



YANMAR
®

BY **series**

OPERATION MANUAL

**4BY
6BY**

P/N: 0ABY0-G00101

**MARINE
ENGINES**

TABLE OF CONTENTS

	Page
Introduction	1
Record of Ownership	2
Safety	3
Safety Precautions	4
General Information	4
Before You Operate	4
During Operation and Maintenance	4
Safety Decals	8
Product Overview	9
Yanmar BY-Series Features and Applications	9
New Engine Break In	10
Component Identification	11
Left Side - 4BY	11
Right Side - 4BY	11
Top View - 4BY	12
Left Side - 6BY	12
Right Side - 6BY	13
Top View - 6BY	13
Location of Nameplates	14
Function of Major Components	15
Fuses and Relays	17
Engine Cover	18
Before You Operate	19
Diesel Fuel	19
Diesel Fuel Specifications	19
Filling the Fuel Tank	21
Bleeding the Fuel System	21
Engine Oil	22

TABLE OF CONTENTS

Engine Oil Specifications	22
Acceptable Engine Oil	23
Checking Engine Oil	26
Adding Engine Oil	26
Marine Gear or Stern Drive Oil	27
Power Steering Fluid Specifications	27
Checking Power Steering Fluid Level	27
Engine Coolant	28
Acceptable Engine Coolant	28
Daily Checks	29
Visual Checks	29
Checking Diesel Fuel, Engine Oil and Engine Coolant Levels	29
Checking the Battery Electrolyte Level	29
Checking the Alarm Indicators	29
Preparing Fuel, Oil and Coolant in Reserve	29
Checking Power Steering Fluid	29
Draining the Fuel / Water Separator	30
Engine Operation	31
Starting the Engine	33
Starting at Low Temperatures	33
Shutting Down the Engine	34
Emergency Shut Down	34
Checking the Engine After Operation	34
Periodic Maintenance	35
Safety Precautions	35
Precautions	37
The Importance of Periodic Maintenance	37
Performing Periodic Maintenance	37
The Importance of Daily Checks	37
Keep a Log of Engine Hours and Daily Checks	37
Yanmar Replacement Parts	37
Tools Required	37
Ask Your Authorized Yanmar Marine Dealer or Distributor For Help	37
Required EPA Maintenance	37
EPA Requirements	38
Conditions to Ensure Compliance with EPA Emission Standards	38
Inspection and Maintenance	38
Periodic Maintenance Schedule	39

Inspection and Maintenance for EPA Emission-Related Parts	43
Periodic Maintenance Procedures	44
After Initial 50 Hours of Operation	44
Every 50 Hours of Operation	45
Every 250 Hours of Operation	46
Every 500 Hours of Operation	51
Every 1000 Hours of Operation	52
Every 2000 Hours of Operation	53
Troubleshooting	55
Troubleshooting Chart	55
Starting Trouble	55
Exhaust Color	56
Vibration - Drive Disengaged	56
Vibration - Drive Engaged	57
Engine Knocks	57
Low Power Output	57
Engine Overheat	58
Engine Runs Cold	58
Coolant Loss	58
Troubleshooting Information	58
Diagnostic Trouble Codes	59
Long-Term Storage	65
Prepare Engine for Long-Term Storage	65
Draining the Seawater Cooling System	66
Specifications	67
Engine Specifications	67
Tightening Fasteners	70
EPA Warranty USA Only	71
Yanmar Co., Ltd. Limited Emission Control System	
Warranty - USA Only	71
Your Warranty Rights and Obligations:	71
Warranty Period:	71
Warranty Coverage:	72
Exclusions:	72
Owner's Responsibility:	72
Customer Assistance:	72

This Page Intentionally Left Blank

INTRODUCTION

Welcome to the world of Yanmar Marine! Yanmar Marine offers engines, drive systems and accessories for all types of boats, from runabouts to sailboats, and from cruisers to mega yachts. In marine leisure boating, the worldwide reputation of Yanmar Marine is second to none. We design our engines to respect nature. This means quieter engines, with minimal vibrations, cleaner than ever. All of our engines designed after 1996 meet most of the present and future emission regulations, such as BSO II, SAV, EPA II, IMO and RCD.

