

Operator's Manual
Walk-Behind Trowels
CT36/CT36A
CT48/CT48A



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Original instructions

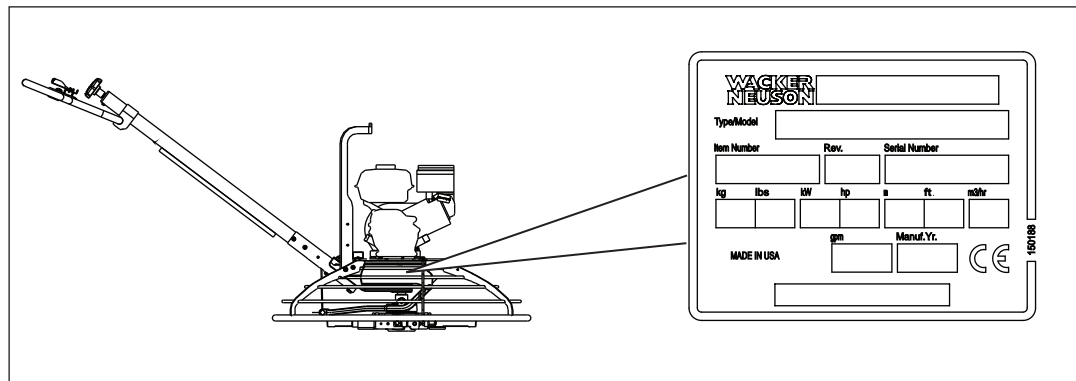
This Operator's Manual presents the original instructions. The original language of this Operator's Manual is American English.

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.

Machines covered by this manual

Machine	Item Number	Machine	Item Number
CT 36-6	500009443 5000620830	CT 48-9	500009453 5000620838
CT 36-9	500009444 5000620833		
CT 36-9V	500009447 5000620834		
CT 36-5A	500009438 5000620106 5000620829 5200016256	CT 48-8A	500009449 5000620837
CT 36-8A	500009439 5000620831	CT 48-11A	500009450 5000620835
CT 36-8A-V	500009442 5000620832	CT 48-13A-V	500009452 5000620836



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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:

Foreword

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.
 - For spare parts information, please see your Wacker Neuson Dealer, or visit the Wacker Neuson website at <http://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

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.

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.





EC Declaration of Conformity

Manufacturer

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

Product

Product	CT36-5A, CT36-8A, CT36-8A-V, CT36-6, CT36-9, CT36-9-V, CT48-8A, CT48-11A, CT48-13A-V, CT48-9
Product category	Trowel
Product function	To smooth and finish semi-cured concrete
Item number	5000620829, 5000620830, 5000620831, 5000620832, 5000620833, 5000620834, 5000620835, 5000620836, 5000620837, 5000620838

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, 2014/30/EU, EN12649

Authorized Person for Technical Documents

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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 walk-behind concrete finishing trowel. The Wacker Neuson Walk-Behind Trowel consists of a frame onto which are mounted a gasoline engine, a fuel tank, a gearbox, and a control handle. A set of four metal blades is connected to the gearbox and is surrounded by a ring guard. The engine rotates the blades through the gearbox and clutch mechanism. The rotating blades ride on the surface of curing concrete, creating a smooth finish. The operator walks behind the machine and uses the handle to control speed and direction of the machine.

This machine is intended to be used for floating and burnishing curing concrete.

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 to finish inappropriate materials such as slurries, sealers, or epoxy finishes
 - 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
- Chemical burns from curing concrete
- Fire hazards from improper refueling techniques
- Fuel and its fumes, fuel spillage from improper lifting technique
- Personal injury from improper lifting techniques or operating techniques
- Cutting hazards from sharp or worn blades

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 Operating Safety

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 machine:

- Remain aware of the machine's moving parts. Keep hands, feet, and loose clothing away from the machine's moving parts.

When operating this machine:

- Do not operate a machine in need of repair.
 - 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
-

General operating safety

- Do not operate the machine with the beltguard missing. Exposed drive belt and pulleys create potentially dangerous hazards that can cause serious injuries.
- Never operate this machine in applications for which it is not intended.
- Do not use the trowel around pop-ups in the concrete that are lower than the lowest ring on the ring guard.
- Do not use a mobile device while operating this machine.
- Do not tip the machine for cleaning or for any other reason.
- Do not operate the trowel with the engine control module (safety interlock) disabled. Serious injury could occur if struck by rotating trowel due to disabling this interlock.

1.4 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 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.
 - Do not test for spark on gasoline-powered engines if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes.
 - Disconnect the spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.
 - Do not remove blades while the machine is hanging overhead.
 - Only change the blades when the machine is supported securely.
 - Handle blades carefully. The blades can develop sharp edges which can cause serious cuts.
-

After use

- Stop the engine when the machine is not being operated.
- Close the fuel valve on engines equipped with one when the 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.

1.5 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:

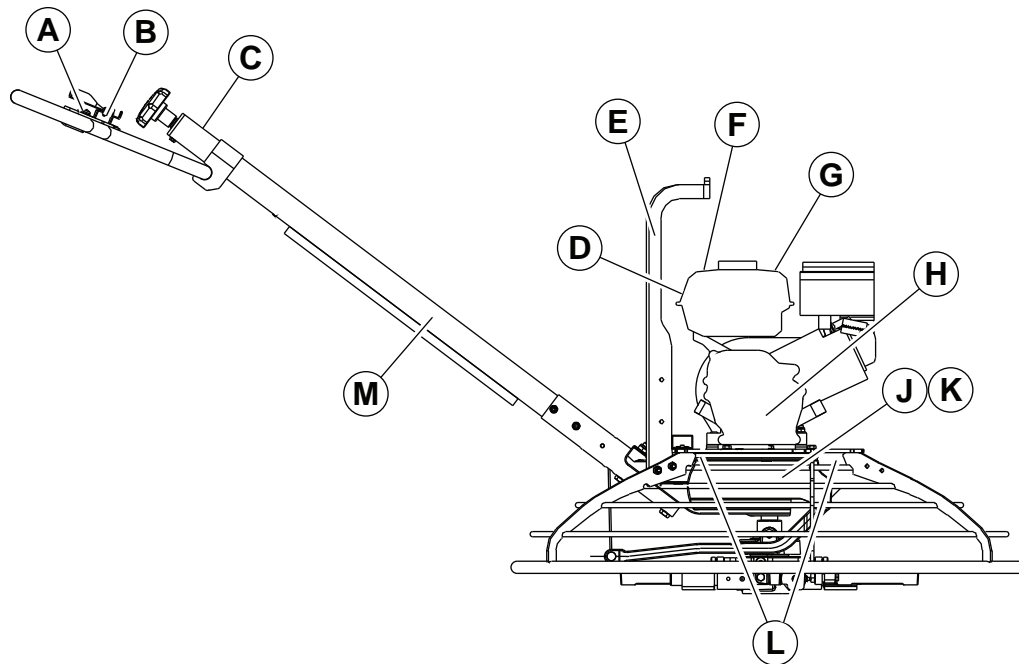
- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Re-install the fuel tank cap after refueling.
- Use suitable tools for refueling (for example, a fuel hose or funnel).

When refueling the engine:

- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near sparks or open flames.

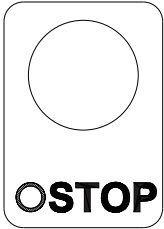



2 Labels

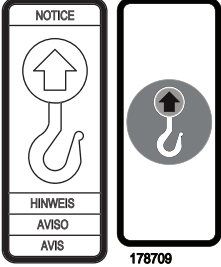






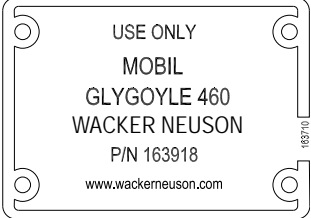
2.1 Label Locations

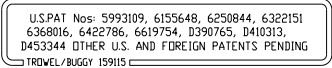
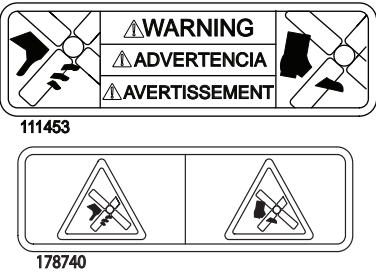
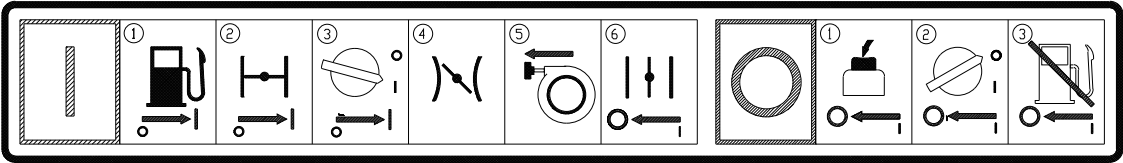


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2.2 Label Meanings

<p>A</p>		<p>Engine stop button: Press to stop engine.</p>
<p>B</p>		<p>Variable speed throttle</p>
<p>C</p>		<p>WARNING Always wear hearing and eye protection when operating this machine.</p>
<p>D</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. ■ NEVER use inside a home or garage, EVEN IF doors and windows are open. ■ Only use OUTSIDE and far away from windows, doors, and vents. ■ Read the Operator's Manual. ■ No sparks, flames, or burning objects near the machine. ■ Stop the engine before refueling. ■ Use only clean, filtered fuel.

<p>E</p>	 <p>178709</p>	<p>NOTICE Lifting point</p>
<p>F</p>	 <p>0117045</p>  <p>178714</p>	<p>CAUTION Read and understand the supplied Operator's Manual before operating this machine. Failure to do so increases the risk of injury to yourself and others.</p>
<p>G</p>	 <p>117039</p>  <p>178713</p>	<p>WARNING Hot surface</p>
<p>H</p>	  <p>178712</p>	<p>WARNING Hand injury if caught in moving belt. Always replace beltguard.</p>
<p>J</p>	 <p>163918</p>	<p>Use only Glygoyle 460 gear oil in gearbox.</p>

<p>K</p>		<p>This machine may be covered by one or more patents.</p>
<p>L</p>		<p>WARNING Cutting hazard. Keep hands and feet away from blades. Always replace blade guard.</p>
<p>M</p>	 <p>To start the machine:</p> <ol style="list-style-type: none"> 1. Open the fuel flow valve. 2. Close the choke. 3. Push or turn engine switch to ON position. 4. Place throttle in the IDLE position. 5. Pull the rewind starter. 6. Open the choke. <p>To stop the machine:</p> <ol style="list-style-type: none"> 1. Press the stop button. 2. Push or turn engine switch to OFF position. 3. Close the fuel flow valve. 	

3 Lifting and Transporting

3.1 Lifting the Machine



WARNING

Personal injury hazard. **NEVER** lift the machine solely by the handle. The component may fail, causing the machine to fall, possibly injuring bystanders.

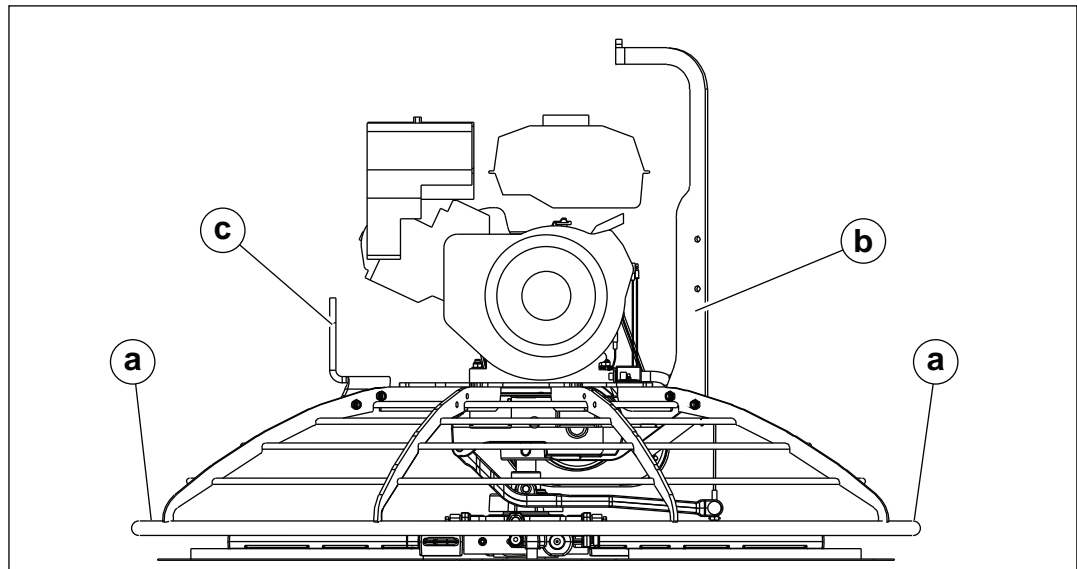
Manual lifting requirements

- Motor stopped
- A partner to help lift

Manual lifting

To manually lift the machine, perform the procedure below.

