



Waveblade

Hull Maintenance Made Easy

Power Barnacle Remover

Operating Instructions

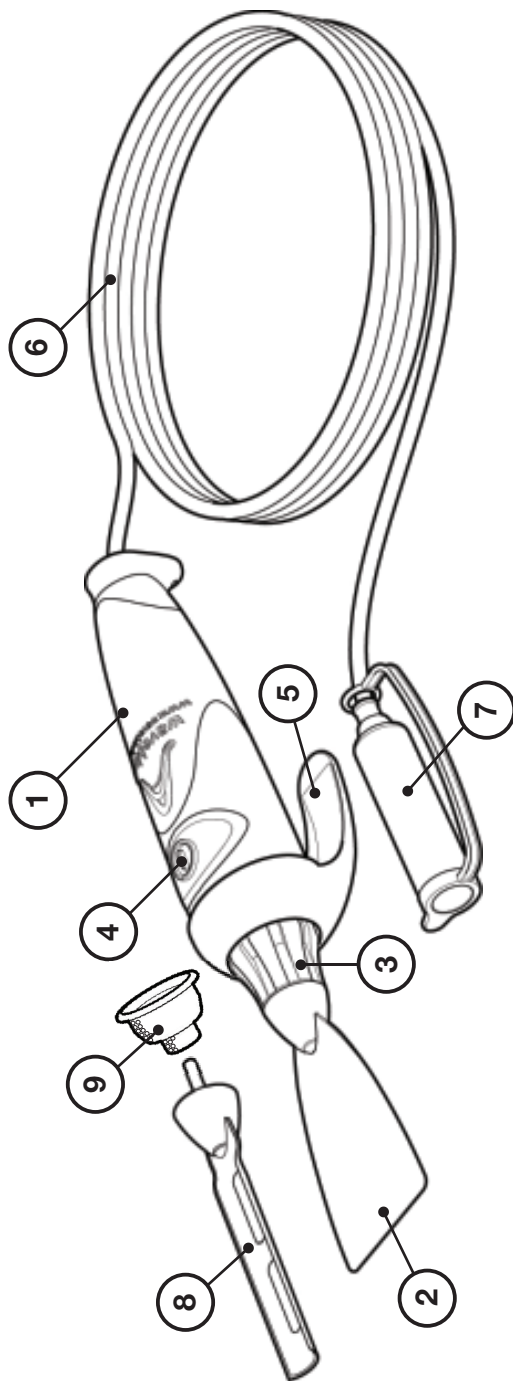


WBACC014-01 February 2010



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The tool consists of the following parts:











1. Body of the Tool
2. 3" Flat Blade
3. Blade Retention Collar
4. On/off Switch
5. Knuckle Guard
6. 45 feet (13.7 meters) long Power Cable
7. 12Vdc Plug Connector within Protective Boot
8. Alternative ½ Round Curved blade (for use on propeller shafts)
9. Replaceable Front Seal Protective Foam Boot

Figure 1: **Main Tool Parts**

GENERAL SAFETY RULES

WARNING! Before reading study the illustrations and fully familiarize yourself with all functions of the Waveblade.

WARNING! Read and understand all instructions. Failure to follow all instructions listed below may result in electric shock, fire, serious personal injury and/ or damage to the work piece.

The following icons/ symbols are used in this instruction manual			
	Read instruction manual!		Voltage (dc)
	Observe caution and safety notes!		Watt (performance)
	Rated idle running speed		Protection category III power tool
	Wear ear protection, safety glasses and protective gloves		Proper procedure and handling
	Product meets the requirements of the relevant EU Directives		Waste Electrical & Electronic Equipment Directive

SAVE THESE INSTRUCTIONS.

