

### FAN BRAIN KIT 09-55900



Thanks for purchasing our fan brain kit. This kit will give your brushless fan(s) the intelligence they need. If you have any questions during installation or suggestions for improvement to the product or the instructions - please don't hesitate to call or email.

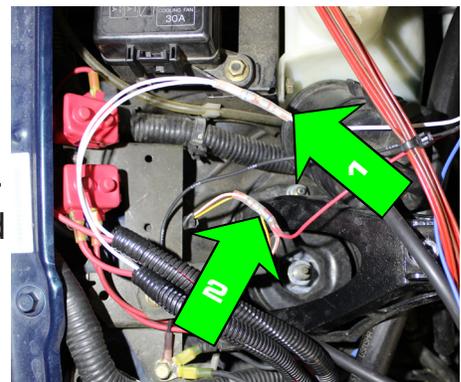
**WARNING: Not everyone can perform every installation. It is critical that you be honest with yourself in regards to your ability. We're more than happy to help, but there are only so many things we can do from the other end of a phone / computer. If in doubt, discuss the install with us before you dive in. Improper installation could cause injury and / or death!**

#### Required tools:

- **Wire cutter, stripper, crimper tool(s)**

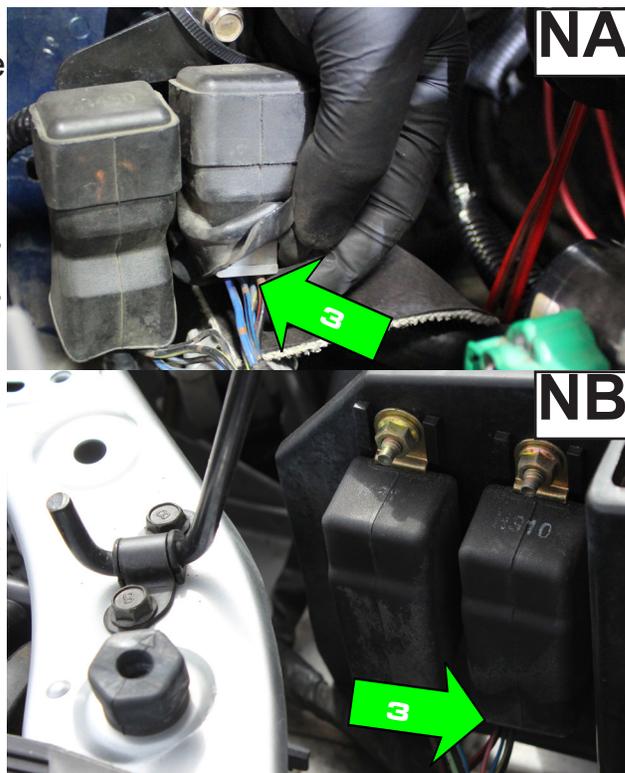
If ECU control isn't an option for you, or if you'd like to avoid any programming, the Spal controller will work fine. There's a bit more wiring involved, and you need a place to install the sensor, but it's pretty straightforward otherwise. Refer to the graphic on the page 9 for more clarification. Bear in mind that it's a generic picture and doesn't exactly match our instructions.

1. Install the four-wire sensor (SBL-TS-215P). This can be threaded into any 3/8" NPT hole in the hot side of the cooling system (e.g., upper radiator hose) with sufficient clearance for both sides of the sensor. The sensor should be placed in a hot portion of the cooling system - don't install it on the radiator outlet (i.e., lower radiator hose). One option is our hose splice (09-32035, available on our website (no separate ground needed)) or simply drill and tap somewhere in the system. Stock systems probably won't have a suitable place, systems with a reroute might. Be sure there's room for the sensor both inside where you're tapping and the sensor and its wiring on the outside. Be sure to seal the threads; we typically prefer thread sealant as opposed to thread tape, but it's less important on cooling systems.
2. Plug the Spal sensor harness adapter (SBL-TS-HARN) into the sensor.
3. Connect the white wire from the sensor harness adapter the white wire from the fan jumper harness (1). Use a pink butt connector included with the sensor kit.
4. Use the small red ring terminal (36-80054) to connect the black wire to the same grounding point as was used for the fan.
5. Use a three-way butt connector (36-80101) to connect the small red wire from the sensor to switched power. Leave it uncrimped for now if you want to run a separate fan switch. You will add another wire to the butt connector in step 7 or 8 depending on if you have A/C. If you're not running a separate switch, go ahead and crimp and seal the butt connector now. White with a red stripe should be switched power, but confirm with a multimeter. We typically use the power for the charcoal canister solenoid (2, on the passenger side of the engine bay, near the shock tower).