1. Stop the engine.
2. Grip the machine by the guard ring **(a)** or attach and grip the optional lifting bracket **(c)**.
 - a. Attach the optional lifting bracket to the trowel with screws and locknuts. Torque the screws to 25 Nm (18 ft.lbs.).
 - b. Insert a 2x4 or other suitable lumber into the bracket. The lumber must be long enough to extend past the ring guard.
 - c. Grip the machine by the handle and the lumber.



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3. Balance the weight between the partners
4. Lift the machine.



WARNING

To reduce risk of back injury while lifting, keep your feet flat on ground and shoulder width apart. Keep your head up and back straight.

Mechanically lifting requirements

- Motor stopped
 - Machine unplugged
 - Lifting equipment (crane, hoist, or fork truck) capable of supporting the machines weight
 - Lifting devices (hooks, chains, and shackles) capable of supporting the machines weight.
-

Mechanical lifting

To lift the machine mechanically, perform the procedure below.

1. Attach the optional lifting bracket **(b)** to the trowel with screws and locknuts. Torque to 25 Nm (18 ft.lbs.).
 2. Attach the lifting devices and equipment to the lifting bracket. Do not attach lifting devices to any other part of the machine.
 3. Lift the machine a small distance.
-



WARNING

Crushing hazard. An unstable machine may cause the lifting devices and equipment to fail. You may be crushed if the lifting devices and equipment fail.

- ▶ Check for stability before continuing.
-

4. Check for stability. If necessary, lower the machine, reposition the lifting devices and lift the machine a small distance again.
 5. Continue lifting the machine when it is stable.
-



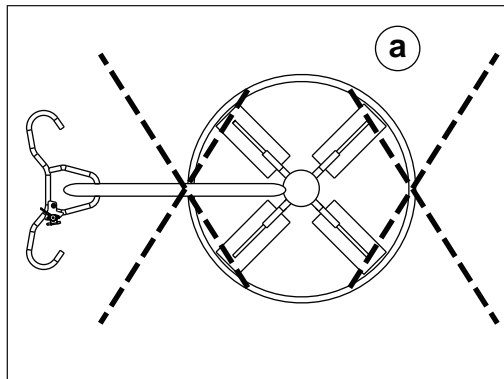
WARNING

Personal injury hazard. Do not lift the trowel overhead with a float pan attached, as the pan could fall off and strike personnel working in the vicinity.

3.2 Transporting the Machine

- Requirements**
- Transport vehicle capable of handling the weight of the trowel. See topic *Dimensions and Weight* for the weight of the machine.
 - Suitable ropes or chains.
-

- Procedure**
- Perform the procedure below to tie down and transport the machine.
1. Adjust the pitch (angle) of the trowel blades until the pitch cable is loose.
 2. Lift the trowel onto the transport vehicle.
 3. Position the handle so that it does not protrude outside of the transport vehicle.
 4. Connect the ropes/chains to the ring guard of the trowel as follows.
 - a. Connect them as low on the ring guard as possible to minimize stress on the gearbox output shaft.
 - b. Use a crossing pattern **(a)**.



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5. Connect the ropes/chains to the transport vehicle. Do not overtighten them.
-

Result The machine is now ready to be transported.

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 and applicable, such as fuel and engine oil.
6. Move the machine to its operating location.

4.2 Recommended Fuel

The engine requires regular grade unleaded gasoline. Use only fresh, clean gasoline. Gasoline containing water or dirt will damage the fuel system. Consult the engine owner's manual for complete fuel 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.

4.3 Refueling the Machine

- Requirements**
- Machine shut down
 - Engine cool
 - Machine/fuel tank level with the ground
 - Fresh, clean fuel supply

Procedure Perform the procedure below to refuel the machine.

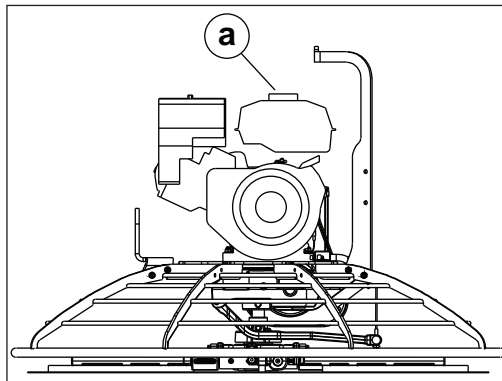


WARNING

Fire hazard. Fuel and its vapors are extremely flammable. Burning fuel can cause severe burns.

- ▶ 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 to the base of the neck.



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 procedure to refuel the machine is now complete.

4.4 Installing the Blades

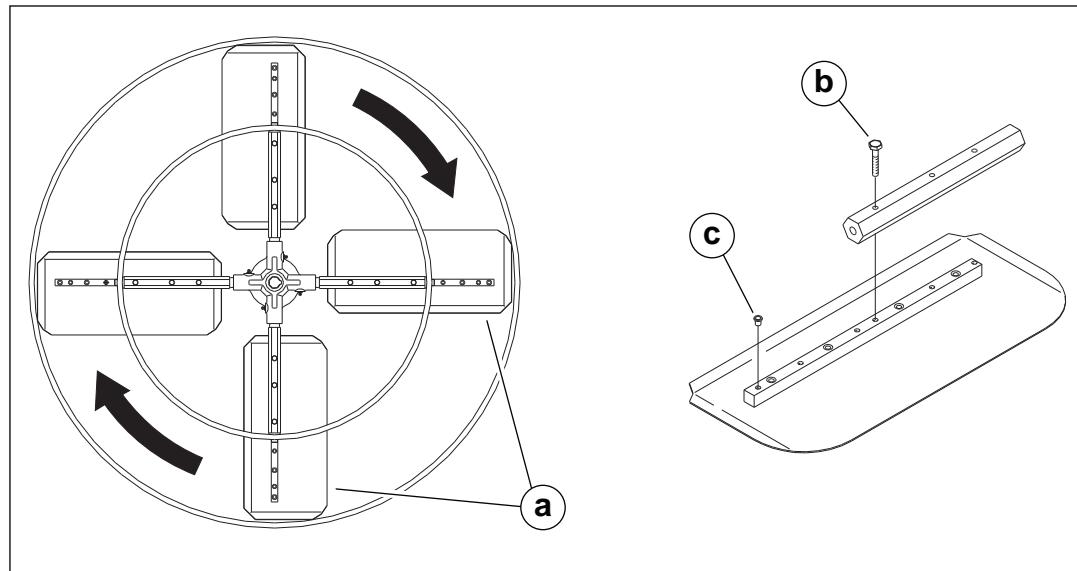
Background Four types of blades are available for the trowels.

Blade	When to Use	Description
Float blade	Early stages	<ul style="list-style-type: none"> ■ Not pitched ■ Clips on over finish or combination blades
Combination	Used throughout	<ul style="list-style-type: none"> ■ Used in place of the other blades ■ Cannot be mixed with finish or float blades
Finish	Final stages	<ul style="list-style-type: none"> ■ Pitched ■ Flat on both edges ■ Can be installed in either direction
Float pan	Used throughout	<ul style="list-style-type: none"> ■ Not pitched ■ Hooks over finish or combination blades

Note: Trowel blades must NOT be interchanged, i.e., do NOT put larger diameter blades on a smaller diameter trowel.

Procedure Perform the procedure below to install the blades.

1. Orient blades as shown (a). This positions the raised edges of the blade correctly for the clockwise rotation of the trowel arms.



wc_gr001097

This procedure continues on the next page.

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2. Secure the blades to the trowel arms with screws **(b)**.

Note: Dip the threads of the screws in grease prior to installation. This will prevent concrete from cementing the screws in place and will make removal of the blades easier.

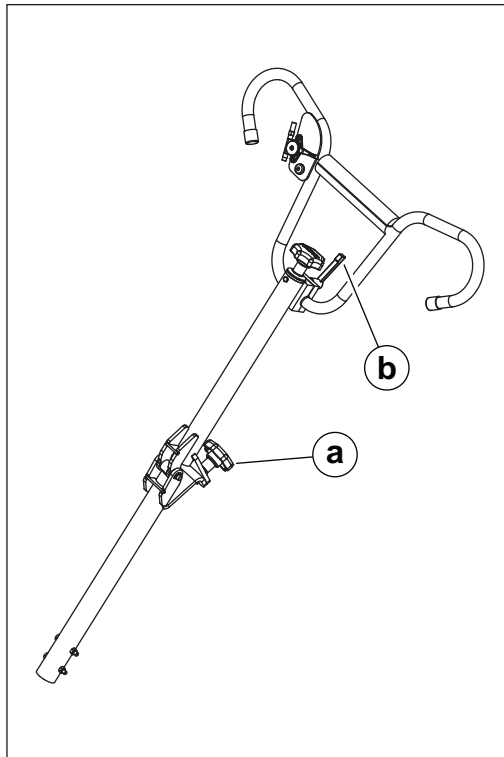
3. Plug the remaining threaded holes in the blade brace with plastic plugs **(c)** to prevent them from filling with concrete.

Result The blades are now installed.

4.5 Adjusting the Handle—CT 36-5A

Background On new machines, the handle comes folded and must be unfolded before use.

- Procedure**
1. Straighten the foldable handle.
 2. Tighten the knob **(a)** to secure the handle in position.



wc_gr012093

3. Position the adjustable handle by loosening the lever **(b)** and adjusting the handle up or down to suit the operator.
4. Tighten the lever to secure the handle in position.

NOTICE: Do not fully pitch the trowel blades and fold the handle. This will result in binding the pitch cable and possibly damaging the pitch assembly. Flatten the trowel blades before folding the handle.

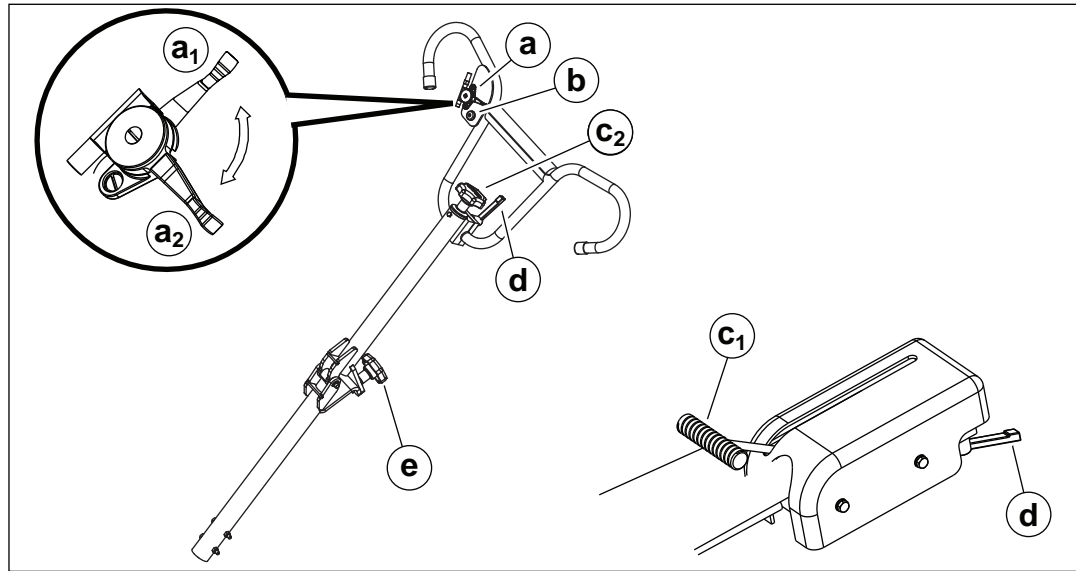
Result The handle is now installed.

4.6 Installing and Adjusting the Handle

Background On new machines, the handle comes folded and must be unfolded before use.

Procedure Perform the following procedure to unfold and adjust the handle.

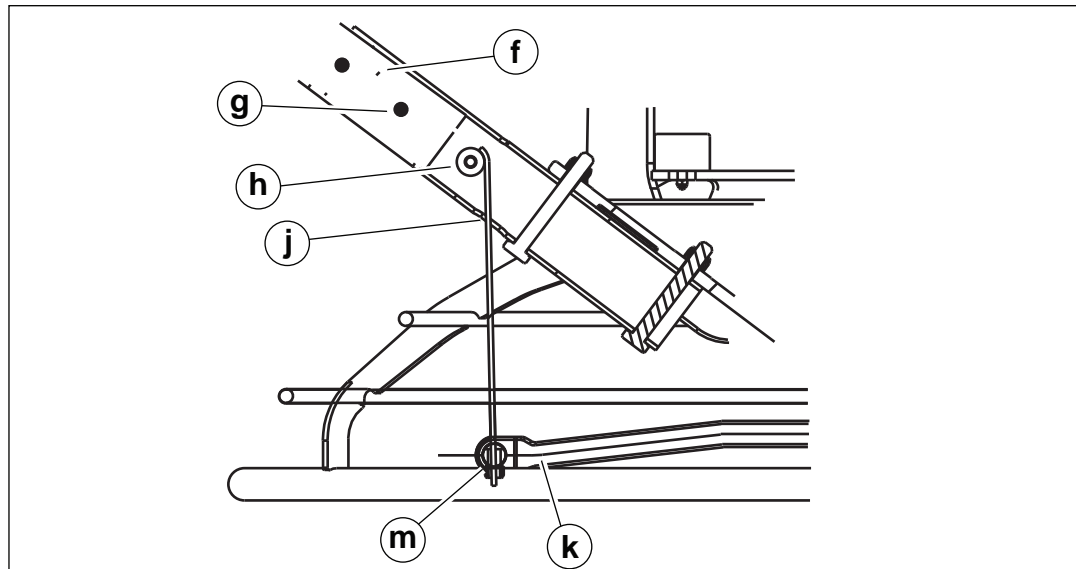
1. On machines with the foldable handle, straighten the handle and tighten the knob **(e)** to secure the handle in position.