Introduction



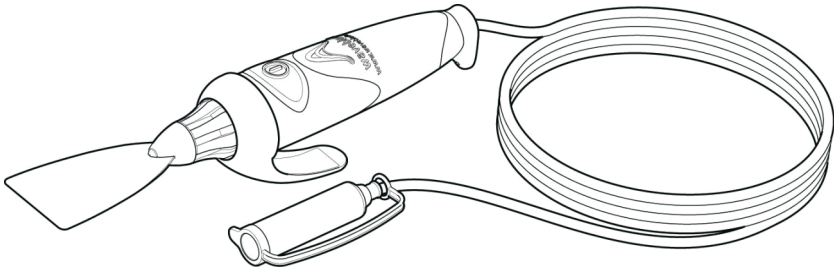
Please make sure you familiarize yourself with the way the Waveblade works before you use it for the first time and that you understand how to handle electric power tools correctly. Further details can be found in this user manual. Keep these instructions in a safe place. If you pass the device on to anyone else, please ensure that you also pass on all the documentation. Please check for updates to this user manual by downloading the latest version from our website.

FUNCTIONAL DESCRIPTION

The WaveCraft Ltd. “Waveblade ” is designed to remove marine fouling from pleasure craft hulls, propellers, drive shafts and stern gear only.

This innovative tool uses patented technology. The key feature is a rapidly vibrating blade which when slid across the hull surface dislodges the marine fouling without pressure or effort. It does not remove your anti-foul!

Any other use of, and modification to, the Waveblade is deemed to be improper usage and may result in serious physical injury and invalidate your warranty. WaveCraft Limited declines to accept responsibility for damage(s) arising out of usage contrary to the instructions specified below. The Waveblade is not intended for commercial applications or to be use continuously for periods exceeding 30 minutes.



Items Supplied

After unpacking, check that these listed items are present and free from damage:

- 1 Waveblade tool with 45 feet (13.7 meters) of power cable, 12Vdc Plug Connector and Replaceable Front Seal Protective Foam Boot.
- 1 3” (75mm) Black Sprung Steel Blade
- 1 Black Flat Chisel Blade
- 1 2.5mm Stainless Steel Allen Key
- 1 Pair of Safety Glasses
- 1 Pair of Work Gloves
- 1 Tool Bag
- 1 User Manual

If any items are missing or damaged please contact your dealer.



Safety Instructions

Waveblade is a sealed unit with no internal serviceable parts other than the replacement of blades and the protective foam boot at the front of the tool.

Take care, when using the Waveblade tool; never use damaged tools or tools you suspect may be damaged or not functioning correctly.



Work Area

1. **Keep your work area clean and well lit.** Cluttered and dark areas invite accidents.
2. **If working subsurface ensure that the water visibility is good and the hull surface is well lit and can be clearly seen.** Working in a poor visibility environment invites damage to the hull and injury to the user.
3. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks that may ignite the dust or fumes.
4. **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.



Electrical Safety

1. **Tool to be powered only from a 12 volt dc** boat or vehicle battery . Ensure that the battery is in a good condition, clean and dry.
2. **Supply must be fused.** Fuse must be 10 Amp or less.
3. **Fuses must not be replaced by larger sizes**
4. **Battery source to be isolated from mains.**
5. Simultaneous charging of the battery source and use of tool must not be done.
6. **Battery eliminators and power splitters are not to be used. They do not supply sufficient isolation from the mains for a tool to be used safely.**
7. **The Plug Connector must match the outlet socket. The Plug Connector must not be altered in any way. Do not use adaptor cables or attempt to extend the cord.**
8. **Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. If the cord becomes damaged the tool must not be used.** Return the tool to your nearest authorized service centre for repair details of which can be found at www.waveblade.co.uk.
9. **Damaged cords increase the risk of injury**, electric shock. Damaged cords may create a fire. Regularly check the condition of the cable and plug for signs of damage.
10. **Waveblade is a sealed unit never attempt to open it.**



Mechanical Safety

1. **Do not touch blade when operating or place it against any part of your body**, the front edge of blade is not sharpened but can become sharper in use.
2. **Keep blade away from your hands, other body parts and other people.**
3. **Do not use unless blade is correctly and securely fitted.**
4. **Do not use the Waveblade in combination with other tools or processes.**
5. **If the tool is dropped the power should be disconnected and the tool thoroughly inspected before further use.**
6. **Disconnect power before installing or removing blade.**
7. **Only use accessories supplied by WaveCraft Limited expressly for this tool.** Accessories that may be suitable for one tool may become hazardous when used on another tool. Use of unauthorized accessories will invalidate the tools warranty.



