



Coolant Reroute Kit

Installation Instructions

For 1994-1997 Miata 1.8L

PART # 910-850 and 910-855

Tools required:

- Timing Light
- Jack, jack stands, wheel chocks
- Phillips Head and Flathead Screwdrivers
- ¼" Ratchet
- ⅜" Ratchet
- 10mm Socket
- 12mm Socket
- 19mm Deep Socket
- 1⅞" Deep Socket
- 7⁄16" Socket
- 5mm Allen Wrench
- 10mm Wrench
- 12mm Wrench
- 22mm or ⅞" Wrench
- Thread Sealant
- Razor blade or similar gasket scraper
- Radiator Hose Cutter
- Telescoping mirror (recommended)
- Spill-Free Funnel such as Lisle 24680 (recommended)
- Torque Wrench ¼" (recommended)
- Cooling System pressure tester (recommended)

Kit number 910-855 does not include an EGR tube, EGR block off plate or block off nut. 910-855 is intended for an individual who has already done away with the EGR system.

If your car presently has a working EGR system, we recommend returning this kit and purchasing Coolant Reroute Kit part# 910-850 which includes a compatible EGR tube.

Removing the EGR tube and blocking off the ports will turn the "Check Engine Light" on.

Notes: The stock coolant routing on the Mazda 1.8L engine leaves much to be desired. Since the 1.8L was originally developed for light-duty transverse-mounted front wheel drive applications, little thought was given to the rear-wheel drive Miata. Coolant flows from the water pump at the front, through passages in the engine to the rear of the cylinder head. Some coolant can exit at the rear of the engine but only through the small heater hose leading to the heater core, a major flow restriction. The majority of the coolant has to reverse direction and travel back through the block again to exit at the thermostat at the front of the engine; transferring unwanted heat back into the block on the way. As a result of this inefficient design, the rear cylinders run hotter than the front. This can lead to a hotter running engine and premature failures of the rear cylinders. The design is especially problematic when a Miata is driven hard on the track or modified for increased power output.

This kit will relocate the thermostat from the front of the engine to the rear, thereby allowing coolant to flow more efficiently one direction through the block. The full-size radiator hose outlet at the rear of the engine ensures maximum coolant flow is directed out of the engine to the radiator. This helps to keep all cylinders at a more uniform lower temperature.

Installation Instructions

Warning:

- **Let the engine cool for at least 6 hours before opening the cooling system to avoid burn injury.**
- **Always use jack stands to support the weight of the vehicle. Never rely on jack alone.**
- **Make sure to dispose of old coolant properly at a recycling facility.**

Removal:

- 1) Chock the rear wheels, jack up the front of the vehicle and safely support on jack stands. Ensure engine is cold. Drain the cooling system then reinstall the drain plug. (You may need to remove the factory plastic splash guard (if equipped) to access the radiator drain plug.)
- 2) Remove the clamp retaining the hose to the Idle Air Control valve. Remove the IAC hose and PCV breather hose at the air tube. Loosen the screws retaining the air intake tube to the throttle body and air filter box. Remove the air intake tube. **Figure 2.**

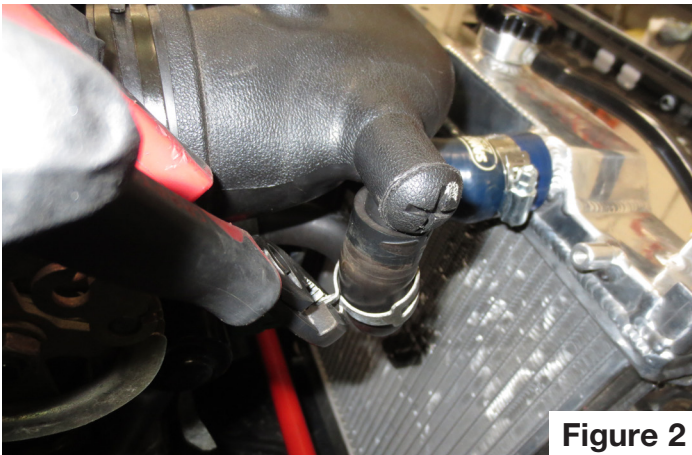


Figure 2

- 3) Remove the two 10mm bolts retaining the metal vacuum line for the power brake booster and throttle cable. Remove the vacuum hose at the intake, and lift the vacuum line up and out of the way. **Figure 3.**



Figure 3

- 4) Remove the one-wire connector for the coolant temperature sensor (temp gauge) located on the driver's side back of the cylinder head, underneath the camshaft position sensor. **Figure 4.1.** Remove the connectors for the camshaft position sensor and oxygen sensor. Position the wiring harness out of the way. **Figure 4.2.**

