motor to the dummy throttle body using the factory bolts. Tighten the screws evenly in a cross pattern to avoid vacuum leaks. Tighten to 9 ft lbs. Illustration 10

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**Illustration 10**



11. Locate the 1/8-inch pipe plug in the hardware bag. Wrap its threads with thread sealing tape. Use a 7/16" socket to install the pipe plug into the side of the dummy throttle body. Tighten firmly. Illustration 11



**Illustration 11**



12. Install the dummy throttle body in place of the original throttle body, reusing the factory hardware and gasket. If the gasket was damaged in removal, clean the throttle body mounting surface and apply the included 1104 liquid gasket sealant. Tighten the fasteners using a 12mm socket to 18 ft-lbs. Reconnect the small coolant hoses and clamp using the factory hose clamps. Then remove the two pairs of locking pliers used to pinch the coolant hoses for the throttle body. Next, plug in the electrical connector for the idle air control motor. Illustration 12



**Illustration 12**

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13. Locate the Idle Control Motor block-off plate and gasket. Also locate four M6 x 10mm flange head bolts in the hardware bag. Attach the gasket and blanking plate to the Mazda throttle body using the four M6 x 10mm bolts. Tighten the bolts in a cross pattern to 9 ft. lbs., using a 10mm socket. Illustration 13



**Illustration 13**



14. Find the four wire sheathed cable and eight inline butt connectors. These will be used to add the required length to the Throttle Position Sensor harness. Remove the first three inches of covering nearest to the Throttle Position Sensor (TPS) connector. Then cut all four wires at a spot 2" from the TPS harness connector. Strip a 1/4" of insulation from both sides of the

cut wires. Crimp an inline connector onto each one of the stripped wires. Now take the provided sheathed cable and carefully cut 1-1/4" of the outer covering off from both ends, exposing the four wires within. Then strip 1/4" of insulation from each wire at both ends of the sheathed cable. Disregard the non-insulated ground wire contained within the sheathed cable. Starting with the wires at the TPS connector, crimp the green wire of the sheathed cable to the butt connector on the green wire of the TPS connector. Then crimp the red wire of the sheathed cable to the butt connector on the red wire of the TPS connector. Crimp the black wire of the sheathed cable to the butt connector on the black/blue (black with blue stripe) wire of the TPS connector. Crimp the white wire of the sheathed cable to the butt connector on the red/black (red with black stripe) wire of the TPS connector. Repeat this process with the other end of the sheathed cable and the factory harness, paying attention to the wire colors. Once all of the wires are crimped, apply heat to the connectors to shrink the tubing. Wrap both ends of the extension harness with the included electrical tape to protect the butt connectors from moisture. We have included 1/4" split loom if you would like to cover the entire harness. Illustration 14

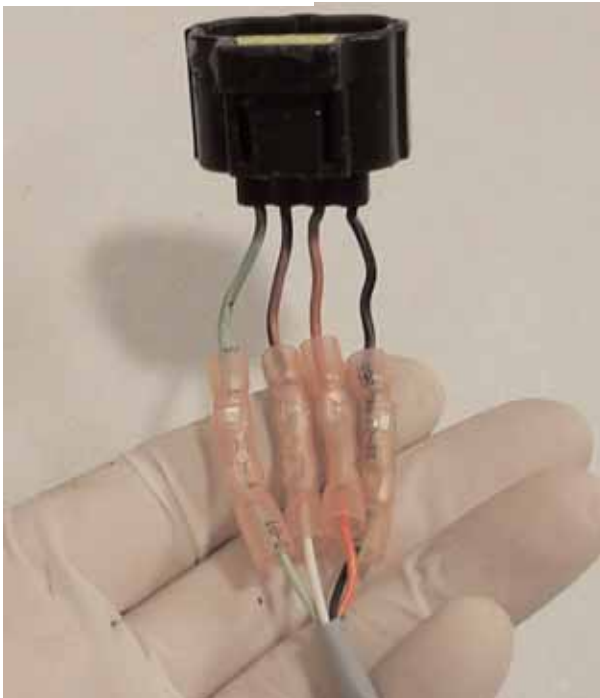


**Illustration 14**

## Supercharger Installation Instructions



Illustration 14 con't



15. Run the extension harness around the outside of the intake manifold, up to the throttle cable clips on the firewall. Hook the harness into both throttle cable mounting clips and lay it across to the brake master cylinder for now. Illustration 15



Illustration 15

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16. For No PS - AC only applications, move on to step 19. Use a 12mm socket and combination wrench to loosen the power steering slide lock bolt. Then loosen the tensioning bolt. Use a 14mm deep socket and combination wrench to loosen the power steering pivot bolt. You may have to rotate the pulley to access this bolt. Using a 14mm socket loosen and remove the slide anchor bolt at the engine. At this point the power steering pump should be able to pivot. Push the pump downward towards the air conditioning compressor and remove the belt. Now, use a 12mm socket to remove the bolt securing the power steering hose to the bracket. Using a 14mm socket, remove the two bolts that are fastening the power steering bracket to the power steering pump. Remove the whole tensioning system including the tensioning and power steering brackets. Then, remove the nut from the power steering pivot bolt. Illustration 16



Illustration 16



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17. Gather together the new belt tensioner assembly, the new power steering hose support bracket and the supercharger strap bracket. Using a 22mm combination wrench slightly loosen the power steering hose on the top of the power steering pump and swing the hose to clear the new power steering hose support bracket. Then install the new hose support bracket in the same place as the factory bracket. Temporarily install the upper bolt to help with alignment. Tighten the bottom bolt to 36 ft lbs. Once the bottom bolt is tight, remove the upper bolt. Now slide the power steering pivot bolt forward out of the pump. If it hits the cooling fan, pull gently and wiggle it out (Optionally, the two mounting bolts at the top of the fan can be removed and the fan can be lifted slightly to allow the bolt to come out). Remove the rubber sleeve holding the bolt in the new tensioner assembly. Slip the new tensioner assembly into place behind the power steering pulley, aligning its lower hole with the pivot bolt hole. Reinstall the pivot bolt. Install the short-headed bolt again just above the pivot bolt. It should thread into the cast power steering bracket, bolted to the engine. Finally, install the last bolt through the tensioner assembly and through the power steering hose support bracket into the upper hole in the pump. Slide the round hole of the strap bracket onto the end of the pivot bolt on the back side of the power steering pump and start the flanged nut. Tighten the two upper bolts on the tensioner assembly, securing it to the power steering pump and the cast power steering bracket, bolted to the engine. Tighten to 36 ft lbs. The power steering pump pivot bolt will stay loose until the supercharger is installed. Illustration 17



**Illustration 17**



**Illustration 17 con't**



18. Gather one M8 x 20mm flanged bolt, two M8 flange nuts and the power steering link. Bend the tabs open on the power steering hose clamp. Open the clamp and slide it down the hose. Make sure that the rubber slides along with the clamp. Install the power steering link over the stud on the power steering bracket and start one of the flange nuts. Align the clamp on the power steering hose with the remaining hole in the power steering link. Slip the bolt through the hole



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and start the nut. Once the bolts are started, pull the hose away from the power steering reservoir to gain clearance and tighten the bolts to 18 ft lbs. Now tighten the hose on the power steering pump. Once the two bolts are tight, the two tabs on the power steering hose clamp can be bent down again.

