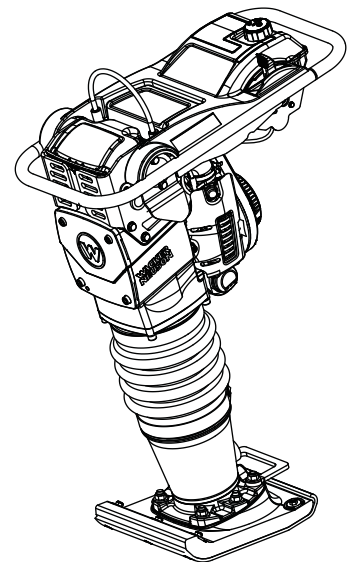


Operator's Manual

Vibratory Rammer

BS50-2, BS50-2i
BS60-2, BS60-2i
BS70-2, BS70-2i
BS65-V



Type	BS50-2, BS50-2i, BS60-2, BS60-2i, BS70-2, BS70-2i, BS65-V
Document	5200016051
Date	1116
Revision	08
Language	EN



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Trademarks

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Manufacturer

Wacker Neuson Production Americas LLC

N92W15000 Anthony Avenue

Menomonee Falls, WI 53051 U.S.A.

Tel: (262) 255-0500 · Fax: (262) 255-0550 · Tel: (800) 770-0957

www.wackerneuson.com

Original instructions

This Operator's Manual presents the original instructions. The original language of this Operator's Manual is American English.

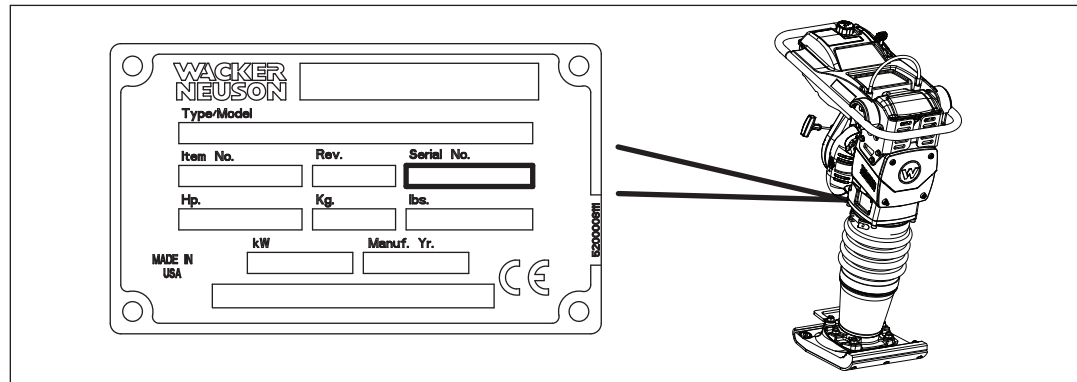
Foreword

SAVE THESE INSTRUCTIONS—This manual contains important instructions for the machine models below. These instructions have been written expressly by Wacker Neuson Production Americas LLC and must be followed during installation, operation, and maintenance of the machines.

Machine	Item Number
BS 50-2i	5200000642, 5200000643, 5200000657, 5200000658, 5200000659, 5200000660, 5200000661, 5200000687, 5200011099, 5200025428, 5200025429
BS 60-2i	5200000645, 5200000646, 5200000664, 5200000665, 5200000689, 5200000690
BS 70-2i	5200000649, 5200000650, 5200000672, 5200000673

Machine	Item Number
BS 50-2	5200000641, 5200000652, 5200000653, 5200000654, 5200000655, 5200000656, 5200000685, 5200000686
BS 60-2	5200000663, 5200000688, 5200019205
BS 70-2	5200000670, 5200000671

Machine	Item Number
BS 65-V	5200000669



wc_gr010403

Machine identification

A nameplate listing the model number, item number, revision number, and serial number is attached to this machine. The location of the nameplate is shown above.

Serial number (S/N)

For future reference, record the serial number in the space provided below. You will need the serial number when requesting parts or service for this machine.

Serial Number:

Machine documentation

- From this point forward in this documentation, Wacker Neuson Production Americas LLC will be referred to as Wacker Neuson.
- Keep a copy of the Operator's Manual with the machine at all times.
- Use the separate Parts Book supplied with the machine to order replacement parts.
- If you are missing either of these documents, please contact Wacker Neuson to order a replacement or visit www.wackerneuson.com.
- When ordering parts or requesting service information, be prepared to provide the machine model number, item number, revision number, and serial number.

Expectations for information in this manual

- This manual provides information and procedures to safely operate and maintain the above Wacker Neuson model(s). For your own safety and to reduce the risk of injury, carefully read, understand, and observe all instructions described in this manual.
- Wacker Neuson expressly reserves the right to make technical modifications, even without notice, which improve the performance or safety standards of its machines.
- The information contained in this manual is based on machines manufactured up until the time of publication. Wacker Neuson reserves the right to change any portion of this information without notice.
- The illustrations, parts, and procedures in this manual refer to Wacker Neuson factory-installed components. Your machine may vary depending on the requirements of your specific region.

**CALIFORNIA
Proposition
65 Warning**

Combustion 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.

**Laws
pertaining to
spark
arresters**

NOTICE: State Health Safety Codes and Public Resources Codes specify that in certain locations spark arresters be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose. In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

**Manufacturer's
approval**

This manual contains references to *approved* parts, attachments, and modifications. The following definitions apply:

- **Approved parts or attachments** are those either manufactured or provided by Wacker Neuson.
- **Approved modifications** are those performed by an authorized Wacker Neuson service center according to written instructions published by Wacker Neuson.
- **Unapproved parts, attachments, and modifications** are those that do not meet the approved criteria.

Unapproved parts, attachments, or modifications may have the following consequences:

- Serious injury hazards to the operator and persons in the work area
- Permanent damage to the machine which will not be covered under warranty

Contact your Wacker Neuson dealer immediately if you have questions about approved or unapproved parts, attachments, or modifications.

Notes



EC Declaration of Conformity

Manufacturer

Wacker Neuson Production Americas LLC, N92W15000 Anthony Avenue,
Menomonee Falls, Wisconsin 53051 USA

Machine:

Product	BS50-2 BS50-2i
Product category	Vibratory Rammer
Product function	To compact soil
Item number	5200000652, 5200000653, 5200000654, 5200000655, 5200000656, 5200000657, 5200000658, 5200000659, 5200000660, 5200000661, 5200011099, 5100014171, 5100014907, 5100016644, 5100016645, 5100016646, 5100016647, 5100016648, 5100016649, 5100016650
Net installed power	1.7 kW
Measured sound power level	105 dB(A)
Guaranteed sound power level	108 dB(A)

Conformity Assessment Procedure

According to 2000/14/EC ANNEX VIII

Notified Body

Lloyds Register Verification Limited (Notified Body No 0038)
71 Fenchurch Street, London EC3M 4BS, United Kingdom

Directives and Standards

We hereby declare that this product meets and complies with the relevant regulations and requirements of the following directives and standards:

