

Item Number / Artikel-Nummer / Número de referencia / Numéro de référence :

0007567, 0007566

This manual is divided into the sections listed below:
 Diese Betriebsanleitung ist in folgende Kapitel eingeteilt:
 Este manual está compuesto por las siguientes secciones:
 Ce manuel contient les sections suivantes:

- 1A** Operation (*English*)
- 1B** Betrieb (*Deutsch*)
- 1C** Operación (*Español*)
- 1D** Opération (*Français*)
- 2** Machine Parts / Maschinenteile / Repuestos de la máquina / Pièces de la machine

 **WARNING**

Engine exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

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This manual provides information and procedures to safely operate and maintain this WACKER model. For your own safety and protection from injury, carefully read, understand and observe the safety instructions described in this manual. THE INFORMATION CONTAINED IN THIS MANUAL WAS BASED ON MACHINES IN PRODUCTION AT THE TIME OF PUBLICATION. WACKER CORPORATION RESERVES THE RIGHT TO CHANGE ANY PORTION OF THIS INFORMATION WITHOUT NOTICE.

Diese Betriebsanleitung enthält Informationen und Verfahren, um dieses WACKER Gerät sicher zu bedienen und zu warten. Für Ihre Sicherheit und zur Verhinderung von Verletzungen, diese Betriebsanleitung bitte genau durchlesen und die Angaben befolgen. DIE HIERIN ENTHALTENEN INFORMATIONEN SIND AKTUELL ZUM ZEITPUNKT DER VERÖFFENTLICHUNG. ÄNDERUNGSRECHT VORBEHALTEN.

Este manual contiene información y procedimientos que son necesarios para operar y mantener esta máquina WACKER. Para su propia seguridad y protección, lea por favor este manual cuidadosamente y observe todas las instrucciones de seguridad descritas en este manual. TODA LA INFORMACION EN ESTE MANUAL SE BASA EN MAQUINAS EN PRODUCCION VEGETE A PARTIR DE LA FECHA DE PUBLICACION. TODOS DERECHOS RESERVADOS POR WACKER CORPORACION.

Ce manuel fournit des informations et des procédures destinées à utiliser et à entretenir en toute sécurité cette machine WACKER. Pour votre propre sécurité et afin d'éviter tout accident, lisez, comprenez et respectez soigneusement les consignes de sécurité décrites dans ce manuel. LES INFORMATIONS CONTENUES DANS CE MANUEL SONT BASEES SUR LES MACHINES EN COURS DE PRODUCTION AU MOMENT DE LA PUBLICATION. WACKER CORPORATION SE RESERVE LE DROIT DE MODIFIER TOUTE PARTIE DE CES INFORMATIONS SANS PREAVIS.

Nameplate / Typenschild / Placa de Identificación / Plaque signalétique

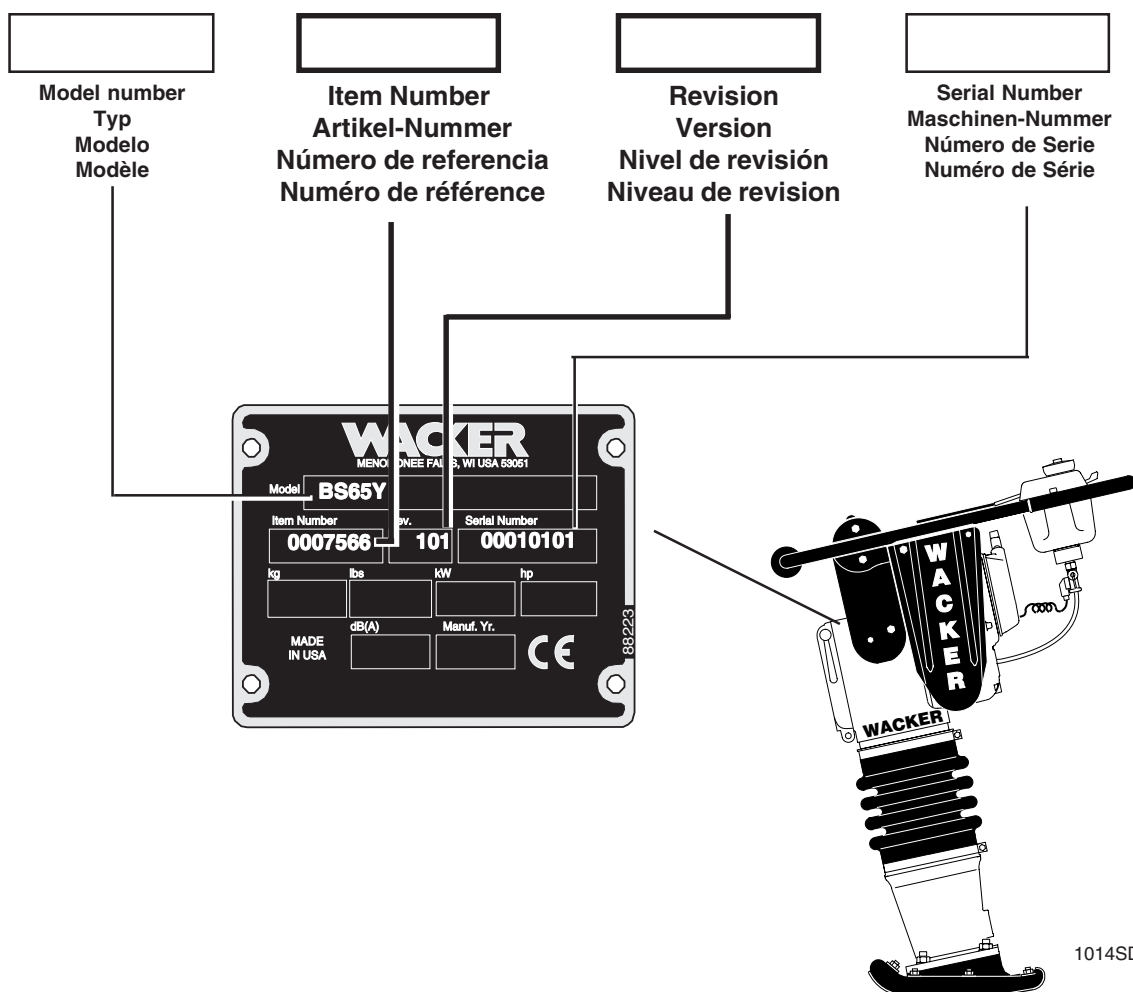
A nameplate listing the Model Number, Item Number, Revision, and Serial Number is attached to each unit. Please record the information found on this plate so it will be available should the nameplate become lost or damaged. **When ordering parts or requesting service information, you will always be asked to specify the model, item number, revision number, and serial number of the unit.**

