

## 2 Safety Information

### 2.1 Safety Symbols Found in this Manual



---

This is the safety alert symbol. It is used to alert you to potential personal hazards.

- Obey all safety messages that follow this symbol..
- 

#### Notice

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

---

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



#### Important!

"Important" identifies an instruction that, when followed, provides for a more efficient and economical use of the machine.

---



#### Environment!

Failure to observe the instructions identified by this symbol can result in damage to the environment. The environment is in danger if environmentally hazardous material, such as waste oil, is not subject to proper use or disposal.

---

## 2.2 Warranty

Warranty claims must be submitted to your Wacker Neuson dealer only.

## 2.3 Designated Use and Exemption from Liability

1. In accordance with its designated use, the machine may be used **ONLY** for moving earth, gravel, coarse gravel or ballast and rubble. It may also be used for working with the attachments approved in the “Fields of Application” chapter.
2. No other applications are designated for the use of the machine. Neuson will not be liable for damage resulting from use other than mentioned above. The user alone will bear the risk.
3. “Designated use” also includes observing the instructions set forth in this Operator’s Manual and observing the maintenance schedule.
4. Machine safety can be negatively affected by carrying out machine modifications without proper authority and by using spare parts, equipment, attachments and optional equipment which have not been checked and released by Neuson. Neuson will not be liable for damage resulting from unapproved parts or unauthorized modifications. Neuson shall not be liable for personal injury and/or damage to property caused by failure to observe the safety instructions on labels and in this Operator’s Manual, and by the negligence of the duty to exercise due care when:
  - transporting the machine
  - operating the machine
  - servicing the machine and carrying out maintenance work
  - repairing the machine

This is also applicable when special attention has not been drawn to the duty to exercise due care.
5. Read and understand this Operator’s Manual before starting up, moving, operating, servicing or repairing the machine. Observe all safety instructions.
6. The machine shall **NOT** be used for transport jobs on public roads!

## 2.4 General Conduct and Safety Instructions

### Conditions for use

- The machine has been designed and built in accordance with state-of-the-art standards and recognized safety regulations. Nevertheless, its use can constitute a risk to the user or to third parties, or cause damage to the machine and to other material property.
- Read and follow this Operator’s Manual and other manuals that accompany the machine.
- The machine must only be used in accordance with its designated use and the instructions set forth in this Operator’s Manual.
- The machine must only be used by qualified operators who are fully aware of the risks involved in operating the machine.
- Do not start, move or operate a damaged or defective machine. Any mechanical dysfunctions, especially those affecting the safety of the machine, must be repaired immediately. Only qualified technicians shall determine how to move a damaged or defective machine to a safe place for diagnoses and repair.
- The user/owner commits himself to operate and keep the machine in serviceable condition and, if necessary or required by law, to require the operating or servicing persons to wear protective clothing and safety equipment

### User training and knowledge

- Always keep this Operator’s Manual and other manuals that accompany the machine in their storage compartment provided in the operator station on the machine. Immediately replace an incomplete or illegible Operator’s Manual.



- All persons working on or with the machine must read and understand the safety information in this Manual before beginning work. This applies especially to persons working only occasionally on the machine, such as performing set-up or maintenance tasks.
  - Follow, and instruct the operator in, legal and other mandatory regulations relevant to accident prevention and environmental protection. These may include handling hazardous substances, issuing and/or wearing personal protective equipment, or obeying traffic regulations.
  - The user/owner must regularly ensure that all persons entrusted with operation or maintenance of the machine are working in compliance with this Operator's Manual and are aware of the risks and safety factors of the machine.
- 

**Preparing for use**

- Before starting up the machine, ALWAYS inspect the machine to make sure that it is ready for safe work and travel operation.
  - Wear close-fitting work clothes that do not hinder movement. Tie back long hair and remove all jewelry (including rings).
- 

**Modifications and spare parts**

- NEVER make any modifications, additions or conversions to the machine and its superstructures (for example, cab, etc.), or the machine's attachments, without the approval of Neuson! Such modifications may affect safety and/or machine performance. This also applies to the installation and adjustment of safety devices and valves, as well as to welding work on load-bearing elements.
  - Spare parts must comply with the technical requirements specified by Neuson. Contact your Wacker Neuson dealer for assistance.
- 