Illustration 18



Illustration 18



19. For No PS - AC only applications, use a 22mm socket or combination wrench to loosen the lock nut in the center of the factory idler pulley. Use a 10mm socket to loosen the tensioner bolt, therefore loosening the belt. Remove the belt.

20. Unthread the tensioner bolt all the way out of the idler pulley stud and set it aside. Next, unthread the nut from the center of the idler pulley and remove the pulley, spacer, and stud. Set them aside. They will not be reused. Gather from the kit a M10 X 60mm hex head bolt, a thick, black washer, an idler pulley, an idler pulley spacer, and a t-nut. Notice that the t-nut has a small hole in one end. The tensioner bolt will engage it here. Slip the thick, black washer onto the bolt and slip the bolt through the idler. Then, slip on the idler spacer with the small diameter against the idler. Insert this assembly through the slot on the front of the cast steel bracket and thread on the t-nut. When the t-nut is in the slot, the small hole should be facing up.



Illustration 19



## Supercharger Installation Instructions



Illustration 19 con't



21. Gather together two M6 nuts and the factory tensioner bolt. Thread one nut all the way up the tensioner bolt, almost to the head. Slip the bolt through it's hole in the cast steel bracket and thread on the second nut about 3/8". Slide the idler assembly to the top of the slot and just snug it's bolt by hand so that it stays at the top. Illustration 20



Illustration 20

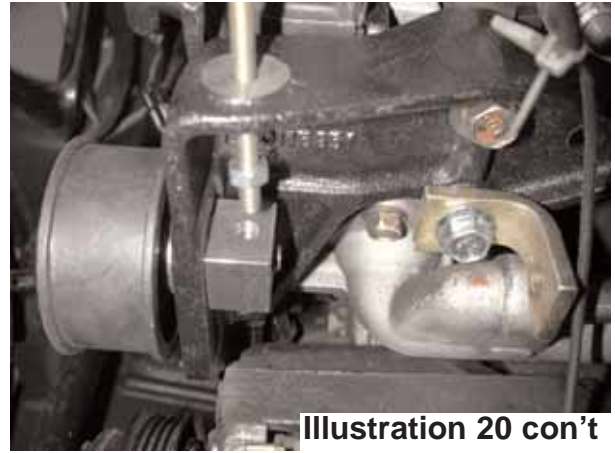


Illustration 20 con't

22. Using a 14mm socket, remove the front, lower bolt securing the cast steel bracket to the engine block. Gather together from the kit a M10 X 45mm flange bolt, the "L" bracket, a M10 X 25mm flange bolt, a M10 locknut, and the supercharger strap brace. Attach the "L" bracket to the cast steel bracket using the M10 X 45mm bolt. The curved cut-out on the "L" bracket should be on the bottom when installed. Position the "L" bracket so that it is not sitting on the casting beneath it and tighten the bolt to 32 ft. lbs. Attach the supercharger brace to this bracket using the M10 X 25mm flange bolt. Slip the bolt through the hole in the "L" bracket from the front, pointing rearward. There is a hole in one end of the brace that will slip over the bolt and then the locknut. Snug the nut so that the brace can still move. It will be tightened in a later step. Illustration 21

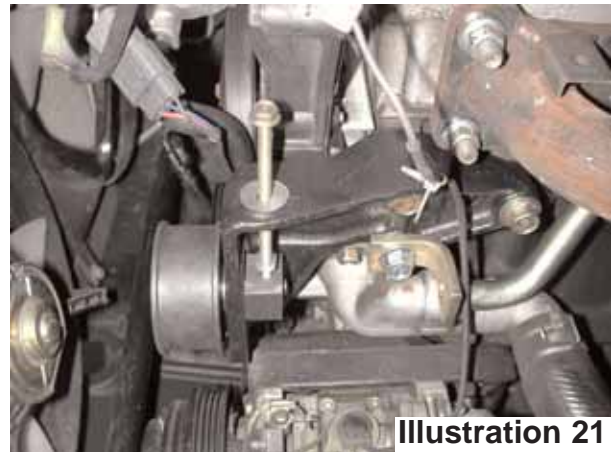


Illustration 21

23. Using a 14mm socket, remove the front engine lift eye. Using a 10mm socket, remove the seven bolts and three nuts securing the heat shield to the exhaust manifold. Remove the heat shield. Illustration 22

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**Illustration 22**



24. Use a 14mm socket to remove the nuts on the two center studs securing the exhaust manifold to the cylinder head. Install the two M10 nuts supplied in the kit onto one of the studs and tighten them together. Now use them to unscrew the stud. Repeat for the other stud. Install the new studs using the same method. Thread them in until they are snug, but do not over tighten. The short thread will go into the head. Illustration 23



**Illustration 23**



**Illustration 23 con't**



25. Gather together the two exhaust mount blocks, the side plate and the side plate block. Also gather together two coarse-threaded M10 x 25mm flange head bolts and two M8 x 20mm flange head bolts. Apply thread lock to the two M8 bolts and use them to attach the exhaust mount block to the side plate. Drop one of the M10 bolts into the lower hole in the side plate and then tighten the M8 bolts to 18 ft lbs. This will align the lower hole in the block to the hole in the plate. Remove the M10 bolt and apply thread lock to both of them. Thread them loosely into the side plate block through the holes in the side plate. Illustration 24



**Illustration 24**

# Supercharger Installation Instructions



Illustration 24 con't



26. Take the side plate assembly and slide it onto the two exhaust studs previously installed in the cylinder head. You may need to use a dead-blow hammer to lightly tap it into place against the exhaust manifold. Slide the side plate block all the way forward. Slip on two 10mm lock washers and start the two 10mm nuts used to install the studs. Use a 17mm socket to tighten them to 36 ft lbs. Illustration 25



Illustration 25



Illustration 25 con't



27. Locate the M10 x 1.25 x 25mm (fine thread) flange bolt and thread it into the head where you removed the engine lift eye earlier. Screw it into the head until there is about 1/2" of thread left sticking out of the head. Illustration 26



