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RAMMER

**BR68, BT1000, BT1400, BT1600
OWNER'S MANUAL**



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SAFETY PRECAUTIONS



DANGER **EXPLOSION HAZARD**

Never operate the machine in an explosive atmosphere, near combustible materials, or where ventilation does not clear exhaust fumes.



WARNING **BURN HAZARD**

Never come into contact with the engine or muffler when engine is operating or shortly after it is turned off. Serious burns may occur.



CAUTION **ROTATING HAZARD**

Never place hands or feet inside safety guard rings. Serious injury will result from contact with rotating blades.



CAUTION **MOVING PARTS**

Before starting the machine, ensure that all guards and safety devices are in place and functioning properly.



ATTENTION **READ OWNER'S MANUAL**

Read and understand owner's manual before using this machine. Failure to follow operating instructions could result in serious injury or death.

Personal Protective Equipment (PPE)



Hearing Protection

Wear earplugs or ear muffs to protect hearing from potentially damaging noise levels



Eye Protection

Wear eye protection to protect eyes from blowing dust and flying debris



Safety Footwear

Wear safety footwear to protect feet from falling objects, compression and punctures or cuts from surrounding and below



Hand Protection

Wear heavy or padded gloves to protect hands and arms from harmful effects of vibration

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INTRODUCTION

The Bartell tamping rammer is designed to give strong impact power despite its compact and lightweight class. It is used to compress various types of soil. This machine serves as the front line to pound loose soil to achieve the required compact density ratio for further construction work.

DEFINITION OF TAMPING RAMMER

A tamping rammer is a compaction machine that moves at a regulated frequency in a predominantly vertical direction by an explosion pressure so as to produce a high impact force to achieve high-density ratio of the compacted material.

STRUCTURE

This machine can be split into two distinct components, the upper body and lower body. The upper component consists of the Power Source, Clutch, Connecting Rod, Operating Handle and Fuel Tank that connects through the Shock Absorbing Rubber to the body. The bottom component consists of Spring Cylinder (Sliding part), Foot and Bellows that covers the sliding part.

POWER TRANSMISSION

An air-cooled 4-stroke single cylinder gasoline engine is used as the power source for these machines. The engine produces a rotary motion to the shaft that is copulated to the centrifugal clutch.

The centrifugal clutch engages by running up the engine. Once it is engaged, power is transmitted to the pinion, which in turn causes the gear to rotate. Henceforth, the reduction in rpm is achieved. The gear is connected to a crankshaft, which converts the rotary motion into a back and forth linear motion for the connecting rod. This action causes a compressive force to the pairs of strong coil-springs between the ground and the connecting rod. Hence, the tamping action begins. The weight of the machine and strong compressive spring force synergistically produce powerful impact force at the foot.

APPLICATIONS

The tamping rammer is lightweight and small in size, yet able to deliver a strong impact force. The machine's usage can be categorized as the following:

A. Construction

- Compaction of backfill around foundation and forms
- Compaction of sub-grades underneath footings
- Base preparation for concrete work such as slabs, curbs and gutters.

B. Utilities

- Base preparation for pipelines
- Compaction around and over pipelines

- Compaction of cable and pipe trenches around utility poles
- C. Municipalities**
 - Base preparation for repair work on streets, highways and sidewalks

WARNING FOR INCORRECT APPLICATIONS AND ABUSE

Please do not use the rammer in the following cases. Using the machine while unbalanced may injure the user or cause damage to the machine or environment.

- A.** Pile foundation
- B.** Hard soil, excessively compacted over normal conditions
- C.** Steep banked slope

GENERAL INFORMATION

Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.

YOUR WARRANTY IS VOIDED if you do not put engine oil in the Engine's crankcase prior to its first use.

- **Never run the Engine with low or no engine oil.**
- **Running the Engine with low or no engine oil WILL permanently damage the Engine.**

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPORTANT SAFETY INFORMATION

In this manual, a grey box is used to alert you to potential personal injury hazards. Obey all safety messages in this manual to avoid possible injury or death.

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: used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION: used without the safety alert symbol is used to address practices not related to personal injury.

NOTICE: is used to address practices not related to personal injury.

GENERAL SAFETY RULES

WARNING: Read all instructions. Failure to follow all instructions listed below may result in serious injury.

