

VERUS ENGINEERING

ND Miata Hood Louver Kit

Install Manual



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Release Date: 2016/10/14

Approvals: E. Hazen, P. Lucas

Document Revisions

Rev	Date	Author	Description
01	2016/10/14	E. Hazen	Initial release of install manual
02	2017/08/09	P. Lucas	Company name change from Velox to Verus

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ND Miata Hood Louver Kit – Install Manual

CONTENTS

1. Introduction	<3>
1.1. Overview	<3>
1.2. Difficult	<3>
1.3. Time Required	<3>
1.4. Tools Needed	<3>
1.5. Hood Louver Kit Components.....	<4>
2. Hood Louver Kit Install	<4-18>

ND Miata Hood Louver Kit – Install Manual

1. Introduction

1.1. Overview: Detailed instructions on installing the hood louver kit for the ND Miata.

1.2. Difficulty: Moderate to Hard

1.3. Time Required: 3-4 hours

1.4. Tools Needed:

- 1.4.1. Drill
- 1.4.2. Painter's Tape
- 1.4.3. 1/8" drill bit
- 1.4.4. 3/16" drill bit
- 1.4.5. 1/4" drill bit
- 1.4.6. Plastic rivet/panel puller
- 1.4.7. Electric or pneumatic cut die grinder
- 1.4.8. Cut-off wheel
- 1.4.9. Sanding discs
- 1.4.10. Center Punch
- 1.4.11. Hammer
- 1.4.12. Blow Gun
- 1.4.13. Ratchet
- 1.4.14. 12mm Socket
- 1.4.15. 11/32 socket
- 1.4.16. Tape measure
- 1.4.17. Marker

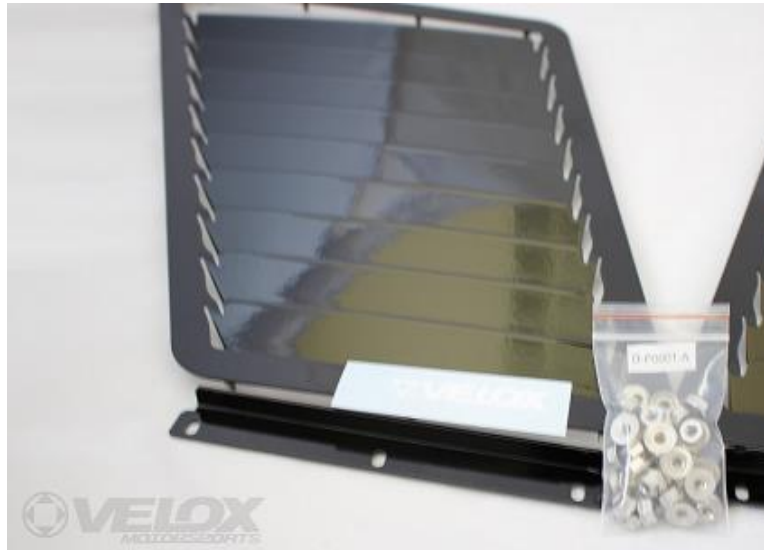


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ND Miata Hood Louver Kit – Install Manual

1.5. Hood Louver Components

- 1.5.1. Left-hand louver
- 1.5.2. Right-hand louver
- 1.5.3. Left-hand wicker
- 1.5.4. Right-hand wicker
- 1.5.5. Left-hand cutout template
- 1.5.6. Right-hand cutout template
- 1.5.7. Hardware Bag
 - 1.5.7.1. (34) 8-32 Serrated Stainless Nuts
 - 1.5.7.2. (1) Warning for over torquing of nuts