Illustration 26

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28. Gather together the four M8 x 30mm flange head bolts, the throttle body gasket, the stock throttle body, and the supercharger assembly. Apply thread lock to the four bolts. Slip a couple of the bolts through the top holes in the throttle body. Slip the gasket over the bolts. Hold the throttle body and gasket up to the supercharger. Note that the throttle cable bell crank fits in the machined step on the side of the throttle body adapter. Thread in the upper bolts and then insert and thread in the lower bolts. Then tighten all of the bolts in a cross pattern to 18 ft. lbs. using a 12mm socket. Illustration 27



**Illustration 27**



29. Gather the M12 x 40mm flanged bolt, one M10 x 25mm coarse thread flange head bolt and one M10 locknut. The M12 bolt will be the rear supercharger mount bolt and will pass through the throttle body adapter on the supercharger and thread into the side plate block once the supercharger is in place. The M10 bolt is for the supercharger strap bracket that is already installed on the pivot bolt of the power steering pump. Illustration 28



**Illustration 28**

30. Take the supercharger assembly over to the car. Slide the keyhole slot, in the front bracket, over the M10 bolt that was threaded into the hole where the lifting eye was previously mounted. Slip the M12 bolt through the throttle body adapter plate and thread it into the side plate block. Illustration 29



**Illustration 29**



## Supercharger Installation Instructions



**Illustration 29 con't**

31. While the supercharger is hanging loosely on the engine, remove the sliding tensioner pulley from the tensioner plate. Be sure that the T-nut on the back side of the tensioner plate doesn't fall. Hold a straight edge between the supercharger pulley and the power steering pulley. Then slide the supercharger assembly forward or backward to align the front face of the supercharger pulley with the front face of the power steering pulley. Once they are aligned, use a 14mm combination wrench to tighten the M10 bolt at the front supercharger mount to 36 ft lbs. Then use a 16mm socket to tighten the M12 bolt at the back of the supercharger to 45 ft lbs. Now use a 15mm combination wrench to tighten the two bolts securing the side plate block to the side plate. Tighten them to 36 ft lbs. Reinstall the tensioner pulley assembly onto the tensioner plate. Illustration 30



**Illustration 30**

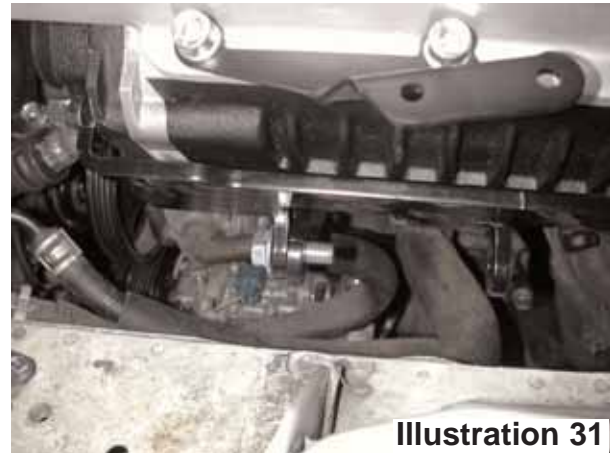


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**Illustration 33 con't**

32. Underneath the supercharger, align the supercharger strap bracket with the rear side of the front tab on the supercharger support bracket. Slip the M10 x 25mm coarse thread bolt through both brackets, start the M10 locknut and tighten using a 15mm combination wrench and 17mm socket. Use a 14mm deep socket and combination wrench to tighten the power steering pump pivot bolt to 36 ft lbs. For No PS – AC only applications, tighten the lower bolt securing the supercharger brace to the "L" bracket also. Illustration 31



**Illustration 31**

33. Gather together the remaining M10 x 25mm coarse thread flange head bolt, M10 locknut and throttle cable bracket. Stretch the throttle cable out to the front of the car and install the throttle cable bracket onto the grommet with the open side facing down. Slide the sleeve into the grommet and then run the nuts down on each side by hand so that the bracket ends up approximately in the center of the adjustment. Loop the throttle cable around, routing it over and above the strut tower and under the front of the supercharger but above the supercharger strap bracket, pointing it towards the throttle body. Hook the end of the cable into the bell crank on the throttle body and then pull the throttle cable bracket back

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towards the rear tab on the supercharger support bracket. Slip the M10 bolt through the hole in the tab from the front. Slip the throttle cable bracket over the bolt and start the nut. Tighten the M10 bolt until it just makes contact with the throttle cable bracket. Rotate the throttle cable bracket until the throttle cable is aligned with the bell crank on the throttle body. Use two 12mm combination wrenches to adjust the cable using the two nuts on either side of the throttle cable bracket so that there is a small amount of slack in the cable when the throttle is released but that full throttle is available when the gas pedal is fully depressed. It may help to have an assistant press the throttle pedal while observing for wide open throttle at the throttle body. If you find that it is too difficult to tighten the two throttle cable nuts together underneath, get a close adjustment by hand, remove the 10mm bolt, remove the cable and bracket, snug the two nuts together with wrenches and then reinstall the cable, rechecking the cable for proper slack and wide open throttle actuation. Finally, tighten the M10 bolt and lock nut using a 15mm combination wrench and a 17mm socket to 36 ft lbs. Illustration 32



**Illustration 32**



**Illustration 32 con't**



34. Route the drive belt around the crank pulley, over to the air conditioning compressor pulley (if present, if not, route to the P/S pump), up to the power steering pump pulley, between the idler and tensioner pulleys, over the supercharger pulley, down between the idler and tensioner pulleys and back to the crank. Tension the belt using a 17mm socket on the tensioner bolt. Tighten the bolt until there is 1/2" of deflection when you press firmly on the belt between the idler and the crank pulleys. Thread the jam nut on the tensioner bolt down against the tensioner bracket. Use a 17mm combination wrench to lock the jam nut into place. Torque the tensioner pulley bolt to 36 ft-lbs. Also double check the torque on the fixed idler pulley bolt. For No PS – AC only applications, route the belt from the crankshaft pulley, under the AC pulley, up to the supercharger pulley, down under the idler and back to the crankshaft pulley. The belt may have to be rolled on. Loosen and slide the idler down to put tension on the belt. Guide the tensioner bolt down to the hole in the top of the t-nut and thread the M6 nut up against the under side of the cast steel bracket. Using a 10mm socket and combination wrench, tighten the bolt while holding the nut with the combination wrench. Tighten until there is about 1/2" of deflection when you press firmly on the belt between the supercharger pulley and the idler. Once tight, use a 17mm socket to tighten the bolt in the center of the idler to 36 ft. lbs. Thread the upper nut on the tensioner bolt down against the cast bracket and tighten to lock the bolt in place. Illustration 33

