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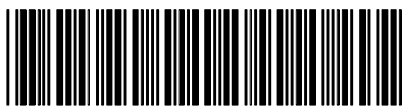
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Rammer

BS 600

BS 700

OPERATOR'S MANUAL



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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.

1. Foreword

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.

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.

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.

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2. 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.*

2.1 Operating Safety



WARNING

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 contained in both this manual and the engine manual and familiarize yourself with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate the machine.

- 2.1.1 NEVER operate this machine in applications for which it is not intended.
- 2.1.2 NEVER allow anyone to operate this equipment without proper training. People operating this equipment must be familiar with the risks and hazards associated with it.
- 2.1.3 NEVER touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.
- 2.1.4 NEVER use accessories or attachments that are not recommended by Wacker. Damage to equipment and injury to the user may result.
- 2.1.5 NEVER leave machine running unattended.
- 2.1.6 NEVER tamper with or disable the function of operating controls.
- 2.1.7 NEVER use choke to stop engine.
- 2.1.8 NEVER operate the machine in areas where explosions may occur.
- 2.1.9 ALWAYS read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.
- 2.1.10 ALWAYS be sure that all other persons are at a safe distance from the machine. Stop the machine if people step into the working area of the machine.
- 2.1.11 ALWAYS be sure operator is familiar with proper safety precautions and operation techniques before using machine.
- 2.1.12 ALWAYS wear protective clothing appropriate to the job site when operating equipment.
- 2.1.13 ALWAYS wear hearing protection when operating equipment.
- 2.1.14 ALWAYS keep hands, feet, and loose clothing away from moving parts of the machine.
- 2.1.15 ALWAYS use common sense and caution when operating the machine.
- 2.1.16 ALWAYS be sure the rammer will not tip over, roll, slide, or fall when not being operated.
- 2.1.17 ALWAYS turn the engine OFF when the rammer is not being operated.

- 2.1.18 ALWAYS guide the rammer in such a way that the operator is not squeezed between the rammer and solid objects. Special care is required when working on uneven ground or when compacting coarse material. Make sure to stand firmly when operating the machine under such conditions.
- 2.1.19 ALWAYS operate the rammer in such a way that there is no danger of it turning over or falling in, when working near the edges of breaks, pits, slopes, trenches and platforms.
- 2.1.20 ALWAYS store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children.
- 2.1.21 ALWAYS close fuel valve on engines equipped with one when machine is not being operated.
- 2.1.22 ALWAYS operate machine with all safety devices and guards in place and in working order. DO NOT modify or defeat safety devices. DO NOT operate machine if any safety devices or guards are missing or inoperative.

2.2 Operator Safety while using Internal Combustion Engines



DANGER

Internal combustion engines present special hazards during operation and fueling! Read and follow warning instructions in engine owner's manual and safety guidelines below. Failure to follow warnings and safety guidelines could result in severe injury or death.

- 2.2.1 DO NOT smoke while operating machine.
- 2.2.2 DO NOT smoke when refueling engine.
- 2.2.3 DO NOT refuel hot or running engine.
- 2.2.4 DO NOT refuel engine near open flame.
- 2.2.5 DO NOT spill fuel when refueling engine.
- 2.2.6 DO NOT run engine near open flames.
- 2.2.7 DO NOT run machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.
- 2.2.8 ALWAYS refill fuel tank in well-ventilated area.
- 2.2.9 ALWAYS replace fuel tank cap after refueling.
- 2.2.10 ALWAYS check fuel lines and fuel tank for leaks and cracks before starting engine. Do not run machine if fuel leaks are present or fuel lines are loose.