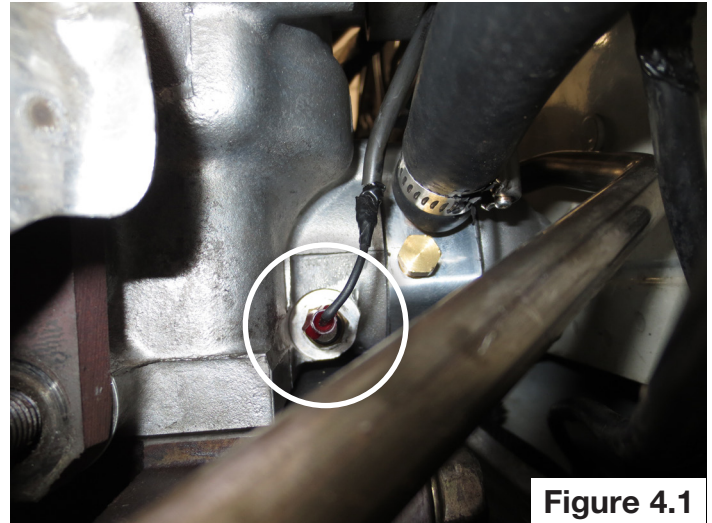


Figure 4.1



Figure 4.2

- 5) Remove the three 12mm bolts retaining the coil bracket to the back of the valve cover. You can leave the spark plug wires and electrical connectors connected to ease reassembly if desired. Carefully lift the coil bracket up and place on top of the valve cover, being careful not to damage the coil connectors. **Note: If you choose to remove the electrical connectors at the coil be sure to mark them, as they can be easily reversed and installed in the wrong coil causing a no start.** **Figure 5.1.** Remove the green electrical connector for the two-wire ECM coolant temperature sensor. **Figure 5.2.**



Figure 5.1

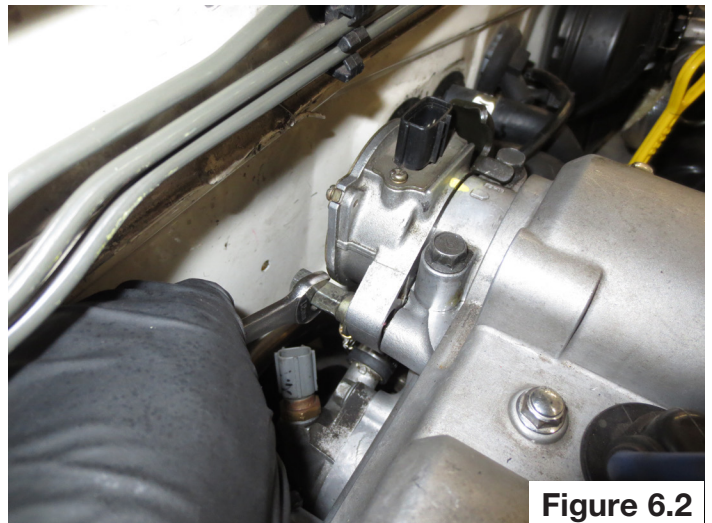


Figure 6.2

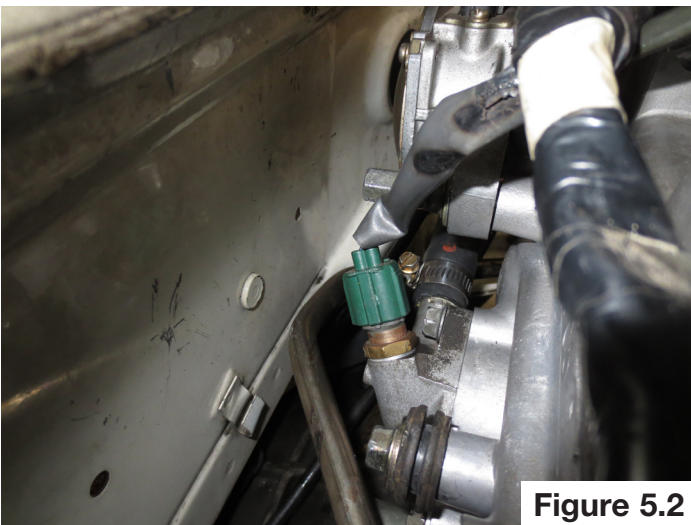


Figure 5.2

- 6) Mark the position of the camshaft position sensor, **Figure 6.1**. Then remove special retaining bolt with a 12 mm wrench, **Figure 6.2**. Only the bolt needs to be removed, the sensor can stay in place.