To help you enjoy your Yanmar BY engine for many years to come, please follow these recommendations:

- Read and understand this *Operation Manual* before you operate the machine to ensure that you follow safe operating practices and maintenance procedures.
- Keep this *Operation Manual* in a convenient place for easy access.
- If this *Operation Manual* is lost or damaged, order a new one from your authorized Yanmar marine dealer or distributor.
- Make sure this manual is transferred to subsequent owners. This manual should be considered a permanent part of the engine and remain with it.
- Constant efforts are made to improve the quality and performance of Yanmar products, so some details included in this *Operation Manual* may differ slightly from your engine. If you have any questions about these differences, please contact your authorized Yanmar marine dealer or distributor.
- The specifications and components (instrument panel, fuel tank, etc.) described in this manual may differ from ones installed on your vessel. Please refer to the manual provided by the manufacturer of these components.

SAFETY

Yanmar considers safety of great importance and recommends that anyone that comes into close contact with its products, such as those who install, operate, maintain or service Yanmar products exercise care, common sense and comply with the safety information in this manual and on the machine's safety decals. Keep the decals from becoming dirty or torn and replace them if they are lost or damaged. Also, if you need to replace a part that has a decal attached to it, make sure you order the new part and decal at the same time.



This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

DANGER

Indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, *could* result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, *could* result in minor or moderate injury.

NOTICE

Indicates a situation which can cause damage to the machine, personal property and / or the environment or cause the equipment to operate improperly.

SAFETY PRECAUTIONS

General Information

There is no substitute for common sense and careful practices. Improper practices or carelessness can cause burns, cuts, mutilation, asphyxiation, other bodily injury or death. This information contains general safety precautions and guidelines that must be followed to reduce risk to personal safety. Special safety precautions are listed in specific procedures. Read and understand all of the safety precautions before operation or performing repairs or maintenance.

Before You Operate

⚠ DANGER

The safety messages that follow have **WARNING** level hazards.



NEVER permit anyone to install or operate the engine without proper training.

- Read and understand this Operation Manual before you operate or service the engine to ensure that you follow safe operating practices and maintenance procedures.
- Safety signs and decals are additional reminders for safe operating and maintenance techniques.
- See your authorized Yanmar marine dealer or distributor for additional training.

During Operation and Maintenance

⚠ DANGER

The safety message that follows has **DANGER** level hazards.



Crush Hazard

NEVER stand under hoisted engine. If the hoist mechanism fails, the engine will fall on you.

⚠ WARNING

The safety messages that follow have **WARNING** level hazards.

Explosion Hazard

Avoid serious personal injury or equipment damage. While the engine is running or the battery is charging, hydrogen gas is being produced and can be easily ignited. Keep the area around the battery well-ventilated and keep sparks, open flames and any other form of ignition out of the area.

Fire and Explosion Hazard

Diesel fuel is flammable and explosive under certain conditions.

NEVER use a shop rag to catch the fuel.

Wipe up all spills immediately.

NEVER refuel with the engine running.

Store any containers containing fuel in a well-ventilated area, away from any combustibles or sources of ignition.

NEVER place diesel fuel or other flammable material such as oil, hay or dried grass close to the engine during engine operation or shortly after shut down.

Fire Hazard

Avoid injury or equipment damage from fire. Undersized wiring systems can cause an electrical fire.

Sever Hazard

Rotating parts can cause severe injury or death. NEVER wear jewelry, unbuttoned cuffs, ties or loose fitting clothing and ALWAYS tie long hair back when working near moving / rotating parts such as the flywheel or PTO shaft. Keep hands, feet and tools away from all moving parts.

Exposure Hazard

To avoid injury, ALWAYS wear personal protective equipment including appropriate clothing, gloves, work shoes, eye and hearing protection as required by the task at hand.

Entanglement Hazard

NEVER leave the key in the key switch when you are servicing the engine. Someone may accidentally start the engine and not realize you are servicing it.

Avoid personal injury. NEVER operate the engine while wearing a headset to listen to music or radio because it will be difficult to hear the warning signals.

Stop the engine before you begin to service it.

If you must service the engine while it is operating, remove all jewelry, tie back long hair, and keep your hands, other body parts and clothing away from moving / rotating parts.

