

# VENTILATION SAFETY

Why you should be concerned .....

Two reasons ..... Carbon monoxide is poison and flammable vapours may blow you up. There is no bigger safety leap you can make that is so easy and so cheap to do right.

This is so simple and so inexpensive to do right that I find it hard to believe so many boat builders still get it wrong. I am not talking about older boats here. Check out the new models in the showroom and you'll be hard pressed to find one done right. While this issue is critical on gasoline fueled boats, CO from diesel is just as deadly as CO from gasoline. Diesel does produce less CO than gasoline but you must remember that CO poisoning is cumulative and will build up in your bloodstream over hours or days and may take up to two weeks to leave your bloodstream. Also remember that CO poisoning closely mimics the symptoms of seasickness.

The following recommendations are based on ABYC " Ventilation of Boats Using Gasoline" Standard H-2 with a little common sense thrown in.

The diagram shows a properly ventilated boat with A, B & C being exhaust outlets with blower fans with D and E being fresh air intake ducts.

1. All three powered exhaust ducts draw air from under the engines.

Gasoline vapours are heavier than air and will seek the lowest level. The space directly below the engines may not be the very lowest level but are generally bordered by stringers which contain the fumes to these areas.

2. ABYC requires one blower for "each gasoline engine used for propulsion" I think they forgot about the generator !

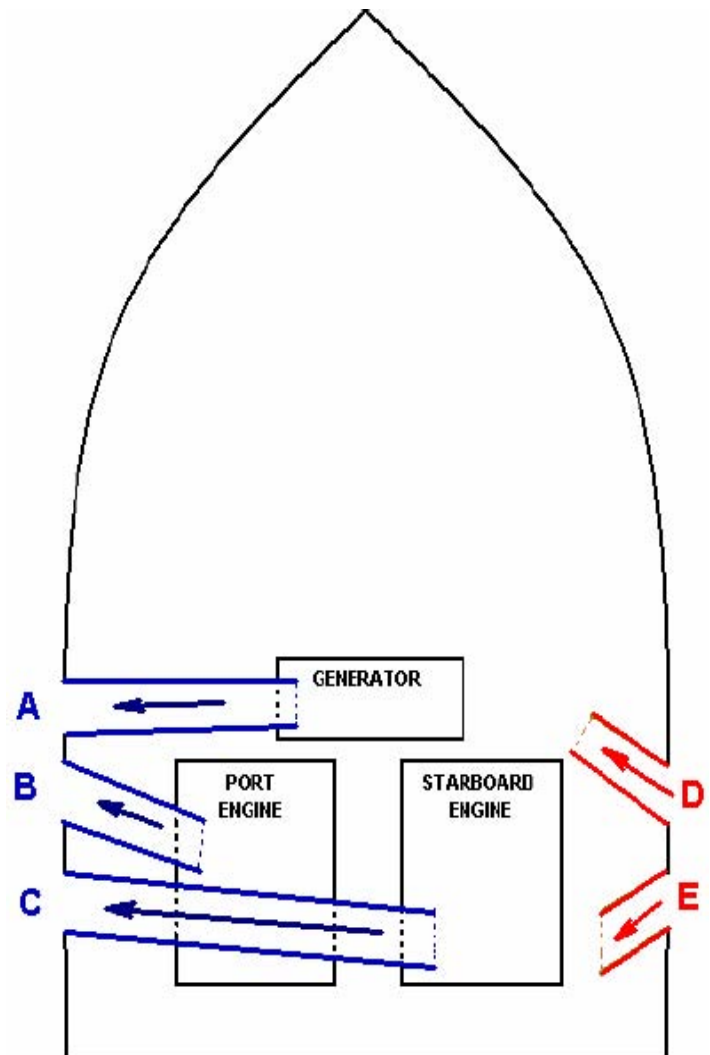
Once again, stringers can trap heavier than air vapours so it's essential that each area have its own blower.

3. All three powered exhaust ducts should exit on the same side of the boat while intakes are on the opposite side. The exhaust duct louvers should face aft and the intake louvers forward.

If intakes and outputs are on the same side you may end up re-circulating the same gasoline vapours. I also often see intakes and output connected to the same plenum which is a surefire way of re-circulating vapours rather than ventilating your engine compartment. What are the builders thinking?

