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## 2003 MARINE MANUFACTURER FUEL RECOMMENDATIONS

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### BOMBARDIER

- *Utopia Sport Boat*

#### RECOMMENDED FUEL

Use regular unleaded gasoline with 87 octane (Ron + Mon)/2 specification.

**NOTE:** This craft features an oil injection system which does not require fuel/oil mixing. Do not mix oil with fuel except at engine break-in. Refer to *MF Jet Drive Operator's Guide*.  
**BREAK-IN PERIOD.** Always check oil reservoir level when refueling.

Refer to *MF Jet Drive Operator's Guide* for more detailed information.

**CAUTION: The use of a fuel other than regular unleaded fuel can result in craft performance deterioration and damage to fuel system and engine components. Never experiment with other fuels or fuel ratios. Never use fuel containing alcohol, methanol or similar products including naphtha.**

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### HONDA

- *BF2D Outboard Engine*

#### FUEL RECOMMENDATIONS

**Use unleaded gasoline with a pump octane rating of 86 or higher.**

This outboard motor is certified to operate on unleaded gasoline. Unleaded gasoline produces fewer engine and spark plug deposits and extends exhaust system life.

Never use stale or contaminated gasoline or an oil/gasoline mixture. Avoid getting dirt or water in the fuel tank.

Occasionally you may hear a light "spark knock" or "pinging" (metallic rapping noise)

while operating under heavy loads. This is no cause for concern.

If spark knock or pinging occurs at a steady engine speed, under normal load, change brands of gasoline. If spark knock or pinging persists, see an authorized Honda marine dealer.

#### NOTICE

*Running the engine with persistent spark knock or pinging can cause engine damage.*

Running the engine with persistent spark knock or pinging is misuse and the *Distributor's Limited Warranty* does not cover parts damaged by misuse.

#### Oxygenated Fuels

Some conventional gasolines are being blended with alcohol or an ether compound. These gasolines are collectively referred to as oxygenated fuels. To meet clean air standards, some areas of the United States and Canada use oxygenated fuels to help reduce emissions.

If you use an oxygenated fuel, be sure it is unleaded and meets the minimum octane rating requirement.

Before using an oxygenated fuel, try to confirm the fuel's contents. Some states/provinces require this information to be posted on the pump.

The following are the EPA approved percentages of oxygenates.

**ETHANOL:** ethyl or grain alcohol; 10% by volume

You may use gasoline containing up to 10% ethanol by volume. Gasoline containing ethanol may be marketed under the name "Gasohol".

**MTBE:** Methyl Tertiary Butyl Ether; 15% by volume.

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You may use gasoline containing up to 15% MTBE by volume.

**METHANOL:** methyl or wood alcohol; 5% by volume

You may use gasoline containing up to 5% methanol by volume as long as it also contains cosolvents and corrosion inhibitors to protect the fuel system. Gasoline containing more than 5% methanol by volume may cause starting and/or performance problems. It may also damage metal, rubber, and plastic parts of your fuel system.

If you notice any undesirable operating symptoms, try another service station or switch to another brand of gasoline.

Fuel system damage or performance problems resulting from the use of an oxygenated fuel containing more than the percentages of oxygenates mentioned above are not covered under warranty.

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### INDMAR MARINE

- **Mastercraft Ski Boats\***

#### What Type of Gasoline to Use

All carbureted and standard EFI engines run on unleaded fuel of 89 Octane (R+M)/2 or higher. The LS1 requires 93 octane or higher. Fuels must meet the specification ASTM D4814 in the US and CGSB 3.5-92 in Canada. These fuels need no additives.

**CAUTION**  
Frequently inspect fuel lines and connections for leaks or deterioration.

Indmar recommends the regular use of Sta-Bil fuel stabilizer for boat users that consume less than a tank of fuel every two weeks. Today's fuels are more susceptible to degradation and the use of a quality stabilizer will help ensure fewer problems for the occasional boater.

If your boat has not been used for more than 30 days with fuel in the tank (even stabilized fuel), the engine may run poorly until the "old"

fuel is used up. Indmar will not pay for repairs to carburetors or fuel injection components that are inoperable or damaged from old and/or poor quality fuel.

#### Using Oxygenated Fuels or Fuels with Alcohol

MTBE (methyl tertiary butyl ether) is an oxygenate and octane enhancer. This compound may be blended with fuel. Fuel that is no more than 15% MTBE is acceptable for use in your Indmar engine.

Ethyl alcohol, ethanol or grain alcohol is acceptable as long as it is a blend and the blended fuel contains no more than 10% ethanol.