## **2.5 Operator and Technician Qualifications and Basic Responsibilities**

**User/owner responsibility**

- Only allow trained and experienced individuals to drive, maintain, or repair the machine. NEVER let unauthorized or underaged persons operate with the machine.
  - Clearly and unequivocally define the individual responsibilities of the operator and technician for operation, maintenance, and repair.
  - Define the machine operator's responsibilities on the job site and for observing traffic rules. Give the operator the authority to refuse instructions by third parties that are contrary to safety.
  - Do not allow persons to be trained or instructed by anyone other than an experienced person. Also, NEVER allow persons taking part in a general training course to work on or with the machine without being supervised by an experienced person.
- 

**Repair person qualifications**

- Work on the electric system and equipment, on the undercarriage and the steering and brake systems may be carried out only by skilled individuals who have been specially trained for such work.
  - Work on the hydraulic system of the machine must be carried out only by a technician with special knowledge and experience in hydraulic equipment.
- 

## **2.6 Safety instructions Regarding Operation**

**Preparing for use**

- Keep the machine clean. This reduces the risk of fire hazards (such as from combustible materials like rags), and reduces the risk of injury or operational accidents that can be caused by dirt build-up on the drive pedals or foot rests and steps.
  - Observe all safety, warning, and informational signs and labels on the machine.
-

- Start and operate the machine from the seat only.
  - The operator must sit in the seat, fasten and adjust the seat belt before putting the machine into operation.
  - Always adjust the seating position before starting work. Never change the seat position when driving or working!
  - Make sure that all safety devices are properly installed and functional before starting work.
  - Before putting the machine/attachment into operation (startup/moving), make sure that no one in the immediate vicinity will be at risk.
- 

### Startup and shutdown

- Perform startup and shutdown procedures according to this Operator's Manual.
  - Observe all indicator lights.
  - Do not use starting fluid (for example, ether) especially in those cases in which a heater plug (intake air pre-heating) is used at the same time.
  - Make sure the control levers, the signaling and the light systems are functional before operating the machine, and also before restarting after an interruption of work.
  - Fold up the control lever base before releasing the seat belt in order to avoid unintentional operation.
- 

### Work area awareness

- Familiarize yourself with the surroundings and circumstances of the work site before beginning work. Be aware of:
    - obstacles in the working and traveling area
    - the soil bearing capacity
    - any necessary barriers separating the work site from public roads
  - Always keep at a safe distance from the edges of building pits and slopes.
  - Look out for the following when working in buildings or in enclosed areas:
    - height of the ceiling/clearances
    - width of entrances
    - maximum load of ceilings and floors
    - sufficient room ventilation—danger of carbon monoxide poisoning!
  - Observe the danger area. See "Danger area awareness".
  - Always use the rearview mirror.
  - Always switch on the work lights in conditions of poor visibility and after dark. However, make sure that users of public roads will not be temporarily blinded by the work lights.
  - Provide additional lighting of the work area if the lights of the machine are not sufficient for carrying out work safely.
- 

### Danger area awareness

- The danger area is the area in which persons are in danger due to the movements of the machine, work equipment, additional equipment, or material.
  - The danger area also includes the area affected by falling material, equipment or construction debris. The danger area must be extended by 0.5 m (20 inches) in the immediate vicinity of buildings, scaffolds, or other elements of construction.
  - Seal off the danger area if it is not possible to keep a safe distance. Stop work immediately if persons do not leave the danger area in spite of warnings!
- 

### Operating the machine

- Never operate the machine if you are standing on the ground.



- Operate the machine **ONLY** when you are seated and you have fastened your seat belt. Stop the engine before releasing the seat belt.
  - During operation on slopes, drive or work uphill or downhill. If traveling across a slope cannot be avoided, bear in mind the tilting limit of the machine. Always keep the attachments/work equipment close to the ground. This also applies to traveling downhill. When traveling or working across a slope, the load must be on the uphill side of the machine.
  - On sloping terrain, adapt your travel speed to the prevailing ground conditions.
  - Never get on or off a moving machine, and Never jump off the machine.
  - The travel control levers require practice before a user becomes familiar with the control response. Therefore, adjust the travel speed to your abilities and the surroundings.
  - When traveling across a slope with the telescopic undercarriage extended, position the boom facing down the slope, and the bucket about 10–20 cm (4–8 inches) above the ground. This will help to minimize the possibility of personal injuries and equipment damage caused by a hydraulic hose/connector failure in the telescopic undercarriage actuation system. The weight of the machine will cause the undercarriage to retract to the narrow configuration if hydraulic system pressure decreases due to lost fluid.
- 