Ein Typenschild mit Typ, Artikelnummer, Version und Maschinen-Nummer ist an jedem Gerät angebracht. Die Daten von diesem Schild bitte notieren, damit sie auch bei Verlust oder Beschädigung des Schildes noch vorhanden sind. **Der Typ, die Artikel-Nummer, die Versions-Nummer und die Maschinen-Nummer sind bei der Ersatzteilbestellung oder Nachfragen bezüglich Service-Informationen stets erforderlich.**

Una placa de identificación con el modelo, número de referencia, nivel de revisión y número de serie ha sido añadida en cada máquina. Favor de anotar los datos en la placa en caso de que la placa de identificación sea destruida o perdida. **En todos los pedidos para repuestos necesita siempre el modelo, el número de referencia, el nivel de revisión y el número de serie de la máquina en cuestión.**

Une plaque signalétique mentionnant le modèle, le numéro de référence, le niveau de révision et le numéro de série est fixée sur chaque machine. Veuillez noter les informations relevées sur cette plaque de façon à ce qu'elles soient toujours disponibles si la plaque signalétique venait à être perdue ou endommagée. **Lorsque vous commandez des pièces détachées ou vous sollicitez des informations auprès-vente, on vous demandera toujours de préciser le modèle, le numéro de référence, le niveau de révision et le numéro de série de la machine.**

*My machine's numbers are / Die Nummern meines Gerätes sind /
Los números de mi máquina son / Les numéros de ma machine sont :*



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This machine may be covered by one or more of the following patents:
 Dieses Gerät ist unter einem oder mehreren der folgenden Patente geschützt:
 Puede ser que las patentes a continuación sean válidas para esta máquina:
 Cette machine peut être protégée sous les brevets d'invention ci-dessous :

WACKER MACHINES PROTECTED BY ONE OR MORE
 OF THESE U.S. PATENTS:
 4643611; 4555238; 5564375; 5586630; 4419048

111891

PATENT PENDING

111845

Keep this manual or a copy of it with the machine. If you lose this manual or need an additional copy, please contact WACKER Corporation. This machine is built with user safety in mind, however, it can present hazards if improperly operated and serviced. Follow operating instructions carefully! If you have questions about operating or servicing this equipment, please contact WACKER Corporation.

Diese Betriebsvorschrift oder eine Kopie stets mit der Maschine aufbewahren. Weitere Kopien sind von WACKER Corporation erhältlich. Diese Maschine ist unter Betracht der Verbrauchersicherheit entwickelt, kann jedoch bei unfachgemäßem Gebrauch oder Wartung Gefahren darstellen. Die Vorschriften genauestens befolgen! Sollten Sie Fragen bezüglich Betrieb oder Service dieser Maschine haben, so steht WACKER Corporation Ihnen gerne zur Verfügung.

Mantenga este manual o una copia de el con la máquina. Si se pierde o si Ud. desea un ejemplar adicional, favor comunicarse con WACKER. Esta máquina fue fabricada con la seguridad del usuario en mente; sin embargo, situaciones peligrosas pueden presentarse si la máquina es utilizada o mantención es dada inapropiadamente. Siga las instrucciones de operación cuidadosamente. Si Ud. tiene preguntas acerca de la operación o mantención de este equipo, favor de comunicarse con WACKER CORPORATION.

Conserver ce manuel ou une copie de celui-ci avec la machine. Si vous perdez ce manuel ou que vous avez besoin d'un exemplaire supplémentaire, veuillez contacter WACKER Corporation. Cette machine est construite dans le soucis de la sécurité de l'utilisateur, elle peut cependant présenter des dangers si elle est utilisée et entretenue de façon incorrecte. Respectez attentivement les consignes d'utilisation ! Si vous avez des questions concernant l'utilisation ou l'entretien de cet équipement, veuillez contacter WACKER Corporation.

EMISSION CONTROL SYSTEM INFORMATION

Source of Emissions

The combustion process produces carbon monoxide, oxides of nitrogen, and hydrocarbons. Control of hydrocarbons and oxides of nitrogen is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

WACKER utilizes lean carburetor settings and other systems to reduce the emissions of carbon monoxide, oxides of nitrogen, and hydrocarbons.

The U.S. and California Clean Air Acts

EPA and California regulations require all manufacturers to furnish written instructions describing the operation and maintenance of emission control systems.

The following instructions and procedures must be followed in order to keep the emissions from your WACKER engine within the emissions standards.

Tampering and Altering

Tampering with or altering the emission control system may increase emissions beyond the legal limit. Among those acts that constitute tampering are:

- Removal or alteration of any part of the intake, fuel, or exhaust systems.
- Altering or defeating the speed-adjusting mechanism to cause the engine to operate outside its design parameters.

Problems That May Affect Emissions

If you are aware of any of the following symptoms, have your engine inspected and repaired by your servicing dealer.

- Hard starting or stalling after starting.
- Rough idle.
- Misfiring or backfiring under load.
- Afterburning (backfiring).
- Black exhaust smoke or high fuel consumption.