Caution: Due to the retaining bolt being removed, ignition timing MUST be checked when installation is completed. Driving with incorrect ignition timing may result in severe engine damage!

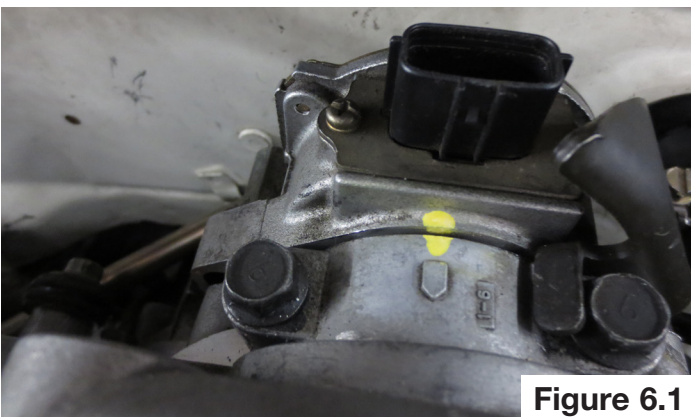


Figure 6.1

- 7) Remove the temp sensor using a 19mm deep socket.
- 8) Remove the electrical connector for the Mass Air Flow Sensor. Loosen the air intake duct and remove the two 12mm bolts retaining the factor air filter box, **Figure 8.1**. Remove the exhaust manifold heat shield to gain access to the EGR tube, **Figure 8.2**.



Figure 8.1



Figure 8.2

Installation Instructions

- 9) Loosen the EGR tube nut using a 7/8" or 22mm wrench. **Figure 9.**

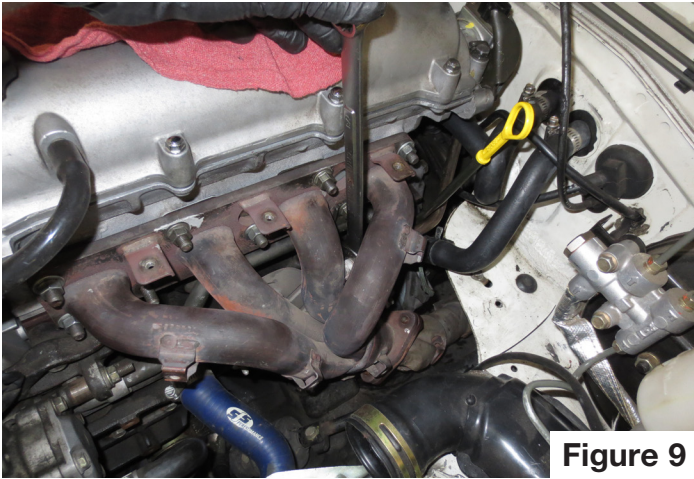


Figure 9

- 10) Loosen the two 10mm nuts at the back of the intake manifold. Remove the stock EGR tube by rotating upwards to clear the intake, then counter-clockwise, **Figure 10.1 and Figure 10.2.**



Figure 10.1



Figure 10.2

- 11) Remove the heater hose clamp and heater hose from the water neck at the rear of the cylinder head by the firewall. Inspect the heater hose. Replace the heater hose and clamp if they are old or in poor condition to ensure against leaks. **Figure 11.**

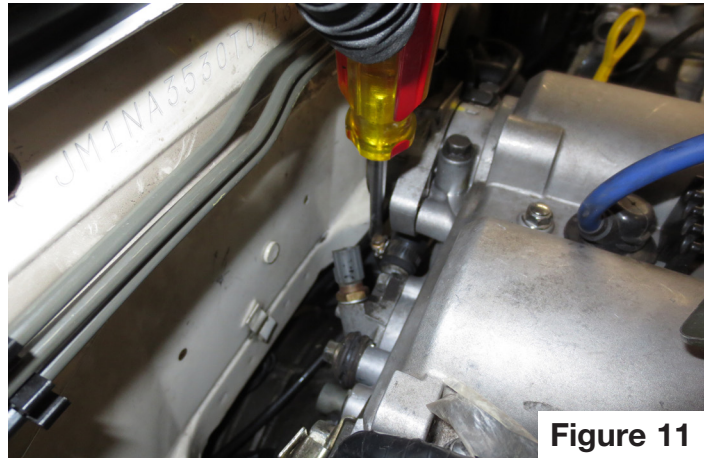


Figure 11

- 12) Remove the 12mm nut and bolt retaining the heater hose water neck at the rear of the cylinder head. Remove the heater hose water neck and set aside. Remove the stud from the rear of the cylinder head (Use double nut method. The other nut can be sourced from the front thermostat housing see step 12). Thoroughly remove all old gasket material with a razor blade and clean the mating surface. Take your time and clean thoroughly. It is helpful to use a telescoping mirror to clearly see the mating surface. Be sure that all old gasket material is removed. **Figure 12.**