**2. Hood Louver Kit Install**

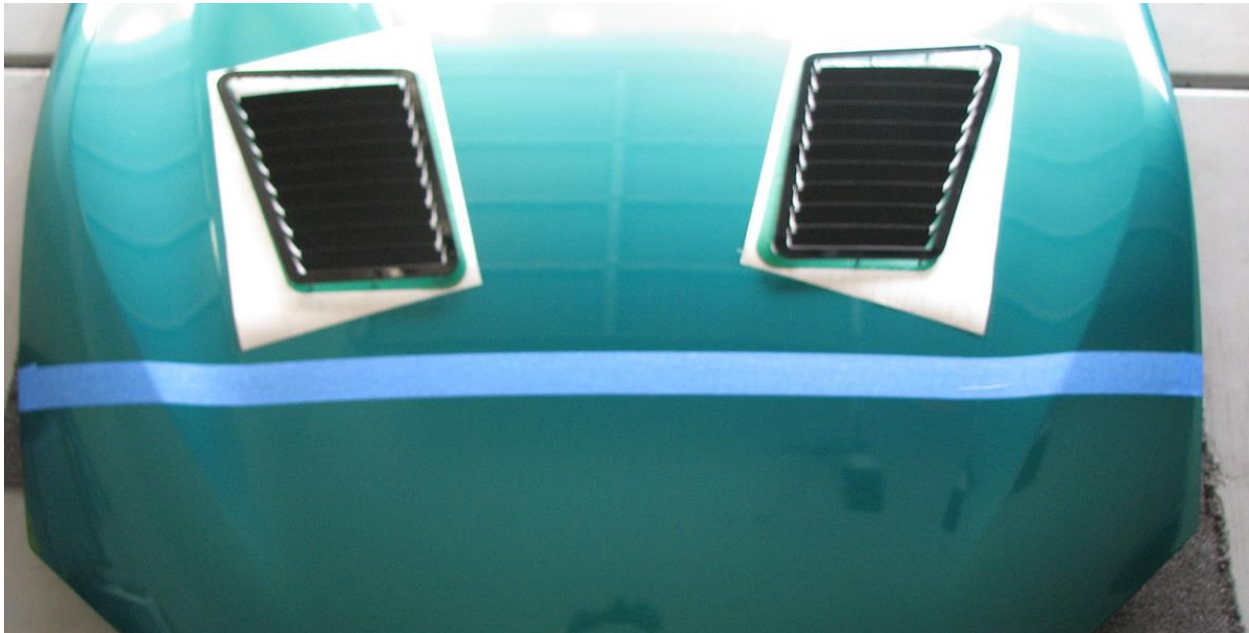
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ND Miata Hood Louver Kit – Install Manual

- 2.1. Verus 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 popping the hood so that we can remove the hood from the car.
- 2.3. Using the 12mm socket and the ratchet, remove the hood from the car. These bolts are circled in yellow in the below photo.



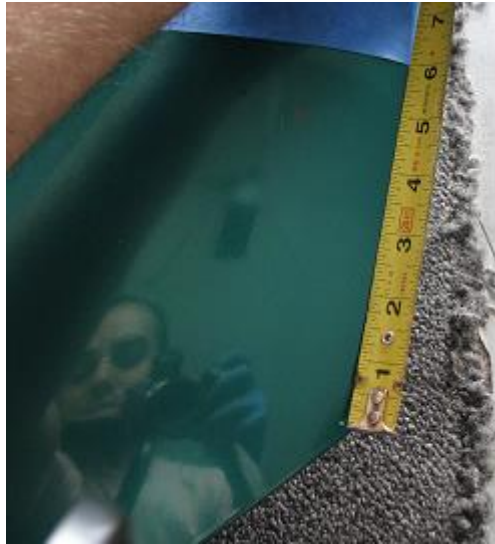
- 2.4. Place the hood top side up on something with a bit of cushion. A large cardboard box, a piece of carpet, saw horse or another stand will work well.



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ND Miata Hood Louver Kit – Install Manual

- 2.5. Ultimately, louver location is up to you. However, we have outlined in this manual the *optimal* placement for best evacuation based on our CFD analysis. We will start by laying down a piece of painter's tape across the whole hood. From the corner of the hood, we measure up 6" as shown below.



