

VERUS ENGINEERING

ND Miata Brake Cooling Kit

Install Manual



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1. Introduction

1.1. Overview: Detailed instructions on installing the brake cooling kit for the ND Miata.

1.2. Difficulty: Moderate

1.3. Time Required: 3 hours

1.4. Tools Needed:

- 1.4.1. Flat Head Screwdriver
- 1.4.2. Philips Screwdriver
- 1.4.3. Razor Blade
- 1.4.4. 10mm Socket
- 1.4.5. 17mm Socket
- 1.4.6. 21mm Socket
- 1.4.7. Ratchet
- 1.4.8. Torque Wrench (up to 105 ft-lbs)
- 1.4.9. Side cuts/scissors

1.5. Brake Cooling Kit Components

- 1.5.1. Left-hand fog light duct
- 1.5.2. Right-hand fog light duct
- 1.5.3. Left-hand backing plate with carbon duct
- 1.5.4. Right-hand backing plate with carbon duct
- 1.5.5. (2) 2.5" high temp silicone hose, cut to length
- 1.5.6. (4) 2.5" stainless hose clamps
- 1.5.7. (6) Zip Ties



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**2. Brake Cooling Kit Install**

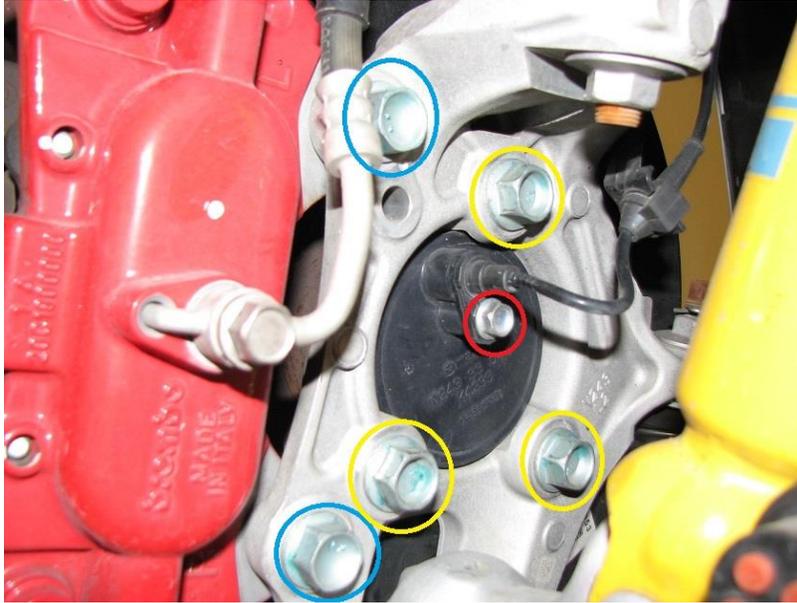
- 2.1. Verus Engineering is not responsible for damage to you or your vehicle by following this manual and/or installing Verus Engineering products.
- 2.2. We begin by lifting the front (or entire) vehicle in the air. You can do this via a jack and jack stands or a lift. Jack up on structural components of the car only and properly secure the car for safety.
- 2.3. Remove the front wheels from the car with the 21mm socket and ratchet/impact.



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- 2.4. With the wheel removed, we can remove the caliper from the knuckle. This is circled below in below and will require a 17mm socket and ratchet to remove.