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**Illustration 33**



**NOTE:** If your car has Cruise Control install kit 999-827 now.

35. Gather together the 180 degree plastic inlet tube, the shortest of the straight hoses, one 45-degree hose and the two brass barb fittings. Wrap the barb fittings with thread sealing tape. Install the barbs into the correct threaded hole in the inlet tube. Snug the hose barbs using a 1/2" and a 7/8" combination wrench. Illustration 34



**Illustration 34**



36. Install the short hose over the end of the tube nearest the sharp bend and clamp it using one of the large hose clamps. Slip a second large hose clamp over that hose. Illustration 35



**Illustration 35**



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37. Remove the engine oil dipstick and plug in the extension harness to the throttle position sensor. Now connect the short hose on the 180 degree plastic inlet tube to the throttle body and snug the hose clamp. Leave the clamp loose enough to be able to rotate the tube. Now install the 45-degree hose. The long leg goes onto the tube. Slip two hose clamps over the 45-degree hose with their tightening screws on the same side as the brake master cylinder. Illustration 36



Illustration 36



38. Now, slide the mass airflow sensor into the hose, paying attention to the arrow on the side of the sensor for airflow direction (arrow points toward the throttle body). The tube and the hose can be rotated to help the mass air sensor align with the holes in the bracket on the supercharger. Temporarily install two M6 x 10mm flanged-head bolts through the mass airflow sensor mounting bracket and into the threaded mounting holes in the mass airflow sensor. Once the two M6 bolts are hand tight and the tube is rotated for best alignment,

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tighten all of the hose clamps. Then take the two M6 bolts back out of the mass airflow sensor and swing the sensor away from the supercharger enough to slip the included air filter (with clamp) onto the mass airflow sensor. Tighten the hose clamp on the air filter. Route the connector for the mass airflow sensor underneath the sensor and plug it in. Then reinstall the two M6 bolts thru the mass airflow sensor mounting bracket and into the mass airflow sensor. Reach under from the front to tighten the mass airflow sensor bolts with a 10mm socket. Tighten to 9 ft lbs. Reinstall the dipstick. Illustration 37



Illustration 37



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39. Install the small plastic restrictor in the 11 inch long piece of 3/8" hose. Use two factory clamps to install the 3/8" hose between the small barbed fitting on the intake tube and the PCV nipple on the valve cover. Illustration 38



**Illustration 38**



40. Slide a hose clamp over the end of the included 3/4" hose. Attach this end of the hose to the large hose barb on the idle air control motor, mounted to the dummy throttle body, and tighten it. Route the hose across the radiator, up between the supercharger and the valve cover and towards the large barb on the plastic inlet tube. Cut this hose to length as necessary. Slide a hose clamp over the end of the hose nearest the intake tube and slide it over the large hose barb connected to the vent tube. Tighten the hose clamp. Use the included tie-wraps to attach this hose to the cooling fan shroud and to the PCV tube at the valve cover. Tie-wrap the throttle position sensor extension harness to the clips on the hard line that the throttle cable was originally attached to. Cut off the excess Tie Wrap. Illustration 39



**Illustration 39**



**Illustration 39 con't**



41. Gather together the crossover tube and the remaining two hoses. With the blank side-facing up and the tube openings facing away from you, put the small end of the reducer hose on the left hand side and the straight hose on the right hand side. Slip the remaining four clamps over the hoses. Arrange the clamps so that the tightening screw faces up. On the supercharger side, the clamps may have to be staggered so they don't come in contact with the pulley or the power steering reservoir. Do not snug the clamps at this time. Slip the reducer hose over the dummy throttle body. Then slip the straight hose over the supercharger outlet. Make sure the crossover tube is as low as it can be on the supercharger outlet side. Doing this will improve hood clearance. Position the clamps and tighten them. Illustration 40



**Illustration 40**

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42. Locate the PowerCard (Fuel Management System) and the Timing Card from your kit. Using a 14mm socket, remove the four bolts securing the passenger seat and remove it from the car. Remove the two push-in fasteners securing the carpet behind the seat. Fold the carpet toward the drivers side of the car to expose the Electronic Control Unit (ECU). You may have to peel back some of the carpet on the floor to expose the wiring harness.

Illustration 41



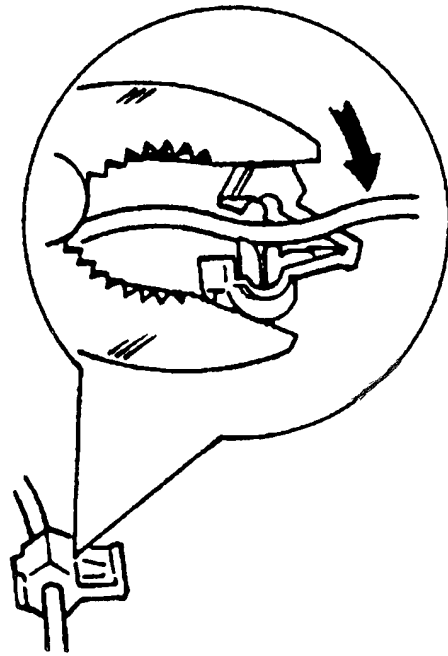
**Illustration 41**

43. There are two different ECU's between 94 & 97. The early ECU has two connectors at the bottom and the later ECU has three connectors. The connector closest to the center of the car is #1. Then #2, (The 96-97 ECU does not have a #2 connector and 94-95 does not have a #3 or 4 connector) #3 and #4 are on the outside. Disconnect all the connectors. Illustration 42



**Illustration 42**

44. In the connector closest to the passenger door (#2 connector for early cars and #4 connector for later cars), locate the fuel injector wires. They are color coded, Yellow, Yellow/Black, Green, and Green/White. Use the attached ECU connector diagrams to assist in locating these wires. Clamp a T-tap onto each of these wires using multi-purpose pliers.



45. Next, locate the White/Red wire (In the #1 connector for early cars and the #4 connector for later cars). This will be the switched 12V +. Also locate the appropriate solid Black wire (In the #2 connector for early cars and the #4 connector for later cars). This will provide ground for the circuit. Install two T-taps onto both of these wires.

46. Now, locate the Throttle Position sensor wire. Again, use the attached ECU connector diagrams to find the correct wire location. We have found that the color codes of the diagrams do not always match the cars wiring harness. In the early car it is in the #2 connector at the 2M pin location. It should be a Red/Black wire. In the later car it is in the #3 connector at the 3F pin location. It should also be a Red/Black wire. Cut the wire 2" from the connector and strip 1/4" of insulation off of both sides of the cut. Crimp a female spade connector on the side leading to the ECU connector and a male spade on the side leading into the harness.