SAVE THESE INSTRUCTIONS

WORK AREA SAFETY

- Keep work area clean and well lit. Cluttered or dark areas invite accidents.
- Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Power tools create sparks which may ignite the dust or fumes.
- Keep children and bystanders away while operating a power tool. Distractions can cause you to lose control.

PERSONAL SAFETY

- Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.
- Use safety equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- Avoid accidental starting. Ensure the switch is in the off-position when the unit is not in use. Carrying power tools with your finger on the switch or plugging in power tools that have the switch on invites accidents.
- Remove any adjusting key or wrench before turning the power tool on. A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
- Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool in unexpected situations.
- Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.

POWER TOOL USE AND CARE

- Do not force the power tool. Use the correct power tool for your application. The correct power tool will do the job better and safer at the rate for which it was designed.
- Do not use the power tool if the switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.

- Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tools operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.
- Use the power tool in accordance with these instructions and in the manner intended for the particular type of power tool, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation.

SERVICE

- Have your power tool services by a qualified repair person using only identical replacement parts. This will ensure that the safety of the power tool is maintained.

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SPECIFIC SAFETY RULES

SPECIFIC SAFETY RULES

1. Using an engine indoors CAN KILL YOU IN MINUTES. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell. NEVER use inside a home or garage, EVEN IF doors and windows are open. Only use OUTSIDE and far away from windows, doors, and vents.
2. Fire and explosion **HAZARD!** Do not fill while engine running or hot, while smoking, or if damaged. Do not overfill.
3. Hold securely with both hands on proper handle locations. Creates strong forces during operation. Pregnant women or infirm persons should consult physician before use.
4. Keep children away during use. Store out of reach of children with engine switch and fuel lever turned off.
5. Wear steel-toed work boots, ANSI-approved safety goggles, dust mask, ear protection, and heavy-duty work gloves during use.
6. Keep out from under base.
7. Move carefully and securely in upright position. Refer to manual for details. Rammer extremely top heavy.
8. Maintain labels and nameplates on the tool. These carry important safety information.
9. The Spring Retaining Base Plate retains heavy springs under compression. When removing the Base Plate, follow the instructions in the "Maintenance" section of this manual carefully to avoid serious personal injury.
10. Never perform service or repairs on the Rammer while it is running. Always stop the engine and remove the spark plug to prevent accidental starting.
11. Make sure all safety guards are in place and in proper working condition.
12. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure. In addition, people with pacemakers should adhere to the following: Caution is necessary when near the magneto, spark plug, and park plug wire or a running engine. The engine should always be off if adjustments are to be made.
13. The warnings, precautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.



This safety alert symbol identifies important safety messages throughout this manual. Please read carefully and follow instructions when this symbol appears.

SAFETY SYMBOLS FOUND ON MACHINE

Decals can be found on the machine itself. All decals indicate important safety instructions and reminders that the user must follow before and during handling the machine. Following the instructions on the decals is not sufficient; it is still necessary for the user to read through the entire user manual and undergo proper training before handling the machine.

Below are the safety symbols that can be found on the machine:



CAUTION

- READ OWNER'S SERVICE MANUAL BEFORE OPERATING OR SERVICING THIS MACHINE
- ALWAYS KEEP UNAUTHORIZED, INEXPERIENCED, UNTRAINED PEOPLE AWAY FROM THIS MACHINE
- MAKE SURE ALL SAFETY DEVICES ARE OPERATIONAL BEFORE THIS MACHINE IS STARTED. MAKE SURE ENGINE IS TURNED OFF AND SPARK PLUG WIRE DISCONNECTED BEFORE SERVICING THE MACHINE OR COMING IN CONTACT WITH ANY MOVING PART. IF EQUIPMENT IS POWERED BY AN ELECTRIC MOTOR. DISCONNECT ELECTRICAL PLUG.
- NEVER LEAVE MACHINE UNATTENDED WHEN OPERATING. ALWAYS STOP ENGINE AND ALLOW ENGINE TO COOL BEFORE ADDING FUEL OR OIL.

OPERATOR QUALIFICATIONS

Carefully read and understand this entire manual before operating machine. Inexperience in operating any machine or attachment can be hazardous and may cause injury or even death in some cases. Trial and error is not the way to become familiar with a piece of equipment and this can be dangerous, expensive, shorten equipment life and create machine downtime. Whenever possible, an experienced operator should be the best person to operate this machine. It is best that new operators of this machine be trained by an experienced user before operating it on his/her own.