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Installing the pitch control cable

2. Pull the pitch control cable **(j)** from the bottom end of the tube.



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3. Remove the cable nut **(m)** from the pitch control cable.

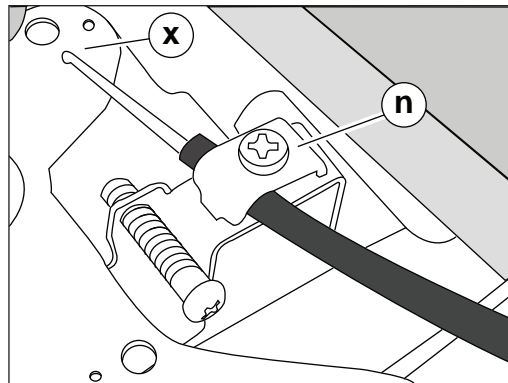
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4. Thread the pitch control cable through the handle base **(f)** and over the pulley **(h)**.
5. Attach the pipe handle to the handle base with two M8x65 screws **(g)**. Torque the screws to 25 Nm (18 ft.lbs.).
6. Push the *Pro-Shift*® handle **(c1)** all the way forward (away from the operator) OR turn the twist pitch control handle **(c2)** counterclockwise as far as possible.
7. Connect the pitch control cable to the fork **(k)** and adjust the cable nut so the cable is snug and the trowel blades lay flat (0° pitch).

Installing the throttle cable

8. Move the throttle to the idle position **(a1)**.
9. Remove the air cleaner cover.
10. Connect the throttle cable to the engine throttle bracket by placing the z-bend through hole in the throttle plate **(x)**. Connect the throttle cable into the throttle casing bracket with the clamp **(n)**.



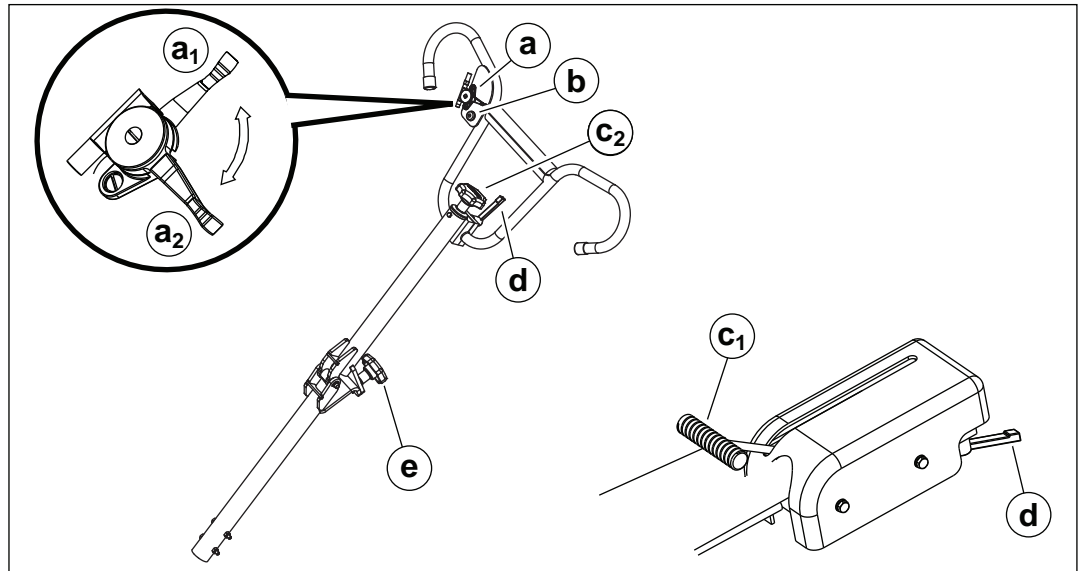
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11. Re-install the air cleaner cover.
 12. Connect the electrical wire on the handle to both ends of the engine wire. See handle instruction sheet for additional detail on installation.
- Note:** Do not connect wires in the bag on the engine to the wires on the handle.
13. On machines with an adjustable handle, position the handle by loosening the knob **(d)** and adjusting the handle up or down to suit the operator. Tighten the knob to secure the handle in position.

Result

The handle is now installed.

4.7 Controls



wc_gr012094

Ref.	Description	Ref.	Description
a	Throttle lever	d	Handle height adjustment (if equipped)
b	Stop button—when pressed, shuts off engine.	e	Foldable handle adjustment (if equipped)
c	Twist pitch control or Pro-Shift® pitch control	—	—

4.8 Braking System

The braking system of the trowel is spring-loaded.

- The brake is engaged when the input shaft of the gearbox is not rotating and/or there is no resistance against the blades of the trowel.
- The brake is released when the input shaft is rotating while there is resistance on the blades.

Note: *If there is no or low resistance against the blades, the brake may not release. Resistance against the blades allows the brake to release. If the machine is suspended or on a highly polished, slippery surface, the brake will not release and the belt could slip.*

4.9 Testing the Engine Control Module

Background To prevent uncontrolled spinning of the trowel, the trowel is equipped with an engine control module designed to shutoff the engine if the operator loses his/her grip on the trowel handle. The engine control module senses that the machine is spinning and shuts down the engine. The momentum of the spinning trowel engages the brake and stops the handle from spinning past 270°.

Procedure Perform the following procedure to test the engine control module.

1. Start the engine.
2. Jerk the handle to the right.
 - ▶ If the engine stops, the engine control module is functioning.
 - ▶ If the engine does not stop, repeat the jerking motion until the engine stops. If the engine still does not stop, push the stop button and turn the engine off. **DO NOT** operate the machine until the engine control module is replaced.



WARNING

Personal injury hazard. The uncontrolled spinning of the trowel may cause injury to the operator and others in the vicinity.

- ▶ Do not operate the trowel if the engine control module is disconnected or not functioning properly.

4.10 Position of the Operator

Background Safe and efficient use of this machine is the operator's responsibility. Full control of the machine is not possible unless the operator maintains the proper working position at all times.

While operating this machine the operator must:

- stand or walk behind the machine, facing forward;
- have both hands on the control handle;
- and guide the motion of the trowel by applying downward pressure to the control handle.

4.11 Optional Weights

Background Wacker Neuson supplies weight kits in order to add weights to the trowel guard rings to increase the burnishing force.

Procedure Perform the following procedure to add weights to the trowel.

1. Place an equal number of weights in both the front and rear of the guard ring in the designated area.
2. Tighten the screw to keep weights in place.



WARNING

Personal injury hazard. Using weights not authorized by Wacker Neuson could lead to personal injury or machine damage.

- ▶ Do not use any object as additional weight other than the weights recommended by Wacker Neuson.

4.12 Before Starting the Machine

- Before starting the machine, perform each item on the following checklist.
- Pre-operation checks**
- Read and understand the engine owner's manual.
 - Review and follow the safety instructions found in the front of this Operator's Manual.
 - Know the label locations and meanings.
-
- External checks**
- Make sure the motor box, switch box, and terminal box covers are tight.
 - Check the condition of the trowel arms and blades.
 - Check the condition of the ring guard.
 - Check that the handle height suits the operator.
 - Make sure the adjustable lever is tight.
 - Check the condition of the fuel lines.
-
- Internal checks**
- Check oil level in the gearbox.
 - Check oil level in the engine.
 - Check fuel level.
 - Check the condition of the air filter.

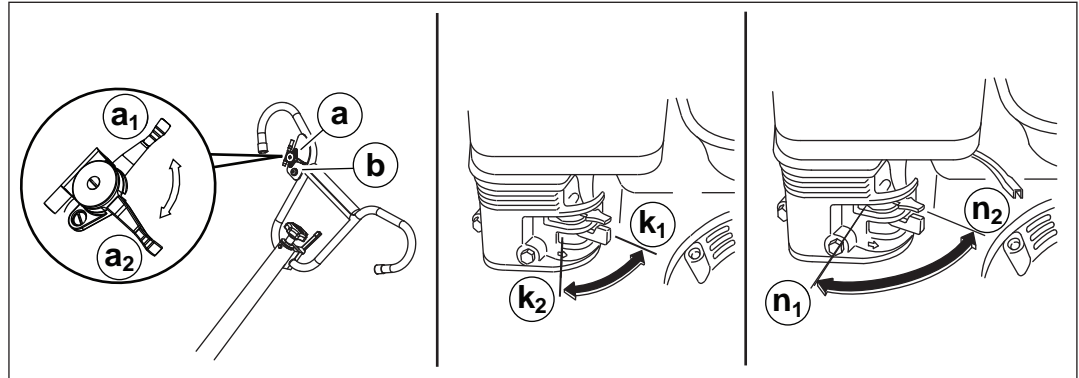
4.13 Starting, Operating, and Stopping the Machine

- Requirements**
- Fuel in fuel tank
 - Oil in the engine

Starting the machine

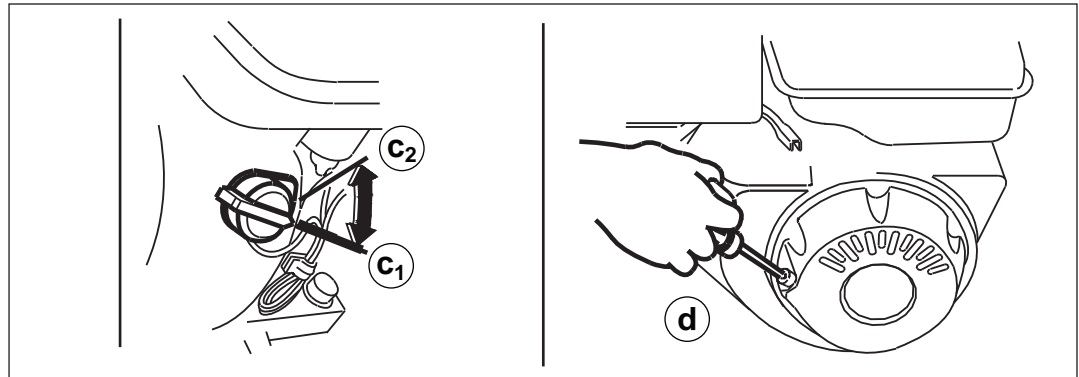
Perform the procedure below to start the machine.

1. Open the fuel valve by moving the lever to the right (**k1**).
 - ▶ If the engine is cold, move the choke to the closed position (**n1**).
 - ▶ If the engine is warm, move the choke to the open position (**n2**).



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2. Turn the ON/OFF switch to the ON position (**c1**).



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3. Move the throttle to the idle position (**a1**).

Note: *The engine does not start unless the throttle is in idle position.*



WARNING

Personal injury hazard. Placing foot on the ring guard when starting the engine may cause severe injury if the foot slips through the ring guard.

- ▶ Do not place foot on the ring guard when starting the engine.

4. Pull the starter rope (**d**) until the engine starts.

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5. Open the choke as the engine warms **(n2)**.



WARNING

Personal injury hazard. ALWAYS test the function of the engine control module before operating the trowel.

- ▶ DO NOT operate the trowel if the engine control module is not functioning properly.
-

6. Test the engine control module. See the topic *Testing the Engine Control Module*.

Notes

7. Open the throttle to operate the trowel **(a2)**.
 - When operating on soft concrete, do not let the trowel stand in one spot too long. Always lift the trowel from the slab when operation is complete.
 - “Left” and “Right” references are made from the operator's position.
-

**WARNING**

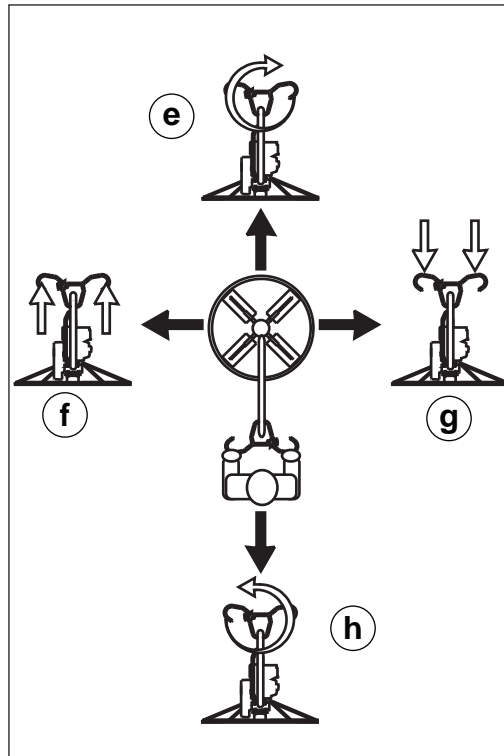
Personal injury hazard. Personnel other than the trowel operator should not be allowed in the work area, as severe injury can occur from contact with operating trowel blades.