Replacement Parts

The emission control systems on your WACKER engine were designed, built, and certified to conform with EPA and California emissions regulations. We recommend the use of genuine WACKER parts whenever you have maintenance done. These original-design replacement parts are manufactured to the same standards as the original parts, so you can be confident of their performance. The use of replacement parts that are not of the original design and quality may impair the effectiveness of your emission control system.

A manufacturer of an aftermarket part assumes the responsibility that the part will not adversely affect emission performance. The manufacturer or rebuilder of the part must certify that use of the part will not result in a failure of the engine to comply with emission regulations.

Maintenance

Follow the maintenance schedule. Remember that this schedule is based on the assumption that your machine will be used for its designed purpose. Sustained high-load or high-temperature operation, or use in unusually wet or dusty conditions, will require more frequent service.

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 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. 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 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.

Emission Control System Warranty

Your new WACKER engine complies with the U.S. EPA emissions regulations. WACKER provides the same emission warranty coverage for engines sold in all 50 states.

YOUR WARRANTY RIGHTS AND OBLIGATIONS

All States

WACKER must warrant the emission control system on your engine for the period of time listed below provided there has been no abuse, neglect or improper maintenance of your engine. Where a warrantable condition exists, WACKER will repair your engine at no cost to you including diagnosis, parts and labor.

Your emission control system may include such parts as the carburetor, the ignition system and the catalytic converter. Also included may be hoses, connectors and other emission-related assemblies.

MANUFACTURER'S WARRANTY COVERAGE:

The 1998 and later engines are warranted for two years. If any emission-related part on your engine is defective, the part will be repaired or replaced by WACKER.

OWNER'S WARRANTY RESPONSIBILITY:

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. WACKER recommends that you retain all receipts covering maintenance on your engine, but WACKER cannot deny warranty coverage solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the engine owner, you should be aware that WACKER may deny you warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your engine to a WACKER dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact your local WACKER dealer.

WARRANTY COVERAGE:

WACKER engines sold after January 1, 1998, are covered by this Emission Control System Warranty for a period of two years from the date of delivery to the original retail purchaser. This warranty is transferable to each subsequent purchaser for the duration of the warranty period.

Warranty repairs will be made without charge for diagnosis, parts or labor. All defective parts replaced under this warranty become property of WACKER. A list of warranted parts is located on the next page. Normal maintenance items, such as spark plugs and filters, that are on the warranted parts list are warranted up to the required replacement interval only.

WACKER is also liable for damages to other engine components caused by a failure of any warranted parts during the warranty period.

Only WACKER approved replacement parts may be used in the performance of any warranty repairs and must be provided without charge to the owner. The use of replacement parts not equivalent to the original parts may impair the effectiveness of your engine emission control system. If such a replacement part is used in the repair or maintenance of your engine, and an authorized WACKER dealer determines it is defective or causes a failure of a warranted part, your claim for repair of your engine may be denied. If the part in question is not related to the reason your engine requires repair, your claim will not be denied.

TO OBTAIN WARRANTY SERVICE:

You must take your WACKER product along with proof of original purchase date, at your expense, to any WACKER authorized dealer during their normal business hours. Claims for repair or adjustment found to be caused solely by defects in material or workmanship will not be denied because the engine was not properly maintained and used.

EXCLUSIONS:

FAILURES OTHER THAN THOSE RESULTING FROM DEFECTS IN MATERIAL OR WORKMANSHIP ARE NOT COVERED BY THIS WARRANTY. THIS WARRANTY DOES NOT EXTEND TO EMISSION CONTROL SYSTEMS OR PARTS WHICH ARE AFFECTED OR DAMAGED BY OWNER ABUSE, NEGLIGENCE, IMPROPER MAINTENANCE, MISUSE, MISFUELING, IMPROPER STORAGE, ACCIDENT AND/OR COLLISION, THE INCORPORATION OF, OR ANY USE OF, ANY ADD-ON OR MODIFIED PARTS, UNSUITABLE ATTACHMENTS, OR THE UNAUTHORIZED ALTERATION OF ANY PART.

THIS WARRANTY DOES NOT COVER REPLACEMENT OF EXPENDABLE MAINTENANCE ITEMS MADE IN CONNECTION WITH REQUIRED MAINTENANCE SERVICES AFTER THE ITEM'S FIRST SCHEDULED REPLACEMENT AS LISTED IN THE MAINTENANCE SECTION OF THE PRODUCT OWNER'S MANUAL, SUCH AS SPARK PLUGS AND FILTERS.

DISCLAIMER OF CONSEQUENTIAL DAMAGE AND LIMITATIONS OF IMPLIED WARRANTIES:

WACKER DISCLAIMS ANY RESPONSIBILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES SUCH AS LOSS OF TIME OR THE USE OF THE POWER EQUIPMENT, OR ANY COMMERCIAL LOSS DUE TO THE FAILURE OF THE EQUIPMENT; AND ANY IMPLIED WARRANTIES ARE LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. THIS WARRANTY IS APPLICABLE ONLY WHERE THE U.S. EPA EMISSION CONTROL SYSTEM WARRANTY REGULATION IS IN EFFECT.

Emission Control System Warranty Parts

SYSTEMS COVERED BY THIS WARRANTY

FUEL METERING

EXHAUST SYSTEM

AIR INDUCTION

IGNITION

MISCELLANEOUS PARTS

PARTS DESCRIPTIONS

CARBURETOR ASSEMBLY

MUFFLER

AIR FILTER HOUSING
AIR FILTER ELEMENT*

FLYWHEEL MAGNETO
IGNITION MODULE
SPARK PLUG CAP
SPARK PLUG*

TUBING, FITTINGS, SEALS, GASKETS
AND CLAMPS ASSOCIATED
WITH THESE LISTED ITEMS

*** Indicates expendable maintenance items.**

1.1 Safety Information

This manual contains DANGER, WARNING, CAUTION, and NOTE callouts which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION: Used without the safety alert symbol, CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Note: *Contains additional information important to a procedure.*

Laws Pertaining to Spark Arresters

Notice: State Health Safety Codes and Public Resources Codes dictate when an engine must use a spark arrester. State codes will also specify that a spark arrester be rated by the United States Forest Service.