Personal Safety

1. **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
2. **Dress properly. Do not wear loose clothing or jewellery. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewellery, or long hair can be caught in moving parts.
3. **Avoid accidental starting. Be sure the switch is not depressed before plugging in.** Carrying the tool with the switch depressed invites accidents. **Carry tool by the knuckle guard.**
4. **Ensure that the Allen Key has been removed from the blade locking collar before switching the tool on.** A key in a moving tool can cause serious injuries.
5. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
6. **Use safety equipment. Always wear the eye protection and gloves supplied or suitable replacements at all times.** Dust mask, non-skid safety shoes, hard hat and hearing protection must be used for appropriate conditions.
7. **Keep blade away from your hands and other people.**
8. **If working subsurface ensure that you are adequately skilled to operate power tools underwater and carry out submerged activities.**
9. **Under no circumstances should children be allowed to use this tool.**



Tool Use and Care

1. **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
2. **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be returned to your nearest authorized service centre for repair.
3. **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally and causing injury or damage.
4. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
5. **While the tool is not in use always ensure that the 12Vdc plug connector is sitting within the protective boot and the closing end cap is firmly in place.**
6. **Maintain tools with care.** Properly maintained tools are less likely to bind and are easier to control.
7. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tools operation. If damaged, have the tool serviced before using.** Poorly maintained tools cause many accidents.
8. **Blade tightness should be periodically checked, as operating the tool with a loose blade will damage the Waveblade.** Always check before every use and re-tighten a loose blade immediately.
9. **Do not use damaged blades as they could cause personnel injury or damage to the hull surface.** Damaged blades must be replaced with a new blade immediately. New blades can be purchased from your nearest Waveblade stockist or at www.waveblade.co.uk.
10. **The Waveblade should not be use continuously for periods exceeding 30 minutes.** Ideally it should have an intermittent duty cycle of 1 minute on 10 seconds off.



Service

1. **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury and will invalidate the tools warranty.
2. **When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.
3. **Details of your nearest authorized service centre can be found at www.waveblade.co.uk.**



Understood Everything

When you have made yourself familiar with these general safety instructions, then you can start work. You will work at your safest when taking note of the manufacturer's declarations and instructions.



Blade Attachment



Before removing or installing a blade disconnect from the power.

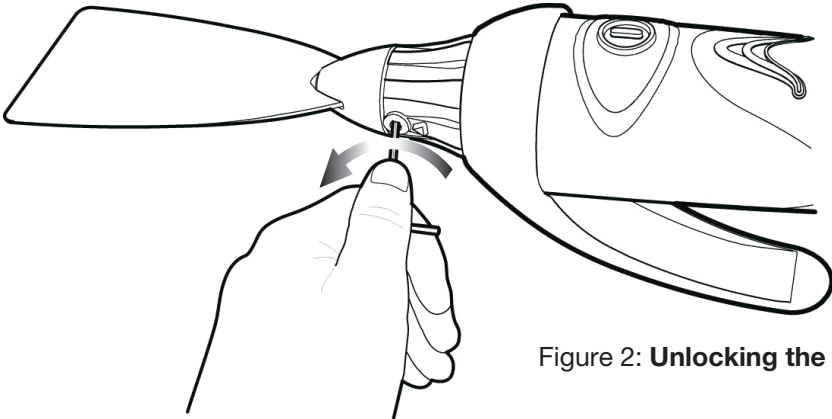


Figure 2: **Unlocking the Blade**

To change the blade take the 2.5mm Allen Key supplied with your Waveblade and insert into the hole in the side of the blade retention collar and locate the locking screw.