47. Before connecting the PowerCard, install the Timing Card. Locate the Brown and the Brown/Yellow wires. (In the #1 connector for the early cars and the #4 connector for later cars.) Again use the attached connector diagram for the pin locations. Cut these wires about 2" from the ECU connector. Make sure you leave enough wire leading into the harness to strip and crimp to. It is a tight space and is difficult to work in. Strip 1/4" of insulation off the ends of the wires. Crimp a female

## Supercharger Installation Instructions

spade connector onto both of the wires leading into the harness and crimp a male spade connector onto both of the wires leading to the ECU connector.

48. Connect the Yellow wire of the Timing Card to the male spade connector on the Brown/Yellow wire leading to the ECU connector. Connect the White/Yellow wire of the Timing Card to the female spade connector on the Brown/Yellow wire leading into the harness. Connect the Gray and Gray/Green wires of the Timing Card to the male and female spade connectors on the Brown wire.

49. Connect the Red wire of the Timing Card to one of the T-taps on the White/Red wire. Connect the Black wire of the Timing Card to one of the T-taps on the Black wire.

50. Now, connect and mount the PowerCard. Connect the Red wire of the PowerCard to the tap on the White/Red wire of the ECU. Connect the Black wire of the PowerCard to the tap on the Black wire of the ECU. Connect the solid Purple wire to the male spade connector on the cut wire of the ECU leading into the harness and connect the Purple/Yellow wire to the female spade connector on the other side of the cut wire leading into the ECU connector. Connect the White/Green, Red/Blue, Green/Gray, and White/Yellow wires of the PowerCard to the T-taps on the Yellow, Yellow/Black, Green, and Green/White wires of the ECU. They can be connected in any order. Once everything is connected, reconnect the ECU connectors. Illustration 43

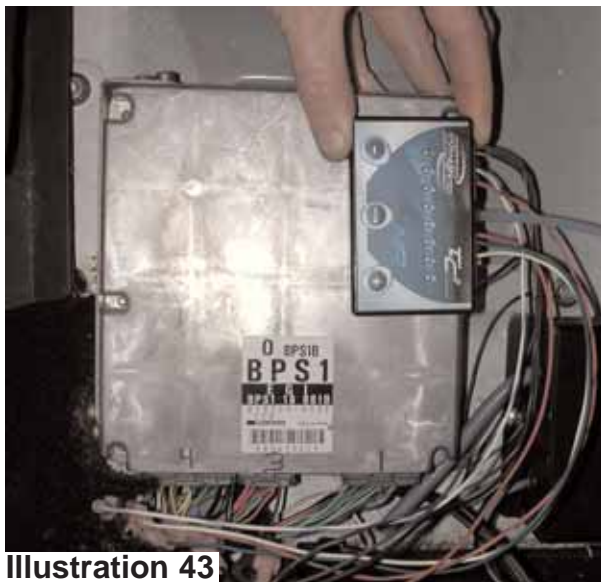


Illustration 43

51. Clean the back of the PowerCard with rubbing alcohol. Peel the back of the Velcro pad and attach it to the back of the PowerCard. Find a good location for the PowerCard on the face of the ECU. (We recommend the upper inner corner.) Again, clean it with rubbing alcohol, peel the back of the Velcro and attach the PowerCard to the ECU. Use the included tie wraps to secure the wiring. Repeat the same procedure for the Timing Card.

52. Route the included plastic tubing from the intake manifold to the PowerCard location. Be careful not to kink this tube during installation as it will give the PowerCard false pressure readings. Remove the passenger (right side) kick panel trim and the door sill plate. The tube will connect to the intake manifold on the passenger side of the engine. Locate an available vacuum port or tap into an existing vacuum hose using the rubber 90 degree fitting or one of the included tees. Next, route the tube through a hole in the firewall behind the windshield washer reservoir and into the interior. Pull all of the tubing into the inside of the car leaving a small amount of slack for engine rock. Route the tubing to the right, behind the kick panel, under the carpet near the door sill plate, along the door opening, and then under the panel near the door jam. Then on to the PowerCard location. Use one of the included Tees to connect the Timing Card to the PowerCard and then to the plastic tubing. The plastic tubing fits inside the Tee. A short piece of plastic tubing can be cut to make the connection between the hose on the PowerCard/ Timing Card and the Tee. Illustration 44



Illustration 44



## Supercharger Installation Instructions

53. Start your engine normally. A few seconds after starting the engine, lights on the PowerCard display will energize. With a proper installation, you will see a continuous sequence of lights run from left to right and then a single green light at position one. The single green light will flash every two seconds when the engine is running but there is no boost.

If PowerCard doesn't power up after 4 seconds double check your power and ground. One or both are incorrectly hooked up.

The single green light may "flicker," however a flashing green and flashing red together indicate improper hookup of the injector leads and PowerCard is not getting an injector signal. If this happens, recheck installation of wiring to the injector leads. Again, make certain spade connectors are inserted properly into the square slot of the t-tap, and not off to the side. If you can see the silver spade connector through the translucent insulation, then you need to disconnect and properly reconnect this connection.

Although it doesn't matter which injector lead is connected to the injector wire, the PowerCard injector leads are "numbered", which can aid in troubleshooting. When you have a flashing green and flashing red together, the position of the flashing green indicates which lead is improperly connected. Trace the problematic lead to the injector wire and carefully inspect its connection.

NOTE: When driving, it is possible to see the flashing green and red together. This is perfectly normal as most engine ECUs will shut off the injectors under extended periods of deceleration. However, if you get a flashing green and red at idle, PowerCard is not seeing the injector signal and you must recheck your installation.

The PowerCard is pre-set and should not need adjustment.

54. The TimingCard is a device which electronically retards the timing when there is boost in the intake manifold. It works in a similar way as the PowerCard, in that it does its work only when necessary under positive manifold pressure or "boost".

We have found that for optimum performance the Miata ECU's timing curve does not need to be retarded as much at low rpm versus high rpm. So, we have included three rpm-based "zones" where different amounts of

timing retard can be used based on engine rpm. The TimingCard is preset for a 94-97 Miata running on California 91 octane gasoline.

### SETTINGS & STRATEGY:

The Miata ECU's timing curve needs the most timing retard above 5000rpm. It needs some in the midrange and very little or none at the low end.

The TimingCard is designed to work with stock base timing. If you have a physical device affecting the base timing (slotted trigger wheel, timing bracket, etc) it should be reset to stock or removed.

55. Recover the ECU location with the carpet and secure with the push in fasteners. Reinstall the passenger seat and tighten the four bolts.