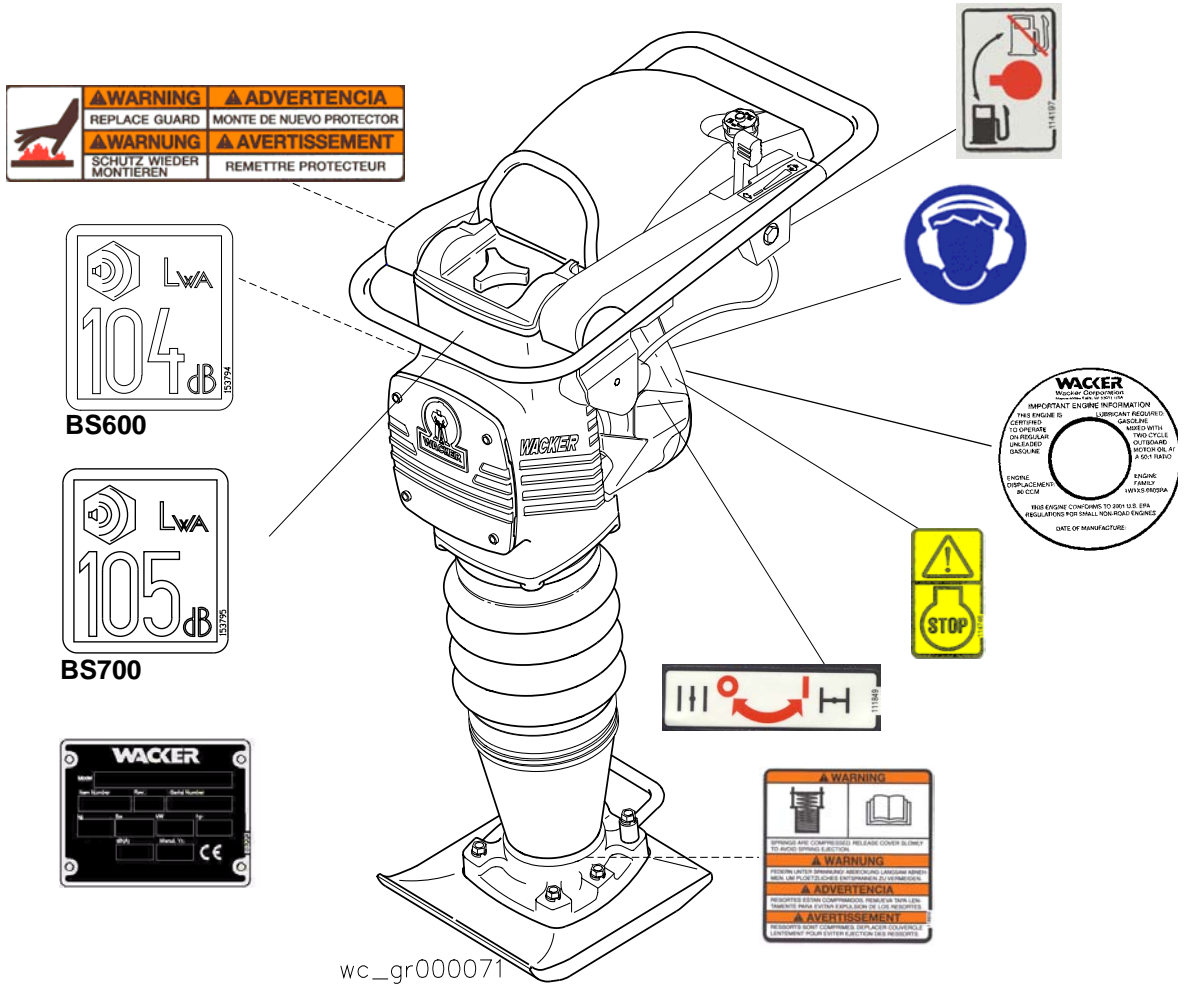
2.3 Service Safety

**WARNING**

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.






- 2.3.1 DO NOT attempt to clean or service machine while it is running. Rotating parts can cause severe injury.
- 2.3.2 DO NOT attempt to clean or service machine while it is running.
- 2.3.3 DO NOT operate engine without air cleaner.
- 2.3.4 DO NOT remove air cleaner cover, paper element, or precleaner while engine is running.
- 2.3.5 DO NOT alter engine speeds. Run the engine only at speeds specified in the Technical Data Section.
- 2.3.6 ALWAYS replace worn or damaged components with spare parts designed and recommended by Wacker.
- 2.3.7 DO NOT crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening.
- 2.3.8 DO NOT test for spark on gasoline-powered engines, if engine is flooded or the smell of gasoline is present. A stray spark could ignite fumes.
- 2.3.9 DO NOT use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.
- 2.3.10 ALWAYS replace safety devices and guards after repairs and maintenance.
- 2.3.11 ALWAYS keep area around muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite them, starting a fire.
- 2.3.12 ALWAYS do Periodic Maintenance as recommended in Operator's Manual.
- 2.3.13 ALWAYS clean debris from engine cooling fins.
- 2.3.14 ALWAYS disconnect spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.
- 2.3.15 ALWAYS keep machine clean and labels legible. Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.