2006/42/EC, 2000/14/EC, 2005/88/EC, 2014/30/EU, EN 500-1, EN 500-4

Authorized Person for Technical Documents

Robert Raethsel, Wacker Neuson Produktion GmbH & Co. KG, Wackerstrasse 6,
85084 Reichertshofen, Germany

Menomonee Falls, WI, USA, 08.07.2016

Keith Herr
Vice President and Managing Director
For Wacker Neuson

Jeff Volden
Director, Product Engineering
For Wacker Neuson

Paul Sina
Manager, Product Engineering
For Wacker Neuson



EC Declaration of Conformity

Manufacturer

Wacker Neuson Production Americas LLC, N92W15000 Anthony Avenue,
Menomonee Falls, Wisconsin 53051 USA

Product

Product	BS60-2 BS60-2i
Product category	Vibratory Rammer
Product function	To compact soil
Item number	5200000663, 5100014847, 5200019205 5200000664, 5200000665, 5100014908
Net installed power	1.8 kW
Measured sound power level	105 dB(A)
Guaranteed sound power level	108 dB(A)

Conformity Assessment Procedure

According to 2000/14/EC ANNEX VIII

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Authorized Person for Technical Documents

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EC Declaration of Conformity

Manufacturer

Wacker Neuson Production Americas LLC, N92W15000 Anthony Avenue,
Menomonee Falls, Wisconsin 53051 USA

Product

Product	BS70-2 BS70-2i
Product category	Vibratory Rammer
Product function	To compact soil
Item number	5200000670, 5200000671, 5100014905, 5100016652 5200000672, 5200000673, 5100014909, 5100016653
Net installed power	2.0 kW
Measured sound power level	105 dB(A)
Guaranteed sound power level	108 dB(A)

Conformity Assessment Procedure

According to 2000/14/EC ANNEX VIII

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EC Declaration of Conformity

Manufacturer

Wacker Neuson Production Americas LLC, N92W15000 Anthony Avenue,
Menomonee Falls, Wisconsin 53051 USA

Product

Product	BS65-V
Product category	Vibratory Rammer
Product function	To compact soil
Item number	5200000669, 5100016651
Net installed power	2.0 kW
Measured sound power level	104 dB(A)
Guaranteed sound power level	108 dB(A)

Conformity Assessment Procedure

According to 2000/14/EC ANNEX VIII

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1 Safety Information

1.1 Signal Words Used in this Manual

This manual contains DANGER, WARNING, CAUTION, *NOTICE*, and NOTE signal words 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 hazards.
▶ Obey all safety messages that follow this symbol.



DANGER

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

- ▶ To avoid death or serious injury from this type of hazard, obey all safety messages that follow this signal word.
-



WARNING

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

- ▶ To avoid possible death or serious injury from this type of hazard, obey all safety messages that follow this signal word.
-



CAUTION

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

- ▶ To avoid possible minor or moderate injury from this type of hazard, obey all safety messages that follow this signal word.
-

NOTICE: Used without the safety alert symbol, NOTICE indicates a situation which, if not avoided, could result in property damage.

Note: A Note contains additional information important to a procedure.

1.2 Machine Description and Intended Use

This machine is a vibratory rammer. The Wacker Neuson Rammer consists of a gasoline or diesel engine, a clutch, a fuel tank, a spring-loaded ramming system, a ramming shoe, and a handle. The engine transmits power through the ramming system and ramming shoe, generating percussive impact force to compact soil. The operator guides and controls the machine from behind using the handle.

This machine is intended to be used for compacting cohesive, mixed, and granular soils in confined areas.

This machine has been designed and built strictly for the intended use described above. Using the machine for any other purpose could permanently damage the machine or seriously injure the operator or other persons in the area. Machine damage caused by misuse is not covered under warranty.

The following are some examples of misuse:

- Using the machine as a ladder, support, or work surface
 - Using the machine to carry or transport passengers or equipment
 - Using the machine as a hammer or for other demolition work
 - Attaching the machine to any other machine
 - Operating the machine outside of factory specifications
 - Operating the machine in a manner inconsistent with all warnings found on the machine and in the Operator's Manual
-

This machine has been designed and built in accordance with the latest global safety standards. It has been carefully engineered to eliminate hazards as far as practicable and to increase operator safety through protective guards and labeling. However, some risks may remain even after protective measures have been taken. They are called residual risks. On this machine, they may include exposure to:

- Heat, noise, exhaust, and carbon monoxide from the engine
- Fire hazards from improper refueling techniques
- Fuel and its fumes
- Personal injury from improper lifting techniques or operating techniques

To protect yourself and others, make sure you thoroughly read and understand the safety information presented in this manual before operating the machine.

1.3 Safety Guidelines for Operating the Machine

Operator training

Before operating the machine:

- Read and understand the operating instructions contained in all manuals delivered with the machine.
- Familiarize yourself with the location and proper use of all controls and safety devices.
- Contact Wacker Neuson for additional training if necessary.

When operating this machine:

- Do not allow improperly trained people to operate the machine. People operating the machine must be familiar with the potential risks and hazards associated with it.

Operator qualifications

Only trained personnel are permitted to start, operate, and shut down the machine. They also must meet the following qualifications:

- have received instruction on how to properly use the machine
- are familiar with required safety devices

The machine must not be accessed or operated by:

- children
- people impaired by alcohol or drugs

Application area

Be aware of the application area.

- Keep unauthorized personnel, children, and pets away from the machine.
- Remain aware of changing positions and the movement of other equipment and personnel in the application area/job site.
- Identify whether special hazards exist in the application area, such as toxic gases or unstable ground conditions, and take appropriate action to eliminate the special hazards before using the machine.

Be aware of the application area.

- Do not operate the machine in areas that contain flammable objects, fuels, or products that produce flammable vapors.

Safety devices, controls, and attachments

Only operate the machine when:

- All safety devices and guards are in place and in working order.
- All controls operate correctly.
- The machine is set up correctly according to the instructions in the Operator's Manual.
- The machine is clean.
- The machine's labels are legible.

To ensure safe operation of the machine:

- Do not operate the machine if any safety devices or guards are missing or inoperative.
- Do not modify or defeat the safety devices.
- Only use accessories or attachments that are approved by Wacker Neuson.

Safe operating practices

When operating this rammer:

- Remain aware of the rammer's moving parts. Keep hands, feet, and loose clothing away from the rammer's moving parts.
- When working near the edges of pits, slopes, trenches, and platforms, always operate the rammer in such a way that there is no possibility of it tipping over or falling in.

When operating this rammer:

- Do not operate a rammer in need of repair.
- Do not tamper with or disable the function of the operating controls.
- Do not leave the rammer running unattended.
- Do not consume the operating fluids used in this machine. Depending on your machine model, these operating fluids may include water, wetting agents, fuel (gasoline, diesel, kerosene, propane, or natural gas), oil, coolant, hydraulic fluid, heat transfer fluid (propylene glycol with additives), battery acid, or grease.