The correct spark arresting muffler for use on this machine is WACKER P/N 58406.

1.2 Operating Safety

Familiarity and proper training are required for the safe operation of equipment! Equipment operated improperly or by untrained personnel can be dangerous! Read the operating instructions and familiarize yourself with the location and proper use of all instruments and controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate the rammer.

WARNING

NEVER operate rammer in applications for which it is not intended.

NEVER allow improperly trained personnel to operate rammer.

NEVER use choke to stop engine.

NEVER touch hot muffler, engine cylinders, or cooling fins. Burns will result.

NEVER use accessories or attachments which are not recommended by WACKER for rammer. Damage to rammer and/or injury to user may result.

NEVER leave a running machine unattended.

ALWAYS read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.

ALWAYS be sure operator is familiar with proper safety precautions and operation techniques before using rammer.

ALWAYS wear protective clothing when operating rammer. For instance, goggles or safety glasses will protect against eye damage caused by flying debris, and wearing safety shoes will reduce the chance of foot injuries.

ALWAYS keep hands, feet, and loose clothing away from moving parts of rammer.

ALWAYS use common sense and caution when operating rammer.

ALWAYS be sure rammer will not tip over, roll, slide, or fall when not being operated.

ALWAYS turn engine OFF when rammer is not being operated.

ALWAYS close fuel valve when rammer is not being operated.

ALWAYS remove or disconnect engine spark plug before servicing rammer, to avoid accidental start-up.

1.3 Operator Safety while using Internal Combustion Engines

Internal combustion engines present special hazards during operation and fueling! Failure to follow the safety guidelines described below could result in severe injury or death.

 **DANGER**

NEVER smoke while operating rammer.

NEVER spill fuel when refueling engine.

NEVER smoke when refueling engine.

NEVER operate rammer near open flames.

NEVER refuel hot or running engine.

ALWAYS refill fuel tank in well-ventilated area.

NEVER refuel engine near open flame.

ALWAYS replace fuel tank cap after refueling.

1.4 Service Safety

Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

 **WARNING**

NEVER attempt to clean or service rammer while it is running.

ALWAYS replace safety devices and guards after repairs and maintenance.

NEVER operate equipment with safety devices or guards removed or not in working order.

ALWAYS keep area around muffler free of debris in order to reduce the chance of an accidental fire.

NEVER operate equipment without air cleaner.

ALWAYS do Periodic Maintenance as recommended in Operator's Manual.

NEVER remove air cleaner or air cleaner cover while operating rammer.

ALWAYS clean debris from engine cooling fins.

NEVER alter engine to run at speeds other than those specified in Technical Data Section.

ALWAYS replace worn or damaged components with spare parts designed and recommended by WACKER for servicing this rammer.

1.5 Technical Data

Engine speed - full	rpm	4500 ± 200
Engine speed - idle	rpm	1500 ± 100
Clutch engagement	rpm	2800 ± 100
Cylinder head compression-cold	psi (kg/cm ²)	120–140 (8.0–9.7)
Spark plug - Gap	in. (mm)	Champion RL86C: 0.035 (0.8–0.9) Bosch WR 8 AC: 0.02 (0.5) P/N 48333
Engine Lubrication	oil grade	Two-cycle or outboard motor oil conforming to BIA-TC-W specifications - ratio 50:1 Note: Use 25:1 for first tank of fuel.
Ramming System Lubrication	oil grade oz. (ml)	SAE 30 25 (750)

Sound and Vibration Measurements

The required sound specifications, per Appendix 1, Paragraph 1.7.4.f of the EC-Machine Regulations, are:

- the sound pressure level at operator's location (L_{pA}) = 93 dB(A)
- the sound power level (L_{WA}) = 104 dB(A)

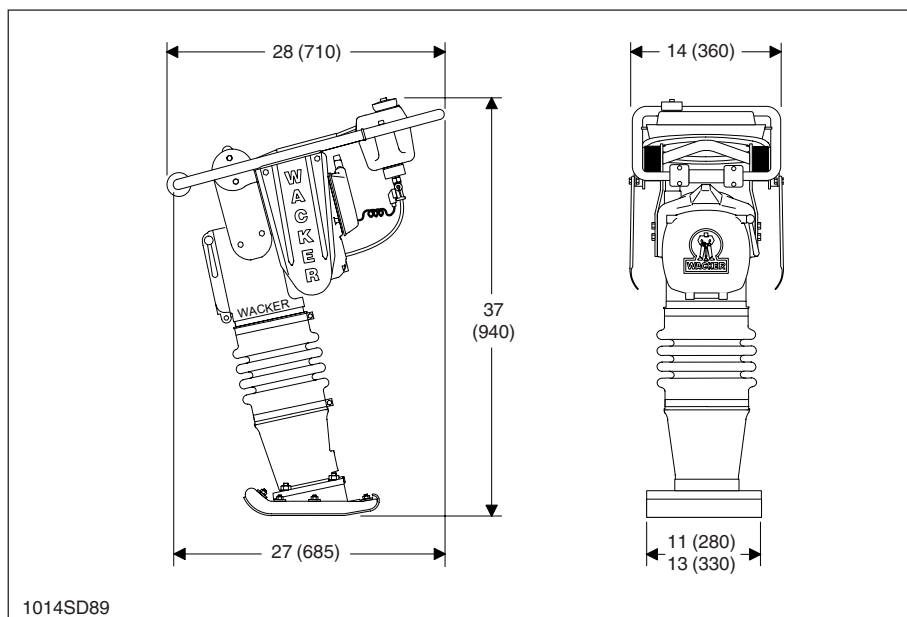
These sound values were determined according to ISO 3744 for the sound power level (L_{WA}) and ISO 6081 for the sound pressure level (L_{pA}) at the operator's location.