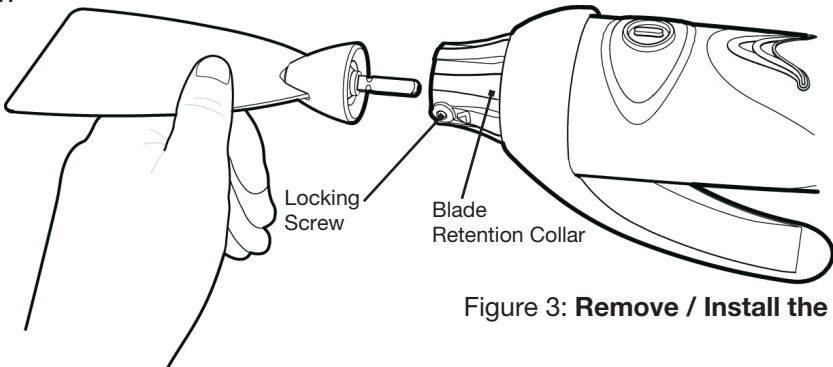


Figure 3: **Remove / Install the Blade**

To release the blade turn the Allen key 3 complete turns anti clockwise. **Do not wind further than this as you could ultimately damage the blade retention collar.** Grip the base of the blade and pull it forward to disengage it from the front of the tool.

Take the replacement blade and holding it by the base, slide the blade shaft into the nose of the product and push fully home.

Note: If it is a 3" flat blade ensure that the flat face of the blade is sitting at 90° to the vertical axis of the knuckle guard. If the ½ round curved blade is to be installed ensure the bottom of the curve points downwards in the same direction as the knuckle guard.

When the blade is fully home turn the Allen key 3 complete turns clockwise to tighten the locking screw. **Do not over tighten the locking screw or you could ultimately damage the blade retention collar.** It only needs to be finger tight. Check to see if the blade is firmly locked in position before you switch on the tool.

Remember to remove the Allen key before reconnecting the power and store safely.



Replacing the Front Seal Protective Foam Boot

Below the blade retention collar sits the front diaphragm seal. This is main water tight seal for the front end of the tool and to protect it, it is covered by an open cell foam boot.

Before using the tool this foam boot should be checked for signs of damage and periodically it should be replaced. Replacement will be dependant upon usage and maintenance care (see section on maintenance).



Figure 4: **Front Diaphragm Seal Protective Foam Boot**

To replace the foam boot, follow the procedure for removing the blade as detailed above. With the blade removed slide the blade retention collar forward off the main shaft of the tool. This will expose the foam boot. Gently roll the foam boot off the shaft which will expose the front diaphragm seal. Take a new WaveCraft approved replacement foam boot and slide it over the front diaphragm seal ensuring that it is pushed fully home into the recess in the front of the knuckle guard. With the foam boot in position slide the blade retention collar back over it. You know when the blade retention collar is in position when the front edge of the shaft is sitting flush with the front face of the locking retention collar. Replace the blade as detailed above.

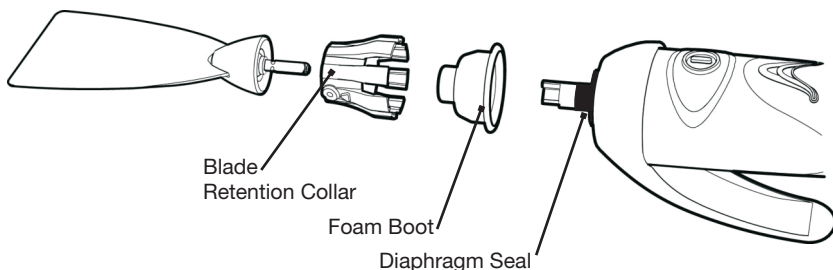


Figure 5: **Inspect the Diaphragm Seal for Signs of Damage**



Connecting to the 12Vdc Power

To connect the tool to the 12Vdc supply firstly remove the closing cap from the end of the protective boot and slide the boot back revealing the 12Vdc Plug Connector.

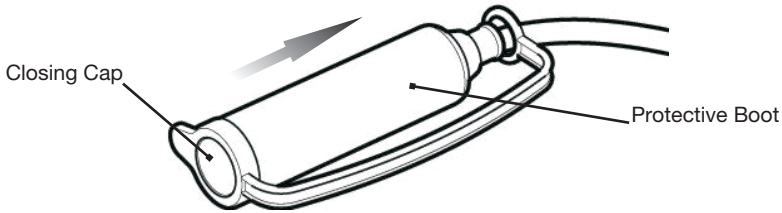


Figure 6: **12Vdc Plug Connector Protective Boot with Closing Cap in Closed Position**

Locate the nearest 12Vdc power socket (cigar lighter or similar) and push the 12Vdc plug connector firmly home into the socket to the stop position. The LED will illuminate red to indicate live power. The supply must be fused and the fuse must be rated 10 Amp or less.