56. Using the idle airscrew on your throttle body (now on the back of the supercharger), adjust your idle speed to 950 rpm after the engine is warm. This is done by backing the adjustment screw out a half turn at a time until the correct speed is achieved (counter-clockwise rotation increases idle speed). Next, turn your headlights on BRIGHT and put your heater fan on HIGH. Leave the air conditioning off. Rev the engine briskly in neutral to at least 2500 rpm and release. Notice if the idle stops at 900rpm. If it dips below this level and feels like it will stall, then recovers to 950 rpm, open the idle airscrew (counter-clockwise rotation) one tenth of a turn at a time until most of this "droop" disappears. A slight droop of 100 rpm or so is acceptable and normal. More than that may create a stalling problem during driving. Turn off the lights and heater fan and double-check that your idle speed is 950 rpm.

57. Your Miata supercharger kit is designed to operate on 91 Octane fuel. Make sure that any fuel you use meets or exceeds this octane level. Failure to use at least 91 Octane fuel will result in engine-damaging detonation. Make sure that you run your engine on 91 Octane only, which means you should completely burn up any lower octane gas in your tank and refill it with 91 octane before installing your supercharger. In any case, should you ever hear "pinging" or knocking from your engine when under acceleration, you should take measures to eliminate this

## Supercharger Installation Instructions

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detonation, i.e. higher-octane fuel. Mixing fuels of different octane will lower the overall rating and detonation could be a problem.

58. Start your engine as you would a standard Miata. Remember to bring the engine up to operating temperature (as indicated by your water temperature gauge) before running it hard. Full boost on a cold engine will greatly increase your engine wear.

59. Oil changes: we suggest you use synthetic oil such as Mobil 1 and change it regularly (5000 miles maximum). If you use a mineral oil, change it every 2500 miles. While your supercharger does not use any engine oil for its lubrication, your engine will be working a little harder with the addition of a supercharger. The synthetic oil provides an extra measure of protection, but is not necessary for safe and reliable operation.

60. Breaking-in: Your supercharger will work perfectly from the first time you fire it up. However, it does need about 500 miles to fully seat the rotors. Up to that time, you may notice a slight noise coming from the supercharger at idle. This is normal.

61. Performance: You will notice that your engine runs stronger during cold days than on very hot ones. This is due to the nature of the internal combustion engine. When the air is cold, the engine receives a denser charge of air, thus more power can be produced. While this is true with any engine, the supercharger amplifies this cold air benefit.

62. The only item to watch with your supercharger kit will be the belt tension for the supercharger drive. If you have a tension gauge for a serpentine belt, the tension is to be 90 pounds. Without a gauge, look for less than 1/2" deflection on the long run of the belt. If you see a large accumulation of belt dust on your supercharger, it is an indication that your belt is slipping. A slight amount of belt dust is normal. CHECKING YOUR BELT FOR WEAR: As the belt wears, small cracks will form in each of the ribs on the inside run of the belt. Replace your belt when you can count six cracks within one inch of length (six cracks total from all ribs combined).

63. Every six months or so, check your hose clamps for correct tension. The rubber hoses will take a set and the clamps may not be holding as tight. Also check all mounting bolts and

nuts, particularly the throttle cable anchor bracket. Your air filter is a long-life unit needing service only every 15,000 miles. To clean, you can wash the filter element in soap and water. Use a dish detergent soap such as Dawn, etc. Rinse thoroughly and allow to dry. Wet the filter element with a light application of ATF (automatic transmission fluid). Alternatively, a special cleaning kit is available (901-970).

### 64. Troubleshooting:

SYMPTOM: Engine cranks but will not start.

PROBABLE CAUSES: Airflow meter disconnected; Idle air line open; Low battery voltage; Boost Timing Controller power/ground not connected.

CURE: Double check that seven pin to airflow meter is well connected. Re-check the 3/4" ICS line and the PCV line to see that they are not leaking. Use a known good battery to "jump" the Miata's battery. It is possible to have enough voltage to crank a Miata but not enough to correctly run the engine's control computer. Check connections at the BTC.

SYMPTOM: No power during boost.

PROBABLE CAUSES: Cross over tube loose; Idle Compensator not connected/not functioning; PowerCard boost hose disconnected; PowerCard power/ground disconnected.

CURE: Check fuel lines for kinking. Check the cross over tube to see that it is well connected at both ends. Check Idle Compensator electrical connections, check its resistance; should be approximately 22k ohms

SYMPTOM: Unstable Idle.

PROBABLE CAUSE: Idle airscrew set incorrectly; Restrictor left out in step 35; air leak in intake track.

CURE: Re-check restrictor. Check idle adjustment procedure in step 8.1 above. Check for air leaks - vacuum at idle should be at least 17.7 in Hg.

### FURTHER MODIFICATIONS

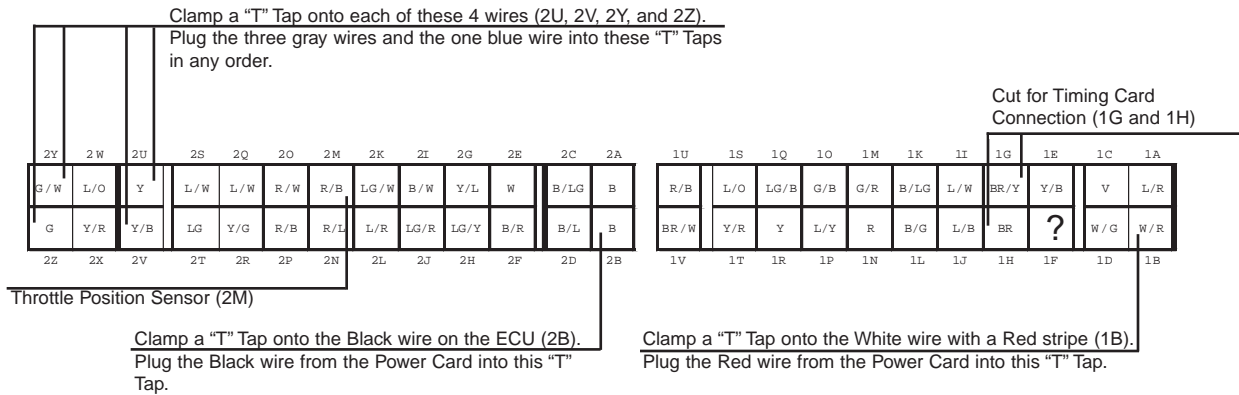
Now that your Miata has a stronger engine, there are a few changes you might want to make to the rest of the car to improve its performance. A free flowing exhaust system will make your supercharged Miata that much faster. Options include a Moss Motors 4-2-1 header (#903-120, CARB approved, Manual Transmission only) and a cat-back exhaust system from Cobalt and Moss Motors.

Available at [MiataMania.com](http://MiataMania.com). Also, while your new supercharger and the standard Mazda clutch work well together, it is a good idea to step up to the ACT Stage 1 clutch kit (#999-606) when you change your clutch.