**Carrying passengers**

- Do not transport people on the machine or in the attachment.
  - Never install a man basket or a working platform to the machine.
- 

**Mechanical integrity**

- Take the necessary precautions to make sure the machine is used only when in a safe and serviceable state.
  - Operate the machine **ONLY** if all protective and safety-oriented devices (ROPS, removable safety devices, soundproofing elements, exhausters, etc.) are in place and fully functional.
  - Check the machine before entering the cab to operate the machine for visible damage and defects. Report any changes, including changes in the machine's function and response, to your supervisor immediately!
  - If the machine is functioning unpredictably, stop the machine immediately, lock it, and report the malfunction to a qualified technician or supervisor. Safety-relevant damage or malfunctions of the machine must be rectified immediately.
- 

**Traveling**

- When traveling on or in public areas, observe all applicable regulations. Make sure beforehand that the machine is in compliance with these regulations.
- Installed work lights must **NOT** be used for travel.
- When crossing underpasses, gates, bridges and tunnels, or when passing under overhead lines, make sure the clearance height and width are sufficient to avoid contact.
- Empty the bucket before traveling on public roads.

## **2.7 Applications with Lifting Gear**

**General information**

- Craning applications are procedures involving raising, transporting and lowering loads with the help of slings and load-securing devices (for example, ropes and tracks). In doing so, the help of persons is necessary for securing and detaching the load. This applies, for example, to lifting and lowering pipes, shaft rings or containers.

- The excavator may be used for applications with lifting gear ONLY if the prescribed safety devices are in place and functional.
- 

### Safety criteria

- When used for craning applications, the machine must meet the following criteria:
    - Proper equipment for slinging and securing the load
    - Proper lift capacity per tables in this Operator's Manual
  - In addition, a safe load indicator is required for machines bearing loads of over 1000 kg (2205 lbs.) or an overturning moment of over 40000 Nm (29,477 ft.lbs.).
- 

### Conditions for safe operation

- Secure the load to prevent it from falling or slipping. Install an OSHA-approved load hook after removing the bucket or other approved attachment to provide a secure attachment point for the lifting sling, chain, or cable.
- Have loads fastened, and crane operators instructed, by a qualified person competent in raning operation and standard hand signals. The person giving instructions to the operator must be within sight of the operator during load attachment and load disconnection.
- The load shall be kept as close to the surface as practical to accomplish the craning operation. The operator shall gently move the controls and machine to avoid swing or oscillating motion of the load. A tether line is recommended to dampen the tendency of the load to swing or oscillate during the craning operation.
- Machine travel with a raised load must be done very carefully on a level surface moving very slowly to avoid sudden motion that can cause swinging or oscillating motion of the load.
- The person(s) attaching the load to the excavator shall approach only if the operator is in visual contact with them. No one shall approach the machine or attempt to attach the load until the excavator has stopped and the operator has signaled for the attachment.

## 2.8 Attachments

### General information regarding attachments

- Prior to traveling remove all attachments which cannot be secured in compliance with the legal regulations of your country.
  - The machine operating characteristics including steering vary with different option attachments and counter weights. The operator shall be familiar with the variations and act accordingly.
  - Use only approved attachments and connecting hardware.
  - Attach and remove attachments carefully to avoid damage and potential injury.
  - Attach and remove attachments carefully to avoid damage and potential injury.
  - Confirm that the attachment has been properly and securely attached to the machine according to the instructions. Before using the attachment, the operator shall confirm that the attachment performs correctly in response to control actuation.
  - Do not attach the attachment with the engine running and the machine moving.
  - Before putting the machine/attachment into operation (startup/moving), make sure that no one in the immediate vicinity will be at risk.
  - Before leaving the seat, always secure the machine against unintentional movement and unauthorized use. Lower the attachments to the ground.
- 

### Installation notes

- Couple and uncouple hydraulic hoses/lines (hydraulic quick couplers) only if the engine is stopped and the controls actuated to release the hydraulic pressure remaining in the circuit. Follow the operating instructions for releasing the pressure.