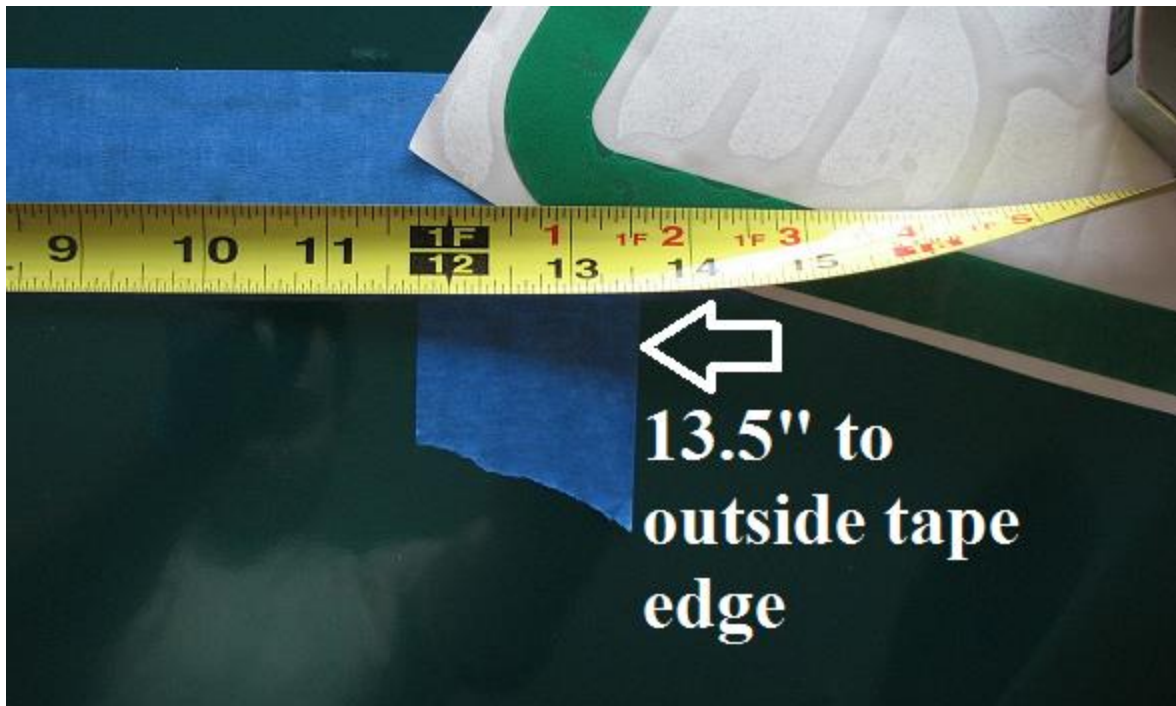
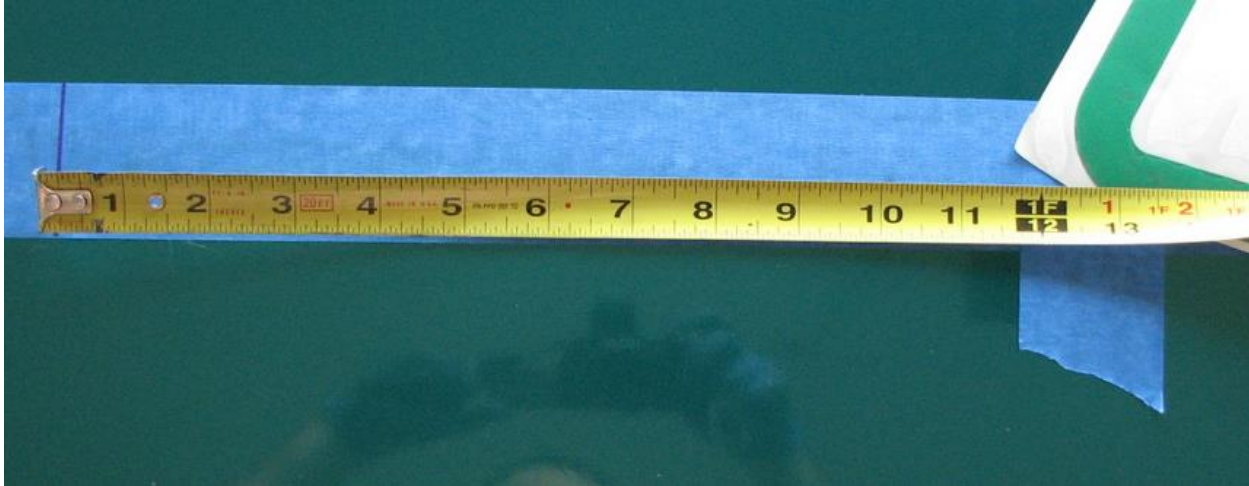
- 2.6. Do this to both sides and lay a piece of painter's tape across the whole hood keeping it as lateral as possible.



- 2.7. Mark the center of the hood with a small line on the painter's tape by measuring the hood width and dividing by two. Measure a few times to ensure you find the true centerline of the hood.

ND Miata Hood Louver Kit – Install Manual

- 2.8.** From the centerline of the hood, measure out 13.5" and lay the outside edge of painters tape at this location as shown in the below two pictures.