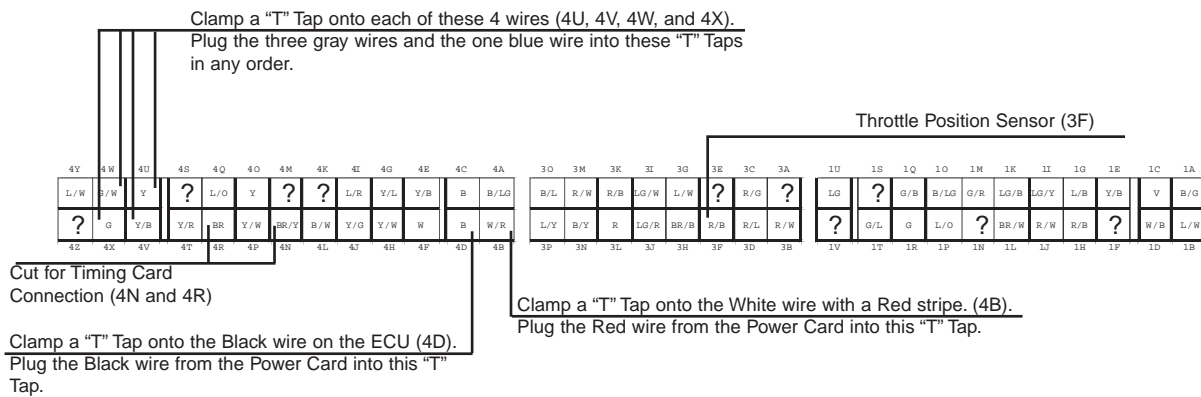
# Supercharger Installation Instructions

## ECU Connector Diagrams

### 1994 – 1995 (OBDI) 2 Connector ECU



### 1996 – 1997 (OBDII) 3 Connector ECU



? Indicates empty pin



# Supercharger Installation Instructions

## Contents of the kit #999-845, #999-846, #999-847

Note – Specifications and components are subject to change and revision without notice.

| <b>Part No.</b> | <b>Description</b>                  | <b>Qty.</b> | <b>UOM</b> |
|-----------------|-------------------------------------|-------------|------------|
| 999-151         | DUMMY THROTTLE BODY                 | 1           | EACH       |
| 052-902         | CROSSOVER TUBE, MP62, 1.8           | 1           | EACH       |
| 052-944         | CUT TUBE, MAF TO THROTTLE BODY      | 1           | EACH       |
| 999-401         | BELT, 4PK1355 (P/S and A/C)         | 1           | EACH       |
|                 | OR                                  |             |            |
| 053-081         | BELT, K040500 (P/S, No A/C)         | 1           | EACH       |
| 053-103         | POWERCARD, MP62 MIATA, O2           | 1           | EACH       |
| 053-102         | TIMINGCARD                          | 1           | EACH       |
| 052-071         | LICENSE PLATE FRAME, JR             | 1           | EACH       |
| 052-946         | AIR FILTER, K&N, 2-9/16 X 4-1/2 X 5 | 1           | EACH       |
| 052-906         | EXHAUST MOUNT BLOCK                 | 2           | EACH       |
| 052-907         | SIDE PLATE                          | 1           | EACH       |
| 052-909         | SIDE PLATE BLOCK                    | 1           | EACH       |
| 052-918         | STRAP BRACKET, MIATA MP62           | 1           | EACH       |
| 053-083         | INSTRUCTIONS, MP62 MIATA,94-97      | 1           | EACH       |
|                 | <b>Hose Bag</b>                     |             |            |
| 051-091         | CLAMP, HOSE, SAE NO. 10             | 2           | EACH       |
| 051-094         | CABLE TIE, BLACK, 11 IN             | 8           | EACH       |
| 051-260         | HOSE, PCV, 3/8 IN ID, BULK          | 11          | INCH       |
| 051-235         | CLAMP, HOSE, SAE NO. 44             | 8           | EACH       |
| 052-350         | HOSE,REDUCER,2.75 X 2.5 X 2.87      | 1           | EACH       |
| 051-460         | HOSE, 94-97, 2.5ID X 2.0LG BLK      | 1           | EACH       |
| 051-456         | HOSE. X-OVER 2.5 ID X 2.75 LG       | 1           | EACH       |
| 051-481         | RESTRICTOR. VENT HOSE               | 1           | EACH       |
| 051-508         | HOSE, COOLANT, 3/4 PER INCH         | 40          | INCH       |
| 051-016         | CABLE TIE, 4IN.                     | 8           | EACH       |
| 051-320         | ELBOW,VACUUM, 1/8X11/64X90 DEG      | 1           | EACH       |
| 163-655         | HOSE, VACUUM, BLACK PLASTIC         | 10          | FOOT       |
| 051-389         | TEE, VACUUM, 3/16                   | 1           | EACH       |
| 051-372         | SLIT LOOM.1/4 INCH                  | 126         | INCH       |
| 051-133         | HOSE BARB, 1/8 NPT X 3/8            | 1           | EACH       |
|                 | - Inlet Tube, Valve Cover           |             |            |
| 052-945         | HOSE BARB,1/2" NPT X 3/4"           | 1           | EACH       |
| 051-183         | WIRE KIT, S/C KIT                   | 1           | EACH       |
| 051-063         | BUTT CONNECTOR, 20-18 GA. WIRE      | 9           | EACH       |
| 051-387         | SPADE CON, FEMALE, 22-18 GA         | 1           | EACH       |
| 051-395         | SPADE CON, MALE, 18-22 GA           | 1           | EACH       |
| 052-939         | HOSE 2.75IDX1.25"X 4.25" X 45D      | 1           | EACH       |
|                 | <b>Tensioner Assembly</b>           |             |            |
| 051-084         | BOLT, HEX, M10 X 1.50 X 50          | 1           | EACH       |
|                 | 1- Idler Pulley to T-Nut            |             |            |
| 051-215         | SPACER, SHOULDER                    | 2           | EACH       |
|                 | 2- b/t M10 bolt head and Idler      |             |            |
| 052-904         | TENSIONER, T-NUT, MIATA MP62        | 1           | EACH       |
| 051-627         | PULLEY, 2.0IN IDLER, NYLON          | 2           | EACH       |
| 052-923         | BOLT, M10 X 1.5 X 45, HEX HEAD      | 1           | EACH       |
|                 | 1- Idler Pulley to Bracket          |             |            |
| 051-916         | BRACKET, POWER STEERING HOSE        | 1           | EACH       |
| 052-903         | BELT DRIVE BRACKET                  | 1           | EACH       |
| 052-331         | SPACER, IDLER, .325                 | 2           | EACH       |
| 052-367         | BOLT, FLANGE, M10 X 1.25 X 20       | 1           | EACH       |
|                 | 1- Belt Drive Bracket - Engine      |             |            |
| 052-922         | JAM NUT, M10 X 1.5                  | 1           | EACH       |
|                 | 1 - belt tension adjustment         |             |            |
| 052-924         | BOLT, M10 X 1.5 X 60, HEX HEAD      | 1           | EACH       |
|                 | 1 - belt tension adjustment         |             |            |

