

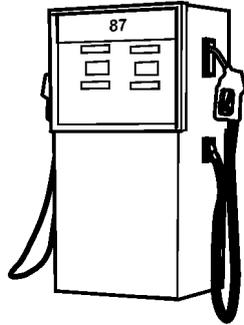
Ethanol Blended Gasolines

Gas Engines

Binder: C

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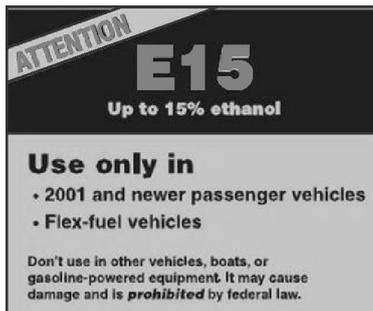
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Gasoline Requirements

Gasoline fuel blended with varying percentages of ethanol is sold throughout the world. Volvo Penta engines are designed to operate on the commercially available blend of gasoline and ethanol approved by the legislation and governmental agencies of all countries where the engines are marketed and sold.

Volvo Penta gasoline engines are designed to operate on fuel blends which have a higher percentage of gasoline than ethanol. Examples are E10 (10% ethanol) and E25. The engines should not be operated on blends with more ethanol than gasoline.

NOTICE! Do not use ethanol blends that contain a higher percentage of ethanol than gasoline, such as E85 (85% ethanol) or E98. Volvo Penta engines are not designed to run on high percentages of ethanol. Loss of performance will occur. Engine damage may also occur; damage caused by fuel with too high a percentage of ethanol is not covered by warranty.

Regardless of the ethanol content, the fuel must meet the octane requirements stated in the engine's operator's manual.

US Only

Fuel with 15% ethanol (E15) is now available in the United States. Fuel pumps using E15 fuel will be marked with the label shown at left.

Federal law prohibits the use of E15 fuel in boats.

Fuel System Care

Ethanol has several characteristics that can create problems in marine fuel systems. It acts as a solvent and it attracts and holds water in a much higher percentage than non-ethanol fuels. Users of ethanol-blended fuels must take additional care in the maintenance of their fuel systems. Ethanol-blended fuels should not cause engine problems if the fuel and fuel system are properly maintained according to the

instructions given in this bulletin and in the operator's manual.

NOTICE! Fuel system or engine damage caused by contamination from water, varnish, foreign particles, sludge, or gums entering or forming in the fuel system is not covered by the warranty.

Water, varnish, foreign particles, sludge, and gums are created or freed by the ethanol and can enter or form in the fuel system. These contaminants can clog fuel filters and damage fuel system components: pumps, injectors, carburetors. The contaminants must be prevented from entering the engine's fuel system.

Recommendations for Ethanol Blended Gasoline

1. Add a second water separating fuel filter between the fuel tank and the engine.

Volvo Penta gasoline engines are equipped with a water separating fuel filter. A second filter adds extra protection from water and contaminants in the gasoline.

The filter must be approved for gasoline inboard applications (USCG, EU 94/25/EC) and installed in accordance with boat building standards (ABYC, EU 94/25/EC). The filter must have a minimum rating of 50 gallons (189L) per hour.

2. Water separating fuel filters should be checked frequently.

Check the filters for water and contaminants in accordance with the filter manufacturer's recommendations. Check and/or replace the filters if engine performance is poor.

Encourage boat owners to carry spare filters and needed tools and supplies to change filters.

3. Use a fuel treatment that counters the negative effects of ethanol-blended fuels.

Use a fuel stabilizer such as Volvo Penta Ethanol Fuel Treatment (P/N 22203959) if the vessel's fuel will not be used within 30 days. Add the stabilizer according to the instructions on the bottle. This will help prevent the fuel from breaking down, which can lead to reduced engine performance and engine damage. See parts bulletin P-18-8-1.

Year-round use of the Volvo Penta Ethanol Fuel Treatment will help prevent the many negative affects of



ethanol-blended fuel; corrosion, oxidation, sludge formation, fuel breakdown.

NOTICE! If the boat will not be used for two months or longer, the fuel system must be properly prepared for this storage period. See service bulletin 23-0-2 for details on storage procedures and use of fuel stabilizer.

Fuel Testing

The mixing of ethanol and gasoline at the distributor can be inaccurate. At delivery, test gasoline for ethanol level to insure it is 10% or below. Also consider testing the fuel in boats with complaints of poor performance and that show symptoms of poor fuel quality. Inexpensive test kits can be purchased locally or found on the internet.

Fuel Additives

Avoid any fuel additives and fuel system treatments that contain ethanol or are alcohol-based.

Fiberglass Fuel Tanks

WARNING!

Fuel leak, explosion and fire may result from continued use of ethanol fuels in polyester resin fiberglass fuel tanks.

Some older boats (mid-80's and earlier) may have polyester resin fiberglass fuel tanks. Ethanol, as a solvent can **dissolve the resin in the tank walls**. This will first show as sludge and gum, that clogs fuel filters and damages fuel system components. When these symptoms are detected, the fuel tank should be replaced. The ethanol will eventually create holes in the tank that will leak fuel.

Volvo Penta does not recommend the use of ethanol blended fuels in fuel tanks constructed of polyester resin fiberglass.

Methanol

Do not use any gasoline containing methanol in Volvo Penta engines. Serious engine damage may result from the continued use of fuel containing methanol. Any resulting engine damage is not covered by the warranty.