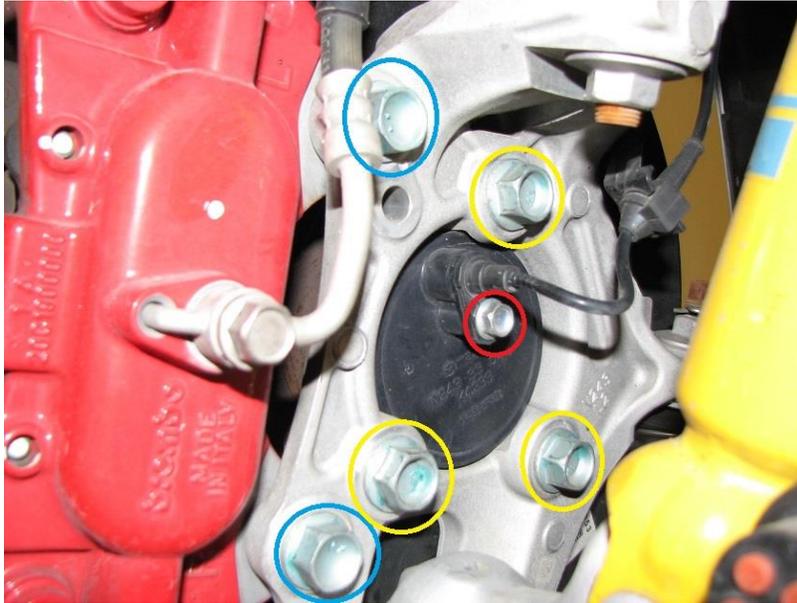


- 2.5. With the caliper loosened, you can rest it on the LCA. Remove the rotor from the vehicle.



- 2.6. Moving back to the rear of the knuckle and the 17mm socket, remove the (3) bolts holding the wheel hub to the knuckle. These are circled in yellow below. And finally, remove the wheel speed sensor with a 10mm socket, circled in red.

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2.7. The hub can then be removed from the car, along with the OEM backing plate which we will be replacing.



2.8. Below is a photo of the knuckle as it sits currently.

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- 2.9. We can now install the Verus Engineering backing plate with brake cooling duct which directs air into the center of the rotor. We install this by placing the backing plate behind the hub, and bolting the hub to the knuckle exactly like OEM. Below is a photo of the backing plate properly installed (disregard the orange hose at this time).



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- 2.10. Tighten the (3) 17mm OEM hub bolts to 91-100 ft-lbs with the torque wrench.
- 2.11. Reinstall the rotor and caliper to the knuckle. Torque the caliper to 59-74 ft-lbs.



- 2.12. Install the speed sensor and 10mm bolt on the back of the hub as well.
- 2.13. Repeat the above steps for the opposite side of the vehicle.

3. Fog Light Duct Install

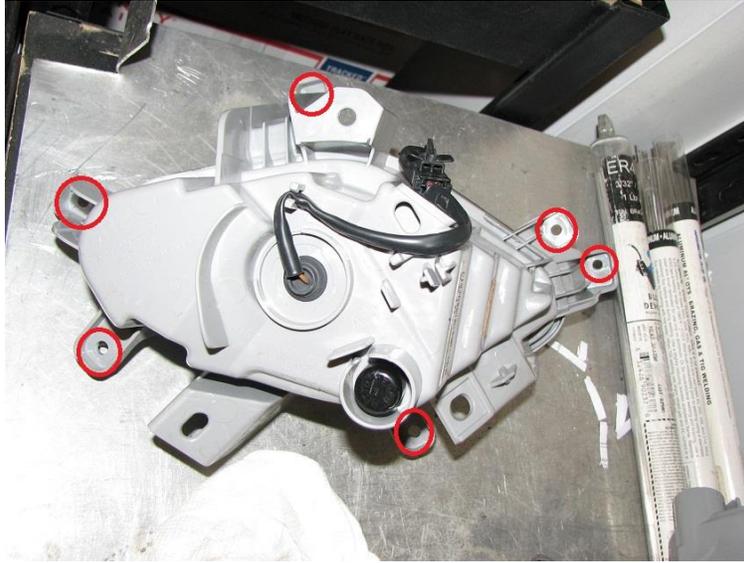
- 3.1. We begin by removing the clips circled in yellow below. This will give us direct access to the fog light housing and the ability to install the carbon fog light ducts. Use a flat head screwdriver on the plastic rivets to remove them.