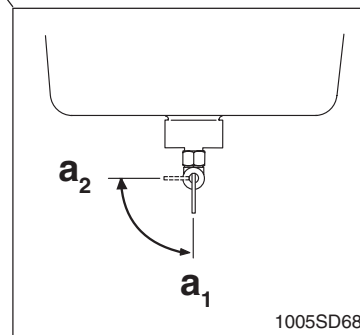
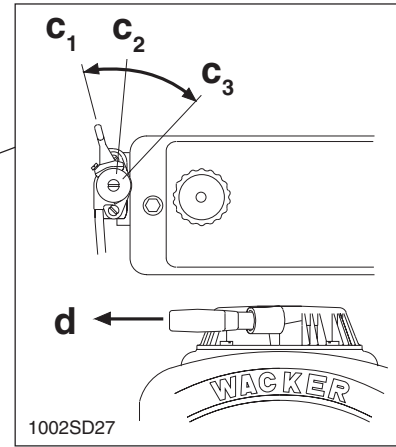
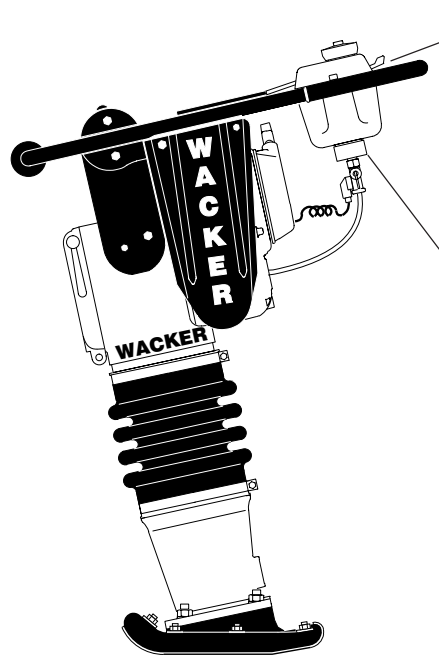
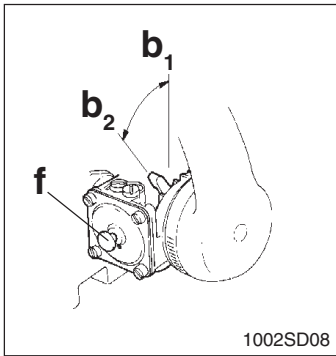
The weighted effective acceleration value, determined according to ISO 8662 Part 1, is 10 m/s².

The sound and vibration measurements were obtained with the machine operating on crushed gravel at nominal engine speed.

1.6 Dimensions

in. (mm)





1.7 Recommended Fuel

This rammer engine requires a two-cycle gasoline/oil mixture.

Note: Use 25:1 mixture for first tank of fuel only. Use 50:1 mixture thereafter.

Mix regular unleaded gasoline and two-cycle / outboard motor oil in separate container before filling tank.

Fuel Ratio 50:1			
Gasoline	Oil	Gasoline	Oil
1 gallon	2.5 ounces	5 liters	100 ml
3 gallons	8.0 ounces	10 liters	200 ml
5 gallons	13.0 ounces	15 liters	300 ml

1.8 Application

Rammers are designed to compact loose soils and gravel to prevent settling and to provide a firm, solid base for the placement of footings, concrete slabs, foundations, and other structures.

1.9 Before Starting

1. Read safety instructions at the beginning of this manual.
2. Fill tank with proper fuel mixture.
3. Set ramming stroke. Read Sections 1.13 and 1.14.
4. Place rammer on loose soil or gravel. **DO NOT** start rammer on hard surfaces such as asphalt or concrete.

1.10 To Start

1. Open fuel valve (**a₁**).
2. If engine is cold, close choke (**b₁**) on carburetor.
3. Open throttle no more than 1/4 (**c₂**).
4. Press button (**f**) on carburetor twice.
5. Pull starter rope (**d**) until engine starts.
6. Open choke (**b₂**) on carburetor as engine warms up.

Note: Cold engine should run approximately one (1) minute at idle (**c₁**) to warm up.

1.11 To Stop

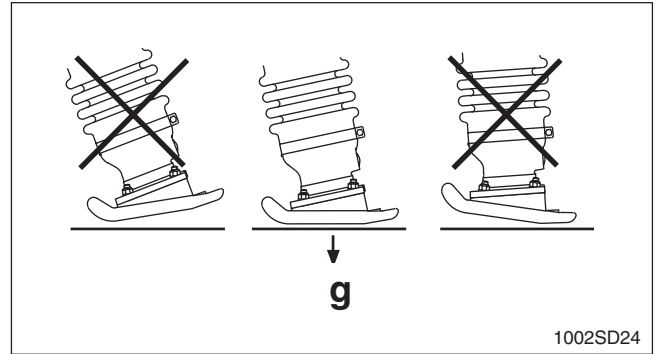
1. Place throttle in "IDLE" (c₁).
2. Shut off engine by closing fuel valve (a₂) on tank.

1.12 Proper Operation

1. Open throttle completely (c₃), then adjust for the smoothest operation. Do not overthrottle. Best compaction is achieved when rammer is running smoothly. Normally, a low stroke setting requires a lower engine speed.

CAUTION: Running the engine too fast will result in poor operation and unnecessary wear to components.

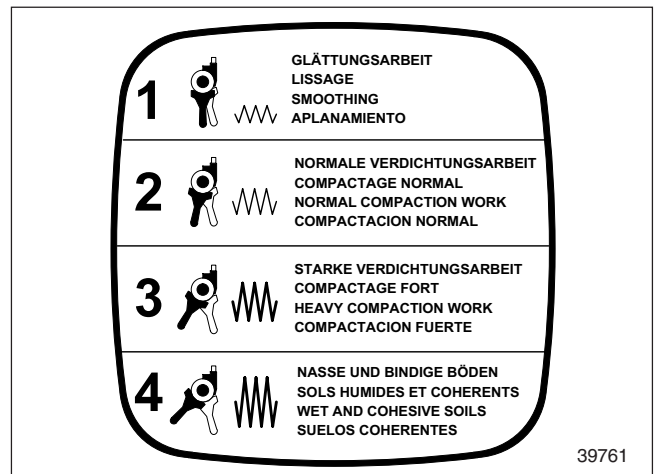
2. Guide rammer with handle. Allow machine to pull itself forward. **DO NOT** try to overpower the machine.
3. For best compaction, shoe must hit the ground flat (g), not on its toe or heel. This will save on excessive shoe wear.