Personal Protective Equipment (PPE)

Wear the following Personal Protective Equipment (PPE) while operating this machine:

- Close-fitting work clothes that do not hinder movement
- Safety glasses with side shields
- Hearing protection
- Safety-toed footwear

After Use

- Stop the engine when the machine is not being operated.
- Close the fuel valve on engines equipped with one when machine is not being operated.
- Ensure that the machine will not tip over, roll, slide, or fall when not being operated.
- Store the machine properly when it is not being used. The machine should be stored in a clean, dry location out of the reach of children.

1.4 Safety Guidelines for Lifting and Transporting the Machine

When lifting the machine:

- Make sure slings, chains, hooks, ramps, jacks, forklifts, cranes, hoists, and any other type of lifting device used is attached securely and has enough weight-bearing capacity to lift or hold the machine safely. See chapter *Technical Data* for machine weight.
- Remain aware of the location of other people when lifting the machine.
- Only use the lifting points and tie-downs described in the Operator's Manual.
- Make sure the transporting vehicle has sufficient load capacity and platform size to safely transport the machine.

To reduce the possibility of injury:

- Do not stand under the machine while it is being lifted or moved.
- Do not get onto the machine while it is being lifted or moved.

1.5 Service Safety

Service training

Before servicing or maintaining the machine:

- Read and understand the instructions contained in all manuals delivered with the machine.
- Familiarize yourself with the location and proper use of all controls and safety devices.
- Only trained personnel shall troubleshoot or repair problems occurring with the machine.
- Contact Wacker Neuson for additional training if necessary.

When servicing or maintaining this machine:

- Do not allow improperly trained people to service or maintain the machine. Personnel servicing or maintaining the machine must be familiar with the associated potential risks and hazards.

Precautions

When servicing or maintaining the machine:

- Read and understand the service procedures before performing any service to the machine.
- All adjustments and repairs must be completed before operating the machine. Do not operate the machine with a known problem or deficiency.
- All repairs and adjustments shall be completed by a qualified technician.
- Turn off the machine before performing maintenance or making repairs.
- Remain aware of the machine's moving parts. Keep hands, feet, and loose clothing away from the machine's moving parts.
- Re-install the safety devices and guards after repair and maintenance procedures are complete.

Machine modifications

When servicing or maintaining the machine:

- Use only accessories/attachments that are approved by Wacker Neuson.

When servicing or maintaining the machine:

- Do not defeat safety devices.
- Do not modify the machine without the express written approval of Wacker Neuson.

Replacing parts and labels

- Replace worn or damaged components.
- Replace all missing and hard-to-read labels.
- When replacing electrical components, use components that are identical in rating and performance to the original components.
- When replacement parts are required for this machine, use only Wacker Neuson replacement parts or those parts equivalent to the original in all types of specifications, such as physical dimensions, type, strength, and material.

Cleaning

When cleaning and servicing the machine:

- Keep the machine clean and free of debris such as leaves, paper, cartons, etc.
- Keep the labels legible.

When cleaning the machine:

- Do not clean the machine while it is running.
- Never use gasoline or other types of fuels or flammable solvents to clean the machine. Fumes from fuels and solvents can become explosive.

Personal Protective Equipment (PPE)

Wear the following Personal Protective Equipment (PPE) while servicing or maintaining this machine:

- Close-fitting work clothes that do not hinder movement
- Safety glasses with side shields
- Hearing protection
- Safety-toed footwear

In addition, before servicing or maintaining the machine:

- Tie back long hair.
- Remove all jewelry (including rings).

Safe service practices

- Do not alter engine speeds. Run the engine only at speeds specified in *Technical Data*.
- Do not operate the machine without an air cleaner.
- Disconnect the spark plug before servicing to avoid accidental start-up.
- Do not crank a flooded engine with the spark plug removed. Fuel trapped in the cylinder will squirt out the spark plug opening.
- Do not test for spark if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes.

1.6 Operator Safety while Using Internal Combustion Engines



WARNING

Internal combustion engines present special hazards during operation and fueling. Failure to follow the warnings and safety standards could result in severe injury or death.

- ▶ Read and follow the warning instructions in the engine owner's manual and the safety guidelines below.



DANGER

Exhaust gas from the engine contains carbon monoxide, a deadly poison. Exposure to carbon monoxide can kill you in minutes.

- ▶ NEVER operate the machine inside an enclosed area, such as a tunnel, unless adequate ventilation is provided through such items as exhaust fans or hoses.

Operating safety

When running the engine:

- Keep the area around the exhaust pipe free of flammable materials.
- Check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.

When running the engine:

- Do not smoke while operating the machine.
- Do not run the engine near sparks or open flames.
- Do not touch the engine or muffler while the engine is running or immediately after it has been turned off.
- Do not operate a machine when its fuel cap is loose or missing.
- Do not start the engine if fuel has spilled or a fuel odor is present. Move the machine away from the spill and wipe the machine dry before starting.