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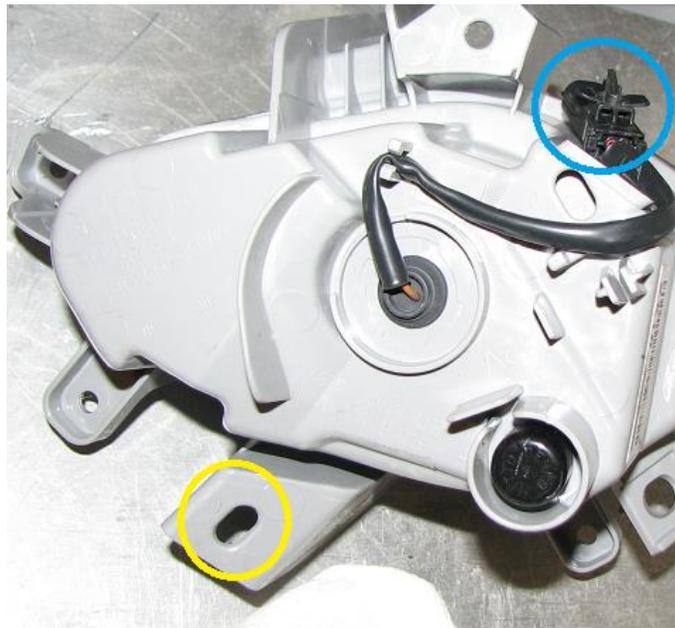


- 3.2. With the plastic rivets removed, we can pull the fender liner down and will get ample access to the fog light.
- 3.3. Remove the (6) screws from the backside of the fog light duct (circled in red below). This will allow us to remove the fog light from the vehicle.

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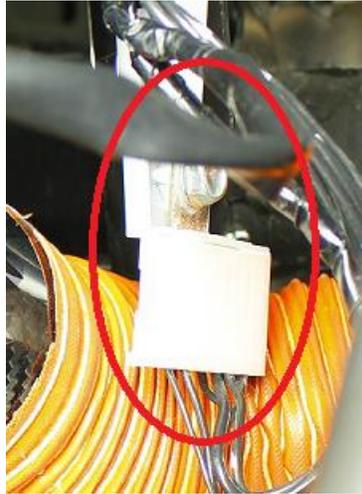
- 3.4.** You will also have to disconnect the connector on the fog light, and remove the wiring harness from the fog light housing. The connector is circled in blue and the wiring harness clip is circled in yellow below.



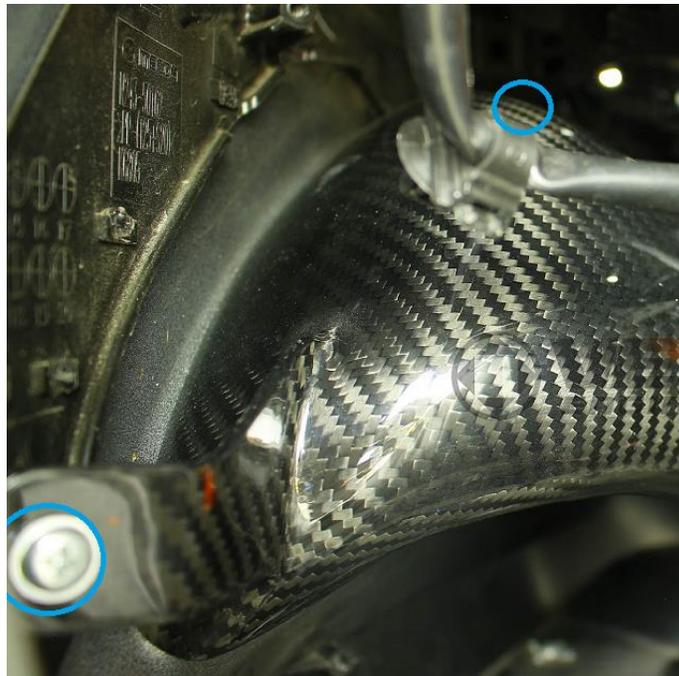
- 3.5.** Remove the wire junction connected (circled in red below) and move it from the front of the bracket on car, to the rear of the bracket (as shown).