# Supercharger Installation Instructions

| <b>Hardware Bag</b>          |                                                                                                                         |   |      |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------|---|------|
| 051-506                      | BOLT,HEX FLANGE,M8 X 1.25 X 30<br>- Throttle Body                                                                       | 4 | EACH |
| 051-324                      | 1104 LIQUID GASKET                                                                                                      | 1 | EACH |
| 051-537                      | GASKET, ICS VALVE                                                                                                       | 1 | EACH |
| 051-535                      | GASKET, T-BODY                                                                                                          | 1 | EACH |
| 999-153                      | PLATE, BLANKING                                                                                                         | 1 | EACH |
| 051-203                      | PLUG, PIPE, 1/8 NPT, HEX HEAD                                                                                           | 1 | EACH |
| 220-136                      | REMOVABLE THREADLOCKER, BLUE                                                                                            | 1 | EACH |
| 051-473                      | JR WARRANTY CARD                                                                                                        | 1 | EACH |
| 052-010                      | STICKER, PREMIUM FUEL REQUIRED                                                                                          | 1 | EACH |
| 051-696                      | BADGE, JACKSON RACING                                                                                                   | 2 | EACH |
| 052-941                      | POWER STEERING LINK, MP62                                                                                               | 1 | EACH |
| 051-451                      | TAPE ELEC. 7-MIL VINYL                                                                                                  | 1 | EACH |
| 052-914                      | THROTTLE CABLE GUIDE                                                                                                    | 1 | EACH |
| 052-930                      | BOLT, M10X1.5X25, FLANGE HEAD<br>1-S/C brace to S/C<br>1-Thr. cable brckt to SCsupprt<br>2-sideplate block to sideplate | 4 | EACH |
| 051-080                      | NUT, NYLOC, M10 X 1.5<br>1-S/C brace to S/C<br>1-Thr. cable brckt to SCsupprt                                           | 2 | EACH |
| 051-119                      | BOLT, HEX FLANGE,M6 X 1.0 X 10<br>2-MAF to bracket<br>4-BlankingPlate toThrottleBody                                    | 6 | EACH |
| 052-932                      | BOLT, M12X1.75X40, FLANGE HEAD<br>1-rearSCthrbdyplt2sidepltblock                                                        | 1 | EACH |
| 052-933                      | BOLT, M10X1.25X25,FLNG HD,ZINC<br>1-SCfrontdriveplt 2engineblock                                                        | 1 | EACH |
| 052-934                      | STUD, M10X1.25X90, ZINC<br>2 - exhaust mount block                                                                      | 2 | EACH |
| 052-935                      | NUT, M10X1.25, ZINC<br>2 - exhaust mount block                                                                          | 2 | EACH |
| 051-090                      | WASHER, LOCK, M10<br>2 - exhaust mount block                                                                            | 2 | EACH |
| 051-127                      | BOLT,HEX FLANGE,M8 X 1.25 X 20<br>2-sideplateblock2exh.mnt block                                                        | 2 | EACH |
| 051-186                      | NUT, HEX FLANGE, M8 X 1.25<br>2 - P/S Link                                                                              | 2 | EACH |
| 051-127                      | BOLT,HEX FLANGE,M8 X 1.25 X 20<br>1 - P/S Link                                                                          | 1 | EACH |
| 051-588                      | WASHER, FLAT, 5/16 IN., SAE<br>2 - P/S Link                                                                             | 2 | EACH |
| <b>Supercharger Assembly</b> |                                                                                                                         |   |      |
| 051-207                      | AHCS M8X1.25X25                                                                                                         | 6 | EACH |
| 052-625                      | GASKET, OUTLET, MP62 GEN4                                                                                               | 1 | EACH |
| 052-216                      | S/C GEN4 M62CW WITH 52MM                                                                                                | 1 | EACH |
| 052-900                      | OUTLET MANIFOLD, MACHINED,MP62                                                                                          | 1 | EACH |
| 052-834                      | GASKET, INLET, M45/MP62 GEN4                                                                                            | 1 | EACH |
| 051-553                      | CLAMP, HOSE,SPRING,7/32 VACUUM                                                                                          | 1 | EACH |
| 051-142                      | HOSE BARB, 5/32 VACUUM                                                                                                  | 1 | EACH |
| 052-913                      | THROTTLE BODY PLATE                                                                                                     | 1 | EACH |
| 052-925                      | SHCS, M8X1.25X20MM<br>4 - TB plate to S/C<br>4 - Support rear to S/C                                                    | 8 | EACH |
| 052-920                      | BRACKET, MAF SUPPORT, 94-97                                                                                             | 1 | EACH |
| 052-912                      | SUPPORT, MIATA MP62                                                                                                     | 1 | EACH |
| 052-905                      | FRONT DRIVE PLATE                                                                                                       | 1 | EACH |
| 052-910                      | SUPPORT SPACER                                                                                                          | 1 | EACH |
| 051-075                      | WASHER, LOCK, M8<br>6 - Outlet manifold to S/C                                                                          | 6 | EACH |
| 051-551                      | HOSE, VACUUM, 7/32 IN., BULK<br>- Bypass signal                                                                         | 9 | INCH |

## Supercharger Installation Instructions

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|         |                                                                             |   |      |
|---------|-----------------------------------------------------------------------------|---|------|
| 053-086 | BLOWER PULLEY, MIATA MP62, CARB<br><b>No PS - With AC Tensioning System</b> | 1 | EACH |
| 999-067 | BRACKET, L                                                                  | 1 | EACH |
| 771-376 | BOLT,HEX FLANGE,M10 X1.25 X 45                                              | 1 | EACH |
| 052-930 | BOLT, M10X1.5X25,FLANGHD,ZINC                                               | 1 | EACH |
| 051-080 | NUT, NYLOC, M10 X 1.5                                                       | 1 | EACH |
| 051-628 | PULLEY, 2.5IN IDLER, NYLON                                                  | 1 | EACH |
| 052-924 | BOLT, HEX, M10 X 1.50 X 60                                                  | 1 | EACH |
| 051-215 | SPACER, SHOULDER                                                            | 1 | EACH |
| 052-331 | SPACER, IDLER, .325                                                         | 1 | EACH |
| 053-082 | T-NUT,NO PS MP62 TENSIONER SYS                                              | 1 | EACH |
| 051-359 | NUT, STANDARD HEX, M6 X 1.0                                                 | 2 | EACH |
| 999-451 | BELT, 4PK1345                                                               | 1 | EACH |