- ▶ Only allow trowel operator in the area during trowel operation.
-

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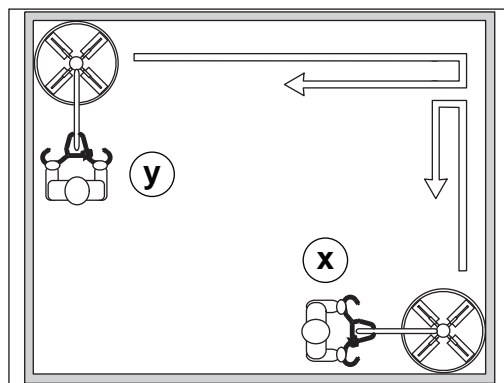
8. Move the trowel in the desired direction.
 - a. To move trowel forward, twist handle clockwise **(e)**.



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- b. To move backward, twist handle counterclockwise **(h)**.
- c. To move to the left, lift up slightly on the handle **(f)**.
- d. To move to the right, press down slightly on the handle **(g)**.

Note: To prevent the creation of valleys in the slab surface, it is recommended that each set of work passes **(x)** be 90° to the previous set of work passes **(y)**.



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Stopping the machine

9. Move the throttle to the idle position **(a1)**.
 10. Push the stop button **(b)**.
 11. Turn the ON/OFF switch to the OFF position **(c2)**.
 12. Close the fuel valve by moving the lever to the left **(k2)**.
 13. Allow the machine to cool.
 14. Clean the trowel after each use by flushing with water to remove concrete splatter. Do not use a high pressure washer to clean electrical equipment.
- Note:** *Do not attempt to clean, service or perform adjustments on the trowel while it is running.*



WARNING

Personal injury hazard. Touching a hot motor could burn the operator.

- ▶ Allow the motor to cool before cleaning or servicing the machine.
-

4.14 Emergency Shutdown Procedure

Procedure

If a breakdown or accident occurs while the machine is operating, follow the procedure below:

1. Stop the engine.
2. Close the fuel valve.
3. Remove the machine from the job site using correct lifting techniques.
4. Clean concrete from the blades and the machine.
5. Contact the rental yard or machine owner for further instructions.

5 General Maintenance



WARNING

A poorly maintained machine can malfunction, causing injuries or permanent damage to the machine.

- ▶ Keep the machine in safe operating condition by performing periodic maintenance and making repairs as needed.

5.1 Maintaining the Emission Control System

Normal maintenance, replacement or repair of emission control devices and systems may be performed by any repair establishment or individual; however, warranty repairs must be performed by a dealer/service center authorized by the engine manufacturer. See the supplied engine owner’s manual for the applicable emission warranty information.

5.2 Periodic Maintenance Schedule

The table below lists basic machine maintenance. Tasks designated with check marks may be performed by the operator. Tasks designated with square bullet points require special training and equipment.

	Daily	Every 50 hr	Every 100 hr
Check external hardware.	✓		
Clean trowel after each use to remove concrete splatter.	✓		
Grease blade arms as needed.		■	
Check drive belt.			■

5.3 Belt Replacement

Background The trowel is equipped with a self-adjusting clutch. This clutch automatically tightens the belt and compensates for belt wear. Replace the belt if the clutch can no longer tighten the belt enough to engage gearbox without slipping.

Procedure Perform the following procedure to replace the belt.

1. Shut off the engine.
2. Disconnect the spark plug lead.

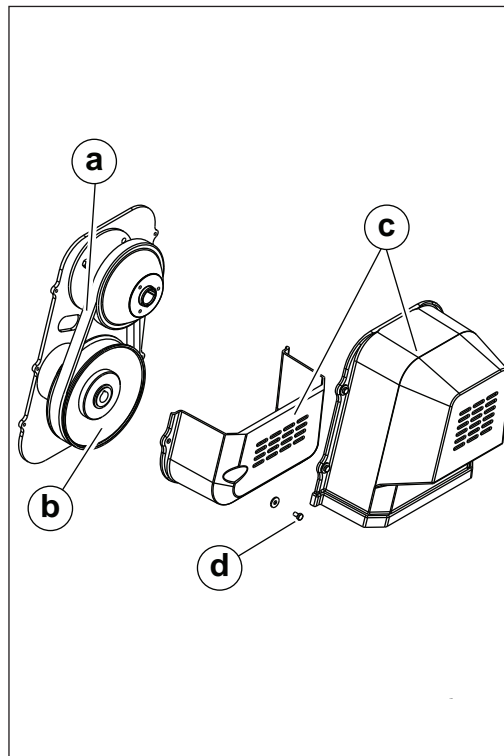


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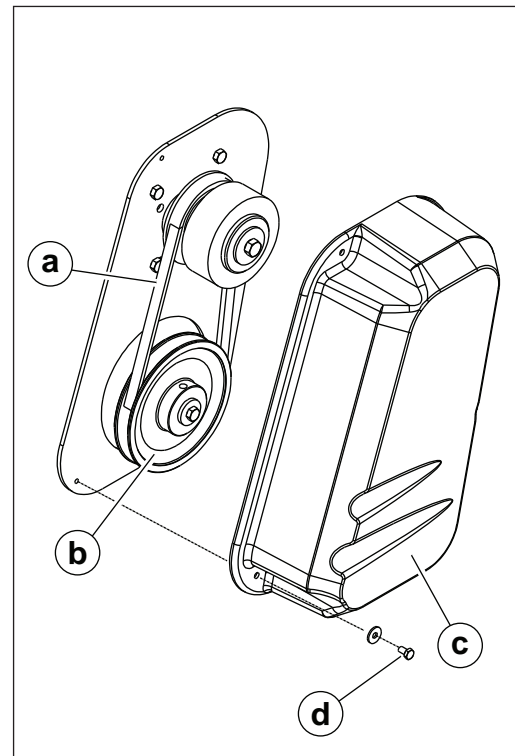
Personal injury hazard. Working on the machine with the spark plugs in may cause accidental starting of the machine which may lead to severe injury.

- Always disconnect the spark plug lead before working on the machine.

3. Loosen the screws **(d)** and remove the belt guard **(c)**.



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wc_gr002380

4. Slowly turn the pulley **(b)** and roll the belt **(a)** off.

Note: The clutch and the pulley are aligned at the factory and neither should be removed during belt replacement.

5. Install the new belt.
6. Re-install the belt guard with washers and screws. Torque the screws to 5 Nm (3.7 ft.lbs.).

5.4 Trowel Lubrication

Trowel part	Instructions
Trowel arms	Grease with Lithium #2 (Shell Gadus S2) or equivalent as needed.
Pitch control cable	Oil as needed.
Gearbox	Oil should not require replacement unless it was drained to service gearbox. Check quantity through plug located on the side of the gearbox. Oil level should be to the bottom of the plug threads. See chapter <i>Technical Data</i> for oil quantity and type.

5.5 Long-Term Storage

Introduction Extended storage of equipment requires preventive maintenance. Performing these steps helps to preserve machine components and ensures the machine will be ready for future use. While not all of these steps necessarily apply to this machine, the basic procedures remain the same.

When Prepare your machine for extended storage if it will not be operated for 30 days or more.

Preparing for storage Perform the procedures below to prepare your machine for storage.

- Complete any needed repairs.
- Replenish or change oils (engine, exciter, hydraulic, and gearcase) per the intervals specified in the Scheduled Maintenance table.
- Grease all fittings and, if applicable, repack bearings.
- Inspect engine coolant. Replace coolant if it appears cloudy, is more than two seasons old, or does not meet the average lowest temperature for your area.
- If your machine has an engine equipped with a fuel valve, start the engine, close the fuel valve, and run the engine until it stops.
- Consult the engine owner’s manual for instructions on preparing the engine for storage.

Stabilizing the fuel After completing the procedures listed above, fill the fuel tank completely and add a high-quality stabilizer to the fuel.

- Choose a stabilizer that includes cleaning agents and additives designed to coat/protect the cylinder walls.
- Make sure the stabilizer you use is compatible with the fuel in your area, fuel type, grade and temperature range. Do not add extra alcohol to fuels which already contain it (for example, E10).
- For engines with diesel fuel, use a stabilizer with a biocide to restrict or prevent bacteria and fungus growth.
- Add the correct amount of stabilizer per the manufacturer’s recommendations.

Storing the machine

Perform these remaining steps to store your machine.

- Wash the machine and allow it to dry.
- Move the machine to a clean, dry, secure storage location. Block or chock wheels to prevent machine movement.
- Use touch-up paint as needed to protect exposed metal against rust.
- If the machine has a battery, either remove or disconnect it.

NOTICE: Allowing the battery to freeze or completely discharge is likely to cause permanent damage. Periodically charge the battery while the machine is not in use. In cold climates, store and charge the battery indoors or in a warm location.

- Cover the machine. Tires and other exposed rubber items should be protected from the weather. Either cover them or use a readily available protectant.

5.6 Machine Disposal / Decommissioning

Introduction

This machine must be properly decommissioned at the end of its service life. Responsible disposal of recyclable components, such as plastic and metal, ensures that these materials can be reused—conserving landfill space and valuable natural resources.

Responsible disposal also prevents toxic chemicals and materials from harming the environment. The operating fluids in this machine, including fuel, engine oil, and grease, may be considered hazardous waste in many areas. Before decommissioning this machine, read and follow local safety and environmental regulations pertaining to the disposal of construction equipment.

Preparation

Perform the following tasks to prepare the machine for disposal.

- Move the machine to a protected location where it will not pose any safety hazards and cannot be accessed by unauthorized individuals.
- Ensure that the machine cannot be operated from the time of final shutdown to disposal.
- Drain all fluids, including fuel, engine oil, and coolant.
- Seal any fluid leaks.

Disposal

Perform the following tasks to dispose of the machine.

- Disassemble the machine and separate all parts by material type.
- Dispose of recyclable parts as specified by local regulations.
- Dispose of all non-hazardous components that cannot be recycled.
- Dispose of waste fuel, oil, and grease in accordance with local environmental protection regulations.

6 Engine Maintenance

6.1 Periodic Maintenance Schedule: Wacker Neuson WM170

The table below lists basic machine and engine maintenance. Tasks designated with check marks may be performed by the operator. Tasks designated with square bullet points require special training and equipment.

Refer to the engine owner’s manual for additional information.

	Daily before starting	After first 20 hours	Every 2 weeks or 50 hrs.	Every month or 100 hrs.	Every year or 300 hrs.	Every 500 hrs.
Check fuel level.	■					
Check engine oil level.	■					
Inspect fuel lines.	■					
Inspect air filter. Replace as needed.	■					
Check external hardware.	■					
Clean air cleaner elements.			■			
Change engine oil.		■*		■		
Clean sediment cup / fuel filter.				■		
Check and clean spark plug.				■		
Check and adjust valve clearance.					■	
Replace spark plug.						■

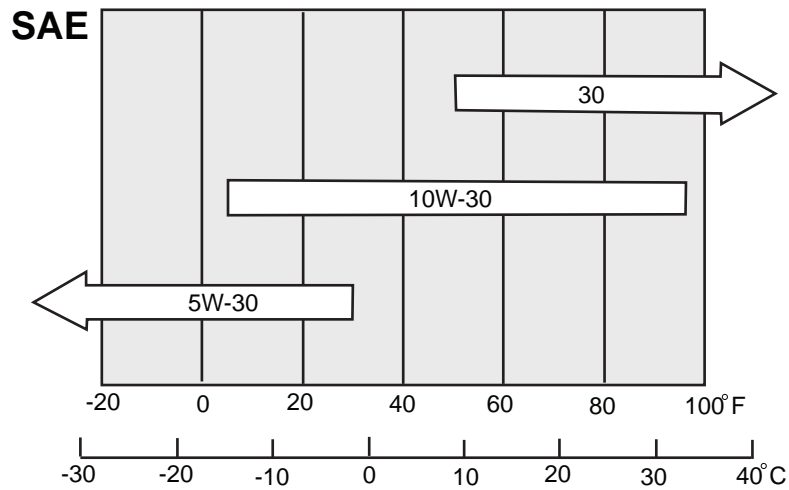
* Perform initially after first 20 hours of operation.
 Maintenance, replacement or repair of emission control devices and systems may be performed by any repair establishment or individual.

6.2 Engine Oil: Wacker Neuson WM 170

Using engine oil of the correct grade and viscosity greatly lengthens engine life and improves performance. Too much or too little oil can result in serious engine problems, including seizure.

- Always use the automotive-type engine oil of the viscosity shown in the table. Adjust the viscosity level as temperatures dictate.
- Check engine oil level before each use of the engine. Change engine oil according to the maintenance schedule.

Note: When using multi-grade engine oil, consumption rate tends to increase when the air temperature is high.