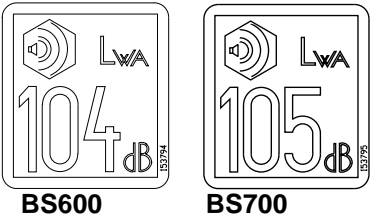
2.4 Label Locations





2.5 Safety Labels

Wacker machines use international pictorial labels where needed. These labels are described below:



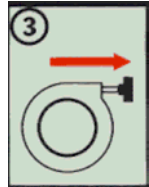
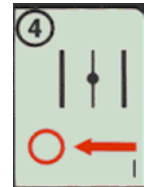
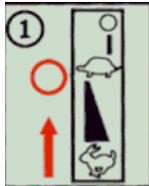
Label	Meaning
	<p>This molded-in label contains important safety and operating information. If it becomes illegible, the cover must be replaced. Refer to the Parts Book for ordering information.</p>
	<p>DANGER! Engines emit carbon monoxide; operate only in well ventilated area.</p>
	<p>Read the operator's manual for machine information.</p>
	<p>DANGER! No sparks, flames or burning objects near machine.</p>
	<p>Shut off engine before refueling.</p>

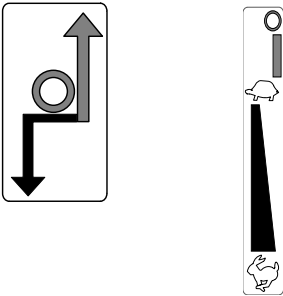



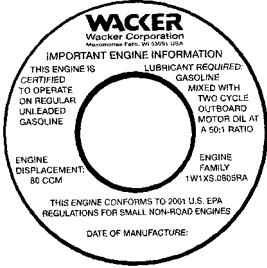
Label	Meaning
	<p>CAUTION! Use only clean, filtered gasoline fuel.</p>
	<p>To prevent hearing loss, wear hearing protection when operating this machine.</p>
	<p>WARNING! Hot surface! Replace guard!</p>
	<p>WARNING! Serious injury if struck by compressed spring or cover. If the spring system cover is removed improperly, the springs can eject.</p>
	<p>Machine sound power level in dB(A).</p>

Label	Meaning
 <p>A black nameplate with the 'WACKER' logo at the top. Below the logo are several rectangular fields for recording information: 'Model', 'Item Number', 'Rev.', 'Serial Number', 'kW', 'hp', and 'Manufact. Yr.'. There is also a CE mark and a small vertical number '88223' on the right side.</p>	<p>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.</p>
 <p>Two rectangular labels. The top one contains the text: 'WACKER MACHINES PROTECTED BY ONE OR MORE OF THESE U.S. PATENTS: 4643611: 4555238: 5564375: 5586630: 4419048'. The bottom one contains the text: 'PATENT PENDING'. Both labels have small vertical numbers on their right sides: '111891' and '111547' respectively.</p>	<p>This machine may be covered by one or more patents.</p>

2.6 Operating Labels

Wacker machines use international pictorial labels where needed. These labels are described below:

Label	Meaning
	Close choke.
	Place the throttle control lever in the “start” position.
	Pull rewind starter.
	Open choke.
	Place the throttle control lever in the “stop” position.

Label	Meaning
	<p>Throttle control lever: 0 = Stop</p> <p>Turtle = Start or Idle</p> <p>Rabbit = Full or Fast</p>
	<p>Fuel valve: Closed</p> <p>Open</p>
	<p>Engine stop button: Press to stop engine.</p>
	<p>Choke: 0 = Open</p> <p>I = Closed</p>
	