STARTING SAFETY

Start and operate only in well-ventilated environments. Exhaust fumes contain poisonous gas that can cause loss of consciousness, injury, or death if inhaled in excessive amounts.

OPERATING SAFETY

This machine must be handled with precaution to ensure the safety of the user, the environment, and surrounding people. Extra care must be exercised to ensure safety and high quality work.



Safety Recommendations

- Know how to stop the engine quickly and understand how to operate all of the controls. Never permit anyone to operate the machine without proper instruction.
- Do not operate under the influence of alcohol and/or medication that can cause drowsiness.
- Keep children and pets away from the machine when it is in operation.
- Stay away from rotating and moving parts while the engine is running.
- A spark arrester is provided as an optional part for this engine. It is illegal in some areas to operate the engine without a spark arrester. Check local law and regulations before operating the engine.
- Work according to the rules and regulation of the work area.
- Work at a safe and comfortable distance from the foot plate.

SERVICING SAFETY

It is necessary to service and maintain your machine regularly so as to ensure safe usage of the machine. Regular service maintenance can help to prolong machine lifespan, reducing machine cost in your project and increasing profit from your investment.



Preventing Fires

- Never add fuel to the fuel tank while the engine is running.

- Wipe away all fuel spills with a clean cloth. Keep gasoline, kerosene, matches, and other explosive inflammables away from the engine, because the temperature around the exhaust muffler is very high during operation.
- Operate the engine on as level a surface as possible. The allowable inclination of the engine for continuous use is 20 degrees. There may be fuel spillage and/or lube oil pressure problems if the engine is tilted beyond that limit.
- Do not put the engine or the engine-mounted machinery indoors while the engine is still hot.



Preventing Burns

- Never touch the muffler, muffler cover or engine body while engine is running or hot.



Preventing Injury

- Use the correct tools and equipment.
- Adopt correct posture while carrying heavy load or lifting the machine.
- Adopt correct position to service the machine.
- Dispose or contain the waste engine and rammer lube properly. Wipe clean the work area if lube is spilled on the ground. A slippery work area is dangerous.

ENGINE SAFETY

Please refer to the engine's operation manual.

SHUTDOWN SAFETY

Emergency Shutdown:

An "ON" "OFF" switch can be found on the engine. To stop the machine immediately, toggle the switch from the "ON" position to the "OFF" position.

Normal Shutdown:

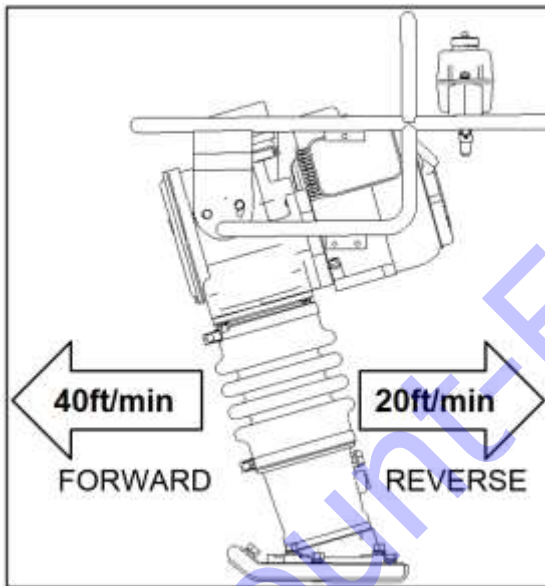
Move throttle quickly from OPERATING position to IDLE position and run engine for 3 to 5 minutes at low speed to allow it to cool. After the engine is cool, it can be turned off in one of two ways:

1. Toggle the switch on the engine to the "OFF" position.
2. Close the fuel valve.

SPECIFICATIONS

TAMPING RAMMER SPECIFICATIONS

	Model	BT1000H / (HF)	BT1400H / (HF)	BT1600H / (HF)	BT1600YD
<i>Dimensions</i>	Overall Length in. (mm)	26.8" (680)	28.3" (720)	28.3" (720)	28.3" (720)
	Overall Width in. (mm)	13.8" (350)	16.3" (415)	16.3" (415)	16.3" (415)
	Overall Height in. (mm)	40.6" (1030)	41.1" (1045)	41.1" (1045)	41.1" (1045)
	Plate Size (WxL) in. (mm)	9.8"x9.8" (250x250)	11"x11.8" (280x300)	11"x11.8" (280x300)	11"x11.8" (280x300)
<i>Weight</i>	Operating Weight lb (kg)	142lb (64kg)	164lb (74kg)	168lb (76kg)	172lb (78kg)
<i>Performance</i>	Jumping Stroke in. (mm)	1.2 - 2.8 (30 - 70)	1.2 - 2.8 (30 - 70)	1.2 - 2.8 (30 - 70)	2.0 - 3.0 (50 - 75)
	Impact Force lbf (kN (kgf))	2205 (9.8 (1000))	3080 (13.7 (1400))	3530 (15.7 (1600))	3530 (15.7 (1600))
	Impact Frequency	600 - 695 per minute	600 - 695 per minute	600 - 695 per minute	640 - 680 per minute
<i>Power</i>	Manufacturer	Honda	Honda	Honda	Yanmar
	Model	GX100	GXR120	GXR120	L48
	Fuel Type	Petrol	Petrol	Petrol	Diesel
	Engine Performace HP (kW)	2.8 (2.1)	3.6 (2.7)	3.6 (2.7)	4.2 (3.1)
	at rpm	3600	3600	3600	3600
	Fuel Tank Capacity US qt. (L)	2.1 (2)	2.1 (2)	2.1 (2)	2.6 (2.5)
	Starting System	Recoil	Recoil	Recoil	Recoil



The recommended speed of advance and reverse while using this machine is 12m/min (40 ft/min) and 6m/min (20 ft/min) respectively.



CAUTION

Exercise caution while handling machine. Advancing or reversing too fast may result in foot injury.

IMPORTANT: This product requires oil and fuel to be added before starting. Attempting to start engine without oil WILL ruin the engine and void the warranty

NOTE: The engine's carburetor may need to be adjusted by a qualified mechanic for high-altitude use.

OPERATING INSTRUCTIONS

WARNING: Risk of accidental starting; resulting in serious personal injury. Turn the Fuel Valve of the tool to its "OFF" position and remove the spark plug before making any adjustments to the tool.

Note: For additional information regarding the parts listed in the following pages, refer to the Assembly Diagram near the end of this manual.

Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text subheadings therein before set-up or use of this product.

RAMMER OPERATING PROCEDURE

It is necessary to be familiar with the operating procedure before handling the rammer. The procedure is as follows:

1. Pre-Check
2. Starting
3. Operating
4. Stopping

Below is a diagram that gives a general introduction to the machine parts.

