



Arctic Tern Roof Hatch Deluxe Installation & Operation Guide

With Rain Sensor & Remote



DO NOT attempt to install this roof hatch before completely reading and understanding **ALL** Instructions and Considerations for Fitment (Found on our Website Resources Page).

Almost ALL issues of damage, leaking, and improper function are due to improper installation. A great deal of time has gone into creating this document to ensure your installation will be easy and successful.

READ ENTIRE INSTALLATION GUIDE BEFORE ATTEMPTING INSTALLATION.

Issues due to improper installation are not covered under the product warranty.



Arctic Tern Roof Hatch Installation & Operation Guide

Thank you for purchasing an Arctic Tern Roof Hatch from Tern Overland! We hope you have a great experience installing and enjoying your Roof Hatch for years to come. Here are some tips and guidance. Please review before installing.

Installation considerations:

1. The electric hatch needs a 12V power source for the drive motor and for the LED lights. The power supplied should be fused at 5 amps. A ground wire must be provided as well.
2. The roof area where the roof hatch is installed must be flat and smooth. If you are installing this roof hatch in a curved roof, a solid flat frame must be fabricated from steel, aluminum or some other rigid material to serve as the base for the hatch. You can fabricate your own adapter ring or contact our partner diyvan.com to order a custom adapter ring specific to your installation. Stressing the hatch to tighten against an uneven surface can cause the opening mechanism to bind.
3. A spoiler is available, and must be used if the hatch is installed with nothing blocking the direct blow of wind and rain to the leading edge of the hatch. Some people have solar panels and other structures that serve to block this wind. The blocking structure must be at least 1.5" tall, and within a few inches of the leading edge of the hatch. The reason for this requirement is that the foam used in the hatch seal is a filtering foam material that is intended to block dust, but allow a small circulation of air through the cabin.
4. Before you begin the installation, be sure that you have the correct parts for the roof thickness that you have. This hatch can accommodate roofs from 30mm to 84mm (1 3/16" - 3 5/16") An additional expansion ring is available to accommodate roofs 70mm to 84mm (2 3/4" - 3 5/16"). The screws provided will accommodate roofs 3 5/16" thick. You will need to trim the screws for roofs thinner than 3 5/16".
5. The hatch must always be installed with the hinge at the leading edge into the direction of travel. Never to the side or rear!
6. Be sure that sufficient framing exists in the wall structure to support the hatch all the way around. Additional framing may be needed in some roofs. FRP composite roofs do not require additional framing.



READ ALL INSTRUCTIONS BEFORE BEGINNING



Tools and supplies Required:

1. Jig saw or other appropriate cutting tool to cut the hole for the hatch
2. Carpenter's framing square
3. Drill with a 1" hole saw, and 7/64" bit
4. Piece of plywood approximately 24" x 32" to make a cut hole template
5. Marking pen
6. Phillips screwdriver
7. Small flat bladed screwdriver
8. A tube of high strength polyurethane adhesive (Bostik Adhesive distributed by Tern Overland is highly recommended, however Sikaflex 252 or similar may be used)
9. Hacksaw

Optional:

1. A vise
2. Light oil (For screws in black clamps)
3. Zip ties

Installation:

1. Create a template out of plywood with a rectangular hole measuring 27 1/2" x 19 3/4". The corners can be cut out with a 1" hole saw as shown in *Figure 1*. Smooth the edges so that a nice line can be drawn around the template. Check the fit of the template on the hatch.
2. Position the template where the hole will be cut, and mark the roof for cutting. Make sure that the position of the cut allows for the installation of the spoiler, if used. The trailing edge of the spoiler should be located 3 inches ahead of the leading edge of the hatch mounting flange. *See Figure 2*. If the spoiler is not used, allow room to the closest structure to allow for full opening of the hatch. There should be 1/2" minimum clearance from the open hatch to the nearest structure at full opening.
3. Route 12V power fused at 5 amps and a ground wire to the leading driver side edge of the hatch. The roof hatch comes with an additional 5 amp fuse installed in the wiring harness to protect the electronics.
4. Cut the hole in the roof, just as you did with the template, and smooth the edges.
5. With the hatch sitting in the hole, test fit the black mounting clamps (all 11 of them) all the way around to ensure that they are the correct length to draw up tight against the roof. These clamps are designed to be trimmed if needed to accommodate a wide range of roof thicknesses. Your hatch will fit into roofs up to 3 5/16" (84mm) thick. If your roof is over 2 3/4" (70mm), optional expansion rings (trim pieces) are available to cover the gap between the inner and outer frames. If trimming is required on the clips, use a hacksaw to carefully cut them. Some of the clamps may need to be shorter than others. The clamps should be slightly shorter than the span they will be drawing up. *See Figure 3*.

