

British Seagull Outboard Motors and today's emissions standards.

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British Seagull outboard engines was and is technically a very good engine made for hard use and will last for many years if looked after and serviced regularly. It is made of marine grade materials for salt water use and is easy to repair with a few standard tools and it is made to last forever, which means at least 40+ years.

There are today some problems however: The emissions from 2-stroke engines.

Two stroke engines do not burn the oil/fuel mixture completely. As much as 30% of the gases are wasted unburned to the water and air and this is not acceptable any more.

The emissions consists of HC (Hydro Carbons), CO (Carbon Monoxide) and NOx (Oxides of Nitrogen) emissions. The emissions can cause human cancer and are dangerous to life in general.

From Ole Evinrude first engine in 1909 most outboard engines are made as 2-strokes but these type of engines need direct injection of the fuel to become cleaner. For small engines direct injection is too costly and the 4-stroke technology cheaper to adopt.

Lake Constance/Bodensee

Lake Constance lies just to the north of the Alps at 395m above sea level and has a surface area of 571 square kilometers. As a natural ecosystem, Lake Constance is a representative and significant natural habitat for plants and animals in Central Europe. The lake has German, Austrian and Swiss shorelines and supply drinking water to approximately 4 million inhabitants in the area. Of all the threats to the lake, recreational boating is only one. Lake Constance has at present 55 000 officially registered watercraft, two-thirds of which have an engine.

In 1993 and 1998 stricter emission regulations (Bodensee Shipping Regulations) for motorboats were decided. Recreational and professional boating must today employ the highest standards of current environmental technology i.e. biocide-free underwater coatings and emissions-free or low emission motors as well as specified low noise levels. Navigational infrastructure must be established in accordance with the needs of nature and the landscape.

Some engine manufacturers has adopted these Bodensee standards as proof of their environmental credentials.

Recreational Craft Directive (EU 2006)

This European Directive was introduced in June 2003 and covers the design and construction of recreational crafts measuring between 2,5 and 24 meters in length and was introduced to standardize safety regulations across the EU. Any product within the scope of RCD must have accompanying documents and the product should also be "CE" marked. The Direktive includes exhaust gas and noise emissions from both inboard and outboard engines. The exhaust requirements take the form of limits of acceptable emissions of carbon monoxide, hydrocarbons, nitrogen oxide

and in the case of diesel engines, particulates. For diesel and 4-stroke ignition engines these measures took full effect from January 1. 2006. In the case of 2-stroke engines they will be mandatory January 1. 2007.

Only new technology (direct injection) spark ignition 2-strokes will be capable of meeting the standard. (All Honda outboards meets the standards and Honda only makes 4-stroke engines).

The Directive has no effect on motors in use prior to the implementation of the new standards "these can be used until they fall apart" and does not affect the sales of second hand units.

In addition to the EU 2006 directive, a local authority can also impose its own engine regulations. This is especially common on inland waterways, fishing lakes and reservoirs.

Environmental Protection Agency (EPA) 2006.

The EPA exhaust emissions are the US equivalents of those that constitute EU 2006. EPA aims to reduce hydrocarbon emissions in the US by 75%. As in the EU conventional 2-strokes can not meet the 2006 standards.

California Air Resources Board (CARB) 2008

The California Air Resources Board sets air quality standards for the State of California. The regulations regarding hydrocarbon and nitrous oxide emissions are the toughest in the world.

CARB does not however legislate regarding carbon monoxide and noise.

A "two star" CARB award for an engine means that it complies with CARB 2004 standards and a "three star" engine complies with CARB 2008 standards.

What can the individual boat and motor owner do to prevent pollution?

A lot of measures can be taken by yourself to avoid unnecessary pollution of water and air.

- Limit engine operation at full throttle.**
- Eliminate unnecessary idling.**
- Avoid spilling gasoline and oil.**
- Follow the manufacturer's recommended maintenance schedule.**

Small Engine Gasoline (ALKYLAT)

Gasoline for small engines (Alkylatbensin) is available on the Swedish market. It can be used in 4-stroke engines. For 2-stroke engines it is used with 2-stroke oil according to the normal instructions for your engine. Aromatic and benzene content is very low. It can be used for outboard engines, chain saws, lawn movers etc.

This gasoline is available at many gas stations and costs only about 10% more than normal gas and is lower taxed by the government.

If we use this gas in our small engines we use the best fuel available today and get lower emissions.

Better oil for 2-stroke outboard engines.

Normal 2-stroke mineral oils are today no longer the best choice for your engine. The oil passes the engine and a lot leaves unburned and pollutes water and air. Today we have a choice of environmentally better 2-stroke oils and also 4-stroke oils.

These outboard oils follows the highest standard of today, "NMMA TC-W3". (National Marine Manufacturers Association). You can* *find lists of certified 2- and 4-stroke oils on their homepage. www.nmma.org

California Air Resources Board Certified Marine Engine List.

CARB sometimes publish a Model Year Certified Spark-Ignition Marine Engine List?

The database contains information submitted to the Air Resources board from manufacturers of marine engines.

For small outboard motors up to max. power 15 kW you find in the list (March 06, 2006) the following manufacturers:

Briggs and Stratton Corporation.

BRP US Inc. Evinrude, Johnson.

Honda Motor Co.

Mercury Marine.

Suzuki Motor Corporation.

Tohatsu Corporation

Yamaha Motor Co.