1.13 Selecting Ramming Stroke

The length of the ramming stroke directly affects the impact force delivered by the rammer. Selecting the best level depends on job requirements and soil conditions.

The label located inside the front cover indicates the general compaction application, together with approximate throttle settings and impact levels for each stroke level. It should be used as a general guide when selecting ramming stroke.



Summary of Stroke and Throttle Settings

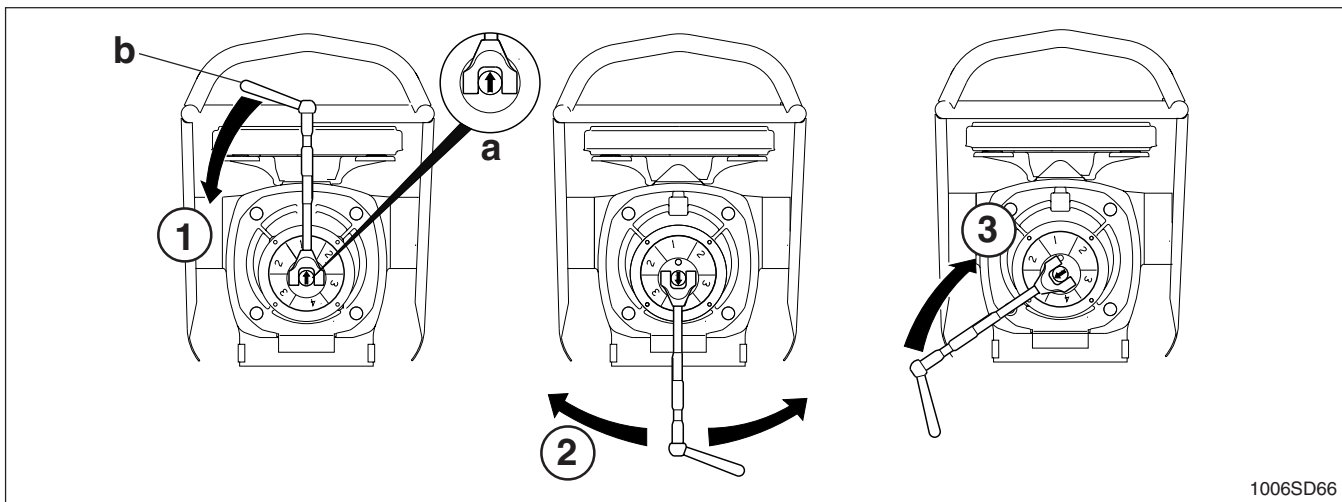
Stroke Setting	Throttle Position	Percussion Blows/Min.	Stroke at Ramming Shoe in. (mm)	Single-Stroke Impact in lbs. (kN)	Applications
1	1/4–1/2	750	up to 1 (25)	2040 (9.2)	smoothing
2	1/2–3/4	650	up to 2.6 (65)	2640 (11.7)	normal compaction
3	3/4–full load	650	up to 3 (75)	3400 (15.1)	heavy compaction
4	full load	600	up to 3.2 (80)	3640 (16.2)	wet and cohesive soils; not for hard soils which are difficult to compact

1.14 Adjusting Ramming Stroke

When adjusting the ramming stroke, observe the following precautions to avoid injury to yourself and others.

! WARNING

- Adjust stroke with machine standing upright and resting on a firm, level surface. Do not adjust stroke if the machine is in an unstable position where it can easily tip or slide.
- Always stop engine before adjusting stroke. The clutch could engage, causing rammer to jump unexpectedly.
- Adjustment should be performed by one person and with no one else near the machine. The tool used to make the adjustment could slip out of your hands and hit someone standing nearby.



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To adjust ramming stroke:

1. Remove adjusting tool from cover. Open cover.
2. Check that arrow **(a)** on center of locking lever is pointing up.

! WARNING

If arrow is pointing down, the spring system is not balanced and could cause the top half of the rammer to drop unexpectedly while making the stroke adjustment. To balance spring system, stand behind the rammer and use guide handle to rock machine back and forth until you feel the spring system relax. The arrow should now be facing up.

3. Insert adjusting tool **(b)** into bore on locking lever. Make sure it is fully seated so it will not slip out. Steady rammer by holding guide handle and use adjusting tool to push locking lever straight down until it is completely disengaged (refer to Operation 1 in illustration above).

4. Using adjusting tool, move locking lever until center arrow is pointing at the desired stroke setting (Operation 2).

! WARNING

During this adjustment, tension is applied to the spring system. This tension will release as the locking lever is returned back to its locked position. When this happens, the rammer will settle, causing the handle and crankcase to drop down. The movement is slight but happens quickly. Be aware of this when moving locking lever.

5. Push or pull the adjusting tool to move the locking lever back to its locked position (Operation 3). When the locking lever is halfway between the locked and unlocked position the spring system will settle and move as described in warning above.
6. Remove adjusting tool. Close cover and lock it in place with tool.