3. Technical Data

3.1 Rammer

		BS600 0007551 0008207 0009307	BS700 0007552 0008051 0008052 0009308
Rammer			
Engine Speed - full	rpm	4350 ± 100	
Engine Speed - idle	rpm	1800 ± 100	
Clutch Engagement	rpm	2800 ± 100	
Spark Plug	type	Champion RL95YC	
Electrode Gap	mm (in)	0.8–0.9 (0.035)	
Cylinder Head Compression (cold)	(kg/cm ²) psi	8.0–9.7 (120–140)	
Air Cleaner	type	Dual Element	
Engine Lubrication	oil grade	With standard two-cycle oil - use 50:1 ratio. With Wacker two-cycle or two-cycle oil per NMMA TC-W3, API TC, JASO FC or ISO EGD specifications - 100:1 ratio.	
Ramming System Lubrication	oil grade	SAE 10W30	
Ramming System Capacity	ml (oz.)	890 (30)	

3.2 Sound Measurements



The operating sound levels, measured per the requirements of Appendix 1, Paragraph 1.7.4.f of the EC-Machine Regulations, are:
 the sound pressure level at operator's location (L_{pA}) = 90 dB(A).

the sound power level (L_{WA}):

BS600 = 104 dB(A)

BS700 = 105 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.

3.3 Vibration Measurements

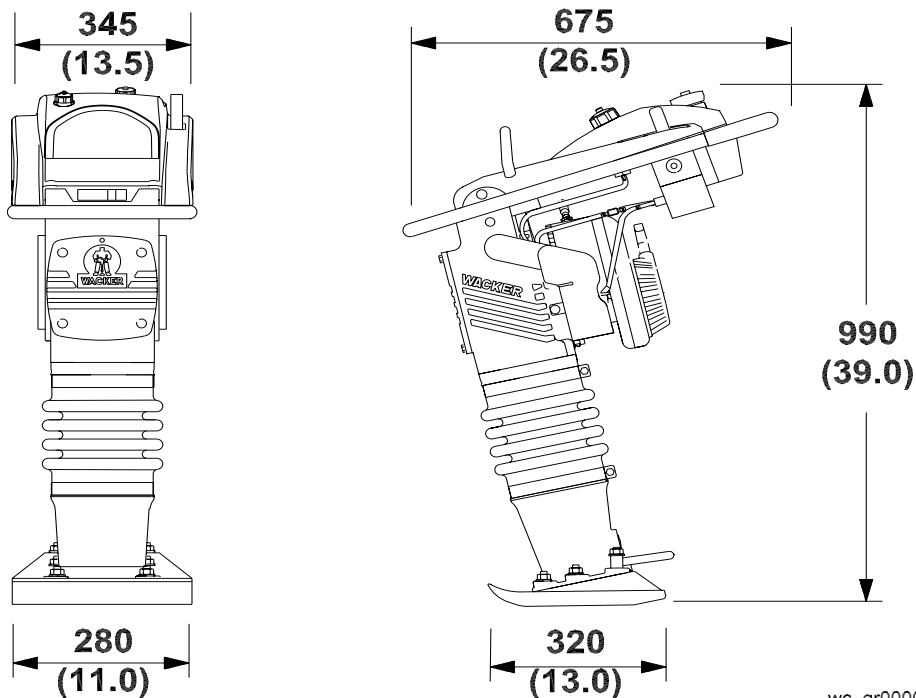
The operating hand/arm vibration level, measured per the requirements of enclosure 1, Paragraph 2.2 or 3.6.3 of the EC-Machine Regulations, is approximately 15 m/s^2 .

The weighted effective acceleration value was determined according to ISO 8662 Part 1.

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

3.4 Dimensions

mm (in.)



wc_gr000052

4. Operation

4.1 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.

4.2 Recommended Fuel

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

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

FUEL RATIO 50:1				FUEL RATIO 100:1			
Gasoline	Oil	Gasoline	Oil	Gasoline	Oil	Gasoline	Oil
5 liters	100 ml	1 gallon	2.5 oz.	5 liters	50 ml	1 gallon	1.75 oz.
10 liters	200 ml	3 gallons	8.0 oz.	10 liters	100 ml	3 gallons	4.0 oz.
15 liters	300 ml	5 gallons	13.0 oz.	15 liters	150 ml	5 gallons	6.5 oz.

4.3 Before Starting

- 4.3.1 Read safety instructions at the beginning of this manual.
- 4.3.2 Fill tank with proper fuel mixture.
- 4.3.3 Place rammer on loose soil or gravel. DO NOT start rammer on hard surfaces such as asphalt or concrete.

4.4 To Start

See Graphic: *wc_gr000053*

4.4.1 Open fuel valve.

4.4.2 If the engine is cold, close choke (**b1**) on the carburetor.

Note: Occasionally, warm engines will need to be choked.