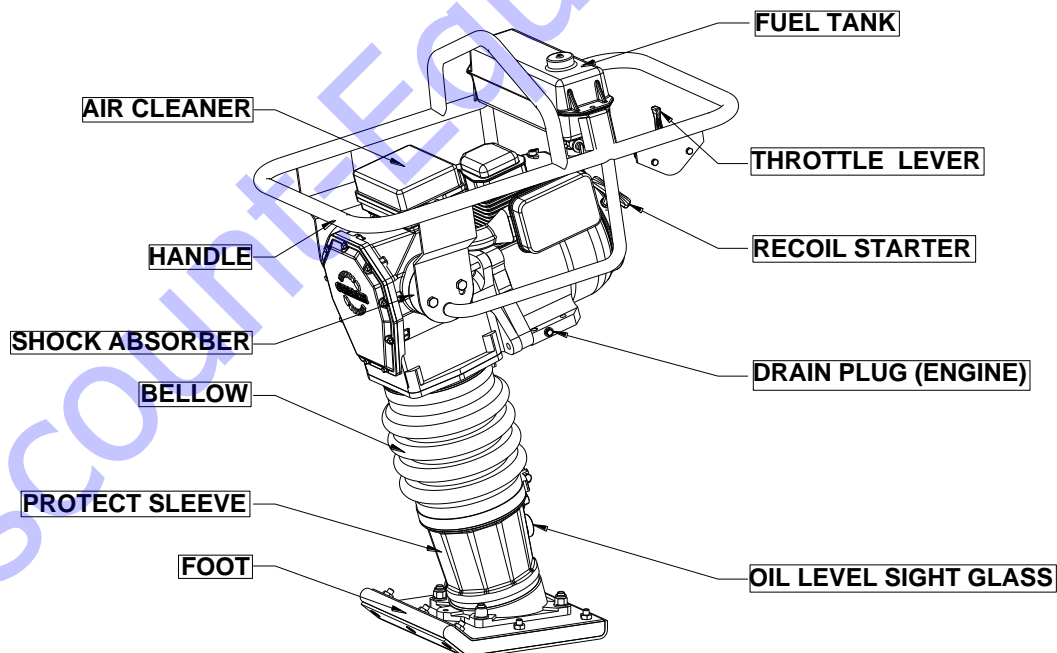


Figure A: Parts of Bartell Rammer

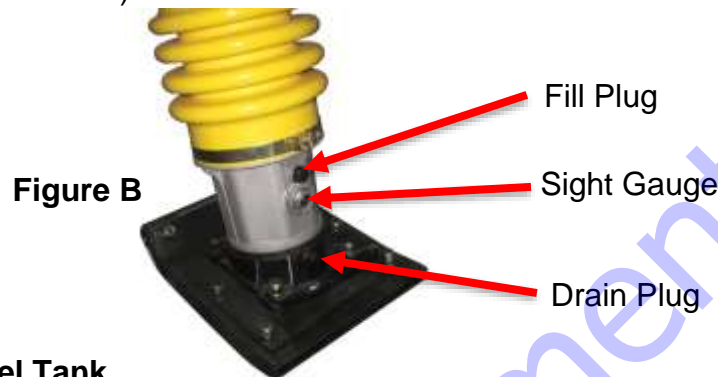
Figure A shows all the essential parts that the user must be familiar with before operating the rammer.

PRE-CHECK

Before starting up the rammer, it is necessary to check over the machine. Below is a list of items to check before starting:

1. Rammer Gearbox and Spring Cylinder

- a. Gearbox and spring cylinder use oil bath lubrication system. Check the oil level sight-gauge at the rear of the foot. If oil is not visible, add SAE 10W-30 oil (SAE 20W-50 for BR68).



2. Engine and Fuel Tank

- a. Use only automobile gasoline fuel. For first time usage of the machine, ensure that the fuel pipeline is filled with fuel and it passes through the carburetor to have a smooth start of the engine. Ensure cap is closed tight after filling fuel tank.
 - i. To fill the fuel tank, unscrew and remove the fuel tank cap. (**Figure C**)
 - ii. Fill the fuel tank with 3/4 gallon of unleaded gasoline. Avoid fuel spills.
 - iii. Wipe off any spilled fuel.
 - iv. Replace the fuel tank cap.



- b. Check the engine oil regularly before starting the engine. Move the engine to a vertical position and check the oil level from the oil level gauge (engine). Make sure that the oil level is about 800cc (0.8 L, 27 fl. oz.). **Use only 10W-30 grade oil or higher.**

- i. To add engine oil, unscrew and remove the oil dipstick.
- ii. Pour approximately 20 ounces (0.6 L) of engine oil into the oil receptacle. Do not overfill.
- iii. Screw the oil dipstick back into the oil receptacle.

Figure D

Oil Fill Port



CAUTION

- **NEVER** attempt to fill the fuel tank when the engine is running or hot.
- Do not smoke or allow flames or sparks in the area where engine is refueled or where fuel is stored.
- Do not overfill the fuel tank. If any fuel is spilled, make sure that the area is dry before starting the engine.
- The engine may be damaged if operated with insufficient oil. It is also dangerous to supply too much oil to the engine because a sudden increase in engine RPM may occur and the oil temperature will become dangerously high. Always check the oil level before starting the engine and refill if necessary.

3. Fasteners

- a. Check all nuts, bolts and fasteners for tightness. Retighten if necessary. Operating a damage to part(s), consequently shortening the lifespan of the machine.

4. Cleanliness

- a. Check for leakage of lube oil from the engine and protective sleeve. If there is leakage, wipe clean and start running for a few minutes. If the problem persists, refer to troubleshooting section.
- b. Clean the recoil starter and foot so that it is dirt free.
- c. Wipe the entire unit clean before operating.

5. Missing Parts

- a. Check for and replace missing parts. If parts are excessively worn, replace with new ones. Replace any missing or damaged Safety/Operation decals.



CAUTION

- Engine parts are hot after operation.
- If the machine needs to be restarted immediately after stopping, gloves should be worn to prevent burns.

STARTING

To start the rammer, follow the procedure below.