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3.6. With the fog light removed, we can now install the Verus fog light duct. With (2) of the OEM screws we just removed, install the fog light as shown below.



3.7. The fog light should be fully installed at this point and not hitting anything on the car. Repeat the same steps on the other side of the vehicle.

4. High Style Brake Duct Routing

4.1. There are two routings for the hoses. We recommend the slightly more invasive route, which involves slight cutting of the fender liner. This ultimately leads to less strain on the

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backing plate, and significantly more wheel to hose clearance. We'll call the two routing styles, the **high style** (less ideal) and the **low style** (ideal, slightly more invasive).

- 4.2. Starting with the high style, we route the hose from the backing plate through the gap in the fender liner near the upper control arm.



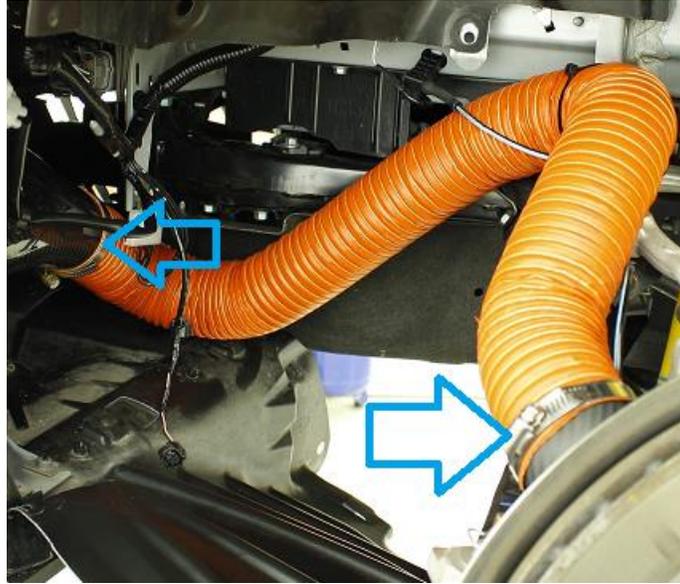
- 4.3. Note the zip tie locations. This is the locations we found to work best for the clearance and movement.



- 4.4. This hose routing, while not invasive at all, may rub with the wheel/tire at full lock. ***You will need to figure this out and if this solution is best for you.***
- 4.5. Use the supplied hose clamps and zip ties to appropriately place the hose and fasten it to both ducts. **Ensure that the hose will not rub on anything sharp or the hose can be damaged.**

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- 4.6. Reinstall the factory plastics with the OEM plastic rivets.
- 4.7. Install the wheels and double/triple check the clearance from hose to wheel to ensure compliance.

5. Low Style Brake Duct Routing

- 5.1. The low style of brake duct routing keeps the hoses away from the wheel and improves backing plate fitment.
- 5.2. We start by locating where we need to make a few 3" long cuts in the plastic with the razor blade. To do so, we have to temporarily install the fender plastic again.
- 5.3. Shown below is the location where we want to make two cuts in the plastic in the shape of a plus sign (+). This location already has the hose through it, but it is marked with a yellow arrow as well.

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5.4. Install the brake duct hose to the fog light duct, and then snake the silicone hose through the cut you just made.

5.5. Fasten the other end of the brake duct hose to the backing plate as shown below.



5.6. With this duct routing, we found it best to use (1) zip tie to hold the hose near the front of the LCA. This is circled in blue below. **Ensure that the hose will not rub on anything sharp or the hose can be damaged.**

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- 5.7. Finally, depending on who installed your steering rack boots, the clips ends may be pointing towards the hose. This could cause the hose to tear and rip, we recommend moving the clamp around as shown below (circled in red).



- 5.8. Reinstall the wheel and ensure there is no interference with the hose.

- 5.9. **Congratulations, you have successfully installed the Verus Engineering brake cooling kit!** The car now benefits from reduced rotor temperatures on and off the track. Please contact Verus Engineering with any questions, comments, concerns, and feedback via sales@verus-engineering.com.

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