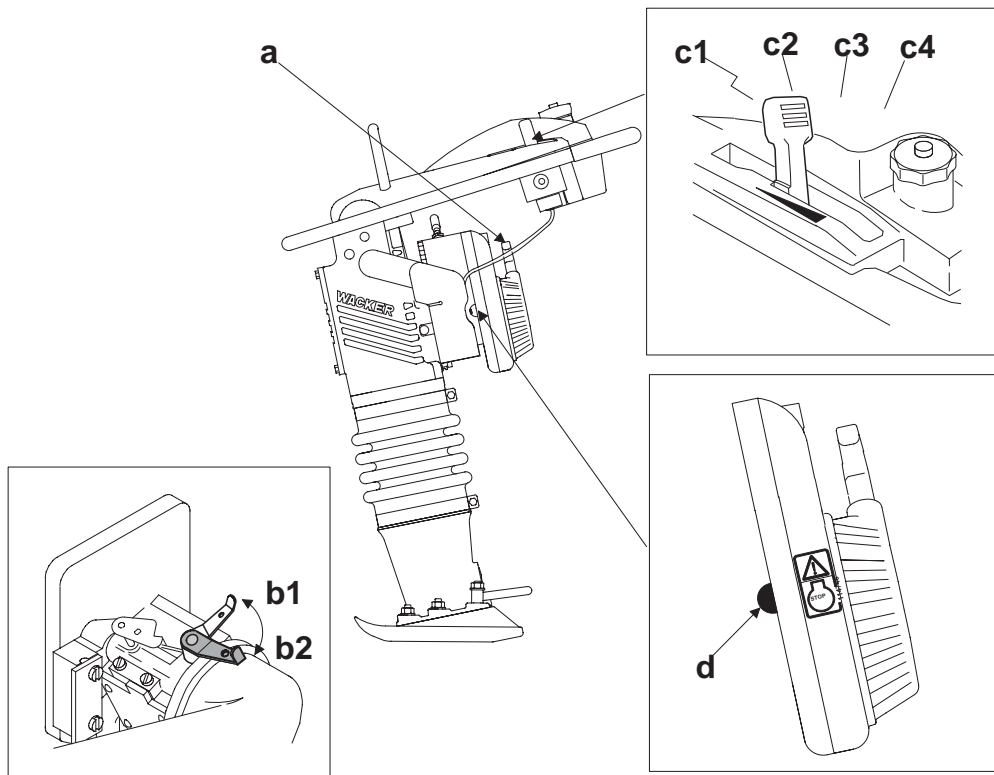
4.4.3 Move throttle control to ¼ to ½ of the full position (**c3**).

4.4.4 Pull the starter rope (**a**) until the engine starts, or attempts to start.

Note: First time use, engines recently serviced, run out of fuel or not used for long periods of time may need the rope to be pulled more times to move fuel to the carburetor.

4.4.5 Open choke (**b2**) on the carburetor as the engine warms up, or, if it attempts to start, continue pulling the rope until it starts.

Note: A cold engine should be allowed to warm up at the idle position (**c2**) for approximately one (1) minute. Failure to open the choke after the engine attempts to start may cause flooding.



wc_gr000053

4.5 To Stop

See Graphic: *wc_gr000053*

4.5.1 Place throttle in the idle position **(c2)**.

4.5.2 Shut off the engine by moving the throttle through the detent to the off position **(c1)**. The engine will stop.

Note: *If the throttle control wire should break, shut off the rammer manually by using the engine STOP button **(d)**.*

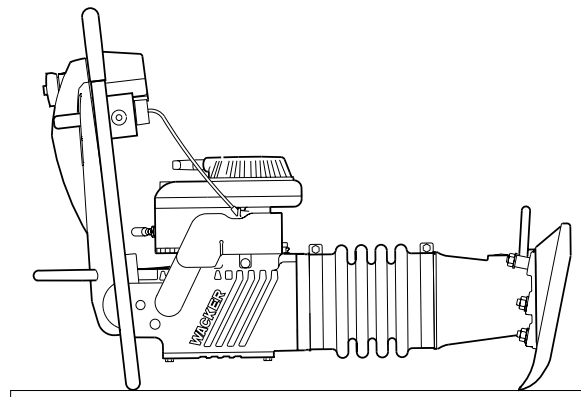
4.6 Operation

See Graphic: *wc_gr000044*

Keep vibratory rammer clean and dry. Avoid no-load strokes. Never allow the rammer to run full throttle when forcing away material or when lifting the equipment.