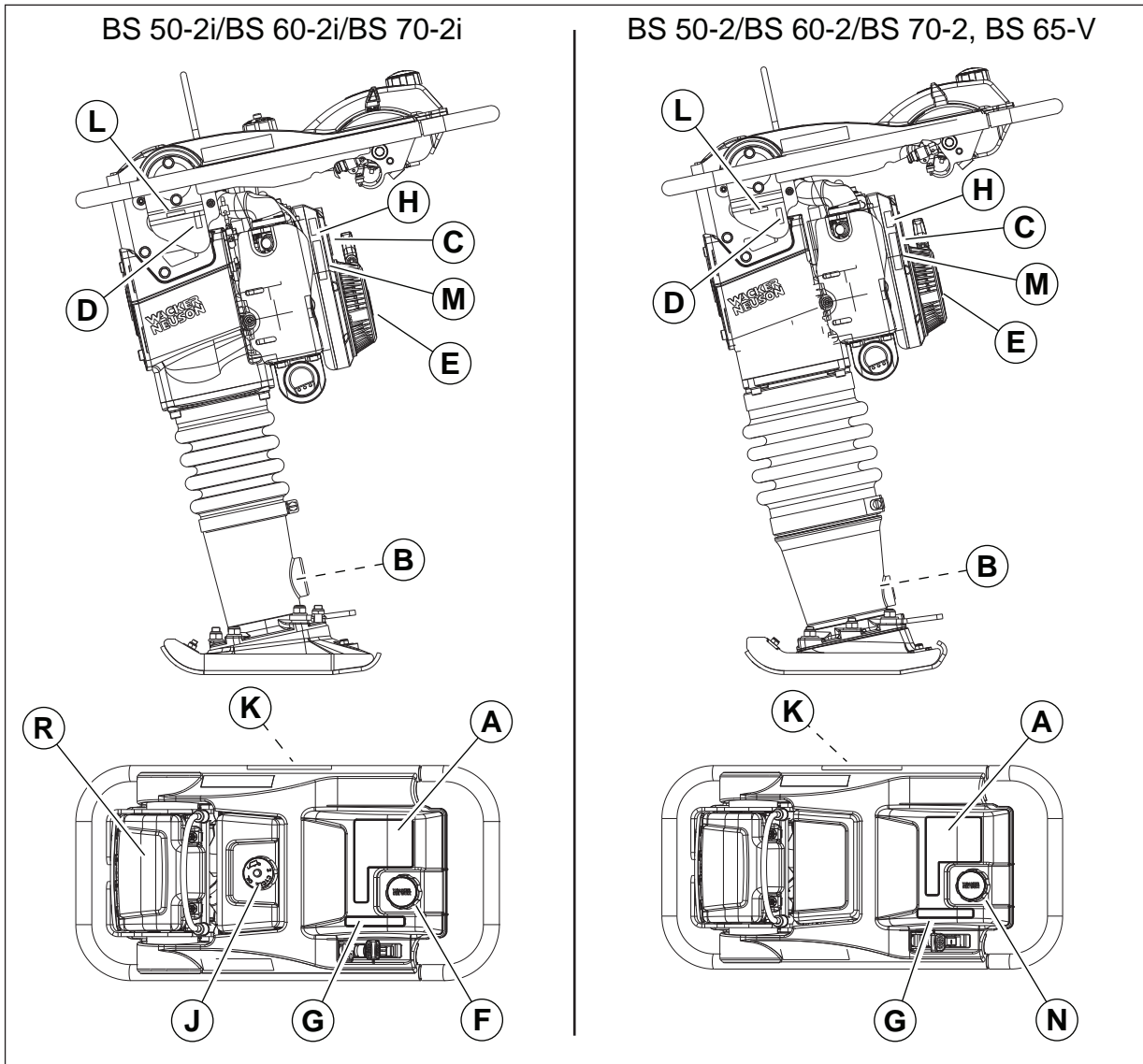
Refueling safety

When refueling the engine:

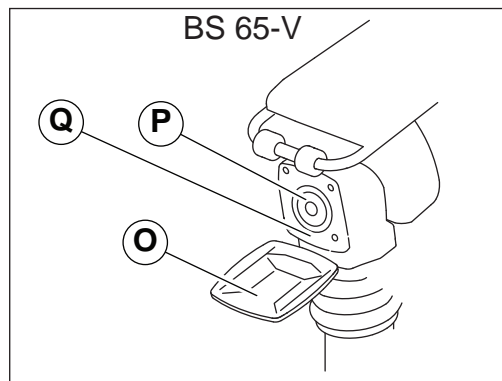
- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Re-install the fuel tank cap after refueling.
- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near sparks or open flames.
- Use suitable tools for refueling (for example, a fuel hose or a funnel).
- Do not refuel if the machine is positioned in a truck fitted with a plastic bed liner. Static electricity can ignite the fuel or fuel vapors.

2 Labels

2.1 Label Locations




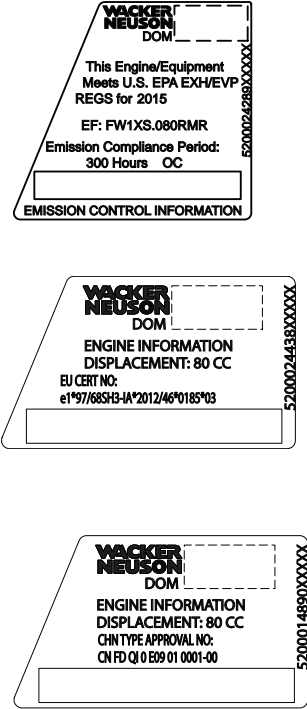
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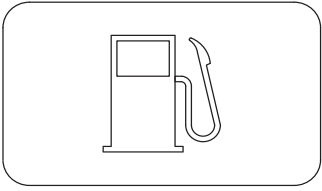
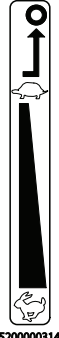
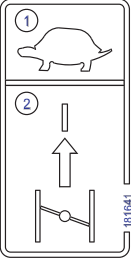





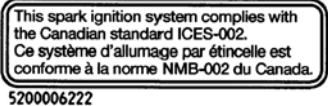
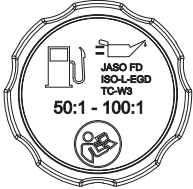
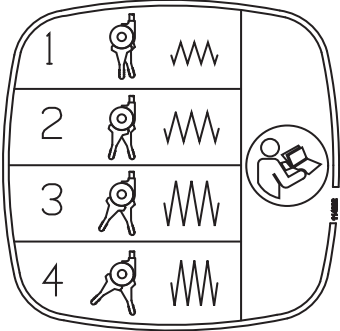
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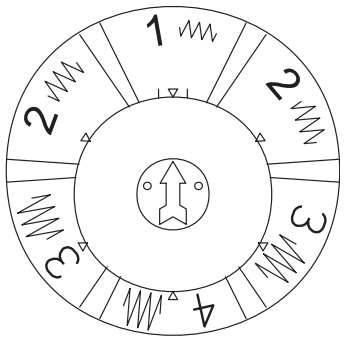

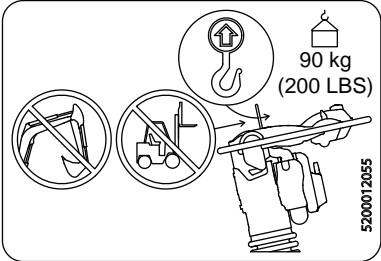
2.2 Label Meanings

<p>A</p>		<p>DANGER Asphyxiation hazard.</p> <ul style="list-style-type: none"> ■ Engines emit carbon monoxide. ■ Do not run the machine indoors or in an enclosed area unless adequate ventilation, through such items as exhaust fans or hoses, is provided. ■ No sparks, flames, or burning objects near the machine. ■ Stop the engine before refueling. <p>WARNING</p> <ul style="list-style-type: none"> ■ To reduce the risk of hearing loss, always wear hearing protection when operating this machine. ■ Read the Operator's Manual. <p>To start the machine:</p> <ol style="list-style-type: none"> 1. Move the throttle to the IDLE position. 2. Push the purge bulb 10 times. 3. Close the choke. 4. Pull the starter rope until engine starts. 5. Move the throttle to the FAST position. <p>To stop the machine:</p> <ol style="list-style-type: none"> 1. Move the throttle past the SLOW position. <p>For optimal control, performance, and minimal hand/arm vibration, grasp the handle as shown.</p>
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<p>B</p>	 <p>178792</p>	<p>WARNING Springs are compressed. Release cover slowly to avoid spring ejection. See the Repair Manual for proper disassembly instructions.</p>
<p>C</p>		<p>Emission control information This engine/equipment meets U.S. EPA exhaust/evaporative regulations for 2015. Engine family: FWIXS.080RMR Emission compliance period: 300 hours (heavy use)</p> <p>Engine information Displacement: 80cc This label also includes the EU Certification Number: e1*97/68SH3-IA*2012/46*0185*03</p> <p>Engine information Displacement: 80cc This label also includes CHN Type Approval Number: CN FD Q1 0 E09 01 0001-00</p>

<p>D</p>		<p>Guaranteed sound power level in dB(A)</p>
<p>E</p>		<p>Wacker Neuson label</p>
<p>F</p>	 	<p>Use only clean, filtered fuel.</p>
<p>G</p>		<p>Turtle = Idle/slow engine speed Rabbit = Full/fast engine speed</p>
<p>H</p>		<ol style="list-style-type: none"> 1. Move the throttle to the IDLE position. 2. Close the choke.