**CAUTION**  
Fuels that are blended to contain methanol or wood alcohol should not be used in Indmar engines. These fuels can corrode metal parts in your fuel system and engine. Fuels that contain methanol will damage your engine. Damage caused by the use of fuels that contain methanol is not covered by your warranty.

#### Fuels in Other Countries

If you operate your Indmar engine outside the USA or Canada, unleaded fuels may be difficult to obtain. Leaded fuels are not recommended as engine components will last longer using unleaded fuel.

**\*[Note: Mastercraft Ski Boats are powered by Indmar inboard marine engines. Indmar marine engines are manufactured by General Motors.]**

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### MERCURY MARINE

- **4-stroke Marine Engine**

#### GASOLINE RECOMMENDATIONS

##### United States and Canada

Use a major brand of automotive unleaded gasoline whenever with a minimum posted octane rating of 87. Mid-grade automotive gasolines that contain fuel injector cleaner are

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preferred for added internal engine cleanliness. Leaded gasoline is not recommended.

### International

Use a major brand of automotive unleaded gasoline whenever with a minimum posted octane rating of 90 RON. Automotive gasolines that contain fuel injector cleaner are preferred for added internal engine cleanliness. Leaded gasoline is acceptable in areas where unleaded gasoline is not available.

### Alcohol in Gasoline

We do not recommend the use of gasoline which contains alcohol because of the possible adverse effect the alcohol may have on the fuel system. In general,

Gasoline containing alcohol may cause the following problems to your outboard and fuel system:

- Corrosion of metal parts.
- Deterioration of elastomers and plastic parts.
- Wear and damage of internal engine parts.
- Starting and operating difficulties.
- Vapor lock or fuel starvation.

Some of these adverse effects are due to the tendency of gasoline containing alcohol to absorb moisture from the air, resulting in a phase of water and alcohol which separates from the gasoline in the fuel tank.

The adverse effects of alcohol are more severe with methanol and are worse with increasing content of alcohol.

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## NISSAN

- **4-stroke NSF Outboard Engine**

### REQUIRED GASOLINE TYPES

Unleaded, minimum pump posted 87 octane gasoline is recommended.

(Octane is based on posted rating.)

(91 based on research octane rating method)

#### Note:

Use of low quality gasoline results in a short engine life as well as starting difficulties and other engine problems.

#### Note:

(1) Gasoline containing alcohol, methanol (methyl), or ethanol (ethyl), may cause:

- Wear and damage to bearings, cams, piston(s), piston rings.
- Corrosion of metal parts.
- Deterioration of rubber and plastic parts.
- Starting, idling, and other engine performance problems.

(2) Do not use gasoline that contains more than 10% ethanol or more than 5% methanol.

(3) Damage resulting from the use of gasolines that contain alcohol are not covered under the limited warranty

- **2-stroke NS Outboard Engine**

### REQUIRED GASOLINE TYPES

Unleaded gasoline is recommended for outboard motors.

The minimum octane rating should be 87 based on the pump posted octane rating method (91 based on research octane rating method).

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## OUTBOARD MARINE

- **Evinrude, Johnson Outboard Engines**

### FUEL

Your outboard is certified to operate on unleaded automotive gasoline with an octane rating equal to or higher than that specified in **Minimum Octane** chart. When using gasoline that contains MTBE or alcohol, follow these guidelines.

Using unleaded gasoline that contains methyl tertiary butyl ether (MTBE) is acceptable **ONLY** if the MTBE content does not exceed 15% by volume.

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Using alcohol-extended fuels is acceptable **ONLY** if the alcohol content does not exceed:

- **10% ethanol by volume.**
- **5% methanol with 5% cosolvents by volume.**

### Minimum Octane

Inside the U.S.....	87 (R+M)/2 AKI
Outside the U.S.....	90 RON

OMC products have been designed to operate using the above fuel: however, be aware of the following:

- The boat's fuel system may have different requirements regarding the use of alcohol fuels. Refer to the boat's owner manual.
- Alcohol attracts and holds moisture that can cause corrosion of metallic parts in the fuel system.
- Alcohol blended fuel can cause engine performance problems.
- All parts in the fuel system should be inspected frequently and replaced if signs of deterioration or leakage are found. Inspect at least annually.

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## PLEASURECRAFT ENGINE GROUP

- **PCM Marine Engines**

### GASOLINE REQUIREMENTS

**Warranty Notice:** Damage caused to the engine through the use of improper gasoline, low-quality or gasoline with an octane rating below the minimum requirements listed below, is considered misuse of the engine. Such damage is not covered by the PCM Engines warranty.