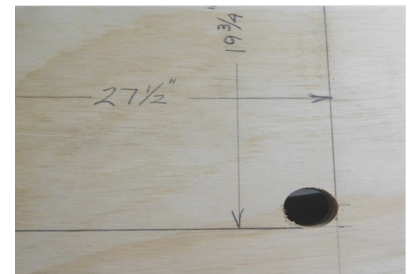


Figure 1

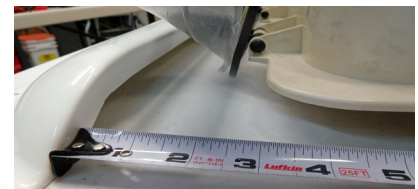


Figure 2

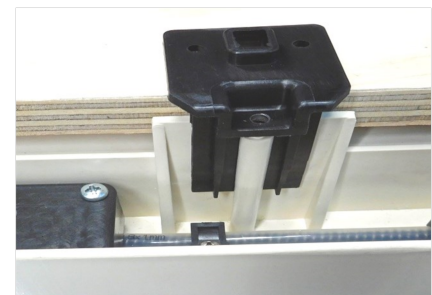


Figure 3

6. With the hatch and the black clamps in place, determine the length of screw required to connect them. **The screws supplied are long enough for a 3 5/16" (84mm) thick roof and must be cut before use in thinner roofs.** The screws must be long enough to screw in 1"- no more and no less. Use a hack saw to trim all 11 screws to the correct length and clean up the ends on a grinder.
7. Once all the clamps and screws have been trimmed, you are ready to glue the hatch in. Clean both the roof surface and the glue channel in the hatch with isopropyl alcohol and allow to dry. **Fill the glue channel with two generous beads of adhesive.** Installation requires a full tube of adhesive! You want enough to see a small amount of squeeze out once the hatch is snugged down. Place the hatch into the hole and gently press the mounting flange down all the way around. Water curing polyurethane adhesive requires humidity and temperature to cure. Ensure your adhesive is completely cured before putting vehicle on the road. See adhesive manufacturer's recommendations.

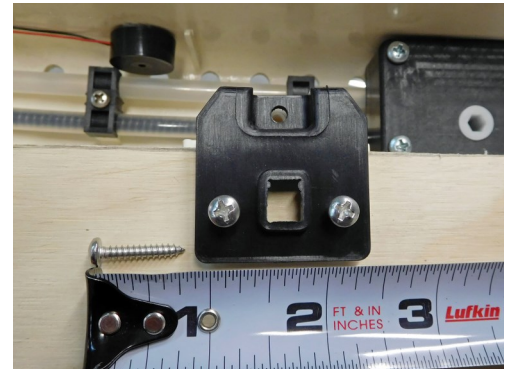


Figure 4

TIP! During the test fit, run tape all the way around the hatch on the roof surface. This way squeezed out glue is easily removed.

8. Working quickly, move to the inside of the camper and begin screwing the black mounting clamps into the ceiling using two 3/4" screws in each clamp as shown in *Figure 4*. Pilot holes (7/64") may be needed depending on the composition of your roof. Snug all of the screws down using a hand screwdriver. Do not over tighten. They just need to be snug. Once all the clamps are secured to the roof, tighten the longer mounting screws to draw the hatch and clamps together. A drop of light oil on each screw will allow them to install easily. It is suggested that you do the final tightening in a cross pattern to draw the hatch down evenly. Once again, a hand driver will give much better feel and prevent over tightening. The mounting flange should be drawn down flush with the roof surface, all the way around without distortion. Clean up any excess adhesive before it dries.

