

# THROUGH-THE-ROOF GENERATOR EXHAUST

After trying an external exhaust pipe that routed auxiliary generator exhaust gases up and over the roof of the coach, the authors devised a system that accomplishes the same thing but is hidden away inside the coach.

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Editor's note: *The installation of this exhaust system may be subject to various local building codes. Although this may seem to be an excessive amount of regulation, we encourage you to seek out any and all requirements and adhere to them. If you are going to err, err on the side of safety.*

At each rally we attend, we hear some polite and some not so polite comments from people who object to the running of RV generators, because of concerns about the exhaust pollution they create. Such comments prompted us to design and install an external roof exhaust. Our local muffler shop bent exhaust pipe to fit our generator tailpipe and run up the outside of our bus to the level of the roof. The pipe had a tendency to rust, even though it was painted with a heat-resistant aluminum paint, and it became very hot when the generator was running at one-half power levels, especially on a hot day. This was solved by adding a heat-absorbing cover. This system stopped our generator from being a nuisance to neighbors. Unfortunately, however, it created a storage

problem while we traveled and was somewhat cumbersome to set up. It also required the addition of an attachment to secure the pipe to the outside of the coach. We considered this disfiguring and were not happy with such an arrangement.

We wanted an internal generator roof exhaust, but our coach converter was reluctant to

We asked numerous people for their thoughts, opinions, and advice. The idea we liked best was to enclose the exhaust pipe in a double-walled outer pipe. The outside diameter of our exhaust pipe was 2 inches, and the only double-walled outer pipe we could find had an inside diameter of 4 inches and an outside diameter of 4 5/8 inches.

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install such a system, because of concerns regarding the risk of fire and carbon monoxide intoxication. We were very aware of the dangers of carbon monoxide (see the reprinted article that appears on page 56 of this magazine), and we had to find out whether we could greatly reduce or eliminate the risk of fire.

We were limited by our floor plan and did not have 4 inches to spare. We then considered covering the 2-inch pipe with ATP's exhaust wrap.

This would give a 4-inch diameter, but a number of people were concerned about the carbon monoxide risk inherent in having only one pipe.

We finally found a smaller size double-walled galvanized stovepipe. It had an inside diameter of 3 inches and an outside diameter of 3 1/2 inches and came in 2-foot, 3-foot, and 5-foot sections. For the first time, the project looked feasible.

The ideal location for the generator roof exhaust pipe was the front inner corner of a closet that was located just in front of the drive axle and to the rear of the last storage bay. This location would allow the pipe to exit on the flat part of the roof rather than on the rounded edge. Inspection under the coach revealed an accessible space of adequate dimensions medial to the air bag and lateral to the frame. Rough height adjustments indicated that a 10-foot exhaust pipe and 10 feet of stovepipe would be required. Also, an exhaust pipe with a 90-degree bend would be needed to run from the present exhaust to the point where the new pipe would start its vertical rise.

We purchased a 3 1/2-inch hole saw and set to work. First we drilled a small hole in the floor, taking care to avoid steel braces. After verifying that our location was still within the predicated parameters, we proceeded to create the 3 1/2-inch opening. We passed a 5-foot section of stovepipe from the closet downward. It safely cleared the air bag and came to rest on the ground. Using the second 5-foot section of stovepipe, we marked the ceiling drill site. We drilled from the inside just until the pilot drill pierced the roof skin, and then we changed to drilling from the outside in order to insure a clean cut on the roof. Next we cut a 3 1/2 inch hole in a removable closet shelf. We then installed the upper pipe through the closet shelf and up through the roof. After that we raised the lower pipe to join and lock the two 5-foot sections together. Approximately 1 1/2 inches extend past the roof skin, and the lower end of the pipe is well below the air bag. The top of the stovepipe fit quite snugly

through the roof, and silicone caulk easily created a watertight seal. It is secured to the floor of the closet with a hose clamp and 'L' brackets, as well as with silicone caulk.

The 90-degree bent exhaust pipe rises just to the height of the outer stovepipe. The 10-foot single piece of 2-inch exhaust pipe is enlarged to 2 inches inside diameter at one end to fit over the 90-degree 2-inch pipe. The 2-inch pipe can be stainless-steel or regular exhaust pipe. If you opt for regular pipe, as we

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did, we suggest that it be painted with aluminum heat-resistant paint. We also wrapped the inner pipe with 2-inch Fireguard 1000 insulation tape. The tape is installed from above. To top it off, a 45-degree chrome exhaust cap was attached to the upper end of the exhaust pipe to keep precipitation from entering through the pipe.

We then needed to secure the exhaust pipe in the middle of the stovepipe. First we drilled three evenly spaced 1/8-inch holes around the top of the stovepipe. We then placed a stainless-steel hose clamp over the exhaust pipe and used double-strand 18-gauge stainless-steel wire as twist ties through the holes and under the clamp to secure the pipe in a centered position.

At the bottom, the straight exhaust pipe is secured by the 90-degree pipe and is held in place by a standard exhaust hanger clamp. A metal bar running under the exhaust from frame to frame keeps it from falling to the ground if the clamp should fail.

In making the short pipe to connect the existing exhaust pipe to the new vertical pipe, we made the proximal expansion 4 inches long to allow for front-to-back adjustment. The pipe required a 90-degree bend. We had the muffler shop leave the distal end (the part that enters the double-walled pipe) several inches longer than we thought necessary, and then we cut it to size with a pipe cutter. We were fortunate in that no side-to-side adjustment was required. If necessary, however, this could be accomplished by using a 45-degree S-curve bend, which would be the only critical measurement.

Having the inner exhaust pipe wrapped with the insulation tape creates much hotter exhaust, thus reducing incomplete combustion and the amount of particulate matter. The outer stovepipe allows precipitation to fall to the ground and provides very good air circulation. Cool air enters from the bottom, and warmed air exits at the top. With an ambient temperature of 90 degrees Fahrenheit and a 70-amp load on the generator, our maximum stovepipe temperature (in the closet) has been 140 degrees Fahrenheit. We usually do not run our generator at full load, and the stovepipe temperature rarely goes above 125 degrees Fahrenheit. The neighbors are happy, and we are happy.

Although we are confident that we have addressed and tremendously reduced the risks of carbon monoxide poisoning and fire, we still NEVER leave the generator running while we are sleeping or away from the coach.