Power will now be fed to the tool so take care not to inadvertently press the on/off switch on the main body of the tool as the blade will immediately start to vibrate.

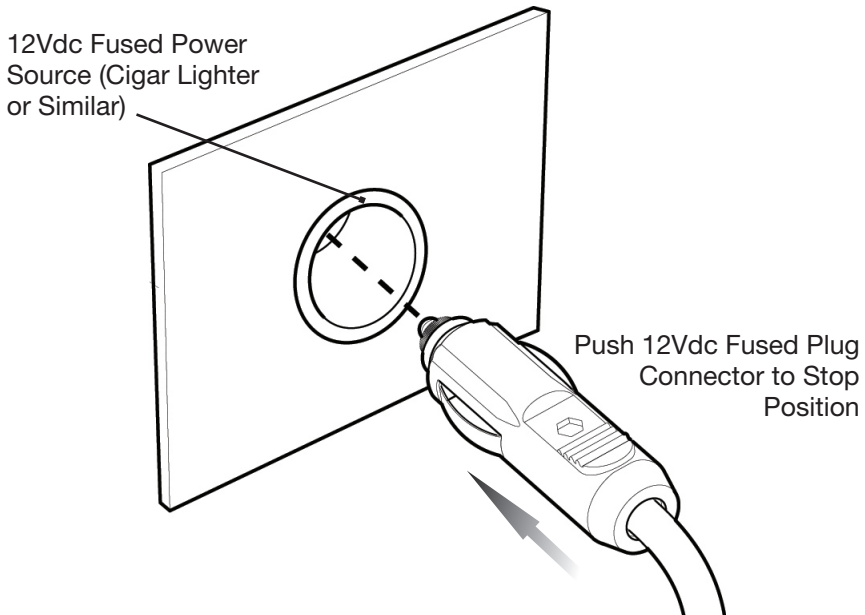


Figure 7: **Power Supply Connection**

OPERATION

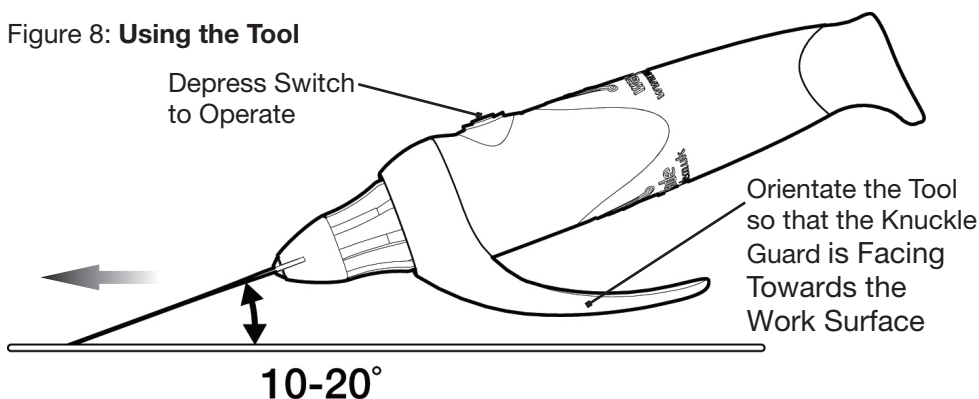
Using the tool

Pressing the switch operates the tool. This activates an internal switch, causing the motor to run and vibrate the blade.

The high-speed oscillation of the blade will remove marine fouling as it slides along the surface. **No force or pushing action is required** to remove fouling; undue force or pushing can cause damage to the motor or to the surface of the workpiece and reduce the life of the tool.

The motor is protected from overheating by an internal thermal switch. Should the motor become too hot the switch will operate and stop the motor until the internal temperature has dropped to a safe value. When the motor has cooled operation will then again be possible. The tool has been designed for short-time operation, followed by a cooling time. The body of the tool and knuckle guard may become warm during normal use.

