

Update Notes on Outboard Motor Emissions

Prepared by: Dave Frid - Friends of the Lake
cbdavefrid@gmail.com for comments or questions

Some good things do come of modern progress and even from our government. As an update to part of the Lake Plan published a few years back, now it should be noted that in regards to outboard motors, modern two strokes of some manufacturers are not the polluters they were in the past. High pressure direct inject technologies used in the Envinrude line and some of the Tohatsu line meet even the most stringent of pollution regulations of the California air quality agency, CARB, (namely the 3 Star ultra low emissions rating). Four stroke engines have been, and continue to be, low emission engines.

The Canadian government passed legislation in 2011 to work in conjunction with the US EPA so that all motors imported or manufactured in Canada meet emission standards that are not unlike what we know of for our automobiles in Ontario - ie regulating the output of Nitrous Oxides, Carbon Monoxides and other emissions. The emissions regulations are evolving and are more stringent for subsequent production years, but the take away is that anyone who is considering the retirement of their "old smoker" can be confident that any outboard purchased in Canada since production year 2012 is the cleanest that is available. For engines under 15 hp it should be noted that the Lehr propane outboards are a very good option with low emissions and represent new forward enviro thinking, and of course there are electric options such as the Elco line of marine engines.

Also, the somewhat obvious should be mentioned, that less is better - the regulations are basically structured to control how much of these pollutants are released per kilowatt of power produced by the motor. Consequently the smaller the engine you can employ to enjoy your boating experience, the better, and as well, the less it is used. I suppose one could say that the more we paddle, row, sail or swim the better for the environment and probably us as well.

Current Canadian legislation governing marine engine emissions:

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-10/page-1.html>

The specific NOx and CO emission limits:

<https://www.law.cornell.edu/cfr/text/40/1045.103>

USA EPA governing regulations for marine engines:

<http://www.epa.gov/otaq/>

California Air Resource Board - CARB marine engine Star rating

(note that the direct inject manufacturers quoted in the three star category are not

current representatives of manufacturers in actual production - it should be Envirode, Tohatsu, and some Mercury)

<http://www.marineenginedigest>

Additional Resources & Internet Links for Boat Motors

Cottage Life

Go with the slow: Electric boats are greener and quieter, but are they good for the cottage? Douglas Hunter. p. 94 – 101. April, 2009.

A green, lean, boating dream: Earth-friendly fuels are making strides in cottage country, thanks to an unlikely pair: an artisanal miller and a driven boat builder. Is biodiesel the future of boating? Robert Mazza. p. 95 – 102. May, 2013.

Revamp your ride: Need a new outboard engine? Don't throw out the boat with the bilge water. Retrofit instead. Peter Robinson. p. 109 -111. May, 2013.

Did you know that Mercury Marine manufactures more than 500 different propellers for its outboards and sterndrives? Peter Robinson. p. 79 – 81. May, 2015.

Electric Power

A 100 percent solar-powered boat that cost under \$3,000 to build! Bridget Borgobello. *Gizmag*. July 11, 2012. http://www.gizmag.com/100-percent-solar-boat-that-cost-under-2900-to-build/23273/?li_source=LI&li_medium=default-widget

The 30 hp Aquawatt - the world's most powerful electric outboard motor. Mike Hanlon. *gizmag*. April 28, 2011. <http://www.gizmag.com/30hp-aquawatt-most-powerful-electric-outboard-motor-in-the-world/18511/>

Bear Mountain Boats. <http://www.bearmountainboats.com/pages/custom-boats>

The Duffy Electric Boat. <http://www.pcsmarine.com>

Tamarack Lake Electric Boats. <http://www.tamarackelectricboats.com>

Torqueedo. <http://www.torqueedo.com/en>

Propane Power

A Propane Outboard? Cam Mcrae. *Power Boating Canada*. Issue 27-6. <http://www.powerboating.com/a-propane-outboard/>

How an [Lehr] Outboard Motor Works. Popular Mechanics. Erin McCarthy. July 23, 2012. <http://www.popularmechanics.com/adventure/outdoors/a7987/how-an-outboard-motor-works-10951080/>

Lehr motors. <http://www.lehrmarine.com>

Available from West Marine in Oakville, Ontario.

<http://www.westmarine.com/propane-outboards>