<p>J</p>		<p>Engine oil tank</p> <ul style="list-style-type: none"> ■ Use only Wacker Neuson two-cycle or other fully synthetic oil meeting the NMMA TC-W3, JASO FD, or ISO-L-EGD specification. <p>Read the Operator's Manual.</p>
<p>K</p>		<p>WARNING Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.</p>
<p>L</p>		<p>This machine may be covered by one or more patents.</p>
<p>M</p>		<p>This spark ignition system complies with the Canadian standard ICES-002.</p>
<p>N</p>		<ul style="list-style-type: none"> ■ Use only Wacker Neuson two-cycle or other fully synthetic oil meeting the NMMA TC-W3, JASO FD, or ISO-L-EGD specification. ■ A gasoline/oil ratio in a range from 50:1 to 100:1 can be used. For optimum engine performance and durability, a 100:1 ratio with a fully synthetic oil meeting the specification described above is preferred.
<p>O</p>	 <p>wc_sy0114282</p>	<p>Adjusting tool label</p> <p>Refer to <i>Selecting Ramming Stroke and Adjusting Ramming Stroke</i> for explanation of this label.</p> <p>Read the Operator's Manual</p>

<p>P</p>		<p>Locking lever label</p> <p>Refer to <i>Selecting Ramming Stroke and Adjusting Ramming Stroke</i> for explanation of this label.</p>
<p>Q</p>		<p>CAUTION</p> <p>Cutting hazard. Moving parts under the housing cover can cut skin and catch clothing. Do not operate the machine while the housing cover is open.</p>
<p>R</p>		<p>Lifting the rammer</p> <p>Use proper lifting device (crane or hoist) with proper lifting gear (hooks, slings and/or chains) to lift the rammer.</p> <p>Do not use the end of a boom or a fork lift tine to directly lift a rammer.</p> <p>Only lift the rammer by the lifting cable.</p>

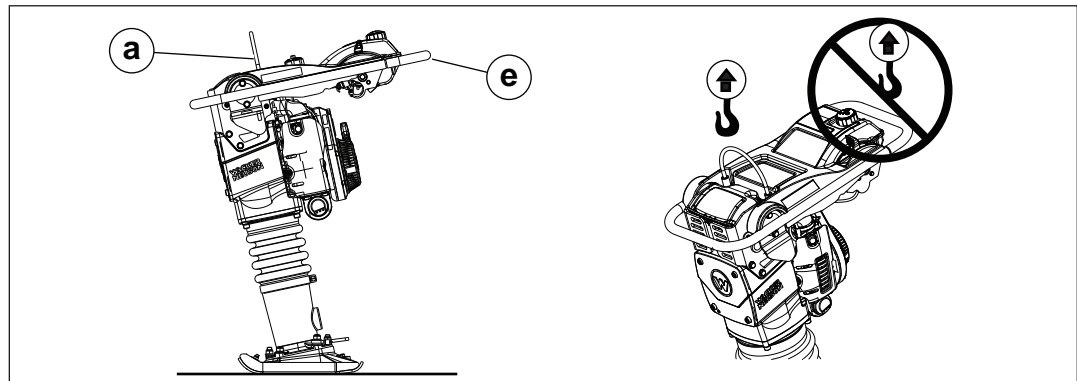
3 Lifting and Transporting

3.1 Lifting the Rammer

- Requirements**
- Lifting device (crane or hoist) capable of supporting the rammer's weight (see the identification plate on the rammer)
 - Lifting gear (hooks, slings, and/or chains) capable of supporting the rammer's weight
 - Engine stopped and cool to the touch

Procedure Perform the procedure below to lift the rammer.

1. Attach the lifting gear to the central lifting cable (**a**).



wc_gr010405



WARNING

Crushing hazard. Do not use the guide handle (**e**) to lift the rammer.

- ▶ Use only the central lifting cable to lift the rammer.



WARNING

Crushing hazard. Do not use the central lifting cable if there are any signs of cut wires, excessive wear, or other defects.

- ▶ Always inspect the central lifting cable for wear, damage, or abuse. Replace a damaged lifting cable immediately.
- ▶ Protect the central lifting cable from all sharp edges.

2. Lift the rammer a short distance, making sure that all connections are secure.
3. Continue lifting the rammer as required.

3.2 Transporting the Rammer

Overview This rammer can be transported in a vehicle, or manually, depending on job site conditions and distance to be traveled.

NOTICE: Do not tow this rammer.

Requirements

- Engine stopped and cool to the touch
- Lifting devices and gear
- Fuel tank drained (if transporting horizontally)

Transporting in a vehicle Perform the procedure below to transport the rammer in a vehicle.



WARNING

Lifting injury. This machine is too heavy to lift without mechanical assistance.

- ▶ Do not attempt to lift or carry the rammer without using appropriate lifting devices and gear as described in topic *Lifting the Rammer*.
-

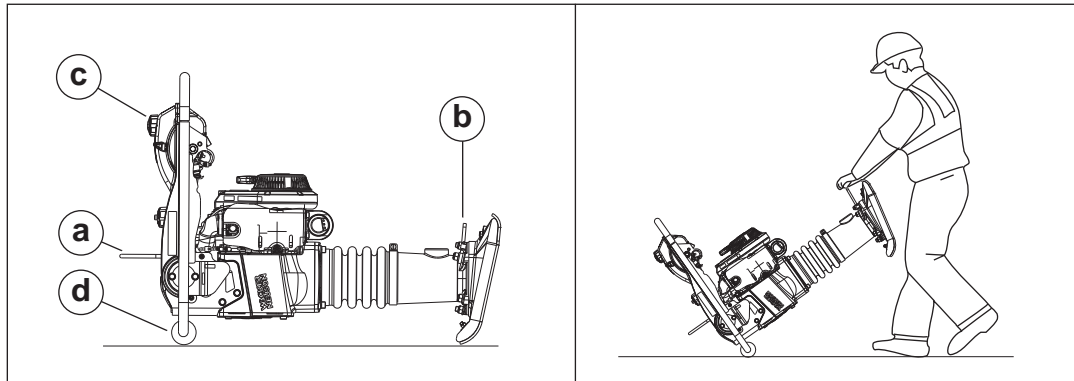
1. Lift the rammer into the transport vehicle. See topic *Lifting the Rammer*.
2. Secure the rammer to the transport vehicle in the upright position to prevent it from tipping, falling, or rolling.

This procedure continues on the next page.

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If the rammer cannot be secured in the upright position,

- a. Drain the fuel tank to prevent fuel from leaking from the cap **(c)**.
- b. Lay the rammer down only as shown and tie it to the vehicle at points **(a)** and **(b)**.



wc_gr010406

Transporting manually

Rollers **(d)** enable the rammer to be rolled from one location to another. Perform the procedure below to transport the rammer manually.

1. Drain the fuel tank to prevent fuel from leaking from the cap.
2. Lay the rammer down as shown.
3. Raise the rammer by the lifting handle **(b)**.
4. Roll the rammer forward or backward as needed.