1. Open the fuel valve. (Figure E)



2. Set throttle lever to START position. In cold weather, choke should be closed fully. In warm weather or if the engine is warm, choke should be half or fully open. In case the engine fails to start, set the choke lever to the half open position.
3. Grip the recoil starter and pull gently until you feel a slight resistance, then allow the starter rope to rewind slowly. Then pull the starter handle with a rapid, full-arm stroke. Allow the starter rope to rewind slowly. If the engine fails to start, repeat the action.



CAUTION

Once the engine starts, **do not let go** of the handle immediately as this will cause it to snap back and damage the starter coil case. Release the handle slowly as the cord retracts into the starter case.

4. Once the engine has started, set the throttle lever to idle and slowly open the choke lever while listening to the sound of the engine. Be sure to perform a warm-up run for a period of 3 to 5 minutes at a low speed, while paying attention for fuel leakage or abnormal sounds.
5. If it is difficult to start the engine, remove the ignition plug and check the sparking performance. If the plug is soiled, or wet due to excessive fuel intake, clean it or replace the plug. With the ignition plug removed, pull the recoil starter handle two or three times to discharge excessive blended gas.



CAUTION

- When operating the Upright Rammer make sure to keep your feet clear from the Bottom Plate to avoid personal injury.
- Always use both hands when operating the Upright Rammer.
- Never operate the Upright Rammer on hard, unyielding surfaces to avoid damage to the machine.

OPERATING

Follow the steps below while operating the rammer.

1. Move the throttle lever quickly from IDLE to OPERATING position to start the tamping action.



CAUTION

DO NOT move the throttle lever **slowly** as this may cause damage to the clutch or spring and unstable performance of the Rammer may result.

2. After starting tamping action, adjust the jumping stroke motion to suit the soil conditions by lightly controlling the throttle lever. When the engine speed falls between the set values shown on the engine, your work can be carried out at the best efficiency and effectiveness.
3. When operating, guide the Rammer with both hands, but allow the machine to do the work. Bearing down on the handle is unnecessary and limits the bottom plate ramming action.
4. The tamping rammer is designed to tamp the ground at 600 to 695 times per minute (640 to 680 times per minute for diesel engine) at an engine speed of 3600 rpm. **Increasing the speed above the recommended rpm will not increase rammer effectiveness.** Impact force will actually decrease because a resonance is created rather than increasing the tamping effect. This resonance may damage the unit.
5. In cold weather, the oil in the machine becomes viscous and may cause greater resistance at the reciprocating part, resulting in irregular movement. Therefore, it is recommended to perform a warm-up run by moving the throttle lever from OPERATING to IDLE position quickly and continuously for several minutes before entering the work.
6. The soil-contacting surface of the foot is lined with a heat-treated metal sheet for extra strength. For compacting cobblestone, use soil to fill cracks so that the foot hits the surface uniformly.
7. Always guide the rammer so that the entire bottom plate, and not just the front or back edge, does the impacting.
8. The machine is designed to travel forward while tamping. To increase the travel speed, a slight back-pull to the handle is necessary so that the rear of the foot contacts the soil first, giving extra forward thrust to the rammer. On uneven surfaces or inclines, rocking the handle slightly may assist the rammer in moving forward.
9. As the soil becomes compacted, the jump height of the rammer will increase.

10. To stop tamping action, quickly move the throttle lever from OPERATING to IDLE position. Do not move the lever slowly as this can result in irregular motion and damage to the unit.



CAUTION

Wear gloves while operating machine to reduce fatigue caused by vibration.

STOPPING

1. Let the engine run for three minutes at idle speed to allow proper cooling before shutting down. This will allow proper cylinder lubrication.
2. After the engine is cooled down, close the fuel valve.
3. Pull the starter handle slowly and return the handle to its original position when resistance is felt. This action is necessary to prevent outside moist air from entering the carburetor chamber.

MAINTENANCE AND SERVICE



CAUTION

- **Flammable liquid** is used for this machine. No naked flames are allowed within a 6 m (20 ft) radius of the machine. Fire or explosion could result from flame, sparks, or if fuel is spilled on a hot engine.
- **Moving parts** are hazardous. Shut down the engine before performing any service or maintenance to the machine. Contact with moving parts can cause serious injury.
- **High temperature** of machine after operation. Allow machine and engine to cool before performing service or maintenance. Contact with hot component can cause serious burns.
- **Risk of serious personal injury from accidental starting.** Remove the sparkplug before performing any inspection, maintenance, or cleaning procedures. Damaged equipment can fail, causing serious personal injury.
- **Do not use damaged equipment.** If abnormal noise or vibration occurs, have the problem corrected before further use.