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6.3 Periodic Maintenance Schedule: Honda GX 160

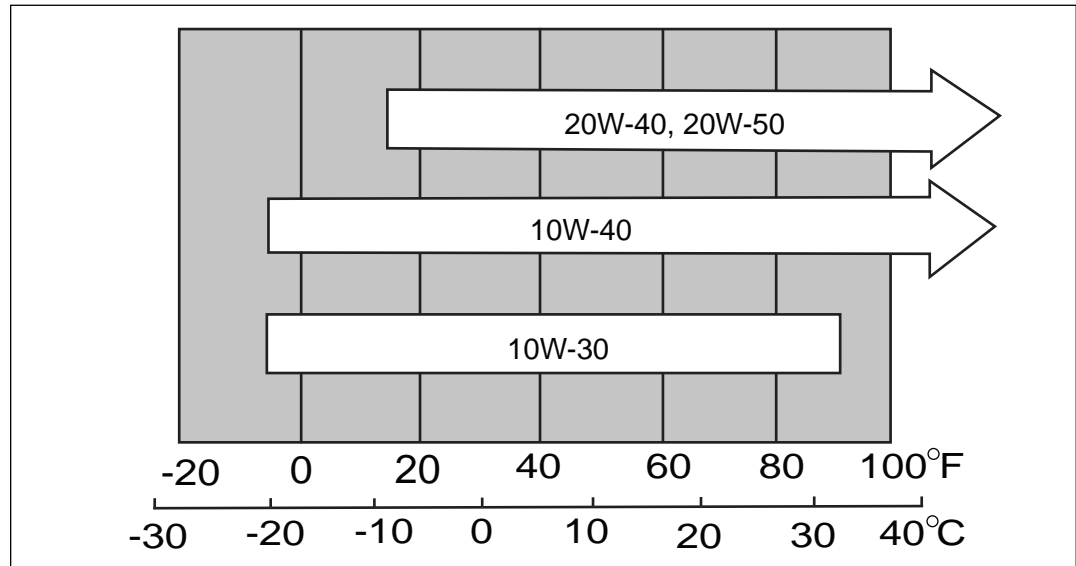
The engine maintenance schedule(s) in this chapter are reproduced from the engine owner's manual. For additional information, see the engine owner's manual.

Item: Perform at ever indicated month or operating hour interval, whichever comes first.	Daily before starting	First mo or 20 hr	Every 3 mo 50 hr	Every 6 mo 100 hr	Every year or 300 hr
Check the engine oil level.	■				
Check the reduction gear oil (applicable models only).	■				
Check the air cleaner.	■				
Change the engine oil.		■		■	
Change the reduction gear oil (applicable models only).		■			■
Clean the air cleaner. ¹			■		
Clean the sediment cup.				■	
Clean/readjust the spark plug.				■	
Clean spark arrester (optional part).				■	
Check/readjust the valve clearance. ²					■
Clean the fuel tank and strainer. ²					■
Check condition of the fuel lines. Replace when necessary. ² — every 2 years					
<p>¹ Service more frequently in dusty conditions.</p> <p>² These items should be serviced by an authorized Honda dealer, unless the owner has the proper tools and is mechanically proficient. See the Honda Shop Manual..</p>					

6.4 Oil recommendations

Use Honda 4-stroke oil, or an equivalent high-detergent, premium-quality motor oil certified to meet or exceed U.S. automobile manufacturer's requirements for Service Classification SG•SF/CC•CD. (Motor oils classified SG•SF/CC•CD will show this designation on the container.)

SAE 10W-30 is recommended for general, all-temperature use. Other viscosities shown in the chart may be used when the average temperature in your area is within the indicated range.



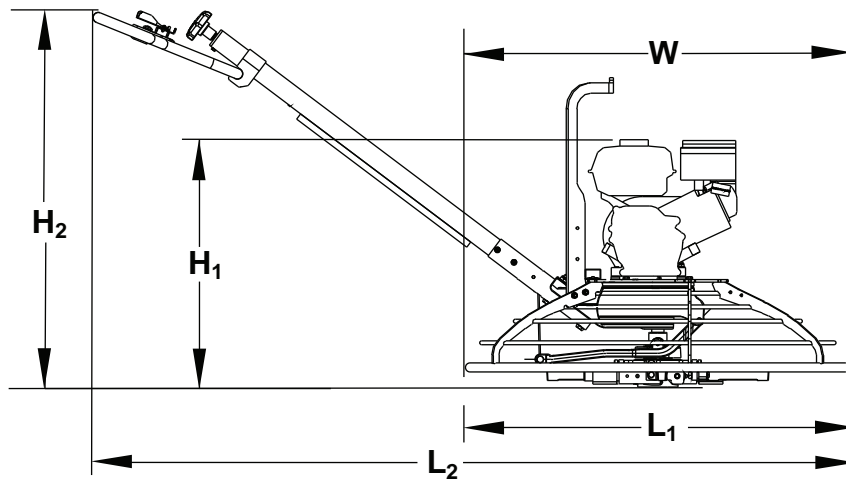
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Notes

- Engine oil is a major factor affecting engine performance and service life. Nondetergent oils and 2 stroke engine oils are not recommended because they have inadequate lubricating characteristics.
- Be sure to check the engine on a level surface with the engine stopped.

7 Technical Data

7.1 Dimensions



wc_gr001757

Model	Without handle	With handle		
	$L_1 \times W \times H_1$ mm (in.)	$L_2 \times W \times H_2$ mm (in.)	without weight kit kg (lb)	with weight kit kg (lb)
CT 36-5A	915x915x607 (36x36x24)	2005x915x1040 (79x36x41)	85 (183)	91 (201)
CT 36-8A	915x915x686 (36x36x27)	2005x915x1040 (79x36x41)	94 (208)	103 (226)
CT 36-8A-V	915x915x686 (36x36x27)	2005x915x1040 (79x36x41)	94 (208)	103 (226)
CT 48-8A	1220x1220x686 (48x48x27)	2160x1220x1040 (85x48x41)	105 (234)	114 (252)
CT 48-11A	1220x1220x712 (48x48x28)	2160x1220x1040 (85x48x41)	113 (250)	122 (268)
CT 48-13A-V	1220x1220x712 (48x48x28)	2160x1220x1040 (85x48x41)	121 (268)	130 (286)
CT 36-6	915x915x607 (36x36x24)	2005x915x1040 (79x36x41)	85 (183)	91 (201)
CT 36-9	915x915x686 (36x36x27)	2005x915x1040 (79x36x41)	90 (199)	98 (217)
CT 36-9-V	915x915x686 (36x36x27)	2005x915x1040 (79x36x41)	90 (199)	98 (217)
CT 48-9	1220x1220x686 (48x48x27)	2160x1220x1040 (85x48x41)	105 (234)	114 (252)

7.2 Engine: Honda

Engine Power Rating

Net power rating per SAE J1349. Actual power output may vary due to conditions of specific use.

Item No.		CT 36-5A 5000009438, 5000620106, 5000620829, 5200016256
Engine		
Engine make		Honda
Engine model		GX 160 K1 QX2
Max. rated power @ rated speed	kW (hp)	4.3 (5.7) @ 3800 rpm
Spark plug		NGK BPR 6ES
Electrode gap	mm (in.)	0.7–0.8 (0.028–0.031)
Operating speed	rpm	3800 ± 100
Engine speed - idle	rpm	1450 ± 100
Clutch engagement	rpm	1800
Valve clearance (cold) intake: exhaust:	mm (in.)	0.15 (0.006) 0.20 (0.008)
Air cleaner	type	Dual element
Engine lubrication	oil grade	SAE 10W30 SG or SF
Engine oil capacity	L (oz.)	0.6 (20)
Fuel	type	Regular unleaded gasoline
Fuel tank capacity	L (qt)	3.6 (3.8)
Fuel consumption	L (qt) /hr	1.8 (1.9)
Running time	hr	2

Item No.		CT 36-8A 5000009439 5000620831	CT 48A-8A 5000009449 5000620837
Engine			
Engine make		Honda	
Engine model		GX 240 K1 QA	
Max. rated power @ rated speed	kW (hp)	6.2 (8.3) @ 3800 rpm	
Spark plug		NGK BPR 6ES	
Electrode gap	mm (in.)	0.7–0.8 (0.028–0.031)	
Operating speed	rpm	3800 ± 100	
Engine speed - idle	rpm	1450 ± 100	
Clutch engagement	rpm	1800	
Valve clearance (cold) intake: exhaust:	mm (in.)	0.15 (0.006) 0.20 (0.008)	
Air cleaner	type	Dual element	
Engine lubrication	oil grade	SAE 10W30 SG or SF	
Engine oil capacity	L (oz.)	1.1 (37)	
Fuel	type	Regular unleaded gasoline	
Fuel tank capacity	L (qt)	6.0 (6.4)	
Fuel consumption	L (qt) /hr	2.7 (2.8)	
Running time	hr	2.25	

Item No.		CT 48-11A 5000009450 5000620835	CT 48-13A-V 5000009452 5000620836
Engine			
Engine make		Honda	
Engine model		GX 340 K1 QA	GX 390 U1 QA
Max. rated power @ rated speed	kW (hp)	8.7 (11.6) @ 3800 rpm	10 (13.4) @ 3800 rpm
Spark plug		NGK BPR 6ES	
Electrode gap	mm (in.)	0.7–0.8 (0.028–0.031)	
Operating speed	rpm	3800 ± 100	
Engine speed - idle	rpm	1450 ± 100	
Clutch engagement	rpm	1800	
Valve clearance (cold) intake: exhaust:	mm (in.)	0.15 (0.006) 0.20 (0.008)	
Air cleaner	type	Dual element	
Engine lubrication	oil grade	SAE 10W30 SG or SF	
Engine oil capacity	L (oz.)	1.1 (37)	
Fuel	type	Regular unleaded gasoline	
Fuel tank capacity	L (qt)	6.0 (6.4)	
Fuel consumption	L (qt) /hr	2.7 (2.8)	
Running time	hr	2.25	

7.3 Engine: Wacker Neuson

Engine Power Rating

Net power rating per SAE J1349. Actual power output may vary due to conditions of specific use.

Item No.		CT 36-6
Engine		
Engine make		Wacker Neuson
Engine model		WM170
Max. rated power @ rated speed	kW (hp)	4.2 (5.6) @ 3800 rpm
Spark plug		NGK BR6HS Champion RL86C
Electrode gap	mm (in.)	0.6–0.7 (0.024–0.028)
Operating speed	rpm	3800 ± 100
Engine speed - idle	rpm	1400 ± 100
Clutch engagement	rpm	1800
Valve clearance (cold) intake: exhaust:	mm (in.)	0.07–0.13 (0.0028–0.0051) 0.17–0.23 (0.0067–0.0091)
Air cleaner	type	Dual element
Engine lubrication	oil grade	SAE 10W30 SJ or higher
Engine oil capacity	L (oz.)	0.6 (20)
Fuel	type	Regular unleaded gasoline
Fuel tank capacity	L (qt)	3.6 (3.8)
Fuel consumption	L (qt) /hr	1.52 (1.6)
Running time	hr	2.4

Item No.		CT36-9 CT 36-9-V	CT 48-9
Engine			
Engine make		Wacker Neuson	
Engine model		WM270	
Max. rated power @ rated speed	kW (hp)	6.5 (8.7) @ 3800 rpm	
Spark plug		NGK BR6HS Champion RL86C	
Electrode gap	mm (in.)	0.7 – 0.8 (0.028 – 0.031)	
Operating speed	rpm	3800 ± 100	
Engine speed - idle	rpm	1400 ± 100	
Clutch engagement	rpm	1800	
Valve clearance (cold) intake: exhaust:	mm (in.)	0.07–0.13 (0.0028–0.0051) 0.17–0.23 (0.0067–0.0091)	
Air cleaner	type	Dual element	
Engine lubrication	oil grade	SAE 10W30 SJ or higher	
Engine oil capacity	L (oz.)	1.1 (37)	
Fuel	type	Regular unleaded gasoline	
Fuel tank capacity	L (qt)	6.0 (6.4)	
Fuel consumption	L (qt) /hr	2.5 (2.6)	
Running time	hr	2.4	

7.4 Trowel

Model	Trowel Diameter* mm (in.)	Number of Blades	Gear Box Lubrication type/ml (oz.)	Speed Range rpm	Pitch Range degrees
Trowel					
CT 36-6	915 (36)	4	Mobil Glygoyle 460 Approx. 620 (21)	60–125	0–30
CT 36-9					
CT 36-5A					
CT 36-8A				25–200	
CT 36-9-V					
CT 36-8A-V					
CT 48-9	1220 (48)			60–125	
CT 48-8A					
CT 48-11A				25–200	
CT 48-13A-V					

* Trowel blades must NOT be interchanged, i.e., do NOT put larger diameter blades on a smaller diameter trowel.

7.5 Sound and Vibration Specifications

The required sound specification, Paragraph 1.7.4.2.u of 2006/42/EC Machinery Directive, is:

- the sound pressure level at operator's location (L_{pA}) : "A" dB(A)
- the guaranteed sound power level (L_{WA}) = "B" 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.

ISO 5349 Part 1 Annex F states, "The vibration characteristics of a vibrating tool can be highly variable. It is therefore important that the range of vibration conditions associated with different work pieces, materials, working conditions, methods of use of the tool, and exposure duration patterns be reported."

- The average hand and arm vibration value obtained for the entire operating rpm range is "C" m/s².
- The maximum hand and arm vibration value obtained within the entire operating rpm range is "D" m/s².
- The minimum hand and arm vibration value obtained within the entire operating rpm range is "E" m/s².

Products are tested for hand/arm vibration (HAV) level in accordance with ISO 5349 Part 1 and ISO 8662 Part 1.