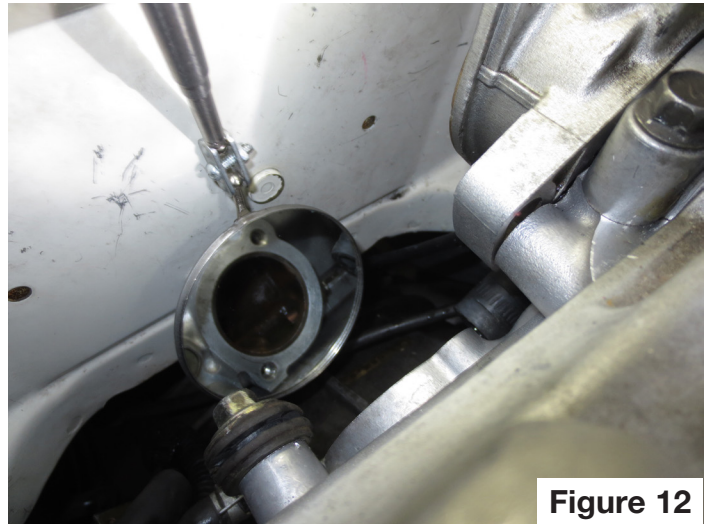


Figure 12

- 13) Remove and discard the upper radiator hose.
Figure 13.



Figure 13

- 14) Remove the 12mm nut and bolt retaining the thermostat housing at the front of the engine. Remove the housing and set the thermostat aside, **Figure 14.** Inspect the thermostat, you may wish to replace the thermostat at this time if there is any doubt that it is functioning properly. The thermostat will be more difficult to access when this modification is completed. Remove the stud from the housing and set aside. Thoroughly clean the gasket sealing surface.



Figure 14

Installation:

- 15) Apply a new thermostat gasket to the provided block off plate and install in the former thermostat housing location using the provided M8 bolts. Torque to 16 ft.-lbs. **Figure 15.**

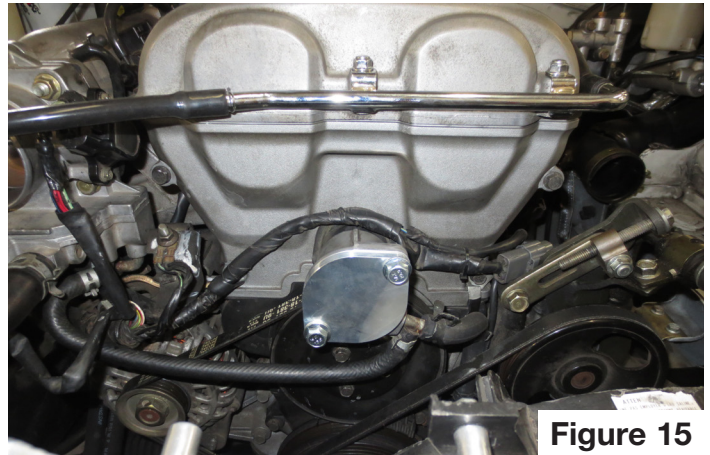


Figure 15

- 16) Install the provided heater hose barb in the reroute spacer. The extra hole in the spacer is provided for an aftermarket coolant temperature sensor. Use the provided $\frac{1}{8}$ " NPT brass plug if you will not be installing another sensor. The heater hose barb and brass plug are pipe thread which means they seal on the threads and do not bottom out. Excessive torque may crack the reroute spacer or cause damage to the parts being threaded in. Transfer the two-wire coolant temperature sensor with washer from the old heater hose water neck to the new radiator hose water neck. Thread the sensor into the new spacer a few threads but do not tighten down at this time. You will use the loose sensor to bleed out air while filling the cooling system. **Figure 16.**



Figure 16

Installation Instructions

- 17) Install the thermostat in the recessed groove in the spacer as shown with the air bleed hole at the top as shown. The bleed hole should be clocked so that it is closest to the factory coolant temp sensor. Peel off the backing and stick a new thermostat gasket on both sides of the reroute spacer. The gasket should overlap over the thermostat slightly and help hold it in place. The bleed hole in the thermostat should be clocked so that it is closest to the factory coolant sensor. Place the new radiator hose outlet neck on the spacer oriented with the outlet neck opposite the heater hose barb as shown. **Figure 17.**

