Auxiliary Thermal Fan Controller for the 2.3L Mazda6i

Scott Burton December 2005

The Mazda 6i engine management computer is tuned to optimize the operation of the 2.3L engine on regular octane gas. This tuning results in retarding the spark timing as the engines coolant temperature reaches about 208 degrees. (According to OBD data readings on my car.) With the standard thermostat calibration of 190 degrees, engine temperatures will frequently rise above 210 degrees and spark timing will be retarded resulting in sluggish low RPM acceleration. The Auxiliary Thermal Fan Controller provides a secondary input for the fan control relay to engage the radiator cooling fans at much lower temperatures. Early activation of the fans helps to reduce engine coolant temperatures and maintain spark advance timing for prompt throttle response.

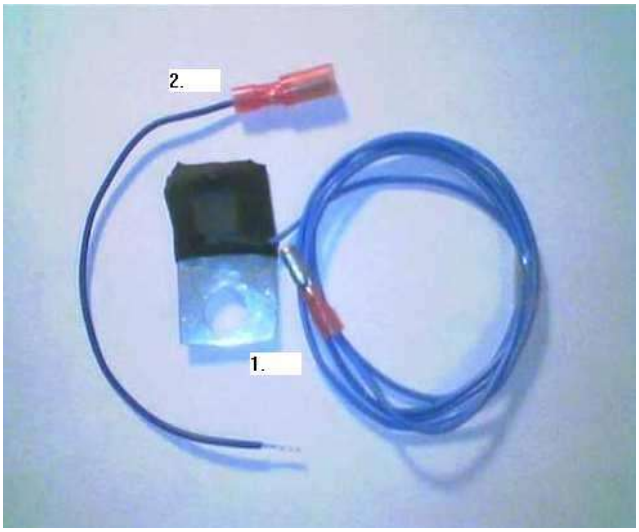
How it Works:

The Auxiliary Thermal Fan Controller provides an extra temperature sensor that enables the fan control relay when the engine temperature exceeds 180F. The sensor is mounted to the head using an existing accessory mounting bolt. As the head temperature reaches 180F, the radiator cooling fans are engaged to pull air through the radiator reducing the temperature of the engine coolant. This sensor does not interfere with fan control signals from the ECU so the fans will also run when commanded by the engine management computer.

Controller mounted on the engine hoist bracket.

Tools and supplies needed for the job:

1. Auxiliary Thermal Fan Controller
2. Fan Relay lead connector
3. 13mm wrench or 13mm socket and breaker bar.
4. Wide grip pliers for easier relay removal



Installation Instructions

1. First, remove the engine 'beauty cover' and set aside. Locate the engine hoist bracket mounted on the rear side of the cylinder head. Loosen and remove the bolt and engine hoist bracket using a 13mm wrench or socket and breaker bar. The bolt is very tight!

Remove the 13mm bolt on the engine hoist bracket.

2. Position the provided washer and controller unit on the bolt in front of the engine hoist bracket as shown. Make sure the flat side of the controller is facing the washer and engine hoist bracket.

Bolt with engine hoist bracket and controller.

3. Hold the controller in an upright position while you reinstall and tighten the engine hoist bracket. Use a 13mm wrench to tighten down the bolt very tight.

Controller mounted on engine hoist bracket.

4. Route the controller wire under the fuel lines and around the back of the battery. Be sure the wire does not have contact with the exhaust manifold.

Wire routing. (Blue wire shown.)

5. Bring the controller wire around the back of the battery and up towards the fuse panel.

Wire routing around battery. (Blue wire shown.)

6. Remove the fuse panel cover and locate the primary fan relay within the fuse panel. This is the top relay in the 1st row of relays. It is designated as 'Fan Relay' on the diagram printed on the underside of the fuse panel cover. Carefully remove the primary fan relay.

This is the relay to remove.

7. With the fan relay removed, push the 1/4" section of stripped wire from the relay connector lead into the top-right hand connector of the relay socket. Make sure the wire is in contact with the relay socket contacts. The contacts are arranged as shown below. The **Red** line indicates the desired relay contact hole.

Connect the relay connector wire here.

8. Push the relay back into its socket to secure the wire in the socket contact. Connect the controller wire's plug into the relay connector wire's socket and route the wires out of the upper left corner of the fuse panel. Replace the cover on the fuse panel and the beauty cover on the engine and you're ready for a test drive!

Note: If desired, the Auxilliary Fan Controller can be unplugged for faster cabin heat during winter.

Replace the fan relay & connect the controller leads.

Please send questions or comments to me at sdburton@bellsouth.net