- Operate the machine only if all protective devices for the attachments have been installed and are functional, and if all brake, light and hydraulic connections have been connected.
- If an optional attachment is installed, make sure that all lights and associated indicator lamps are installed and functional.
- The lock pin of the quick hitch attachment shall be visible at each end of the pin to confirm that the attachment is securely locked in place. The operator shall perform a check operation to confirm the latching integrity before operating at a production pace.
- Prior to fitting attachments to the stick (the mobile extension of the boom), secure the control lever of the hydraulic control unit against unintentional movement. Raise the left arm rest to avoid unintentional activation for the ISO/SAE operating mode. Avoid actuating the right hand control if the alternative control mode is selected.

## 2.9 Transport and Towing

### Towing

The machine must be towed, loaded and transported according to the procedures described within this Operator's Manual. See section [See "Strapping down the machine" on page 40.](#)

---

### Transporting

- The transporting vehicle must have sufficient load capacity and platform size to safely transport the machine. Refer to section 6 of this manual to determine the physical characteristics of the machine before loading and transporting.
- Use OSHA-approved straps, tracks or cables to securely fastened the machine to the surface of the transport.
- Use the tie down points provided on the load surface of the transport.
- Attach the tie down devices to the excavator at the designated tie down points.
- Confirm that the excavator tie down procedures will prevent sideways, forward, rearward and upward motion of the excavator in the event the transport vehicle is involved in an incident or sudden avoidance maneuver.

## 2.10 Safety Guidelines for Maintenance

### General maintenance notes

- Adhere to prescribed intervals or those specified in this Operator's Manual for routine checks/inspections and maintenance work.
  - For inspection and maintenance work, ensure that all tools and workshop equipment are capable of performing the tasks prescribed. Do not use defective or broken tools. Use certified measuring devices that are routinely calibrated for accuracy (torque wrench, pressure gauge, ammeter, etc.).
  - Replace hydraulic hoses within stipulated and appropriate intervals even if no safety-relevant defects have been detected.
  - Make sure all consumables and replaced parts are disposed of safely and with minimum environmental impact.
  - Always tighten any screws, electrical connections, or hose connections that may have been loosened during maintenance.
  - Upon completion of the maintenance and repair work, immediately refit and check any safety devices removed for set-up or maintenance purposes.
- 

### Personal safety measures

- Brief the technician and the operator before beginning maintenance or repair work. Appoint someone to supervise the activities.

- Always work in groups of two when diagnosing a machine problem requiring the engine to be running. Both persons must be trained on the machine—one person must be seated on the seat and maintain visual contact with the other person.
  - Observe the specific safety instructions in the Maintenance section of this Operator's Manual.
  - Always keep a safe distance from all rotating and moving parts, for example, fan blades, V-belt drives, PTO shaft drives, fans, etc.
  - Before starting work on the machine, always ensure safe blocking/support.
  - Apply special care when working on the fuel system due to the increased danger of fire.
  - Engine and exhaust system become very hot during operation and require cool-down time after machine is shut off. Avoid contact with hot parts. Wait for the machine to cool before touching components.
  - Retainer pins can fly out or splinter when struck with force. Avoid striking the pins during operation, repair, or maintenance.
  - Do not use starting fluid (for example, ether), especially in those cases in which a heater plug (intake air pre-heating) is used at the same time.
- 

### Preparing for maintenance and repair work

- Prior to carrying out repair and maintenance work, always attach a warning label such as "Repair work—do not start machine!" to the control elements as a precautionary measure.
  - Observe the startup and shutdown procedures set forth in this Operator's Manual. This applies to any work concerning the operation, conversion or adjustment of the machine and its safety-oriented devices, or any work related to inspection and maintenance.
  - Prior to carrying out assembly work on the machine, stabilize the area under repair and use proper lifting and support devices to change parts weighing more than 9 kg (20 lbs.).
  - Carry out maintenance work ONLY if:
    - the machine is positioned on firm and level ground
    - secured against unintentional movement
    - all hydraulically movable attachments and working equipment have been lowered to the ground
    - if the engine is stopped
    - if the starting key has been removed
    - the pressure accumulator is discharged
  - Carry out maintenance work beneath a raised machine, attachments or additional equipment ONLY if a safe and secure support has been provided. The use of hydraulic rams or jacks as the sole method of support does NOT sufficiently secure raised machines or equipment/attachments!
- 