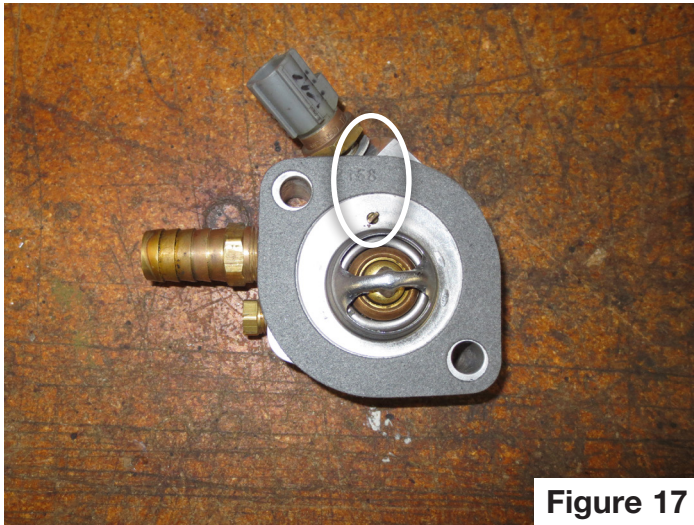


Figure 17

- 18) Insert the 75mm and 50mm M8 bolts and keep the assembly sandwiched together by hand ensuring that the thermostat does not fall out of its recessed groove in the spacer. Install the assembly on the rear of the engine, ensuring the coolant temp sensor is on top and the radiator hose outlet is facing towards the intake side of the engine. Keep it sandwiched tightly together as you tighten the bolts to 16 ft-lbs. **Figure 18.**

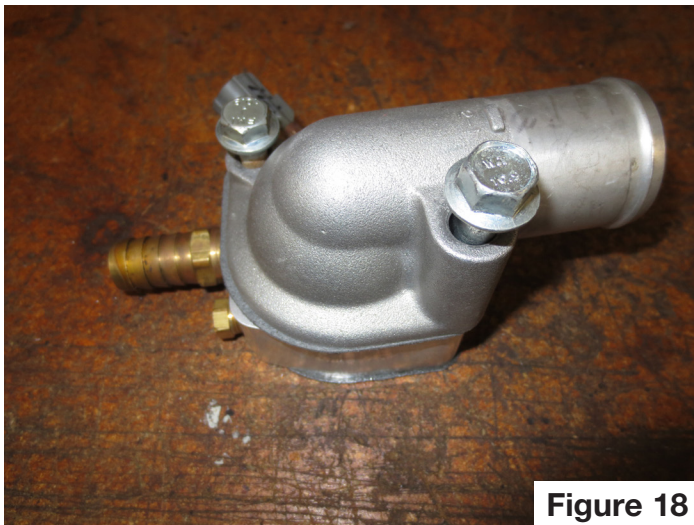


Figure 18

- 19) Install the heater hose to the heater barb on the spacer. Install the reroute radiator hose in the newly installed thermostat outlet and route hose to the radiator. **Figure 19.**

Note: The reroute radiator hose will need to be trimmed to fit at the radiator end for 1994-1997 applications.

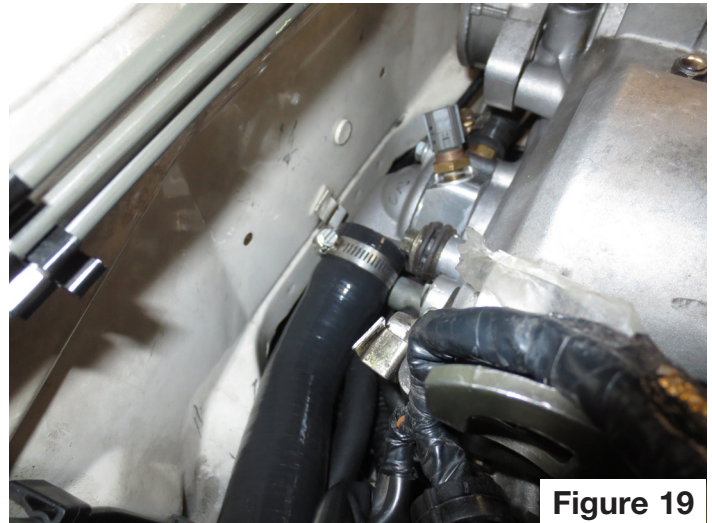


Figure 19

- 20) Remove the EVAP canister by sliding it upward off the bracket. Install the provided hose support bracket using an M6 Bolt and nut as shown. Slide the EVAP canister back into the housing. Install a P-clamp in the bracket as shown. A/C equipped vehicles will have a relay bracket at the location indicated in **Figure 20.** Remove this bracket (if equipped) and secure the relay out of the way with a zip-tie. Install a P-clamp as shown using an M6 bolt.