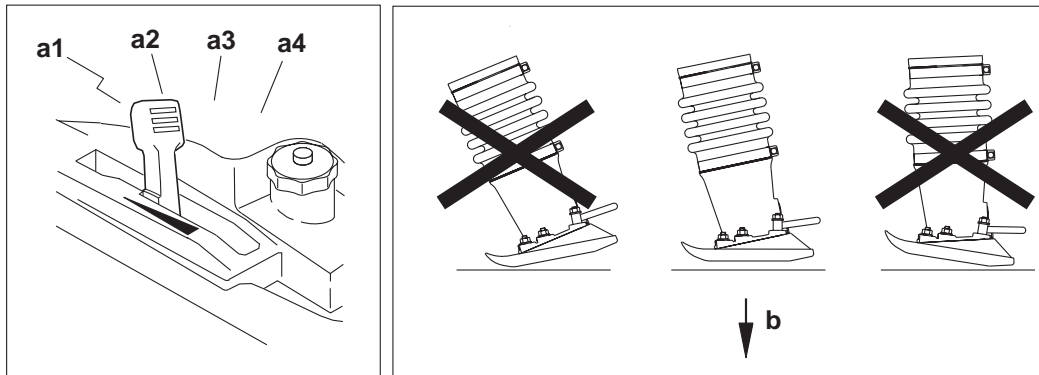
CAUTION: To prevent damage to the rammer, do not allow the rammer to run on its side.

If the rammer should tip on its side, place the rammer in the position shown, then shut off the engine by moving the throttle control lever through the detent to the off position.



wc_gr000044

4.7 Proper Compaction



wc_gr000045

See Graphic: *wc_gr000045*

- 4.7.1 Run rammer at the full throttle position (**a4**) for maximum performance.
- 4.7.2 Guide rammer with its handle. Allow machine to pull itself forward. DO NOT try to over-power the machine.
- 4.7.3 For best compaction, the shoe must hit the ground flat (**b**), not on its toe or heel. This will save on excessive shoe wear.

5. Maintenance

5.1 Periodic Maintenance Schedule

	Daily before starting	After first 5 hours	Every week or 25 hours	Every month or 100 hours	Every 3 months or 300 hours
Check fuel level.	•				
Check oil level in sightglass.	•				
Check fuel line and fittings for cracks or leaks.	•				
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.					•
Inspect crane lifting cable for wear, damage, or abuse.					•

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

Note: *If engine performance is poor, check, clean, and replace air filter elements as needed.*

5.2 Air Cleaner

See Graphic: *wc_gr000046*

Under normal operating conditions the elements will not require cleaning and should not be removed from the machine. If the elements do become plugged with dirt, the engine will begin to lose power. In this case, the air cleaner elements can be removed and cleaned as described below. Replace an element if it becomes so plugged with dirt it can no longer be cleaned.

CAUTION: NEVER run engine without air cleaner. Severe engine damage will occur.



NEVER use gasoline or other types of low flash point solvents for cleaning the air cleaner. A fire or explosion could result.

The engine is equipped with a dual element air cleaner.

5.2.1 Remove air cleaner cover (a). Remove precleaner and paper element and inspect them for holes or tears. Replace if damaged.

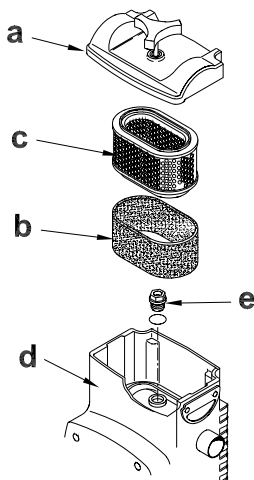
5.2.2 Precleaner (b): Clean with low-pressure compressed air. When very soiled, wash in solution of mild detergent and warm water. Rinse thoroughly in clean water. Allow to dry thoroughly before re-installing.

Note: Do not oil precleaner.