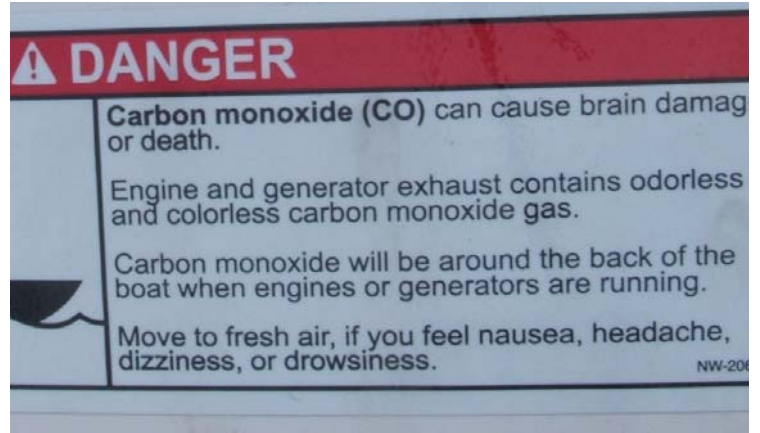
A few other ABYC requirements.... Exhaust ducts must terminate in the lower 1/3 of the bilge but above the normal accumulation of bilge water. Exhaust duct ends must be no closer than 24" to intake openings. Air intakes and exhaust outlets shall be no closer than 15" from gasoline fill and tank vent fittings. Ventilation outlets must remain outside of weather enclosures.

You will get better cross ventilation if the intake ducts are high in the engine compartment. Don't forget to run your blowers at low speeds as the "station wagon" effect can pull fumes back toward you. Of course none of this makes any difference if you don't use your blowers. Canadian law requires that blowers be run for a minimum of 4 minutes before starting your engines. Keep an eye out this season and watch most people flick the blower switch and immediately fire up their engines. The insurance investigation takes place shortly thereafter. Is the safety of your family worth \$15.00 of ducting and another blower ?



ABYC and NMMA also prohibit ventilation intakes or outputs at the stern due to the “station wagon effect and the fact that people tend to hang around the swim platform.

BELOW - I spotted this 2006 model at a local marina. Note all the intake and output holes across the transom (round holes above vessel name) and none on the side, a clear violation of common sense, ABYC and NMMA standards. Then they have the temerity to put a CO warning label on the transom !



BELOW - At left, shows another Regal with transom ventilation but they are not alone as the photo at right shows a Maxum with the same flaw.



Or this one



This one vents into the cockpit !

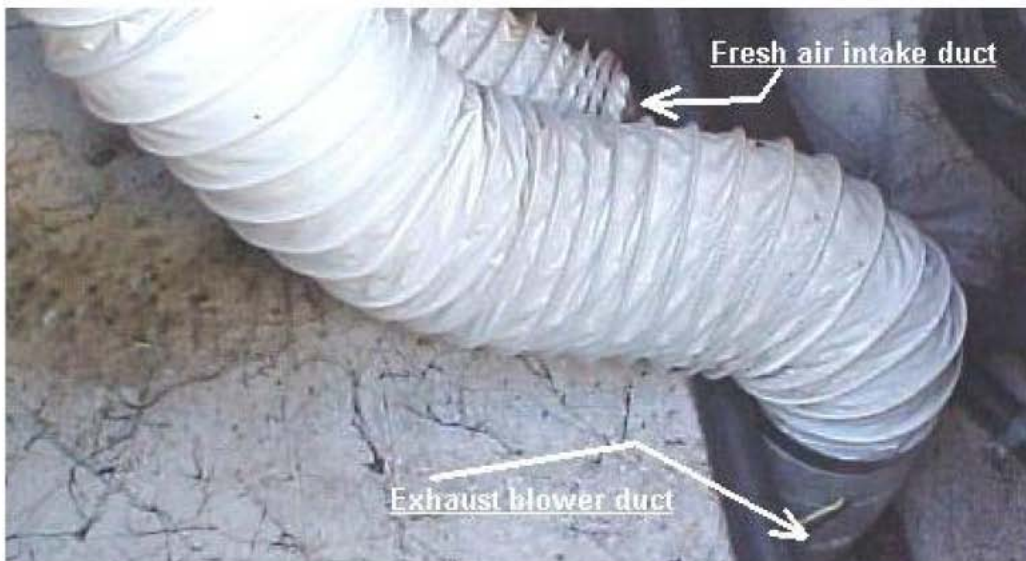


Here are a few extracts from actual surveys and although the photography is not good it does show how common poor ventilation is and unfortunately most of these boats came from the factory this way. The builders are well aware of ABYC Standards and NMMA (National Marine Manufacturers Association) is their own organization. Why can't they get it right? Why don't you call and ask them before you hand over your deposit cheque ?