Model	A	B	C	D	E
CT 36-5A	103	89	4.8	7.3	3.7
CT 36-8A	109	95	5.9	7.9	4.8
CT 36-8A-V	109	95	3.4	4.1	2.6
CT 48-8A	109	95	3.9	5.2	3.2
CT 48-11A	113	96	8.4	9.1	6.9
CT 48-13A-V	115	98	5.7	9.0	3.8
CT 36-6	103	89	6.3	8.4	4.7
CT 36-9	109	95	3.9	6.9	2.9
CT 36-9-V	109	95	3.5	2.9	5.1
CT 48-9	109	95	5.4	8.1	3.0

The sound and vibration specifications were obtained on wetted and cured concrete using the most commonly sold machine configurations. Vibration values will vary depending on throttle position, operating conditions, and handle option.

HAV Uncertainties

Hand-transmitted vibration was measured per ISO 5349-1. This measurement includes an uncertainty of 1.5 m/s².

8 Troubleshooting

Problem / Symptom	Reason	Remedy
Trowel does not develop full speed.	<ul style="list-style-type: none"> ■ Buildup in engine cylinder and engine head ■ Engine speed too low ■ Dirty or damaged air filter ■ Debris in moving parts and trowel blades ■ Cold engine ■ Damaged throttle lever or cable 	<ul style="list-style-type: none"> ■ Remove deposits from engine cylinder and engine head. ■ Adjust speed. ■ Clean or replace air filter. ■ Clean debris from moving parts and trowel blades. ■ In cold weather, warm the engine in idle for 3 or 4 minutes. ■ Check throttle lever and cable for proper operation.
Engine runs; poor trowel operation.	<ul style="list-style-type: none"> ■ Damaged or worn belt ■ Damaged or worn clutch ■ Debris in moving parts and trowel blades 	<ul style="list-style-type: none"> ■ Check belt for wear or damage. ■ Check clutch for wear or damage. ■ Clean debris from moving parts and trowel arms.
Engine does not start or runs erratically.	<ul style="list-style-type: none"> ■ Low fuel level ■ Closed fuel valve ■ Dirty air filter ■ Damaged spark plug ■ Damaged in-line fuel filter ■ Low oil level ■ Engine stop button is stuck ■ Throttle not in idle position at startup 	<ul style="list-style-type: none"> ■ Check fuel level. ■ Open fuel valve. ■ Clean air filter. ■ Check/replace spark plug. ■ Check in-line fuel filter. ■ Check engine oil level. ■ Check engine stop button. ■ Check that throttle is in idle position when starting machine.
Trowel handle tends to rotate when idling.	<ul style="list-style-type: none"> ■ High engine speed ■ Belt alignment off 	<ul style="list-style-type: none"> ■ Check engine idle speed. ■ Check belt alignment.

9 Emission Control Systems Information and Warranty

The Emission Control Warranty and associated information is valid only for the U.S.A., its territories, and Canada.

9.1 Emission Control Systems Warranty Statement

See the supplied engine owner's manual for the applicable exhaust and evaporative emission warranty statement.





SAFETY MANUAL

FOR OPERATING AND MAINTENANCE PERSONNEL

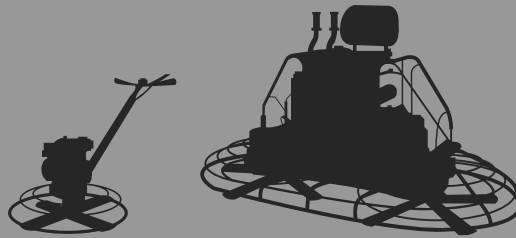


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Acknowledgment

We wish to thank the members of the Association of Equipment Manufacturers for their invaluable contributions in preparing this Safety Manual.

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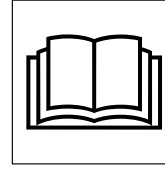
Foreword

This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of your trowel and to instruct you in safety practices for dealing with these conditions. This manual is **NOT** a substitute for the manufacturer's operating manual(s).

Additional precautions may be necessary, or some instructions may not apply, depending on equipment, attachments and conditions at the job site or in the service area. The manufacturer has no direct control over equipment application, operation, inspection, or maintenance. Therefore, it is **YOUR** responsibility to use good safety practices in these areas.

The information provided in this manual supplements the specific information about your trowel that is contained in the manufacturer's operating manual(s). Other information that may affect the safe operation of your machine may be contained in the following:

- Safety signs
- Insurance requirements
- Employer safety and training programs
- Safety codes
- Local, state/provincial, and federal laws, rules, and regulations



Read and understand manuals before operating

IMPORTANT! Before you operate this machine, make sure you have the manufacturer's manual(s) for this trowel and all attachments. If the manufacturer's manual(s) are missing, obtain replacements from your employer, equipment dealer, or directly from the manufacturer. Keep this safety manual and the manufacturer's manual(s) with the machine at all times. Read and understand all manuals.

Safety videos and other training resources are available from some manufacturers and dealers. Operators are encouraged to periodically review these resources.

3

Safety Alerts

Safety Alert Symbol

This Safety Alert Symbol means:
"Attention! Stay alert! Your safety is involved!"



The Safety Alert Symbol identifies important safety messages on equipment, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of death or personal injury. Carefully read the message that follows and inform other operators. Follow instructions in the safety message.

Signal Words

Signal words are distinctive words that are typically found on safety signs on the concrete power trowels and other job site equipment. These words may also be found in this manual and the manufacturer's manual(s). These words are intended to alert the operator to a hazard and the degree of severity of the hazard.



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



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



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



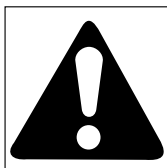
NOTICE is used to address practices not related to physical injury.

A Word to the User/Operator

It is **YOUR** responsibility to read and understand this safety manual and the manufacturer's manual(s) before operating this equipment. This safety manual takes you step by step through the working day.

Graphics have been provided to help you understand the text.

Hazard recognition and accident prevention depend upon you being alert, careful, and properly trained in the inspection, operation, transport, maintenance, and storage of this equipment.



Read and understand all safety signs – replace damaged signs

Remember that **YOU** are the key to safety. Good safety practices not only protect you but also protect the people around you. Study this manual and the manufacturer's operating manual(s) for the specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written only for concrete power trowels.

After studying the manufacturer's operating manual(s) and this safety manual, please contact the equipment manufacturer with any remaining questions.

Practice all usual and customary safe working precautions and remember:

Safe operation is up to you!

You can prevent death or serious injury caused by unsafe work practices!

5

Follow a Safety Program

For Safe Operation

You must be a qualified and authorized operator for safe operation of this trowel. You must clearly understand the written instructions supplied by the manufacturer, be trained—including actual operation—and know the safety rules and regulations for the job site. It is a good safety practice to point out and explain safety signs and practices to others, and to make sure they understand the importance of following these instructions.



Never operate while impaired by alcohol or drugs

⚠ WARNING! Death or serious injury could result from operating machinery while impaired by drugs or alcohol. Drugs and alcohol affect operator alertness, coordination, and the ability to safely operate the equipment. **Never operate the trowel while impaired by use of alcohol or drugs. Never knowingly allow anyone to operate the machine when their alertness or coordination is impaired.**

An operator taking prescriptions or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to safely operate this equipment.

Be Alert!

Know where to get assistance. Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone. Know how to use a first aid kit and fire extinguisher/fire suppression system; know their location and practice getting to them. Ensure they have been properly tested and maintained.

Let others know where you will be working, and what time you will be returning. In case of an emergency, you want others to know where to find you.

Be Aware!

Take advantage of training programs offered.

Know the proper response to a fire or chemical spill on your trowel.

Follow a Safety Program

Be Careful!

Human error is the result of many factors: carelessness, fatigue, sensory overload, preoccupation, unfamiliarity with the machine or attachments, or drugs and alcohol, to name a few. You can avoid death or serious injury caused by these and other unsafe work practices. Be careful; never assume accidents cannot happen to you.

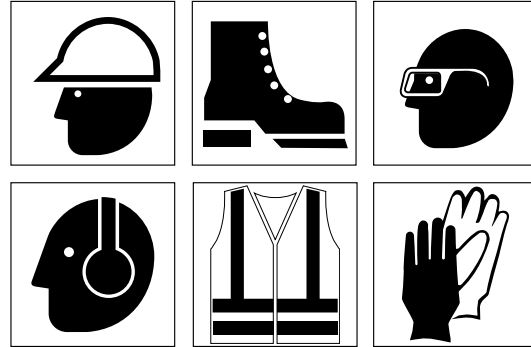
For your safety and the safety of others, act safely and encourage your fellow workers to act safely as well.

Protect Yourself

Wear all the personal protective clothing and Personal Protective Equipment (PPE) issued to you or called for by job conditions.

You may need:

- Hard hat
- Safety shoes
- Safety glasses, goggles, or face shield
- Heavy duty gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask



Wear whatever is needed to protect yourself—don't take chances.

⚠ WARNING! Avoid death or serious injury from entanglement. **Do not wear loose or frayed clothing or accessories that could catch on moving parts.** Examples of items to avoid include flopping cuffs, dangling neckties and scarves, wallets attached to chains, jewelry and wrist watches.

7

Follow a Safety Program

Know the Rules

Most job sites have rules governing equipment use and maintenance. Before you start work at a new location, check with the supervisor or safety coordinator. Ask about the rules you will be expected to obey.

OSHA enforces federal laws within the United States that apply to the safe operation, application, and maintenance of equipment on some job sites. It is the employer's responsibility to comply with these laws. A federal representative may periodically inspect a job site to see that these laws are being followed.

There may be other local, state/provincial, federal laws or international organizations that regulate the use of this equipment, along with specific job site or employer rules. It is important that you know and comply with all applicable laws and rules, **including those requiring operator training and certification.**

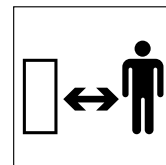
These are some of the rules you must work by:

- Only qualified and authorized individuals may operate this equipment.
- Inspect your machine and attachments before each use as specified by the manufacturer and your employer.

- Know the operating characteristics of your equipment. Do not misuse it.
- Wear proper clothing and PPE. Check that others are also wearing appropriate clothing.
- All shields, guards, air filters, access panels, and doors must be properly installed before each use.
- Know the rules regarding traffic at your job site. Know what all signs, flags, and markings mean. Know hand, flag, horn, whistle, siren, or bell signals, if used.
- Never modify or remove any part of the machine (except for qualified service personnel; then make sure the part is re-installed or replaced if defective or worn out).



Know and understand rules of operation



Keep bystanders away

8

Follow a Safety Program

- **Never allow children to play near, ride on or operate the equipment.**
- Keep bystanders away from the machine during operation.
- Know the work area before you use the equipment. Be aware of possible hazards.
- Only use attachments and parts that are approved by the manufacturer.
- Follow all safe shutdown instructions (See page 21, **Shut Down Safely**).

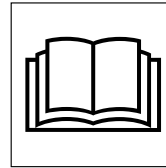
Know the Equipment

Read and understand the DANGER, WARNING, CAUTION, and NOTICE safety labels and other informational signs on the machine, the attachments, and in the manufacturer's operating manual(s). Ask your supervisor or dealer to explain any information you do not understand. Failure to obey safety instructions could result in death or serious injury.

Know the following about your equipment:

- Function, purpose, and use of all controls
- Correct operation speeds
- How to quickly stop equipment in an emergency
- Rated operating capacity

- Know the meaning of all identification symbols on the controls and gauges
- Know the location and type of emergency shut-down control the trowel is equipped with
- Never start or operate the trowel without protective guards and panels in place
- Know the capabilities and limitations of the trowel



Read and understand manuals before operating

Dust Precaution

Some dust created by construction activities may cause silicosis or respiratory harm.

Your risk of exposure varies depending on how often you do this type of work. To reduce your risk, work in a well ventilated area, use a dust control system, and wear approved personal safety equipment such as a dust/particle respirator designed to filter out microscopic particles.

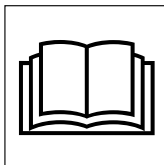
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Prepare for Safe Operation

Load and Unload Safely

Precautions

- Power trowels are heavy and awkward to move around.
- Do not attempt to lift the ride-on trowel by the guard rings.
- Use proper heavy lifting procedures.
- Keep all non-essential personnel clear of the area.
- Never lift the trowel over areas where people are standing or working.
- Remove tools and loose items before lifting.
- Make sure the crossbars on the safety catches are in good condition if so equipped.
- Always consult the machine's operator's manual for the best and proper lifting, loading, and unloading methods.



Read and understand manuals before loading and unloading

Walk-Behind Trowels

Some walk-behind trowels can be lifted or moved by two people utilizing lifting tubes or other special attachments. Generally however, they must be lifted using lifting bales (special lifting brackets), or other specific lifting points provided by the manufacturer, and cranes, hoists, or forklifts. Be certain any lifting devices used have adequate capacity.

Ride-On Trowels

Ride-on trowels are very heavy. They require heavy-duty lifting devices such as cranes or heavy-duty hoists to lift them on and off the concrete slab.

Be certain any lifting devices used have adequate capacity. Some ride-on trowels are equipped with lifting bosses that are used with specialized apparatus to assist in moving the trowels around. Use extreme care when lifting or moving a ride-on trowel.