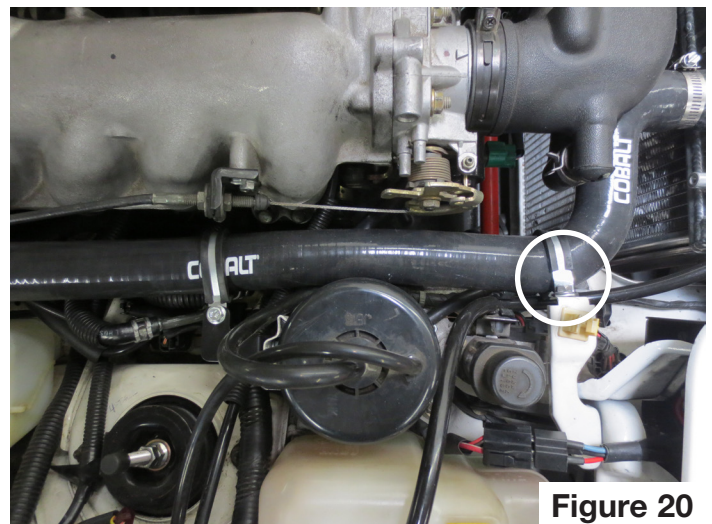


Figure 20

- 21) Attach the spill-free funnel if you have one. Fill the cooling system slowly while watching for coolant at the coolant temp sensor. Continue filling until all air has bled out of the coolant temp sensor hole, then torque the sensor to 20 ft-lbs with a 19mm deep socket. **Figure 21.** Continue filling radiator until full and check for leaks. Top off coolant overflow tank. If you have a cooling system pressure tester, pressure test now to ensure there are no leaks.

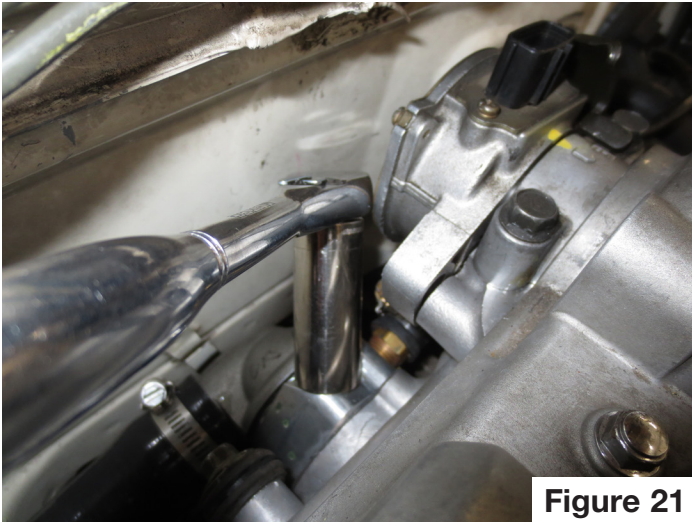


Figure 21

Ensure that the bushing is oriented correctly. The raised part of the bushing shown in **Figure 24.4** should be facing down so it does not contact the fork on the coil bracket. Install the coil bracket on the rear of the valve cover by simply sliding it down onto the bushing and then tightening the two easily accessible bolts into valve cover. **Figure 24.5.**

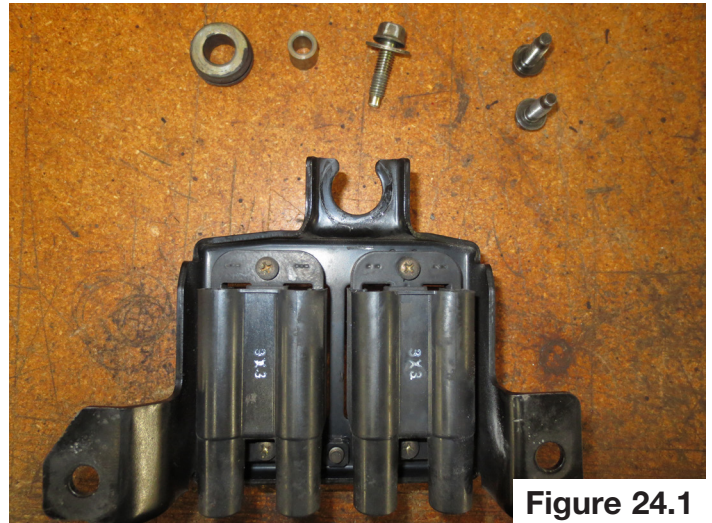


Figure 24.1

- 22) Fit the new EGR tube behind the engine, apply anti-seize to the EGR tube threads on the exhaust manifold and thread the large tube nut on loosely. Leave the other end of the EGR tube loose at the intake manifold. If you tighten down the EGR tube at this time it will be difficult or impossible to install the lower bolt for the coil bracket. **910-855 does not include this tube.**