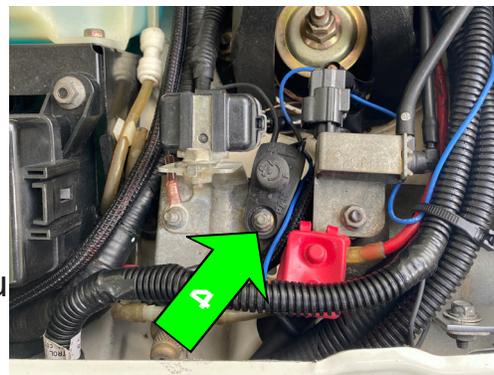
6. The blue wire from the Spal sensor triggers the fan to full speed. If you have AC, you **MUST** use this wire so that the fan comes on when the AC is engaged. Failure to ensure that the fan comes on with the AC will over-pressurize the system quickly (and make a horrible noise). Follow step eight to wire for AC.
7. If you don't have AC, you can connect the blue wire to a switch (not included) to allow you to command full speed as needed. Connect the blue wire to one side of the switch and connect the other side to the switched power source from step 5.

**If you have AC, you MUST wire a separate trigger for the fan.** Refer to steps 8 or 9 to see how to install the AC trigger.

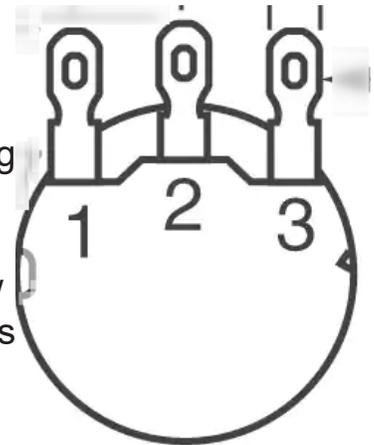


8. **If you did NOT purchase our brushless fan AC controller kit**, use another three-way butt connector (36-80101) to connect the blue wire from the Spal sensor to the switched power output from the AC relay (3). If you plan to add an override switch, leave the butt connector uncrimped for now. On a 90-93, the switched power output from the AC relay is a black wire with a blue stripe, 94-99 is black / red, 01-05 (including MSM) is black / yellow. The NA AC relay is at the front of the passenger side, the NB relay is at the front of the driver's side. If you have AC but would also like a switch, add an additional wire into the three-way butt connector at the AC relay. Connect this wire to a switch (not included). Have another wire go from the other end of the switch to the switched power source from step 5. You will also need to source and install a diode so turning the switch on doesn't engage the AC compressor. Use a diode that is rated for >14V & >200mA.

9. **If you purchased our brushless fan AC controller kit**, Install the potentiometer into the 3D printed housing and add the knob. The knob and bracket have matching ridges. One on the knob, three on the bracket. The bracket's ridges are for at each end of its rotation and one in the middle, these are there to help gauge where you are in the pot's rotation. We suggest that you



spin the pot all the way in one direction, then install the knob with the ridge lined up with the appropriate ridge on the base. Determine where you wish to mount the potentiometer. It needs to share an existing M5 mounting bolt and should be easily accessible once installed. The image to the right shows an example location on an NA 4). Don't fully install it at this time. You just need to know where it installs since the next steps involve cutting wires to length to reach it at its installed location.



- Use a three-way butt connector (36-80101) to tee in the red wire supplied with the kit to the switched power output from the AC relay (3, previous page). On a 90-93, the switched power output from the AC relay is a black wire with a blue stripe, 94-99 its black / red, 01-05 (including MSM) is black / yellow. The NA AC relay is at the front of the passenger side. The NB relay is at the front of the driver's side.
- Route the wire from the AC relay to reach the potentiometer and attach it to terminal 1 after crimping on a supplied female spade (36-80162).
- Route the blue wire from the Spal controller to the potentiometer, lengthening it as needed with the white wire and pink butt connector (36-80100) supplied in the kit. Attach a supplied female spade (36-80162) and connect it to terminal 2.
- Add a female spade (36-80162) on the supplied black wire to one end and connect it to terminal 3. The other end will attach to chassis ground using the supplied eyelet (36-80054). Cut it to length before adding the eyelet.
- Terminal pin numbering appears on the body of the potentiometer and the diagram to the right.
- Now that all the wires are attached to the potentiometer, fully install it in the desired location.
- Adjust the fan speed to work for your setup using the following information as a guide: 2V on the blue wire = 30% fan speed, 10+V = 100%, and the speed varies linearly between the two voltage values. Adjust the voltage accordingly. 50% (~5V) will probably be okay, but you might need more on especially hot days. Bear in mind that there's no intelligent control here; you'll need to increase the voltage if you hear a terrible noise coming from your AC compressor. Most Miatas have no high-pressure switch to turn the AC off if the pressure is too high. The fan will always run at the highest speed commanded, so if your AC is set at 50%, but the temperature dictates 70%, the fan will run at 70%.

**SPAL 12VDC BRUSHLESS FAN WIRING DIAGRAM**