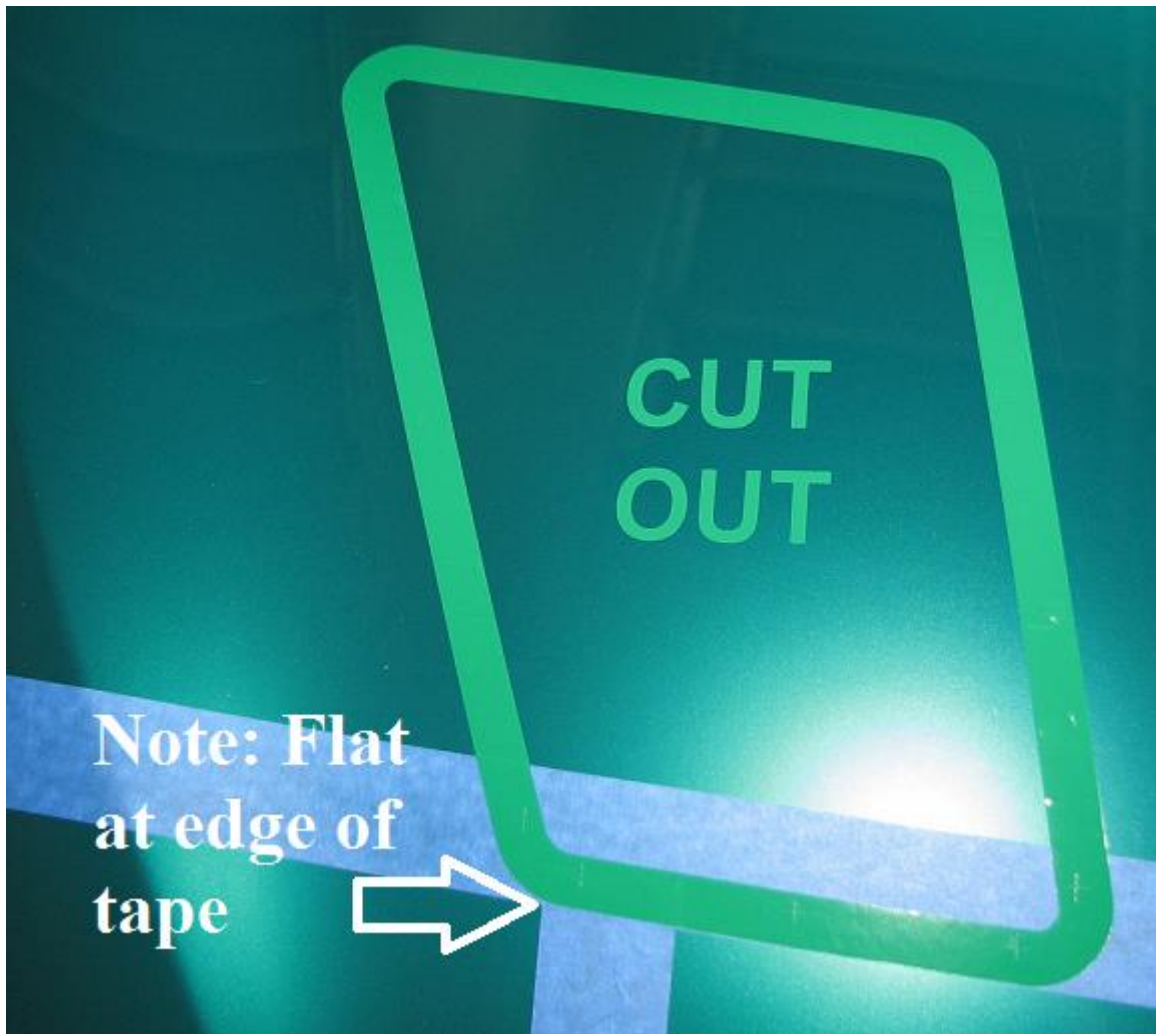


- 2.9.** Repeat step 2.8 for the other side of the hood
- 2.10.** Ensure that the outside tape edge to the outside edge of the hood is equal side to side to ensure the centerline was accurate.
- 2.11.** It's now time to lay down the cut template. Peel off the back of the vinyl sticker.