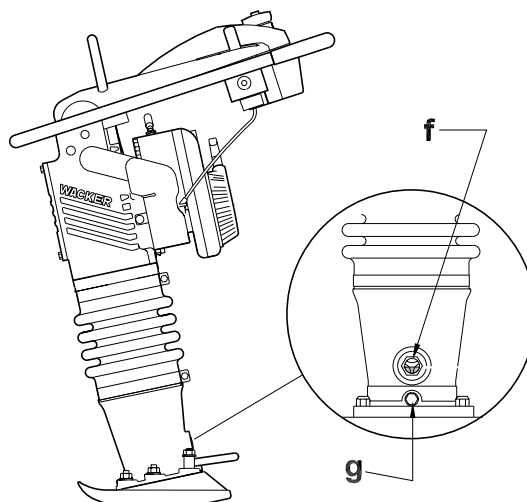
5.2.3 Paper element (c): Tap element lightly to remove excess dirt. Replace paper element if it appears heavily soiled.

5.2.4 Wipe out filter housing (d) with a clean cloth.

CAUTION: Do not allow dirt to get into the engine intake port while cleaning—damage to engine will result.



wc_gr000046



wc_gr000054

5.3 Lubrication

See Graphic: wc_gr000054

See Graphic: wc_gr000046

- 5.3.1 Change ramming system oil after first 50 hours of operation and every 300 hours thereafter. To drain oil, remove plug **(g)** and tilt machine back until it is resting on handle.

Note: *In the interests of environmental protection, place a plastic sheet and a container under the machine to collect any liquid which drains off. Dispose of this liquid in accordance with environmental protection legislation.*

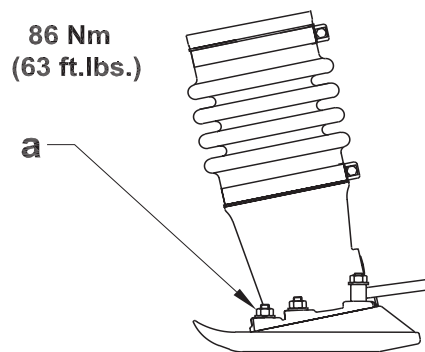
- 5.3.2 With the rammer on a level surface, add oil through plug **(e)**. Proper ramming system lubrication is indicated when approximately 1/2-3/4 of the sightglass **(f)** is full.

5.4 Shoe Hardware

See Graphic: wc_gr000055

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

Torque hardware as specified.



wc_gr000055

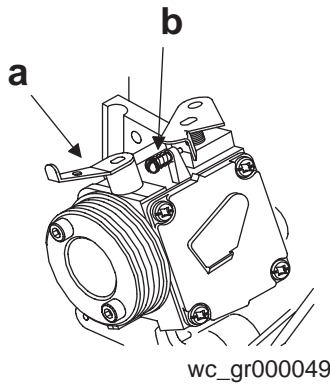
5.5 Carburetor Adjustments

See Graphic: *wc_gr00049*

Refer to *Technical Data* for correct idle and operating rpm. For best accuracy, use a tachometer when making carburetor adjustments.

- 5.5.1 Start engine and allow it to warm up to operating temperature.
- 5.5.2 Set engine idle speed with engine running at idle and choke **(a)** fully open. Adjust idle speed screw **(b)**, in or out, to obtain correct idle speed.

CAUTION: DO NOT turn the adjusting screw in too tight or you may damage the carburetor.



wc_gr000049

5.6 Storage

- 5.6.1 Drain fuel from tank.
- 5.6.2 Start engine and run until remaining fuel is used.
- 5.6.3 Remove spark plug. Pour approximately 1 oz. (30 ml) of clean SAE 10W30 engine oil into cylinder through spark plug opening.
- 5.6.4 Pull starter rope slowly to distribute oil in engine.
- 5.6.5 Re-install spark plug.