WARNING

Alcohol and Drug Hazard



NEVER operate the engine while under the influence of alcohol or drugs or feeling ill.

Piercing Hazard



Avoid skin contact with high-pressure diesel fuel spray caused by a fuel system leak such as a broken fuel injection line. High-pressure fuel can penetrate your skin and result in serious injury. If you are exposed to high-pressure fuel spray, obtain prompt medical treatment.

NEVER check for a fuel leak with your hands. ALWAYS use a piece of wood or cardboard. Have your authorized Yanmar marine dealer or distributor repair the damage.

Burn Hazard



Avoid serious injury. Some of the engine surfaces become very hot during operation and shortly after shut-down. Keep hands and other body parts away from hot engine

surfaces.

Sudden Movement Hazard

Avoid personal injury. ALWAYS stop the engine before beginning service.

Exhaust Hazard



Avoid serious injury or death. NEVER block windows, vents or other means of ventilation if the engine is operating in an enclosed area. All internal combustion engines create carbon monoxide gas during operation and special precautions are required to avoid carbon monoxide poisoning.

CAUTION

The safety messages that follow have CAUTION level hazards.

Poor Lighting Hazard

Avoid personal injury or equipment damage. Ensure that the work area is adequately illuminated. ALWAYS install wire cages on portable safety lamps.

Tool Hazard

Avoid personal injury or equipment damage. ALWAYS use tools appropriate for the task at hand and use the correct size tool for loosening or tightening machine parts.

Flying Object Hazard

Avoid personal injury. ALWAYS wear eye protection when servicing the engine or when using compressed air or high-pressure water. Dust, flying debris, compressed air, pressurized water or steam may injure your eyes.

Coolant Hazard



Wear eye protection and rubber gloves when you handle Long Life engine coolant. If contact with the eyes or skin should occur, flush eyes and wash immediately with clean water.

NOTICE**The safety messages that follow have NOTICE level hazards.**

It is important to perform daily checks as listed in the *Operation Manual*.

Periodic maintenance prevents unexpected downtime, reduces the number of accidents due to poor engine performance and helps extend the life of the engine.

See your authorized Yanmar marine dealer or distributor if you need to operate the engine at high altitudes. At high altitudes the engine will lose power, run rough and produce exhaust gases that exceed the design specifications.



ALWAYS be environmentally responsible.

Follow the guidelines of the EPA or other governmental agencies for the proper disposal of hazardous materials such as engine oil, diesel fuel and engine coolant. Consult the local authorities or reclamation facility.

NEVER dispose of hazardous materials by dumping them into a sewer, on the ground or into ground water or waterways.

If a Yanmar Marine Engine is installed at an angle that exceeds the specifications stated in the Yanmar Marine Installation manuals, engine oil may enter the combustion chamber causing excessive engine speed, white exhaust smoke and serious engine damage. This applies to engines that run continuously or those that run for short periods of time.

If you have an installation with two or three engines and only one engine is operating, the water pickup (thru-hull) of the non-running engine(s) should be closed. This will prevent water from being forced past the seawater pump and eventually finding its way into the engine. The result of water entering the engine could cause seizure or other serious problems.

If you have an installation with two or three engines, and only one engine is operating, please note that if the propeller shaft thru-hull (stuffing box) is lubricated by engine water pressure and the engines are interconnected, care must be taken that water from the running engine does not enter the exhaust of the non-running engine(s). This water could cause seizure of the non-running engine(s). See your authorized Yanmar marine dealer or distributor for a complete explanation of this condition.

If you have an installation with two or three engines, and only one engine is operating, it is important to limit the amount of throttle applied to the running engine. If you observe black smoke or movement of the throttle does not increase engine rpm, you are overloading the engine that is running. Immediately throttle back to approximately 2/3 throttle or to a setting where the engine performs normally. Failure to do so may cause the running engine to overheat or cause excess carbon buildup which may shorten the engine's life.

Thank you so much for reading.
Please click the “Buy Now!”
button below to download the
complete manual.



After you pay.

You can download the most
perfect and complete manual in
the world immediately.

Our support email:

ebooklibonline@outlook.com