Prepare for Safe Operation

Check and Use All Available Safety Devices

To protect you and others around you, your machine may be equipped with the safety equipment listed below. Additional equipment may be required or some items may not apply, depending on attachments used, job site conditions, or applicable job site rules. Check that each required item is securely in place and in operating condition:

- Emergency stop switch or other “Shut-Down” devices
- Guards, Shields & Panels
- Alarms or Warning Lamps
- Drain Covers, Plugs, and Caps
- Pressure Relief Devices
- Lights
- Special enclosures or accessories required for specific applications or job site conditions
- Safety Signs

Use them! Never remove or disconnect any safety device.

Check the Machine

Before beginning your work day, inspect the machine and have all systems in good operational condition.

- Perform daily and periodic service procedures as instructed by the equipment manufacturer.
- Check for broken, missing, loose, or damaged parts. Make necessary repairs.



Inspect the machine before each work day

- Keep handholds clean and free of grease, oil, dirt, snow or ice.
- Ensure shielding is properly installed and in good condition. Repair or replace if damaged or missing.
- Ensure all tools or loose objects are removed or securely fastened before operating the machine.

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Prepare for Safe Operation

Hydraulic Fluid Injection Hazard

▲ WARNING! Accidental injection of pressurized fluid into the hands or body is dangerous and could result in death or serious injury. **Use caution when checking hydraulic leaks as pressurized hydraulic fluid has enough force to penetrate skin, causing serious personal injury.**

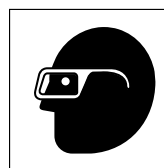
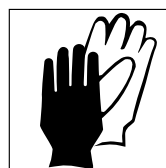
If a leak is discovered:

- Ensure engine is turned off; relieve pressure in hydraulic circuit.
- Wear proper hand and eye protection.
- Visually examine the hydraulic hose or fluid lines in the vicinity of the leak for breaks or cracks. **Do not** use your hand to check for leaks.
- Repair or replace hydraulic lines per manufacturer's recommendation.

Fluid injection injuries are not always obvious. Victims have reported such injuries feel like a bee sting or splinter under the skin. If you suspect you have a fluid injection injury, do not take chances. Seek proper medical care immediately. If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury.



Pressurized fluid can inject into the body



Wear proper hand and eye protection

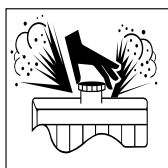
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Prepare for Safe Operation

Check the Cooling System

When checking the cooling system, make sure the engine is turned off and is cool. Remove the key to prevent fans from unexpectedly starting. Ensure the coolers and engine compartment are clean and free from debris, which could ignite and cause a fire.

If the machine is air-cooled, be sure the cooling unit has an unobstructed air flow. If it is liquid-cooled, check coolant level (at overflow tank, if provided).



Allow radiator to cool before removing cap slowly

⚠ WARNING! Allow the radiator to cool before checking the level. Hot radiator fluids could escape as steam and burn you. (See page 27, **Engine Coolant Hazards.**)

Use Caution When Fueling

⚠ WARNING! Avoid injury from fire or explosion. **Never fill the fuel tank with the engine running, while smoking or when near an open flame.**

Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately.

Be sure to use the correct type and grade of fuel.

Ground the fuel funnel or nozzle against the filler neck to prevent sparks that could ignite fuel vapors. Be sure to replace the fuel fill cap (if equipped) when you are done.



No smoking and no open flames in flammable/explosive atmospheres

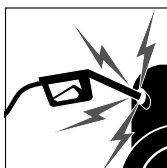
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Prepare for Safe Operation

Ultra-Low Sulfur Diesel (ULSD) Fuel Hazard

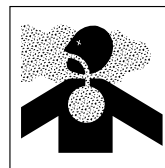
Avoid Static Electricity Risk When Fueling

⚠ WARNING! Ultra-Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations. Avoid death or serious injury from fire or explosion; **consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.**



Static discharge during fueling can cause explosion

⚠ WARNING! Exhaust fumes from diesel, gasoline or LP gas engines can kill. **Do not breath exhaust fumes from any kind of engine.**



Ventilate work area

Operating in Flammable/Explosive Atmospheres

⚠ WARNING! A trowel must not be operated in flammable or explosive atmospheres. Use in explosive atmospheres can result in fires and/or explosions which could cause serious injury or death.



Do not operate in explosive/flammable atmosphere

Follow Safe Operating Practices

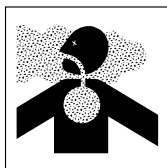
Exhaust Fumes in a Closed Space Can Kill

Vent exhaust and assure a flow of fresh air when an internal combustion engine is used in a closed space.

Prepare for Safe Operation

Avoid Crystalline Silica (quartz) Dust

⚠ WARNING! Avoid exposure to dust containing crystalline silica particles. This dust can cause serious injury to the lungs (silicosis).



Avoid silica dust

Because crystalline silica is a basic component of sand and granite, many activities at construction sites produce dust containing crystalline silica. Trenching, sawing and boring of material containing crystalline silica can produce dust containing crystalline silica.

If dust which contains crystalline silica is present there are guidelines which should be followed.

1. Be aware of the health effects of crystalline silica and that smoking adds to the damage.
2. Be aware of and follow OSHA (or other) guidelines for exposure to airborne crystalline silica.
3. Know the work operations where exposure to crystalline silica may occur.
4. Participate in air monitoring or training programs offered by the employer.
5. Be aware of and use optional equipment controls such as water sprays, local exhaust ventilation, and enclosed cabs with positive pressure air conditioning.
6. Where respirators are required, wear a respirator approved for protection against crystalline silica-containing dust. Do not alter the respirator in any way. Workers who use tight-fitting respirators cannot have beards/mustaches which interfere with the respirator seal to the face.
7. If possible, change into disposable or washable work clothes at the worksite; shower and change into clean clothing before leaving the worksite.
8. Do not eat, drink, use tobacco products, or apply cosmetics in areas where there is dust containing crystalline silica.
9. Store food, drink and personal belongings away from the work area.
10. Wash hands and face before eating, drinking, smoking, or applying cosmetics after leaving the exposure area.

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Prepare for Safe Operation

Know the Working Area

Learn as much about your working area as possible.

Check at Ground or Floor Level

Thoroughly check the area for unusual or dangerous conditions, such as tools, or items that may damage the trowel or be propelled by the trowels rotating blades. Note where pipes and forms are located. Locate and mark protrusions (rebar, anchor bolts, floor drains, etc.) in the concrete.

Plan Your Work

Know in advance the conditions likely to be encountered, and plan for any likely emergency.

Getting on and off a Ride-On Trowel

If operating a ride-on trowel, mount and dismount carefully. Use the steps and hand holds provided. Do not use control levers as hand holds and never use guard rings as steps. Watch for surfaces that may be slippery. Never jump off a ride-on trowel.

Operating on an Elevated Deck (Multi-Story Operation)

Consult local/state regulations before you operate equipment on an elevated deck. If operating on an elevated deck, ensure perimeter safety cabling of proper size and strength is in place. Do not operate the trowel close to the edge of the deck.



Use three points of contact when mounting and dismounting

Start Safely

Warn Personnel Before Starting

Before starting, walk completely around the machine. **Make sure no one is on it or close to it.** Let others know you are starting up and don't start until everyone is completely clear of the machine. As the equipment operator, you are responsible for the safe use of the machine, so always make sure you have communicated your work plans to others on the site.



Before starting,
walk completely
around trowel

Check the trowel thoroughly at delivery for any shipping damage.

Locate the trowel in an accessible location, as close to the work site as possible.

Secure the trowel after it is placed in its intended operating position so it does not tip, roll, slide or fall.

Starting the Engine

⚠ WARNING! Never attempt to start the engine by shorting across starter terminals. Serious injury or death may result.

Know the exact starting procedure for your machine. See the manufacturer's operating manual(s) for starting.

- Familiarize yourself with warning devices, gauges and operating controls.
- Make sure controls are in the neutral/locked position.
- Clear the area of all persons.
- Start the engine following the instructions in the manufacturer's operating manual(s).
- If necessary to run the engine or operate the machine in an enclosed area, ensure there is adequate ventilation.

⚠ WARNING! Never operate the machine without adequate ventilation. Exhaust fumes can kill. Do not breathe exhaust fumes!

For a walk-behind (pedestrian operated) trowel machine, make sure that a circular area with a minimum radius equal to the length of the machine is clear. This will ensure safety of personnel around the machine.

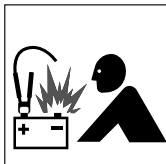
17

Start Safely

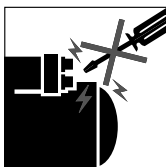
Starting Aids

If you have trouble starting the engine and need to use jumper cables, follow the instructions in manufacturer's operating manual(s). **Jump-starting is a two-person operation.** The operator must be in the operator's seat when jump-starting so the machine will be under control when the engine starts.

⚠ WARNING! Improper jump-starting procedures may cause serious injury or death from a battery explosion or a run-away machine. **Always use proper jump-starting procedure.** (See page 29, **Battery Hazards.**)



To avoid explosion,
follow proper jump-
starting procedures



Never start engine
by shorting across
starter terminals

Ether/cold start fluid is HIGHLY FLAMMABLE. Before using it, always read the instructions on the ether/cold start fluid container and the instructions in the manufacturer's operating manual(s).

⚠ WARNING! Avoid injury from explosion or fire. If the engine is equipped with a glow plug pre-heater or other intake manifold type pre-heater, follow manufacturer's instructions before using ether/cold start fluid.

After Starting Engine

Observe gauges, instruments, and warning lights to assure that they are functioning and their readings are within the operating range.

Run an Operating Check

Do not use a machine that is not in proper operating condition. It is your responsibility to check the condition of all systems and to run the check in a safe area.

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Operate Safely

Walk-Behind Trowels

- Ensure that the operator is familiar with the trowel and is trained on its operation.
- Do not start or operate the trowel if the drive train will not disengage. Centrifugal force between the trowel and surface when starting can cause uncontrolled handle movement that can cause serious injury. The handle must not move while pulling the engine recoil starter.
- Visually check to be sure that the blades are free of obstructions and the area is clear for operation.
- For trowels that use this feature, ensure that the emergency stop switch is in the ON position.
- Move the throttle to the idle position.
- Switch the engine ON/OFF switch to the ON position.
- Never place your foot on the ring guard when starting the engine or severe injury can occur if your foot slips through the ring guard as the blades start to spin.
- While firmly holding the handle with one hand, start the engine following the guidelines in the engine manufacturer's instruction manual.
- Hold the handle bar firmly with both hands while the trowel is "throttled-up".

- If control of the trowel is lost, stay clear and do not attempt to regain control until the trowel has stopped moving. Depending on the engine speed, the trowel handle can swing around before it stops completely.

Ride-On Trowels

- Ensure that the operator is familiar with the trowel and is trained on its operation.
- Ensure the operator is well rested and not fatigued, is alert, and not impaired in any way (medications, drugs, alcohol, etc.).
- Adjust the seating if necessary and get into a comfortable position where all controls are accessible.
- Visually check to be sure that the blades are free of obstructions and the area is clear for operation.
- Start the trowel following the instructions in the engine manufacturer's operation manual. For diesel powered trowels, follow the instructions for glow plug and cold start operation.
- Observe any gauges and warning lights to ensure they are functioning and their readings are within the manufacturer's normal operating range.
- Check operation of controls. Make certain they operate properly.

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Operate Safely

Electrical Equipment

Some walk-behind trowels are powered by electric motors. Electric motors and components present special hazards during operation. Read the operator's manual.

- Never operate a trowel with a damaged or worn electrical cord. When using an extension cord, be sure to use one heavy enough to carry the current load. When trowel is used outdoors, use only extension cords that are marked for outdoor use.
- Use only appropriate extension cords that have grounding-type plugs and receptacles that accept the machine's plug.
- Use an electrically powered trowel that has been built in accordance with the requirements of the National Electrical Code (NFPA-70) and has been approved by a Nationally Recognized Test Lab.



- Keep all electrical cords away from rotating components, heat, oil, and sharp edges to avoid damaging them.
- Avoid body contact with grounded surfaces such as pipes, metal railings, radiators and metal ductwork.
- Always check the power supply before running the trowel. Using the wrong voltage supply will damage the motor.
- Always make sure the motor switch is OFF or in the stop position before plugging the trowel into the power supply.
- Do not operate an electric powered trowel in the rain or snow. Keep the motor, switch, and electrical cords dry.
- Never operate the trowel in areas exposed to flammable or explosive liquids or gases. Sparks could ignite fumes.

Shut Down Safely

Storage

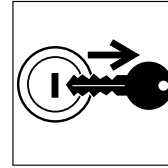
Always store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of reach of children.

⚠ WARNING! Avoid death or serious injury. **Never leave a machine unattended with the engine running.**

Safe Shutdown

The detailed shutdown procedure is given in your manufacturer's manual(s). In general, this includes:

- Stop machine.
- Position controls in neutral or locked position.
- Idle engine for short cool-down period.
- Stop engine and remove ignition key (if equipped).
- Cycle hydraulic controls to eliminate pressure.
- Lock covers and enclosures.
- Shut off master electric switch (if equipped).