Figure 8: **Using the Tool**



1. Offer tool to the work surface at a typical angle of 10-20 with the knuckle guard facing towards the work surface, but do not touch the blade on the work surface.
2. Depress switch to activate the blade.
3. Slide tool steadily forward along the surface.
4. Follow the action of the blade.
5. Let the blade vibration do the work.
6. Reduce the force on the tool if it slows down.
7. **Waveblade should not be use continuously for periods exceeding 30 minutes.** Ideally it should have an intermittent duty cycle of 1 minute on 10 seconds off.



Do Not!

Do not jam the blade against fixed obstructions, such as metal fixings

Do not force the blade.

Do not dig the blade into the surface or marine growth

Do not stab the blade at the growth

Do not use blade to lever growth from surface.

Do not point tool at any person.

Do not use for any purpose other than removing marine growth.

Do not operate with the knuckle guard removed.

Do not run the tool continuously for more than 30 minutes.

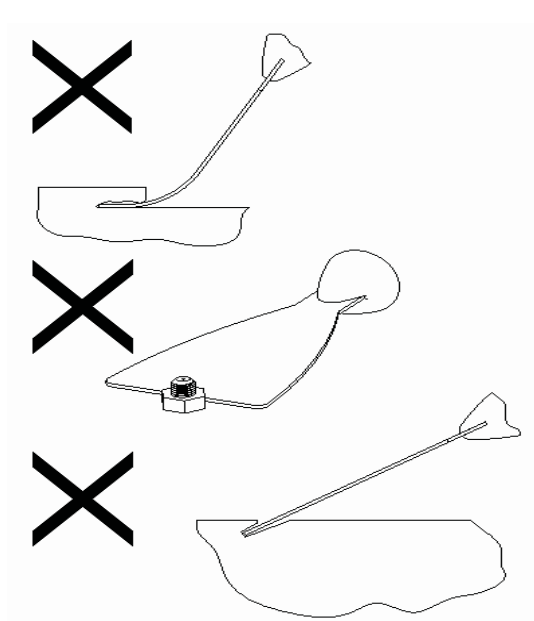


Figure 9: **How Not to Use the Tool**

MAINTENANCE

The tool is a sealed unit and not repairable by the user, it does not require internal maintenance; however we do recommend regular checks for damage and regular cleaning. Store in a cool dry environment to preserve the tool's parts.

The only user maintenance required is to keep the tool clean and the blade free from damage.

Before cleaning ensure that the tool is disconnected from the 12Vdc power supply.

The removal of marine debris from the tool is essential after use and before storage. The use of a non-pressurised water source, soft brush etc is advised. Marine fouling residue must be removed from the blade and slots in the blade retention collar in order to keep the area around the front diaphragm seal clean & free from debris & damage. To assist in cleaning this area it may be beneficial to remove the blade and blade retention collar prior to cleaning.

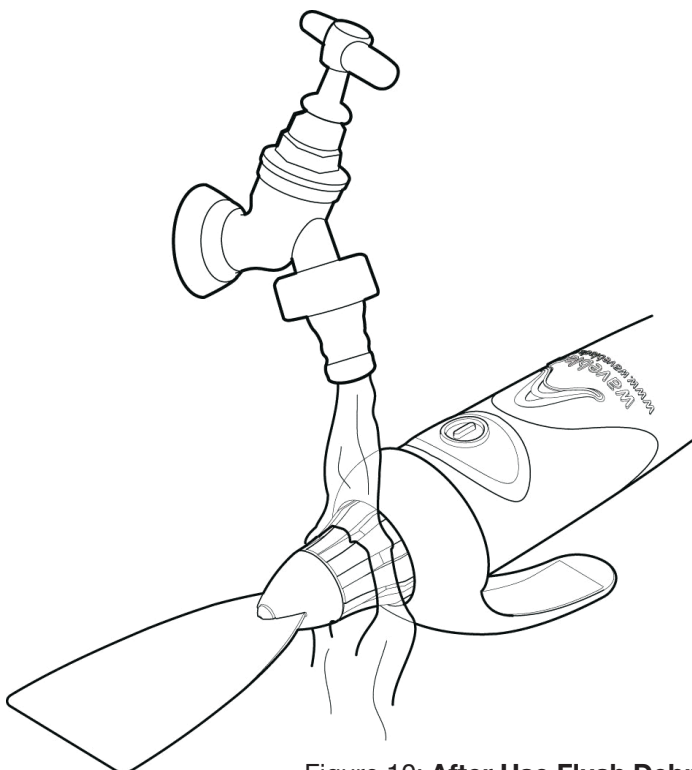


Figure 10: After Use Flush Debris from the Blade Retention Collar

Never operate the tool with a damaged front diaphragm seal. Return it to your dealer.