It is essential to do regular machine maintenance for safe usage and prolonged lifespan. Below is the breakdown of the service and maintenance procedure.

MAINTENANCE

• DAILY

- Remove oil and dirt thoroughly from the engine and control area.
- Clean or replace air filter as necessary.
- Check and retighten all fasteners as necessary.
- Check protective sleeve, bellow, and engine for oil leaks. Repair as needed.
- Remove element from pre-filter at the top of crankcase and clean it with air.

SERVICE

Refer to the engine owner's manual for engine maintenance and service procedures.

REPLACEMENT OF LUBRICANT (BODY)

- Remove the drain plug at the rear of the rammer foot and drain dirty oil. Refill with SAE 10W-30 oil (20W-50 for BR68) to the middle of the sight glass.
- The oil change interval is 50 hours after first operation. After that, oil should be changed following every 200 hours of use.

CLEANING THE AIR FILTER ELEMENT

- Air filter should be cleaned after every 200 to 300 hours of use.
- Remove the air filter element from the top of the crankcase.
- Use detergent solution to wash the element.
- Shake out excess moisture and dry the element.

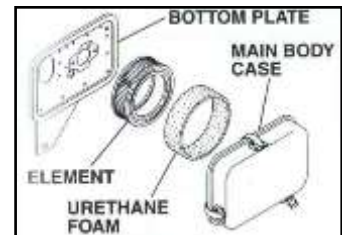


Table 2: Service Chart

		First Use	Each Use	After two weeks or 25 hours	Each 3 months or 100 hours	Each 6 months or 200 hours
GENERAL INSPECTION:						
Warning Stickers	Check		●			
Test Run	Check operation			●	●	●
ENGINE						
Air filter ¹	Check/Clean		●	●		
	Replace				●	●
Engine Oil ¹²	Check level		●			
	Change				●	●
Sparkplug ¹²	Check Gap/Clean			●	●	●
	Change					●
Muffler ¹²	Clean					●
Engine Fasteners	Check/Tighten	●		●		
RAMMER BODY						
Lube Oil	Check level		●			
	Change					●
Foot Plate Fasteners	Check/Tighten	●		●		
FUEL						
Fuel Tank	Check level		●			
Fuel Line and Accessories	Check		●			

1. Service more frequently in dusty conditions.
2. Refer to the engine owner's manual for servicing instructions and a detailed maintenance schedule. Some items should be serviced by your servicing dealer, unless you have the proper tools and are mechanically proficient. Refer to the Honda shop manual for service procedures.



CAUTION

All maintenance, service, and repairs not mentioned in this manual must only be performed by a qualified service technician.

TRANSPORTATION

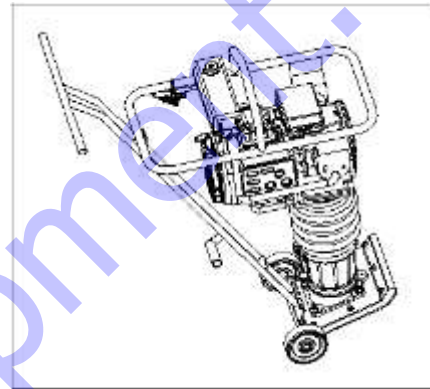
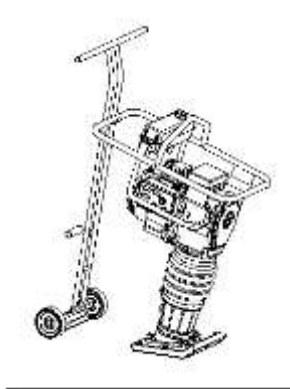
Transport rammer in the upright position. If machine must be laid down for transportation, fuel tank must be drained. Machine lays with muffler side down.



CAUTION

- The fuel filter is installed at the bottom of the fuel tank. Should the rammer be laid down, dirt from the fuel filter may enter the injection nozzle and fuel pump, causing damage.