Screws that are too long can penetrate the frame and jam the drive mechanism!

~This is a good stopping point if you want to continue the installation later. ~

9. Now you may install the trim ring. Place the trim ring in place against the roof hatch and use the screw locations to drill a 7/64" pilot hole for the ten 1" screws that will be used to attach the trim ring to the ceiling. The screw locations are shown to the right in *Figure 5*. Make sure your incoming power and ground are situated near the corner where the hatch electrical connectors are located.

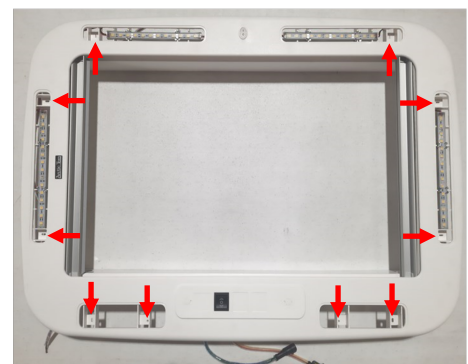


Figure 5

NOTE: The following operations are best accomplished with one person supporting the interior trim ring while the electrical connections are made by the second person.

10. Strip and twist the positive and negative wires coming in from your electrical system, and the positive and negative wires from the interior trim ring, using the guide shown in *Figure 6*. Locate the electrical connectors as shown in *Figure 7*. There are two open ports on the positive and negative wire harness. One port on each is for the incoming wires, and one port on each is for the wires from the interior trim ring. Push the wires in and close the lever lock as shown in *Figure 8*.

11. Plug in the two switch connectors (the 2 pin and 3 pin weather pack connectors) as shown in *Figure 9*.

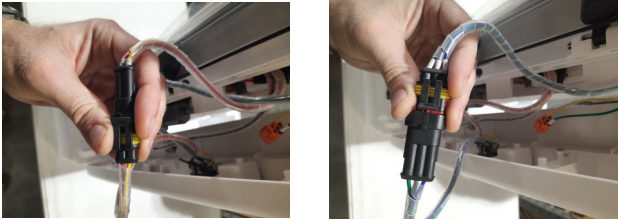


Figure 9

12. Plug in the rain sensor connector (white) and the reset button (orange) as shown in *Figure 10*. These can only be plugged in in one orientation.