Notes



4 Operation

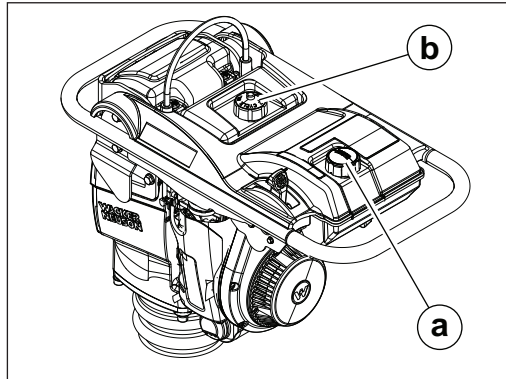
4.1 Preparing the Machine for First Use

1. Make sure all loose packaging materials have been removed from the machine.
2. Check the machine and its components for damage. If there is visible damage, do not operate the machine! Contact your Wacker Neuson dealer immediately for assistance.
3. Take inventory of all items included with the machine and verify that all loose components and fasteners are accounted for.
4. Attach component parts not already attached.
5. Add fluids as needed, including fuel, engine oil, and ramming system oil.
6. On rammers with oil injection (BS 50-2i, BS 60-2i, BS 70-2i), visually check the oil in the oil supply line for air bubbles. If air bubbles exist, purge the oil supply line before operating the machine. See topic *Purging the Oil Lines* for detailed instructions.
7. Move the machine to its operating location.

4.2 Recommended Fuel

For rammers with oil injection (BS 50-2i, BS 60-2i, BS 70-2i)

If the rammer has a fuel tank **(a)** and an oil tank **(b)**, it has oil injection—**No premixing of the gasoline and oil is required.** Mixing of the gasoline and oil is done automatically by the machine.



wc qr010452

Fill the fuel tank with regular unleaded gasoline. Fill the oil tank with Wacker Neuson two-cycle oil (or an equivalent). See chapter *Technical Data* for fuel and oil specifications.

Use of oxygenated fuels

Some conventional gasolines are blended with alcohol. These gasolines are collectively referred to as oxygenated fuels. If you use an oxygenated fuel, be sure it is unleaded and meets the minimum octane rating requirement.

Before using an oxygenated fuel, confirm the fuel's contents. Some states and provinces require this information to be posted on the fuel pump.

The following is the Wacker Neuson approved percentage of oxygenates:

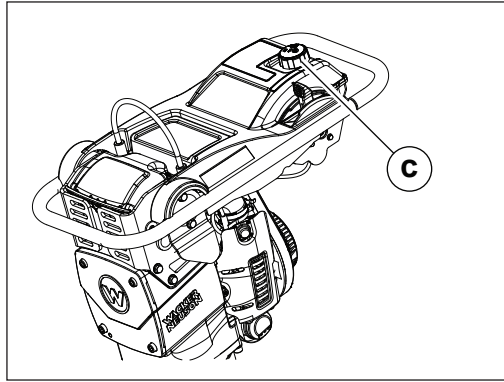
ETHANOL - (ethyl or grain alcohol) 10% by volume. You may use gasoline containing up to 10% ethanol by volume (commonly referred to as E10). Gasoline containing more than 10% ethanol (such as E15, E20, or E85) may not be used because it could damage the engine.

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.

**For rammers without oil injection
(BS 50-2, BS 60-2, BS 70-2, BS 65-V, BS 65-V)**

If the rammer has a fuel tank (c) but no oil tank, the engine **requires a two-cycle gasoline/oil mixture.**



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NOTICE: Use only the recommended gasoline/oil mixture to fuel this machine. Using gasoline alone will severely damage the engine.

Requirements

- Use only Wacker Neuson two-cycle or other fully synthetic oil meeting the NMMA TC-W3, JASO FD, or ISO-L-EGD specification.
- A gasoline/oil ratio in a range from 50:1 to 100:1 can be used. For optimum engine performance and durability, a 100:1 ratio with a fully synthetic oil meeting the specification described above is preferred.
- Mix regular unleaded gasoline and two-cycle engine oil in a separate container before filling the tank.
- Refer to the chart below for the proper quantities to use when mixing gasoline and oil.

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	1.25 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 Refueling the Machine

- Requirements**
- Machine shut down
 - Engine cool
 - Machine standing upright on the ramming shoe
 - Fresh, clean fuel supply

Procedure Perform the procedure below to refuel the machine.

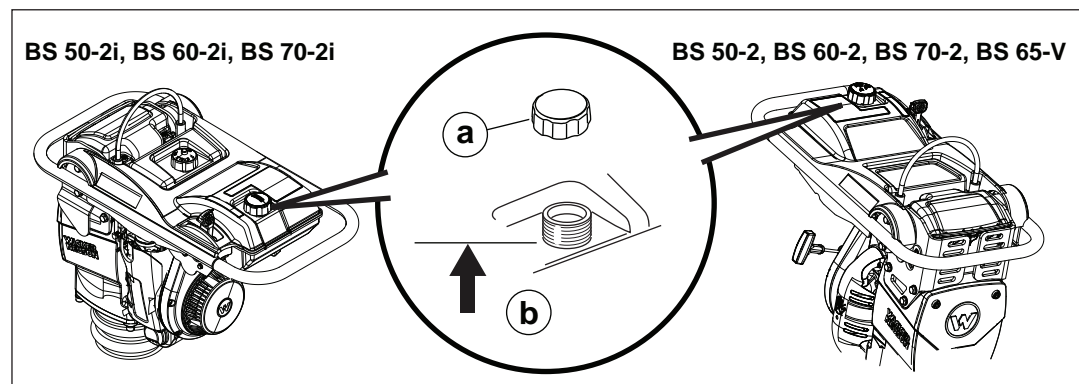


WARNING

Fire and burn hazard. Fuel and its vapors are extremely flammable.

- ▶ Keep all sources of ignition away from the machine while refueling.
- ▶ Do not refuel if the machine is positioned in a truck fitted with a plastic bed liner. Static electricity can ignite the fuel or fuel vapors.
- ▶ Refuel only when the machine is outdoors.
- ▶ Clean up spilled fuel immediately.

1. Remove the fuel cap (a).



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2. Fill the fuel tank up to the base of the neck (b).



CAUTION

Fire and health hazard. Fuel expands when heated. Expanding fuel in an over-filled tank can lead to spills and leaks.

- ▶ Do not overfill the fuel tank.

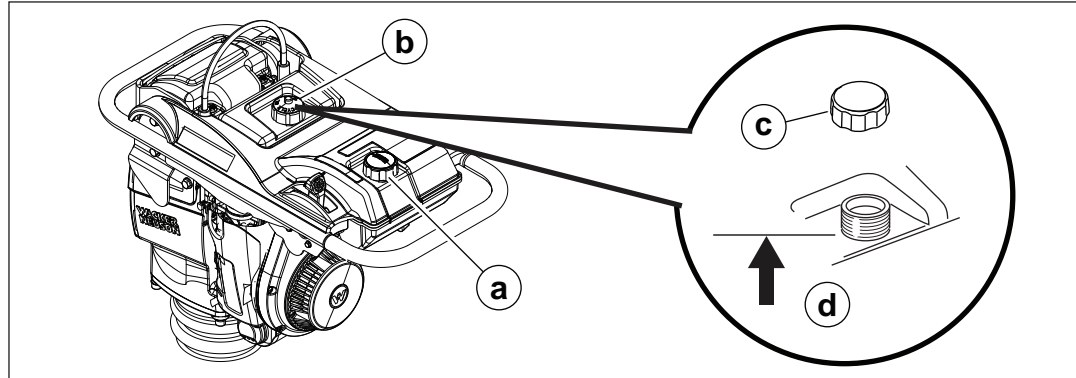
3. Re-install the fuel cap.