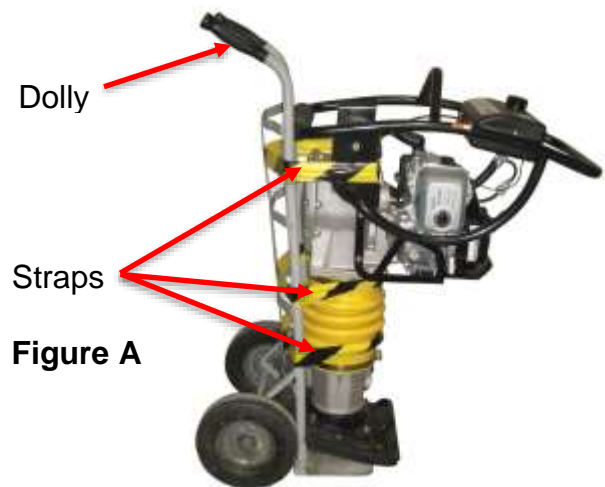
A transport dolly is an additional accessory that is used to transport the rammer short distances.



1. Hook the handle to the dolly's top hook.
2. Push the dolly forward and place the Rammer's footplate onto the dolly base plate.

3. With additional assistance, strap the Rammer to the dolly. Then carefully move the Rammer to the work location. **(See Figure A).**

Note: Straps and Dolly not included with Rammer



CAUTION

- The upright rammer is extremely top-heavy. Move carefully and securely in an upright position.

STORAGE

SHORT TERM (2 TO 3 DAYS)

Rammer should be stored on level ground. After the engine and machine have been cooled down, be sure to secure the rammer to avoid knocking it down. If the rammer has to be laid down, tighten the fuel tank cap and engine oil plug securely. After lying down, ensure there is no leak of fuel or oil. If fuel does leak, drain the tank.

LONG TERM (OVER 3 DAYS)

Drain the fuel from the tank, fuel line, and carburetor. Remove the sparkplug and pour a few drops of motor oil into the cylinder. Crank the engine three or four times so that the oil reaches all internal parts. Clean the exterior with a cloth soaked in clean oil. Cover the unit with a plastic sheet and store in a moisture and dust free location out of direct sunlight.

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TROUBLESHOOTING

A. Difficult to start

Fuel is available but plug does not ignite.	Power available at high tension code	Improper spark gap
		Ignition plug being bridged
		Carbon deposit at ignition plug
		Short circuit due to defective insulation
	Power NOT available at high tension code	Ignition coil defective
		Short circuit at stop button
	Compression normal	Air filter clogged
		Water or dust in fuel
		Inadequate fuel quality
		Inadequate mixed fuel quality
		Muffler clogged with carbon deposit
	Compression insufficient	Cylinder worn
Piston ring stuck		
Roughened valve seat		
Insufficient tightening of ignition plug		

Fuel not available at carburetor	Fuel filter clogged
	Air in the fuel pipe
	No fuel in tank
	Fuel valve not properly opened
	Tank cap air breather clogged

Recoil starter does not operate smoothly	Dust in rotating part
	Spiral spring failure

B. Operation not satisfactory

Not enough power available	Compression insufficient	Cylinder worn
		Piston ring stuck
		Roughened valve seat
		Insufficient tightening of ignition plug
	Compression normal, no misfire	Air in fuel pipe
		Air filter clogged
		Carbon deposit in cylinder
		Improper fuel level in carburetor float chamber
	Compression normal, misfire	Inadequate fuel
		Defective ignition coil
		Short circuits at ignition coil
		Ignition plug needs cleaning

Smoke coming out of muffler	Blue smoke	Compression is not available	Cylinder piston ring worn Piston ring damaged
		Compression is available	Mixed oil entered
			Oil too high
			Engine oil leaked into air filter (laid down in wrong position)
	Dark smoke	Choke lever not pushed back	
		Chamber needle worn	
	White smoke*	Moisture in fuel	*In cold weather, it is normal to see white smoke after starting up.
Air filter contains water			

Rotational speed fluctuates	Improper governor adjustment
	Governor spring is defective
	Defective fuel flow
	Air entering suction line

Engine overheating	Inadequate fuel mixing ratio or insufficient blending
	Excessive carbon in combustion chamber
	Exhaust or muffler clogged with carbon
	Improper ignition plug heat value

Engine rotates erratically or does not start	Clutch slip
	Excess oil
	Spring failure
	Improper engine speed setting
	Throttle lever is being adjusted to slowly