**Shut engine off,
remove key**

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Perform Maintenance Safely

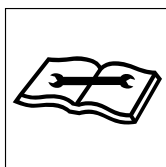
Know What You're Doing

Maintenance on this type of machine is not for inexperienced or untrained personnel. It can be hazardous unless performed properly. Be sure you have the necessary skill, information, correct tools, and proper equipment to do the job safely.

Be sure to maintain the equipment according to the manufacturer's instructions. Regularly check the operation of the protective and safety devices.

Do not perform any work on a machine unless you are authorized and qualified to do so.

If you have been authorized to perform maintenance, **read the manufacturer's operating and service manual(s)**. Study the instructions: check the lubrication charts, examine all the instruction messages on the machine.



Maintain equipment

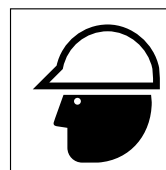
Protect Yourself

Wear all the personal protective clothing and PPE issued to you or called for by job conditions.

You may need:

- Hard hat
- Safety shoes
- Safety glasses, goggles or face shield
- Heavy duty gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask

Wear whatever is needed to protect yourself. Do not take chances.



Perform Maintenance Safely

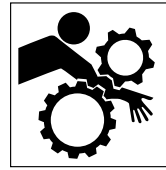
⚠ WARNING! Avoid death or serious injury from entanglement. **Do not wear loose clothing or accessories. Stay away from all rotating components when the engine is running.** Contact, wrapping or entanglement with rotating or moving parts could result in death or serious injury.

Wear a rubber apron and rubber gloves when working with corrosives. Wear gloves and safety shoes when handling wooden blocks or sharp-edged metal.

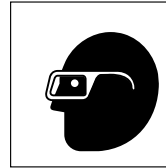
Always use safety glasses, goggles or a face shield. They provide eye protection from fluids under pressure, during grinding and while servicing batteries. Protection is also needed from flying debris, liquids and loose material produced by equipment, tools and pressurized air/water.

Wear a face shield and follow manufacturer's instructions when you disassemble spring-loaded components or work with battery acids. Keep pockets free of all objects that could fall out and drop into machinery.

Handle tools and heavy parts sensibly, with regard for the safety of yourself and others. Lower items; don't drop them.



Avoid rotating parts



Wear eye protection



**Do not
loosen
radiator cap
until cool**

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Perform Maintenance Safely

Prepare the Work Area

- Position the machine in a level area out of the way of other working equipment.
- Make sure there is adequate light, ventilation and clearance.
- Remove oil, grease or water to eliminate any slippery surfaces.
- Clean around the area to be serviced to minimize contamination.



**Avoid falls, clean
slippery surfaces**

Prepare the Machine

Stored energy sources (electrical, mechanical, hydraulic, pneumatic, chemical, thermal, etc.) must be controlled or reduced to a practical minimum before performing any maintenance, repair, or service procedures.

⚠ CAUTION! Load and unload machinery using proper procedures. (See page 10, **Load and Unload Safely.**)

Safety practices to prevent potential injuries from energy-releasing sources include:

- Place controls in NEUTRAL or LOCKED position before shutting off engine.
- Allow all moving parts to stop.
- Shut off engine.
- Follow your manufacturer's recommendation for relieving hydraulic system pressure.
- Lock ignition, remove key (if equipped) and take it with you.
- Look and listen for evidence of moving parts before dismounting.
- Shut off master electrical switch (if equipped).
- Securely support or block up machine before working underneath machine or other lifted components.
- Securely support, block up, or lock up other components with approved locking devices before working near or underneath them.
- Relieve pressure before disconnecting or disassembling any pressurized system.
- Block or relieve spring pressure before disassembling any spring-loaded mechanism.
- Avoid flames, sparks, or smoking near any fuel, hydraulic fluid or other flammable material such as spraying debris.

Perform Maintenance Safely

Attach a “DO NOT OPERATE” warning tag to the control levers. Lockout/tagout the unit according to the manufacturer’s operating manual(s). If there is a key, remove it and take it with you.

Install approved support device(s) when working under or near raised equipment.

Remove only guards or covers that provide access to the area being serviced. Replace all guards and covers when work is complete.

Do not operate the machine with gaurds removed.

⚠ WARNING! Avoid injury or death. **Never work on machinery with the engine running unless instructed by the manufacturer’s manual(s) for specific service.**

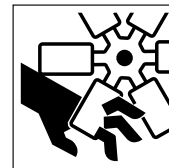
Trowel Maintenance and Repair

MAKE SURE the trowel is disconnected from the power source or the appropriate circuits are dead and OSHA Lockout/Tagout is applied before doing any maintenance or repair work on the trowel.



Trowel Blades, Pans and Attachments

- Do not attempt to clean, service or perform adjustments on the trowel while it is running.
- Do not remove blades or pans while the trowel is hanging overhead. Always support the trowel securely on a flat, level surface before changing blades or pans.
- Always handle blades and pans carefully. Worn blades or pans may develop sharp edges that can cause serious cuts.
- Always replace worn or damaged parts with service parts designated by the manufacturer.
- Replace blades and pans as a complete set – even if only one blade or pan is showing wear or damage. They can wear differently depending on different jobs, and a difference in blade size will damage the finish of the slab surface.
- Only use manufacturer approved polishing and brush attachments.



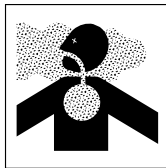
25

Perform Maintenance Safely

Common Maintenance Safety Practices

Use Proper Ventilation

Never run an engine in an enclosed area without an approved ventilation system.



Ventilate work area

⚠ WARNING! Exhaust fumes contain carbon monoxide which could be deadly if inhaled. **Never operate any type of engine without proper ventilation. EXHAUST FUMES CAN KILL.**

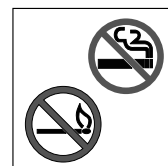
A feeling of tiredness, or nausea, is an indication of being overcome by exhaust. Shut the engine off immediately if this occurs.

Fuel Hazards

⚠ WARNING! Avoid serious injury or death. **Always use approved fuel containers and/or fuel dispensing equipment to reduce the risk of explosion or fire.**

Always observe these practices to reduce the possibility of a serious accident:

- Shut off engine and ignition during refueling.
- Turn off all electrical switches.
- Ground the fuel nozzle against the filler neck.
- Keep sparks and open flames away from fuel. Do not smoke while refueling or when handling fuel containers.
- Do not cut or weld on or near fuel lines, tanks or containers.
- Do not overfill the tank or spill fuel. Clean up spilled fuel immediately. Clean spills immediately.



No smoking and no open flames

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Perform Maintenance Safely

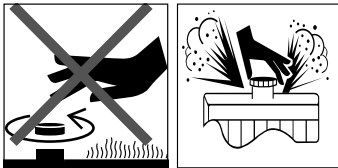
Ultra-Low Sulfur Diesel (ULSD) Hazard

⚠ WARNING! Ultra-Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher sulfur content. Avoid death or serious injury from fire or explosion; **consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.**

Engine Coolant Hazards

⚠ WARNING! Avoid serious injury or death. Liquid cooling systems build up pressure as the engine gets hot, so **use extreme caution before removing the radiator cap.**

- Stop the engine and wait for the system to cool.
- Wear protective clothing and safety glasses.
- Turn the radiator cap slowly to the first stop to allow the pressure to escape before removing completely.



Allow radiator to cool before removing cap slowly

Engine Coolant Hazards (cont.)

⚠ CAUTION! Before replacing engine coolant, refer to the manufacturer's operating manual(s) for direction. Using incorrect coolant type may cause overheating and increase safety risks.

Hydraulic System Hazards

Be sure to follow manufacturer's instructions for relieving fluid pressure before performing any maintenance. The hydraulic system is pressurized whenever the engine is on and may hold pressure even after the engine is shut off. Cycle hydraulic controls, including auxiliary hydraulic control (if equipped), after the engine is shut off.



Check for leaks and inspect hoses

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Perform Maintenance Safely

Hydraulic System Hazards (cont.)

During inspection of the hydraulic system:

- Wait for fluid to cool before disconnecting the lines. Hot hydraulic fluid can cause **severe burns**.
- Wear appropriate eye protection. Hydraulic fluid can cause permanent eye injury.
- When venting or filling the hydraulic system, loosen the filler cap slowly and remove it gradually.
- **Never** reset any relief valve in the hydraulic system to a pressure higher than recommended by the manufacturer.

Hydraulic Fluid Injection Hazard

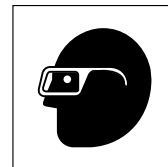
⚠ WARNING! Accidental injection of pressurized fluid into the hands or body is dangerous and could result in death or serious injury. **Use caution when checking hydraulic leaks as pressurized hydraulic fluid has enough force to penetrate skin, causing serious personal injury.**

If a leak is discovered:

- Ensure engine is turned off; relieve pressure in hydraulic circuit.
- Wear proper hand and eye protection.

- Visually examine the hydraulic hoses or fluid lines in the vicinity of the leak for breaks or cracks. **Do not** use your hand to check for leaks.
- Repair or replace hydraulic lines according to the manufacturer's recommendations.

Fluid injection injuries are not always obvious. Victims have reported such injuries feel like a bee sting or splinter under the skin. If you suspect you have a fluid injection injury, do not take chances. Seek proper medical care immediately. If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury.



Wear eye protection



Pressurized fluid can inject into the body

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Perform Maintenance Safely

Battery Hazards

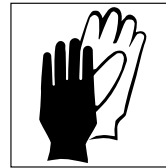
The liquid in batteries contains acid, which is a POISON and could cause SEVERE CHEMICAL BURNS.

Avoid injury:

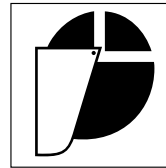
- Wear a face shield to prevent contact with your eyes.
- Wear chemical-resistant gloves and clothing to keep electrolyte off your skin and regular clothing.

⚠ WARNING! Electrolyte will damage eyes or skin on contact. **Always wear a face shield to avoid electrolyte in eyes.**

If liquid from the battery contacts your eyes, flush immediately with clean water and get medical attention. Wear chemical-resistant gloves and protective clothing to keep liquid off your skin. If liquid contacts exposed skin or clothing, wash off immediately with clean water. If liquid is ingested, drink large quantities of water or milk. DO NOT induce vomiting. Seek medical attention immediately.



Wear hand protection



Wear face protection

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Perform Maintenance Safely

Avoid Explosion

⚠ WARNING! Avoid serious injury from explosion. Lead-acid batteries produce extremely explosive gases especially when being charged. **Keep arcs, sparks, flames and lighted tobacco away.**

- Do not smoke near batteries.
- Keep them away from arcs, sparks and open flames.
- Provide adequate ventilation.

Never check the battery by placing a metal object across the battery posts. The resulting spark could cause an explosion.

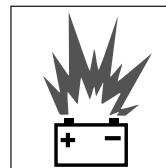
⚠ WARNING! Avoid serious injury from battery explosion. **Do not charge a battery or jump-start the engine if the battery is frozen.**

Warm to 60°F (15.6°C) or the battery may explode and could cause serious injury.

Safety rules during battery jump-starting:

- Follow the instructions for proper battery jump-starting, as specified in the manufacturer's manual(s).
- Be sure the machines are not touching.
- Adhere to the polarity of the batteries and connections.

- Make the final cable connection to the engine or the farthest ground point away from the battery. Never make the final connection at the starter or dead battery. Sparks may ignite the explosive gases present at the battery.
- When disconnecting cables, remove the cables in reverse order of connection (e.g., final connection first).



Avoid sparks and open flames near batteries



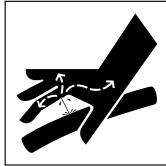
When jump-starting, observe polarity and make final connection at ground point

Perform Maintenance Safely

Complete Service and Repairs Before Machine is Released

Tighten all bolts, fittings, and connections to torques specified by the manufacturer.

Inspect for leftover components such as cotter pins, washers, locknuts, etc. after completing service. Replace any missing parts.



**Pressurized fluid
can inject into
the body**

Start the engine and check for leaks. (See page 27, **Hydraulic System Hazards**.) Operate all controls to make sure the machine is functioning properly. Test the machine if necessary. After testing, shut down and check the work you performed.

Recheck all fluid levels before releasing the equipment for operation.

All parts should be inspected during repair and replaced if worn, cracked or damaged. Excessively worn or damaged parts could fail and cause injury or death.

Install all guards, covers, and shields after servicing. Refill and recharge pressure systems only with manufacturer-approved or recommended fluids.



**Verify service work
when completed**

Notes

Notes

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Notes

Final Word to the User

You have just finished reading the AEM Concrete Power Trowel Safety Manual. It is impossible for this manual to cover every safety situation that you may encounter on a daily basis. Your knowledge of these safety precautions and your application to the basic rules of safety will help to build good judgment in all situations. Our objective is to help you develop, establish, and maintain good safety habits to make operating a concrete power trowel easier and safer for you.

Many pictorials in this safety manual can be downloaded at <http://pictorials.aem.org>.

For additional publications, visit our website at www.safetymaterials.org.

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ASSOCIATION OF
EQUIPMENT MANUFACTURERS

e-mail safetymaterials@aem.org
www.aem.org

This manual is one in a series on the safe operation of machinery, published by AEM.



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Important: For spare parts information, please see your Wacker Neuson Dealer, or visit the Wacker Neuson website at <http://www.wackerneuson.com/>.

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