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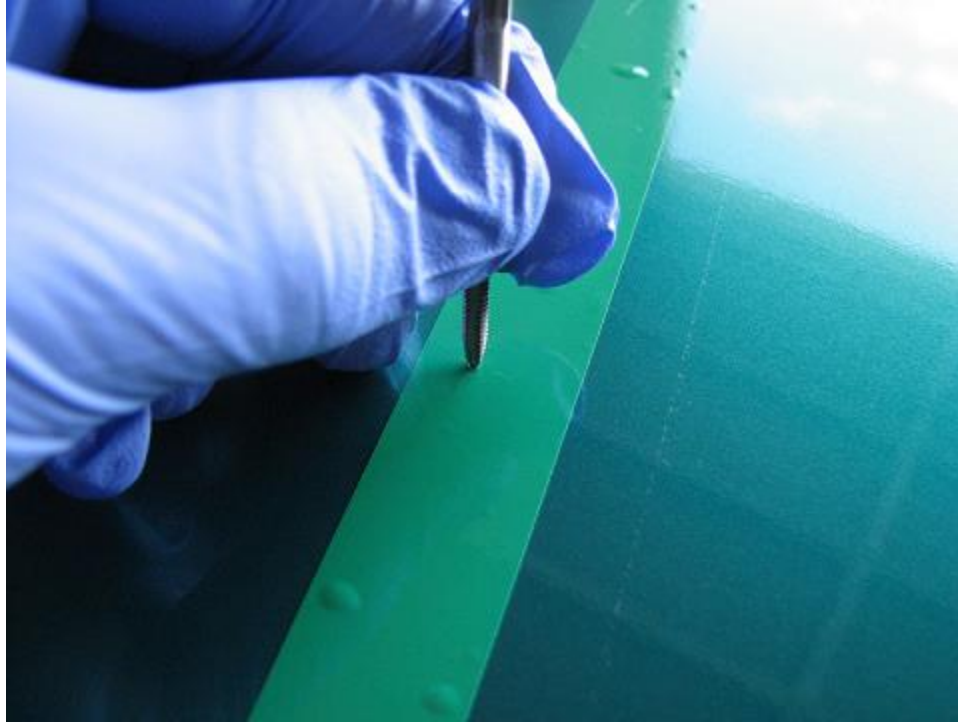
ND Miata Hood Louver Kit – Install Manual

- 2.12.** Using the bottom of the lateral painter's tape and the vertical small piece as guides, lay the template as shown below. The very last part of the horizontal part of the template lays at the vertical piece of painter's tape which was 13.5" from the center of the hood. You do not need to remove the clear vinyl sheet, it acts as an added protection barrier if you want to keep it on.



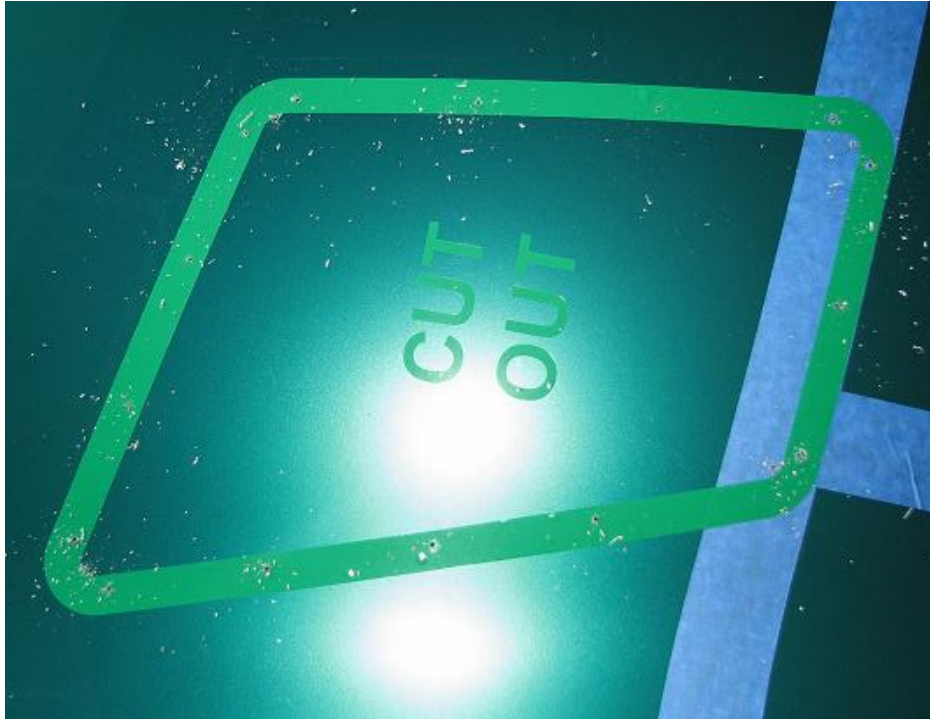
- 2.13.** Using the center punch (or a sharp un-used tap) and hammer, gently center punch all 16 holes. The holes are located with crosshatch markings, center punch the intersection of each. Also center punch the inside (4) corners of the template.