1.15 Periodic Maintenance Schedule

	Daily before starting	After first 5 hours	Every week or 25 hrs.	Every month or 100 hrs.	Every 3 months or 300 hrs.
Check fuel level.	●				
Check oil level in sightglass.	●				
Check canister type air filter. Replace filter element as required.	●				
Tighten ramming shoe hardware.		●	●		
Check and tighten engine cylinder screws.		●	●		
Check and tighten external hardware.		●	●		
Clean engine cooling fins.			●		
Clean and check spark plug gap.			●		
Replace spark plug.				●	
Clean recoil starter.					●
Change ramming system oil.*					●
Clean engine muffler and exhaust port.					●

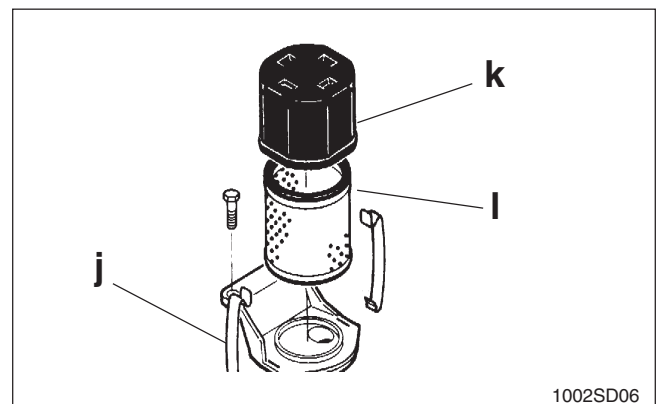
* Change ramming system oil after first 50 hours of operation.

1.16 Canister-Type Air Cleaner

1. To remove air cleaner, unsnap spring clips (**j**), and remove cover (**k**) and filter element (**l**).
2. Gently tap element on flat surface to knock off loose dirt. Be careful not to damage rubber seals or dent element. If element is heavily soiled or wet, replace it.

Note: ***DONOT** wash or use compressed air to clean filter element.*

3. Place element on bracket. Replace cover. By pressing centers of clips in toward cover, the clips will snap into place. Be sure cover is properly seated and clips securely in grooves on cover before starting machine.



1.17 Low Maintenance Air Cleaner

This air cleaner is self-cleaning and uses the movement of the machine to shake dust and dirt loose from the air cleaner element while the rammer is operating. Under normal operating conditions this element will not require cleaning and should not be removed from the machine. If the element does become plugged with dirt, the engine will begin to lose power. In this case the air cleaner element can be removed and cleaned as described below. Replace element if it becomes so plugged with dirt it can no longer be cleaned.

1. Remove the two locknuts from the top of the air cleaner and lift air cleaner off.
2. Use compressed air directed from the inside of the air cleaner, through the grommet hole **(a)**, to blow dirt and dust from element.

CAUTION: Air pressure must not exceed 100 psi.

3. Run fresh water through grommet hole **(a)** until water runs clear.

CAUTION: DO NOT use solvents, fuel oil, or gasoline to wash filter.

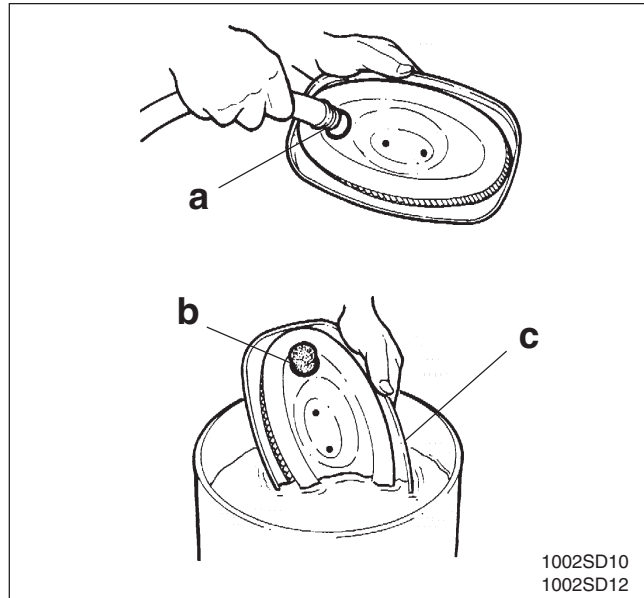
4. Plug or cover hole in air cleaner **(b)** using a cork or tape to prevent dirty water from entering inside of element. Soak air cleaner **(c)** in a solution of warm water and a low suds detergent for at least 15 minutes. Longer periods of time (up to several hours) of soaking may be required, depending on how dirty the element is.

5. Remove air cleaner from wash and repeat rinse described in Step 3. Allow element to air dry in a dust-free area. **DO NOT** use heat to speed drying.

6. Inspect grommet before assembly and replace it if it is worn or damaged. Install grommet on element carefully to avoid cutting it.

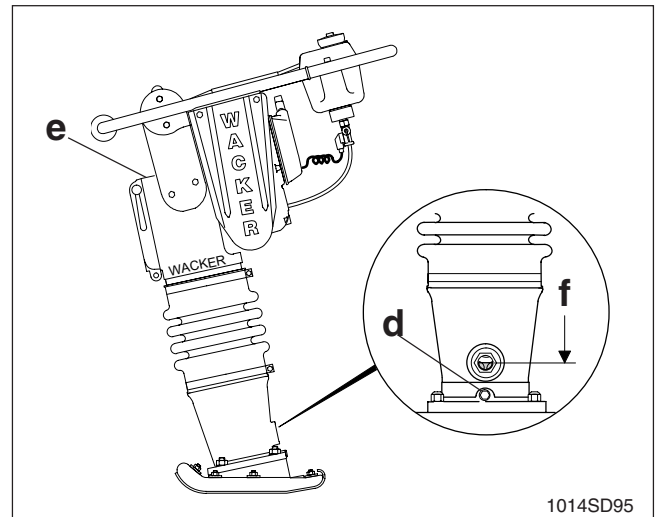
7. Install air cleaner on mount and secure it with washers and locknuts. **DO NOT** overtighten. Overtightening can deform washers and indent top of air cleaner.

Note: Apply grease or liquid soap to inside of grommet so it slides easily on mount.