Clean the outside of the tool with a dry cloth.

Store in a cool dry environment to prevent corrosion and preserve the life of the tool.

While the tool is not in use always ensure that the 12Vdc plug connector is sitting within the protective boot and the closing end cap is firmly in place.

To change the fuse in the 12Vdc plug connector unscrew the knurled ring at the front of the connector which surrounds the sprung plunger. Carefully withdraw the plunger assembly and remove the fuse. Replace with a new 10A fuse and screw the plunger assembly back into position. Plug the 12Vdc plug connector into the socket and ensure that the red LED has illuminated signifying power is running to the tool.

Repairs are only to be carried out by a WaveCraft Limited authorised service centre. Visit www.waveblade.co.uk to locate your nearest service centre. Unauthorised repairs may result in considerable danger to the user.



Fault Finding

If the Waveblade should fail to operate it could be caused by several possibilities. Before assuming that the tool is faulty, check the following:

1. Has the fuse blown in the supply? Check the 12Vdc plug connector by plugging in another known working device such as a spotlight.
2. Has the fuse blown in the 12Vdc plug connector? The red LED should illuminate when the connector is plugged into the socket. To change the fuse unscrew the knurled ring at the front of the connector which surrounds the sprung plunger. Carefully withdraw the plunger assembly and remove the fuse. Replace with a new 10A fuse and screw the plunger assembly back into position.
3. Check that the power from the source is active.
4. Check that the 12Vdc plug connector is pushed fully home into the socket.
5. Check the fuse in the 12Vdc plug connector on the end of the 45' long operating cable. (instructions on how to change fuse, if used, depends on plug)
6. If the tool was working then it stopped; this could be due to the tool being too hot. Unplug the 12Vdc plug connector and allow the tool to cool, and then retry. The tool has an over-temperature switch that will turn the tool off if it gets hot; it can take 30 minutes to 1 hour for the tool to cool and the switch to become operational.
7. If the tool is not effective in removing barnacles and marine growth check that the blade is correctly fitted and not loose.

- 8. Do not force the tool against barnacles and other marine growth. Force reduces the effectiveness of the tool and can give the appearance of a faulty tool.
- 9. If this product has been subjected to improper or inappropriate handling, abuse, or interventions not carried out by an authorised service centre, the tool will not operate correctly and the warranty will be considered void.




The packaging is made entirely of recyclable materials, which you may dispose of at local recycling facilities.

Do not dispose of electrical appliances in household waste. In accordance with European Directive 2002/96/EC on used electrical and electronic appliances and its implementation in national law. Used power tools must be collected separately and recycled to comply with local regulations, in an ecologically compatible manner.

Information on options for disposing of electrical appliances after their useful life can be obtained from your local or city council.

The marine growths removed from boats may contain anti-fouling agents. Please dispose of correctly in accordance with your local guidelines/ byelaws / legal and accepted practices.

Technical Data

Model No: WB12DC001	Waveblade 12Vdc Corded
Manufacturer	WaveCraft Limited (Manufactured in China)
Address	PO Box 1961, Dubai, United Arab Emirates
Classification - Protection against electric shock	Class III
Classification - Protection against moisture	 Waterproof tool to IP68.
The two water drops are the international symbol for watertight construction. That is the tool is suitable to use in wet conditions. The tool is designed to be hose cleaned (not pressurised) and can cope with splashing and submersion for short periods.	
Intended use of tool	To remove barnacles and marine growth from the surfaces of pleasure craft.