### Performing maintenance and repairs

- Observe the adjustment, maintenance and inspection activities and intervals set forth in this Operator's Manual, including information on the replacement of parts and partial equipment. These activities must be carried out only by qualified personnel.
- Disconnect the negative battery terminal when working on the electrical system.
- Do not allow the machine to be serviced, repaired, or test-driven by unauthorized personnel.
- If maintenance with the engine running cannot be avoided, lower the stabilizer blade and raise the control lever base.
- Wear a safety harness when performing elevated maintenance work. Keep all handles, steps, handrails, platforms, landings, and ladders free from dirt, snow and ice.





- Always use specially designed or otherwise safety-oriented ladders and working platforms to carry out overhead assembly work. NEVER use machine parts or attachments/superstructures as a climbing aid!
- Do not use the work equipment as lifting platforms for persons.
- In accordance with this Operator's Manual and instructions for the respective assembly, release the pressure in all system sections and pressure lines (hydraulic system) before carrying out any maintenance work.

## 2.11 Special Hazards

### Battery

- In case of a frozen battery or of an insufficient electrolyte level, do not try starting the machine with battery jumper cables. The battery can burst or explode.
  - Batteries contain caustic sulphuric acid. When handling the battery, observe the specific safety instructions and regulations relative to accident prevention.
  - A volatile oxyhydrogen mixture forms in batteries during normal operation and especially when charging. Always wear gloves and eye protection when working with batteries.
  - Starting the machine with a battery jumper cable can be dangerous if carried out improperly. Observe the safety instructions regarding the battery.
- 

### Tracks

- Repair work on the tracks must be carried out only by trained technical staff or by an authorized workshop.
  - Defective tracks reduce the machine's operational safety. Therefore, check the tracks regularly for cracks, cuts or other damage.
  - Check track tension at regular intervals.
- 

### Electric energy

- Use only original fuses with the specified current rating.
  - In case of electrical system malfunctions, switch off the machine immediately, disconnect the battery (by using the battery master switch), and carry out troubleshooting procedures.
  - When working with the machine, maintain a safe distance from overhead electric lines! If work must be carried out close to overhead lines, the equipment and attachments must be kept well away from them.
  - If the machine comes into contact with a live wire:
    - Immediately drive the machine out of the danger area.
    - Warn others against approaching and touching the machine.
    - Do not leave the machine until the line that has been touched or damaged has been safely de-energized!
  - Make sure that work on the electric system is carried out only by a technician with appropriate training, in accordance with applicable electrical engineering codes.
  - Inspect and check the electrical equipment of the machine at regular intervals. Defects such as loose connections or scorched cables must be repaired immediately.
  - Observe the operating voltage of the machine/attachments. The voltages must be compatible (12 volts) and confirm that an appropriate fuse or circuit breaker is incorporated in the system to prevent damage from malfunction or short circuit.
  - Always remove the grounding strap from the battery when working on the electric system.
-

### Hydraulics

- Check all lines, hoses, and threaded couplers and fittings regularly for leaks and obvious damage. Repair any damage and leaks immediately. Splashed oil can cause injury and fire!
- 

### Noise

- Close all doors and windows if practical.
  - Wear ear protection. This is especially important when performing hammer operations or working in enclosed areas.
- 


### MSDS

- When handling oil, grease, and other chemical substances such as battery electrolyte or hydraulic fluid, observe the product-related safety regulations (Material Safety Data Sheet (MSDS)).

## 2.12 Safety Guidelines while using Internal Combustion Engines

---

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

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

---

### Running the engine

When running the engine:

- Keep the area around 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:

- Engine exhaust **CAN KILL YOU IN MINUTES**. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell. Never run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided.
  - Do not smoke while operating the machine.
  - Do not run the engine near 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 remove the radiator cap when the engine is running or hot. The radiator fluid is hot and under pressure, and may cause severe burns!
- 

### Fueling the engine

When fueling the engine:

- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Replace the fuel tank cap after refueling.

When fueling the engine:

- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near an open flame