1.18 Lubrication

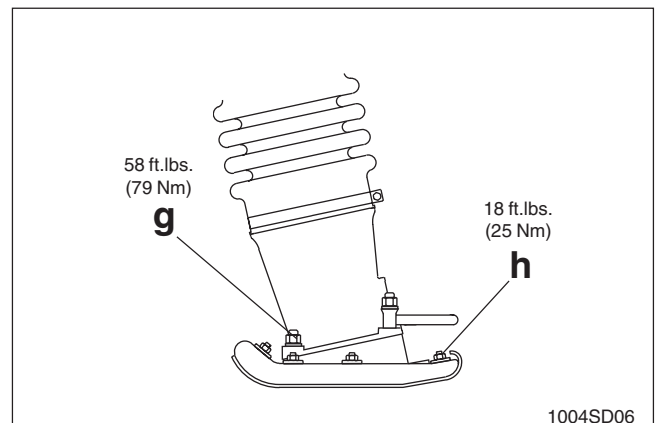
1. Change ramming system oil after first 50 hours of operation and every 300 hours thereafter. To drain oil, remove plug **(d)** and tilt machine back until it is resting on handle.
2. With rammer on level surface, add oil through plug **(e)**. Proper ramming system lubrication is indicated when approximately 1/2–3/4 of the sightglass **(f)** is full.



1.19 Shoe Hardware

On new machines, or after replacing shoe, check and tighten shoe hardware **(g, h)** after the first 5 hours of operation. Inspect hardware every week thereafter.

Torque hardware as specified.



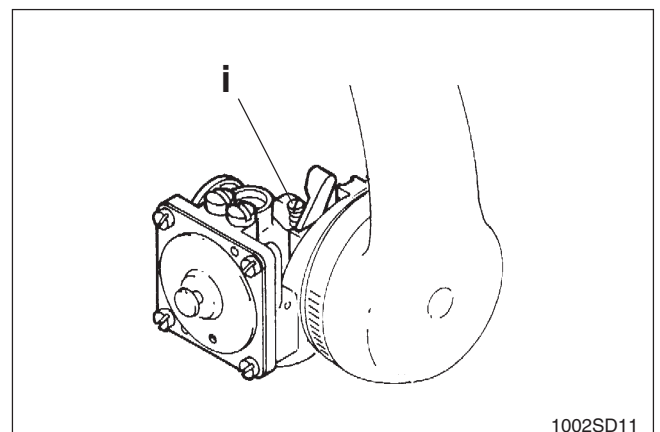
1.20 Carburetor Adjustments

Bing Carburetor

Idle Speed

Adjust engine idle speed with the throttle closed and the engine running at idle. Attach tachometer and set idle speed screw **(i)** on carburetor to achieve the specified idle speed. Refer to "Technical Data".

No other carburetor adjustments are required.



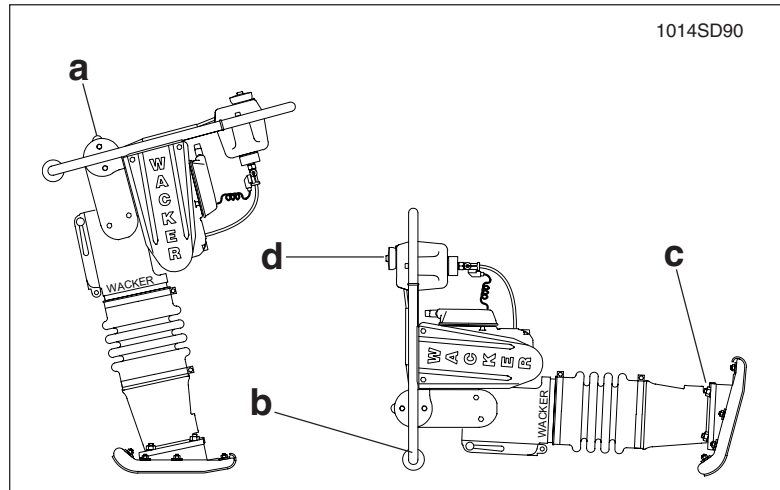
1.21 Long-term Storage

1. Drain fuel from tank.
2. Start engine and run until remaining fuel is used.
3. Remove spark plug. Pour approximately 1 oz. (30 ml) of clean SAE 30W engine oil into cylinder through spark plug opening.
4. Pull starter rope slowly to distribute oil in engine.
5. Re-install spark plug.

1.22 Transportation

1. Always shut off engine and close fuel valve when transporting machine.
2. Make sure lifting device has enough capacity to hold machine (see identification plate on machine for weight).
3. Use central lifting point **(a)** when lifting machine.
4. Tie down machine on vehicle to prevent it from tipping, falling, or rolling. Lay machine down flat and tie to vehicle at points **(b)** and **(c)**.

CAUTION: Drain fuel tank as required to prevent fuel leaking from cap **(d)**.



1.23 Troubleshooting

Problem / Symptom	Reason / Remedy
Engine does not start, or stalls.	<ol style="list-style-type: none"> 1. No fuel in tank. 2. Spark plug fouled. 3. Fuel valve closed.
Engine does not accelerate, is hard to start, or runs erratically.	<ol style="list-style-type: none"> 1. Improper fuel mix. Too much oil. 2. Spark plug fouled. 3. Clean muffler and exhaust port. 4. Crankshaft seals are leaking. 5. Air cleaner may be clogged.
Engine overheats.	<ol style="list-style-type: none"> 1. Improper fuel mix. Not enough oil. 2. Carburetor set too lean. 3. Clean cooling fins and fan blades.
Engine runs; rammer does not tamp.	<ol style="list-style-type: none"> 1. Inspect clutch for damage. Replace if necessary. 2. Broken connecting rod or crankgear. 3. Low engine performance. Compression loss. Plugged exhaust port.
Engine runs, rammer operation is erratic.	<ol style="list-style-type: none"> 1. Oil/grease on clutch. 2. Broken/worn springs. 3. Soil buildup on ramming shoe. 4. Broken parts in ramming system or crankcase. 5. Engine operating speed is too high.