5.7 Transportation

See Graphic: *wc_gr000208*

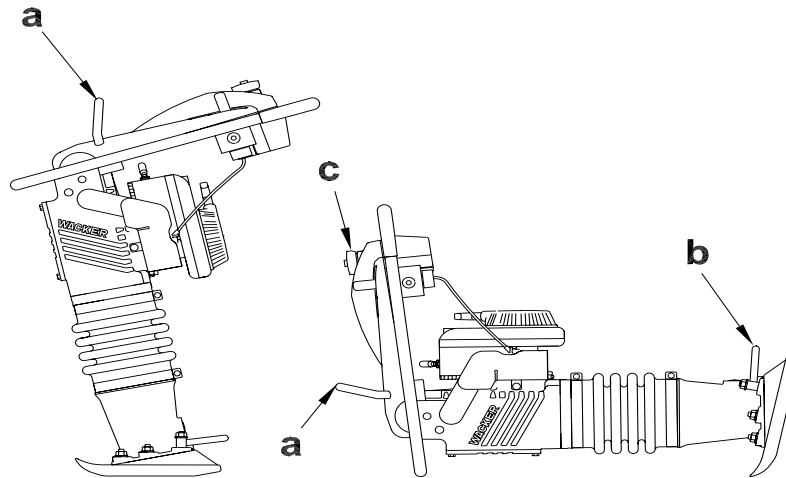
- 5.7.1 Always shut off engine and close fuel valve when transporting machine.
- 5.7.2 Make sure lifting device has enough capacity to hold machine (see identification plate on machine for weight).
- 5.7.3 Use central lifting point **(a)** when lifting machine.



Always inspect crane lifting cable for wear, damage, or abuse. Protect cable from any sharp edges. Do not use if there are any signs of cut wires, excessive wear, or other defects. Replace damaged cable immediately to avoid injury or death.

- 5.7.4 Tie down machine on vehicle to prevent it from tipping, falling, or rolling. Lay machine down flat and tie to vehicle at points **(a)** and **(b)**.

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



wc_gr000208

5.8 Troubleshooting

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

**EC - CONFORMITY CERTIFICATE
EG-KONFORMITÄTSERKLÄRUNG
CE-CERTIFICADO DE CONFORMIDAD
CERTIFICAT DE CONFORMITÉ DE LA CEE**

WACKER CORPORATION, N92 W15000 ANTHONY AVENUE, MENOMONEE FALLS, WISCONSIN USA

hereby certifies that the construction equipment specified hereunder:
bescheinigt, daß das Baugerät:
certifica que la máquina de construcción:
atteste que le matériel :

1. Category / Art / Categoría / Catégorie

**Rammer
Stampfer
Apisonador
Pilonneuse**

2. Type - Typ - Tipo - Type

BS 600, BS 700

3. Item number of equipment / Artikelnummer /

Número de referencia de la máquina / Numéro de référence du matériel :

**0007551, 0008207, 0009076, 0009077, 0009166, 0009212, 0009262, 0009307
0007552, 0008051, 0008052, 0009078, 0009079, 0009167, 0009308**

4. Net installed power / absolute installierte Leistung /

Potencia instalada neta / Puissance installée nette :

**BS 600 2,1kW
BS 700 2,3 kW**

Has been sound tested per Directive 2000/14/EC / In Übereinstimmung mit Richtlinie 2000/14/EG bewertet worden ist / Ha sido ensayado en conformidad con la norma 2000/14/CE / A été mis à l'épreuve conforme aux dispositions de la directive 2000/14/CEE :

Conformity Assessment Procedure / Konformitätsbewertungsverfahren / Procedimiento para ensayar conformidad / Procédé pour l'épreuve de conformité	Name and address of notified body / Bei folgender einbezogener Prüfstelle / Oficina matriculadora / Organisme agréé	Measured sound power level / Gemessener Schall- leistungspegel / Nivel de potencia acústica determinado / Niveau de puissance acoustique fixé	Guaranteed sound power level / Garantierter Schalleleistungspegel / Nivel de potencia acústica garantizado / Niveau de puissance acoustique garanti
Annex VIII	BSI, 389 Chiswick High Road, London W4 4AL United Kingdom	104 dB(A)	104 dB(A)

and has been produced in accordance with the following standards:
und in Übereinstimmung mit folgenden Richtlinien hergestellt worden ist:
y ha sido fabricado en conformidad con las siguientes normas:
et a été produit conforme aux dispositions des directives européennes ci-après :

**2000/14/EC
EMC 89/336/EEC
EN 50082-1
VDE 0879-1
98/37/EEC
EN 500-1
EN 500-4**

29.05.02

Date / Datum / Fecha / Date

William Lahner
Vice President of Engineering

Greg Orzal
Manager, Product Engineering

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