ND Miata Hood Louver Kit – Install Manual

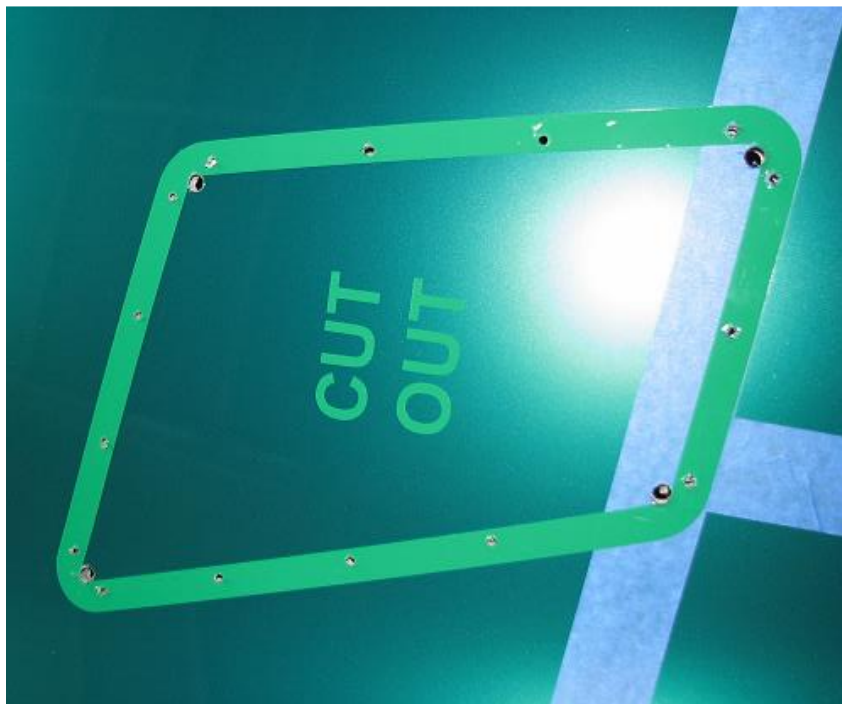


- 2.14.** Using the smallest drill bit, 1/8", drill through the multiple layers of the hood as shown below. Use high speed and light pressure to not break the bit or go plummeting through the hood and scratching it.

ND Miata Hood Louver Kit – Install Manual



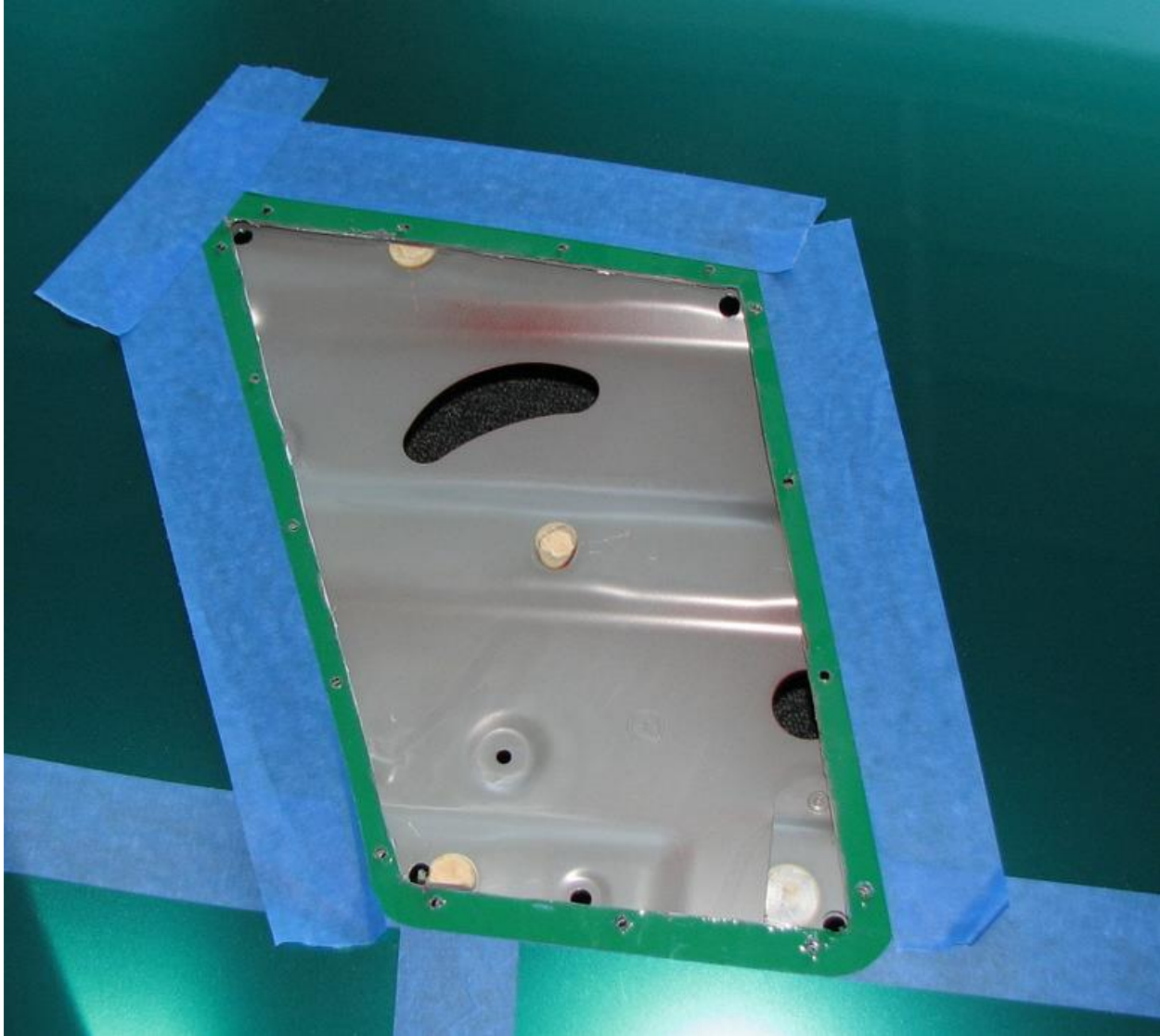
- 2.15.** Enlarge the inside holes to 1/4" or 3/8" as shown below. Enlarge the 16 mounting holes to 3/16" initially.