Supply voltage rating - 12.0 Vdc Nominal
To be supplied via the supplied 13.7 meter (45 feet) specially designed Waveblade cable. Shorter cables are not to be used. Supply to be fuses at a current of 10 Amps or less.




n₀ Rated Idle Running Speed 4,000 CPM

Nominal power rating - 37.2 Watts
Tool is not loaded by removal of barnacles

Intermittent duty cycle - 1 minute on 10 seconds off.
Tool to run for a maximum time of 30 minutes, followed by an off time, that is the tool not running, sufficiently long to allow the tool to cool down approximately to room temperature.

Weight 2.6 kg

Sound pressure
Calculated sound pressure level L_{pA} 88.4 db(A)
Calculated sound power level L_{wA} 99.4 db(A)
Uncertainty K 3 db(A)

 
 Safety glasses and gloves are to be worn at all times while the tool is in use. The sound power level is high enough to warrant ear protection when the tool is in use. (Not supplied).

Vibration
Overall vibration values (vector sum of three directions) determined according to EN 60745-1: 2009.

Vibration value 9.950 m/s²
Uncertainty K 1.5 m/s²

The vibration emission level given in the table above have been measured in accordance with a standardised test given in EN 60745-1:2009. The vibration emission level will vary because of the way in which the tool can be used and may increase above the level given in this information sheet. This could lead to a significant underestimation of the level of exposure when the tool is used regularly in such a way. For recommended exposure limitations refer to BS EN ISO 5349-1:2001.

Declaration of Conformity / Producer

WaveCraft Limited, PO Box 1961, Dubai, United Arab Emirates, hereby declare that this product complies with the following EU directives and international standards:

EU Machinery Directive 2006/42/EC
EU Low Voltage Directive 2006/95/EC
EU WEEE Directive 2002/96/EC
EU RoHS Directive 2002/96/EC

BS EN 60745-1: 2006
BS EN 61000-6-3:2007
UL 745-1:2007
UL 745-2-36:2007
UL 745-3:2007
FCC CFR47 Part 15

Should you need to contact us regarding a specific part see below for details of the relevant part numbers:

Main Tool	Part Number
Waveblade 12 Vdc Corded V1	WB12DC001
Accessories	
3" Black Sprung Steel Blade	WBACC001-01
3" Stainless Steel Blade	WBACC002-01
Black Half Round Blade	WBACC003-01
Stainless Steel Half Round Blade	WBACC004-01
Black Flat Chisel Blade	WBACC005-01
Stainless Steel Flat Chisel Blade	WBACC006-01
3" Black Sprung Steel Delicate Surface Blade	WBACC007-01
3" Stainless Steel Delicate Surface Blade	WBACC008-01
Replacement Locking Collar	WBACC009-01
Front Seal Protective Foam Boot	WBACC010-01
Fuses	WBACC011-01
Safety Gloves	WBACC012-01
Safety Glasses	WBACC013-01
Operating Instructions	WBACC014-01
Waveblade Carry Bag	WBACC015-01

Guarantee

WaveCraft Limited tools carry a guarantee for 12 months from the date of purchase. Your Waveblade has been carefully manufactured and meticulously checked before delivery.

Please keep your receipt as proof of purchase.

Contact your authorised service centre, details of which can be found at www.waveblade.com, in case of questions pertaining to the warranty. This warranty applies only to the initial purchaser and is non-transferable.

This warranty covers against defective material or workmanship and not normal wear or damage to fragile parts such as switches and on condition that it has been used for private purposes and not commercial use.

If this product has been subjected to improper or inappropriate handling, abuse, or interventions not carried out by an authorised service centre, the warranty will be considered void.

This warranty does not affect your statutory rights.

Patented Wave Technology

Patent & Copyright Notice Waveblade is covered by a number of international patent rights, intellectual property rights and trade secrets. These rights take the form of both granted and pending patents, copyright, trade secrets and registered designs. All rights are reserved. This product may not be copied, disassembled, reproduced or tampered with. Inquiries in regard to the Intellectual Property in regard to this product can be addressed to info@waveblade.com. Wave Craft Limited maintain vigilance in regard to copies and infringement of their rights and will seek to prosecute to the full extent permitted by law any infringements of these rights

For distribution information please visit:

www.waveblade.com

or email: info@waveblade.com

Subject to change without notice.

Please check our website www.waveblade.com for updates to these instructions.