The ignition timing set by the factory requires the used of a high-quality lead-free regular gasoline with the following octane specification.

Pump Octane Number (R+M/2) (PUMP) - 87

**Notice:** Most PCM Fuel Injected engines are calibrated to operate on 87 octane fuel and maximum performance is obtained costs, can cause temporary performance loss. Therefore, the use of these fuels is not recommended.

Some applications may require a higher octane fuel. These particular applications will be noted.

If a slight pinging is heard during acceleration and the proper octane fuel is being used, it is considered normal. If a constant, heavy knock occurs, the engine should be evaluated by a PCM Engine service technician.

### Gasoline Containing Alcohol

Gasoline containing alcohol, either ethanol (ethyl alcohol) or methanol (methyl alcohol) is not recommended for used in your engine. Gasoline containing alcohol will attract and hold moisture and may cause the following:

- Hard starting and operating difficulties (vapor lock, low speed stalling)
- Corrosion of metal parts
- Excessive wear and damage to internal engine parts
- Fuel permeation through flexible fuel lines
- Deterioration of some nonmetallic materials

The adverse effects of alcohol are more severe with methanol and are worse with increasing alcohol content.

If gasoline containing alcohol is used, or if the presence of alcohol is uncertain, more frequent inspections of the complete fuel system are required. Any sign of fuel leakage or deterioration must be repaired immediately before further engine operation.

**Notice:** Some gasolines contain an octane-enhancing additive called methylcyclopentadienyl manganese tricarbonyl (MMT), and they should not be used. These fuels may reduce spark plug life, and engine performance may be effected.

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## SUZUKI

- **DF60, DF70 Outboard Motor**

### FUEL AND OIL

#### Gasoline

Suzuki highly recommends that you use alcohol-free unleaded gasoline whenever

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possible, with a minimum pump octane rating of 87 ((R+M)/2 method). In some areas, the only fuels that are available are oxygenated fuels. Oxygenated fuels which meet the minimum octane rating requirement and the requirements described below may be used in your outboard motor without jeopardizing the New Outboard Motor Limited Warranty.

### CAUTION

**If leaded gasoline is used, engine damage may result. Use only unleaded gasoline. Do not use fuel of a lower than recommended octane or fuel that may be stale or contaminated by dirt/water etc. Such poor quality fuel will affect performance and may damage your engine and fuel system.**

*NOTE: Oxygenated fuels are fuels which contain oxygen-carrying additives such as MTBE or alcohol.*

### Gasoline containing MTBE

Unleaded gasoline containing MTBE. (Methyl Tertiary Butyl Ether) may be used in your outboard motor if the MTBE content is not greater than 15%. This oxygenated fuel does not contain alcohol.

### Gasoline/Ethanol Blends

Blends of unleaded gasoline and ethanol (grain alcohol), also known as GASOHOL, may be used in your outboard motor if the ethanol content is not greater than 10%.

### Gasoline/Methanol Blends

Avoid using blends of unleaded gasoline and methanol (wood alcohol) whenever possible. DO NOT USE fuels containing more than 5% methanol under any circumstances. Fuel system damage or outboard motor performance problems resulting from the use of such fuels are not the responsibility of Suzuki and may not be covered under the New Outboard Motor Limited Warranty.

Fuel containing 5% or less methanol (wood alcohol) may be suitable for use in your outboard motor if they contain cosolvents and corrosion inhibitors.

### Fuel Pump Labeling

In some states, pumps that dispense oxygenated fuels are required to be labeled for

the type and percentage of oxygen, and whether important additives are present. Such labels may provide enough information for you to determine if a particular blend of fuel meets the requirements listed above. In other states, pumps may not be clearly labeled as to the content or type of oxygen and additives. If you are not sure that the fuel you intend to use meets these requirements, check with the service station operator or the fuel suppliers.

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## YAMAHA

- *VZ150 Outboard Engine*

### CAUTION

- **Use only new clean gasoline which has been stored in clean containers and is not contaminated with water or foreign matter.**
- **Do not use leaded gasoline (petrol). Leaded gasoline will cause damage to the oxygen sensor for Electronic Fuel Injection System.**

### Gasoline (Petrol)

Recommended gasoline:

Regular unleaded gasoline with a minimum octane rating of 86 (Pump Octane Number = (R+M)/2)

### Gasohol

There are two types of gasohol: gasohol containing ethanol and that containing methanol. Gasohol containing ethanol can be used if ethanol content does not exceed 10% and the fuel meets minimum octane ratings. Gasohol containing methanol is not recommended by Yamaha because it can cause fuel system damage or engine performance problems.