**Blowers vented outboard** – The exhaust blower does not reach under engine and is too close to the fresh air intake duct. See recommendation (5).



**Engine room ventilation** -- Engine compartment blower motor is very noisy. Fresh air intake and exhaust duct are within 10" of each other and share the same plenum. See recommendation (11).



**Blowers vented outboard** – No. Only one powered exhaust duct is fitted and as shown in the photo below it lies flush against the deck. In this position it **cannot** exhaust engine compartment fumes. This exhaust duct is fitted to the same plenum as the fresh air intake duct on the port side of the vessel. There are no ducts fitted to the starboard side plenum. See recommendation (2).



**Engine room ventilation** – Exhaust blowers do not reach under propulsion engines and exhaust is blocked by a small bulkhead which acts as a drip pan. See recommendation (2). The generator does not have an exhaust blower fitted. See recommendation (3).

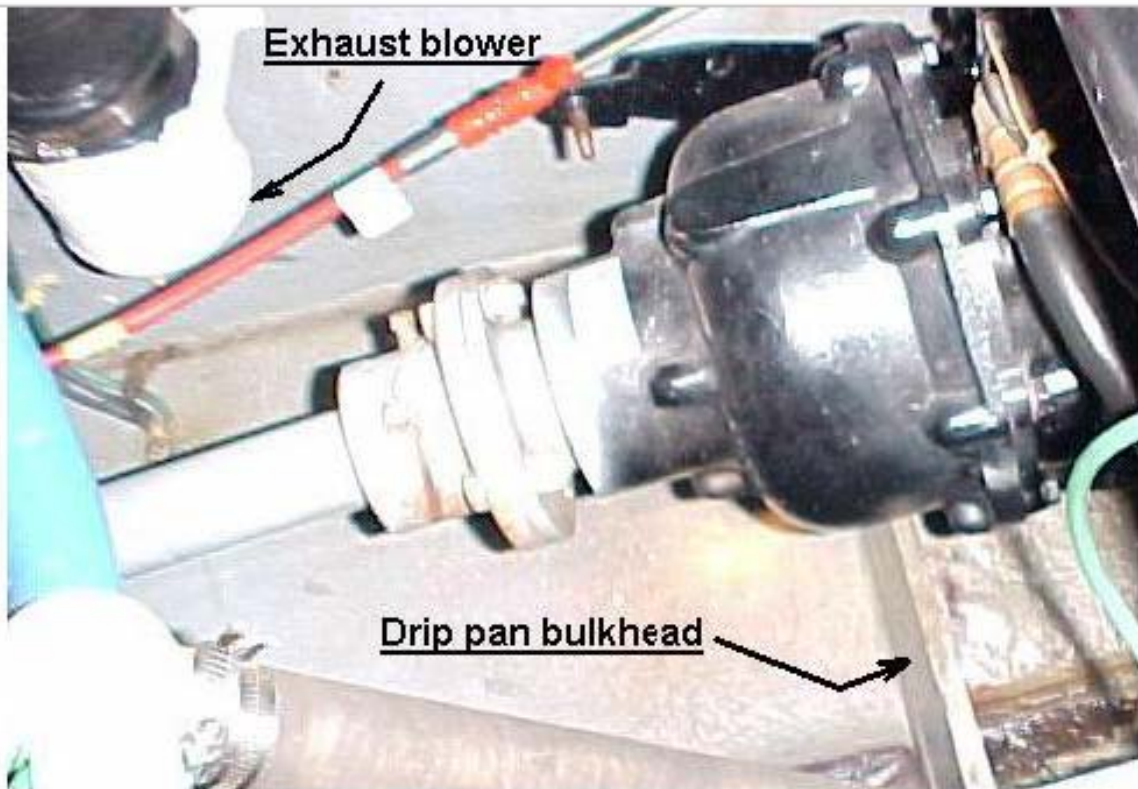




Photo # 5