Result The machine has now been refueled.

4.4 Filling the Oil Tank

For rammers with oil injection (BS 50-2i, BS 60-2i, BS 70-2i)

If the rammer has a fuel tank (a) and an oil tank (b), it has oil injection. The oil tank requires oil.



wc_gr011417

- Requirements**
- Machine shut down
 - Engine cool
 - Machine standing upright on the ramming shoe
 - Wacker Neuson 2-cycle or equivalent oil

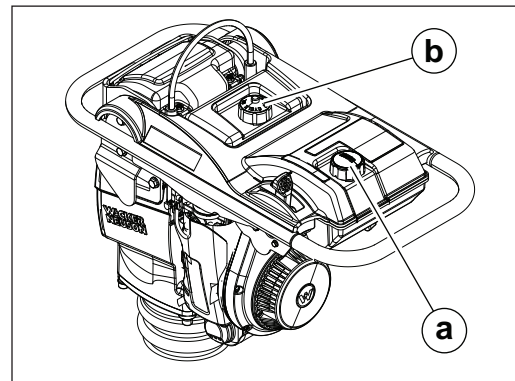
- Procedure**
- Perform the procedure below to fill the oil tank.
1. Remove the oil tank cap (c). Fill the oil tank up to the base of the neck (d).
 2. Re-install the oil tank cap.
- Note:** Clean up any spilled oil.

Result The oil tank has now been filled.

4.5 Purging the Oil Lines

For rammers with oil injection (BS 50-2i, BS 60-2i, BS 70-2i)

If the rammer has a fuel tank (a) and an oil tank (b), it has oil injection. The oil lines may need purging.



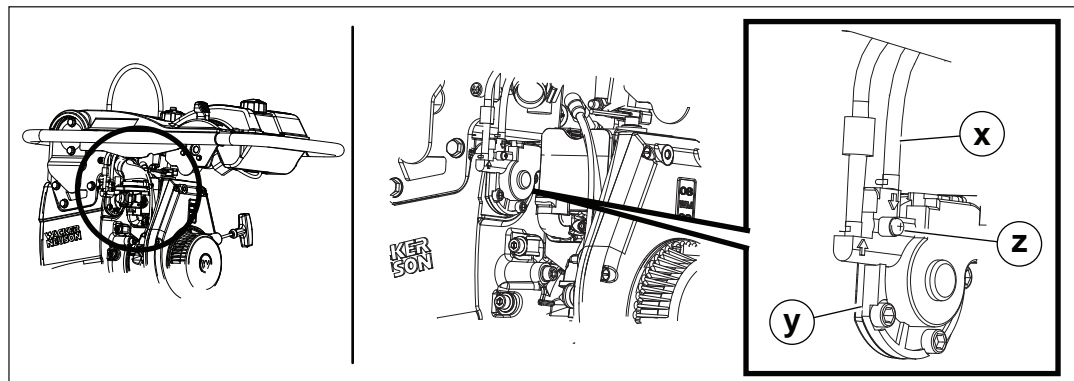
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When As needed: when air bubbles are visible in the oil supply line or discharge line

- Requirements**
- Machine is stopped
 - Engine is cool to the touch
 - Oil tank is filled
 - Fresh oil (as specified in *Technical Data*)
 - Phillips screwdriver
 - Plastic syringe
 - Clean, dry, absorbent cloth or paper towels

Purging the oil supply line Perform the procedure below to purge the oil supply line.

1. Locate the oil supply line (x) connected to the oil pump (y).



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2. Loosen (open), but do not remove, the bleed screw (z). Gravity in the oil supply line will purge trapped air.
3. When air bubbles are no longer visible in the oil supply line, retighten the bleed screw.
4. Wipe residual oil from the supply line and oil pump.

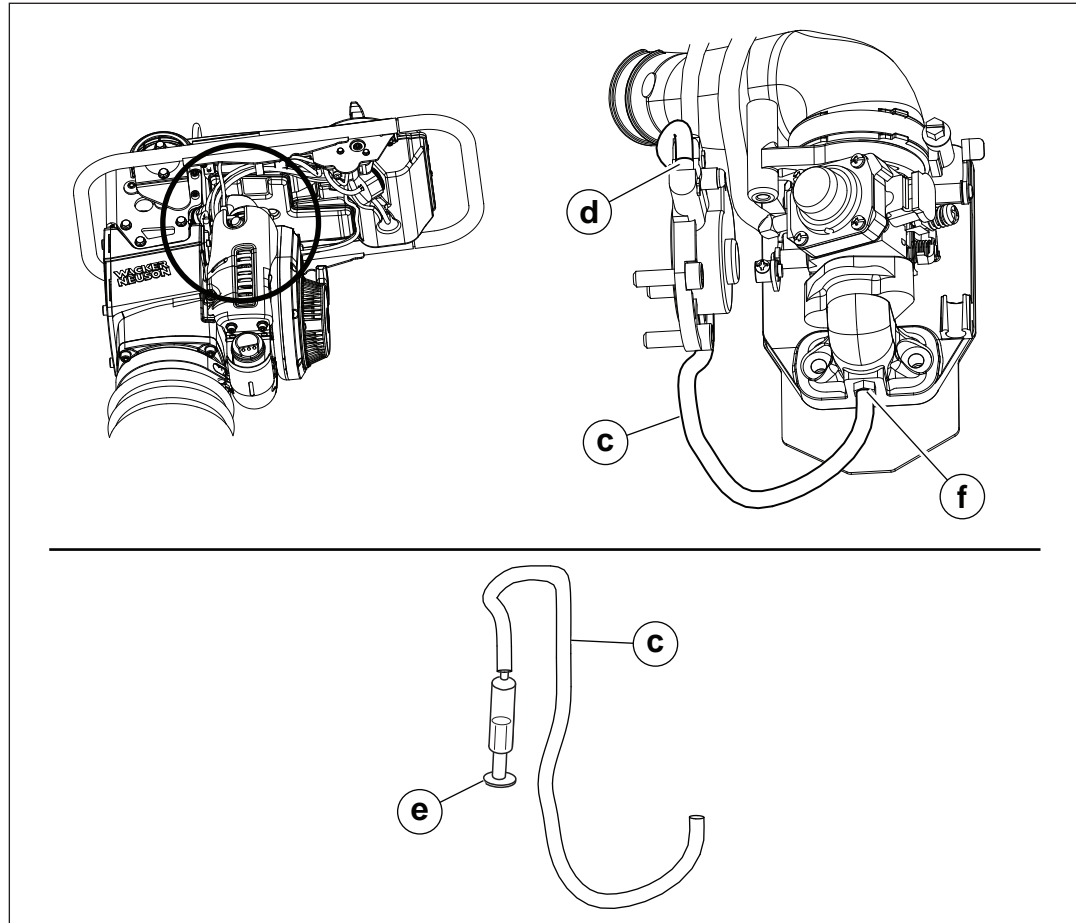
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Purging the oil discharge line

Perform the procedure below to purge the oil discharge line.