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- 2.16.** Using the template as a guide, cut out the section marked “cut out”. We added another layer of protection with painter’s tape on the outside of the louver.



- 2.17.** Perform the same operations on the other side of the hood from the top side.
- 2.18.** The hood needs to be flipped over now. Protect the paint in whichever way you see fit. Some customers will use tape on the high spots of the hood, others use towels, and others use a combination of both. We did not worry about this as the customer was going to vinyl wrap his hood again.
- 2.19.** On the bottom side of the hood, you’ll see all the mounting holes through the structural metal. Using these holes as guides, place painter's tape roughly 1/2" further outward than

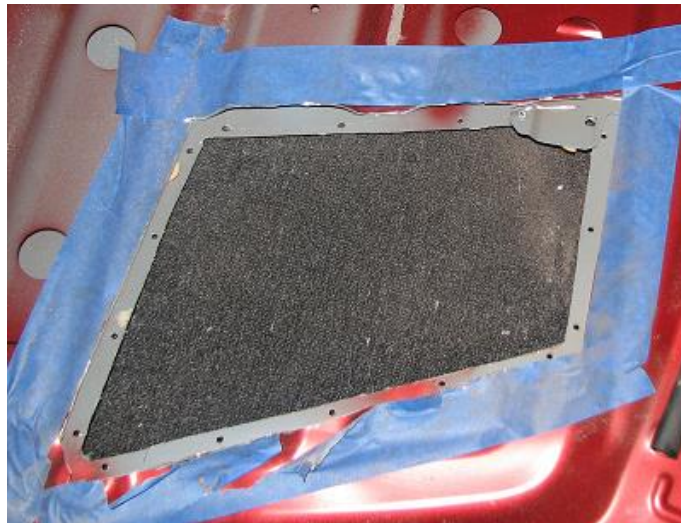
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ND Miata Hood Louver Kit – Install Manual

these holes, as shown below. This added distance is to allow the nuts to fasten directly to the hood's skin.



- 2.20.** Using the cutoff wheel, remove all of this material as well. This is shown below. ****Be sure that you do not cut through the hood's skin.****



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ND Miata Hood Louver Kit – Install Manual

- 2.21.** Finally, remove the last remaining structural metal tab circled in green with the cut-off wheel.



- 2.22.** Again, repeat the same steps on the other half of the hood. The picture below shows both sides ready for final sanding and test fitting.



