M-Tuned reroute kit
14-161XX

Manufactured and designed by:

*Professional Installation Recommended but not required

1) Disconnect the negative terminal from the battery in the trunk.

2) Drain the coolant from your cooling system. This can be done by removing the drain plug on the bottom of your radiator and removing the radiator cap.

3) Remove the coil pack from the rear of the engine. There are 2 upper bolts at each corner and one lower bolt in the middle of the bracket.
4) If your car has a crank/cam angle sensor (CAS) you will need to remove it from the engine to install the reroute kit. The CAS has 2 upper bolts and a timing adjustment bolt on the side.

5) You will now have access to the rear of the engine. Remove the heater hose from the rear of the engine, unplug the two- or three-wire ECU sensor and start removing the rear housing. This housing is held in place with a 12mm bolt and a 12mm nut.

6) Once removed you will need to remove the 8mm stud which was used to hold the OE housing. This is done using the Mazda 12mm nut and the 13mm nut provided with the M-Tuned Kit. Place the OE nut on backwards and spin it onto the stud. Now install the included 13mm nut and tighten the two nuts against each other. Once tight you will loosen the OE nut which will remove the stud from the head.
Here are some pictures of the process and what is needed to complete this task.

7) Remove the ECU coolant sensor for the OE rear coolant housing. We will reuse the sensor, but not the rear housing.
8) Once removed you will need to install this sensor and washer into the new M-Tuned rear housing.

9) The M-Tuned rear housing has an extra 1/8 NPT Port. This can be used for an aftermarket coolant sensor, or a turbo coolant feed port. If you are not using it for either you will need to plug it with one of the provided 1/8 NPT plugs as shown below. Please ensure Teflon tape is used to seal this fitting.

10) We have noticed quite an inconsistency with EGR pipes on 96-05 cars equipped with EGR. In some cases you may need to bend the EGR pipe to gain an extra 1-2mm of clearance to install the rear housing. Make sure you test fit the rear housing first. Extra clearance can be gained using a 2” x 4” and a hammer and by giving the 2” x 4” a few light taps.

We have noticed the inconsistency more with 99-05 Miatas, vs earlier 96-97 Miatas.
11) Stick the gasket on the M-Tuned rear housing.

12) Install the LARGER coolant fitting (the one with O-ring) on the rear housing. Do not install the heater hose fitting yet as it needs to be removed to install rear housing.

13) There are 2 bolts used to install the rear housing. The largest of the 4 Allen head bolts is used on the lower hole and one of the smaller bolts is used on the upper hole. Make sure you clean off the old rear housing gasket before installing the new housing. Failure to do so will guarantee coolant leaks. *Below is a picture of us cleaning the gasket on the front of the engine, but the procedure is the same.

It is recommended to start with the upper bolt and then work with the lower bolt. EGR equipped cars will find the lower bolt a little hard to reach, but it is certainly possible. Installation of the rear housing is the hardest part of installing this kit.
14) Once the rear housing is bolted up you will need to install the heater hose fitting. Please ensure you use Teflon tape on this fitting also to ensure a proper seal.

We don’t recommend permanently installing the heater hose yet as you still need to plug in the ECU sensor and it is much easier with the hose disconnected.

15) Now that the M-Tuned rear housing and fittings are installed we will deal with the ECU sensor. The wires on this sensor will need to be extended by 8-10”.

Please ensure you use heat shrink butt connectors (not included) to complete your connections. Solder joints are brittle (try to find one in the factory wiring) and non-heat shrink butt connectors are more prone to failure. The heat shrink seals the wires, but – arguably more importantly – it provides a strain relief for the wire that makes it less likely to fail.

You can now plug in the ECU coolant temp sensor. It is also now a good time to install the heater hose and firmly attach the OE clamp.
16) We are now going to move to the front of the engine bay to start removal of the front thermostat housing. This is held on with a 12mm nut and bolt.

17) Once removed you will need to remove the stuff using the double nut trick we used at the back of the engine (step 6).

18) Once removed you need to ensure you clean any old gasket material to ensure no future leaks.
19) Before installing the front block-off plate we recommend installing the two 1/8 NPT plugs with Teflon tape. Once done you should affix the second paper gasket to the backside of the plate. Now start to fasten this plate to the front of your engine.

Once done, we recommend checking to ensure the two plugs are tight (not shown in this picture).

20) Now we are onto the fun part of the installation. You will notice you were given 2 pieces of silicone. We will be using the smaller piece and 2 hose clamps. Place the small piece on the rear fitting. Ensure the fastener on the clamp on the housing is facing the firewall or you will have trouble installing your coil pack later. (See below)

Now install the thermostat housing in the other end of the hose. Please make sure the hole in the thermostat is sitting at the highest point possible. We recommend marking the housing with a marker so you can see the top when installing this housing.

**Be sure to install the thermostat in the proper orientation!** The thermostat should be installed into the housing half with the male threads, with the spring / copper piece pointing down (it will probably be pre-installed). When you install the housing, be sure the spring / copper piece points towards the head. The picture on the right of the previous page shows the end that should face towards the radiator.
Above are a few angles of the thermostat housing installed.

21) The kit is provided with a 36” piece of high quality silicone hose. Insert the coil spring into the hose and leave yourself 1” of un-sprung hose. This end will be attached to the thermostat housing. We found clamping the hose before installation ensured the spring does not move and makes installation easier. Once you have installed this hose you will loosen the clamp and use it to fix the hose to the housing permanently.
22) The spring should come as close as possible to the radiator end of the hose. You can stretch the spring if you need to make yours longer. The spring ensures the silicone does not kink when making sharp bends.

Clamp the silicone hose to your radiator using one of the provided clamps.

Ensure the hose is not rubbing against anything sharp. We recommend zip-tying the hose out of the way of sharp areas, and/or protecting it with a piece of your old rad hose by wrapping it around the new silicone hose.

23) Re-install your ignition coils at the rear of the engine. You will find the lower bolt will be a challenge to install on a 1.8 engine. It can be done, but some have chosen to leave out the lower bolt. If you decide to do this we recommend that you remove the metal coated washer at the bottom of the coil pack to avoid a rattling sound.

24) Re-install your crank/cam angle sensor (if you have one). You will need to reset your timing once you have the car started.
25) Fill your cooling system up with antifreeze/distilled water and check for any leaks. Water transfers heat better than coolant, so you want to run as much water as you can. We typically run 70% water / 30% antifreeze, but be sure that that mix will be safe for your freezing conditions. You still need antifreeze for its anti-corrosive and lubricating properties, so we don’t recommend running less antifreeze unless you’re using something like Redline Water Wetter. We don’t recommend running Water Wetter and antifreeze together, they’re an either/or type of thing.

26) Check all electrical connections are plugged in (ECU temp sensor, coils etc) and reconnect your battery.

27) You are ready to start the car and SET THE ENGINE TIMING! We recommend the OEM spec from Mazda or your ECU/turbo kit provider. Even if you marked your CAS before removing it, you’ll still want to double-check your timing. For 99-05 cars without a CAS in the head, there’s no need to worry about your timing.

28) Once the engine timing is set you need to complete a full coolant bleeding process to ensure all air bubbles are out of your cooling system. Elevating the front of the car will make this easier.

29) Once the system is bled you should check for any leaks. It is not uncommon to forget to tighten a hose and therefore you should triple check all connections before driving on the road or race track. Hose clamps will sometimes need to be snugged down a second time, so keep an eye on things for the first few drive cycles.

30) Enjoy your Miata and the M-Tuned Coolant Reroute Kit!

* Professional installation is recommended, but not required. Please contact tech@flyinmiata.com if you have any questions.