1. Locate the oil discharge line **(c)**.



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2. If air bubbles are visible in the oil discharge line, they must be manually purged using the following method:

Disconnect the oil discharge line at the oil pump **(d)**. Using a plastic syringe **(e)** filled with oil, inject oil into the oil discharge line until the air bubbles are gone and oil is visible up to the carburetor adapter fitting **(f)**.

3. After the air bubbles have been purged, reconnect the oil discharge line. Make sure that the connections are tight with no oil leaks.
4. Wipe residual oil from the oil discharge line and fittings.

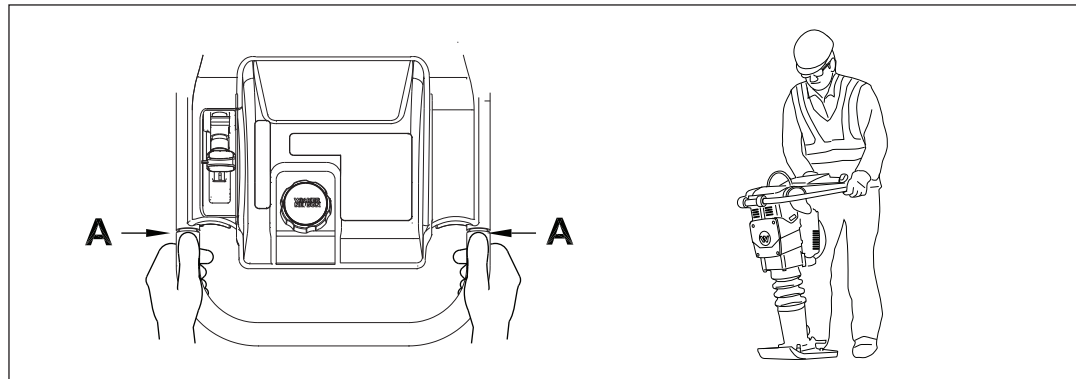
Result

The oil lines have been purged.

4.6 Position of the Operator

For optimal control, performance, and minimal hand/arm vibration, follow the guidelines below when using the machine.

Grasp the handle with both hands as shown.



wc_gr011468

Stand behind the rammer, walking slowly and guiding the direction of travel as the machine moves forward.

Note: *Hand/Arm Vibration (HAV) has been optimized for the hand position shown. Reported HAV levels are measured at position A in conformance with EN 1033 and ISO 5349 standards.*

4.7 Before Starting

1. Read safety instructions at the beginning of this manual.
2. Make sure that the fuel tank is full.
3. On machines with oil tanks:
 - ▶ Make sure the oil tank is at least ¼ full.
 - ▶ Check the oil lines for air.
4. Check the fuel lines and fittings.
5. Check the air filter.
6. Check the ramming system oil level.
7. Place the rammer on loose soil or gravel. DO NOT start the rammer on hard surfaces such as asphalt or concrete.

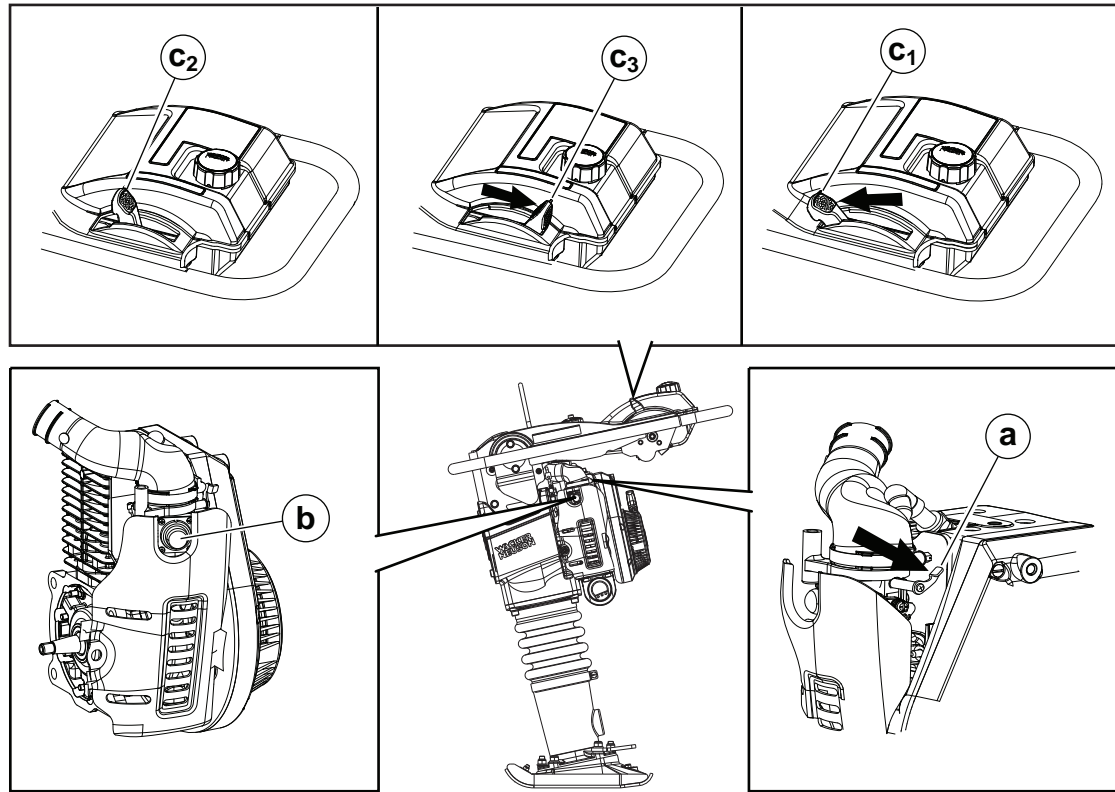
4.8 Starting, Operating, and Stopping the Machine

- Requirements**
- Rammer is in serviceable condition and has been properly maintained
 - There is fuel in the tank

Starting the machine

Perform the procedure below to start the machine.

1. Move the throttle to the idle position (**c2**). This will automatically start the flow of fuel.



wc_gr011422

2. Close the choke (**a**).
 3. Pump the purge bulb (**b**) 6 to 10 times or until you see fuel in the bulb.
- Note:** The engine will not become flooded by pumping the purge bulb more than 10 times. Pumping the purge bulb removes air from the fuel system. It does not pump fuel into the carburetor.
4. Pull the starter rope repeatedly until the engine starts.

Multiple pulls of the starter rope (usually fewer than five) may be required to start an engine:

- on a new machine being operated for the first time
- that has not been run for a long period of time (a week or more)
- that has been run completely out of fuel
- in cold weather conditions

This procedure continues on the next page.