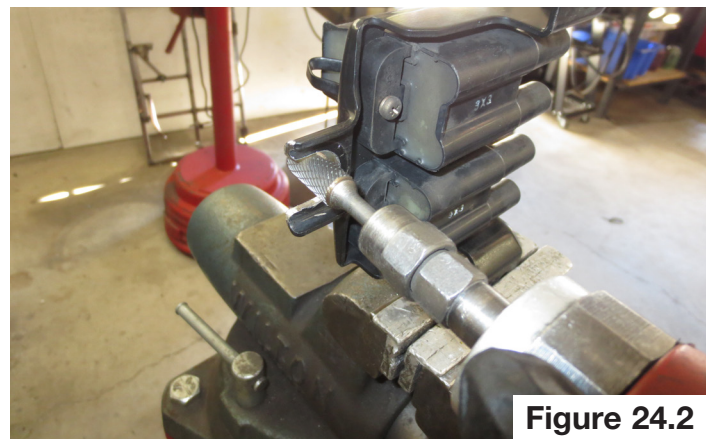


Figure 24.2

- 23) Install the two-wire coolant temp (ECM) connector. Install the special cam sensor retaining bolt and tighten to 16 ft.-lbs. Connect the one-wire coolant temp sensor wire to the sensor.

- 24) Reinstall coil bracket to rear of engine. The lower bolt must be replaced with the provided button head bolt for EGR tube clearance. Install with a 5 mm allen wrench. **910-855 does not include this button head bolt. (Optional)** The coil bracket can be modified to greatly ease future removal and installation if desired. Remove the coil bracket from the vehicle. Lubricate the rubber bushing with silicone spray. Remove the metal sleeve and carefully pry out the rubber bushing with a flathead screwdriver. **Figure 24.1.** The rubber is old and easily damaged. Grind out the fork as shown so that it will easily slide down onto the rubber bushing, **Figure 24.2.** Insert the metal sleeve back into the rubber bushing and install on the back of the engine using the provided button head bolt. **Figure 24.3.**