- 2.23.** Using sanding discs/roll-locs, sand the edges of the skin and structural metal to avoid cuts.
- 2.24.** The hood's cuts do not need to be coated as the hood is aluminum and will not rust. If you have touch up paint and want to coat the exposed edges, do so now and let it dry.

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ND Miata Hood Louver Kit – Install Manual

- 2.25.** Test fit the louver on the hood. **If the louver does not go into the holes cleanly and without hesitation, pull the louver back off and enlarge the holes that are causing trouble!**
- 2.26.** Once the hood louver fits in the holes well, begin to tighten the nuts on the louver from the bottom side. **Only use your fingers to tighten the nuts at this point!**
- 2.27.** When all nuts are **finger tight**, use the 11/32" socket to add approximately 1/8 turn to each of the nuts. Watch the top of the hood louver to ensure you are not pulling the stud down through the material. **MAXIMUM TORQUE IS 17 IN.LBS!** The nuts are serrated and resist backing off, they do not need significant torque.



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ND Miata Hood Louver Kit – Install Manual

- 2.28.** The wickers are installed from the bottom side of the hood louver. These increase evacuation of under hood pressure and temperature. (Note: Below picture is an FRS/BRZ install.)



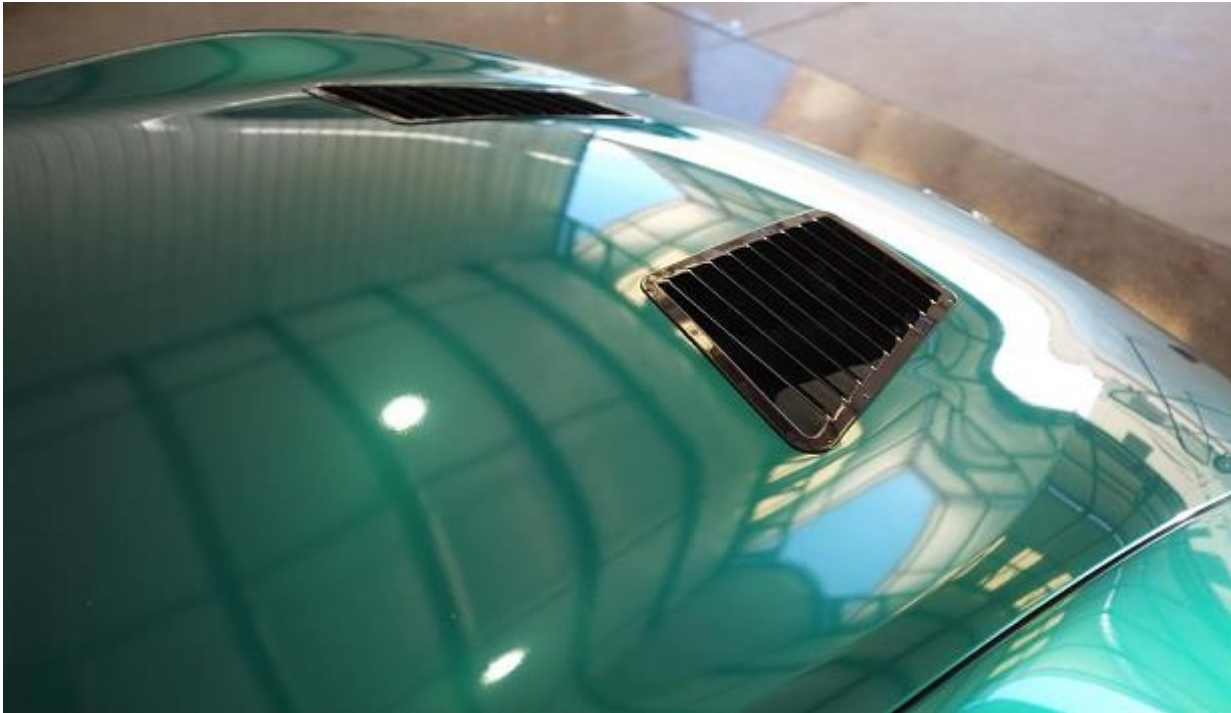
- 2.29.** Reinstall the hood with the (4) 12mm bolts and tighten to approximately 18-24 ft-lbs



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ND Miata Hood Louver Kit – Install Manual

- 2.30.** Congratulations, you have successfully installed the Verus Engineering hood louvers. The car now benefits from reduced under hood pressure and reduction in underhood temperature. Please contact Verus Engineering with any questions, comments, concerns, and feedback via sales@verus-engineering.com.



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