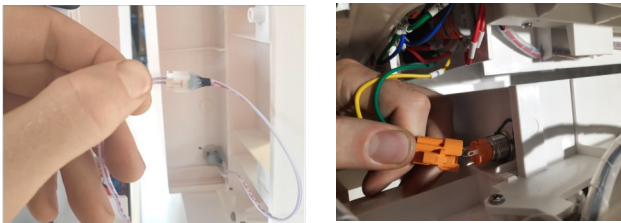


Figure 10

13. Secure the wires with zip ties as needed and push them under the trim ring as it is lifted into place.

14. Insert and snug down the ten 1" screws to secure the trim ring in place.

15. With the hatch fully installed and functioning properly, snap in the LED light lenses and vent grids into place.

16. **Read the operation instructions on the next pages carefully!**

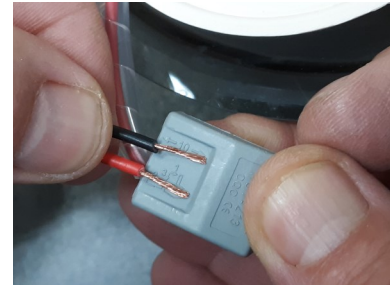


Figure 6

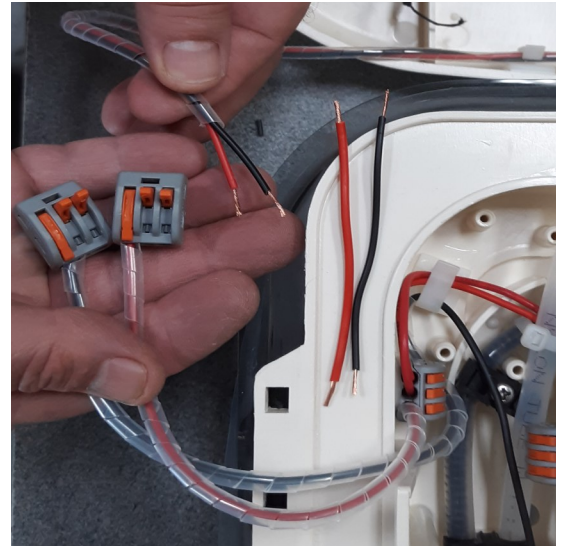


Figure 7

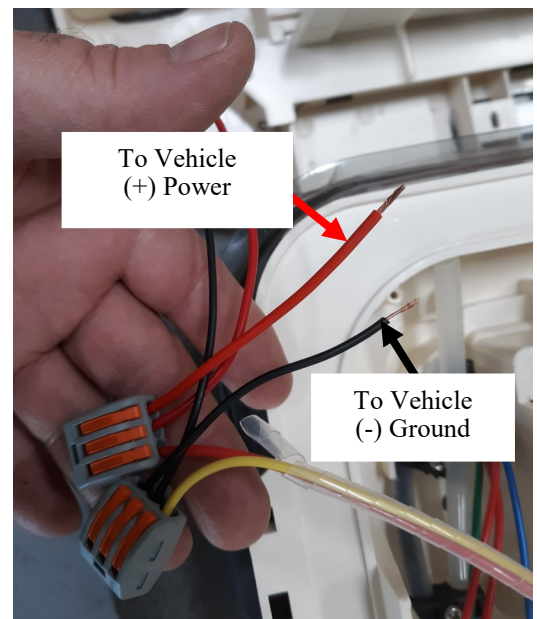


Figure 8

Operation Instructions

Important Information

1. The shell of the hatch is ABS and the dome is acrylic. Only use cleaners and polishes compatible with these materials. We recommend Novus products, which can be purchased from Tern Overland.
2. It is recommended to remove snow from the hatch before opening to avoid over stressing the opening mechanism
3. The hatch should always be closed completely before the vehicle is moved.

Using the Remote to Open and Close the Roof Hatch

1. On the remote control the lock symbol closes the roof hatch and the unlock symbol opens the roof hatch, *Figure 11*.
2. Pressing the open button will open the roof hatch until it reaches the full open position where it will stop automatically. Pressing the close button will close the roof hatch fully.
3. When opening the roof hatch, to stop the hatch between the closed and fully open positions, simply press the open button a second time and the roof hatch will stop in that position. The same can be done with the close button while the roof hatch is closing. Pressing the open button while the roof hatch is closing or vice versa will change the direction of the roof hatch travel until it is in the fully open or closed position, or until another button is pressed.
4. If your roof hatch came with a spare remote of a different style, the “A” button has been programmed to close the roof hatch and the “B” button has been programmed to open it, *Figure 12*.



Figure 11

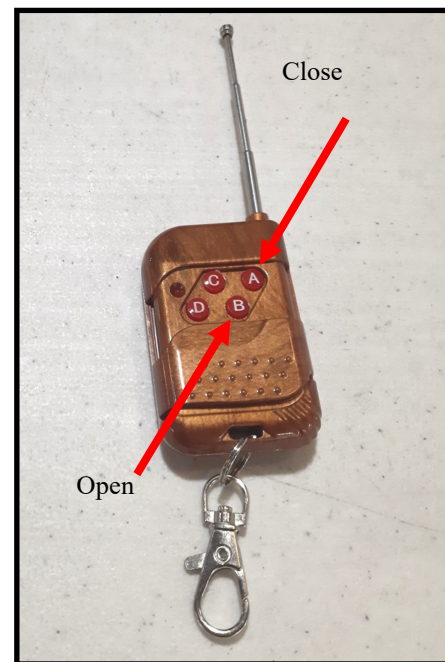


Figure 12

Operation Instructions Continued

Using the Switch to Open and Close the Roof Hatch

1. Pressing the black rectangular switch on the trim ring will cause the roof hatch to open or close until the switch has been released, pictured in *Figure 13*. The hatch stops automatically at the full open and full closed positions. The hatch may also be stopped at any point by releasing the switch.
2. When closing the hatch, be sure to hold the button until the hatch has fully stopped. This will ensure the locking pawl has engaged.
3. Note that the remote overrides the switch in the full open and closed positions and will lock out the switch functionality. If this happens and the switch needs to be used (i.e. the remote cannot be found), simply press the reset button located on the trim ring and shown below in *Figure 14*. The button does not need to be held, only pressed and released. From there, the switch will function normally.