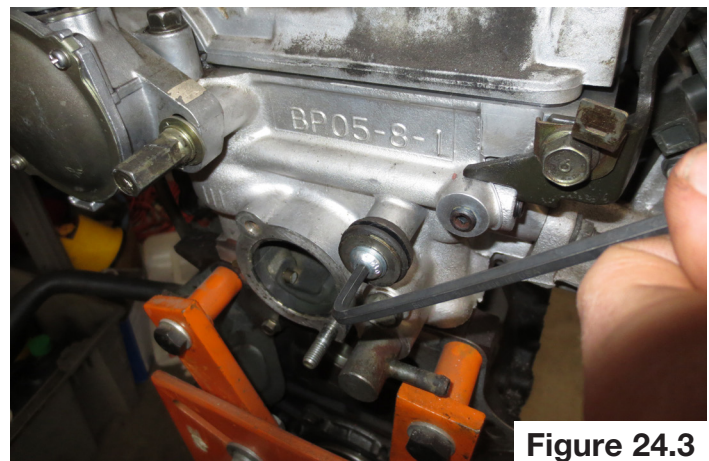


Figure 24.3

Installation Instructions

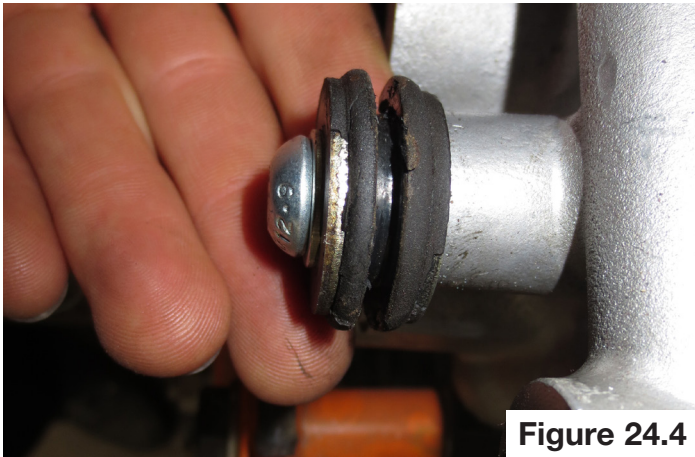


Figure 24.4

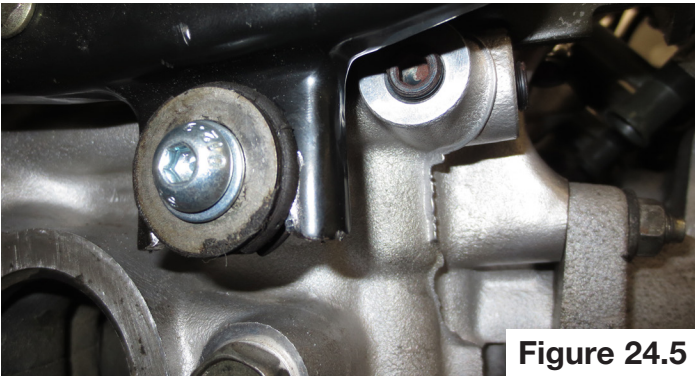


Figure 24.5

25) Install and tighten the two 10mm nuts securing the EGR tube to the intake and then the large tube nut. Reinstall the exhaust manifold heat shield and the air filter box. Reinstall the harness for the Mass Air Flow Sensor.

26) Reconnect the oxygen sensor and Camshaft Position Sensor harnesses. **Figure 26.**



Figure 26

27) Reconnect the vacuum line for the brake booster at the intake and install the two 10mm bolts holding the metal vacuum line in place.

- 28) Reinstall the air intake tube, PCV breather hose and IAC hose.
- 29) Start engine. Run vehicle at idle with radiator cap off (or with funnel attached) to bleed any remaining air from the cooling system. Do this with the front of the car still elevated on jack stands to help trapped air make its way to the radiator filler neck. The new upper hose will suddenly become warm to the touch when the thermostat opens. Once this happens any air trapped behind the thermostat will be pulled through the hose into the radiator. Once the upper hose becomes warm, install radiator cap. Check/reset ignition timing to factory specs 10 deg BTDC. Timing must be checked with all loads off, vehicle idling at full operating temp, and check connector shorted from TEN to GRD. **Timing must be set correctly or severe engine damage may result!** Consult service information if further information is required.
- 30) Test drive vehicle while closely monitoring temperature and re-check for leaks. Allow engine to fully cool down overnight and recheck that radiator and overflow tank are full. Top off as necessary and enjoy your cooler running Miata!

910-850, 910-855 Bill of Materials

Item No.	Description	Quantity	Unit of Measure
772-910	SPACER, COOLANT REROUTE	1	EACH
772-913	WATER NECK, COOLANT REROUTE	1	EACH
910-851	HOSE,COOLANT RE-ROUTE	1	EACH
051-132	HOSE BARB, 3/8 NPT X 5/8	1	EACH
051-203	PLUG, PIPE, 1/8 NPT, HEX HEAD	1	EACH
772-911	PLATE, COOLANT BLOCK OFF	1	EACH
051-860	BOLT,HEX FLANGE,M8 X 1.25 X 16	2	EACH
051-730	BOLT,HEX FLANGE,M8 X 1.25 X 50	1	EACH
771-330	BOLT,HEX FLANGE,M8 X 1.25 X 75	1	EACH
999-023	GASKET/T-STAT 160 DEGREE	3	EACH
772-956	TUBE, EGR, COOLANT REROUTE (NOT IN 910-855)	1	EACH
051-810	P-CLAMP, 1.625IN. ID	2	EACH
772-947	BRACKET, HOSE	1	EACH
051-004	BOLT, HEX FLANGE,M6 X 1.0 X 16	2	EACH
051-787	NUT, HEX FLANGE, M6 X 1.0	2	EACH
052-947	BOLT,BHCS,M8X1.25X25,ZINC (NOT IN 910-855)	1	EACH
051-074	WASHER, FLAT, M8	1	EACH

Although every effort has been made to ensure the accuracy and clarity of this information, any suggestions that you may have that will improve the information (especially detailed installation notes and photos) are welcome. These instructions were developed and written by Moss Technical Support. If you have any questions or difficulties with your installation of this product, telephone 800-667-7872 between 7:00 a.m. and 4:00 p.m., Pacific Time for assistance.

Moss Motors, Ltd.
 440 Rutherford Street, Goleta, California 93117
 In the US & Canada Toll Free (800) 667-7872
 LOCAL (805) 681-3400 FAX (805) 692-2510



Moss Europe Ltd.
 Hampton Farm Industrial Estate
 Hampton Road West, Hanworth Middlesex, TW13 6DB
 In the UK: 020-8867-2020 FAX: 020-8867-2030