Figure 13



Figure 14

Rain Sensor Functionality

1. The rain sensor, shown in *Figure 15*, is designed to close an open roof hatch if it is raining and water contacts the sensor. During normal operation it is not possible to open the roof hatch until the rain sensor has dried. This can be an issue during brief rain storms and with that in mind we have installed a rain sensor disconnect switch pictured in *Figure 16*.
2. To disconnect the rain sensor, fully depress the disconnect switch. To reconnect the rain sensor, depress the disconnect switch and verify that it extends back to its original extended position.

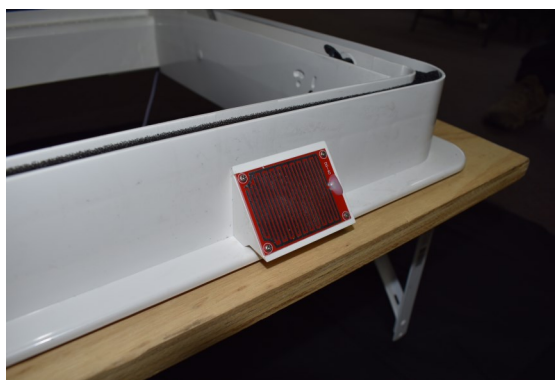


Figure 15

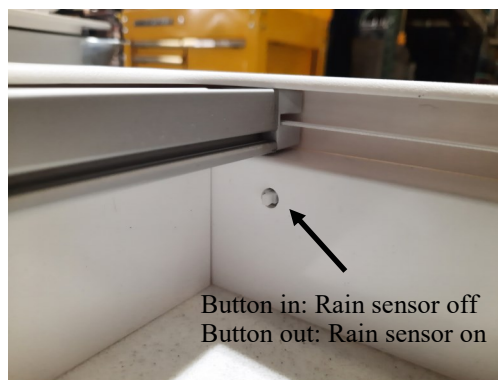


Figure 16

Operation Instructions Continued

LED Lights

1. The led lights are operated by a separate switch, simple on / off, located on the trim ring, pictured below in *Figure 17*.

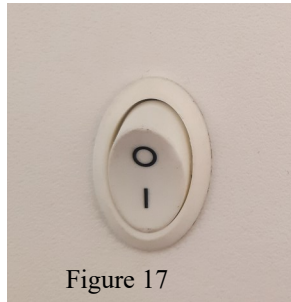


Figure 17

Using the Emergency Crank

1. An emergency crank is supplied with each roof hatch. In the unlikely event that the motor fails, the emergency crank may be used to close the hatch. **To use emergency crank, follow this procedure:**
 - Cut the power to the hatch.
 - Remove the switch cover to gain access to the drive gear box.
 - **Push and hold the white motor release button indicated in the photo in Figure 14.**
 - Insert the emergency crank into the white drive socket just off the end of the motor.
 - Carefully raise or lower the dome as needed. If the system binds, try again to fully push the release button.
 - Once the problem with the motor is resolved, normal operation may be resumed by simply activating the switch. The white button will pop back out and the motor will be engaged.

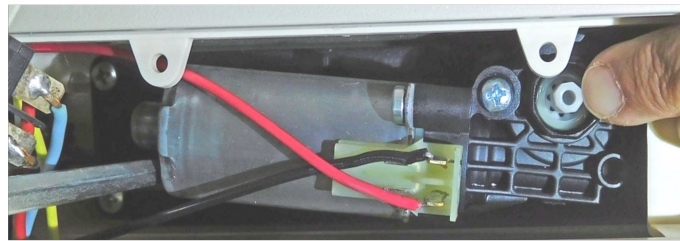


Figure 18